Evaluation of the Home Health Value-Based Purchasing (HHVBP) Model

First Annual Report:
Appendix of Supplemental Tables and Results

Arbor Research Collaborative for Health
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Table 1. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Arizona

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	133	146	150	149	146
Ownership					
% For-Profit	89.5	89.7	88.0	89.3	89.0
% Non-Profit	10.5	10.3	12.0	10.7	11.0
% Government-Owned	0.0	0.0	0.0	0.0	0.0
Setting					
% Hospital-Based	8.3	6.2	6.0	4.7	4.8
% Freestanding	91.7	93.8	94.0	95.3	95.2
% Chain Affiliation	31.5	30.3	29.7	30.3	31.3
Average Age	10.2	10.5	10.3	10.7	11.5
Entry/Exit*					
# New HHAs that Entered	N/A	13	11	11	5
# HHAs that Exited	N/A	3	10	12	11
HHAs per 10,000 Medicare Beneficiaries	2.2	2.4	2.3	2.3	2.1
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	36,913	39,277	40,651	42,826	44,110
Average Age	77.7	77.8	77.8	78.1	78.3
% Female	61.9	60.7	60.9	59.9	62.4
Race/Ethnicity					
% White	91.1	90.8	90.6	90.1	89.7
% Black	2.9	2.8	2.8	2.9	3.0
% Hispanic	2.6	2.7	2.8	2.9	2.9
% Other	0.9	0.9	1.0	1.0	1.1
% Rural	1.0	0.7	0.8	0.8	0.9
% Dual Eligible	16.0	15.6	16.4	16.5	16.4
Chronic Conditions					
% Chronic Kidney Disease	45.7	46.5	47.5	51.2	56.5
% Congestive Heart Failure	39.7	38.6	36.8	38.1	39.0
% Diabetes	40.5	40.5	40.4	41.2	41.4
% Pressure Ulcers and Chronic Ulcers	25.8	25.1	25.1	25.4	25.9
% Alzheimer's Disease and Related Disorders or Senile Dementia	32.5	31.9	31.8	33.5	37.0
% Ischemic Heart Disease	54.7	53.8	52.3	53.1	53.4
% Anemia	65.0	62.7	61.0	60.2	59.4
Episode Characteristics					
Total # Episodes	56,283	60,003	62,756	68,077	71,442
Episodes Type**					
% Normal	83.7	83.8	84.2	84.0	84.1
% LUPA	12.1	11.4	11.3	11.1	10.4
% Outlier	1.0	1.8	1.4	1.6	2.5
% PEP	4.6	4.8	4.6	4.7	4.5
Episodes within a Sequence					
% 1st in Sequence	69.8	69.6	68.9	67.5	65.9
% 2nd in Sequence	13.9	15.9	14.2	14.6	15.4
% 3rd+ in Sequence	16.4	16.3	16.9	17.9	18.8
# Visits in an Episode	15.0	15.0	14.8	15.1	15.7
Visits by Type					
% Therapy	44.1	45.2	45.9	47.1	47.7
% Skilled Nurse	45.6	45.4	45.6	44.7	44.4
% HH Aide	9.0	8.2	7.4	7.1	6.9
% Medical Social Services	1.3	1.1	1.1	1.1	1.0

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 2. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Florida

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	1,420	1,357	1,235	1,121	1,028
Ownership					
% For-Profit	94.3	94.2	93.9	92.5	91.5
% Non-Profit	5.5	5.6	5.7	6.4	7.3
% Government-Owned	0.2	0.2	0.5	1.1	1.2
Setting					
% Hospital-Based	1.1	1.3	1.7	1.9	1.7
% Freestanding	98.9	98.8	98.3	98.1	98.4
% Chain Affiliation	18.7	19.4	19.9	21.3	27.0
Average Age	7.1	7.8	8.8	9.6	10.7
Entry/Exit*					
# New HHAs that Entered	N/A	89	41	60	29
# HHAs that Exited	N/A	134	169	179	117
HHAs per 10,000 Medicare Beneficiaries	6.0	5.7	5.1	4.7	4.3
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	341,066	341,506	333,895	324,907	313,229
Average Age	77.3	77.4	77.6	77.9	78.1
% Female	62.1	61.6	61.1	60.8	60.1
Race/Ethnicity					
% White	80.0	80.1	80.9	82.3	83.6
% Black	8.8	8.7	8.5	8.4	8.2
% Hispanic	9.5	9.3	8.6	7.1	6.0
% Other	0.8	0.8	0.9	0.9	0.9
% Rural	1.7	1.6	1.7	1.9	1.9
% Dual Eligible	34.6	33.9	32.3	29.8	27.7
Chronic Conditions					
% Chronic Kidney Disease	38.9	40.7	43.3	47.4	53.2
% Congestive Heart Failure	41.7	41.1	41.2	41.9	42.1
% Diabetes	49.3	49.6	49.5	48.9	48.3
% Pressure Ulcers and Chronic Ulcers	22.7	22.8	23.5	24.4	25.0
% Alzheimer's Disease and Related Disorders or Senile Dementia	39.2	39.7	40.6	41.8	43.6
% Ischemic Heart Disease	66.1	64.9	63.6	62.9	62.2
% Anemia	66.6	65.6	65.0	64.7	64.7
Episode Characteristics					
Total # Episodes	693,206	687,914	663,322	643,197	604,059
Episodes Type**					
% Normal	83.9	83.6	84.2	83.8	82.9
% LUPA	6.5	6.3	6.4	6.6	6.9
% Outlier	6.5	7.3	6.4	6.7	7.2
% PEP	4.4	4.2	4.1	4.1	4.4
Episodes within a Sequence					
% 1st in Sequence	56.4	57.5	56.9	55.3	56.5
% 2nd in Sequence	15.4	12.6	15.7	15.8	15.9
% 3rd+ in Sequence	28.2	27.2	27.4	28.9	27.6
# Visits in an Episode	21.1	21.0	20.7	20.5	20.0
Visits by Type					
% Therapy	38.4	40.7	41.8	42.5	43.7
% Skilled Nurse	52.3	50.4	49.8	49.4	48.9
% HH Aide	8.8	8.4	8.0	7.6	6.9
% Medical Social Services	0.5	0.5	0.5	0.5	0.5

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.*

Table 3. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Iowa

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	164	159	157	153	153
Ownership					
% For-Profit	27.4	28.9	29.3	30.7	30.7
% Non-Profit	28.7	29.6	30.6	32.0	31.4
% Government-Owned	43.9	41.5	40.1	37.3	37.9
Setting					
% Hospital-Based	36.6	34.6	33.1	33.3	32.7
% Freestanding	63.4	65.4	66.9	66.7	67.3
% Chain Affiliation	28.0	30.3	27.0	29.1	42.9
Average Age	26.8	27.4	28.0	28.0	28.8
Entry/Exit*					
# New HHAs that Entered	N/A	6	2	7	3
# HHAs that Exited	N/A	6	6	9	7
HHAs per 10,000 Medicare Beneficiaries	3.6	3.4	3.3	3.2	3.2
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	25,091	26,727	26,239	26,164	24,126
Average Age	78.5	78.3	78.1	78.2	78.0
% Female	65.7	64.7	63.7	62.9	62.8
Race/Ethnicity					
% White	96.6	96.4	96.1	95.8	96.0
% Black	2.1	2.3	2.4	2.5	2.3
% Hispanic	0.4	0.3	0.4	0.4	0.5
% Other	0.3	0.3	0.4	0.4	0.4
% Rural	25.3	24.5	24.9	24.1	24.6
% Dual Eligible	20.3	20.2	20.6	20.0	21.6
Chronic Conditions					
% Chronic Kidney Disease	42.5	43.1	44.6	47.7	53.3
% Congestive Heart Failure	43.1	43.2	42.5	43.4	43.7
% Diabetes	40.5	40.4	40.9	40.8	41.8
% Pressure Ulcers and Chronic Ulcers	19.5	19.9	20.6	20.5	21.7
% Alzheimer's Disease and Related Disorders or Senile Dementia	22.9	22.8	23.0	23.3	26.8
% Ischemic Heart Disease	51.5	51.5	50.7	50.8	50.9
% Anemia	56.2	55.5	55.8	55.9	55.3
Episode Characteristics					
Total # Episodes	35,039	38,868	37,988	37,259	34,376
Episodes Type**					
% Normal	85.8	84.3	85.1	84.8	83.9
% LUPA	9.8	10.2	9.7	9.8	9.7
% Outlier	1.8	3.3	3.1	3.4	4.2
% PEP	3.2	3.0	2.8	2.6	3.0
Episodes within a Sequence					
% 1st in Sequence	71.1	69.0	67.9	69.2	68.3
% 2nd in Sequence	12.4	12.4	13.0	12.6	13.0
% 3rd+ in Sequence	16.5	17.9	19.1	18.2	18.7
# Visits in an Episode	16.8	16.7	17.2	17.0	17.2
Visits by Type					
% Therapy	30.8	31.5	32.7	34.4	34.7
% Skilled Nurse	44.5	45.2	44.0	43.2	43.3
% HH Aide	24.3	22.8	22.7	21.8	21.4
% Medical Social Services	0.4	0.5	0.6	0.6	0.6

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 4. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Massachusetts

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	153	161	176	179	191
Ownership					
% For-Profit	60.1	64.0	69.9	71.0	74.9
% Non-Profit	37.9	34.8	29.0	27.9	24.1
% Government-Owned	2.0	1.2	1.1	1.1	1.1
Setting					
% Hospital-Based	6.5	5.6	5.1	5.0	4.7
% Freestanding	93.5	94.4	94.9	95.0	95.3
% Chain Affiliation	23.5	21.7	20.9	21.8	26.4
Average Age	19.2	18.5	17.4	17.0	16.0
Entry/Exit*					
# New HHAs that Entered	N/A	14	22	24	12
# HHAs that Exited	N/A	6	4	10	7
HHAs per 10,000 Medicare Beneficiaries	1.8	1.8	2.0	2.0	2.1
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	105,926	108,544	106,544	111,082	110,105
Average Age	78.0	77.9	78.0	78.1	77.9
% Female	63.8	63.0	62.0	61.4	60.4
Race/Ethnicity					
% White	91.2	91.2	91.2	91.2	91.1
% Black	4.8	4.7	4.7	4.6	4.5
% Hispanic	1.3	1.3	1.2	1.1	1.2
% Other	1.3	1.3	1.2	1.2	1.3
% Rural	0.1	0.1	0.1	0.1	0.1
% Dual Eligible	28.6	28.0	27.9	27.3	26.7
Chronic Conditions					
% Chronic Kidney Disease	44.4	45.9	47.6	49.8	53.5
% Congestive Heart Failure	44.2	44.2	44.4	44.1	43.0
% Diabetes	41.0	40.8	40.3	39.8	39.5
% Pressure Ulcers and Chronic Ulcers	22.6	23.2	23.7	23.0	22.9
% Alzheimer's Disease and Related Disorders or Senile Dementia	30.3	29.9	30.0	31.0	33.6
% Ischemic Heart Disease	55.5	54.3	53.5	52.9	52.8
% Anemia	59.7	58.2	57.6	56.2	55.9
Episode Characteristics					
Total # Episodes	185,369	186,879	183,304	190,881	191,022
Episodes Type**					
% Normal	82.1	80.9	81.9	82.1	81.5
% LUPA	12.0	12.1	11.5	11.1	10.8
% Outlier	3.2	4.6	4.0	4.2	5.3
% PEP	4.1	3.7	3.9	3.9	3.8
Episodes within a Sequence					
% 1st in Sequence	59.6	61.2	61.3	61.6	61.5
% 2nd in Sequence	15.9	15.2	16.4	16.5	16.3
% 3rd+ in Sequence	24.5	22.6	22.3	21.9	22.1
# Visits in an Episode	17.3	17.0	17.1	17.1	17.3
Visits by Type					
% Therapy	30.9	33.0	34.9	37.0	39.5
% Skilled Nurse	53.4	52.8	52.1	51.3	49.6
% HH Aide	14.6	13.1	11.9	10.7	9.9
% Medical Social Services	1.1	1.1	1.1	1.0	0.9

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 5. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Maryland

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	55	54	53	53	52
Ownership					
% For-Profit	58.2	59.3	60.4	60.4	61.5
% Non-Profit	38.2	37.0	34.0	34.0	32.7
% Government-Owned	3.6	3.7	5.7	5.7	5.8
Setting					
% Hospital-Based	10.9	11.1	13.2	15.1	11.5
% Freestanding	89.1	88.9	86.8	84.9	88.5
% Chain Affiliation	55.8	60.0	63.3	65.3	70.4
Average Age	22.3	23.2	24.1	25.1	26.3
Entry/Exit*					
# New HHAs that Entered	N/A	0	0	0	0
# HHAs that Exited	N/A	1	1	1	1
HHAs per 10,000 Medicare Beneficiaries	0.8	0.7	0.7	0.7	0.7
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	60,055	62,720	64,278	68,872	70,361
Average Age	77.5	77.3	77.3	77.3	77.3
% Female	64.2	63.4	63.0	62.0	61.9
Race/Ethnicity					
% White	72.8	71.7	71.1	70.2	69.3
% Black	24.2	25.0	25.2	25.9	26.3
% Hispanic	0.6	0.6	0.7	0.7	0.8
% Other	0.9	1.0	1.0	1.1	1.1
% Rural	1.8	1.8	1.9	1.9	1.9
% Dual Eligible	17.7	18.4	18.8	18.9	19.0
Chronic Conditions					
% Chronic Kidney Disease	48.8	48.7	49.0	50.5	55.4
% Congestive Heart Failure	45.4	44.3	43.2	43.1	42.6
% Diabetes	47.4	47.4	47.5	47.3	47.7
% Pressure Ulcers and Chronic Ulcers	27.9	27.9	27.5	27.2	26.9
% Alzheimer's Disease and Related Disorders or Senile Dementia	34.2	33.7	33.6	34.0	37.1
% Ischemic Heart Disease	59.0	57.3	56.1	55.8	55.7
% Anemia	68.7	67.0	65.8	64.4	62.9
Episode Characteristics					
Total # Episodes	88,390	92,598	95,125	102,045	105,061
Episodes Type**					
% Normal	85.3	85.6	86.2	86.3	86.0
% LUPA	11.9	11.3	10.9	10.8	10.5
% Outlier	0.5	0.9	0.7	0.9	1.2
% PEP	3.4	3.4	3.2	3.0	3.2
Episodes within a Sequence					
% 1st in Sequence	72.2	72.0	71.8	72.1	71.7
% 2nd in Sequence	14.2	14.1	14.3	14.4	14.5
% 3rd+ in Sequence	13.7	13.9	13.9	13.5	13.8
# Visits in an Episode	15.1	15.2	15.0	15.3	15.5
Visits by Type					
% Therapy	46.2	48.7	50.1	50.4	52.1
% Skilled Nurse	44.2	42.7	42.0	41.8	40.7
% HH Aide	8.6	7.7	7.0	6.8	6.3
% Medical Social Services	1.0	1.0	0.9	0.9	0.9

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.*

Table 6. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, North Carolina

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	175	174	174	172	172
Ownership					
% For-Profit	46.3	46.6	47.7	51.2	54.1
% Non-Profit	28.6	28.2	27.0	26.2	25.6
% Government-Owned	25.1	25.3	25.3	22.7	20.4
Setting					
% Hospital-Based	15.4	15.5	14.9	15.1	14.5
% Freestanding	84.6	84.5	85.1	84.9	85.5
% Chain Affiliation	57.8	59.5	60.7	60.2	72.7
Average Age	25.9	26.8	27.7	28.9	29.8
Entry/Exit*					
# New HHAs that Entered	N/A	0	1	1	2
# HHAs that Exited	N/A	0	1	3	4
HHAs per 10,000 Medicare Beneficiaries	1.4	1.3	1.4	1.4	1.4
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	106,891	110,417	101,947	105,600	105,508
Average Age	75.5	75.6	75.5	75.7	75.8
% Female	65.2	64.4	62.9	62.6	62.1
Race/Ethnicity					
% White	77.6	77.5	77.7	77.2	77.4
% Black	20.5	20.3	20.0	20.4	20.2
% Hispanic	0.3	0.4	0.4	0.4	0.5
% Other	0.5	0.6	0.6	0.6	0.6
% Rural	8.7	8.6	8.7	8.7	8.8
% Dual Eligible	32.5	30.5	32.0	31.1	30.2
Chronic Conditions					
% Chronic Kidney Disease	46.2	47.2	48.3	50.6	55.6
% Congestive Heart Failure	42.0	41.9	41.5	41.4	41.5
% Diabetes	47.0	47.0	47.6	47.3	47.8
% Pressure Ulcers and Chronic Ulcers	25.5	26.1	26.3	26.4	26.4
% Alzheimer's Disease and Related Disorders or Senile Dementia	33.1	32.7	33.1	33.9	37.3
% Ischemic Heart Disease	49.2	48.6	48.3	48.6	48.9
% Anemia	62.9	61.5	60.5	59.2	58.6
Episode Characteristics					
Total # Episodes	171,887	176,549	162,897	169,621	173,053
Episodes Type**					
% Normal	82.3	82.8	83.8	84.5	84.4
% LUPA	14.8	13.7	13.2	12.5	12.1
% Outlier	0.7	1.3	0.9	1.0	1.5
% PEP	3.3	3.3	3.0	2.8	2.9
Episodes within a Sequence					
% 1st in Sequence	63.9	64.5	64.4	64.2	62.9
% 2nd in Sequence	14.3	16.3	14.8	15.2	15.8
% 3rd+ in Sequence	21.8	21.2	20.8	20.5	21.3
# Visits in an Episode	14.5	14.7	14.5	14.8	15.2
Visits by Type					
% Therapy	46.0	46.3	47.8	49.3	51.3
% Skilled Nurse	44.3	44.7	44.2	43.2	41.4
% HH Aide	8.8	8.1	7.0	6.6	6.3
% Medical Social Services	0.9	0.9	1.0	0.9	0.9

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 7. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Nebraska

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	73	76	72	73	74
Ownership					
% For-Profit	45.2	44.7	43.1	42.5	43.2
% Non-Profit	35.6	38.2	37.5	38.4	37.8
% Government-Owned	19.2	17.1	19.4	19.2	18.9
Setting					
% Hospital-Based	49.3	47.4	44.4	43.8	41.9
% Freestanding	50.7	52.6	55.6	56.2	58.1
% Chain Affiliation	23.9	21.1	23.2	22.5	20.4
Average Age	18.8	19.8	20.8	21.4	22.1
Entry/Exit*					
# New HHAs that Entered	N/A	1	2	3	1
# HHAs that Exited	N/A	0	4	2	2
HHAs per 10,000 Medicare Beneficiaries	2.9	3.0	2.8	2.7	2.7
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	14,893	15,256	15,208	15,839	15,925
Average Age	78.3	78.4	78.4	78.6	78.4
% Female	65.7	65.4	64.0	63.6	63.3
Race/Ethnicity					
% White	93.8	94.0	93.5	93.5	93.7
% Black	4.3	3.9	4.4	4.0	3.8
% Hispanic	0.5	0.7	0.7	0.7	0.7
% Other	0.5	0.4	0.5	0.5	0.5
% Rural	18.2	18.4	17.7	17.4	17.3
% Dual Eligible	20.6	19.9	20.3	19.9	20.5
Chronic Conditions					
% Chronic Kidney Disease	42.0	43.1	43.9	46.6	51.5
% Congestive Heart Failure	39.9	39.8	38.5	39.3	40.0
% Diabetes	39.1	38.7	38.8	38.8	40.0
% Pressure Ulcers and Chronic Ulcers	23.4	22.5	22.7	22.6	22.3
% Alzheimer's Disease and Related Disorders or Senile Dementia	28.3	28.1	28.4	29.9	32.0
% Ischemic Heart Disease	48.5	48.0	47.4	47.4	47.9
% Anemia	55.6	53.7	53.4	53.5	53.4
Episode Characteristics					
Total # Episodes	23,830	24,273	24,342	25,661	25,942
Episodes Type**					
% Normal	84.6	83.2	84.8	85.3	85.3
% LUPA	11.5	12.4	10.4	9.7	9.2
% Outlier	1.6	2.2	2.4	2.8	3.4
% PEP	3.0	3.2	3.2	2.9	3.1
Episodes within a Sequence					
% 1st in Sequence	67.1	67.1	66.0	65.8	65.4
% 2nd in Sequence	13.9	15.4	14.3	14.6	14.7
% 3rd+ in Sequence	19.0	19.0	19.7	19.7	20.0
# Visits in an Episode	16.3	16.1	16.8	17.0	17.2
Visits by Type					
% Therapy	42.2	44.6	45.8	47.7	48.7
% Skilled Nurse	42.7	41.7	41.3	40.6	40.2
% HH Aide	14.4	13.2	12.3	11.2	10.6
% Medical Social Services	0.6	0.6	0.6	0.5	0.5

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 8. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Tennessee

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	142	141	138	132	130
Ownership					
% For-Profit	76.8	77.3	77.5	78.8	78.5
% Non-Profit	18.3	18.4	18.1	16.7	17.7
% Government-Owned	4.9	4.3	4.4	4.6	3.9
Setting					
% Hospital-Based	12.0	10.6	11.6	10.6	10.0
% Freestanding	88.0	89.4	88.4	89.4	90.0
% Chain Affiliation	69.0	64.3	59.6	59.8	69.3
Average Age	24.9	26.0	27.1	28.3	29.1
Entry/Exit*					
# New HHAs that Entered	N/A	3	0	1	1
# HHAs that Exited	N/A	0	4	5	4
HHAs per 10,000 Medicare Beneficiaries	1.7	1.7	1.7	1.7	1.6
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	81,593	78,810	75,012	74,196	72,786
Average Age	76.5	76.6	76.7	77.0	77.0
% Female	66.6	65.7	65.0	64.1	63.2
Race/Ethnicity					
% White	87.0	87.3	87.4	87.4	87.4
% Black	12.1	11.9	11.6	11.6	11.5
% Hispanic	0.2	0.1	0.1	0.2	0.2
% Other	0.3	0.3	0.3	0.3	0.3
% Rural	16.7	16.4	16.1	16.1	16.5
% Dual Eligible	34.2	33.8	31.8	30.8	29.9
Chronic Conditions					
% Chronic Kidney Disease	44.6	46.2	48.3	51.5	57.2
% Congestive Heart Failure	51.6	50.5	49.7	49.2	49.3
% Diabetes	47.1	47.3	47.1	47.1	47.3
% Pressure Ulcers and Chronic Ulcers	24.8	25.2	26.1	25.7	25.6
% Alzheimer's Disease and Related Disorders or Senile Dementia	38.0	37.7	38.4	39.2	40.6
% Ischemic Heart Disease	59.1	58.1	57.3	56.4	56.9
% Anemia	59.6	59.6	59.1	58.2	58.0
Episode Characteristics					
Total # Episodes	190,664	175,656	161,265	157,775	152,991
Episodes Type**					
% Normal	89.1	88.4	88.9	88.9	88.8
% LUPA	8.4	8.8	8.6	8.4	8.3
% Outlier	0.8	1.0	0.7	0.8	1.1
% PEP	2.5	2.7	2.6	2.6	2.5
Episodes within a Sequence					
% 1st in Sequence	38.0	40.6	43.6	44.5	45.4
% 2nd in Sequence	15.8	16.5	17.5	17.7	17.9
% 3rd+ in Sequence	46.2	43.0	38.9	37.8	36.7
# Visits in an Episode	17.2	16.6	16.5	16.4	16.6
Visits by Type					
% Therapy	41.0	42.4	45.2	47.4	49.3
% Skilled Nurse	44.7	44.8	43.9	43.0	42.1
% HH Aide	13.2	11.6	9.7	8.4	7.5
% Medical Social Services	1.1	1.1	1.2	1.2	1.1

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.*

Table 9. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, Washington

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	58	61	61	62	62
Ownership					
% For-Profit	50.0	54.1	54.1	58.1	56.5
% Non-Profit	36.2	32.8	32.8	29.0	32.3
% Government-Owned	13.8	13.1	13.1	12.9	11.3
Setting					
% Hospital-Based	34.5	31.2	31.2	27.4	24.2
% Freestanding	65.5	68.9	68.9	72.6	75.8
% Chain Affiliation	55.4	56.7	60.7	61.3	57.1
Average Age	25.8	25.3	26.3	26.5	27.5
Entry/Exit*					
# New HHAs that Entered	N/A	5	0	2	0
# HHAs that Exited	N/A	1	0	2	1
HHAs per 10,000 Medicare Beneficiaries	0.8	0.8	0.8	0.8	0.8
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	40,611	42,169	42,859	44,264	45,949
Average Age	79.0	79.1	79.0	79.1	79.1
% Female	64.5	63.5	62.8	62.2	60.6
Race/Ethnicity					
% White	91.5	91.3	90.8	90.7	90.8
% Black	2.7	2.6	2.7	2.5	2.6
% Hispanic	0.8	0.9	0.9	0.9	0.8
% Other	1.3	1.3	1.4	1.4	1.4
% Rural	3.3	3.5	3.6	3.5	3.4
% Dual Eligible	25.4	24.6	24.7	24.3	23.9
Chronic Conditions					
% Chronic Kidney Disease	44.9	45.4	45.9	48.1	52.3
% Congestive Heart Failure	42.7	42.1	41.6	41.3	42.0
% Diabetes	38.4	37.8	37.9	38.6	39.1
% Pressure Ulcers and Chronic Ulcers	29.1	28.7	28.8	28.3	27.9
% Alzheimer's Disease and Related Disorders or Senile Dementia	36.8	36.2	36.3	36.8	38.9
% Ischemic Heart Disease	44.1	43.3	43.7	43.7	44.3
% Anemia	54.7	54.3	52.6	51.6	49.8
Episode Characteristics					
Total # Episodes	62,165	64,129	65,807	68,822	72,271
Episodes Type**					
% Normal	83.5	82.9	83.2	83.4	84.2
% LUPA	14.4	14.5	14.4	14.3	13.0
% Outlier	0.4	0.8	0.7	0.8	1.3
% PEP	2.8	2.7	2.4	2.3	2.1
Episodes within a Sequence					
% 1st in Sequence	67.8	68.1	67.5	66.5	65.6
% 2nd in Sequence	14.3	14.5	15.0	15.6	16.0
% 3rd+ in Sequence	17.9	17.5	17.5	17.9	18.4
# Visits in an Episode	13.9	13.9	14.2	14.5	15.1
Visits by Type					
% Therapy	48.5	49.9	51.4	53.3	55.8
% Skilled Nurse	42.7	42.0	40.7	39.1	37.0
% HH Aide	7.1	6.5	6.3	6.0	5.7
% Medical Social Services	1.6	1.6	1.6	1.5	1.5

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 10. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, All HHVBP States

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	2,373	2,329	2,216	2,094	2,008
Ownership					
% For-Profit	79.2	79.3	78.8	78.1	77.4
% Non-Profit	14.4	14.5	14.6	15.2	15.8
% Government-Owned	6.5	6.2	6.6	6.7	6.8
Setting					
% Hospital-Based	8.6	8.3	8.6	8.8	8.6
% Freestanding	91.5	91.7	91.4	91.2	91.4
% Chain Affiliation	28.6	29.2	29.6	30.8	37.2
Average Age	13.0	13.8	14.8	15.7	16.8
Entry/Exit*					
# New HHAs that Entered	N/A	131	79	109	53
# HHAs that Exited	N/A	151	199	223	154
HHAs per 10,000 Medicare Beneficiaries	2.9	2.8	2.7	2.5	2.4
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	813,039	825,426	806,633	813,750	802,099
Average Age	77.2	77.3	77.4	77.6	77.7
% Female	63.6	62.9	62.2	61.7	60.9
Race/Ethnicity					
% White	83.2	83.1	83.4	83.8	84.2
% Black	10.4	10.4	10.2	10.3	10.3
% Hispanic	4.4	4.3	4.0	3.4	2.9
% Other	0.8	0.8	0.8	0.9	0.9
% Rural	5.0	4.9	4.8	4.9	4.9
% Dual Eligible	30.3	29.4	28.8	27.3	26.2
Chronic Conditions					
% Chronic Kidney Disease	42.4	43.8	45.7	48.9	54.2
% Congestive Heart Failure	43.4	42.9	42.5	42.8	42.8
% Diabetes	46.5	46.5	46.4	46.0	45.8
% Pressure Ulcers and Chronic Ulcers	23.9	24.1	24.6	24.9	25.2
% Alzheimer's Disease and Related Disorders or Senile Dementia	36.0	36.0	36.5	37.4	39.5
% Ischemic Heart Disease	59.6	58.4	57.4	56.8	56.4
% Anemia	63.6	62.5	61.8	61.0	60.5
Episode Characteristics					
Total # Episodes	1,506,833	1,506,869	1,456,806	1,463,338	1,430,217
Episodes Type**					
% Normal	84.2	83.8	84.5	84.4	83.9
% LUPA	9.4	9.2	9.1	9.1	9.0
% Outlier	3.7	4.4	3.9	4.0	4.5
% PEP	3.8	3.7	3.6	3.6	3.7
Episodes within a Sequence					
% 1st in Sequence	57.7	59.0	59.2	58.7	59.2
% 2nd in Sequence	15.1	14.6	15.6	15.8	15.9
% 3rd+ in Sequence	27.2	25.8	25.2	25.5	24.9
# Visits in an Episode	18.3	18.2	18.0	17.9	17.8
Visits by Type					
% Therapy	39.3	41.2	42.6	43.9	45.6
% Skilled Nurse	49.6	48.5	47.8	47.1	46.0
% HH Aide	10.3	9.6	8.8	8.2	7.6
% Medical Social Services	0.8	0.7	0.8	0.7	0.8

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

Table 11. Home Health Agency, Beneficiary, and Episode Characteristics 2012-2016, All 41 Non-HHVBP States

	2012	2013	2014	2015	2016
Agency Characteristics					
Total Number of HHAs	9,222	9,452	9,467	9,281	9,096
Ownership					
% For-Profit	78.1	79.3	79.6	79.8	80.2
% Non-Profit	16.2	15.5	15.4	15.6	15.6
% Government-Owned	5.7	5.2	5.0	4.6	4.2
Setting					
% Hospital-Based	10.6	10.0	9.5	8.9	8.4
% Freestanding	89.4	90.0	90.5	91.2	91.6
% Chain Affiliation	20.0	19.9	19.8	20.6	21.3
Average Age	13.7	14.0	14.5	15.3	15.9
Entry/Exit*					
# New HHAs that Entered	N/A	643	390	294	205
# HHAs that Exited	N/A	236	374	458	528
HHAs per 10,000 Medicare Beneficiaries	3.4	3.5	3.4	3.4	3.3
Beneficiary Characteristics					
Total Number of Beneficiaries Receiving HH Care	2,613,012	2,629,753	2,614,057	2,643,714	2,634,783
Average Age	76.7	76.7	76.7	76.8	76.9
% Female	64.4	63.4	62.7	62.2	61.4
Race/Ethnicity					
% White	79.1	79.2	79.3	79.8	80.1
% Black	14.2	13.9	13.7	13.2	12.7
% Hispanic	3.0	2.9	2.8	2.7	2.6
% Other	1.1	1.1	1.1	1.2	1.2
% Rural	8.7	8.6	8.5	8.5	8.5
% Dual Eligible	33.5	32.5	32.2	31.1	30.5
Chronic Conditions					
% Chronic Kidney Disease	42.7	43.6	44.9	48.4	54.1
% Congestive Heart Failure	47.9	47.0	46.4	46.2	46.1
% Diabetes	49.2	49.2	49.1	48.9	48.8
% Pressure Ulcers and Chronic Ulcers	23.5	23.4	23.6	23.6	23.8
% Alzheimer's Disease and Related Disorders or Senile Dementia	33.3	33.0	33.1	33.9	36.2
% Ischemic Heart Disease	59.8	58.9	58.2	57.6	57.1
% Anemia	60.4	59.4	58.6	58.1	57.9
Episode Characteristics					
Total # Episodes	5,210,169	5,175,778	5,115,886	5,136,192	5,086,555
Episodes Type**					
% Normal	86.9	86.2	86.9	86.7	86.2
% LUPA	8.8	8.8	8.7	8.7	8.6
% Outlier	2.2	2.9	2.5	2.6	3.2
% PEP	3.0	3.0	2.8	2.9	3.0
Episodes within a Sequence					
% 1st in Sequence	47.3	48.3	48.8	49.5	50.2
% 2nd in Sequence	15.2	14.9	15.1	15.4	15.5
% 3rd+ in Sequence	38.1	36.8	36.1	35.2	34.3
# Visits in an Episode	16.6	16.4	16.3	16.2	16.3
Visits by Type					
% Therapy	31.7	33.2	35.1	37.1	39.2
% Skilled Nurse	52.1	51.8	51.3	50.4	49.5
% HH Aide	15.4	14.2	12.9	11.7	10.5
% Medical Social Services	0.8	0.8	0.8	0.8	0.8

*Entry/Exit values are derived from OASIS assessments. **PEP is not mutually exclusive with LUPA and Outlier.

2. Annual Means for TPS and Spending, Utilization, and Quality Measures

Table 12. Unadjusted Annual Means 2012-2016, HHVBP Pooled States

Measure	2012	2013	2014	2015	2016
TPS	N/A	29.6	27.5	30.9	37.4
Spending					
Medicare Home Health Spending per FFS Home Health Episode	$2,902.57	$2,913.00	$2,903.03	$2,945.75	$2,946.15
Medicare Home Health Spending per FFS Beneficiary	$144.81	$142.85	$137.59	$138.84	$133.12
Medicare Spending for Unplanned ACH / all FFS Home Health Episodes	$2,001.02	$1,990.90	$2,076.18	$2,177.72	$1,943.58
Medicare Spending for SNF / all FFS Home Health Episodes	$584.07	$590.81	$628.58	$654.50	$616.81
Utilization					
Average Number of Home Health Episodes / 1,000 FFS Beneficiaries	49.89	49.04	47.39	47.13	45.19
Unplanned Acute Care Hospitalization / first FFS Home Health Episodes	17.2%	16.7%	17.2%	17.5%	16.7%
Emergency Department Use without Hospitalization / first FFS Home Health Episodes	10.6%	11.0%	11.4%	11.9%	12.4%
Unplanned Acute Care Hospitalization / all FFS Home Health Episodes	16.4%	15.8%	16.2%	16.7%	15.7%
Skilled Nursing Facility Use / all FFS Home Health Episodes	4.7%	4.7%	5.0%	5.2%	4.9%
OASIS Outcome Measures					
Improvement in Ambulation-Locomotion	59.8%	62.5%	64.8%	68.3%	74.0%
Improvement in Bathing	67.7%	69.3%	70.0%	72.2%	76.4%
Improvement in Bed Transferring	55.7%	58.3%	60.2%	64.7%	71.8%
Improvement in Dyspnea	63.1%	64.5%	65.2%	70.1%	74.9%
Improvement in Management of Oral Medications	47.0%	48.8%	50.5%	55.0%	61.6%
Improvement in Pain Interfering with Activity	69.7%	70.3%	69.9%	71.9%	76.7%
Discharged to Community	72.5%	73.0%	72.8%	72.4%	72.9%
OASIS Process Measures					
Influenza Immunization Received for Current Flu Season	63.2%	65.8%	66.7%	58.7%	67.7%
Pneumococcal Polysaccharide Vaccine Ever Received	65.7%	68.4%	70.2%	67.0%	75.6%
Drug Education on Medications Provided to Patient/Caregiver during Episodes of Care	90.0%	91.4%	91.8%	94.5%	96.4%
HHCAHPS Measures					
How often the home health team gave care in a professional way	88.6%	88.8%	88.7%	88.8%	88.6%
How well did the home health team communicate with patients	85.9%	86.1%	86.0%	85.8%	85.8%
Did the home health team discuss medicines, pain, and home safety with patients	82.6%	82.9%	82.8%	82.9%	82.5%
How do patients rate the overall care from the home health agency	84.5%	84.5%	84.3%	84.4%	84.5%
Would patients recommend the home health agency to friends and family	79.9%	79.7%	79.7%	79.4%	79.5%

Table 13. Unadjusted Annual Means 2012-2016, Pooled Comparison

Measure	2012	2013	2014	2015	2016
TPS	N/A	30.1	28.3	31.2	35.4
Spending					
Medicare Home Health Spending / FFS Home Health Episode	$2,891.96	$2,903.03	$2,892.95	$2,934.62	$2,937.51
Medicare Home Health Spending / FFS Beneficiary	$144.23	$142.28	$137.12	$138.47	$136.44
Medicare Spending for Unplanned ACH / all FFS Home Health Episodes	$1,942.32	$1,937.16	$1,992.99	$2,082.41	$1,884.09
Medicare Spending for SNF / all FFS Home Health Episodes	$520.34	$536.19	$569.28	$599.10	$575.55
Utilization					
Average Number of Home Health Episodes / 1,000 FFS Beneficiaries	49.91	49.06	47.42	47.16	46.4
Unplanned Acute Care Hospitalization / first FFS Home Health Episodes	16.4%	15.8%	15.9%	16.3%	15.7%
Emergency Department Use without Hospitalization / first FFS Home Health Episodes	11.1%	11.3%	11.9%	12.1%	12.4%
Unplanned Acute Care Hospitalization / all FFS Home Health Episodes	16.6%	15.9%	16.1%	16.6%	15.6%
Skilled Nursing Facility Use / all FFS Home Health Episodes	4.2%	4.2%	4.3%	4.6%	4.4%
OASIS Outcome Measures					
Improvement in Ambulation-Locomotion	58.1%	60.4%	62.7%	66.6%	71.7%
Improvement in Bathing	65.7%	66.6%	67.6%	70.1%	73.5%
Improvement in Bed Transferring	54.2%	55.8%	58.1%	62.5%	68.6%
Improvement in Dyspnea	63.2%	64.1%	65.0%	68.6%	72.2%
Improvement in Management of Oral Medications	47.9%	49.3%	50.7%	54.4%	59.7%
Improvement in Pain Interfering with Activity	66.6%	67.0%	67.4%	69.7%	73.9%
Discharged to Community	70.3%	70.9%	70.9%	70.9%	70.9%
OASIS Process Measures					
Influenza Immunization Received for Current Flu Season	67.1%	68.8%	69.5%	61.7%	68.8%
Pneumococcal Polysaccharide Vaccine Ever Received	69.2%	71.0%	72.3%	70.0%	76.9%
Drug Education on Medications Provided to Patient/Caregiver during Episodes of Care	91.3%	92.3%	92.3%	95.2%	96.5%
HHCAHPS Measures					
How often the home health team gave care in a professional way	88.3%	88.3%	88.3%	88.3%	88.3%
How well did the home health team communicate with patients	85.7%	85.7%	85.6%	85.5%	85.6%
Did the home health team discuss medicines, pain, and home safety with patients	83.4	83.5	83.5%	83.3%	83.6%
How do patients rate the overall care from the home health agency	84.0%	83.9%	83.9%	83.9%	84.0%
Would patients recommend the home health agency to friends and family	79.4%	79.1%	79.0%	78.7%	78.9%

3. Sample Sizes

The tables in this section provide the sample size for their corresponding table in the 2017 Annual Report. For example, Table 8n corresponds to Table 8 in the 2017 Annual Report.

Table 8n. Sample Size for 2015 and 2016 Annual Means for Impact Measures, All HHVBP States and Comparison Group

Measure	2015		2016	
	All HHVBP States	**Comparison**	**All HHVBP States**	**Comparison**
TPS*	1,666	7,028	1,508	6,432
Spending				
Medicare Home Health Spending per FFS Home Health Episode**	2,088	9,752	2,088	9,752
Medicare Home Health Spending per FFS Beneficiary**	2,088	9,752	2,088	9,752
Medicare Spending for Unplanned ACH/all FFS Home Health Episodes***	1,230,933	1,230,933	1,190,431	1,190,431
Medicare Spending for SNF/all FFS Home Health Episodes***	1,230,933	1,230,933	1,190,431	1,190,431
Utilization				
Average Number of Home Health Episodes per 1,000 FFS Beneficiaries**	2,088	9,752	2,088	9,752
Unplanned Acute Care Hospitalization/first FFS Home Health Episodes***	719,159	719,159	703,118	703,118
Emergency Department Use without Hospitalization/first FFS Home Health Episodes***	719,159	719,159	703,118	703,118
Unplanned Acute Care Hospitalization/all FFS Home Health Episodes***	1,230,933	1,230,933	1,190,431	1,190,431
Skilled Nursing Facility Use/all FFS Home Health Episodes***	1,230,933	1,230,933	1,190,431	1,190,431
OASIS Outcome Measures***				
Improvement in Ambulation-Locomotion	1,069,114	1,069,114	1,116,377	1,116,377
Improvement in Bathing	1,086,803	1,086,803	1,130,705	1,130,705
Improvement in Bed Transferring	1,025,544	1,025,544	1,086,478	1,086,478
Improvement in Dyspnea	802,039	802,039	870,916	870,916
Improvement in Management of Oral Medications	854,033	854,033	955,375	955,375
Improvement in Pain Interfering with Activity	898,803	898,803	961,557	961,557
Discharged to Community	1,499,481	1,499,481	1,540,201	1,540,201
OASIS Process Measures****				
Influenza Immunization Received for Current Flu Season	6,436	27,381	6,137	26,536
Pneumococcal Polysaccharide Vaccine Ever Received	6,602	27,956	6,305	27,136
Drug Education on Medications Provided to Patient/Caregiver during Episodes of Care	6,603	27,959	6,305	27,148
HHCAHPS Measures*				
How often the home health team gave care in a professional way	1,437	5,017	1,332	4,661
How well did the home health team communicate with patients	1,437	5,017	1,332	4,661
Did the home health team discuss medicines, pain, and home safety with patients	1,437	5,017	1,332	4,661
How do patients rate the overall care from the home health agency	1,437	5,017	1,332	4,661
Would patients recommend the home health agency to friends and family	1,437	5,017	1,332	4,661

Sample size reflects the number of agency-years*, county-quarters**, episodes***, and agency-quarters****. The county-quarter observations are unweighted, above, but are weighted prior to analysis as described in Section 1.4.1 of the Quantitative Technical Appendix.

Table 9n. Sample Size for D-in-D Results for HHA TPS, 2016

Measure	Total Effect	
	HHVBP	Comparison
TPS	3,174	13,460

Sample size reflects agency-years from 2015-2016 with non-missing data.

Table 10n. Sample Size for D-in-D Results for OASIS-Based Outcome Measures, 2016

Measure	Total Effect	
	HHVBP	Comparison
Discharged to Community	7,411,538	7,411,538
Improvement in Bathing	5,368,149	5,368,149
Improvement in Bed Transferring	4,988,638	4,988,638
Improvement in Ambulation-Locomotion	5,260,321	5,260,321
Improvement in Dyspnea	3,948,514	3,948,514
Improvement in Management of Oral Medications	4,104,638	4,104,638
Improvement in Pain Interfering with Activity	4,433,391	4,433,391

Sample size reflects episodes from 2012-2016 with non-missing data.

Table 11n. Sample Size for D-in-D Results for OASIS-Based Process Measures, 2016

Measure	Total Effect	
	HHVBP	Comparison
Influenza Immunization Received for Current Flu Season	12,573	53,917
Pneumococcal Polysaccharide Vaccine Ever Received	12,907	55,092
Drug Education on Medications Provided to Patient/Caregiver during Episodes of Care	12,908	55,107

Sample size reflects agency-quarters from 2015-2016 with non-missing data.

Table 12n. Sample Size for D-in-D Results for HHCAHPS-Based Measures, 2016

Measure	Total Effect	
	HHVBP	Comparison
How often the home health team gave care in a professional way	2,769	9,768
How well did the home health team communicate with patients	2,769	9,768
Did the home health team discuss medicines, pain, and home safety with patients	2,769	9,768
How do patients rate the overall care from the home health agency	2,769	9,768
Would patients recommend the home health agency to friends and family	2,769	9,768

Sample size reflects agency-years from 2015-2016 with non-missing data.

Table 13n. Sample Size for D-in-D Aggregate Medicare Spending and Utilization Results for HH FFS Episodes, CY 2016

Measure	Total Effect	
	HHVBP	Comparison
Medicare SNF Spending/ all FFS HH Episodes	6,180,849	6,180,642
SNF Use among/ All FFS HH Episodes	6,180,849	6,180,642
Medicare Unplanned ACH Spending/all FFS HH Episodes	6,180,849	6,180,642
Unplanned ACH / First FFS HH Episodes	3,624,150	3,623,993
Unplanned ACH / All FFS HH Episodes	6,180,849	6,180,642
ED Use (no Hospitalization) / First HH Episodes	3,624,150	3,623,993
Medicare HH Spending/FFS HH Episode	10,440	48,760

Sample size reflects episodes from 2012-2016 with non-missing data.

Table 14n. Sample Size for D-in-D Aggregate Medicare Spending and Utilization Results for all FFS Beneficiaries, CY 2016

Measure	Total Effect	
	HHVBP	Comparison
Medicare HH Spending/FFS Beneficiary	10,440	48,760
HH Episodes/1,000 FFS Beneficiaries	10,440	48,760

Sample size reflects county-quarters from 2012-2016 with non-missing data. The counties represent an average over a number of FFS beneficiaries, and are weighted as such. The HHVBP county weights equal the number of FFS beneficiaries in the county during the quarter. The comparison county weights were calculated such that the weighted average of the measure equaled the weighted average in the HHVBP state(s) over all quarters of the baseline period. Weights for comparison counties were scaled to equal the total number of FFS beneficiaries in the HHVBP state(s) in each quarter.

4. TPS Supporting Analyses

Table 14. D-in-D Estimates of Measure Scores for 17 Performance Measures Used in TPS Creation

Measure	D-in-D	P Value
Drug Education on Medications Provided to Patient/Caregiver during Episodes of Care	0.369	0.002
Influenza Immunization Received for Current Flu Season	-0.010	0.914
Pneumococcal Polysaccharide Vaccine Ever Received	0.077	0.398
Improvement in Ambulation-Locomotion	0.598	<.0001
Improvement in Bathing	0.576	<.0001
Improvement in Bed Transferring	0.508	<.0001
Improvement in Dyspnea	0.147	0.146
Improvement in Pain Interfering with Activity	0.613	<.0001
Improvement in Management of Oral Medications	0.238	0.014
Discharged to Community	0.470	<.0001
Unplanned Hospitalization / First HH Episodes (%)	0.030	0.773
ED Use (no Hospitalization) / First HH Episodes (%)	0.576	<.0001
How often the home health team gave care in a professional way	-0.068	0.578
How well did the home health team communicate with patients	0.101	0.423
Did the home health team discuss medicines, pain, and home safety with patients	-0.464	0.0001
How do patients rate the overall care from the home health agency	-0.017	0.888
Would patients recommend the home health agency to friends and family	-0.044	0.739

5. New HHVBP Measures

Table 15. Reporting Rates for New HHVBP Measures in 2016, by HHA Characteristic

Agency Characteristics		All 3 Measures Reported	N
All HHAs		**73.6%**	**1622**
Size Cohorts	Small HHAs	47.1%	140
	Large HHAs	73.2%	974
	Single Size (Statewide)	85.0%	508
Setting	Freestanding	72.0%	1459
	Hospital-Based	87.1%	163
Age	Open at Baseline	50.8%	248
	Opened < 2012	77.7%	1374
Ownership Status	For-Profit	70.0%	1210
	Government-Owned	80.2%	111
	Non-Profit	85.4%	301

6. Use of HHVBP Connect

6.1 Background

HHVBP Connect is an interactive web-based platform that allows HHAs in the nine HHVBP Model states to:

- "Find the latest updates for the HHVBP Model; download valuable resources to help [agencies] succeed in the model;
- View upcoming HHVBP events and key Model milestones;
- View the '2015 Benchmarks and Achievement Thresholds';
- Obtain the updated Frequently Asked Questions (FAQs);
- View past webinars and register for future webinars;
- Share best practices and chat with colleagues in the nine Model states; and,
- Understand when to submit New Measures data to the HHVBP Secure Portal and when and how to retrieve performance reports."[1]

It was launched in January 2016, coinciding with the beginning of HHVBP Model implementation. HHVBP Connect allows the HHVBP Technical Assistance (TA) staff and HHAs in the nine intervention states to securely login to the platform and communicate with each other and share best practices for improving performance and quality among competing HHAs. The resources available on the HHVBP Connect website include newsletters, FAQs, quality improvement tools, materials regarding HHVBP performance measures, and other information pertinent to the HHVBP Model. As part of our evaluation, we assess use of the HHVBP Connect website and its resources to answer the research question: To what extent did participants use the technical assistance provided?

6.2 Approach & Methodology

We assessed use of the HHVBP Connect site by reviewing 2016 data on user registration, logins, online posts, resource downloads, and webinar participation provided by the HHVBP TA contractor. The data did not include information that allowed for identification of individual HHAs. However, the majority of available data regarding HHVBP Connect website use and participation included flags for HHA user type (including HHVBP Practice Users, HHVBP Administrator, and other non-HHA user types[2]) and organization name. This information allowed us to determine that between 97.8%–100% of users (depending on the resource) represent HHAs in the HHVBP intervention states. The 2.2% of HHVBP Connect users who do not represent HHA users include CMS staff, TA contractor staff, and other CMS contractors. Table 16 below identifies the population that was used for analysis of each type of HHVBP Connect activity or resource. All data presented are for calendar year 2016. Where possible, information is reported separately by month during 2016.

Table 16. Population Analyzed for each HHVBP Connect Activity/Resource

HHVBP Connect Activity/Resource	Description of Population
Registration	HHAs Only
Logins	All HHVBP Connect Users*
"Chatter" Activity	All HHVBP Connect Users*
Resource Downloads	All HHVBP Connect Users*
Webinar Participation	HHAs Only

Approximately 97.8% of all HHVBP Connect users are HHAs (identified via the HHVBP Connect user profile name variable sent by the TA contractor).

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[1] CMS (2016) Home Health Value-Based Purchasing Model. Accessed from: https://innovation.cms.gov/initiatives/home-health-value-based-purchasing-model

[2] Primarily CMS staff and its contractors.

6.3 Summary of Participation and Resource Use

6.3.1 HHVBP Connect Registration

At the end of 2016, HHVBP Connect had 1,863 registered HHA users (Figure 1). Over half of these registrations occurred in January (1,070). For context, there were a total of 2,011 HHAs in the nine HHVBP intervention states that had a FFS claim in 2016. The total number of registered users may contain multiple staff from a single HHA and may include users that are no longer active (e.g., staff that no longer work at an HHA).

Figure 1. Cumulative HHA Registrations on HHVBP Connect in 2016, by Month
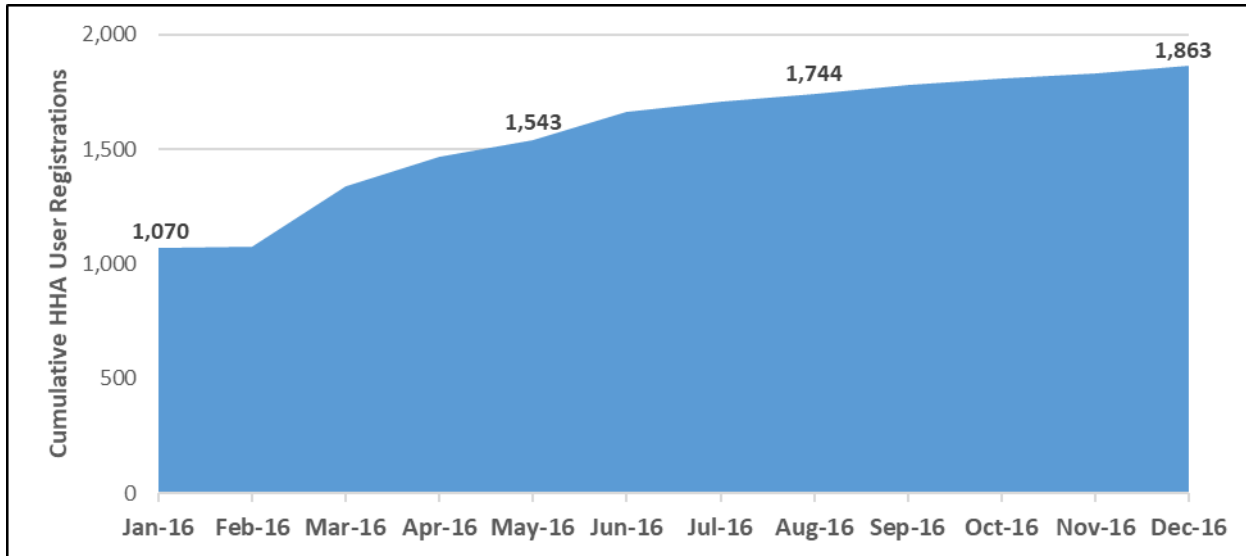
6.3.2 Logins to HHVBP Connect

The TA Contractor tracked the total number of logins for all HHVBP Connect users from June through December 2016 via weekly dashboards. We used the last dashboard of each month for our analyses (e.g., December 2016 login data is drawn from the December 30th dashboard).

Users were required to enter a user name and password for each login to the HHVBP Connect website (i.e., the system logged users out). Available login data represent the aggregate activity across all users (i.e., the number of logins per unique user is not available). From June through December 2016, there were a total of 2,949 logins among all HHVBP Connect users. The monthly logins were relatively consistent from June through October (averaging 461 logins per month), then dropped in the final two months of the year (averaging 322 logins per month; Figure 2).

Figure 2. Logins by HHVBP Connect Users in 2016, by Month
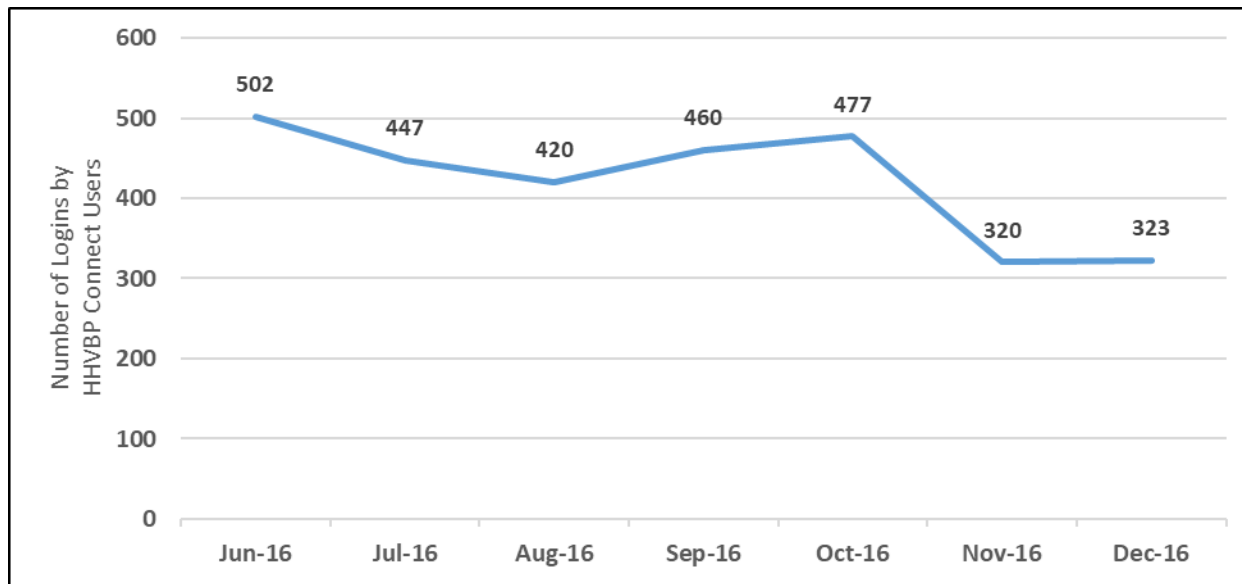
Login data were only available for June through December 2016.

6.3.3   Participation in HHVBP Connect's "Chatter" Feature

HHVBP Connect's "Chatter" feature provides an interactive online community where HHAs are invited to "post status updates, share files and links with other users, 'like' posts and documents, 'follow' people and groups, and share tools, resources, and documents with other users and groups"[3].

The TA Contractor tracked the "Chatter" feature via weekly dashboards throughout 2016 and includes online posts and subsequent responses (Figure 3). We used the last dashboard of each month for our analyses (e.g., December 2016 login data is drawn from the December 30th dashboard). Users of the "Chatter" feature, who include both HHAs and HHVBP TA Contractor staff, posted 377 times during 2016. The number of posts each month was usually between 23 and 40, with peaks of 45 and 52 in May/June and a minimum of 9 in December.

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[3] "HHVBP Connect Website Overview" Slides from 2/11/2016 Webinar.

Figure 3. HHVBP Connect "Chatter" Activity by HHVBP Connect Users in 2016, by Month
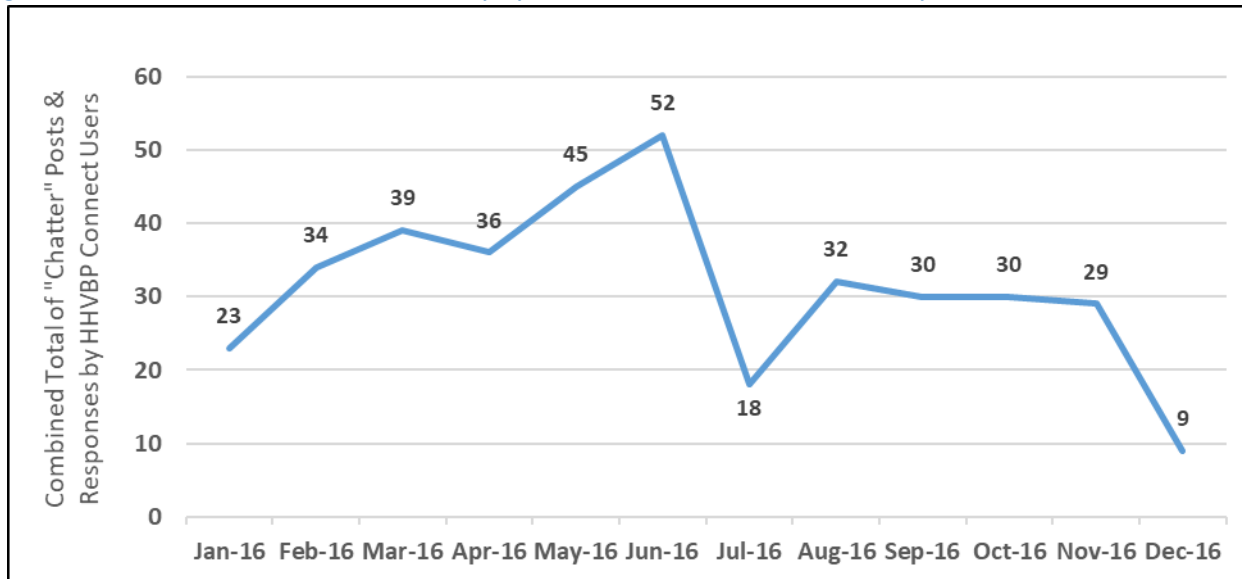
Table 17 below summarizes the "Chatter" activity between the TA Contractor and HHAs. HHVBP TA staff accounted for close to half (43%) of the overall use of the "Chatter" feature. Their posts and responses were focused primarily on the promotion of upcoming online events (e.g., a webinar) or newly available resources (e.g., an updated FAQ document), and responding to HHA questions and requests. Broadly, HHAs' use of the "Chatter" feature focused on website use and technical assistance, including questions about passwords, requests to share resource or webinar registration links, and assistance with registration on the HHVBP Secure Portal. The most common website technical assistance issue posted by HHAs was regarding the webinar registration process. There were also a number of posts and comments requesting information on baseline report and interim performance report data availability and new measures (e.g., how to submit, requesting more details).

Table 17. "Chatter" Posts and Responses by TA Contractor and HHAs

	Posts	Responses	Total
TA Contractor	76	87	**163**
HHA Users	29	190	**219**
Total	**105**	**277**	**382**

6.3.4 Use of HHVBP Connect Library Resources and Live Webinar Participation

In addition to participating in the "Chatter" activity described above, HHVBP Connect users can download resources posted in the website's library and participate in live webinars.

Download of HHVBP Connect Library Resources

To provide assistance to HHAs, the HHVBP TA Contractor made several resources available in the HHVBP Connect Library on a broad range of topics and categories. Throughout 2016, the TA Contractor created and shared 96 different library resources on the HHVBP Connect website in a variety of formats, including audio webinar recordings and documents (e.g., PDFs, Excel files).

To better understand the types of content most frequently downloaded by users in the first year of the Model, we grouped the library resources into three broad domains and counted the number of downloads corresponding to each domain (Table 18). Domain 1 encompasses background material on the HHVBP Model, information about HHVBP Connect, and regularly updated reference documents (e.g., FAQs). Although there were only three "Fact Sheets"

resources, they were downloaded over 600 times. Domain 2 provides introductory materials to help HHAs access and use both the HHVBP Connect and Secure Portal sites. The 14 resources under Domain 2's sub-category "New Measure Submission" were downloaded 3,404 times (average of 243 downloads/resource). Finally, Domain 3 includes materials developed by the TA Contractor to facilitate performance improvement. These include quality improvement tools as well as organizational assessments, which help HHAs understand key HHVBP Model categories and provide action plans to aid in organizational improvement efforts.

Table 18. HHVBP Connect Resource Domains and Downloads in 2016

	# of Resources	# of Downloads	Downloads per Resource
Domain 1 – Background & Updates HHVBP Model and HHVBP Connect	**14**	**2,177**	**155.5**
Final Rules	3	210	70.0
Monthly Updates – Newsletters & Frequently Asked Questions	8	1,364	170.5
Fact Sheets	3	603	201.0
Domain 2 – Introduction to and Use of HHVBP Connect and HHVBP Secure Portal	**35**	**4,625**	**132.1**
New Measure Submission	14	3,404	243.1
Introduction/Registration, User Manual, HHVBP Connect vs. Secure Portal	21	1,221	58.1
Domain 3 – Performance Improvement Tools	**47**	**4,708**	**100.2**
Quality Improvement Resources	39	3,931	100.8
Understanding HHVBP Measures	10	1,072	107.2
Understanding the TPS Calculation	2	274	137.0
Journey to Improvement/QI Webinars and Materials	22	2,064	93.8
Understanding your Interim Performance Report	5	521	104.2
Organizational Assessments	8	777	97.1
Action Plans	4	452	113.0
Assessment Tools	4	325	81.3

Data include downloads by all HHVBP Connect users, 97.8% of whom are HHAs.

Of the 96 resources in the HHVBP Connect library during 2016, the number of downloads ranged from 587 for the new measure template to just 19 for the HHVBP Registration Overview. Table 19 displays the resources that had at least 200 downloads during 2016. The high number of downloads for some of the Domain 1 and Domain 2 resources may partly be due to their broad applicability to all HHAs (e.g., new measures resources). While collectively the Domain 3 resources accounted for more downloads than each of the other two domains, individually they addressed specific quality improvement topics that may only be applicable to certain HHAs. It does not appear that the volume of downloads is largely a function of timing, as some resources released late in 2016 still have a high number of total downloads; for example, the resource with the second highest number of downloads (HHVBP New Measures Template [for] January 2017) was released in December 2016.

Table 19. Most Commonly Downloaded Resources by HHVBP Connect Users in 2016

Resource Title	Domain	Total Downloads
HHVBP New Measures Template [for 2016]	Domain 2	587
HHVBP New Measures Template [for] January 2017	Domain 2	401
HHVBP New Measures Quick Reference Guide	Domain 2	387
HHVBP FAQs September 2016 FAQs_10_4_2016	Domain 1	344
Fact Sheet: HHVBP	Domain 1	338
HHVBP Webinar Recording, Submitting New Measures Data in January 2017_12-8-16	Domain 2	294
HHVBP New Measures Webinar 1/28/16	Domain 2	281
HHVBP Webinar Materials Submitting New Measures Data in January 2017_12-8-16	Domain 2	231
HHVBP Newsletter December 2016	Domain 1	225
HHVBP New Measures Quick Reference Guide	Domain 2	215
HHVBP FAQ December 2016	Domain 1	213
HHVBP Webinar Recording - Submitting New Measures Data_09_22_2016	Domain 2	213
HHVBP Webinar Slides - Submitting New Measures_09_22_2016	Domain 2	208
All Other Resource Files	*Domains 1, 2, 3*	*7,573*

HHVBP Connect Webinar Participation

In addition to resources available in the library, the HHVBP TA Contractor hosted 15 webinars for HHAs on HHVBP Connect throughout 2016. The webinar topics, webinar date, and attendance by HHAs are shown in Figure 4 (listed by date of webinar). These data refer to live attendance to the online event and reflect HHAs only (i.e., do not include non-HHA participants). Webinar participation was higher during the first half of 2016, averaging 501 participants per event, compared to an average of 373 participants per event for webinars held in July–December. Webinar topics with the highest participation rates included the HHVBP Connect Website Overview in February (668), the Performance Reports & TPS Calculation in February (562), and Submitting New Measures Data in September (558). All webinars reflected content in Domain 2 and Domain 3 (i.e., there were no webinars for Domain 1).

Figure 4. HHVBP Connect Webinar Topics and Participation in 2016 by Domain.
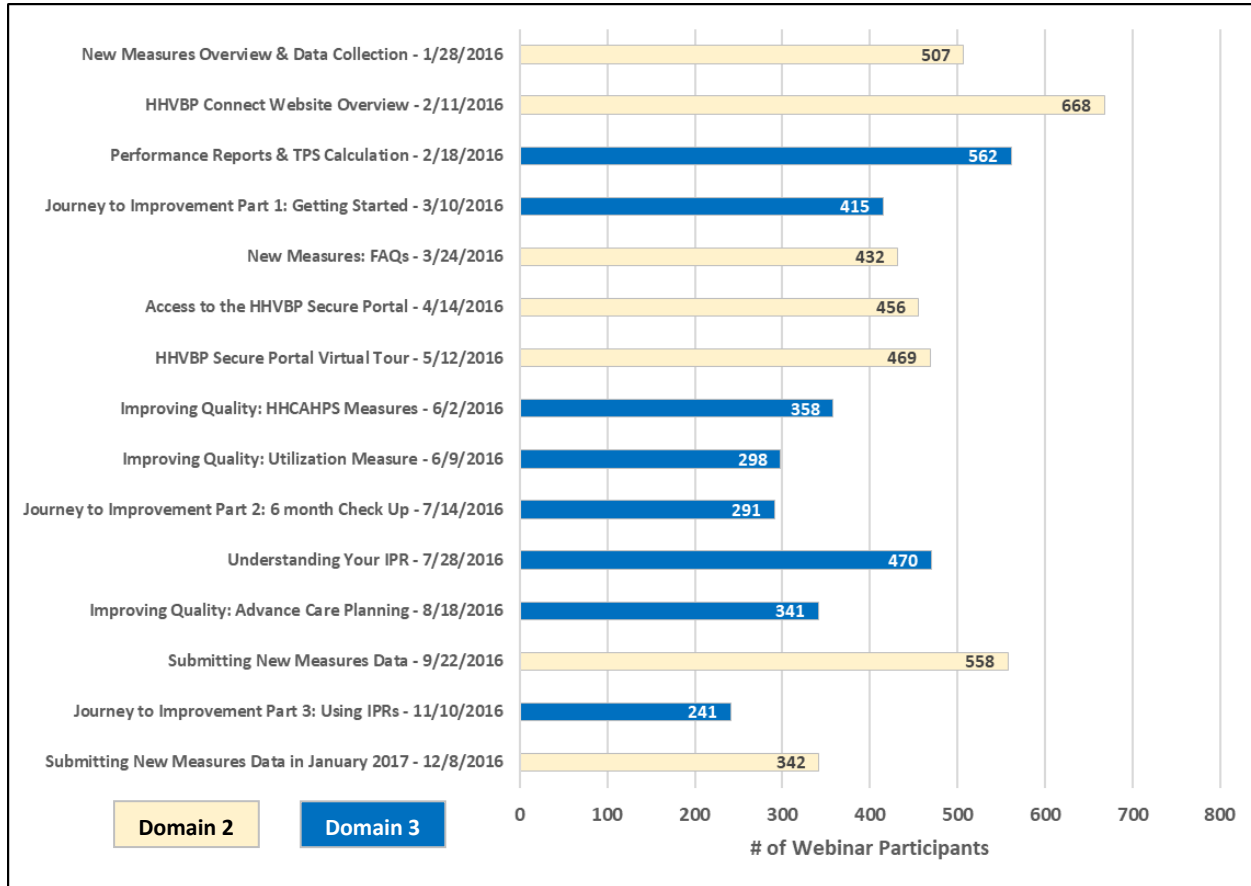
Note: Webinar participation refers to attendance during the live online event only.

Analyses of HHVBP Connect Webinar Participation across HHA Characteristics

HHVBP Connect webinar participation was also analyzed across the following HHA characteristics: size cohort, ownership, and setting. The Provider of Services File was used to obtain ownership and setting data, and the Preliminary TPS/payment Adjustment Report was used for size cohort. HHA characteristics were assigned to CMS Certification Numbers (CCNs) that were self-reported by webinar participants; invalid CCNs (i.e., CCNs with invalid values; corresponded to HHAs in non-VBP states, or did not have a FFS claim in 2016) were excluded from the analyses.

Of the 3,046 unique CCNs that were self-reported by webinar participants, 1,058 (34.7%) were CCNs from one of the nine intervention states with a paid FFS claim 2016 (Table 20). Over half (53%) of all HHVBP HHAs participated in at least one HHVBP Connect Webinar (1,058/2,011). Compared to all HHAs in the nine HHVBP states, HHA webinar participants were more likely to be non-profit (22.8% vs. 6.8%) and hospital-based (14.2% vs. 8.6%). HHA webinar participants were slightly more likely to be in large cohorts or entire state cohorts than small cohorts. Of note, 9.3% of webinar participants did not receive a TPS in the Preliminary TPS/Payment Adjustment Report.

Table 20. HHVBP Connect Webinar Participation by HHAs in 2016, by HHA Characteristics.

	HHA Characteristic	Unique HHA Webinar Participants with Valid CCN (N=1,058)	HHAs in HHVBP States* (N=2,011)
Ownership Type	For-Profit	67.8%	77.5%
	Non-Profit	22.8%	6.8%
	Government	9.5%	15.8%
Setting	Freestanding	85.8%	91.4%
	Hospital-Based	14.2%	8.6%
Size Cohort**	Small Cohort	6.2%	6.9%
	Large Cohort	52.4%	48.3%
	Entire State Cohort	32.1%	25.3%
	No Cohort (Did not receive 2016 TPS)	9.3%	19.6%

Total number of HHAs in the nine HHVBP states with a paid fee-for-service claim in 2016; includes HHAs that closed before the end of 2016.

**Size cohort aligns with the definition used in the HHVBP Model: small agencies serve less than 60 unique beneficiaries a year, and large agencies serve at least 60 unique beneficiaries a year. In states with fewer than nine small HHAs (i.e., AZ, MD, NC, TN, WA), the small and large cohorts are combined into a single state cohort.*