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Policy Research

Independent Evaluation
of Comprehensive
Primary Care Plus (CPC+)

First Annual Report
Appendices to the Supplemental Volume

April 2019

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Independent Evaluation of Comprehensive Primary Care Plus (CPC+)

First Annual Report, Appendices to the Supplemental Volume
April 2019

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CHAPTER 2 APPENDIX

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2.A.   Background information on CPC+ in 2017, by region

Table 2.1. Background market information on CPC+ regions that started in 2017

Background market information	CPC+ region[a]													
	Arkansas	Colorado	Hawaii	Greater Kansas City (Kansas/Missouri)	Michigan	Montana	New Jersey	Capital District-Hudson Valley (New York)	Ohio/Northern Kentucky (Ohio)	Oklahoma	Oregon	Greater Philadelphia (Pennsylvania)	Rhode Island	Tennessee
Demographics[a]														
Total population (2015)[1]	2,978,204	5,456,574	1,431,603	2,088,269	9,922,576	1,032,949	8,958,013	3,014,711	12,022,970	3,911,338	4,028,977	6,069,875	1,056,298	6,600,299
Percentage of population non-white (2015)[2]	22.5%	15.6%	74.0%	21.2%	21.4%	11.1%	32.3%	16.7%	17.1%	27.4%	14.8%	32.8%	19.6%	22.3%
Percentage of population in urban areas (2010)[3]	56.2%	86.2%	91.9%	87.1%	74.6%	55.9%	94.7%	68.8%	78.2%	66.2%	81.0%	94.9%	90.7%	66.4%
Socioeconomics[a]														
Median household income (2015)[1]	$41,995	$63,909	$73,486	$60,502	$51,084	$46,766	$72,222	$60,887	$52,585	$48,568	$54,148	$65,123	$58,073	$47,275
Percentage of population below federal poverty level (2015)[1]	19.1%	11.5%	10.6%	11.8%	15.8%	14.6%	10.8%	11.2%	14.7%	16.1%	15.4%	13.1%	13.9%	16.7%
Percentage of population 18 years and older with a high school degree or higher (2015)[1]	85.4%	91.2%	90.9%	91.2%	90.1%	93.5%	89.1%	90.0%	88.7%	87.3%	90.0%	89.9%	87.7%	86.1%
Percentage of population 18 years and older with a bachelor's degree or higher (2015)[1]	21.8%	39.2%	31.4%	35.8%	27.8%	30.6%	37.6%	28.4%	24.1%	24.6%	32.2%	36.0%	32.7%	25.7%
Health status														
Percentage of population under age 65 with any disability (2015)[3,b]	10.4%	6.4%	5.7%	7.3%	8.7%	7.6%	5.6%	7.7%	8.3%	9.8%	8.6%	7.3%	7.7%	9.6%
Percentage of adults who smoke (2014)[4,c]	24.7%	15.7%	14.1%	(19.4%)	21.2%	19.9%	15.1%	(14.4%)	(21.0%)	21.1%	17.0%	(19.9%)	16.3%	24.2%
Percentage of adults who have ever been told by a doctor that they have diabetes (2014)[4,c]	12.7%	7.3%	9.8%	(10.7%)	10.4%	8.8%	9.7%	(10.0%)	(11.7%)	12.0%	9.0%	(11.2%)	9.4%	13.0%
Percentage of adults with cardiovascular disease (2014)[4,c]	9.7%	4.7%	5.0%	(7.0%)	7.8%	5.9%	6.6%	(5.9%)	(7.8%)	8.3%	6.4%	(7.4%)	6.4%	8.8%
Prescription opioid overdose deaths per 100,000 population (age adjusted, 2014)[5,c]	157	352	48	(264)	576	47	369	(1,008)	(1,171)	471	214	(642)	149	699
Medicare outcomes[d]														
Number of medical hospital discharges per 1,000 Medicare beneficiaries (2014)[6]	200.0	134.5	104.7	208.6	219.0	142.2	187.2	190.3	206.5	193.7	131.5	203.0	202.2	200.3
Number of surgical hospital discharges per 1,000 Medicare beneficiaries (2014)[6]	78.6	70.8	42.0	80.3	82.6	68.3	73.9	66.9	79.4	78.8	65.3	74.8	66.5	74.5
Mortality rate among FFS Medicare beneficiaries (age, sex, and race-adjusted) (2014)[6]	5.1%	4.2%	3.5%	4.6%	4.9%	4.5%	4.1%	4.5%	5.0%	5.2%	4.5%	4.6%	4.3%	5.2%
Provider market[c]														
Number of primary care physicians (2016)[7]	3,209	6,694	1,791	(6,135)	16,683	1,066	13,471	(36,128)	(17,649)	4,374	5,437	(21,267)	2,178	8,334
Number of primary care physicians per 10,000 population (2016)[8]	10.8	12.3	12.5	(13.4)	16.8	10.3	15.0	(18.3)	(15.2)	11.2	13.5	(16.6)	20.6	12.6
Number of specialist physicians (2016)[7]	3,324	6,856	1,866	(6,521)	18,332	1,084	14,355	(43,674)	(20,440)	4,364	5,613	(24,074)	2,313	9,418
Number of specialist physicians per 10,000 population (2016)[8]	11.2	12.6	13.0	(13.8)	18.5	10.5	16.0	(22.1)	(17.6)	11.2	13.9	(18.8)	21.9	14.3

Table 2.1. *(continued)*

Background market information	CPC+ region[a]													
	Arkansas	Colorado	Hawaii	Greater Kansas City (Kansas/Missouri)	Michigan	Montana	New Jersey	Capital District-Hudson Valley (New York)	Ohio/Northern Kentucky (Ohio)	Oklahoma	Oregon	Greater Philadelphia (Pennsylvania)	Rhode Island	Tennessee
Community hospital beds per 1,000 population (2015)[9]	3.2	1.9	1.9	(3.3)	2.5	3.7	2.3	(2.7)	(2.9)	2.8	1.7	(2.9)	2.2	3.0
Health insurance market[c]														
Market share of largest insurer—large group market (2014)[10]	80%	40%	69%	(44%)	53%	83%	56%	(27%)	(42%)	54%	42%	(32%)	76%	77%
Number of insurers with greater than 5 percent market share—large group market (2014)[10]	3	4	2	(4)	4	2	5	(7)	(4)	5	4	(4)	3	2
State HMO penetration rate (2016)[11]	14.2%	16.6%	58.2%	(17.6%)	38.9%	4.4%	25.0%	(35.6%)	(31.7%)	7.1%	40.2%	(31.3%)	32.6%	32.3%

Sources: [1] 2015 American Community Survey 1-Year Estimates.

[2] 2015 American Community Survey 1-Year Estimates. Non-white population calculated as the complement of the percentage of population defined by the Census Bureau as white alone, not Hispanic or Latino.

[3] 2010 Census Summary File 1—Urban and Rural, where urban areas include percentage of population inside urbanized areas (UAs) of 50,000 or more people or urban clusters (UCs) of at least 2,500 and fewer than 50,000 people.

[4] Kaiser Family Foundation analysis of the Behavioral Risk Factor Surveillance System (BRFSS) 2014 survey results. Available at http://kff.org/state-category/health-status/.

[5] Kaiser Family Foundation analysis of the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics. Multiple Cause of Death database 1999–2014 on CDC WONDER, released 2015. Data are from the Multiple Cause of Death database, 1999–2014, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Available at http://kff.org/state-category/health-status/opioids/.

[6] Data from the Dartmouth Atlas of Health Care available at http://www.dartmouthatlas.org/. The Medicare beneficiary population includes those alive and age 65 to age 99 on June 30, 2014.

[7] Kaiser Family Foundation analysis of active state-licensed physicians from Redi-Data, Inc. Primary care physicians include internal medicine, family medicine/ general practice, pediatrics, obstetrics and gynecology, and geriatrics allopathic physicians (MDs) and osteopathic physicians (DOs). Note that clinician eligibility for CPC+ differs from this definition. Pediatrics and obstetrics and gynecology are not eligible for CPC+; nurse practitioners, physician assistants, and clinical nursing specialists providing primary care are eligible for CPC+.

[8] Constructed for each region from number of practicing physicians divided by total population, and multiplied by 10,000.

[9] Kaiser Family Foundation analysis of the American Hospital Association Annual Survey of Hospitals. Community hospitals include all nonfederal, short-term general, and specialty hospitals whose facilities and services are available to the public.

[10] Kaiser Family Foundation analysis of medical loss ratio (MLR) data from the Center for Consumer Information & Oversight (CCIIO), Centers for Medicare & Medicaid Services (CMS). Public Use File for 2014, as of October 7, 2015. Available at http://kff.org/state-category/health-insurance-managed-care/insurance-market-competitiveness/.

[11] Kaiser Family Foundation analysis of DR/Decision Resources, LLC data available at http://kff.org/other/state-indicator/hmo-penetration-rate/.

Notes: [a] For regions that are not statewide, data reflect CPC+ geographic boundaries; however, values in parentheses reflect only statewide data

[b] Data for markets that are not statewide reflect the following census counties: Capital District-Hudson Valley defined as "Albany County; Columbia County; Dutchess County; Greene County; Montgomery County; Orange County; Rensselaer County; Saratoga County; Schenectady County; Schoharie County; Sullivan County; Ulster County; Warren County; Washington County;" Greater Philadelphia Region defined as "Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area;" Greater Kansas City Region defined as "Kansas City, MO-KS Metro Area." Ohio and Northern Kentucky Region defined as "all counties in Ohio; Boone County, KY; Campbell County, KY; Grant County, KY" and Greater Buffalo Region defined as "Erie County and Niagara County."

[c] Data reflect only statewide data. For Greater Kansas City Region, Missouri and Kansas are averaged. Ohio and Northern Kentucky Region reflects only Ohio.

[d] Data for markets that are not statewide reflect the following health services areas (HSAs): Capital District Region reflects averages for the following HSAs (NY-Albany, NY-Amsterdam, NY-Catskill, NY-Cobleskill, NY-Newburgh, NY-Schenectady, NY-Yonkers); Greater Philadelphia reflects the PA-Philadelphia HSA; Greater Kansas City Region reflects averages for the following HSAs (KS-Kansas City, KS-Shawnee Mission/Overland Pk, MO-Kansas City); Greater Buffalo Region reflects NY-Buffalo.

Table 2.2. Existing initiatives relevant to CPC+, by region, for regions that started in 2017

	CPC + region[a]													
	Arkansas	Colorado	Hawaii	Greater Kansas City (Kansas/ Missouri)	Michigan	Montana	New Jersey	Capital District-Hudson Valley (New York)	Ohio/Northern Kentucky (Ohio)	Oklahoma	Oregon	Greater Philadelphia (Pennsylvania)	Rhode Island	Tennessee
Multi-payer efforts														
Ever participated in a multi-payer Patient-Centered Medical Home (PCMH) initiative[1,b,f]	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was a CPC region[g]	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No
Was a Multi-Payer Advanced Primary Care Practice (MAPCP) region[2,b,g]	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes	Yes	No
Received State Innovation Models (SIM) award[3,b]	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIM implementation (Imp) or design award?	Imp	Imp	Design	-	Imp	Design	Design	Imp	Imp	Design	Imp	Design	Imp	Imp
SIM implementation began	Oct 2013	Feb 2016	-	-	Aug 2016	-	-	Feb 2016	Feb 2016	-	Oct 2013	-	Jul 2016	Feb 2016
SIM implementation end	Sept 2016	On going			On going			On going	On going		Jun 2017		On going	On going
SIM design began			Apr 2013; Feb 2015			Feb 2015	Feb 2015			Feb 2015		Apr 2013		
Was an Aligning Forces for Quality community[4,b]	No	No	No	Kansas City	Detroit	No	No	No	Cincinnati; Cleveland	No	Statewide	No	No	Memphis
Other delivery system reform initiatives[b]														
Number of Transforming Clinical Practices Initiative Practice Transformation/Support and Alignment Networks (which engage multiple practices)[5]	3	2	1	(2/2)	6	2	3	(4)	(1)	3	2	(4)	2	3
Number of Federally Qualified Health Center Advanced Primary Care Practice Demonstration sites[6]	12	10	4	(2/17)	12	4	7	(14)	(20)	3	8	(9)	3	11
Number of Health Care Innovation Awards[7]	4	8	4	(3/5)	10	2	6	(20)	(8)	2	5	(9)	3	5
Medicaid State Plan Option (Health Homes in Section 2703)[8]	-	-	-	- /Yes	Yes	-	Yes	Yes	Yes	Yes	-	-	Yes	-
Number of Accountable Health Communities Model participants[9,e]	-	2	-	-	1	-	2	(3)	(3)	1	1	(1)	1	1
Number of Medicare SSP ACOs[10,d]	12	10	1	(21)	24	2	31	(38)	36	10	2	(29)	2	18
Payment reform initiatives[b]														
Medicaid Incentives for the Prevention of Chronic Diseases Model participating state[11]	-	-	Yes	-	-	Yes	-	Yes	-	-	-	-	-	-
Bundled Payments for Care Improvements sites[12]	7	16	1	(1/14)	34	2	48	(42)	(123)	4	35	(115)	16	108
Million Hearts Cardiovascular Disease Risk Reduction Model sites[13]	10	16	1	(9/10)	18	5	30	(61)	(19)	6	4	(23)	3	7

Table 2.2. *(continued)*

	CPC + region[a]													
	Arkansas	Colorado	Hawaii	Greater Kansas City (Kansas/ Missouri)	Michigan	Montana	New Jersey	Capital District-Hudson Valley (New York)	Ohio/Northern Kentucky (Ohio)	Oklahoma	Oregon	Greater Philadelphia (Pennsylvania)	Rhode Island	Tennessee
Medicare Advantage Value-Based Insurance Design Model starting year[14]	-	-	-	-	2018	-	-	-	-	-	2017	2017	-	2017
Transformation penetration														
Percentage of primary care practices with any PCMH recognition[15,c]	30.2%	26.4%	14.4%	46.7%	14.9%	33.5%	14.6%	31.9%	22.7%	54.1%	46.4%	28.2%	40.3%	11.8%
Percentage of primary care practices that are recognized by the National Committee for Quality Assurance (NCQA) as a PCMH (2016)[16,c]	9.5%	24.3%	14.2%	45.5%	7.9%	29.8%	14.1%	31.4%	20.7%	5.0%	8.2%	28.0%	40.3%	11.2%
Electronic health record (EHR) use														
Any EHR system among office-based physicians (percentage, 2014)[17,b]	89.1%	82.5%	78.4%	(85.8%)	80.6%	88.1%	77.7%	(79.9%)	(81.4%)	85.9%	88.9%	(81.4%)	70.9%	76.3%
Meaningful use certification among office-based clinicians (MDs, DOs, NPs and PAs) (percentage, 2014)[18,b]	43%	44%	41%	(43%)	44%	34%	39%	(32%)	(49%)	40%	56%	(45%)	31%	36%
Estimated percentage of population covered by an accountable care organization (2016)[19,b]	3–5%	10–15%	10–15%	(10–15%/ 7–10%)	>20%	10–15%	>20%	(10–15%)	(>20%)	3-5%	>20%	(15–20%)	>20%	15–20%

Sources: [1] Information comes from multiple sources, primarily the Patient-Centered Primary Care Collaborative's Primary Care Innovations and Patient-Centered Medical Home (PCMH) Map and the Centers for Medicare & Medicaid Services' Where Innovation is Happening Map available at https://www.pcpcc.org/initiatives and https://innovation.cms.gov/initiatives/map.

[2] Multi-Payer Advanced Primary Care Practice (MAPCP) is a multi-payer reform initiative to evaluate whether advanced primary care practice will improve quality or reduce costs. Includes sites currently or formerly participating in initiative. More information available at https://innovation.cms.gov/initiatives/Multi-payer-Advanced-Primary-Care-Practice/index.html.

[3] The State Innovation Models (SIM) Initiative is providing financial and technical support to states for the development and testing of state-led, multi-payer health care payment and service delivery models. More information available at https://innovation.cms.gov/initiatives/state-innovations/.

[4] Aligning Forces for Quality (AF4Q) is a Robert Wood Johnson Foundation initiative designed to lift the overall quality of health care in targeted communities, reduce racial and ethnic disparities, and provide models for national reform. More information available at http://forces4quality.org/.

[5] The Transforming Clinical Practice Initiative (TCPI) is designed to support clinician practices in sharing, adapting, and further developing their comprehensive quality improvement strategies. The Practice Transformation Networks are peer-based learning networks designed to coach, mentor, and assist clinicians in developing core competencies specific to practice transformation. The Support and Alignment Networks will provide a system for workforce development utilizing national and regional professional associations and public-private partnerships that are currently working in practice transformation efforts. More information available at https://innovation.cms.gov/initiatives/Transforming-Clinical-Practices/.

[6] Completed in 2014, the three-year Federally Qualified Health Center (FQHC) Advanced Primary Care Practice demonstration showed how the patient-centered medical home model can improve quality of care, promote better health, and lower costs. More information available at https://innovation.cms.gov/initiatives/fqhcs/.

[7] The Health Care Innovation Awards are funding up to $1 billion in awards to organizations implementing promising new ideas to deliver better health, improved care, and lower costs to people enrolled in Medicare, Medicaid, and Children's Health Insurance Program (CHIP). More information available at https://innovation.cms.gov/initiatives/Health-Care-Innovation-Awards/.

[8] Section 2703 of the Affordable Care Act created an optional Medicaid State Plan benefit for states to establish Health Homes to coordinate care for people with Medicaid who have chronic conditions. More information available at https://www.medicaid.gov/medicaid/ltss/health-homes/index.html. Data as of May 2016. Kansas and Oregon terminated their Medicaid health home state plan amendments and are no longer providing services under the 2703 option.

Table 2.2. *(continued)*

[9] The Accountable Health Communities Model provides support to community bridge organizations to test promising service delivery approaches aimed at linking beneficiaries with community services that may address their health-related social needs. More information is available at https://innovation.cms.gov/initiatives/ahcm/.

[10] The Medicare SSP is a delivery system reform initiative created to facilitate coordination and cooperation among providers to improve the quality of care for Medicare Fee-For-Service (FFS) beneficiaries and reduce unnecessary costs. Eligible providers, hospitals, and suppliers may participate in the SSP by creating or participating in an Accountable Care Organization (ACO). https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/ACOs-in-Your-State.html

[11] Section 4108 of the Affordable Care Act authorizes grants to states to provide incentives to Medicaid beneficiaries of all ages who participate in prevention programs and demonstrate changes in health risk and outcomes. More information available at https://innovation.cms.gov/initiatives/mipcd/.

[12] The Bundled Payments for Care Improvement (BPCI) initiative comprises four broadly defined models of care, which link payments for the multiple services beneficiaries receive during an episode of care. More information available at https://innovation.cms.gov/initiatives/bundled-payments/.

[13] The Million Hearts Cardiovascular Disease (CVD) Risk Reduction Model is a randomized controlled trial that seeks to bridge a gap in cardiovascular care by providing targeted incentives for health care practitioners to engage in beneficiary CVD risk calculation and population-level risk management. More information available at https://innovation.cms.gov/initiatives/Million-Hearts-CVDRRM/.

[14] The Medicare Advantage Value-Based Insurance Design (VBID) Model is an opportunity for Medicare Advantage plans to offer supplemental benefits or reduced cost sharing to enrollees with specified chronic conditions, focused on the services that are of highest clinical value to them. More information available at https://innovation.cms.gov/initiatives/vbid/.

[15] Data represents a Mathematica-created data set of practices that combines the four main national PCMH recognition programs including the National Committee for Quality Assurance (NCQA), the Joint Commission (TJC, previously known as Joint Commission on Accreditation of Healthcare Organizations), the Accreditation Association for Ambulatory Healthcare (AAAHC), and the Utilization Review Accreditation Commission. Data from NCQA is current as of June 2016. Data from TJC and AAAHC and Utilization Review Accreditation Commission (URAC) is current as of February 2017.

[16] Constructed by the number of NCQA-recognized PCMH primary care practices. Practices were considered NCQA-recognized if they included any provider with NCQA PCMH recognition. Providers in the data have NCQA PCMH recognition effective as of June 1, 2016.

[17] The percentage of all office-based physicians that self-report the use of an electronic health record (EHR) or electronic medical record. This value does not include billing record systems. Data from the Office of the National Coordinator for Health Information Technology (ONC), National and State Estimates, 2014.

[18] The percentage of all office-based clinicians (MDs, DOs, NPs and PAs) that have demonstrated meaningful use of certified electronic health record technology (CEHRT) through participation in either the Medicare or Medicaid EHR Incentive Programs. Data from ONC, CMS EHR Incentive Programs data, 2014.

[19] Muhlestein, David, and Mark McClellan. "Accountable Care Organizations in 2016: Private and Public Sector Growth and Dispersion." Available at http://healthaffairs.org/blog/2016/04/21/accountable-care-organizations-in-2016-private-and-public-sector-growth-and-dispersion/.

Notes: [a] For regions that are not statewide, data reflect CPC+ geographic boundaries; however, values in parentheses reflect only statewide data.

[b] Data reflect only statewide data. For Greater Kansas City Region, data is displayed as Kansas/Missouri, where the two states have different initiatives. The Ohio and Northern Kentucky region reflect only Ohio. Information is current as of May 2017 unless otherwise noted.

[c] Data for markets which are not statewide reflect CPC + geographic boundaries.

[d] Many SSP ACOs serve multiple regions, therefore counts are not mutually exclusive.

[e] The number of AHC participants in the New York region includes Danbury Hospital in Danbury, Connecticut as the hospital serves patients in Westchester County and Putnam County, Hudson Valley, New York.

[f] A practice was considered to have medical home recognition if it at least one of its primary care practitioners was listed as having recognition at some point 2014-2017 from a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Community for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC), as determined by the June 2016 NCQA PCMH file and data extracted from the websites of TJC, AAAHC, URAC and state-specific sources between October 2016 and February 2017.

[g] We considered a practice to be a MAPCP participant if it participated in any year from 2011-2014, as determined by a file from CMS

[h] A practice was considered to have participated in CPC Classic if it enrolled in CPC Classic and did not drop out within the first five months of the program. Program started in October 2012 and ended in December 2016.

[i] Aligning Forces for Quality began funding organizations between 2006 and 2007 and continued until mid-2015.

DO = Doctor of Osteopathic Medicine; MD = Doctor of Medicine; NP = nurse practitioner; PA = physician assistant.

Table 2.3. Participation in regions joining CPC+ in 2017—across both tracks, by region

	Overall	AR	CO	HI	GKC	MI	MT	NJ	NHC	OH/KY	OK	OR	PH	RI	TN
Number of payer partners [a, b]															
Jan. 1, 2017	63	6	5	1	1	2	3	3	3	12	4	14	2	3	4
Dec. 29, 2017	61	6	5	1	1	2	3	3	3	12	4	12	2	3	4
Number of practices [a, c]															
Jan. 1, 2017	2,905	182	208	103	109	447	54	447	157	562	174	156	219	31	56
Dec. 29, 2017	2,833	180	202	95	99	431	49	442	152	557	169	154	216	31	56
Number of practitioners [a]															
Jan. 1, 2017	13,209	698	1,243	273	680	2,016	361	1,424	595	2,580	689	1,096	1,004	206	344
Dec. 29, 2017	13,519	696	1,275	264	662	2,016	374	1,438	650	2,701	727	1,134	1,028	213	341
Number of patients															
Attributed Medicare FFS beneficiaries in a given quarter [d]															
Jan. 1, 2017	1,826,944	144,380	135,665	39,611	101,039	254,164	55,762	263,763	84,159	336,087	110,967	104,361	132,429	25,858	38,699
Dec. 31, 2017	1,888,447	146,847	146,611	40,521	102,117	258,081	57,567	257,981	90,347	352,815	115,332	114,438	140,048	24,637	41,105
Unique attributed Medicare FFS beneficiaries over time [d]															
Through Dec. 31, 2018	2,237,033	172,962	172,148	46,417	121,997	305,849	71,211	319,394	107,884	411,202	35,361	133,245	161,782	30,314	47,267
Attributed patients by other payer partners [e]															
Dec. 31, 2017	3,348,302	274,692	179,556	130,370	204,078	659,389	93,245	267,233	234,540	711,041	98,699	252,951	126,271	92,933	23,304
Other, nonattributed patients served by practices [e]															
Dec. 31, 2017	9,738,218	513,444	889,781	222,267	627,454	1,384,118	234,176	1,115,015	442,840	1,875,261	528,975	710,748	862,619	86,629	244,891
Total patients served by CPC+ practices (attributed by Medicare FFS and other payers plus nonattributed patients) [e]															
Dec. 31, 2017	15,022,820	931,616	1,196,390	356,335	939,528	2,314,488	395,383	1,647,352	783,366	2,944,130	745,832	1,104,549	1,140,607	209,111	314,133

[a] Quarterly analysis of practice and payer rosters provided to Mathematica by CMS.

[b] Payers are counted separately for each region in which they participate. Advantage Medicare Plan and Community Care operate as one payer in Oklahoma.

[c] In January 2018, CMS assigned distinct IDs to 13 practices that were operating as distinct practice sites in New Jersey—but were participating under only one of two CPC+ IDs. We retroactively counted these practices as 13 distinct practices since the start of CPC+.

[d] Quarterly analysis of Medicare FFS beneficiary attribution lists provided to Mathematica by CMS and its contractors. CMS attributes beneficiaries to CPC+ practices quarterly. We deduplicated lists of Medicare FFS beneficiaries attributed to CPC+ practices from January 2017 through December 2018 to calculate the total unique Medicare FFS beneficiaries ever attributed during this period.

[e] Annual analysis of financial data reported by CPC+ practices to CMS. In the first quarter of 2018, practices that started in 2017 reported their number of attributed patients from CPC+ payer partners (payers aside from Medicare FFS) and the total number of patients (attributed and nonattributed) they served in 2017. To calculate the number of other nonattributed patients served, we subtracted the total attributed patients from the total number of patients. Due to missing data, some practices are excluded from the analysis of one or more variables; thus, total patients served may not equal the sum of attributed lives from Medicare, attributed lives from other payers, and unattributed lives.

[f] A practice was considered to have medical home recognition if it at least one of its primary care practitioners was listed as having recognition at some point 2014-2017 from a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Community for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC), as determined by the June 2016 NCQA PCMH file and data extracted from the websites of TJC, AAAHC, URAC and state-specific sources between October 2016 and February 2017.

[g] We considered a practice to be a Multi-Payer Advanced Primary Care Practice (MAPCP) participant if it participated in any year from 2011-2014, as determined by a file from CMS

[h] A practice was considered to have participated in CPC Classic if it enrolled in CPC Classic and did not drop out within the first five months of the program. Program started in October 2012 and ended in December 2016.

FFS = fee-for-service; GKC= Greater Kansas City; NHC = North Hudson–Capital Region; OH/KY = OH and Northern KY; PH = Greater Philadelphia.

2.B.   Characteristics of CPC+ practices that started in 2017

Table 2.4. Mean practice characteristics for CPC+ practices that started in 2017, CPC+ applicants, and all primary care practices in CPC+ regions, before CPC+

Characteristic	Practices in CPC+ regions that provide primary care to adult Medicare beneficiaries				
	All practices (n = 14,842)[a]	Applicants (n = 4,018)[b]	Participants (n = 2,888)	Track 1 (n = 1,373)	Track 2 (n = 1,515)
Practice size and ownership as of November 2016					
Total number of practitioners (any specialty)	3.5	5.1	5.5	4.7	6.2
Number of primary care practitioners	3.1	4.5	4.8	4.2	5.2
Number of attributed Medicare beneficiaries in 2016	343	603	674	641	705
Number of attributed Medicare beneficiaries in 2016 per primary care practitioner in practice	154	178	193	208	179
Percentage owned by a health system or a hospital[c]	31	52	55	53	57
Percentage owned (or managed) by a health system	27	47	50	47	52
Percentage owned by a hospital	17	26	28	26	29
Percentages of practices with selected transformation experience					
Patient-centered medical-home recognition[d]	25	48	52	42	61
Participant in a Medicare SSP ACO as of January 1, 2017	31	49	48	54	42
Participant in CMMI's Transforming Clinical Practice Initiative at any point in 2016	7	10	10	9	11
Participant in CMMI's Multi-Payer Advanced Primary Care Program[e]	3	6	7	6	8
Participant in CPC Classic[f]	3	11	15	5	24
Percentages of practices using EHRs					
Use of EHR software to prescribe, view labs and X-rays, and take patient notes[g]	61	78	80	77	83
Meaningful EHR use, 2011-2015[h]	59	86	90	87	93
Characteristics of practices' county					
Median household income in the county in which the practice is located ($), 2014	55,577	56,808	57,886	58,100	57,691
Percentage in a rural location, 2013	12	9	9	10	8

Table 2.4. *(continued)*

Characteristic	Practices in CPC+ regions that provide primary care to adult Medicare beneficiaries				
	All practices (n = 14,842)[a]	Applicants (n = 4,018)[b]	Participants (n = 2,888)	Track 1 (n = 1,373)	Track 2 (n = 1,515)
Percentage in a suburban location, 2013	13	14	15	17	12
Percentage in an urban location, 2013	74	77	77	73	80
Percentage of people age 25 years or older in the county with four or more years of college education	29	30	31	31	31

Sources: Data on practice size and ownership from SK&A data; data on the number and characteristics of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's Master Data Management data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's Multi-Payer Advanced Primary Care Program, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program; county data from the Area Resource File.

Notes: Table presents the mean value for each characteristic. Primary care practices include all practices that have at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a specialty of primary care (defined as family practice, general practice, geriatrics, or internal medicine).

[a] We exclude 2,692 practices (15 percent) from the sample of all primary care practices in the 2017 regions (17,534) because they had no attributed Medicare FFS beneficiaries in 2016.

[b] 4,265 practices applied for CPC+. The number of applicants in this table, 4,018, is smaller, because some applicants could not be identified in the SK&A data and some applicants had no attributed Medicare FFS beneficiaries in 2016.

[c] In the SK&A data, a practice can be both owned (or managed) by a health system and owned by a hospital.

[d] A practice was considered to have medical home recognition if it at least one of its primary care practitioners was listed as having recognition at some point 2014-2017 from a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Community for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC), as determined by the June 2016 NCQA PCMH file and data extracted from the websites of TJC, AAAHC, URAC and state-specific sources between October 2016 and February 2017.

[e] We considered a practice to be a Multi-Payer Advanced Primary Care Program participant if it participated in any year from 2011-2014, as determined by a file from CMS.

[f] A practice was considered to have participated in CPC Classic if it enrolled in CPC Classic and did not drop out within the first five months CPC Classic.

[g] The variable for use of EHR software is missing for 68 participating practices; from SK&A data measured as of November 2016.

[h] At least one practitioner attested to meaningful use under the Medicare EHR Incentive Program, 2011–2015.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CMMI = Center for Medicare & Medicaid Innovation; EHR = electronic health record; FFS = fee for service; NCQA = National Committee for Quality Assurance; SSP = Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 2.5. Difference in means for practice characteristics for CPC+ practices that started in 2017, CPC+ applicants, and all primary care practices in CPC+ regions, before CPC+

		Difference in means		
	All practices, mean (n = 14,842)[a]	**Applicant practices relative to all practices**	**Participant practices relative to applicants**	**Track 2 practices relative to Track 1 practices**
Practice size and ownership as of November 2016				
Total number of practitioners (any specialty)	3.5	2.2***	1.4***	1.5***
Number of primary care practitioners	3.1	1.9***	1.0***	1.0***
Number of attributed Medicare beneficiaries in 2016	343	358***	252***	64***
Number of attributed Medicare beneficiaries in 2016 per primary care practitioner	154	34***	52***	-28***
Percentage owned by a health system or a hospital[b]	31	28***	11***	4**
Percentage owned (or managed) by a health system	27	27***	10***	5**
Percentage owned by a hospital	17	12***	7***	3
Percentages of practices with selected transformation experience				
Patient-centered medical-home recognition[c]	25	31***	17***	19***
Participant in a Medicare SSP ACO as of January 1, 2017	31	24***	-5**	-12***
Participant in CMMI's Transforming Clinical Practice Initiative at any point in 2016	7	3***	1	2
Participant in CMMI's Multi-Payer Advanced Primary Care Program[d]	3	4***	4***	2**
Participant in CPC Classic[e]	3	11***	15***	18***
Percentages of practices using EHRs				
Use of EHR software to prescribe, view labs and X-rays, and take patient notes[f]	61	24***	7***	6***
Meaningful EHR use, 2011–2015[g]	59	38***	15***	6***
Characteristics of practices' county				
Median household income in the county in which the practice is located ($), 2014	55,577	1,688***	3,832***	-409
Percentage in a rural location, 2013	12	-5***	1	-2*
Percentage in a suburban location, 2013	13	1	2*	-5***

Table 2.5. *(continued)*

	All practices, mean (n = 14,842)[a]	Difference in means		
		Applicant practices relative to all practices	Participant practices relative to applicants	Track 2 practices relative to Track 1 practices
Percentage in an urban location, 2013	74	4***	-3**	7***
Percentage of people age 25 years or older in the county with four or more years of college education	29	1.6***	2.2***	0.2

Sources: Data on practice size and ownership from SK&A data; data on the number and characteristics of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's Master Data Management data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's Multi-Payer Advanced Primary Care Program, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program; county data from the Area Resource File.

Note: Primary care practices include all practices that have at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a specialty of primary care (defined as family practice, general practice, geriatrics, or internal medicine).

[a] We exclude 2,692 practices (15 percent) from the sample of all primary care practices in the 2017 regions (17,534) because they had no attributed Medicare FFS beneficiaries in 2016.

[b] In the SK&A data, a practice can be both owned (or managed) by a health system and owned by a hospital.

[c] A practice was considered to have medical home recognition if it at least one of its primary care practitioners was listed as having recognition at some point 2014-2017 from a state, the Accreditation Association for Ambulatory Health Care (AAAHC), The Joint Commission (TJC), National Community for Quality Assurance (NCQA), or Utilization Review Accreditation Commission (URAC), as determined by the June 2016 NCQA PCMH file and data extracted from the websites of TJC, AAAHC, URAC and state-specific sources between October 2016 and February 2017.

[d] We considered a practice to be a Multi-Payer Advanced Primary Care Program participant if it participated in any year from 2011-2014, as determined by a file from CMS.

[e] A practice was considered to have participated in CPC Classic if it enrolled in CPC Classic and did not drop out within the first five months CPC Classic.

[f] The variable for use of EHR software is missing for 68 participating practices; from SK&A data measured as of November 2016.

[g] At least one practitioner attested to meaningful use under the Medicare EHR Incentive Program, 2011–2015.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CMMI = Center for Medicare & Medicaid Innovation; EHR = electronic health record; FFS = fee for service; NCQA = National Committee for Quality Assurance; SSP = Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

2.C.   Characteristics of Medicare beneficiaries attributed to CPC+ practices that started in 2017

Table 2.6. Characteristics of Medicare beneficiaries attributed to CPC+ practices that started in 2017, CPC+ applicants, and all primary care practices in CPC+ regions, before CPC+

Characteristic	Practices in CPC+ regions that provide primary care to adult Medicare beneficiaries				
	All practices (n = 14,842)[a]	Applicants (n = 4,018)[b]	Participants (n = 2,888)	Track 1 (n = 1,373)	Track 2 (n = 1,515)
Characteristics of Medicare beneficiaries attributed to practices in 2016					
Percentage of beneficiaries who were dually eligible for Medicare and Medicaid during October–December 2015	20	15	14	14	13
Mean HCC score in 2015	1.08	1.05	1.03	1.03	1.03
Percentage of beneficiaries in the top quartile of HCC scores in 2015	27	26	25	25	25
Percentages of beneficiaries with the following chronic conditions as of January 1, 2016					
Alzheimer's and related dementia	8	8	7	7	7
Cancer	7	8	8	8	8
Chronic obstructive pulmonary disease	12	11	10	11	10
Chronic kidney disease	17	17	16	16	17
Congestive heart failure	13	11	11	11	11
Diabetes	28	26	26	27	25
Medicare expenditures and service use between January 1, 2016, and December 31, 2016, among Medicare beneficiaries attributed to practices in 2016					
Mean monthly Medicare expenditures per beneficiary ($ per month)	964	906	883	888	879
Risk-adjusted [c] mean monthly Medicare expenditures per beneficiary ($ per month)	894	863	858	861	854
Median monthly Medicare expenditures per beneficiary ($ per month)	284	236	227	231	223
Acute care stays per 1,000 beneficiaries, annualized	320	301	288	289	287
ED visits per 1,000 beneficiaries, annualized	608	545	513	513	512

Table 2.6. *(continued)*

Characteristic	Practices in CPC+ regions that provide primary care to adult Medicare beneficiaries				
	All practices (n = 14,842)[a]	Applicants (n = 4,018)[b]	Participants (n = 2,888)	Track 1 (n = 1,373)	Track 2 (n = 1,515)
Primary care (ambulatory) visits per 1,000 beneficiaries, annualized	3,529	3,593	3,593	3,624	3,564
Percentage of eligible inpatient discharges among attributed beneficiaries that were followed by a 14-day follow-up visit [d]	67	68	69	69	69

Sources: Data on the number, characteristics, and service use and spending of attributed Medicare beneficiaries based on Medicare Enrollment Database and claims data.

Notes: Table presents the mean value for each characteristic. Primary care practices include all practices that have at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a specialty of primary care (defined as family practice, general practice, geriatrics, or internal medicine).

[a] We exclude 2,692 practices (15 percent) from the sample of all primary care practices in the 2017 regions (17,534) because they had no attributed Medicare FFS beneficiaries in 2016.

[b] 4,265 practices applied for CPC+. The number of applicants in this table (4,018) is smaller, because some applicants could not be identified in the SK&A data and some applicants had no attributed Medicare FFS beneficiaries in 2016.

[c] Risk-adjusted mean monthly expenditure is calculated by dividing the average monthly expenditure of the practice by the average HCC score at the practice.

[d] This measure was calculated for beneficiaries attributed in the first quarter of 2016. A discharge was eligible for inclusion if the beneficiary was enrolled in Medicare Part A and Part B for the month of the admission and one month after the discharge date, and was discharged alive from a non-federal short-term acute care hospital to their home or a non-acute care setting.

ED = emergency department; FFS = fee for service; HCC = Hierarchical Condition Category.

Table 2.7. Difference in means for characteristics of Medicare beneficiaries attributed to CPC+ practices that started in 2017, CPC+ applicants, and all primary care practices in CPC+ regions, before CPC+

Characteristics	All practices, mean (n = 14,842)[a]	Difference in means		
		Applicants relative to all practices	Participants relative to applicants	Track 2 relative to Track 1
Characteristics of Medicare beneficiaries attributed to practices in 2016				
Percentage of beneficiaries who were dually eligible for Medicare and Medicaid during October–December 2015	20	-6***	-6***	-0.3
Mean HCC score in 2015	1.08	-0.05***	-0.06***	0
Percentage of beneficiaries in the top quartile of HCC scores in 2015	27	-2***	-3***	-0.1
Percentages of beneficiaries with the following chronic conditions as of January 1, 2016				
Alzheimer's and related dementia	8	-0.9***	-1***	-0.1
Cancer	7	0.6***	0.9***	-0.2*
Chronic obstructive pulmonary disease	12	-1.2***	-1.7***	-0.7***
Chronic kidney disease	17	0	-1.2***	0.6***
Congestive heart failure	13	-1.8***	-1.5***	-0.7***
Diabetes	28	-2.4***	-2.1***	-1.4***
Medicare expenditures and service use between January 1, 2016, and December 31, 2016, among Medicare beneficiaries attributed to practices in 2016				
Mean monthly Medicare expenditures per beneficiary ($ per month)	964	-80***	-79***	-9
Risk-adjusted[b] mean monthly Medicare expenditures per beneficiary ($ per month)	894	-42***	-21**	-6
Median monthly Medicare expenditures per beneficiary ($ per month)	284	-67***	-31***	-8***
Acute care stays per 1,000 beneficiaries, annualized	320	-27***	-46***	-2
ED visits per 1,000 beneficiaries, annualized	608	-86***	-114***	-2

Characteristics	All practices, mean (n = 14,842)[a]	Difference in means		
		Applicants relative to all practices	Participants relative to applicants	Track 2 relative to Track 1
Primary care (ambulatory) visits per 1,000 beneficiaries, annualized	3,529	87***	0	-60
Percentage of eligible inpatient discharges among attributed beneficiaries that were followed by a 14-day follow-up visit[c]	67	3***	2***	1**

Sources: Data on the number, characteristics, and service use and spending of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data.

Note: Primary care practices include all practices that have at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a specialty of primary care (defined as family practice, general practice, geriatrics, or internal medicine).

[a] We exclude 2,692 practices (15 percent) from the sample of all primary care practices in the 2017 regions (17,534) because they had no attributed Medicare FFS beneficiaries in 2016.

[b] Risk-adjusted mean monthly expenditure is calculated by dividing the average monthly expenditure of the practice by the average HCC score at the practice.

[c] This measure was calculated for beneficiaries attributed in the first quarter of 2016. A discharge was eligible for inclusion if the beneficiary was enrolled in Medicare Part A and Part B for the month of the admission and one month after the discharge date, and was discharged alive from a non-federal short-term acute care hospital to his or her home or a non-acute care setting.

ED = emergency department; FFS = fee for service; HCC = Hierarchical Condition Category.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

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CHAPTER 3 APPENDIX

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3.A. 2018 CPC+ Practice Survey

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2018 Comprehensive Primary Care Plus (CPC+)

**First Year Follow-up
Practice Survey**

FINAL - April 26, 2018

**Sponsored by
The Centers for Medicare & Medicaid Services
(CMS)**

[INSTRUCTIONS FOR TREATMENT PRACTICES]

The 2018 Comprehensive Primary Care Plus (CPC+) Practice Survey is a critical component of the independent evaluation sponsored by the Centers for Medicare & Medicaid Services (CMS), and its completion is a condition of your participation in CPC+.

The practice manager should complete the survey. **We strongly encourage you to get input from others in your practice;** for example, you may ask others to review answers to questions and discuss the survey at a practice meeting. The survey will be most helpful to you—and most accurate—if it represents a consensus view of your practice site's clinical and support staff, arriving at the best answers after discussion.

Please complete all questions in the survey to the best of your knowledge and that of others in the practice from whom you seek input.

- For practices that have more than one physical location/practice site that participates in CPC+, we will contact each site to complete the survey.
- If this practice has multiple locations/practice sites, please respond only about the site identified in the cover letter or email, and be as accurate as possible.

We encourage your candid responses and remind you that there is no "passing grade" for this survey. This survey was developed to understand how practices provide patient care and is different from the quarterly care delivery reporting you complete for CMS in the CPC+ Practice Portal.

Your responses to this survey will never be tied to your name or your practice in any report to CMS, other payers, or the public. Your responses will only be reported in aggregate (with all CPC+ practices combined). Your responses will not have any consequences for payment or for your participation in CPC+. We are genuinely interested in your candid observations of how your practice operates today.

For the purposes of providing learning support, both nationally and in your region, your practice's name and answers will be shared with the CPC+ learning team who will not share this information with CMS or other payers. This information will also be shared with independent researchers to study the effects of CPC+.

Questions? Contact CPC+ Support at CPCPlus@telligen.com or by telephone (toll free) at 1-888-372-3280.

IMPORTANT

- ✓ **If this practice has multiple physical locations/practice sites, please respond <u>only</u> about the site identified in the cover letter or email, and be as accurate as possible.**

- ✓ **We use the term "<u>physician</u>" in this survey. If your practice has nurse practitioners, physician assistants, and/or clinical nurse specialists who also act as lead clinicians with patients, please consider them as well in your responses to questions that refer to physicians.**

INSTRUCTIONS TO COMPLETE THE SURVEY

- ✓ Answer all questions to the best of your ability.

- ✓ If you answer "Other" for a question, please write what you mean on the "specify" line.

- ✓ When answering questions that require marking a check box, please use an *X.*

- ✓ For each item, please mark only one answer unless instructions say to "MARK ALL THAT APPLY."

- ✓ Some check boxes are followed by a directional arrow. Please proceed to the appropriate question as indicated by the arrow.

<p align="center">or   →</p>
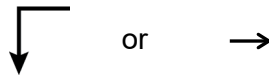
- ✓ Follow all "GO TO" instructions after marking a box. If no such instruction is provided, you should continue to the next question.

- ✓ You may use either a pen or pencil.

A. INFORMATION ABOUT THIS PRACTICE SITE

This section focuses on background information about this practice site.

PRACTITIONERS AT THIS PRACTICE SITE

A1. **This question is about <u>all practitioners</u> at this practice site, regardless of specialty [CPC+ PRACTICES ONLY: or whether they are involved in CPC+]. How many <u>total practitioners</u> work *full-time* <u>(35 hours or more per week)</u> and *part-time* <u>(fewer than 35 hours per week)</u> at this practice site?**

Please include all practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such practitioners at this practice site.

Total Practitioners	NUMBER <u>FULL-TIME</u> AT PRACTICE SITE	NUMBER <u>PART-TIME</u> AT PRACTICE SITE
a. Physician (MD or DO), not including psychiatrist	|__|__|__|	|__|__|__|
b. Physician resident or fellow (trainee)	|__|__|__|	|__|__|__|
c. Nurse practitioner (NP)	|__|__|__|	|__|__|__|
d. Physician assistant (PA)	|__|__|__|	|__|__|__|
e. Clinical nurse specialist (CNS)	|__|__|__|	|__|__|__|

A2. This question focuses on the <u>primary care practitioners</u> at this practice site. A primary care practitioner is defined as a physician (MD or DO), nurse practitioner (NP), physician assistant (PA), or clinical nurse specialist (CNS) who has a primary specialty designation of family medicine, internal medicine, or geriatric medicine, and who practices under their own National Provider ID (NPI).

How many primary care practitioners work <u>*full-time* (35 hours or more per week)</u> and <u>*part-time* (fewer than 35 hours per week)</u> at this practice site?

Please include all primary care practitioners who work at this practice site, regardless of who employs them. Please enter "0" if there are no such primary care practitioners at this practice site.

Primary Care Practitioners with Own NPI	NUMBER <u>FULL-TIME</u> AT PRACTICE SITE	NUMBER <u>PART-TIME</u> AT PRACTICE SITE
a. Physician (MD or DO)	|__|__|__|	|__|__|__|
b. Physician resident or fellow (trainee)	|__|__|__|	|__|__|__|
c. Nurse practitioner (NP)	|__|__|__|	|__|__|__|
d. Physician assistant (PA)	|__|__|__|	|__|__|__|
e. Clinical nurse specialist (CNS)	|__|__|__|	|__|__|__|

KEY APPROACHES TO PROVIDING PRIMARY CARE

General Instructions. In this section, each row pertains to a particular aspect of primary care. The four response boxes in each row represent different approaches to providing a specific aspect of primary care.

For each row, **please mark the box** that best describes the level of care that this practice site currently provides.

Patients …	…are not assigned to specific practitioner panels.	…are assigned to specific practitioner panels but panel assignments are <u>not routinely used</u> by the practice for administrative or other purposes.	…are assigned to specific practitioner panels and panel assignments are <u>routinely used</u> by the practice mainly for scheduling purposes.	…are assigned to specific practitioner panels and panel assignments are routinely used for scheduling purposes and are <u>continuously monitored</u> to balance supply and demand.
	☐	☐	☐	☐
Non-physician practice team members …	…play a limited role in providing clinical care.	…are primarily tasked with managing patient flow and triage.	…provide <u>some</u> clinical services such as assessment or self-management support.	…perform <u>key</u> clinical service roles that match their abilities and credentials.
	☐	☐	☐	☐
Care plans for patients …	…are not routinely developed or recorded.	…are developed and recorded but reflect practitioners' priorities only.	…are developed collaboratively with patients and families and include self-management and clinical goals, but they <u>are not routinely</u> recorded or used to guide subsequent care.	…are developed collaboratively, include self-management and clinical management goals, <u>are routinely</u> recorded, and guide care at every subsequent point of service.
	☐	☐	☐	☐
Sharing of care plans, in paper or electronic form, with high-risk patients …	…is not done.	…is <u>rarely</u> done.	…is <u>sometimes</u> done.	…is <u>usually</u> done.
	☐	☐	☐	☐
Sharing of care plans, in electronic form, with <u>providers outside this practice site</u> who serve your high-risk patients … *Providers include anyone providing health care services, such as specialists, hospitals, and home health agencies.*	…is not done.	…is <u>rarely</u> done.	…is <u>sometimes</u> done.	…is <u>usually</u> done.
	☐	☐	☐	☐

A standard method or tool(s) to stratify patients by risk level …	…is not available. ☐	…is available but not consistently used to stratify all patients. ☐	…is available and is consistently used to stratify all patients, but is <u>inconsistently integrated</u> into all aspects of care delivery. ☐	…is available, consistently used to stratify all patients, and is <u>integrated</u> into all aspects of care delivery. ☐
Follow-up by this primary care practice with patients seen in the emergency department (ED) or hospital …	…generally does not occur. ☐	…occurs only if the ED or hospital alerts this primary care practice. ☐	…occurs because this primary care practice makes proactive efforts to identify patients ☐	…is done routinely because this primary care practice has arrangements in place with the ED and hospital to both track these patients and ensure that follow-up is completed within a few days. ☐
Linking patients to supportive community-based resources …	…is not done systematically. ☐	…is limited to <u>providing patients a list</u> of identified community resources in an accessible format. ☐	…is accomplished through a <u>designated staff person or resource</u> responsible for connecting patients with community resources. ☐	…is accomplished through <u>active coordination</u> between the health system, community service agencies, and patients, and accomplished by a designated staff person. ☐
Patient after-hours access (24 hours, 7 days a week) to a physician, PA/NP, or nurse…	...is not available or is limited to an answering machine. ☐	…is available from a coverage arrangement (e.g., answering service) that <u>does not</u> offer a standardized communication protocol back to the practice for urgent problems. ☐	…is provided by a coverage arrangement (e.g., answering service) that shares necessary patient data with and provides a summary to the practice. ☐	…is available via the patient's choice of email or phone directly with the practice team or a practitioner who has real-time access to the patient's electronic medical record. ☐
Quality improvement (QI) activities …	…are not organized or supported consistently. ☐	…are conducted on an ad hoc basis in reaction to specific problems. ☐	…are based on a proven improvement strategy in reaction to specific problems. ☐	…are based on a proven improvement strategy and used continuously in meeting organizational goals. ☐
Staff, resources, and time for QI activities…	…are not readily available in this practice. ☐	…are occasionally available but are limited in scope (due to some deficiencies in staff, resources, or time). ☐	…are generally available and usually at the level needed. ☐	…are all fully available in the practice. ☐

B. CURRENT APPROACHES TO PROVIDING PRIMARY CARE

General Instructions. **In this section, each row pertains to a particular aspect of primary care. The four response boxes in each row represent different approaches to providing a specific aspect of primary care.**

For each row, **please mark the box** that best describes the level of care that this practice site currently provides.

ACCESS

B1. **Same-day appointments for patients who need them are available at this practice site for …**	…none of this practice's patients. ☐	…some of this practice's patients. ☐	…many of this practice's patients. ☐	…most or all of this practice's patients. ☐
B2. **[IF B1 = 2 - 4] Same-day appointments for patients who need them …** ☐ **Not applicable – same day appointments are not available**	…are available only when there are openings for that day. ☐	…are generally available by squeezing patients in between scheduled appointments. ☐	…are generally available through slots reserved for same-day appointments with any physician at this practice site. ☐	…are generally available through slots reserved for same-day appointments with the physician who treats them regularly. ☐
B3. **Communicating with the practice team through email, text messaging, or accessing a patient portal occurs for …**	…none of this practice's patients. ☐	…some of this practice's patients. ☐	…many of this practice's patients. ☐	…most or all of this practice's patients. ☐
B4. **Scheduled phone or video visits with a physician …**	…are not regularly available to patients. ☐	…are available on a limited basis to patients. ☐	…are generally available at a patient's request. ☐	…are generally available, and patients are regularly asked about their preferences for in-person versus phone/video visits. ☐
B5. **Home visits by primary care physicians or staff from this practice site to high-risk or homebound patients …**	…are not regularly available. ☐	…are available on a limited basis. ☐	…are generally available at the patient's request. ☐	…are generally available, and these patients are regularly asked about their preferences for office visits versus home visits. ☐

CONTINUITY

B6. Patients …	…do not have a specific physician that they see at this practice.	…have a specific physician, and the patient is <u>sometimes</u> scheduled with that physician.	….have a specific physician, and the patient is <u>frequently</u> scheduled with that physician.	….have a specific physician, and the patient is <u>almost always</u> scheduled with that physician.
	☐	☐	☐	☐
B7. **[IF B6 = 2-4] Patients have a specific physician, but <u>for acute care</u>, they see that physician …** ☐ **Not applicable - patients do not have a specific physician**	…never or rarely. ☐	…<u>sometimes</u>. ☐	…<u>frequently</u>. ☐	…<u>usually or always</u>. ☐
B8. **When patients contact the practice with clinical questions or concerns (e.g., a new problem or questions about their treatment) between scheduled encounters …**	…they do not have a specific physician that they see at the practice, so any member of the practice responds. ☐	…their specific physician or practice care team that has primarily worked with the patient <u>sometimes</u> responds. ☐	…their specific physician or practice care team that has primarily worked with the patient <u>frequently</u> responds. ☐	…their specific physician or practice care team that has primarily worked with the patient <u>almost always</u> responds. ☐
B9. Visits by primary care physicians or staff from this practice site <u>to patients in the hospital</u> occur for …	…none of this practice's hospitalized patients. ☐	…<u>some</u> of this practice's hospitalized patients. ☐	…<u>many</u> of this practice's hospitalized patients. ☐	…<u>most or all</u> of this practice's hospitalized patients. ☐

CARE MANAGEMENT

Care management is a set of activities designed to assist patients and their caregivers in managing medical conditions and related psychosocial problems. Care management activities include providing support and education to high-risk patients to monitor and manage their chronic condition(s), working with patients during primary care visits and between visits (e.g., by phone), and monitoring transitions in care such as after a hospitalization.

B10. Care management services for high-risk patients …	…are not provided at this practice.	…are provided by care managers from an outside organization (e.g., a health insurance plan).	…are provided by a care manager within this practice's organization who is not physically located at this practice site.	…are provided by a care manager located at this practice site.
	☐	☐	☐	☐
B11. [IF B10 = 2-4] Care managers engage in meetings, huddles, or conversations with the physicians at this practice site about the high-risk patients they manage … ☐ Not applicable – care management services for high-risk patients are not provided	…never or rarely.	…a few times a month.	…weekly.	…daily.
	☐	☐	☐	☐

B12.	Comprehensive medication management (CMM) assesses the patient's medications to determine that each medication is appropriate for the patient, effective for the medical condition, safe (given comorbidities and other medications taken), and able to be taken by the patient as intended. CMM includes action plans, individualized therapy goals, and planned follow-up with the patient. CMM is intended for high-risk patients who are at risk of medication therapy problems, such as non-compliance or side effects. This practice site conducts CMM for ...	…none of these patients.	…some of these patients.	…many of these patients.	…most or all of these patients.
		☐	☐	☐	☐
B13.	Comprehensive medication management services by a pharmacist …	…are not provided.	…are provided by a pharmacist who works largely independently of the care team at this practice site.	…are provided by a pharmacist who works closely with the care team at this practice site, but is not routinely located at the practice site.	…are provided by a pharmacist who works closely and is co-located with the care team at this practice site.
		☐	☐	☐	☐

COORDINATION OF CARE ACROSS PROVIDERS AND SETTINGS IN YOUR COMMUNITY

Please answer the questions in this section based on the providers that serve most of your patients.

B14. Receipt of clinical information (e.g., a discharge summary) from an <u>emergency department</u> (ED) about this practice's patients who had an <u>ED visit</u> …	…does not occur consistently. ☐	…usually occurs <u>more than 3 days</u> after the visit. ☐	…usually occurs <u>1–3 days</u> after the visit. ☐	…usually occurs <u>within a day</u> of the visit. ☐
B15. Outreach by this practice site to patients within <u>one week of an ED visit</u> occurs for …	…none of this practice's patients. ☐	…<u>some</u> of this practice's patients. ☐	…<u>many</u> of this practice's patients. ☐	…<u>most or all</u> of this practice's patients. ☐
B16. With patients who have had recent ED visits, talking to them about the best ways <u>to avoid future ED visits</u> is done for…	…none of these patients. ☐	…<u>some</u> of these patients. ☐	…<u>many</u> of these patients. ☐	…<u>most or all</u> of these patients. ☐
B17. Receipt of clinical information (e.g., a discharge summary) from <u>hospitals</u> about this practice's patients who had a <u>hospital visit</u> …	…does not occur consistently. ☐	…usually occurs <u>more than 3 days</u> after discharge. ☐	…usually occurs <u>1–3 days</u> after discharge. ☐	…usually occurs <u>within a day</u> of discharge. ☐
B18. Outreach by this practice site to patients within <u>3 days of hospital discharge</u> occurs for …	…none of this practice's patients. ☐	…<u>some</u> of this practice's patients. ☐	…<u>many</u> of this practice's patients. ☐	…<u>most or all</u> of this practice's patients. ☐

		…none	…some	…many	…most or all
B19.	**Discussing recommended medication, diet, or activity plans with patients who have had recent hospital stays is done for …**	…none of these patients. ☐	…<u>some</u> of these patients. ☐	…<u>many</u> of these patients. ☐	…<u>most or all</u> of these patients. ☐
B20.	**With patients who have had recent hospital stays, talking to them about the best ways <u>to avoid future hospitalizations</u> is done for …**	…none of these patients. ☐	…<u>some</u> of these patients. ☐	…<u>many</u> of these patients. ☐	…<u>most or all</u> of these patients. ☐
B21.	**Timely receipt of information (e.g., consultation reports, diagnoses, new medications) about your patients after they visit specialists occurs for…**	…none of this practice's patients. ☐	…<u>some</u> of this practice's patients. ☐	…<u>many</u> of this practice's patients. ☐	…<u>most or all</u> of this practice's patients. ☐
B22.	**Practices may or may not have agreements with specialists they refer patients to. A formal, written agreement with a specialist describes expectations for timely patient visits, the frequency and type of information communicated between the primary care practice and specialist, and their respective roles.** **This practice site has formal, written agreements with ...**	…no medical or surgical specialist groups. ☐	…<u>some</u> medical and surgical specialist groups. ☐	…<u>many</u> medical and surgical specialist groups. ☐	…<u>most or all</u> medical and surgical specialist groups. ☐
B23.	**This practice site assesses the social and functional support needs (e.g., transportation, home equipment) for …**	…none of this practice's patients. ☐	…<u>some</u> of this practice's patients. ☐	…<u>many</u> of this practice's patients. ☐	…<u>most or all</u> of this practice's patients. ☐
B24.	**Care managers with behavioral health training screen for and monitor mental health conditions, and provide education and self-management support for...**	…<u>none</u> of this practice's patients with mental health needs. ☐	…<u>some</u> of this practice's patients with mental health needs ☐	…<u>many</u> of this practice's patients with mental health needs. ☐	…<u>most or all</u> of this practice's patients with mental health needs. ☐

PATIENT AND CAREGIVER ENGAGEMENT

B25. Patient comprehension of verbal communications …	…is not assessed. ☐	…is assessed but not addressed. ☐	…is assessed and addressed by staff who are <u>not</u> trained in communicating with patients with different abilities to understand health information needed to make appropriate health decisions. ☐	…is assessed and addressed by staff <u>trained</u> in communicating with patients with different abilities to understand health information needed to make appropriate health decisions. ☐
B26. After giving medical information to a patient (or caregiver), physicians and care team members may ask the patient to explain back the information to ensure the patient understands. At this practice site, this …	…is never or rarely done. ☐	…is <u>sometimes</u> done. ☐	…is <u>frequently</u> done. ☐	…is <u>usually or always</u> done. ☐
B27. Assessing patient and family values and preferences …	…is not done. ☐	…is done but not used in planning and organizing care. ☐	…is done and <u>sometimes</u> incorporated in planning and organizing care. ☐	…is done and <u>consistently</u> incorporated in planning and organizing care. ☐
B28. This practice site discusses advance care planning (e.g., for end-of-life care and advanced directives for when patients might become too sick to make their own decisions) with …	…none of this practice's high-risk patients. ☐	…<u>some</u> of this practice's high-risk patients. ☐	…<u>many or all</u> of this practice's high-risk patients. ☐	…<u>many or all</u> of this practice's high-risk patients, and patient preferences for end-of-life care are documented and accessible to the care team. ☐
B29. Self-management support is help for patients to better manage their health on a day-to-day basis. **At this practice site, self-management support for most patients who have chronic conditions …**	…is limited to either (1) the distribution of information (e.g., pamphlets, booklets) with no or little discussion or (2) referral to self-management classes or educators. ☐	…is provided by practice staff but they do <u>not</u> set specific goals with patients (e.g., they just offer patient education). ☐	…is provided by practice staff <u>who set specific goals</u> with patients but are not trained in assessing how ready patients are to change their health behavior and how to motivate patient behavior change. ☐	…is provided by practice staff who set specific goals with patients and are <u>trained</u> in assessing how ready patients are to change their health behavior and how to motivate patient behavior change. ☐

B30.	Feedback to the practice from a patient and family advisory council (PFAC)… *A PFAC is a formal committee of patients, family, and caregivers that provides patient feedback to the practice.*	…is not collected. ☐	…is collected but is not used to guide practice improvements. ☐	…is collected and is occasionally used to guide practice improvements. ☐	…is collected and is consistently used to guide practice improvements. ☐

PLANNED CARE FOR CHRONIC CONDITIONS AND POPULATION HEALTH

B31.	Care team huddles are brief meetings among physicians and staff such as nurses and medical assistants. They are typically held before morning or afternoon patient visits, to discuss patient-specific issues and keep the core clinical team informed. At this practice site, care team huddles …	…do not occur. ☐	…occur some days. ☐	…occur most days. ☐	…occur every day. ☐
B32.	A registry is a data system that identifies and tracks patients with specific health conditions, risk states, or medications. At this practice site, registry data to assess or manage care for groups of patients …	…are not available. ☐	…are available for 1–2 diseases and/or risk states. ☐	…are available for 3–5 diseases and/or risk states. ☐	…are available for 6 or more diseases and/or risk states. ☐
B33.	Pre-visit planning (gathering and organizing patient information to prepare for the visit) prior to the day of the visit …	…is not done. ☐	…is done but primarily focuses on reviewing test results and consultation reports from specialist referrals. ☐	…is done and includes (1) reviewing test results and consultation reports from specialist referrals, and (2) identifying gaps in health care (e.g., a needed flu shot or cancer screenings). ☐	…is done and includes (1) reviewing test results and consultation reports from specialists, (2) identifying gaps in health care, and (3) conducting outreach before the visit, to ask the patient to obtain needed tests prior to the visit. ☐

B34. Comprehensive, evidence-based guidelines on preventive care and treatment of chronic illnesses …	…are not made available to physicians. ☐	…are <u>made available</u> to physicians but do not inform general protocols or practices to treat a health condition (e.g., asthma). ☐	…are made available to physicians and <u>inform general protocols or practices</u> to treat a health condition. ☐	…are made available to physicians, and inform general protocols or practices to treat a health condition and <u>specific treatment of individual patients</u> at the time of encounter. ☐
B35. Notifying patients of their laboratory and radiology test results …	…is not generally done. ☐	…is done for <u>abnormal results only</u>. ☐	…is done for abnormal results and <u>sporadically</u> for normal results. ☐	…is <u>consistently</u> done for abnormal and normal results. ☐
B36. Behavioral health outcomes <u>at the population level</u> (such as % of patients at the practice <u>with depression</u> who have a completed PHQ-9) … *By "population-level", we mean measured as a percentage of a group of patients (for example, those with a particular health condition, or all the patients at the practice).*	…are not measured. ☐	…are measured but <u>not tracked</u> to see changes over time. ☐	…are measured and tracked. ☐	…are measured and tracked, with regular reviews and efforts to improve care delivery and outcomes. ☐
B37. Clinical quality of care metrics <u>at the population level</u> for patients with chronic conditions (such as % of patients at the practice with diabetes meeting A1c goals) …	…are not measured. ☐	…are measured but <u>not tracked</u> to see changes over time. ☐	…are measured and tracked. ☐	…are measured and tracked, with regular reviews and efforts to improve care delivery and outcomes. ☐

CONTINUOUS IMPROVEMENT DRIVEN BY DATA

	…is not done.	…is rarely done.	…is sometimes done.	…is usually done.
B38. Use of performance measures by this practice site to guide quality improvement (QI) …	☐	☐	☐	☐

	…is not done.	…is rarely done.	…is done on an ad hoc basis.	…is done routinely.
B39. Use of patient experience measures (from surveys) by this practice site to guide quality improvement …	☐	☐	☐	☐
B40. Use of quality of care measures by this practice site to guide quality improvement … *An example is the % of patients with diabetes at the practice who received an HbA1c test.*	☐	☐	☐	☐
B41. Use of cost or utilization measures by this practice site to guide quality improvement … *Examples are average cost of care for all of your patients across all providers, average cost of hospitalizations, or average number of ED visits.*	☐	☐	☐	☐

SCREENING FOR MENTAL HEALTH CONDITIONS

B42. When does this practice site <u>use a formal screening tool</u> to assess patients for each of the following conditions?

MARK ONE RESPONSE PER ROW

	Never, we do not screen <u>with a formal tool</u>	We screen only as needed, <u>with a formal tool</u>	We screen at least annually (such as at annual well visits/physicals) and more if needed, <u>with a formal tool</u>
a. Depression (such as PHQ-2 or PHQ-9)	1 ☐	2 ☐	3 ☐
b. Anxiety (such as GAD-7)	1 ☐	2 ☐	3 ☐
c. Dementia (such as the Mini Mental Status Examination or Mini Cog)	1 ☐	2 ☐	3 ☐
d. Substance use (such as AUDIT-C or DAST)	1 ☐	2 ☐	3 ☐
e. Adult attention-deficit/hyperactivity disorder (such as Adult ADHD self-report tool)	1 ☐	2 ☐	3 ☐

C. PRACTICE SITE'S CHARACTERISTICS

PRACTICE OWNERSHIP AND AFFILIATIONS

C1. **Which of the following <u>best</u> describes the <u>organization</u> that employs the physicians at this practice site?**

MARK ONE ONLY

- 1 ☐ Solely owned by <u>1 to 9</u> practitioners and/or non-practitioners
- 2 ☐ Solely owned by <u>10 or more</u> practitioners and/or non-practitioners
- 3 ☐ Co-owned by a group of practitioners and a hospital, hospital system, or medical school
- 4 ☐ Hospital, hospital system, or medical school
- 5 ☐ HMO – group or staff model
- 6 ☐ Health insurance company
- 7 ☐ Community health center or clinic
- 99 ☐ Other *(specify)*

_____

C2. **Is the organization that employs physicians at this practice site a multispecialty group that includes both specialists and primary care physicians? Please do not include behavioral health workers as specialists.**

- 1 ☐ Yes
- 0 ☐ No

C3. **Please indicate how much autonomy <u>this practice site</u> has in making decisions for this site in the following areas.**

MARK ONE RESPONSE PER ROW

	LITTLE/NO AUTONOMY	SOME AUTONOMY	MODERATE AUTONOMY	HIGH AUTONOMY
a. Staff hiring	1 ☐	2 ☐	3 ☐	4 ☐
b. Organizational priorities (e.g., choosing a specific quality improvement goal)	1 ☐	2 ☐	3 ☐	4 ☐
c. Clinical work processes (e.g., a process for rooming patients)	1 ☐	2 ☐	3 ☐	4 ☐
d. Choice of specialists to whom this practice site refers (for patients whose insurance permits referrals to any specialist)	1 ☐	2 ☐	3 ☐	4 ☐

THIS PRACTICE SITE'S PATIENTS

C4.   Among this practice site's patients seen during the past 12 months, what percentage of patients were in the following two categories? Your best estimate is fine.

Please enter "0" if there are no such patients at this practice site.

	PERCENTAGE OF PATIENTS
a. Insured through Medicaid, including Medicaid managed care	|__|__|__|%
b. Uninsured or self-pay patients	|__|__|__|%

C5.   During the past two years, approximately how many patients has this practice site dismissed? By dismissing patients, we mean directing patients to leave this practice site and seek primary care elsewhere. Your best estimate is fine.

MARK ONE ONLY

0 ☐ No patients dismissed ➔ **GO TO C7**

1 ☐ 1–5 patients

2 ☐ 6–10 patients

3 ☐ 11–20 patients

4 ☐ 21–50 patients

5 ☐ 51–99 patients

6 ☐ More than 99 patients

C6.   Please indicate the reasons this practice site has dismissed patients from this practice site during the past two years.

MARK ALL THAT APPLY

1 ☐ Patient repeatedly missed appointments

2 ☐ Patient repeatedly violated bill payment policies

3 ☐ Patient violated chronic pain/controlled substance policies

4 ☐ Patient was extremely disruptive and/or behaved inappropriately toward physicians or staff

5 ☐ Patient repeatedly did not follow health care recommendations (such as medication regimens or getting lab tests done)

6 ☐ Patient repeatedly did not follow recommended lifestyle changes (such as diet, exercise, or smoking cessation)

7 ☐ Patient made frequent visits to the ED and/or frequently self-referred to specialists

99 ☐ Other *(specify)* _____

PARTICIPATION IN INITIATIVES

C7. **[CPC+ practices: Other than CPC+, does]/[Comparison practices: Does] this practice site currently participate in any of the following initiatives, demonstrations, or programs?**

MARK ONE RESPONSE PER ROW

	YES	NO
a. Health Care Innovation Awards (sponsored by CMS)	1 ☐	0 ☐
b. Accountable Care Organizations (ACOs) that are not sponsored by Medicare	1 ☐	0 ☐
c. [Name of program] (a State Innovation Model (SIM) sponsored by CMS)	1 ☐	0 ☐
d. Medicaid Health Home	1 ☐	0 ☐
e. A state- or community-based quality improvement program or collaborative (for example, Institute for Healthcare Improvement collaborative or EHR users' group)	1 ☐	0 ☐
f. An insurer-sponsored program linking payment to performance or value (such as a bonus payment from an insurer for quality)	1 ☐	0 ☐

PRACTICE STAFF AND ROLES

C8. **How many of the following staff work _full-time_ (35 hours or more per week) and _part-time_ (fewer than 35 hours per week) in primary care at this practice site?**

Please include all staff who work at this practice site, regardless of who employs them. Please enter "0" if there are no such staff at this practice site.

	NUMBER FULL-TIME AT PRACTICE SITE	NUMBER PART-TIME AT PRACTICE SITE
a. Registered nurse (RN)	|__|__|__|	|__|__|__|
b. Licensed practical nurse (LPN) or licensed vocational nurse (LVN)	|__|__|__|	|__|__|__|
c. Medical assistant (MA)	|__|__|__|	|__|__|__|

C9. Does this practice site have individuals working full-time or part-time in any of the following job roles? Please include all staff who work at this practice site, regardless of who employs them.

MARK ONE RESPONSE PER ROW

	YES	NO
a. Clinical psychologist, psychiatrist, or clinical social worker (behavioral health specialists)	1 ☐	0 ☐
b. Referral coordinator or referral specialist (someone who obtains prior authorizations, helps patients obtain appointments with specialists, and/or tracks referrals to specialists)	1 ☐	0 ☐
c. Quality improvement (QI) specialist	1 ☐	0 ☐
d. Health educator, dietitian, or nutritionist	1 ☐	0 ☐
e. Clinical pharmacist or doctor of pharmacy	1 ☐	0 ☐

C10. This question is about <u>care managers/care coordinators who work as part of a practice's care team, regardless of who employs them or where they are located</u>. A care manager/care coordinator works with high-risk patients between and during visits to provide ongoing support and education on chronic care management, and coordinates care from other providers. A care team consists of staff who regularly work together to provide patient care.

How many <u>full-time</u> and <u>part-time</u> care manager(s) and care coordinator(s) work as part of a care team at this practice site to address the needs of its patients? Please include all staff who work at this practice site, regardless of who employs them. Please enter "0" if no care managers or care coordinators work as part of a care team at this practice site.

	NUMBER OF STAFF
a. Full-time care managers and care coordinators	|___|___|___|
b. Part-time care managers and care coordinators	|___|___|___|

C11. **What is the clinical background of the care managers or care coordinators at this practice site?**

MARK ALL THAT APPLY

  1 ☐ Registered nurse (RN)

  2 ☐ Licensed practice nurse (LPN) or licensed vocational nurse (LVN)

  3 ☐ Medical assistant (MA)

  4 ☐ Social worker

  5 ☐ Other clinical background

  6 ☐ No clinical background

  7 ☐ No care manager or care coordinator at this practice site

C11a. **Do any care managers and/or care coordinators at this practice site have behavioral health training (such as screening for and monitoring of mental health conditions, and providing education and self-management support)?**

  1 ☐ Yes

  0 ☐ No

D. DATA FEEDBACK ON COST OF CARE TO INSURERS

D1a. Does this practice site get data on what insurers pay for diagnostic or lab services? These data may be provided by insurers or other organizations.

Please consider the costs to the insurer, not the cost to the patient.

MARK ONE ONLY

- 1 ☐ Yes, we get data on what <u>all</u> insurers pay
- 2 ☐ Yes, we get data on what <u>some</u> insurers pay
- 0 ☐ No, we do not get data on what any insurers pay → **SKIP TO D2a**

D1b. How often does this practice site use these data on what insurers pay for diagnostic or lab services to inform where to refer patients for diagnostic or lab services?

MARK ONE ONLY

- 1 ☐ Never or rarely
- 2 ☐ Sometimes
- 3 ☐ Frequently
- 4 ☐ Usually or always

D2a. Does this practice site get data on what insurers pay for specialist services? These data may be provided by insurers or other organizations.

Please consider the costs to the insurer, not the cost to the patient.

MARK ONE ONLY

- 1 ☐ Yes, we get data on what <u>all</u> insurers pay
- 2 ☐ Yes, we get data on what <u>some</u> insurers pay
- 0 ☐ No, we do not get data on what any insurers pay → **GO TO SECTION E**

D2b. How often does this practice site use these data on what insurers pay for specialist services to inform where to refer patients for specialist services?

MARK ONE ONLY

- 1 ☐ Never or rarely
- 2 ☐ Sometimes
- 3 ☐ Frequently
- 4 ☐ Usually or always

E. DATA FEEDBACK ON PRACTICE SITE'S PERFORMANCE

Practices may receive <u>data feedback</u> on the performance of the practice, including feedback on patient experience, quality, cost, or utilization. This data feedback may be provided by private health insurers, Medicaid, Medicare, your own organization, state health agencies, or others.

E1. In the past 12 months, has this practice site received any data feedback on the performance of the practice or physicians within the practice site?

1 ☐ Yes

0 ☐ No → **GO TO SECTION F**

E2. For each <u>type</u> of data feedback that this practice site may have received in the <u>past 12 months</u>, please indicate if this practice site has changed how it delivers care in response to this feedback.

MARK ONE RESPONSE PER ROW

	DID NOT RECEIVE THIS TYPE OF DATA FEEDBACK	DID PRACTICE SITE CHANGE HOW IT DELIVERS CARE IN RESPONSE TO DATA FEEDBACK?			
		YES, MAJOR CHANGES	YES, MINOR CHANGES	NO CHANGE	DON'T KNOW IF CHANGES WERE MADE
a. Patient experience (from surveys)	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
b. Quality of care	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
c. Cost	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
d. Utilization	0 ☐	1 ☐	2 ☐	3 ☐	d ☐

E3. **Practices may receive data feedback for this practice site as a whole, for individual physicians, or for individual patients. For each <u>type</u> of data feedback this practice site may have received in the <u>past 12 months</u>, please indicate if this practice site has changed how it delivers care in response to this feedback.**

MARK ONE RESPONSE PER ROW

	DID NOT RECEIVE THIS TYPE OF DATA FEEDBACK	DID PRACTICE SITE CHANGE HOW IT DELIVERS CARE IN RESPONSE TO DATA FEEDBACK?			
		YES, MAJOR CHANGES	YES, MINOR CHANGES	NO CHANGE	DON'T KNOW IF CHANGES WERE MADE
a. Data feedback for **this practice site as a whole** (for example, <u>% of patients with diabetes at this practice site who received an HbA1c test</u>)	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
b. Data feedback for each **physician** at this practice site (for example, <u>% of Dr. Smith's patients with diabetes who received an HbA1c test</u>)	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
c. Data feedback for **individual** patients (for example, <u>names of individual patients with diabetes who received an HbA1c test</u>)	0 ☐	1 ☐	2 ☐	3 ☐	d ☐

F. HEALTH INFORMATION TECHNOLOGY

F1. **Does this practice site use an Electronic Health Record (EHR) system?**

₁ ☐ Yes

₀ ☐ No → **GO TO F4**

F2. **Does this practice site use data extracts or reports generated from the EHR to guide quality improvement (QI) efforts?**

₁ ☐ Yes

₀ ☐ No

d ☐ Don't know

F3. **For each of the following types of providers, please think of the specific providers where most of your patients obtain care. With how many of these providers does this practice site electronically send and receive patient clinical data?**

MARK ONE RESPONSE PER ROW

	ELECTRONICALLY SENDS AND RECEIVES PATIENT CLINICAL DATA WITH...				
	NONE	**SOME**	**MOST**	**ALL**	**DON'T KNOW**
a. Hospitals	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
b. Specialist practices	0 ☐	1 ☐	2 ☐	3 ☐	d ☐
c. Diagnostic service facilities (lab or imaging)	0 ☐	1 ☐	2 ☐	3 ☐	d ☐

F4. **Does this practice site currently participate in a state or regional health information exchange?**

₁ ☐ Yes

₀ ☐ No

d ☐ Don't know

G. PRACTICE SITE REVENUES

G1. **During the <u>2017 calendar year</u>, what percentage of this practice site's revenue came from fee-for-service (FFS) payments? Please include FFS payments from all insurers.**

Your best estimate is fine.

|___|___|___|% PERCENTAGE OF 2017 PRACTICE REVENUE FROM FEE-FOR-SERVICE

G2. **During the <u>2017 calendar year</u>, did any portion of <u>this practice site's revenue</u> come from the following sources?**

	MARK ONE RESPONSE PER ROW		
	YES	**NO**	**DON'T KNOW**
a. <u>Care management fees</u> (prospective payments to support care management for patients, paid in addition to usual payments for services)	1 ☐	0 ☐	d ☐
b. <u>Capitation</u> (per-patient per-month payment for specific patients, intended to cover costs of some or <u>all</u> services provided, regardless of amount or type, in lieu of fee-for-service payments). Do <u>not</u> include the care management fees described in <u>item a.</u> above. [T2 CPC+ PRACTICES ONLY: Please include the CPC+ Comprehensive Primary Care Payment (CPCP) here.]	1 ☐	0 ☐	d ☐
c. <u>Episode-based payments</u> (a fixed payment for all services needed for a patient with a particular condition, such as an upper respiratory infection or urinary tract infection)	1 ☐	0 ☐	d ☐
d. <u>Shared savings</u>, in which costs of care are compared to an expenditure target or to costs for another group of practices and a proportion of any savings are shared with practices.	1 ☐	0 ☐	d ☐
e. <u>Financial rewards or bonuses from insurers</u> for improving quality of care, patient experience, and/or controlling costs, <u>not including</u> shared savings. [T NON-SSP CPC+ PRACTICES ONLY: Please include the CPC+ Performance-Based Incentive Payment (PBIP) here.]	1 ☐	0 ☐	d ☐
f. Other payments *(please describe)*	1 ☐	0 ☐	d ☐

_____

G3. During the <u>2017 calendar year</u>, what portion of this practice site's revenue was tied to cost or quality performance?

Insurers may refer to payments tied to cost or quality performance as "performance bonuses," "merit based incentive payments," "shared savings or shared losses," or "payment withholds."

[T NON-SSP CPC+ PRACTICES ONLY: Please consider CMS's Performance-Based Incentive Payments (PBIPs) as revenue that is tied to cost or quality performance.]

Your best estimate is fine.

|___|___|___|%   PERCENTAGE OF 2017 PRACTICE REVENUE TIED TO COST OR QUALITY PERFORMANCE

H. CPC+ PAYMENTS

These questions are about this practice site's CPC+ payments from Medicare FFS and CPC+ payer partners. Please note that we will NOT share practice-identifiable responses to this section (or any of your other responses to this survey) with CMS or CPC+ payer partners. [Sections H, I, and J are only for CPC+ practices]

H1. **[FOR T SSP PRACTICES in TRACK 1: This question]/[FOR T SSP PRACTICES IN TRACK 2 OR T NON-SSP PRACTICES: The first set of questions] is about CPC+ payments from Medicare fee-for-service (FFS).**

Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments from Medicare FFS?

- 1 ☐ More than adequate
- 2 ☐ Adequate
- 3 ☐ Less than adequate
- d ☐ Don't know– not familiar with CPC+ payments from Medicare FFS or costs of doing CPC+ work

H2. **[FOR T NON-SSP PRACTICES ONLY]: The Performance-Based Incentive Payment (PBIP) is paid by CMS prospectively at the beginning of each program year. After each program year ends, CMS retrospectively reconciles the amount of PBIP that a practice earned based on how well the practice performed on patient experience of care measures, clinical quality measures, and utilization measures that drive total cost of care.**

Thinking about this practice's experience with the PBIP payments from Medicare FFS for CPC+, please indicate how much you agree or disagree with the following statements.

MARK ONE RESPONSE PER ROW

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. Our practice understands how Medicare FFS calculates the proportion of the Performance-Based Incentive Payment (PBIP) my practice will retain and the proportion CMS will recoup	1 ☐	2 ☐	3 ☐	4 ☐	
b. Our practice feels that Medicare FFS's methodology <u>is fair</u> in how it determines the proportion of the Performance-Based Incentive Payment (PBIP) my practice will retain and the proportion CMS will recoup	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

H3. **[FOR TRACK 2 CPC+ PRACTICES ONLY]: The Comprehensive Primary Care Payment (CPCP) is a lump sum quarterly payment paid to Track 2 practices based on their historical FFS payment amounts for evaluation and management (E&M) services. Track 2 practices' FFS payments for these services are reduced to account for the CPCP.**

Thinking about this practice's experience with the CPCP payments from Medicare FFS for CPC+, please indicate how much you agree or disagree with the following statements.

	MARK ONE RESPONSE PER ROW				
	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. Our practice <u>understands</u> how Medicare FFS calculated its Comprehensive Primary Care Payments (CPCPs)	1 ☐	2 ☐	3 ☐	4 ☐	
b. Our practice feels that Medicare FFS' methodology <u>is fair</u> in how it calculates Comprehensive Primary Care Payments (CPCPs)	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

H4. **CPC+ payer partners are payers <u>other than Medicare FFS</u> that participate in CPC+. The next set of questions is about CPC+ payments from <u>CPC+ payer partners</u>. These payers include private health insurers, Medicare Advantage, Medicaid FFS, and Medicaid Managed Care.**

Does this practice contract with CPC+ payer partners for CPC+?

   1 ☐ Yes

   0 ☐ No → **GO TO SECTION I**

H4a. **Overall, considering the amount of work required by CPC+, how adequate or inadequate are the CPC+ payments across the <u>CPC+ payer partners</u> you work with on CPC+?**

CPC+ payments from these payers could include care management fees; full or partial capitated, global, or bundled payments; or payments that reward cost or quality performance.

   1 ☐ More than adequate

   2 ☐ Adequate

   3 ☐ Less than adequate

   d ☐ Don't know– not familiar with CPC+ payments from CPC+ payer partners or costs of doing CPC+ work

H5. **Thinking across all of the <u>CPC+ payer partners</u> you work with on CPC+, please indicate how much you agree or disagree with the following statements about this practice's experience with CPC+ payments from these <u>CPC+ payer partners</u>.**

MARK ONE RESPONSE PER ROW

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
a. Our practice <u>understands which payments</u> we receive from CPC+ payer partners for CPC+	1 ☐	2 ☐	3 ☐	4 ☐	
b. Our practice <u>understands how</u> CPC+ payer partners calculated their CPC+ payments	1 ☐	2 ☐	3 ☐	4 ☐	
c. Our practice feels that the CPC+ payer partners' methodology to calculate CPC+ payments is <u>fair</u>	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

I. LEARNING ACTIVITIES AND ASSISTANCE IN CPC+

These questions are about the learning activities and assistance that the CPC+ National Learning Community and Regional Learning Network [CPC CLASSIC PRACTICES ONLY: (known as regional learning faculty in CPC Classic)] provided to this practice site as part of CPC+. Please note, we will NOT share practice-identifiable responses to these questions with the <u>National Learning Community or Regional Learning Network</u>. [Sections H, I, and J are only for CPC+ practices]

I1.   Overall, how would you rate the quality of all services from [NAMES OF REGIONAL LEARNING NETWORK ORGANIZATIONS] in meeting this practice site's CPC+-related needs and helping improve primary care?

MARK ONE ONLY

1   ☐   Excellent

2   ☐   Very good

3   ☐   Good

4   ☐   Fair

5   ☐   Poor

I2. **The CPC+ National Learning Community and Regional Learning Network offer assistance to practices in a variety of ways. For each of the following types of assistance that this practice site may have received in the <u>past six months</u>, please rate how useful this assistance has been to this practice site in improving primary care.**

MARK ONE RESPONSE PER ROW

	NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	NEVER RECEIVED OR ATTENDED
a. Webinars (for example, Action Groups or Practices in Action meetings)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Health IT Affinity Groups (groups enabling CPC+ practices to network with their health IT vendors or other practices that use the same health IT)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. In-person learning sessions	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. In-person coaching at this practice site to improve practice processes and workflows	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e. One-on-one telephone/virtual coaching with this practice site to improve practice processes and workflows	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
f. CPC+ Connect (the online information resource and collaboration website for CPC+)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
g. CPC+ Implementation Guides	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
h. CPC+ Practice Spotlights (articles highlighting the work of individual CPC+ practices)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
i. CPC+ Support (CPC+ help desk managed by Telligen)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

I3. **[FOR PRACTICES WITH CPC+ PAYER PARTNERS]: In addition to the support from the CPC+ National Learning Community and Regional Learning Network, <u>CPC+ payer partners</u> may provide their own support and assistance. For each of the following types of assistance that this practice site may have received from CPC+ payer partners in the <u>past six months</u>, please rate how useful this assistance has been to this practice site in improving primary care.**

CPC+ payer partners are payers other than Medicare FFS that participate in CPC+.

	MARK ONE RESPONSE PER ROW				
	NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	NEVER RECEIVED OR ATTENDED
a. On-site care manager provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Telephone-based care manager provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. Explanation of payers' CPC+ payment methodologies	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. Training on how to access data feedback provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e. Training on how to use data feedback provided by the payer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
f. Coaching on how to improve practice processes and workflows	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

J. PRACTICE SITE INVOLVEMENT AND PERCEPTIONS OF CPC+

[Sections H, I, and J are only for CPC+ practices]

J1. Thinking of the different types of staff <u>at this practice site</u>, how involved is each type of staff in implementing CPC+?

MARK ONE RESPONSE PER ROW

	VERY INVOLVED	SOMEWHAT INVOLVED	NOT VERY INVOLVED	NOT AT ALL INVOLVED
a. Medical director or clinician lead at this practice site	1 ☐	2 ☐	3 ☐	4 ☐
b. Physicians	1 ☐	2 ☐	3 ☐	4 ☐
c. Nurse practitioners (NPs), clinical nurse specialists (CNSs), or physician assistants (PAs)	1 ☐	2 ☐	3 ☐	4 ☐
d. Clinical support staff	1 ☐	2 ☐	3 ☐	4 ☐
e. Clerical support staff	1 ☐	2 ☐	3 ☐	4 ☐

J2. Thinking about this practice organization, how involved are <u>system-level leadership</u> (e.g., chief executive officer (CEO) or chief medical officer (CMO)) in implementing CPC+?

MARK ONE ONLY

- 0 ☐ Practice site is independent and not part of a system
- 1 ☐ Very involved
- 2 ☐ Somewhat involved
- 3 ☐ Not very involved
- 4 ☐ Not at all involved

J3. In answering this question, please consider the:

- **Improvements made to the practice site's care delivery,**
- **CPC+ participation requirements (including care delivery, health IT, and reporting requirements), and**
- **CPC+ supports (payments, learning activities, data feedback, and health IT vendor support).**

Given this practice's overall experience participating in CPC+, how likely is it that this practice would participate in CPC+ if this practice could do it all over again?

MARK ONE ONLY

1 ☐ Very likely

2 ☐ Somewhat likely

3 ☐ Not very likely

4 ☐ Not at all likely

J4. How much has participation in CPC+ improved the quality of care that this practice currently provides to its patients?

MARK ONE ONLY

1 ☐ A lot

2 ☐ Somewhat

3 ☐ Not very much

4 ☐ Not at all

J5. How burdensome are the following requirements in CPC+?

MARK ONE RESPONSE PER ROW

	NOT AT ALL BURDENSOME	NOT VERY BURDENSOME	SOMEWHAT BURDENSOME	VERY BURDENSOME	DON'T KNOW
a. Meeting care delivery requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b. Completing care delivery reporting requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
c. Completing financial reporting requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
d. Meeting health IT requirements	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

J6. **How useful are the following supports provided by CPC+ in improving primary care? Please consider supports from all payers participating in CPC+.**

MARK ONE RESPONSE PER ROW

	NOT AT ALL USEFUL	NOT VERY USEFUL	SOMEWHAT USEFUL	VERY USEFUL	DON'T KNOW
a. Financial support	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
b. Learning support	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
c. Data feedback	1 ☐	2 ☐	3 ☐	4 ☐	d ☐
d. Health IT vendor support	1 ☐	2 ☐	3 ☐	4 ☐	d ☐

K. PRACTICE SITE CONTACT INFORMATION AND SURVEY COMPLETION

K1.   **Please provide the following information for this practice site.**

Practice Site Name: _____

Physical Street Address: _____

City: _____   State: _____   Zip Code: _____

Practice Site Telephone Number: _____

Mailing Address: _____

City: _____   State: _____   Zip Code: _____

K2.   **Please provide the name, title, email, and phone number of the person who completed this survey so we know who to contact if we have any questions.**

Name: _____

Title: _____

Email: _____

Telephone Number: _____

K3.   **Please confirm the name and address of the person who should receive the check for completing the survey. You may enter your practice name in the "Name of Check Recipient" field if you prefer that the check be made out to your practice. If you are unable to accept payment, please mark the box that says, "Do not send payment" and leave the remaining fields blank. [Only for comparison practices]**

☐   Do not send payment

Name of Check Recipient: _____

Address: _____

City: _____   State: _____   Zip Code: _____

K4. **Who filled out this survey or provided input to complete this survey?**

MARK ALL THAT APPLY

1 ☐ Practice or office manager (e.g., Clinic manager, office coordinator, office supervisor)

2 ☐ Lead physician

3 ☐ Other physicians

4 ☐ Nurse practitioner (NP), clinical nurse specialist (CNS), or physician assistant (PA)

5 ☐ Care manager or coordinator

6 ☐ Nursing staff, including nurse manager or supervisor

7 ☐ Medical assistant staff

8 ☐ Quality improvement staff (e.g., quality manager or coach, population health staff)

9 ☐ Administrative support staff (e.g., billing or finance staff, front desk staff)

10 ☐ Non-physician owner of practice

11 ☐ Leadership or staff from our larger health care system or medical group (e.g., CEO, CMO)

12 ☐ Data analytics staff (e.g., EMR analyst, health IT team)

13 ☐ CPC+ lead

14 ☐ Patients

99 ☐ Other *(specify)*

_____

K5. **Please add any comments about this survey here.**

Thank you for completing the survey!

INSTRUCTIONS TO SUBMIT THE COMPLETED SURVEY

If you complete a paper survey, please return your **completed** survey to:

BY MAIL: Mathematica Policy Research – CPC Plus
P.O. Box 2393
Princeton, NJ 08543-9809

BY EMAIL: CPCPlusPracticeSurvey@mathematica-mpr.com
BY FAX: 1-609-799-0005
Attn: CPC Plus Practice Survey

3.B.   Details of CPC+ payers shared savings approaches

CMS' approach to rewarding CPC+ practices for improving quality or reducing costs varies depending on whether practices participate in CPC+ only or participate in both CPC+ and the Medicare Shared Savings Program (SSP). Practices participating in CPC+ only are eligible to receive CPC+ performance-based incentive payments (see Chapter 3 for details). Practices participating in CPC+ and SSP are not eligible to receive CPC+ performance-based incentive payments and, instead, are rewarded for cost or quality performance through their ACO's SSP shared savings/shared losses arrangement. Forty-seven percent of CPC+ practices fall into this category. Thirty non-Medicare FFS payers (49 percent) also used a shared savings approach to reward CPC+ practice performance. Table 3.A.1 summarizes the approaches used by CMS and these payers.

Table 3.A.1. 2017 shared savings methodologies among CPC+ payers

Type of payment support	Used by Medicare FFS for SSP?	Percentage of non-Medicare FFS CPC+ payers using approach (N = 23 or 24) [a]
Group for whom savings were calculated		
All practices in the region[b]		13
Practice or groups of affiliated providers	✓	63
Groups of unaffiliated practices		25
Downside risk is shared with practices	✓, for SSP Tracks 1+, 2, and 3	13
Adjustments to savings calculations		
Excludes or truncates high-cost outliers	✓	87
Adjusts for demographic characteristics or population risk	✓	70
Minimum savings rate must be met to earn shared savings	✓	50
Maximum percentage of total dollar savings shared with practices		
Less than 50		50
50	✓ for SSP Track 1	41
More than 50	✓ for SSP Tracks 2 and 3	9
Metrics used to determine whether practices are eligible to receive share of savings		
Claims-based quality measures	✓	71
Patient experience measures	✓	25
Electronic Clinical Quality Measures	✓	33
Percentage of savings shared varies depending on quality performance	✓	17

Sources: CPC+ 2017 payer survey.

Centers for Medicare & Medicaid Services, Medicare Shared Savings Program. "Shared Savings and Losses and Assignment Methodology." Version 5, April 2017. Available at https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/Shared-Savings-Losses-Assignment-Spec-V5.pdf.

Note: Response categories are not mutually exclusive.

[a] Thirty non-Medicare FFS payers offered shared savings opportunities for CPC+ practices in 2017. Some payers declined to report on certain aspects of their shared savings methodologies. Each table row indicates the number of payers that reported on a given feature. Payers operating in more than one region are counted multiple times, once for each region in which they participate.

[b] That is, all CPC+ practices with which the payer has attributed lives. Payers calculating savings for all practices in a region include payers doing so separately by line of business.

3.C.   Sample Medicare FFS data feedback report

CMS released its first round of CPC+ data feedback on Medicare FFS beneficiaries in May 2017 and two subsequent rounds in August and November 2017. This appendix includes a sample of the practice-level data feedback dashboard.

CPC+ Practice Medicare Fee for Service Feedback Report | 2017 Report 1
Claims Period Covered: 2015 Q1 - 2016 Q4 | Created: May 17, 2017

Print   Quick Tips   User Guide   CMS

All the measures and metrics reported in this dashboard are for Medicare CPC+ attributed beneficiaries only. Some measures are greyed out and will be reported in future reports when additional data becomes available.

Performance Highlights (risk adjusted)

Measure Name	Beneficiaries	Practitioners	Expenditures	Hospitalizations	ED Visits
Measure Units	Total	Total	PBPM	Observed/Expected Ratio	Observed/Expected Ratio
Current Quarter Actual	**1,328**	**8**	**$893**	-	-
Current Quarter 12 Month Avg. / Rate of Change / Last Quarter 12 Month Avg.	- / - / -	- / - / -	$838 → 3.4% / $810	0.89 ↓ -5.6% / 0.94	1.46 → -0.5% / 1.47
Prior Five Quarters Trend 12 Month Avg.	-	-			

Report Insight

Your Practice reduced Acute Inpatient Hospitalizations from 0.94 to 0.89 observed to expected ratio from last reporting period (Oct 2015 - Sep 2016) to this reporting period (Jan 2016 - Dec 2016).

↑ Increase > 5%   → Within 5%   ↓ Decrease > 5%

Demographics

Practice

HCC Risk Score: min 0.1, avg 0.9, max 7.4

CPC+ Risk Tier: 33% (1), 30% (2), 18% (3), 11% (4), 7% (5)

	1	2	3	4	5
Total	444	403	243	140	98

Age: 3% (18-49), 8% (50-64), 51% (65-74), 28% (75-84), 9% (>84)

	18-49	50-64	65-74	75-84	>84
Total	45	105	678	378	122
Tier 4	3	23	32	51	31
Tier 5	2	14	20	36	26

Race/Ethnicity: 11% (A/PI), 0.2% (AI/AN), 8% (B), 1% (H), 73% (W), 7% (O/U)

	A/PI	AI/AN	B	H	W	O/U
Total	147	2	103	17	963	96
Tier 4	14	0	12	3	109	2
Tier 5	6	0	7	0	82	3

Gender: 54% (Female), 46% (Male)

	Female	Male
Total	722	606
Tier 4	77	63
Tier 5	41	57

Dual Eligibles: 11% (Yes)

	Yes
Total	142
Tier 4	27
Tier 5	13

Panel Size: Avg **166** Beneficiaries per Practitioner

Region

HCC Risk Score: min 0.1, avg 1.0, max 12.7

CPC+ Risk Tier: 27% (1), 28% (2), 23% (3), 17% (4), 6% (5)

	1	2	3	4	5
Total	67,143	70,349	57,628	43,618	14,035

Age: 4% (18-49), 10% (50-64), 44% (65-74), 28% (75-84), 14% (>84)

	18-49	50-64	65-74	75-84	>84
Total	11,299	24,187	111,661	70,850	34,776
Tier 4	1,603	5,656	11,142	14,276	10,941
Tier 5	352	1,173	3,101	4,965	4,444

Race/Ethnicity: 1% (A/PI), 0.1% (AI/AN), 6% (B), 2% (H), 87% (W), 4% (O/U)

	A/PI	AI/AN	B	H	W	O/U
Total	2,756	356	15,827	4,002	219,042	10,790
Tier 4	315	86	3,499	700	38,560	458
Tier 5	129	22	1,013	214	12,536	121

Gender: 58% (Female), 42% (Male)

	Female	Male
Total	147,150	105,623
Tier 4	24,980	18,638
Tier 5	8,186	5,849

Dual Eligibles: 10% (Yes)

	Yes
Total	25,758
Tier 4	7,319
Tier 5	1,798

Panel Size: Avg **104** Beneficiaries per Practitioner

Race/Ethnicity Categories: A/PI: Asian or Pacific Islander | AI/AN: American Indian or Alaska Native | B: Black or African American | H: Hispanic | W: Non-Hispanic White | O/U: Other or Unknown

| Risk Tier (all) ▾ | Age (all) ▾ | Race (all) ▾ | Gender (all) ▾ | **View Beneficiary Data** | **Reset** | 1,309 of 1,309 (100%) Attributed Beneficiaries |

Select from the above demographics filters to display only those beneficiaries in the below expenditure and utilization measures. Click an expenditure or utilization measure to display that measure's associated chart(s).

Expenditures (unadjusted) — Toggle 100%

Measure Name	
Current Quarter 12 Month Avg. PBPM	Medicare Total %

Medicare Total
$728.80

Key Expenditures

Acute Inpatient	
$234.17	32%

Specialty	
$36.06	5%

My Practice Primary Care	
$13.85	2%

Other Practice Primary Care	
$9.33	1%

Breakdown of Medicare Total Expenditure

Quarter	Inpatient	Outpatient	Professional	Post Acute	Other
2016 Q4	$245	$250	$152	$65	$18
2016 Q3	$235	$247	$146	$59	$17
2016 Q2	$224	$237	$143	$51	$17
2016 Q1	$224	$241	$140	$51	$18
2015 Q4	$221	$234	$138	$47	$16

PBPM Expenditure — $0 to $800

■ Inpatient ■ Outpatient ■ Professional ■ Post Acute ■ Other

Medicare Total Expenditure Comparison

PBPM Expenditure — $0 to $900 across 2015 Q4, 2016 Q1, 2016 Q2, 2016 Q3, 2016 Q4

-- Practice Actual — Practice 12 Month Avg. — Region 12 Month Avg.

12 Month Avg. includes the last 12 months inclusive of the quarter indicated

Utilization

Measure Name	
Current Quarter 12 Month Avg. per 1,000 beneficiary-years	

Acute Inpatient
160

Percent of Beneficiaries by Discharge Count	
Zero Discharges	89%
One Discharge	9%
Two+ Discharges	3%

ACSC Discharges
19

ED Visits
493

Expenditure vs Utilization for Acute Inpatient Current Quarter

Rate Per 1,000 Beneficiary-Years — 51 to 651
Expenditure PBPM — $32 to $932

● Other Practices in the Region ▲ Regional Average ■ Practice

Rate of Acute Inpatient Utilization Comparison

Rate per 1,000 Beneficiaries — 0 to 300 across 2015 Q4, 2016 Q1, 2016 Q2, 2016 Q3, 2016 Q4

-- Practice Actual — Practice 12 Month Avg. — Region 12 Month Avg.

12 Month Avg. includes the last 12 months inclusive of the quarter indicated

3.D.   CPC+ data aggregation efforts in 2017

In this appendix, we provide additional detail on data aggregation efforts in 2017. We first describe the content and structure of aggregated reports and then highlight the factors that facilitated or hindered data aggregation efforts.

3.D.1. Content and structure of aggregated reports

Payers in four regions provided aggregated data feedback to practices in 2017. Medicare FFS joined regional aggregation efforts in the three of these regions that had aggregated data in CPC Classic—Colorado, Ohio/Northern Kentucky, and Oklahoma. We collected detailed information on these CPC+-specific aggregation efforts, which we describe below. All non-Medicare FFS payers in Tennessee—all of which participate in CPC+ for their Medicaid lines of business only—also aggregated data as part of a state Medicaid initiative. (See text box for a brief overview of the content and structure of their reports.)

Closer look: Aggregated and aligned data feedback in Tennessee

Tennessee Medicaid required all of its Medicaid managed care organizations (MCOs) to participate in CPC+; no other payers participate in the region. Under the leadership of the state Medicaid agency, payers in Tennessee began sharing aggregated data feedback with practices that participate in the state's Patient-Centered Medical Home (PCMH) and behavioral health programs, a subset of which also participate in CPC+. The state's feedback tool, called the Care Coordination Tool (CCT), incorporates a variety of data: quality measures, mostly from MCO claims data; admissions, discharges, and transfer (ADT) data reported by hospitals; and pharmacy data. The CCT generates lists of attributed patients, gap-in-care reports, and priority action lists for practices. Because the claims data come from monthly data feeds from the MCOs, the data is delayed less than three months, potentially making it more useful for informing patient care decisions than many other tools with longer data lags. The ADT data may be the most actionable, however, because it is provided closest to real time. In addition to making the CCT available, each of the MCOs separately disseminates to practices aligned performance reports each quarter, using a TennCare template that reflects performance on quality, cost, and utilization measures and whether a given practices' performance is sufficient to earn incentive payments under TennCare's PCMH and behavioral health programs. These reports include system-level data only.

Details on data aggregation efforts that include Medicare FFS data. Payers in Colorado, Ohio/Northern Kentucky, and Oklahoma began sharing aggregated data feedback that included Medicare FFS data under CPC Classic. However, due to data aggregation contracting changes, CMS stopped providing Medicare FFS data to these regions' data aggregation vendors at the start of CPC+. Specifically, CMS changed its data aggregation contracting arrangement from CMS developing cooperative agreements directly with data aggregators under CPC Classic to CMS contracting with one data feedback contractor for CPC+ (Deloitte), which in turn developed subcontracting agreements with each data aggregator. While CMS underwent contracting changes, Colorado shared aggregated data that did not include Medicare FFS data with practices in June 2017, but Ohio/Northern Kentucky and Oklahoma delayed sharing aggregated data until Medicare FFS data was available. For this reason, those two regions first shared aggregated reports in December 2017.

Appendix Table 3.D.1 provides information on the data aggregation management infrastructure and timeline and on the level of payer and practice involvement in data aggregation in each region. Appendix Table 3.D.2 includes detail on the content and structure of aggregated reports.

Table 3.D.1. Features of the data aggregation management infrastructure and the level of payer and practice involvement in Colorado, Ohio/Northern Kentucky, and Oklahoma, as of December 2017

	Colorado	Ohio/Northern Kentucky	Oklahoma
Management and timeline			
Type of organization responsible for managing the data aggregation effort	Health care consulting and advisory organization	Regional health improvement collaborative	Health Information Exchange
Organization responsible for technically aggregating data	Data technology and analytics company	Health care IT company	Health care IT company
Date when aggregated data first shared with practices in CPC Classic	June 2015	January 2016	Early 2015
Date when aggregated data first shared with practices in CPC+	June 2017	December 2017	December 2017
Date when Medicare data first included under CPC+	December 2017	December 2017	December 2017
Payer participation and financing			
Participating non-Medicare payers	5 of 5 CPC+ payers[a]	6 of 12 CPC+ payers[b]	3 of 4 CPC+ payers
Allocation of data aggregation costs between payers and practices[c]	100 percent of payers[d]	35 percent of payers, 65% practices	Shared by payers and practices[e]
Practice participation			
Approximate percentage of CPC+ practices with access to feedback tool	80 percent	50 percent	> 75 percent
Tool available to non-CPC+ practices	Yes	No	No

Source: Data aggregation vendor interviews and pre-interview worksheets.

[a] One payer not providing CPC+ practices enhanced or alternative payments also participates in data aggregation.

[b] Four Ohio Medicaid managed care organizations (MCOs) participated in a separate data aggregation effort conducted by Ohio Medicaid. These payers did not participate in the CPC+-specific data aggregation initiative and are not reflected in this table.

[c] Each payer in all three regions pays an amount based on its proportion of total attributed patients.

[d] Colorado Medicaid is not directly paying for data aggregation but is contributing toward other general CPC project management costs.

[e] The data aggregation vendor did not report on the specific proportions.

Table 3.D.2. Content and structure of aggregated feedback in Colorado, Ohio/Northern Kentucky, and Oklahoma

	Colorado	Ohio/ Northern Kentucky	Oklahoma [a]
Data sources			
Payer claims	✓	✓	✓
Pharmacy data	✓	✓	✓
Laboratory data	✓ (in pilot phase)		✓
Admission discharge and transfer data			✓
Electronic health record data			✓
Practice's performance can be displayed at			
Patient level	✓	✓	✓
Physician level	✓	✓	
Practice level	✓	✓	✓
Across multiple sites in a single practice or system	✓	✓	✓
Payer level	✓	✓	Not provided
Number of measures reported	Not provided	16	4
Cost	✓	✓	
Utilization	✓	✓	✓
Quality	✓	✓	✓
Patient lists provided			
Patients attributed to the practice	✓	✓	
Patients with gaps in care	✓		✓
Patients with high total health care costs	✓	✓	
Patients who have multiple ED and/or hospital stays	✓	✓	✓
Patients receiving care from specific specialists	✓		
Patients filling prescriptions for specific drugs	✓		✓
Expenditure data for a given provider or provider type			
Specialists	✓		
Hospitals	✓		

Source: Data aggregation vendor interviews and pre-interview worksheets.

[a] Oklahoma's data feedback specifically designed for CPC+ practices are provided on the same platform as data provided under MyHealth's role as the Health Information Exchange (HIE). While CPC+ aggregated feedback is based on claims data, the HIE platform integrates EHR; laboratory; pharmacy; and admissions, discharge, and transfer (ADT) data. The table describes Oklahoma's feedback specifically aggregated for CPC+ practices.

3.D.2. Factors influencing progress toward aggregated data feedback

Section 3.4 of the supplemental report outlines factors that influence payers' ability to provide CPC+ practices with data feedback—individual or aggregated—that is useable, used, and useful, including the need to train practices to use the tools, long claims processing delays, and difficulties integrating clinical data into reports. Payers also identified factors that relate specifically to aggregating data.

A few factors appeared to promote aggregation in the regions that achieved it in 2017:

- **Experience aggregating data with Medicare FFS. Only regions that produced data feedback that aggregated Medicare FFS data with that of other payers in CPC Classic also did so for CPC+. This experience built a foundation for their work in CPC+.**

- **Using trusted, experienced organizations as data aggregators.** In all three regions that aggregated data with Medicare FFS, payers are working with data aggregation vendors with long ties to the community. From early in CPC Classic, these organizations were widely regarded as well-positioned to play a role in aggregation.

- **Sharing lessons across regions.** Data aggregation vendors appreciated the opportunity to share lessons learned across regions. This communication was accomplished through informal conversations as well as one organized session on cost measures hosted by CMS.

Payers identified challenges that relate to aggregating data feedback. These centered on:

- **Cost of aggregation**. The costs associated with mapping the data into a standard format that is consistent across payers, cleaning the data, applying risk adjustment, and ensuring the security of the data can be significant. For nearly all payers, these costs are in addition to the investment they have already made in producing their individual reports.

- **Ability to gain full payer participation.** Some CPC+ payers have declined to participate in aggregated reporting in a region. These gaps in participation reduce the volume of data in aggregated claims reports, which undercuts the value of the report. Compounding this situation are the presence of non-CPC+ payers that do not participate in data aggregation.

- **Challenges agreeing on specific measures to report**. Several factors complicated conversations around these choices. First, payer preferences vary based on the characteristics of their covered population. For example, Medicaid plans tend to prefer measures tailored to pediatric and maternal populations, whereas some commercial plans find greater value in measures aimed at preventive care needs of an older population. In some regions, national payers were particularly reluctant to agree to region-specific measures given the corporate preference to compare regions across a common measure set.

- **Concerns about reporting cost data. M**any payers expressed concern that reporting cost data would allow competitors to deduce their payment rates to practices or other providers. Payers not only consider their payment rates to be confidential, proprietary information, but regulators could perceive revealing payment rates as contributing to collusion or non-competitive price fixing.

- **Accurately combining data across payers.** The validity of the aggregated report depends on the aggregator accurately combining data from multiple sources and navigating a variety of challenges, including accurately mapping individual payer data to a uniform reporting format, resolving instances of mapping discrepancies, adjusting for different data refresh periods, and responding to changes in individual payers' submission formats.

- **Ability to get practices to use the data.** Not all practices have signed up to use aggregated data tools. In 2017, around 80 percent of CPC+ practices had registered to use the tool in Colorado, which is free of charge for practices. In Ohio/Northern Kentucky and Oklahoma—both of which require practices to pay to access their tools—around one-half and three-quarters, respectively, of practices have done so. Data aggregators indicated that practices who have declined to sign up have cited several reasons for not doing so. For example, data aggregators indicated some practices did not know about aggregated tools yet and the aggregators were still educating practices (especially practices that did not participate in CPC Classic) about them. Other practices—particularly those that received data from other sources outside of their practice, such as a local Health Information Exchange, indicated that they did not see value in aggregated claims data.

- **Continued dissemination of parallel reports.** The payers (including CMS) that participated in data aggregation in 2017 did not stop providing individual data feedback to practices as a result of an aggregated report being available. This choice reflects that payers value using the reports to accomplish some of their own payer-specific goals (such as the inclusion of scorecards tied to payment incentives), the flexibility to tailor measures, and the inclusion of payer-specific real-time data on hospitalizations and ED visits. The downside, however, is that practices are still expected to review multiple reports, and one of the goals of aggregated feedback—easing the burden on practices—has not been met. In addition, issuing parallel reports introduces the possibility of discrepancies in data across reports, likely stemming from different data cleaning methods, measure specification, and/or reporting intervals, which creates confusion and can lead practices to question the validity of the data.

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CHAPTER 4 APPENDIX

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4.A.   Care delivery requirement reporting data

Active CPC+ practices must submit quarterly responses about care delivery requirements online through the CPC+ Practice Portal. Table 4.A.1 summarizes the number of practices that were active in CPC+ at the beginning (January 1, 2017) and end (December 31, 2017) of the first intervention year. At the end of the first intervention year, 2,786 practices participated in CPC+; 1,310 practices were in Track 1, and 1,476 were in Track 2. Participation status in a Medicare Shared Savings Program (SSP) accountable care organization reflects status at the end of the first intervention year.

Table 4.A.1. Participation in CPC+ for practices that started in 2017, by track and SSP status

		Track 1			Track 2		
	Overall	Total	SSP	Non-SSP	Total	SSP	Non-SSP
Number of practices[a,b]							
January 1, 2017	2,905	1,385	738	647	1,520	616	904
December 31, 2017	2,786	1,310	689	621	1,476	587	889
Number of practices active at end of year with CPC+ Practice Portal data[c]							
Quarter 1	2,786	1,310	689	621	1,476	587	889
Quarter 2	2,786	1,310	689	621	1,476	587	889
Quarter 3[d]	2,785	1,310	689	621	1,475	586	889
Quarter 4[e]	2,785	1,309	689	620	1,476	587	889

Note: Data reported for 2017 reflect participation for 2017 starters only.

[a] Quarterly analysis of practice rosters provided to Mathematica by CMS and its contractors. These numbers exclude practices that were terminated by May 25, 2018, with a retrospective termination date before December 31, 2017.

[b] Practices' SSP status reflects SSP status as of December 2017.

[c] In January 2018, CMS assigned individual ID numbers to 13 practices that operated as distinct practice sites but participated under only one of two CPC+ IDs. We retroactively counted these practices as 13 distinct practices since the start of CPC+.

[d] One practice did not submit CPC+ Practice Portal data in Quarter 3. This practice was slated to merge with another practice but later was reinstated as a stand-alone practice.

[e] One practice did not submit CPC+ Practice Portal data in Quarter 4. This practice has a termination date of March 2018, so although it was officially active as of December 31, 2017, it withdrew not long after.

SSP = Medicare Shared Savings Program.

The tables in this appendix present findings based on Mathematica's analysis of the CPC+ Practice Portal data. We downloaded the data from the business intelligence tool on March 30, 2018; April 11, 2018; April 13, 2018; and March 29, 2018 (for Quarters 1–4, respectively). In these tables, we report data from the most recent quarter available at the end of the first intervention year (for most tables, Quarter 3 or 4 of 2017), by track and SSP status. Tables are organized according to the order in which they appear in the CPC+ Practice Portal (although not all data are reported here). Some questions include skip patterns. Therefore, it is important to note denominators when interpreting the percentage of practices with a particular response.

We generally maintained the wording and organization of the questions and responses as they appear in the CPC+ Practice Portal, recognizing that these factors could affect interpretation and practices' responses. (We report the actual question that practices answered as a subheading in each table.) To facilitate reading, we:

- Generally, moved "no" responses to the bottom of the list of response options, except when a "no" response caused a skip pattern in a question or was crucial to interpreting the other response options.

- Reordered response options from most to least common for long lists.

- Dropped "other" response options when:

  - They were uncommon (less than 5 percent), and

  - Part of a "select all that apply" question.

Footnotes document additional cleaning steps or survey notes that are relevant for interpreting the estimates.

Table 4.A.2. CPC+ practices that provide coverage 24 hours a day, 7 days per week, and whether they have access to the practice's EHR (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Does a clinician or care team member from your practice site usually provide 24/7 coverage? [Quarter 3] [a]							
	N = 2,785	**N = 1,310**	**N = 689**	**N = 621**	**N = 1,475**	**N = 586**	**N = 889**
Yes	82%	81%	80%	82%	83%	84%	82%
No, we have a centralized call center for our health systems (after-hours coverage for all practices in the system)	12%	11%	11%	12%	12%	11%	13%
No, we have a formal coverage arrangement with another practice/organization	5%	7%	9%	4%	4%	4%	4%
No, we do not provide 24/7 coverage	<1%	<1%	<1%	2%	<1%	<1%	<1%
Is 24/7 coverage provided with real-time access to your practice's EHR? [Quarter 3] [b]							
	N = 2,770	**N = 1,297**	**N = 688**	**N = 609**	**N = 1,473**	**N = 585**	**N = 888**
Yes	97%	96%	97%	96%	98%	97%	98%

Source: Mathematica's analysis of 2017 (Q3) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] A care team is a group of individuals at a practice who work together to care for a specific panel of patients. The members on a care team providing 24/7 coverage must include only licensed medical practitioners.

[b] Practices that answered "No, we do not provide 24/7 coverage" did not answer this question about real-time access. "Real time" refers to having access to current, up-to-date medical records in the EHR during off hours.

EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.3. Frequency with which CPC+ practices provide enhanced access options for patients, by type of option (percentages)

		Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
When patients need it, my practice is able to provide… [Quarter 4]								
… same- or next-day appointments	Never/Rarely[a]	<1%	<1%	<1%	0%	0%	0%	0%
	Sometimes	1%	<1%	1%	<1%	1%	<1%	2%
	Often	21%	22%	21%	22%	20%	19%	21%
	Always	78%	77%	77%	78%	78%	80%	77%
… office visits during **expanded hours** on the weekend, evening, or early morning	Never/Rarely[a]	15%	18%	16%	21%	12%	10%	13%
	Sometimes	9%	8%	7%	10%	9%	8%	9%
	Often	25%	25%	25%	25%	24%	27%	23%
	Always	52%	48%	52%	44%	55%	55%	55%
… telephone advice on clinical issues **during office hours**	Never/Rarely[a]	<1%	0%	0%	0%	<1%	<1%	<1%
	Sometimes	3%	2%	1%	2%	4%	5%	3%
	Often	10%	10%	9%	12%	10%	9%	10%
	Always	87%	88%	90%	86%	87%	85%	87%
… telephone advice on clinical issues **on weekends and/or after regular office hours**	Never/Rarely[a]	1%	1%	1%	<1%	2%	1%	2%
	Sometimes	4%	5%	4%	6%	3%	2%	3%
	Often	12%	12%	10%	14%	13%	15%	11%
	Always	83%	82%	85%	79%	83%	82%	84%
… email or portal advice on clinical issues	Never/Rarely[a]	6%	10%	9%	11%	3%	2%	4%
	Sometimes	7%	9%	9%	8%	6%	4%	7%
	Often	15%	14%	13%	14%	17%	19%	15%
	Always	71%	68%	69%	67%	75%	74%	75%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] This table combines the "Never" and "Rarely" categories. In most cases, the percentages for these categories were small (<5%).

SSP = Medicare Shared Savings Program.

Table 4.A.4. Frequency of alternatives to traditional office visits offered by CPC+ practices, by type of alternative visit (percentages unless indicated)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Did your practice provide any alternative visits in the last two quarters? [Quarter 4] [a]							
Yes, our practice provided alternative visits in the last two quarters[b,c]	89%	86%	85%	87%	92%	92%	92%

Alternative visits	Statistic	Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Total number of alternative visits provided in the last two quarters [Quarter 4] [a]								
Home visits (i.e., primary care home visits)	At least one visit[c]	28%	24%	27%	21%	31%	27%	34%
	Minimum	1	1	1	1	1	1	1
	Median	6	5	4	6	6	5	6
	Maximum	20,221	8,104	686	8,104	20,221	14,899	20,221
Medical group visits (e.g., shared medical appointments)	At least one visit[c]	6%	5%	5%	4%	7%	8%	7%
	Minimum	1	1	1	1	1	1	1
	Median	10	5	3	10	11	11	11
	Maximum	2,933	2,933	2,933	1,613	218	218	157
Group education classes (e.g., diabetes self-management education [DSME])	At least one visit[c]	17%	12%	10%	15%	21%	17%	24%
	Minimum	1	1	1	1	1	1	1
	Median	4	3	3	3	5	6	4
	Maximum	367	367	67	367	188	101	188
Preventive counseling services (e.g., reimbursable counseling for obesity, alcohol misuse, tobacco cessation)	At least one visit[c]	42%	45%	44%	46%	39%	48%	33%
	Minimum	1	1	1	1	1	1	1
	Median	40	45	50	42	38	36	40
	Maximum	9,368	7,293	7,293	3,000	9,368	9,368	3,805
Medical nutrition consultation visits	At least one visit[c]	20%	15%	13%	17%	25%	23%	27%
	Minimum	1	1	1	1	1	1	1
	Median	20	20	20	20	20	28	17
	Maximum	1,200	1,200	1,200	776	1,139	1,139	910

Table 4.A.4. *(continued)*

Alternative visits	Statistic	Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Total number of alternative visits provided in the last two quarters [Quarter 4] [a]								
Visits in alternative locations (e.g., nursing facilities, hospitals, senior centers)	At least one visit[c]	32%	31%	31%	31%	32%	35%	30%
	Minimum	1	1	1	1	1	1	1
	Median	80	90	84	96	73	102	56
	Maximum	26,013	4,847	4,847	4,776	26,013	7,835	26,013
Telehealth (or tele-medicine) and eVisits	At least one visit[c]	16%	9%	8%	9%	23%	30%	18%
	Minimum	1	1	1	1	1	1	1
	Median	12	10	9	10	13	10	16
	Maximum	9,032	698	213	698	9,032	2,278	9,032
Remote monitoring	At least one visit[c]	3%	3%	2%	3%	3%	2%	4%
	Minimum	1	1	1	1	1	1	1
	Median	21	20	21	19	25	25	23
	Maximum	2,421	1,102	1,102	300	2,421	2,421	243
Other	At least one visit[c]	17%	12%	8%	16%	21%	21%	22%
	Minimum	1	1	1	1	1	1	1
	Median	18	5	1	22	22	8	55
	Maximum	17,429	1,545	234	1,545	17,429	1,240	17,429

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] This question refers to medical services that go beyond traditional face-to-face office-based visits that are currently reimbursable services through traditional fee-for-service (FFS) billing. Track 2 practices were required to develop the capacity for alternative visits in 2017, and practices may have used or plan to use the Comprehensive Primary Care Payment (CPCP) for this work, in addition to or instead of FFS billing. These ranges are not adjusted for practice characteristics including practice size, population size, HCC scores, or whether the practice is geriatric, and thus should be interpreted with caution.

[b] We calculated the percentage of practices with at least one alternative visit in the previous two quarters by examining the number of practices with at least one alternative visit of any type (including other).

[c] Some practices had no reported alternative visits in the previous two quarters. We removed these practices before calculating percentages with at least one visit because we could not distinguish between true zeros and missing values. We also recoded visit counts of 9999 or 9999999999 as missing.

SSP = Medicare Shared Savings Program.

Table 4.A.5. Primary provider of alternative visits among CPC+ practices that provided at least one alternative visit in the two previous quarters, by type of alternative visit (percentages)

Alternative visits	Provider type	Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Among practices with at least one alternative visit in the last two quarters, who primarily provided this service? (Select all that apply) [Quarter 4] [a]								
Home visits (i.e., primary care home visits)	At least one visit[a]	28%	24%	27%	21%	31%	27%	34%
	MD/DO	73%	78%	81%	74%	70%	56%	77%
	NP/PA	30%	26%	21%	33%	33%	43%	27%
	RN	16%	10%	10%	10%	21%	20%	21%
	MA	2%	1%	1%	2%	3%	3%	3%
	LPN	2%	2%	1%	3%	1%	1%	1%
	RD	2%	<1%	<1%	2%	3%	8%	<1%
Medical group visits (e.g., shared medical appointments)	At least one visit[a]	6%	5%	5%	4%	7%	8%	7%
	MD/DO	79%	75%	69%	83%	82%	75%	87%
	NP/PA	31%	40%	33%	50%	26%	17%	33%
	RN	29%	22%	22%	21%	32%	23%	40%
	MA	17%	17%	8%	29%	17%	10%	22%
	LPN	6%	7%	8%	4%	6%	4%	7%
	RD	17%	10%	8%	13%	20%	15%	25%
Group education classes (e.g., diabetes self-management education [DSME])	At least one visit[a]	17%	12%	10%	15%	21%	17%	24%
	MD/DO	13%	15%	10%	19%	12%	9%	13%
	NP/PA	16%	12%	9%	14%	19%	22%	17%
	RN	35%	33%	40%	28%	36%	40%	34%
	MA	6%	8%	1%	12%	5%	7%	4%
	LPN	5%	5%	7%	3%	5%	8%	4%
	RD	47%	46%	50%	42%	48%	53%	46%

Table 4.A.5. *(continued)*

Alternative visits	Provider type	Overall N = 2,785	Track 1 Total N = 1,309	Track 1 SSP N = 689	Track 1 Non-SSP N = 620	Track 2 Total N = 1,476	Track 2 SSP N = 587	Track 2 Non-SSP N = 889
Among practices with at least one alternative visit in the last two quarters, who primarily provided this service? (Select all that apply) [Quarter 4] [a]								
Preventive counseling services (e.g., reimbursable counseling for obesity, alcohol misuse, tobacco cessation)	At least one visit[a]	42%	45%	44%	46%	39%	48%	33%
	MD/DO	86%	87%	92%	82%	85%	93%	77%
	NP/PA	43%	40%	47%	33%	45%	43%	48%
	RN	10%	10%	11%	9%	10%	7%	12%
	MA	5%	6%	6%	5%	5%	4%	5%
	LPN	3%	3%	1%	4%	3%	2%	4%
	RD	4%	2%	2%	1%	6%	4%	7%
Medical nutrition consultation visits	At least one visit[a]	20%	15%	13%	17%	25%	23%	27%
	MD/DO	23%	40%	50%	32%	14%	19%	12%
	NP/PA	15%	19%	23%	16%	13%	19%	9%
	RN	19%	13%	14%	12%	22%	11%	28%
	MA	2%	3%	4%	2%	1%	3%	<1%
	LPN	1%	1%	1%	<1%	2%	2%	1%
	RD	59%	49%	43%	54%	64%	63%	64%
Visits in alternative locations (e.g., nursing facilities, hospitals, senior centers)	At least one visit[a]	32%	31%	31%	31%	32%	35%	30%
	MD/DO	95%	97%	98%	95%	93%	96%	90%
	NP/PA	28%	21%	18%	24%	34%	35%	33%
	RN	7%	1%	<1%	2%	12%	5%	17%
	MA	2%	<1%	<1%	2%	2%	<1%	3%
	LPN	<1%	<1%	<1%	1%	<1%	<1%	2%
	RD	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Telehealth (or tele-medicine) and eVisits	At least one visit[a]	16%	9%	8%	9%	23%	30%	18%
	MD/DO	85%	75%	68%	83%	89%	94%	83%
	NP/PA	43%	35%	25%	44%	45%	49%	40%
	RN	11%	14%	21%	7%	10%	11%	9%
	MA	3%	4%	2%	7%	3%	2%	4%
	LPN	2%	<1%	2%	<1%	3%	3%	2%
	RD	3%	<1%	<1%	2%	4%	4%	3%

Table 4.A.5. *(continued)*

Alternative visits	Provider type	Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Among practices with at least one alternative visit in the last two quarters, who primarily provided this service? (Select all that apply) [Quarter 4] [a]								
	At least one visit[a]	3%	3%	2%	3%	3%	2%	4%
	MD/DO	65%	74%	87%	65%	58%	50%	62%
	NP/PA	33%	31%	60%	10%	33%	7%	44%
Remote monitoring	RN	23%	20%	13%	25%	25%	21%	27%
	MA	17%	14%	7%	20%	19%	14%	21%
	LPN	10%	9%	7%	10%	10%	7%	12%
	RD	2%	<1%	<1%	<1%	4%	14%	<1%
	At least one visit[a]	17%	12%	8%	16%	21%	21%	22%
	MD/DO	33%	15%	15%	14%	42%	35%	46%
	NP/PA	17%	5%	2%	6%	23%	16%	28%
Other	RN	19%	18%	11%	22%	20%	15%	23%
	MA	4%	3%	6%	2%	4%	2%	6%
	LPN	4%	4%	<1%	6%	4%	<1%	7%
	RD	3%	1%	2%	1%	4%	10%	1%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

Note: The percentages of providers in this table are based on the denominator of those with at least one visit. For example, in the case of home visits, the correct interpretation is, among practices who reported at least one home visit (28 percent of practices, n = 779), 73 percent of those practices (n = 569) reported that MD/DOs primarily provided this service.

[a] Some practices reported they provided zero visits in the last two quarters. We removed these practices before calculating percentages with at least one visit because we could not meaningfully distinguish zeros and missing values. We also recoded visit counts of 9999 or 9999999999 as missing.

DO = doctor of osteopathic medicine; MA = medical assistant; MD = medical doctor; NP= nurse practitioner; PA = physician assistant; RD = registered dietician; RN = registered nurse; SSP = Medicare Shared Savings Program.

Table 4.A.6. Empanelment of patients by CPC+ practices to a practitioner or to a care team, and share of active empaneled patients at CPC+ practices (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Do you primarily empanel patients by practitioner (i.e., each MD, DO, PA, or NP) or by care team (i.e., practitioner-led teams)? [Quarter 4] [a]							
Practitioner	88%	87%	92%	81%	89%	91%	87%
Care team	12%	13%	8%	19%	11%	9%	13%
Percentage of practices with 95 percent or more of their active patients empaneled [Quarter 4]							
Percentage of practices	87%	86%	86%	86%	88%	85%	89%
Percentage of active patients empaneled [Quarter 4] [b]							
Minimum	1%	5%	5%	8%	1%	1%	18%
Median	100%	100%	100%	100%	100%	100%	100%
Maximum	100%	100%	100%	100%	100%	100%	100%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] A care team is a group of individuals at a practice who work together to care for a specific panel of patients.

[b] Active patients for purposes of this table are patients who recently received care at the practice. The 2017 CPC+ Guide defines "recently" as having had a visit during the last 18 months. Practices typically use a lookback period of 18–36 months to identify their active patients.

DO = doctor of osteopathic medicine; MD = medical doctor; NP= nurse practitioner; PA = physician assistant; SSP = Medicare Shared Savings Program.

Table 4.A.7. Scheduling strategies used by CPC+ practices to optimize continuity of care, and share of CPC+ practices that track continuity of care and how they track it (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
What scheduling strategies do you use to optimize continuity of care? (Select all that apply) [Quarter 3]							
	N = 2,785	N = 1,310	N = 689	N = 621	N = 1,475	N = 586	N = 889
Open scheduling	40%	41%	40%	43%	39%	41%	37%
Same-day scheduling for urgent/acute care	95%	95%	96%	93%	96%	98%	95%
Tools to help patients identify their practitioner or care team (e.g., practitioner and care team photos on practice website)	57%	55%	57%	54%	58%	63%	56%
Other	22%	19%	21%	17%	25%	37%	17%
We do not use any strategies to optimize continuity of care [a]	1%	2%	<1%	3%	<1%	<1%	<1%
Do you track continuity of care for your patients? [Quarter 3] [b]							
	N = 2,785	N = 1,310	N = 689	N = 621	N = 1,475	N = 586	N = 889
Yes	77%	77%	74%	80%	78%	77%	79%
What systems do you use to track continuity of care? (Select all that apply) [Quarter 3] [c]							
	N = 2,155	N = 1,003	N = 507	N = 496	N = 1,152	N = 454	N = 698
EHR	86%	86%	89%	83%	87%	87%	86%
Electronic practice management systems	35%	43%	45%	41%	28%	27%	28%
Other	12%	15%	17%	14%	9%	4%	12%

Source: Mathematica's analysis of 2017 (Q3) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] If practices selected "We do not use any strategies," they could not select the other options for this question.

[b] Continuity of care refers to an ongoing relationship between a patient and the practitioner(s) or care team to which they are empaneled for the delivery of care.

[c] This question contains a skip pattern. Practices that answered "Yes" to whether they track continuity of care for their patients were prompted to answer an additional question about what systems they use to track continuity of care.

SSP = Medicare Shared Savings Program.

Table 4.A.8. Approaches to risk stratification reported by CPC+ practices, and other factors that practices consider when using care team or clinical intuition to stratify patients by risk (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What type of data-driven algorithm do you use for risk stratifying your patients? (Select all that apply) [Quarter 4] [a]							
Algorithm based on claims variables	18%	20%	24%	15%	16%	27%	10%
Algorithm based on clinical variables from the EHR	61%	60%	58%	61%	63%	53%	70%
Published clinical algorithm (e.g., AAFP risk tool)	27%	26%	26%	26%	28%	31%	26%
Other	27%	24%	23%	25%	30%	37%	25%
We do not use a data-driven algorithm as a part of our risk stratification	3%	4%	5%	4%	1%	<1%	2%
What other factors do you consider when using care team/clinical intuition to stratify your patients? (Select all that apply) [Quarter 4] [b]							
Social needs	80%	69%	66%	71%	90%	87%	92%
Behavioral health needs	76%	67%	65%	69%	85%	80%	88%
Clinical factors that are not included in the algorithm	70%	61%	55%	67%	79%	79%	79%
Other	14%	11%	12%	10%	16%	28%	9%
We do not use the care team's perception as a part of our risk stratification[c]	11%	19%	24%	12%	4%	8%	<1%
Do you use a two-step risk-stratification process based on a data-driven algorithm and the care team's perception of risk [Quarter 4] [c]							
Yes	87%	79%	73%	85%	95%	91%	98%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] All practices must identify and prioritize a methodology to risk stratify all empaneled patients. Track 2 practices must further use a two-step risk-stratification process: (1) basing risk stratification on defined diagnoses, claims, or another algorithm (i.e., not care team intuition), and (2) adding the care team's perception of risk (care team/ clinical intuition) to adjust the risk stratification of patients, as needed.

[b] Clinical intuition/care team perception is a practitioner's and/or care team's knowledge of a patient and a global assessment of the patient's risk, which may include clinical, social, and behavioral risk. It is the second step in the risk-stratification process required of Track 2 practices.

[c] We calculated the percentage of practices that use a two-step risk stratification process by identifying practices who provided a response to "What type of data-driven algorithm do you use for risk stratifying your patients?" other than "We do not use a data-driven algorithm as part of our risk stratification" and provided a response to "What other factors do you consider when using care team/ clinical intuition to stratify your patients?" other than "We do not use the care team's perception."

AAFP = American Academy of Family Physicians; EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.9. CPC+ patients by risk tier, patients under longitudinal care management, total empaneled patients, and practices using a particular tier to target patients for care management (percentages unless indicated)

		Track 1			Track 2		
	Overall N = 2,785	Total N = 1,309	SSP N = 745	Non-SSP N = 564	Total N = 1,476	SSP N = 640	Non-SSP N = 836
Tier 1: highest risk							
Percentage of practices with a response[a]	97%	96%	97%	95%	98%	98%	98%
Median number of patients in this risk tier[b]	80	80	77	82	81	76	83
Mean number of patients in this risk tier[b]	245	287	187	399	209	165	238
Median number of patients in this tier under longitudinal care management[c]	16	15	17	13	17	17	17
Mean number of patients in this risk tier under longitudinal care management[c]	68	77	61	97	60	64	58
Median percentage of total empaneled patients in this risk tier[d]	2%	2%	2%	2%	2%	2%	2%
Median percentage of patients in this risk tier under longitudinal care management[e]	35%	38%	36%	47%	34%	32%	38%
Percentage of practices that indicated this risk tier was used to target patients for care management[f]	65%	69%	71%	66%	62%	57%	65%
Tier 2							
Percentage of practices with a response	94%	93%	92%	94%	96%	92%	98%
Median number of patients in this risk tier[b]	338	319	323	316	349	332	365
Mean number of patients in this risk tier[b]	766	882	658	1127	667	635	687
Median number of patients in this tier under longitudinal care management[c]	18	11	11	10	25	24	25
Mean number of patients in this tier under longitudinal care management[c]	117	122	109	136	112	131	100
Median percentage of total empaneled patients in this risk tier[d]	9%	10%	11%	10%	8%	8%	8%
Median percentage of patients in this risk tier under longitudinal care management[e]	8%	6%	7%	6%	10%	12%	9%
Percentage of practices that indicated this risk tier was used to target patients for care management[f]	45%	41%	43%	40%	47%	53%	44%

Table 4.A.9. *(continued)*

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 745	Non-SSP N = 564	Total N = 1,476	SSP N = 640	Non-SSP N = 836
Tier 3							
Percentage of practices with a response	89%	86%	90%	82%	92%	89%	93%
Median number of patients in this risk tier[b]	926	760	838	724	1,091	896	1,278
Mean number of patients in this risk tier[b]	1,938	1,700	1,680	1,724	2,136	1,918	2,275
Median number of patients in this tier under longitudinal care management[c]	8	4	4	4	15	9	18
Mean number of patients in this tier under longitudinal care management[c]	256	161	143	183	336	299	359
Median percentage of total empaneled patients in this risk tier[d]	29%	28%	30%	26%	30%	29%	31%
Median percentage of patients in this risk tier under longitudinal care management[e]	1%	<1%	<1%	1%	2%	1%	2%
Percentage of practices that indicated this risk tier was used to target patients for care management [f]	22%	24%	24%	23%	21%	29%	15%
Tier 4–Tier 10: lower risk							
Percentage of practices with a response	56%	52%	49%	56%	60%	63%	58%
Median number of patients in this risk tier[b]	1,626	1,451	1,505	1,281	1,831	1,629	1,995
Mean number of patients in this risk tier[b]	2,590	2,364	2,480	2,251	2,765	2,805	2,737
Median number of patients in this tier under longitudinal care management[c]	6	3	2	4	9	12	8
Mean number of patients in this risk tier under longitudinal care management[c]	217	258	312	206	184	203	171
Median percentage of total empaneled patients in this risk tier[d]	46%	47%	46%	47%	45%	43%	48%
Median percentage of patients in this risk tier under longitudinal care management[e]	<1%	<1%	<1%	<1%	<1%	1%	<1%
Percentage of practices that indicated this risk tier was used to target patients for care management[f]	14%	19%	23%	15%	10%	16%	5%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Practices generated a row for each risk tier in their risk-stratification method. Practices were directed to label the rows using their practices' terminology to define risk. Practices could input as many as 10 risk tiers. We provide response for Tiers 1–3 here, and we lumped responses together for Tiers 4–10. Risk tiers are reported in descending order, with the highest risk tier at the top and the lowest risk tier at the bottom. Results presented in this table are not adjusted for practice size or other practice characteristics and thus should be interpreted with caution.

Table 4.A.9. *(continued)*

[b] Practices were asked to provide information on the number of patients in each risk tier. We calculated the median and mean number of patient in this risk tier for all practices with at least one patient in the risk tier (that is, we removed practices from these counts if they reported zero patients).

[c] Practices were asked to indicate the number of patient in each risk tier who were targeted for and received ongoing, longitudinal care management. We calculated the median and mean number of patient in this risk tier under longitudinal care management for all practices with at least one patient in the risk tier. We did not exclude zeros from this calculation.

[d] We calculated the percentage of total empaneled patients in each risk tier using the number of empaneled patients from Function 1.1: "Total number of patient empaneled with a practitioner or care team at your practice." Per the CPC+ implementation guide, this column is auto-calculated in the CPC+ Practice Portal. However, because that data was not made available to us, we have recreated it here.

[e] We calculated the percentage of under longitudinal care management in each risk tier by dividing the number of patients under care management by the number of patient in that risk tier where there was at least one patient in that risk tier. Per the CPC+ implementation guide, this column is auto-calculated in the CPC+ Practice Portal. However, that data was not made available to us, so we have recreated it here.

[f] Practices were asked to mark the tier(s) used to target patients for longitudinal care management. For example, a practice may target patients for care management based on the highest risk tier. Note that practices could report that more than one patient in that risk tier is under care management and not check that the risk tier was used to identify patients for care management.

SSP = Medicare Shared Savings Program.

Table 4.A.10. How CPC+ practices identify patients for episodic care management (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
	N = 2,785	N = 1,309	N = 689	N = 620	N = 1,476	N = 587	N = 889
Indicate how you identify patients for episodic care management (Select all that apply) [Quarter 4][a]							
Hospital admission	98%	98%	98%	98%	99%	99%	99%
ED visit	92%	91%	89%	92%	93%	93%	93%
New health condition (e.g., cancer diagnosis, accident, chronic condition)	75%	71%	70%	72%	78%	81%	75%
New clinical instability in a chronic condition, including change in medications	69%	65%	66%	64%	73%	75%	72%
Life event (e.g., death of spouse, financial loss)	45%	41%	42%	40%	47%	46%	49%
Initiation or stabilization on a high-risk medication (e.g., anticoagulant)	50%	48%	51%	46%	51%	57%	47%
Other, please specify	21%	22%	26%	18%	20%	26%	16%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Episodic care management refers to short-term, goal-directed care management for patients who are not already in longitudinal care management as a result of their risk status.

ED = emergency department; SSP = Medicare Shared Savings Program.

Table 4.A.11. Type of clinician and staff responsible for care management and coordination activities at CPC+ practices, by type of care management or care coordination activity (percentages)

Activities	Staff	Overall N = 2,786	Track 1			Track 2		
			Total N = 1,310	SSP N = 689	Non-SSP N = 621	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What type of clinician and staff at your practice is/are primarily responsible for each of the following care management and coordination activities? (Select all that apply) [Quarter 1] [a]								
Developing and monitoring care plans	MD/DO	71%	76%	74%	77%	66%	70%	64%
	NP/PA	38%	40%	39%	40%	36%	42%	32%
	RN	41%	32%	29%	34%	49%	47%	50%
	MA	11%	12%	9%	16%	9%	9%	10%
	SW	9%	9%	6%	12%	9%	10%	9%
	None	10%	13%	16%	10%	7%	5%	8%
Assessing and reassessing patient risk status	MD/DO	77%	78%	78%	79%	76%	72%	80%
	NP/PA	41%	38%	38%	38%	44%	45%	43%
	RN	41%	32%	32%	31%	48%	45%	51%
	MA	17%	17%	14%	21%	17%	13%	19%
	SW	9%	7%	7%	8%	11%	9%	13%
	None	8%	9%	8%	10%	7%	11%	4%
Providing patient education and self-management support	MD/DO	84%	85%	83%	87%	82%	73%	89%
	NP/PA	50%	47%	48%	45%	52%	48%	55%
	RN	55%	46%	45%	46%	62%	62%	63%
	MA	53%	52%	44%	60%	55%	54%	55%
	SW	14%	11%	9%	13%	17%	23%	12%
	None	1%	2%	3%	1%	<1%	<1%	<1%
Coordinating care transitions (hospital, ED discharges)	MD/DO	41%	45%	45%	44%	38%	39%	38%
	NP/PA	22%	21%	22%	20%	22%	24%	21%
	RN	52%	43%	42%	44%	59%	58%	60%
	MA	38%	42%	41%	44%	35%	33%	36%
	SW	8%	7%	8%	7%	8%	11%	7%
	None	4%	6%	7%	5%	1%	2%	<1%

Table 4.A.11. *(continued)*

Activities	Staff	Overall N = 2,786	Track 1			Track 2		
			Total N = 1,310	SSP N = 689	Non-SSP N = 621	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What type of clinician and staff at your practice is/are primarily responsible for each of the following care management and coordination activities? (Select all that apply) [Quarter 1] [a]								
Coordinating and communicating with specialty care	MD/DO	68%	74%	74%	74%	63%	64%	63%
	NP/PA	39%	38%	39%	37%	39%	43%	37%
	RN	43%	36%	36%	37%	48%	44%	51%
	MA	58%	59%	58%	61%	57%	53%	61%
	SW	8%	6%	6%	6%	10%	9%	10%
	None	1%	2%	2%	<1%	<1%	2%	<1%
Navigating patients to community and social services	MD/DO	45%	49%	47%	52%	41%	38%	43%
	NP/PA	26%	26%	27%	25%	27%	27%	26%
	RN	46%	41%	39%	43%	51%	50%	52%
	MA	52%	54%	51%	57%	51%	45%	55%
	SW	22%	17%	16%	19%	26%	32%	22%
	None	4%	5%	5%	5%	2%	4%	1%
Clinical monitoring and following up with specific patients	MD/DO	76%	78%	78%	77%	75%	70%	79%
	NP/PA	44%	40%	42%	38%	48%	47%	48%
	RN	51%	42%	44%	41%	59%	60%	58%
	MA	49%	51%	48%	54%	47%	39%	53%
	SW	9%	7%	7%	8%	10%	8%	11%
	None	2%	2%	2%	2%	<1%	2%	<1%
Scheduling needed appointments and tests	MD/DO	14%	15%	15%	17%	13%	10%	15%
	NP/PA	10%	9%	10%	9%	10%	8%	11%
	RN	36%	32%	29%	35%	39%	30%	45%
	MA	74%	73%	77%	68%	76%	76%	76%
	SW	6%	5%	4%	5%	7%	7%	7%
	None	1%	1%	2%	<1%	1%	3%	<1%

Source: Mathematica's analysis of 2017 (Q1) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Practices were asked to limit their reporting of data to the staff at their practice who spend the most amount of time on these activities, even if these activities are not among the staff's primary duties. For example, if MAs at a practice make most of the follow-up calls to patients, but an RN sometimes makes these calls, the MA is primarily responsible for this activity. If an MA and an RN equally split the coordination, practices could select both.

DO = doctor of osteopathic medicine; MA = medical assistant; MD = medical doctor; NP= nurse practitioner; PA = physician assistant; RD = registered dietician; RN = registered nurse; SSP = Medicare Shared Savings Program; SW = social worker.

Table 4.A.12. Use of care plans for patients under longitudinal care management by CPC+ practices, and whether CPC+ practices report documenting, storing, and routinely updating care plans (percentages)

		Track 1			Track 2		
	Overall	**Total**	**SSP**	**Non-SSP**	**Total**	**SSP**	**Non-SSP**
Does your practice use care plans for patients under longitudinal care management? [Quarter 4] [a]							
	N = 2,785	N = 1,309	N = 689	N = 620	N = 1,476	N = 587	N = 889
We use care plans for **some** patients, on an ad hoc basis	16%	15%	13%	16%	16%	16%	17%
We use care plans for **some** patients, targeted based on conditions or other factors	39%	42%	47%	37%	36%	30%	40%
We systematically implement care plans for **all or most** patients under care management	38%	30%	26%	34%	46%	53%	41%
No, we **do not use** care plans in our care management process	7%	13%	13%	13%	2%	2%	2%
Do you document and store care plans? [Quarter 4]							
	N = 2,584	N = 1,138	N = 597	N = 541	N = 1,446	N = 576	N = 870
Yes, care plans are integrated with the EHR	86%	85%	86%	85%	87%	90%	86%
Yes, care plans are documented and stored but not integrated with the EHR	12%	12%	13%	12%	12%	10%	14%
No	1%	2%	2%	4%	<1%	0%	<1%
Do you have a routine process for monitoring, updating, and reviewing care plans? [Quarter 4]							
	N = 2,584	N = 1,138	N = 597	N = 541	N = 1,446	N = 576	N = 870
Yes	81%	76%	75%	78%	85%	84%	86%
When are care plans reviewed and updated? [Quarter 4]							
	N = 2,100	N = 870	N = 450	N = 420	N = 1,230	N = 485	N = 745
Pre-specified changes in clinical status (e.g., new diagnoses, injuries, and exacerbations of illness)	50%	45%	48%	42%	54%	52%	55%
Routinely, on a time-based schedule (e.g., monthly or at every visit)	69%	77%	76%	79%	64%	67%	62%
Other	14%	9%	5%	13%	17%	21%	15%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] A care plan is a mutually agreed upon and documented plan of care based on the patient's goals and available medical evidence and is accessible to all team members providing care for the patient. Practices that answered "No, we do not use care plans" could skip subsequent questions.

EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.13. Types of information that CPC+ practices typically include in care plans (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
	N = 2,553	N = 1,110	N = 588	N = 522	N = 1,443	N = 576	N = 867
What type(s) of information are typically included in care plans? (Select all that apply) [Quarter 4]							
Treatment goals and interventions as identified by the care team	95%	94%	94%	94%	95%	96%	95%
Medication adjustments for changes in condition	73%	74%	77%	70%	72%	78%	67%
Patient's overall health goals	88%	87%	87%	87%	90%	93%	87%
Patient/caregiver's plan for self-management	86%	85%	86%	84%	87%	86%	88%
Patient/caregiver's plan for acute changes in condition	70%	68%	66%	70%	72%	69%	74%
Advance directives and preferences of care	43%	42%	51%	32%	44%	52%	39%
Plan for next update or review of care plan with patient and care team	69%	69%	67%	72%	68%	72%	66%
Contact information for practitioners and services involved in the patient's care, including contact options for after-hours coverage	45%	44%	43%	45%	46%	48%	44%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.14. CPC+ practices reporting who can access a patient's care plan, and how CPC+ practices share care plans with patients and caregivers (percentages)

		Track 1			Track 2		
	Overall	**Total**	**SSP**	**Non-SSP**	**Total**	**SSP**	**Non-SSP**
	N = 2,553	**N = 1,110**	**N = 588**	**N = 522**	**N = 1,443**	**N = 576**	**N = 867**
Who has real-time/point of care access to a patient's care plan? (Select all that apply) [Quarter 4] [a]							
Members of the care team within the practice	98%	96%	95%	97%	99%	99%	100%
Clinicians outside of the practice (i.e., other specialists who care for the patient)	35%	27%	29%	25%	40%	50%	34%
Community and/or social service agencies and practitioners	5%	6%	6%	6%	5%	4%	6%
Patient and his/her caregiver(s)	44%	51%	54%	46%	40%	49%	33%
Other	9%	11%	9%	13%	8%	6%	9%
How are care plans shared with patients and caregivers? (Select all that apply) [Quarter 4]							
Care plans are not shared with patients in a systemic way[b]	8%	10%	5%	14%	7%	6%	7%
Patient portal	39%	43%	47%	37%	35%	38%	33%
At the time of a face-to-face visit	80%	78%	82%	74%	82%	78%	84%
Incorporated in the after-visit summary	43%	47%	49%	45%	40%	48%	35%
Other	21%	15%	15%	15%	26%	33%	21%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] "Real time" refers to having access to current, up-to-date medical records in the EHR.

[b] Respondents who selected "Care plans are not shared with patients in a systemic way" cannot select other options. All other response options are "Select all that apply."

EHR = electronic health record. SSP = Medicare Shared Savings Program.

Table 4.A.15. Minimum, median, and maximum follow-up rates reported by CPC+ practices for empaneled patients discharged from an ED or hospital (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Practice ED follow-up rate [Quarter 4] [a]							
	N = 2,586	N = 1,172	N = 618	N = 554	N = 1,414	N = 539	N = 875
Minimum	0%	0%	0%	0%	0%	0%	0%
Median	75%	73%	70%	79%	77%	64%	84%
Maximum	100%	100%	100%	100%	100%	100%	100%
Practice hospital follow-up rate [Quarter 4] [b]							
	N = 2,673	N = 1,216	N = 657	N = 559	N = 1,457	N = 579	N = 878
Minimum	0%	0%	0%	0%	0%	0%	0%
Median	81%	80%	78%	82%	81%	67%	87%
Maximum	100%	100%	100%	100%	100%	100%	100%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Practices were asked to provide counts of their empaneled patients discharged from the ED during the reporting quarter and the counts of those who received follow-up contact within one week after visiting the ED. We calculated practice ED follow-up rates by dividing the number of patient discharges with follow up by the number of patients discharged during the reporting quarter across facilities for which a practice had complete data. If a practice indicated that it did not track follow-up for a specific facility, or did not have at least one patient discharged from the facility, we did not count it toward the practice's overall follow-up rate. For the data reported here, the median number of emergency department visits per practice was 119.

[b] Practices were asked to provide counts of their empaneled patients discharged from the hospital during this quarter and the counts of those who received follow-up contact within 72 hours or two business days after visiting the hospital. We calculated practice hospital discharge follow-up rate by dividing the total number of patients with follow up by the number of patients discharged during the reporting quarter across facilities for which a practice had complete data. If a practice indicated that it did not track follow-up for a facility, or did not have at least one patient discharged from the facility, we did not count it toward the practice's overall follow-up rate. For the data reported here, the median number of hospital discharges across all practices was 61.

ED = emergency department; SSP = Medicare Shared Savings Program.

Table 4.A.16. How CPC+ practices engage pharmacists on care teams (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
	N = 2,786	N = 1,310	N = 689	N = 621	N = 1,476	N = 587	N = 889
How does the practice engage pharmacist(s) as part of the care team? (Select all that apply) [Quarter 1]							
We do not formally engage pharmacists	77%	83%	87%	78%	72%	74%	70%
Direct hire	7%	4%	<1%	7%	11%	8%	12%
Shared resource for practices in our health system	14%	10%	10%	10%	17%	18%	17%
Contract	3%	2%	1%	3%	3%	<1%	5%
Relationship with a teaching facility	6%	3%	2%	4%	8%	7%	8%
We use a non-pharmacist with prescribing authority for medication management	<1%	<1%	0%	<1%	<1%	0%	<1%

Source: Mathematica's analysis of 2017 (Q1) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.17. CPC+ practices with formal care compacts or collaborative agreements with high-volume or high-cost specialists or health care organizations, by specialty (percentages)

Specialists	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Identify the high-volume or high-cost specialists and health care organizations with whom you have formal care compacts/collaborative agreements. (Select all that apply) [Quarter 4] [a]							
Cardiology	37%	30%	32%	28%	43%	41%	44%
Gastroenterology	32%	24%	27%	21%	39%	49%	32%
Behavioral health	26%	22%	27%	15%	30%	40%	24%
Endocrinology	23%	22%	23%	20%	24%	30%	20%
Orthopedic surgery	19%	17%	20%	14%	20%	28%	15%
Obstetrics/gynecology	18%	19%	21%	16%	18%	25%	14%
Oncology/hematology	18%	18%	23%	13%	18%	28%	11%
Surgery	18%	17%	19%	16%	19%	25%	14%
Ophthalmology	17%	12%	11%	13%	20%	28%	16%
Neurology	16%	15%	17%	13%	17%	23%	13%
Urgent care or after-hours care	16%	15%	15%	15%	17%	19%	15%
ENT/otolaryngology	15%	17%	19%	14%	14%	22%	9%
Hospitalist care	15%	12%	13%	10%	18%	22%	16%
Nephrology	14%	15%	14%	15%	14%	21%	10%
Urology	14%	15%	17%	13%	14%	23%	8%
Dermatology	13%	10%	8%	12%	15%	23%	9%
Rheumatology	13%	13%	16%	10%	13%	22%	7%
Other	13%	9%	9%	9%	17%	18%	16%
Allergy/infectious disease	12%	10%	8%	12%	13%	20%	8%
Psychiatry	12%	9%	9%	9%	15%	20%	11%
Podiatry	11%	9%	8%	10%	14%	23%	7%
Home health agency	11%	7%	7%	7%	14%	21%	9%
Physical therapy	10%	8%	6%	10%	13%	16%	10%
Pain management	9%	9%	8%	10%	10%	17%	5%
Radiology	9%	10%	10%	9%	9%	15%	5%
Nutritionist/dietician services	9%	8%	7%	9%	9%	13%	7%

Table 4.A.17. *(continued)*

Specialists	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Identify the high-volume or high-cost specialists and health care organizations with whom you have formal care compacts/collaborative agreements. (Select all that apply) [Quarter 4] [a]							
Emergency medicine	8%	8%	8%	8%	8%	11%	6%
Optometry	8%	7%	4%	10%	9%	15%	5%
Palliative care	8%	7%	10%	5%	9%	12%	7%
Pharmacist	8%	7%	5%	8%	10%	9%	10%
We have not established care compacts/collaborative agreements	28%	43%	39%	47%	14%	17%	13%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Collaborative care agreements (care compacts/collaborative agreements) are established with other practitioners or health care organizations to create formal working relationships and common expectations around roles, flow of information, and shared plans for management. For purposes of CPC+, "care compacts," "collaborative care agreements," and "collaborative care agreements" are synonymous. If practices selected "We have not established care compacts/collaborative agreements," they could not select the other options for this question.

ENT = ear, nose, and throat; SSP = Medicare Shared Savings Program.

Table 4.A.18. Sources and components included in care compacts among CPC+ practices with established care compacts with at least one specialist or health care organization (percentages)

	Overall N = 2,013	Track 1			Track 2		
		Total N = 750	SSP N = 423	Non-SSP N = 327	Total N = 1,263	SSP N = 490	Non-SSP N = 773
Please indicate the source(s) of the care compact(s) you use (Select all that apply) [Quarter 4]							
American Academy of Pediatrics	<1%	<1%	<1%	<1%	<1%	<1%	<1%
American College of Physicians	2%	3%	4%	2%	2%	1%	2%
American Academy of Family Physicians	4%	5%	6%	5%	4%	5%	3%
We use a practice-developed or customized care compact template	81%	78%	78%	80%	82%	78%	85%
Other	19%	22%	22%	21%	18%	26%	13%
What components are typically included in your care compacts? (Select all that apply) [Quarter 4]							
Sharing data: accurate and up-to-date clinical records	87%	82%	78%	87%	90%	91%	89%
Sharing data: practice-level quality and performance measures	34%	35%	36%	33%	34%	49%	24%
Requirements related to content, timing, and method of communication	82%	75%	78%	72%	86%	90%	84%
Defined responsibilities for patient care and communication throughout the referral process	83%	81%	84%	77%	84%	86%	83%
Defined responsibilities for clinical co-management of specific conditions	61%	57%	60%	52%	63%	61%	64%
Protocols for requesting and conducting referrals	69%	65%	69%	59%	71%	74%	69%
Other	8%	7%	4%	11%	8%	13%	5%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.19. CPC+ practices that screen for unmet social needs, integrate screening tools into an EHR, integrate social services resources into EHR, and frequency of updates to social service resources (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Do you screen for unmet social needs? [Quarter 4] [a]							
	N = 2,785	N = 1,309	N = 689	N = 620	N = 1,476	N = 587	N = 889
We screen **targeted patients** with high risk that are more likely to suffer from unmet social needs (e.g., depression, hypertension, and diabetes)	19%	19%	19%	18%	19%	23%	17%
We universally screen **all patients** for unmet social needs	60%	52%	52%	53%	66%	62%	69%
We **do not screen** patients for unmet social needs	21%	29%	29%	29%	14%	16%	13%
Are these screening tools integrated with your EHR? [Quarter 4]							
	N = 2,198	N = 933	N = 492	N = 441	N = 1,265	N = 496	N = 769
Yes	59%	48%	46%	51%	67%	66%	67%
How frequently is the inventory of social service resources your practice uses updated? [Quarter 4] [b]							
	N = 2,785	N = 1,309	N = 689	N = 620	N = 1,476	N = 587	N = 889
Ad hoc basis only	41%	44%	38%	51%	39%	34%	42%
At least monthly	8%	4%	2%	6%	12%	9%	14%
Every 2 to 6 months	12%	8%	6%	10%	16%	20%	13%
Every 6 to 12 months	26%	26%	30%	21%	27%	26%	27%
Less than annually	5%	7%	12%	2%	3%	7%	1%
We do not maintain or have access to an inventory of these resources	7%	11%	12%	10%	3%	3%	3%
Is the inventory of social service resources integrated with your EHR? [Quarter 4]							
	N = 2,598	N = 1,165	N = 609	N = 556	N = 1,433	N = 568	N = 865
Yes	15%	10%	12%	8%	19%	20%	19%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] If respondents selected "We do not screen patients for unmet social needs," the next question was automatically skipped.

[b] In CPC+, the inventory is a catalog or a listing of social service resources available in the community that a practice uses to meet its patients' social needs. A practice may create its own or use an existing inventory. If a respondent selected "We do not maintain or have access to an inventory of these resources," the subsequent question was automatically skipped.

EHR = electronic health record; SSP = Medicare Shared Savings Program.

Table 4.A.20. Services CPC+ practices plan to develop in the coming year, how CPC+ practices provide behavioral health services for patients, and how CPC+ practices plan to further develop behavioral health services for patients (percentages)

	Overall	Track 1			Track 2		
		Total	SSP	Non-SSP	Total	SSP	Non-SSP
Identify 1–3 services your practice plans to further develop in the upcoming year [Quarter 3]							
	N = 2,541	N = 1,087	N = 590	N = 497	N = 1,454	N = 583	N = 871
Behavioral health care	80%	72%	72%	73%	85%	81%	88%
Chronic pain management	24%	31%	35%	26%	19%	21%	18%
Gynecological services	12%	14%	14%	15%	11%	9%	13%
Palliative care	15%	18%	20%	15%	13%	18%	10%
Medication therapy management	27%	29%	28%	30%	26%	28%	24%
Other	18%	15%	16%	12%	20%	25%	17%
How are behavioral health care services currently provided? [Quarter 3] [a]							
	N = 2,029	N = 788	N = 423	N = 365	N = 1,241	N = 474	N = 767
Referral to specialist	61%	59%	58%	61%	62%	64%	61%
Co-management: relationship with a specialist via a care compact	6%	6%	7%	5%	5%	8%	3%
Co-location: specialist care at the primary care practice	19%	18%	16%	20%	20%	19%	21%
In our practice, by primary care clinician	14%	17%	19%	14%	13%	10%	15%
How do you plan to develop behavioral health care services for your patients? [Quarter 3] [a]							
	N = 2,029	N = 788	N = 423	N = 365	N = 1,241	N = 474	N = 767
Co-management: relationship with a specialist via a care compact	28%	40%	45%	33%	20%	28%	16%
Co-location: specialist care at the primary care practice	41%	26%	22%	32%	50%	48%	51%
In our practice, by primary care clinician	10%	9%	9%	9%	10%	10%	10%
Other	21%	24%	23%	26%	20%	14%	23%

Source: Mathematica's analysis of 2017 (Q3) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] These responses represent practices that indicated behavioral health care was a service they plan to further develop in the upcoming year.

SSP = Medicare Shared Savings Program.

Table 4.A.21. Behavioral health integration strategies used by CPC+ practices (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Tell us about your primary behavioral health integration strategy [Quarter 4] [a]							
Primary care practitioner delivers behavioral health care	34%	36%	40%	31%	32%	28%	34%
Specialty referral	20%	24%	23%	26%	16%	19%	14%
Established care compact/referral agreement with behavioral health practitioners	3%	3%	4%	1%	3%	3%	2%
Co-management between primary care and behavioral health care	7%	6%	5%	8%	7%	5%	9%
Care Management for Mental Illness model (proactive, relationship-based care management for mental health condition)	3%	3%	2%	3%	4%	2%	6%
Primary Care Behaviorist model (behavioral health professional co-located and integrated into workflow)	25%	13%	11%	15%	36%	37%	35%
We are not integrating or planning to integrate behavioral health at our practice	9%	15%	14%	16%	3%	5%	1%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] CPC Classic practices and Track 2 practices are required to integrate behavioral health in 2017. Practices could also indicate whether these strategies were secondary strategies, in planning (not yet implemented), or supported via telemedicine. See page 115 of the implementation guide.

SSP = Medicare Shared Savings Program.

Table 4.A.22. Mental health conditions that CPC+ practices target with their behavioral health strategy (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What mental health conditions are you targeting with your behavioral health strategy? (Select all that apply) [Quarter 4]							
Anxiety disorders	77%	73%	77%	68%	80%	81%	79%
Dementia	50%	53%	54%	52%	48%	52%	45%
Depressive disorders	88%	85%	87%	83%	90%	85%	94%
Chronic pain	42%	45%	50%	40%	40%	52%	32%
Complex/chronic disease and comorbidities (e.g., major depressive disorder and poorly controlled diabetes)	69%	66%	72%	59%	71%	74%	69%
High risk behaviors (e.g., tobacco use, obesity, and medication adherence)	66%	71%	74%	67%	63%	66%	61%
Insomnia	33%	35%	38%	30%	32%	45%	24%
Substance abuse	43%	44%	43%	44%	43%	47%	41%
Other	8%	6%	4%	9%	9%	13%	6%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.23. CPC+ practices' capabilities in place to support behavioral health (percentages)

Capabilities	Response	Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Do you have the following capabilities currently in place to support behavioral health at your practice? [Quarter 4]								
Screening for behavioral health conditions as standard practice	Yes	85%	83%	87%	80%	87%	84%	89%
	No	3%	3%	3%	3%	3%	7%	<1%
	In planning	11%	14%	11%	17%	9%	9%	10%
Registries and/or EHR functionality to track care of patients with behavioral health conditions	Yes	49%	47%	53%	40%	51%	48%	53%
	No	20%	25%	24%	26%	16%	12%	18%
	In planning	31%	28%	22%	34%	33%	40%	29%
Ability to monitor and assess treatment response and behavioral health outcomes at your practice (e.g., using validated scales such as PHQ-9)	Yes	87%	85%	89%	80%	88%	90%	87%
	No	3%	4%	4%	4%	2%	2%	2%
	In planning	11%	11%	7%	17%	10%	8%	11%
Method to share medical records between behavioral health and primary care clinicians	Yes	67%	61%	59%	63%	72%	64%	78%
	No	12%	18%	22%	14%	7%	8%	6%
	In planning	21%	21%	19%	23%	21%	28%	16%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

EHR = electronic health record; PHQ = patient health questionnaire; SSP = Medicare Shared Savings Program.

Table 4.A.24. Payment mechanisms used by CPC+ practices for behavioral health integration (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What payment mechanisms do you use to support behavioral health integration? (Select all that apply) [Quarter 4] [a]							
FFS reimbursement	54%	54%	49%	59%	54%	56%	54%
CPC+ care management fee	59%	44%	40%	49%	71%	62%	78%
CPC+ CPCP	9%	0%	0%	0%	17%	13%	20%
Payer funding specifically for behavioral health services	4%	4%	4%	3%	5%	4%	5%
Grant funding	4%	3%	2%	4%	4%	4%	4%
Quality incentives or bonus payments from your health system	2%	2%	2%	<1%	3%	5%	2%
Quality incentives or bonus payments from payers	13%	14%	18%	10%	12%	7%	16%
Other	6%	4%	3%	4%	9%	6%	11%
None	17%	28%	31%	23%	8%	13%	6%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] This question refers to all types of payment mechanisms a practice is using to support behavioral health integration (BHI), not limited to Medicare- or CPC+-related funding.

CPCP = Comprehensive Primary Care Payment; FFS = fee for service; SSP = Medicare Shared Savings Program.

Table 4.A.25. Steps CPC+ practices have taken to integrate PFACs into their practices and membership of PFAC (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Which of the following steps has your practice achieved to integrate the PFAC in your practice? (Select all that apply) [Quarter 4] [a]							
We have not taken any of the following steps to integrate the PFAC at our practice	1%	3%	3%	2%	<1%	<1%	<1%
Identified staff participants	89%	89%	90%	88%	89%	89%	90%
Recruited patient participants	88%	86%	85%	87%	89%	88%	90%
Defined mission and vision of PFAC	83%	80%	82%	78%	86%	86%	85%
Determined structure of PFAC (e.g., number of patients or family advisors, frequency of meetings, term lengths, and other meeting logistics)	87%	83%	83%	84%	90%	88%	91%
Developed a sustainability plan for the PFAC	57%	55%	52%	60%	59%	58%	59%
Who typically meets or is a part of your PFAC (Select all that apply) [Quarter 4] [b]							
Practitioners (MD/DOs, NPs, PAs)	70%	70%	71%	70%	70%	78%	65%
Clinical staff (RNs, LPNs, MAs, care managers)	85%	84%	86%	81%	87%	90%	85%
Patients and family/caregivers	97%	95%	96%	95%	98%	98%	98%
Non-clinical staff (e.g., administration, front office, IT)	87%	85%	85%	85%	89%	88%	90%
Other	12%	11%	11%	10%	14%	15%	13%
Rate how well your PFAC reflects your practice's overall patient population [Quarter 4] [c]							
Not applicable, or PFAC is still in development	5%	7%	10%	5%	2%	3%	2%
Not at all representative	2%	1%	1%	1%	2%	2%	2%
Slightly representative	20%	19%	20%	18%	22%	22%	22%
Moderately representative	45%	44%	43%	44%	46%	39%	50%
Very representative	27%	27%	25%	29%	27%	30%	25%
Completely representative	2%	2%	2%	3%	2%	4%	1%

Table 4.A.25. *(continued)*

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Meetings held by practice's PFAC in program year one [Quarters 1–4] [d]							
Minimum number of PFAC meetings held	0	0	0	0	0	0	0
Median number of PFAC meetings held	2	1	1	1	2	2	2
Maximum number of PFAC meetings held	55	55	18	55	20	13	20

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] The intent of this question is to identify where a practice is in the development of PFACs. The steps listed here for PFAC integration are not necessarily sequential.

[b] In the practice portal, practices were required to report the number of individuals in each category. In this question, we show the percentage of practices with at least one participant of each type.

[c] The rating of how well respondent's practice reflects practice's overall patient population should account for factors such as age, gender, race, socioeconomic status, language, or medical condition.

[d] The ranges reported in this question suggest that some respondents indicated the number of PFAC meetings held across the whole system, not associated with an individual practice, making the distribution difficult to interpret.

DO = doctor of osteopathic medicine; IT = information technology; LPN = licensed practical nurse; MA = medical assistant; MD = medical doctor; NP= nurse practitioner; PA = physician assistant; PFAC = Patient and Family Advisory Council; RN = registered nurse; SSP = Medicare Shared Savings Program.

Table 4.A.26. How CPC+ practices engage patients and caregivers in practice improvement, and areas of practice change influenced by patients and caregivers (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Besides your PFAC, how do you engage patients and caregivers in practice improvement processes? (Select all that apply) [Quarter 4]							
Patient surveys	87%	83%	87%	80%	91%	93%	89%
Community meetings	8%	6%	3%	9%	10%	4%	13%
Facebook page or other social media site	28%	28%	28%	28%	27%	29%	26%
Website/portal	60%	59%	58%	59%	61%	59%	62%
Suggestion box	31%	31%	32%	30%	31%	39%	25%
Focus groups	4%	3%	4%	2%	6%	6%	5%
Other	12%	13%	11%	15%	12%	17%	9%
What areas of practice changes were influenced by patient and caregiver input in the last two quarters? (Select all that apply) [Quarter 4] [a]							
We did not implement changes based on patient and caregiver input[b]	9%	12%	13%	11%	6%	4%	7%
Governance policies and procedures	4%	2%	2%	3%	5%	7%	4%
Patient education and outreach	46%	40%	36%	45%	51%	54%	50%
Communication and customer service	72%	69%	70%	69%	75%	75%	75%
Patient portal/patient health record changes	34%	32%	29%	36%	36%	39%	33%
Practice capabilities to serve unmet medical needs in the population	8%	8%	10%	5%	9%	10%	8%
Working with high-risk patients (e.g., risk-stratification methodology, care plan development, medication management, self-management support)	16%	16%	15%	17%	16%	13%	18%
Patient access and flow (e.g., scheduling, office hours, front-office staffing, wait times, forms, etc.)	59%	54%	51%	58%	63%	63%	64%
Linkages to community-based social services	12%	11%	11%	12%	13%	20%	9%
Coordination with medical neighborhood (e.g., tracking and follow-up from hospital/ED/diagnostic studies, coordination with specialists, etc.)	17%	16%	17%	15%	18%	25%	13%
Other	9%	6%	6%	6%	12%	19%	7%

Table 4.A.26. *(continued)*

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How did your practice communicate about practice changes to your patients in the last two quarters? (Select all that apply) [Quarter 4] [c]							
We did not communicate changes to our patients	22%	25%	24%	25%	19%	16%	21%
Materials distributed at the office (e.g., brochures, posters, written notice on visit summary)	59%	57%	61%	53%	62%	62%	62%
Materials distributed outside of the office (e.g., newsletters, mailings, social media)	24%	22%	24%	20%	25%	29%	22%
Website or patient portal/patient health record	34%	31%	30%	31%	38%	41%	36%
Public reporting through local/regional collaboratives or press releases	5%	6%	7%	6%	3%	4%	3%
Other	16%	15%	14%	16%	17%	17%	17%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Input includes all forms of patient and caregiver engagement, including PFACs and other strategies.

[b] If respondents selected "We did not implement changes based on patient and caregiver input," they could not select the other options for this question.

[c] If respondents selected "We did not communicate changes to our patients," they could not select the other options for this question.

ED = emergency department; PFAC = patient and family advisory council; SSP = Medicare Shared Savings Program.

Table 4.A.27.a. Conditions that CPC+ practices selected for self-management support (percentages), by track and SSP status

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
For which conditions did your practice provide self-management support in the last quarter? [Quarter 4]							
We did not select any conditions for self-management support[a]	7%	12%	10%	14%	2%	2%	2%
Support for cardiovascular conditions							
Congestive heart failure (CHF)	53%	47%	50%	44%	58%	64%	54%
Hyperlipidemia/high cholesterol	40%	43%	46%	40%	37%	39%	35%
Coronary artery disease (CAD)	27%	28%	32%	23%	26%	29%	25%
Support for respiratory/pulmonary conditions							
COPD	53%	49%	53%	45%	57%	59%	55%
Asthma	34%	39%	43%	35%	30%	30%	30%
Support for mental health conditions							
Depression	46%	44%	46%	41%	48%	52%	45%
Support for substance misuse conditions							
Tobacco cessation	64%	65%	69%	60%	64%	66%	63%
Alcohol misuse	22%	26%	33%	19%	18%	17%	18%
Opioid misuse	18%	20%	27%	13%	15%	16%	15%
Support for other conditions							
Diabetes	87%	80%	82%	79%	92%	90%	94%
Hypertension	62%	61%	64%	57%	63%	64%	61%
Obesity/weight loss	50%	54%	59%	48%	46%	51%	42%
Chronic pain	23%	28%	31%	24%	19%	21%	18%
Other	11%	8%	8%	8%	14%	19%	11%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] If respondents selected "We did not select any conditions for self-management support," they could not select the subsequent options for this question.

COPD = chronic obstructive pulmonary disease; SSP = Medicare Shared Savings Program.

Table 4.A.27.b. Conditions that CPC+ practices selected for self-management support (percentages), by track and, within Track 1, by CPC Classic participation

	Overall N = 2,785	Track 1		Track 2 N = 1,476
		Track 1 non-Classic N =1,227	Track 1 Classic N = 76	
For which conditions did your practice provide self-management support in the last quarter? [Quarter 4]				
We did not select any conditions for self-management support[a]	7%	13%	4%	2%
Support for cardiovascular conditions				
Congestive heart failure (CHF)	53%	47%	45%	58%
Hyperlipidemia/high cholesterol	40%	43%	47%	37%
Coronary artery disease (CAD)	27%	29%	17%	26%
Support for respiratory/pulmonary conditions				
COPD	53%	50%	37%	57%
Asthma	34%	40%	22%	30%
Support for mental health conditions				
Depression	46%	44%	32%	48%
Support for substance misuse conditions				
Tobacco cessation	64%	66%	50%	64%
Alcohol misuse	22%	27%	18%	18%
Opioid misuse	18%	21%	15%	15%
Support for other conditions				
Diabetes	87%	80%	92%	92%
Hypertension	62%	60%	70%	63%
Obesity/weight loss	50%	54%	50%	46%
Chronic pain	23%	28%	18%	19%
Other	11%	8%	11%	14%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] If respondents selected "We did not select any conditions for self-management support," they could not select the subsequent options for this question.

COPD = chronic obstructive pulmonary disease; SSP = Medicare Shared Savings Program.

Table 4.A.28. How CPC+ practices identify patients for self-management support (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How do you identify patients for self-management support? (Select all that apply) [Quarter 4]							
We do not systematically identify patients for self-management support[a]	8%	14%	13%	14%	3%	3%	3%
All patients with targeted condition	48%	46%	48%	43%	50%	61%	43%
General risk status (using the practice's risk stratification methodology)	47%	38%	37%	39%	54%	47%	59%
Poorly controlled disease	77%	68%	70%	67%	84%	87%	83%
Data from a formal self-management assessment tool	16%	13%	14%	12%	18%	20%	16%
Patient expression of interest	70%	63%	67%	59%	75%	80%	71%
Clinician referral/identification	76%	68%	73%	63%	82%	85%	80%
Other	6%	5%	4%	6%	8%	5%	10%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] If respondents selected "We do not systematically identify patients for self-management support," they could not select the other options for this question.

SSP = Medicare Shared Savings Program.

Table 4.A.29. How CPC+ practice clinicians and staff identify and involve patients in making shared decisions (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How do clinicians and staff at your practice involve patients with preference-sensitive conditions in shared decision making? (Select all that apply) [Quarter 4] [a]							
We do not implement shared decision making for specific conditions[b]	12%	14%	16%	12%	9%	6%	12%
Discuss preferences for care with patients with targeted preference-sensitive conditions	77%	77%	79%	76%	77%	87%	71%
Distribute decision aids to patients with targeted preference-sensitive conditions	42%	36%	31%	41%	48%	46%	50%
Document patients' decisions after shared decision making	53%	50%	52%	48%	55%	58%	53%
How do you identify patients for shared decision making? (Select all that apply) [Quarter 4]							
We do not systematically identify patients for shared decision making[c]	15%	17%	18%	17%	13%	8%	16%
Ad hoc basis only, no established process or protocol	38%	43%	42%	44%	34%	37%	31%
Clinician or care team referral, based on clinical intuition	35%	35%	35%	35%	35%	40%	31%
Clinician or care team identification, based on routine established protocols	34%	28%	30%	27%	39%	43%	37%
Automatic flags built into EHR or health IT platform	18%	14%	11%	17%	20%	20%	21%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Shared decision making is an approach to care that seeks to fully inform patients about the risks and benefits of available treatments for preference-sensitive conditions and engage them as participants in decisions about the treatments. Preference-sensitive conditions are conditions where multiple treatment options exist and there is not a consensus supporting a single recommended pathway of care. Decision aids are tools designed to support patient decision making in preference sensitive care.

[b] If respondents selected "We do not implement shared decision making for specific conditions," they could not select the other options for this question.

[c] If respondents selected "We do not systematically identify patients for shared decision making," they could not select the other options for this question.

EHR = electronic health record; IT = information technology; SSP = Medicare Shared Savings Program.

Table 4.A.30. Preference-sensitive health conditions, decisions, or tests of focus for which CPC+ practices have implemented shared decision making (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
For which preference-sensitive health conditions, decisions, or tests of focus is your practice implementing shared decision making? (Select all that apply) [Quarter 4]							
We did not select any preference-sensitive health conditions, decisions, or tests of focus for shared decision making	17%	19%	17%	21%	15%	9%	19%
Therapeutic options in management							
Tobacco cessation choices in approach (e.g., classes, medication)	62%	63%	63%	63%	61%	72%	55%
Care preferences over the life continuum (e.g., end-of-life decisions and advance care planning)	41%	45%	52%	38%	37%	48%	30%
Depressive disorders	37%	39%	39%	40%	35%	39%	32%
Chronic pain	30%	35%	38%	31%	25%	29%	22%
Low back pain (acute or chronic)	29%	31%	32%	30%	27%	29%	26%
Osteoporosis management and medication choices	24%	27%	29%	26%	21%	23%	19%
Insomnia	19%	22%	26%	17%	16%	17%	15%
Adult sinusitis	16%	18%	22%	13%	14%	14%	14%
Osteoarthritis of the hip or knee	16%	20%	24%	15%	13%	15%	12%
Chronic stable angina	11%	13%	18%	8%	8%	8%	9%
Medication choices							
Diabetes management	52%	54%	54%	55%	49%	57%	45%
Statin use	37%	40%	42%	38%	34%	37%	32%
Hypertension management	35%	40%	42%	38%	31%	36%	27%
COPD management	31%	31%	39%	23%	30%	37%	25%
Congestive heart failure management	28%	29%	36%	21%	27%	34%	22%
Antibiotic use for acute infections	25%	29%	33%	25%	22%	22%	21%
Asthma management	24%	31%	36%	25%	19%	17%	20%
Anticoagulation for atrial fibrillation	23%	28%	35%	20%	18%	19%	18%

Table 4.A.30. *(continued)*

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
For which preference-sensitive health conditions, decisions, or tests of focus is your practice implementing shared decision making? (Select all that apply) [Quarter 4]							
Screenings							
Colon cancer screening	61%	63%	63%	64%	59%	53%	63%
Mammography for patients age 40–49 or over the age of 75	52%	54%	57%	51%	51%	57%	46%
Prostate cancer screening	44%	42%	46%	36%	46%	52%	41%
Lung cancer screening	35%	34%	38%	30%	36%	41%	32%
Other	6%	3%	4%	2%	8%	10%	6%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

COPD = chronic obstructive pulmoYenary disease; SSP = Medicare Shared Savings Program.

Table 4.A.31. Member roles found on typical care teams at CPC+ practices (percentages)

	Overall N = 2,786	Track 1			Track 2		
		Total N = 1,310	SSP N = 689	Non-SSP N = 621	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Please select the member roles found on your typical care team [Quarter 1]							
Physician	98%	98%	99%	97%	99%	99%	99%
Nurse practitioner	46%	43%	45%	40%	49%	55%	45%
Physician assistant	23%	21%	20%	24%	24%	19%	27%
Registered nurse	37%	34%	30%	38%	39%	42%	37%
Medical assistant	84%	85%	89%	80%	84%	90%	80%
Licensed practice nurse	36%	35%	30%	39%	37%	35%	38%
Care manager	56%	44%	46%	41%	67%	64%	69%
Behavioral health specialist	16%	11%	13%	10%	20%	21%	19%
Pharmacist	14%	10%	7%	12%	19%	19%	18%
Dietician or nutritionist	10%	7%	6%	8%	12%	14%	11%
Administrative staff	74%	72%	74%	71%	76%	75%	77%
Other	31%	25%	24%	27%	35%	34%	36%

Source: Mathematica's analysis of 2017 (Q1) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.32. Frequency with which CPC+ practices delegate clinical activities to members of the care team other than physicians or practitioners (percentages)

Clinical activities	Frequency	Overall N = 2,786	Track 1			Track 2		
			Total N = 1,310	SSP N = 689	Non-SSP N = 621	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How often are the following clinical activities delegated to members of the care team besides the physician/practitioner (e.g., RN, MA, front desk staff, other care manager)? [Quarter 1] [a]								
Direct patient care activities (e.g., patient education, self-management support activities)	Never	2%	4%	3%	4%	<1%	<1%	<1%
	Rarely	6%	7%	7%	7%	5%	5%	4%
	Sometimes	30%	32%	34%	30%	29%	23%	33%
	Often	55%	51%	49%	52%	58%	63%	55%
	Always	7%	6%	7%	6%	7%	8%	7%
Patient assessments (e.g., assessing lifestyle factors, screening)	Never	3%	5%	5%	6%	2%	2%	2%
	Rarely	6%	6%	6%	7%	6%	6%	7%
	Sometimes	27%	25%	26%	24%	29%	22%	33%
	Often	53%	52%	51%	54%	54%	58%	51%
	Always	10%	11%	13%	9%	10%	12%	8%
Communicating with patients (e.g., answering messages from patients)	Never	<1%	1%	<1%	1%	<1%	0%	<1%
	Rarely	<1%	<1%	<1%	<1%	<1%	2%	<1%
	Sometimes	9%	10%	13%	8%	8%	5%	9%
	Often	62%	62%	59%	66%	62%	58%	65%
	Always	28%	26%	27%	25%	29%	36%	25%

Source: Mathematica's analysis of 2017 (Q1) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Per the CPC+ Implementation guide, this question was slated to be asked in Quarters 1 and 3; however, we identified data for this question only in Quarter 1 in the business intelligence tool.

SSP = Medicare Shared Savings Program.

Table 4.A.33. Type and frequency of use of communication structures used by care teams in CPC+ practices (percentages)

Communication structures	Frequency	Overall N = 2,786	Track 1			Track 2		
			Total N = 1,310	SSP N = 689	Non-SSP N = 621	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What communication structures and processes do care teams use and how often? (Select all that apply) [Quarter 1] [a]								
Structured pre-visit huddles	Practice has structured pre-visit huddles[b]	68%	61%	60%	62%	74%	74%	74%
	Not routinely, or ad hoc	24%	29%	26%	32%	20%	21%	19%
	Daily	62%	58%	64%	53%	65%	60%	69%
	Every 1–2 weeks	9%	8%	7%	9%	10%	13%	7%
	Monthly	1%	2%	2%	1%	1%	2%	<1%
	Other	4%	3%	2%	5%	4%	5%	4%
Scheduled care team meetings to discuss high-risk patients and planned care	Practice has scheduled care team meetings[b]	56%	50%	48%	53%	62%	57%	65%
	Not routinely, or ad hoc	36%	42%	39%	45%	31%	32%	31%
	Daily	10%	11%	14%	9%	9%	12%	8%
	Every 1–2 weeks	23%	16%	18%	13%	29%	24%	32%
	Monthly	20%	22%	24%	20%	19%	26%	14%
	Other	10%	8%	4%	13%	12%	7%	15%

Source: Mathematica's analysis of 2017 (Q1) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Per the CPC+ Implementation guide, this question was slated to be asked in Quarters 1 and 3; however, we identified data for this question only in Quarter 1 in the business intelligence tool.

[b] The frequency of communication structures reported in this table reflect practices that indicated they used structured pre-visit huddles or care team meetings, respectively.

SSP = Medicare Shared Savings Program.

Table 4.A.34. CPC+ practices reports on the frequency of review of various data sources on quality and outcomes, and helpfulness of each data source (percentages)

Data source		Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How frequently do care teams review data on quality, utilization, patient experience, and other measures? [Quarter 4]								
Electronic Clinical Quality Measures (eCQMs)	Available	98%	98%	98%	98%	98%	95%	>99%
	Weekly	21%	17%	10%	25%	25%	12%	34%
	Monthly	49%	48%	48%	48%	50%	67%	40%
	Quarterly	25%	29%	35%	23%	22%	18%	25%
	Annually	4%	6%	7%	5%	2%	4%	2%
Patient experience data	Available	89%	85%	89%	81%	92%	92%	91%
	Weekly	9%	8%	4%	13%	9%	9%	9%
	Monthly	43%	42%	47%	37%	43%	48%	40%
	Quarterly	30%	31%	31%	30%	30%	25%	34%
	Annually	18%	19%	18%	21%	17%	18%	17%
Patient-reported outcome measures (PROMs)	Available	20%	19%	20%	17%	21%	21%	21%
	Weekly	7%	9%	9%	8%	5%	<1%	8%
	Monthly	22%	20%	10%	32%	25%	23%	26%
	Quarterly	53%	49%	45%	54%	57%	52%	60%
	Annually	18%	23%	35%	7%	14%	25%	7%
Public health data from county or state government	Available	26%	25%	26%	25%	26%	28%	25%
	Weekly	12%	12%	10%	14%	12%	9%	13%
	Monthly	24%	20%	24%	15%	27%	36%	20%
	Quarterly	30%	28%	27%	29%	31%	14%	43%
	Annually	35%	40%	39%	42%	31%	41%	23%

Table 4.A.34. *(continued)*

Data source	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How helpful is this data? (Report median for each source) [Quarter 4] [a]							
Electronic Clinical Quality Measures (eCQMs)	4	4	4	4	4	5	4
Patient experience data	4	4	4	4	4	4	4
Patient-reported outcome measures (PROMs)	4	3	3	4	4	4	4
Public health data from county or state government	3	3	3	3	3	3	3

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Practices could rate data sources from 1–5, with 5 being the most helpful and 1 being not helpful at all.

SSP = Medicare Shared Savings Program.

Table 4.A.35. Percentage of CPC+ practices reporting that eCQM data are available at various levels

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N =889
At what level is data on eCQMs available? [Quarter 4]							
Practice level	22%	28%	29%	26%	18%	24%	14%
Care team or panel level	6%	6%	7%	5%	7%	4%	9%
Both the practice and the care team/panel level	69%	65%	62%	68%	73%	66%	78%
Not available	2%	2%	2%	2%	2%	5%	<1%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.36. How CPC+ practices use available data to inform quality improvement (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How does your practice use available data (e.g., quality metrics, utilization data, payer reports) to inform quality improvement? [Quarter 4]							
Identify specific patients with gaps or high risk	96%	95%	95%	95%	97%	97%	97%
Identify groups or specific conditions to focus on	84%	83%	83%	84%	85%	89%	81%
Identify opportunities for improvement in existing services at the practice	82%	79%	83%	75%	85%	83%	85%
Identify new services to provide within the practice	59%	51%	53%	49%	66%	70%	63%
Identify practitioners outside of the practice with to coordinate with	39%	37%	39%	35%	42%	51%	35%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

Table 4.A.37. CPC+ measures that are the focus of quality improvement efforts by CPC+ practices (percentages)

		Track 1			Track 2		
	Overall N = 2,785	Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Identify the CPC+ measures on which your practice focused its quality improvement efforts during the past two quarters (Select all that apply) [Quarter 4]							
eCQMs[a]							
Colorectal Cancer Screening	85%	85%	89%	81%	84%	84%	84%
Diabetes: Hemoglobin HbA1c Poor Control (>9%)	83%	82%	82%	82%	83%	86%	81%
Breast Cancer Screening	81%	82%	86%	78%	80%	81%	78%
Controlling High Blood Pressure	74%	73%	74%	73%	74%	70%	77%
Falls: Screening for Future Falls Risk	69%	70%	63%	77%	69%	63%	73%
Diabetes: Eye Exam	67%	70%	73%	66%	65%	67%	64%
Screening for tobacco use and cessation intervention	58%	58%	56%	59%	58%	52%	62%
Cervical Cancer Screening	54%	55%	52%	59%	54%	41%	62%
Use of High-Risk Medications in the Elderly	35%	36%	27%	45%	34%	25%	40%
Closing the Referral Loop: Receipt of Specialist Report	33%	30%	23%	38%	36%	28%	41%
Dementia: Cognitive Assessment	30%	28%	21%	36%	32%	20%	41%
Use of Imaging Studies for Low Back Pain	26%	26%	27%	25%	27%	30%	24%
Depression Remission at Twelve Months	19%	20%	19%	20%	18%	16%	20%
Other	9%	5%	5%	5%	12%	18%	9%
Initiation and Engagement of Alcohol and Other Drug Dependence Treatment	7%	7%	6%	8%	7%	6%	8%
Utilization and cost							
ED	79%	78%	78%	77%	80%	87%	76%
Inpatient	65%	63%	65%	61%	66%	71%	62%
Post-acute care	18%	20%	28%	10%	16%	24%	11%
Imaging/labs	16%	14%	17%	10%	17%	16%	17%
Specialty care	15%	16%	20%	12%	15%	11%	17%
Other	5%	4%	3%	4%	5%	11%	2%

Table 4.A.37. *(continued)*

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Identify the CPC+ measures on which your practice focused its quality improvement efforts during the past two quarters (Select all that apply) [Quarter 4]							
Patient experience (CAHPS domains)							
Getting timely appointments, care, and information	66%	64%	71%	56%	68%	71%	65%
How well practitioners communicate with patients	47%	39%	42%	35%	55%	51%	57%
Overall practitioner ratings	45%	44%	50%	38%	46%	49%	44%
Practitioners support patients in taking care of their own health	23%	21%	20%	22%	24%	15%	30%
Attention to care from other practitioners	15%	16%	17%	14%	15%	8%	20%
Other	6%	5%	4%	6%	7%	7%	6%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] Practices must pick at least three quality improvement measures from the nine eCQMs to report on in their EHR. Per the CPC+ Implementation Guide, the intent with this question was not for practices to choose all of the selected eCQMs but to indicate those they have focused quality improvement efforts on in the last two quarters. Three eCQM measures were listed in the implementation guide but were not found in the raw data: (1) Pneumococcal Vaccination Status for Older Adults, (2) Documentation of Current Medications in the Medical Record, and (3) Preventative Care and Screening: Screening for Depression and Follow-Up Plan. We excluded these measures from this table, because we were not confident that practices that were asked about them.

CAHPS = Consumer Assessment of Healthcare Providers and Systems; ED = emergency department; SSP = Medicare Shared Savings Program.

Table 4.A.38. Quality improvement approaches used by CPC+ practices to improve measures (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
What quality improvement approach are you using to improve these measures? (Select all that apply) [Quarter 4] [a]							
Root cause analysis	21%	21%	13%	30%	21%	28%	16%
Plan-do-study-act	73%	70%	72%	68%	76%	71%	79%
FADE model	<1%	<1%	<1%	<1%	0%	0%	0%
Six Sigma	10%	9%	9%	10%	10%	15%	7%
Clinical practice improvement method	30%	36%	38%	33%	25%	23%	27%
Other	12%	12%	12%	12%	13%	19%	10%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] The intent of this question is to learn about the quality improvement approaches practices use to improve measures. If an approach was not included on this list, practices were instructed to add or state "None," under "Other," in the text box.

FADE = focus, analyze, develop, execute, and evaluate; SSP = Medicare Shared Savings Program.

Table 4.A.39. Culture of improvement at CPC+ practices (percentages)

		Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Over the last two quarters, who in your practice… (Select all that apply) [Quarter 4] [a]								
…primarily generated improvement ideas and opportunities?	Clinical and administrative leadership	83%	80%	83%	76%	86%	91%	83%
	Designated quality improvement team	47%	41%	48%	34%	53%	53%	52%
	Care teams and clinical staff	60%	59%	57%	60%	62%	65%	59%
	Non-clinical staff	29%	27%	26%	28%	31%	40%	26%
	Patients/caregivers	25%	20%	19%	22%	29%	30%	28%
	Did not occur	<1%	<1%	<1%	<1%	<1%	<1%	<1%
…implemented improvement projects or tests of change?	Clinical and administrative leadership	71%	70%	69%	71%	72%	78%	69%
	Designated quality improvement team	45%	39%	46%	32%	49%	50%	49%
	Care teams and clinical staff	68%	64%	60%	70%	71%	68%	72%
	Non-clinical staff	33%	32%	32%	33%	34%	41%	29%
	Patients/caregivers	4%	4%	4%	4%	5%	6%	4%
	Did not occur	2%	3%	3%	3%	1%	1%	1%
…had access to practice-level results?	Clinical and administrative leadership	86%	84%	85%	83%	88%	91%	86%
	Designated quality improvement team	54%	47%	52%	41%	60%	64%	57%
	Care teams and clinical staff	76%	73%	72%	73%	79%	82%	78%
	Non-clinical staff	44%	39%	39%	39%	49%	52%	47%
	Patients/caregivers	10%	9%	9%	8%	12%	14%	10%
	Did not occur	1%	2%	2%	2%	1%	<1%	2%

Table 4.A.39. *(continued)*

		Overall N = 2,785	Track 1			Track 2		
			Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
Over the last two quarters, who in your practice… (Select all that apply) [Quarter 4] [a]								
…had access to results identified to the applicable practitioner or care team?	Clinical and administrative leadership	86%	83%	84%	82%	89%	93%	86%
	Designated quality improvement team	50%	44%	50%	37%	56%	63%	52%
	Care teams and clinical staff	72%	70%	69%	70%	74%	77%	72%
	Non-clinical staff	35%	31%	30%	32%	38%	43%	34%
	Patients/caregivers	5%	4%	5%	3%	6%	5%	7%
	Did not occur	2%	3%	4%	3%	2%	<1%	2%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

[a] A quality improvement team refers to a group of people within the practice who meet regularly and are devoted to quality improvement efforts.

SSP = Medicare Shared Savings Program.

Table 4.A.40. Frequency of CPC+ practice care team meetings to track and measure progress on quality improvement projects (percentages)

	Overall N = 2,785	Track 1			Track 2		
		Total N = 1,309	SSP N = 689	Non-SSP N = 620	Total N = 1,476	SSP N = 587	Non-SSP N = 889
How frequently do care teams at your practice track and measure progress on quality improvement projects? [Quarter 4]							
At least weekly	15%	12%	8%	16%	18%	7%	26%
At least monthly	48%	43%	43%	44%	53%	61%	47%
At least quarterly	27%	32%	37%	27%	22%	27%	19%
Only as needed or ad hoc	7%	9%	9%	10%	5%	4%	6%
We do not routinely track and measure progress on quality improvement projects	2%	3%	3%	4%	<1%	<1%	1%

Source: Mathematica's analysis of 2017 (Q4) care delivery reporting data submitted by practices to CMS via the CPC+ Practice Portal.

SSP = Medicare Shared Savings Program.

4.B.   Methods used for the deep-dive practice study

4.B.1. Selection of deep-dive practices

We selected the sample of deep-dive practices in August 2017 to be similar to the larger population of practices that began participating in CPC+ in 2017 based on four key characteristics: (1) CPC+ track, (2) SSP participation, (3) whether they were independent or part of a system, and (4) practice size (measured by the number of primary care practitioners at that physical practice site). System practices include those owned by a hospital or health system as well as those that were part of a large group practice that includes multiple primary care practices and sometimes also specialty practices that are managed together, and therefore benefit from economies of scale. To identify practice characteristics, we used CPC+ practice tracking data, which CMS and its contractors update monthly to reflect changes in practice participation (such as withdrawals) and practitioner participation, and annually to note changes in practices' SSP or ownership status.

In drawing the total sample of deep-dive practices, we selected three to nine practices in each of the 14 regions that started in 2017. We selected three practices in each of the three regions with the smallest number of participating practices (Montana, Rhode Island, and Tennessee), nine practices in each of the three regions with the largest number of participating practices (Michigan, New Jersey, and Ohio & Northern Kentucky), and six practices in each of the remaining eight regions (Arkansas, Colorado, Greater Kansas City, Greater Philadelphia, Hawaii, North Hudson-Capital, Oklahoma, and Oregon).

The characteristics of the final sample of 81 deep-dive practices were similar to those of the 2,846 practices participating in CPC+ as of August 2017 in terms of their CPC+ track, SSP participation, whether they were independent or part of system, and practice size (number of primary care practitioners) (see Table 4.B.1).[1]

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[1] The initial deep-dive sample included 84 practices; three practices were ultimately unable to accommodate a site visit during the data collection period, leaving us with a final sample of 81 deep dive practices.

Table 4.B.1. Characteristics of deep-dive practices and all CPC+ practices starting in 2017

Practice characteristic	Deep-dive Practices (N = 81)	All CPC+ practices (N = 2,846)
Track 1	44%	47%
Track 2	56%	53%
Classic	11%	15%
SSP	40%	46%
Non-SSP	60%	54%
Independent practice	27%	27%
System or group	73%	73%
Practice size (number of primary care practitioners)		
Small (1–2)	30%	35%
Medium (3–5)	32%	37%
Large (6+)	38%	28%

Source: Mathematica's analysis of 2017 CMS practice tracking data collected by CMS.

Notes: The system variable is updated annually, and the analyses reflect system status in November 2016. SSP status is updated annually; the analyses for SSP and non-SSP status reflect the status for 2017. Practice size is updated monthly; the analyses reflect practice status in August 2017.

The percentages in this table for all CPC+ practices are largely similar to the percentages shown in Chapter 2, Table 2.2. Differences reflect several factors: data in this table exclude practices that stopped participating before August 2017, and used a different data source that defines system practices differently. System practices in Table 2.2 include only those that are owned by a hospital or health system, whereas system practices in this table reflect ownership by *any* larger health care organization, including group practices.

4.B.2. Protocol for deep-dive site visits

We used nine data collection modules to guide our interviews with deep-dive practices. The modules covered the following topics: the five CPC+ functions (Access and Continuity, Care Management, Comprehensiveness and Coordination, Patient and Caregiver Engagement, and Planned Care and Population Health); one each on CPC+ payments and learning activities; and two special topics on use of specialists and teamwork. We explored practices' experiences with and perceptions of data feedback (in the module on planned care and population health), and health IT (with questions embedded in modules for the five CPC+ functions). Findings on how practices experienced and perceived all of the CPC+ supports are reported in Chapter 3. Findings about how CPC+ supports contributed to implementation of specific care delivery requirements and primary care functions are reported in this chapter.

To ensure that we covered topics in each module in depth, we used only three or four of the nine modules with any given deep-dive practice. We distributed the modules across the deep-dive practices to ensure that we explored each topic with a sufficient number of practices of different types. As shown in Table 4.B.2, this approach resulted in our using each module with roughly 30 practices (split roughly evenly between Tracks 1 and 2) and at least 6 practices for each of the key practice characteristics of interest (SSP status, independent versus system ownership, and practice size).

Table 4.B.2. Number of deep-dive practices providing data for each module, by practice characteristic

Practice characteristic	Access and Continuity	Care Management	Comprehensiveness and Coordination	Patient and Caregiver Engagement	Planned Care and Population Health[a]	Teamwork[b]	Use of Specialists[b]	Learning Supports	Payments[c]
Track									
Track 1	14	15	13	13	13	14	15	11	9
Track 2	16	18	17	15	15	18	18	18	18
CPC Classic status									
CPC Classic	4	4	2	3	3	3	4	4	7
Non-Classic	26	29	28	25	25	29	29	25	20
SSP Status									
SSP	12	15	12	9	11	13	8	8	13
Non-SSP	18	18	18	19	17	19	25	21	14
Ownership									
Independent practice	9	10	8	9	7	9	16	6	7
System or group	21	23	22	19	21	23	17	23	20
Practice size (number of primary care practitioners)									
Small (1–2)	9	10	11	8	9	8	8	9	6
Medium (3–5)	9	8	10	9	8	14	12	8	9
Large (6+)	12	15	9	11	11	10	13	12	12
Totals	**30**	**33**	**30**	**28**	**28**	**32**	**33**	**29**	**27**

Note: We explored practice experiences with health IT support with questions in each of the primary care function modules.

[a] We asked questions about data feedback supports in the planned care and population health module.

[b] Future data collection may cover different special topics.

[c] To ensure that we collected enough information to adequately describe practices' experiences moving away from visit-based Medicare FFS payments, we oversampled practices that selected higher Comprehensive Primary Care Payment (CPCP) levels (25, 40, or 65 percent) for the deep-dive payment module. Specifically, in 2017, we collected qualitative information on payment from 9 Track 1 practices, 11 Track 2 practices with a 10 percent CPCP, and 7 Track 2 practices with a higher CPCP.

4.B.3. Analysis of the deep-dive interview data

We transcribed all interview recordings and then used a trained team of qualitative researchers to code interview transcripts. We used codes aligned with the CPC+ care delivery requirements and each of the four CPC+ supports to flag when practices were discussing a specific aspect of CPC+. We also used codes that correspond with factors that can influence practice transformation (such as a practice's internal QI resources or the presence of other primary care initiatives) to identify the barriers and facilitators to CPC+ implementation. We used Atlas.ti software for coding the data, and elements of the Consolidated Framework for Implementation Research to guide aspects of our coding and analytic approach (Damschroder et al. 2009).

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CHAPTER 5 APPENDIX

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5.A.   Attribution Methodology

In this appendix, we explain beneficiary attribution and describe each step of the attribution approach we use for CPC+ and comparison practices. We then compare how our evaluation attribution process differs from CMS' payment attribution. Finally, we explore similarities between our evaluation attribution sample and CMS' payment attribution sample.

5.A.1. What is beneficiary attribution?

Attribution is a methodology used to identify the population of beneficiaries under the care of a particular provider, practice, or health system. CPC+ provides each participating practice site with enhanced and alternative payments for their Medicare fee-for-service (FFS) beneficiaries. A practice site is composed of a unique grouping of practitioners and billing numbers (described in more detail below). To determine the amount of payments practices receive, CMS uses attribution to measure the size and acuity of the Medicare FFS population receiving regular, continuous care from the practice. The CPC+ payment attribution process uses Medicare administrative data (claims and enrollment data) to identify the Medicare FFS beneficiaries associated with CPC+ practices.[2,3]

As a part of the evaluation of CPC+, we use a similar claims-based attribution process to assign Medicare beneficiaries to all primary care practice sites serving Medicare beneficiaries in a given quarter. We assign eligible Medicare beneficiaries to practice sites for each quarter of the time period we are analyzing. For the first annual report, this period includes four baseline quarters in 2016 and four quarters in 2017.[4] Although we use a process similar to CMS payment attribution, there are a few key differences that we highlight in section 5.A.3.

5.A.2. How do we do attribution?

Like the CMS payment attribution method, attribution for the CPC+ evaluation uses Medicare administrative data to assign Medicare FFS beneficiaries to CPC+ and comparison practice sites. The CPC+ evaluation attribution process consists of five steps. First, we identify a pool of primary care practices that compete for beneficiaries in the attribution process. Second, because we use Medicare claims, which report the practitioners who provided the service rather than the practice, we group practitioners into the practices identified in the first step. Third, we identify the set of beneficiaries who are eligible for attribution. Fourth, we identify the set of primary care services that we consider in the attribution process. Fifth, we use the information from the previous four steps to attribute eligible Medicare beneficiaries to a single practice in each quarter.

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[2] See CMS' CPC+ Payment Methodologies at https://innovation.cms.gov/Files/x/cpcplus-methodology.pdf for details on CPC+ payment attribution. Section 5.A.3 summarizes the differences between the payment and evaluation attribution process.

[3] Starting in 2019, CMS will incorporate Voluntary Alignment, a method by which beneficiaries confirm their primary care practitioner, into CPC+ attribution methodology.

[4] After attribution, beneficiaries are assigned to the first practice they are attributed to in that period (i.e., the baseline or first year of CPC+ period).

Below we describe each of these steps in detail.

Step 1: Identify a pool of primary care practices

To develop a frame of primary care practices that compete for beneficiaries in the attribution process, we start with a roster of all practices in the United States with at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a primary care specialty (defined as family practice, general practice, geriatrics, or internal medicine). We purchase the roster from SK&A, a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the country, including practices' names and addresses along with the name, specialty, and National Provider Identifier (NPI) of each practitioner at the practice site. We augment the SK&A data with provider taxonomy and Medicare specialty codes and fill in missing NPIs by linking the provider-level SK&A data to the National Plan and Provider Enumeration System (NPPES). We then identify CPC+ practices within the roster of SK&A practices, using a combination of address, name, and provider matching. If we cannot identify a CPC+ practice in the SK&A roster, we augment the SK&A data by appending CPC+ practice- and practitioner data from CMS.

Step 2: Group practitioners into practice sites.

Two key inputs in attribution are a roster of practitioners working at practice sites and the information they use to bill Medicare for services provided at those practice sites. In the CMS payment attribution method for CPC+, a practice is defined by the combinations of Taxpayer Identification Number (TIN) or CMS Certification Number (CCN) for critical access hospitals and NPIs identified for each practitioner at the practice site. Participating CPC+ practices submit this information in monthly rosters. Each service in the Medicare claims data includes (1) the TIN or CCN and (2) the NPI of the practitioner who rendered the service. CMS determines whether the TIN (or CCN) and NPI combination on the claim match a TIN (or CCN) and NPI combination in a practitioner-practice site roster. If so, the visit is associated with that practice in the CPC+ payment attribution algorithm. Otherwise, CMS assigns that visit to the individual practitioner identified as the single TIN-NPI or CCN-NPI combination.

To facilitate attribution for the evaluation, we proceed with three substeps to construct a roster of practitioners working at all CPC+ and potential comparison practices and their associated TINs (or CCNs) and NPIs.

Substep 1: Create initial roster of NPIs from SK&A data

As a starting point, we use the practice-provider rosters we purchased from SK&A in 2016 (used to create practices' roster of providers for the period 2014 through 2016) and 2017 (used for practices' roster of providers in 2017). Although we had extensive information about CPC+ practices from their applications, we opted to identify CPC+ practice and practitioner characteristics for matching using the same data source (SK&A) as the potential comparison practices, both at baseline and over time. This approach removes bias that could result from using different data sources for the two groups, such as more frequent or thorough updates to provider rosters in the CPC+ data than in SK&A data. We found approximately 80 percent overlap between the practitioners in CPC+ rosters and in the rosters we created from SK&A data. This finding suggests that although SK&A data is not perfectly capturing CPC+ practitioners,

our rosters include a high proportion of them. We explore this topic more extensively in Section 5.A.4.

Substep 2: Assign TINs to each practice in roster

Because the SK&A data do not include the practice or provider TINs used in the payment attribution method, we use claims data to assign TINs to each practice.[5] To do so, we use an algorithm that picks the TIN most frequently billed in Medicare claims data for primary care services by the NPIs of primary care practitioners that the SK&A roster indicates are located at a practice.[6] We start by assigning a single TIN to a practice in each year over the three-year period from 2015 through 2017. We then maintain all TINs previously associated with a practice, resulting in practices with multiple TINs at a given time. Additionally, we backdate the start date of each TIN by one calendar year to ensure we correctly associate claims billed by a practice at some point during the year prior to the practice's new TIN.[7]

Substep 3: Unique NPI/TIN assignment

In some instances, the same NPI and TIN combination occurs at multiple practices identified in the SK&A data at the same time (approximately 13 percent of all practice-provider observations share the same NPI and TIN). In these cases, which occur when a provider works in more than one practice site within a health care system (if the practice sites share the same billing TIN), we cannot distinguish which practice provided care for a beneficiary. To reconcile duplicate NPI–TIN combinations before attribution, we assign the NPI to one practice using the following hierarchy of rules: (1) if the duplicate occurs between a CPC+ practice and a comparison practice, we assign the duplicate to the CPC+ practice; (2) ascending practice size, as measured by number of primary care practitioners (that is, we assign the NPI to the smaller practice); and (3) random assignment, if the duplicate occurs among practices in the same research group (CPC+ or potential comparison) and of the same size.[8]

This process results in a master provider file with a unique crosswalk between NPIs-TINs and their associated SK&A practice IDs in each year. We use this crosswalk to map each Medicare service to a particular practice.

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[5] For CPC+ applicants, we examine the overlap between the TINs we assign and the TINs practices reported to CMS: for 95 percent of applicants, at least one assigned TIN was also on the CPC+ application. Using the assigned TINs in attributing beneficiaries to CPC+ practices (rather than using TINs on the application) increases the risk of misattributing beneficiaries to CPC+ practices (if we assigned an incorrect or invalid TIN to that practice).

[6] In practices where at least one practitioner is found to practice only at that practice per SK&A, we limit practitioners used in TIN assignment to these "single-site" practitioners. For practices where there are no single-site practitioners, we use all primary care practitioners associated with the practice in TIN assignment.

[7] Specifically, we backdate assigned TINs in this way to avoid cases where the practice switched ownership (and so the TIN changed) midyear. Because we use a plurality approach to assigning TINs to a year, if we did not backdate TINs (for example, by forcing only one TIN to be active during a year) we would not assign the correct practice on up to 50 percent of the claims for that switching year.

[8] Consistent with CMS' attribution approach, we prioritize the smaller practice to avoid dropping any practices altogether.

Step 3: Identify Medicare beneficiaries eligible for attribution

We start with the list of beneficiaries who had at least one primary care visit (see Step 4 for definition of primary care visits) to any NPI in our master provider file (created in Step 2). We then limit the pool of beneficiaries to those who meet the eligibility criteria. To be eligible for evaluation attribution in a given quarter, beneficiaries must meet the following criteria at the start of the quarter, as indicated by the Medicare enrollment database (EDB):[9,10]

1. Be enrolled in both Medicare Part A and Part B,

2. Have Medicare as their primary payer,

3. Not be covered under a Medicare Advantage or other Medicare health plan,

4. Not be incarcerated,

5. Be alive.

These criteria ensure that we can reliably measure beneficiary outcomes in the Medicare FFS data unlike, for example, beneficiaries enrolled in a Medicare Advantage plan.

Step 4: Identify primary care claims used in attribution

We next narrow the universe of all billed Medicare services to the primary care services used in beneficiary attribution. There are four criteria for a billed service that determine whether we use it in attribution for a given quarter: (1) the type of claim, (2) date of the claim, (3) type of service, and (4) provider. A service must meet all four criteria to be included in the attribution process.

1.   Type of claim

For attribution, we use national Medicare FFS Physician and Outpatient claims. Most visits are in the Physician file, except claims submitted by critical access hospitals, which are in the Outpatient file.

2.   Date of the claim

We use primary care services that occurred during a 24-month "lookback" period in the attribution process. For each quarter, the lookback period is the 24-month period that ended immediately before the quarter started. For example, we use claims from January 2015 to December 2016 to attribute beneficiaries to CPC+ practices for the first quarter of 2017. Table 5.A.1 lists the lookback periods we used for each quarter in the Annual Report. Claims for attribution were pulled on May 3, 2018.

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[9] For example, beneficiaries must meet all eligibility criteria on January 1, 2017, to be eligible for evaluation attribution in the first quarter of 2017 (January 1, 2017–March 31, 2017).

[10] The EDB provides information, by month, for beneficiaries enrolled in Medicare, including the parts of Medicare in which they were enrolled—Part A, Part B, or Part C (a health maintenance organization)—whether Medicare was their primary payer of medical bills, whether they were incarcerated, and the date they died, if applicable.

Table 5.A.1. Lookback periods for Annual Report quarterly beneficiary attribution

Attribution quarter	CPC+ period	Lookback period
2016 Q1	Baseline	Jan. 2014–Dec. 2015
2016 Q2	Baseline	Apr. 2014–Mar. 2016
2016 Q3	Baseline	July 2014–June 2016
2016 Q4	Baseline	Oct. 2014–Sept. 2016
2017 Q1	Intervention	Jan. 2015–Dec. 2016
2017 Q2	Intervention	Apr. 2015–Mar. 2017
2017 Q3	Intervention	July 2015–June 2017
2017 Q4	Intervention	Oct. 2015 – Sept. 2017

3.   Type of service

Next, we limit claims to eligible primary care services using the Current Procedural Terminology (CPT) code reported on the claim. Table 5.A.2 lists the CPT codes of services that we consider to be related to primary care, following the definition CMS uses for CPC+ payment attribution (Table 5.A.4 in Section 5.A.3 below describes the similarities and differences between the attribution approach for the evaluation versus the one used by CMS for payment).[11] A subset of eligible primary care services are related to chronic care management (CCM); these claims receive precedence in the attribution algorithm (described below).

Table 5.A.2. Primary care services eligible for attribution

Type of service	Service	CPT codes
All primary care	Office/outpatient visit evaluation and management (E&M)	99201–99205 99211–99215
	Home care	99324-99328 99334–99337 99339–99345 99347–99350
	Welcome to Medicare and annual wellness visits	G0402, G0438, G0439
	Advance care planning	99497
	Collaborative care model	G0502–G0504[a]
	Cognition and functional assessment for patient with cognitive impairment	G0505[a]
	Outpatient clinic visit for assessment and management (CAHs only)	G0463
	Transitional care management services	99495–99496
CCM-related service	CCM services	99490
	Complex CCM services	99487, 99488[b], 99489
	Assessment/care planning for patients requiring CCM services	G0506[a]
	Care management services for behavioral health conditions	G0507[a]
	Prolonged services without face-to-face contact	99358[a], 99359[a]

[a] Added effective January 1, 2017.

[b] Discontinued effective January 1, 2017.

CAH = critical access hospital; CCM = chronic care management.

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[11] See CMS' CPC+ Payment Methodologies at: https://innovation.cms.gov/Files/x/cpcplus-methodology.pdf.

4.   Provider

Only claims that have a provider that is one of the following are included in the attribution process:

- A provider in SK&A data that is part of a practice with at least one practitioner with a primary care specialty (see Steps 1 and 2 for more details).

- A provider that is not in SK&A data but has a primary or secondary primary care specialty determined by the National Plan and Provider Enumeration System (NPPES; see Table 5.A.3 for the list of primary care specialty codes that we and CMS use).

- Any provider if the claim is for a CCM service (lower half of Table 5.A.2).

Additionally, we limit claims to services that are reported in the physician (carrier) claims or are from critical access hospitals in the outpatient claims. Like CMS' payment attribution approach, this process excludes claims from federally qualified health centers (FQHCs) and rural health clinics (RHCs).[12]

Table 5.A.3. Primary care practitioner specialties

Family Medicine	207Q00000X
Adult Medicine	207QA0505X
Geriatric Medicine	207QG0300X
Hospice and Palliative Medicine	207QH0002X
General Practice	208D00000X
Internal Medicine	207R00000X
Geriatric Medicine	207RG0300X
Hospice and Palliative Medicine	207RH0002X
Clinical Nurse Specialist	364S00000X
Acute Care	364SA2100X
Adult Health	364SA2200X
Chronic Care	364SC2300X
Community Health/Public Health	364SC1501X
Family Health	364SF0001X
Gerontology	364SG0600X
Holistic	364SH1100X
Women's Health	364SW0102X
Nurse Practitioner	363L00000X
Acute Care	363LA2100X
Adult Health	363LA2200X
Community Health	363LC1500X
Family	363LF0000X
Gerontology	363LG0600X
Primary Care	363LP2300X
Women's Health	363LW0102X
Physician Assistant	363A00000X
Medical	363AM0700X

Source: CMS' CPC+ Payment Methodologies, at https://innovation.cms.gov/Files/x/cpcplus-methodology.pdf.

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[12] This restriction means that in both payment and evaluation attribution, even if beneficiaries have most of their visits at a FQHC or RHC, they would not be attributed to a practice that is an FQHC or RHC.

Step 5: The attribution algorithm

After we identify beneficiaries eligible for attribution and pull all eligible primary care services (as determined by type of claim, date of the claim, the type of service, and the provider), we apply the CPC+ payment attribution algorithm used by CMS. There are two parts to the attribution algorithm:

1.   **Attribution based on CCM-related billing.**

If a beneficiary's ***most recent*** eligible primary care visit in the 24-month lookback period was for CCM-related services, we attribute the beneficiary to the practice that provided that CCM-related service.[13]

2.   **Attribution based on plurality of eligible primary care services.**

If a beneficiary is not attributed on the basis of CCM-related billing (including cases in which a beneficiary had CCM billed but the most recent visit was not for CCM-related services), we first count the number of eligible primary care visits the beneficiary received from each practice that provided such services. We then attribute the beneficiary to the practice that provided the plurality (that is, the largest share) of eligible primary care visits during the lookback period. If a beneficiary has the same number of eligible primary care visits at more than one practice, we attribute the beneficiary to the practice where the beneficiary had his or her most recent visit. If more than one of these practices share the same most recent visit date, we attribute the beneficiary to a practice that is on our SK&A practice roster over a primary care NPI that is not on the roster.[14] We break any further ties randomly.

5.A.3. How does attribution differ between the CPC+ evaluation and CMS payment?

Our attribution method for the evaluation identifies Medicare beneficiaries assigned to any practice each quarter using roughly the same claims-based attribution algorithm that CMS uses to attribute beneficiaries for CPC+ payments. However, our attribution approach for the evaluation differs from CMS' attribution approach in four key ways:

1.   **The evaluation provider rosters come from SK&A data for all practices (including CPC+ practices).**

For payment attribution, CMS uses CPC+ practice rosters (lists of participating practitioners that practices participating in CPC+ submit to CMS) to determine the composition of CPC+ practices and their NPIs and TINs. However, analogous information about practice composition and TINs is not available for comparison practices. Therefore, to maintain consistency in identifying practice composition across CPC+ and comparison practices for the purposes of the evaluation, we use SK&A's roster to obtain information on NPIs affiliated with a practice. Also, for both CPC+ and comparison practices, we assign TINs to each practice using an algorithm

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[13] Because CPC+ care management (indicated by the care management fee) and the CCM are duplicative services, it is important to note that CPC+ practices cannot bill for CCM-related services for their CPC+ payment-attributed beneficiaries. CPC+ practices are free to bill for CCM-related services for non-payment-attributed beneficiaries, which may result in future attribution to the CPC+ practice.

[14] Although, in a tie, CMS payment attribution gives preference to CPC+ practices, we did not want to favor CPC+ practices over comparison practices.

that picks the TIN that was most frequently billed in Medicare claims for primary care services by the NPIs at that practice.

Because we use SK&A provider rosters for all practices, we group non-CPC+ practitioners into primary care practices, whereas payment attribution defines non-CPC+ practices as individual practitioners using single TIN-NPI or CCN-NPI combinations (because information regarding how they are grouped as actual practices is not available), or as practice sites that applied for CPC+ but were not selected for CPC+. The evaluation approach allows all non-CPC+ primary care practices in the frame, as well as any individual primary care practitioners not identified in SK&A data, to compete with CPC+ practices for beneficiaries. This process results in attributing fewer beneficiaries to CPC+ practices than the payment attribution process but likely leads to a more comparable attribution, because non-CPC+ practices compete for beneficiaries on equal footing with CPC+ practices.

2.   The evaluation approach applies fewer restrictions to our definition of an attribution-eligible Medicare beneficiary.

In CMS' payment attribution methodology, CMS excludes from attribution: (1) beneficiaries with end-stage renal disease (ESRD) or those enrolled in hospice when they are first attributed (although beneficiaries with ESRD or hospice enrollment can be attributed if they were attributed to a CPC+ practice in an earlier quarter), (2) beneficiaries who are in a long-term care institution, and (3) beneficiaries enrolled in any other program that includes a Medicare FFS shared savings opportunity, except SSP.[15] However, for the evaluation, we do not apply any of these three exclusions in identifying attributed beneficiaries, because CMS expects CPC+ to affect all beneficiaries attributed to the practice, not just those beneficiaries for whom CMS calculates payments. In other words, for the evaluation, we want to assess impacts on all beneficiaries who received the plurality of their care from a CPC+ practice relative to similar beneficiaries attributed to comparison practices. Therefore, we think it is appropriate to apply only the eligibility criteria that pertain to the observability of the beneficiary's outcomes in Medicare FFS claims. To be eligible for inclusion in our analysis, attributed beneficiaries must (1) be alive, (2) be enrolled in Medicare Parts A and B, (3) have Medicare as their primary payer, (4) not be covered under a Medicare Advantage or other Medicare health plan, and (5) not be incarcerated. CMS applies the same eligibility criteria in identifying attributed beneficiaries for payments, although the timing of these checks differs, as we describe below.

3.   The evaluation uses a lookback period of two years immediately prior to the start of the quarter.

For payment attribution, CMS uses a two-year claims lookback period that ends three months before the start of the quarter, because CMS needs the list of attributed beneficiaries before the start of the quarter to calculate the care management fees and other CPC+ payments, such as the Comprehensive Primary Care Payment for beneficiaries attributed to each CPC+ practice. For the impact analysis, however, the three-month gap between the end of the lookback period and the beginning of the quarter is unnecessary. Our objective is to identify the

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[15] In 2017, the excluded programs included Next Generation ACO, Comprehensive ESRD Care, the Financial Alignment Demonstration, and the Independence at Home Practice Demonstration. Excluded programs may change as CMS launches new initiatives.

appropriate sample of attributed beneficiaries in both CPC+ and comparison practices, without the need for calculating payments in real time. Therefore, the two-year claims lookback period for attribution in the impact analysis ends the day before the start of the quarter.

The difference in the claims lookback period also leads to a difference between CMS' approach and the evaluation in the timing of the above-mentioned Medicare FFS eligibility checks. Specifically, CMS checks for eligibility one month before the start of the quarter, and we apply these eligibility criteria at the beginning of the quarter. For example, beneficiaries must meet all eligibility criteria on December 1, 2017, to be eligible for CMS' payment attribution in the first quarter of 2018 (January 1, 2018–March 30, 2018) but need to meet the Medicare FFS eligibility criteria as of January 1, 2018, for attribution to the evaluation sample.

4.   CMS adjusted its payment attribution methodology in 2018 to include an annual wellness criterion.

Starting with the first quarter of 2018, CMS included an additional criterion in its payment attribution process, as follows:

- If the most recent primary care service was a CCM-service, attribute beneficiaries to the practice with most recent CCM-related billing.

- Attribute remaining beneficiaries to the practice with the most recent Annual Wellness Visits or Welcome to Medicare Visits.

- Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.

We did not run attribution for 2018 quarters for the Annual Report, but our attribution for 2017 Quarter 4 (Q4) covers the same lookback period as CMS' payment attribution for 2018 Q1. Because we do not include the Annual Wellness Visit criterion, this could result in more differences in attribution results between the evaluation and payment methods in those two quarters.

The similarities and differences between CMS' approach and the evaluation's approach for beneficiary attribution are summarized in Table 5.A.4 below.

Table 5.A.4. Similarities and differences between beneficiary attribution for payment versus evaluation

	Payment attribution	Evaluation attribution
Similarities between payment and evaluation attribution processes		
Frequency of attribution	Quarterly	Quarterly
Criteria for beneficiary eligibility	• Be enrolled in Medicare Part A and Part B. • Not be covered under a Medicare Advantage or other Medicare health plan. • Not be incarcerated. • Be alive.	• Be enrolled in Medicare Part A and Part B. • Not be covered under a Medicare Advantage or other Medicare health plan. • Not be incarcerated. • Be alive.
Criteria used to identify eligible services for attribution	The same primary care HCPCS codes	The same primary care HCPCS codes
Attribution algorithm for 2017 quarters	If the most recent primary care service was a CCM service, attribute beneficiaries to the practice with most recent CCM-related billing. Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.	If the most recent primary care service was a CCM service, attribute beneficiaries to the practice with most recent CCM-related billing. Attribute all remaining beneficiaries to practices on the basis of the plurality of eligible primary care visits.
Differences between payment and evaluation attribution processes		
Time period for conducting attribution	Intervention quarters	Baseline and intervention quarters
Source for roster of practices and their practitioners	CPC+ practice rosters	SK&A
Source for TINs	CPC+ practice rosters	TIN assignment process based on claims
Practices/practitioners with whom CPC+ practices compete for beneficiaries	Practices rejected from CPC+ and single primary care NPIs not on CPC+ rosters	All primary care practices from SK&A roster and single primary care NPIs not on SK&A roster
Criteria for beneficiary eligibility	<u>Cannot</u> have end-stage renal disease and cannot be enrolled in hospice when they are first attributed. <u>Cannot</u> be in a long-term care institution. <u>Cannot</u> be enrolled in program that includes a Medicare FFS shared savings opportunity, except SSP.	<u>Can</u> have end-stage renal disease or be enrolled in hospice. <u>Can</u> be in a long-term care institution. <u>Can</u> be enrolled in program that includes a Medicare FFS shared savings opportunity.
Time frame for evaluating eligibility criteria	Month before start of quarter	Day of the start of quarter
Look-back period for claims used in quarter's attribution process	Two-year period that ends <u>three months</u> before the start of the quarter	Two-year period that ends <u>immediately</u> before the start of the quarter
Tie-breaking for practices with the most visits that have the same number of visits and same date of most recent of visit	Preference given to CPC+ practices over all other practices and NPIs	No preference given to CPC+ practices relative to comparison practices (all practices on SK&A roster are given preference over all other single primary care NPIs not on SK&A roster)

CCM = Chronic Care Management; FFS = fee-for-service; NPI = National Provider Identifier; SSP = Medicare Shared Savings Program; TIN = Tax Identification Number.

5.A.4. How similar are the evaluation attribution samples to CMS' payment attribution samples?

Given the differences in attribution methodology between CPC+ payment and the CPC+ evaluation, the evaluation is unlikely to attribute 100 percent of the same beneficiaries to CPC+ practices as CMS does for payment attribution. The biggest concern is the difference between using the practice rosters and using SK&A data and TIN assignment—because including different sets of practitioners within practices could lead to large differences in the beneficiaries attributed to the practices.

If there are large differences between the payment attribution sample and the evaluation sample, that could mean that the beneficiaries in our evaluation sample are not actually under the care of CPC+ practices—and thus they are not expected to be impacted by CPC+.[16] This would lead to attenuation in the impact estimates.

Therefore, it is important to track how well the Medicare beneficiary sample used in the evaluation and the Medicare beneficiary sample used by CMS for payments to CPC+ practices align.

To do this, we implement the following analyses:

First, we calculate the overlap of practitioners assigned to CPC+ practices based on the practitioner roster submitted to CMS and those on the practitioner rosters we develop using data purchased from SK&A. When we construct our master practice-provider file, we use the practice location and practice address to identify practices participating in CPC+ in the data received from SK&A. However, even though the two data sources might indicate the same practice by practice name and location, there might be important differences in the practitioner rosters that would affect beneficiary attribution. To check, we merge CPC+ program data with SK&A data by practitioner NPI and report (1) the percentage of practitioners in CPC+ rosters who were found in the SK&A rosters of these practices and (2) the percentage of practitioners in SK&A rosters for these practices who were found in the CPC+ rosters. When we did this for two time points—December 2016 (before CPC+ began) and December 2017 (month 12 of CPC+)—we found 78 to 81 percent of practitioners in the CPC+ rosters appeared in the SK&A rosters (Table 5.A.5). The percentage of SK&A practitioners found in CPC+ rosters was similar, 78 to 83 percent. For both, practitioner overlap slightly declined from baseline to the end of the first year of CPC+.

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[16] It is also possible that the CPC+ payment sample might include beneficiaries for whom the practices are not truly responsible; however, once beneficiaries become attributed to a CPC+ practice, that practice has an incentive to make sure they receive high quality care.

Table 5.A.5. CMS and SK&A provider roster comparison

Compared rosters	Before CPC+ began (Baseline) December 2016 CPC+ roster 2016 SK&A roster	After CPC+ began (Intervention) December 2017 CPC+ roster 2017 SK&A roster
Number of practices	2,865	2,888
Unique PCPs		
Number of PCPs in CPC+ roster	12,950	13,342
Number of PCPs in SK&A roster	12,629	13,298
Percentage overlap in CPC+ roster	81.0	78.1
Percentage overlap in SK&A roster	83.1	78.4

Note: All duplicate NPIs were removed from both rosters.

PCP = primary care practitioner.

Second, we calculate the overlap in beneficiaries attributed to CPC+ practices in the payment and evaluation samples. Due to the differences in the lookback period for a specific calendar quarter (see difference 4 above), we compare the evaluation sample from 2017 Q1 (January–March 2017) to the payment sample from 2017 Q2 (April–June 2017). This ensures we are comparing attribution from quarters that use the same lookback period. In addition to all the intervention quarters, CMS only ran payment attribution for baseline quarters 2016 Q1 and Q4, so we are unable to compare our attribution for 2016 Q2 and Q3 to the equivalent payment attribution sample.

We found substantial overlap between the sample of beneficiaries attributed to CPC+ practices by CMS and by the evaluation. As we show in Figure 5.A.1, using a two-year lookback period covering 2015 and 2016, 1,608,030 Medicare beneficiaries were attributed to CPC+ practices in both the evaluation sample and the sample CMS used for payment; 187,056 beneficiaries were attributed to the CPC+ payment sample but not the evaluation sample; and 159,437 were attributed to the CPC+ evaluation sample but not the payment sample. More generally, Table 5.A.6 shows that more than 90 percent of the beneficiaries attributed to CPC+ practices in our evaluation sample for the first four CPC+ quarters were also attributed to the payment attribution sample. Also, 86 to 90 percent of beneficiaries attributed to the payment attribution sample by CMS each quarter were also attributed to CPC+ practices for the evaluation.

Third, using CMS' payment eligibility criteria, we calculate the number of beneficiaries we attribute to CPC+ practices who would have been eligible for payment attribution. This involves additionally limiting the sample to beneficiaries who are not receiving hospice, do not have ESRD, are not institutionalized, and are not enrolled in any other program that includes a Medicare FFS shared savings opportunity, except SSP. Table 5.A.6 row 4 reports the number of beneficiaries in the evaluation sample for each quarter and row 5 reports the number of beneficiaries in the evaluation sample under CMS' payment eligibility rules. This difference is approximately 40,000 or 2.5 percent of the evaluation sample.

Figure 5.A.1. Attribution of Medicare FFS beneficiaries for the 2017 starters

**Overlap of Payment and Evaluation Attribution
2017 Q1**

159,437

**Beneficiaries attributed into
CPC+ evaluation sample but
not payment sample**

1,608,030

**Beneficiaries attributed to CPC+
practices in both evaluation and
payment samples**

187,056

**Beneficiaries attributed into
CPC+ payment sample but not
evaluation sample**
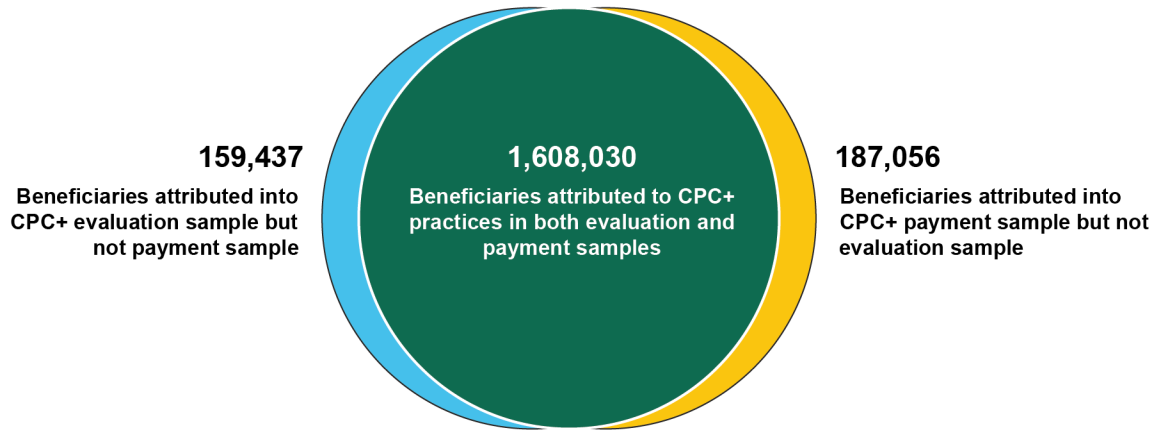
Table 5.A.6. Beneficiaries attributed to CPC+ practices for Annual Report by quarter

	Mathematica attribution quarter							
	2016 Q1	**2016 Q2**	**2016 Q3**	**2016 Q4**	**2017 Q1**	**2017 Q2**	**2017 Q3**	**2017 Q4**
Comparison to payment quarter	2016 Q2	n.a.	n.a.	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1[a]
Beneficiaries in both payment and evaluation samples	1,489,022	n.a.	n.a.	1,638,668	1,608,030	1,648,317	1,677,920	1,670,180
Beneficiaries in payment sample	1,655,920	n.a.	n.a.	1,820,621	1,795,086	1,847,515	1,894,700	1,937,859
Beneficiaries in evaluation sample	1,651,432	1,720,593	1,773,509	1,810,383	1,767,467	1,795,237	1,816,089	1,832,867
Beneficiaries in evaluation sample under payment eligibility rules	1,609,642	1,680,865	1,734,138	1,770,994	1,723,410	1,755,056	1,776,888	1,794,104
Percentage of beneficiaries in payment sample who are in evaluation sample	90%	n.a.	n.a.	90%	90%	89%	89%	86%
Percentage of beneficiaries in evaluation sample who are in payment sample	90%	n.a.	n.a.	91%	91%	92%	92%	91%

[a] In 2018, CMS changed its attribution rules to prioritize practices in which beneficiaries had their most recent Annual Wellness Visit, which results in additional differences in attribution.

n.a. = not available.

5.B.   Comparison group selection

In this appendix, we describe our approach to selecting the primary comparison group for practices that started CPC+ in 2017.

We selected this comparison group using a four-step process:

1. **Identify external regions from which to draw potential comparison practices.**

2. **Define a set of potential comparison practices**—that is, all primary care practices in the external regions, using a roster of primary care practice sites purchased from SK&A.

3. **Use propensity score matching to narrow that pool**—selecting 7,556 initial comparison practices similar to the CPC+ practices on a range of practice-, patient-, and market-level characteristics available from claims and other secondary data sources. Matching characteristics included practice characteristics, such as number of providers and urban/rural status, and practice-level averages of Medicare beneficiary characteristics, such as age and expenditures during the year before CPC+ (2016, or baseline). We shared results from this matching with CMS in spring 2017.

   We conducted this initial matching step to ensure we could field the 2017 practice survey to both CPC+ and likely comparison practices as close as possible to the CPC+ start date. After selecting this initial comparison group, we refined our comparison group in step 4.

4. **Further restrict the initially selected comparison practices**—by removing practices that were not likely to be eligible for CPC+ (such as rural health centers) or that did not resemble CPC+ practices on updated baseline characteristics (described below). We then reweighted the remaining practices so that the final comparison group would resemble the CPC+ practices as closely as possible on important baseline characteristics. We employed these additional steps for two reasons. First, we included additional information in our set of matching characteristics, incorporating changes we had made to our empirical strategy for estimating the impact of CPC+ on claims-based outcomes (described in Appendix 5.C) as well as information that (1) we had not constructed in time for the initial external matching that we performed in 2017, or (2) was not available at the time of the initial external matching. Second, we used a modified propensity score weighting method that optimizes balance on baseline characteristics subject to a constraint on the distribution of the matching weights. Since a highly variable distribution of matching weights can decrease power, this novel approach effectively allowed us to simultaneously improve baseline equivalence without unduly affecting power. We completed reweighting and finalized the primary comparison group for 2017 starters in July 2018.

We selected comparison groups separately for Track 1 and Track 2, because CMS views each track as a separate intervention that should be analyzed separately. CPC+ practices in the two tracks have different average care delivery approaches in place at baseline (reflecting CMS' different eligibility criteria for the two tracks) and different average baseline characteristics. Similarly, we matched separately within track by Medicare Shared Savings Program (SSP) status, because we and CMS deemed practice participation in SSP to be the most important practice characteristic, given the different incentives that SSP practices face. The end result was six comparison groups supporting analyses for six groups: (1) Track 1 overall, (2) Track 2 overall, (3) Track 1-SSP, (4) Tack 1-non-SSP, (5) Track 2-SSP, and (6) Track 2-non SSP.

Next, we describe each of the four steps in detail, and present final matching results.

5.B.1. Identify external market areas from which to draw potential comparison practices

To maximize face validity, we sought comparison practices that were geographically close to their matched CPC+ practices, increasing similarity in market characteristics between the two groups of practices. Unlike in CPC Classic, we did not conduct matching separately for each of the CPC+ regions, because there were too many CPC+ regions to make this approach feasible, and we will not show CPC+ region-specific impacts. Instead, we grouped CPC+ regions into four market areas (Northeast, Midwest, South and Plains, and West) using the four U.S. census regions as our starting point.[16] We drew external comparison practices from practices that were in the same geographic region but were outside the CPC+ regions (Table 5.B.1). For example, potential external practices for CPC+ practices in the Midwest census region (Michigan, Ohio, and Northern Kentucky) came from Illinois, Indiana, Iowa, Minnesota, West Virginia, and Wisconsin. Then for each propensity score model (described in Section B.3 of this appendix), we exact-matched on census region to ensure we matched a CPC+ practice only to another practice within its given census region. Exact matching means that we limited the comparison practices selected to match a given CPC+ practice to only those that have an identical value for the variable.

Also for face validity, we excluded several states from the external market areas from which we could draw comparison practices. We used three criteria to define the exclusions: (1) states with ongoing robust primary care interventions somewhat similar to CPC+ (Delaware and Maryland), (2) states or regions that had applied to start CPC+ in 2018 and that CMS thought were likely to be selected, and (3) states that appeared qualitatively different from CPC+ regions in their respective geographic region (such as Alaska and Florida). We also assigned three external states to a geographic region different from their census region, to more closely mirror the CPC+ regions' market characteristics. (We moved Washington, DC, from the South to the Northeast, West Virginia from the South to the Midwest, and South Dakota from the Midwest to the West). As we selected the external market areas from which to draw comparison practices, we considered the need to (1) restrict the pool to potential comparison practices located in areas similar to those of CPC+, and (2) achieve a large enough pool of comparison practices to ensure a sufficient sample of well-matched comparison practices.

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[16] We moved two CPC+ 2017 regions from their given census region to a neighboring census region. The Ohio/Northern Kentucky region spans two census regions; therefore, we moved CPC+ practices in Northern Kentucky to the Midwest region. Because of its geographic proximity to CPC+ regions in the South (Oklahoma, Arkansas), we moved the Kansas City region from the Midwest region to the South.

Table 5.B.1. CPC+ and external regions for practices that started in 2017

Modified U.S. census region	CPC+ regions (states)	External regions (states)
Northeast	New Jersey	Connecticut
	North Hudson-Capital region (NY)	Massachusetts
	Philadelphia region (PA)	New York, excluding CPC+ regions[a]
	Rhode Island	Pennsylvania, excluding CPC+ region
		Washington, DC
Midwest	Michigan	Illinois
	Ohio	Indiana
	Cincinnati region (KY, OH)	Iowa
		Minnesota
		West Virginia
		Wisconsin
South and Plains	Arkansas	Alabama
	Kansas City region (KS, MO)	Georgia
	Oklahoma	Mississippi
	Tennessee	Missouri, excluding CPC+ region
		North Carolina
		South Carolina
		Texas
West	Colorado	Arizona
	Hawaii[b]	California, excluding Riverside and San Bernardino counties[c]
	Montana	Idaho
	Oregon	Nevada
		New Mexico
		South Dakota
		Utah
		Washington
		Wyoming

[a] Excludes the CPC+ 2018 region of New York (Greater Buffalo region).

[b] We selected comparison practices for CPC+ practices in Hawaii only from practices in Washington or California.

[c] We excluded these two counties, because at the time of matching, they were being considered for the CPC+ 2018 region.

5.B.2. Identify a broad pool of potential comparison practices

To develop a frame of practices to serve as comparison practices for the evaluation, we began with a roster of all practices in the United States with at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) with a primary care specialty (defined using SK&A's (a commercial health care data vendor that maintains and verifies lists of practitioners who work in practices throughout the country) measure for provider specialty as family practice, general practice, geriatrics, or internal medicine). We purchased the roster from SK&A, including practices' names and addresses along with the name, specialty, and National Provider Identifier (NPI) of each practitioner at the practice site. We augment the SK&A data with provider taxonomy and Medicare specialty codes and fill in missing NPIs by linking the provider-level SK&A data to the National Plan and Provider Enumeration System (NPPES). We then identify CPC+ practices within the roster of SK&A practices. Although we had extensive information about CPC+ practices from their applications, we opted to identify CPC+ practice

and practitioner characteristics for matching using the same data source (SK&A) as the potential comparison practices, both at baseline and, eventually, over time. This approach removes bias that could result from using different data sources for the two groups, such as more frequent or thorough updates to provider rosters in the CPC+ data than in SK&A data. However, to the extent that there are discrepancies between SK&A and CPC+ data, a disadvantage to using SK&A data for CPC+ practices is the risk of incorrectly specifying CPC+ practice and patient characteristics. (See Appendix 5.A, specifically, Table 5.A.5 and Figure 5.A.1, for details on the similarities and differences between the list of practitioners and beneficiaries based on SK&A versus CPC+ data).

5.B.3. Narrow the pool of potential comparison practices using propensity score matching on administrative data

The first phase of our matching approach used propensity score matching to select initial-comparison groups, by track and SSP status. We used practice-, market-, and patient-level characteristics from administrative and other secondary data sources in this phase of comparison group matching.

We identified our initial-comparison group in four sub-steps:

a.   Assemble secondary data on matching variables for CPC+ and potential comparison practices

We developed variables for all CPC+ and potential comparison practices to use when matching to ensure comparability of CPC+ and comparison practices at baseline, defined before the start of the intervention period (January 1, 2017). These matching variables included the following:

- **Characteristics of practices**, including the number of providers in the practice, whether the practice was owned by a hospital or a health system, whether providers working at the practice were certified as meaningful users of EHRs and participation in the Medicare SSP.

- **Characteristics of patients** in each practice, comprising demographic characteristics and health care use and risk characteristics of all Medicare FFS beneficiaries attributed to practices prior to the start of CPC+ (based on the practices they visited between October 1, 2014, and September 30, 2016), including age, race, and ethnicity; dual eligibility for Medicare and Medicaid; Hierarchical Condition Category (HCC) scores (a measure of risk for subsequent expenditures); chronic conditions; original reason for Medicare eligibility; number of emergency department (ED) visits and hospitalizations during the two-year period from August 1, 2014, to July 31, 2016; Medicare spending during the same two-year period; the number of primary care visits during the same two-year period; and other measures of health care service use and continuity of care.

- **Characteristics of the county** in which the practice was located, such as median income, whether the county is a medically underserved area, percentage of the population in poverty, and whether it is rural, suburban, or urban.

Table 5.B.2 shows the data sources and variables included in this matching step.

Table 5.B.2. Propensity-score matching variables and data sources for initial external matching for 2017 starters

Matching variable	Data source
Practice characteristics	
Number of practitioners (physicians, NPs, PAs)	SK&A 2016
Whether practice had an NP/PA	SK&A 2016
Percentage of doctors on SK&A practice roster who used assigned TIN	SK&A 2016, Mathematica assignment algorithm
Number of practitioners at practice with primary care specialty	SK&A 2016, NPPES 2016
Whether practice is multispecialty	SK&A 2016
Whether practice is owned by either a hospital or health system	SK&A 2016
Whether practice had ever participated in an SSP accountable care organization	MDM 2016
Participated in prior primary care transformation initiatives: NCQA, TJC, AAAHC, URAC, or state medical-home recognition status (whether practice is in a medical home) or alumni of CPC Classic or MAPCP	NCQA 2016, TJC 2016, AAAHC 2016, URAC 2016, state-specific sources 2016; CPC+ data; CMS 2016
Meaningful use status (whether physicians at practice are meaningful users of EHRs and earliest year that physician at practice became meaningful user)	CMS 2016
Practice hours (number of weekdays practice is open after 5 p.m. and whether practice is open Saturday or Sunday)	SK&A 2016
Modified U.S. census region (Midwest, Northeast, South and Plains, West)	SK&A 2016
Characteristics of Medicare beneficiaries attributed to practices based on primary care visits from October 2014 through September 2016	
Number of attributed Medicare beneficiaries; number of attributed Medicare beneficiaries per PCP; number of Tier 4 and Tier 5 beneficiaries	Medicare claims data, 2014–2016
Mean annual Medicare expenditures per attributed beneficiary (total Part A and Part B expenditures, trend in Medicare expenditures); mean annual Medicare expenditures for Tier 4 and Tier 5 beneficiaries	Medicare claims data, 2014–2016
Mean annual Medicare service use per attributed beneficiary (number of E&M visits, hospitalizations, ER visits, primary care visits, 14-day visit follow-up after hospitalization)	Medicare claims data, 2014–2016
Continuity-of-care measure capturing how consistently patients see the same doctor at a practice (a proxy for empanelment)	Medicare claims data, 2014–2016
Percentage of practices' Medicare charges for primary care among primary care practitioners	Medicare claims data, 2014–2016
Distribution of Medicare risk scores (HCC)	2015 risk scores computed from Medicare claims and enrollment data
Demographic mix of attributed patients (percentage of practice in age, race, and gender categories)	Medicare enrollment data, 2014–2016
Percentage having age as original reason for Medicare entitlement	Medicare enrollment data, 2014–2016
Percentage of practice's attributed patients dually eligible for Medicaid	Medicare enrollment data, 2014–2016
Percentage of practice's attributed Medicare beneficiaries with selected chronic conditions (diabetes, cancer, chronic obstructive pulmonary disease, kidney disease, Alzheimer's, congestive heart failure)	Medicare claims data, 2013–2016

Table 5.B.2 *(continued)*

Matching variable	Data source
Characteristics of practice's geographic location	
Median household income of county	Area Resource File, 2015–2016
Whether in area with a shortage of (primary care) health professionals	Area Resource File, 2015–2016
Whether in an urban, rural, or suburban area	Area Resource File, 2015–2016
Percentage of adults age 25 or older in the county with a degree from a four-year college	Area Resource File, 2015–2016
Percentage of county's population in poverty	Area Resource File, 2015–2016
Number of hospitals and/or hospital beds in the county	Area Resource File, 2015–2016
Rate of Medicare Advantage penetration in county	Area Resource File, 2015–2016

Note: Categorical (rather than continuous) versions of measures were often used in the matching.

AAAHC = Accreditation Association for Ambulatory Health Care; CMS = Centers for Medicare & Medicaid Services; E&M = evaluation and management; EHR = electronic health record; ER = emergency room; HCC = Hierarchical Condition Category; MAPCP = Multi-Payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPPES = National Plan & Provider Enumeration System; PA = physician assistant; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TIN = tax identification number; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

To characterize the number, demographics, and cost and use history of each practice's patients, we used Medicare FFS beneficiaries attributed to practices. We defined these external matching characteristics using the same approach to defining the baseline Medicare FFS population used on CPC Classic; this sample includes the Medicare beneficiaries attributed to CPC+ or potential comparison practices in the first quarter of the initiative (2017).

To support external comparison group selection for 2017 starters, CMS attributed beneficiaries for the first quarter of 2017 to both CPC+ and potential comparison practices using Medicare claims data and unique combinations of Tax Identification Numbers (TINs) and NPIs. CMS's attribution process used the same rules CMS used when assessing practice applications for 2017 starters. Specifically, beneficiaries who met CPC+ eligibility criteria as of October 1, 2016, were attributed to a practice based on how recently they had received chronic care management (CCM) services or the plurality of their eligible primary care visits during the two-year period from October 1, 2014, through September 30, 2016.

For CPC+, practices are defined by unique combinations of TINs and NPIs. To facilitate attribution for this step, we provided CMS with a roster of TINs and NPIs for each CPC+ and potential comparison practice. Our roster used the SK&A roster of provider NPIs as a starting point; however, because the SK&A data do not include practice or provider TINs, we needed to assign TINs to each practice. To do so, we used an algorithm that picked the TIN most frequently billed in Medicare claims data for primary care visits by the NPIs SK&A indicated are

at a practice.[17] We assigned a single TIN to a practice in each year of the baseline period, which for attribution is the two-year period from October 1, 2014, through September 30, 2016. If the practice TIN changed over time, we assigned both TINs to the practice for the full baseline period.

In some instances, the same NPI and TIN combination occurred at multiple practices identified in the SK&A data (approximately 13 percent of all provider observations shared the same NPI and TIN). In these cases, which occur when a provider works in more than one practice site within a health care system (if the practice sites share the same billing TIN), we could not distinguish which practice provided care for a beneficiary. To reconcile duplicate NPI–TIN combinations prior to attribution, we assigned the NPI to one practice using the following hierarchy of rules: (1) if the duplicate occurred between a CPC+ practice and a potential comparison practice, the duplicate was assigned to the CPC+ practice; (2) ascending practice size, as measured by number of primary care practitioners (that is, the NPI was assigned to the smaller practice); and (3) random assignment, if the duplicate occurred among practices in the same research group (CPC+ or potential comparison) and of the same size.

b.   Narrow pool of potential comparison practices

Before conducting matching, we removed practices from the pool that we considered ineligible for CPC+ due to their target patient populations. As we note above, our starting point for the SK&A sample included all practices with at least one practitioner (defined as a physician, nurse practitioner, or physician assistant) that had a primary care specialty (defined using SK&A's measure for provider specialty as family practice, general practice, geriatrics, or internal medicine). Then, we manually reviewed all potential comparison practices, removing practices that appeared to be specialty clinics (such as cardiologists, diagnostics, surgery clinics, or urgent/emergency care clinics). Lastly, using SK&A's measure for practice specialty, we further narrowed the sample to the following eight specialties: (1) adolescent medicine, (2) family medicine, (3) geriatric medicine, (4) general practice, (5) internal medicine/pediatrics, (6) internal medicine, (7) multispecialty, and (8) pediatrics.[18] We also removed from the pool (1) practices that had 50 or fewer attributed Medicare FFS beneficiaries for the first quarter of 2017, because the small number of attributed beneficiaries led to instability in aggregate patient

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[17] CPC+ practices reported on their applications TINs that CMS uses for payment purposes. However, we did not use those TINs, because application data were not available for potential comparison practices. Instead, we assigned TINs for both CPC+ and comparison practices using an algorithm that chose the TIN that was billed most frequently in the Medicare claims data by the NPIs listed in SK&A data to ensure a consistent approach for both research groups. For CPC+ applicants, we examined the overlap between the assigned TINs and reported TINs: for 95 percent of applicants, at least one assigned TIN was also on the CPC+ application. Using the assigned TINs to attribute beneficiaries to CPC+ practices (rather than using TINs on the application) increases the risk of undercounting beneficiaries seen at CPC+ practices (if we did not assign a valid TIN for that practice) or incorrectly attributing beneficiaries to CPC+ practices (if we assigned an incorrect TIN to that practice).

[18] Pediatricians are not considered primary care physicians for CPC+. However, some *practices* with pediatric specialties are participating in CPC+, because they have at least one provider with a primary care specialty; therefore, we included practices with pediatric or other specialties in our potential external comparison sample as long as they had at least one provider with another primary care specialty.

characteristics such as hospitalizations and Medicare expenditures,[19] and (2) those beneath the minimum primary care billing percentage of 9.25 that we observed among CPC+ practices in the two years before CPC+ began.

c.   Use propensity score matching to create a narrower pool of potential comparison practices containing matched comparison practices for each CPC+ practice

We used propensity score methods to select potential comparison practices that were similar to the CPC+ practices on the matching variables. Specifically, we estimated a logistic regression model with a binary dependent variable for participation status—one for CPC+ practices and zero for potential comparison practices. The propensity score for a given practice is the predicted probability, based on all matching variables, that the practice is participating in the intervention (Rosenbaum and Rubin 1983). The score summarizes information from all of the matching variables in a single value for each practice, so practices with similar propensity scores on average should have similar values on the matching characteristics. Notably, the propensity-score approach does not necessarily match each CPC+ practice to a comparison practice (or practices) with similar or identical characteristics (except in cases of exact matching); rather, by matching on the score, the method finds a *group* of comparison practices that is on average comparable to a given CPC+ practice, or in some cases, matches a single comparison practice to multiple CPC+ practices.

We divided the CPC+ practices into four strata defined by track and SSP status. Stratifying in this way enabled us to use one matching model to select comparison practices for Track 1 SSP participants, a second model to select comparison practices for Track 1 non-SSP participants, and so on. Therefore, each CPC+ practice could match only to a comparison practice or practices with the same SSP participation status. We used the same pool of comparison practices for Track 1 and Track 2, so a potential comparison practice could be matched to CPC+ practices in both tracks (because comparison practices do not have a track). Estimating separate matching models helps to ensure that, within each stratum, CPC+ and comparison practices are similar on all matching characteristics, an important precondition for valid analyses of the SSP subgroups.

Our propensity score matching models prioritized matching CPC+ and comparison practices on several key characteristics. We used exact matching techniques to ensure the narrowed pool of comparison group practices (1) were located in the same geographic region as their matched CPC+ practice; (2) had participated in similar prior primary care transformation initiatives (as measured by participation in CPC Classic or CMS' Multi-Payer Advanced Primary Care Practice

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[19] Although we removed practices without many attributed beneficiaries from the comparison pool, we retained 12 CPC+ practices with 50 or fewer beneficiaries. CPC+ eligibility rules required that practices have at least 125 attributed beneficiaries. Thus, these 12 CPC+ practices must have had at least 125 beneficiaries attributed to the TINs and NPIs that the practices provided on their applications, or they would not have been accepted to the program. The fact that they had 50 or fewer beneficiaries attributed using the NPIs available in the SK&A data highlights the difference between the applications and SK&A data. We expect that the number of beneficiaries attributed to these 12 CPC+ practices will increase as we receive updated NPI rosters from SK&A. In the meantime, to ensure stability of the claims-based measures used for matching, we imputed values for the 12 CPC+ practices with 50 or fewer beneficiaries. Specifically, we set the imputed number of beneficiaries per practice and all the claims-based measure values for each practice equal to the mean values among CPC+ practices in the same track, state, and category of primary care provider count (i.e., one to two, three to four, five to seven, eight or more providers), and with the same SSP status.

[MAPCP] demonstration, or recognition as a patient-centered medical home); (3) had similar ownership—that is, were or were not owned by a hospital or health care system; and (4) were a similar size, as measured by the number of providers working in the practice (1 or 2, 3 to 24, 25 or more). For all other variables, we matched using a combination of propensity scores and calipers (that is, forcing each matched comparison practice to have a value within a specified range of the CPC+ practice's value). We set caliper values based on the variation in the variable in the CPC+ group, the variable's importance in ensuring unbiased impact estimation, and the desired balance on the variable.[20]

We used a propensity score matching method called "full optimal matching," which forms matched sets that contain one CPC+ and multiple comparison practices or one comparison and multiple CPC+ practices. This technique combines two ideas: (1) optimal matching minimizes the overall difference between intervention practices and their matched comparisons as measured by the propensity score, and (2) full matching maximizes the size of the comparison sample by permitting each intervention practice to match to more than one comparison practice. Full matching also allows the number of comparison practices selected for each CPC+ practice to vary depending on how many good comparisons are available for that CPC+ practice. For example, CPC+ practices with a combination of characteristics that were difficult to match had relatively fewer available comparison practices with similar characteristics; thus, these practices may be included in matched sets that contained, for example, two CPC+ practices and one comparison practice. In contrast, CPC+ practices with characteristics more similar to those of the comparison practices could be matched to multiple comparison practices to maximize the size of the analytic sample and increase statistical power. For the easy-to-match cases, we allowed as many as five comparison practices to match to one CPC+ practice. For practices that were difficult to match, we allowed a comparison practice to serve as the match for two CPC+ practices in a given stratum.[21] Our target ratio of comparison to CPC+ practices was 3:1. To assess balance between the CPC+ and comparison practices, we weighted the comparison practices by the ratio of CPC+ to comparison practices within a matched set; for example, if five comparison practices were matched to one CPC+ practice, each of those comparison practices received a weight of one-fifth.

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[20] For example, we used a caliper of 0.75 standard deviations among the CPC+ practices for Medicare expenditures. Therefore, we could match a CPC+ practice only to a comparison practice with Medicare expenditures within +/- 0.75 CPC+-practice standard deviations of its Medicare expenditures.

[21] Because we used the same comparison pool for Track 1 and Track 2, a single comparison practice could serve as the match to as many as four CPC+ practices. However, this situation was rare.

d.　　Perform diagnostic tests

During the iterative matching process, we used several metrics to check for baseline equivalence between CPC+ practices and their matched comparison practices. The diagnostic tests included calculating the weighted mean difference between the CPC+ and selected comparison practices on each of the matching variables and the standardized differences[22] of those variables. We also ran several diagnostic tests to assess equivalence of baseline trends in Medicare spending, hospitalizations, and ED visits.

As part of our diagnostics, we produced tables showing two types of results: (1) means for the potential comparison, CPC+, and selected comparison groups; and (2) unstandardized and standardized differences between the CPC+ group means and the weighted means for the selected comparison group for all characteristics used in the matching process. We produced these tables for each track overall and for SSP participants versus non-SSP participants within each track to ensure that our stratification strategy achieved its goal. To assess the quality of the matching, we set a minimum matching target for each characteristic used in the matching model at a standard of 0.25 standardized differences but attempted to get much smaller differences on key variables (such as Medicare expenditures).[23]

We provided CMS with details of our matching approach including the matching level, covariate selection and strata, prioritized variables, propensity score specification, matching algorithm used, and approach for assessment of match quality. CMS reviewed and approved the matching approach in advance; after matching, CMS reviewed and approved the final matched sets.

Overall, after matching on administrative and secondary data, our initial-selected comparison groups included 5,565 practices in Track 1, and 4,291 practices in Track 2. Because we used the same pool of potential comparison practices for both tracks, some (2,300) comparison practices served as initial-comparisons in both Track 1 and Track 2. Thus, we had a total of 7,556 unique initial-comparison practices, at the end of this step, with about 30 percent serving as initial-comparison practices in both tracks.

5.B.4.　Select the final external comparison group using trimming and weighting

After using propensity score matching to narrow the potential comparison group pool, we conducted a second round of propensity score modeling to trim and reweight practices to form the final external comparison group for 2017 starters. The substeps to select the final external comparison group were as follows:

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[22] The standardized difference is the difference in means between the matched CPC+ and comparison practices divided by the standard deviation of the variable among the CPC+ practices. Standardized differences are the preferred metric for assessing balance, because unlike hypothesis tests and *p*-values, they do not conflate balance with statistical power. Further, hypothesis tests implicitly refer to a larger target population, while standardized differences assess balance based on more relevant in-sample metrics (see Stuart 2010).

[23] The 0.25 target is an industry standard; see Ho et al. (2007).

1. Create additional matching variables and restrict the pool of potential comparison practices based on new information (that was not available initially for external matching) to make the pool better resemble the CPC+ practices.

2. Reweight the remaining practices to achieve balance on matching characteristics.

3. Assess the quality of the selected comparison group, in terms of similarity to the CPC+ practices on the matching variables and trends in outcomes during the baseline period, distribution of the weights, and likely statistical power.

We describe each of these substeps in detail next.

1.   Refine baseline matching characteristics and restrict sample

We constructed several new matching variables that we had not used for the initial external matching described earlier in this section. These variables fell into two categories:

- **Characteristics of Medicare beneficiaries assigned to CPC+ and potential comparison practices, using an updated definition of the baseline study population.** For convenience in the initial external matching and, notably, because we needed to field the 2017 practice survey as close as possible to the CPC+ start date, we defined external matching characteristics for this initial step using the definition of the baseline Medicare FFS population that we had used for CPC Classic. Specifically, this population included beneficiaries who were attributed to practices in the first quarter of the initiative (January 2017) and were alive as of the start of the prior quarter (October 1, 2016).[24] Later in 2017, however, we updated this definition so that our baseline study population would reflect the baseline sample we use in the regression models, described in Appendix 5.D. In this approach, we instead attribute beneficiaries to practices in both the baseline and intervention periods, and the study population in the baseline period comprises beneficiaries attributed to a practice in the first quarter of 2016, or in any subsequent quarter of the baseline year if they have not previously been attributed to another CPC+ or comparison practice. Importantly, this study population includes beneficiaries who died during the baseline year.

For comparison selection, we then created practice-level variables describing the characteristics of the beneficiaries assigned in the baseline period—for example, their Medicare FFS spending, service use, demographics, and chronic conditions, among others. The full list of matching variables appears below, in Tables 5.B.3–5.B.8. We imputed values for these practice-level variables for CPC+ practices with 50 or fewer assigned beneficiaries in 2016, to avoid overly noisy matching variables—for example, practices with mean spending based on spending among just a handful of beneficiaries. We imputed values for 13 of the 2,888 (or 0.5 percent of) CPC+ practices (both tracks combined). We did not

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[24] CMS' attribution methodology assesses beneficiary eligibility three months before the start of a given quarter; here, eligibility on October 1, 2016, is used to attribute beneficiaries as of the start of CPC+ on January 1, 2017.

impute values for comparison practices, but as we describe later in this section, we excluded small comparison practices.[25]

- **Other new variables not available for external matching.** Finally, we constructed a set of additional matching variables that (1) we had not constructed in time for external matching, (2) we could not have constructed given data availability in March 2017, or (3) were not relevant given the earlier definition of the baseline study population that excluded beneficiaries who died during the year. For example, we added variables for (1) the proportion of beneficiaries assigned at the start of 2016 who died, used hospice services, or used home health services by the end of 2016 (three separate variables); (2) the 2015 Medicare price index of the hospital referral region in which a practice was located; and (3) whether an SSP practice was participating in Tracks 2 or 3 of the SSP. This list is not exhaustive; we present the full list of matching variables in Tables 5.B.3–5.B.8. We also updated the main SSP variable to reflect participation in SSP as of January 1, 2017, rather than whether a practice had *ever* participated in SSP as of that date.

In consultation with CMS, we classified each matching variable as "high," "medium," or "low" priority. High-priority variables were those we considered essential as balance variables when constructing a credible comparison group.

From the group of potential comparison practices, we then removed (1) practices we identified in administrative data as federally qualified health centers (FQHCs) or rural health clinics (RHCs); (2) practices identified in the CMS master data management system (MDM) as participating in the NextGen ACO model as of January 1, 2017; and (3) practices with 50 or fewer assigned beneficiaries in 2016, using the updated definition of the baseline study population. We applied these restrictions to mimic CPC+ exclusion criteria related to FQHC/RHC status, NextGen ACO participation, and minimum attributed beneficiary count.[26]

These restrictions yielded a final pool of 7,166 unique potential comparison practices, 5,335 Track 1 comparison practices and 4,024 Track 2 comparison practices (2,193 are potential comparison practices in both Track 1 and Track 2).

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[25] As we describe earlier, we opted to impute for the CPC+ practices, because CMS required participating practices to have a minimum attributed beneficiary count of 125. We know, therefore, that low beneficiary counts among the CPC+ practices are artificial—most likely caused by a data error in the NPI roster from SK&A that we used for attribution, relative to the practice's true roster submitted to CMS, and likely to be corrected in a future year of the evaluation when we receive an updated NPI roster from SK&A. In contrast, we did not impute values for comparison practices, because we could not know whether apparently small comparison practices also reflect data errors or, instead, truly reflect practices that see few Medicare beneficiaries. For the CPC+ practices with low beneficiary counts, we imputed values of claims-based variables based on the values observed among other CPC+ practices in the same CPC+ track, in the same state, with the same SSP participation status and the same total practitioner count category (1 to 2, 3 to 24, or 25 or more).

[26] CMS required practices to have at least 125 assigned beneficiaries to be eligible for CPC+; however, because the SK&A roster of clinicians differs from the CMS roster, and because we define the study population based on assignment (that is, attribution in any quarter of the baseline period, rather than attribution as of the model start), some CPC+ practices had fewer than 125 assigned beneficiaries. We imposed a threshold of 50 beneficiaries for comparison practices to ensure that CPC+ practices and comparison practices were qualitatively similar.

2.   Select the final external comparison group

To select the final external comparison group, we used a propensity score weighting method to reweight the 5,335 Track 1 and 4,024 Track 2 potential comparison practices. As is typical for propensity score weighting, we fixed the weights for the CPC+ practices at 1, meaning that each CPC+ practice will count equally in practice-level analysis and each CPC+ beneficiary will count equally in beneficiary-level analysis. However, to achieve better balance between the CPC+ and comparison practices, we allowed the comparison practice weights to vary based on the practice's similarity to the CPC+ practices. Although we implemented a propensity score weighting approach rather than a matching approach, we refer to the resulting weights as "matching weights" to distinguish them from other types of weights described in this report.

One implication of weighting is that our resulting analytic sample does not include a comparison practice, or group of comparison practices, that is matched to each CPC+ practice. That is, there are no matched sets.

2.a.   Detailed methods

The methodology for selecting the final external comparison group for CPC+ 2017 starters has four main components:

- A recently developed propensity score weighting method called covariate-balancing propensity scores (CBPS)

- Trimming the full sample of 5,335 Track 1 and 4,024 Track 2 potential comparison practices to exclude practices dissimilar to the CPC+ practices

- A generalized version of CBPS that optimizes balance subject to a constraint on the distribution of the matching weights

- Winsorization of the matching weights—that is, recoding extreme values so that they do not exceed a pre-specified minimum or maximum value—to improve their face validity and reduce the risk of future imbalance if some practices become unobservable over time

    We describe each of these components in turn.

CBPS. To reweight the comparison practices, we used the CBPS method of Imai and Ratkovic (2014). CBPS extends the standard propensity score weighting approach, in which the fitted values from a propensity score model represent predicted probabilities of receiving the intervention conditional on the covariates included in the model. These estimated propensity scores determine the weight that each practice receives; when estimating the average treatment effect on the treated population, CPC+ practices receive a weight of 1, and comparison practice i receives a weight as follows:

$$(1) \qquad w_i = \frac{1}{1 - \hat{p}_i},$$

where $\hat{p}_i$ is the estimated propensity score for practice i (Mansournia and Altman 2016). CBPS adheres to this general procedure, but instead of fitting the propensity score model by

maximizing the likelihood of a logistic regression model, as is conventional, CBPS uses an estimation procedure that *maximizes the balance* between intervention and comparison units on the regression covariates. Specifically, it minimizes the mean standardized difference between the intervention and comparison groups across the regression covariates; the standardized difference for each variable is the weighted difference in intervention and comparison group means divided by the standard deviation. Estimating the propensity score model in this way means that CBPS weights balance the intervention and comparison groups almost exactly on the matching characteristics.

This tight balance comes at a cost: the distribution of CBPS weights can be diffuse, with some comparisons that are dissimilar to the intervention group receiving weights of essentially zero, and some comparisons that are highly similar to the intervention group receiving weights 50 times larger or more than the mean weight in the intervention group. These extremely high and low weights detract from the face validity of the weighting scheme and reduce statistical power relative to a tighter weight distribution. As we describe in the next few pages, we addressed this concern by compromising among good covariate balance, a reasonable weight distribution, and sample size, focusing first on sample size.

Trimming the sample. After incorporating revisions to the set of matching characteristics, some potential comparison practices did not closely resemble the CPC+ practices. Including dissimilar comparisons in the CPBS model distorts the propensity score estimation, resulting in extremely high weights among practices that closely resemble the CPC+ practices and extremely low weights among practices that do not resemble the CPC+ practices. Thus, to obtain both good balance and a reasonable weight distribution, we removed dissimilar comparison practices from the sample *before* estimating final propensity scores and weights. This approach not only removes practices that would otherwise receive very low weights in the final analytic sample but also reins in the weight values of practices that would remain.

We trimmed dissimilar practices from the potential comparison group based on provisional weights from a CBPS model. We ran the CBPS model once in each track using the pool of 5,335 potential comparison practices in Track 1, and 4,024 potential comparison practices in Track 2. Among the model covariates, we included interactions between SSP status and the other matching variables we considered high priority. This approach ensures the CBPS propensity scores account for differences between CPC+ and potential comparison practices by SSP status, as well as overall within the track, so that our eventual weights produce balance for both the overall group and SSP subgroups. Having run the CBPS model once in each track, we then removed from the sample the potential comparison practices that were least similar to the CPC+ practices, by track, as measured by their provisional CBPS weights.

For each track, we created several data sets with different amounts of trimming of potential comparison practices, ranging from 0 percent—retaining all potential comparison practices—to 20 percent of the comparison practices. Considering several comparison group sample sizes allowed us to identify the minimum amount of trimming that would provide a good combination of balance and a compact weight distribution.

Generalized CBPS. Although removing dissimilar potential comparison practices helps to narrow the distribution of CBPS weights, the CBPS algorithm optimizes balance with no regard

for the distribution of weights, so trimming alone may not suffice to constrain the weight distribution. To incorporate our desired compromise between balance and a tight weight distribution into the procedure, we modified Imai and Ratkovic's method. We created a custom program to optimize balance subject to a constraint on the standard deviation of the weight distribution. Constraining the optimization means that the generalized CBPS procedure will produce slightly worse balance than the original version, but the tighter weight distribution should increase statistical power and thus reduce the mean squared error of the treatment effect estimates relative to using a comparison group created through unconstrained CBPS.

We fit models from this generalized CBPS approach to each of our trimmed data sets. We selected a value for the standard deviation constraint for each data set by fitting the constrained CBPS model iteratively, with successively tighter constraints in each iteration. Constraining the weights too aggressively produces unacceptable balance, so in each data set—for each amount of trimming in each track—we proceeded with the tightest constraint that achieved good balance on the matching variables (including interactions between SSP status and selected other variables we considered especially important). We typically defined "good balance" as having a maximum standardized CPC+-comparison difference on the matching variables of roughly 0.1.

Winsorization. In addition to having a low standard deviation of the weights, which enhances statistical power, we aimed for final matching weights in each track that fall between 0.1 and 10 on a scale with mean 1. (As noted previously, each CPC+ practice receives a weight of exactly 1.) Keeping the matching weights within a moderate range improves face validity. Specifically, very large weights decrease face validity, because they amplify the influence any single comparison practice has on the impact analyses. Very large weights could also introduce imbalance if highly weighted practices closed and no longer had new patients attributed to them or, in survey analyses, if the practices stopped responding to surveys. Very small weights also detract from face validity, because they contribute essentially no information to our analysis; having very small weights also complicates survey logistics, because we would need to survey practices—and potentially large numbers of practices—each contributing essentially no information.

Imposing a minimum and maximum weight is difficult to achieve directly as part of the weighting procedure, because our generalized CBPS approach constrains the distribution of the weights—their standard deviation—not the endpoints of that distribution. We implemented the constraint in this way, because the distribution of the weights (specifically, their standard deviation) is most relevant for statistical power, and because this approach is more computationally tractable than the alternatives.[27]

Without a direct way to constrain the endpoints of the weight distribution as part of the optimization procedure, we chose to Winsorize the constrained CBPS weights, so that for the comparison practices in each track, the maximum value was 10 and the minimum was 0.1 on a scale with mean 1. That is, we set weight values greater than 10 to be equal to exactly 10 and weight values less than 0.1 to be exactly 0.1, while maintaining the mean comparison group

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[27] We attempted to implement a constraint on the maximum weight in addition to constraining the standard deviation, but it proved prohibitively challenging computationally; no models that we tested with this constraint converged.

weight at 1. Relative to the un-Winsorized weights, the Winsorized results produced comparable balance, better power, and greater face validity.

2.b.   Selecting the final comparison group

The methodology described above generated several possible comparison groups for each track, one for each of the trimmed data sets. We chose the final comparison group as the group in each track with the best combination of balance (measured through the matching diagnostics described in Subsection 2.c below) and statistical power, both overall for the track and within the track by SSP status.

The final research sample in Track 1 contains all 1,373 CPC+ practices and 5,247 comparison practices (after removing 1 percent of the potential comparison sample). These practices served 874,826 beneficiaries attributed to CPC+ practices and 2,906,755 beneficiaries attributed to comparison practices during the baseline year, who, after weighting, represent effective sample size**s** of 829,558 CPC+ and 1,307,302 comparison beneficiaries during the baseline period.[28] In Track 2, the final research sample contains all 1,515 CPC+ practices and 3,784 comparison practices (after removing 5 percent of the potential comparison sample).[29] The 1,068,107 beneficiaries attributed to CPC+ practices and 2,467,459 beneficiaries attributed to comparison practices during the baseline year represent effective sample sizes of 1,012,995 CPC+ and 996,653 comparison beneficiaries during the baseline period.

2.c.   Matching diagnostics

We used four sets of diagnostics to select the final comparison group from among the candidate groups:

- Standardized differences on the key matching variables

- Plots of the pre-intervention trends in CPC+ and comparison practices on the three primary outcome variables: total Medicare expenditures, hospitalizations, and outpatient ED visits

- Distribution of the matching weights

- Likely statistical power of analyses using the selected comparison group to detect CPC+ impacts

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[28] Calculations of effective sample size take into account both the matching weights and beneficiary eligibility weights—that is, accounting for the fact that some beneficiaries are observed for only part of the baseline year. Calculations assume that observations are independent. Although we are using a simplification, the calculations this way demonstrate the impact of weighting, specifically, on the effective sample size.

[29] In addition to trimming practices from the potential comparison group based on provisional weights from a CBPS model, we also removed 41 practices from the final comparison group that self-reported they were not providing primary care (according to their practice survey responses) or did not have any assigned beneficiaries in the baseline period after we revised our attribution process. The practices were removed after calculating final matching weights. After removing these practices, the CPC+ and comparison practices remained balanced in terms of the matching characteristics.

In the following section, we describe the first three of these diagnostics in more detail and present the results for the final selected Track 1 and Track 2 external comparison groups. Chapter 5 in this report contains more information about the final power estimates.

2.c.i.   Standardized differences

The standardized difference, calculated as the difference in weighted means between the CPC+ and comparison groups on the standard deviation scale, is the accepted metric for assessing balance of a matched comparison group. Standardized differences less than 0.25 in absolute value are typically considered adequate to proceed with impact analysis, using regression adjustment to account for differences that persist after matching (Stuart 2010).

For the CPC+ external comparison group, we achieved standardized differences less than 0.25 in absolute value —that is, between -0.25 and 0.25—for all of the matching variables, and less than 0.1 in absolute value for most of them. Tables 5.B.3 and 5.B.4 show overall balance for Track 1 and Track 2, respectively; Tables 5.B.5 to 5.B.8 show balance in each track by SSP status.

Columns 2 through 4 of these tables show the mean value for each variable. In Column 2, observations are weighted by practice size (number of assigned beneficiaries) only. Weighting by practice size scales the practice-level values by the number of assigned beneficiaries in each practice, which approximates the balance we would see in the beneficiary-level data we will use to conduct primary impact analyses of Medicare claims-based outcomes (described in Appendix 5.C). In Columns 3 and 4, which present the means with matching weights in the comparison and CPC+ groups, observations are weighted using a combination of practice size and matching weights.

Column 5 in this tables gives the difference in means with matching weights between the CPC+ and comparison groups on the variable's original scale, while Column 6 gives the standardized difference—the adjusted difference divided by the variable's standard deviation in the CPC+ group. The standardized difference column is color-coded to draw attention to values that fall outside the desired threshold of ±0.1 standardized differences (yellow). There were no values outside the acceptable threshold of ±0.25 standardized differences.

Table 5.B.3. Post-matching balance for the Track 1 external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 5,247)		(4) CPC+ group mean (N = 1,373)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Participant in Medicare SSP ACO as of January 1, 2017 (MDM January 1, 2017)	0.580	0.523	0.512	-0.011	-0.022
Modified U.S. census region					
Northeast	0.273	0.284	0.282	-0.003	-0.006
Midwest	0.328	0.294	0.299	0.005	0.011
South	0.209	0.224	0.233	0.009	0.020
West	0.190	0.197	0.186	-0.011	-0.028
Hospital ownership or health system management or ownership (SK&A 2016)	0.576	0.553	0.551	-0.002	-0.004
Participated in prior primary care transformation initiatives[c]	0.485	0.524	0.536	0.011	0.023
Urbanicity of practice's county (Area Resource File 2016)					
Rural	0.074	0.098	0.103	0.005	0.016
Suburban	0.168	0.184	0.181	-0.003	-0.008
Urban	0.758	0.718	0.716	-0.002	-0.004
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.209	0.21	0.208	-0.002	-0.005
Medium (3 to 24 providers)	0.741	0.741	0.739	-0.003	-0.006
Large (25 or more providers)	0.050	0.048	0.053	0.005	0.021
Number of assigned Medicare beneficiaries in 2016	1,050	1,135	1,197	63	0.061
Proportion of Medicare charges that are for primary care[d]	0.716	0.715	0.714	-0.001	-0.006
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	805	802	805	2.4	0.016
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	889	884	882	-2.2	-0.012

Table 5.B.3 *(continued)*

(1) Variable	Comparison group mean (N = 5,247)		(4) CPC+ group mean (N = 1,373)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	279.3	283.6	285.8	2.200	0.028
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	504.5	499.4	495.1	-4.283	-0.022
Mean PBPM Medicare spending, 2016 Q1	869	865	863	-2.0	-0.011
Mean PBPM Medicare spending, 2016 Q2	899	893	894	0.4	0.002
Mean PBPM Medicare spending, 2016 Q3	885	879	876	-3.1	-0.015
Mean PBPM Medicare spending, 2016 Q4	902	896	892	-3.8	-0.019
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.022	1.022	1.023	0.001	0.003
Indian Health Center[e]	0.001	0.003	0.005	0.002	0.026
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.220	0.216	0.213	-0.003	-0.007
Three to four	0.239	0.240	0.232	-0.008	-0.018
Five to seven	0.261	0.254	0.256	0.001	0.003
Eight or more	0.280	0.290	0.299	0.009	0.020
Hospital-owned (SK&A 2016)	0.269	0.280	0.282	0.003	0.006
Participant in Medicare SSP ACO, Track 2 or 3	0.011	0.008	0.006	-0.002	-0.023
Practice is multispecialty[f]	0.217	0.200	0.196	-0.005	-0.012
HRR price index (CMS' Medicare Geographic Variation data 2015)	1.072	1.058	1.050	-0.008	-0.100
Meaningful EHR use[g]					
Never attested	0.094	0.085	0.080	-0.005	-0.018
Attested since 2011 or 2012	0.792	0.786	0.787	0.002	0.004
Attested since 2013 or later	0.114	0.129	0.132	0.003	0.009
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	211	226	231	5.6	0.043

Table 5.B.3 *(continued)*

(1) Variable	Comparison group mean (N = 5,247)		(4) CPC+ group mean (N = 1,373)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of Medicare beneficiaries who would be Tier 4	0.126	0.126	0.125	-0.001	-0.020
Proportion of Medicare beneficiaries who would be Tier 5	0.161	0.162	0.162	-0.001	-0.010
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	564	564	568	3.0	0.021
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.039	0.039	0.039	0.000	-0.012
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.015	0.011	0.009	-0.002	-0.023
County median household income ($) (Area Resource File 2016)	58,381	57,832	57,900	68.2	0.004
County percentage of population in poverty in 2014 (Area Resource File 2016)	14.20	14.00	13.86	-0.145	-0.028
County Medicare Advantage penetration rate, 2015 (%) (Area Resource File 2016)	29.13	28.83	28.61	-0.216	-0.017
Proportion male	0.419	0.418	0.417	-0.001	-0.008
Proportion with age as original reason for Medicare entitlement	0.793	0.796	0.798	0.002	0.016
Within-state quintile of dually eligible patients[h]					
1st quintile (lowest)	0.222	0.244	0.251	0.008	0.018
2nd quintile	0.324	0.316	0.321	0.005	0.011
3rd quintile	0.234	0.236	0.226	-0.010	-0.023
4th quintile	0.158	0.146	0.141	-0.006	-0.016
5th quintile (highest)	0.062	0.059	0.061	0.002	0.010
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,502.9	3,506.7	3,487.3	-19.41	-0.019
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.683	0.684	0.685	0.001	0.011

Table 5.B.3 *(continued)*

(1) Variable	Comparison group mean (N = 5,247)		(4) CPC+ group mean (N = 1,373)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Age (proportion)					
Under 50	0.047	0.046	0.043	-0.002	-0.056
50–64	0.109	0.108	0.107	-0.001	-0.019
65–74	0.457	0.459	0.464	0.004	0.054
75–84	0.262	0.262	0.263	0.000	0.001
85+	0.125	0.124	0.123	-0.001	-0.016
Race					
Proportion Black	0.063	0.059	0.057	-0.003	-0.024
Proportion Hispanic	0.011	0.009	0.007	-0.002	-0.057
Proportion with ESRD	0.009	0.009	0.009	0.000	-0.018
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.026	0.027	0.027	0.000	0.029
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.100	0.099	0.100	0.000	0.012
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.055	0.055	0.056	0.000	0.014
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.884	0.880	0.877	-0.004	-0.085
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.048	0.050	0.052	0.002	0.018
Chronic condition					
Proportion of beneficiaries with diabetes	0.255	0.255	0.254	-0.001	-0.012
Proportion of beneficiaries with cancer	0.082	0.083	0.083	0.000	0.007
Proportion of beneficiaries with COPD	0.098	0.101	0.103	0.002	0.043
Proportion of beneficiaries with CKD	0.165	0.158	0.155	-0.003	-0.064
Proportion of beneficiaries with Alzheimer's and related dementia	0.074	0.075	0.074	-0.001	-0.016

Table 5.B.3 *(continued)*

(1) Variable	Comparison group mean (N = 5,247)		(4) CPC+ group mean (N = 1,373)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.108	0.110	0.110	0.001	0.015
Practice employs at least one NP/PA (SK&A 2016)	0.620	0.614	0.616	0.002	0.005
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.200	0.208	0.215	0.008	0.019
2nd quartile	0.305	0.272	0.262	-0.010	-0.023
3rd quartile	0.277	0.267	0.263	-0.004	-0.009
4th quartile (most beds)	0.218	0.253	0.259	0.006	0.014
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	30.88	31.24	31.56	0.321	0.029
Ever participated in Medicare SSP ACO as of January 1, 2017 (MDM January 1, 2017)	0.621	0.569	0.591	0.022	0.045
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.032	0.035	0.035	0.000	-0.001

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS' master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS' Medicare EHR Incentive Program data; data on HRR Price Index from CMS' Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct analyses of Medicare claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home).

Table 5.B.3 *(continued)*

[d] We define proportion of Medicare charges that are for primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] To identify Indian Health Centers, we first flagged practices where 90 percent of 2016 assigned Medicare beneficiaries were American Indian/Alaska Native; we then confirmed these practices are Indian Health Centers by comparing the practice name and address with the Indian Health Service website list of Indian Health Service facilities.

[f] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[g] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[h] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-Payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.B.4. Post-matching balance for the Track 2 external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 3,784)		(4) CPC+ group mean (N = 1,515)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Participant in Medicare SSP ACO as of January 1, 2017 (MDM January 1, 2017)	0.500	0.442	0.444	0.002	0.004
Modified U.S. census region					
Northeast	0.264	0.280	0.269	-0.011	-0.024
Midwest	0.349	0.304	0.336	0.032	0.067
South	0.186	0.213	0.204	-0.009	-0.022
West	0.201	0.203	0.191	-0.012	-0.030
Hospital ownership or health system management or ownership (SK&A 2016)	0.612	0.599	0.581	-0.018	-0.036
Participated in prior primary care transformation initiatives[c]	0.618	0.753	0.809	0.056	*0.142*
Urbanicity of practice's county (Area Resource File 2016)					
Rural	0.070	0.077	0.076	0.000	-0.001
Suburban	0.170	0.169	0.160	-0.009	-0.024
Urban	0.760	0.755	0.764	0.009	0.022
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.145	0.129	0.125	-0.004	-0.013
Medium (3 to 24 providers)	0.772	0.784	0.775	-0.010	-0.023
Large (25 or more providers)	0.083	0.087	0.101	0.014	0.047
Number of assigned Medicare beneficiaries in 2016	1,355	1,313	1,366	54	0.042
Proportion of Medicare charges that are for primary care[d]	0.701	0.711	0.713	0.001	0.009
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	803	798	801	2.6	0.017
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	886	879	877	-1.9	-0.010

Table 5.B.4 *(continued)*

(1) Variable	Comparison group mean (N = 3,784)		(4) CPC+ group mean (N = 1,515)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	280.2	283.7	287.5	3.800	0.050
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	492.5	495.0	494.0	-0.925	-0.005
Mean PBPM Medicare spending, 2016 Q1	865	863	863	0.2	0.001
Mean PBPM Medicare spending, 2016 Q2	896	890	889	-0.6	-0.003
Mean PBPM Medicare spending, 2016 Q3	884	875	871	-4.1	-0.020
Mean PBPM Medicare spending, 2016 Q4	898	887	884	-3.0	-0.015
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.022	1.028	1.029	0.001	0.008
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.151	0.135	0.130	-0.006	-0.018
Three to four	0.209	0.222	0.223	0.002	0.004
Five to seven	0.247	0.262	0.261	-0.002	-0.004
Eight or more	0.392	0.381	0.386	0.006	0.012
Hospital-owned (SK&A 2016)	0.285	0.303	0.292	-0.012	-0.025
Participant in Medicare SSP ACO, Track 2 or 3	0.012	0.024	0.034	0.011	0.058
Practice is multispecialty[e]	0.273	0.261	0.261	-0.001	-0.002
HRR price index (CMS' Medicare Geographic Variation data 2015)	1.070	1.054	1.047	-0.007	-0.087
Meaningful EHR use[f]					
Never attested	0.040	0.038	0.035	-0.003	-0.014
Attested since 2011 or 2012	0.881	0.878	0.881	0.003	0.010
Attested since 2013 or later	0.080	0.084	0.084	-0.001	-0.002
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	211	201	196	-4.9	-0.043
Proportion of Medicare beneficiaries who would be Tier 4	0.126	0.126	0.126	0.000	0.000

Table 5.B.4 *(continued)*

(1) Variable	Comparison group mean (N = 3,784)		(4) CPC+ group mean (N = 1,515)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of Medicare beneficiaries who would be Tier 5	0.161	0.164	0.163	-0.001	-0.018
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	562	562	563	0.6	0.004
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.039	0.039	0.040	0.000	0.006
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.013	0.013	0.012	0.000	-0.003
County median household income ($) (Area Resource File 2016)	57,988	57,361	57,144	-216.3	-0.015
County percentage of population in poverty in 2014 (Area Resource File 2016)	14.30	14.21	14.17	-0.041	-0.008
County Medicare Advantage penetration rate, 2015 (%) (Area Resource File 2016)	29.37	30.66	31.43	0.767	0.060
Proportion male	0.422	0.419	0.420	0.001	0.013
Proportion with age as original reason for Medicare entitlement	0.798	0.794	0.797	0.004	0.033
Within-state quintile of dually eligible patients[g]					
1st quintile (lowest)	0.217	0.207	0.225	0.017	0.042
2nd quintile	0.339	0.353	0.357	0.005	0.010
3rd quintile	0.244	0.255	0.252	-0.003	-0.007
4th quintile	0.152	0.134	0.120	-0.015	-0.045
5th quintile (highest)	0.048	0.051	0.046	-0.005	-0.022
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,499.0	3,517.4	3,490.18	-27.233	-0.026
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.688	0.688	0.692	0.004	0.052

Table 5.B.4 *(continued)*

(1) Variable	(2) Without matching weights	(3) With matching weights	(4) CPC+ group mean (N = 1,515)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	Comparison group mean (N = 3,784)				
Age (proportion)					
Under 50	0.045	0.047	0.045	-0.002	-0.059
50–64	0.106	0.111	0.107	-0.004	-0.071
65–74	0.457	0.459	0.467	0.008	*0.113*
75–84	0.265	0.260	0.258	-0.002	-0.032
85+	0.126	0.123	0.122	-0.001	-0.015
Race					
Proportion Black	0.065	0.066	0.062	-0.004	-0.039
Proportion Hispanic	0.010	0.009	0.007	-0.001	-0.051
Proportion with ESRD	0.009	0.009	0.009	0.000	-0.030
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.026	0.027	0.028	0.000	0.020
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.099	0.101	0.102	0.001	0.028
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.055	0.054	0.054	0.000	0.022
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.884	0.876	0.868	-0.008	*-0.169*
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.046	0.050	0.055	0.005	0.044
Chronic condition					
Proportion of beneficiaries with diabetes	0.250	0.248	0.245	-0.002	-0.034
Proportion of beneficiaries with cancer	0.083	0.082	0.082	0.000	0.000
Proportion of beneficiaries with COPD	0.095	0.098	0.099	0.001	0.016
Proportion of beneficiaries with CKD	0.165	0.164	0.163	-0.001	-0.015
Proportion of beneficiaries with Alzheimer's and related dementia	0.073	0.075	0.074	-0.001	-0.024

Table 5.B.4 *(continued)*

(1) Variable	Comparison group mean (N = 3,784)		(4) CPC+ group mean (N = 1,515)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.107	0.108	0.109	0.001	0.016
Practice employs at least one NP/PA (SK&A, 2016)	0.671	0.684	0.696	0.012	0.026
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.197	0.222	0.233	0.011	0.025
2nd quartile	0.279	0.255	0.238	-0.017	-0.039
3rd quartile	0.283	0.258	0.249	-0.009	-0.020
4th quartile (most beds)	0.240	0.266	0.28	0.015	0.033
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	30.85	31.07	31.27	0.200	0.021
Ever participated in Medicare SSP ACO as of January 1, 2017 (MDM January 1, 2017)	0.531	0.471	0.489	0.019	0.038
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.036	0.028	0.024	-0.004	-0.026

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS' master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS' Medicare EHR Incentive Program data; data on HRR Price Index from CMS' Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct analyses of Medicare claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations. Yellow shading with *bold, italicized text* signifies that our estimate was outside the desired threshold of ±0.1 standardized differences, but not outside the acceptable threshold of ±0.25 standardized differences.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

Table 5.B.4 *(continued)*

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home).

[d] We define proportion of Medicare charges that are for primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[f] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[g] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-Payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.B.5. Post-matching balance for the Track 1-non-SSP external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 2,266)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Modified U.S. census region					
Northeast	0.195	0.178	0.176	-0.002	-0.006
Midwest	0.334	0.256	0.244	-0.012	-0.027
South	0.223	0.312	0.339	0.027	0.056
West	0.248	0.254	0.241	-0.013	-0.030
Hospital ownership or health system management or ownership (SK&A 2016)	0.528	0.533	0.533	0.000	0.000
Participated in prior primary care transformation initiatives[c]	0.443	0.561	0.598	0.037	0.075
Urbanicity of practice's county (Area Resource File 2016)					
Rural	0.106	0.146	0.159	0.013	0.034
Suburban	0.225	0.211	0.192	-0.019	-0.048
Urban	0.669	0.643	0.650	0.006	0.013
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.236	0.201	0.193	-0.008	-0.021
Medium (3 to 24 providers)	0.702	0.728	0.730	0.003	0.006
Large (25 or more providers)	0.062	0.071	0.077	0.006	0.021
Number of assigned Medicare beneficiaries in 2016	1,025	1,239	1,323	83.6	0.074
Proportion of Medicare charges that are for primary care[d]	0.718	0.715	0.715	0.000	0.001
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	799	785	785	-0.3	-0.002
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	884	863	856	-6.2	-0.033
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	280.8	284.1	285.4	1.344	0.017

Table 5.B.5 *(continued)*

(1) Variable	Comparison group mean (N = 2,266)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	532.8	519.9	512.3	-7.625	-0.038
Mean PBPM Medicare spending, 2016 Q1	863	848	845	-3.4	-0.016
Mean PBPM Medicare spending, 2016 Q2	893	870	866	-4.1	-0.020
Mean PBPM Medicare spending, 2016 Q3	881	858	849	-9.2	-0.045
Mean PBPM Medicare spending, 2016 Q4	897	873	866	-7.2	-0.036
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.025	1.012	1.008	-0.004	-0.026
Indian Health Center[e]	0.002	0.006	0.010	0.004	0.036
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.244	0.204	0.196	-0.008	-0.021
Three to four	0.228	0.233	0.215	-0.018	-0.043
Five to seven	0.234	0.232	0.235	0.002	0.006
Eight or more	0.294	0.331	0.354	0.024	0.049
Hospital-owned (SK&A 2016)	0.317	0.332	0.290	-0.043	-0.094
Participant in Medicare SSP ACO, Track 2 or 3	0.000	0.000	0.000	0.000	Not applicable
Practice is multispecialty[f]	0.240	0.234	0.223	-0.011	-0.026
HRR price index (CMS's Medicare Geographic Variation data 2015)	1.066	1.043	1.034	-0.009	*-0.114*
Meaningful EHR use[g]					
Never attested	0.135	0.108	0.094	-0.014	-0.048
Attested since 2011 or 2012	0.756	0.770	0.792	0.022	0.054
Attested since 2013 or later	0.110	0.122	0.114	-0.008	-0.025
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	220.5	237.0	231.4	-5.7	-0.044

Table 5.B.5 *(continued)*

(1) Variable	Comparison group mean (N = 2,266)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of Medicare beneficiaries who would be Tier 4	0.129	0.127	0.125	-0.002	-0.063
Proportion of Medicare beneficiaries who would be Tier 5	0.164	0.162	0.160	-0.002	-0.030
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	552	544	556	12.3	0.081
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.040	0.039	0.040	0.000	0.019
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.015	0.012	0.007	-0.005	-0.064
County median household income ($) (Area Resource File 2016)	55,670	54,801	55,214	413.3	0.028
County percentage of population in poverty in 2014 (Area Resource File 2016)	14.87	14.74	14.57	-0.170	-0.032
County Medicare Advantage penetration rate, 2015 (percentage) (Area Resource File 2016)	29.34	28.39	29.25	0.858	0.066
Proportion male	0.419	0.415	0.420	0.005	0.073
Proportion with age as original reason for Medicare entitlement	0.781	0.788	0.791	0.003	0.030
Within-state quintile of dually eligible patients[h]					
1st quintile (lowest)	0.207	0.229	0.239	0.010	0.023
2nd quintile	0.315	0.323	0.313	-0.010	-0.022
3rd quintile	0.237	0.226	0.212	-0.014	-0.035
4th quintile	0.168	0.164	0.172	0.009	0.023
5th quintile (highest)	0.072	0.058	0.063	0.006	0.023
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,515.4	3,456.9	3,482.8	25.917	0.025
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.665	0.665	0.666	0.001	0.011

Table 5.B.5 *(continued)*

(1) Variable	Comparison group mean (N = 2,266)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Age (proportion)					
Under 50	0.049	0.047	0.045	-0.002	-0.037
50–64	0.114	0.112	0.111	-0.001	-0.023
65–74	0.453	0.460	0.467	0.008	0.097
75–84	0.261	0.262	0.258	-0.004	-0.072
85+	0.123	0.119	0.118	-0.001	-0.017
Race					
Proportion Black	0.067	0.063	0.058	-0.005	-0.038
Proportion Hispanic	0.012	0.010	0.007	-0.003	*-0.114*
Proportion with ESRD	0.010	0.009	0.009	0.000	0.017
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.026	0.026	0.028	0.001	0.091
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.096	0.094	0.098	0.004	0.100
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.054	0.053	0.053	0.001	0.036
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.886	0.883	0.873	-0.010	*-0.220*
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.054	0.052	0.061	0.008	0.056
Chronic condition					
Proportion of beneficiaries with diabetes	0.259	0.254	0.250	-0.005	-0.063
Proportion of beneficiaries with cancer	0.079	0.080	0.079	-0.001	-0.031
Proportion of beneficiaries with COPD	0.100	0.103	0.102	-0.001	-0.021
Proportion of beneficiaries with CKD	0.164	0.154	0.151	-0.002	-0.044
Proportion of beneficiaries with Alzheimer's and related dementia	0.075	0.073	0.073	-0.001	-0.027

Table 5.B.5 *(continued)*

(1) Variable	Comparison group mean (N = 2,266)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.110	0.110	0.107	-0.003	-0.077
Practice employs at least one NP/PA (SK&A 2016)	0.598	0.619	0.641	0.022	0.046
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.217	0.215	0.219	0.004	0.010
2nd quartile	0.296	0.268	0.287	0.019	0.042
3rd quartile	0.245	0.239	0.186	-0.052	***-0.135***
4th quartile (most beds)	0.242	0.278	0.307	0.029	0.064
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	29.09	29.74	30.75	1.003	0.090
Ever participated in Medicare SSP ACO as of January 1, 2017 (MDM, January 1, 2017)	0.099	0.097	0.168	0.071	***0.190***
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.032	0.030	0.021	-0.009	-0.064

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS' Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct primary analyses of claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations. Yellow shading with ***bold, italicized text*** signifies that our estimate was outside the desired threshold of ±0.1 standardized differences, but not outside the acceptable threshold of ±0.25 standardized differences.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

Table 5.B.5 *(continued)*

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home and level of NCQA medical home).

[d] We define proportion of Medicare charges that are for primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] To identify Indian Health Centers, we first flagged practices where 90 percent of 2016 assigned Medicare beneficiaries were American Indian/Alaska Native; we then confirmed these practices are Indian Health Centers by comparing the practice name and address with the Indian Health Service website list of Indian Health Service facilities.

[f] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[g] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[h] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.B.6. Post-matching balance for the Track 1-SSP external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 2,981)		(4) CPC+ group mean (N = 738)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Modified U.S. census region					
Northeast	0.329	0.382	0.383	0.001	0.003
Midwest	0.324	0.330	0.352	0.023	0.047
South	0.199	0.144	0.131	-0.012	-0.036
West	0.148	0.145	0.133	-0.012	-0.034
Hospital ownership or health system management or ownership (SK&A 2016)	0.611	0.571	0.568	-0.003	-0.006
Participated in prior primary care transformation initiatives[c]	0.517	0.491	0.476	-0.014	-0.029
Urbanicity of practice's county (Area Resource File 2016)					
Rural	0.050	0.054	0.050	-0.004	-0.020
Suburban	0.127	0.160	0.171	0.011	0.028
Urban	0.823	0.786	0.780	-0.006	-0.015
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.190	0.219	0.223	0.004	0.010
Medium (3 to 24 providers)	0.769	0.754	0.747	-0.007	-0.017
Large (25 or more providers)	0.042	0.027	0.030	0.003	0.017
Number of assigned Medicare beneficiaries in 2016	1,069	1,039	1,078	38.3	0.043
Proportion of Medicare charges that are for primary care[d]	0.714	0.714	0.712	-0.002	-0.013
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	809	818	824	5.7	0.039
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	893	903	906	2.5	0.013
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	278.25	283.18	286.14	2.965	0.040

Table 5.B.6 *(continued)*

(1) Variable	Comparison group mean (N = 2,981)		(4) CPC+ group mean (N = 738)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	483.94	480.67	478.75	-1.922	-0.010
Mean PBPM Medicare spending, 2016 Q1	873	881	881	-0.6	-0.003
Mean PBPM Medicare spending, 2016 Q2	902	914	920	5.7	0.027
Mean PBPM Medicare spending, 2016 Q3	889	899	902	3.6	0.018
Mean PBPM Medicare spending, 2016 Q4	905	917	918	0.4	0.002
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.019	1.032	1.037	0.005	0.033
Indian Health Center[e]	0	0	0	0	N/A
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.202	0.227	0.230	0.003	0.007
Three to four	0.246	0.246	0.248	0.002	0.005
Five to seven	0.281	0.274	0.275	0.001	0.003
Eight or more	0.270	0.253	0.246	-0.006	-0.015
Hospital-owned (SK&A 2016)	0.234	0.231	0.275	0.044	0.098
Participant in Medicare SSP ACO, Track 2 or 3	0.020	0.016	0.012	-0.003	-0.030
Practice is multispecialty[f]	0.201	0.170	0.169	0.000	-0.001
HRR price index (CMS's Medicare Geographic Variation data 2015)	1.077	1.072	1.066	-0.006	-0.082
Meaningful EHR use[g]					
Never attested	0.064	0.064	0.067	0.003	0.013
Attested since 2011 or 2012	0.819	0.800	0.783	-0.017	-0.041
Attested since 2013 or later	0.117	0.136	0.150	0.014	0.038
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	205	216	232	15.9	*0.120*
Proportion of Medicare beneficiaries who would be Tier 4	0.125	0.125	0.125	0.001	0.022

Table 5.B.6 *(continued)*

(1) Variable	Comparison group mean (N = 2,981)		(4) CPC+ group mean (N = 738)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of Medicare beneficiaries who would be Tier 5	0.159	0.163	0.164	0.000	0.008
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	572	583	578	-4.9	-0.037
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.038	0.039	0.039	-0.001	-0.041
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.015	0.011	0.011	0.001	0.006
County median household income ($) (Area Resource File 2016)	60,347	60,601	60,462	-138.9	-0.009
County percentage of population in poverty in 2014 (Area Resource File 2016)	13.70	13.32	13.17	-0.150	-0.031
County Medicare Advantage penetration rate, 2015 (percentage) (Area Resource File 2016)	28.98	29.22	28.00	-1.222	*-0.102*
Proportion male	0.419	0.420	0.415	-0.005	-0.076
Proportion with age as original reason for Medicare entitlement	0.801	0.803	0.804	0.001	0.005
Within-state quintile of dually eligible patients[h]					
1st quintile (lowest)	0.233	0.257	0.263	0.006	0.015
2nd quintile	0.331	0.309	0.328	0.019	0.040
3rd quintile	0.231	0.244	0.239	-0.005	-0.011
4th quintile	0.150	0.130	0.110	-0.020	-0.064
5th quintile (highest)	0.054	0.060	0.060	-0.001	-0.002
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,493.9	3,552.2	3,491.6	-60.632	-0.058
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.696	0.702	0.703	0.002	0.023

Table 5.B.6 *(continued)*

(1) Variable	Comparison group mean (N = 2,981)		(4) CPC+ group mean (N = 738)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Age (proportion)					
Under 50	0.045	0.044	0.041	-0.003	-0.078
50–64	0.106	0.105	0.104	-0.001	-0.017
65–74	0.460	0.459	0.460	0.001	0.012
75–84	0.263	0.263	0.267	0.004	0.070
85+	0.126	0.128	0.128	-0.001	-0.012
Race					
Proportion Black	0.061	0.055	0.055	-0.001	-0.006
Proportion Hispanic	0.011	0.008	0.008	-0.001	-0.016
Proportion with ESRD	0.009	0.009	0.008	0.000	-0.053
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.026	0.027	0.027	0.000	-0.033
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.103	0.105	0.102	-0.003	-0.089
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.056	0.058	0.058	0.000	0.000
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.883	0.878	0.880	0.002	0.046
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.045	0.048	0.044	-0.004	-0.045
Chronic condition					
Proportion of beneficiaries with diabetes	0.253	0.256	0.259	0.003	0.034
Proportion of beneficiaries with cancer	0.083	0.085	0.086	0.001	0.048
Proportion of beneficiaries with COPD	0.096	0.099	0.104	0.005	*0.102*
Proportion of beneficiaries with CKD	0.165	0.162	0.158	-0.004	-0.079
Proportion of beneficiaries with Alzheimer's and related dementia	0.074	0.076	0.076	0.000	-0.005

Table 5.B.6 *(continued)*

(1) Variable	Comparison group mean (N = 2,981)		(4) CPC+ group mean (N = 738)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.106	0.110	0.114	0.004	0.092
Practice employs at least one NP/PA (SK&A 2016)	0.637	0.609	0.593	-0.016	-0.033
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.188	0.201	0.211	0.011	0.026
2nd quartile	0.311	0.276	0.239	-0.037	-0.087
3rd quartile	0.300	0.292	0.336	0.044	0.093
4th quartile (most beds)	0.200	0.231	0.213	-0.017	-0.042
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	32.17	32.61	32.34	-0.269	-0.024
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.032	0.040	0.049	0.009	0.040

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS' Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct our primary analyses of claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations. Yellow shading with *bold, italicized text* signifies that our estimate was outside the desired threshold of ±0.1 standardized differences, but not outside the acceptable threshold of ±0.25 standardized differences.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home and level of NCQA medical home).

Table 5.B.6 *(continued)*

[d] We define proportion of Medicare charges that are for primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] To identify Indian Health Centers, we first flagged practices where 90 percent of 2016 assigned Medicare beneficiaries were American Indian/Alaska Native; we then confirmed these practices are Indian Health Centers by comparing the practice name and address with the Indian Health Service website list of Indian Health Service facilities.

[f] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[g] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[h] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.B.7. Post-matching balance for the Track 2-non-SSP external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 1,967)		(4) CPC+ group mean (N = 879)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Modified U.S. census region					
Northeast	0.205	0.230	0.229	-0.001	-0.002
Midwest	0.299	0.235	0.233	-0.003	-0.007
South	0.223	0.282	0.296	0.014	0.030
West	0.274	0.253	0.243	-0.010	-0.023
Hospital ownership or health system management or ownership (SK&A 2016)	0.591	0.574	0.555	-0.019	-0.037
Participated in prior primary care transformation initiatives[c]	0.557	0.740	0.804	0.064	*0.161*
Urbanicity of practice's county (Area Resource File 2016)					
Rural	0.088	0.102	0.107	0.004	0.014
Suburban	0.211	0.173	0.158	-0.016	-0.043
Urban	0.701	0.724	0.736	0.011	0.026
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.148	0.137	0.127	-0.011	-0.032
Medium (3 to 24 providers)	0.788	0.791	0.797	0.006	0.014
Large (25 or more providers)	0.065	0.072	0.077	0.005	0.018
Number of assigned Medicare beneficiaries in 2016	1,307	1,255	1,273	18.6	0.016
Proportion of Medicare charges that are for primary care[d]	0.711	0.716	0.717	0.001	0.005
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	796	789	790	0.7	0.005
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	879	868	861	-6.6	-0.036
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	278.65	281.61	281.94	0.331	0.004

Table 5.B.7 *(continued)*

(1) Variable	Comparison group mean (N = 1,967)		(4) CPC+ group mean (N = 879)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	515.30	509.86	504.45	-5.412	-0.028
Mean PBPM Medicare spending, 2016 Q1	859	852	848	-4.1	-0.020
Mean PBPM Medicare spending, 2016 Q2	888	876	868	-7.6	-0.037
Mean PBPM Medicare spending, 2016 Q3	877	865	858	-7.2	-0.036
Mean PBPM Medicare spending, 2016 Q4	891	879	871	-7.2	-0.036
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.026	1.027	1.025	-0.003	-0.018
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.152	0.144	0.133	-0.011	-0.033
Three to four	0.212	0.227	0.240	0.013	0.030
Five to seven	0.259	0.268	0.279	0.012	0.026
Eight or more	0.376	0.361	0.347	-0.013	-0.028
Hospital-owned (SK&A 2016)	0.310	0.341	0.311	-0.030	-0.065
Participant in Medicare SSP ACO, Track 2 or 3	0.000	0.000	0.000	0.000	N/A
Practice is multispecialty[e]	0.281	0.263	0.271	0.008	0.017
HRR price index (CMS's Medicare Geographic Variation data 2015)	1.066	1.043	1.041	-0.001	-0.016
Meaningful EHR use[f]					
Never attested	0.052	0.047	0.037	-0.010	-0.053
Attested since 2011 or 2012	0.866	0.863	0.880	0.017	0.052
Attested since 2013 or later	0.083	0.090	0.083	-0.007	-0.024
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	216	204	203	-0.8	-0.007
Proportion of Medicare beneficiaries who would be Tier 4	0.129	0.129	0.128	-0.001	-0.022
Proportion of Medicare beneficiaries who would be Tier 5	0.165	0.167	0.167	-0.001	-0.013

Table 5.B.7 *(continued)*

(1) Variable	Comparison group mean (N = 1,967)		(4) CPC+ group mean (N = 879)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	547	545	549	4.0	0.025
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.040	0.041	0.040	0.000	-0.013
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.010	0.012	0.015	0.003	0.024
County median household income ($) (Area Resource File 2016)	56,558	56,448	56,748	300.0	0.021
County percentage of population in poverty in 2014 (Area Resource File 2016)	14.82	14.41	14.44	0.027	0.006
County Medicare Advantage penetration rate, 2015 (percentage) (Area Resource File 2016)	30.01	31.48	31.63	0.149	0.010
Proportion male	0.421	0.419	0.421	0.002	0.034
Proportion with age as original reason for Medicare entitlement	0.788	0.784	0.788	0.005	0.042
Within-state quintile of dually eligible patients[g]					
1st quintile (lowest)	0.202	0.209	0.216	0.007	0.016
2nd quintile	0.341	0.359	0.355	-0.004	-0.008
3rd quintile	0.244	0.239	0.229	-0.010	-0.025
4th quintile	0.145	0.127	0.145	0.018	0.052
5th quintile (highest)	0.068	0.066	0.055	-0.011	-0.048
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,515.8	3,501.66	3,552.03	50.370	0.046
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.672	0.672	0.682	0.010	*0.130*

Table 5.B.7 *(continued)*

(1) Variable	Comparison group mean (N = 1,967)		(4) CPC+ group mean (N = 879)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Age (proportion)					
Under 50	0.048	0.050	0.047	-0.003	-0.070
50–64	0.110	0.115	0.110	-0.005	-0.081
65–74	0.453	0.454	0.463	0.009	*0.112*
75–84	0.264	0.260	0.258	-0.001	-0.028
85+	0.124	0.122	0.121	0.000	-0.001
Race					
Proportion Black	0.069	0.062	0.057	-0.005	-0.050
Proportion Hispanic	0.010	0.008	0.006	-0.002	-0.086
Proportion with ESRD	0.010	0.010	0.009	0.000	-0.041
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.027	0.028	0.028	0.000	-0.002
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.096	0.098	0.101	0.003	0.072
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.052	0.051	0.051	0.000	0.002
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.886	0.878	0.872	-0.007	*-0.128*
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.053	0.056	0.067	0.011	0.079
Chronic condition					
Proportion of beneficiaries with diabetes	0.253	0.248	0.245	-0.003	-0.053
Proportion of beneficiaries with cancer	0.081	0.080	0.080	-0.001	-0.040
Proportion of beneficiaries with COPD	0.095	0.098	0.100	0.002	0.048
Proportion of beneficiaries with CKD	0.165	0.161	0.164	0.003	0.046
Proportion of beneficiaries with Alzheimer's and related dementia	0.075	0.077	0.076	0.000	-0.010

Table 5.B.7 *(continued)*

(1) Variable	Comparison group mean (N = 1,967)		(4) CPC+ group mean (N = 879)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.106	0.107	0.108	0.001	0.017
Practice employs at least one NP/PA (SK&A 2016)	0.662	0.681	0.693	0.012	0.026
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.237	0.267	0.262	-0.005	-0.012
2nd quartile	0.278	0.247	0.238	-0.009	-0.021
3rd quartile	0.215	0.211	0.235	0.025	0.058
4th quartile (most beds)	0.269	0.275	0.265	-0.011	-0.024
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	30.41	31.22	31.17	-0.045	-0.005
Ever participated in Medicare SSP ACO as of January 1, 2017 (MDM, January 1, 2017)	0.061	0.052	0.096	0.044	*0.150*
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.043	0.033	0.026	-0.007	-0.042

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct analyses of claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations. Yellow shading with **bold, italicized text** signifies that our estimate was outside the desired threshold of ±0.1 standardized differences, but not outside the acceptable threshold of ±0.25 standardized differences.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

Table 5.B.7 *(continued)*

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home and level of NCQA medical home).

[d] We define proportion of Medicare charges that are for primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[f] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[g] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Table 5.B.8. Post-matching balance for the Track 2-SSP external comparison group: practice values scaled by number of beneficiaries

(1) Variable	Comparison group mean (N = 1,817)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
High-priority variables					
Modified U.S. census region					
Northeast	0.323	0.343	0.319	-0.024	-0.051
Midwest	0.399	0.392	0.466	0.074	*0.149*
South	0.150	0.126	0.090	-0.037	*-0.128*
West	0.128	0.139	0.125	-0.014	-0.042
Hospital ownership or health system management or ownership (SK&A 2016)	0.633	0.631	0.614	-0.017	-0.034
Participated in prior primary care transformation initiatives[c]	0.679	0.769	0.815	0.046	*0.118*
Urbanicity of Practice's county (Area Resource File 2016)					
Rural	0.052	0.044	0.038	-0.006	-0.032
Suburban	0.129	0.163	0.162	0.000	0.000
Urban	0.819	0.794	0.800	0.006	0.015
Practice size category (SK&A 2016)					
Small (1 to 2 providers)	0.142	0.118	0.121	0.003	0.011
Medium (3 to 24 providers)	0.756	0.776	0.747	-0.029	-0.067
Large (25 or more providers)	0.102	0.106	0.131	0.025	0.075
Number of assigned Medicare beneficiaries in 2016	1,404	1,386	1,483	97.0	0.069
Proportion of Medicare charges that are for primary care[d]	0.691	0.705	0.707	0.002	0.014
Mean PBPM Medicare expenditures in 2016 (Winsorized at 98th percentile)	810	810	815	4.9	0.033
Mean PBPM Medicare expenditures in 2016 (non-Winsorized)	893	893	897	3.9	0.020
Acute care hospitalizations in 2016 per 1,000 beneficiaries, annualized	281.7	286.3	294.5	8.134	*0.109*

Table 5.B.8 *(continued)*

(1) Variable	Comparison group mean (N = 1,817)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Outpatient ED visits in 2016 per 1,000 beneficiaries, annualized	469.8	476.1	480.9	4.842	0.033
Mean PBPM Medicare spending, 2016 Q1	871	876	882	5.4	0.023
Mean PBPM Medicare spending, 2016 Q2	905	908	916	8.0	0.037
Mean PBPM Medicare spending, 2016 Q3	890	889	889	-0.2	-0.001
Mean PBPM Medicare spending, 2016 Q4	906	898	900	2.3	0.011
Mean HCC score in 2015 among beneficiaries assigned in 2016	1.019	1.028	1.034	0.006	0.041
Medium-priority variables					
Number of primary care practitioners (SK&A 2016)					
One to two	0.150	0.124	0.125	0.001	0.002
Three to four	0.206	0.214	0.202	-0.012	-0.029
Five to seven	0.236	0.256	0.237	-0.018	-0.043
Eight or more	0.408	0.406	0.435	0.029	0.059
Hospital-owned (SK&A 2016)	0.259	0.255	0.267	0.012	0.027
Participant in Medicare SSP ACO, Track 2 or 3	0.024	0.053	0.077	0.024	0.089
Practice is multispecialty[e]	0.266	0.259	0.248	-0.011	-0.025
HRR price index (CMS' Medicare Geographic Variation data 2015)	1.074	1.068	1.054	-0.014	***-0.201***
Meaningful EHR use[f]					
Never attested	0.028	0.026	0.033	0.007	0.039
Attested since 2011 or 2012	0.896	0.897	0.883	-0.014	-0.044
Attested since 2013 or later	0.076	0.077	0.084	0.007	0.026
Number of assigned Medicare beneficiaries in 2016 per PCP (Mathematica attribution based on SK&A roster)	205	198	188	-10.0	***-0.101***
Proportion of Medicare beneficiaries who would be Tier 4	0.124	0.123	0.124	0.001	0.034

Table 5.B.8 *(continued)*

(1) Variable	Comparison group mean (N = 1,817)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of Medicare beneficiaries who would be Tier 5	0.157	0.160	0.159	-0.001	-0.025
Median monthly Medicare expenditures of beneficiaries who would be Tiers 4 and 5 ($)	576	584	580	-3.8	-0.028
Proportion of Medicare beneficiaries assigned in Q1 2016 who died in 2016	0.038	0.038	0.039	0.001	0.029
Area with a shortage of primary care health professionals (Area Resource File 2016)	0.015	0.013	0.009	-0.004	-0.046
County median household income ($) (Area Resource File 2016)	59,416	58,514	57,642	-872.6	-0.061
County percentage of population in poverty in 2014 (Area Resource File 2016)	13.78	13.95	13.82	-0.124	-0.025
County Medicare Advantage penetration rate, 2015 (percentage) (Area Resource File 2016)	28.73	29.62	31.18	1.551	*0.141*
Proportion male	0.422	0.420	0.419	-0.001	-0.015
Proportion with age as original reason for Medicare entitlement	0.808	0.806	0.808	0.002	0.019
Within-state quintile of dually eligible patients[g]					
1st quintile (lowest)	0.232	0.205	0.236	0.031	0.073
2nd quintile	0.338	0.345	0.361	0.016	0.032
3rd quintile	0.244	0.275	0.280	0.006	0.013
4th quintile	0.158	0.143	0.088	-0.056	*-0.197*
5th quintile (highest)	0.028	0.032	0.035	0.004	0.019
Primary care (ambulatory) visits in 2016 per 1,000 beneficiaries, annualized	3,482.2	3,537.3	3,412.6	-124.746	*-0.126*
Mean 14-day follow-up visit rate after hospitalization in 2016 (proportion)	0.704	0.709	0.704	-0.004	-0.068

Table 5.B.8 *(continued)*

(1) Variable	Comparison group mean (N = 1,817)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Age (proportion)					
Under 50	0.043	0.043	0.042	-0.001	-0.042
50–64	0.102	0.106	0.103	-0.003	-0.056
65–74	0.461	0.465	0.473	0.008	*0.117*
75–84	0.266	0.261	0.259	-0.002	-0.038
85+	0.128	0.125	0.123	-0.002	-0.035
Race					
Proportion Black	0.060	0.071	0.068	-0.003	-0.026
Proportion Hispanic	0.009	0.009	0.008	-0.001	-0.032
Proportion with ESRD	0.009	0.009	0.009	0.000	-0.014
Proportion of Q1 2016 beneficiaries with any use of hospice services in 2016	0.026	0.026	0.027	0.001	0.054
Proportion of Q1 2016 beneficiaries with any use of home health services in 2016	0.102	0.104	0.103	-0.001	-0.034
Proportion of Q1 2016 beneficiaries with any use of skilled nursing facility care in 2016	0.057	0.056	0.057	0.001	0.046
For beneficiaries assigned in 2016, proportion of months eligible for Medicare FFS in 2014 and 2015	0.883	0.873	0.863	-0.010	*-0.235*
Low-priority variables					
Proportion of beneficiaries whose race is not Black, White, or Hispanic	0.039	0.042	0.039	-0.003	-0.067
Chronic condition					
Proportion of beneficiaries with diabetes	0.247	0.246	0.246	-0.001	-0.012
Proportion of beneficiaries with cancer	0.085	0.085	0.086	0.001	0.047
Proportion of beneficiaries with COPD	0.096	0.099	0.098	-0.001	-0.027
Proportion of beneficiaries with CKD	0.165	0.168	0.163	-0.005	*-0.107*
Proportion of beneficiaries with Alzheimer's and related dementia	0.072	0.073	0.071	-0.002	-0.043

Table 5.B.8 *(continued)*

(1) Variable	Comparison group mean (N = 1,817)		(4) CPC+ group mean (N = 636)	(5) Adjusted difference[a]	(6) Standardized difference[b]
	(2) Without matching weights	(3) With matching weights			
Proportion of beneficiaries with heart failure	0.107	0.109	0.110	0.001	0.014
Practice employs at least one NP/PA (SK&A 2016)	0.679	0.689	0.701	0.012	0.026
Hospital beds in county per 10,000 population (Area Resource File 2016)					
1st quartile (fewest beds)	0.158	0.165	0.196	0.031	0.079
2nd quartile	0.280	0.265	0.238	-0.026	-0.062
3rd quartile	0.351	0.317	0.266	-0.051	*-0.116*
4th quartile (most beds)	0.211	0.253	0.300	0.046	*0.101*
Percentage of adults age 25 or older with a degree from a four-year college (Area Resource File 2016)	31.29	30.88	31.39	0.509	0.050
Practice is above 95th percentile of the distribution of Medicare expenditures in 2016 among all assigned Medicare beneficiaries	0.030	0.021	0.020	-0.001	-0.004

Source: Data on practice size and ownership from SK&A data; data on the number and characteristics of assigned Medicare beneficiaries from Medicare Enrollment Database and claims data; data on patient-centered medical home recognition from NCQA, TJC, AAAHC, URAC, and state-specific data sources; data on Medicare SSP ACO participation from CMS's master data management (MDM) data; data on participation in CMMI's Transforming Clinical Practice Initiative, participation in CMMI's MAPCP, and participation in CPC Classic from CMS; data on meaningful use of EHR from CMS's Medicare EHR Incentive Program data; data on HRR Price Index from CMS's Medicare Geographic Variation data; county data from the Area Resource File.

Notes: Because CPC+ is a practice-level intervention, and to aid computation, we matched using practice-level data rather than beneficiary-level data. However, we conduct analyses of claims-based outcomes using beneficiary-level data rather than practice-level data (Appendix 5.C), so we show balance statistics to approximate beneficiary-level balance. This approach best reflects the baseline balance among the analytic sample that we will use in regression analyses. Specifically, the values in Columns 2, 3, and 4 in this table represent practice-level means, scaled by the number of beneficiaries assigned to each practice in 2016, and the values in Columns 5 and 6 represent the differences based on these means and their standard deviations. Yellow shading with *bold, italicized text* signifies that our estimate was outside the desired threshold of ±0.1 standardized differences, but not outside the acceptable threshold of ±0.25 standardized differences.

[a] Adjusted difference is the difference between the CPC+ value and the comparison value with matching weights.

[b] Standardized difference is the adjusted difference, divided by the standard deviation in the CPC+ group.

[c] We define participation in prior primary care transformation initiatives as CPC Classic or MAPCP participation, or NCQA, TJC, AAHC, URAC, or state medical-home recognition status (whether the practice is in a medical home and level of NCQA medical home).

Table 5.B.8 *(continued)*

[d] We define proportion of Medicare charges that are primary care as the proportion of Medicare charges that are for office visit evaluation and management, nursing home and home care, Welcome to Medicare and Annual Wellness Visits, advance care planning, chronic care management services, or transitional care management services among NPIs with a primary care specialty, according to SK&A.

[e] We define multispecialty as having at least one provider, according to SK&A, with a specialty other than general practice, internal medicine, family medicine, or geriatrics.

[f] A practice is considered to have meaningful use of EHR if at least one provider attested to meaningful use of EHR.

[g] Because Medicaid eligibility requirements vary by state, we define dual quintiles according to where the practice falls in the distribution of the population dually eligible for Medicare and Medicaid within the state. For example, a practice in Michigan that has fewer dually eligible beneficiaries than 95 percent of primary care practices in Michigan would be in the bottom quintile, or Quintile 1.

AAAHC = Accreditation Association for Ambulatory Health Care; ACO = accountable care organization; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ED = emergency department; EHR = electronic health record; ESRD = end-stage renal disease; HCC = Hierarchical Condition Category; HRR = hospital referral region; MAPCP = Multi-payer Advanced Primary Care Practice; MDM = master data management system; NCQA = National Committee for Quality Assurance; NP = nurse practitioner; NPI = National Provider Identifier; PA = physician's assistant; PBPM = per beneficiary per month; PCP = primary care practitioner; SSP = Medicare Shared Savings Program; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

2.c.ii.   Pre-intervention trends of the CPC+ and external comparison practices

As we describe in Appendix 5.D, the CPC+ impact analysis of claims-based outcomes uses a difference-in-differences regression approach. The central assumption of this approach is that outcomes among the matched comparison group practices will follow the same trajectory during the intervention period that the CPC+ practices' outcomes would have followed in the absence of CPC+. We assessed the plausibility of this assumption by checking whether the CPC+ and Medicare comparison groups were on parallel trajectories on selected outcome variables before CPC+ began. Specifically, we compared the trends in the CPC+ group and the selected external comparison group on three primary outcome variables: total Medicare expenditures, hospitalizations, and outpatient ED visits, in the eight calendar quarters immediately before CPC+ began for 2017 starters. As Figures 5.B.1 and 5.B.2 indicate, the final Track 1 and Track 2 comparison groups have very similar pre-intervention trends as the CPC+ practices for each of these key outcome variables, especially on Medicare expenditures, where the two groups are practically indistinguishable. Pre-intervention trends in each track by SSP status are also similar (Figures 5.B.3 to 5.B.6).

Figure 5.B.1. Pre-intervention trends on key outcome variables in Track 1

Notes: Plots represent mean values in CPC+ Track 1 and the final Track 1 Medicare comparison group, weighted by the beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among Medicare FFS beneficiaries assigned to a Track 1 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis of 2017 starters, described in detail in Appendix 5.D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016, as a condition of inclusion in the beneficiary population assigned during the first quarter of 2016.

Figure 5.B.2. Pre-intervention trends on key outcome variables in Track 2

Notes: Plots represent mean values in CPC+ Track 2 and the final Track 2 Medicare comparison group, weighted by the beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among Medicare FFS beneficiaries assigned to a Track 2 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis for 2017 starters, described in detail in Appendix 5.D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016, as a condition of inclusion in the beneficiary population assigned during the first quarter of 2016.

Figure 5.B.3. Pre-intervention trends on key outcome variables in Track 1-non-SSP group

Notes: Plots represent mean values for beneficiaries assigned to non-SSP practices in CPC+ Track 1 and the final Track 1 Medicare comparison group, weighted by beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among beneficiaries assigned to a Track 1 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis for 2017 starters, described in detail in Appendix D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016 as a condition of inclusion in the beneficiary population assigned during the first quarter of 2016.

Figure 5.B.4. Pre-intervention trends on key outcome variables in Track 1-SSP group

(a) Total Medicare expenditures ($) per beneficiary per month

(b) Hospitalizations per 1,000 beneficiaries

(c) ED visits per 1,000 beneficiaries

CPC+ — Comparison

Notes: Plots represent mean values for beneficiaries assigned to SSP practices in CPC+ Track 1 and the final Track 1 Medicare comparison group, weighted by beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among beneficiaries assigned to a Track 1 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis for 2017 starters, described in detail in Appendix 5.D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016 as a condition of inclusion in the beneficiary population assigned during the first quarter of 2016.

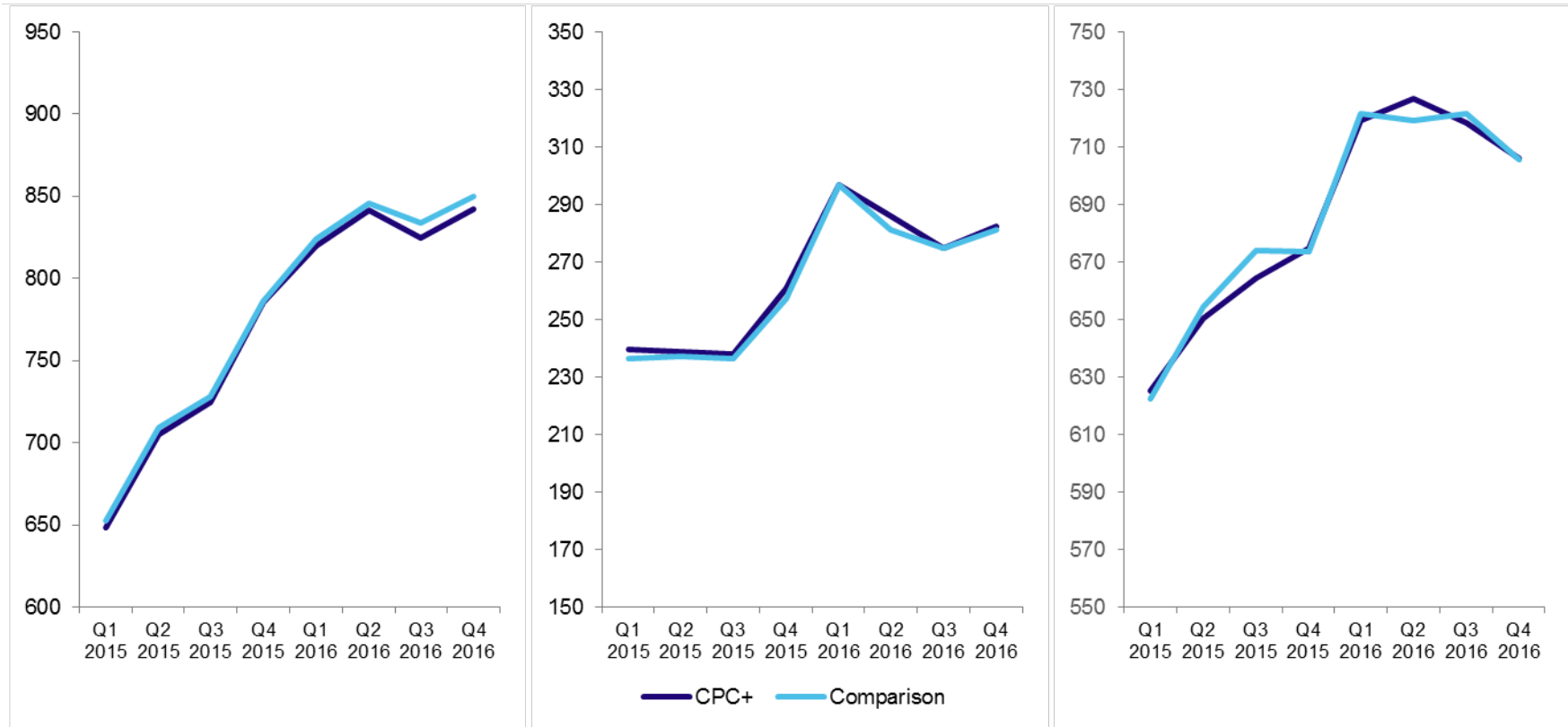**Figure 5.B.5. Pre-intervention trends on key outcome variables in Track 2-non-SSP group**

(a) Total Medicare expenditures ($) per beneficiary per month

(b) Hospitalizations per 1,000 beneficiaries

(c) ED visits per 1,000 beneficiaries

CPC+   Comparison

Notes: Plots represent mean values for beneficiaries assigned to non-SSP practices in CPC+ Track 2 and the final Track 2 Medicare comparison group, weighted by beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among beneficiaries assigned to a Track 2 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis for 2017 starters, described in detail in Appendix 5.D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016 as a condition of inclusion in the beneficiary population.

Figure 5.B.6. Pre-intervention trends on key outcome variables in Track 2-SSP group

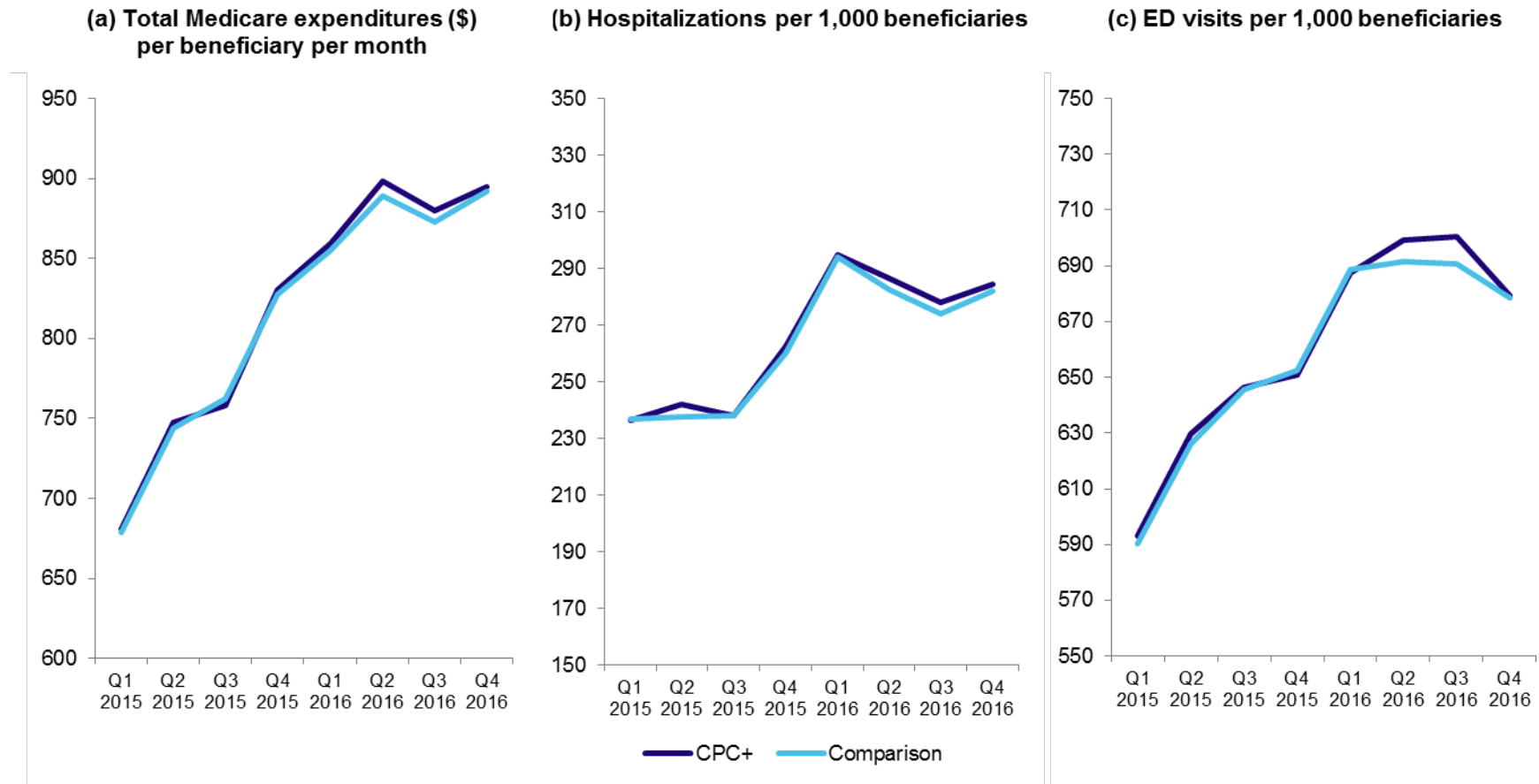(a) Total Medicare expenditures ($) per beneficiary per month

(b) Hospitalizations per 1,000 beneficiaries
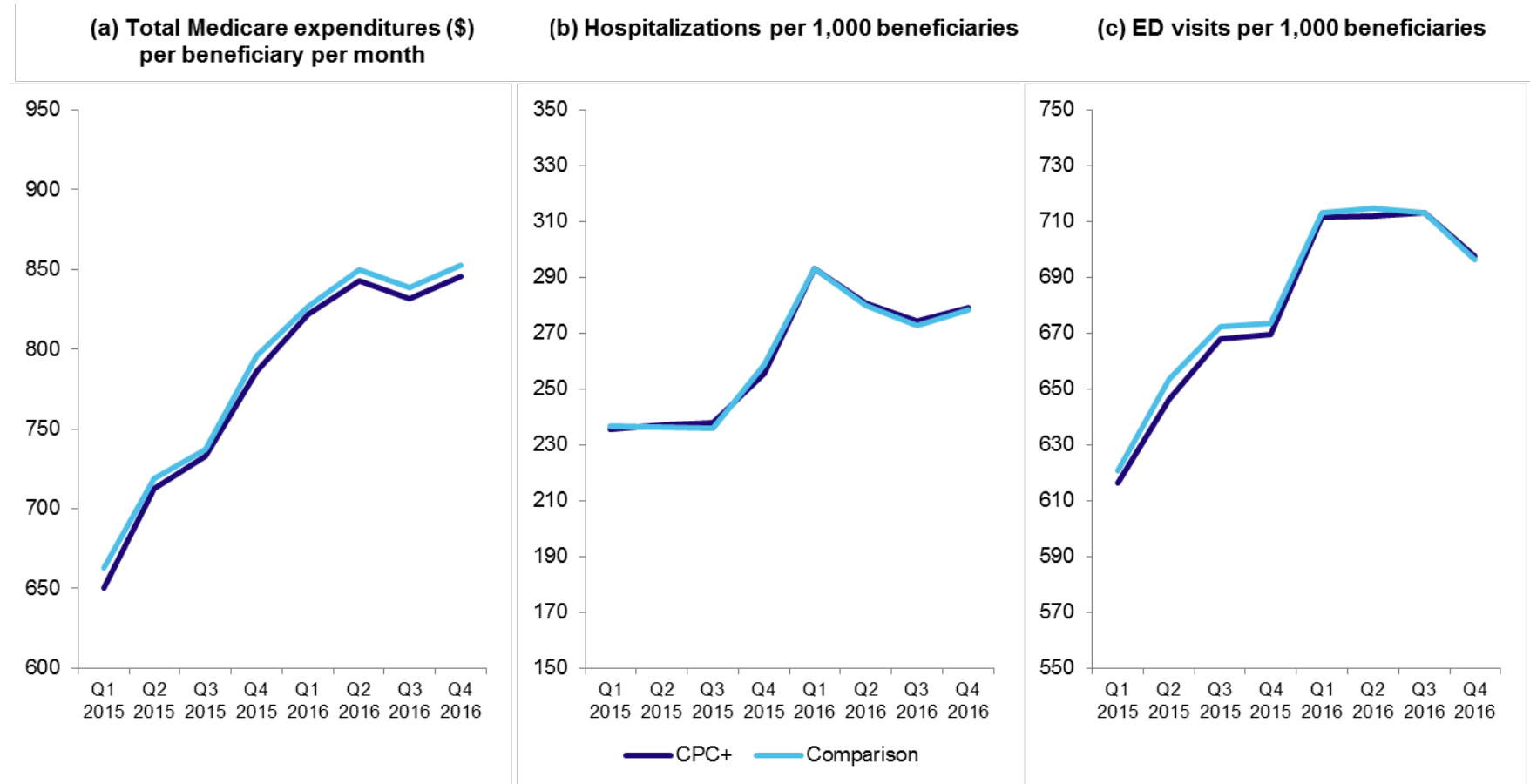
(c) ED visits per 1,000 beneficiaries

CPC+ — Comparison

Notes: Plots represent mean values for beneficiaries assigned to SSP practices in CPC+ Track 2 and the final Track 2 Medicare comparison group, weighted by beneficiary-level eligibility and matching weights. In each quarter of 2016, means are calculated among beneficiaries assigned to a Track 2 CPC+ or comparison practice—meaning that, in each quarter, the beneficiaries were (1) attributed to the practice in the quarter or in a previous quarter of 2016, based on primary care visits in the previous 24 months; (2) alive at the start of the quarter; and (3) enrolled in Medicare FFS with Medicare as the primary payer at the start of the quarter. In each quarter of 2015, in contrast, means are calculated among beneficiaries assigned during the first quarter of 2016 (2016 is the baseline period used for the Medicare impact analysis for 2017 starters, described in detail in Appendix 5.D). We expect expenditures, hospitalizations, and outpatient ED visits to be lower in the four quarters of 2015 than in the four quarters of 2016, because all beneficiaries observed in 2015 had to survive until the start of 2016 as a condition of inclusion in the beneficiary population.

2.c.iii. Weight distribution

The distribution of the weights was the final consideration in assessing the external comparison group. As already noted, extreme weights detract from the face validity of the comparison group, because they imply that a single comparison group beneficiary is counted in the analyses many more or many fewer times than a CPC+ beneficiary. At the same time, a diffuse distribution of weights limits statistical power relative to equal weights. To forestall these concerns, we designed our matching procedure to produce a compact weight distribution with a minimum of 0.1 and a maximum of 10. The matching weight distributions for the selected comparison groups are relatively smooth with very few weights greater than 5, as we show in Figures 5.B.7 and 5.B.8. Weight distributions by SSP status (not shown) are similar to those shown for the tracks overall.

Figure 5.B.7. Distribution of matching weights among Track 1 comparison practices
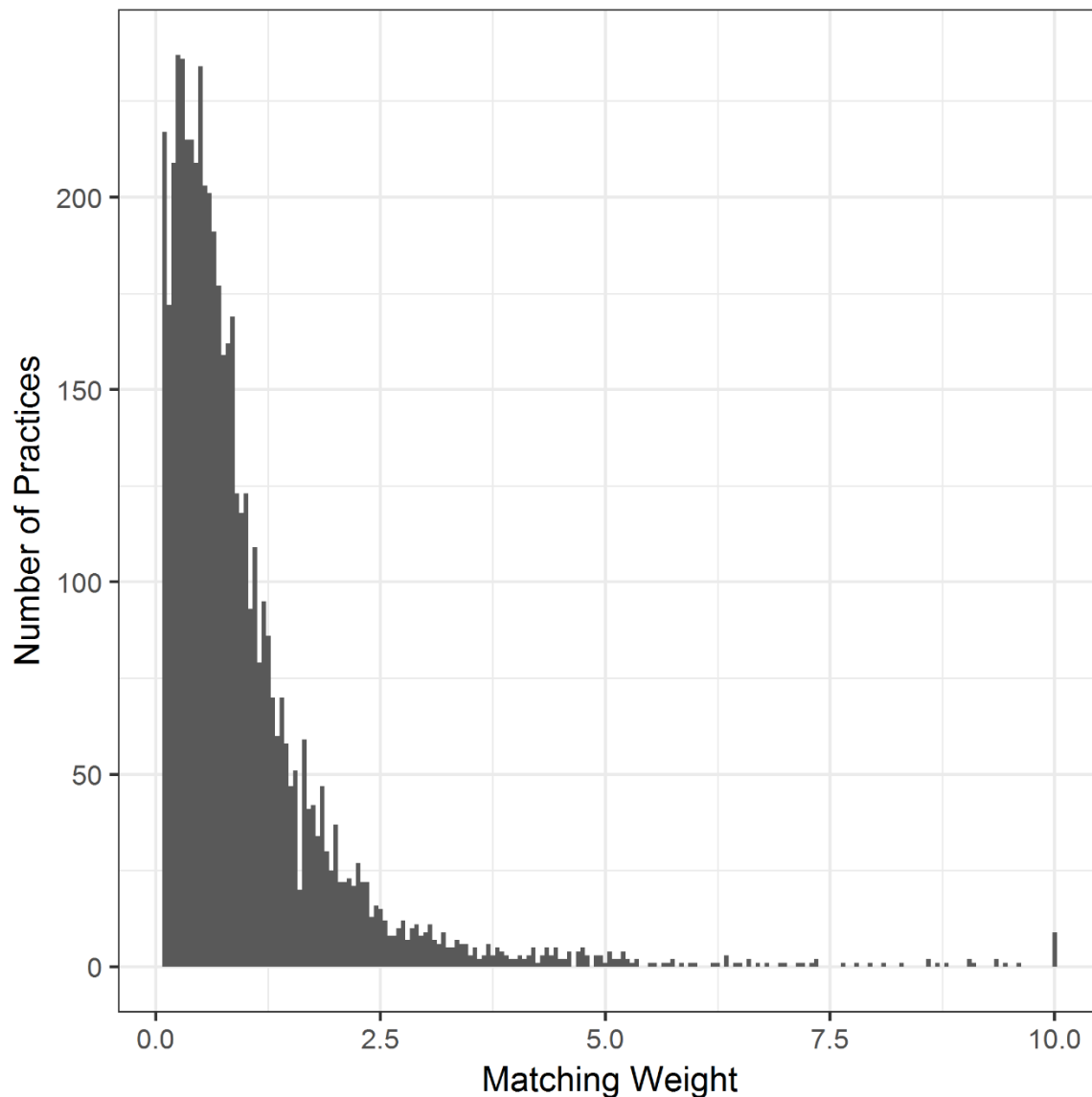
Figure 5.B.8. Distribution of matching weights among Track 2 comparison practices
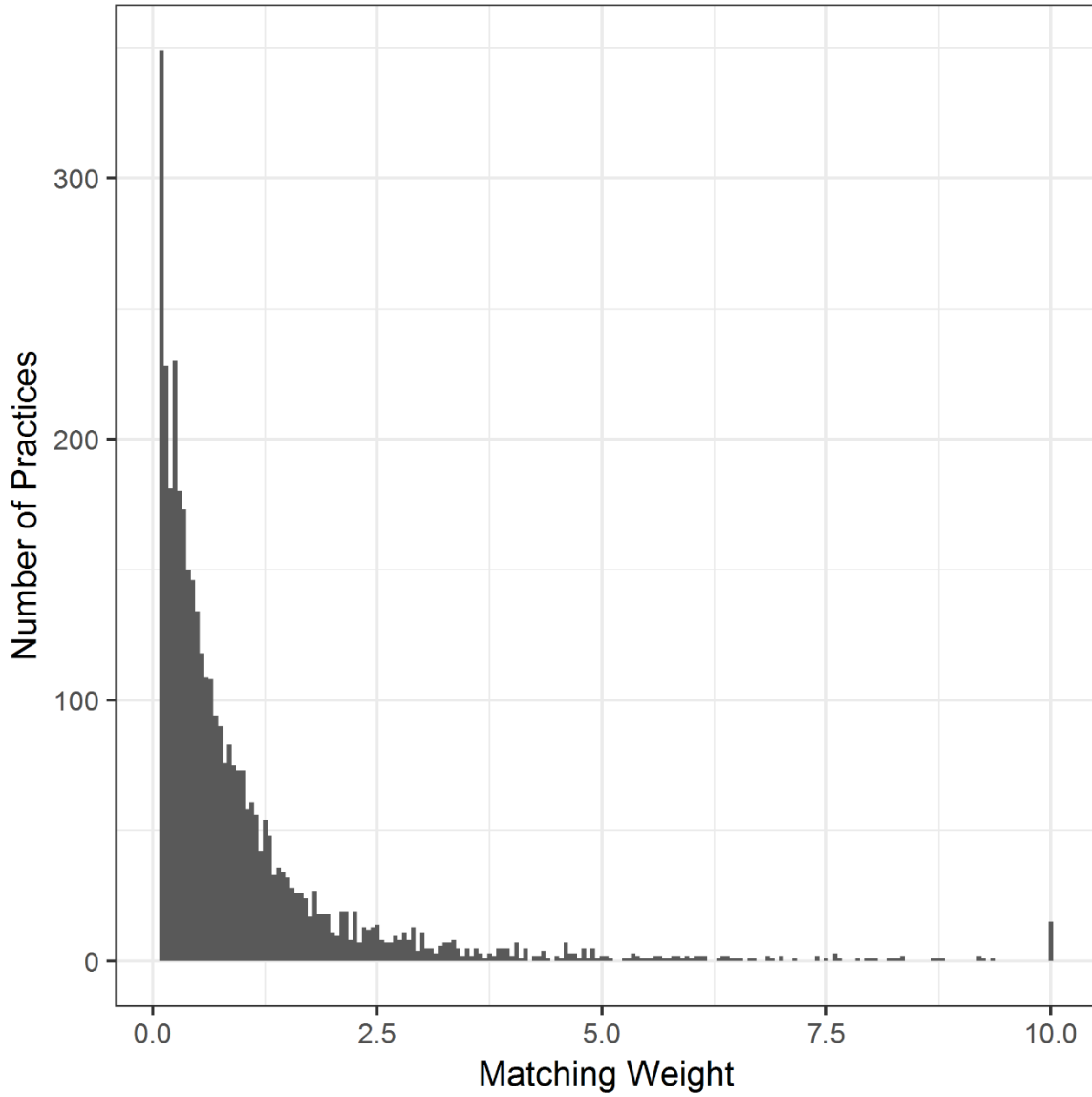
5.C.   Claims-based measures specification

In this Appendix, we define the key claims-based measures used in this report. First, we define and discuss the Medicare claims-based outcome measures used in the impact analysis. Next, we describe non-outcome measures based on Medicare claims that we used as control variables in the regression analysis or for other analyses.

5.C.1. Medicare claims-based outcome measures

Table 5.C.1 summarizes the outcome measures we used in the annual impact analysis in this report. We classified the claims-based outcome measures into groups by Medicare expenditures, service utilization, and three of the five CPC+ functions.

Table 5.C.1. Medicare claims-based outcome measures for the first annual report to CMS

Medicare expenditures
Total Medicare Parts A and B FFS expenditures (with and without CPC+ payments), PBPM
Total Medicare Parts A and B FFS expenditures, by service category, PBPM
Inpatient: Expenditures for both acute and non-acute inpatient care (e.g., inpatient rehabilitation services)
Outpatient: Outpatient expenditures including those for ED visits, observation stays, and other outpatient services (e.g., outpatient surgery, imaging, outpatient rehabilitation, and services provided by RHCs and FQHCs)
Physician and non-physician (noninstitutional) services: Non-institutional expenditures including physician services and other services provided by ambulance providers, independent clinical laboratories, and free-standing ambulatory surgical centers.
Ambulatory visits with primary care practitioners: Expenditures for face-to-face visits with a primary care practitioner in the following settings: office, hospital outpatient department, FQHC, RHC, or CAH
Ambulatory visits with specialist: Expenditures for face-to-face visits with a specialist in the following settings: office, hospital outpatient department, FQHC, RHC, or CAH
SNF: Expenditures billed by skilled nursing facilities
Home health: Expenditures billed by home health providers
Hospice: Expenditures billed by hospice providers in both institutional and home settings
DME: Expenditures for durable medical equipment, such as wheelchairs, home oxygen, and home hospital beds
Service utilization
Number of hospitalizations (short-stay acute hospitals and CAHs) per 1,000 beneficiaries per year
Number of outpatient ED visits (including observation stays) per 1,000 beneficiaries per year
Number of ED visits per 1,000 beneficiaries per year (includes outpatient ED visits and ED visits resulting in a hospitalization)
Number of primary care ambulatory visits (including visits to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year
Number of specialist ambulatory visits (including visits to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year
Coordination of care
Likelihood of an unplanned readmission within 30 days of a hospital discharge

Table 5.C.1. *(continued)*

Patient and caregiver engagement
Any use of hospice services
Any visit to discuss advance care plans

Planned care and population health
Among Medicare FFS beneficiaries ages 18–75 who had diabetes:
Hemoglobin A1c testing
Retinal eye exam
Medical attention for nephropathy
Composite measure of receiving all three tests (HbA1c testing, eye exam, and medical attention for nephropathy for beneficiaries with diabetes)
Composite measure of receiving none of the three tests for beneficiaries with diabetes
Among female Medicare FFS beneficiaries ages 52–74:
Breast cancer screening
Among all Medicare FFS beneficiaries
Likelihood of death within 12 months

CAH = critical access hospital; DME = durable medical equipment; ED = emergency department; FQHC = Federally Qualified Health Center; FFS= fee for service; PBPM = per beneficiary per month; RHC = Rural Health Clinic; SNF = skilled nursing facility.

a.   Medicare expenditures

CMS theorized that changes in care delivery made by CPC+ practices would result in a reduction in overall Medicare expenditures that is great enough to offset CMS's enhanced payments. Therefore, we analyzed Medicare expenditures for FFS beneficiaries with and without CMS' enhanced payments. (As we are estimating impacts for Medicare expenditures for FFS beneficiaries, we do not include enhanced payments from other payers in our calculations.) Enhanced payments are made *in addition to traditional payments for services.* These enhanced payments include CMS's CPC+ care management fees for Medicare FFS beneficiaries as well as CMS's payments for rewarding performance: (1) prospectively paid and retrospectively reconciled Performance-based Incentive Payments (PBIPs) for practices not participating in the Medicare Shared Savings Program (SSP); and (2) shared savings payments to ACOs for practices participating in SSP.

For Track 2 practices, CMS also provided alternative payments that shifted a portion of practices' payments for services from FFS to prospective payments—referred to as Comprehensive Primary Care Payments. As these are payments *for services*, they are included in both sets of Medicare expenditure analyses.

Total Medicare fee-for-service (FFS) expenditures, in dollars per beneficiary per month (PBPM), for all services (excluding Part D prescription drugs) during a reporting period, excluding CMS's enhanced payments.[30] This measure reflects total Medicare FFS expenditures for Part A and Part B covered services during the baseline or intervention period. It includes Medicare payments only and excludes third-party and beneficiary liability payments. To obtain the PBPM amount, we summed total Part A and Part B payments for the months that a beneficiary was eligible for Medicare FFS during the year and then divided the payments by the number of months the beneficiary was eligible for Medicare FFS. For Track 2 practices, we also included Comprehensive Primary Care Payments (CPCPs). We calculated this PBPM by dividing the total CPCPs to a practice during the reporting period, minus any adjustments or debits (due to retrospective changes in Medicare FFS eligibility of attributed beneficiaries or duplicative billing of services), by the total number of Medicare FFS eligible beneficiary-months in that practice during the period.[31]

Total Medicare FFS expenditures, in dollars PBPM for all services (excluding Part D prescription drugs) during a reporting period, including CMS's CPC+ enhanced payments. We added in to the measure above the final, reconciled PBIP (after recoupments for not meeting quality or utilization targets) for the year received by non-SSP practices. For each practice, we divided the reconciled PBIPs by the total number of Medicare FFS eligible beneficiary-months in the practice during the reporting period. For practices in an SSP ACO, we divided the total shared savings payments earned by their SSP ACO during the reporting period by the total number of Medicare FFS eligible beneficiary-months in that ACO during the period.

Medicare FFS expenditures, in dollars PBPM during a reporting period, excluding enhanced CPC+ payments, by service category. This measure reflects Medicare FFS expenditures PBPM (defined above) stratified by type of Part A or Part B service (inpatient, outpatient, Part B noninstitutional services provided by physicians or non-physicians, home health, skilled nursing facility [SNF], hospice, and durable medical equipment [DME]). We also separately looked at two subcategories of Part B noninstitutional service expenditures: (1) expenditures for ambulatory visits with primary care physicians and (2) expenditures for ambulatory visits with specialists.

b. **Service utilization**

Number of hospitalizations (at short-stay acute hospitals and critical access hospitals [CAHs]) per 1,000 beneficiaries per year. This measure is the annualized hospitalization rate per 1,000 beneficiaries of all short-stay acute hospital and CAH admissions. Transfers between facilities are counted as a single admission. Multiple claims for acute admissions from traditional

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[30] We do not include Part D expenditures, because Medicare makes prospective payments to Part D prescription drug plans that are not directly related to each individual prescription filled by a beneficiary. That is, changes in prescription use do not affect Medicare expenditures.

[31] Since we use the ITT assigned sample which keeps beneficiaries even after they are no longer attributed to a CPC+ practice (thus no longer generating payments for the practice), our calculated per beneficiary per month payments (CPCPs, CMFs, and PBIPs) are lower than the CMS reported numbers.

acute care hospitals and CAHs that represent transfers between hospitals are combined into a single record, so that they count as one admission.

Outpatient emergency department (ED) visits, including observation stays, per 1,000 beneficiaries per year. This measure is the annualized number of ED visits and observation stays that do not lead to a hospitalization, per 1,000 beneficiaries. Visits that do not lead to a hospitalization are identified in the outpatient department file using revenue center line items equal to 045X or 0981 (emergency room care), 0762 (treatment or observation room), or 0760 (treatment or observation room—general classification). We counted a visit as an observation stay if it was longer than 8 hours and had a corresponding Health Care Common Procedure Coding System (HCPCS) code of G0378 (hospital observation services per hour). If the procedure code on the line item of the ED claim equals 70000 through 79999 or 80000 through 89999, we excluded it (to exclude claims in which only radiological or pathology/laboratory services are provided).

Number of ED visits per 1,000 beneficiaries per year. This measure combines outpatient ED visits and observation stays with ED visits that lead to a hospitalization. ED visits that lead to a hospitalization are identified in the inpatient file and include hospital stays that have a claim with a revenue center line item equal to 045X or 0981 (emergency room care) or 0762 (treatment or observation room).

Number of primary care ambulatory visits, including visits to Federally Qualified Health Centers (FQHCs), Rural Health Clinics (RHCs), and Critical Access Hospitals (CAHs) per 1,000 beneficiaries per year. This measure is the number of annualized visits per 1,000 beneficiaries to primary care practitioners, including nurse practitioners (NPs), clinical nurse specialists (CNSs), and physician assistants (PAs), as defined by Healthcare Provider Taxonomy Codes reported in the National Plan and Provider Enumeration System (NPPES) (provider taxonomy codes are listed in Table 5.C.2). Visits for office-based evaluation and management, for nursing home and home care, and for care management services are classified as ambulatory visits, as defined by HCPCS/Current Procedural Terminology (CPT) and revenue center codes (HCPCS/CPT and revenue center codes are listed in Table 5.C.3).

Number of ambulatory visits to specialists (including to FQHCs, RHCs, and CAHs) per 1,000 beneficiaries per year. This measure is the annualized number of ambulatory visits to specialists, per 1,000 beneficiaries. Specialists are providers whose taxonomy code is not included in Table 5.C.2. Codes for ambulatory visits are listed in Table 5.C.3, and are explained in Table 5.C.4.

Table 5.C.2. Primary care taxonomy codes

Medicare provider/supplier type description	Provider taxonomy code	Provider taxonomy description
Physician/Family Practice	207Q00000X	Physicians/Family Medicine
	207QA0505X	Physicians/Family Medicine, Adult Medicine
	207QG0300X	Physicians/Family Medicine, Geriatric Medicine
	207QH0002X	Physicians/Family Medicine, Hospice and Palliative Medicine
Physician/Internal Medicine	207R00000X	Physicians/Internal Medicine
	207RH0002X	Physicians/Internal Medicine, Hospice and Palliative Medicine
	207RG0300X	Physicians/Internal Medicine, Geriatric Medicine
Nurse Practitioner	363L00000X	Nurse Practitioner
	363LA2100X	Nurse Practitioner, Acute Care
	363LA2200X	Nurse Practitioner, Adult Health
	363LC1500X	Nurse Practitioner, Community Health
	363LF0000X	Nurse Practitioner, Family
	363LG0600X	Nurse Practitioner, Gerontology
	363LP2300X	Nurse Practitioner, Primary Care
	363LW0102X	Nurse Practitioner, Women's Health
Certified Clinical Nurse Specialist	364S00000X	Clinical Nurse Specialist
	364SA2100X	Clinical Nurse Specialist, Acute Care
	364SA2200X	Clinical Nurse Specialist, Adult Health
	364SC1501X	Clinical Nurse Specialist, Community Health/Public Health
	364SC2300X	Clinical Nurse Specialist, Chronic Care
	364SF0001X	Clinical Nurse Specialist, Family Health
	364SG0600X	Clinical Nurse Specialist, Gerontology
	364SH1100X	Clinical Nurse Specialist, Holistic
	364SW0102X	Clinical Nurse Specialist, Women's Health
Physician Assistant	363A00000X	Physician Assistant
	363AM0700X	Physician Assistant, Medical
Physician/Undefined Physician Type	208D00000X	General Practice
Federally Qualified Health Center	261QF0400X	Ambulatory Health Care Facilities/ FQHC
Rural Health Clinic	261QR1300X	Ambulatory Health Care Facilities/Clinic Center, Rural Health

Table 5.C.3. Ambulatory visit HCPCS/CPT codes and revenue center codes

Place of service	HCPCS/CPT codes	Revenue center codes
Office/outpatient, home	99201- 99205, 99211-99215, 99324-99328, 99334–99337, 99339–99345, 99347–99350, 99495-99497, 99487, 99489, 99490, G0402, G0438, G0439, G0502–G0507	n.a.
Federally Qualified Health Center	99201- 99205, 99211-99215, 99324-99328, 99334–99337, 99339–99345, 99347–99350, 99495-99497, 99487, 99489, 99490, G0402, G0438, G0439, G0502–G0507, G0466, G0467, or G0468	n.a.
Critical Access Hospital[a]	99201- 99205, 99211-99215, 99324-99328, 99334–99337, 99339–99345, 99347–99350, 99495-99497, 99487, 99489, 99490, G0402, G0438, G0439, G0502–G0507 G0463	096x, 097x, or 098x
Rural Health Clinic	n.a.	0521, 0522, 0524, 0525, 0527, 0528

[a] For Critical Access Hospitals, we required an ambulatory visit to have both HCPCS/CPT codes and revenue center codes.

HCPCS/CPT = Health Care Common Procedure Coding System/Current Procedural Terminology; n.a. = not applicable.

Table 5.C.4. Detailed description of the HCPCS/CPT codes and revenue center codes

HCPCS/CPT codes and description		Revenue center codes and description	
Office, outpatient, home, care management			
99201-99205, 99211-99215	Evaluation and Management (E&M): office or outpatient	n.a.	
99324-99337	Evaluation and Management (E&M): domiciliary, rest home, or custodial care		
99339-99340	Evaluation and Management (E&M): domiciliary, rest home, or home plan oversight		
99341-99345	Evaluation and Management (E&M): home services		
99347-99350	Evaluation and Management (E&M): home services		
99495-99497	Evaluation and Management (E&M): office or outpatient		
99487, 99489, 99490,	Chronic care management		
G0402	Initial preventive physical examination		
G0438, G0439	Annual wellness visit		
G0502–G0504, G0507	Care management for behavioral health		
G0505	Cognitive and functional assessment with development of care plan		
G0506	Comprehensive assessment of and care planning for chronic care management services		
Federally Qualified Health Center			
99490	Chronic care management	n.a.	
G0402	Initial preventive physical examination		
G0438, G0439	Annual wellness visit		
G0502–G0504, G0507	Care management for behavioral health		
G0505	Cognitive and functional assessment with development of care plan		
G0506	Comprehensive assessment of and care planning for chronic care management services		
G0466, G0467	FQHC visit		
G0468	Initial preventive physical examination or annual wellness visit		
Critical Access Hospital[a]			
99201-99205, 99211-99215,	Evaluation and Management (E&M): office or outpatient	096x, 097x, or 098x	Professional fees
99324-99337	Evaluation and Management (E&M): domiciliary, rest home, or custodial care		
99339-99340	Evaluation and Management (E&M): domiciliary, rest home, or home plan oversight		
99341-99345	Evaluation and Management (E&M): home services		
99347-99350	Evaluation and Management (E&M): home services		
99495-99497	Evaluation and Management (E&M): office or outpatient		
99487, 99489, 99490	Chronic care management		
G0402	Initial preventive physical examination		

Table 5.C.4. *(continued)*

HCPCS/CPT codes and description		Revenue center codes and description	
G0438, G0439	Annual wellness visit		
G0502–G0504, G0507	Care management for behavioral health		
G0505	Cognitive and functional assessment with development of care plan		
G0506	Comprehensive assessment of and care planning for chronic care management services		
G0463	Hospital outpatient clinic visit		
Rural Health Clinic			
n.a.		0521, 0522, 0524, 0525, 0527, 0528	Visit to a free-standing clinic or from a practitioner from an RHC/FQHC

[a] For Critical Access Hospitals, we required an ambulatory visit to have both HCPCS/CPT codes and revenue center codes.

FQHC = Federally Qualified Health Center; HCPCS/CPT = Health Care Common Procedure Coding System/Current Procedural Terminology; n.a. = not applicable ; RHC = Rural Health Clinic.

c.   Coordination of care

Unplanned readmissions within 30 days of a hospital discharge. For calculating the 30-day readmission rate, we used a slightly different time period definition than for the other measures. We looked at all eligible inpatient discharges during the last month of the previous year and the first 11 months of the current year[32], and calculated the proportion of these index discharges that were followed by an unplanned hospitalization within 30 days of the discharge. An unplanned readmission is defined as any hospitalization that does not continue care (examples of planned admissions include recurring admissions for chemotherapy and planned admission for transplant surgery). For an inpatient discharge to qualify as an index admission, the beneficiary had to be enrolled in Medicare FFS Part A and not in an HMO in the month of the index admission and during the month following discharge, alive at discharge, and not discharged against medical advice. In addition, certain admissions were excluded from the universe of index admissions, including discharges with lengths of stay longer than one year; stays at cancer hospitals exempt from the Prospective Payment System (PPS); and stays for psychiatric conditions, rehabilitation, or cancer. Our definition of this measure is based on the Yale readmission measure developed by the Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE 2017) that is used in the Hospital Readmission Reduction Program under Section 3025 of the Affordable Care Act.[33]

d.   Patient and caregiver engagement

Any use of hospice services. This measure is the percentage of beneficiaries who received any hospice services in the year.

Any visit to discuss advance care plan. This measure is the percentage of beneficiaries with a face-to-face visit in which advance care plans were discussed with a physician or other qualified health professional during the year. Visits to discuss advance care plans are defined by CPT code 99497.

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[32] We examine all index discharges during the last month of the previous year and the first 11 months of the current year to ensure that the relevant outcome "readmission within 30 days" is observed within the analysis period with adequate claims runout. One minor disadvantage is that for the first intervention year, some readmissions are measured in the last month of the baseline (December 2016), before the CPC+ intervention began, which would dilute any observed effect on readmissions in year 1. However, this affects only one out of 13 months of observed readmissions in year 1, and should not discernibly change the year 1 effect, especially since we do not expect the intervention to have sizeable effects in year 1. We considered the alternative of including index discharges over all 12 months of a calendar year. If we did this, we would not be able to observe all possible 30-day readmissions without expanding the analysis period into the first month of the following year, which for the fifth year of CPC+ would include a month after the intervention ended. Also, it would lead to limited claims run out of only two months for that last month of readmissions in each measurement period.

[33] Additional information about the Yale readmission measure is available here: https://www.qualitynet.org/dcs/ContentServer?cid=1219069855841&pagename=QnetPublic%2FPage%2FQnetTier4&c=Page.

e.   Planned care and population health

We constructed a total of seven claims-based measures under the planned care and population health domain. Five of these were for Medicare FFS beneficiaries ages 18 to 75 with diabetes, one was for breast cancer screening among women ages 52 to 74, and one was for 12-month mortality among all beneficiaries. We restricted the five diabetes measures to beneficiaries with continuous Medicare FFS Part A and B enrollment during the 12-month performance period (that is, the year for which the measure is being defined). The breast cancer screening measure required continuous Medicare FFS Part A and Part B enrollment during the 27-month measurement period.

We constructed all six measures using the 2017 specifications obtained from HEDIS (available at http://www.ncqa.org/hedis-quality-measurement/hedis-measures/hedis-2017), with the exception that we did not use prescription drug data in constructing these measures.[34] Table 5.C.5 summarizes the measure specifications.

Table 5.C.5. 2017 HEDIS-based measure specifications

Measure	Measure denominator	Measure numerator
HbA1c testing	Beneficiaries ages 18–75 with diabetes (type 1 and type 2), defined as having one of the following during the measurement year or the prior year: • Two face-to-face encounters in an outpatient setting or non-acute inpatient setting on different dates of service, with a diagnosis of diabetes. • One face-to-face encounter in an acute inpatient setting, with a diagnosis of diabetes. Beneficiaries with gestational or steroid-induced diabetes during the measurement year or the prior year were excluded.	Beneficiaries had an HbA1c test performed during the measurement year.
Eye exam (retinal) performed	Beneficiaries ages 18–75 with diabetes (type 1 and type 2), defined as having one of the following during the measurement year or the prior year: • Two face-to-face encounters in an outpatient setting or non-acute inpatient setting on different dates of service, with a diagnosis of diabetes. • One face-to-face encounter in an acute inpatient setting, with a diagnosis of diabetes. Beneficiaries with gestational or steroid-induced diabetes during the measurement year or the prior year were excluded.	Beneficiaries had an eye exam during the measurement year, defined as having one of the following: • A retinal or dilated eye exam by an eye care professional (optometrist or ophthalmologist) in the measurement year. • A negative retinal or dilated eye exam (negative for retinopathy) by an eye care professional in the year prior to the measurement year.

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[34] We also conducted a sensitivity analysis to test whether the HEDIS measures included here are sensitive to the removal of CPT-II and Level II HCPCS codes that are included in the HEDIS specifications and that are not separately payable under the Medicare physician fee schedule. Overall, removing these codes had only a minor impact on the HEDIS Comprehensive Diabetes Care measure—the performance rate decreased by only 0.04 percent for the composite measure and by 0.01 or 0.02 percent for the components measures.

Table 5.C.5. *(continued)*

Measure	Measure denominator	Measure numerator
Medical attention for nephropathy	Beneficiaries ages 18–75 with diabetes (type 1 and type 2), defined as having one of the following during the measurement year or the prior year: • Two face-to-face encounters in an outpatient setting or non-acute inpatient setting on different dates of service, with a diagnosis of diabetes. • One face-to-face encounter in an acute inpatient setting, with a diagnosis of diabetes. Beneficiaries with gestational or steroid-induced diabetes during the measurement year or the prior year were excluded.	Beneficiaries had a nephropathy screening or monitoring test OR evidence of nephropathy during the measurement year, defined as having one of the following during the measurement year: • A nephropathy screening or monitoring test. • Evidence of treatment for nephropathy or ACE/ARB therapy. • Evidence of stage 4 chronic kidney disease. • Evidence of end-stage renal disease. • Evidence of kidney transplant. A visit with a nephrologist.
Breast cancer screening	Women ages 52–74 as of December 31 of the measurement year. Beneficiaries who had a bilateral mastectomy or a right and a left unilateral mastectomy were excluded.	Beneficiaries with one or more mammograms any time on or between October 1 two years prior to the start of the measurement year and December 31 of the measurement year.

The diabetes measures below include beneficiaries with type 1 or type 2 diabetes who are 18 to 75 years of age by the end of the measurement year:

- **HbA1c testing.** Percentage who had a hemoglobin A1c (HbA1c) test during the year.

- **Eye examination.** Percentage who had a retinal eye examination during the year. The measure requires a retinal or dilated eye examination by an eye care professional, but only retinal eye exams can be measured in claims.

- **Medical attention for nephropathy.** Percentage who had a nephropathy screening or monitoring test or evidence of nephropathy during the year.

- **Received all three tests (HbA1c testing, eye exam, and medical attention for nephropathy).** Percentage who received all three exams or tests recommended for beneficiaries with diabetes during the year.

- **Received none of the three tests.** Percentage who did not receive any of the three exams or tests recommended for beneficiaries with diabetes during the year.

We constructed the following measure for female beneficiaries ages 52 to 74 by the end of the measurement year:

- **Breast cancer screening.** Percentage who had one or more mammograms to screen for breast cancer in the past 27 months.[35]

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[35] Given the 27-month measurement period, the breast cancer screening measure for Years 1 and 2 include 15 and 3 months of the baseline period, respectively. Therefore, effects on this measure could be diluted (more so for year 1) due to inclusion of baseline months during the Year 1 and Year 2 measurement periods.

Finally, we constructed the following measure for all Medicare FFS beneficiaries in the analysis:

- **12-month mortality.** Percentage who died within 12 months of being first attributed in a measurement year.

5.C.2. Non-outcome claims-based measures

Receipt of chronic care management (CCM), transitional care management (TCM), or other care management (OCM) services. We used these measures to examine the extent of billing for other care management services during the year by beneficiaries assigned to CPC+ and comparison practices. We identified beneficiaries with a claim in the Carrier or Outpatient file with one of the procedure codes in Table 5.C.6 as having received one of these management services. Although CPC+ practices cannot bill CCM services for attributed Medicare beneficiaries, we expect to observe a small proportion of CPC+ beneficiaries with such claims in our analysis sample based on ITT assignment rules, where we retain beneficiaries even if they are no longer attributed to a CPC+ practice.

Table 5.C.6. Procedure codes for CCM, TCM, and OCM services

	CPT/HCPCS code	Description
CCM	99490	Chronic care management (20 minutes of clinical staff time)
	99487	Complex chronic care management (60 minutes of clinical staff time)
	99489	Additional 30 minutes of clinical staff time for chronic care management
	G0506	Chronic care management care planning
	G0507	Care management services for behavioral health conditions
	99358	Prolonged (< 75 minutes) of non-face-to-face E&M service before and/or after direct patient care
	99359	Additional 30 minutes of prolonged non-face-to-face E&M service before and/or after direct patient care
TCM	99495	Transitional care management for patients discharged to community from an inpatient setting; moderate complexity of medical decision making
	99496	Transitional care management for patients discharged to community from an inpatient setting; high complexity of medical decision making
OCM	G0181	Home health supervision of at least 30 minutes
	G0182	Hospice health supervision of at least 30 minutes
	G0502	Initial psychiatric collaborative care management, first 70 minutes
	G0503	Subsequent psychiatric collaborative care management, first 60 minutes
	G0504	Initial or subsequent psychiatric collaborative care management, additional 30 minutes
	G0505	Cognition and functional assessment
	99497	Advance care planning

CCM = chronic care management; TCM = transitional care management; OCM = other care management.

5.C.3. Claims-based control variables

Hierarchical condition category (HCC) score. We controlled for HCC score in our regressions to account for variation in beneficiaries' health status, or their level of risk for Medicare spending (Pope et al. 2004, 2011). To avoid endogeneity issues, we controlled for 2016 HCC score (calculated using 2015 claims) for observations in the baseline period (2016), and for 2017 score (calculated using 2016 claims) for observations during the intervention period (2017). We calculated both the 2016 and 2017 HCC scores using CMS' HCC score software and algorithm, using information from Medicare claims and enrollment data. We deviated from the exact approach CMS uses in a few ways to adapt the CMS algorithm for the purpose of the impact analysis. For instance, to avoid endogeneity concerns, we used information on dual status, long-term institutionalization (LTI), and end-stage renal disease (ESRD) status from the prior year instead of the year for which the HCC score was being calculated. Also, we adopted a more nuanced approach to assigning the new enrollee versus the community score to beneficiaries with less than 12 months of FFS enrollment during the base year, as described in Step 5 below.

Specifically, we used the following approach:

1. To calculate HCC scores, we used the latest version of the HCC score software—the version 22 2017 HCC model software—which has greater predictive accuracy than earlier versions. We also used the version 21 2017 ESRD model software for beneficiaries with ESRD.

2. To calculate HCC scores, we used a 12-month lookback for Medicare claims to obtain diagnosis information. For instance, to calculate the 2017 HCC score, we used Medicare claims during 2016.

3. The HCC algorithm also uses information on demographics, reason for Medicare eligibility, new enrollee status, dual eligibility status (with the latest version of the model distinguishing between beneficiaries who have full versus partial dual eligibility status), long-term nursing home care, kidney transplant, and dialysis status. To estimate and assign HCC scores for any year, we used information on these attributes from the prior year, with the exception of demographics and reason for Medicare eligibility, which were from the current year. For example, to calculate the 2017 HCC score, we used demographics from 2017, Medicare eligibility (eligible due to age or disability) from 2017, new enrollee status from 2016 (a beneficiary with less than six months of Medicare FFS enrollment during the year was flagged as a new enrollee), dual status (full, partial, or nondual) during the last three months of 2016, ESRD status during the last three months of 2016, and LTI status during a 120-day period ending on December 31, 2016. We also looked at the number of months since a kidney transplant, looking back from January 1, 2017, and whether the transplant was successful or the beneficiary was on dialysis.

4. The HCC algorithm estimates the following separate models: (1) ESRD (further differentiating by dialysis status and time since kidney transplant), (2) LTI, (3) community (further differentiating by dual status and aged versus disabled status), and (4) new enrollee. These models include different covariates and interaction terms, and therefore lead to multiple values of the HCC scores for each beneficiary. For instance, the new enrollee model is estimated with covariates only for demographics and Medicare eligibility

information, without any covariates for claims-based diagnoses. Thus, for the 2017 HCC score a beneficiary would have multiple values of the 2017 HCC score, with one score from each model.

5. After estimating the four HCC models, we selected one HCC score for each beneficiary, following CMS' approach to determine which model's score was appropriate for the beneficiary. For example, we assigned a specific value of the 2017 HCC score to a beneficiary, by progressively checking the criteria in the following order:

    -   We assigned the value of the ESRD score to a beneficiary for the 2017 HCC score if the beneficiary had ESRD anytime during the last three months of 2016 (the ESRD score could further vary or come from a different ESRD model, depending on length of time since a successful kidney transplant, dialysis status, new enrollee status, and age).

    -   If a beneficiary did not have ESRD and met the criteria for LTI during the 120-day period ending on December 31, 2016, we assigned the value of the institutional or LTI score for 2017.

    -   If a beneficiary did not meet the criteria for either the ESRD or LTI score, and—

        i. Had less than six months of Medicare FFS enrollment during 2016, we assigned the new enrollee score for 2017.

        ii. Had 10 or more months of Medicare FFS enrollment during 2016, we assigned the community score for 2017. The community score varied or was obtained from a different model, depending on dual status (full, partial, or nondual) during the last three months of 2016, and aged versus disabled status.

        iii. Had six to nine months of Medicare FFS enrollment during 2016, we again assigned the community score for 2017 (varying as above by dual and aged or disabled status), but adjusted that score upward or inflated it by 25 percent. We did this to account for missing information on Medicare claims for three to six months in 2016, and therefore, the limited information on diagnoses available for such beneficiaries.

6. Finally we used CMS' official normalization factors for 2016 and 2017 HCC scores to calculate a normalized risk score for each beneficiary. Specifically, the normalized risk score for 2016 (or 2017) is equal to the raw 2016 (or 2017) risk score, calculated using the approach laid out above, divided by the normalization factor for that year. The normalization factors account for changes in coding practice as well as in population demographics between the year an HCC model was calibrated and the year for which we calculated the HCC score. Normalization ensures that the national average of the HCC scores across all Medicare FFS beneficiaries in a year is equal to 1.

Chronic condition indicators based on individual or combined HCCs. Our regressions also controlled for 2016 HCCs (based on diagnoses in 2015) in the baseline period and 2017 HCCs (based on diagnoses in 2016) in the intervention period. As part of generating the HCC score, the HCC models produce a set of condition categories or HCCs based on diagnosis information in Medicare claims (Pope et al. 2004, 2011). The HCC models produce a total of 87 HCCs (79 from the V22 HCC model and an additional 8 from the ESRD model). We identified 21 HCCs to include as control variables to adjust for chronic conditions in our regressions, in three steps (Table 5.C.7):

Step 1: We narrowed the pool to 38 HCCs, selecting those that met at least one of the following criteria:

- Had a relatively high prevalence among beneficiaries in our sample (4 percent and above)

- Had higher-than-average relative factors (greater than or equal to 1) from the HCC models, implying that they were important predictors of Medicare expenditures

- Showed a noticeable change in prevalence rates between baseline (2016) and the follow-up year (2017), among beneficiaries in the yearly samples (greater than or equal to 0.4 percentage points in either the CPC+ group or the comparison group)

- Showed a noticeable difference in prevalence rates between CPC+ and comparison beneficiaries in the sample (greater than or equal to 0.2 percentage points)

Step 2: We ran difference-in-differences regressions for total Medicare expenditures without fees, using one year of baseline and one year of follow-up period data on 2017 CPC+ starters, and including all 38 HCCs, separately for Track 1 and Track 2 practices.

Step 3: Based on the magnitude and significance of the coefficient estimate for each HCC in these regressions, and their overall prevalence in our sample, we selected 21 categories as regression controls. Ten of these were individual HCCs denoting a specific condition, while 11 others were combinations of one or more HCCs. We combined certain HCCs with high or significant coefficient estimates if their individual rates of prevalence were low and they belonged to the same broad family of conditions.

Table 5.C.7. List of HCCs used as chronic condition controls

	HCC	Description
1	HCC 8	Metastatic Cancer and Acute Leukemia
2	HCC 18	Diabetes with Chronic Complications
3	HCC 21	Protein-Calorie Malnutrition
4	HCC 22	Morbid Obesity
5	HCC 23	Other Significant Endocrine and Metabolic Disorders
6	HCC 85	Congestive Heart Failure
7	HCC 96	Specified Heart Arrhythmias
8	HCC 106	Atherosclerosis of the Extremities with Ulceration or Gangrene
9	HCC 111	Chronic Obstructive Pulmonary Disease
10	HCC 173	Traumatic Amputations and Complications
11	HCC 186	Major Organ Transplant or Replacement Status
12	HCC 40 or 47	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease or Disorders of Immunity
13	HCC 46 or 48	Severe Hematological Disorders, or Coagulation Defects and Other Specified Hematological Disorders
14	HCC 54 or 55	Drug/Alcohol Psychosis or Dependence
15	HCC 57 or 58	Schizophrenia or Major Depressive, Bipolar, and Paranoid Disorders
16	HCC 70 or 71	Quadriplegia or Paraplegia
17	HCC 80 or 82	Coma, Brain Compression/Anoxic Damage or Respirator Dependence/Tracheostomy Status
18	HCC 86, 87, or 88	Acute Myocardial Infarction, Unstable Angina and Other Acute Ischemic Heart Disease, or Angina Pectoris
19	HCC 99 or 100	Cerebral Hemorrhage, or Ischemic or Unspecified Stroke
20	HCC 107 or 108	Vascular Disease, with Complications
21	HCC 157 or 158	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone; or of Skin with Full Thickness Skin Loss

Indicator for presence of Alzheimer's or dementia based on the Chronic Conditions Warehouse (CCW) algorithm. Similar to the HCCs described earlier, we also constructed a CCW indicator for Alzheimer's disease or dementia to adjust for this condition in our regressions (this indicator is also used to identify high-risk beneficiaries in Tier 5, as described in Chapter 5). We used this CCW indicator instead of HCCs for Alzheimer's and dementia from the HCC model to ensure consistency with CMS' approach for identifying high-risk, Tier 5 beneficiaries in Track 2 of CPC+. We defined this indicator based on the CCW algorithm, separately for the baseline and intervention periods, defining the indicator as of December 31, 2015, for the baseline year (2016) and as of December 31, 2016, for the intervention period. The CCW algorithm for defining this indicator requires a diagnosis code from Table 5.C.8 in any position on at least one inpatient, skilled nursing facility, home health, outpatient, or carrier claim in a three-year lookback period.

Table 5.C.8. Diagnosis codes used to identify Alzheimer's disease or dementia

ICD-9 diagnosis codes	ICD-10 diagnosis codes
331.0, 331.11, 331.19, 331.2, 331.7, 290.0, 290.10, 290.11, 290.12, 290.13, 290.20, 290.21, 290.3, 290.40, 290.41, 290.42, 290.43, 294.0, 294.10, 294.11, 294.20, 294.21, 294.8, 797	F01.50, F01.51, F02.80, F02.81, F03.90, F03.91, F04, G13.8, F05, F06.1, F06.8, G30.0, G30.1, G30.8, G30.9, G31.1, G31.2, G31.01, G31.09, G94, R41.81, R54

5.C.4. Non-claims-based control variables

We controlled for beneficiaries' demographics (age, race, and gender) and original reason for Medicare eligibility (age, disability, or ESRD) in our regression models, based on information in the Medicare enrollment database. We calculated age as of January 1, 2016, for baseline observations, and as of January 1, 2017, for observations in the intervention period. The exact age and race categories used in our regressions are described in Appendix 5.D.

We also controlled for dual eligibility status, based on information obtained from the Master Beneficiary Summary File (MBSF). Specifically, we used the DUAL_STATUS_CD variable in the MBSF during the last three months of 2015 and 2016 to define dual status for the baseline (2016) and intervention periods, respectively. We flagged a beneficiary as dually eligible, if this variable indicated either full or partial dually eligible status during any of those three months.[36]

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[36] We use dual eligibility status in the three months *prior to the measurement period* (baseline or intervention) as a control variable in order to avoid endogeneity concerns with using concurrent values of time-varying beneficiary characteristics. Using the *last three months* before the start of the measurement period for outcomes gives us of the closest approximation to dual status during the measurement period. Note that this approach differs from CMS's dual status specification for payment purposes in which concurrent month-by-month dual status is used to determine the appropriate risk score in the month.

5.D.   Regression approach

This Appendix describes the regression approach we used to estimate impacts on Medicare claims-based outcomes in this report. We used a difference-in-differences regression model to estimate impacts during the first year of CPC+, using data on 2017 starters and their matched comparison practices. In this Appendix, we first describe the study population and unit of observation in the regressions before discussing the regression model itself. We next describe the difference-in-differences estimation approach overall. Finally, we describe the subgroup analyses and sensitivity tests that we implemented to check for (1) differential effects of CPC+ on subgroups and (2) the robustness of the impact estimates on Medicare spending.

5.D.1. Study population and unit of observation in the regression analysis

Study population. We used a cross-sectional approach to define the study population, with two highly overlapping cross-sections for: (1) the baseline year (calendar year 2016) and (2) the first year of CPC+ (calendar year 2017). The study population is based on beneficiary attribution described in Appendix 5.A, and the annual cross-sections of beneficiaries for the baseline year and the first intervention year were based on quarterly attribution. See Table 5.D.1 below.

Table 5.D.1. Baseline and first intervention year cross-section definitions for study population

Cross-section	Study population definition
Baseline	Beneficiaries attributed to CPC+ or comparison practices at any time during the baseline year[a]
First intervention year	Beneficiaries attributed to CPC+ or comparison practices at any time during the first intervention year (2017)[b]

[a] The baseline period is January 1, 2016, to December 31, 2016, for the 14 regions that began in 2017. This baseline period definition is the same for any comparison practices matched to the CPC+ practices that started in 2017.

[b] The first intervention year is January 1, 2017, to December 31, 2017, for the regions that began in 2017. This intervention period definition is the same for any comparison practices matched to the CPC+ practices that started in 2017.

Assignment to the CPC+ or comparison groups, based on attribution. We assigned beneficiaries to the CPC+ or comparison groups at two points:

- For the **baseline period**, we assigned beneficiaries to the CPC+ or comparison group based on the first practice they were attributed to during the baseline period.

- During the **intervention period**, we assigned beneficiaries to the CPC+ or comparison group based on the first practice they were attributed to during the intervention period. For subsequent reports, following an intent-to-treat rule, we will continue to assign the beneficiary to that practice in all successive intervention years, regardless of whether the beneficiary continues to receive care at that practice.

Following these definitions, it is possible for a beneficiary to be in the study population (1) only during the baseline period—for example, if the beneficiary died during the baseline period or was no longer attributed to a CPC+ or comparison practice during the intervention period; or (2) only during the intervention period—for example, if the beneficiary was first attributed to a CPC+ or comparison practice during an intervention year (including people who

were new to Medicare). A large share of beneficiaries (79.8 percent) were included in both the baseline and intervention periods in our analysis, whereas 9.7 and 10.5 percent, respectively, were included only for the baseline year or the intervention year.

Unit of observation. The unit of observation in the regressions for almost all claims-based outcomes is the beneficiary-year. Each beneficiary has observations for as many years as he or she remains in the sample (as defined above) and can still be observed in claims. Specifically, to be observed, a beneficiary assigned to a practice for the baseline or the intervention period had to be alive, have both Part A and B Medicare fee-for-service (FFS) coverage with Medicare as the primary payer, and not be covered under a Medicare Advantage or other Medicare health plan.[37] This includes Medicare beneficiaries who were dually eligible for Medicaid.

Study population and unit of observation for readmissions analyses. For one outcome— 30-day readmissions per discharge—the study population and unit of observation differ from those used for the other outcomes. We estimated impacts of CPC+ on the probability that an index hospital admission was followed by a readmission within 30 days. In this case, the study population in each year includes only the subset of the full study population who had at least one index admission during that year. The unit of analysis is the index stay, rather than the beneficiary. Therefore, a beneficiary who had two index stays in the first intervention year has two observations in the first intervention year, one for each stay. Also, a readmission could qualify as an index stay if it meets the eligibility criteria for an index admission.

5.D.2. Model specification

Let i index the beneficiary, j index the practice, and t index time, where t ranges from 0 to 1, with 0 denoting the baseline year. Given the study population and unit of observation defined above, we estimated difference-in-differences regression models of the following form, with one regression for each outcome:

$$(2) \qquad y_{ijt} = \alpha + \beta X_{it} + \gamma_t p_t + \theta_t z_j p_t + b_j + \varepsilon_{ijt}$$

where

y_{ijt} represents a claims-based outcome variable for beneficiary i, in practice j, in year t. Outcome variables include total Medicare expenditures and measures of utilization such as hospitalizations. Table 5.C.1 in Appendix 5.C lists the outcomes.

X_{it} is a vector of characteristics of beneficiary i measured at the start of the baseline period for baseline observations, and at the start of the intervention period for intervention period observations. For example, beneficiary characteristics include demographics (age, race, and gender), variables capturing Medicare and Medicaid eligibility (that is, original reason for

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[37] As we describe in Appendix 5.A, we apply an additional criterion for a beneficiary not being incarcerated when we identify attributed patients, following CMS' approach to patient attribution. Once we attribute a patient to a CPC+ or a comparison practice based on all criteria in the attribution algorithm, the final analysis sample does not include the "not incarcerated" requirement in identifying the number of FFS eligible months for patients.

Medicare eligibility, and dual Medicare-Medicaid status), and hierarchical condition category (HCC) score. In future reports, we will also include HCC scores interacted with the year indicators (from Year 2 onward) to account for possible changes in the relationship between the HCC score measured at baseline and outcomes, as we include additional years of data in the model. We describe covariates in more detail in Section 5.D.5 below.

p_t (for "post") is an intervention-period indicator that takes the value of 1 during a specific intervention year, in this case Year 1, and 0 otherwise.

z_j is a binary indicator of intervention status or of being in a CPC+ practice; the indicator takes the value of 1 if practice j is a CPC+ practice, and is otherwise 0. The main effect of this indicator is not identified in this equation since it is collinear with the practice fixed effects.

b_j is a practice-level fixed effect for practice j, which controls for all time-invariant practice characteristics.

ε_{ijt} is the idiosyncratic error term. It represents unexplained variability in the outcome variable for beneficiary i, in practice j, during period t.

5.D.3. Model output and interpretation of key coefficients

In Equation (2), the intervention period-specific coefficients $\left(\gamma_t\right)$ capture changes experienced by the comparison group in each intervention-period interval. Note that, instead of assuming a linear time trend, we allowed the coefficients to vary for each interval. The set of interaction terms $\left(\theta_t z_j p_t\right)$ captures the difference in outcomes between the CPC+ and comparison groups for each intervention-period interval relative to that difference in the baseline period, adjusting for differences in (observed) beneficiary and (observed and unobserved) practice characteristics that remain after matching. Thus, the θ_t coefficients are the interval-specific impact estimates that capture whether the CPC+ intervention made a difference to an outcome of interest.

By estimating Equation (2) for the impact analysis in this report, we obtained an estimate of θ_t for the first year of CPC+, as well as regression-adjusted means for the baseline year and intervention Year 1, by intervention status. In subsequent annual reports with more than one intervention year, we will also estimate an alternative model that assumes a constant impact $_o$ across the entire intervention period, providing an average impact estimate across all intervention years. This overall or "cumulative" impact estimate will be used to summarize the program's impact over an extended period, for example, overall impact through Year 3.

Table 5.D.2 summarizes how we used the parameter estimates from Equation (2) to obtain the regression-adjusted CPC+ and comparison group means for the baseline and first intervention year, along with the difference-in-differences impact estimates for Year 1.

Table 5.D.2. Impact estimates and CPC+ and comparison group means based on a linear regression from Equation (2): a stylized representation

Year	CPC+ group mean	Comparison group mean	Difference between CPC+ and comparison means	Difference-in-differences impact estimate
Baseline year $(t=0)$ [reference period]	$\alpha + (\varphi)$	α	(φ)	N/A
First intervention year $(t=1)$	$\alpha + (\varphi) + \gamma_1 + \theta_1$	$\alpha + \gamma_1$	$(\varphi) + \theta_1$	θ_1

Notes: To highlight the key coefficients in Equation (2) above, we exclude the coefficients on beneficiary characteristics and practice characteristics in the expressions for the CPC+ and comparison group means in this table. The parameter φ in the table denotes the main effect of intervention status, or a coefficient on the indicator for being in a CPC+ practice. This term is not included in Equation (2), since this cannot be directly estimated, due to the inclusion of practice fixed effects in the model. We include this term in this table to illustrate the difference-in-differences approach but show it in parentheses since we do not obtain an estimate of φ. This parameter is differenced out in obtaining the impact estimate.

5.D.4. Model estimation

Separate regressions by track and by Medicare Shared Savings Program (SSP) status. For each Medicare claims-based outcome of interest, we estimated six separate regressions. We estimated impacts separately for Track 1 and Track 2, given that participating practices face track-specific requirements, payments, and incentives, which may yield very different impacts. Within each track, in addition to an overall estimate of CPC+, we also estimated impacts separately by SSP participation status at the start of CPC+ (January 1, 2017, for practices that started CPC+ in 2017).[38] The difference between CPC+ practices on their SSP participation status is an integral feature of the intervention in both tracks. Therefore, we matched on SSP status (see Appendix 5.B), and also examined impacts separately by SSP status within each track for all outcomes. For selected outcomes, we also estimated impacts separately for other key subgroups, by including additional interaction terms in the regression, as we describe below in Section 5.D.7.

Linear regression. For Medicare expenditures with and without care management fees, and for any other continuous expenditure outcomes, we estimated a linear regression. We also used linear regressions for (1) all service utilization outcomes (for example, hospitalizations, ED visits, and physician visits), which were measured as utilization counts per 1,000 beneficiaries per year; and (2) all binary outcomes (unplanned readmission within 30 days following a discharge, any hospice use, any advance care planning, mortality, and receipt of recommended services for beneficiaries with diabetes and for breast cancer screening). An alternative approach would have been to use generalized linear models to account for the distinctive distributional features of service use outcomes and use logistic regression for binary outcomes. However, from the perspective of computational feasibility, nonlinear models were expected to be much more

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[38] Practices may change their SSP status over the course of CPC+, but we do not control for this change, because participation in CPC+ may cause a practice to participate in (or drop out of) SSP.

resource- and time-intensive given the large sample sizes. Also, we were more likely to experience problems with model convergence with a nonlinear model, especially when using a specification with practice fixed effects, due to features in the data (for example, a binary outcome being equal to zero or one for all beneficiaries in a practice or for all beneficiaries with a certain combination of characteristics). Therefore, our preferred approach was to estimate linear regressions for all outcomes. We tested how much the choice of functional form might influence the results of our impact evaluation, and we found we obtained nearly identical point estimates of the difference-in-differences impacts using either linear or nonlinear models.[39]

Non-independence. All regressions accounted for non-independence across observations within the same practice using standard error estimates clustered at the practice level. Although this approach yields consistent standard error estimates, we considered alternatives for two reasons. First, because there is much stronger correlation across repeated observations from the same beneficiary than among beneficiaries receiving care from the same practice, we tested whether explicitly accounting for beneficiary-level clustering would improve standard error estimates. Second, we tested whether including fixed or random effects at the beneficiary or practice level could help guard against omitted-variable bias by controlling for any time-stable unmeasured beneficiary- or practice-level confounders. The detailed testing methods and results are in Appendix 3.A of the evaluation design report (Peikes et al. 2018b). We found that a model with practice-level fixed effects and standard error estimates clustered at the practice level provided the best performance in terms of the mean squared error of the difference-in-differences point estimate and the coverage of the confidence interval around this estimate.[40] Therefore, we decided to adopt this approach for our regressions in the first annual report. However, we are continuing to test additional models using an updated simulation approach. In future reports, we may consider switching to an alternative specification, depending on findings from the ongoing model testing.

Interpretation. We used regression output to calculate *p*-values for statistical inference. To minimize the probability of mistaking noise for signal when examining impacts in Year 1, we combined evidence from *p*-values with evidence from subgroup analyses, related outcomes, sensitivity tests, and the implementation analysis to reinforce or discount the interpretation of observed results.

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[39] In a sensitivity analysis comparing inference from two models that were identical except that one was a linear regression and the other was a zero-inflated negative binomial model, we found that across the four years of CPC Classic, the two approaches gave nearly identical point estimates of the difference-in-differences impact for a count variable of number of hospitalizations. The linear model's standard errors around those point estimates were about 10 percent larger than those from the zero-inflated negative binomial model. Therefore, using a linear model should provide us with similar point estimates as those from a more complex, maximum likelihood model, but slightly more conservative standard errors, potentially lowering the likelihood that a small to moderate-size effect is considered statistically significant.

[40] Although practice fixed effects account for part of the within-practice correlation in outcomes, they do not account for such correlation completely. Specifically, practice fixed effects assume a fixed degree of correlation between any two observations from the same practice. In reality, however, there could be differences in the degree of correlation arising due to beneficiaries being in the same practice versus correlation in outcomes over time for the same beneficiary in that practice (autocorrelation). Also, practice fixed effects do not account for heteroscedasticity. Therefore, using standard error estimates clustered at the practice level on top of practice fixed effects is likely to provide a more accurate estimate of the standard error for the impact estimates.

5.D.5. Control variables

Each regression controlled for beneficiary characteristics and practice fixed effects. When we looked at the intervention period, beneficiary-level control variables were measured directly before the start of CPC+ (that is, based on data from calendar year 2016). For observations in the baseline period (that is, calendar year 2016), beneficiary-level control variables were measured directly before the start of the yearlong baseline period (based on data from calendar year 2015). The practice fixed effects are indicators or dummy variables—one for each practice in the CPC+ and comparison groups. Including these effects controls for any inherent, time-invariant differences between the CPC+ and comparison practices—whether such differences are observed or unobserved. Including practice fixed effects ensured that we accounted for any remaining imbalance in the practice-level variables used in matching, and in any other unmeasured practice characteristics at baseline, when obtaining the difference-in-differences impact estimates.

Beneficiary-level control variables for Medicare analysis. Table 5.D.3 shows the beneficiary-level control variables used in the regressions. These control variables included demographics (age categories, race categories, and gender), chronic conditions, original reason for Medicare entitlement, dual eligibility status, and HCC score. For comprehensive risk adjustment, the regression additionally includes indicators for specific chronic conditions or HCCs that are prevalent in the CPC+ sample (collapsing categories where appropriate) defined by applying the HCC algorithm on Medicare claims. Given that we used a difference-in-differences approach, we did not include as control variables Medicare service use or expenditures during the baseline period, as is often done in a cross-sectional analysis. These baseline outcomes are the dependent variable for the baseline observations in our model and, therefore, cannot be viewed as independent of the error term.

Additional control variables for discharge-level outcomes. As we noted previously, our analysis for readmissions is at the discharge (rather than beneficiary) level. Therefore, the regression for this outcome included additional control variables. Specifically, we included indicators for conditions identified in inpatient episodes of care during the 12 months prior to the index admission as well as those present at admission (there are 31 such condition categories for this analysis). Given their similarity with HCCs, to avoid collinearity, we excluded the chronic condition controls for specific HCCs from the readmission regression, while retaining the controls for HCC score. We also controlled for whether the principal diagnosis or procedure associated with the index discharge is best classified as (1) medicine, (2) surgery, (3) cardiorespiratory, (4) cardiovascular, or (5) neurology.[41]

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[41] The 31 condition categories for the Medicare analysis include a range of diagnoses or risk factors, such as severe infection, metastatic cancer/acute leukemia, diabetes mellitus, end-stage liver disease, drug and alcohol disorders, congestive heart failure, chronic obstructive pulmonary disease, ulcers, cardiorespiratory failure or cardiorespiratory shock, acute renal failure, transplants, hip fracture/dislocation, and more. Our approach was based on reviewing standard models in the literature for risk-adjusting the likelihood of readmission, although it differed from other models in that we did not estimate a separate readmission equation for each of the specialty cohorts (medicine, surgery, cardiorespiratory or cardiovascular, or neurology), given our goal of estimating the impact of the intervention on the risk of all unplanned readmissions. The lookback period for these conditions is one to three years, depending on the condition, as specified in the Yale algorithm (YNHHSC/CORE 2017).

Table 5.D.3. Medicare beneficiary-level control variables for the difference-in-differences regressions

Baseline characteristic category	Variables

Demographics	Age categories
	    < 65
	    65–74 (reference category)
	    75–84
	    ≥ 85
	Race categories
	    White (reference category)
	    Black
	    Asian/Hispanic/American Indian/Alaska Native
	    Other/Unknown
	Gender (binary indicator for male)

Original reason for Medicare eligibility	Original Medicare eligibility categories
	    Age (reference category)
	    Disability only
	    ESRD only or ESRD with disability

Dual eligibility	Indicator for dual status (whether enrolled in Medicaid)
Chronic conditions	Indicators for 21 HCCs generated from HCC score model[a]
Risk score	HCC score Indicator for whether HCC score was imputed

Notes: Beneficiary-level control variables were measured either directly before the start of CPC+ (for the intervention-period observations) or directly before the start of the yearlong baseline period (for the baseline-period observations). The yearlong baseline period is 2016 for regions that started in 2017.

[a] We chose a subset (21) of the 79 HCCs created by the HCC model to include as control variables, based on the relative weight of specific HCCs in HCC score calculation as well as their prevalence in our analysis sample. See the list of HCCs included as chronic condition controls in Table 5.C.4 in Appendix 5.C.

ESRD = end-stage renal disease; FFS = fee for service; HCC = hierarchical condition category.

5.D.6. Weighting

We applied weights to the observations in the regressions to ensure that (1) beneficiaries who were observed for longer periods receive relatively more weight than those observed for shorter periods (using a Medicare enrollment weight) and (2) the CPC+ and comparison groups are comparable (using a matching weight). To achieve the first goal, for each beneficiary in each year, we calculated fractional enrollment weights that capture the share of months observed during that year. For this analysis, a beneficiary is observed during each month that he or she is alive and enrolled in Medicare FFS (enrolled in both Part A and Part B), has Medicare as the primary payer, and is not covered under a Medicare Advantage or other Medicare health plan.

As we describe in Appendix 5.B, we used an external comparison group as the main comparison group for the impact analysis of Medicare claims-based outcomes. For all analyses using this comparison group, the matching weight was the same as the covariate-balancing propensity score-based weights used to balance the CPC+ and comparison practices on their baseline characteristics.

The final composite weight for beneficiaries in the comparison group was the product of (1) the enrollment weight, and (2) the matching weight. For beneficiaries in the CPC+ group, we needed only the enrollment weight because, by construction, the matching weight for each CPC+ beneficiary is one.

Regressions for most outcomes incorporated these final composite weights—that is, the product of the enrollment weight and the matching weight—for CPC+ and comparison beneficiaries in each baseline and intervention period interval. Regressions for discharge-level measures, such as readmissions, incorporated only the matching weight; the enrollment weight was unnecessary, because these regressions included beneficiaries only if they were enrolled in Medicare FFS during the full month following the discharge.[42] For certain binary outcome measures defined at the beneficiary level—for example, whether a beneficiary received hospice services or whether a beneficiary had a face-to-face visit in which advance care plans were discussed with a physician or other qualified health professional—we used the composite weight, but after recoding the enrollment weight to account for truncation. Specifically, the enrollment weight was recoded to a value of one if the outcome was observed and was equal to the enrollment weight (accounting for possible truncation) if the outcome was not observed. For the diabetes process-of-care quality measures, we restricted the analysis to beneficiaries with diabetes who had Medicare FFS enrollment the whole year; the enrollment weight, therefore, was equal to one.

5.D.7. Variation in effects among subgroups of beneficiaries and practices

As we discuss above, within each track, we estimated impacts separately by baseline SSP status of practices to investigate whether participating in both CPC+ and an SSP Accountable Care Organization had a different impact than participating in CPC+ alone. Given that SSP participation is a critical dimension on which participating CPC+ practices differ, we estimated these separate regressions, by SSP status, for all outcomes.

In addition, the impacts of CPC+ could differ for different types of beneficiaries and practices, based on other baseline characteristics. Therefore, for selected outcomes, we estimated the effects of the program on *subsets of beneficiaries* for whom CPC+ is likely to have especially large effects, such as the chronically ill and other patients with complex health conditions (Brown et al. 2012; Rich et al. 2012). We also examined effects for different *types of practices*, such as those that had a larger number of primary care practitioners, had participated in prior primary care transformation initiatives at baseline, or were owned by a hospital or health system. For these subgroup analyses, we included in the regressions interactions of variables denoting subgroup membership with the indicator for CPC+ versus comparison status, the intervention year indicator, and the CPC+ indicator interacted with the intervention year indicator. Because there is likely to be significant correlation among practice characteristics, for example, between practice size and ownership, testing for differential effects for each practice characteristic separately may not unmask the real drivers of significant differences. Therefore, for the practice subgroup analysis, we included interactions with subgroup indicators for *all* practice

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[42] The only exception is that the regression retains beneficiaries who die during the month following the discharge.

characteristics in a single regression to disentangle which characteristics actually influence program impacts.[43]

Practice-level subgroups. We estimated differential effects for subgroups defined at baseline by various characteristics, as shown in Table 5.D.4.

Table 5.D.4. Practice-level subgroups

Subgroup definitions	Why potentially important to CPC+
Whether the practice had participated in prior primary care transformation initiatives—defined as participation in CPC Classic or the Multi-Payer Advanced Primary Care Practice demonstration, or NCQA, TJC, AAAHC, URAC, or state medical-home recognition status	Practices with participation in prior primary care transformation initiatives may be more advanced and, as a result, may require less time and resources to make changes at the start of CPC+. On the other hand, these practices may have less room for improvement after their prior practice transformation experience.
Practice size, as defined by the number of primary care practitioners (1–2, 3–5, 6 or more)	Larger practices will likely have access to greater resources and better medical infrastructure. Smaller practices may, on the other hand, have greater flexibility to implement changes more rapidly.
Whether the practice was multi-specialty	Multi-specialty practices face different financial incentives and economies of scale.
Practice ownership by a hospital or a health system	Practices owned by a hospital or health system will likely have access to greater resources and better medical infrastructure. These practices may also face different financial incentives and economies of scale.
The year in which the first practitioner in the practice attested as a meaningful user of health IT (never, between 2011–2012, or between 2013–2015)	The Medicare EHR Incentive Programs, also known as meaningful use, started in 2011 and ended in 2016. Meaningful ese attestation rates went up a lot between 2011 and 2016, and practices that attested earlier to meaningful ese are likely more advanced.
Whether the practice was in a rural, suburban, or urban area	Practices in more urban areas will likely have access to greater resources and better medical infrastructure than those in rural areas.

AAAHC = Accreditation Association for Ambulatory Health Care; IT = information technology; NCQA = National Committee for Quality Assurance; TJC = The Joint Commission; URAC = Utilization Review Accreditation Commission.

Beneficiary-level subgroups. When analyzing differential impacts by subsets of beneficiaries, we considered high-risk subgroups based on HCC score or by CPC+ Tier 4 (and Tier 5 status for Track 2 practices). In addition, we tested for differential effects on high-risk beneficiaries using additional subgroup definitions based on Medicare claims data. Table 5.D.5 summarizes the beneficiary subgroups we defined, along with our rationale for doing so.

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[43] Given the high degree of overlap between certain beneficiary subgroups—for example, between those above the 75th percentile of the HCC score distribution and those above the 90th percentile—we did not include interactions with all beneficiary subgroup definitions in a single regression. Table 5.D.6 and 5.D.7 indicate the extent of overlap between the beneficiary subgroups in Tracks 1 and 2, respectively.

Table 5.D.5. Beneficiary subgroups

Subgroup definitions	Why potentially important to CPC+
Patients in the highest quartile of the distribution of HCC score (both Track 1 and Track 2), or patients who either were in the highest decile of the distribution of HCC score or had dementia (both Track 1 and Track 2)	Patients with high HCC scores and/or those with dementia are at greater risk of incurring high health care expenditures. Also, these high-risk definitions are based on CMS' criteria for identifying beneficiaries in risk Tier 4 and risk Tier 5.[a]
Patients with behavioral health conditions (HCCs for schizophrenia or major depressive, bipolar, and paranoid disorders, or drug/alcohol psychosis or drug/alcohol dependence)	Behavioral health conditions are among the costliest health conditions and key drivers of health care utilization.
Patients with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions,[b] who also had at least one hospitalization in the year before the start of CPC+	Beneficiaries with multiple chronic conditions who have also experienced relatively recent hospitalizations are among the highest risk beneficiaries.
Patients who were also eligible for Medicaid (dually eligible)	Dually eligible beneficiaries typically have higher health care utilization and higher costs than those who are not dually eligible.

[a] CMS' approach for identifying Tier 4 and Tier 5 high-risk beneficiaries differs from the approach we used in the impact analysis. Specifically, CMS includes the entire Medicare population in each CPC+ region, and uses the region-specific distribution of HCC scores to identify the 75th and 90th percentiles of the distribution. For the impact analysis, we identified the high-risk HCC cutoffs by looking at the distribution of HCC scores among Medicare beneficiaries in our final analytic sample, and across all regions. Also, CMS identifies Tier 5 patients for Track 2 only, whereas we ran separate subgroup analyses for Tier 4 and Tier 5 for both Track 1 and Track 2 practices.

[b] The 12 frequently occurring chronic conditions we used in this definition are: congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, ischemic heart disease, diabetes, severe cancer, stroke, depression, dementia, atrial fibrillation, rheumatoid arthritis or osteoarthritis, and chronic kidney disease.

CMS = Centers for Medicare & Medicaid Services; HCC = hierarchical condition category.

Tables 5.D.6 and 5.D.7 list the percentage of beneficiaries in each subgroup that we examined (those described in Table 5.D.5) and the extent of overlap in the beneficiary subgroups by CPC+ versus comparison status and time period for each track. The percentage of beneficiaries in each subgroup was very similar in each track, in the CPC+ and comparison groups, and in each time period. As we would expect, about 25 percent of the beneficiaries were in the highest quartile of the distribution of HCC scores, and 15 percent of the beneficiaries were either in the highest decile of HCC scores or had dementia. The percentage of beneficiaries with multiple chronic conditions and at least one hospitalization in the prior year varied from 7 to 8 percent and declined by 1 percentage point from baseline to follow-up for both CPC+ and comparison beneficiaries in Track 2. There was a 2 percentage point increase in beneficiaries diagnosed with behavioral health conditions in the CPC+ group in Track 1 (from 8 to 10 percent) from baseline to follow-up. We see a similar increase (of 1 percentage point) over time for the comparison beneficiaries in Track 1 and both CPC+ and comparison beneficiaries in Track 2. Finally, 13 to 16 percent of the beneficiaries were also eligible for Medicaid (duals). Duals have a slightly higher representation in the comparison group relative to CPC+ practices in both tracks (15 to 16 percent in comparison practices versus 13 percent for CPC+ practices), and this difference remained from the baseline to the follow-up period.

As expected, considerable overlap exists in the two beneficiary subgroups based on HCC scores and dementia: roughly half (48 to 49 percent) of beneficiaries in the highest quartile of the distribution of HCC scores were either in the highest decile of the distribution of HCC scores or had dementia. Beneficiaries with multiple chronic conditions and at least one hospitalization in the prior year account for 25 to 30 percent of the beneficiaries in the highest quartile of the distribution of HCC scores. Those beneficiaries also account for 33 to 40 percent of the beneficiaries who were either in the highest decile of HCC scores or had dementia, with the extent of overlap higher at baseline. Patients with behavioral health conditions represent 17 to 22 percent of beneficiaries who were in the highest quartile or decile of the distribution of HCC scores or had dementia. Those patients also represent 22 to 26 percent of the beneficiaries with multiple chronic conditions and at least one hospitalization in prior year, with the overlap increasing from baseline to follow-up. This finding is consistent with the general increase in the percentage of beneficiaries with the conditions noted above. The percentage of beneficiaries with behavioral health conditions who were dually eligible was considerably higher (34 to 39 percent for CPC+ beneficiaries and 40 to 44 percent for the comparison beneficiaries) than the somewhat comparable percentage of duals represented in the other three beneficiary subgroups (21 to 26 percent).

Table 5.D.6. Overlap in beneficiary subgroups, Track 1 2017 starters

	Period: 2016 (baseline) 2017 (follow-up)	Group: CPC+ or comparison	Patients in the highest quartile of the distribution of HCC score	Patients in the highest decile of the distribution of HCC score or those who had dementia	Patients with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions, who also had at least one hospitalization in the previous year	Patients with behavioral health conditions	Patients who were also eligible for Medicaid	Total number (percentage of all beneficiaries in the analysis sample in the period and group)
Patients in the highest quartile of the distribution of HCC score	2016	CPC+		105,423 (48)	65,835 (30)	37,609 (17)	46,962 (21)	218,554 (25)
	2016	Comparison		350,590 (48)	214,299 (29)	135,565 (19)	189,450 (26)	726,897 (25)
	2017	CPC+		112,421 (49)	58,402 (26)	46,346 (20)	48,798 (21)	228,828 (26)
	2017	Comparison		365,456 (49)	187,172 (25)	156,053 (21)	192,236 (26)	749,345 (25)
Patients in the highest decile of the distribution of HCC score or those who had dementia	2016	CPC+			53,209 (40)	24,126 (18)	29,307 (22)	132,702 (15)
	2016	Comparison			173,160 (39)	84,549 (19)	116,076 (26)	441,317 (15)
	2017	CPC+			47,652 (34)	29,908 (21)	30,885 (22)	140,406 (16)
	2017	Comparison			152,072 (33)	98,557 (21)	119,990 (26)	459,096 (16)
Patients with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions, who also had at least one hospitalization in the previous year	2016	CPC+				16,195 (22)	15,747 (22)	72,653 (8)
	2016	Comparison				54,835 (23)	59,603 (25)	236,224 (8)
	2017	CPC+				16,100 (25)	13,382 (21)	64,079 (7)
	2017	Comparison				51,650 (25)	49,850 (24)	204,967 (7)
Patients with behavioral health conditions	2016	CPC+					27,887 (39)	72,419 (8)
	2016	Comparison					116,405 (44)	265,616 (9)
	2017	CPC+					31,079 (36)	87,231 (10)
	2017	Comparison					123,588 (41)	301,437 (10)
Patients who were also eligible for Medicaid	2016	CPC+						111,965 (13)
	2017	Comparison						458,984 (16)
	2016	CPC+						113,642 (13)
	2017	Comparison						461,565 (16)

Notes: The percentages in parentheses in each cell represent the fraction of the total number of beneficiaries in the row subgroup that are common with the beneficiaries in the column subgroup. For example, the first row shows that among CPC+ practices in 2016, there are 105,423 beneficiaries in the highest quartile of the distribution of HCC scores who are also in the highest decile of the distribution of HCC scores or have dementia. These overlapping 105,423 beneficiaries represent 48 percent of all beneficiaries in the highest quartile of the distribution of HCC scores (row subgroup) in CPC+ practices in 2016.

In the last column, we show the total number of beneficiaries in the row subgroup for CPC+ or comparison practices by time period (2016 or 2017). The percentages in the parentheses in this column represent the fraction of the beneficiaries in the analysis sample that belong to the row subgroup.

HCC = hierarchical condition category.

Table 5.D.7. Overlap in beneficiary subgroups, Track 2 2017 starters

	Period: 2016 (baseline) 2017 (follow-up)	Group: CPC+ or comparison	Patients in the highest quartile of the distribution of HCC score	Patients in the highest decile of the distribution of HCC score or those who had dementia	Patients with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions, who also had at least one hospitalization in the previous year	Patients with behavioral health conditions	Patients who were also eligible for Medicaid	Total number (percentage of all beneficiaries in the analysis sample in the period and group)
Patients in the highest quartile of the distribution of HCC score	2016	CPC+		128,906 (48)	80,998 (30)	49,329 (18)	57,090 (21)	267,115 (25)
	2016	Comparison		296,824 (48)	182,908 (30)	113,997 (18)	153,813 (25)	617,124 (25)
	2017	CPC+		137,773 (49)	72,173 (26)	60,159 (22)	58,510 (21)	279,788 (26)
	2017	Comparison		309,834 (49)	159,947 (25)	130,379 (21)	155,520 (24)	635,490 (25)
Patients in the highest decile of the distribution of HCC score or those who had dementia	2016	CPC+			65,363 (40)	31,026 (19)	35,538 (22)	161,939 (15)
	2016	Comparison			147,644 (40)	71,369 (19)	94,611 (25)	372,536 (15)
	2017	CPC+			58,414 (34)	38,137 (22)	37,276 (22)	172,206 (16)
	2017	Comparison			130,031 (34)	82,637 (21)	97,415 (25)	387,652 (15)
Patients with multiple chronic conditions, specifically at least 2 of 12 frequently occurring chronic conditions, who also had at least one hospitalization in the previous year	2016	CPC+				20,602 (23)	19,101 (21)	89,288 (8)
	2016	Comparison				46,346 (23)	49,021 (24)	201,693 (8)
	2017	CPC+				20,542 (26)	16,284 (21)	79,237 (7)
	2017	Comparison				43,615 (25)	40,781 (23)	175,221 (7)
Patients with behavioral health conditions	2016	CPC+					35,542 (38)	94,389 (9)
	2016	Comparison					94,544 (43)	221,614 (9)
	2017	CPC+					38,745 (34)	113,695 (10)
	2017	Comparison					99,888 (40)	250,042 (10)
Patients who were also eligible for Medicaid	2016	CPC+						135,938 (13)
	2017	Comparison						369,694 (15)
	2016	CPC+						136,651 (13)
	2017	Comparison						369,996 (15)

Notes: The percentages in parentheses in each cell represent the fraction of the total number of beneficiaries in the row subgroup that are common with the beneficiaries in the column subgroup. For example, the first row shows that among CPC+ practices in 2016, there are 128,906 beneficiaries in the highest quartile of the distribution of HCC scores who are also in the highest decile of the distribution of HCC scores or have dementia. These overlapping 128,906 beneficiaries represent 48 percent of all beneficiaries in the highest quartile of the distribution of HCC scores (row subgroup) in CPC+ practices in 2016.

In the last column, we show the total number of beneficiaries in the row subgroup for CPC+ or comparison practices by time period (2016 or 2017). The percentages in the parentheses in this column represent the fraction of the beneficiaries in the analysis sample that belong to the row subgroup.

HCC = hierarchical condition category.

5.D.8. Sensitivity tests and exploratory analysis

We calculated alternative estimates as robustness checks of the main impact estimates on Medicare expenditures. Specifically, we assessed the sensitivity of our results to changes in the following key elements of our estimation approach: (1) definition of the beneficiary sample, (2) modeling assumptions, (3) length of the baseline period, and (4) definition of outcome variables. We describe the motivation for each sensitivity test in Table 5.D.8.

When results from the sensitivity tests were inconsistent with results from our main analysis, we incorporated that information into our discussion and interpretation of findings. We assessed the conditions under which the alternative estimates would be preferred, and the likelihood that those conditions were met.

Table 5.D.8. Sensitivity tests

Sensitivity test	Motivation
Altering the composition of the beneficiary sample[a]	
Instead of using a baseline sample, use sample of beneficiaries attributed during the intervention, and control for their baseline characteristics and outcomes.	The main advantage of this approach is that it helps adjust for changes in sample composition over time that may differ for the CPC+ and comparison groups. Rather than using a difference-in-differences model, we use a straight differences model, including baseline outcomes as beneficiary-level covariates. This approach should greatly improve the R-squared of the model (by including strong predictors of future outcomes), improving the precision of impact estimates. It should also account for any modest differences in baseline outcomes between the CPC+ and comparison groups that result from changes in sample composition over time and/or imperfect matching at baseline.
Altering the modeling assumptions	
For analysis of expenditures, use a generalized linear model with log link.	Accounts for skewed expenditure distribution.
Altering length of baseline period	
Use two instead of one pre-intervention years in the baseline period	Tests whether impact estimates are sensitive to using a longer baseline period and whether there are differences in trends prior to CPC+ for CPC+ and comparison practices.
Definition of outcome measures	
Log-transform the total Medicare expenditures variable (generating impact estimates in percentage terms)	Reduces influence of high-cost cases; accounts for skewed expenditure distribution.
Trim expenditures at 98th percentile	Reduces influence of high-cost cases.
Examine impacts on a beneficiary-level readmission outcome, defined as the probability of being admitted and readmitted during a year	Removes concerns about possible endogeneity in analysis of readmissions, which can arise if CPC+ alters the probability of an index admission. In that case, the analysis of the discharge-level readmission measure would be biased, because CPC+ may have prevented hospitalizations that would have been at lower relative risk of a readmission.

[a] In future reports with additional intervention years, we will add another sensitivity test that holds sample composition fixed within the baseline period and also the intervention period. Specifically, we will examine impacts separately for Medicare beneficiaries attributed in the first quarter of the baseline year and the first quarter of the intervention year. This will remove effects that may be due to differences over time in sample addition between the CPC+ and comparison groups, because different types of beneficiaries may be attracted over time to receive care at CPC+ practices or be attributed over time to CPC+ practices given possible shifts to non-billable visits.

5.E.   Bayesian Analysis

This appendix describes the Bayesian analysis we used to estimate the probability of true CPC+ impacts on Medicare expenditures.

Analogous to the main analysis, we used a difference-in-differences regression model to estimate impacts during the first year of CPC+, using data on 2017 starters. In this Appendix, we first explain the benefits of using this Bayesian approach and then describe the regression equation. We next describe the Bayesian prior distributions. Finally, we describe our computational approach.

5.E.1. Benefits of the Bayesian paradigm

In this setting, the Bayesian paradigm offers two primary advantages. First, it offers the ability to draw probabilistic conclusions through statements such as, "*There is a 60 percent chance that CPC+ reduced Medicare expenditures by 5 percent or more in Track 2.*" In this report, we present the results of the Bayesian analysis using the probabilities of achieving enough saving to offset the care management fees in each track. Second, when estimating CPC+ impacts in subgroups of practices, it "borrows strength," or shares information across related subgroups, which increases statistical power and provides a built-in correction for multiple comparisons.

5.E.2. Regression equation

The Bayesian impact analysis used the same data and largely the same regression equation as the main analysis of subgroup impacts on total Medicare expenditures. We estimated overall impact estimates as a weighted average of subgroup-specific impacts, with weights equal to the relative sizes of the subgroups. For each track, we estimated the following regression equation:

$$(3) \qquad y_{ijt} = \beta^B X_{it}^B + \beta^P X_{jt}^P + \gamma_{g[j]t} + \phi_{g[j]} z_j + \theta_{g[j]} z_j p_t + a_i + b_j + c_{jt} + \varepsilon_{ijt}$$

In this equation, as in the main analysis, y_{ijt} represents the outcome of interest, total Medicare expenditures without CPC+ payments (but with Comprehensive Primary Care Payments for Track 2 practices), measured for beneficiary *i* attributed to practice *j* in year *t*. The subscript $g[j]$ refers to the subgroup *g* to which practice *j* belongs—for example, whether the practice had participated in prior primary care transformation initiatives. The full list of practice subgroups is in Appendix 5.D.

The vectors X_{it}^B and X_{jt}^P, respectively, represent characteristics of beneficiary *i* and practice *j*. As in the main analysis, z_j is a binary indicator of being in a CPC+ practice, and p_t (for "post") is an intervention-period indicator. The hierarchical model also includes beneficiary, practice, and practice-time random effects a_i, b_j, and c_{jt}, which account for clustering at these levels. For example, a_i is a random effect for beneficiary *i* that captures clustering of the

beneficiary's pre- and post-intervention observations. A positive value of a_i would reflect that beneficiary i's regression-adjusted expenditures are consistently higher than average, and a negative value would reflect that they are consistently lower. Finally, the regression includes an error term, ε_{ijt}.

As in the frequentist regression with practice subgroup interactions, the γ_{gt} parameters capture subgroup-specific secular time trends, and the ϕ_g terms are subgroup-specific baseline differences between CPC+ practices and comparison practices. The difference-in-differences coefficient θ_g gives the impact of CPC+ in subgroup g.

As in the main analysis, we applied weights to the observations in the regressions to ensure that (1) beneficiaries who were observed for longer periods receive relatively more weight than those observed for shorter periods (using a Medicare enrollment weight) and (2) the CPC+ and comparison groups are comparable (using a matching weight).

5.E.3. Prior distributions

In the Bayesian paradigm, we put a prior distribution on each parameter in the model, specifying our assumptions about these parameters. These assumptions describe the plausible range of values for each parameter and for assumed relationships in the data—for example, the correlation of outcomes between observations of the same beneficiary in different time periods. We used three types of prior distributions in this analysis.

Evidence-based prior distribution for the overall impact of CPC+. Until recently, the guidance in the statistical literature has been to default to uniform, or "flat," prior distributions, which assign equal probability to every value in a given range (see, for example, Gelman 2006). Many analysts might prefer these distributions because they appear to exert less influence on the results. However, flat prior distributions for program impacts make the implausible assumption that huge savings, huge cost increases, and no effect at all are equally likely impacts; for impact estimates in particular, this assumption can lead to improbably extreme conclusions (Gelman et al. 2008). Therefore, placing equal weight on these extreme values regarding the impact of CPC+ would fail to adjust for implausible impact estimates and probability statements.

Based on current guidance in the statistical literature, we moderated this assumption and instead chose a normal prior distribution for the overall impact of CPC+ (θ^{CPC+}). We set the mean of this normal prior distribution to zero, to remain agnostic about whether the intervention will prove successful. We set the standard deviation equal to 5 percent of the comparison group baseline mean to rule out extreme values of the impact, based on the general result that we have not found any intervention designed to reduce total Medicare fee-for-service (FFS) expenditures that has obtained very large estimated effects in a rigorous evaluation. For example, the evaluation of CPC Classic found a not statistically significant 1 percent reduction in Medicare FFS expenditures without fees, and a not statistically significant 1 percent increase with fees (Peikes et al. 2018a; 2018c). A systematic review of primary care transformation initiatives funded by the Center for Medicare & Medicaid Innovation did not find that any of the initiatives were statistically significantly different from CPC Classic in savings, and the average impact for

22 specific programs within the systematic review was a 1 percent reduction in expenditures (Cohen et al. 2018). Only 4 of the 22 programs significantly reduced expenditures with a maximum of 12 percent for one program, and 4 programs significantly increased expenditures with a maximum of 25 percent for one program.

This prior distribution implies that impacts are unlikely (31.7 percent chance) to exceed 5 percent of the mean, very unlikely (4.5 percent chance) to exceed 10 percent of the mean, and exceedingly unlikely (0.3 percent chance) to exceed 15 percent of the mean. We conducted a sensitivity analysis that was even more skeptical, with a prior standard deviation equal to 1 percent of the mean, implying a 31.7, 4.5, and 0.3 percent chance of impacts exceeding 1, 2, and 3 percent of the mean, respectively. We also conducted two sensitivity analyses that were less skeptical. The first had a prior standard deviation equal to 10 percent of the mean, implying a 31.7, 4.5, and 0.3 percent chance of impacts exceeding 10, 20, and 30 percent of the mean, respectively; the second used a flat prior. We include the flat prior for comparison, but we caution the reader against taking the resulting probability statements at face value, since this prior can lead to overly optimistic (anticonservative) probability statements (Gelman 2015).

- **Shrinkage prior distributions.** Given the large number of parameters being estimated in this model, some based on relatively sparse data, shrinkage prior distributions were crucial for reining in implausible values and correcting for multiple comparisons. For example, we used a shrinkage prior distribution to induce borrowing of strength across the subgroup-specific impacts θ_g. This implied that the estimated impact in each subgroup g leveraged information from the overall impact θ^{CPC+} to increase statistical power. We also used a shrinkage prior distribution for each batch of random effects.

- **Default weakly informative prior distributions.** For the rest of the model parameters, we used default weakly informative prior distributions that allow for a wide, but realistic, range of possible values.[44]

5.E.4. Computational approach

Given the size of the CPC+ beneficiary sample, we were not able to fit the impact estimation model directly to the beneficiary-level data set. Instead, we used a two-stage estimation procedure that closely approximates the Bayesian model described above. The first-stage analysis is a beneficiary-level propensity-score-weighted risk-adjustment fit using hierarchical linear regression in the Julia programming language (v1.0.0; Bezanson et al. 2017). The goal of the first-stage analysis is to (1) aggregate beneficiaries to the practice level and (2) risk-adjust to enable comparisons across practices that have different case mixes. We used the risk-adjusted practice-level output from Stage 1 or Equation (4) below as data in Stage 2 or Equation (5), which estimated the impact of CPC+ in a Bayesian difference-in-differences framework by calling the Stan programming language through its RStan interface (v2.17.3; Stan Development Team 2018). We used the following two regression equations to implement this approach.

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[44] This type of prior distribution is considered a best practice (for example by the Stan development team; see https://github.com/stan-dev/stan/wiki/Prior-Choice-Recommendations).

(4) $y_{ijt} = \beta^B X_{it}^B + a_i + C_{jt} + \varepsilon_{ijt}$

(5) $\hat{C}_{jt} = \beta^P X_{jt}^P + \gamma_{g[j]t} + \phi_{g[j]} z_j + \theta_{g[j]} z_j p_t + b_j + c_{jt}$

Note that if you "plug in" $\hat{C}$ from Equation (5) for C in Equation (4), you recover the full impact estimation model given in Equation (3).

5.F. Detailed tables with impact estimates, including 90% confidence intervals and *p*-values

Table 5.F.1. Regression-adjusted means and estimated impact of CPC+ on selected Medicare expenditures outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 1 2017 Starters

	Track 1 – Overall						Track 1 – SSP						Track 1 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	*p*-value
Medicare expenditures (per beneficiary per month)																		
Total Medicare Part A and B expenditures excluding enhanced CPC+ payments																		
Baseline	$880	$883	NA	NA	NA	NA	$906	$904	NA	NA	NA	NA	$854	$861	NA	NA	NA	NA
Year 1	$882	$882	$3.1 ($3.4)	0.3%	(-$2.4, $8.6)	0.358	$906	$905	-$0.1 ($4.6)	0.0%	(-$7.6, $7.5)	0.989	$857	$857	$6.4 ($5.0)	0.7%	(-$1.8, $14.6)	0.196
Total Medicare Part A and B expenditures including CPC+ care management fees																		
Baseline	$880	$883	NA	NA	NA	NA	$906	$904	NA	NA	NA	NA	$854	$861	NA	NA	NA	NA
Year 1	$896	$882	$16.9*** ($3.4)	1.9%***	($11.4, $22.4)	0.000	$920	$905	$13.9*** ($4.6)	1.5%***	($6.3, $21.4)	0.002	$870	$857	$20.1*** ($5.0)	2.3%***	($11.9, $28.3)	0.000
Total Medicare Part A and B expenditures including CPC+ care management fees and CPC+ Performance-based Incentive Payments																		
Baseline	$880	$883	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$854	$861	NA	NA	NA	NA
Year 1	$897	$882	$17.5*** ($3.4)	2.0%***	($12.0, $23.1)	0.000	NA	NA	NA	NA	NA	NA	$872	$857	$21.4*** ($5.0)	2.5%***	($13.3, $29.6)	0.000
Total Medicare Part A and B expenditures including CPC+ care management fees, CPC+ Performance-based Incentive Payments, and shared savings payments to SSP ACOs																		
Baseline	$883	$885	NA	NA	NA	NA	$910	$908	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Year 1	$899	$884	$17.7*** ($3.4)	2.0%***	($12.2, $23.3)	0.000	$926	$909	$14.1*** ($4.6)	1.5%***	($6.6, $21.7)	0.002	NA	NA	NA	NA	NA	NA
Medicare expenditures by service category (per beneficiary per month)																		
Inpatient expenditures																		
Baseline	$311	$318	NA	NA	NA	NA	$318	$322	NA	NA	NA	NA	$303	$314	NA	NA	NA	NA
Year 1	$310	$315	$2.3 ($2.3)	0.7%	(-$1.5, $6.0)	0.319	$317	$320	$0.2 ($3.0)	0.1%	(-$4.8, $5.1)	0.957	$302	$309	$4.6 ($3.4)	1.5%	(-$1.1, $10.2)	0.184
Outpatient expenditures																		
Baseline	$165	$169	NA	NA	NA	NA	$164	$168	NA	NA	NA	NA	$167	$171	NA	NA	NA	NA
Year 1	$171	$175	$0.2 ($0.8)	0.1%	(-$1.2, $1.6)	0.819	$170	$174	$0.3 ($1.1)	0.2%	(-$1.6, $2.1)	0.810	$172	$177	$0.1 ($1.3)	0.1%	(-$2.0, $2.2)	0.924
Expenditures on physician and nonphysician Part B noninstitutional services in any setting																		
Baseline	$253	$242	NA	NA	NA	NA	$268	$254	NA	NA	NA	NA	$238	$229	NA	NA	NA	NA
Year 1	$255	$244	-$0.3 ($0.8)	-0.1%	(-$1.6, $1.0)	0.695	$269	$256	-$1.5 ($1.1)	-0.6%	(-$3.3, $0.2)	0.156	$241	$231	$1.0 ($1.1)	0.4%	(-$0.9, $2.9)	0.397
Expenditures on ambulatory visits with primary care physicians																		
Baseline	$24	$25	NA	NA	NA	NA	$24	$25	NA	NA	NA	NA	$24	$24	NA	NA	NA	NA
Year 1	$25	$25	-$0.2** ($0.1)	-0.8%**	(-$0.4, $0.0)	0.043	$25	$26	-$0.2 ($0.1)	-0.8%	(-$0.4, $0.0)	0.120	$24	$25	-$0.2 ($0.1)	-0.8%	(-$0.4, $0.1)	0.200

Table 5.F.1. *(continued)*

	Track 1 – Overall						Track 1 – SSP						Track 1 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value
Expenditures on ambulatory visits with specialists																		
Baseline	$26	$25	NA	NA	NA	NA	$29	$26	NA	NA	NA	NA	$24	$23	NA	NA	NA	NA
Year 1	$26	$24	$0.0 ($0.1)	0.1%	(-$0.1, $0.1)	0.813	$28	$26	-$0.2* ($0.1)	-0.6%*	(-$0.3, $0.0)	0.060	$23	$22	$0.2** ($0.1)	0.9%**	($0.1, $0.4)	0.014
Skilled nursing home expenditures																		
Baseline	$67	$68	NA	NA	NA	NA	$71	$72	NA	NA	NA	NA	$63	$64	NA	NA	NA	NA
Year 1	$64	$65	$0.3 ($0.7)	0.5%	(-$0.9, $1.4)	0.676	$68	$69	$0.0 ($1.0)	0.1%	(-$1.5, $1.6)	0.961	$60	$60	$0.5 ($1.0)	0.8%	(-$1.2, $2.2)	0.617
Home health expenditures																		
Baseline	$39	$41	NA	NA	NA	NA	$40	$44	NA	NA	NA	NA	$39	$38	NA	NA	NA	NA
Year 1	$38	$40	-$0.3 ($0.3)	-0.9%	(-$0.8, $0.1)	0.239	$38	$42	-$0.2 ($0.4)	-0.4%	(-$0.8, $0.5)	0.689	$37	$37	-$0.5 ($0.4)	-1.4%	(-$1.2, $0.1)	0.193
Hospice expenditures																		
Baseline	$23	$24	NA	NA	NA	NA	$22	$25	NA	NA	NA	NA	$23	$23	NA	NA	NA	NA
Year 1	$24	$24	$1.1*** ($0.4)	4.6%***	($0.4, $1.7)	0.009	$24	$25	$1.5*** ($0.5)	6.5%***	($0.6, $2.4)	0.007	$24	$24	$0.6 ($0.6)	2.6%	(-$0.4, $1.6)	0.305
Durable medical equipment expenditures																		
Baseline	$22	$21	NA	NA	NA	NA	$22	$20	NA	NA	NA	NA	$22	$21	NA	NA	NA	NA
Year 1	$20	$19	-$0.1 ($0.3)	-0.3%	(-$0.5, $0.3)	0.789	$20	$19	-$0.3 ($0.3)	-1.6%	(-$0.9, $0.2)	0.330	$21	$20	$0.2 ($0.4)	1.0%	(-$0.4, $0.9)	0.577
Sample sizes																		
Number of practices	1,373	5,247					738	2,981					635	2,266				
Number of beneficiaries	1,039,783	3,455,337					536,943	2,012,629					504,756	1,453,322				
Number of beneficiary-years	1,771,336	5,859,953					910,522	3,409,405					860,814	2,450,548				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in Year 1 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. Expenditures on Part B noninstitutional services include expenditures on primary care ambulatory visits, ambulatory visits to specialists, and non-ambulatory physician visits, as well as services provided by other noninstitutional providers (the third category is not shown separately).

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

[a] We calculated percentage impacts relative to what the CPC+ mean would be in Year 1 in the absence of the intervention, i.e., the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; FFS = fee-for-service; NA = not applicable; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.F.2. Regression-adjusted means and estimated impact of CPC+ on selected service utilization outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 1 2017 Starters

	Track 1 – Overall						Track 1 – SSP						Track 1 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value
Service use (per 1,000 beneficiaries per year)																		
Acute hospitalizations (short-stay acute care and critical access hospitals)																		
Baseline	285	283	NA	NA	NA	NA	285	280	NA	NA	NA	NA	285	283	NA	NA	NA	NA
Year 1	279	279	-1.2 (1.5)	-0.4%	(-3.7, 1.3)	0.421	279	280	-3.4* (1.9)	-1.2%*	(-6.5, -0.2)	0.076	280	277	1.2 (2.3)	0.4%	(-2.7, 5.0)	0.612
Total ED visits, including observation stays																		
Baseline	703	701	NA	NA	NA	NA	690	687	NA	NA	NA	NA	717	716	NA	NA	NA	NA
Year 1	686	692	-7.8*** (2.8)	-1.1%***	(-12.4, -3.2)	0.005	672	678	-8.9** (3.7)	-1.3%**	(-15.0, -2.8)	0.016	701	707	-6.4 (4.2)	-0.9%	(-13.3, 0.5)	0.126
Outpatient ED visits, including observation stays																		
Baseline	492	497	NA	NA	NA	NA	475	478	NA	NA	NA	NA	509	517	NA	NA	NA	NA
Year 1	478	489	-6.1*** (2.3)	-1.2%***	(-9.8, -2.3)	0.007	462	471	-5.9** (3.0)	-1.2%**	(-10.8, -1.0)	0.046	496	510	-6.0* (3.4)	-1.2%*	(-11.6, -0.4)	0.079
Ambulatory primary care visits (including to FQHCs, RHCs, and CAHs)																		
Baseline	4,482	4,626	NA	NA	NA	NA	4,415	4,624	NA	NA	NA	NA	4,554	4,627	NA	NA	NA	NA
Year 1	4,507	4,724	-74.0*** (16.3)	-1.6%***	(-100.8, -47.1)	0.000	4,447	4,725	-68.2*** (19.4)	-1.5%***	(-100.1, -36.2)	0.000	4,569	4,722	-79.7*** (26.7)	-1.7%***	(-123.7, -35.7)	0.003
Ambulatory specialty care visits (including to FQHCs, RHCs, and CAHs)																		
Baseline	4,752	4,552	NA	NA	NA	NA	5,084	4,781	NA	NA	NA	NA	4,404	4,303	NA	NA	NA	NA
Year 1	4,644	4,452	-8.2 (10.3)	-0.2%	(-25.2, 8.7)	0.425	4,959	4,687	-30.9** (14.4)	-0.6%**	(-54.6, -7.2)	0.032	4,312	4,194	15.8 (14.8)	0.4%	(-8.5, 40.1)	0.286
Sample sizes																		
Number of practices	1,373	5,247					738	2,981					635	2,266				
Number of beneficiaries	1,039,783	3,455,337					536,943	2,012,629					504,756	1,453,322				
Number of beneficiary-years	1,771,336	5,859,953					910,522	3,409,405					860,814	2,450,548				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in Year 1 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. For Medicare service use measures, measures of outpatient ED visits and total ED visits include observation stays. Ambulatory visits with primary care practitioners and specialists include office-based visits, visits at home, as well as visits in other settings, such as FQHCs, RHCs, and CAHs.

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the p-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

Table 5.F.2. *(continued)*

[a] We calculated percentage impacts relative to what the CPC+ mean would be in Year 1 in the absence of the intervention, i.e., the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; CAH = critical access hospital; ED = emergency department; FQHC = federally qualified health center; NA = not applicable; RHC = rural health center; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.F.3. Regression-adjusted means and estimated impact of CPC+ on selected claims-based quality-of-care outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 1 2017 Starters

	Track 1 – Overall					Track 1 – SSP					Track 1 – Non-SSP				
	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value
Planned care and population health measures for beneficiaries ages 18–75 with diabetes (percentage)															
Received HbA1c test															
Baseline	91.1%	91.7%	NA	NA	NA	92.2%	92.3%	NA	NA	NA	90.0%	91.1%	NA	NA	NA
Year 1	90.8%	91.5%	-0.1 (0.2)	(-0.3, 0.2)	0.734	91.8%	92.1%	-0.2 (0.2)	(-0.5, 0.2)	0.456	89.7%	90.8%	0.0 (0.3)	(-0.4, 0.5)	0.859
Received eye exam															
Baseline	62.3%	62.9%	NA	NA	NA	63.0%	64.6%	NA	NA	NA	61.6%	61.0%	NA	NA	NA
Year 1	62.5%	62.1%	1.0*** (0.2)	(0.6, 1.4)	0.000	62.8%	64.0%	0.4 (0.3)	(-0.1, 0.9)	0.148	62.2%	60.1%	1.6*** (0.3)	(1.0, 2.2)	0.000
Received attention for nephropathy															
Baseline	81.4%	81.4%	NA	NA	NA	83.1%	82.1%	NA	NA	NA	79.7%	80.6%	NA	NA	NA
Year 1	81.7%	81.0%	0.7*** (0.3)	(0.3, 1.1)	0.007	83.2%	81.9%	0.3 (0.3)	(-0.2, 0.9)	0.350	80.2%	80.1%	1.1*** (0.4)	(0.4, 1.7)	0.005
Diabetes composite measure 1 (received all three tests above: HbA1c test, eye exam, attention for nephropathy)															
Baseline	50.2%	50.7%	NA	NA	NA	52.2%	52.7%	NA	NA	NA	48.1%	48.7%	NA	NA	NA
Year 1	50.3%	50.0%	0.8*** (0.3)	(0.4, 1.3)	0.002	51.7%	52.2%	-0.1 (0.4)	(-0.7, 0.6)	0.882	48.9%	47.7%	1.8*** (0.4)	(1.1, 2.4)	0.000
Diabetes composite measure 2 (received none of the three tests above)															
Baseline	2.3%	2.2%	NA	NA	NA	2.1%	2.0%	NA	NA	NA	2.6%	2.4%	NA	NA	NA
Year 1	2.3%	2.3%	-0.2** (0.1)	(-0.3, -0.1)	0.018	2.0%	2.1%	-0.2** (0.1)	(-0.4, -0.1)	0.026	2.6%	2.5%	-0.1 (0.1)	(-0.4, 0.1)	0.223
Sample sizes for the diabetes measures															
Number of beneficiaries	136,656	455,268				69,176	259,547				67,694	196,830			
Number of beneficiary-years	211,445	701,299				106,706	399,772				104,739	301,527			
Planned care and population health measures for female beneficiaries 52–74 years of age (percentage)															
Received breast cancer screening															
Baseline	72.5%	73.1%	NA	NA	NA	73.5%	73.9%	NA	NA	NA	71.4%	72.2%	NA	NA	NA
Year 1	73.3%	73.5%	0.4*** (0.2)	(0.2, 0.7)	0.005	74.2%	74.5%	0.1 (0.2)	(-0.2, 0.4)	0.631	72.4%	72.4%	0.8*** (0.2)	(0.4, 1.2)	0.001

Table 5.F.3. *(continued)*

	Track 1 – Overall					Track 1 – SSP					Track 1 – Non-SSP				
	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	*p*-value
Sample sizes for the breast cancer screening measure															
Number of beneficiaries	248,926	819,120				128,127	475,297				121,248	346,253			
Number of beneficiary-years	399,427	1,308,956				204,664	758,423				194,763	550,533			
Measures for coordination of care (percentage)															
30-day all-cause unplanned readmissions															
Baseline	15.4%	15.6%	NA	NA	NA	15.3%	15.7%	NA	NA	NA	15.5%	15.5%	NA	NA	NA
Year 1	15.4%	15.6%	0.0 (0.1)	(-0.2, 0.3)	0.859	15.1%	15.5%	0.0 (0.2)	(-0.3, 0.3)	0.940	15.8%	15.8%	0.0 (0.2)	(-0.3, 0.4)	0.909
Measures for patient and caregiver engagement (percentage)															
Received hospice services															
Baseline	2.7%	2.7%	NA	NA	NA	2.7%	2.7%	NA	NA	NA	2.8%	2.7%	NA	NA	NA
Year 1	2.7%	2.7%	0.0 (0.0)	(0.0, 0.1)	0.155	2.7%	2.7%	0.1** (0.0)	(0.0, 0.2)	0.029	2.8%	2.6%	0.0 (0.0)	(-0.1, 0.1)	0.965
Had an advance care plan visit															
Baseline	2.7%	1.8%	NA	NA	NA	2.6%	2.1%	NA	NA	NA	2.9%	1.4%	NA	NA	NA
Year 1	3.6%	3.1%	-0.4 (0.3)	(-0.9, 0.0)	0.125	3.8%	3.4%	0.0 (0.3)	(-0.6, 0.5)	0.929	3.4%	2.8%	-0.8* (0.4)	(-1.6, -0.1)	0.057
Sample sizes for unplanned readmission, receiving hospice services, and having an advance care plan visit															
Number of index discharges for readmissions	427,945	1,385,954				219,539	804,069				208,406	581,885			
Number of beneficiaries	1,039,783	3,455,337				536,943	2,012,629				504,756	1,453,322			
Number of beneficiary-years	1,771,336	5,859,953				910,522	3,409,405				860,814	2,450,548			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for baseline beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the intervention year compared with the average outcome in the baseline year, relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. For the readmissions outcome, which is estimated at the discharge level, we also controlled for discharge-level risk factors. For the binary quality-of-care outcomes, we present the absolute impact estimate only in percentage points. This is because percentage impacts for some of the outcomes are likely to be misleadingly large, given the low means for the outcome measures.

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

Table 5.F.3. *(continued)*

We grouped the claims-based quality-of-care measures into four domains according to the CPC+ function where they are covered in the 2018 implementation guide (CMMI 2018).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; FFS = fee-for-service; NA = not applicable; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.F.4. Regression-adjusted means and estimated impact of CPC+ on selected Medicare expenditures outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 2 2017 Starters

	Track 2 – Overall						Track 2 – SSP						Track 2 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value
Medicare expenditures (per beneficiary per month)																		
Total Medicare Part A and B expenditures including CPC+ Comprehensive Primary Care Payments																		
Baseline	$876	$877	NA	NA	NA	NA	$896	$892	NA	NA	NA	NA	$860	$864	NA	NA	NA	NA
Year 1	$877	$876	$1.1 ($3.5)	0.1%	(-$4.6, $6.8)	0.753	$896	$895	-$2.8 ($5.1)	-0.3%	(-$11.2, $5.6)	0.583	$861	$861	$4.1 ($4.7)	0.5%	(-$3.7, $11.9)	0.392
Total Medicare Part A and B expenditures including CPC+ Comprehensive Primary Care Payments and care management fees																		
Baseline	$876	$877	NA	NA	NA	NA	$896	$892	NA	NA	NA	NA	$860	$864	NA	NA	NA	NA
Year 1	$902	$876	$27.0*** ($3.5)	3.0%***	($21.2, $32.7)	0.000	$922	$895	$23.0*** ($5.1)	2.5%***	($14.5, $31.4)	0.000	$887	$861	$30.0*** ($4.7)	3.4%***	($22.2, $37.8)	0.000
Total Medicare Part A and B expenditures including CPC+ Comprehensive Primary Care Payments, care management fees, and Performance-based Incentive Payments																		
Baseline	$876	$877	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$860	$864	NA	NA	NA	NA
Year 1	$904	$876	$28.3*** ($3.5)	3.2%***	($22.5, $34.0)	0.000	NA	NA	NA	NA	NA	A	$889	$861	$32.3*** ($4.7)	3.7%***	($24.5, $40.1)	0.000
Total Medicare Part A and B expenditures including CPC+ Comprehensive Primary Care Payments, care management fees, Performance-based Incentive Payments, and shared savings payments to SSP ACOs																		
Baseline	$878	$879	NA	NA	NA	NA	$901	$898	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Year 1	$905	$879	$26.9*** ($3.5)	3.0%***	($21.1, $32.6)	0.000	$924	$901	$20.2*** ($5.1)	2.2%***	($11.8, $28.6)	0.000	NA	NA	NA	NA	NA	NA
Medicare expenditures by service category (per beneficiary per month)																		
Inpatient expenditures																		
Baseline	$314	$316	NA	NA	NA	NA	$322	$321	NA	NA	NA	NA	$308	$312	NA	NA	NA	NA
Year 1	$313	$314	$1.1 ($2.3)	0.3%	(-$2.6, $4.8)	0.627	$321	$322	-$2.0 ($3.4)	-0.6%	(-$7.6, $3.5)	0.548	$306	$306	$3.6 ($3.0)	1.2%	(-$1.4, $8.6)	0.241
Outpatient expenditures																		
Baseline	$166	$170	NA	NA	NA	NA	$175	$166	NA	NA	NA	NA	$160	$173	NA	NA	NA	NA
Year 1	$173	$176	$0.1 ($0.9)	0.1%	(-$1.3, $1.5)	0.889	$182	$173	$0.7 ($1.3)	0.4%	(-$1.6, $2.9)	0.624	$166	$180	-$0.3 ($1.1)	-0.2%	(-$2.2, $1.5)	0.782
Expenditures on physician and nonphysician Part B noninstitutional services in any setting																		
Baseline	$245	$239	NA	NA	NA	NA	$248	$250	NA	NA	NA	NA	$243	$230	NA	NA	NA	NA
Year 1	$244	$240	-$2.7*** ($0.8)	-1.1%***	(-$4.0, -$1.4)	0.001	$245	$252	-$5.0*** ($1.1)	-2.0%***	(-$6.8, $3.1)	0.000	$244	$232	-$1.0 ($1.1)	-0.4%	(-$2.8, $0.8)	0.367
Expenditures on ambulatory visits with primary care physicians																		
Baseline	$25	$25	NA	NA	NA	NA	$24	$25	NA	NA	NA	NA	$25	$25	NA	NA	NA	NA
Year 1	$23	$26	-$2.2*** ($0.1)	-8.5%***	(-$2.4, -$2.0)	0.000	$23	$26	-$2.2*** ($0.2)	-8.5%***	(-$2.4, -$1.9)	0.000	$23	$25	-$2.2*** ($0.2)	-8.5%***	(-$2.5, -$1.9)	0.000

Table 5.F.4. *(continued)*

	Track 2 – Overall						Track 2 – SSP						Track 2 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value
Expenditures on ambulatory visits with specialists																		
Baseline	$25	$24	NA	NA	NA	NA	$26	$26	NA	NA	NA	NA	$24	$23	NA	NA	NA	NA
Year 1	$24	$24	-$0.1 ($0.1)	-0.3%	(-$0.2, $0.0)	0.292	$25	$25	-$0.1 ($0.1)	-0.4%	(-$0.3, $0.1)	0.310	$23	$22	$0.0 ($0.1)	-0.2%	(-$0.2, $0.1)	0.648
Skilled nursing home expenditures																		
Baseline	$65	$64	NA	NA	NA	NA	$69	$69	NA	NA	NA	NA	$62	$60	NA	NA	NA	NA
Year 1	$62	$61	-$0.2 ($0.7)	-0.3%	(-$1.4, $1.0)	0.794	$66	$65	$0.7 ($1.1)	1.1%	(-$1.0, $2.5)	0.488	$59	$58	-$1.0 ($1.0)	-1.6%	(-$2.6, $0.7)	0.336
Home health expenditures																		
Baseline	$41	$41	NA	NA	NA	NA	$41	$44	NA	NA	NA	NA	$41	$40	NA	NA	NA	NA
Year 1	$39	$40	-$0.5 ($0.3)	-1.2%	(-$1.0, $0.0)	0.135	$39	$42	-$0.2 ($0.5)	-0.4%	(-$0.9, $0.6)	0.740	$39	$39	-$0.8* ($0.4)	-1.8%*	(-$1.5, $0.0)	0.093
Hospice expenditures																		
Baseline	$24	$25	NA	NA	NA	NA	$22	$23	NA	NA	NA	NA	$25	$27	NA	NA	NA	NA
Year 1	$24	$25	$0.5 ($0.4)	2.3%	(-$0.1, $1.2)	0.199	$23	$24	$0.4 ($0.6)	1.6%	(-$0.6, $1.4)	0.560	$26	$27	$0.7 ($0.6)	2.8%	(-$0.2, $1.6)	0.223
Durable medical equipment expenditures																		
Baseline	$21	$21	NA	NA	NA	NA	$20	$20	NA	NA	NA	NA	$21	$22	NA	NA	NA	NA
Year 1	$20	$19	$0.3 ($0.2)	1.7%	(-$0.1, $0.7)	0.169	$19	$18	$0.1 ($0.3)	0.7%	(-$0.4, $0.7)	0.689	$20	$20	$0.5 ($0.3)	2.5%	(-$0.1, $1.0)	0.149
Sample sizes																		
Number of practices	1,515	3,784					636	1,817					879	1,967				
Number of beneficiaries	1,263,651	2,928,232					563,755	1,469,296					702,985	1,467,369				
Number of beneficiary-years	2,157,742	4,973,185					955,938	2,493,201					1,201,804	2,479,984				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in Year 1 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. Expenditures on Part B noninstitutional services include expenditures on primary care ambulatory visits, ambulatory visits to specialists, and non-ambulatory physician visits, as well as services provided by other noninstitutional providers (the third category is not shown separately).

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

[a] We calculated percentage impacts relative to what the CPC+ mean would be in Year 1 in the absence of the intervention, i.e., the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; FFS = fee-for-service; NA = not applicable; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.F.5. Regression-adjusted means and estimated impact of CPC+ on selected service utilization outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 2 2017 Starters

	Track 2 – Overall						Track 2 – SSP						Track 2 – Non-SSP					
	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	Percentage impact[a]	90% confidence interval	p-value
Service use (per 1,000 beneficiaries per year)																		
Acute hospitalizations (short-stay acute care and critical access hospitals)																		
Baseline	287	283	NA	NA	NA	NA	294	286	NA	NA	NA	NA	281	280	NA	NA	NA	NA
Year 1	281	278	-1.4 (1.6)	-0.5%	(-4.0, 1.2)	0.389	290	283	-1.5 (2.4)	-0.5%	(-5.4, 2.4)	0.518	274	274	-1.2 (2.1)	-0.4%	(-4.7, 2.3)	0.563
Total ED visits, including observation stays																		
Baseline	702	696	NA	NA	NA	NA	695	684	NA	NA	NA	NA	707	706	NA	NA	NA	NA
Year 1	684	687	-8.4*** (2.9)	-1.2%***	(-13.2, -3.6)	0.004	678	675	-8.8** (4.2)	-1.3%**	(-15.8, -1.8)	0.038	689	696	-8.1** (4.1)	-1.1%**	(-14.7, -1.4)	0.047
Outpatient ED visits, including observation stays																		
Baseline	491	491	NA	NA	NA	NA	478	473	NA	NA	NA	NA	501	505	NA	NA	NA	NA
Year 1	476	484	-7.7*** (2.3)	-1.6%***	(-11.5, -3.8)	0.001	461	466	-9.4*** (3.4)	-2.0%***	(-15.0, -3.8)	0.006	488	498	-6.3* (3.2)	-1.2%*	(-11.5, -1.0)	0.050
Ambulatory primary care visits (including FQHCs, RHCs, and CAHs)																		
Baseline	4,595	4,697	NA	NA	NA	NA	4,465	4,640	NA	NA	NA	NA	4,697	4,742	NA	NA	NA	NA
Year 1	4,585	4,773	-86.8*** (17.5)	-1.8%***	(-115.6, -57.9)	0.000	4,474	4,714	-65.4*** (22.2)	-1.4%***	(-102.0, -28.8)	0.003	4,672	4,821	-104.1*** (26.0)	-2.2%***	(-146.8, -61.3)	0.000
Ambulatory specialty care visits (including FQHCs, RHCs, and CAHs)																		
Baseline	4,551	4,462	NA	NA	NA	NA	4,735	4,653	NA	NA	NA	NA	4,406	4,309	NA	NA	NA	NA
Year 1	4,449	4,367	-7.3 (10.4)	-0.2%	(-24.4, 9.8)	0.483	4,621	4,553	-14.0 (17.0)	-0.3%	(-42.0, 13.9)	0.410	4,314	4,219	-1.8 (12.8)	0.0%	(-22.9, 19.2)	0.886
Sample sizes																		
Number of practices	1,515	3,784					636	1,817					879	1,967				
Number of beneficiaries	1,263,651	2,928,232					563,755	1,469,296					702,985	1,467,369				
Number of beneficiary-years	2,157,742	4,973,185					955,938	2,493,201					1,201,804	2,479,984				

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for pre-CPC+ beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in Year 1 compared with baseline relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. For Medicare service use measures, measures of outpatient ED visits and total ED visits include observation stays. Ambulatory visits with primary care practitioners and specialists include office-based visits, visits at home, and visits in other settings, such as FQHCs, RHCs, and CAHs.

Table 5.F.5. *(continued)*

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

[a] We calculated percentage impacts relative to what the CPC+ mean would be in Year 1 in the absence of the intervention, i.e., the unadjusted CPC+ mean minus the impact estimate.

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; CAH = critical access hospital; ED = emergency department; FQHC = federally qualified health center; NA = not applicable; RHC = rural health center; SE = standard error; SSP = Medicare Shared Savings Program.

Table 5.F.6. Regression-adjusted means and estimated impact of CPC+ on selected claims-based quality-of-care outcomes for attributed Medicare FFS beneficiaries during Year 1: Track 2 2017 Starters

	Track 2 – Overall					Track 2 – SSP					Track 2 – Non-SSP				
	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value
Planned care and population health measures for beneficiaries ages 18–75 with diabetes (percentage)															
Received HbA1c test															
Baseline	92.4%	92.3%	NA	NA	NA	92.6%	92.3%	NA	NA	NA	92.2%	92.4%	NA	NA	NA
Year 1	92.4%	92.0%	0.4* (0.2)	(0.1, 0.7)	0.055	92.7%	92.2%	0.1 (0.2)	(-0.2, 0.5)	0.534	92.2%	91.8%	0.5* (0.3)	(0.1, 1.0)	0.063
Received eye exam															
Baseline	64.0%	64.1%	NA	NA	NA	65.0%	65.8%	NA	NA	NA	63.2%	62.8%	NA	NA	NA
Year 1	63.8%	63.3%	0.6** (0.2)	(0.2, 1.0)	0.014	64.7%	64.7%	0.7** (0.4)	(0.1, 1.4)	0.046	63.2%	62.2%	0.5 (0.3)	(0.0, 1.0)	0.125
Received attention for nephropathy															
Baseline	82.9%	82.6%	NA	NA	NA	84.5%	83.3%	NA	NA	NA	81.6%	82.0%	NA	NA	NA
Year 1	83.1%	82.3%	0.5* (0.2)	(0.1, 0.9)	0.050	84.9%	83.2%	0.5 (0.3)	(0.0, 1.1)	0.118	81.6%	81.7%	0.4 (0.3)	(-0.1, 1.0)	0.203
Diabetes composite measure 1 (received all three tests above: HbA1c test, eye exam, attention for nephropathy)															
Baseline	52.7%	52.5%	NA	NA	NA	54.5%	54.4%	NA	NA	NA	51.4%	51.1%	NA	NA	NA
Year 1	52.8%	51.8%	0.8*** (0.3)	(0.3, 1.3)	0.007	54.7%	53.6%	1.0** (0.4)	(0.2, 1.7)	0.030	51.3%	50.4%	0.7* (0.4)	(0.0, 1.3)	0.087
Diabetes composite measure 2 (received none of the three tests above)															
Baseline	2.0%	1.9%	NA	NA	NA	1.9%	2.0%	NA	NA	NA	2.1%	1.9%	NA	NA	NA
Year 1	2.0%	2.1%	-0.1 (0.1)	(-0.3, 0.0)	0.137	2.0%	2.0%	0.0 (0.1)	(-0.2, 0.2)	0.821	2.1%	2.1%	-0.2** (0.1)	(-0.4, 0.0)	0.038
Sample sizes for the diabetes measures															
Number of beneficiaries	166,562	378,816				73,486	186,315				93,387	193,302			
Number of beneficiary-years	258,626	584,336				113,661	286,540				144,965	297,796			
Planned care and population health measures for female beneficiaries 52–74 years of age (percentage)															
Received breast cancer screening															
Baseline	73.5%	74.2%	NA	NA	NA	75.5%	74.9%	NA	NA	NA	71.9%	73.6%	NA	NA	NA
Year 1	74.5%	74.7%	0.4*** (0.1)	(0.2, 0.7)	0.004	76.5%	75.6%	0.2 (0.2)	(-0.1, 0.6)	0.296	73.0%	74.0%	0.6*** (0.2)	(0.3, 0.9)	0.003

Table 5.F.6. *(continued)*

	Track 2 – Overall					Track 2 – SSP					Track 2 – Non-SSP				
	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value	CPC+ mean	C mean	Impact estimate (SE)	90% confidence interval	p-value
Sample sizes for the breast cancer screening measure															
Number of beneficiaries	297,867	688,236				132,295	343,379				166,230	346,745			
Number of beneficiary-years	479,205	1,101,177				211,243	548,633				267,962	552,544			
Measures for coordination of care (percentage)															
30-day all-cause unplanned readmissions															
Baseline	15.5%	15.7%	NA	NA	NA	15.6%	15.8%	NA	NA	NA	15.3%	15.6%	NA	NA	NA
Year 1	15.3%	15.6%	-0.1 (0.2)	(-0.4, 0.2)	0.521	15.7%	15.9%	-0.1 (0.2)	(-0.4, 0.3)	0.775	15.0%	15.4%	-0.1 (0.2)	(-0.5, 0.2)	0.535
Measures for patient and caregiver engagement (percentage)															
Received hospice services															
Baseline	2.8%	2.7%	NA	NA	NA	2.7%	2.6%	NA	NA	NA	2.8%	2.8%	NA	NA	NA
Year 1	2.8%	2.7%	0.0 (0.0)	(0.0, 0.1)	0.182	2.7%	2.6%	0.0 (0.0)	(-0.1, 0.1)	0.856	2.9%	2.8%	0.1 (0.0)	(0.0, 0.1)	0.109
Had an advance care plan visit															
Baseline	2.6%	2.0%	NA	NA	NA	2.9%	2.1%	NA	NA	NA	2.4%	1.9%	NA	NA	NA
Year 1	3.7%	3.1%	-0.1 (0.2)	(-0.4, 0.3)	0.775	4.2%	3.5%	0.0 (0.3)	(-0.5, 0.5)	0.958	3.4%	2.9%	-0.1 (0.3)	(-0.6, 0.4)	0.741
Sample sizes for unplanned readmission, receiving hospice services, and having an advance care plan visit															
Number of index discharges for readmissions	524,684	1,180,152				238,984	596,160				285,700	583,992			
Number of beneficiaries	1,263,651	2,928,232				563,755	1,469,296				702,985	1,467,369			
Number of beneficiary-years	2,157,742	4,973,185				955,938	2,493,201				1,201,804	2,479,984			

Source: Mathematica's analysis of Medicare claims data from January 2013 through December 2017.

Notes: Impact estimates are regression-adjusted for baseline beneficiary characteristics and practice fixed effects. Each impact estimate is based on a difference-in-differences analysis and reflects the difference in the regression-adjusted average outcome for attributed Medicare FFS beneficiaries in CPC+ practices in the intervention year compared with the average outcome in the baseline year, relative to the same difference over time for attributed Medicare FFS beneficiaries in comparison practices. For the readmissions outcome, which is estimated at the discharge level, we also controlled for discharge-level risk factors. For the binary quality-of-care outcomes, we present the absolute impact estimate only in percentage points. This is because percentage impacts for some of the outcomes are likely to be misleadingly large, given the low means for the outcome measures.

Table 5.F.6. *(continued)*

This table indicates which estimates are statistically significant; when we interpret evidence, we combine evidence from the magnitude of the effect, the *p*-values, findings on related outcomes, subgroups, sensitivity tests, and other data sources.

We grouped the claims-based quality-of-care measures into four domains according to the CPC+ function where they are covered in the 2018 implementation guide (CMMI 2018).

*/**/*** Significantly different from zero at the 0.10/0.05/0.01 level, two-tailed test.

C = comparison; FFS = fee-for-service HCC = hierarchical condition category; NA = not applicable; SE = standard error; SSP = Medicare Shared Savings Program.

5.G.   Participation in other initiatives

In this appendix, we quantify how participation in other initiatives differs between CPC+ and comparison practices and how this participation shifted from the baseline period to the first year of CPC+ for both research groups.

CPC+ is taking place at the same time as many other initiatives that aim to improve the quality and value of medical care. Some, but not all, CPC+ practices are allowed to participate in some of these initiatives; therefore, we expect comparison practices to participate in some initiatives—such as billing for chronic care management (CCM) services—at higher rates than the CPC+ practices. Higher participation rates among comparison practices than among CPC+ practices will not bias our main impact estimates, because we assume that the comparison practices represent the accurate counterfactual (that is, CPC+ practices might have participated in other initiatives at higher rates had they not joined CPC+). However, differences in participation could potentially lead to smaller overall effects of CPC+ than we would observe if some or all of the other initiatives did not exist. This weakening of effects would occur if the other initiatives duplicate some of the incentives and supports provided through CPC+. Since the primary concern is whether participation in other initiatives changed differentially for CPC+ and comparison practices between the baseline and intervention years, we used a difference-in-differences strategy, when possible, to examine changes in participation over time between the two groups.

We analyzed participation in four broad types of initiatives: (1) care management services, (2) value-based purchasing models, (3) primary care transformation initiatives, and (4) insurer-sponsored initiatives. In Table 5.G.1, we list the specific initiatives for which we examined participation under each of these four broad types, the data source, the definition of a beneficiary being exposed to the initiative, and whether CPC+ practices (or their CMS-attributed Medicare beneficiaries) could participate in these initiatives during the periods we study.

We found low use—and small differences in the relative change in the use—of Medicare fee-for-service (FFS) care management services from baseline to the first year of CPC+. In contrast, we found that members of the CPC+ group had a moderately smaller increase in their participation in other Medicare FFS value-based purchasing models we tracked than members of the comparison group in the first year of CPC+, with a difference-in-differences estimate of -9 to -2 percentage points (pp). CPC+ practices were also less likely to participate in three of the four other primary care transformation initiatives that we tracked during the first year of CPC+. However, we found that CPC+ practices were more likely to participate in insurer-sponsored initiatives in the first year of CPC+.

Table 5.G.1. Potential participation by active CPC+ practices in other initiatives

Type of initiative	Name of initiative	Data source	Definition of a beneficiary being exposed to the initiative	Can active CPC+ practices or their CMS-attributed Medicare beneficiaries participate…	
				During baseline period?	During intervention period?
Medicare FFS Care Management Charges	Chronic Care Management	Medicare FFS physician and outpatient claims	Beneficiary received at least one care management service in the year	Yes	No
	Transitional Care Management			Yes	Yes
	Other care management			Yes	Yes
Other Medicare FFS value-based purchasing models	Medicare Shared Savings Program	CMS Master Data Management System	Beneficiary's assigned practice was in the initiative in the year[a]	Yes	Yes
	Next Generation or Pioneer Accountable Care Organization Model			No[b]	No
Other primary care transformation initiatives	Transforming Clinical Practice Initiative	CMS rosters	Beneficiary's assigned practice was in initiative in the year[a]	Yes	No
	State Innovation Models[d]	CPC+ baseline practice survey[c]	Beneficiary's assigned practice responded that it currently participates in initiative in CPC+ practice survey	Yes	Yes
	Medicaid Health Home			Yes	Yes
	Health Care Innovation Award[d]			Yes	Yes
	State or community-based QI initiatives			Yes	Yes
Insurer-sponsored initiatives	Initiatives linking payment to performance or value	CPC+ baseline practice survey[c]	Beneficiary's assigned practice responded that it currently participates in initiative in CPC+ practice survey	Yes	Yes

[a] A practice is defined as being in the initiative if any of its practitioners were in the initiative.

[b] Baseline participation for SSP and NextGen is defined as participating as of January 1, 2017, and CPC+ Year 1 participation is defined as participating as of January 1, 2018. Active CPC+ practices could not participate in NextGen as of January 1, 2017.

[c] Note that the baseline practice survey has information on participation in initiatives for only the first year of CPC+, as practices responded to surveys in the spring/summer of 2017.

[d] Participation is based on responses to a survey question that asked about current participation and did not specify the exact round of the initiative.

CMS = Centers for Medicare & Medicaid Services; FFS = fee-for-service; QI = quality improvement; SSP = Medicare Shared Savings Program.

In the rest of this appendix, first, we describe the methods used; second, we report the results in greater detail; and finally, we discuss the implications of the results for the impact analyses.

5.G.1. Methods

We present participation in all initiatives at the beneficiary level, as the percentage of beneficiaries in each group—CPC+ and comparison—that are exposed to that initiative, separately for Track 1 and Track 2 of CPC+. We chose this measure of participation primarily because our impact estimates are at the beneficiary level. To the extent that participation in other initiatives affected the impact findings, this would likely depend on the number of beneficiaries

affected by such participation. Also, reporting participation at the beneficiary level for all initiatives allows us to maintain consistency across initiatives in our participation analysis.[45]

We measured participation in Medicare FFS care management services as the percentage of beneficiaries who received at least one of those services in that year. Since Medicare FFS value-based purchasing models and the Transforming Clinical Practice Initiative (TCPI) both reported practitioners' participation in the initiatives, as opposed to practice sites participating, we first used the SK&A practice roster to roll participation up to the practice site level by counting a practice as participating if any practitioners in the practice were reported as participating.[46] We then treated all assigned beneficiaries in the year as exposed to the initiative.

For all initiatives that define participation at the practice level, we weighted practice participation by the number of Medicare beneficiaries assigned to that practice in the baseline year so that the results can be interpreted as the number of beneficiaries who were participating in the initiative.[47]

The data for many of the other primary care initiatives and insurer-sponsored initiatives were based on the CPC+ practice survey, to which most CPC+ practices and 29 percent of the comparison practices responded. Because the responders may have been systematically different than nonresponders, we used nonresponse weights to ensure respondents resemble the full comparison group on observable characteristics.

Finally, to estimate difference-in-differences changes in participation in each initiative, comparing the CPC+ and comparison practices from the baseline year to Year 1 of CPC+, we followed a similar regression model to the one used for all claims-based beneficiary-level outcomes described in this report (see Chapter 5). For the initiatives that had observations at the beneficiary level (that is, the Medicare FFS care management charges), we used a linear difference-in-differences model, with the beneficiary weights, but we did not include any additional regression covariates other than the differences-in-differences estimators.

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[45] For some initiatives, like CCM, participation is inherently at the beneficiary level, since billing for CCM services occurs on a per-beneficiary basis. However, for some other initiatives, like TCPI and NextGen, practices decide whether or not to participate, and we assume that all beneficiaries assigned to participating practices were affected. Also, we selected comparison practices based on baseline initiative participation in Medicare SSP at the beneficiary level. Therefore, we would like to assess CPC+ - comparison balance in Medicare SSP participation at that level.

[46] The Medicare Shared Savings Program (SSP) reports participation at the Tax Identification Number (TIN) level. Since TINs are not unique at the practice level, we merged measures of participation of all practitioners to whom we assigned that TIN, and then rolled up participation to the practice level using the SK&A roster.

[47] Note that, although there is a beneficiary-level master data management system, this is the same method that we used for comparison selection. That is, we first looked at practitioner-level participation in SSP or other initiatives and then rolled these measures up to the practice level. Then we weighted by the number of beneficiaries in the practice in the baseline year.

For the initiatives that had observations at the practice level, we also used a linear difference-in-differences model, but the matching weights included adjustments for practice size. Again, we included no additional covariates.[48]

5.G.2. Results

Tables 5.G.2 and 5.G.3 report participation of beneficiaries in various initiatives by time period (baseline or intervention Year 1) for practices that began CPC+ in 2017 and their comparison practices for Tracks 1 and 2, respectively.

Table 5.G.2. Participation in other initiatives by beneficiaries in Track 1 CPC+ practices and in comparison practices, during baseline and Year 1

| | Time period | Percentage of Medicare FFS beneficiaries exposed to the initiative | | Percentage point difference | Percentage point difference-in-differences estimate (90% CI) |
		CPC+ group	Comparison group		
Type of initiative: Medicare FFS Care Management Charges					
Name of initiative:					
Chronic Care Management	Base	1.1	1.5	-0.5	NA
	Year 1	0.5	2.6	-2.1	-1.6 (-1.9, -1.3)
Transitional Care Management	Base	3.6	3.4	0.3	NA
	Year 1	4.6	3.8	0.8	0.5 (0.4, 0.7)
Other care management[a]	Base	2.8	1.9	0.9	NA
	Year 1	3.6	3.1	0.4	-0.4 (-0.8, 0.0)
Type of initiative: Other Medicare FFS value-based purchasing models					
Name of initiative:					
Medicare Shared Savings Program	Base[b]	51.2	52.3	-1.1	NA
	Year 1[c]	53.1	58.5	-5.4	-4.3 (-7.8, -0.8)
Next Generation or Pioneer ACO	Base[b]	0.0	0.0	0.0	NA
	Year 1[c]	0.2	3.2	-2.9	-2.9 (-3.7, -2.2)
Type of initiative: Other primary care transformation initiatives					
Name of initiative:					
Transforming Clinical Practice Initiative	Base	11.1	10.8	0.3	NA
	Year 1	10.4[e]	12.2	-1.8	-2.0 (-4.3, 0.2)
State Innovation Models	Base	-	-	-	-
	Year 1[d]	11.0	12.1	-1.1	NA
Medicaid Health Home	Base	-	-	-	-
	Year 1[d]	11.6	17.4	-5.8	NA
Health Care Innovation Award	Base	-	-	-	-
	Year 1[d]	4.0	19.8	-15.8	NA
State or community-based QI initiatives	Base	-	-	-	-
	Year 1[d]	12.4	21.1	-8.7	NA

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[48] We chose not to include additional covariates in any of the regressions, because we would not be able to include beneficiary-level controls for the regressions that had observations at the practice level.

Table 5.G.2. *(continued)*

	Time period	Percentage of Medicare FFS beneficiaries exposed to the initiative		Percentage point difference	Percentage point difference-in-differences estimate (90% CI)
		CPC+ group	Comparison group		
Type of initiative: Insurer-sponsored initiatives					
Name of initiative:					
Initiatives linking payment to performance or value	Base	-	-	-	-
	Year 1[d]	74.6	61.6	13.0	NA

Source: Analysis of Medicare FFS claims for 2016 and 2017; MDM extracts from January 27, 2017, and January 23, 2018; CMS January 2018 TCPI roster; and the 2017 Starter Wave 1 CPC+ practice survey.

Notes: We report participation in initiatives as the percentage of beneficiaries who were exposed to the initiative in each period in each group (Track 1 CPC+ or comparison practices). We calculated the difference in participation in a given year between Track 1 CPC+ and comparison practices as the percentage point difference. We calculated the difference-in-differences estimate as the difference in percentage participation between CPC+ and comparison practices in the intervention period, minus the difference in the baseline period. The difference-in-differences estimate is in percentage point units. We estimated 90 percent confidence intervals calculating standard errors using linear regression and clustering at the practice level. Dashes (-) indicate that participation or difference values are not available, due to limitations of the data source. N/A indicates that the difference-in-differences estimate is not applicable, because we do not have data for the baseline period.

[a] This includes CPT codes G0181 (physician supervision of a HHA patient, patient not present), G0182 (physician supervision of hospice patient, patient not present), G0502-G0504 (Collaborative Care Model), G0505 (cognitive and function assessment for patient with cognitive impairment), and 99497 (advance care planning). These are codes that capture some type of care management but are not chronic care management or transitional care management codes.

[b] Baseline participation value is defined as participation as of January 1, 2017.

[c] Year 1 participation value is defined as participation as of January 1, 2018.

[d] Year 1 participation value is defined as when the practice survey response was submitted in spring/summer 2017.

[e] CPC+ practices were technically unable to participate in TCPI during the first year of CPC+; however, we found many CPC+ practices did not withdraw from TCPI before the beginning of 2017. This is likely because the practices did not immediately initiate withdrawal.

ACO = accountable care organization; CI = confidence interval; CMS = Centers for Medicare & Medicaid Services; CPT = current procedural terminology; FFS = fee-for-service; HHA = home health; MDM = CMS Master Data Management System; QI = quality improvement; TCPI = Transforming Clinical Practice Initiative.

Table 5.G.3. Participation in other CMS initiatives by beneficiaries in Track 2 CPC+ practices and in comparison practices, during baseline and Year 1

| | Time period | Percentage of Medicare FFS beneficiaries exposed to the initiative | | Percentage point difference | Percentage point difference-in-differences estimate (90% CI) |
		CPC+ group	Comparison group		
Type of initiative: Medicare FFS Care Management Charges					
Name of initiative:					
Chronic Care Management	Base	1.4	1.9	-0.5	NA
	Year 1	0.6	2.5	-1.9	-1.4 (-1.8, -1.0)
Transitional Care Management	Base	4.7	3.4	1.3	NA
	Year 1	5.3	3.8	1.5	0.1 (0.0, 0.3)
Other care management[a]	Base	2.6	2.2	0.5	NA
	Year 1	3.8	3.2	0.6	0.1 (-0.3 0.4)
Type of initiative: Other Medicare FFS value-based purchasing models					
Name of initiative:					
Medicare Shared Savings Program	Base[b]	44.4	44.2	0.2	NA
	Year 1[c]	44.9	53.5	-8.6	-8.8 (-12.3, -5.3)
Next Generation or Pioneer ACO	Base[b]	0.2	0.0	0.2	NA
	Year 1[c]	1.1	3.0	-1.9	-2.1 (-2.9, -1.3)
Type of initiative: Other primary care transformation initiatives					
Name of initiative:					
Transforming Clinical Practice Initiative	Base	9.9	12.8	-2.9	NA
	Year 1	10.0[e]	14.5	-4.6	-1.6 (-4.0, 0.7)
State Innovation Models	Base	-	-	-	-
	Year 1[d]	14.7	11.8	2.8	NA
Medicaid Health Home	Base	-	-	-	-
	Year 1[d]	15.3	21.2	-5.8	NA
Health Care Innovation Award	Base	-	-	-	-
	Year 1[d]	5.4	22.6	-17.2	NA
State or community-based QI initiatives	Base	-	-	-	-
	Year 1[d]	23.9	26.8	-2.9	NA
Type of initiative: Insurer-sponsored initiatives					
Name of initiative:					
Initiatives linking payment to performance or value	Base	-	-	-	-
	Year 1[d]	77.5	67.0	10.6	NA

Source: Analysis of Medicare FFS claims for 2016 and 2017; MDM extracts from January 27, 2017, and January 23, 2018; CMS January 2018 TCPI roster; and the 2017 Starter Wave 1 CPC+ practice survey.

Notes: We report participation in initiatives as the percentage of beneficiaries who were exposed to the initiative in each period in each group (Track 2 CPC+ or comparison practices). We calculated the difference in participation in a given year between Track 2 CPC+ and comparison practices as the percentage point difference. We calculated the difference-in-differences estimate as the difference in percentage participation between CPC+ and comparison practices in the intervention period, minus the difference in the baseline period. The difference-in-differences estimate is in percentage point units. We estimated 90 percent confidence intervals calculating standard errors using linear regression and clustering at the practice level. Dashes (-) indicate that participation or difference values are not available due to limitations of the data source. N/A indicates that the difference-in-differences estimate is not applicable, because we do not have data for the baseline period.

Table 5.G.3. *(continued)*

[a] This includes CPT codes G0181 (physician supervision of a HHA patient, patient not present), G0182 (physician supervision of hospice patient, patient not present), G0502-G0504 (Collaborative Care Model), G0505 (cognitive and function assessment for patient with cognitive impairment), and 99497 (advance care planning). These are codes that capture some type of care management but are not chronic care management or transitional care management codes.

[b] Baseline participation value is defined as participation as of January 1, 2017.

[c] Year 1 participation value is defined as participation as of January 1, 2018.

[d] Year 1 participation value is defined as when the practice survey response was submitted in spring/summer 2017.

[e] CPC+ practices were technically unable to participate in TCPI during the first year of CPC+; however, we found that many CPC+ practices did not withdraw from TCPI before the beginning of 2017. This is likely because the practices did not immediately initiate withdrawal.

ACO = accountable care organization; CI = confidence interval; CMS = Centers for Medicare & Medicaid Services; CPT = current procedural terminology; FFS = fee-for-service; HHA = home health; MDM = CMS Master Data Management System; QI = quality improvement; TCPI = Transforming Clinical Practice Initiative.

a.   Participation in Medicare FFS care management services

Generally, we found low use—and small differences in the relative change in the use—of Medicare FFS care management services from the baseline period to the first year of CPC+. Between 0.5 to 5.3 percent of assigned Medicare FFS beneficiaries in each research group used each of these services, and each group experienced small changes over time. From the baseline to first year of CPC+, CPC+ practices decreased their use of CCM services, increased their use of transitional care management (TCM) services and, in the case of Track 2 practices, increased their use of other care management services,[49] relative to comparison practices.

In particular, for both Track 1 and Track 2 practices, we found that CPC+ practices had a slightly lower percentage of beneficiaries with CCM billing in the baseline period (-0.5 pp difference for Track 1 and Track 2). This difference widened in the first year of CPC+ to a -2.1 pp difference for Track 1 and a -1.9 pp difference for Track 2 practices. This widening is a result of CPC+ practices decreasing their use and the comparison practices increasing their use. The decrease among CPC+ practices is likely explained by the fact that CPC+ practices cannot bill for CCM-related services for their CPC+ payment-attributed beneficiaries. The increase among comparison practices may be a result of additional CCM billing codes that became active starting in 2017, or practices gaining familiarity with billing for CCM services.

For TCM services, we found opposite results—CPC+ practices increased their use of TCM services more than comparison practices. In the baseline period, Track 1 CPC+ practices had a 0.3 pp higher proportion of beneficiaries using TCM services than comparison practices, which widened to 0.8 pp in the first year of CPC+. Track 2 CPC+ practices initially had 1.3 pp higher use of these services than comparison practices, which widened slightly to a 1.5 pp difference in the first year of CPC+. Because one of the CPC+ milestones is to increase post-hospital discharge transitional care (and more generally their comprehensiveness of care), practices may be using TCM fees to help pay for activities CPC+ expects them to do.

For other care management services, we found that, although the use was higher for CPC+ practices at baseline for both Track 1 and Track 2, this difference diminished for Track 1 practices and increased slightly for Track 2 practices in Year 1.

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[49] This includes the following services: advance care planning, collaborative care model, cognition and functional assessment for patient with cognitive impairment, and physician supervision of hospice or home health patient where patient is not present. Note that the cognitive and functional assessment and collaborative care model billing codes were only active starting January 1, 2017.

Looking at whether beneficiaries had any care management service within a year, we found that the difference-in-differences estimates range from -0.9 to -1.1 pp depending on track. This suggests that, overall, CPC+ practices decreased billing for care management services relative to comparison practices by a small amount.

Although the difference-in-differences estimates are quantitatively small (less than 2 pp) due to low overall use of these services throughout the observation period, these services were only applicable to a limited population of beneficiaries. For example, we found average use of TCM services for the CPC+ group was about 5 percent. Given that approximately 25 percent of Medicare beneficiaries are hospitalized in a year, this suggests CPC+ practices were billing TCM services for approximately 20 percent of beneficiaries who were hospitalized during a year. Given that these services target additional resources toward high-risk beneficiaries with a recent hospitalization, these small differences may translate into substantial differences in Medicare expenditures—especially if the difference between CPC+ practices and comparison practices in the use of TCM widens over time.

b.   Participation in other Medicare FFS value-based purchasing models

Our process for selecting comparison practices ensured that participation in SSP and the Next Generation Accountable Care Organization Model (NextGen) was similar between CPC+ and comparison groups at baseline: for both CPC+ and comparison practices, participation in NextGen during baseline was close to 0 percent, whereas participation in SSP during the baseline year was around 51 percent for the Track 1 research group, and 44 percent for the Track 2 research group. However, we found that participation in these two initiatives grew moderately faster for the comparison group than for the CPC+ group in Year 1.[50]

For the Track 1 CPC+ group, participation in SSP grew modestly from 51.2 percent to 53.1 percent, while for the comparison group, participation grew from 52.3 percent to 58.5 percent—leading to a difference-in-differences estimate of -4.3 pp, which is statistically significant at the 5 percent level. That is, participation in SSP increased by 4 pp less for beneficiaries in Track 1 CPC+ practices relative to beneficiaries in comparison practices. For the Track 2 CPC+ group, participation in SSP increased slightly from 44.4 percent to 44.9 percent, but for the comparison group it grew from 44.2 percent to 53.5 percent, leading to a difference-in-differences estimate of -8.8 pp, which is statistically significant at the 1 percent level.

CPC+ practices are not excluded from joining SSP during the intervention period, but they do have to give up the CPC+ Performance-based Incentive Payments to join SSP. Therefore, comparison practices may receive more benefit from joining SSP than CPC+ practices. This may help explain why comparison practices had much higher growth in participation in SSP during Year 1.

For NextGen, the CPC+ and comparison groups started out at close to 0 percent participation in the baseline period. This is because practices participating in CPC+ were unable to join NextGen, and in the comparison selection process, we restricted potential comparison

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[50] For comparison selection, we measured baseline participation status for SSP and NextGen as of January 1, 2017 for comparison selection. Therefore, we measured participation in first year of CPC+ as participation as of January 1, 2018, which is the end of IY1.

practices to practices that were not participating in NextGen during the baseline period.[51] In the first year of CPC+, participation grew for all groups—but the size of growth differed by CPC+ status. Participation in NextGen among Track 1 CPC+ practices barely grew to 0.2 percent, while participation among the Track 1 comparison practices grew to 3.2 percent. The Track 2 CPC+ group's participation grew slightly to 1.1 percent participation, while the Track 2 comparison group's participation grew to 3 percent. For both Track 1 and Track 2, the difference-in-differences estimates of -2.9 and -2.1 pp, respectively, are statistically significant at the 1 percent level. The lack of growth in NextGen participation for the CPC+ group is not surprising, since only practices that withdraw from CPC+ can join NextGen. (These practices remain in our intent-to-treat study population despite withdrawing from CPC+.) Growth for the comparison group is consistent with the fact that the number of accountable care organizations (ACOs) participating in NextGen has increased since it started in 2016.

c.   Participation in other primary care transformation initiatives

Overall, CPC+ was associated with reduced participation in other primary care transformation initiatives. In the first year of CPC+, the CPC+ group's participation in TCPI diminished in each track while the comparison group's participation grew. We also found that CPC+ practices were less likely to participate in three of the four other primary care transformation initiatives that we tracked during the first year of CPC+.

Specifically, in the baseline period, the Track 1 CPC+ group had slightly higher TCPI participation than the comparison group—11.1 percent versus 10.8 percent.[52] However, in the first year of CPC+, participation in TCPI declined slightly to 10.4 percent for CPC+ practices, while the comparison group's participation increased slightly to 12.2 percent. The -2.0 pp difference-in-differences estimate is not statistically significant. For Track 2 practices, the CPC+ group had slightly lower TCPI participation than comparison practices at baseline—9.9 percent versus 12.8 percent. The Track 2 CPC+ group's participation in TCPI increased slightly to 10.0 percent and the comparison group's participation increased to 14.5 percent, producing a difference-in-differences estimate of -1.6 pp, which is not statistically significant. Given that CPC+ practices are not eligible to join TCPI, and previous participants graduate out of TCPI once they have joined an alternative payment model, it is perhaps surprising that participation in TCPI for beneficiaries in CPC+ practices did not drop even more in Track 1, and in the case of Track 2, slightly increased. This is likely due to the following reason: although CPC+ practices had to commit to dropping out of TCPI at the start of CPC+, they did not immediately initiate withdrawal, and therefore on CMS rosters they appeared to remain participating through the beginning of 2017. The increase in participation in the comparison group suggests that, even in the absence of CPC+, some CPC+ practices would have undergone primary care transformation.

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[51] Participation is not exactly zero because the SK&A rosters we use are not the same as the CMS rosters. Therefore, a couple of CPC+ practices are marked as participating in NextGen based on the fact that at least one practitioner affiliated with the practice, according to SK&A, had participated in NextGen.

[52] We measured baseline TCPI participation as participation in the initiative in 2016, and we measured participation in the first year of CPC+ as participation in 2017.

For most of the other primary care transformation initiatives we are studying, we found that the comparison group was more likely to have participated in them during the first year of CPC+.[53] For both Track 1 and Track 2, the CPC+ group had a 6 pp lower participation rate in Medicaid Health Home initiatives, 16 to 17 pp lower participation rate in Health Care Innovation Awards (HCIAs), and 3 to 9 pp lower participation in state- or community-based quality improvement initiatives. These differences are statistically significant. However, we found very little difference in participation in State Innovation Models (SIMs). Overall, participation in these initiatives in the first year of CPC+ was 4 to 27 percent, depending on the research group and initiative.

One possible explanation for the difference in participation rates between CPC+ and comparison practices in most of the initiatives is that participating in CPC+ requires practices to make efforts to meet care delivery requirements, which may make them less likely to concurrently participate in other initiatives.[54] Because we assessed participation in these initiatives through the practice survey, which was fielded during March through September 2017, it is unclear whether these large differences in participation were present before CPC+ and whether they will persist. One additional limitation in interpreting these results is that 29 percent of the comparison practices responded to the survey. Although we reweighted the respondents to look like the full comparison group, they may be different in important unobservable characteristics—such as being more likely to participate in other initiatives. In future reports, we hope to explore and understand these differences more.

d.   Participation in insurer-sponsored initiatives

We found many practices participated in insurer-sponsored initiatives in the first year of CPC+, with participation rates of 62 to 78 percent, depending on the research group. We also found that CPC+ practices were more likely to participate in these initiatives in the first year of CPC+, by 13 pp for Track 1 and 11 pp for Track 2. One reason for this could be that CPC+ regions were chosen partly by regional payers' agreements to partner with CPC+. Payers that were most likely to agree to partnering may be those that already sponsored their own initiatives, such that the payers' "cost" of participating in CPC+ would be smaller.

e.   Combination of initiatives

Looking at whether practices participated in *any* of the initiatives from the practice survey (which measured participation in the first year of CPC+), we found that 80 percent of the Track 1 CPC+ group participated in SIM, HCIA, Medicaid Health Home, a state quality improvement initiative, or another payer initiative during Year 1 of CPC+, while only 72 percent of the Track 1 comparison group did. For Track 2, we found that 85 and 80 percent of the CPC+ and comparison groups participated in such initiatives, respectively. This suggests that, although

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[53] For most primary care transformation initiatives, the data come from the practice survey, which provides participation information only at the time of the survey. The practice survey was fielded from March 30, 2017, to September 25, 2017, for treatment practices, and from May 24, 2017, to September 27, 2017, for comparison practices.

[54] One reason we do not see differences in SIM participation is that SIM may provide additional resources and create synergies with participation in CPC+, while it may be overwhelming to participate in the other programs in addition to CPC+.

comparison practices are participating in more CMS-sponsored initiatives (other than CPC+), after we account for the high participation of CPC+ practices in insurer-sponsored programs, overall participation rates in other initiatives is higher for the CPC+ group.

5.G.3. Implications for impact analyses

The moderate-to-large differences in participation in primary care transformation initiatives and the moderate differences in growth of participation in Medicare FFS value-based purchasing models could decrease the marginal impact of the CPC+ incentives and supports in improving primary care, relative to a case in which these other initiatives did not exist. That is, if these other initiatives are encouraging similar types of changes in the comparison group to those occurring in the CPC+ group, we may observe only small effects, or no effects at all, of CPC+ specifically, even if the broader model of care transformation is indeed effective in improving quality or lowering costs. At the same time, if CPC+ practices are more likely than comparison practices to receive additional incentives from other, non-CMS payers, then failing to account for the impact of these other payers' incentives could lead us to overestimate the impacts of CPC+. In future reports, we will explore the extent to which differential participation in other initiatives by comparison practices might be affecting the marginal impact of CPC+.

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