

## **eAppendix**

### **Detailed Attribution Summary Statistics**

This section provides a detailed look at the numbers behind Figures 1 and 2 in the manuscript. **eAppendix Table 1** shows detailed attribution summary statistics of patients attributed by attribution method (basis of manuscript Figure 1, and Figure 2 Part A). For all but the lookback methods, the fraction attributed is subdivided into the members who were previously attributed to the same clinic system, those who were attributed to a different clinic system and switched affiliation, and those who were not attributed in the prior year. The latter category includes both patients who had newly established relationships, and those who were newly enrolled in coverage in the current year. Stability of attribution was measured for those attributed in the current and prior year as the fraction that stayed in the same system in both years. **eAppendix Table 2** shows the percentage of health expenditures (allowed charges) from attributed patients according to the subdivisions of eAppendix Table 1, by attribution method (basis of manuscript Figure 2 Part B). Patients attributed by PCP- and hierarchical-based methods account for the largest percentage of expenditures, but stably attributed patients under PCP-based methods account for larger percentage of expenditures than hierarchical or all physician attribution methods.

### **Impact of Partial Years of Enrollment**

In practice, retrospective attribution is performed on the entire insured population, including members who may have partial years of exposure due to recent enrollment or termination. **eAppendix Figure 1** is analogous to the manuscript's Figure 1, but divides the population into members with a partial year of enrollment and those with a full 12 months of enrollment. While those with a partial year of enrollment have a lower probability of physician visits due to the shorter exposure time, and thus have lower attribution rates, the relative performance of the attribution rules is consistent in the partial-year and full-year populations.

### **Trinomial Attribution Variable**

Members can be unattributed for 2 reasons: either they have fragmented care and do not meet the majority or plurality rule required for attribution, or they do not seek the type of care on

which attribution is based in the year. **eAppendix Table 3** shows the breakdown between the 2 types on unattributed members, creating a trinomial rather than a binary measure of attribution status, for all but the lookback attribution methods.

### **Impact of Health Status on Attribution**

Health status of the members may substantially change the performance of an attribution method. Related work<sup>1</sup> using a PCP-based method shows that members with more complex health status are more likely to be attributed, but also more likely to switch attributed providers from year to year, possibly because they have a greater chance of divided loyalties due to primary care and specialty relationships spanning multiple provider systems. To assess the performance of the attribution rules by health status, we repeated the calculation of fraction attributed, stability of attribution and association with healthcare utilization for members by health status. We measure health status in 2 ways: by the presence or absence of at least 1 chronic condition, and whether or not the ACG system categorizes the member as high/very high risk (“complex health status”). Whether segmenting the population by the presence of chronic conditions (**eAppendix Table 4**, the basis of Figure 3 in the manuscript) or by health status complexity (**eAppendix Table 5**, the basis of Figure 4 in the manuscript), these tables show a higher fraction attributed for sicker members across all attribution rules. In contrast, the tables show attribution stability is higher for members with 1 or more chronic conditions across all attribution rules, but consistently lower for members with complex health status among PCP-based attribution rules. Thus, we see a marked difference between the impact of chronic conditions (possibly managed in a primary care setting) and complex health status (a mix of chronic and acute conditions) on stability of attribution.

### **Attribution from the Provider’s Perspective**

Our summary statistics focus on the percentage of patients who are attributed in any 1 year, and who have a stable relationship with their providers from year to year. However, a provider system would be interested in only the patients they encounter, and the fraction of patients for whom they are responsible under a shared savings or pay for performance program. They are not concerned about the stability of attribution of the average patient, but the stability of their patients’ relationship with their provider system. We would expect patient loyalty to a

provider system to vary depending on the size and structure of the provider system, with large multispecialty provider systems most likely to create strong patient attachment over time<sup>1</sup> due to their ability to provide a broad spectrum of healthcare services. To explore this alternative perspective, we have created a series of additional summary statistics, displayed in **eAppendix Table 6**, making the assumption that the population covered by this health plan is representative of the general under-65 population in the area, and that the distribution of revenue from this payer is representative of all payers for the under-65 population. The first 2 statistics capture measures of the attributed patient population as a fraction of the provider system's total patient population, and the third measures the fraction of care delivered by the provider system for patients attributed to that system:

1. Patients attributed to the provider system as a fraction of all patients receiving care from that provider system. Here the "Total" column is the sum of the "Returning" and "New" columns.
2. The fraction of the provider system's revenue from attributed patients, ie, allowed charges paid to the provider system for their attributed patients as a fraction of all dollars paid to the provider system. Here the "Total" column is the sum of the "Returning" and "New" columns.
3. Fraction of the attributed patient's revenue under the provider system's control, ie, for the provider system's attributed patients, allowed charged paid to the provider system as a fraction of all dollars paid for covered services received by the patient. Here the "Total" column is the average of the "Returning" and "New" columns.

**eAppendix Figure 4** helps to clarify the distinction between the first 2 statistics and the third statistic. In this Venn diagram, we see the universe of allowed charges for the care of the covered population, some of which is paid to the provider system under consideration, and some of which is paid to other systems. The patients attributed to the provider system under consideration receive care from that system and from other systems. Statistic 2 is  $(\text{area B}) / (\text{area A} + \text{area B})$ , the fraction of the provider system's allowed charges from attributed patients; Statistic 1 is defined analogously using patient counts rather than dollars. Statistic 3 is  $(\text{area B}) / (\text{area B} + \text{area C})$ , the fraction of the attributed patient's allowed charges under the provider system's control.

We expect these statistics to vary significantly across provider system size and structure, so the statistics are computed in total and then separately for vertically integrated hospital and physician provider systems, for large physician-only systems (number of providers in the system above the median), and for small physician-only systems (number of providers in the system below the median). We further break down these statistics into the attributed patients who are newly attributed to the provider system, versus the patients who were also attributed to that system in the previous year. The “Returning” column in eAppendix Table 6 is analogous to the “Previously in System” column in eAppendix Table 4, and the “New” column in eAppendix Table 6 is analogous to the sum of eAppendix Table 4’s “Switched Systems” and “Newly Attributed” columns. Due to space constraints, here we do not identify why the “New” patients are new to the system.

These results show that the attributed population comprises a larger fraction of the provider system’s total patient population as the size of the provider organization increases. This gradient is strong when the fraction is computed by patient count (first set of columns); less strong but still monotonic when the fraction is computed by dollars (second set of columns). We also find that the attributed patient population is weighted more towards patients newly attributed to the system when the provider system is small, suggesting that smaller systems see greater turnover in their attributed population; this in conjunction with the small fraction attributed means smaller systems will have less success in reaping the future benefits of investments in population health.

In the final set of columns in eAppendix Table 6, we see the average fraction of total attributed patient care dollars controlled by the provider system. As expected, the larger clinic systems, especially those vertically integrated with hospitals, control a greater fraction of the care accessed by their attributed patients. However, even for the large integrated delivery systems, on average there is a large plurality or small majority of care provided outside of their system.

## REFERENCES

1. Carlin CS. Patient loyalty in a mature IDS market: is population health management worth it? *Health Serv Res.* 2014;49(3):1011-1033. doi: 10.1111/1475-6773.12147.

**eAppendix Table 1.** Detailed Attribution Statistics – Attributed Patients

				% Attributed patients					
				Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>	
PCP	Cost	All visits	Majority	31.9%	8.2%	24.2%	64.3%	79.5%	
			Plurality	32.0%	9.3%	23.9%	65.2%	77.5%	
		E&M	Majority	29.8%	6.8%	24.1%	60.6%	81.4%	
			Plurality	29.8%	8.0%	23.8%	61.6%	78.8%	
	Count	All visits	Majority	32.4%	7.6%	24.1%	64.1%	80.9%	
			Plurality	32.5%	8.3%	24.0%	64.7%	79.7%	
		E&M	Majority	29.9%	6.9%	24.0%	60.8%	81.2%	
			Plurality	30.0%	7.3%	23.9%	61.2%	80.4%	
	All physicians	Cost	All visits	Majority	25.1%	12.5%	26.6%	64.3%	66.8%
				Plurality	27.1%	18.2%	25.1%	70.4%	59.9%
			E&M	Majority	27.0%	9.1%	25.1%	61.3%	74.8%
				Plurality	27.8%	12.7%	24.2%	64.7%	68.6%
Count		All visits	Majority	27.0%	10.5%	26.3%	63.8%	71.9%	
			Plurality	29.0%	13.8%	25.5%	68.2%	67.8%	
		E&M	Majority	27.7%	9.4%	24.9%	61.9%	74.7%	
			Plurality	28.4%	10.9%	24.4%	63.7%	72.3%	
Hierarchical		Cost	All visits	Majority	33.7%	12.5%	24.8%	70.9%	72.9%
				Plurality	33.7%	13.6%	24.4%	71.8%	71.2%
			E&M	Majority	31.1%	9.2%	24.2%	64.5%	77.2%
				Plurality	31.0%	10.4%	23.9%	65.4%	74.9%
	Count	All visits	Majority	34.1%	11.8%	24.7%	70.6%	74.4%	
			Plurality	34.3%	12.5%	24.5%	71.3%	73.2%	
		E&M	Majority	31.2%	9.3%	24.1%	64.6%	77.0%	
			Plurality	31.3%	9.8%	24.0%	65.1%	76.2%	
	Lookback	Cost	All visits	Majority	42.5%	8.2%	24.2%	74.9%	83.8%
				Plurality	42.0%	9.3%	23.9%	75.2%	81.9%
			E&M	Majority	41.2%	6.8%	24.1%	72.0%	85.8%
				Plurality	40.7%	8.0%	23.8%	72.5%	83.6%
Count		All visits	Majority	43.0%	7.6%	24.1%	74.8%	84.9%	
			Plurality	42.8%	8.3%	24.0%	75.0%	83.8%	
		E&M	Majority	41.2%	6.9%	24.0%	72.1%	85.6%	
			Plurality	41.1%	7.3%	23.9%	72.3%	84.9%	

E&M indicates evaluation and management; PCP, primary care physician.

<sup>a</sup>% Stable = (Previously in system)/(Previously in system + Switched systems)

**eAppendix Table 2.** Detailed Attribution Statistics – All Costs

				% All costs				
				Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>
PCP	Cost	All visits	Majority	48.1%	16.3%	26.1%	90.5%	74.7%
			Plurality	48.5%	19.3%	25.5%	93.4%	71.5%
		E&M	Majority	47.4%	13.0%	26.7%	87.1%	78.5%
			Plurality	47.8%	16.3%	26.3%	90.3%	74.6%
	Count	All visits	Majority	50.1%	14.0%	26.0%	90.0%	78.2%
			Plurality	50.4%	16.6%	25.7%	92.7%	75.2%
		E&M	Majority	48.4%	12.8%	26.6%	87.8%	79.1%
			Plurality	48.5%	14.7%	26.4%	89.6%	76.8%
All physicians	Cost	All visits	Majority	31.9%	17.0%	26.8%	75.7%	65.2%
			Plurality	37.2%	29.7%	25.3%	92.3%	55.6%
		E&M	Majority	38.3%	14.3%	27.2%	79.7%	72.9%
			Plurality	42.0%	23.3%	25.9%	91.2%	64.3%
	Count	All visits	Majority	34.7%	13.1%	25.6%	73.4%	72.5%
			Plurality	41.0%	22.4%	25.8%	89.1%	64.7%
		E&M	Majority	40.1%	14.8%	26.7%	81.6%	73.1%
			Plurality	43.1%	20.4%	26.2%	89.8%	67.8%
Hierarchical	Cost	All visits	Majority	49.8%	21.8%	24.3%	95.9%	69.6%
			Plurality	50.2%	24.4%	23.7%	98.3%	67.3%
		E&M	Majority	49.2%	16.5%	25.6%	91.3%	75.0%
			Plurality	49.4%	19.6%	25.0%	93.9%	71.6%
	Count	All visits	Majority	51.8%	18.9%	24.4%	95.0%	73.3%
			Plurality	52.1%	21.7%	24.0%	97.7%	70.6%
		E&M	Majority	50.2%	16.1%	25.4%	91.7%	75.7%
			Plurality	50.2%	18.1%	25.1%	93.4%	73.5%
Lookback	Cost	All visits	Majority	52.6%	16.3%	26.1%	95.0%	76.3%
			Plurality	51.1%	19.3%	25.5%	95.9%	72.5%
		E&M	Majority	53.2%	13.0%	26.7%	92.9%	80.4%
			Plurality	51.7%	16.3%	26.3%	94.2%	76.0%
	Count	All visits	Majority	54.7%	14.0%	26.0%	94.6%	79.7%
			Plurality	53.4%	16.6%	25.7%	95.7%	76.3%
		E&M	Majority	53.8%	12.8%	26.6%	93.2%	80.8%
			Plurality	52.8%	14.7%	26.4%	93.9%	78.2%

E&M indicates evaluation and management; PCP, primary care physician.

<sup>a</sup>% Stable = (Previously in system)/(Previously in system + Switched systems)

**eAppendix Table 3.** Summary of Trinomial Attribution Variable

			No Care	Fragmented Care	Attributed	
PCP	Cost	All visits	<u>Majority</u>	26.9%	0.8%	72.3%
			<u>Plurality</u>	26.9%	0.1%	73.0%
		E&M	<u>Majority</u>	30.7%	0.8%	68.5%
			<u>Plurality</u>	30.7%	0.1%	69.2%
	Count	All visits	<u>Majority</u>	26.9%	0.9%	72.2%
			<u>Plurality</u>	26.9%	0.4%	72.7%
		E&M	<u>Majority</u>	30.7%	0.7%	68.6%
			<u>Plurality</u>	30.7%	0.3%	69.0%
All physicians	Cost	All visits	<u>Majority</u>	20.7%	8.3%	71.0%
			<u>Plurality</u>	20.7%	1.7%	77.6%
		E&M	<u>Majority</u>	27.0%	4.5%	68.6%
			<u>Plurality</u>	27.0%	0.7%	72.3%
	Count	All visits	<u>Majority</u>	20.7%	8.6%	70.8%
			<u>Plurality</u>	20.7%	3.6%	75.7%
		E&M	<u>Majority</u>	27.0%	3.7%	69.3%
			<u>Plurality</u>	27.0%	1.6%	71.4%
Hierarchical	Cost	All visits	<u>Majority</u>	20.7%	0.8%	78.5%
			<u>Plurality</u>	20.7%	0.1%	79.3%
		E&M	<u>Majority</u>	27.0%	0.8%	72.2%
			<u>Plurality</u>	27.0%	0.1%	73.0%
	Count	All visits	<u>Majority</u>	20.7%	1.0%	78.3%
			<u>Plurality</u>	20.7%	0.4%	78.9%
		E&M	<u>Majority</u>	27.0%	0.6%	72.4%
			<u>Plurality</u>	27.0%	0.3%	72.7%

E&M indicates evaluation and management; PCP, primary care physician.



**eAppendix Table 4.** Attribution Summary Statistics by Number of Chronic Conditions

			No Chronic Conditions					One or More Chronic Conditions					
			% Attributed					% Attributed					
			Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>	Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>	
PCP	Cost	All visits	Majority	28.7%	9.3%	20.5%	58.5%	75.5%	61.0%	13.3%	6.9%	81.2%	82.1%
			Plurality	28.8%	10.2%	20.3%	59.3%	73.9%	61.2%	15.5%	5.8%	82.5%	79.7%
	E&M	Majority	25.2%	7.6%	21.9%	54.7%	76.9%	58.9%	11.2%	8.2%	78.3%	84.1%	
		Plurality	25.3%	8.5%	21.7%	55.5%	74.8%	58.9%	13.6%	7.1%	79.6%	81.2%	
	Count	All visits	Majority	28.9%	8.9%	20.6%	58.4%	76.6%	62.2%	12.1%	6.9%	81.1%	83.7%
			Plurality	29.0%	9.3%	20.4%	58.8%	75.8%	62.4%	13.5%	6.2%	82.0%	82.2%
	E&M	Majority	25.3%	7.7%	21.8%	54.8%	76.7%	59.2%	11.4%	8.0%	78.5%	83.9%	
		Plurality	25.3%	7.9%	21.8%	55.0%	76.2%	59.5%	12.3%	7.5%	79.2%	82.9%	
All physicians	Cost	All visits	Majority	24.6%	15.0%	21.0%	60.7%	62.2%	45.6%	19.3%	11.6%	76.4%	70.3%
			Plurality	25.9%	19.5%	19.7%	65.1%	57.0%	50.0%	30.7%	5.5%	86.2%	61.9%
	E&M	Majority	23.9%	10.5%	21.9%	56.3%	69.4%	52.3%	14.4%	10.1%	76.9%	78.4%	
		Plurality	24.2%	13.4%	21.2%	58.8%	64.4%	54.2%	21.9%	6.4%	82.6%	71.2%	
	Count	All visits	Majority	25.8%	13.2%	21.0%	60.0%	66.2%	49.7%	15.5%	11.0%	76.3%	76.2%
			Plurality	26.9%	15.5%	20.5%	62.9%	63.4%	54.4%	22.4%	7.0%	83.9%	70.8%
	E&M	Majority	24.2%	10.8%	21.8%	56.8%	69.2%	53.8%	15.0%	9.2%	78.1%	78.1%	
		Plurality	24.6%	11.7%	21.5%	57.8%	67.8%	55.6%	18.5%	7.2%	81.3%	75.0%	
Hierarchical	Cost	All visits	Majority	30.8%	14.7%	19.7%	65.2%	67.6%	63.8%	19.6%	4.3%	87.7%	76.5%
			Plurality	30.9%	15.7%	19.4%	65.9%	66.3%	63.9%	21.8%	3.2%	88.9%	74.5%
	E&M	Majority	26.6%	10.6%	21.3%	58.4%	71.6%	61.2%	14.7%	6.5%	82.5%	80.6%	
		Plurality	26.6%	11.5%	21.0%	59.1%	69.8%	61.0%	17.2%	5.5%	83.7%	78.0%	
	Count	All visits	Majority	31.0%	14.1%	19.8%	64.9%	68.7%	65.0%	18.1%	4.4%	87.4%	78.2%
			Plurality	31.1%	14.7%	19.6%	65.4%	67.9%	65.1%	19.7%	3.6%	88.4%	76.8%
	E&M	Majority	26.6%	10.7%	21.2%	58.5%	71.4%	61.5%	14.9%	6.3%	82.7%	80.4%	
		Plurality	26.7%	10.9%	21.2%	58.8%	70.9%	61.7%	16.0%	5.8%	83.4%	79.5%	
Lookback	Cost	All visits	Majority	43.6%	9.3%	20.5%	73.4%	82.4%	74.6%	13.3%	6.9%	94.7%	84.9%
			Plurality	43.2%	10.2%	20.3%	73.7%	80.9%	73.7%	15.5%	5.8%	95.1%	82.6%
	E&M	Majority	40.7%	7.6%	21.9%	70.2%	84.3%	74.1%	11.2%	8.2%	93.5%	86.9%	
		Plurality	40.3%	8.5%	21.7%	70.5%	82.6%	73.1%	13.6%	7.1%	93.9%	84.3%	
	Count	All visits	Majority	43.9%	8.9%	20.6%	73.3%	83.2%	75.7%	12.1%	6.9%	94.7%	86.2%
			Plurality	43.8%	9.3%	20.4%	73.5%	82.5%	75.3%	13.5%	6.2%	95.0%	84.8%
	E&M	Majority	40.7%	7.7%	21.8%	70.2%	84.1%	74.3%	11.4%	8.0%	93.6%	86.7%	
		Plurality	40.6%	7.9%	21.8%	70.3%	83.7%	74.0%	12.3%	7.5%	93.8%	85.8%	

E&M indicates evaluation and management; PCP, primary care physician.

<sup>a</sup>% Stable = (Previously in system)/(Previously in system + Switched systems)

**eAppendix Table 5.** Attribution Summary Statistics by Complexity of Health Status

			Not Complex Health Status					Complex Health Status						
			% Attributed					% Attributed						
			Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>	Previously in System	Switched Systems	Newly Attributed	Total	% Stable <sup>a</sup>		
PCP	Cost	All	Majority	40.1%	10.0%	16.0%	66.1%	80.0%	61.5%	17.6%	4.7%	83.8%	77.7%	
		visits	Plurality	40.2%	11.1%	15.7%	67.0%	78.3%	62.0%	21.6%	2.4%	86.0%	74.1%	
		E&M	Majority	37.2%	8.4%	17.2%	62.8%	81.6%	59.1%	14.2%	6.9%	80.2%	80.7%	
			Plurality	37.1%	9.6%	16.9%	63.6%	79.5%	59.4%	18.4%	4.7%	82.5%	76.4%	
	Count	All	Majority	40.5%	9.5%	16.1%	66.0%	81.1%	63.6%	15.4%	4.7%	83.7%	80.5%	
		visits	Plurality	40.6%	10.0%	15.9%	66.5%	80.2%	64.3%	18.3%	2.9%	85.4%	77.9%	
All physicians	Cost	All	Majority	33.1%	16.7%	17.0%	66.8%	66.5%	39.3%	18.3%	15.8%	73.3%	68.3%	
			visits	Plurality	34.9%	22.9%	14.6%	72.4%	60.3%	46.9%	34.3%	6.1%	87.3%	57.8%
		E&M	Majority	34.6%	11.8%	17.4%	63.8%	74.5%	48.5%	15.2%	12.2%	75.9%	76.1%	
			Plurality	35.0%	15.8%	16.1%	66.9%	68.9%	53.2%	26.0%	5.5%	84.6%	67.2%	
	Count	All	Majority	35.1%	14.3%	16.9%	66.4%	71.0%	44.5%	13.7%	14.5%	72.7%	76.5%	
			visits	Plurality	36.9%	17.6%	15.7%	70.2%	67.7%	52.7%	24.8%	7.2%	84.7%	68.0%
		E&M	Majority	35.2%	12.1%	17.1%	64.4%	74.3%	51.0%	16.0%	10.5%	77.4%	76.1%	
			Plurality	35.8%	13.5%	16.6%	65.9%	72.6%	54.5%	22.5%	6.2%	83.2%	70.8%	
	Hierarchical	Cost	All	Majority	42.5%	15.8%	14.4%	72.7%	72.9%	63.6%	23.4%	3.0%	90.1%	73.1%
				visits	Plurality	42.5%	17.0%	14.0%	73.6%	71.5%	64.0%	27.3%	0.8%	92.1%
			E&M	Majority	38.8%	11.5%	16.2%	66.6%	77.2%	61.3%	18.1%	5.4%	84.7%	77.2%
				Plurality	38.7%	12.7%	15.9%	67.4%	75.3%	61.3%	22.3%	3.2%	86.8%	73.4%
Count		All	Majority	42.9%	15.1%	14.5%	72.5%	73.9%	65.8%	20.6%	3.2%	89.7%	76.2%	
			visits	Plurality	43.0%	15.8%	14.3%	73.1%	73.1%	66.4%	23.8%	1.3%	91.5%	73.6%
		E&M	Majority	38.9%	11.6%	16.2%	66.7%	77.0%	61.9%	18.3%	4.8%	85.0%	77.2%	
			Plurality	39.0%	12.0%	16.0%	67.0%	76.5%	62.3%	20.5%	3.6%	86.4%	75.3%	
Lookback	Cost	All	Majority	54.6%	10.0%	16.0%	80.7%	84.5%	74.3%	17.6%	4.7%	96.6%	80.8%	
			visits	Plurality	54.1%	11.1%	15.7%	80.9%	83.0%	73.2%	21.6%	2.4%	97.2%	77.2%
		E&M	Majority	52.7%	8.4%	17.2%	78.3%	86.3%	73.4%	14.2%	6.9%	94.5%	83.8%	
			Plurality	52.1%	9.6%	16.9%	78.6%	84.5%	72.2%	18.4%	4.7%	95.3%	79.7%	
	Count	All	Majority	55.1%	9.5%	16.1%	80.6%	85.3%	76.5%	15.4%	4.7%	96.6%	83.2%	
			visits	Plurality	54.9%	10.0%	15.9%	80.8%	84.6%	75.9%	18.3%	2.9%	97.1%	80.6%
		E&M	Majority	52.7%	8.5%	17.2%	78.3%	86.1%	73.9%	14.5%	6.3%	94.7%	83.6%	
			Plurality	52.6%	8.8%	17.1%	78.4%	85.7%	73.5%	16.5%	5.1%	95.2%	81.7%	

E&M indicates evaluation and management; PCP, primary care physician.

**eAppendix Table 6.** Attribution Measures from the Provider Perspective

			1. Attributed Patients as a Fraction of System's Total Patients			2. Revenue from Attributed Patients as a Fraction of System's Total Revenue			3. Fraction of Attributed Patients' Total Revenue Paid to System				
			Returning	New	Total	Returning	New	Total	Returning	New	Total		
PCP	Cost	All visits	Majority	IDS	0.332	0.263	0.596	0.365	0.252	0.617	0.521	0.483	0.505
				Large	0.175	0.169	0.344	0.189	0.192	0.380	0.295	0.304	0.299
				Small	0.048	0.069	0.117	0.060	0.116	0.176	0.126	0.167	0.150
				All	0.240	0.207	0.447	0.299	0.229	0.527	0.441	0.407	0.426
			Plurality	IDS	0.321	0.261	0.582	0.350	0.247	0.597	0.519	0.470	0.498
				Large	0.163	0.161	0.324	0.184	0.189	0.374	0.290	0.289	0.290
				Small	0.048	0.070	0.118	0.065	0.129	0.195	0.125	0.168	0.151
				All	0.227	0.201	0.427	0.287	0.225	0.512	0.436	0.392	0.415
			E&M	IDS	0.326	0.269	0.595	0.355	0.247	0.601	0.498	0.461	0.482
				Large	0.189	0.185	0.374	0.183	0.172	0.355	0.272	0.279	0.275
				Small	0.074	0.094	0.168	0.075	0.119	0.194	0.111	0.139	0.126
				All	0.251	0.222	0.474	0.292	0.219	0.512	0.419	0.387	0.405
		All visits	IDS	0.314	0.267	0.580	0.340	0.246	0.585	0.495	0.456	0.477	
			Large	0.175	0.176	0.351	0.179	0.173	0.351	0.269	0.266	0.267	
			Small	0.073	0.095	0.168	0.082	0.128	0.210	0.108	0.130	0.120	
			All	0.236	0.215	0.451	0.281	0.219	0.500	0.413	0.377	0.396	
		Count	All visits	IDS	0.334	0.260	0.594	0.364	0.242	0.606	0.510	0.486	0.500
				Large	0.170	0.157	0.326	0.190	0.172	0.362	0.280	0.287	0.283
				Small	0.051	0.067	0.118	0.063	0.102	0.165	0.115	0.161	0.140
				All	0.236	0.198	0.434	0.298	0.216	0.513	0.426	0.401	0.415
	E&M		IDS	0.330	0.259	0.589	0.355	0.242	0.597	0.508	0.478	0.495	
			Large	0.177	0.165	0.343	0.189	0.174	0.362	0.278	0.281	0.279	
			Small	0.050	0.066	0.116	0.062	0.099	0.161	0.116	0.153	0.136	
			All	0.240	0.203	0.443	0.292	0.216	0.508	0.424	0.394	0.410	
	All visits	IDS	0.323	0.267	0.589	0.349	0.238	0.588	0.494	0.462	0.481		
		Large	0.179	0.174	0.354	0.187	0.171	0.357	0.268	0.273	0.271		
		Small	0.075	0.096	0.171	0.086	0.134	0.220	0.107	0.138	0.124		
		All	0.243	0.215	0.457	0.290	0.214	0.503	0.412	0.383	0.399		

	IDS	0.320	0.266	0.586	0.343	0.240	0.583	0.493	0.459	0.479
	Large	0.189	0.185	0.374	0.185	0.174	0.359	0.266	0.270	0.268
	Small	0.075	0.095	0.169	0.086	0.136	0.222	0.106	0.139	0.124
	<i>All</i>	<i>0.248</i>	<i>0.221</i>	<i>0.469</i>	<i>0.286</i>	<i>0.216</i>	<i>0.501</i>	<i>0.410</i>	<i>0.380</i>	<i>0.397</i>

Table A6: Attribution Measures from the Provider Perspective, cont.

			1. Attributed Patients as a Fraction of System's Total Patients			2. Revenue from Attributed Patients as a Fraction of System's Total Revenue			3. Fraction of Attributed Patients' Total Revenue Paid to System			
			Returning	New	Total	Returning	New	Total	Returning	New	Total	
				IDS	0.295	0.305	0.600	0.346	0.311	0.657	0.655	0.572
All Physicians	All visits	Majority	Large	0.124	0.214	0.338	0.207	0.308	0.515	0.498	0.391	0.428
		Small	0.035	0.115	0.150	0.158	0.239	0.397	0.483	0.313	0.364	
		<i>All</i>	<i>0.186</i>	<i>0.245</i>	<i>0.431</i>	<i>0.287</i>	<i>0.309</i>	<i>0.596</i>	<i>0.599</i>	<i>0.478</i>	<i>0.530</i>	
		Plurality	IDS	0.268	0.278	0.546	0.311	0.279	0.591	0.622	0.534	0.577
	Cost	Large	0.112	0.198	0.311	0.190	0.286	0.476	0.442	0.334	0.370	
		Small	0.034	0.107	0.141	0.139	0.214	0.353	0.408	0.262	0.305	
		<i>All</i>	<i>0.166</i>	<i>0.223</i>	<i>0.390</i>	<i>0.260</i>	<i>0.281</i>	<i>0.540</i>	<i>0.553</i>	<i>0.424</i>	<i>0.478</i>	
		E&M	IDS	0.314	0.291	0.605	0.355	0.278	0.634	0.554	0.483	0.520
		Majority	Large	0.127	0.174	0.301	0.162	0.203	0.365	0.365	0.304	0.329
		Small	0.049	0.113	0.161	0.078	0.127	0.206	0.217	0.183	0.195	
		<i>All</i>	<i>0.199</i>	<i>0.219</i>	<i>0.418</i>	<i>0.277</i>	<i>0.247</i>	<i>0.525</i>	<i>0.493</i>	<i>0.403</i>	<i>0.446</i>	
		Plurality	IDS	0.288	0.275	0.563	0.322	0.260	0.582	0.534	0.459	0.498
	Large	0.119	0.171	0.291	0.155	0.196	0.351	0.334	0.271	0.296		
	Small	0.044	0.106	0.150	0.070	0.126	0.196	0.194	0.174	0.181		
	<i>All</i>	<i>0.182</i>	<i>0.209</i>	<i>0.391</i>	<i>0.253</i>	<i>0.233</i>	<i>0.486</i>	<i>0.464</i>	<i>0.370</i>	<i>0.413</i>		
	Majority	IDS	0.314	0.299	0.613	0.365	0.298	0.662	0.625	0.573	0.600	
Count	All visits	Large	0.137	0.200	0.336	0.210	0.277	0.487	0.445	0.398	0.417	
		Small	0.042	0.111	0.153	0.155	0.218	0.372	0.411	0.304	0.341	
		<i>All</i>	<i>0.201</i>	<i>0.234</i>	<i>0.435</i>	<i>0.300</i>	<i>0.288</i>	<i>0.588</i>	<i>0.560</i>	<i>0.486</i>	<i>0.521</i>	
		Plurality	IDS	0.298	0.278	0.576	0.336	0.272	0.608	0.592	0.535	0.565
		Large	0.125	0.181	0.307	0.197	0.257	0.454	0.407	0.352	0.374	
		Small	0.040	0.102	0.142	0.141	0.193	0.334	0.355	0.254	0.288	
		<i>All</i>	<i>0.186</i>	<i>0.214</i>	<i>0.399</i>	<i>0.277</i>	<i>0.264</i>	<i>0.541</i>	<i>0.521</i>	<i>0.440</i>	<i>0.478</i>	

E&M	Majority	IDS	0.308	0.283	0.592	0.345	0.262	0.608	0.546	0.479	0.515
		Large	0.131	0.173	0.303	0.168	0.201	0.369	0.341	0.297	0.316
		Small	0.049	0.107	0.156	0.078	0.125	0.203	0.198	0.179	0.186
		All	0.198	0.214	0.413	0.272	0.237	0.509	0.474	0.395	0.434
	Plurality	IDS	0.300	0.274	0.574	0.328	0.253	0.581	0.531	0.467	0.501
		Large	0.124	0.165	0.290	0.163	0.194	0.357	0.327	0.277	0.297
		Small	0.049	0.106	0.155	0.077	0.124	0.201	0.194	0.167	0.177
		All	0.190	0.206	0.396	0.260	0.228	0.488	0.458	0.375	0.415

Table A6: Attribution Measures from the Provider Perspective, cont.

Hierarchical			1. Attributed Patients as a Fraction of System's Total Patients			2. Revenue from Attributed Patients as a Fraction of System's Total Revenue			3. Fraction of Attributed Patients' Total Revenue Paid to System			
			Returning	New	Total	Returning	New	Total	Returning	New	Total	
Cost	All visits	Majority	IDS	0.328	0.261	0.589	0.362	0.247	0.609	0.523	0.481	0.505
			Large	0.128	0.145	0.272	0.162	0.188	0.351	0.306	0.321	0.314
			Small	0.030	0.065	0.095	0.032	0.093	0.124	0.144	0.217	0.192
			All	0.196	0.183	0.379	0.276	0.221	0.497	0.446	0.408	0.428
		Plurality	IDS	0.318	0.259	0.577	0.349	0.243	0.592	0.521	0.469	0.498
			Large	0.126	0.146	0.272	0.161	0.186	0.347	0.300	0.306	0.303
			Small	0.030	0.065	0.095	0.031	0.092	0.123	0.138	0.212	0.187
			All	0.192	0.183	0.375	0.268	0.218	0.486	0.440	0.393	0.418
	E&M	Majority	IDS	0.324	0.266	0.589	0.354	0.241	0.596	0.498	0.454	0.480
			Large	0.131	0.142	0.273	0.151	0.153	0.304	0.277	0.278	0.278
			Small	0.048	0.085	0.134	0.047	0.100	0.146	0.116	0.155	0.140
			All	0.203	0.188	0.391	0.270	0.205	0.475	0.421	0.379	0.402
		Plurality	IDS	0.312	0.264	0.576	0.340	0.241	0.581	0.496	0.451	0.476
			Large	0.131	0.145	0.276	0.149	0.154	0.304	0.272	0.265	0.268
			Small	0.048	0.085	0.132	0.047	0.098	0.145	0.115	0.147	0.135
			All	0.198	0.189	0.387	0.262	0.205	0.467	0.416	0.369	0.394
Count	All visits	Majority	IDS	0.332	0.258	0.589	0.363	0.240	0.603	0.513	0.484	0.501
			Large	0.132	0.142	0.273	0.165	0.173	0.338	0.291	0.310	0.300
			Small	0.033	0.064	0.096	0.033	0.083	0.116	0.130	0.214	0.181
			All	0.200	0.180	0.380	0.278	0.210	0.488	0.431	0.405	0.420

E&M	Plurality	IDS	0.327	0.257	0.584	0.355	0.239	0.594	0.511	0.477	0.497
		Large	0.130	0.141	0.271	0.163	0.172	0.334	0.289	0.300	0.295
		Small	0.032	0.064	0.096	0.033	0.083	0.116	0.128	0.202	0.174
		<i>All</i>	<i>0.197</i>	<i>0.180</i>	<i>0.377</i>	<i>0.272</i>	<i>0.209</i>	<i>0.481</i>	<i>0.429</i>	<i>0.396</i>	<i>0.414</i>
	Majority	IDS	0.321	0.263	0.584	0.350	0.233	0.583	0.496	0.456	0.479
		Large	0.133	0.143	0.275	0.155	0.153	0.309	0.272	0.274	0.273
		Small	0.050	0.087	0.136	0.051	0.106	0.157	0.115	0.154	0.139
		<i>All</i>	<i>0.203</i>	<i>0.188</i>	<i>0.390</i>	<i>0.270</i>	<i>0.200</i>	<i>0.470</i>	<i>0.415</i>	<i>0.376</i>	<i>0.397</i>
	Plurality	IDS	0.318	0.262	0.580	0.343	0.236	0.579	0.494	0.455	0.477
		Large	0.131	0.142	0.273	0.152	0.154	0.306	0.269	0.270	0.270
		Small	0.049	0.086	0.135	0.051	0.106	0.157	0.113	0.154	0.138
		<i>All</i>	<i>0.201</i>	<i>0.187</i>	<i>0.387</i>	<i>0.265</i>	<i>0.202</i>	<i>0.466</i>	<i>0.413</i>	<i>0.373</i>	<i>0.395</i>

Table A6: Attribution Measures from the Provider Perspective, cont.

Lookback			1. Attributed Patients as a	2. Revenue from Attributed	3. Fraction of Attributed
			Fraction of System's	Patients as a Fraction of	Patients' Total Revenue
			Total Patients	System's Total Revenue	Paid to System
			Total	Total	Total
Cost	All visits	IDS	0.586	0.606	0.501
		Large	0.332	0.371	0.296
		Small	0.111	0.154	0.147
		<i>All</i>	<i>0.435</i>	<i>0.516</i>	<i>0.421</i>
	Plurality	IDS	0.578	0.593	0.497
		Large	0.317	0.368	0.291
		Small	0.112	0.170	0.151
		<i>All</i>	<i>0.421</i>	<i>0.507</i>	<i>0.415</i>
	Majority	IDS	0.586	0.591	0.478
		Large	0.360	0.342	0.274
		Small	0.164	0.182	0.124
		<i>All</i>	<i>0.461</i>	<i>0.498</i>	<i>0.401</i>
E&M	IDS	0.576	0.581	0.477	
	Large	0.342	0.341	0.269	
	Small	0.163	0.177	0.120	
	<i>All</i>	<i>0.444</i>	<i>0.491</i>	<i>0.397</i>	

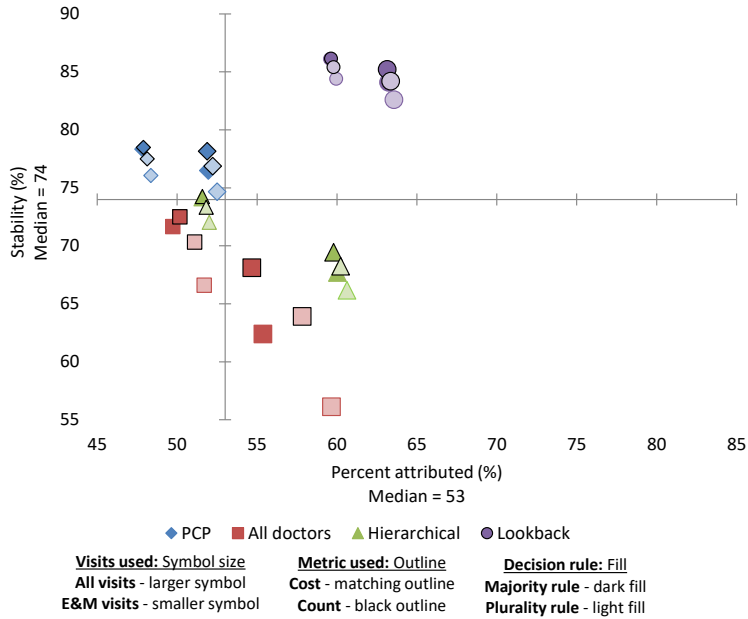


		IDS	0.584	0.595	0.496
	Majority	Large	0.316	0.353	0.280
		Small	0.111	0.141	0.134
	All visits	<i>All</i>	<i>0.423</i>	<i>0.502</i>	<i>0.411</i>
		IDS	0.582	0.592	0.494
	Plurality	Large	0.334	0.357	0.280
		Small	0.110	0.141	0.134
Count		<i>All</i>	<i>0.434</i>	<i>0.502</i>	<i>0.409</i>
		IDS	0.581	0.578	0.477
	Majority	Large	0.341	0.343	0.269
		Small	0.166	0.184	0.118
	E&M	<i>All</i>	<i>0.446</i>	<i>0.490</i>	<i>0.396</i>
		IDS	0.580	0.577	0.477
	Plurality	Large	0.362	0.347	0.269
		Small	0.165	0.186	0.123
		<i>All</i>	<i>0.460</i>	<i>0.492</i>	<i>0.396</i>

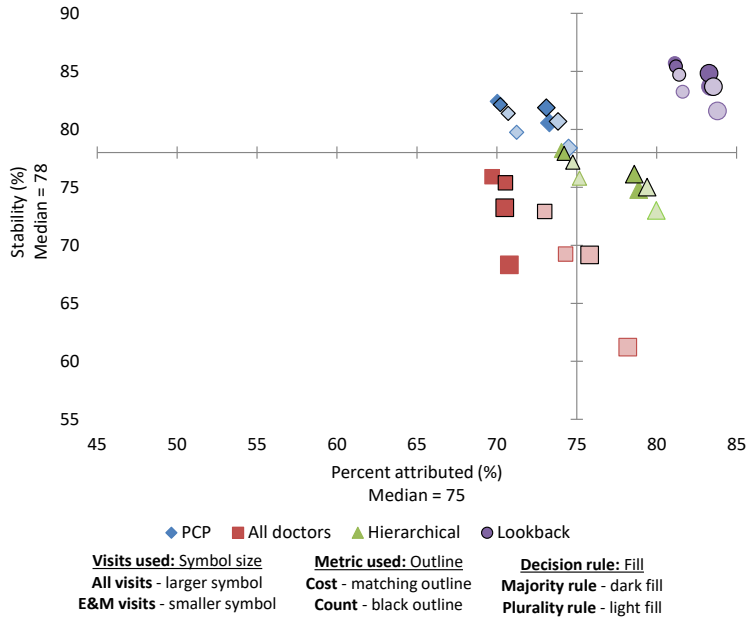
E&M indicates evaluation and management; IDS, integrated delivery system.

**eAppendix Figure 1. Fraction of Patients Attributed and Stability of Attribution by Length of Enrollment**

**A. Enrollees with 12 months of exposure**



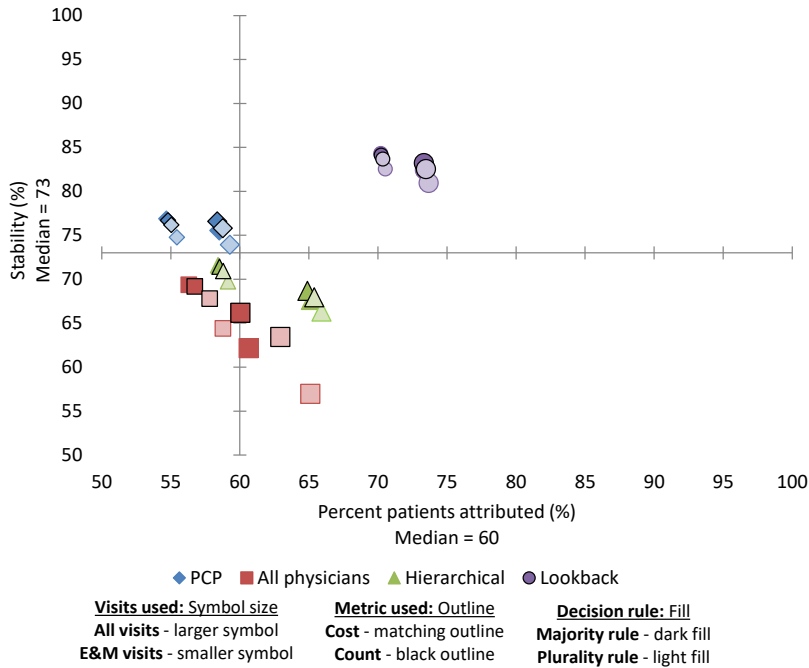
**B. Enrollees with less than 12 months of exposure**



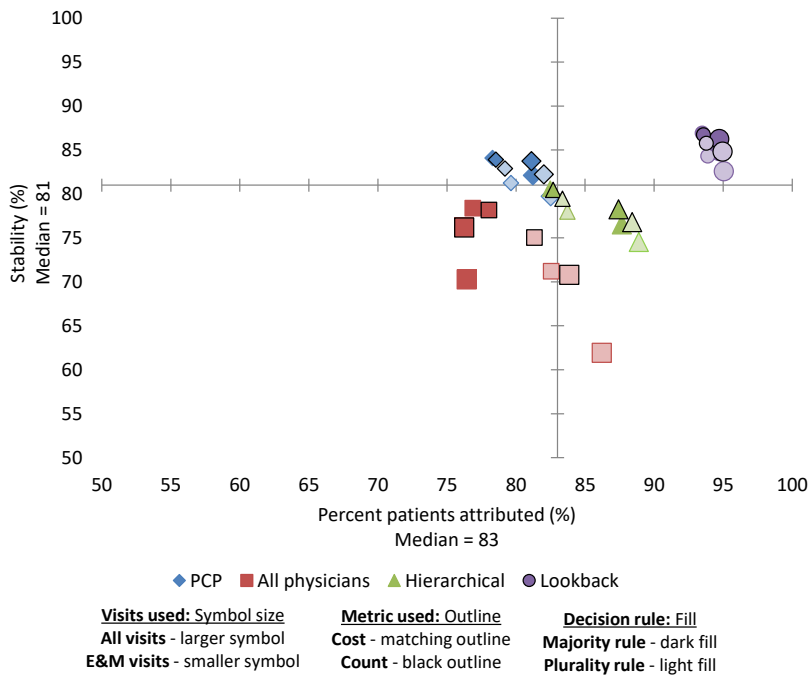
E&M indicates evaluation and management; PCP, primary care physician.

**eAppendix Figure 2. Fraction of Patients Attributed and Stability of Attribution, by Chronic Condition Status**

**A. No chronic conditions**



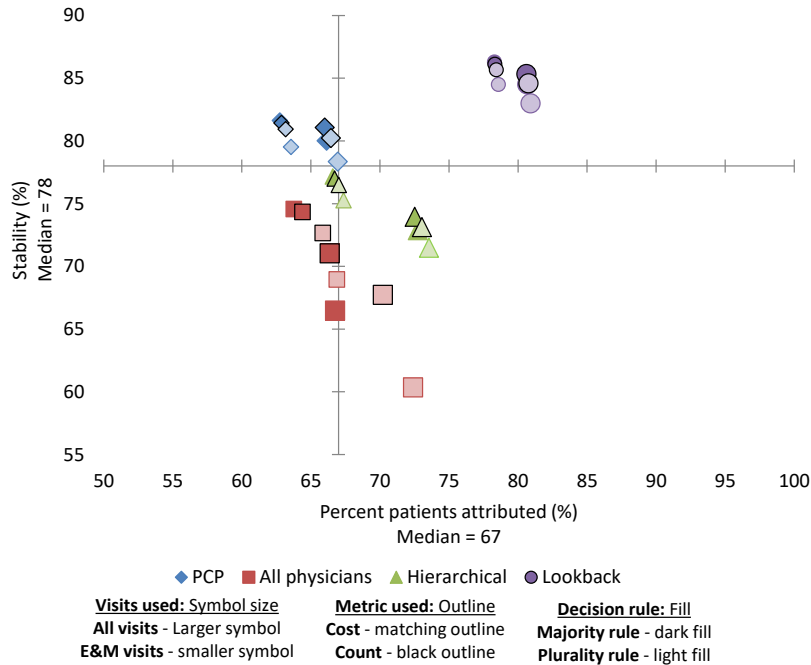
**B. One or more chronic conditions**



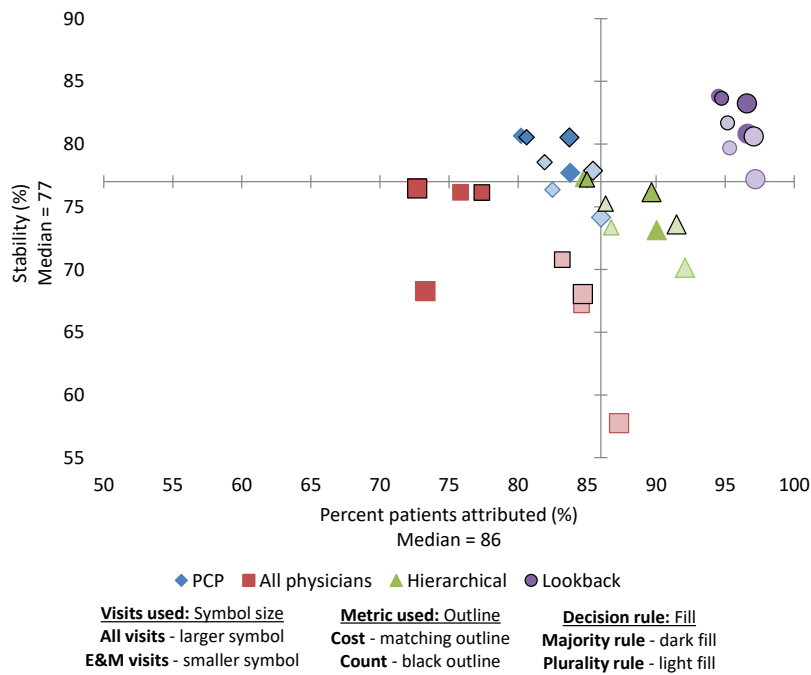
E&M indicates evaluation and management; PCP, primary care physician.

**eAppendix Figure 3. Fraction of Patients Attributed and Stability of Attribution, by Health Complexity Status**

**A. Low complexity**



**B. High complexity**



E&M indicates evaluation and management; PCP, primary care physician.

**eAppendix Figure 4.** Division of Allowed Charges from the Perspective of a Provider System

