Supplemental Figure 1. Medical Care Costs by Percentile Ranking

Total Costs

Acute Inpatient Costs

Post-acute Inpatient Costs

Ambulatory Care Costs

Home Health Care Costs

Other Costs
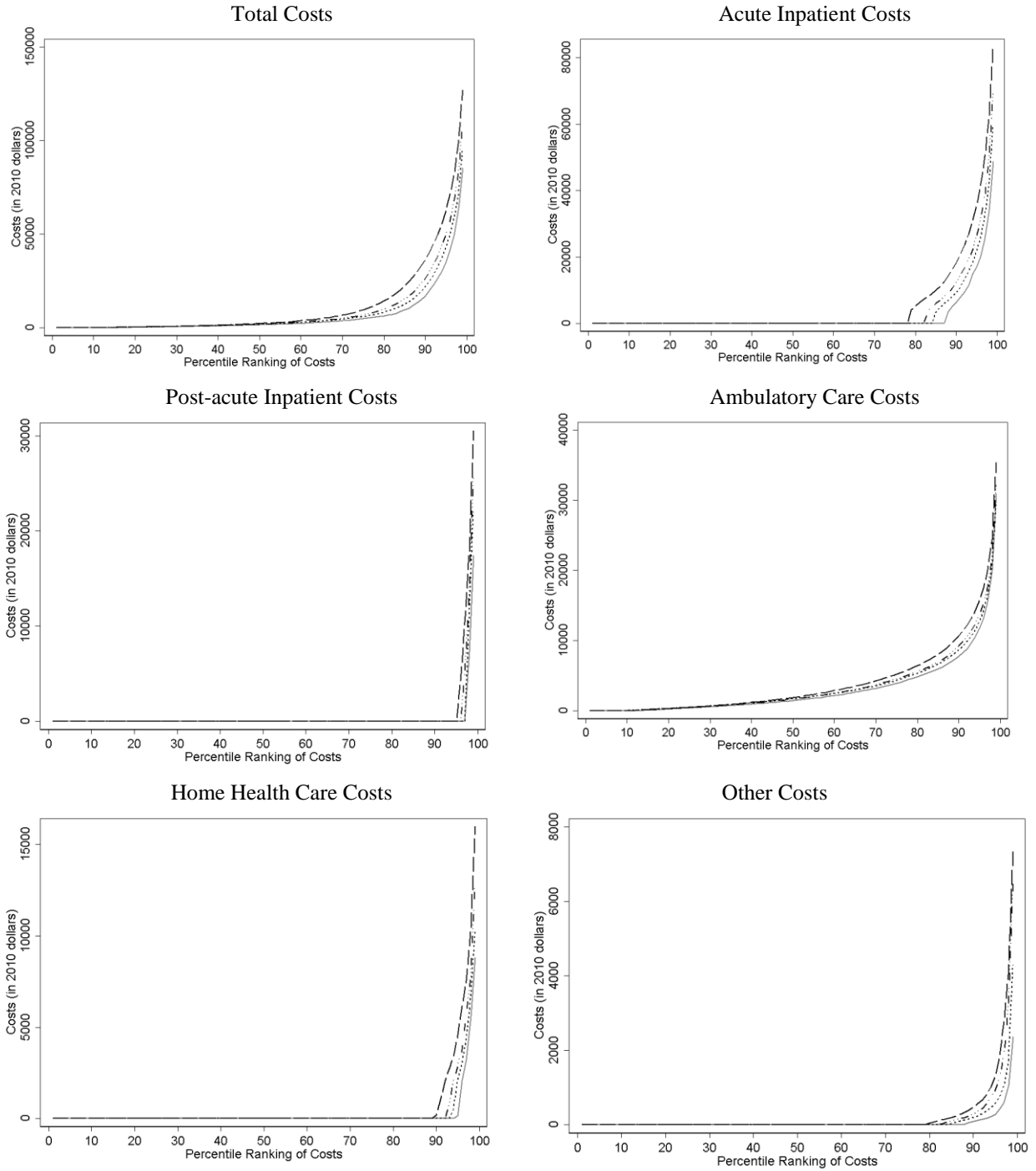
Legend: All Favorable · · · · · · · · 1+ Elevated, Zero High · — · · — · 1 High — — — — 2+ High

Notes: Plots shows the medical care costs (unadjusted) at each percentile from 0th to 99th percentile by CVH strata.

Supplemental Table 1.
Differences in Annual Medicare Care Utilization Per Person between Less Favorable CVH and All Favorable by Whether the Primary Reason for Admission/Visit is CVD or Non-CVD
(N = 158,306)

	Acute Inpatient Admission		Acute Inpatient Length of Stay		Post-acute Inpatient Admissions	
	CVD	Non-CVD	CVD	Non-CVD	CVD	Non-CVD
All Favorable (ref. mean)	0.02	0.17	0.08	0.83	0.001	0.03
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.02***	0.02**	0.14***	0.19**	0.002***	0.004
	(0.006)	(0.01)	(0.03)	(0.08)	(0.0007)	(0.003)
1 High	0.03***	0.06***	0.21***	0.45***	0.002***	0.009***
	(0.005)	(0.01)	(0.03)	(0.08)	(0.0007)	(0.002)
2 + High	0.05***	0.10***	0.32***	0.73***	0.003***	0.017***
	(0.005)	(0.01)	(0.03)	(0.08)	(0.0007)	(0.003)

	Post-acute Inpatient Length of Stay		Ambulatory Care Visits		Home Health Visits	
	CVD	Non-CVD	CVD	Non-CVD	CVD	Non-CVD
All Favorable (ref. mean)	0.04	0.93	0.58	13.99	0.10	1.31
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.04**	0.11	0.42***	0.60	0.13***	0.47**
	(0.02)	(0.11)	(0.09)	(0.42)	(0.05)	(0.21)
1 High	0.06***	0.21**	0.67***	0.96**	0.21***	0.72***
	(0.02)	(0.10)	(0.09)	(0.40)	(0.05)	(0.19)
2 + High	0.08***	0.47***	1.13***	2.08***	0.32***	1.40***
	(0.02)	(0.11)	(0.09)	(0.41)	(0.05)	(0.20)

Notes: Each column is from a separate regression. The sample size for each regression is 158,306. Coefficients (marginal effects calculated at the mean of covariates) and cluster-robust standard errors (in parenthesis) are reported in cells. The coefficients represent the per person difference in the dependent variable between less favorable CVH strata and all favorable strata. All regressions also control for age at follow-up, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year. ** $p<0.05$; *** $p<0.01$

Supplemental Table 2.
The Association between Costs and CVH by Sex: P-values on the Interaction Term between CVH and Female Indicator Variable
(N = 158,306)

	Quantiles Regressions					GLM
	Q25	Q50	Q75	Q90	Q95	
Total Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	0.459	0.774	0.501	0.100	0.136	0.758
1 High	0.096	0.289	0.164	0.113	0.195	0.762
2 + High	0.008	0.020	0.016	0.074	0.366	0.863
CVD-related Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	-	-	0.277	0.017	0.009	0.021
1 High	-	-	<0.001	<0.001	<0.001	0.045
2 + High	-	-	<0.001	<0.001	<0.001	0.012
Non-CVD-related Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	0.471	0.740	0.658	0.412	0.080	0.586
1 High	0.148	0.417	0.495	0.933	0.584	0.811
2 + High	0.020	0.047	0.254	0.684	0.886	0.938
Acute Inpatient Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1 Elevated, None High	-	-	-	0.192	0.030	0.913
1 High	-	-	-	0.005	0.017	0.937
2 + High	-	-	-	0.004	0.009	0.959
Post-acute Inpatient Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	-	-	-	-	0.695	0.838
1 High	-	-	-	-	0.595	0.979
2 + High	-	-	-	-	0.001	0.812
Ambulatory Care Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	0.438	0.660	0.307	0.596	0.693	0.597
1 High	0.122	0.190	0.122	0.249	0.697	0.389
2 + High	0.011	0.015	0.007	0.016	0.155	0.184
Home Health Costs						
All Favorable	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1+ Elevated, None High	-	-	-	0.688	0.485	0.683
1 High	-	-	-	0.476	0.476	0.782
2 + High	-	-	-	0.040	<0.001	0.752
Other Costs						
All Favorable	Ref.	Ref.		Ref.	Ref.	Ref.
1+ Elevated, None High	-	-	-	0.705	0.951	0.323
1 High	-	-	-	0.952	0.467	0.041
2 + High	-	-	-	0.200	0.939	0.155

Notes: Values in cells are the p-values on the interaction term between CVH strata and female indicator variable from separate models in which the interaction term is include. All regressions also control for age at follow-up, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year.

Supplemental Table 3.
Differences in Annual Medical Care Costs between Less Favorable CVH and All Favorable Stratified by Sex

	Quantiles Regressions					GLM
	Q25	Q50	Q75	Q90	Q95	Mean
Panel A: CVD-related Costs						
Men						
All Favorable (ref., $)	0	0	0	661	1,569	1,036
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	-	-	6	80	218	263
			(4)	(50)	(138)	(386)
1 High	-	-	20***	392***	1,317***	883**
			(5)	(65)	(285)	(381)
2 + High	-	-	234***	1,455***	8,457***	1552***
			(20)	(129)	(748)	(375)
Women						
All Favorable (ref., $)	0	0	0	200	871	390
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	-	-	2***	50***	284***	828***
			(1)	(18)	(106)	(183)
1 High	-	-	2***	91***	321***	1047***
			(1)	(28)	(89)	(168)
2 + High	-	-	101***	825***	5,557***	1581***
			(18)	(104)	(701)	(169)
Panel B: Acute Inpatient Costs						
Men						
All Favorable (ref., $)	0	0	0	6,793	18,099	2,946
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	-	-	-	741	4,738***	839
				(430)	(1,635)	(504)
1 High	-	-	-	2,840***	8,445***	1646***
				(559)	(1,598)	(495)
2 + High	-	-	-	8,408***	15,770***	2821***
				(736)	(1,675)	(490)
Women						
All Favorable (ref., $)	0	0	0	6,174	16,539	2,416
Marginal effect from ref.; Mean [SE]						
1 Elevated, None High	-	-	-	744	2,284	745**
				(466)	(1,402)	(307)
1 High	-	-	-	2,338***	5,845***	1454***
				(631)	(1,265)	(289)
2 + High	-	-	-	7,175***	12,873***	2631***
				(857)	(1,398)	(292)

Notes: Coefficients (cluster-robust standard errors in parenthesis) are obtained from quantile regressions. Each column by outcome is one regression. Sample size is 88,627 for men and 69,679 for women. All regressions also control for age at follow-up, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year. ** $p < 0.05$; *** $p < 0.01$

Supplemental Table 4a.
Survivors and Decedents: Differences in Annual Medical Care Utilization between Less Favorable CVH and All Favorable

Panel A: Survivors
(N = 96,909)

	Acute Inpatient		Post-acute Inpatient		Ambulatory Care	Home Health
	No. of Admissions	Length of Stay	No. of Admissions	Length of Stay	No. of Visits	No. of Visits
All Favorable (ref. mean)	0.15	0.62	0.02	0.62	14.07	1.05
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.03***	0.20***	0.003	0.14***	0.73	0.34***
	(0.01)	(0.06)	(0.002)	(0.05)	(0.48)	(0.12)
1 High	0.05***	0.31***	0.005***	0.20***	0.97**	0.38***
	(0.01)	(0.06)	(0.002)	(0.05)	(0.47)	(0.10)
2 + High	0.09***	0.52***	0.010***	0.33***	2.40***	0.66***
	(0.01)	(0.06)	(0.002)	(0.05)	(0.49)	(0.11)

Panel B: Decedents
(N = 61,397)

	Acute Inpatient		Post-acute Inpatient		Ambulatory Care	Home Health
	No. of Admissions	Length of Stay	No. of Admissions	Length of Stay	No. of Visits	No. of Visits
All Favorable (ref. mean)	0.36	2.03	0.08	2.36	16.52	2.82
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.03	0.29	0.005	0.15	1.45	0.59
	(0.03)	(0.26)	(0.007)	(0.28)	(0.94)	(0.90)
1 High	0.08***	0.66***	0.009	0.08	1.46	1.22
	(0.03)	(0.25)	(0.007)	(0.26)	(0.91)	(0.85)
2 + High	0.15***	1.08***	0.018***	0.32	2.46***	2.58***
	(0.03)	(0.24)	(0.007)	(0.26)	(0.91)	(0.85)

Notes: Coefficients (marginal effects calculated at the mean of covariates) and cluster-robust standard errors (in parenthesis) are reported in cells. All regressions also control for age at follow-up, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year. ** $p<0.05$; *** $p<0.01$

Supplemental Table 4b.
Survivors and Decedents: Differences in Annual Medical Care Cost between Less Favorable CVH and All Favorable

Panel A: Survivors
(N = 96,909)

	Q25	Q50	Q75	Q90	Q95	Mean
All Favorable (ref., $)	402	1,478	4,359	13,678	29,334	5,847
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	88[***]	201[***]	403[**]	832	1978	753[**]
	(31)	(74)	(178)	(685)	(1440)	(370)
1 High	81[***]	243[***]	607[***]	2004[***]	4999[***]	1265[***]
	(30)	(71)	(175)	(701)	(1505)	(355)
2 + High	173[***]	510[***]	1565[***]	6791[***]	13104[***]	2668[***]
	(34)	(79)	(219)	(878)	(1910)	(369)

Panel B: Decedents
(N = 61,397)

	Q25	Q50	Q75	Q90	Q95	Mean
All Favorable (ref., $)	492	1,849	7,935	33,234	59,370	11,027
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	102	351[**]	1105	5918[**]	8599[**]	2019
	(69)	(175)	(620)	(2315)	(3594)	(1107)
1 High	44	330[**]	1421[**]	8585[***]	13519[***]	2918[***]
	(65)	(167)	(581)	(2134)	(3208)	(1072)
2 + High	94	662[***]	3578[***]	15266[***]	21016[***]	4923[***]
	(66)	(173)	(690)	(2085)	(3407)	(1066)

See notes above.

Supplemental Table 5.
Sensitivity Analyses (Length of Follow-up): Differences in Annual Utilization/Cost between Less Favorable CVH and All Favorable
(N = 158,306)

Panel A: Utilizations

	Acute Inpatient Admission		Post-acute Inpatient Admissions		Ambulatory Care	Home Health
	No. of Admission	Length of Stay	No. of Admission	Length of Stay	No. of Visits	No. of Visits
All Favorable (ref. mean)	0.19	0.91	0.04	0.97	14.57	1.4
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.04***	0.29***	0.006**	0.14	0.80	0.55**
	(0.01)	(0.09)	(0.003)	(0.12)	(0.45)	(0.24)
1 High	0.09***	0.63***	0.011***	0.30***	1.40***	0.92***
	(0.01)	(0.09)	(0.003)	(0.12)	(0.44)	(0.22)
2 + High	0.15***	1.04***	0.021***	0.59***	3.04***	1.75***
	(0.01)	(0.09)	(0.003)	(0.12)	(0.45)	(0.22)
Controlled for length of Follow-up in Medicare	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Panel B: Total Costs

	Q25	Q50	Q75	Q90	Q95	Mean
All Favorable (ref., $)	416	1,548	4,844	16,962	35,084	6,903
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	86***	199***	358*	1274	3980***	1156***
	(29)	(68)	(185)	(824)	(1334)	(440)
1 High	80***	279***	881***	4424***	10203***	2428***
	(28)	(66)	(187)	(859)	(1241)	(425)
2 + High	160***	635***	3004***	13100***	21572***	4628***
	(29)	(74)	(240)	(994)	(1388)	(428)
Controlled for length of Follow-up in Medicare	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Notes: Coefficients and cluster-robust standard errors (in parenthesis) are reported in cells. The sample size for each regression is 158,306. All regressions also control for the length of follow-up in Medicare, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year. ** $p<0.05$; *** $p<0.01$

	Hypertension (ICD-9-CM = 401)	Diabetes (ICD-9-CM = 250)	Obesity (ICD-9-CM = 278)	Hyperlipidemia (ICD-9-CM = 272.4)	Smoking
Supplemental Table 6.					
At Medicare Follow-up: Percent Distribution of Cardiovascular Risk Factors by CVH Strata					
All Favorable (% of stratum)	40.5%	8.0%	1.4%	20.1%	N/A
1+ Elevated, None High (% of Stratum)	49.0%	14.0%	1.9%	26.5%	N/A
1 High (% of stratum)	55.6%	17.2%	2.1%	24.9%	N/A
2+ High (% of stratum)	60.8%	25.2%	3.6%	25.5%	N/A
P-value	<0.01	<0.01	<0.01	<0.01	

Notes: P-values are obtained from Wald tests for the equality of the sample means among the four risk strata.

Supplemental Table 7.
Sensitivity Analyses (HMO): Differences in Annual Utilization/Cost between Less Favorable CVH and All Favorable
(N = 158,306)

Panel A: Utilizations

	Acute Inpatient Admission		Post-acute Inpatient Admissions		Ambulatory Care	Home Health
	No. of Admission	Length of Stay	No. of Admission	Length of Stay	No. of Visits	No. of Visits
All Favorable (ref. mean)	0.19	0.91	0.04	0.97	14.57	1.4
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	0.04***	0.28***	0.005	0.20	0.80	0.55**
	(0.02)	(0.11)	(0.003)	(0.13)	(0.47)	(0.26)
1 High	0.09***	0.64***	0.011***	0.35***	1.42***	0.93***
	(0.01)	(0.10)	(0.003)	(0.12)	(0.45)	(0.24)
2 + High	0.16***	1.04***	0.020***	0.65***	3.07***	1.76***
	(0.01)	(0.10)	(0.003)	(0.13)	(0.46)	(0.26)
Controlled for Switching between HMO and FFS	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Panel B: Total Costs

	Q25	Q50	Q75	Q90	Q95	Mean
All Favorable (ref., $)	416	1,548	4,844	16,962	35,084	6,903
Marginal effect from ref.; Mean [SE]						
1+ Elevated, None High	106***	198**	371	1109	4155**	1060**
	(37)	(83)	(239)	(1082)	(1950)	(481)
1 High	92***	261***	828***	4403***	10653***	2439***
	(32)	(74)	(218)	(1009)	(1750)	(452)
2 + High	174***	604***	2921***	13016***	22131***	4622***
	(34)	(81)	(279)	(1249)	(2078)	(472)
Controlled for Switching between HMO and FFS	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Notes: Coefficients and cluster-robust standard errors (in parenthesis) are reported in cells. The sample size for each regression is 158,306. All regressions also control for fraction switched from FFS to HMO, fraction switched from HMO to FFS, and fraction remained in HMO in addition to age at follow-up, state of residence, year, baseline age, race, sex, baseline education, and whether the participant died during the year. ** $p<0.05$; *** $p<0.01$