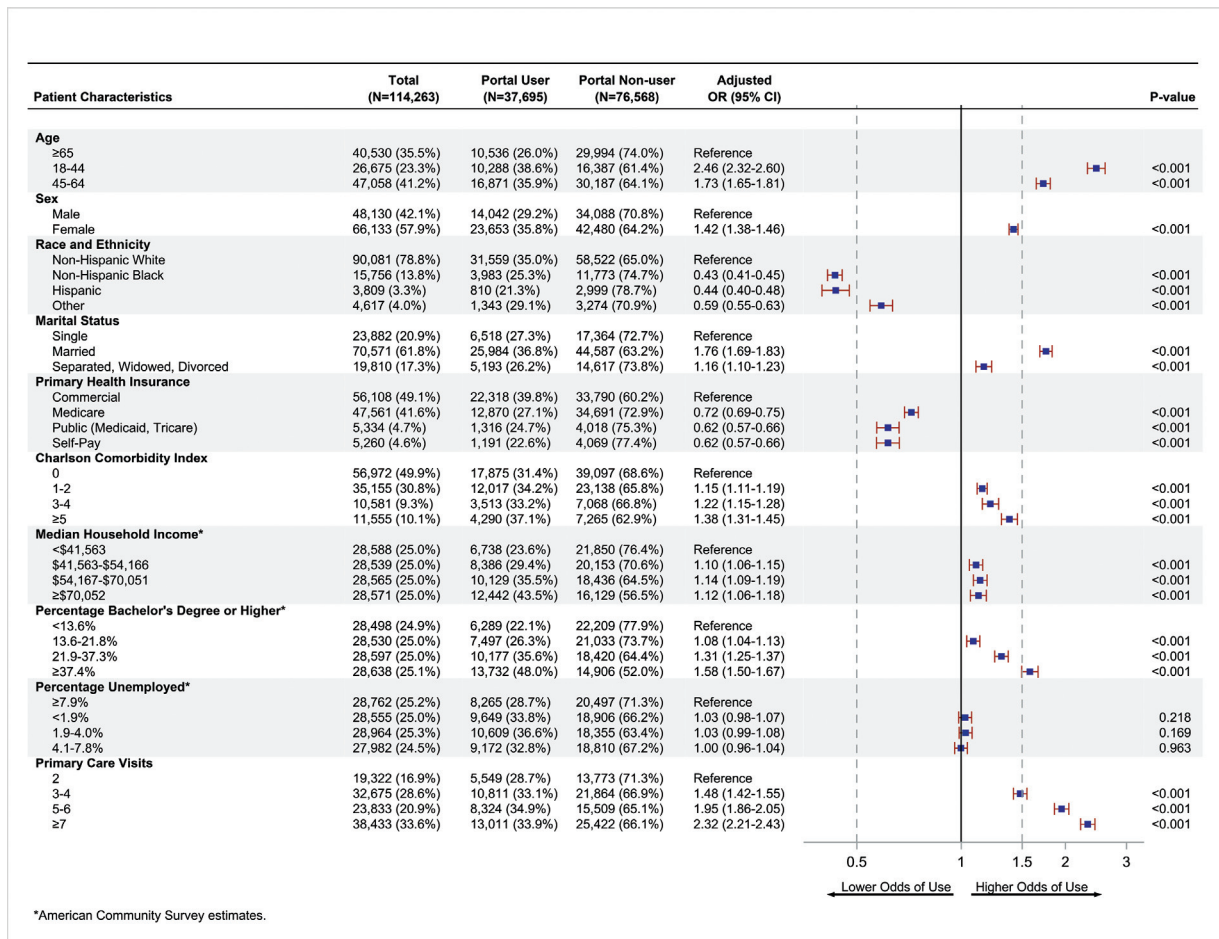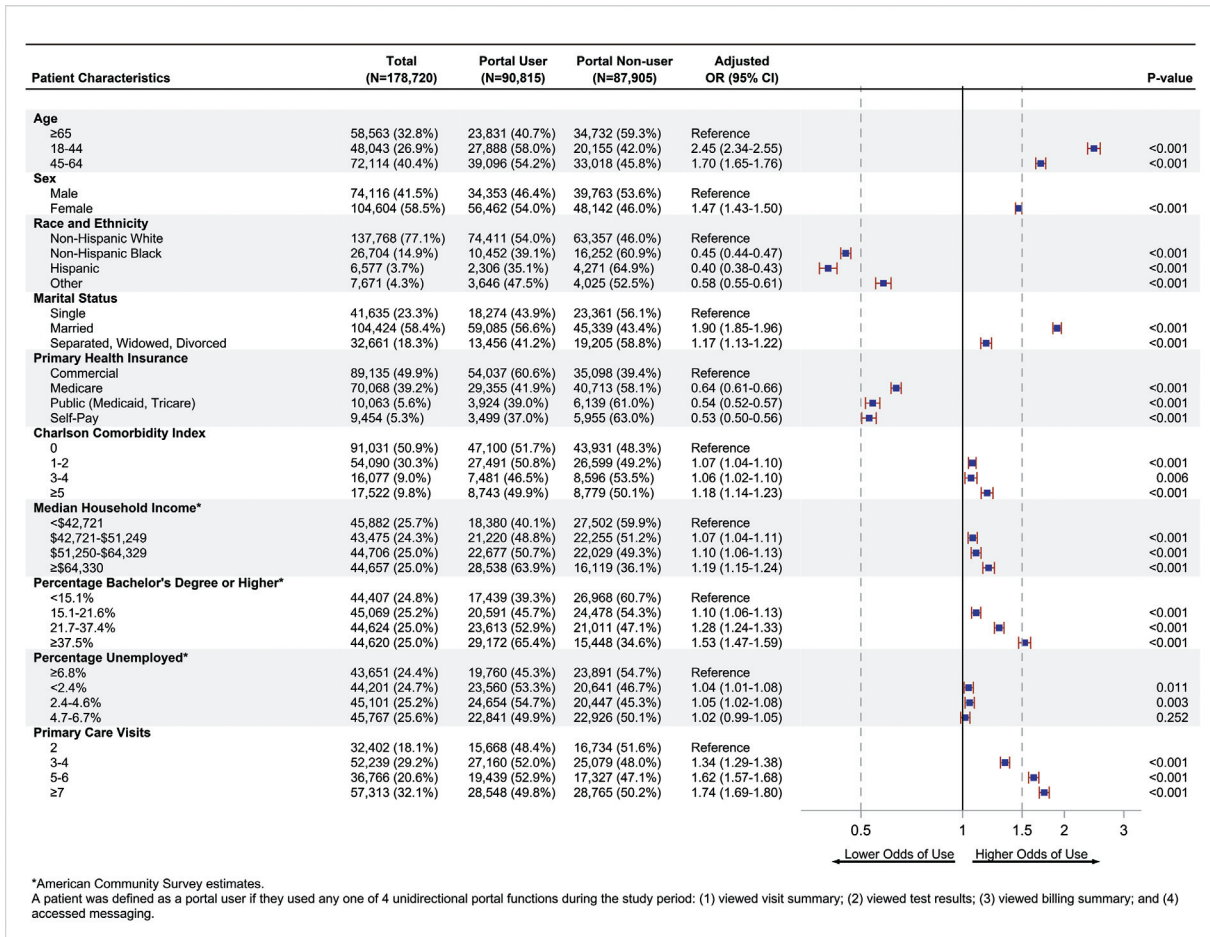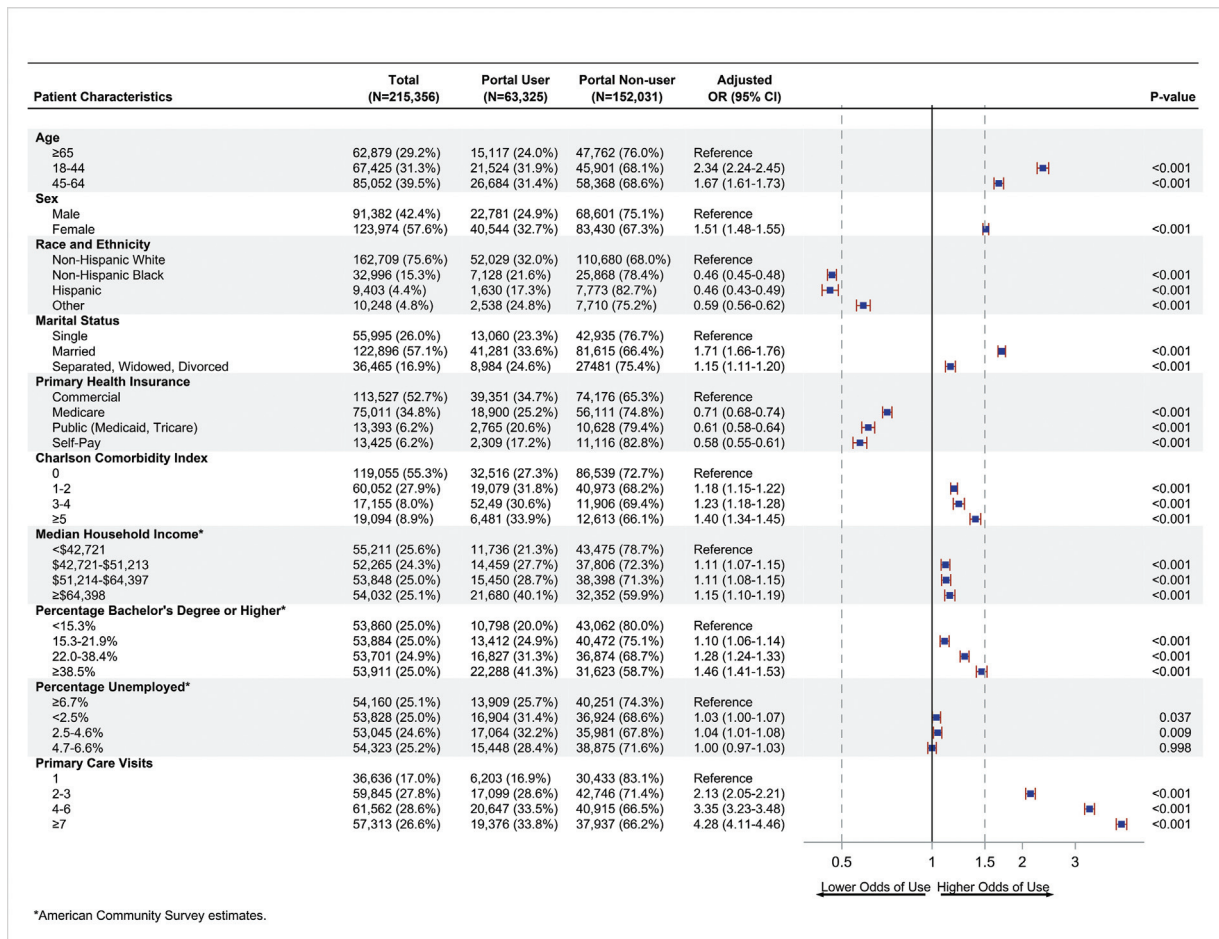| Patient Characteristics	Total (N=146,318)	Portal User (N=48,445)	Portal Non-user (N=97,873)	Adjusted OR (95% CI)		P-value
Age						
≥65	53,266 (36.4%)	13,398 (25.2%)	39,868 (74.8%)	Reference		
18-44	34,330 (23.5%)	14,270 (41.6%)	20,060 (58.4%)	2.61 (2.48-2.75)		<0.001
45-64	58,722 (40.1%)	20,777 (35.4%)	37,945 (64.6%)	1.70 (1.63-1.77)		<0.001
Sex						
Male	59,152 (40.4%)	17,204 (29.1%)	41,948 (70.9%)	Reference		
Female	87,166 (59.6%)	31,241 (35.8%)	55,925 (64.2%)	1.42 (1.39-1.46)		<0.001
Race and Ethnicity						
Non-Hispanic White	114,051 (77.9%)	40,211 (35.3%)	73,840 (64.7%)	Reference		
Non-Hispanic Black	21,683 (14.8%)	5,454 (25.2%)	16,229 (74.8%)	0.43 (0.41-0.45)		<0.001
Hispanic	4,853 (3.3%)	1,117 (23.0%)	3,736 (77.0%)	0.44 (0.40-0.47)		<0.001
Other	5,731 (3.9%)	1,663 (29.0%)	4,068 (71.0%)	0.56 (0.52-0.60)		<0.001
Marital Status						
Single	31,546 (21.6%)	9,142 (29.0%)	22,404 (71.0%)	Reference		
Married	85,849 (58.7%)	31,711 (36.9%)	54,138 (63.1%)	1.73 (1.67-1.79)		<0.001
Separated, Widowed, Divorced	28,923 (19.8%)	7,592 (26.2%)	21,331 (73.8%)	1.15 (1.10-1.20)		<0.001
Primary Health Insurance						
Commercial	67,718 (46.3%)	27,927 (41.2%)	39,791 (58.8%)	Reference		
Medicare	63,823 (43.6%)	16,824 (26.4%)	46,999 (73.6%)	0.69 (0.66-0.72)		<0.001
Public (Medicaid, Tricare)	7,824 (5.3%)	2,064 (26.4%)	5,760 (73.6%)	0.59 (0.55-0.62)		<0.001
Self-Pay	6,953 (4.8%)	1,630 (23.4%)	5,323 (76.6%)	0.57 (0.53-0.60)		<0.001
Charlson Comorbidity Index						
0	68,095 (46.5%)	22,090 (32.4%)	46,005 (67.6%)	Reference		
1-2	47,462 (32.4%)	16,032 (33.8%)	31,430 (66.2%)	1.13 (1.10-1.17)		<0.001
3-4	14,849 (10.1%)	4,690 (31.6%)	10,159 (68.4%)	1.16 (1.10-1.21)		<0.001
≥5	15,912 (10.9%)	5,633 (35.4%)	10,279 (64.6%)	1.30 (1.24-1.36)		<0.001
Median Household Income*						
<$42,708	35,993 (24.6%)	8,714 (24.2%)	27,279 (75.8%)	Reference		
$42,708-$51,115	37,126 (25.4%)	11,574 (31.2%)	25,552 (68.8%)	1.11 (1.06-1.15)		<0.001
$51,116-$63,768	36,525 (25.0%)	11,538 (31.6%)	24,987 (68.4%)	1.09 (1.04-1.13)		<0.001
≥$63,769	36,674 (25.1%)	16,619 (45.3%)	20,055 (54.7%)	1.14 (1.09-1.20)		<0.001
Percentage Bachelor's Degree or Higher*						
<14.9%	36,494 (24.9%)	8,298 (22.7%)	28,196 (77.3%)	Reference		
14.9-20.8%	36,402 (24.9%)	10,155 (27.9%)	26,247 (72.1%)	1.11 (1.07-1.15)		<0.001
20.9-36.4%	36,747 (25.1%)	12,794 (34.8%)	23,953 (65.2%)	1.27 (1.22-1.32)		<0.001
≥36.5%	36,675 (25.1%)	17,198 (46.9%)	19,477 (53.1%)	1.51 (1.44-1.58)		<0.001
Percentage Unemployed*						
≥6.8%	36,256 (24.8%)	10,511 (29.0%)	25,745 (71.0%)	Reference		
<2.4%	36,420 (24.9%)	12,630 (34.7%)	23,790 (65.3%)	1.04 (1.00-1.08)		0.077
2.4-4.6%	36,630 (25.0%)	13,347 (36.4%)	23,283 (63.6%)	1.06 (1.02-1.10)		0.006
4.7-6.7%	37,012 (25.3%)	11,957 (32.3%)	25,055 (67.7%)	1.01 (0.97-1.05)		0.745
Primary Care Visits						
3	27,443 (18.8%)	8,422 (30.7%)	19,021 (69.3%)	Reference		
4-5	45,247 (30.9%)	14,968 (33.1%)	30,279 (66.9%)	1.30 (1.25-1.35)		<0.001
6-8	39,017 (26.7%)	13,489 (34.6%)	25,528 (65.4%)	1.68 (1.61-1.74)		<0.001
≥9	34,611 (23.7%)	11,566 (33.4%)	23,045 (66.6%)	1.90 (1.83-1.98)		<0.001

*American Community Survey estimates.

Supplementary Fig. S1 Association between patient characteristics and the odds of a portal user. Population is restricted to patients who had three or more primary care visits during the study period. A patient was defined as a portal user if they used any one of four bidirectional portal functions during the study period: (1) sent an appointment request message; (2) sent a medication renewal request message; (3) sent a medical advice message; and (4) directly scheduled an appointment.

Patient Characteristics	Total (N=114,263)	Portal User (N=37,695)	Portal Non-user (N=76,568)	Adjusted OR (95% CI)	P-value
Age					
≥65	40,530 (35.5%)	10,536 (26.0%)	29,994 (74.0%)	Reference	
18-44	26,675 (23.3%)	10,288 (38.6%)	16,387 (61.4%)	2.46 (2.32-2.60)	<0.001
45-64	47,058 (41.2%)	16,871 (35.9%)	30,187 (64.1%)	1.73 (1.65-1.81)	<0.001
Sex					
Male	48,130 (42.1%)	14,042 (29.2%)	34,088 (70.8%)	Reference	
Female	66,133 (57.9%)	23,653 (35.8%)	42,480 (64.2%)	1.42 (1.38-1.46)	<0.001
Race and Ethnicity					
Non-Hispanic White	90,081 (78.8%)	31,559 (35.0%)	58,522 (65.0%)	Reference	
Non-Hispanic Black	15,756 (13.8%)	3,983 (25.3%)	11,773 (74.7%)	0.43 (0.41-0.45)	<0.001
Hispanic	3,809 (3.3%)	810 (21.3%)	2,999 (78.7%)	0.44 (0.40-0.48)	<0.001
Other	4,617 (4.0%)	1,343 (29.1%)	3,274 (70.9%)	0.59 (0.55-0.63)	<0.001
Marital Status					
Single	23,882 (20.9%)	6,518 (27.3%)	17,364 (72.7%)	Reference	
Married	70,571 (61.8%)	25,984 (36.8%)	44,587 (63.2%)	1.76 (1.69-1.83)	<0.001
Separated, Widowed, Divorced	19,810 (17.3%)	5,193 (26.2%)	14,617 (73.8%)	1.16 (1.10-1.23)	<0.001
Primary Health Insurance					
Commercial	56,108 (49.1%)	22,318 (39.8%)	33,790 (60.2%)	Reference	
Medicare	47,561 (41.6%)	12,870 (27.1%)	34,691 (72.9%)	0.72 (0.69-0.75)	<0.001
Public (Medicaid, Tricare)	5,334 (4.7%)	1,316 (24.7%)	4,018 (75.3%)	0.62 (0.57-0.66)	<0.001
Self-Pay	5,260 (4.6%)	1,191 (22.6%)	4,069 (77.4%)	0.62 (0.57-0.66)	<0.001
Charlson Comorbidity Index					
0	56,972 (49.9%)	17,875 (31.4%)	39,097 (68.6%)	Reference	
1-2	35,155 (30.8%)	12,017 (34.2%)	23,138 (65.8%)	1.15 (1.11-1.19)	<0.001
3-4	10,581 (9.3%)	3,513 (33.2%)	7,068 (66.8%)	1.22 (1.15-1.28)	<0.001
≥5	11,555 (10.1%)	4,290 (37.1%)	7,265 (62.9%)	1.38 (1.31-1.45)	<0.001
Median Household Income*					
<$41,563	28,588 (25.0%)	6,738 (23.6%)	21,850 (76.4%)	Reference	
$41,563-$54,166	28,539 (25.0%)	8,386 (29.4%)	20,153 (70.6%)	1.10 (1.06-1.15)	<0.001
$54,167-$70,051	28,565 (25.0%)	10,129 (35.5%)	18,436 (64.5%)	1.14 (1.09-1.19)	<0.001
≥$70,052	28,571 (25.0%)	12,442 (43.5%)	16,129 (56.5%)	1.12 (1.06-1.18)	<0.001
Percentage Bachelor's Degree or Higher*					
<13.6%	28,498 (24.9%)	6,289 (22.1%)	22,209 (77.9%)	Reference	
13.6-21.8%	28,530 (25.0%)	7,497 (26.3%)	21,033 (73.7%)	1.08 (1.04-1.13)	<0.001
21.9-37.3%	28,597 (25.0%)	10,177 (35.6%)	18,420 (64.4%)	1.31 (1.25-1.37)	<0.001
≥37.4%	28,638 (25.1%)	13,732 (48.0%)	14,906 (52.0%)	1.58 (1.50-1.67)	<0.001
Percentage Unemployed*					
≥7.9%	28,762 (25.2%)	8,265 (28.7%)	20,497 (71.3%)	Reference	
<1.9%	28,555 (25.0%)	9,649 (33.8%)	18,906 (66.2%)	1.03 (0.98-1.07)	0.218
1.9-4.0%	28,964 (25.3%)	10,609 (36.6%)	18,355 (63.4%)	1.03 (0.99-1.08)	0.169
4.1-7.8%	27,982 (24.5%)	9,172 (32.8%)	18,810 (67.2%)	1.00 (0.96-1.04)	0.963
Primary Care Visits					
2	19,322 (16.9%)	5,549 (28.7%)	13,773 (71.3%)	Reference	
3-4	32,675 (28.6%)	10,811 (33.1%)	21,864 (66.9%)	1.48 (1.42-1.55)	<0.001
5-6	23,833 (20.9%)	8,324 (34.9%)	15,509 (65.1%)	1.95 (1.86-2.05)	<0.001
≥7	38,433 (33.6%)	13,011 (33.9%)	25,422 (66.1%)	2.32 (2.21-2.43)	<0.001

0.5   1   1.5   2   3

Lower Odds of Use   Higher Odds of Use

*American Community Survey estimates.

Supplementary Fig. S2 Association between patient characteristics and the odds of a portal user. Population is restricted to patients who had ACS estimates as the census block group level. A patient was defined as a portal user if they used any one of four bidirectional portal functions during the study period: (1) sent an appointment request message; (2) sent a medication renewal request message; (3) sent a medical advice message; and (4) directly scheduled an appointment.
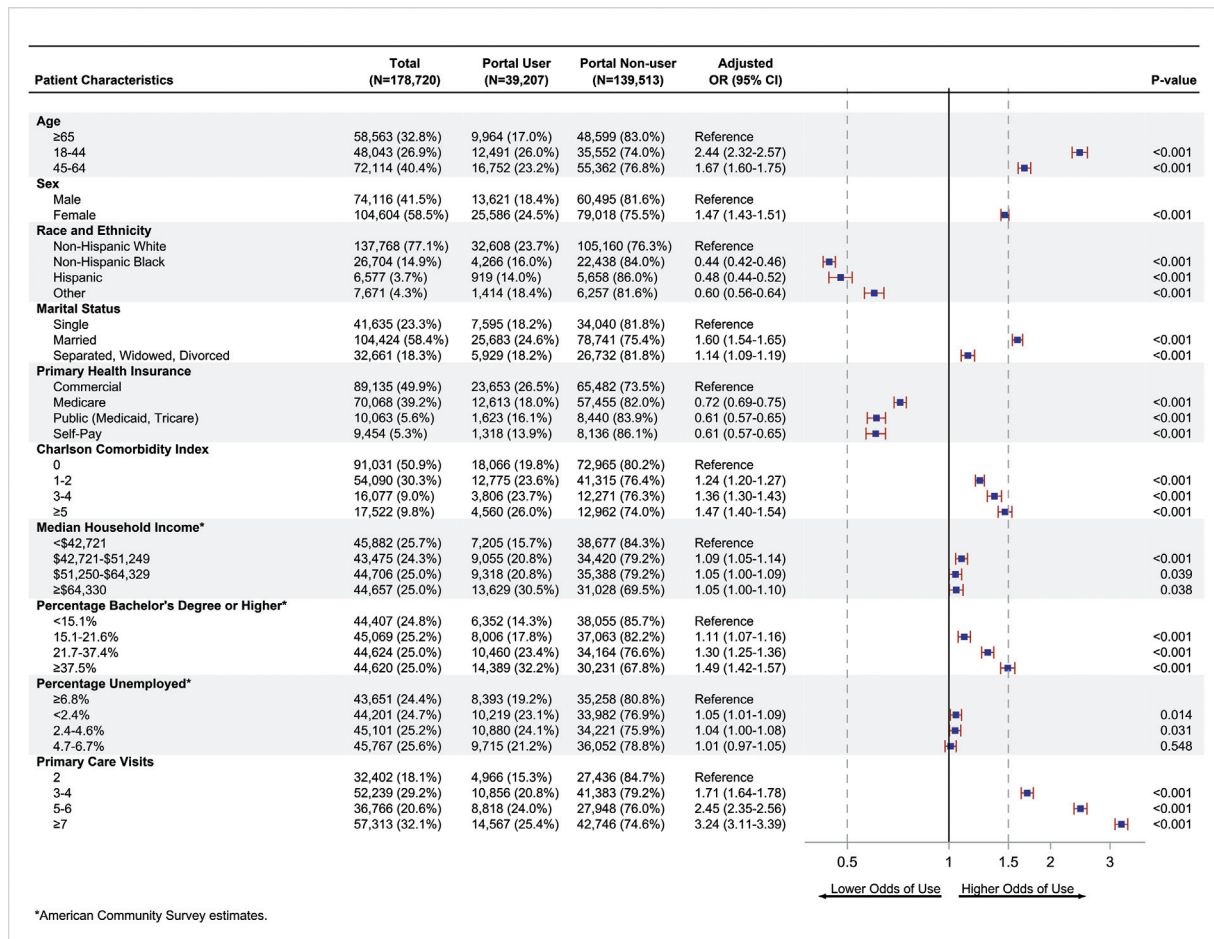
Patient Characteristics	Total (N=178,720)	Portal User (N=90,815)	Portal Non-user (N=87,905)	Adjusted OR (95% CI)		P-value
Age						
≥65	58,563 (32.8%)	23,831 (40.7%)	34,732 (59.3%)	Reference		
18-44	48,043 (26.9%)	27,888 (58.0%)	20,155 (42.0%)	2.45 (2.34-2.55)		<0.001
45-64	72,114 (40.4%)	39,096 (54.2%)	33,018 (45.8%)	1.70 (1.65-1.76)		<0.001
Sex						
Male	74,116 (41.5%)	34,353 (46.4%)	39,763 (53.6%)	Reference		
Female	104,604 (58.5%)	56,462 (54.0%)	48,142 (46.0%)	1.47 (1.43-1.50)		<0.001
Race and Ethnicity						
Non-Hispanic White	137,768 (77.1%)	74,411 (54.0%)	63,357 (46.0%)	Reference		
Non-Hispanic Black	26,704 (14.9%)	10,452 (39.1%)	16,252 (60.9%)	0.45 (0.44-0.47)		<0.001
Hispanic	6,577 (3.7%)	2,306 (35.1%)	4,271 (64.9%)	0.40 (0.38-0.43)		<0.001
Other	7,671 (4.3%)	3,646 (47.5%)	4,025 (52.5%)	0.58 (0.55-0.61)		<0.001
Marital Status						
Single	41,635 (23.3%)	18,274 (43.9%)	23,361 (56.1%)	Reference		
Married	104,424 (58.4%)	59,085 (56.6%)	45,339 (43.4%)	1.90 (1.85-1.96)		<0.001
Separated, Widowed, Divorced	32,661 (18.3%)	13,456 (41.2%)	19,205 (58.8%)	1.17 (1.13-1.22)		<0.001
Primary Health Insurance						
Commercial	89,135 (49.9%)	54,037 (60.6%)	35,098 (39.4%)	Reference		
Medicare	70,068 (39.2%)	29,355 (41.9%)	40,713 (58.1%)	0.64 (0.61-0.66)		<0.001
Public (Medicaid, Tricare)	10,063 (5.6%)	3,924 (39.0%)	6,139 (61.0%)	0.54 (0.52-0.57)		<0.001
Self-Pay	9,454 (5.3%)	3,499 (37.0%)	5,955 (63.0%)	0.53 (0.50-0.56)		<0.001
Charlson Comorbidity Index						
0	91,031 (50.9%)	47,100 (51.7%)	43,931 (48.3%)	Reference		
1-2	54,090 (30.3%)	27,491 (50.8%)	26,599 (49.2%)	1.07 (1.04-1.10)		<0.001
3-4	16,077 (9.0%)	7,481 (46.5%)	8,596 (53.5%)	1.06 (1.02-1.10)		0.006
≥5	17,522 (9.8%)	8,743 (49.9%)	8,779 (50.1%)	1.18 (1.14-1.23)		<0.001
Median Household Income*						
<$42,721	45,882 (25.7%)	18,380 (40.1%)	27,502 (59.9%)	Reference		
$42,721-$51,249	43,475 (24.3%)	21,220 (48.8%)	22,255 (51.2%)	1.07 (1.04-1.11)		<0.001
$51,250-$64,329	44,706 (25.0%)	22,677 (50.7%)	22,029 (49.3%)	1.10 (1.06-1.13)		<0.001
≥$64,330	44,657 (25.0%)	28,538 (63.9%)	16,119 (36.1%)	1.19 (1.15-1.24)		<0.001
Percentage Bachelor's Degree or Higher*						
<15.1%	44,407 (24.8%)	17,439 (39.3%)	26,968 (60.7%)	Reference		
15.1-21.6%	45,069 (25.2%)	20,591 (45.7%)	24,478 (54.3%)	1.10 (1.06-1.13)		<0.001
21.7-37.4%	44,624 (25.0%)	23,613 (52.9%)	21,011 (47.1%)	1.28 (1.24-1.33)		<0.001
≥37.5%	44,620 (25.0%)	29,172 (65.4%)	15,448 (34.6%)	1.53 (1.47-1.59)		<0.001
Percentage Unemployed*						
≥6.8%	43,651 (24.4%)	19,760 (45.3%)	23,891 (54.7%)	Reference		
<2.4%	44,201 (24.7%)	23,560 (53.3%)	20,641 (46.7%)	1.04 (1.01-1.08)		0.011
2.4-4.6%	45,101 (25.2%)	24,654 (54.7%)	20,447 (45.3%)	1.05 (1.02-1.08)		0.003
4.7-6.7%	45,767 (25.6%)	22,841 (49.9%)	22,926 (50.1%)	1.02 (0.99-1.05)		0.252
Primary Care Visits						
2	32,402 (18.1%)	15,668 (48.4%)	16,734 (51.6%)	Reference		
3-4	52,239 (29.2%)	27,160 (52.0%)	25,079 (48.0%)	1.34 (1.29-1.38)		<0.001
5-6	36,766 (20.6%)	19,439 (52.9%)	17,327 (47.1%)	1.62 (1.57-1.68)		<0.001
≥7	57,313 (32.1%)	28,548 (49.8%)	28,765 (50.2%)	1.74 (1.69-1.80)		<0.001

0.5   1   1.5   2   3

← Lower Odds of Use   Higher Odds of Use →

*American Community Survey estimates.
A patient was defined as a portal user if they used any one of 4 unidirectional portal functions during the study period: (1) viewed visit summary; (2) viewed test results; (3) viewed billing summary; and (4) accessed messaging.

Supplementary Fig. S3 Association between patient characteristics and the odds of being a unidirectional portal user. A patient was defined as a portal user if they used any one of four unidirectional portal functions during the study period: (1) viewed visit summary; (2) viewed test results; (3) viewed billing summary; and (4) accessed messaging.

Patient Characteristics	Total (N=215,356)	Portal User (N=63,325)	Portal Non-user (N=152,031)	Adjusted OR (95% CI)	P-value
Age					
≥65	62,879 (29.2%)	15,117 (24.0%)	47,762 (76.0%)	Reference	
18-44	67,425 (31.3%)	21,524 (31.9%)	45,901 (68.1%)	2.34 (2.24-2.45)	<0.001
45-64	85,052 (39.5%)	26,684 (31.4%)	58,368 (68.6%)	1.67 (1.61-1.73)	<0.001
Sex					
Male	91,382 (42.4%)	22,781 (24.9%)	68,601 (75.1%)	Reference	
Female	123,974 (57.6%)	40,544 (32.7%)	83,430 (67.3%)	1.51 (1.48-1.55)	<0.001
Race and Ethnicity					
Non-Hispanic White	162,709 (75.6%)	52,029 (32.0%)	110,680 (68.0%)	Reference	
Non-Hispanic Black	32,996 (15.3%)	7,128 (21.6%)	25,868 (78.4%)	0.46 (0.45-0.48)	<0.001
Hispanic	9,403 (4.4%)	1,630 (17.3%)	7,773 (82.7%)	0.46 (0.43-0.49)	<0.001
Other	10,248 (4.8%)	2,538 (24.8%)	7,710 (75.2%)	0.59 (0.56-0.62)	<0.001
Marital Status					
Single	55,995 (26.0%)	13,060 (23.3%)	42,935 (76.7%)	Reference	
Married	122,896 (57.1%)	41,281 (33.6%)	81,615 (66.4%)	1.71 (1.66-1.76)	<0.001
Separated, Widowed, Divorced	36,465 (16.9%)	8,984 (24.6%)	27481 (75.4%)	1.15 (1.11-1.20)	<0.001
Primary Health Insurance					
Commercial	113,527 (52.7%)	39,351 (34.7%)	74,176 (65.3%)	Reference	
Medicare	75,011 (34.8%)	18,900 (25.2%)	56,111 (74.8%)	0.71 (0.68-0.74)	<0.001
Public (Medicaid, Tricare)	13,393 (6.2%)	2,765 (20.6%)	10,628 (79.4%)	0.61 (0.58-0.64)	<0.001
Self-Pay	13,425 (6.2%)	2,309 (17.2%)	11,116 (82.8%)	0.58 (0.55-0.61)	<0.001
Charlson Comorbidity Index					
0	119,055 (55.3%)	32,516 (27.3%)	86,539 (72.7%)	Reference	
1-2	60,052 (27.9%)	19,079 (31.8%)	40,973 (68.2%)	1.18 (1.15-1.22)	<0.001
3-4	17,155 (8.0%)	52,49 (30.6%)	11,906 (69.4%)	1.23 (1.18-1.28)	<0.001
≥5	19,094 (8.9%)	6,481 (33.9%)	12,613 (66.1%)	1.40 (1.34-1.45)	<0.001
Median Household Income*					
<$42,721	55,211 (25.6%)	11,736 (21.3%)	43,475 (78.7%)	Reference	
$42,721-$51,213	52,265 (24.3%)	14,459 (27.7%)	37,806 (72.3%)	1.11 (1.07-1.15)	<0.001
$51,214-$64,397	53,848 (25.0%)	15,450 (28.7%)	38,398 (71.3%)	1.11 (1.08-1.15)	<0.001
≥$64,398	54,032 (25.1%)	21,680 (40.1%)	32,352 (59.9%)	1.15 (1.10-1.19)	<0.001
Percentage Bachelor's Degree or Higher*					
<15.3%	53,860 (25.0%)	10,798 (20.0%)	43,062 (80.0%)	Reference	
15.3-21.9%	53,884 (25.0%)	13,412 (24.9%)	40,472 (75.1%)	1.10 (1.06-1.14)	<0.001
22.0-38.4%	53,701 (24.9%)	16,827 (31.3%)	36,874 (68.7%)	1.28 (1.24-1.33)	<0.001
≥38.5%	53,911 (25.0%)	22,288 (41.3%)	31,623 (58.7%)	1.46 (1.41-1.53)	<0.001
Percentage Unemployed*					
≥6.7%	54,160 (25.1%)	13,909 (25.7%)	40,251 (74.3%)	Reference	
<2.5%	53,828 (25.0%)	16,904 (31.4%)	36,924 (68.6%)	1.03 (1.00-1.07)	0.037
2.5-4.6%	53,045 (24.6%)	17,064 (32.2%)	35,981 (67.8%)	1.04 (1.01-1.08)	0.009
4.7-6.6%	54,323 (25.2%)	15,448 (28.4%)	38,875 (71.6%)	1.00 (0.97-1.03)	0.998
Primary Care Visits					
1	36,636 (17.0%)	6,203 (16.9%)	30,433 (83.1%)	Reference	
2-3	59,845 (27.8%)	17,099 (28.6%)	42,746 (71.4%)	2.13 (2.05-2.21)	<0.001
4-6	61,562 (28.6%)	20,647 (33.5%)	40,915 (66.5%)	3.35 (3.23-3.48)	<0.001
≥7	57,313 (26.6%)	19,376 (33.8%)	37,937 (66.2%)	4.28 (4.11-4.46)	<0.001

0.5   1   1.5   2   3

Lower Odds of Use   Higher Odds of Use

*American Community Survey estimates.

Supplementary Fig. S4 Association between patient characteristics and the odds of being a portal user. Population is restricted to patients who had one or more primary care visits during the study period. A patient was defined as a portal user if they used any one of four bidirectional portal functions during the study period: (1) sent an appointment request message; (2) sent a medication renewal request message; (3) sent a medical advice message; and (4) directly scheduled an appointment.

Patient Characteristics	Total (N=178,720)	Portal User (N=39,207)	Portal Non-user (N=139,513)	Adjusted OR (95% CI)		P-value
Age						
≥65	58,563 (32.8%)	9,964 (17.0%)	48,599 (83.0%)	Reference		
18-44	48,043 (26.9%)	12,491 (26.0%)	35,552 (74.0%)	2.44 (2.32-2.57)		<0.001
45-64	72,114 (40.4%)	16,752 (23.2%)	55,362 (76.8%)	1.67 (1.60-1.75)		<0.001
Sex						
Male	74,116 (41.5%)	13,621 (18.4%)	60,495 (81.6%)	Reference		
Female	104,604 (58.5%)	25,586 (24.5%)	79,018 (75.5%)	1.47 (1.43-1.51)		<0.001
Race and Ethnicity						
Non-Hispanic White	137,768 (77.1%)	32,608 (23.7%)	105,160 (76.3%)	Reference		
Non-Hispanic Black	26,704 (14.9%)	4,266 (16.0%)	22,438 (84.0%)	0.44 (0.42-0.46)		<0.001
Hispanic	6,577 (3.7%)	919 (14.0%)	5,658 (86.0%)	0.48 (0.44-0.52)		<0.001
Other	7,671 (4.3%)	1,414 (18.4%)	6,257 (81.6%)	0.60 (0.56-0.64)		<0.001
Marital Status						
Single	41,635 (23.3%)	7,595 (18.2%)	34,040 (81.8%)	Reference		
Married	104,424 (58.4%)	25,683 (24.6%)	78,741 (75.4%)	1.60 (1.54-1.65)		<0.001
Separated, Widowed, Divorced	32,661 (18.3%)	5,929 (18.2%)	26,732 (81.8%)	1.14 (1.09-1.19)		<0.001
Primary Health Insurance						
Commercial	89,135 (49.9%)	23,653 (26.5%)	65,482 (73.5%)	Reference		
Medicare	70,068 (39.2%)	12,613 (18.0%)	57,455 (82.0%)	0.72 (0.69-0.75)		<0.001
Public (Medicaid, Tricare)	10,063 (5.6%)	1,623 (16.1%)	8,440 (83.9%)	0.61 (0.57-0.65)		<0.001
Self-Pay	9,454 (5.3%)	1,318 (13.9%)	8,136 (86.1%)	0.61 (0.57-0.65)		<0.001
Charlson Comorbidity Index						
0	91,031 (50.9%)	18,066 (19.8%)	72,965 (80.2%)	Reference		
1-2	54,090 (30.3%)	12,775 (23.6%)	41,315 (76.4%)	1.24 (1.20-1.27)		<0.001
3-4	16,077 (9.0%)	3,806 (23.7%)	12,271 (76.3%)	1.36 (1.30-1.43)		<0.001
≥5	17,522 (9.8%)	4,560 (26.0%)	12,962 (74.0%)	1.47 (1.40-1.54)		<0.001
Median Household Income*						
<$42,721	45,882 (25.7%)	7,205 (15.7%)	38,677 (84.3%)	Reference		
$42,721-$51,249	43,475 (24.3%)	9,055 (20.8%)	34,420 (79.2%)	1.09 (1.05-1.14)		<0.001
$51,250-$64,329	44,706 (25.0%)	9,318 (20.8%)	35,388 (79.2%)	1.05 (1.00-1.09)		0.039
≥$64,330	44,657 (25.0%)	13,629 (30.5%)	31,028 (69.5%)	1.05 (1.00-1.10)		0.038
Percentage Bachelor's Degree or Higher*						
<15.1%	44,407 (24.8%)	6,352 (14.3%)	38,055 (85.7%)	Reference		
15.1-21.6%	45,069 (25.2%)	8,006 (17.8%)	37,063 (82.2%)	1.11 (1.07-1.16)		<0.001
21.7-37.4%	44,624 (25.0%)	10,460 (23.4%)	34,164 (76.6%)	1.30 (1.25-1.36)		<0.001
≥37.5%	44,620 (25.0%)	14,389 (32.2%)	30,231 (67.8%)	1.49 (1.42-1.57)		<0.001
Percentage Unemployed*						
≥6.8%	43,651 (24.4%)	8,393 (19.2%)	35,258 (80.8%)	Reference		
<2.4%	44,201 (24.7%)	10,219 (23.1%)	33,982 (76.9%)	1.05 (1.01-1.09)		0.014
2.4-4.6%	45,101 (25.2%)	10,880 (24.1%)	34,221 (75.9%)	1.04 (1.00-1.08)		0.031
4.7-6.7%	45,767 (25.6%)	9,715 (21.2%)	36,052 (78.8%)	1.01 (0.97-1.05)		0.548
Primary Care Visits						
2	32,402 (18.1%)	4,966 (15.3%)	27,436 (84.7%)	Reference		
3-4	52,239 (29.2%)	10,856 (20.8%)	41,383 (79.2%)	1.71 (1.64-1.78)		<0.001
5-6	36,766 (20.6%)	8,818 (24.0%)	27,948 (76.0%)	2.45 (2.35-2.56)		<0.001
≥7	57,313 (32.1%)	14,567 (25.4%)	42,746 (74.6%)	3.24 (3.11-3.39)		<0.001

0.5   1   1.5   2   3

← Lower Odds of Use   Higher Odds of Use →

*American Community Survey estimates.

Supplementary Fig. S5 Association between patient characteristics and the odds of using three or more bidirectional portal functions. A patient was defined as a portal user if they used at least three of four bidirectional portal functions during the study period: (1) sent an appointment request message; (2) sent a medication renewal request message; (3) sent a medical advice message; and (4) directly scheduled an appointment.