

Inbox Inequity: Age and Gender-Based Disparities in Patient-Initiated Messaging and Clinician Inbasket Burden

Jill E. Rushton-Miller, M.D.¹, Jonathan Chiang, D.O., FAAFP¹, John Paul Graff, D.O.¹, Mark Moubarek, M.D.¹
¹University of California, Davis, California, USA

Introduction

Patient-initiated electronic messages through Epic MyChart have expanded access to care but contribute to rising clinician inbasket workload. Emerging evidence suggests that messaging patterns differ by patient age and gender, yet these disparities are not well quantified across full age strata nor have they been evaluated in relation to clinician inbasket burden. This project examines how patient demographics shape MyChart message volume and whether inbox burden correlates with clinician gender, age, and patient panel composition. The variation may lead to certain clinician demographics being disproportionately burdened with inbox work. This in turn can disproportionately affect clinician wellbeing.

Initial UC Davis analyses show a pattern of increasing messaging among female patients compared to age-matched males, with greatest disparity observed in adults aged 30-39. This aligns with Liu et al., who observed that across multiple systems “female patients were more likely to use the portal” and that there was an age associated increase in portal utilization for messaging. Cosmos data provides broader context and allows comparison of messaging distributions across a national dataset, however it does not report clinician-level gender identity information. In our study, we looked at the last patient medical advice request message our patients sent over the past year and evaluated whether it was directed to a male or female clinician. We then looked at the proportion of male to female clinicians and patients at our organization to calculate what the expected ratio of messages would be based upon the distribution of patients and clinicians. Finally we then compared it to the actual number of messages.

Results

We analyzed data from three sources – SER record data from UC Davis’s instance of Epic downloaded from Clarity, Epic Slicer Dicer data patients and messaging model and Epic Cosmos encounter model. At our organization, we have been collecting data for clinician reported gender for the past 10 years. This data is entered into the clinician’s Epic SER record (Item 1340) upon hire. We have record this for an average of 3744 new instance users with clinician titles (MD, DO, PA, NP, DPM) annually over the past 10 years (min 1976, max 6231). However, 5.5% of these clinicians were recorded as sex as Unknown. We had 0 clinicians recorded as Non-Binary. There are significantly more female clinicians than male at UC Davis Health however this is small magnitude (48% Female, 46% Male, 1.5% difference, p <0.001).

Table 1. Clinicians Hired at UC Davis 1/1/15-12/31/25

Clinician Sex	APC	MD/Equiv	Grand Total
F	6574 (16.8%)	12280 (31.3%)	18854 (48.0%)
	1777 (4.5%)	16473 (42.0%)	18250 (46.5%)
M	158 (0.4%)	1981 (5.0%)	2139 (5.5%)
U	8509 (21.7%)	30734 (78.3%)	39243 (100.0%)

Table 2. All Time Number of Patients in UC Davis Health System

Patient Sex	Number of Patients
F	1785328 (51.4%)
M	1690956 (48.6%)

Table 3 and 4 – Expected message volumes based upon UCD clinician and patient sex distribution

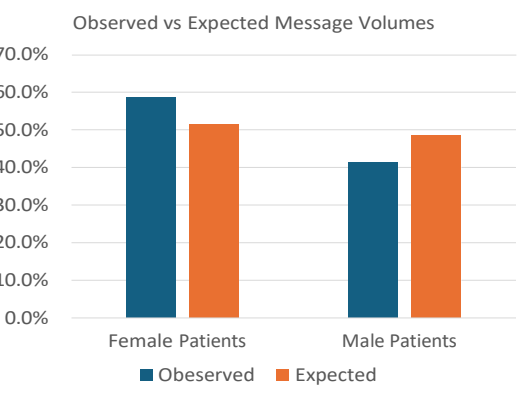
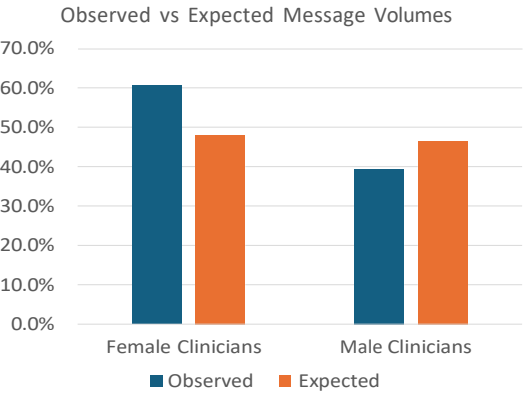


Table 5-8. Messages sent to Clinicians at UC Davis 7/1/24-7/1/25

Total includes <20 Non-Binary and Unknown Patients

Patient Legal Sex	Female	Male	Total*
Patient Age in Years (Current)			
<10	3,098	3,647	6,747
10-19	3,171	3,096	6,271
20-29	3,707	1,597	5,318
30-39	6,361	2,236	8,621
40-49	7,059	3,011	10,080
50-59	6,981	3,466	10,450
60-69	8,344	4,830	13,177
70-79	8,414	5,621	14,037
80-89	3,596	2,873	6,469
90 or more	638	329	967
Total*	51,369	30,706	82,137

Messages sent to Female Clinicians

Patient Legal Sex	Female	Male	Total*
Patient Age in Years (Current)			
<10	985	1,359	2,345
10-19	1,134	1,514	2,649
20-29	1,773	1,376	3,157
30-39	3,007	1,873	4,891
40-49	3,784	2,614	6,405
50-59	3,967	3,273	7,242
60-69	5,104	4,710	9,816
70-79	5,568	5,498	11,067
80-89	2,533	2,686	5,219
90 or more	445	320	765
Total*	28,300	25,223	53,556

Messages sent to Male Clinicians

Patient Legal Sex	Female	Male	Total*
Patient Age in Years (Current)			
<10	404	432	836
10-19	300	296	596
20-29	212	95	307
30-39	435	114	549
40-49	546	170	716
50-59	542	227	769
60-69	829	478	1,308
70-79	869	687	1,556
80-89	354	369	723
90 or more	60	29	89
Total*	4,551	2,897	7,449

Messages sent to Unknown Clinicians

Patient Legal Sex	Female	Male	Total*
Patient Age in Years (Current)			
<10	3,660	4,344	8,006
10-19	3,724	3,893	7,621
20-29	4,498	2,409	6,924
30-39	7,514	3,278	10,820
40-49	8,556	4,468	13,035
50-59	8,504	5,268	13,775
60-69	10,334	7,239	17,576
70-79	10,549	8,035	18,586
80-89	4,625	3,981	8,606
90 or more	837	478	1,315
Total*	62,801	43,393	106,264

Messages sent to All Clinicians

Table 9 – Observed last message volumes based upon UCD clinician and patient sex distribution

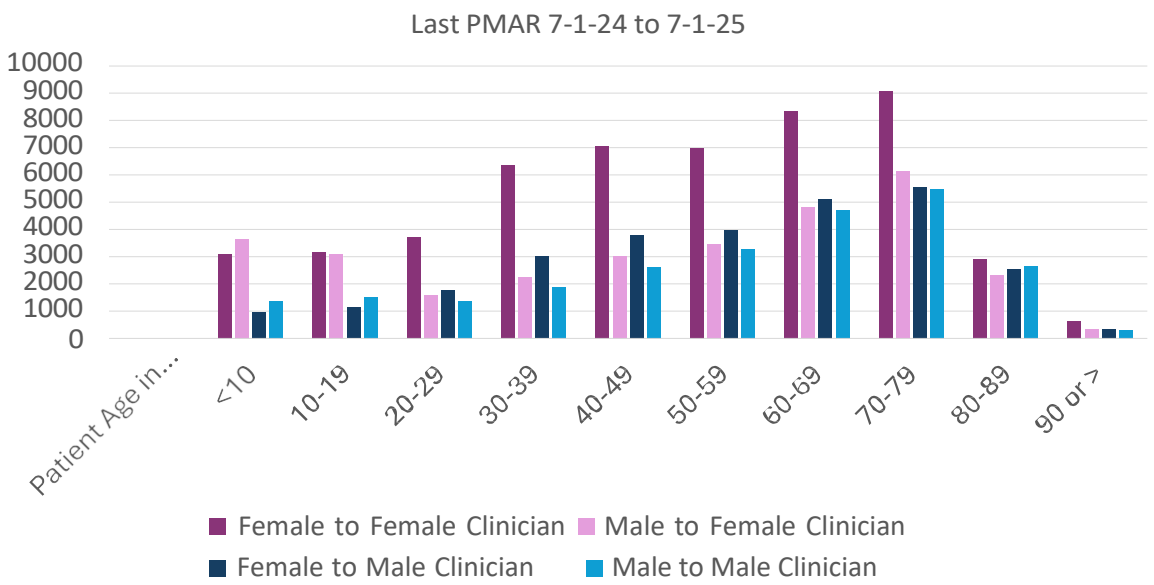


Table 10. Messages sent to Clinicians at UC Davis 7/1/24-7/1/25

Age in Years (Current)	Pt Legal Sex Female (N, %)	Pt Legal Sex Male (N, %)	Total	Chi-square Value	p-value	Cramer's V
<10	3958 (3.5%)	4668 (4.1%)	8628 (7.6%)	58.44	2.10e-14	0.0823
10-19	3963 (3.5%)	4124 (3.6%)	8091 (7.1%)	3.21	0.0734	0.0199
20-29	4859 (4.3%)	2542 (2.2%)	7429 (6.6%)	730.66	<0.000001	0.3140
30-39	8097 (7.1%)	3607 (3.2%)	11735 (10.3%)	1722.50	<0.000001	0.3836
40-49	9111 (8%)	4839 (4.3%)	13961 (12.3%)	1308.24	<0.000001	0.3062
50-59	9031 (8%)	5678 (5%)	14722 (13%)	759.77	<0.000001	0.2272
60-69	11128 (9.8%)	7838 (6.9%)	18970 (16.7%)	570.71	<0.000001	0.1735
70-79	11206 (9.9%)	8592 (7.6%)	19799 (17.5%)	345.14	<0.000001	0.1320
80-89	4699 (4.1%)	4055 (3.6%)	8754 (7.7%)	42.41	5.86e-12	0.0736
>= 90	839 (0.74%)	476 (0.42%)	1315 (1.2%)	100.20	<0.000001	0.2760

When we compared normalized data, normalized message rates to male (n=1849) vs female (=3457) clinicians from female patients showed no significant difference. Whereas for male patients the male clinicians received significantly higher per clinician message loads from male patients compared to female clinicians.

Table 11-12. Cosmos Pt Msg Encounters 7/1/24-7/1/25

Cosmos Data # of Pts by Pt Legal Sex and Pt Age in Year				Number of Patients by Patient Legal Sex and Patient Age in Year...						
All Time				All Time						
Patient Legal Sex	Female	Male	Total*	Patient Legal Sex	Female	Male	Unknown	X	Other	Total*
Patient Age in Years (Current)	Number of Patients	Number of Patients	Number of Patients	Patient Age in Years (Current)	Number of Patients	Number of Patients	Number of Patients	Number of Patients	Number of Patients	Number of Patients
Less than 10	1,593,832	1,820,310	3,414,380	Less than 10	12,959,857	14,012,357	15,235	821	803	26,991,149
≥ 10 and < 20	1,633,203	1,487,790	3,121,962	≥ 10 and < 20	18,147,145	17,007,541	17,783	2,364	963	33,177,560
≥ 20 and < 30	3,418,313	1,373,257	4,796,671	≥ 20 and < 30	20,097,273	18,043,980	34,046	8,455	2,435	38,188,262
≥ 30 and < 40	4,351,883	1,946,315	6,301,646	≥ 30 and < 40	22,689,745	19,225,104	35,729	6,450	2,260	41,961,779
≥ 40 and < 50	4,190,933	2,300,002	6,492,462	≥ 40 and < 50	19,571,244	17,179,159	32,020	2,582	1,251	36,788,237
≥ 50 and < 60	4,139,938	2,658,224	6,799,105	≥ 50 and < 60	17,496,172	15,989,592	27,310	1,200	875	33,516,584
≥ 60 and < 70	4,368,184	3,143,426	7,512,266	≥ 60 and < 70	18,655,073	17,261,103	21,119	987	626	35,940,311
≥ 70 and < 80	3,311,412	2,515,708	5,827,532	≥ 70 and < 80	15,447,668	13,727,462	13,601	573	259	29,190,517
≥ 80 and < 90	1,198,876	906,106	2,105,106	≥ 80 and < 90	8,803,083	7,216,332	5,685	214	101	16,025,855
90 or more	251,355	138,788	390,160	90 or more	5,209,713	3,245,613	55,370	189	428	8,514,559
No value	45	47	92	No value	2,181	2,498	10 or fewer	10 or fewer	10 or fewer	4,687
Total	28,457,974	18,289,973	46,761,382	Total	157,079,154	142,910,741	257,925	23,738	10,021	300,299,200

For the Cosmos data, female patients are both over-represented among message-encounter patients and have a substantially higher per-patient likelihood of having >1 message encounter than male patients. Except for <10, every age band shows a significantly higher female share among message-encounter patients than expected from the population with the largest over-representation in young/middle age adults age 20-39.

Discussion

Large-scale variation in messaging behavior by patient gender and age may differentially shift workload toward specific clinician groups depending on their patient panel composition. These disparities may contribute to administrative burden and may exacerbate clinician burnout if not addressed through equitable digital workflow design. At UC Davis, we have employed more female than male clinicians over the past 10 years. This is represented by the overall trend of an increase in female clinicians entering the workforce. This difference in percentage does not explain the difference in messaging rates between male and female clinicians. We did not obtain any information about the male vs female distribution of clinicians in primarily ambulatory vs inpatient specialties nor look at the differences in male vs female clinicians in primary care vs non-primary care specialties, and it is certainly possible that this is a significant driver to gender differences in messaging burden.

Conclusion & Future Research

Understanding demographic drivers of patient-initiated messaging can guide fairer distribution of inbox workload, inform staffing and panel management, and support clinician wellness. Multi-site comparative analyses strengthen the generalizability of these findings and provides insight for organizations seeking to optimize digital care efficiency while minimizing unintended burden. In the future, Epic is planning on debuting their messages model to cosmos and that will allow for greater understanding of the impact of clinician and patient gender on messaging volumes. Obtaining more information from SER records of the studied clinicians such as specialty department would allow for better understanding of how messaging frequencies differ across specialties.