Online Patient Portals: If You Build It, Who Will Come?

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BACKGROUND

- Patient portal technology has been rapidly adopted by health care providers
- Portals enable asynchronous communication and can extend care delivery beyond office visits
- Portals embedded in electronic health records (EHRs) can prompt service use and potentially engage patients in supporting health behaviors and decision making
- Ability to do so depends upon both who uses portals and how they use them

RESEARCH OBJECTIVES

- Identify subgroups of patients who may be at risk of being left behind as reliance on portals for access and engagement increases
  - Determine patient and other factors associated with portal use/non-use
  - Identify portal functionalities commonly accessed by portal users and determine whether disparities in functions accessed exist by patient and other characteristics

STUDY DESIGN

Setting

- Retrospective cohort design
- Integrated health system serving Detroit, MI and surrounding suburbs

Participants

- N=20,282 primary care patients
- 18 years or older
- Insured
- ≥ 1 visit to primary care between 4/13 – 5/14
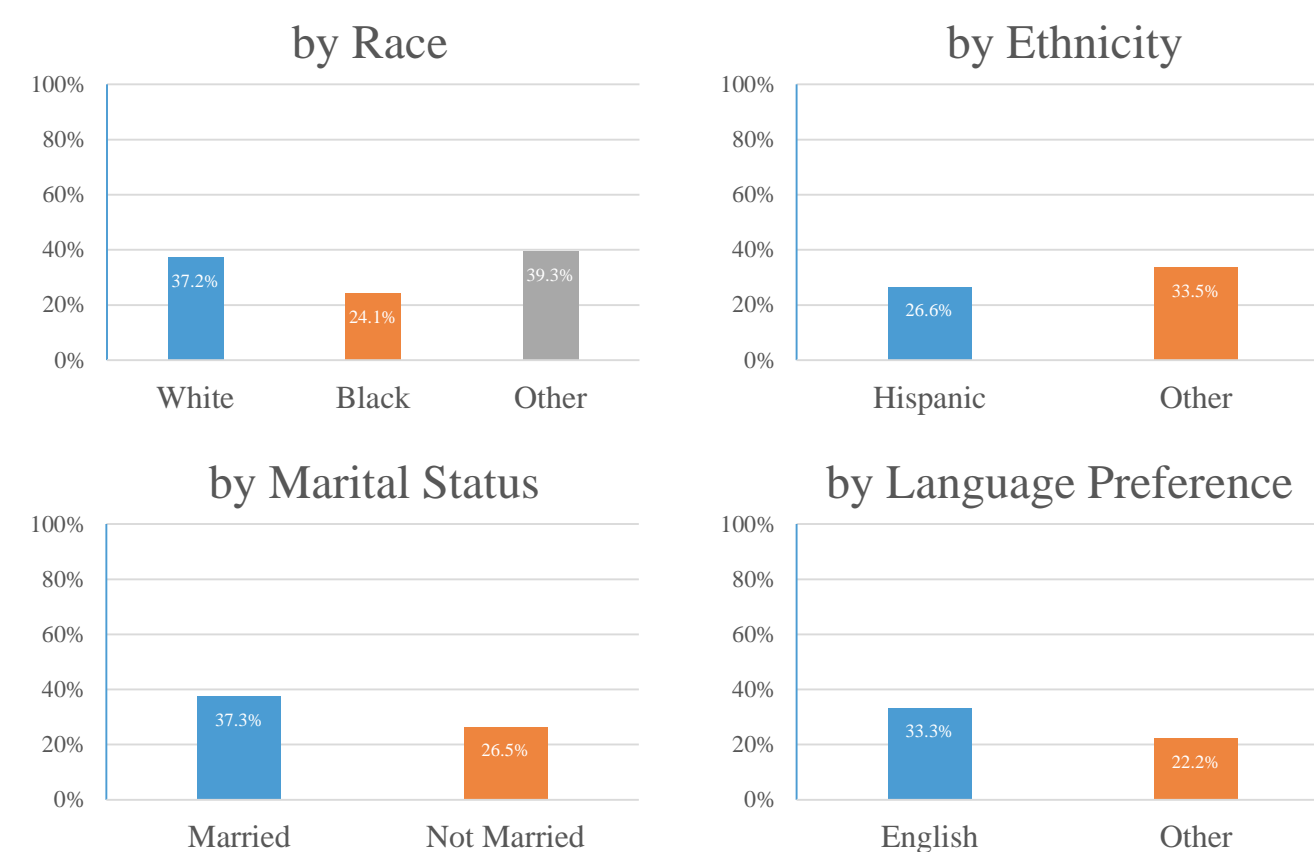
Data Sources

- EHR repository for patient-level socio-demographic characteristics, comorbidities, service use and portal access
  - Age, gender, race and ethnicity
  - Language preference
  - Marital Status
  - Charlson Comorbidity Score
  - Primary care visit use
- Health System administrative records for clinic-level characteristics
  - Location (urban/suburban)
  - Size (number of primary care physicians)
  - Onsite medical teaching
- Online survey administered to primary care physician and nursing staff between July and September 2014 used to derive clinic-level measure of positive team culture
  - Previously validated Clinician Staff Survey (Jaen et al, *Ann Fam Med* 2010) used to assess perceptions of positive team culture
  - Response rate
    - 63% [n=119] Physician
    - 76% [n=165] Nursing Staff

Primary Outcomes

- Portal user defined by 1+ online sessions
- Portal features accessed defined by user "clicks" in four functional areas:
  - Messaging
  - Appointment Management
  - Visit and Admission Summaries
  - Medical Record Access and Management
- Categorized individual features accessed by whether data viewing vs. data viewing + data input feasible
  - Interactive Function

FINDINGS

- Within 18 months of portal implementation, 33% had activated account
- Most users had accessed portal multiple times
  - 92% accessed portal at least twice
  - 86% accessed portal at least 3 times

Percent Portal Users by Socio-demographic Characteristics (N=20,282)

by Race — White 37.2%, Black 24.1%, Other 39.3%

by Ethnicity — Hispanic 26.6%, Other 33.5%

by Marital Status — Married 37.3%, Not Married 26.5%

by Language Preference — English 33.3%, Other 22.2%

Sample Characteristics by Activation Status

	All N=20,282	Non-users N=13,661	Users N=6,621	p-value
Socio-demographic Characteristics				
Age (sd)	68.7 (14.7)	70.1 (14.7)	65.7 (14.1)	<.0001
Female Gender (%)	60.4	61.8	57.7	<.0001
Race (%)				<.0001
White	65.4	61.7	72.9	
Black	30.0	34.1	21.6	
Other	4.6	4.2	5.4	
Hispanic Ethnicity (%)	1.7	1.9	1.4	0.0137
Currently Married (%)	58.0	54.0	66.0	<.0001
Non-English Language Preference (%)	1.7	1.9	1.1	<.0001
Health & Healthcare Use				
Charlson Comorbidity Score (sd)	1.3 (1.8)	1.3 (1.7)	1.3 (1.8)	0.3909
Health Maintenance Visit (%)	27.5	24.6	33.6	<.0001
Number Primary Care Visits (sd)	1.9 (1.6)	1.9 (1.6)	1.9 (1.6)	0.9709
Clinic Characteristics				
Urban Location (%)	11.1	13.1	6.8	<.0001
No. Primary Care Physicians (sd)	9.5 (4.5)	9.4 (4.5)	9.7 (4.4)	0.0001
Onsite Medical Teaching (%)	32.6	33.9	29.7	<.0001
Clinician Reported Team Culture (sd)	73.6 (6.7)	73.3 (6.4)	74.3 (7.1)	<.0001

Logistic Regression Results: Activation Status

|	Estimate	95% Confident Limit
Socio-demographic Characteristics		
Age		
Less than 50 years	1.20	1.06 – 1.35
50-69 years of age	1.00	Reference
70 years and older	0.48	0.44 – 0.52
Female Gender	1.03	0.96 – 1.12
Race		
White and other	1.00	Reference
Black	0.50	0.46 – 0.56
Hispanic Ethnicity	0.63	0.47 – 0.84
Currently Married	1.55	1.44 – 1.67
Non-English Language Preference	0.43	0.31 – 0.59
Health & Healthcare Use		
Charlson Comorbidity Score[1]	1.04	1.02 – 1.07
Health Maintenance Visit	1.39	1.27 – 1.52
Number of Primary Care Visits[1]	1.08	1.05 – 1.10
Clinic Characteristics		
Urban Location	0.90	0.53 – 1.51
Number of Primary Care Physicians	1.02	0.98 – 1.07
Onsite Medical Teaching	0.91	0.57 – 1.47
Clinician Reported Team Culture[1]	1.02	1.00 – 1.05

[1]Estimates for continuous variables represent a 1-unit increase; a change of 1 Charlson score point, 1 primary care visit, and 1% team culture score.

Portal Functions Accessed (N=6,621)

Record Access and Management 95.9%

Appointment Management 76.6%

Interactive Function 68.8%

Messaging 59.1%

Visit/Admission Summaries 41.0%

Logistic Regression Results: Type of Use

Parameter	Record Access and Management OR	95% CI	Appointment Management OR	95% CI	Messaging OR	95% CI	Visit/Admission Summaries OR	95% CI	Any Interactive Feature OR	95% CI
Socio-demographic Characteristics										
Age										
< 50 years	0.68	0.44-1.07	0.86	0.70-1.06	1.12	0.93-1.35	1.34	1.12-1.61	0.82	0.68-0.99
50-69 years	Reference		Reference		Reference		Reference		Reference	
≥ 70 years	0.79	0.55-1.12	0.82	0.70-0.95	0.63	0.56-0.72	0.79	0.69-0.89	0.75	0.65-0.86
Female Gender	0.96	0.69-1.33	0.87	0.76-1.01	0.87	0.78-0.99	0.96	0.85-1.08	0.87	0.76-0.99
Race										
White and other	Reference		Reference		Reference		Reference		Reference	
Black	0.57	0.39-0.83	0.70	0.59-0.84	0.78	0.67-0.91	0.91	0.78-1.06	0.84	0.71-0.99
Hispanic Ethnicity	2.11	0.29-15.38	0.71	0.41-1.23	0.95	0.58-1.56	1.03	0.64-1.66	0.85	0.51-1.43
Currently Married	1.13	0.81-1.58	1.08	0.93-1.25	0.90	0.80-1.03	0.90	0.80-1.02	1.05	0.91-1.20
Non-English Language Preference	0.35	0.12-0.99	0.53	0.29-0.96	0.64	0.37-1.11	0.74	0.42-1.30	0.73	0.41-1.30
Health & Healthcare Use										
Charlson Comorbidity Score[1]	1.03	0.93-1.13	1.09	1.04-1.14	1.08	1.04-1.12	1.06	1.03-1.10	1.06	1.02-1.11
Physical Exam	1.10	0.77-1.59	1.21	1.03-1.42	0.93	0.81-1.06	1.04	0.92-1.19	1.08	0.93-1.24
Primary Care Visits[1]	1.09	0.97-1.23	1.25	1.19-1.33	1.15	1.10-1.20	1.09	1.05-1.14	1.19	1.13-1.24
Clinic Characteristics										
Urban Location	1.43	0.71-2.87	1.29	0.95-1.76	1.03	0.79-1.33	1.03	0.80-1.33	1.10	0.83-1.45
Number of PCPs	1.00	0.96-1.05	1.04	1.02-1.06	1.02	1.00-1.04	1.00	0.98-1.02	1.02	1.01-1.04
Medical Teaching Site	0.94	0.62-1.41	0.86	0.71-1.04	0.92	0.78-1.08	1.09	0.93-1.27	0.93	0.79-1.11
Team Culture[1]	0.98	0.96-1.01	1.00	0.99-1.01	1.00	0.99-1.01	0.99	0.98-1.00	1.01	1.00-1.02

[1]Estimates for continuous variables represent a 1-unit increase; a change of 1 Charlson score point, 1 primary care visit, and 1% team culture score.
PCP= Primary Care Physician
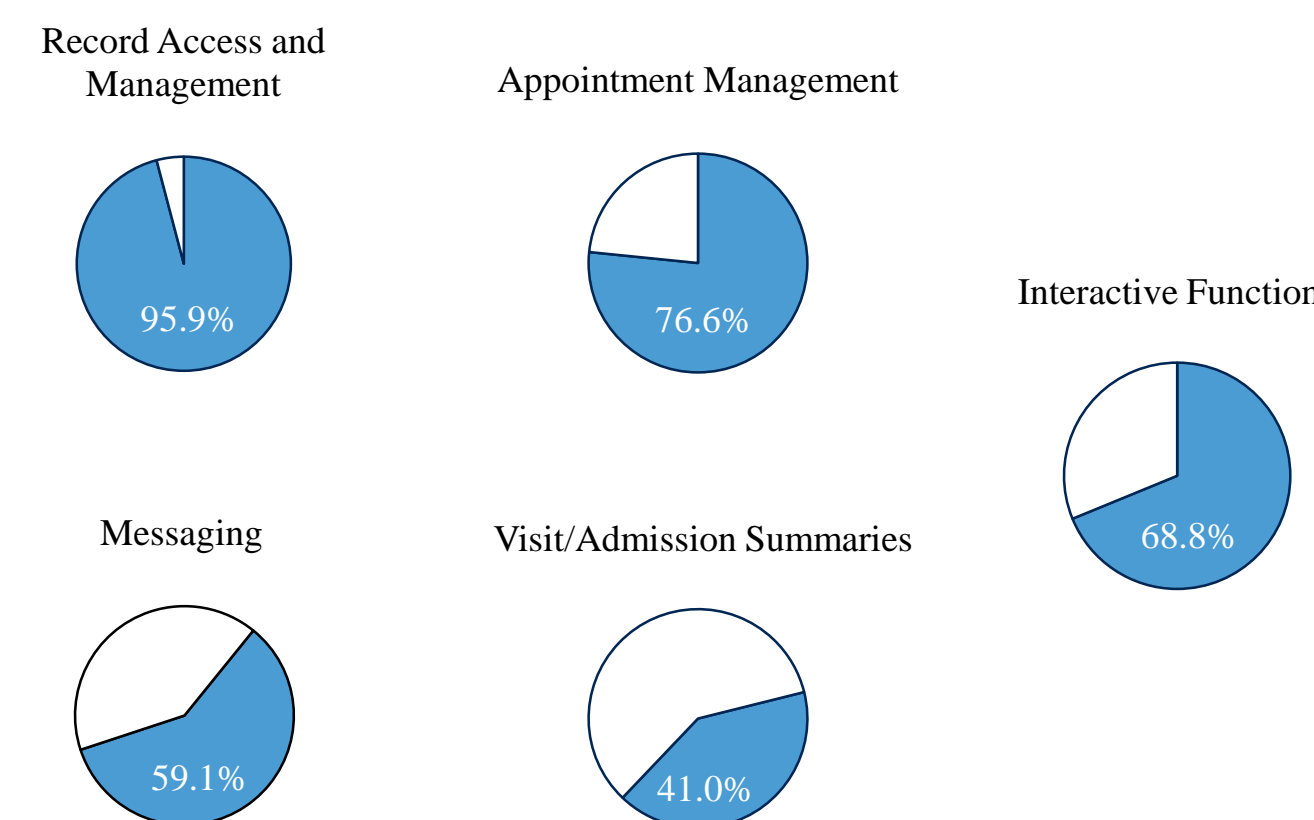
CONCLUSIONS

- Portals have ability to reach large number of patients, particularly those already engaged with a primary care provider
- Socio-demographic and other disparities found not only between portal users and non-users, but also in terms of features assessed by users
- Without purposeful intervention, portal technology may exacerbate known disparities

POLICY IMPLICATIONS

- Our findings underscore the opportunities and challenges that patient portals present
- Online portals have the potential to extend care beyond the confines of traditional office visits, but inattention to who uses portals may exacerbate known disparities in health care access and outcomes
- As subsequent stages of Meaningful Use are considered, it is imperative that both the reach and impact of patient portals continues to be considered

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