

Healthcare and the Role of Internet: An Exploratory Study

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Overview

- Kansas Rural Health Works
- Internet Use and Healthcare-Literature
- Data/Survey and Methodology
- Findings
- Conclusion
- Implications

Rural Health Works

- National program to help foster sustainable rural health care systems
 - Active programs in 30-35 states
 - Supported by Office of Rural Health Policy & Medicare Rural Hospital Flexibility (FLEX) program
 - Sponsored in Kansas by the Kansas Rural Health Options Project
 - K-State– Office of Local Govt./Ag Econ

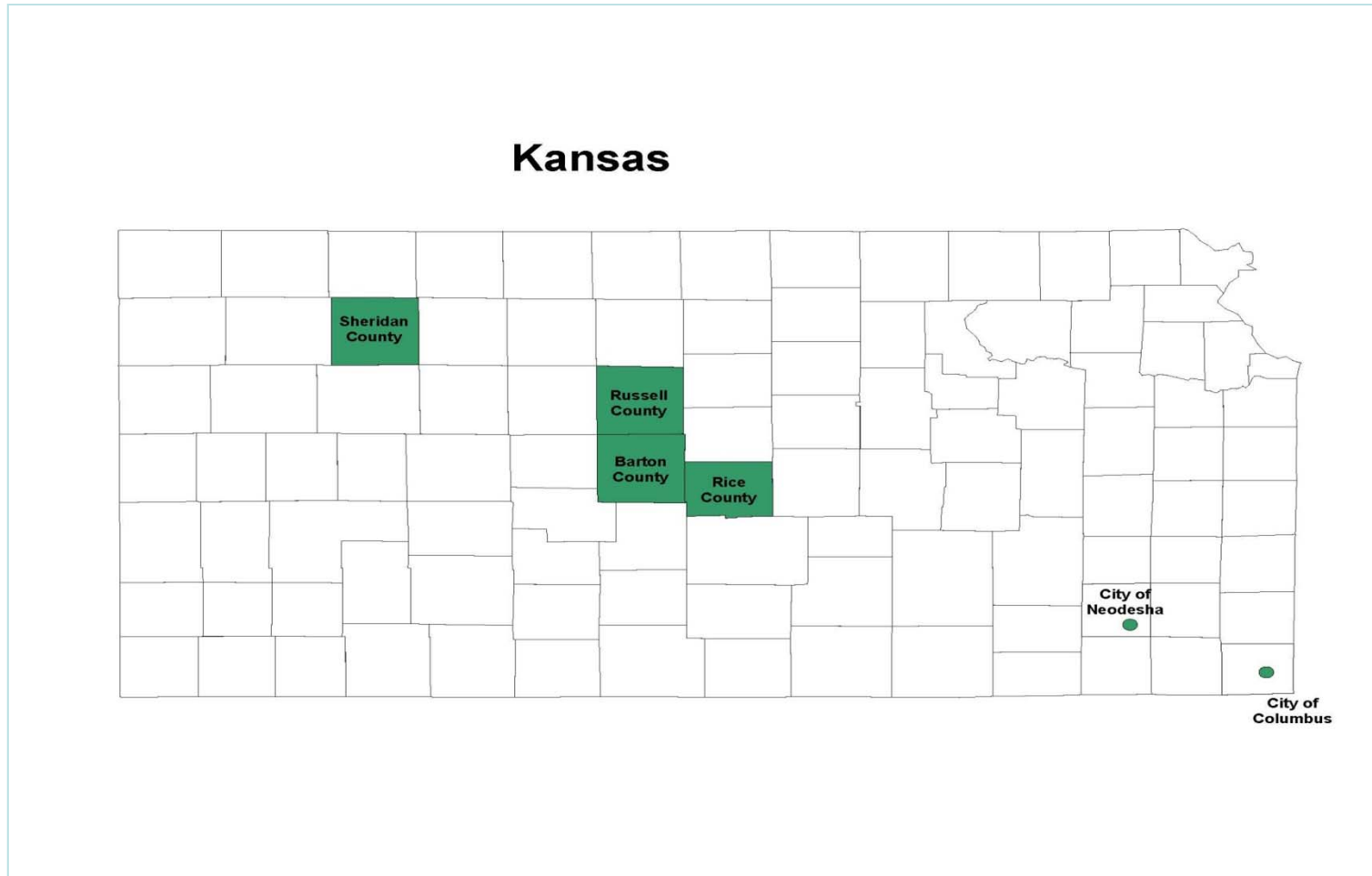
Role of Internet: Literature

- NTIA (2010); Pew Research (2009)
- Almost 80 percent of U.S. adults use Internet
 - Mail, News, Sports, Entertainment, Travel, Food, Health etc.
- 75-80 percent of them use it for health related purpose
- Why Healthcare?
- Literature offers divergent findings
- Digital Divide: urban versus rural, gender, age, income, education

Healthcare and Internet

- WebMD, Mayo Clinic, Cleveland Clinic
- Health related information
 - Medical conditions
 - Drugs, side-effects
 - Treatment options/forums
- Interaction with healthcare providers
- Quest, Labcorp
 - Locating providers
 - Scheduling appointment
 - Interaction with physicians
 - Obtaining records

Study Area



Data: Survey

- 6 communities
- Docking Institute of Public Affairs, Fort Hays State University in Hays, KS
- All surveys were pilot tested prior to administration
- Employed random sampling of telephone landlines by zip code
- Only adults over 18 years of age are surveyed.
Minimum of 200 responses

Research Questions

- “Do you use the Internet?” [Yes/No]
- “Have you used the Internet to find health-related information?” [Yes/No]
- “Have you used the Internet to find [local] health services information and providers?” [Yes/No]
- “In general, how confident are you that you can find local health-related information on the Internet?” [Very Confident/Somewhat Confident/Not Confident at All]
- Economic and Demographic information

Methodology

- Contingency Tables: Chi-square test of independence
 - H0:Internet Use independent of purpose of internet use/predictor variables
 - H1:Internet Use dependent
- Contingency Tables: Interaction effects
- Binomial Logistic Regression:
 - Odds Ratio, predict probability of internet use
- Multinomial Logistic Regression

Findings: Basic Survey Findings

Variables	Do You Use Internet?			Do You Use Internet to find Health-related information?			Do You Use Internet to find local health service information or providers?			How confident are you to find local health related information on internet?			
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Very	Somewhat	Not at all	Total
Overall	887 (72)	349 (28)	1236	692 (78)	194 (22)	886	105 (12)	739 (88)	844	541 (62)	290 (33)	41 (5)	872
Missing			0			350			392				364
Age													
18-34	146 (89)	18 (11)	164	115 (79)	30 (21)	145	21 (15)	122 (85)	143	92 (63)	46 (32)	8 (5)	146
35-49	292 (88)	41 (12)	333	238 (82)	54 (18)	292	41 (15)	234 (85)	275	191 (66)	89 (31)	10 (3)	290
50-64	302 (81)	73 (19)	375	231 (76)	71 (24)	302	29 (10)	256 (90)	285	178 (61)	105 (36)	11 (4)	294
65+	147 (40)	217 (60)	364	108 (73)	39 (27)	147	14 (10)	127 (90)	141	80 (56)	50 (35)	12 (8)	142
Missing			0			350							
Income													
< \$30K	141 (44)	178 (56)	319	98 (70)	43 (30)	141	18 (14)	112 (86)	130	71 (53)	52 (39)	12 (9)	135
\$30-\$70K	434 (83)	91 (17)	525	344 (79)	90 (21)	434	48 (12)	365 (88)	413	274 (64)	142 (33)	13 (3)	429
> \$70K	224 (93)	17 (7)	241	191 (85)	33 (15)	224	29 (13)	190 (87)	219	153 (68)	63 (28)	8 (4)	224
Missing			0			437			82				0
Gender													
Male	271 (72)	107 (28)	378	185 (68)	86 (32)	615	30 (12)	222 (88)	252	172 (66)	76 (29)	14 (5)	262
Female	616 (69)	271 (31)	887	108 (18)	507 (82)	271	75 (13)	517 (87)	592	369 (60)	214 (35)	27 (4)	610
Missing			0										
Caregivers													
One	36 (88)	5 (12)	41	26 (72)	10 (28)	36	3 (9)	31 (91)	34	21 (60)	11 (31)	3 (9)	35
Two +	370 (91)	36 (9)	406	301 (82)	68 (18)	369	52 (15)	301 (85)	353	248 (68)	107 (29)	12 (3)	367
Missing			789										
Kids													
No Kids	481 (61)	308 (39)	789	365 (76)	116 (24)	481	50 (11)	407 (89)	457	272 (58)	172 (37)	26 (6)	470
2+ Kids	406 (91)	41 (9)	447	327 (81)	78 (19)	405	55 (14)	332 (86)	387	269 (67)	118 (29)	15 (4)	402
Missing			0										

Findings: Test of Independence

	Affirmative			Test Statistic (χ^2) (DF)	p-value	
Overall	Overall					
General Internet Use	887 (72)			522.17 (2)	< 0.001	
Internet for health information	692 (78)					
Internet for Health Services/Providers	105 (12)					
Caregivers	One	Two +				
General Internet Use	36 (88)	370 (91)		0.495 (1)	0.48	
Internet for health information	26 (72)	301 (82)		1.84 (1)	0.17	
Internet for Health Services/Providers	3(9)	52 (15)				
Kids	No Kids	With Kids				
General Internet Use	481 (61)	406 (91)		125.59 (1)	< 0.001	
Internet for health information	365 (76)	327 (81)		3.03 (1)	0.08	
Internet for Health Services/Providers	50 (11)	55 (14)		2.05 (1)	0.15	
Gender	Men	Women				
General Internet Use	271 (72)	616 (69)		0.001 (1)	0.97	
Internet for health information	507 (82)	185 (68)		22.09 (1)	<0.001	
Internet for Health Services/Providers	30 (12)	75 (13)		0.09 (1)	0.75	
Income	< \$30K	\$30-\$70K	> \$70K			
General Internet Use	141 (44)	434 (83)	224 (93)	210.74 (2)	< 0.001	
Internet for health information	98 (70)	344 (79)	191 (85)	13.06 (2)	<0.001	
Internet for Health Services/Providers	18 (14)	48 (12)	29 (13)	0.61 (2)	0.73	
Age	18-34	35-49	50-64	65+		
General Internet Use	146 (89)	292 (88)	302 (81)	147 (40)	256.89 (3)	< 0.001
Internet for health information	115 (79)	238 (82)	231 (76)	108 (73)	4.40 (3)	0.22
Internet for Health Services/Providers	21 (15)	41 (15)	29 (10)	14 (10)	4.35 (3)	0.22

Findings: Interaction Effects

	Do You Use Internet?				Test Statistic (χ^2) (DF), p-value	Do You Use Internet for health information?				Test Statistic (χ^2) (DF), p-value	Do You Use Internet to locate healthcare services and providers?				Test Statistic (χ^2) (DF), p-value		
	One	Two +			One	Two +			One	Two +			One	Two +			
Caregiver*Income																	
< \$30K	16 (50)	37 (11)			37.02 (2) <0.001	13 (52)	28 (10)			35.52 (2) <0.001	2 (67)	8 (17)					
\$30-\$70K	9 (28)	186 (54)				6 (24)	151 (53)				1 (33)	24 (50)					
> \$70K	7 (22)	119 (35)				6 (24)	104 (37)				0 (0)	16 (33)					
Kids*Income	No Kids	Kids				No Kids	Kids				No Kids	Kids					
< \$30K	88 (21)	53 (14)			13.44 (2) 0.001	57 (18)	41 (13)			9.18 (2) <0.01	8 (18)	10 (20)				0.10 (2) 0.95	
\$30-\$70K	239 (56)	195 (43)				187 (57)	157 (51)				23 (52)	25 (49)					
> \$70K	98 (23)	126 (28)				81 (25)	110 (36)				13 (30)	16 (31)					
Age*Income	18-34	35-49	50-64	65+		18-34	35-49	50-64	65+		18-34	35-49	50-64	65+			
< \$30K	34 (25)	41 (15)	41 (9)	27 (6)	14.6 (6) 0.02	25 (23)	31 (14)	25 (12)	17 (18)	14.6 (6) 0.02	8 (42)	8 (21)	1 (4)	1 (9)			
\$30-\$70K	68 (49)	141 (52)	149 (32)	76 (60)		53 (49)	116 (53)	114 (55)	60 (64)		9 (48)	17 (45)	13 (48)	9 (82)			
> \$70K	36 (26)	87 (19)	78 (29)	23 (5)		31 (28)	73 (33)	70 (34)	17 (18)		2 (10)	13 (34)	13 (48)	1 (9)			
Age*Gender	18-34	35-49	50-64	65+		18-34	35-49	50-64	65+		18-34	35-49	50-64	65+			
Male	45 (31)	91 (31)	97 (32)	38 (26)	1.93 (3)	28 (24)	81 (33)	66 (29)	35 (29)	2.49 (3)	4 (19)	13 (32)	9 (31)	4 (29)	1.21 (3)		
Female	101 (69)	201 (69)	205 (68)	109 (74)	0.58	87 (76)	170 (68)	165 (71)	85 (71)	0.47	17 (81)	28 (68)	20 (69)	10 (71)	0.74		

Findings: Binomial Logit Model

Do You Use Internet?

General Internet Use	Individual Variables							Chosen Model						
	B	S.E.	Wald	Sig	Exp (B)	C & S R-Squar	N R-Square	B	S.E.	Wald	Sig	Exp (B)	C & S R-Square	N R-Square
Constant	0.39	0.11	13.29	0.00	1.47	0.18	0.26	-1.65	0.41	16.57	0.00	0.19	0.28	0.41
Age			221.88							62.55	0.00			
Age (1)	-2.48	0.27	83.50	0.00	0.08			-1.84	0.36	26.41	0.00	0.16		
Age (2)	-2.35	0.20	141.10	0.00	0.10			-1.52	0.29	28.35	0.00	0.22		
Age (3)	-1.80	0.17	115.19	0.00	0.16			-1.42	0.20	49.09	0.00	0.24		
Constant	-2.57	0.25	105.04	0.00	0.07	0.17	0.25							
Income			177.53							125.88	0.00			
Income(1)	2.81	0.27	104.00	0.00	16.63			2.47	0.29	71.40	0.00	11.82		
Income(2)	1.02	0.27	13.48	0.00	2.76			0.72	0.29	6.14	0.01	2.05		
Constant	-0.92	0.11	66.24	0.00	0.40	0.00	0.00							
Gender(1)	-0.01	0.14	0.00	0.97	1.00			-1.64	0.18	4.13	0.04	0.69		
Constant	-2.33	0.17	178.10	0.00	0.09	0.00	0.00							
Caregiver(1)	-2.33	0.51	0.49	0.48	1.42									
Constant	-2.29	0.16	195.76	0.00	0.10	0.11	0.16							
Kids(1)	1.84	1.79	106.01	0.00	6.34			0.81	0.28	8.54	0.00	2.05		

Findings: Binomial Logit Model-Have you used the Internet to find health-related information?

Internet use for health related information	Individual Variables						Chosen Model							
	B	S.E.	Wald	Sig	Exp (B)	C & S R-Square	N R-Square	B	S.E.	Wald	Sig	Exp (B)	C & S R-Square	N R-Square
Constant	-1.01	0.187	29.72	0	0.361	0.005	0.008	-1.421	0.238	35.74	0	0.241	0.033	0.051
Age			4.37	0.233										
Age (1)	-0.325	0.277	1.37	0.24	0.722									
Age (2)	-0.465	0.24	3.74	0.05	0.628									
Age (3)	-0.161	0.231	0.48	0.485	0.851									
Constant	-1.68	0.192	76.9	0	0.185	0.01	0.02							
Income			12.08	0.002						10.43	0.05			
Income(1)	0.843	0.251	11.27	0.001	2.32			0.795	0.255	9.71	0.02	2.213		
Income(2)	0.338	0.228	2.18	0.13	1.4			0.316	0.231	1.878	0.17	1.372		
Constant	-0.76	0.131	34.44	0	0.465	0.02	0.03							
Gender(1)	-0.78	0.168	21.54	0	0.458			-0.633	0.182	12.07	0.001	0.531		
Constant	-1.48	0.134	122.8	0	0.226	0.004	0.007							
Caregiver(1)	0.532	0.396	1.809	0.179	1.7									
Constant	-1.43	0.126	129.4	0	0.239	0.003	0.005							
Kids(1)	0.287	0.165	3.02	0.08	1.33			0.317	0.179	3.12	0.07	1.37		

Findings: Binomial Logit Model

Have you used the Internet to find local health services information and providers?

	Individual Variables						
Internet for finding health services and providers	B	S.E.	Wald	Sig	Exp (B)	C & S R-Square	N R-Square
Constant	2.205	0.282	61.31	0	9.07	0.005	0.01
Age			4.31	0.23			
Age (1)	-0.446	0.368	1.47	0.225	0.64		
Age (2)	-0.463	0.329	1.98	0.15	0.629		
Age (3)	-0.027	0.343	0.006	0.937	0.973		
Constant	1.98	0.218	83.3	0	7.29	0	0.001
Income			0.324	0.851			
Income(1)	-0.021	0.319	0.004	0.948	0.98		
Income(2)	-0.133	0.264	0.253	0.615	0.876		
Constant	2.001	0.195	105.87	0	7.4	0	
Gender(1)	-0.071	0.23	0.095	0.75	0.932		
Constant	1.75	0.15	136.7	0	5.78	0.003	0.005
Caregiver(1)	0.58	0.623	0.865	0.352	1.78		
Constant	1.79	0.146	152.5	0	6.03	0.002	0.005
Kids(1)	0.299	0.209					

Findings: Multinomial Logit Model

	How confident are you that you can find local health related information on the internet?	B	S.E.	Wald	DF	Sig	Exp (B)	C & S R-Square	N R-Square
Very Confident	Intercept	0.406	1.477	0.076	1	0.783		0.04	0.052
	Age (1)	2.867	1.594	3.238	1	0.072	17.598		
	Age (2)	3.987	1.617	6.082	1	0.014	53.893		
	Age (3)	3.795	1.853	4.195	1	0.041	44.485		
	Age (4)				0				
	Gender (1)	-0.337	0.747	0.203	1	0.652	0.714		
	Gender (2)				0				
	Caregiver (1)	-1.267	0.813	2.428	1	0.119	0.282		
	Caregiver (2)				0				
	Kids (1)								
	Kids (2)								
	Income (1)	-0.904	0.885	1.044	1	0.307	0.405		
	Income (2)	-0.302	0.789	0.146	1	0.702	0.739		
	Income (3)				0				
Somewhat Confident	Intercept	0.216	1.472	0.022	1	0.883			
	Age (1)	2.176	1.592	1.868	1	0.172	8.807		
	Age (2)	3.17	1.614	3.856	1	0.05	23.797		
	Age (3)	3.047	1.861	2.681	1	0.102	21.061		
	Age (4)				0				
	Gender (1)	-0.267	0.764	0.122	1	0.727	0.766		
	Gender (2)				0				
	Caregiver (1)	-1.527	0.862	3.14	1	0.076	0.217		
	Caregiver (2)				0				
	Kids (1)								
	Kids (2)								
	Income (1)	-0.344	0.904	0.144	1	0.704	0.709		
	Income (2)	-0.344	0.807	0.181	1	0.67	0.709		
	Income (3)				0				

Conclusion

- Findings reinforce each other
- Compare well with other studies
- High income, middle-age, with children
- Older demographics using internet
- Income major deterrent
- Socio-economic factors impact fade as Internet use is more specific about healthcare

Discussion

- Healthcare critical for Eco. Devp.
- Study useful for adopting new strategies to increase Internet usage.
- Rural areas not lagging behind
- Other factors affecting Internet use
- Cost of Internet for providers
- Cost of Internet for Users
- Value to public policy makers/industry