"Navigating welfare regimes in divided societies: Diversity and the quality of service delivery in Lebanon"

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A1: Sample selection

We classify health centers operating in the Lebanon Ministry of Public Health (MOPH) network into four main types run by the public sector, secular NGOs, religious charities, and political parties (see Table A1.1). Religious charities, sectarian political parties, and non-sectarian groups each run about one quarter of primary health facilities in the non-profit sector. The remaining quarter are run directly by public agencies, such as the MOPH or municipalities.

Coding centers was relatively straightforward as most belong to networks with clear organizational affiliations. Public facilities include those run by a government agency, whether national or local. NGOs refer to non-state providers that have no religious or political affiliation and often broadcast their mission in explicitly non-sectarian terms. Religious centers are linked to a religious community, such as the Maronite Church, the Sunni Dar al-Fatwa, or the Shia Mabarrat, but are not affiliated with a political party or politician. Finally, political facilities are directly run by a politician or party that contests elections or holds public office, or by a party-linked charitable arm. In Lebanon, where virtually all of the major political parties are sectarian, party-linked centers are associated with particular religious communities. Examples include the health networks of the Shia Hezbollah and Amal Movement, and Christian Kataeb Party. After carrying out intercoder reliability checks between the two coders, we resolved any discrepancies through additional research and confirmation with MOPH officials.

Table A1.1: Distribution of the sampling frame, selected sample, and realized sample by center type

Types of centers	Sampling frame (MOPH network)	Selected sample	Realized sample
Public	**57 (26%)**	**25 (25%)**	**18 (26%)**
Religious charities	**57 (26%)**	**26 (27%)**	**22 (32%)**
Sectarian political parties	**54 (24%)**	**24 (24%)**	**8 (12%)**
Non-affiliated NGOs	**53 (24%)**	**24 (24%)**	**21 (30%)**
TOTAL	**221**	**99**	**69**

To assess the quality of medical care in the non-profit primary health sector, we selected a representative sample of centers from across the country. Given time and budgetary constraints, we included in the sample up to 100 centers (with an estimated response rate of about 70%). Based on a two-stage random selection process, we first selected cadastral regions, the primary sampling unit, and then included all centers in the selected regions in the sample. The choice of cadastral regions as primary sampling units and, hence, the geographical clustering of centers was necessary given the intensive nature of the data collection process, which entailed multiple visits over four- to five-day periods, sometimes to remote areas. It is important to note that cadastral regions in Lebanon are socially meaningful units that comprise villages in rural areas and neighborhoods in urban areas.

To select cadastral regions, we used a dataset constructed by the World Bank (Muñoz & Aguilera, 2016), which includes population information (for both Lebanese and Syrians) in 1,301 cadastral regions. Using probability-proportional-to-size sampling, we selected 70 cadastral regions, yielding a sample of 99 centers. Centers within a 1.25-km buffer zone around the outer boundaries of cadastral regions were included in the sample because these nearby centers are in walking distance of residents of that cadastral region based on a calculation of how far a normal person walks in 15 minutes, taking 5 kilometers per hour as the average walking speed.

Data collection was carried out in 69 of these centers. Table A1.1 depicts the distribution of the selected and realized sample of center types, showing that non-response was highest among centers run by political parties. This was mainly due to the fact that the Future Movement, the largest Sunni party in Lebanon, shut down its health centers shortly before data collection began due to budget constraints and therefore cannot be considered "missing." Moreover, Hezbollah, a major Shia sectarian party, did not permit its centers to participate in the study. To account for this, we used simple survey weights in which the weight of each respondent was readjusted according to the share of the center types in the sampling frame. Section A8 of this appendix presented the main findings with weighted data. No substantial difference exists between the tests using unweighted and weighted data.

A2: Descriptive statistics of center selection factor variables

Table A2.1: Descriptive statistics of center selection variables for Lebanese patients in sectarian centers only

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Proximity	274	0.620	0.486	0	0	1	1
Affordability	274	0.766	0.424	0	1	1	1
Center reputation	274	0.872	0.334	0	1	1	1
Doctor reputation	274	0.825	0.381	0	1	1	1
Knowing medical staff	274	0.208	0.407	0	0	0	1
Knowing brokers	274	0.135	0.342	0	0	0	1
Special care	274	0.223	0.417	0	0	0	1

Table A2.2: Descriptive statistics of center selection variables for Lebanese patients with access to both ingroup and outgroup centers

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Proximity	175	0.634	0.483	0.000	0.000	1.000	1.000
Affordability	175	0.777	0.417	0.000	1.000	1.000	1.000
Center reputation	175	0.863	0.345	0.000	1.000	1.000	1.000
Doc reputation	175	0.829	0.378	0.000	1.000	1.000	1.000
Knowing medical staff	175	0.253	0.413	0.000	0.000	0.750	1.000
Knowing brokers	175	0.137	0.345	0.000	0.000	0.000	1.000
Special care	175	0.246	0.432	0.000	0.000	0.000	1.000

Table A2.3: Descriptive statistics of center selection variables for Lebanese patients in both sectarian and non-sectarian centers

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Proximity	594	0.638	0.481	0.000	0.000	1.000	1.000
Affordability	594	0.783	0.413	0.000	1.000	1.000	1.000
Center reputation	594	0.847	0.360	0.000	1.000	1.000	1.000
Doc reputation	594	0.813	0.390	0.000	1.000	1.000	1.000
Knowing medical staff	594	0.254	0.436	0.000	0.000	1.000	1.000
Knowing brokers	594	0.143	0.350	0.000	0.000	1.000	1.000
Special care	594	0.258	0.438	0.000	0.000	0.000	1.000

A3: Multinomial and logistic regression results for center selection analysis

	Dependent variable:			
	Non-sectarian center vs. ingroup center *multinomial log-linear (neural networks)*	Sectarian outgroup center vs. ingroup center *multinomial log-linear (neural networks)*	Outgroup center vs. ingroup center *logistic*	
	All Lebanese patients	All Lebanese patients	Lebanese patients in sectarian centers	Lebanese patients in sectarian centers with access to both ingroup and outgroup centers
	(1)	(2)	(3)	(4)
Proximity	0.184	0.184	0.123	-0.490
	(0.200)	(0.395)	(0.409)	(0.595)
	[0.235]	[0.570]	[0.537]	[0.678]
Affordability	0.138	0.440	0.372	-0.199
	(0.241)	(0.508)	(0.500)	(0.693)
	[0.303]	[1.430]	[0.535]	[1.020]
Center reputation	-0.474	0.298	0.460	2.116
	(0.290)	(0.620)	(0.629)	(1.260)*
	[0.332]	[1.903]	[0.666]	[1.192]*
Doc reputation	-0.217	-0.453	-0.490	-0.317
	(0.261)	(0.468)	(0.509)	(0.824)
	[0.324]	[0.563]	[0.605]	[1.031]
Specialized care	0.382	-0.045	-0.096	0.041
	(0.225)*	(0.458)	(0.474)	(0.645)
	[0.336]	[1.925]	[0.749]	[0.897]
Knowing medical staff	0.403	-0.090	-0.075	-1.259
	(0.253)	(0.552)	(0.562)	(0.916)
	[0.296]	[1.829]	[0.744]	[1.347]
Knowing brokers	-0.366	-0.687	-0.674	0.195
	(0.304)	(0.729)	(0.743)	(0.943)
	[0.438]	[3.101]	[0.918]	[1.370]
Patient age	0.009	0.022	0.022	0.043
	(0.007)	(0.014)	(0.014)	(0.022)**
	[0.011]	[0.016]	[0.015]	[0.022]**
Respondent age	0.004	-0.011	-0.012	-0.021
	(0.010)	(0.021)	(0.021)	(0.028)
	[0.012]	[0.029]	[0.028]	[0.044]

Patient gender: Female	0.219	-0.323	-0.368	-0.950
	(0.233)	(0.498)	(0.524)	(0.853)
	[0.235]	[0.528]	[0.514]	[0.642]
Respondent gender: Female	-0.317	-0.240	-0.252	-0.013
	(0.289)	(0.569)	(0.584)	(0.928)
	[0.313]	[0.592]	[0.559]	[0.628]
Socioecon. status	0.450	-0.197	-0.216	0.953
	(0.148)***	(0.287)	(0.300)	(0.513)*
	[0.215]**	[0.404]	[0.427]	[0.557]*
Patient general health	0.132	0.194	0.157	0.090
	(0.111)	(0.223)	(0.220)	(0.313)
	[0.145]	[0.287]	[0.243]	[0.375]
Religiosity	-0.228	-0.149	-0.050	-0.206
	(0.090)**	(0.173)	(0.174)	(0.255)
	[0.138]*	[0.231]	[0.203]	[0.270]
Constant	-0.409	-1.831	-1.885	-4.652
	(0.710)	(1.395)	(1.446)	(2.262)**
	[1.036]	[2.728]	[1.755]	[2.418]*
Observations			253	165
Log Likelihood			-99.317	-50.074
Akaike Inf. Crit.	985.832	985.832	228.634	130.148

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01.
Normal standard errors are presented in parentheses.
Cluster-robust standard errors (at the provider level) are presented in brackets.

A4: Results of SUR analyses with demographic controls

		All Types of Centers (n=556)					Only Sectarian Centers (n=253)					Only Sectarian Centers, Patients with Access to both Ingroup and Outgroup Centers (n=165)				
Dependent variable	**Covariate**	**Estimate**	**Std. Error**	**Sign.**	**Cluster-Robust Std. Error**	**Sign.**	**Estimate**	**Std. Error**	**Sign.**	**Cluster-Robust Std. Error**	**Sign.**	**Estimate**	**Std. Error**	**Sign.**	**Cluster-Robust Std. Error**	**Sign.**
Proximity	Constant	0.586	0.149	***	0.150	***	0.787	0.218	***	0.208	***	0.930	0.287	***	0.290	***
	Non-Sectarian Center	0.037	0.044		0.053											
	Sectarian Outgroup Center	0.054	0.086		0.102		0.044	0.088		0.104		-0.049	0.123		0.129	
	Patient age	0.001	0.001		0.002		0.002	0.002		0.002		0.003	0.003		0.003	
	Respondent age	0.001	0.002		0.002		-0.002	0.003		0.003		-0.003	0.004		0.004	
	Patient gender	0.030	0.052		0.047		-0.066	0.079		0.069		-0.011	0.095		0.083	
	Respondent gender	-0.097	0.063		0.055	*	-0.038	0.098		0.089		-0.056	0.121		0.109	
	SES	0.020	0.032		0.034		0.019	0.048		0.047		-0.057	0.065		0.058	
	Patient general health	0.005	0.024		0.025		-0.001	0.035		0.036		0.005	0.045		0.045	
	Religiosity	-0.010	0.019		0.020		-0.045	0.029		0.029		-0.031	0.038		0.038	
Affordability	Constant	0.709	0.125	***	0.144	***	0.794	0.186	***	0.197	***	0.540	0.244	**		**
	Non-Sectarian Center	0.020	0.037		0.049										0.281	
	Sectarian Outgroup Center	0.071	0.072		0.071		0.069	0.075		0.075		0.002	0.105		0.140	
	Patient age	0.001	0.001		0.001		0.000	0.002		0.002		0.002	0.002		0.003	
	Respondent age	0.001	0.002		0.002		0.000	0.003		0.003		0.003	0.003		0.004	
	Patient gender	0.091	0.043	**	0.043	**	0.120	0.067	*	0.071	*	0.120	0.081		0.083	
	Respondent gender	-0.003	0.053		0.049		-0.023	0.084		0.080		0.057	0.103		0.107	
	SES	0.047	0.027	*	0.027	*	0.014	0.041		0.045		-0.016	0.055		0.054	
	Patient general health	-0.034	0.020	*	0.023		-0.012	0.030		0.035		0.033	0.038		0.043	
	Religiosity	0.003	0.016		0.017		-0.022	0.025		0.024		-0.045	0.032		0.031	
Center reputation	Constant	0.499	0.110	***	0.115	***	0.651	0.149	***	0.170	***	0.721	0.197	***		***
	Non-Sectarian Center	-0.040	0.032		0.037										0.225	
	Sectarian Outgroup Center	0.027	0.063		0.051		0.031	0.061		0.053		0.125	0.084		0.061	**
	Patient age	-0.001	0.001		0.001		-0.001	0.002		0.002		-0.001	0.002		0.002	
	Respondent age	0.005	0.002	***	0.002	**	0.003	0.002		0.002		0.002	0.003		0.003	
	Patient gender	-0.027	0.038		0.039		-0.003	0.054		0.055		-0.004	0.065		0.076	
	Respondent gender	0.012	0.046		0.044		0.049	0.067		0.063		0.113	0.083		0.094	
	SES	0.031	0.024		0.026		0.005	0.033		0.041		-0.069	0.045		0.046	
	Patient general health	0.010	0.018		0.019		0.013	0.024		0.027		0.031	0.031		0.035	
	Religiosity	0.040	0.014	***	0.016	**	0.009	0.020		0.023		-0.004	0.026		0.029	
Doctor reputation	Constant	0.373	0.118	***	0.149	**	0.305	0.165	*	0.234		0.274	0.220		0.262	
	Non-Sectarian Center	-0.026	0.035		0.043											
	Sectarian Outgroup Center	-0.060	0.068		0.082		-0.070	0.067		0.083		0.028	0.095		0.109	
	Patient age	-0.002	0.001	*	0.001	*	0.000	0.002		0.002		0.000	0.002		0.002	
	Respondent age	0.005	0.002	***	0.002	***	0.005	0.003	*	0.003	*	0.005	0.003	*	0.004	
	Patient gender	0.034	0.041		0.044		-0.007	0.060		0.071		0.004	0.073		0.084	
	Respondent gender	0.006	0.050		0.049		0.029	0.074		0.087		0.096	0.093		0.111	
	SES	0.053	0.026	**	0.030	*	0.054	0.037		0.047		0.047	0.050		0.060	
	Patient general health	0.010	0.019		0.020		0.014	0.026		0.024		0.013	0.034		0.034	
	Religiosity	0.051	0.015	***	0.021	**	0.065	0.022	***	0.037	*	0.041	0.029		0.040	
Know in	Constant	-0.099	0.135		0.146		0.148	0.187		0.194		-0.061	0.247		0.204	
	Non-Sectarian Center	0.043	0.040		0.051											

g medical staff	Sectarian Outgroup Center	-0.058	0.078		0.080		-0.059	0.076		0.081		-0.150	0.106		0.094	
	Patient age	-0.001	0.001		0.001		-0.002	0.002		0.002		0.000	0.002		0.002	
	Respondent age	0.004	0.002	**	0.002	**	0.002	0.003		0.003		0.003	0.004		0.004	
	Patient gender	0.002	0.047		0.050		-0.064	0.068		0.074		-0.122	0.082		0.084	
	Respondent gender	0.064	0.057		0.060		0.061	0.085		0.088		0.204	0.105	*	0.112	*
	SES	0.085	0.029	***	0.035	**	0.043	0.042		0.041		0.108	0.056	*	0.056	*
	Patient general health	-0.003	0.022		0.023		-0.016	0.030		0.027		-0.014	0.039		0.031	
	Religiosity	0.002	0.017		0.021		0.002	0.025		0.029		-0.022	0.033		0.037	
Knowing brokers	Constant	-0.012	0.111		0.143		0.237	0.159		0.207		0.110	0.211		0.254	
	Non-Sectarian Center	-0.015	0.033		0.047											
	Sectarian Outgroup Center	-0.074	0.064		0.058		-0.072	0.064		0.061		-0.050	0.091		0.088	
	Patient age	0.000	0.001		0.001		0.000	0.002		0.002		0.002	0.002		0.002	
	Respondent age	0.002	0.002		0.002		0.001	0.002		0.003		-0.003	0.003		0.004	
	Patient gender	-0.012	0.038		0.041		-0.045	0.058		0.057		-0.007	0.070		0.076	
	Respondent gender	0.043	0.047		0.050		0.084	0.072		0.061		0.093	0.089		0.078	
	SES	0.046	0.024	*	0.027	*	0.003	0.035		0.042		0.041	0.048		0.053	
	Patient general health	-0.005	0.018		0.019		-0.030	0.025		0.027		0.003	0.033		0.027	
	Religiosity	-0.003	0.014		0.017		-0.009	0.021		0.028		-0.020	0.028		0.034	
Special care	Constant	0.130	0.134		0.139		0.087	0.182		0.203		0.328	0.250		0.260	
	Non-Sectarian Center	0.057	0.039		0.055											
	Sectarian Outgroup Center	-0.014	0.077		0.122		-0.025	0.074		0.113		0.042	0.107		0.143	
	Patient age	0.003	0.001	**	0.002	*	0.003	0.002	*	0.002		0.003	0.002		0.002	
	Respondent age	0.000	0.002		0.002		0.001	0.003		0.002		0.003	0.004		0.003	
	Patient gender	-0.042	0.046		0.045		-0.024	0.066		0.054		-0.086	0.083		0.063	
	Respondent gender	0.154	0.056	***	0.053	***	0.094	0.082		0.075		0.098	0.106		0.115	
	SES	0.023	0.029		0.031		0.047	0.040		0.042		-0.033	0.057		0.067	
	Patient general health	-0.019	0.022		0.023		-0.009	0.029		0.033		-0.036	0.039		0.044	
	Religiosity	-0.021	0.017		0.018		-0.031	0.024		0.032		-0.031	0.033		0.040	

*Notes: * denotes p < 0.1, ** denotes p < 0.05, *** denotes p < 0.01. Cluster-robust standard errors reported in brackets at the provider level through block-bootstrapping (1000 resampling).*

A5: Testing the validity of the objective quality variable

Table A5.1: The relationship between the Doctor Effort Index and health variables

	Dependent variable:							
	Doctor effort index							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
General health	-0.199**	-0.153**						
	(0.080)	(0.067)						
Today's health			-0.242***	-0.144***				
			(0.062)	(0.043)				
Symptom count					0.271***	0.182***		
					(0.055)	(0.042)		
Visit type: Other							-0.473	-0.089
							(0.343)	(0.335)
Visit type: Pregnancy							1.161***	0.469
							(0.277)	(0.412)
Visit type: First-time primary care							0.551**	0.410**
							(0.248)	(0.163)
Visit type: Vaccination							0.403	0.370
							(0.307)	(0.244)
Constant	0.926***	0.410	0.973***	0.302	-0.142	-0.376	-0.231	-0.552
	(0.327)	(0.392)	(0.243)	(0.333)	(0.134)	(0.299)	(0.277)	(0.439)
Enumerator F.E.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	256	256	255	255	258	258	258	258
R^2	0.034	0.373	0.068	0.380	0.093	0.389	0.067	0.377
Adjusted R^2	0.030	0.345	0.065	0.352	0.090	0.362	0.052	0.341
Residual Std. Error	1.025 (df = 254)	0.843 (df = 244)	1.009 (df = 253)	0.840 (df = 243)	0.993 (df = 256)	0.832 (df = 246)	1.014 (df = 253)	0.846 (df = 243)
F Statistic	9.021*** (df = 1; 254)	13.221*** (df = 11; 244)	18.514*** (df = 1; 253)	13.522*** (df = 11; 243)	26.325*** (df = 1; 256)	14.233*** (df = 11; 246)	4.555*** (df = 4; 253)	10.484*** (df = 14; 243)

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01.
Cluster-robust standard errors (at the provider level) are presented in parentheses.

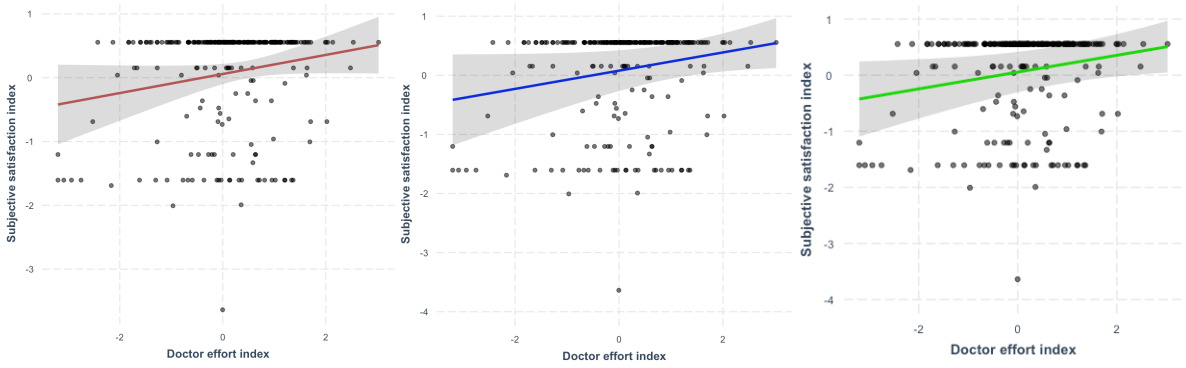
Table A5.2: The relationship between the Doctor Effort Index and subjective patient satisfaction

	Dependent variable:		
	Subjective patient satisfaction index		
	(1)	(2)	(3)
Doctor effort index	0.149***	0.154***	0.150***
	(0.048)	(0.053)	(0.051)
Patient age		-0.006	-0.004
		(0.004)	(0.004)
Respondent age		0.003	0.001
		(0.006)	(0.006)
Patient gender: Female		-0.081	-0.104
		(0.130)	(0.127)
Respondent gender: Female		0.039	0.085
		(0.166)	(0.161)
Socioecon. status		-0.032	-0.033
		(0.082)	(0.080)
Patient general health		-0.079	-0.085
		(0.063)	(0.062)
Religiosity		0.031	-0.004
		(0.049)	(0.049)
Visit type: Other		0.478	0.381
		(0.361)	(0.354)
Visit type: Pregnancy		-0.332	-0.235
		(0.495)	(0.488)
Visit type: Primary		0.001	0.024
		(0.147)	(0.145)
Visit type: Vaccination		-0.076	-0.078
		(0.189)	(0.188)
Proximity			0.067
			(0.110)
Affordability			0.050
			(0.124)
Doc reputation			0.401***
			(0.150)
Center reputation			0.089
			(0.166)
Knowing medical staff			0.073
			(0.145)
Knowing brokers			0.066
			(0.171)
Special care			-0.525***
			(0.131)

Constant	0.058 (0.051)	0.415 (0.402)	0.112 (0.420)
Observations	254	244	244
R^2	0.036	0.071	0.159
Adjusted R^2	0.033	0.023	0.088
Residual Std. Error	0.802 (df = 252)	0.794 (df = 231)	0.767 (df = 224)
F Statistic	9.545^{***} (df = 1; 252)	1.478 (df = 12; 231)	2.234^{***} (df = 19; 224)

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01.
Cluster-robust standard errors (at the provider level) are presented in parentheses.

Figure A5.1



The red line shows the ab-line of the bivariate regression, the blue line shows the ab line of the multivariate regression (with patient characteristics added as control variables), and the green line shows the ab line of the multivariate regression (with patient characteristics and preference reasons added as control variables).

A6: Control variables in analyses of healthcare quality differences

The indicator for socioeconomic status is an additive index based on three questions in the patient exit interview, which include education level (no school = 0, some school but no degree = 0.2, primary school degree = 0.4, middle school degree = 0.6, high school degree = 0.8, university degree = 1), a household asset ownership (car, computer, and satellite dish; each item = 0.33), and a general statement about the income status of the household (covers needs well, and able to save = 1; covers needs adequately = 0.75; does not cover needs, some difficulties = 0.50; does not cover needs, great difficulties = 0.25).

Religiosity is based on the average values of three questions in the patient exit interview asking the respondent whether they pray, attend weekly services, and read or listen to scripture. For each question, "never" is coded as 0, "rarely" is 1, "sometimes" is 2, "most of the time" is 3, and "always" is 4.

The general health of the patient is measured with the following question in the patient exit interview: "On average, how would you rate your health?" "Very bad" is coded as 1 and "very good" is coded as 5.

Table A6.1: Descriptive statistics of demographic control variables

Statistic	N	Mean	St. Dev.	Min.	Max.	Diff of means outgroup vs. ingroup patients	p-value
Patient age	274	25.661	25.265	0	81	9.241**	0.044
Respondent age	271	40.018	15.047	14	81	3.689	0.239
Patient gender: Female	274	0.573	0.496	0	1	0.058	0.517
Respondent gender: Female	274	0.803	0.399	0	1	-0.116	0.144
SES	269	1.733	0.678	0.25	3	-0.122	0.326
Patient general health	272	3.901	0.999	1	5	-0.091	0.638
Religiosity	273	2.862	1.137	0	4	-0.140	0.471

* p < 0.1, ** p <0.05, *** p <0.01.

Based on information collected from direct observations of clinical examinations, we classified the type of each visit or examination, including primary care visits, follow-up visits, vaccination, pregnancy, and other, which largely includes administrative exchanges and small procedures such as post-operative stitch removal. Visit type information is used as a control variable to enhance the comparability of examinations. Table A6.2 shows the distribution of visit types for ingroup and outgroup patients. A simple chi-squared test finds no statistically significant difference between ingroup and outgroup patients in visit types (chi-squared = 3.55, df = 4, p-value = 0.471).

Table A6.2: Types of visits in ingroup and outgroup dyads

	Primary care visits	Follow-up visits	Vaccination	Pregnancy	Other	Total
Outgroup	23	6	7	1	0	37
	62.2%	16.2%	18.9%	2.7%	0%	100%
Ingroup	115	43	58	2	7	225
	51.1%	19.1%	25.8%	0.9%	3.1%	100%

Finally, we use the reasons reported by patients for visiting a given center as control variables, since these reasons can be confounders between the independent variable (i.e., visiting an ingroup center) and the dependent variables, although this is unlikely to be the case for analyses of objective quality. For example, doctor reputation may be a reason for selecting an ingroup center and rating a doctor more favorably. In addition, we use "knowing the organization that runs the center" as a control variable as it might affect both selection of the center and the quality of care received in that center. Table A6.3 shows descriptive statistics for these variables.

Table A6.3: Descriptive statistics of center selection factor variables

Statistic	N	Mean	S.D.	Min	Max	Difference of means: Outgroup vs. in patients	p-value
Proximity	274	0.620	0.486	0	1	0.056	0.510
Affordability	274	0.766	0.424	0	1	0.077	0.253
Center reputation	274	0.872	0.334	0	1	0.023	0.678
Doctor reputation	274	0.825	0.381	0	1	-0.073	0.329
Knowing medical staff	274	0.208	0.407	0	1	-0.068	0.310
Knowing brokers	274	0.135	0.342	0	1	-0.071	0.161
Special care	274	0.223	0.417	0	1	0.016	0.836
Knowing the organization	274	0.314	0.465	0	1	0.133	0.130

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A7: Results exploring objective quality differences with weighted data

	Dependent variable:			
	Questions asked by doctor (log) (1)	Physical examinations (2)	Minutes of exam (log) (3)	Doctor effort index (4)
Outgroup	0.104	-0.676**	-0.246**	-0.286
	(0.146)	(0.318)	(0.109)	(0.179)
Patient age	0.003	-0.019*	0.0004	-0.002
	(0.004)	(0.011)	(0.002)	(0.005)
Respondent age	-0.008	0.004	0.0003	-0.004
	(0.006)	(0.012)	(0.004)	(0.009)
Patient gender: Female	0.112	-0.010	0.161**	0.200*
	(0.073)	(0.239)	(0.064)	(0.118)
Respondent gender: Female	-0.050	-0.278	-0.075	-0.163
	(0.129)	(0.327)	(0.092)	(0.167)
Socioecon. status	-0.014	-0.033	0.003	-0.012
	(0.074)	(0.161)	(0.055)	(0.107)
Patient general health	-0.074	-0.051	-0.136***	-0.165*
	(0.062)	(0.132)	(0.040)	(0.085)
Religiosity	0.033	0.115	0.072*	0.101
	(0.057)	(0.122)	(0.037)	(0.076)
Visit type: Other	0.194	-0.644	0.207	0.155
	(0.282)	(0.647)	(0.323)	(0.386)
Visit type: Pregnancy	0.438**	-0.192	0.269	0.463
	(0.217)	(0.869)	(0.472)	(0.294)
Visit type: Primary	0.343***	0.595	0.092	0.425**
	(0.122)	(0.413)	(0.108)	(0.200)
Visit type: Vaccination	0.099	1.398**	0.136	0.466
	(0.177)	(0.582)	(0.145)	(0.297)
Proximity	-0.088	-0.140	-0.058	-0.140
	(0.094)	(0.197)	(0.052)	(0.105)
Affordability	-0.297**	-0.064	-0.127*	-0.305**
	(0.138)	(0.260)	(0.074)	(0.127)
Doc reputation	-0.052	0.242	0.112	0.110
	(0.157)	(0.409)	(0.123)	(0.247)
Center reputation	-0.120	-0.257	-0.030	-0.154
	(0.155)	(0.365)	(0.113)	(0.219)

Knowing medical staff	-0.028	0.226	0.007	0.029
	(0.164)	(0.343)	(0.101)	(0.225)
Knowing brokers	-0.073	-0.017	-0.038	-0.081
	(0.120)	(0.374)	(0.107)	(0.205)
Special care	-0.099	-0.526*	-0.034	-0.190
	(0.121)	(0.283)	(0.114)	(0.161)
Knowing the organization	-0.019	-0.194	0.125	0.049
	(0.162)	(0.453)	(0.118)	(0.235)
Constant	2.924***	1.785	2.400***	0.594
	(0.444)	(1.248)	(0.335)	(0.696)
Enumerator f.e.	Yes	Yes	Yes	Yes
Observations	240	240	239	239
R^2	0.425	0.506	0.390	0.387
Adjusted R^2	0.342	0.435	0.302	0.299
Residual Std. Error	0.635 (df = 209)	1.422 (df = 209)	0.518 (df = 208)	0.865 (df = 208)
F Statistic	5.149*** (df = 30; 209)	7.142*** (df = 30; 209)	4.428*** (df = 30; 208)	4.377*** (df = 30; 208)

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01. Cluster-robust standard errors (at the provider level) are presented in parentheses. Models are estimated with weights that correct for the underrepresentation of party-affiliated centers.

A8: Using the "know-do gap" as an indicator of objective quality

Table A10.1: Descriptive statistics of the "know-do gap"

Variable	N	Mean	Standard deviation	Min	Max	Diff between outgroup and ingroup patients	p-value in t-test
Know-do gap	177	-0.188	1.065	-3.047	2.572	-0.076	0.72

Table A10.2: Is there an outgroup disadvantage in objective quality ("know-do gap")?

	Dependent variable:	
	Know-do gap	
	(1)	(2)
Outgroup	0.221	0.148
	(0.193)	(0.191)
Patient age	-0.006	-0.003
	(0.006)	(0.006)
Respondent age	0.010	0.008
	(0.009)	(0.009)
Patient gender: Female	-0.161	-0.142
	(0.172)	(0.163)
Respondent gender: Female	0.140	0.118
	(0.167)	(0.177)
Socioecon. status	0.054	0.001
	(0.133)	(0.147)
Patient general health	-0.037	-0.052
	(0.112)	(0.120)
Religiosity	-0.088	-0.078
	(0.096)	(0.114)
Visit type: Other	0.075	0.354
	(0.555)	(0.563)
Visit type: Pregnancy	0.062	0.170
	(0.360)	(0.394)
Visit type: Primary	-0.622***	-0.450*
	(0.212)	(0.263)
Visit type: Vaccination	-0.777**	-0.521
	(0.310)	(0.353)

Constant	0.231	0.218
	(0.734)	(0.805)
Enumerator f.e.	Yes	Yes
Observations	164	164
R^2	0.410	0.368
Adjusted R^2	0.318	0.269
Residual Std. Error (df = 141)	0.890	0.898
F Statistic (df = 22; 141)	4.447^{***}	3.731^{***}

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01. Cluster-robust standard errors (at the provider level) are presented in parentheses. Model 2 is estimated with survey design weights that correct for the underrepresentation of party-affiliated centers.

A9: Why the ingroup advantage in quality? Testing potential mechanisms

Why might patients visiting ingroup versus outgroup facilities experience distinct quality of care? In this section, we provide alternative explanations about how the ingroup advantage might be working and offer suggestive evidence based on the data at hand.

Potential explanations

A variety of potential mechanisms may account for the apparent ingroup quality dividend and, conversely, the outgroup quality deficit observed in our analyses. These include ingroup affinity or greater interpersonal ease among ingroup members, more effective modes of accountability among ingroup members, higher levels of ingroup trust, and proselytism.

Ingroup comfort

Doctors may deliver (and patients may perceive that they are receiving) higher quality care when they share cultural backgrounds simply because they experience their interactions more positively and feel more at ease with each other. This has been documented in health care settings (Hsu, Hackett, & Hinkson, 2014; Malat, 2001) and may arise because people attach inherent value to group boundaries, irrespective of their content or overlap with other social categories, as Social Identity Theory holds (Barth, 1988 [1969]; Tajfel, Billig, Bundy, & Flament, 1971). If this mechanism is supported, we expect that patients in ingroup dyads would ask more questions of their providers and that greater comfort between both parties would result in higher quality measures.

Shared social networks and informal monitoring

Enhanced accountability as a result of shared social networks may explain why health care quality is superior in ingroup dyads, a mechanism broadly posited in studies of accountability and service delivery (Björkman & Svensson, 2010; Kosack & Fung, 2014; World Bank, 2016). On the one hand, it may be easier to find and coordinate with ingroup members, making it easier to monitor and informally sanction the behavior of providers. The increased efficacy of informal mechanisms of social accountability among ingroup members may reduce doctors' concerns about the satisfaction of outgroup patients, who share few if any social connections with them. As a result, patients may have greater informal leverage over ingroup providers. If this mechanism is supported, we would expect that evidence of shared social networks, such as common acquaintances or places of origin, are more likely to be mentioned during examinations among ingroup dyads, yielding superior quality ratings.

Ingroup trust

It is well known that intergroup trust is low when ethnoreligious cleavages are politicized (Insko & Schopler, 2013). In the service delivery context, this may result in reduced trust between doctors and patients from outgroup communities, especially from those perceived as antagonistic. In the current historical moment in Lebanon, this might translate into mistrust across the politicized Shi'a-Sunni cleavage but also within some Muslim-Christian dyads. If this is the case, patient satisfaction with doctors from outgroup communities would be low and, in turn, doctors may consciously or subconsciously discriminate against outgroup patients from such communities, resulting in especially poor levels of objective quality. Mistrust among outgroup members in social relationships among equals is well established in social psychology research, but the negative effect of identity-based cleavages may be exacerbated in unequal dyads, as in the provider-beneficiary relationship. Examinations in which trust concerns are most

salient – as arises when the patient doubts the altruistic or professional motivations of the doctor – would be associated with lower measures of quality.

Proselytism

Political "proselytism" or persuasion occurs when providers working for political parties and associated groups exert themselves more in serving beneficiaries as a way to garner political support for or further the influence of the organization (Thachil, 2014). As a result, the objective quality of care provided may be superior when delivered to members of target groups. (Although we do not address subjective evaluations in this paper, it is worth noting that the perceived instrumentalization of service delivery for political ends may backfire, reducing patient satisfaction as citizens may be cynical about the intentions of providers at such facilities.)

An observable implication of this hypothesis in contemporary Lebanon can be tested by comparing the outgroup disadvantage experienced by Lebanese patients to the outgroup disadvantage experienced by the Syrian patients. For the foreseeable future, Syrian refugees will not gain citizenship rights in Lebanon and therefore cannot participate in electoral or other forms of political mobilization in the domestic arena. As a result, if political parties and associated groups undertake health care provision to garner political support – which sectarian parties and politicians largely derive from ingroup members – we would expect to find varied levels of care for different Lebanese patients, but no such variation across Syrian ingroup and outgroup patients.

Tests of potential explanations

In this section, we present statistical tests to explore some observable implications of these potential explanations.

Causal mediation: Ingroup comfort, informal monitoring, and ingroup trust

To measure ingroup comfort, we use the number of questions asked by patients during examinations as recorded by the trained enumerator during direct observation. We capture informal sanctioning capacity through shared social networks by including a variable indicating whether common social connections were mentioned during the examination. This variable takes a value of "1" if the patient's family or friends or a shared place of origin is mentioned during the examination beyond discussions of family medical history, or if a mutual acquaintance referred the patient to the doctor. To measure trust in this context, we use the patient's opinion of the doctor's motivation to work in a particular center, with references to altruism indicating higher levels of trust. This is measured by the following statement, with responses recorded on a five-point Likert scale: "This doctor works here because he/she cares about people." Table A9.1 shows these variables and their descriptive statistics.[1]

[1] This variable only taps into the patient's trust in the doctor rather than the general level of trust between the two parties. We were unable to ask similar questions of doctors due to political sensitivities highlighted during pilot tests of an expanded version of the physician survey.

Table A9.1: Descriptive statistics of selected mediating variables

Statistic	N	Mean	St. Dev.	Min	Max	Difference b/t out- and ingroup examinations	p-value
Questions by the patient (log)	250	1.518	0.746	0.000	2.944	0.157	0.138
Shared social network mentioned	257	0.128	0.335	0.000	1.000	-0.116	0.003
Patient opinion: Altruistic doc	262	4.744	0.463	3.000	5.000	-0.052	0.532

We present the results for all objective quality variables in Tables A9.2 but, to streamline the interpretation, we focus the narrative on one objective quality measure (i.e., the log duration of the examination). Analyses with the other indicators yield similar results.

These tests of potential mechanisms are based on causal mediation analysis using the "mediation" package in R (Imai, Keele, & Tingley, 2010; Tingley, Yamamoto, Hirose, Keele, & Imai, 2014). This technique enables researchers to test the relationship between an independent variable and potential mediators and the relationship between potential mediators and the dependent variable simultaneously. Moreover, it yields non-parametric estimates of the mediation effects even though linear relationships are assumed between the independent variable and the mediator, and between the independent variable and the outcome variable. Causal mediation analysis then produces estimations of the average causal mediation effect (ACME), or the portion of the estimated effect of the explanatory variable on the outcome variable that goes through the tested mediator.

Tables A9.2 show the estimates for the ACME for each potential mechanism vis-à-vis objective quality. The findings suggest that neither ingroup comfort nor intergroup mistrust explains the apparent diversity deficit in health care quality. However, the results suggest that shared social networks mediate the relationship between ingroup status and superior health care quality.

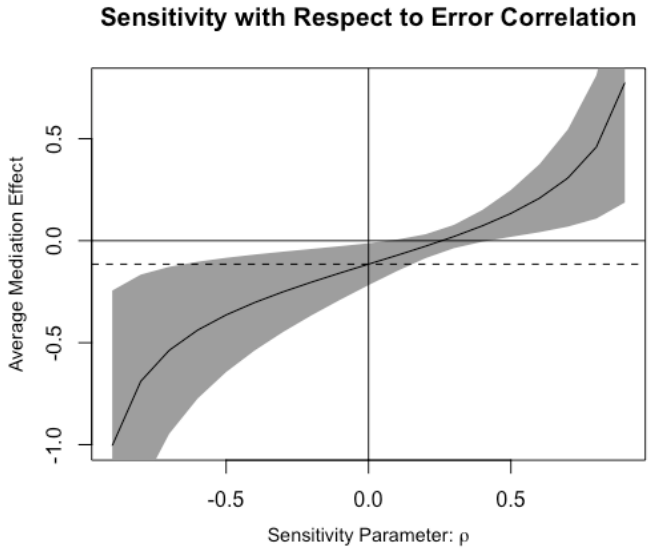
Table A9.2: Testing the effects of potential mediators: Objective quality

	ACME estimate for objective quality: Questions asked by the doctor (log)	ACME estimate for objective quality: Physical examinations	ACME estimate for objective quality: Minutes of examination (log)	ACME estimate for objective quality: Doctor effort index
Ease of interaction (Questions asked by the patient (log))	0.05 [-0.01, 0.14]	0.01 [-0.07, 0.10]	0.04 [-0.01, 0.10]	0.06 [-0.02, 0.16]
Potential monitoring through social network (Shared social connection mentioned during examination)	-0.05** [-0.12, 0.00]	-0.10** [-0.25, 0.00]	-0.07** [-0.15, -0.01]	-0.010** [-0.21, -0.01]
Trust (Patient perception doctor altruism)	0.01 [-0.03, 0.06]	0.02 [-0.03, 0.10]	0.003 [-0.02, 0.03]	-0.01 [-0.03, 0.06]

Notes: * p < 0.1, ** p <0.05, *** p <0.01.

Imai et al. (2010) suggest that findings from mediation analyses should be further tested to check whether the effects are robust to another potential pretreatment confounder, which might determine both the mediator and the outcome. The results of sensitivity analyses bolster our confidence in the finding that lack of shared social networks leads to lower levels of objective quality for outgroup patients.

Figure A9.1: Sensitivity analysis regarding the findings of the causal mediation analysis (DV: objective quality – doctor effort index, mediator: shared social network)



This figure suggests the following:

(1) The average mediation effect is estimated to be around -0.11 when we assume that no pretreatment variable explains the outcome and mediator variables at the same time (i.e., when the sensitivity parameter rho is 0).

(2) For the estimated average mediation effect to be zero, rho must be, on average, 0.3. In other words, an uncontrolled pretreatment variable should explain quite a large portion of the unexplained variation in the models for the mediation variable and outcome variable at the same time. Since this is fairly unlikely, we report the results about shared social networks as a mediator between a heterogeneous dyad and reduced doctor effort with confidence.

Testing "political proselytism"

As explained above, the current sociopolitical situation in Lebanon allows for one possible test of the "political proselytism" hypothesis as an explanation for the outgroup disadvantage in sectarian health centers. If such organizations provide higher quality care to ingroup patients in order to secure political support, such variation should not be observed in a population that can also be categorized along similar ingroup-outgroup lines but is unable to vote or engage in other forms of domestic political mobilization. The presence of Syrian refugees in contemporary Lebanon affords us the opportunity to test this observable implication: As Syrian refugees largely live in disadvantaged conditions and are unlikely to attain Lebanese citizenship, they cannot exert electoral or extra-electoral influence on Lebanese politics. Although the Syrian refugee population in Lebanon is overwhelmingly Sunni, some refugees identify with other communities, including Christians and Shia Muslims. Our data show that 47% of patients using the primary health care network were Syrian, 48% were Lebanese, and 5% were from other nationalities. Thus, the Syrian refugee population is comparable to the Lebanese population for the purposes of testing this observable implication.

Table A9.3 shows the ingroup-outgroup status of the 259 Syrian patients in our dataset who visited sectarian centers. 52.5% of Syrian patients who sought care at this subset of centers visited ingroup centers, whereas 22.4% were classified in a Christian-Sunni dyad (either because the patient was Christian and visited a Sunni center or, more likely, because the patient was Sunni and visited a Christian center). (Tables A9.4a-c provide additional descriptive statistics.)

Table A9.3: Descriptive statistics of key independent variables for Syrian patients in sectarian centers

Statistic	N	Mean	St. Dev.	Min	Max
Outgroup dyad	259	0.456	0499	0.000	1.000

Table A9.4a: Descriptive statistics of outcome variables for Syrian patients in sectarian centers

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Questions by the doctor (log)	248	2.707	0.627	0.693	2.303	3.135	4.159
Physical examinations	248	2.657	1.553	0.000	1.000	4.000	7.000
Min. of examination (log)	248	1.996	0.538	0.693	1.609	2.303	3.401
Doctor effort index	248	0.282	0.834	-2.047	-0.262	0.891	2.315

Table A9.4b: Descriptive statistics of control variables for Syrian patients in sectarian centers

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Patient age	263	14.163	18.041	0.000	1.000	26.500	74.000
Respondent age	262	32.004	11.076	16.000	24.000	37.000	74.000
Patient gender: Female	266	0.523	0.500	0.000	0.000	1.000	1.000
Respondent gender: Female	266	0.827	0.379	0.000	1.000	1.000	1.000
Socioecon. status	253	1.073	0.476	0.250	0.650	1.383	2.600
Patient general health	265	3.917	0.946	1.000	3.000	5.000	5.000
Religiosity	265	2.650	1.072	0.000	2.000	3.667	4.000

Table A9.4c: Descriptive statistics of selection variables for Syrian patients in sectarian centers

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Proximity	267	0.592	0.492	0.000	0.000	1.000	1.000
Affordability	267	0.835	0.372	0.000	1.000	1.000	1.000
Doc reputation	267	0.719	0.450	0.000	0.000	1.000	1.000
Center reputation	267	0.831	0.375	0.000	1.000	1.000	1.000
Knowing medical staff	267	0.060	0.238	0.000	0.000	0.000	1.000
Knowing brokers	267	0.026	0.160	0.000	0.000	0.000	1.000
Special care	267	0.240	0.428	0.000	0.000	0.000	1.000
Knowing organization	267	0.221	0.416	0.000	0.000	0.000	1.000

Table A9.5 provides a direct replication of the models we conducted for Lebanese patients but for Syrian patients using objective quality indicators as dependent variables. Unlike for Lebanese patients, the coefficients for the "outgroup" variable are close to zero and statistically insignificant, suggesting that Syrian patients do not experience an outgroup disadvantage. This finding lends support to the hypothesis that religious and political sectarian centers provide higher quality care to Lebanese ingroup patients to secure political support.

Table A9.5: Is there an outgroup disadvantage in objective quality for Syrian patients?

	Dependent variable:			
	Questions asked by doctor (log) (1)	Physical examinations (2)	Minutes of exam (log) (3)	Doctor effort index (4)
Outgroup	0.038	-0.106	-0.092	-0.072
	(0.137)	(0.299)	(0.117)	(0.210)
Patient age	0.001	-0.029***	0.004	-0.002
	(0.003)	(0.009)	(0.003)	(0.005)
Respondent age	0.002	0.017**	0.0001	0.005
	(0.004)	(0.009)	(0.004)	(0.004)
Patient gender: Female	0.008	-0.311	0.008	-0.053
	(0.068)	(0.217)	(0.072)	(0.108)
Respondent gender: Female	-0.077	0.373	-0.055	-0.016
	(0.124)	(0.288)	(0.092)	(0.175)
Socioecon. status	0.228**	0.160	0.092	0.256*
	(0.103)	(0.216)	(0.080)	(0.146)
Patient general health	-0.064	-0.260**	-0.041	-0.130**
	(0.040)	(0.129)	(0.032)	(0.058)
Religiosity	0.054	0.109	0.077*	0.120*
	(0.045)	(0.112)	(0.042)	(0.070)
Visit type: Other	0.072	-0.296	0.137	0.095
	(1.164)	(0.680)	(0.828)	(1.510)
Visit type: Pregnancy	0.433**	0.492	-0.186	0.233
	(0.171)	(0.557)	(0.215)	(0.246)
Visit type: Primary	0.365***	1.301***	0.083	0.578***
	(0.136)	(0.354)	(0.121)	(0.207)
Visit type: Vaccination	-0.103	1.299***	0.124	0.307
	(0.185)	(0.482)	(0.163)	(0.274)
Proximity	0.077	-0.043	0.089	0.113
	(0.083)	(0.163)	(0.074)	(0.123)
Affordability	0.017	0.753***	-0.124	0.069

	(0.110)	(0.235)	(0.104)	(0.154)
Doc reputation	-0.078	0.356	0.049	0.064
	(0.120)	(0.264)	(0.091)	(0.164)
Center reputation	0.085	-0.116	-0.064	-0.021
	(0.121)	(0.252)	(0.103)	(0.157)
Knowing medical staff	0.226	-1.329**	0.076	-0.072
	(0.148)	(0.658)	(0.198)	(0.293)
Knowing brokers	-0.543*	-0.123	-0.759***	-0.992**
	(0.280)	(0.605)	(0.259)	(0.398)
Special care	0.264	0.097	0.078	0.255
	(0.167)	(0.466)	(0.156)	(0.267)
Knowing the organization	-0.106	-0.241	-0.173	-0.260
	(0.118)	(0.394)	(0.127)	(0.204)
Constant	1.793***	0.412	1.972***	-0.803
	(0.379)	(0.896)	(0.314)	(0.549)
Enumerator f.e.	Yes	Yes	Yes	Yes
Observations	223	223	223	223
R^2	0.461	0.449	0.309	0.335
Adjusted R^2	0.373	0.359	0.197	0.228
Residual Std. Error (df = 191)	0.501	1.216	0.475	0.736
F Statistic (df = 31; 191)	5.269***	5.018***	2.761***	3.109***

Note: * denotes p-value < 0.1, ** denotes p-value < 0.05 and *** denotes p-value < 0.01. Cluster-robust standard errors (at the provider level) are presented in parentheses.

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