Appendix: "Political Context, Organizational Mission and the Quality of Social Services: Insights from Lebanon"

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Part A1: Items included in "Workplace equipment" and "Health equipment" indicators

During a nine-day training session for the data collection team, enumerators were shown photographs of each item included in the checklists used to construct the infrastructural quality indicators ("Workplace equipment" and "Healthcare equipment") in order to ensure their familiarity with the appearance and uses of the material and equipment. The items for the "Workplace equipment" include hand-washing facilities with soap and running water, hand disinfectant, drinking water, toilets for staff use only, separate toilets for patients, an electric supply, a generator for use during regular power cuts and to protect refrigeration for vaccines and medications, at least one telephone, a computer, a locked filing cabinet for patient records, and an electronic system for maintaining patient records. The items for the "Health equipment" include stethoscopes, blood pressure instruments, weighing scales, fridge/deep freezers, electric sterilizers, alcohol and other liquid sterilizers, IV-drips, beds or appropriate examination tables in patient examination rooms, thermometers, disposable syringes, disposable gloves, ophthalmoscopes, otoscopes, and EKG machines.

Part A2: Control Variables Used for the Statistical Analyses

Statistical analyses use a battery of control variables at the patient level. In addition, we employ a number of potential mediator variables, which arguably account for at least part of the relationship between provider type and patient satisfaction. Summary statistics of these variables are presented in Table A2.1.

Table A2.1: Summary statistics of variables used in statistical analyses

Statistic	N	Mean	St. Dev.	Min	Max
Dependent variables (patient-level)					
Patient satisfaction with health center	134	3.761	0.685	3	5
Patient satisfaction with doctor	134	3.791	0.684	3	5
Patient-level characteristics					
Gender: Female	133	0.617	0.488	0	1
Age	133	32.256	13.759	5	60
Socioeconomic status	129	2.881	0.989	0.4	5
Minutes of transport to health center	130	9.669	4.609	3	30
Vehicle used in transport (dummy)	129	0.217	0.414	0	1
Days of sickness before visit	132	7.705	13.33	0	60
Self-reported health status	132	3.72	0.96	1	5
Previous visit to health center (dummy)	134	0.5	0.502	0	1
Doctor-level characteristics					
Doctor medical knowledge	45	1.156	0.706	0	4
Doctor job satisfaction	41	3.61	0.802	2	5
Doctor sectoral experience	39	22.179	10.356	0	47
Doctor degree from formerly communist country (dummy)	39	0.513	0.506	0	1

The control variables used in the statistical analyses include a number of patient characteristics. The indicator for socioeconomic status is a composite index based on questions about the patient's education level and ownership of assets such as a residence, car and satellite dish. The variables indicating relevant characteristics of doctors include the number of correct diagnoses of medical vignettes by the doctor, the level of satisfaction of the doctor with the organization running the facility where she works, the experience of the doctor in the health sector and whether or not the doctor received her medical degree in a former Soviet bloc country. Qualitative data collected for this project suggest that many Lebanese view doctors who received their medical training in a former Soviet bloc country as less qualified, and therefore we control for this factor in models that focus on patient evaluations of their doctors. All data on doctors and patients can be matched across the multiple survey instruments. With few exceptions, it was not possible to collect systematic data through the surveys on the financial resources and budgets of the health networks or of the individual health centers in the sample, but interviews with the heads of health networks revealed that compensation schemes are virtually identical across organizations.

Part A3: Alternative model specifications for the outcome model

Table A3.1: Alternative model specifications for the outcome model

	Dependent variable:			
	Patient's satisfaction with the doctor			
	OLS	linear mixed-effects		ordered probit
	(1)	(2)	(3)	(4)
Provider: NGO	0.568	0.599	0.634	1.090
	(0.265)**	(0.339)*	(0.317)**	(0.483)**
	[0.380]+	[0.377]+	[0.355]*	[0.979](See Note a)
Provider: Religious	0.221	0.149	0.196	0.484
	(0.208)	(0.288)	(0.249)	(0.393)
Provider: Political	0.234	0.238	0.246	0.508
	(0.219)	(0.304)	(0.261)	(0.406)
Gender: Female	0.239*	0.268**	0.274**	0.459**
	(0.127)	(0.122)	(0.119)	(0.230)
Age	-0.002	-0.001	-0.002	-0.005
	(0.005)	(0.005)	(0.005)	(0.009)
Socio-economic status	-0.218***	-0.152**	-0.164**	-0.415***
	(0.068)	(0.073)	(0.071)	(0.126)
Minutes of transport to the PHC	0.002	0.003	0.003	0.003
	(0.014)	(0.013)	(0.013)	(0.025)
Vehicle used in transport (dummy)	-0.043	-0.030	-0.057	-0.095
	(0.160)	(0.152)	(0.151)	(0.286)
Days of sickness before visit	0.002	0.002	0.001	0.003
	(0.005)	(0.005)	(0.005)	(0.008)
Self-reported health status	0.130*	0.171**	0.133*	0.259**
	(0.070)	(0.072)	(0.072)	(0.126)
Previous visit to the PHC (dummy)	0.042	-0.052	-0.053	0.063
	(0.133)	(0.129)	(0.127)	(0.239)
Constant	3.606***	3.263***	3.449***	
	(0.404)	(0.447)	(0.428)	
Observations	121	121	121	121
R2	0.196			
Adjusted R2	0.115			
Log Likelihood		-135.089	-134.669	
Akaike Inf. Crit.		298.179	297.339	
Bayesian Inf. Crit.		337.320	336.480	
Residual Std. Error	0.650 (df = 109)			
F Statistic	2.412** (df = 11; 109)			

Note: Normal standard errors are in parantheses, and block-bootstrapped standard errors (1,000 resampling) are in brackets. Column 1 is Column 5 in Table 3 added for purposes of comparison. Column 2 reports the results of a hierarchical linear model with varying intercepts at the PHC level. Column 3 reports a hierarchical linear model with varying intercepts at the provider level. Column 4 reports the results of ordered probit model.

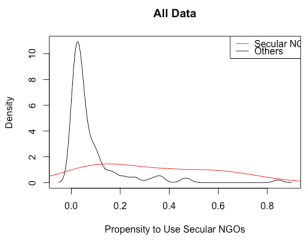
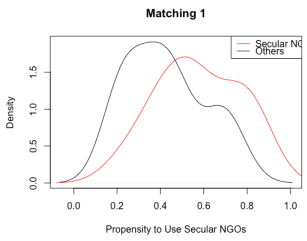
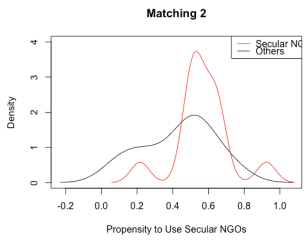
Note a: Block-bootstrapping in this model led to a right-skewed distribution of the estimates of this coefficient. Even though the standard error is quite high, 93.7% of the estimates in block-bootstrapping were above zero.

*p<0.1; **p<0.05; ***p<0.01; +p<0.15.

Part A4: Matching results

The table below (Table A4.1) suggests the results of the matching exercises. We use two matching methods: Nearest neighbor matching using Mahalanobis distance and nearest neighbor matching using logistical propensity score. Coarsened exact matching did not provide meaningful results due to the small sample size. The results of the matching methods used, on the other hand, provide further evidence that supports the findings in Table 3 of the article and Part A3 of this supplemental appendix: The secular NGOs seem to garner more satisfaction from their patients. Point estimates of the difference between the patient satisfaction in secular NGOs versus other provider types are also similar between linear regression results and matching exercises. Our preferred matching result is Matching 1 in which we observe improvement (albeit a small one) in local common support, and also a much-improved similarity in the distribution of propensity to use secular NGOs between the treatment group and the control group.

Table A4.1: Results of matching exercises

	Actual data	**Matching 1**	**Matching 2**
Matching method used	-	Nearest neighbor using Mahalanobis as the measure of distance	Nearest neighbor using logistical propensity score as the measure of distance
Number of observations (treated)	121 (13)	26 (13)	26 (13)
Multivariate imbalance measure (L1)	0.981	0.923	1.000
Local common support (LCS)	1.8%	4.0%	0.0%
Imbalances in individual variables (differences between treatment mean and control mean)			
Gender: Female	0.11	0	0.15
Age	0.70	-2.46	-0.08
Socio-economic status	-0.78	-0.29	-0.11
Minutes of transport to the PHC	-1.89	-1.31	-0.23
Vehicle used in transport (dummy)	-0.17	-0.08	-0.08
Days of sickness before visit	10.63	2.77	-6.7
Self-reported health status	0.44	0.23	0.23
Previous visit to the PHC (dummy)	0.24	0.00	-0.15
Propensity to treatment graph			
t-test results for difference in doctor satisfaction between the treatment and control groups			
Point estimate		0.62	0.62
95% confidence interval		[0.06, 1.17]	[0.06, 1.17]
p-value		0.03	0.03
Linear regression results			

Coefficient on the treatment		0.57	0.49
Standard error		0.32	0.26
p-value		0.09	0.07

Part A5: Checking for the posttreatment confounding

Sequential ignorability also assumes that there is no posttreatment confounding between the mediator and outcome variables. The most important reason for posttreatment confounding might be a causal relationship between potential mediators. Following Imai and Yamamoto (2013), we regress the mediator of interest (in this case, doctor job satisfaction) on the other potential mediator (doctor medical knowledge) using the treatment and appropriate control variables. Both the regression and an F-test suggest that there is no significant relationship between the two potential mediating factors (See Table A4.1). It is important to recall that this is a baseline check: Even though we fail to reject the null hypothesis of no conditional association, we cannot fully rule out the possibility of a causal relationship between potential mediators. Nevertheless, this result gives us more confidence that at least some of the positive effect of NGO provider type on patient satisfaction is mediated through doctor satisfaction with her position in the health center.

Table A5.1: Regressing the mediator of interest on the other potential mediator

	Dependent variable:		
	Doc's job satisfaction		
	(1)	(2)	(3)
Provider: NGO	0.800*	0.931**	0.813
	(0.454)	(0.446)	(0.520)
Provider: Religious	-0.267	-0.023	-0.040
	(0.370)	(0.377)	(0.384)
Provider: Political	-0.055	0.021	0.018
	(0.387)	(0.376)	(0.381)
Doc's experience		0.006	0.007
		(0.012)	(0.012)
Doc's degree: Communist		0.541**	0.563**
		(0.264)	(0.272)
Doc's obj. knowledge			0.097
			(0.214)
Constant	3.600***	3.046***	2.905***
	(0.321)	(0.494)	(0.588)
Observations	36	36	36
R2	0.207	0.306	0.311
Adjusted R2	0.132	0.190	0.168
Residual Std. Error	0.717 (df = 32)	0.693 (df = 30)	0.702 (df = 29)
F Statistic	2.780* (df = 3; 32)	2.642** (df = 5; 30)	2.178* (df = 6; 29)
Note:			*p<0.1; **p<0.05; ***p<0.01

References

Imai, Kosuke, and Teppei Yamamoto. 2013. "Identification and sensitivity analysis for multiple causal mechanisms: revisiting evidence from framing experiments." *Political Analysis* 21 (2):141-171.