

Supplementary Materials for “Legal Origins, Religion and Health
Outcomes: A Cross-Country Comparison of Organ Donation
Laws”

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1 Additional data details

This section provides further details on data sources and descriptive statistics. Table 1 provides the policy for each country, as well as the source(s) used. Details for countries that do not appear in the most standard sources can be found in Table 2. Table 3 provides detailed information for all independent variables, including both how they are measured and the source used. All descriptive statistics for these variables can be found in Table 4. Figure 1 below shows a world map with the main variables of interest: donation laws, legal origins, and religious faith.

1.1 Some details on specific variables:

We code the explanatory variable “Civil Law” as follows: 0=No Civil Law (common law or neither) [N=20].¹ 1=*Both* Common Law and Civil Law [N=8, this category is not reported in the tables]. 2=Civil Law only [N=65]. All data from [CIA \(2018\)](#). The category

Predominant religion of each country is determined as the largest religious community according to [CIA \(2018\)](#). We group them into the following categories: Catholicism; Protestantism; Orthodoxy (Christian); Islam; and Other (which includes Judaism, Confucianism, Buddhism, Hinduism, and Shintoism). The countries that are defined as Protestant in our data set are Denmark, Finland, Latvia, Iceland, New Zealand, Norway, South Africa, South Korea, Sweden, Trinidad and Tobago, United Kingdom, and the United States of America ([CIA, 2018](#)). Australia and Germany are excluded from the main analysis for the reasons explained in the main manuscript.

The measure of country religiosity that we use (from the CIA World Factbook) is not as precisely estimated as other variables in our data set. For example, some entries are outdated (the information for Cuba is “prior to Castro assuming power”), may require some hand-waving (the French State, by law, cannot collect any information on individuals’ religion beliefs since 1872), or may report large proportions of “unspecified” faith (e.g., 27.4% for Bulgaria, or 26.3% for Finland) ([CIA, 2018](#)).

¹Out of these 20, 17 have common law, and 3 have neither.

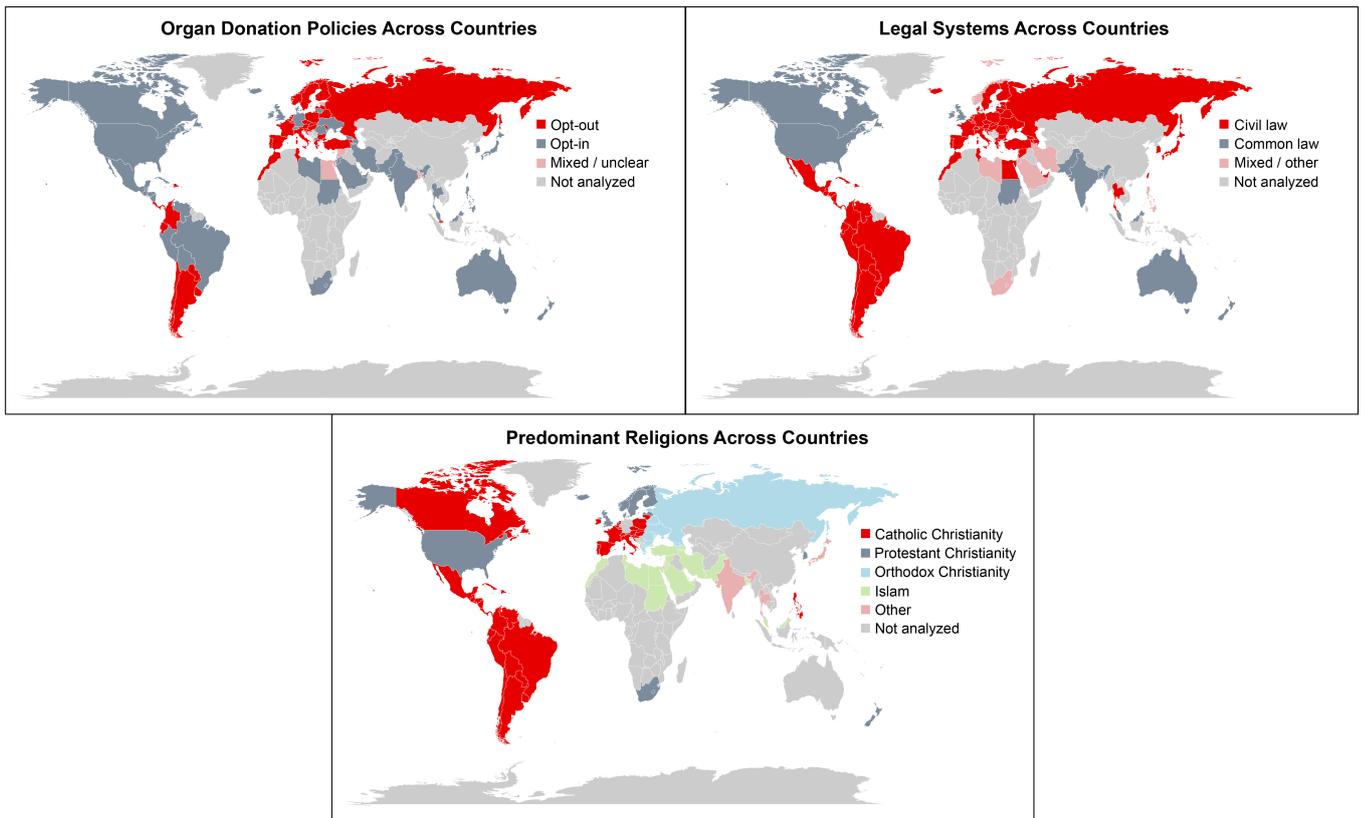


Figure 1: Organ donation policies (top left), legal origins (top right), and predominant religions across the globe (bottom). Countries were included in the analyses if they were part of the International Registry in Organ Donation and Transplantation (IRODaT). As Australia and Germany had more than one predominant religion, they were excluded from analyses where predominant religion was the regressor.

Table 1: Policy and source by country

Country	Policy	Source	Country	Policy	Source
Argentina	Opt-out	[1],[2]	Libya	Opt-in	[8]
Armenia	Opt-out	[3]	Lithuania	Opt-in	[3],[1],[5],[6]
Australia	Opt-in	[3],[1],[4]	Luxembourg	Opt-out	[3],[5],[6]
Austria	Opt-out	[3],[1],[4],[5],[6]	Macedonia	Opt-in	[7]
Azerbaijan	Opt-in	Other	Malaysia	Opt-in	[3],[1]
Bahrain	Opt-out	[8]	Malta	Opt-out	[3],[5]
Bangladesh	Unclear	[14]	Mexico	Opt-in	[3],[1],[4]
Belarus	Opt-out	[3],[1]	Moldova	Opt-out	[7]
Belgium	Opt-out	[3],[1],[4],[5],[6]	Morocco	Opt-out	[8]
Bolivia	Opt-in	Other	Netherlands	Opt-out	[9]
Brazil	Opt-in	[3],[1]	New Zealand	Opt-in	[3],[1],[4]
Brunei	No policy	Other	Nicaragua	Opt-in	Other
Bulgaria	Opt-out	[1],[5],[7],[6]	Norway	Opt-out	[3],[4],[5]
Canada	Opt-in	[3],[1],[4]	Pakistan	Opt-in	[16]
Chile	Opt-out	[3],[4],[2]	Panama	Opt-out	[1],[2]
Colombia	Opt-out	[3],[1],[2]	Paraguay	Opt-out	[3],[2]
Costa Rica	Opt-out	[3],[1],[2]	Peru	Opt-in	Other
Croatia	Opt-out	[3],[1],[5],[6]	Philippines	Opt-in	[3]
Cuba	Opt-in	[3],[1]	Poland	Opt-out	[3],[1],[4],[5],[6]
Cyprus	Opt-in	[5],[6]	Portugal	Opt-out	[1],[4],[5],[6]
Czech Republic	Opt-out	[3],[1],[4],[5],[6]	Puerto Rico (USA)	Opt-in	[1]
Denmark	Opt-in	[3],[1],[4],[5],[6]	Qatar	Opt-in	Other,[8]
Dominican Republic	Opt-out	[2]	Romania	Opt-in	[3],[1],[5],[7]
Ecuador	Opt-out	[3],[1],[2]	Russia	Opt-out	[3],[1]
Egypt	No policy	Other,[13]	Saudi Arabia	Opt-in	[3]
El Salvador	No policy	Other	Singapore	Opt-out	[3],[1]
Estonia	Mixed	[3],[5],[6],[10]	Slovakia	Opt-out	[3],[1],[4],[5],[6]
Finland	Opt-out	[3],[1],[4],[5],[6]	Slovenia	Opt-out	[3],[4],[5],[6]
France	Opt-out	[3],[1],[4],[5],[6]	South Africa	Opt-in	[3]
Georgia	Opt-in	Other	South Korea	Opt-in	[3]
Germany	Opt-in	[3],[1],[4],[5],[6]	Spain	Opt-out	[3],[1],[4],[5],[6]
Greece	Opt-out	[1],[4],[5],[6]	Sudan	Opt-in	[8],[11]
Guatemala	Opt-in	[1]	Sweden	Opt-out	[3],[1],[4],[6]
Honduras	Opt-in	Other	Switzerland	Opt-in	[3],[4]
Hong Kong	Opt-in	[1]	Syria	Unclear	[8],[12]
Hungary	Opt-out	[1],[4],[5],[6]	Taiwan	Opt-in	[1]
Iceland	Opt-in	[3]	Thailand	Opt-in	[3]
India	Opt-in	[3]	Trinidad and Tobago	Opt-in	Other
Iran	Opt-in	[15]	Tunisia	Opt-out	[3],[1]
Ireland	Opt-in	[3],[1],[4],[5],[6]	Turkey	Opt-out	[3],[4]
Israel	Opt-in	[3],[1]	Ukraine	Opt-in	Other
Italy	Opt-out	[3],[1],[4],[5],[6]	United Arab Emirates	Opt-in	Other
Japan	Opt-in	[3],[1],[4]	United Kingdom	Opt-in	[3],[1],[4],[5],[6]
Jordan	Opt-in	[8]	United States	Opt-in	[3],[1],[4]
Kuwait	Opt-in	[3]	Uruguay	Opt-out	[2]
Latvia	Opt-out	[1],[4],[5],[6]	Venezuela	Opt-in	[3],[1]
Lebanon	Opt-in	[1]			

Estonia: [3] defines it as opt-in, [5] defines it as “mixed”, [6] defines it as opt-out, and [10] defines it as opt-out but notes that previous studies classified it as opt-in. See Table 2 for more details.

Netherlands: [1],[3],[4],[5],[6] define it as opt-in, but the law was changed in February, 2018, to make it opt-out, as [9] notes.

[1] Shepherd et al. (2014); [2] OPS (2013); [3] Rosenblum et al. (2012); [4] Li and Nikolka (2016); [5] Council of Europe (2016); [6] Ugur (2015); [7] Spasovski et al. (2012); [8] UNESCO (2011) ; [9] Sheldon (2018); [10] Rithalia et al. (2009); [11] Saeed (2011); [12] Saeed (2011) ; [13] Paris and Nour (2010) ; [14] Rahman and Mahmood (2017); [15] Griffin (2007); [16] Bile et al. (2010); “Other”: Table 2 gives all details for “Other” sources.

Table 2: Policy and source by country, further details on sources (all webpages cited accessed on May 15, 2018).

Country	Source
Azerbaijan	http://sehiyye.gov.az/insan_orqan_toxumalarnn.html [The Law of the Republic of Azerbaijan “On the transplantation of human organs and (or) tissues”]
Bolivia	https://www.lexivox.org/norms/B0-L-1716.html [Ley de Donaciòn y Transplante de Òrganos, Cèlulas y Tejidos, 5 de noviembre de 1996]
Brunei	http://www.wpro.who.int/health_technology/documents/docs/HumanOrganTransplantationMeetingReport.pdf , IRODAT database also has no records of deceased donations in Brunei Gómez et al. (2014).
Egypt	http://www.wipo.int/edocs/lexdocs/laws/en/eg/eg060en.pdf [Egypt 2014 Constitution]
El Salvador	http://elmundo.sv/nunca-se-ha-hecho-trasplante-de-organos-de-cadaveres/
Estonia	Private correspondence with the Director of Transplantation Centre, Tartu University Hospital [who described it as a “mixed system”]
Georgia	https://matsne.gov.ge/ru/document/download/16780/10/en/pdf [Law of Georgia No 3393 of 23 June 2006]
Honduras	http://www.transplant-observatory.org/download/ley-de-trasplante-y-extraccion-de-organos-y-tejidos-humanos-1982 [Honduras. Ley de Trasplante y Extracciòn de Òrganos y Tejidos Humanos, 1982.]
Nicaragua	https://www.laprensa.com.ni/2013/09/27/politica/163967-legalizan-trasplante-de-organos
Peru	http://www2.congreso.gob.pe/sicr/cendocbib/con4_uibd.nsf/DD1DEA7AFEE1A30405257A86006203DC/\$FILE/28189.pdf https://ww1.essalud.gob.pe/trasplanteweb/regulaciones.html
Qatar	https://www.hamad.qa/EN/your%20health/Organ-Donation/Documents/Law%2015%20-%20English.pdf [Law No. (15) of 2015 on Regulating the Human Organs Transfer and Transplantation]
Trinidad and Tobago	http://www.health.gov.tt/sitepages/default.aspx?id=109 [Ministry of Health, National Organ Transplant Unit]
Ukraine	http://zakon3.rada.gov.ua/laws/show/1007-14 [Ukraine Law “About transplantation of organs and other anatomical materials to man”] http://keratoplastika.dp.ua/en/the-legislative-framework.html
United Arab Emirates	https://www.haad.ae/HAAD/LinkClick.aspx?fileticket=YHdkY2-FnX8%3D&tabid=183 [Ministerial Decision No. (566) of 2010, On the Implementing Regulation of Federal Law No. (15) of 1993 Regulating the Transfer and Transplant of Human Organs] https://government.ae/en/information-and-services/health-and-fitness/blood-and-organ-donation [Official Portal of the UAE Government]

Table 3: Data details

Variable	Year	Source	Details
Legal system	2016	CIA (2018)	0=Not civil law [$N=20$]; 1=Both civil law and common law [$N=8$]; 2=Only civil law [$N=65$] https://www.cia.gov/library/publications/the-world-factbook/
GDP per capita	2016	World Bank (2018)	GDP per capita in current 2016 US dollars (natural log). Data for Taiwan taken from the IMF (link here). https://datacatalog.worldbank.org
% secondary education	2015	United Nations (2016)	% population with at least some secondary education (ages 25 and older) http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf [Table 9 in the pdf] Data for Taiwan is taken from ?. Data for Puerto Rico, from the U.S. Census (link here).
Public sector size	2014	IMF (2016)	General government total expenditure (% of GDP) https://www.imf.org/en/Data
State religion	2014	Pew Research Center (2017)	0=Secular (favored religion/no religion/hostile to religion) [$N=68$]; 1=Official religion [$N=25$] http://www.pewforum.org/2017/10/03/many-countries-favor-specific-religions-officially-or-unofficially/
Main religion	2016	CIA (2018)	Taken as the religion with the largest proportion of followers 1=Catholic [$N=40$]; 2=Christian (not Catholic or Orthodox) [$N=14$]; 3=Orthodox Christian [$N=12$]; 4=Islam [$N=20$]; 5=Any other [$N=7$]
% main religion	2016	CIA (2018)	% of citizens who follow the largest religious group. When the CIA World Factbook does not provide an accurate estimate, data is taken from the International Religious Freedom Reports issued by the US Department of State [Cuba, Czech Republic, Guatemala, Iceland] http://www.state.gov/j/drl/rls/irf/religiousfreedom/index.htm?year=2014&dclid=238478
% any religion	2016	CIA (2018)	% of citizens who are religious (any faith). When the CIA World Factbook does not provide an accurate estimate, data is taken from the International Religious Freedom Reports issued by the US Department of State [Argentina, Cuba, Czech Republic, Guatemala, Iceland, Malta] http://www.state.gov/j/drl/rls/irf/religiousfreedom/index.htm?year=2014&dclid=238478
Democracy index	2017	The Economist (2018)	0=Authoritarian regime or hybrid regime [$N=32$]; 1=Flawed democracy of full democracy [$N=61$] https://infographics.economist.com/2018/DemocracyIndex/
Urbanization	2013	World Bank (2018)	Urban population (% of total) https://datacatalog.worldbank.org . Data for Taiwan is taken from https://eng.stat.gov.tw
Income tax rate	2018	The Heritage Foundation (2018)	Top individual income tax rate (%) https://www.heritage.org/index/download
Inheritance tax	2017	Deloitte (2018) , Ernst & Young (2017) , Global Property Guide (2018)	If there is a range, the maximum is considered. Most countries data is taken from either Deloitte (2018) ($N=47$), Ernst & Young (2017) ($N=31$), and Global Property Guide (2018) ($N=11$). Other sources are BDO (2016) (Georgia), KPMG International Cooperative (Venezuela), Ministry of Finance (Slovenia, Lithuania), and Schoenblum (2008) ; Pérez (2012) (Cuba)
Mortality rate (Ages 5-14)	2018	WHO (2018)	Probability of dying per 1,000 children https://www.who.int/data/gho/data/indicators/indicator-details/GHO/mortality-rate-for-5-14-year-olds
Physicians per 1,000 people	2018	World Bank (2019)	https://data.worldbank.org/
Health (% public)	2015	WHO (2018)	Domestic General Government Health Expenditure (GGHE-D) as % Current Health Expenditure (CHE) http://apps.who.int/nha/database
Health (% GDP)	2015	WHO (2018)	Domestic General Government Health Expenditure (GGHE-D) as % Gross Domestic Product (GDP) http://apps.who.int/nha/database
Public spending health p.c.	2015	WHO (2018)	Domestic general government health expenditure per capita (current US\$) http://apps.who.int/nha/database
Net debt (gov.)	2014	IMF (2016)	General government net debt (percent of GDP). Link here
% women MPs	2013	World Bank (2018)	Proportion of seats held by women in national parliaments (%) https://data.worldbank.org/indicator/SG.GEN.PARL.ZS?view=chart
Blood donations p.c.	2013	WHO (2018) World Bank (2018)	Blood donations: 2016 Global Status Report on Blood Safety and Availability. Link here Population: World Bank. https://data.worldbank.org/indicator/SP.POP.TOTL
Life expectancy	2015	WHO (2018)	Life expectancy, at birth, in years http://apps.who.int/gho/data/view.main.SDG2016LEXv?lang=en
Gini index	2015	CIA (2018) CIA (2018)	Gini index (with perfect equality the index would be zero; with perfect inequality, the index would be 100) https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html
Literacy rate	2015	CIA (2018) CIA (2018)	Adult literacy rate (%) https://www.cia.gov/library/publications/the-world-factbook/fields/2103.html

CIA= Central Intelligence Agency (USA); IMF=International Monetary Fund; WHO = World Health Organization.
When the link is too long to fit, a hyperlink is provided.

Table 3: Data details (continued)

Variable	Year	Source	Details
Ethnic polarization	2005	Montalvo and Reynal-Querol (2005)	1=Extremely polarized; 0=Not polarized. Continuous variable.
Ethnic fractionalization	2013	Dražanová (2019)	1=Extremely fractionalized; 0=Not fractionalized. Continuous variable. Interpretation: probability that two randomly selected individuals do not belong to the same group.
Corruption	2017	Transparency International (2017)	Corruption Perceptions Index 2017: perceived levels of public sector corruption according to experts and businesspeople. 0 = highly corrupt; 100 = very clean. https://www.transparency.org/news/feature/corruption_perceptions_index.2017#table
Giving index score	2017	Charities Aid Foundation (2017)	World Giving Index 2017. It relies on a simple averaging of the responses from the three key questions asked in each country: “Have you done any of the following in the past month?” (i) Helped a stranger, or someone you didnt know who needed help; (ii) Donated money to a charity; (iii) Volunteered your time to an organization”. Link here
GDP per capita	2016	World Bank (2018)	GDP per capita in current 2016 US dollars (natural log). Data for Taiwan taken from the IMF (link here). https://datacatalog.worldbank.org
% secondary education	2015	United Nations (2016)	% population with at least some secondary education (ages 25 and older) http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf [Table 9 in the pdf] Data for Taiwan is taken from ?. Data for Puerto Rico, from the U.S. Census (link here).
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CIA= Central Intelligence Agency (USA); IMF=International Monetary Fund; WHO = World Health Organization.
When the link is too long to fit, a hyperlink is provided.

Table 4: Descriptive statistics

Variable	Mean	St. dev.	Min	Max	<i>N</i>	Comments
Variables included in main results						
Legal system	1.48	0.83	0	2	93	0=Neither Common Law or Civil Law (<i>N</i> =3) or Common Law only (<i>N</i> =17); 1=Both Common Law and Civil Law (<i>N</i> =8); 2=Civil Law only (<i>N</i> =65)
Mortality (5-14 y.o.)	2.20	1.93	0.36	11.84	93	Probability of dying per 1,000 children (2018)
Physicians per 1,000 people	2.61	1.40	0.31	8.19	93	
log (GDP per capita)	9.47	1.14	7.21	11.73	91	
% secondary education	73.79	21.18	16.3	100	91	
Public sector size	35.49	11.83	13.4	78.17	93	
State religion	0.27	0.45	0	1	93	0=favored religion (<i>N</i> =22) / no religion (<i>N</i> =44) / hostile to religion (<i>N</i> =2); 1=Official religion (<i>N</i> =25)
Democracy index	2.68	1.00	1	4	93	1=Authoritarian regime; 2=Hybrid regime; 3=Flawed democracy; 4=Full democracy
OECD membership	0.38	0.49	0	1	93	35 members and 58 non-members
Urbanization	71.74	17.64	8.67	100	92	% urban population
% religious	85.11	17.91	29.2	100	93	
Main religion						
Catholicism	0.44	0.50	0	1	93	41 countries (used as base given the largest <i>N</i>)
Protestantism	0.14	0.35	0	1	93	13 countries
Orthodoxy (Christian)	0.13	0.34	0	1	93	12 countries
Islam	0.22	0.21	0	1	93	20 countries
Other	0.08	0.27	0	1	93	Includes Buddhism (<i>N</i> =4), Shintoism (<i>N</i> =1), Hinduism (<i>N</i> =1), and Judaism (<i>N</i> =1).
Variables included in robustness checks						
Religious fractionalization	0.21	0.22	0.001	0.78	69	0=Minimum; 1=Maximum
Ethnic fractionalization	0.37	0.22	0.19	0.86	82	0=Minimum; 1=Maximum
Blood donations	0.024	0.0139	0.004	0.056	84	
Giving Index score	34.06	10.39	16	57	83	
Income tax rate	29.38	14.05	0	57	92	Maximum bracket in case there are multiple ones
Inheritance tax	4.12	20.73	0	80	93	Maximum bracket in case there are multiple ones
Health (% public)	61.55	17.85	14.7	93.99	89	
Health (% GDP)	4.56	2.25	0.39	9.42	89	
Public health p.c.	1,273	1,612	4.7	6,944	89	In USD
Net debt (gov.)	26.62	67.02	-244.03	126.25	58	
% female MPs	22.20	11.06	0	48.9	89	
% main religion	67.97	23.80	16.2	99.8	93	
Corruption	51.40	20.15	14	89	92	Corruption perceptions. The lower the number, the more corrupt.
Life expectancy	76.61	4.71	62.9	83.7	90	
Literacy rate	93.53	8.42	57.9	99.9	73	
Gini index	37.39	8.85	21.5	62.5	81	

All variables are coded as of 2016, except where no data was available, in which case the closest year with data was chosen.

2 Robustness checks

As a robustness check, we adopt a machine learning based approach to sort through all the possible partial correlations between predictors and organ donation consent laws. This allows us to relax the more parametric approach of the OLS when sorting through the possible predictors of organ donation consent laws. To that avail, we use the Lasso regression approach (section 2.1), and an exhaustive search model (section 2.2). In both cases we find that legal origins is the only variable selected in all specifications (with the only exception one particular Lasso search that returns no variables at all).

2.1 Model selection: LASSO

We use the variables for which we have observations for all countries, all of which all listed in Table 5. We use three different specifications: the Extended Bayesian Information Criterion (EBIC), the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC). The first three columns in Table 5 show the results: both legal origins and mortality rate for children 5 to 14 are chosen by the BIC and the AIC models. The latter further includes Catholicism as the main religion, level of democracy, and public sector size. On the other hand, the Extended-BIC criterion selects no variable —this is likely due to the fact that the EBIC imposes an additional penalty on the number of parameters (see [Chen and Chen \(2012\)](#) for details).

We repeat the analysis also introducing measures of ethnic and religious fractionalization. We do this separately because there exists reliable data on these measures only for a subset of countries (69 out of 93).² We use the measures from [Montalvo and Reynal-Querol \(2005\)](#) and [Dražanová \(2019\)](#): they range from 0 to 1, where 0 means completely homogenous, and 1 reflects maximal fragmentation by their measure.

Results are remarkably consistent: both legal origins and mortality rate for children 5 to 14 are selected. Religious fractionalization is also selected, suggesting there exists a negative relationship between fragmentation and presumed consent. Importantly, these results show that, even if civil law nations may be more culturally, ethnically or religiously homogenous than common law contexts, results on legal origins hold even when controlling for religious and ethnic fragmentation (religious fragmentation average for civil law countries is 0.17; average for common law countries is 0.30; p-value=0.024). Figure 2 shows the effect size: Civil law is correlated with an increase in the probability of presumed consent of around one third. The correlation for religious fragmentation is also not negligible: a one standard deviation increase in religious fragmentation is correlated with a reduction of ten percentage points in the probability of having presumed consent (standard deviation: 0.22. Associated coefficient: -0.49).

Table 6 shows the results for the Lasso approach when a correction for a binary outcome is used. We run ten different specifications (all details in the table) and report which are the variables selected in each case. Legal origins is the variable most frequently chosen. Mortality rates for children 5 to 14 and religious fractinalization (when included) are the other two variables mosts frequently selected. Finally, in Table 7 we repeat the exercise using ‘Giving Index’, a proxy for altruism for which we have data on 79 countries. They confirm the relevance of all previously mentioned variables, and also altruism as a key predictor. Although detailed results are not shown, the relationship is negative: higher altruism decreases the likelihood of presumed consent.

²The countries dropped are Argentina, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Cuba, Czech, Republic, Georgia, Latvia, Lebanon, Libya, Lithuania, Macedonia, Moldova, Puerto Rico, Qatar, Romania, Russia, Slovakia, Slovenia, and the Ukraine

Overall, results using the Lasso approach confirm that legal origins are key to explaining organ donation policies. We next turn to an alternative approach to further check this result.

Table 5: Model selection: Lasso. EBIC: Extended Bayesian Information Criterion. BIC: Bayesian Information Criterion. AIC: Akaike Information Criterion. If a variable is selected by the criterion, the corresponding OLS coefficient is reported. If not selected, the cell corresponding to the variable is left blank. Dependent variable: Presumed consent (opt-out).

Model election criterion →	Main model			Model including fractionalization		
	EBIC	BIC	AIC	EBIC	BIC	AIC
Legal system ¹ Civil Law only		0.344*** (0.111)	0.292*** (0.121)		0.323*** (0.116)	0.323*** (0.116)
log (GDP per capita)						
Public sector size (% GDP)			0.006 (0.004)			
% secondary education						
Life expectancy						
Physicians per 1,000 people						
Mortality rate (5-14 y.o.)		-0.069*** (0.031)	-0.041 (0.036)		-0.049 (0.031)	-0.049 (0.031)
Public spending in health ²						
State religion						
% religious						
Main religion ³ Catholic			0.131 (0.112)			
Democracy index			0.043 (0.059)			
OECD membership						
Urbanization						
Ethnic fractionalization	(not included)	(not included)	(not included)			
Religious fractionalization	(not included)	(not included)	(not included)		-0.563** (0.262)	-0.563** (0.262)
R ²	–	0.19	0.23	–	0.28	0.28
Observations	87	87	87	65	65	65

(1) Unreported category: Civil Law & Common Law. Base category: Common Law, or neither. (2) Per capita, in USD.

(3) Unreported categories: Orthodox, Islam, and other. Base category: Other Christian.

All regressions in STATA 14 using the command `lasso2`.

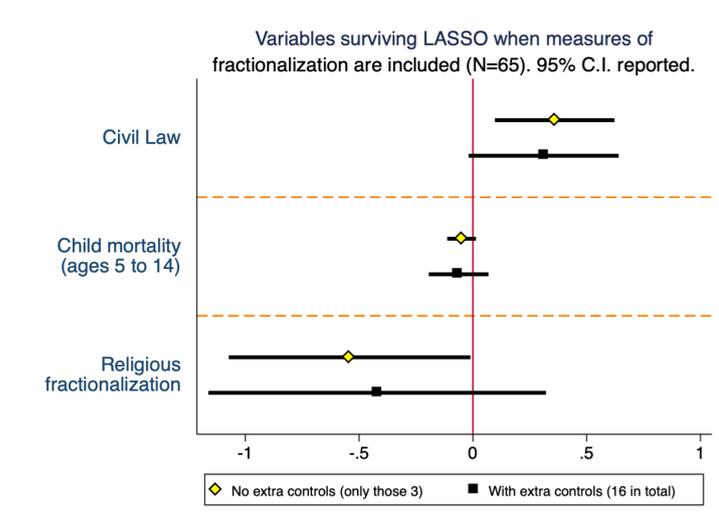


Figure 2: Effect size of legal origins, mortality for ages 5–14, and religious fractionalization on presumed consent. Bars with an empty diamond show the 95% confidence interval for the coefficient of the relevant variable (vertical axis) when no extra controls are included. Bars with a solid square show 95% confidence intervals of coefficients when all other controls in Table 5 are used.

Table 6: Model selection: Lasso, corrected for a binary outcome. Selected variables marked with a ‘✓’. Dependent variable: Presumed consent (opt-out).

	Regularized logistic regression						K -fold cross-validation with logistic regression, $K = 5$			
	without fractionalization			with fractionalization			without fractionalization		with fractionalization	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Legal system Civil Law only		✓	✓		✓	✓	✓		✓	
log (GDP per capita)			✓							
Public sector size (% GDP)		✓	✓				✓			
% secondary education			✓							
Life expectancy										
Physicians per 1,000 people										
Mortality rate (5-14 y.o.)		✓	✓		✓	✓	✓		✓	
Public spending in health										
State religion			✓							
% religious			✓							
Main religion Catholic		✓	✓				✓			
Orthodox			✓							
Other			✓							
Democracy index			✓							
OECD membership										
Urbanization										
Ethnic fractionalization	–(not included)–						–(not included)–			
Religious fractionalization	–(not included)–				✓	✓	–(not included)–		✓	

Details: (1) & (4): EBIC; (2) & (5): BIC; (3) & (6): AIC; (7) & (9): model with penalty factor λ such that mean-squared prediction error is minimized; (8) & (10): model with largest penalty factor λ that is within one standard deviation from the previous. Models (1) - (6) are run using the STATA command `lassologit`. Models (7) - (10) are run using the STATA command `cvllassologit`. All details can be found here: https://statalasso.github.io/docs/lassologit_help/. STATA version 14.

Table 7: Model selection: Lasso. Subset of countries for which we have complete data on altruism ($N=79$). Selected variables marked with a ‘✓’. Dependent variable: Presumed consent (opt-out).

	Linear model			Logistic regression				
				Regularized			Cross-validation	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Legal system Civil Law only		✓	✓	✓	✓	✓	✓	✓
Giving Index (altruism)			✓		✓	✓	✓	
log (GDP per capita)						✓		
Public sector size (% GDP)			✓		✓	✓	✓	
% secondary education						✓		
Life expectancy								
Physicians per 1,000 people			✓		✓	✓	✓	✓
Mortality rate (5-14 y.o.)			✓		✓	✓	✓	✓
Public spending in health								
State religion			✓			✓		
% religious			✓					
Main religion Catholic			✓		✓	✓	✓	✓
Orthodox						✓		
Other			✓			✓	✓	
Democracy index			✓		✓	✓	✓	
OECD membership						✓		
Urbanization								

Details: (1) & (4): EBIC; (2) & (5): BIC; (3) & (6): AIC; (7): model with penalty factor λ such that mean-squared prediction error is minimized (K -fold cross-validation with $K = 5$); (8) model with largest penalty factor λ that is within one standard deviation from the previous (K -fold cross-validation with $K = 5$). Models (1) - (3) are run using the STATA command `lasso2`. Models (4) - (6) are run using the STATA command `lassologit`. Models (7) - (8) are run using the STATA command `cvlassologit`. All details can be found here: https://statalasso.github.io/docs/lassologit_help/. STATA version 14.

2.2 Model selection: Exhaustive search (using the package ‘leaps’ in R)

Using the **R**-package ‘leaps’ we perform an extra robustness check, in this case by performing an exhaustive search for the best subsets of the variables for predicting the dependent variable in linear regression, using an efficient branch-and-bound algorithm.³ Note that since the algorithm returns a best model of each size, the results do not depend on a penalty model for model size: it does not make any difference whether one wants to use AIC, BIC, EBIC, or any other related criterion. We use the same variables as in section 2.1.

Table 8 shows the results for the variables selected if the optimal model is to contain just one variable (first column), then two variables (second column), etc. up to a model of 8 variables in the right-most column. Results are consistent with all evidence shown so far. We can see that legal origins is the only variable that is always included, regardless of the size of the model. Also, main religion and variables regarding health outcomes are typically chosen as key predictors by the algorithm.

We replicate the analysis now including religious and ethnic fractionalization (which, as explained above, reduces our data set). Results are not shown, but are very consistent with those in table 8. Legal origins are always selected as a key predictor of organ donation laws. Religious fractionalization is selected only when the model is specified to contain five variables or more. Overall, all these results further support legal origins as a key predictor of organ donation laws.

³All details can be found at <https://cran.r-project.org/web/packages/leaps/leaps.pdf> [last accessed on April 1, 2020].

Table 8: Model selection: exhaustive search. Selected variables marked with a ‘✓’. Dependent variable: Presumed consent (opt-out).

Variable	Number of variables for the optimal model							
	1	2	3	4	5	6	7	8
Legal system								
Civil Law only	✓	✓	✓	✓	✓	✓	✓	✓
Civil Law & Common Law								
Common Law (or neither)								
log (GDP per capita)								
Public sector size (% GDP)			✓	✓	✓	✓	✓	✓
% secondary education								
Life expectancy								
Physicians per 1,000 people								
Mortality rate (5-14 y.o.)		✓			✓			
Public sector spending in health ¹					✓		✓	✓
State religion						✓	✓	✓
% religious						✓	✓	✓
Main religion								
Catholic								
Other Christian				✓		✓	✓	✓
Orthodox								
Islam								
Other								✓
Democracy index			✓	✓	✓	✓	✓	✓
OECD membership								
Urbanization								

(1) Per capita, in USD

2.3 Further robustness checks

Figure 3 shows how robust results for the main explanatory variables are to the inclusion of the extra controls. In order to keep a reasonable number of degrees of freedom, we include these controls one at a time. The specification is

$$\text{Policy}_i = \alpha + X_i' \beta + \gamma z_i + \varepsilon_i, \quad (1)$$

where z is the new variable included in each case. Figure 3a, for instance, shows the 95% confidence intervals of the coefficient on civil law when each of the extra controls is included. We repeat this exercise for dominant religious faith (Figure 3b), size of religious population (Figure 3c), and altruism (Figure 3d).

Figures 3a, 3b and 3d show that results for civil law, religious faith and altruism are robust to nearly all specifications. This gives us confidence on the robustness of our findings. On the other hand, Figure 3c shows that results regarding proportion of religious population are not as robust: even though the point estimate and confidence intervals indicate a clear negative correlation, only in one case the 95% confidence interval fails to cut the vertical bar at 0. Whereas results in 3c are clearly suggestive, we cannot make conclusive statements as with the case of legal origins and Catholicism.

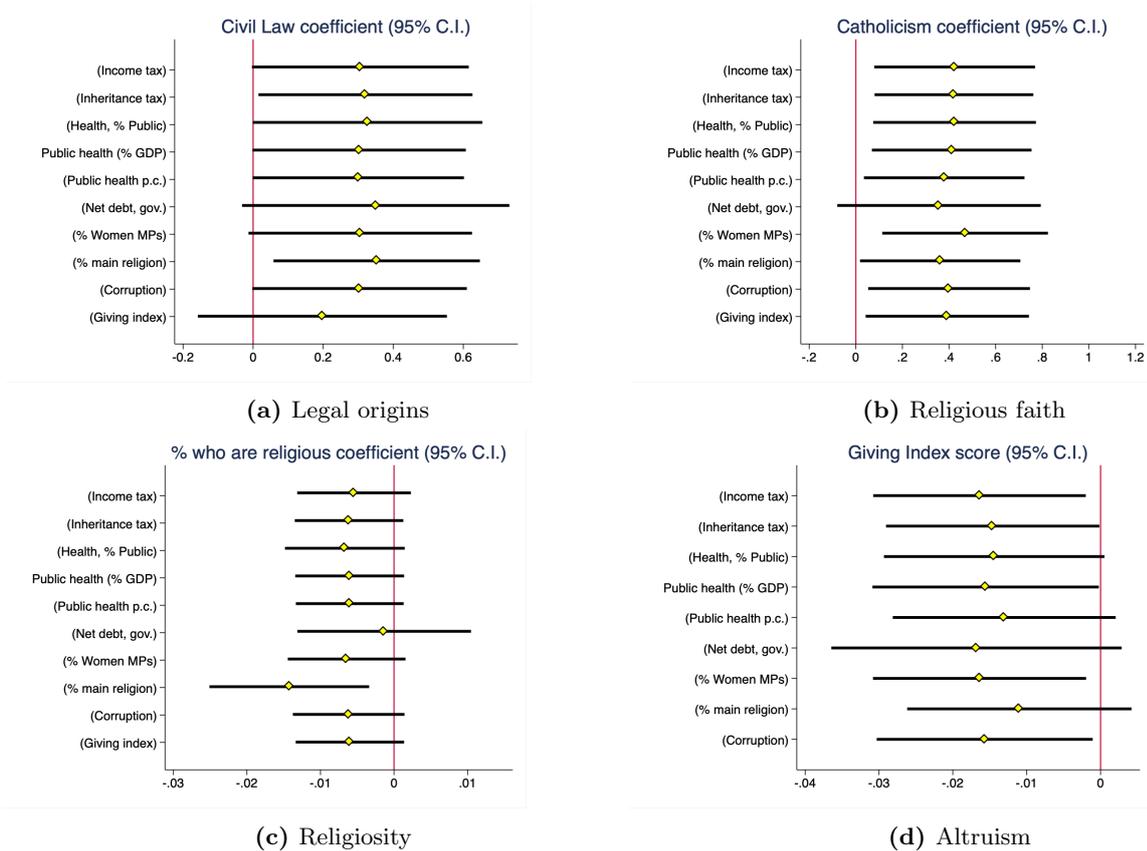


Figure 3: 95% confidence intervals of the coefficient for the variable of interest when the the full model with controls is used and an extra variable z (vertical axis) is included (i.e., bars represent the coefficient for the *same* variable all throughout). Specifically, the model is $\text{Policy}_i = \alpha + X_i' \beta + \gamma z_i + \varepsilon_i$, where i denotes country, Policy is a dummy for adoption of presumed consent, and X is a vector of country specific controls comprised of legal origins, mortality rate (ages 5-14), public sector size, GDP per capita, state religion, main religion, percent who are religious, democracy index, and OECD membership. z is the new control variable added in each regression.

3 Additional results

This section provides results for other variables that could potentially explain presumed consent policies. Since organ transplants are more likely in economically developed countries, we check if development plays a role in determining donation policies. To that avail, we use life expectancy and literacy rate as proxies for economic development. We also include net government debt to broadly check if countries with preferences for tighter budgets or less expansionary policies are more likely to pass either type of law. Similarly, we check whether political preferences are correlated with any particular policy. First, we check for preferences for a public health system. In this case, we use the size of the public health care system (relative to the total health spending and to GDP), as well as public spending in health care per capita. Furthermore, we also check if preferences for wealth redistribution are correlated with organ donations laws. Highest income tax rate and highest inheritance tax rate broadly capture such preferences —hence, we use them as proxies. Finally, we also add controls that measure the degree of gender equality (% of parliamentary MPs who are women), of economic equality (Gini Index), and level of corruption. We also include another control for religion (% of the population who follow the main religion in the country). The updated regression specification is

$$\text{Policy}_i = \alpha + X_i' \beta + \gamma z_i + \varepsilon_i, \quad (2)$$

where z is the new variable control added. As before, Policy_i is a dummy that captures presumed consent (1=presumed consent; 0=explicit consent), i denotes country, and X is a vector of explanatory variables comprised of legal origins, GDP per capita, State religion, main religion, percent of the population who are religious, democracy index, and OECD membership.

Given the small size of our data set, we include the controls one at a time. Figure 4 shows the 95% confidence intervals for coefficient γ attached to the added control z . Percentage of citizens who are religious is dropped from the second regression in Panel *b* (% main religion). This is because percentage of followers of the main religion and percentage of citizens who are religious (one of the controls in X_i) are strongly positively correlated ($corr=0.82$).

Results show that variables that proxy economic development are, in general, positively correlated with presumed consent policies (bars with empty diamonds). However, they lose their explanatory power when the full set of controls is taken into consideration (bars with solid squares). This is the case also for size of public health care system: those countries where a larger proportion of resources are devoted to public health care seem to be more likely to pass presumed consent laws. Also, more unequal countries (higher Gini index) are less likely to legislate presumed consent. All these results are however not robust to including a full set of controls.



(a) Preferences for redistribution and public health care size

(b) Economic development, equality, corruption and religious measures

Figure 4: Bars with an empty diamond show the 95% confidence interval for the coefficient of the relevant variable (vertical axis) when no controls are included. Specifically, for the γ in $Policy_i = \alpha + \gamma z_i + \varepsilon_i$, where i denotes country, and z denotes the variable at hand. Bars with a solid square show 95% confidence intervals of coefficients when the full model with controls is used. Specifically, for the γ in $Policy_i = \alpha + X_i' \beta + \gamma z_i + \varepsilon_i$, where X_i is a vector of country specific controls: legal origins, mortality rate (ages 5-14), public sector size, GDP per capita, state religion, main religion, percent who are religious, democracy index, and OECD membership. The second regression in Panel (b) [% main religion] does not include “% religious population” as a control.

Including countries with unclear policies

Finally, we include all countries in our dataset. Our results in the main manuscript include countries for which there is enough information for us to determine whether the country has opt-in (coded as 0) or opt-out (coded as 1) policies. Results in Table 9 below also include countries that do not have clear policies, or that have a mixed system. In order to be consistent with our focus throughout the paper (what explains presumed consent), we code all unclear/mixed countries with ‘0’, too. Hence, our new dependent variable represents legislating presumed consent vs. everything else (explicit consent or unclear/mixed). The number of observations increases from 87 to 93.

Results are consistent with those presented in the main manuscript. The only difference is that, in this case, percentage of religious population is no longer significant at a 5% level. This suggests that more research should be devoted to fully disentangling the relationship between religious population and organ donation laws.

Table 9: Drivers of *presumed consent* legislation. Replication of Table 1 in the main manuscript with *all* countries included)

Dependent Variable: Presumed consent (opt-out)				
	(1)	(2)	(3)	(4)
Civil Law	0.284** (0.135)	0.291** (0.142)	0.311** (0.143)	0.317** (0.145)
Mortality (5–14 year old)	-0.067** (0.027)	-0.057 (0.042)	-0.052 (0.042)	-0.050 (0.041)
Main religion:				
Catholic	0.204 (0.153)	0.294* (0.163)	0.337** (0.168)	0.374** (0.170)
Orthodox	0.090 (0.189)	0.217 (0.230)	0.220 (0.230)	0.250 (0.229)
Islam	0.060 (0.174)	0.223 (0.243)	0.276 (0.248)	0.340 (0.248)
State religion		0.142 (0.141)	0.199 (0.150)	0.197 (0.150)
% religious			-0.004 (0.004)	-0.005 (0.004)
Public sector size		0.007 (0.005)	0.007 (0.005)	0.007 (0.005)
log (GDP) p.c.		-0.068 (0.086)	-0.060 (0.086)	-0.051 (0.085)
Democracy index		0.117 (0.082)	0.124 (0.082)	0.143* (0.082)
Urbanization		-0.002 (0.004)	-0.003 (0.004)	-0.004 (0.004)
Observations	93	93	93	91
R ²	0.237	0.293	0.303	0.328

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Dependent Variable: 1=Presumed consent (“opt-out”); 0=Explicit consent (“opt-in”) or unclear/mixed. Civil Law: legal system based on civil law only (base category: common law or neither. Unreported category: both civil law and common law). State religion: dummy variable for holding an official, government-endorsed religion. Main religion: base category=‘Other Christian’; unreported category=‘Other’. Not shown: OECD membership (dummy). See Tables 3 and 4 for more details on the variables.

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