Opt-out and living kidney donation

Adnan Sharif

Consultant Transplant Nephrologist

University Hospitals Birmingham, University of Birmingham


NHS
From spring 2020
the law around organ donation
in England is changing
PASS IT ON

Do opt-out countries have less living kidney donors?

- Abadie and Gay identified a “positive and sizable effect” of presumed consent legislation on organ donor rates independent of other factors in a cross-country panel study.
- Rithalia and colleagues found ambivalent evidence from their analysis to suggest presumed consent alone was responsible for any variation of organ donation rates between countries.
- Coppen and colleagues found no difference in organ donation rates between opt-out versus opt-in countries once mortality rates were factored into the analysis.
- Shepherd and colleagues demonstrated opt-out countries have higher rates of kidney and liver transplantation activity from more deceased organ donors (but lower rates of living donors).
- Horvat and colleagues observed opt-countries had higher deceased-donor kidney but lower living-donor transplantation activity.

Abadie and Gay. J Health Econ 2006
Rithalia et al. BMJ 2009
Coppen et al. Transpl Int 2005
Shepherd et al. BMC Med 2014
Horvat et al. Ann Intern Med 2010

www.kidney-international.org

clinical investigation

Comparison of organ donation and transplantation rates between opt-out and opt-in systems

see commentary on page 1301

Adam Arshad[1], Benjamin Anderson[2] and Adnan Sharif[2,3]

[1]College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK; [2]Department of Nephrology and Transplantation, Queen Elizabeth Hospital, Edgbaston, Birmingham, UK; and [3]Institute of Immunology and Immunotherapy, University of Birmingham, Birmingham, UK

Arshad et al. Kidney Int 2019

Methodology

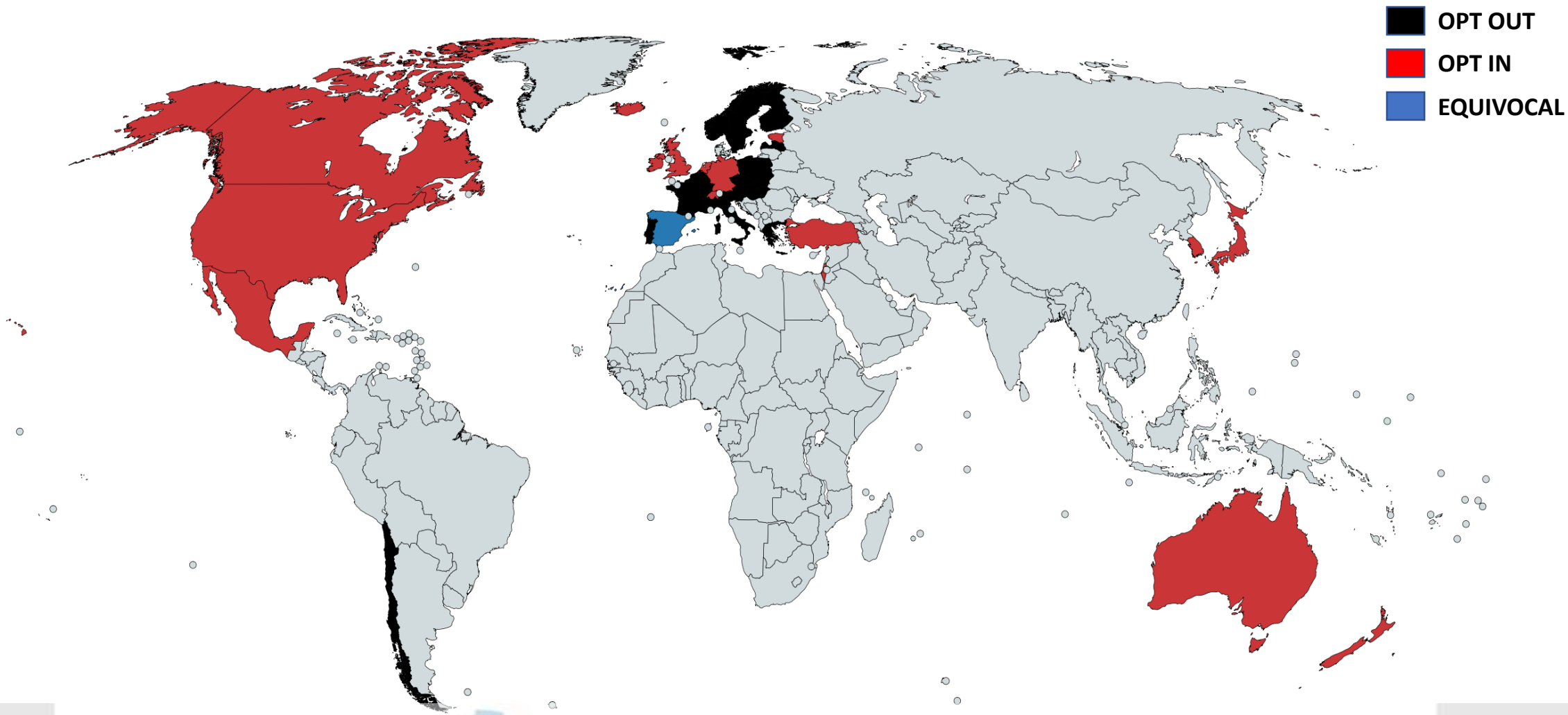
- This cross-sectional study utilised secondary data to compare organ donor/transplant rates among the 35 countries registered with the Organisation for Economic Co-operation and Development (OECD).
- Organ donation/transplantation rates from the latest available year (2016) were extracted from the Global Observatory for Donation and Transplantation (GODT) and the International Registry in Organ Donation and Transplantation (IRODaT).
- Data from the latest available year was utilised in the majority of cases (2016 at the time of access).
- We obtained socio-economic variables from the following data sources which were freely available; OECD website, World Health Organisation, Pew Research Centre and the UN Department of Economic and Social Affairs.

www.oecd.org
www.transplant-observatory.org
www.irodat.org

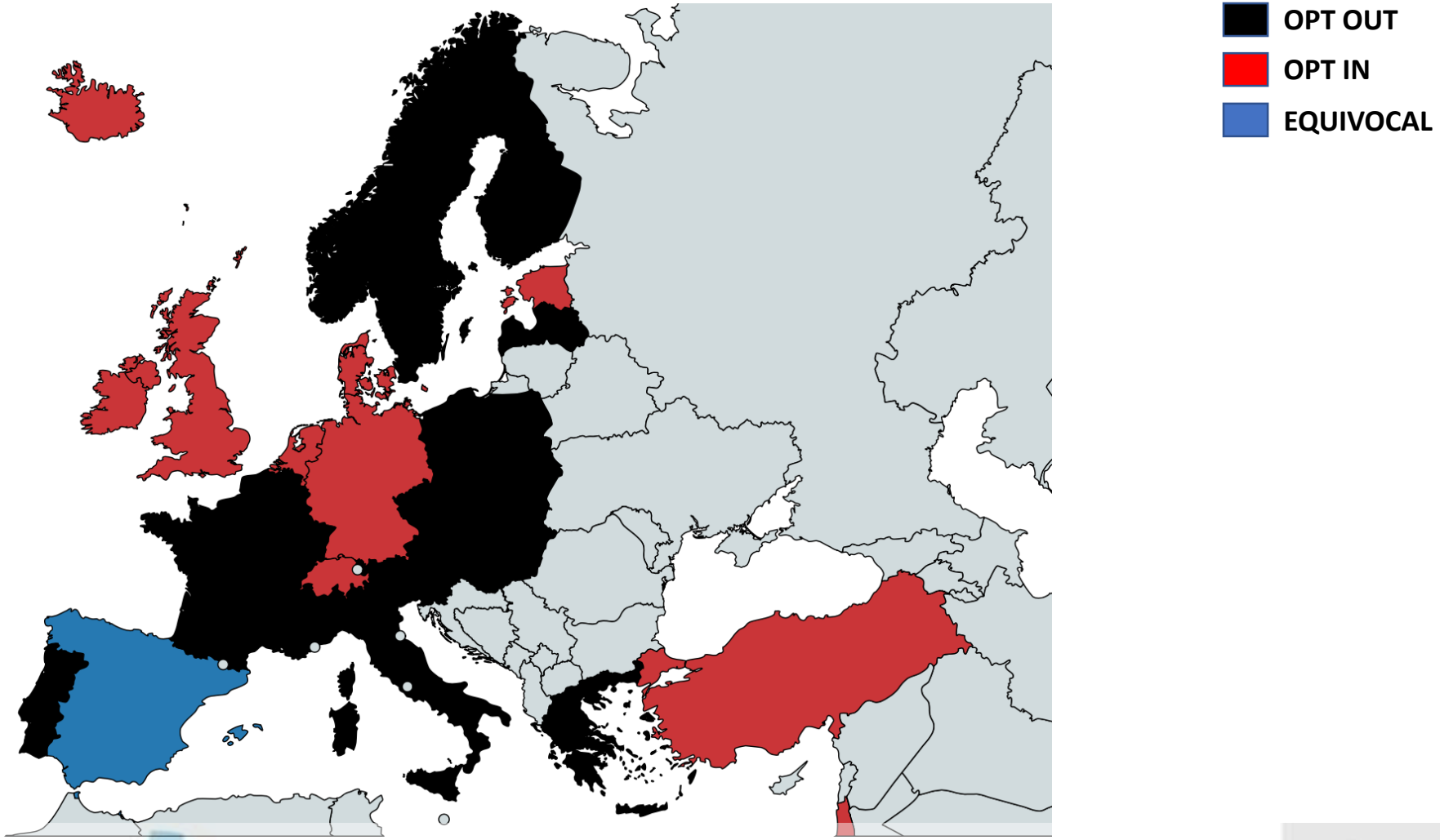
Analysis

- Stratification of countries into whether any organ donation system was opt-out versus opt-in was made on the basis of published literature and country-specific reports.
- Univariate comparisons of organ donation rates and transplantation activity were done with chi-squared tests for categorical data and Mann-Whitney U analyses for continuous data.
- A forwards stepwise multiple linear regression analysis was undertaken to investigate the effect of opt-out versus opt-in on organ donation rates or solid organ transplantation activity (continuous dependent variable), adjusted for country-specific economic and social variables (independent variables):
  - The following variables were included; opt-out versus opt-in, population, GDP, household debt, Government debt, tax, road traffic accidents, legal system, religious affiliation, hospital beds, health spending and tertiary education.

Global map of opt-out versus opt-in countries registered with the OECD



European map of opt-out versus opt-in countries registered with the OECD



Organ donation rates (per million population)

Variable	Opt-out	Opt-in	P value
Organ donation rates (per million population)			
Total deceased donors	**20.3 (13.7 – 25.0)**	**15.4 (10.4 – 20.7)**	**0.195**
Total living donors	**4.8 (3.5 – 8.4)**	**15.7 (10.8 – 21.2)**	**< 0.001**

Organ transplantation activity (per million population)

Variable	Opt-out	Opt-in	P value
Organ-specific transplantation activity (per million population)			
Deceased kidney transplantation	30.3 (22.0 – 40.7)	23.4 (14.1 – 33.8)	0.134
Living kidney transplantation	4.5 (3.5 – 7.0)	15.2 (10.8 – 20.1)	< 0.001
Deceased liver transplantation	13.0 (5.6 – 20.3)	10.2 (6.9 – 13.0)	0.483
Living liver transplantation	0.0 (0.0 – 0.2)	0.6 (0.0 – 1.5)	0.025
Heart transplantation	4.5 (2.1 – 6.6)	3.1 (0.7 – 5.1)	0.083
Lung transplantation	2.5 (0.0 – 6.2)	4.1 (1.4 – 6.8)	0.219
Pancreas transplantation	1.1 (0.1 – 2.7)	1.4 (0.2 – 1.7)	0.961
Small bowel transplantation	0.0 (0.0 – 0.0)	0.0 (0.0 – 0.1)	0.309

Overall solid organ transplantation activity (per million population)

Variable	Opt-out	Opt-in	P value
Overall solid organ transplantation activity (per million population)			
Overall kidney transplantation	35.2 (24.2 – 46.5)	42.3 (30.4 – 48.0)	0.405
Overall non-renal transplantation	28.7 (9.1 – 34.5)	20.9 (17.5 – 27.3)	0.606
Overall solid organ transplantation	63.6 (34.3 – 81.5)	61.7 (44.6 – 76.4)	0.909

Sensitivity analyses: reclassifying Spain as opt-out

Variable	Opt-out	Opt-in	P value
Organ donation rates (per million population)			
Total deceased donors	20.6 (14.0 – 25.9)	14.7 (10.3 – 20.3)	0.062
Total living donors	5.0 (3.5 – 8.2)	15.9 (12.8 – 23.3)	< 0.001
Organ-specific transplantation activity (per million population)			
Deceased kidney transplantation	31.0 (22.4 – 41.8)	21.8 (12.7 – 31.3)	0.038
Living kidney transplantation	4.6 (3.5 – 7.5)	15.4 (11.2 – 21.2)	< 0.001
Overall solid organ transplantation activity (per million population)			
Overall kidney transplantation	39.2 (25.2 – 47.7)	42.3 (28.8 – 46.6)	0.782
Overall non-renal transplantation	29.5 (9.7 - 35.5)	20.2 (17.2 – 24.4)	0.325
Overall solid organ transplantation	67.9 (35.5 – 84.0)	60.0 (44.3 – 74.5)	0.708

Organ donation activity (number, pmp) for last five years: real world data

Opt-out legislation change 1st December 2015

Donor type	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	
DBD	37 (12.1)	38 (12.3)	37 (12.0)	39 (12.6)	49 (15.8)	+32%
DCD	23 (7.5)	33 (10.7)	38 (12.3)	29 (9.4)	30 (9.6)	
Living	55 (17.9)	41 (13.3)	49 (15.9)	46 (14.8)	40 (12.9)	-27%

Donor type	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	
DBD	644 (12.0)	629 (11.7)	658 (12.1)	674 (12.3)	819 (14.8)	+23%
DCD	453 (8.5)	431 (8.0)	476 (8.8)	483 (8.8)	530 (9.6)	
Living	938 (17.5)	904 (16.8)	869 (16.0)	829 (15.1)	849 (15.4)	-9%

https://www.odt.nhs.uk/statistics-and-reports/annual-activity-report/

How do we explain this effect?

- As with any observational data, association does not automatically imply causality and numerous pitfalls (e.g. insufficient control for confounders, selection bias) can affect the observed association between opt-out countries and reduced living donor rates.
- Presumed consent may simply reflect prevalent national attitudes toward deceased and living organ transplantation.
- Public support for living kidney donation after opt-out change could go two ways:
  - Positive attitude: The public may perceive a lack of need for living kidney donation if media hype is to be believed; "*opt-out will save up to 700 lives every year*".
  - Negative attitude: Distrust of opt-out (amplified by misinformation) could spread to distrust of living kidney donor assessment pathway.

How do we overcome any negative living-donor effect?

- The benefits of living versus deceased kidney donation must be emphasised including shorter waiting time, better graft/recipient survival outcomes and economic savings to the health care system.
- The impact of presumed consent on organ donation rates (both deceased and living) from the BAME community is unknown (and could potentially be negative) - targeted BAME-specific education will be warranted.
- Research in Spain has found that the introduction of living organ donation information programs can increase its uptake[1].
- We have a paucity of evidence-based intervention strategies for living-donation but education packages targeting potential recipients and their social networks appears most promising[2].

[1]Monte et al . Transplant Proc 2010
[2]Barnier et al. CJASN 2017

Thank you for your attention

adnan.sharif@uhb.nhs.uk

@AdnanSharif1979

Arshad A, Anderson B, Sharif A. ***Comparison of organ donation and transplantation rates between opt-out and opt-in systems.*** **Kidney International 2019; 95(6): 1453-1460**

To help you access and share this work, we have created a Share Link – a personalized URL providing ***50 days' free access*** *to your article. Anyone clicking on this link before* ***July 10, 2019*** *will be taken directly to the final version of your article on ScienceDirect, which they are welcome to read or download. No sign up, registration or fees are required.*

Your personalized Share Link:

https://authors.elsevier.com/a/1Z5GwJOcpdN-R