

A Comparison of Mandated, Presumed, and Explicit Consent Systems for Deceased Organ Donation among University Students in Singapore

Dear Editor,

Since the first transplant surgery was performed in Singapore, Parliament has passed 2 acts to facilitate organ transplants. First, in 1972, the Medical (Therapy, Education and Research) Act was enacted allowing individuals to opt-in for organ donation through an “explicit consent” scheme.¹ Later, to boost deceased organ donations, the government implemented the Human Organ Transplant Act (HOTA) in 1987.²

HOTA is a “presumed consent” scheme allowing doctors to remove the kidney, liver, heart, and corneas from deceased Singaporeans and permanent residents who have not opted out.² Although this system produces a larger pool of donors than explicit consent,³ implementation has come with problems. For example, individuals may be opposed to organ donation without being aware of HOTA. Procurement of organs would then breach their autonomy. Similarly, families may perceive presumed consent as being invalid. If so, proceeding with organ transplant could grief the family and erode the patient-doctor relationship. Because of these concerns, doctors have, at times, refrained from using the presumed consent. Instead, they have resorted to a “soft” opt-out, allowing the family’s wishes to be considered by offering alternatives such as terminal extubation before brain death is established.⁴ These practices have led to missed opportunities in the face of a mounting organ shortage.

As a substitute to presumed consent, there have been growing calls for the government to use a “mandated consent” approach to organ donation.⁵ Under this scheme, it would be compulsory for all residents to register their preference for organ donation after death (with no default indicated). Previous studies found that: i) mandated consent led to higher consent rates than explicit consent, and that ii) these rates did not differ from those of presumed consent.^{3,6} Accordingly, mandated consent has been mooted in Parliament as a solution to Singapore’s shortage of transplantable organs.⁷

To inform this debate, we conducted a survey exploring the willingness of Singaporeans and permanent residents to donate their organs as a function of the explicit, presumed, and mandated consent systems. To our knowledge, this is the first Asian dataset addressing this question.

Materials and Methods

The survey was conducted in November 2016 at the National University of Singapore. Research assistants approached students who met the eligibility criteria for the HOTA (Singapore citizens or permanent residents aged ≥ 21 years old). Respondents completed a self-administered survey in English, in accordance with a protocol approved by the university’s Institutional Review Board.

Three types of survey forms were prepared, with each form presenting one of the organ donation systems. In the presumed consent version, respondents were told that by default, everyone was a donor but they could choose not to donate. They were then asked whether they would like to keep the default option (to donate) or if they would like to opt-out (and not donate). In the explicit consent scenario, respondents were told the reverse: by default, nobody was an organ donor but they could choose to donate. Again, they were asked whether they would like to keep the default (not donate), or if they would like to opt-in (and donate). Finally, in the mandated choice scenario, respondents were simply told that they had to register their decision regarding organ donation; they were then asked whether they would like to become an organ donor or not. Participants were randomly allocated to receive one of the survey forms based on a computer-generated randomisation list.

In all 3 forms, an additional question asked participants to rate how confident they were that they had made a right decision. Responses were made using a 10 cm visual analogue scale (VAS) anchored on one end with “0%, not at all confident that I have made the right decision” and on the other with “100%, extremely confident that I have made the right decision”.

As the primary analysis, a chi-squared test of independence was used to examine whether agreement to donate one’s organs (yes or no) depended upon policy type (presumed, explicit, and mandated consent). Follow-up chi-squared tests were run to compare agreement rates under mandated choice versus presumed consent; mandated choice versus explicit consent; and explicit consent versus presumed consent. The type 1 decision-wise error rate was controlled at $\alpha = 0.05$, with power calculations showing that there was statistical power at the recommended 0.80 level to detect a proportion difference of ~ 0.25 in agreement rates.

All analyses were conducted using Statistical Package for the Social Sciences (SPSS) and R.

Results

Baseline Characteristics

A total of 157 respondents were enrolled in the study. As shown in Table 1, participants allocated to the 3 groups were comparable in: age, gender, country of birth, nationality, ethnicity, religion, marital status, highest qualification, house type, and household size.

Willingness to Donate One's Organs

There was a significant relation between willingness to donate and policy type, ($\chi^2 = 10.5$, [2, $n = 157$], $P = 0.005$) (Fig. 1). Namely, a larger proportion of participants agreed to be organ donors in the presumed consent group (95% CI: 85.4% to 99.3%) than in either the mandated (95% CI: 68.6% to 91.1%; $\chi^2 = 4.99$, [1, $n = 102$], $P = 0.025$) or explicit consent groups (95% CI: 58.8% to 83.5%; $\chi^2 = 10.72$, [1, $n = 106$], $P = 0.001$). Although there was a higher proportion of organ donors in the mandated consent

Table 1. Baseline Characteristics of Study Participants

Variable	Presumed Consent (n = 51)	Explicit Consent (n = 55)	Mandated Consent (n = 51)
Age (year) mean and SD	21.9 ± 1.81	22.1 ± 1.22	22.1 ± 1.1
Gender, n (%)			
Male	34 (66.7)	39 (70.9%)	34 (66.7%)
Female	17 (33.3)	16 (29.1%)	17 (33.3%)
Country of birth, n (%)			
Singapore	50 (98)	55 (100%)	50 (98%)
Others	1 (2)	0 (0%)	1 (2%)
Nationality, n (%)			
Singapore/PR	51 (100)	55 (100)	51 (100)
Others	0 (0)	0 (0)	0 (0)
Ethnicity, n (%)			
Chinese	43 (84.3)	53 (96.4)	47 (92.2)
Malay	2 (3.9)	2 (3.6)	3 (5.9)
Indian	3 (5.9)	0 (0)	1 (2)
Eurasian	3 (5.9)	0 (0)	0 (0)
Others	0 (0)	0 (0)	0 (0)
Religion, n (%)			
Buddhism	6 (11.8)	3 (5.5)	6 (11.8)
Taoism/Chinese belief	2 (3.9)	2 (3.6)	2 (3.9)
Islam	3 (5.9)	0 (0)	0 (0)
Hinduism	0 (0)	1 (1.8)	1 (2)
Sikhism	0 (0)	0 (0)	0 (0)
Roman Catholicism	3 (5.9)	5 (9.1)	5 (9.8)
Christian	14 (27.5)	24 (43.6)	15 (29.4)
No religion	19 (37.3)	19 (34.5)	22 (43.1)
Others	4 (7.8)	1 (1.8)	0 (0)
Marital status, n (%)			
Single	41 (80.4)	44 (77.2)	38 (74.5)
Dating	10 (19.6)	11 (19.3)	13 (25.5)
Married	0 (0)	0 (0)	0 (0)
Widowed	0 (0)	0 (0)	0 (0)
Separated	0 (0)	0 (0)	0 (0)
Divorced	0 (0)	0 (0)	0 (0)

HDB: Housing and Development Board; ITE: Institute of Technical Education; PR: Permanent resident; SD: Standard deviation

Table 1. Baseline Characteristics of Study Participants (Cont'd)

Variable	Presumed Consent (n = 51)	Explicit Consent (n = 55)	Mandated Consent (n = 51)
Highest qualification, n (%)			
No formal education	0 (0)	0 (0)	0 (0)
Primary school	0 (0)	0 (0)	0 (0)
'N' level	0 (0)	0 (0)	0 (0)
'O' level	0 (0)	0 (0)	0 (0)
'A' level	38 (74.5)	43 (78.2)	38 (74.5)
ITE	0 (0)	0 (0)	0 (0)
Diploma	3 (5.9)	4 (7.3)	3 (5.9)
Degree	8 (15.7)	8 (14.5)	9 (17.6)
Postgraduate	0 (0)	0 (0)	0 (0)
Others	2 (3.9)	0 (0)	1 (2)
House type, n (%)			
HDB 1- to 2-room	0 (0)	0 (0)	1 (2)
HDB 3-room	1 (2)	3 (5.5)	2 (3.9)
HDB 4-room	9 (17.6)	11 (20)	12 (23.5)
HDB 5-room/executive flat	20 (39.2)	18 (32.7)	19 (37.3)
Condominium/private apartment	9 (17.6)	10 (18.2)	7 (13.7)
Landed property	10 (19.6)	13 (23.6)	7 (13.7)
Others	2 (3.9)	0 (0)	3 (5.9)
Household size, mean and SD	4.72 ± 1.33	4.49 ± 1.12	4.16 ± 1.07

HDB: Housing and Development Board; ITE: Institute of Technical Education; PR: Permanent resident; SD: Standard deviation

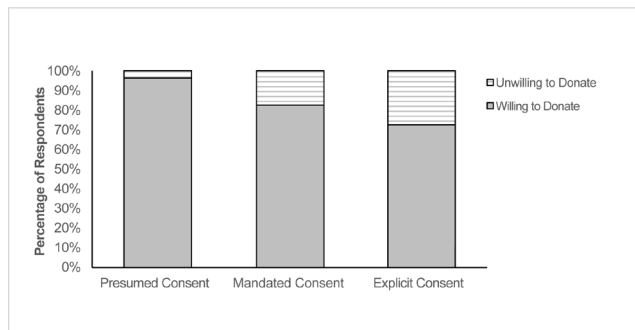


Fig. 1. Graph showing willingness to donate organs as a function of which policy participants encountered. Bars represent the percentage of participants who chose either to donate or not to donate their organs.

than in the explicit consent group, this difference was not significant ($\chi^2 = 1.4$, [1, $n = 106$], $P = 0.237$).

To explore whether participant demographics moderated the effects of policy type, we conducted a logistic regression analysis of policy condition, age, gender, country of birth, nationality, ethnicity, religion, marital status, highest qualification, house type, and household size on willingness to donate one's organs. Overall, prediction success was 85.7% (95.5% for donors and 35.3% for non-donors), with the Wald criterion indicating that only the policy type significantly predicted whether participants would donate or not ($P = 0.006$). This finding highlights the magnitude

of the policy framing effect, over and above standard demographic variables.³

Confidence in Decision

As a secondary outcome, we ran a 1-way analysis of variance (ANOVA) to explore how confident participants were as a function of the policy they read. Surety in decision-making did not depend on policy type, $F(2, 154) = 0.54$, $P = 0.58$ (mean for the presumed consent group: $76.5\% \pm 15.2\%$, mandated consent: $76.2\% \pm 23.4\%$, explicit consent: $73.1\% \pm 17.2\%$).

Discussion

This is the first demonstration of how presumed, mandated, and explicit consent systems may affect organ donation rates in Singapore. We found that presumed consent was the most effective scheme, increasing donation rates relative to both mandated and explicit consent. Additionally, we found no evidence that mandated consent was more effective than explicit consent.

Together, our findings provide important data for the ongoing discussion on organ donation laws.^{5,7,8} As we noted in the introduction, previous studies had suggested that the size of donor pools would be equivalent under both mandated consent and presumed consent.^{3,6} If this

were the case, mandated consent should be favoured over presumed consent since actualisation rates do not merely depend on the donor pool.⁴

Unlike previous studies, however, we found that mandated consent was inferior to presumed consent in the Singaporean context. This suggests that if HOTA was amended to a mandated consent system, this would come at the cost of a smaller donor pool. What remains unknown is whether the decrease in the donor pool can be compensated by a decrease in the number of soft “opt-outs”, resulting in a net increase in donor actualisation rates. Accordingly, we urge policymakers to undertake further research before making changes to the current presumed consent laws.

Our study had some limitations. First, we used a sample size of 157. Although this matched Johnson et al’s seminal study comparing donation rates under the 3 policy types,³ our study was inadequately powered to detect small-effect sizes. This could account for the lack of a significant effect between the mandated and explicit consent policies. Second, our study involved university students who were primarily from middle- to upper-class families. Although this sample is not representative of the larger Singapore population, our report nonetheless cautions against implementing mandated consent without further local data.

Conclusion

In conclusion, our research suggests that replacing presumed consent with mandated consent will likely decrease Singapore’s donor pool. This highlights how studies conducted in Western countries may not apply to Singapore, and shows the need for further research to understand the complex factors affecting actualisation rates.

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