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Encouraging Organ Donation: Evidence from a Randomized Informational Intervention Among Young Adults in Tunisia

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Response to Reviewers:	

Journal of Development Economics Registered Report Stage 1: Proposal: Encouraging Organ Donation: Evidence from a Randomized Informational Intervention Among Young Adults in Tunisia

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March 18, 2025

Abstract

Organ transplantation saves lives and improves the life quality of patients, reducing reliance on costly invasive treatments. The technology is becoming available in LMICs, but the gap between organ demand and supply remains substantial. Our previous work suggests that inadequate information and low trust in institutions contribute to Tunisia's organ shortage. In a randomized controlled trial at a Tunisian university, we assess the impact of an expert-led informational intervention on young adults' attitudes towards organ donation and their donor status. To the best of our knowledge, this study is the first to assess the causal effect of an informational treatment on willingness to donate organs in a non-Western context, focusing on both attitudinal and behavioral outcomes. Our study also relates to the literature on the importance of institutional trust for public health. Finally, by accounting for students' social networks, we contribute to the literature on information spread through social networks.

JEL classification: I12, I15, O17, F63

Keywords: organ donation; health; institutional trust

Pre-registration of the study: AEA Social Science registry (AEARCTR-0015516) on 7 March 2025.

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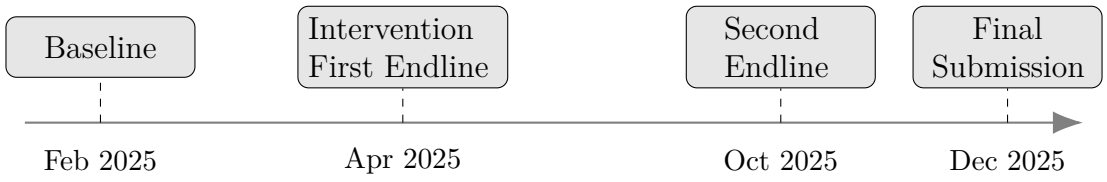
1 Timeline

Our pilot study received IRB approval by the Ethics Committee of the European University Institute on 3 April 2024 (20240227-HAUSER) and was preregistered at the AEA RCT Registry (AEARCTR-0013280) on 4 April 2024. The IRB approval was amended on 20 December 2024 to cover the additional elements of this study. We pre-registered the full study at the AEA Social Science registry (AEARCTR-0015516) on 7 March 2025. Figure 1 shows a timeline of the proposed study: We plan to collect a first round of baseline data in late February 2025. We will subsequently implement and evaluate the intervention within an "Organ Donation Awareness Week" at a Tunisian university in April 2025. During this week, we will collect a first endline of behavioral and survey outcomes. We will add a second endline about 6 months later to check for persistence of potential treatment effects and spillover effects. The pre-specified research design will thus be concluded by late October 2025. If accepted based on pre-results review, we will submit the final paper in December 2025. Conditional on securing some top-up funding, we will conduct a second round of the study in the fall of 2025, following the same experimental design. This would delay the final submission by about 8 months.

Figure 1: Project Timeline



2 Introduction

From a health economics perspective, organ transplant technology is a cost efficient way to treat organ failure due to genetic diseases, infections such as hepatitis or chronic diseases such as diabetes. Alternative treatments such as kidney dialysis are intrusive and painful for the patient, and also costly for the health systems. In most cases, patients who require a transplant will die if the transplant is not available on time (HDSA; 2024). The infrastructure and medical expertise to perform organ transplantation is increasingly available in low and middle income countries (LMICs). But in most countries, the demand for donated organs exceeds the supply by far. International comparison suggests that the shortage of donated

organs is particularly severe in LMICs (GODT; 2023). In regular competitive markets, the price of the commodity would increase up to the equilibrium. In the case of organ transplants, supply derives exclusively from organ donations which makes it a specific commodity where the price becomes irrelevant. A popular policy to increase the supply of donated organs is "presumed consent", which states that an individual is willing to donate their organs upon death *unless* they have actively opted out of the system by declaring themselves a non-donor. Presumed consent has proven to be one of the most successful policies for increasing the supply of donated organs in Europe (Steffel et al.; 2019). However, the success of this policy relies on high levels of institutional trust (Shepherd et al.; 2014). Presumed consent is therefore unlikely to be a policy solution in LMICs, where trust in institutions tends to be low (for example Algan and Cahuc; 2010).

The optimal policy to increase deceased organ donations is likely to depend on the cultural context. Yet, up to this date, most research on how to encourage organ donation has focused on North America and Europe (e.g. Roth et al., 2004; Kessler and Roth, 2012; Steffel et al., 2019; Vanholder et al., 2021). Our quantitative and qualitative research in Tunisia suggests that donation rates are low due to general lack of awareness, institutional mistrust and fear of organ trafficking. These context-specific issues have not been sufficiently addressed by previous research. A lack of research on which policies work in non-Western countries may lead to the adoption of inefficient policies, harming patients and societies at large. Our research aims to make a contribution to filling this gap answering the following research question: Can an expert-led informational intervention increase young Tunisian adults' willingness to become deceased organ donors?

To address the general lack of awareness about organ transplantation and prejudice about organ trafficking among young adults, we have designed an informational intervention in partnership with the Tunisian National Center for the Promotion of Organ Transplantation (CNPTO)[1]. The intervention explains the social importance of organ donation, the medical procedure, as well as the legal and administrative framework in detail. It will also include a short video testimonial of an organ recipient. It is led by an experienced medical doctor of the CNPTO and complemented by a 10-minute Q&A session with the participants. Within a randomized controlled trial at a Tunisian university, we will assess the impact of this informational intervention on young adults' donor status and attitudes towards organ

[1]The CNPTO's responsibilities include removing, storing and transplanting organs, training medical staff as well as managing the national tissue bank and waiting list for organ transplants. Moreover, it is the main organism in charge of promoting awareness of organ donation.

donation.[2] Using extensive network data in a baseline survey and a follow-up survey, we will furthermore quantify spillover effects from the treatment group to the control group based on the assumption that spillovers increase linearly in the number of friends who are treated (akin to Miguel and Kremer, 2004 and Baird et al., 2016). This will allow for a better understanding of the spread of policy-relevant information and the intervention's cost effectiveness. In a small-scale pilot, we find that the intervention significantly increased students' self-declared desire to register as organ donors, their administrative and legal knowledge as well as their medical knowledge. The intervention had a marginally significant impact on their trust in medical institutions. Exploiting the legal provision that allows Tunisians to confirm their donor status in their national ID, the proposed study will complement these attitudinal measures with a behavioral outcome: ID changes.

Tunisia is an ideal context for studying organ donation. The country has one of the most advanced organ transplant centers on the African continent, the CNPTO, and a strong legal framework for organ donation. Since 1999, Tunisians can explicitly express their desire to become deceased organ donors by adding the word "donor" to their national ID. However, only 13,000 individuals - about 0.16 percent of the adult population - have done so.[3] The potential benefits of increasing the donor pool are tremendous. One deceased organ donor can save the lives of up to eight patients with organ failure and improve the lives of another 75 by tissue transplantation (HDSA; 2024). Moreover, surgeons learn by doing and become more skilled and efficient the more transplants they perform (Magee and Pomfret; 2021). Finally, if available, alternative treatments such as dialysis for kidney failure are intrusive and painful for the patient, as well as expensive for the national health system. Organ transplantation is more cost effective for most patients and higher deceased organ donation rates would therefore also decrease public health spending (Axelrod et al., 2018; Zhang et al., 2023). From a policy point of view, encouraging deceased organ donation is thus crucially important for LMICs.

[2]There is a growing literature on the effectiveness of expert- and layperson-led informational interventions with mixed results (see for example Banerjee et al., 2024a). Abu-Akel et al. (2021) show that the health messages pronounced by medical professionals during the COVID-19 pandemic are significantly more likely to be shared by the respondents than the messages shared by government officials or celebrities. Alsan and Eichmeyer (2024) provide evidence that expert-led health interventions are the most effective among the *less* hesitant segments of the population. The quantitative evidence collected in a nationwide phone survey run by one of the authors (Hauser; 2024) confirms that the young and educated segments of the Tunisian population are relatively more willing to become organ donors. Based on the previous literature, the choice of an expert-led intervention seems thus appropriate.

[3]The number of donors is based on our qualitative interviews with the CNPTO (Zannad; 2024). For official population statistics, we rely on the most recent numbers published by the Tunisian National Institute of Statistics (INS; 2022b).

We expect our informational intervention to be efficient in encouraging organ donation: Tunisian public opinion surveys show high acceptance of organ donation. In 2017, about three in four Tunisians stated that they approved of organ donation (Zargouni; 2017). In 2023, in a nation-wide phone survey run by one of the authors (Hauser; 2024), 53.7% of respondents said that they would like to become organ donors. However, only 27.1% stated that they knew *how to* become an organ donor.[4] The survey evidence also suggests that, in contrast to other countries in the Middle East and North Africa (MENA) region (Metwally et al., 2020; Zargouni, 2017), religious concerns about organ donation play a minor role in Tunisia. Indeed, most scholars of Islamic law argue that Islam encourages organ donation, with reproductive organs being the only exception.[5]

The failure to encourage a sufficient number of organ donations has far-reaching consequences. Waiting lists for transplants grow and, in the extreme case, patients' despair may lead to illegal organ sales and human rights violations: Egypt has become known as an international hub for organ trafficking from Sub Saharan Africa and "organ transplant tourism" in the MENA region (COFS; 2011). Rumors about organ trafficking decrease trust in the medical system and are likely to decrease willingness to become organ donors even in neighboring countries (Abouna; 1993).

Our study contributes to the literature by addressing a so far understudied policy issue: how to encourage organ donation in an environment with low levels of general awareness and institutional trust. This study is the first to assess the causal effect of an informational treatment on young adults' willingness to become organ donors in a non-Western context. To the best of our knowledge, it is also the first study to measure donor status in IDs, a behavioral outcome which signals strong commitment to organ donation, and analyze its relationship with trust in medical institutions. While organ donation legislation differs from country to country, our findings may also be of interest to other LMICs in the MENA re-

[4] Hauser (2024). See Tables 9 and 10 in the Appendix.

[5] A Tunisian fatwa explicitly endorsed organ donation conditional on donor or family members' consent back in 2006. An equivalent fatwa by the Al-Azhar University in Cairo, which is widely recognized within the Sunni community, followed in 2009 (Ali et al.; 2020). The prevailing consensus among Muslim religious scholars is that organ donation and transplantation for the purpose of saving lives is not only permitted but also desirable. Ali et al. (2020) hypothesize that a lack of knowledge about these religious rulings and misunderstanding thereof contribute to the widespread skepticism about organ donation among Muslims. In favor of this hypothesis, Aghaee et al. (2015) find that medical students in Tehran who are aware of the religious authority's fatwa endorsing organ donation are more likely to approve of organ donation. However, in our 2023 survey, only 12% of respondents said that they hesitated to become organ donors due to religious concerns (see Table 10 in the Appendix). We therefore decided to propose a broader intervention to increase general awareness of organ transplantation.

gion and beyond, which suffer from similar informational constraints, low institutional trust and fear of organ trafficking.[6] Our study also speaks to the literature on the importance of institutional trust for public health by analyzing the impact of an expert-led informational intervention on trust in medical institutions in a context where misconceptions about organ trafficking are widespread (for example Alsan and Wanamaker, 2017; Alsan and Eichmeyer, 2024; Banerjee et al., 2024a). Finally, we contribute to the literature on the spread of information through social networks by mapping the flow of policy-relevant health information from the treated to the non-treated study participants (Abu-Akel et al., 2021; Alan and Kubilay, 2024; Banerjee et al., 2024a; Banerjee et al.; 2024b).

The paper proposal proceeds as follows: Section 3 describes the research design in detail. Section 4 discusses data collection plans and pilot results. Section 5 elaborates on potential challenges to the implementation of the study. Section 6 and Section 7 explain the planned analysis and, respectively, interpretation of results. Section 8 provides information on our funding and implementation partners. Section 10 provides tables and figures based on the pilot data. We include an Appendix with three sections: Section A includes the instructions which will be given to the intervention team. Section B includes a selection of important baseline measures. Section C lists the main survey outcomes we measure. Section E provides additional descriptive data on attitudes towards organ donation from a national phone survey (Hauser; 2024).

3 Research Design

This study will be implemented as a stratified randomized controlled trial at the South Mediterranean University (SMU) in Tunis in 2025.

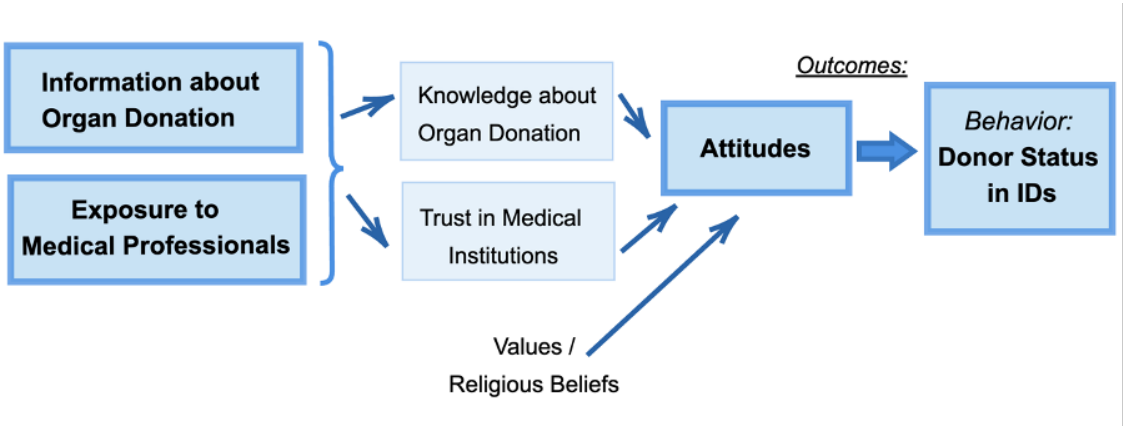
3.1 Theory of change

Figure 2 illustrates our theory of change. The intervention consists of two main components: i. information about organ donation and ii. real-life exposure to medical professionals. We expect the treatment to increase students' knowledge about organ donation as well as their trust in medical institutions. Taking personal values and religious beliefs as given, we expect that this will make attitudes more favorable towards organ donation. Improved attitudes

[6] See Al-Thnaibat et al. (2024) for Jordan.

may eventually translate to policy relevant behavioral change: more individuals declaring themselves as donors.

Figure 2: Theory of Change



3.2 Basic methodological framework / identification strategy

Tunisia does not have a centralized register of organ donors (Zannad; 2024). The only practical way to measure a behavioral outcome is thus to do so during an event where the technical police offers ID changes on site.[7] The CNPTO has offered spot ID changes in public events in the past, for example, on the occasion of the Tunis Marathon. The university setting is ideal since it allows us to randomize treatment at the classroom level, to clearly identify treatment effects and to later recontact subjects for a follow-up.

Our target population is interesting and relevant: Numerous studies have shown that the opinions and attitudes of young people are more malleable than those of older individuals (Abrams; 2022). Based on our pilot study, we are convinced that university students are of the appropriate age and maturity to approach the topic of organ donation in a meaningful way. A significant share of deceased organ donations stem from traffic accidents (Cron et al.; 2023). Targeting a young population seems reasonable even from a social welfare perspective.

As illustrated in Figure 1 we will collect three rounds of survey data which will be sent to all students by their lecturers and the university research center. Each survey is preceded by a privacy statement and students will only be allowed to proceed to the survey if

[7] An alternative behavioral outcome would be to measure public endorsements, similar to Macours et al. (2024), where young girl leaders speak up about menstruation. However, although both studies address a sensitive issue, unlike menstrual pads which concern all women, organ donation ultimately remains an individual choice, and we prefer to avoid generating any form of social pressure for ethical reasons.

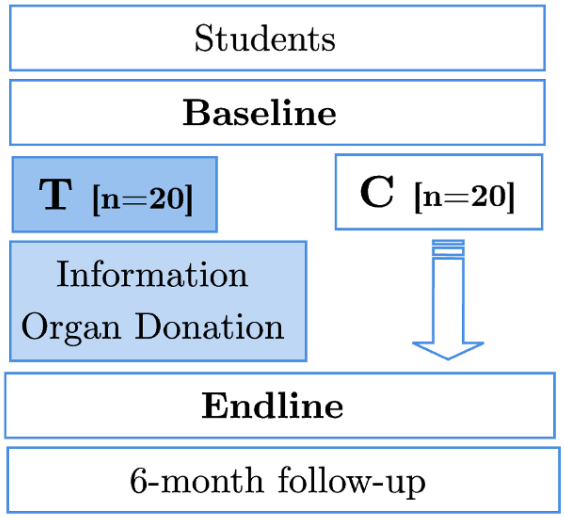
they agree to the consent form. We will collect baseline data in February 2025. Within a Qualtrics questionnaire, we will measure students' basic demographic characteristics, attitudes towards organ donation, altruism, risk aversion, propensity to give socially desirably answers (Reynolds; 1982), and their social network at school (similar to Alan and Kubilay; 2024). Section B in the Appendix contains a selection of question items. To measure students' social network, we will provide a drop-down menu with the names of all students currently enrolled at the university and ask respondents to choose the names of those who they frequently talk with. The maximum number of peers they can choose is set to 10. This network measure will allow us to quantify spillover effects on the control group by estimating treatment effects on control students who are highly connected to the treatment students. We will measure the immediate impact of the intervention with an endline survey in April 2025. Finally, we will measure its long-term impact with a second endline survey in October 2025.

3.3 Intervention

The study will take place at the South Mediterranean University, which comprises two main departments: engineering and business. In partnership with the CNPTO, we will organize an Organ Donation Awareness Week on campus. In this occasion, we will display posters in the university's atrium and students will be free to engage with the material on their own. This light-touch intervention will be in the background of a more targeted expert-led informational intervention. We have identified 40 classes without student overlap (see Table 2). After gathering consent from the university and lecturers we will randomly allocate 20 classes to a treatment and 20 classes to a control condition. The randomization will be stratified by department (engineering vs business) and level of study (year of study). Figure 3 summarizes the experimental design.

There is one treatment arm which consists in the expert-led informational intervention. CNPTO representatives will visit the treatment classes of the engineering school and those of the business school during regular teaching activities on Monday and Tuesday. Using a short powerpoint presentation, the representatives of the CNPTO will explain the medical procedure behind organ donation and its benefits for the patients and society at large. Moreover, they will provide details on the administrative procedure around organ donation in Tunisia and explain students how they can add their donor status to their ID. The intervention will also include a short video testimonial from a patient who survived thanks to a

Figure 3: Experimental Design



Notes: "n" refers to the number of classrooms (clusters) allocated to each treatment condition.

heart transplant administered by the CNPTO. We expect this component to reinforce the intervention: Personal narratives have been found to be highly efficient at changing attitudes (Oschatz and Marker; 2020). The intervention will conclude with a 10 minutes Q&A session. During our pilot, a particular focus of the discussion - driven by the interest of the students and numerous questions - was the issue of organ trafficking and legal provisions against it. Section A in the Appendix includes detailed instructions for the intervention team.

After the Q&A the intervention team will leave the classroom and the students will fill in the first endline survey in the form of a Qualtrics questionnaire on their mobile device or personal computer. In the control group, the questionnaire will be distributed by the lecturer on the same days as in the treated classes. Section C in the Appendix lists the main survey outcomes we measure. Students who complete the survey will receive a lunch voucher, which they can use to redeem a free lunch at the university cafeteria. A short text included at the end of the survey will inform students that the technical police will be on campus offering on-the-spot ID changes on Thursday and Friday during the day. The timing of the study implies that students who consider adding their donor status to their ID have some time to think about their decision.[8] There will be no monetary or in-kind incentives for changing

[8]There is a trade-off between the ethical imperative of allowing enough time for students to decide about their donor status and considerations regarding our experimental design - we risk spillover effects to the control group as students from both treatment arms may a couple of days between the intervention and the

one's ID. We are collaborating with a police agent who has worked with the CNPTO to provide on the spot ID changes in the occasion of the Tunis Marathon. The University will provide a separate room for her and the photographer who will take biometric photos. We will ensure to create a safe environment, adequately train the police and the photographer beforehand, and monitor them closely during the data collection.

3.4 Outcomes and hypotheses

Our primary outcome derives from administrative data while our secondary outcomes are mostly based on survey data.

1. ID changes: addition of donor status to national ID

Outcome 1 - ID changes: We treat ID changes as our primary outcome because it is a behavioral outcome reported by an external observer who is blind to the students' treatment status. Students will have the possibility to add their donor status to their ID on the spot. In accordance with the Tunisian Law n° 99-27 of March 1, 1999, this requires signing an official donor declaration form.[9]

After this, the photographer will take a biometric picture, which the technical police representative will use to issue a new ID, adding the word "donor". The CNPTO has offered on-the-spot ID changes in previous awareness events following the same procedure. Based on their experience, we expect it to take 10-15 minutes. In compliance with our Ethics protocol and the General Data Protection Regulation of the European Union, we will ask the students who have added their donor status to their ID if they are willing to share this decision with the research team. They will be given a printed privacy form and consent form by the representative of the technical police. We will collect the signed consent forms and digitize the names of the signatories after the intervention. We will then match this data with the baseline and endline surveys to measure how many students from treatment and control group respectively change their ID to declare their donor status. The outcome will

ID changes on campus. We use an empirical strategy similar to Miguel and Kremer (2004) and Baird et al. (2016) to account for spillovers.

[9]The donor status on an ID represents a strong commitment to being a donor. There is no official data which would allow us to calculate the conversion rate from having the organ donor status on one's ID to becoming an actual organ donor in Tunisia. However, declaring one's donor status relieves the family of the responsibility to decide about organ donation upon a loved one's death. Previous research finds that a potential donor's family is significantly more likely to approve of donation when the deceased has explicitly stated their preference (Siminoff and Lawrence; 2002).

be coded as 1 for students who change their ID and 0 otherwise. The consent form also asks students whether they have discussed their decision to become an organ donor with their friends at university and family members. We will use this information to corroborate spillover effects from the treatment to the control group.

We measure and analyze four secondary outcomes:

2. Attitudes towards organ donation and social norms
3. Administrative and legal knowledge
4. Medical knowledge
5. Trust in medical institutions.

The secondary outcomes are measured with a Qualtrics survey tool in the first and second endline. These outcomes, especially the attitudes, social norms and trust measures, may be subject to experimenter demand effects and social desirability bias, which is why we consider them as secondary outcomes. However, they will allow us to shed light on potential mechanisms to better understand how the treatment works. We will measure students' propensity to give socially desirable answers to test for the possibility that our results are driven by social desirability bias. In the baseline survey conducted in February, we will include five relevant questions from the Marlowe-Crowne Social Desirability Scale (Reynolds; 1982). This will allow us to test for the importance of potential social desirability bias by estimating treatment effects on the set of students who have a relatively low propensity to give socially desirable answers. Section B in the Appendix displays the complete list of items.

Outcome 2 - Attitudes towards organ donation and social norms: The treatment aims to change behavior by improving attitudes, which is why we have designed a set of questions to evaluate different aspects of students' attitudes towards organ donation (see Section C in the Appendix).[10] Most items measuring attitudes are answered on a 4-point Likert scale from "strongly" and "somewhat agree" to "somewhat" and "strongly disagree". We will code these outcomes as 1 when students strongly or somewhat agree and 0 otherwise. Other questions rely on a slide scale from 0 "strongly disagree" to 100 "strongly agree". We first evaluate the students' *own attitudes* towards being an organ donor, for example with

[10]The survey tool we piloted in April 2024 contained a subset of these questions and can be consulted here.

the items: "I would like to be an organ donor myself" and "The idea of my organs being in someone else's body gives me a feeling of discomfort". Second, we ask students about *their families' attitudes*. For example, "I feel comfortable discussing organ donation with my family". Family attitudes and the students' perception thereof are crucial measures for policy: The fear that one's family may disapprove of organ donation can prevent an individual from stating their wish to become an organ donor. Moreover, when a potential deceased organ donor has not added their donor status to their ID, organs can only be harvested after family consent. To have a larger societal impact, an organ donation awareness campaign must thus also encourage individuals to discuss the topic with their families. We will aggregate these questions in indices but also present disaggregated results in an Online Appendix. Third, considering the growing literature on the importance of social norms for individual decision making (e.g. Bursztyn et al., 2020; Jayachandran, 2021; Bursztyn and Yang, 2022; Bursztyn et al., 2023), we gather information on the perceived social norm around organ donation: "In your opinion, which percentage of Tunisians approve of organ donation?". As a second norms outcome, we ask students to guess the number of peers who will sign up to become organ donors during the Organ Donation Awareness Week. This outcome is incentivized; the student who gets closest to the true number will receive a voucher worth 50 Tunisian dinars for the cafeteria.

Outcome 3 - Administrative and legal knowledge: Our third outcome is administrative and legal knowledge about organ donation and transplantation, which is specific to Tunisia. Measures of subject knowledge are less likely to be affected by experimenter demand effects and social desirability bias than self-reported attitudes (Stantcheva; 2023). In our pilot, we found that only 23% of the students in the control group knew that they can declare their desire to be an organ donor by adding the word "donor" to their ID. When a potential donor dies without the word "donor" in their ID, the CNPTO is only allowed to harvest their organs conditional on family consent. A number of survey items will investigate whether the students are aware of these administrative procedures and the legal restrictions in place, which also act as safeguards against organ trafficking. For example, we will ask whether the sale of organs is legal in Tunisia.[11] We will code these question items as 1 when students answer correctly and 0 otherwise. We will aggregate the survey items into one index by averaging them but we will also present disaggregated results.

Outcome 4 - Medical knowledge: We use a number of questions to assess medical

[11]The sale of organs is illegal in Tunisia. However, in our small-scale pilot, we found that 38.6% of the students in the control group believed that it was legal. See Section 4.3 and Table 7.

knowledge, the full list of which can be consulted in Section C of the Appendix. For instance, we provide students with a list of organs and ask them to indicate which ones can be transplanted in Tunisia (we piloted this question in April 2024; see Figure 5 for the results). They are furthermore asked to identify the different types of eligible organ donors.[12] Further examples of knowledge items include "It is possible for a brain-dead person to recover from their injuries" and "You can have a regular funeral service after organ donation" (Correct / Wrong / I do not know).[13] We will analyze the treatment effect on each knowledge item separately but also aggregate them to a knowledge index where students receive one point for every correct answer and lose one point for every wrong answer. In robustness checks, we will construct the index without deducing points for wrong answers.

Outcome 5 - Trust in medical institutions: The question items measuring trust in medical institutions are modeled after the most recent waves of the Arab Barometer (2023) and the World Values Survey (2022) and scored on a 4-point Likert scale. We will measure trust in the public health system in general and the CNPTO in particular: for example, "How much confidence do you have in the medical system in Tunisia?" (a great deal / quite a lot / not very much / none at all / I do not know). As a benchmark, we also measure trust in other state institutions, which will allow for comparison with the cited surveys. Beyond these standard trust measure, we also ask respondents to assess the prevalence of organ trafficking and whether organ transplantation benefits all patients equally (see Section C in the Appendix). These survey items proxy respondents' perceptions of how well the law is being applied and thus contribute to our understanding of institutional trust.

We hypothesize that the treatment

1. increases the share of students who add the donor status to their ID;
2. makes students' attitudes and perceived social norms more favorable towards organ donation;
3. improves students' administrative and legal knowledge;
4. enhances students' medical knowledge;
5. increases trust in medical institutions.

[12] The Tunisian law clearly states that organs can be harvested after brain death, not after cardiac death.
[13] The correct answers are "Wrong" and "Correct" respectively.

In the second endline six months later, we will repeat the same survey items to investigate whether potential treatment effects persist over time. Moreover, we will ask students whether they have discussed organ donation with their family members and friends. We will interpret changes in knowledge and attitudes in the control group as suggestive evidence for spillover effects. For example, if we observe an increase in administrative and legal knowledge in the control group in the second endline relative to the first endline, a likely explanation is spillover effects: The students have learned from their peers who were in the treatment group.

3.5 Sample and statistical power

Our unit of analysis is the individual level. We include a total of 40 classes, 20 treatment and 20 control in the trial. We expect a response rate of about 15 students per class. The total sample size will thus be about N=600 students.[14]

Table 1 shows power calculations based on the means, standard deviations and intraclass correlations of the control group as measured during our pilot study in April 2024 (see Section 4.3). We have recruited n=20 classes per treatment arm and based on the baseline survey, we expect a response rate of at least 15 per class, yielding a total of N=600 study participants.[15] The minimum detectable effect (MDE) sizes appear reasonable considering the pilot results: With respect to our main outcome, ID changes, we are powered to detect a 4.4 percentage points increase in the share of individuals who declare their donor status in their ID. Given that the overall mean of individuals who have declared their donor status in their IDs is low (3.8% in the control group of our pilot sample), this minimum detectable effect size appears attainable and economically relevant.[16] Table 1 also shows power calculations for

[14]We used an algorithm to choose disjoint classes with no student overlap, see Table 2. We identified 40 disjoint classes with N=900 students. This is the maximum number of students we can reach, assuming all students complete the surveys and all lecturers agree to participate in the research project.

[15]We expect the study participants in the scale-up to resemble the participants of the pilot study with respect to their observable characteristics (see Table 3 and Table 6).

[16]In absolute terms, 4.4 out of 100 students in the treatment group represents a relatively small effect size despite the risk of spillover. DuBay et al. (2020) evaluate a video showcasing in Alabama driver license registration offices and measure registrations as deceased organ donors as their main outcome, reporting a 2.3 percentage points increase. Their intervention was significantly lighter compared to our in-person expert-led intervention, consisting solely of a 10-minute video screening. Notably, the increase in registration rates occurred despite the absence of audio and the fact that only about 16% of respondents reported watching the video. Using a similar video-based study design at the Ohio Bureau of Motor Vehicles, Thornton et al. (2012) even reach a 12 percentage points increase in sign-up rates. Similarly, university-based awareness interventions have reached large effect sizes, e.g. Murakami et al. (2016) find an increase of 5.9 percentage points in deceased organ donor sign-up rates among a sample of Japanese nursing students.

our secondary outcomes. For example, we are powered to detect a 0.7 point increase in the medical knowledge score (the treatment effect in our pilot study was 1.5 points, significant at the 1% level).

Table 1: Power calculations

	n	k	N	MDE	Mean	SD	ICC
Primary Outcome:							
Donor Status in ID	20	15	600	0.044	0.038	0.191	0.000
Secondary Outcomes:							
Wants to be Donor	20	15	600	0.108	0.680	0.470	0.000
Knows ID Procedure	20	15	600	0.169	0.233	0.425	0.144
Medical Knowledge	20	15	600	0.744	1.818	1.804	0.161
Trust Medical System	20	15	600	0.217	1.333	0.949	0.000
Trust CNPTO	20	15	600	0.377	1.590	0.973	0.134

Notes: Significance level $\alpha = 0.05$ and power $\beta = 0.8$. Number of clusters n = 20 per treatment arm, expected cluster size k = 15, total sample size N = 600. Means, standard deviations (SD) and intra-class correlations (ICC) are based on the control group in our pilot study. MDE is short for "minimum detectable effect size". "Wants to be Donor", "Knows ID Procedure" and "Donor Status in ID" are binary variables with 1 meaning "yes" and 0 "no". Medical knowledge is a score from -3 to 7 depending on how many knowledge items were correctly solved. The trust outcomes are rated on a 4-point Likert scale from 0 to 3.

Table 5 in Section 9 presents power calculations with the addition of another 14 Freshmen classes in the fall 2025.

4 Data

This project is based on primary data collection.

4.1 Data collection and processing

Our key data sources are i. administrative data and ii. surveys. Our administrative data consists in ID changes during the Organ Donation Awareness Week. As discussed in Section 3.4, we will invite an agent of the technical police with whom the CNPTO has collaborated before. Together with a professional photographer, she will be present in a separate room during the last two days of the Organ Donation Awareness Week and offer on-the-spot ID changes. She will collect students' signed consent forms and hand them over to the research

team. We will also collect three rounds of survey data - one before and two after the intervention - to better understand its impact (see Figure 1 and Section 3.4). We will collect baseline data in the end of February 2025. Our first round of endline data will be collected directly after the intervention in treatment classes and simultaneously in control classes during normal lectures in April 2025. The main outcome, ID changes, will be recorded at the same time during the Organ Donation Awareness Week. About six months later, we will collect a follow-up survey.

The baseline and first endline survey will be completed in the classroom which is why we will halt data collection the following day. For the second endline survey we will follow the same procedure with the students who will still be on campus. Those who will have graduated by fall 2025 will be invited to complete it individually which is why we will give them 7 days time before stopping data collection. We therefore expect to finalize all data collection by November 2025.

4.2 Variations from the intended sample size

We have carefully prepared the intervention and discussed the research project extensively with our implementation partners. On February 17, 18 and 19, 2025, we will hold informational meetings with the lecturers to explain the intervention to them. We will only include their classes into the trial after gathering the their consent. We also require the students to give explicit consent for participating in the study before filling out the surveys. Based on the results of our pilot study (see Section 4.3), we expect high compliance. Moreover, we have scheduled the intervention after Ramadan and before the exam session to maximize student attention and engagement.

Our sample size may still be smaller than expected, for example, if many students are absent during the Organ Donation Awareness Week due to illness. However, our budget allows for incentivizing students to answer the surveys with a lunch voucher, which is why we expect high response rates. We therefore do not expect major challenges in collecting the first rounds of data. By contrast, we expect up to 40% attrition during the second endline in fall 2025 since the students in the final year of study will have graduated by then and may be less likely to respond.[17] We will check for attrition by treatment arm and use

[17] First- and second-year students will be on campus in October 2025 and we will ask lecturers to administer the survey during official classes, while also providing incentives to encourage student participation. Since the second endline survey will be conducted in October, third-year students may have graduated, however,

inverse-probability weights in the analysis of the results from the second endline. We note that the second endline primarily serves to validate the findings of the first endline, check for persistence of treatment effects and potential spillover effects to the control group. Attrition in the second endline will not impact our main results, as the behavioral outcome is captured in the first endline, measured during the Organ Donation Awareness Week in April 2025. Therefore, the primary focus of the paper will be on the first endline.

4.3 Pilot data

We piloted the study at the Mediterranean School of Business in Tunis in spring 2024. The experimental design was similar: We enrolled 6 classes into a treatment and 6 into a control condition. There was no baseline survey and we therefore do not have data on students' social network. Moreover, the intervention did not include the patient video testimonial and the students did not receive any incentives for completing the endline survey. Importantly, we were not able to measure actual ID changes.

Table 6 shows demographic characteristics of the respondents in the control and treatment group. About 61% of the respondents are female and they are on average 21 years old. More than a third of the students were born in Tunis and about 7% were born abroad. Most come from privileged family backgrounds: 82% have a university-educated parent. Parental university education is the only baseline characteristic which is unbalanced between treatment arms - the difference is significant at the 5% level. The students are equally spread between year 1, 2 and 3 of study; about half of them practice their religion at least once a week and 3% declare that they already have the donor status in their ID.

Table 7 shows treatment effects on student attitudes and knowledge as measured in the first endline, immediately following the intervention.[18] Panel 1 of Table 7 shows treatment effects on students' willingness to become organ donors. Treated students are 12.7 percentage points more likely to want to become an organ donor, a finding which however fails to reach statistical significance. Treated students are 10.8 percentage points more likely to declare that they want to add the donor status to their ID. Compared to a mean of 71.2% in the control group, this implies an increase of about 15%. Moreover, treated students are 24.5

they will remain registered as alumni and we will be able to contact them via their student email addresses.

[18] We use the double lasso post selection algorithm to select our set of covariates. However, the algorithm does not select any covariates. Given that parental education was unbalanced at baseline, we control for it in all regressions.

percentage points more likely to say that they feel sufficiently well informed to take an informed decision about their donor status.

Treated students are significantly more knowledgeable about the administrative procedure of becoming an organ donor and further legal aspects. They are also 39.6 percentage points more likely to know that one can declare one's donor status by adding the word "donor" to the ID. The wild bootstrapped p-value for this outcomes is ≤ 0.001. Over a control mean of only 23.3%, this implies an increase of 170%. In the control group, almost 39% of students believe that organ trafficking is legal in Tunisia. The treatment almost halved this misperception, decreasing its prevalence by over 18 percentage points (statistically significant at the 10% level).

The treatment also significantly increases students' medical knowledge: Panel 3 of Table 7 shows that treated students are, on average, able to correctly identify 1.23 more organs than control students. Moreover, students are 9.3 percentage points more likely to correctly identify the different types of organ donors, a finding which is marginally significant at the 10% level. We thus conclude that the treatment succeeded in increasing students' knowledge about organ transplantation and donation in the small-scale pilot.

Table 8 shows that the treatment marginally increased trust in the Tunisian medical system. By contrast, it did not increase trust in the Tunisian CNPTO in a statistically significant way. However, the sample size for the last outcome is small because many students did not know the CNPTO at all, which may explain the lack of statistical significance. Importantly, trust in the medical system and the CNPTO is generally higher than trust in other institutions such as the government or the police, as shown by the control group means.

5 Limitations and Challenges

We are confident that we will be able to implement the study as planned because we have a well-established working relationship with our implementation partners, the CNPTO, and the South Mediterranean University. Moreover, we have successfully piloted the main components of the intervention as discussed in Section 4.3. Below, we elaborate on four remaining limitations and challenges to this study.

High refusal to consent: One potential challenge stems from the measurement of our main outcome, ID changes. In compliance with our Ethics protocol, we will only register ID changes if the students give explicit consent for the data collection. A high refusal rate could jeopardize the measurement of this outcome. However, based on our previous research and interactions with the students who have been eager to participate in scientific studies, we believe that refusal is unlikely to be widespread.

Risk of harm induced to the subjects: Low trust in institutions may be warranted, especially if one considers recent organ trafficking scandals. Cases of organ trafficking have been reported both in developed and developing countries. Mahr et al. (2024) show that the media coverage of corruption scandals involving public health workers in organ donation has decreased the number of reported organ donors in Italy. Tunisian authorities recently dismantled an international organ trafficking network (Jelassi; 2021), though neither our implementation partner the CNPTO nor public health workers were involved.[19] Our intervention aims to educate participants about the legal and administrative procedures surrounding organ donation, which is crucial for the system to work. Furthermore, by informing participants of their rights, the intervention equips them with the knowledge required to detect potential unethical situations involving local institutions should they occur.

External validity: The intervention addresses both the informational constraint and the logistical constraint of changing one's ID. First, the treatment addresses the informational constraint with an expert-led intervention from which only the treatment group benefits. Second, the experimental setting of this study makes changing IDs easy by decreasing the waiting time and potential costs required for obtaining a new photo ID. Both the treatment and the control groups are eligible to change their ID on the spot. Admittedly, this process is likely to be more challenging in real-world conditions. As a result, merely alleviating informational constraints may not yield the same treatment effects if the intervention were to be scaled up. This may limit the external validity of this study. However, the CNPTO has offered on-the-spot ID changes on a larger scale, through initiatives like the Tunis marathon. Similar opportunities to change one's ID are regularly available in the larger metropolitan area of Tunis and, conditional on positive results from this study, they are likely to be further encouraged by the policymaker.

[19] In Tunisia, organ sales are illegal. Organ harvesting and transplantation are only allowed in authorized public hospitals; any kind of financial transaction is strictly forbidden.

Policy relevance of the main outcome: While ID changes are a suitable behavioral outcome in the context of this study, they are unlikely to immediately increase the deceased organ donor pool. The probability that one of the study participants becomes a deceased organ donor is very small: Brain death is a rare event and, in the Tunisian context a potential donor must die in a hospital which is authorized to harvest organs, or be sent to such a hospital timely enough.

The conversion rates from registered donors to actual donors are generally low: In the US, it is estimated that only about 3 in 1,000 total deaths qualify for deceased organ donation (Bambha et al.; 2020). In Spain, "2.3% of hospital deaths and 12.4% of deaths in the intensive care unit could yield potential donors" (de la Rosa et al.; 2012). Simulations based on US data suggest that it is efficient to target organ donation awareness campaigns to certain population groups and states where the conversion rates from registered donor to actual donor are high (Cardon et al.; 2020). The issue has, however, not been studied in Tunisia, where detailed donor registration data is unavailable. Tunisian authorities registered 81,334 deaths in 2022 (INS; 2022a), out of which 86 were confirmed as brain dead and potential deceased organ donors by the CNPTO (Aissi; 2022). The CNPTO eventually harvested organs from 19 donors (Aissi; 2022), pointing to a much lower donor conversion rate in our context. This could be due to several factors, which we lack data on, including a relatively high share of deaths occurring outside hospitals. However, the available data shows that a high rate of family refusals plays a role: In 2022, 63.7% of the families of potential deceased organ donors without donor status on their ID refused consent for donation (Aissi; 2022). From a legal perspective, family consent is no longer required when a donor has their status in their ID. In practice, the CNPTO still contacts the deceased's family to inform them and confirm their support for the harvesting of organs. In the unlikely case that the family were to refuse, the CNPTO would respect their decision. However, registering one's donor status sends a strong signal to the family, making their consent more likely, as confirmed by our pilot data and extensive qualitative interviews (Zannad; 2024). Promoting the addition of donor status to one's ID thus likely bears potential for improving donor conversion rates in the Tunisian context.

6 Empirical Analysis

6.1 Main analysis

To test the null hypothesis that the intervention had no impact on the outcome y_{ic} of student i in classroom c, we estimate a linear model using OLS:

$$y_{ic} = \alpha_0 + \alpha_1 T_c + X_{ic}^{'}\gamma + \delta_s + \varepsilon_{ic} \tag{1}$$

where T_c is a binary variable which equals 1 if classroom c was allocated to treatment and 0 otherwise. X_{ic}' is a vector of control variables for student i in classroom c that are potentially predictive of the outcome y_{ic}. We will use double lasso post selection to choose our covariates among the potential pre-treatment covariates. We also include strata fixed effects δ_s (we stratify by program and year of study). Standard errors are clustered at the classroom level, which is the level of treatment assignment.

6.2 Spillover analysis

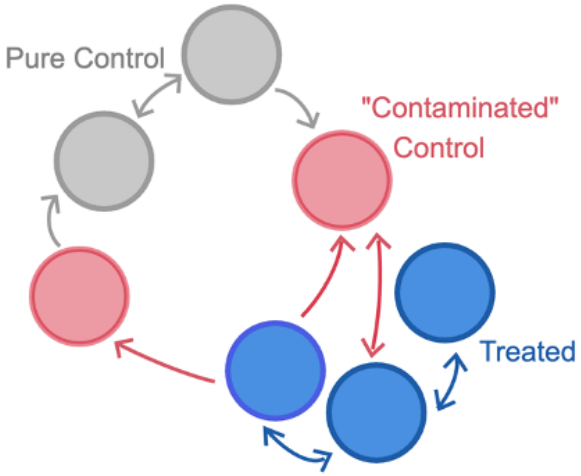
We expect imperfect compliance to treatment status and therefore interpret the estimated treatment effect $\hat{\alpha}_1$ as intention-to-treat effect. The stable unit treatment value assumption (SUTVA) is unlikely to hold in this setting (Imbens and Rubin; 2015). As in similar informational interventions (for example Banerjee et al., 2024a), we expect spillovers to non-targeted individuals: Students in the treatment group may share the information received during the intervention with friends in the control group. These spillover effects will bias $\hat{\alpha}_1$ towards 0 and we will therefore interpret it as a lower bound of the true treatment effect α_1 as Baird et al. (2016).

We will use the network data collected during the baseline survey to quantify potential spillover effects of the treatment. In the baseline survey, we ask students to nominate the peers with whom they regularly discuss important questions. This will allow us to calculate both the number of in-degree ties and out-degree ties for each student in the control group.[20] We will then determine the share of in-degree and out-degree ties that come from or go to students in the treatment group. We assume that, as social connectivity to the treatment

[20] As is standard in the literature, we define in-degree ties as the number of nominations a student i receives from her peers j, k, l, ... and out-degree ties as the number of nominations the student i makes of her peers. We restrict the number of nominations a student can make to 10.

group increases, a control student becomes more likely to learn about the intervention from peers in the treatment group, thus being "contaminated" by spillover effects. We define control students with low social connectivity to treatment students as "pure control" and students with high social connectivity as "contaminated control" as illustrated by Figure 4.

Figure 4: Spillovers from Treatment to Control



Notes: Circles represent students. Arrows represent social ties: arrows directed towards a student i are in-degree ties for i; arrows directed from i towards another student j are out-degree ties for i.

In addition to estimating the intent-to-treat effect $\hat{\alpha}_1$, we can therefore make two theoretical comparisons, between:

1. the treatment group relative to the "pure control" group, and
2. the "contaminated" control group relative to the "pure control" group.

Comparing the treatment group to the "pure control" would allow us to estimate a treatment effect which is cleared of spillover effects as much as possible. We would therefore expect it to be larger in absolute size than $\hat{\alpha}_1$. The second comparison between the "contaminated" and the "pure control" would allow us to quantify potential spillover effects on non-treated units, which are of high policy interest: We expect the spillover effects to be positive and to improve behavior, attitudes and knowledge in the "contaminated" control group. If attitudes improve in a significant way, our intervention may turn out to be more cost effective than expected because the treatment benefits more people than the individuals who are targeted.[21]

[21] We will register the day of ID change for each student. If the ID change occurs on the second day, spillover effects are more likely and we will therefore control for the day of ID change in robustness checks.

A potential issue with directly comparing the "pure" and the "contaminated" control groups is that they could differ from each other in their baseline characteristics. i.e. isolated students who do not have any social ties will automatically be allocated to the "pure" control group. If socially connected students inherently differ from less socially connected students in their preferences regarding organ donation, the direct comparison between "pure control" and treatment group may yield biased treatment effect estimates.

We will therefore use the network data to estimate the following regression inspired by Miguel and Kremer (2004) and Baird et al. (2016), which assumes that spillovers increase linearly in the number of friends who are treated:

$$y_{ic} = \alpha_0 + \alpha_1 T_c + \alpha_2 N_{ic}^T T_c + \alpha_3 N_{ic}^C T_c + \alpha_4 N_{ic}^T + \alpha_5 N_{ic}^C + X_{ic}^{'}\gamma + \delta_s + \varepsilon_{ic} \tag{2}$$

where N_{ic}^T is the number of student i's friends in the treatment group in classroom c and N_{ic}^C is the total number of friends in control. We explicitly allow for peer effects to differ by treatment arm. $\hat{\alpha}_4$ is the parameter of interest: the effect of having social ties with treated students on students in the control group. As a an alternative, we will run the same specification using the proportion of social ties in the treatment and control group:

$$y_{ic} = \alpha_0 + \alpha_1 T_c + \alpha_2 \frac{N_{ic}^T}{N_{ic}} T_c + \alpha_3 \frac{N_{ic}^T}{N_{ic}} + \alpha_4 N_{ic} + X_{ic}^{'}\gamma + \delta_s + \varepsilon_{ic} \tag{3}$$

where N_{ic}^T is student i's number of social ties with the treatment group in classroom c and N_{ic} is the total number of social ties. $\hat{\alpha}_3$ measures spillover effects to the control group: the impact of having a higher proportion of social ties with the treatment group.

Table 4 reports social network measures from our baseline data collection. The baseline questionnaire asked students to list the peers with whom they regularly discuss important things. Panel A shows out-degree statistics, that is, the statistics are computed with respect to the nominations made by a given student. For example, 0.5% of the students in the control group are isolated in the out-degree sense, that is, they do not make any nominations. In the treatment group, this is the case for 0.8% of the students. By contrast, 19.7% of control students are isolated in the in-degree sense, that is, they are not listed by anyone else. The share of isolated students is balanced across treatment arms, as is the total number of social

Moreover, the consent sheets we use to gather data on students' ID changes also contain questions on whether they have discussed this decision with family and with friends at university. We will use this data to cross-validate the results from the network data. We recognize the limitations of this self-reported data, and will therefore mostly use it for exploratory purposes and descriptive analysis.

ties. This suggests that the general structure of the social network is similar across treatment and control classrooms.

By contrast, the data shows that the control group has a significantly higher number of social ties with the control group than the treatment group, both in terms of out-degree (Panel A) and in-degree (Panel B). The share of students who do not have any social ties to the control group is 16.5% in the control group and 56.6% in the treatment group. The share of students who do not have any social ties to the treatment group is 63.3% in the control group and 16.5% in the treatment group. The picture looks very similar for in-degree ties. Finally, the share of social ties to the treatment group is 21.6% in the control group and 76.0% in the treatment group. All these differences are statistically significant at the 1% level and large enough to be economically significant. We thus conclude that, while it is undeniable that there will be spillover effects, there is substantial variability in the degree of connectivity of students to the other treatment arm, which should allow us to estimate the spillover effects models in Equations (2) and (3).

We will construct an additional proxy of student interactions based on students' course choices. We now have access to the participant lists of all courses being held at the South Mediterranean University, which we have used to ensure that there is no overlap in the students assigned to treatment and control. In the engineering school, cohorts at a given level usually take the same classes, although some students may follow individualized study plans. In contrast, the business school exhibits substantial variation: for a given year of study, each course is composed of several classes with varying student allocations. Furthermore, in both schools, some students may be taking classes they failed in previous years, which further contributes to variation in classroom composition. As a result, a student may have different classmates across their classes.

Suppose that one of the "International Economics" classes is assigned to the control group, one of the "International Finance" classes to the treatment group, and the "Consumer Behavior" classes to neither treatment arm. In this scenario, a student is assigned to the control group through her "International Economics" class, meaning that all her peers in this class will also be in the control group. However, some of her classmates in "Consumer Behavior" may have taken the treated "International Finance" class, making them part of the treatment group. By exploiting the variation in class composition, we can compute the share of treated classmates for each student, even for those for whom we lack baseline data. Assuming that the likelihood of spillover effects increases with the number of treated

classmates a student has, we can conduct spillover analyses accordingly. We will use this variable to estimate Equation (3), thereby corroborating the results generated from the collected network data.

The second endline will provide additional evidence regarding the persistence of treatment effects on attitudes and spillover effects. Any treatment effects observed in the long-term follow-up are unlikely to be driven by experimenter demand effects (Stantcheva; 2023). Moreover, if we observe improvements in attitudes and knowledge of organ donation in the control group in the second endline, these changes are likely to be driven by interaction with the treatment group. We would thus interpret them as the likely result of spillover effects.

6.3 Heterogenous analysis

We will check for treatment effect heterogeneity by religiosity, expected family consent and gender.

Religiosity: It is possible that the treatment effect will be weaker among religious individuals. In the baseline survey we measure students' level of religiosity by asking them how often they practice their religion. In our pilot, about half of the students declared that they practiced their religion at least once a week or more often (see Table 6). We expect a similar distribution of religiosity in the full study and will code students who practice their religion at least once a week as "religious" and "non-religious" otherwise.

$$y_{ic} = \alpha_0 + \alpha_1 T_c + \alpha_2 T_c * relig_{ic} + \alpha_3 * relig_{ic} + X_{ic}^{'}\gamma + \delta_s + \varepsilon_{ic} \tag{4}$$

as before, T_c is a binary variable equal to 1 if classroom c was allocated to treatment and 0 otherwise. $relig_{ic}$ equals 1 for students who are "religious" and 0 otherwise. $\hat{\alpha}_2$ thus identifies the additional effect of the treatment on students who are religious. X'_{ic} is a vector of control variables for student i in classroom c that are potentially predictive of the outcome y_{ic}.

Expected family consent: It is possible that the treatment effect will be weaker among students from less progressive families. In the baseline survey, we ask respondents about the educational achievement of both parents, as well as whether they work in the medical sector. We expect parents with high educational levels and those working in the medical sector to be more supportive of organ donation. We also inquire whether respondents feel comfortable

discussing organ donation with their families and whether they are concerned that their families may disapprove of organ donation. We will aggregate these measures to an index of expected family consent:

$$y_{ic} = \alpha_0 + \alpha_1 T_c + \alpha_2 T_c * familyconsent_{ic} + \alpha_3 * familyconsent_{ic} + X_{ic}^{'}\gamma + \delta_s + \varepsilon_{ic} \quad (5)$$

where $familyconsent_{ic}$ equals 1 when a student's family has an above-median likelihood to approve of organ donation and 0 otherwise. $\hat{\alpha}_2$ thus captures the additional effect of the treatment on students whose families are likely to consent to organ donation.

Finally, we will also check for heterogeneity by student gender, however, we do not have strong priors on this and we are likely to be underpowered for extensive heterogeneity analysis. To uncover treatment heterogeneity in an agnostic manner, we will therefore employ the causal forest technique suggested by Athey and Imbens (2016). Applying this supervised machine learning method will allow us to estimate conditional intent-to-treat effects, confirming the results on potential heterogeneity by baseline characteristics including social ties.

We will impute missing baseline covariates using the stratum-specific means or medians of the covariates. However, we will present all regression results without imputation and without covariates as a robustness check. Our main outcome (ID changes) is binary and we will measure all secondary outcomes using a Qualtrics survey, in which we use the appropriate constraints. We thus do not expect any outliers.

As discussed in Section 3, we will aggregate knowledge items to indices of administrative / legal and medical knowledge. We will also present disaggregated item-by-item analyses in the Online Appendix. Given that we test multiple outcomes, we will apply the Romano-Wolf algorithm to our secondary outcomes to reduce the risk of generating false positives. For this procedure, we will follow Katz et al. (2001). We will also compute sharpened False Discovery Rate (FDR) q-values following Anderson (2008).

7 Interpreting Results

We expect the proposed intervention to increase the number of students who add their donor status to their ID. The sensitivity of the subject requires us to provide a minimum amount of information to the control group who will have access to the posters and general information on organ donation we display in the university. Moreover, as discussed in Section 6, spillover effects from the treatment to the control group are likely to occur. The light-touch intervention in the background and potential spillover effects imply that the estimated treatment effect on ID changes is likely to be a lower bound of the true treatment effect and we will interpret it as such.

The survey data which is collected directly after the intervention in treatment classes and the six-month follow-up survey offer the possibility to analyze spillover effects. Considering that the first endline is collected directly after the intervention, we expect the secondary survey outcomes to be less contaminated by spillover effects from the treatment group than the primary outcome. However, social desirability bias is a potential concern. We will test this by comparing treatment effect estimates for students with low and above-median propensity to give socially desirable answers. Moreover, with the network data provided by the baseline survey, we will exploit potential spillover effects from the treatment group to the control group to learn more about how the information propagates as explained in Section 6. This will help us understand whether the treatment also has an impact on the larger social network of treated students, a highly policy relevant question. The second endline in October 2025 will measure all secondary outcomes again. An improvement of attitudes towards organ donation in the control group in the follow-up relative to the first endline would suggest that there were positive spillovers from the treatment group.

Our secondary outcomes may shed light on the potential mechanisms at play. In particular, if we observe statistically and economically significant treatment effects on behavior and attitudes but no impact on student knowledge, we would conclude that a lack of knowledge about the technicalities of organ donation is unlikely to be a binding constraint in this context. By contrast, if we observe important improvements in knowledge but no treatment impact on trust in medical institutions, we would conclude that an improvement in knowledge is likely to drive any potential treatment effects on behavior and attitudes.

Organ transplantation is a highly effective technology that can improve life quality and save lives. In many developing countries, the infrastructure constraint is no longer binding:

An increasing number of LMICs possess the medical equipment and expertise required for organ transplantation. This research tackles another potentially binding constraint: the low supply of deceased organ donations (GODT; 2023). We argue that, in the context of Tunisia, the lack of organ donations is closely related to a general lack of awareness, low institutional trust and fear of organ trafficking.

Our research aims to evaluate whether an expert-led intervention can increase young adults' willingness to become deceased organ donors and their trust in medical institutions. In contrast to previous research (for example Roth et al., 2004; Kessler and Roth, 2012; Elías et al., 2019; Steffel et al., 2019; Vanholder et al., 2021), our study takes place in a LMIC setting which is characterized by low levels of institutional trust. To the best of our knowledge, it is the first rigorous impact evaluation of an expert-led informational intervention in a non-Western setting. It also contributes to the literature by analyzing a new behavioral outcome: ID changes, a policy relevant behavioral outcome, which in the Tunisian context, signals a strong commitment to the cause of organ donation. This study also speaks to the literature analyzing the link between institutional trust and public health (for example Alsan and Wanamaker, 2017; Alsan and Eichmeyer, 2024; Banerjee et al., 2024a). Finally, the experimental design of our study relates to a growing literature that documents and analyzes the spread of policy-relevant information through social networks (Abu-Akel et al., 2021; Banerjee et al., 2024a; Banerjee et al.; 2024b).

This research is of profound interest to the Tunisian ministry of health which is strongly committed to promoting organ donation and transplantation via the CNPTO. Positive findings would justify allocating larger funds to the organ donation awareness campaign and events offering on-the-spot ID changes, whereas zero findings would point to the need of designing alternative policy interventions. Many LMICs face the dual challenge of a lack of deceased organ donors and low institutional trust, which is why we believe that our findings will be of interest to policy makers in other countries of the region and beyond.

8 Administrative Information

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Ethics Approval: The study received IRB approval by the Ethics Committee of the European University Institute on 3 April 2024 (20240227-HAUSER) and was amended on 20 December 2024 to cover the additional elements of this study. On 4 March 2025 it also received IRB approval and data clearance at the South Mediterranean University. The study was pre-registered at the AEA Social Science registry on 7 March 2025.

Declaration of Interests: The authors have no competing interests to declare.

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9 Study Sample

Table 2: Sampling of Students

(I)	(II)	(III) Sampled classes	(IV) Sampled students	(V) Enrolled students	(VI) Share sampled
Business	Year 1	8	210	299	70.2%
	Year 2	4	110	294	37.4%
	Year 3	4	120	197	60.9%
	Sum	16	440	790	55.7%
Engineering	Year 1	8	164	172	95.3%
	Year 2	6	118	157	75.2%
	Year 3	5	96	138	69.6%
	Year 4	5	85	96	88.5%
	Sum	24	463	563	82.2%
	Total	**40**	**903**	**1353**	**66,7%**

Notes: This table shows our sampled classes by department and year of study. Column (III) shows the number of disjoint classes we have sampled and Column (IV) the number of students enrolled in these classes. Column (V) lists the number of students enrolled by department and year. Column (VI) shows the share of sampled students relative to the total of students enrolled.

Table 3: Baseline Balance, March 2025

	N	Control	Treatment	Diff: C-T	p-value
A. Demographics:					
Female	453	0.447	0.542	-0.095	0.067
Born in Tunis	459	0.399	0.456	-0.057	0.224
Mother university education	459	0.798	0.805	-0.007	0.853
Father university education	458	0.797	0.788	0.009	0.820
Mother works in medical sector	459	0.147	0.116	0.031	0.317
Father works in medical sector	458	0.096	0.121	-0.025	0.441
Practices religion	338	0.718	0.726	-0.008	0.882
High social desirability	441	0.244	0.280	-0.036	0.425
High altruism	433	0.602	0.595	0.007	0.872
B. Institutional Trust:					
Government	393	0.934	1.114	-0.180	0.095
Police	399	0.924	0.935	-0.011	0.883
Medical sector	410	1.471	1.434	0.037	0.562
CNPTO	295	1.311	1.422	-0.111	0.326
C. Organ Donation Attitudes:					
Comfortable discussing with family	363	0.715	0.733	-0.018	0.698
Feels sufficiently informed	327	0.547	0.608	-0.061	0.328
Wants to add status	316	0.559	0.634	-0.075	0.179
Worries about family disapproving	298	0.592	0.558	0.034	0.611

Notes: "High social desirability" is a binary variable that equals 1 whenever a student displays above the median propensity to give socially desirable answers in a subsample of questions taken from Reynolds (1982), and 0 otherwise. "Practices religion" equals 1 whenever a student stated that they practice their religion at least once a week or more often, 0 otherwise. "High altruism" is a binary variable equal to 1 whenever a student scores above the median in a subsample of questions from the Rushton et al. (1981) altruism scale, and 0 otherwise. The items on institutional trust are scored on a scale from 0 to 3 where 3 is high trust. The items on attitudes towards organ donation are the following: "I have sufficient knowledge about organ donation to make an informed decision about whether I want to become a donor myself."; "I feel comfortable discussing organ donation with my family."; "I would like to be an organ donor myself."; "I worry my family may disapprove of organ donation." They are scored as 1 when a student somewhat or strongly agrees and 0 otherwise.

Table 4: Social Network Measures, March 2025

	N	Control	Treatment	Diff: C-T	p-value
A. Out-Degree:					
Isolated student	460	0.005	0.008	-0.003	0.621
Total social ties	460	3.142	3.182	-0.040	0.931
Number social ties to control group	460	2.495	0.785	1.710	0.000
Number social ties to treatment group	460	0.647	2.397	-1.750	0.000
No social ties to control group	460	0.165	0.566	-0.401	0.000
No social ties to treatment group	460	0.633	0.165	0.468	0.000
Share of social ties to treatment group	423	0.216	0.760	-0.544	0.000
B. In-Degree:					
Isolated student	460	0.197	0.227	-0.030	0.630
Total social ties	460	2.349	1.942	0.407	0.290
Number social ties from control group	460	1.917	0.314	1.603	0.000
Number social ties from treatment group	460	0.431	1.628	-1.197	0.000
No social ties from control group	460	0.275	0.748	-0.473	0.000
No social ties from treatment group	460	0.711	0.277	0.434	0.000
Share of social ties from treatment group	362	0.197	0.828	-0.631	0.000

Notes: Panel A shows out-degree ties, that is, the nominations made by a given student. Panel B shows in-degree ties, that is, the nominations received by a given student. For example, a student is isolated following the out-degree definition if they do not list any peers who they frequently talk to. By contrast, a student is isolated in the in-degree sense if they are not listed by any of their peers. The share of social ties to/from the treatment group is undefined for students without social ties.

Table 5: Power Calculations with Additional Classes

	n	k	N	MDE	Mean	SD	ICC
Primary Outcome:							
Donor Status in ID	27	15	810	0.038	0.038	0.191	0.000
Secondary Outcomes:							
Wants to be Donor	27	15	810	0.093	0.680	0.470	0.000
Knows ID Procedure	27	15	810	0.145	0.233	0.425	0.144
Medical Knowledge	27	15	810	0.641	1.818	1.804	0.161
Trust Medical System	27	15	810	0.187	1.333	0.949	0.000
Trust CNPTO	27	15	810	0.325	1.590	0.973	0.134

Notes: Assuming the fall cohort of students is similar based on observable characteristics and can be pooled with the spring cohort. Significance level $\alpha = 0.05$ and power $\beta = 0.8$. Number of clusters n = 27 per treatment arm, expected cluster size k = 15, total sample size N = 810. Means, standard deviations (SD) and intra-class correlations (ICC) are based on the control group in our pilot study. MDE is short for "minimum detectable effect size". "Wants to be Donor", "Knows ID Procedure" and "Donor Status in ID" are binary variables with 1 meaning "yes" and 0 "no". Medical knowledge is a score from -3 to 7 depending on how many knowledge items were correctly solved. The trust outcomes are rated on a 4-point Likert scale from 0 to 3.

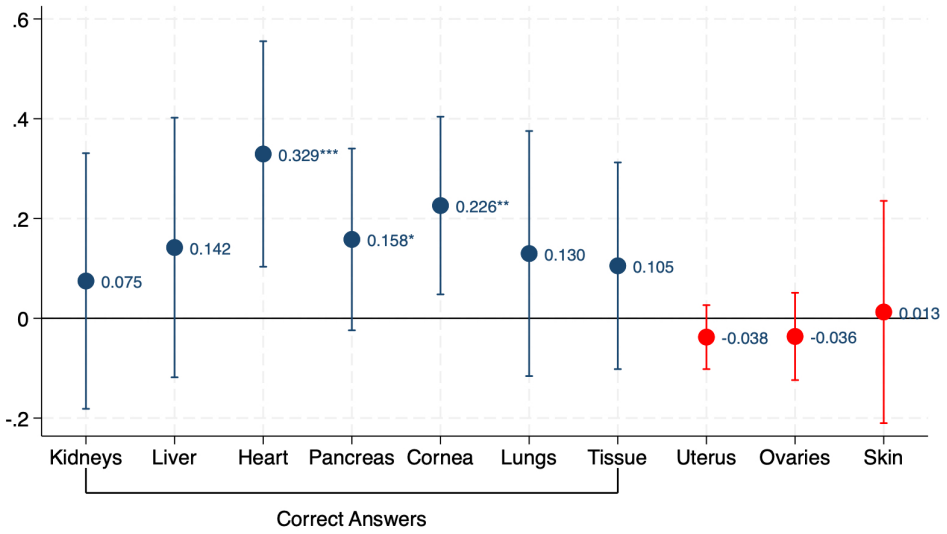
10 Tables and Figures - Pilot April 2024

Table 6: Baseline Balance

	N	Control	Treatment	Diff: C-T	p-value
Female	141	0.617	0.600	0.017	0.868
Age in Years	139	20.810	21.117	-0.307	0.484
Born in Tunis	176	0.386	0.366	0.020	0.820
Born abroad	176	0.057	0.098	-0.041	0.376
Parent univ educat	130	0.747	0.927	-0.180	0.039
Year of study	169	1.909	2.288	-0.379	0.450
Practices religion	125	0.507	0.558	-0.051	0.574
Donor status in ID	156	0.038	0.026	0.012	0.584
Class size	170	29.932	29.817	0.115	0.960

Notes: "Year of study" is a categorical variable that ranges from 1 to 3. All students in the pilot were part of the undergraduate program. "Practices religion" equals 1 whenever a student stated that they practice their religion at least once a week or more often, 0 otherwise.

Figure 5: Treatment Effects: Which Organs can be Transplanted in Tunisia?



Notes: All results are estimated using ordinary least squares (OLS) regressions. The outcomes are equal to 1 whenever a student thought that a given organ can be transplanted in Tunisia and 0 otherwise. Blue color marks correct answers; wrong answers are highlighted in red. "Tissue" is short for "bone tissue". All regressions control for parental education. Standard errors in parentheses are clustered at the class level. Asterisks indicate significance at the *** 1%, ** 5% and *10% level.

Table 7: Treatment Effects on Attitudes and Knowledge

Panel 1: Attitudes Towards Organ Donation

	Wants to be a Donor	Wants to Add Status	Feels Sufficiently Informed
Treatment	0.127	0.108*	0.245**
	(0.079)	(0.054)	(0.101)
Bootstrap p-val	0.196	0.092	0.040
Control Mean	0.680	0.712	0.627
Observations	131	127	144

Panel 2: Administrative and Legal Knowledge

	Knows ID Procedure	Organ Sale is Legal
Treatment	0.396***	-0.181*
	(0.038)	(0.087)
Bootstrap p-val	0.000	0.096
Control Mean	0.233	0.386
Observations	165	155

Panel 3: Medical Knowledge

	Organs Can Be Transplanted	Types of Organ Donation
Treatment	1.227**	0.093*
	(0.489)	(0.045)
Bootstrap p-val	0.044	0.100
Control Mean	1.818	0.250
Observations	170	170

Notes: All results are estimated using ordinary least squares (OLS) regressions. "Wants to be a Donor", "Wants to Add Status", "Feels Sufficiently Informed", "Knows ID Procedure" are binary variables that equal 1 if a respondent answered yes and 0 otherwise. "Organ Sale is Legal" equals 1 if a respondent (wrongly) believes that the sale of organs is legal and 0 otherwise. "Organs Can Be Transplanted" is an index score of students' knowledge about which organs can be transplanted in Tunisia and ranges from -3 to 7. We add 1 point for each correct answer and deduce 1 point for each wrong answer. "Types of Organ Donation" equals 1 when a respondent knows that organs can be donated in vivo and after brain death, and 0 otherwise. All regressions control for parental education. Standard errors in parentheses are clustered at the class level. Asterisks indicate significance at the *** 1%, ** 5% and *10% level. Wild cluster bootstrap, 1000 replications, Rademacher weights.

Table 8: Treatment Effects on Institutional Trust

Institutional Trust				
	Government	Police	Medical System	CNPTO
Treatment	0.160	0.094	0.325*	0.403
	(0.130)	(0.157)	(0.148)	(0.238)
Bootstrap p-val	0.238	0.596	0.084	0.160
Control Mean	0.877	0.855	1.333	1.590
Observations	131	132	131	113

Notes: All results are estimated using ordinary least squares (OLS) regressions. The outcomes are measured on a 4-point Likert scale from 0 to 3, where 3 is high trust. All regressions control for parental education. Standard errors in parentheses are clustered at the class level. Asterisks indicate significance at the *** 1%, ** 5% and *10% level. Wild cluster bootstrap, 1000 replications, Rademacher weights.

A Instructions for the Intervention Team

CNPTO representatives:

Before the intervention, verify that you have a USB key with the presentation and sufficient informational flyers and brochures with you. Make sure to arrive to the classroom at the scheduled time. After introducing yourself and the CNPTO, briefly announce the topic and ask all people present if they consent to attending the presentation. Anyone who feels uneasy about the topic is allowed to leave the room during the presentation.

The lecturer will help you set up the powerpoint presentation. Limit the presentation to about 15 minutes and follow the slides closely. After this, participants have 10 minutes to ask questions. At the end of the presentation, distribute flyers and brochures, then thank the lecturer and the students before leaving the room. The lecturer will distribute the link / QR code to the endline survey.

Police agent and photographer:

Greet the students and introduce yourself. Explain the procedure of adding the donor status to one's ID to them. Use neutral language throughout and do not influence their decision in any way. If they want to change their ID, ask them to sign the relevant forms. The photographer will then take a biometric photo.

Once the new ID is issued, ask the student whether they consent to sharing their decision with the research team. Hand them one printed copy of the privacy statement and two copies of the consent form. Give them time to read the forms and explain any points that may be unclear. If they consent to sharing their decision, ask them to sign the consent forms. They can keep one copy for themselves. Please collect the other copy and hand it to the research team at the end of the day.

B Baseline Survey

Below, we present a subset of the question items contained in our baseline survey.

Attitudes towards organ donation

1. I have sufficient knowledge about organ donation to make an informed decision about whether I want to become a donor myself.
2. I feel comfortable discussing organ donation with my family.
3. I would like to be an organ donor myself.
4. I worry my family may disapprove of organ donation.

We use the following question item to measure stated risk preferences:

Risk aversion

Please rate your willingness to take risks, in general, on a scale from 1 to 10 where 1 means that you are not willing to take risks at all, and 10 means that you are very much willing to take risks.

We include the following questions from the Marlowe-Crowne Social Desirability Scale (Reynolds; 1982) into our baseline survey:

Propensity to give socially desirable answers

1. No matter who I am talking to, I am always a good listener.
2. When I don't know something, I don't at all mind admitting it.
3. I am always polite, even to people who are disagreeable.
4. I have never been annoyed when people expressed ideas very different from my own.
5. There have been times when I was quite jealous of the good fortune of others.

We use the following items from Rushton et al. (1981) to measure altruism:

Altruism

1. I have given money to a stranger who asked me for it.
2. I have allowed someone to go ahead of me in a queue in a shop.
3. I have offered to help a classmate I did not know well with a homework assignment.

We furthermore measure students' social networks with a dropdown menu, similar to Alan and Kubilay (2024):

Social Networks

We are interested in studying the social network in the university. Please choose the names of the students that you talk with about important things. This can be any student from SMU who you spend a lot of time with. Note that you will have to choose their department and year of study first.

[Dropdown menu with student names]

C Measurement of Secondary Outcomes

Below, we present the question items which will be used for the construction of our secondary outcomes. With the exception of the incentivized norm question (Social Norms, item 2), which will only be included in the endline survey, they will be asked twice, in the endline survey (April 2025) and follow-up survey (October 2025).

Attitudes towards Organ Donation

1. I would like to be an organ donor myself. *(Completely disagree, Somewhat disagree, Somehow agree and Completely agree)*
2. The idea of my organs being in someone else's body gives me a feeling of discomfort. *(Completely disagree, Somewhat disagree, Somehow agree and Completely agree)*
3. I feel comfortable discussing organ donation with my family. *(Completely disagree, Somewhat disagree, Somehow agree and Completely agree)*

Social Norms

1. In your opinion, which percentage of Tunisians approve of organ donation?

   (Slide scale from 0 to 100)
2. How many students from MSB / MedTech will choose to change their ID to become organ donors this week? We will give a 50 TND cafeteria voucher to the person who gets closest to the sign-up data.

   (Please insert the number here)

Administrative & legal knowledge

1. Do you know how you can declare your desire to be an organ donor in Tunisia? *(Yes - No - Don't know - Prefer not to answer).*
2. Does Tunisian law allow for the sale of organs? *(Yes - No - Don't know - Prefer not to answer).*
3. If you agree to donate a family members' organs you may end up paying extra medical bills in Tunisia. *(Correct - Wrong - Don't know - Prefer not to answer).*

Medical knowledge

1. Which organs can be transplanted in Tunisia? *(Kidney, Liver, Heart, Pancreas, Uterus, Ovaries, Lungs, Cornea, Skin, Bone tissue, Brain, Eyes, Don't know)*
2. From whom can organs be removed for the purpose of being transplanted? *Living persons, Dead persons (cerebral death), Dead persons (cardiac / circulatory death), Don't know, Prefer not to answer*
3. It is possible for a brain-dead person to recover from their injuries. *(Yes - No - Don't know - Prefer not to answer).*

Trust in medical institutions

1. How much confidence do you have in the medical system in Tunisia? *(A great deal, Quite a lot, Not very much, None at all, Don't know, Prefer not to answer)*
2. How much confidence do you have in the CNPTO?[a] *(A great deal, Quite a lot, Not very much, None at all, Don't know, Prefer not to answer)*
3. Do you feel that organ donation benefits all categories of persons equally in Tunisia? *(Yes, absolutely; Yes, mostly; No, not really; No, not at all; Prefer not to answer).*
4. How common is organ trafficking in Tunisia in your opinion? *(Not common at all, Not very common, Common, Very common, Don't know, Prefer not to answer)*

[a] Centre National pour la Promotion de la Transplantation d'Organes

D Second Endline

To gather more information on the importance of peers on individual decision making, we will add a number of additional questions to the second endline:

1. Have you discussed organ donation with your family ?
2. Have you discussed organ donation with your friends at university?
3. If you have recently decided to become an organ donor, who had the most influence on your decision? *(a lot of influence, some, not very much, none)*
    - Friends at university
    - Friends outside university
    - Siblings, cousins
    - Parents
    - Medical experts
    - Social media

E National Survey Results

The data below was collected during a phone survey in spring 2023. The sample was generated using random digital dialing and is fairly representative of the Tunisian population (see Hauser; 2024). The survey items shown in Table 9 were yes-or-no questions. The part of the interview reported in Table 10 was semi-structured. The respondents were asked to answer the open question: "What is the main reason why you would hesitate to become an organ donor?" Their answers were subsequently categorized by the enumerators and the author.

Table 9: Attitudes Towards Organ Donation

(I)	(II) N	(III) Yes	(IV) No	(V) Unsure
Knows procedure	1495	27.1	70.4	2.5
Has donor status in ID	1502	2.2	95.2	0.0
Wants to be Donor	1496	53.7	42.6	3.6

Notes: Phone survey, nationally representative sample. Columns III-V report the percentage of respondents giving the respective answer.

Table 10: Why Would you Hesitate to Become an Organ Donor?

(I) Answer	(II) Count	(III) Percent	(IV) Percent U30
There is no reason	734	48.8	44.8
Do not like the idea	196	13.0	9.2
Religion	179	11.9	11.6
Organ trafficking	122	8.1	12.3
Mistrust in medical system	95	6.3	7.5
Have not thought about it	38	2.5	3.3
Afraid of complications with healthcare	34	2.3	3.7
Own medical preconditions	33	2.2	1.8
Do not know who could benefit	26	1.7	1.3
Family may oppose	17	1.1	1.8
Other reasons	31	2.1	2.6
N	1505	1505	455

Notes: Semi-structured phone interviews, nationally representative sample. Column II shows the total count of respondents making the respective statement, column III the percentage. Column IV limits the sample to respondents between the ages of 18 and 30.