1. The Story and the Business Problem

The idea for our project started with an empirical observation: every time Silvia, one of the members of our team, went donating blood, she saw posters on the walls aimed at encouraging young people to do the same. Also, the other three of us often saw many campaigns to raise awareness of the importance of blood donations among young people. As these initiatives explain, the reason why the associations focus so much on young people is that, of all possible donors, young people (18-35) are the proportionally least likely to donate (in 2019 they represented 29,7% of donors). Since we knew that the number of donors is too small for the necessities of blood from patients and hospitals, we decided to try and solve this issue by encouraging as many young people as possible to become donors.
The first thing we did was to wonder: why is that so?
Based on our past experience, two possible reasons came to mind. Indeed, whenever we asked one of our peer friends why they do not donate blood, the most common answers were that they either did not know much about it, they were somehow scared, or they had never thought of it.
After we speculated on possible reasons, we tried to find a solution. Firstly, we focused on fear and disinformation. What do fear and disinformation have in common? That something can be done about them. Whenever we are either scared or not informed about something, our instinctive reaction is to turn to someone that has more experience or more information than us. Therefore, we thought of a service that connects blood donors to people who would be willing to donate but need to be supported and informed to start.
Then we asked ourselves: “What about those people who never thought about donating?”. We did not believe that these people are apathetic or selfish, but rather that they never received a stimulus to start donating. Therefore, we understood that we had to nudge them.
To combine these two problems with a unique solution we decided that we needed a unique tool, and so we chose to propose an application. This is how “Blooder” was born.

2. The Focused Theory

As previously mentioned, our project originated from empirical observation, but that was only the starting point of our research. We saw that there were some critical values regarding the trend of donations in Italy. Indeed, the number of donors was falling (in 2020 there were 3,4% fewer donors in total than in 2019), just like the number of new donors: in 2020 they were 2% less than the previous year. In addition to that, the average age of the donors was rising, with less than 200 000 donors between 18 and 25[1].

[1] https://www.centronazionalesangue.it/nel-2020-garantita-in-italia-lautosufficienza-per-il-sangue-ma-calano-i-donatori/

In light of this, we started questioning whether there was a way to improve this situation where the number of people who donate is lower than it could be.

Our first thought was that the majority of people are non-donors (excluding the ones that cannot due to health reasons), *not* because they are strongly convinced that they do not want to do good for the community. The next question was spontaneous: why then?

The answer was given by our intuition and past experience, which brought us to the thought that the two main reasons why people were not donating were fear, lack of true information and lack of stimuli.

The solution to the first two issues was brought to us by the theory we crafted, reasoning in a deductive way: if it is true in general that when people are scared or uninformed they look for answers and reassurance from somebody who is more experienced than them, this mechanism should work in the specific situation of donating blood, too. Therefore, we decided to find a way to connect these donors and non-donors effectively.

We looked for the already existing similar services to have a sense of why they were not effective. Putting ourselves in the shoes of a “fearful” non-donor or a “lazy uninformed” or “misinformed” non-donor, we inferred that they would not actively search for these services for the same specific reasons why they are not donating.

Furthermore, we believe that fearful people need real human contact to overcome their feelings. On the other hand, uninformed or misinformed non-donors that are very interested in donating may probably just google their questions. However, we believe that a majority of them are just not proactive enough to do it. For this reason, we thought of something that eliminates the search costs of information and combines information, human experience and a reliable source. In our opinion, this is what these two categories need to become more inclined to give blood. Therefore, we realized that we had to develop an app that linked and matched donors and non-donors. Among the many possible alternatives to developing an app, this option has specific characteristics that allow to stimulate “detached” individuals.

For what concerns the uninterested non-donors, we used a sociological theory[2]: it is well known that people, especially youngsters, are influenced by peer pressure, and if lots of their peers do something, then they will also be interested in it. If a friend invites them to do something or recommends something, they are more willing to accept this suggestion rather than one coming from a stranger or from someone older than them. In short, individuals may change their attitudes, values or behaviors to conform to those of the influencing group or individual. By deduction, this should also work for blood donation. Moreover, the idea behind a social network or an app is that people register themselves not only because they like it,

[2] Brown, B. Bradford (2004). "Adolescents' Relationships with Peers". In Lerner, R. M.; Steinburg, L. (eds.). Handbook of Adolescent Psychology (2nd ed.). Hoboken, NJ, USA: John Wiley & Sons, Inc. pp. 363–394

but also because many of their friends and peers are there. Our app is intended to draw on the same mechanism.

We believe that donors would start to invite their friends to be able to share information and awareness through the app, and non-donors may download it for the curiosity of the invitation, especially if they are already interested or have positive attitudes towards blood donation. Once they are inside the app, they would be able to connect with donors, but also discover how many of their friends already donate blood, find out why it is so important, get more information about the matter and see others' experiences. In our opinion, these features would make even the less interested more willing to start informing about blood donation and then become more inclined to donate.

Moreover, we would also implement another important feature to the app: a notification that is sent to users whenever there is a shortage of blood in their area. This would have a two-fold effect. Firstly, the notification is aimed at strengthening the effectiveness of the app on the most hesitant non-donors. Secondly, we believe that this feature would increase the download rate as people would feel the urgency and the importance of receiving this information, and once they are registered, the mechanism described above will kick in.

2.1. Main Components of the Theory

After crafting the theory, the first thing we did was figure out who were the main components of our story, and were:

- Potential donors: they are the ones that could determine an increase in the number of actual donors if they started giving blood.
- Actual donors: they are a key component for the success of the app since they have the role of convincing and helping other people to donate.
- The perceived value: it is necessary to make people understand the value brought by this project to prompt them to use the service.

2.2. Our Target

We then asked ourselves who the target of our service would be, and in what way we would present our offer, as these matters are strictly linked.

Both on the side of the donors and the side of the potential donors, our target users would be people willing not only to do something good for the community, but also to put themselves into something new, get to know new people, and communicate their needs simply and effectively. Moreover, they would have to be willing to do these things through an application.

That is why we thought that the target of our service would be people aged between 18 and 35. Indeed, this is the time in life where individuals tend to be more prone to get out of their comfort zone and change something in their habits, two things that usually become harder as you get older. Additionally, people in that age range are used to doing almost anything through an application, so thinking analogically, they would use an application for blood donation as well. Moreover, young people are less prone to having health conditions that prevent people from donating blood, therefore the number of potential donors among youths is supposed to be high.
The next step was then to define the key features this application needed to be, and how to communicate their value to the users.

2.3. The Value

The value that Blooder would bring to the market can be divided into three dimensions: the value for the community, for the donors, and the potential donors.
The value for the community, which is the main reason why the idea of Blooder was born, is evident: blood is needed for life, so making sure that the people who require it have access to blood is of utmost importance. Some people need blood transfusions to survive, for example, those who suffer from diseases like thalassemia or leukaemia or for a variety of other reasons, including post-injury or surgical haemorrhages. Translating the slogan for a campaign made by the association Avis: “Blood does not grow on tree
Aggiungi intestazioni (Formato > Stili paragrafo) da visualizzare nel sommario.

s”.
For these reasons, doing something that would help to increase the number of donors of blood would certainly bring value to the community.
For what concerns the value for the users: it may be a little less evident, but we believe that it is just as considerable.
For the people who actively donate blood, the value of this app would be in making their contribution even more precious by sharing their knowledge and giving their support. Indeed, we believe that people who regularly give blood have enough interest in the matter to take their effort a step further and help other people join the community of donors.
In addition to this main feature though, the app would include functions for donors, like the possibility of booking the donation via the app, having a reminder when they are ready to donate (every 3 months for men and every 6 months for women), and getting a notification whenever there is an urgent necessity of blood somewhere near them.

For non-donors, the value of the application would lie in the fact that it would encourage them to do something good not only for the community but for themselves as well because it would make them overcome their fears and their apathy. Moreover, good acts make us feel better psychologically and emotionally ("warm-glow" effect)[3]

2.4. The Features of the Offer

The necessity of attracting the users brought us to the idea of giving the app the same structure as the one of a social network to make it a place where you can not only link with donors if you are not a donor and vice versa, but also a platform where you can invite your friends and promote your activity as a donor, to act on the desire of people of getting recognition and positive attention. In this context, each person would have their profile where they would give information about themselves like their age, where they live and their blood group. The app would then link each user to a donor user, and open a private chat with them (after the operation is approved on both sides). In this way there would be personal contact between the individuals of each group, leaving room for an informal and supposedly warm conversation to take place. Via this contact the person who does not donate would have the chance to ask questions not only about the practical act of the donation and its medical consequences but also to talk to the donor about the experience: how you feel when you do it, how to overcome fear and the feelings afterwards. In this way, the donor would supposedly deliver information in an informal and accessible way, and possibly organize a donation together or live support via chat during the donation, depending on their availability.
The app would also contain functions that are specifically thought for donors (the ones that were listed in the paragraph about value), as we would like to add these features to encourage as many donors as possible to download the app. In our theory, they would download it mainly to do a service to the community, to encourage non-donors by helping and sharing their experience. Yet giving them other reasons to do it, could be very important. Also, these features may keep donors constant in their donations.
Finally, we would also like to add a map with all the donation centres and a list of the events organized by blood associations so that people who prefer real contact may just look for their closest centre.

TABELLA

[3] Andreoni, James (1989). "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence". *Journal of Political Economy*. **97** (6): 1447–1458.

2.5. Potential Alternatives

We looked for potential alternatives that could already be on the market.

For what concerns the service that links donor and non-donors our research brought us to consider as potential alternatives:

1) Websites: they are a valid source of information, but they do not provide the link between people that characterizes Blooder. Indeed, they could often be perceived as cold, and since they are not designed individually for each person that uses them, they may not satisfy all of the needs of the user.
2) Telegram groups: they are difficult to find because you need the exact name and you do not have the privacy you would need to talk about something as personal as fear.
3) Social media groups or pages: they would be familiar to our target but they would require the user to already have an account and to know the name of the association and the group. Moreover, they are not designed in a way that allows an easy connection: they are often chaotic, excessively big, and filled with many people. Non-donors would have to write to the admins (if public) or directly to the page. Admins may not answer immediately, especially if the group/association represents a medium/large city, which may receive many messages every day. Moreover, we believe that speaking to a “page” lacks the human contact that people may need when speaking of fear or a personal issue. Something that instead, Blooder offers.
4) Contact with a volunteer through a phone call or WhatsApp: all the blood donations associations have a website with the telephone numbers of the volunteers. However, many medium and large cities' centres have only a landline that, in our opinion, lacks the human contact that people may need when speaking of fear or a personal issue. Some centres also have a cellular line. This may be a good way to communicate and so we will test the response rate of these cellular lines.

We believe that the strength of Blooder lies in the fact that it can create an environment where donating blood is treated like a topic that can be part of everybody’s life, in an easy, warm and fun way. Furthermore, it would be the only application in the market to which can have access not only donors but non-donors too.

Also, being Blooder an independent app, it would be easier to advertise it, especially if some brands got interested in it and wanted to brand it.

2.6. Cascade Effect

To make Blooder popular, especially among the target users, we would need action on two sides. On one hand, the app would have to be promoted by existing associations for donating blood, so that the first users of the app would be donors, who would then supposedly invite their friends on the app. On the other hand, there would have to be a marketing effort as well, involving promotion on existing social networks, looking for help from influencers and creating filters both on Instagram and Facebook, to make Blooder as popular as possible.
The goal of it all would be to donate blood something that people are proud of and want to show off, and the application would make donating blood an activity where you can feel supported and welcomed by an existing community of donors.

2.7. Partners

To make the development of Blooder possible, we would need to have partners.
Firstly, the app would need to be supported by the existing associations for donating blood, not only to be promoted but also to activate all the features, like booking appointments through the app or posting events. Therefore, to have an idea of how existing associations would react to an application like Blooder and to understand possible needs that we might not have considered yet, we conducted short telephonic interviews with volunteers of Avis (the association that provides for 70% of the total requirement of blood in Italy (Avis, s.d.)) to ask what they thought of Blooder and if they believed that the associations would be willing to use and promote an external application.
The result of those interviews was that there is the perceived need for an innovative and youth-friendly way to approach the matter of donation, and they all supported the concept of Blooder.
Secondly, Blooder would need partners for the financial side for the development.
We would ideally rely on non-repayable loans that are issued by Italy or by the European Union for no profit start-ups, and on sponsorship from companies that would like to contribute as part of their CSR program. We think it is worth saying that the group of donors of Fideuram S.p.A, for instance, showed interest in supporting Blooder if the analysis indicates a positive outlook.

3. Scenario-Action Map

3.1. Scenarios

Starting from this simple idea of devising an application that could in principle solve an issue such as the low number of young donors, we needed to analyse the current situation and possibly the future prospects. More specifically, we needed to identify the scenario in which

we are among the many possible ones to assess the viability and confidently predict the expected value that such a project would yield.

In doing so, we considered all the parties involved, including donors and potential donors, and we decided to focus on the more relevant ones for our application. This is because it is unreasonable and possibly useless to try to analyze such a high number of different scenarios. Therefore, we focused our analysis on donors and potential donors because they would be the main user groups. Taking into account the considerations described above, we assume that the relevant institutions that would need to incentivize the use of the app would be willing to do it since they highlighted the need for the simplification of some procedures and the improvement of some services during phone interviews.

We will first describe each macro group's scenario (donors, "fearful" non-donors, "uninterested" non-donors) and then we will also describe their combinations.

Firstly, we considered those who were scared of some aspect related to blood donation and decided to assess their attitudes towards the services under consideration. We needed to investigate whether they would find it useful to communicate with donors and whether this method would make them more willing to give blood. If this was confirmed, we should have assessed whether they would do it on an application or not. The possible scenarios were then three.

- Connecting donors and not donors would not help the latter overcome their fears.
- Such a connection would be useful for potential donors, but they would not use an app for such service.
- Such a connection would be useful for potential donors, and they would use an app to do it.

The first two scenarios would yield a negative expected value for our goal, and so we can join them in a unique scenario of fearful non-donors not willing to download the app. The third one is the opposite, and it would be a good scenario in which developing the app with this specific function would yield a positive expected value.

Secondly, some individuals are uninterested in blood donation. They would not be the main targets or users of the chatting services. However, we believed that they would be more interested in donating blood if they were nudged through peer pressure. Therefore, the elements to form the different scenarios are two. The first one was whether or not peer pressure would increase their propensity to become donors or not, and the second one was whether the peer pressure would make them download the app. These created three scenarios.

- Uninterested people would not be subject to peer pressure in the case of blood donation.

- Uninterested people would be subject to peer pressure in the case of blood donation but they would not download an app.
- Uninterested people would be subject to peer pressure in the case of blood donation and they would download an app.

As before, for the scope of our analysis, we considered the first two scenarios as a unique negative one, which we summarized into a negative propensity of uninterested non-donors towards downloading the app. Again, the third one is exactly the opposite, and it would yield a positive expected value if the considered action was developing the app.

For what concerns donors, they are a key element for the correct functioning of the app and for determining the value it would bring. The elements that composed their scenario are: whether they would want to help non-donors or not and whether they would do it through an app or not. Combining them, the scenarios are:

- Donors would not be willing to help non-donors through chatting and support.
- Donors would be willing to help non-donors, but not through an app.
- Donors would be willing to help non-donors and they would do it through an app.

Again, the first two options result in a scenario where donors find our initiative not valuable, and, therefore, developing an app would only lead to costs. The third one is, instead, the one we are interested in and that we hope for.

Before exploring the actions, it is worth noting that the donors' scenario is very important because it is interconnected with the fearful scenario. Indeed, even if we had the interest of the fearful, without the donors we would not be able to develop the service.

3.2. Actions

The action we are interested in analyzing and possibly implementing is the development of the app. This follows from our original idea, and it is therefore centred around the possibility to link donors and potential donors through a chat service. Additionally, the development of the app would include several features that nudge the less interested non-donors, such as: the possibility to invite friends and to connect with those who already give blood, to see others' experiences, get more information and discover why it is so important to donate. As already specified, some other functions would be included to attract and provide more services to donors (book donations online, receive news from their association).

For Blooder's aim, we considered the various elements that constitute these actions only within the context of the app, therefore excluding the option of other ways to solve the same needs or to implement the same services. Moreover, we decided not to consider intermediate actions like "develop only the chat service" or "develop only an app for the donors" because there would not be the need for an app, which is very expensive to develop if there is no demand from all sides.

The second action would be not to develop the app. In this case, we would also provide all relevant information collected through the analyses to the institutions and associations active in the sector, so that they can use it when developing their strategies and according to their needs.

3.3. Scenario-Action Map and Expected Values

As outlined in Section 2.3, the value that could be brought about by the development of this application is to be measured in terms of social benefit for the community as a whole. Therefore, rather than specifying precise numerical values for each scenario-action combination, we decided to focus on a ranking of expected values, also taking into account the costs that would be incurred for the development of the app.

			SCENARIOS							
			Categories that like the idea of using an app linking donors and non-donors							
			D	F	U	D + F	D + U	F + U	D + F + U	Nobody
ACTIONS	Develop Blooder		N	N	N	v1 - c1	v1 - c2	N	v1	N
	Not develop Blooder		0	0	0	0	0	0	0	0

It is reasonable to claim that the expected value would be maximized when all the three groups considered finding the app interesting and are keen on using it (D + F + U). As a matter of fact, all the features considered would contribute marginally to the expected value and no costs would be incurred for functions that in the end are not exploited.

Considering instead the scenario in which the only category who would use the app are the donors (scenario D), the expected value is negative: no benefit would be created as there would be no potential donor to reassure or simply talk to, while the development costs of the app would still be incurred. The same reasoning can be applied for the categories of “fearful” and uninterested considered singularly (scenarios F and U, respectively).

As a consequence of this consideration, we can safely state that the same is also true in the case that the donors are not interested in the project, while the “fearful” and the uninterested are (scenario F +U). The absence of donors among the users would prevent the functioning of the chat, and the value created by the other functions would not compensate for the outlays required to develop the app.

In the case that the donors and the “fearful” show positive attitudes towards using the app (scenario D + F), the expected value of developing the app would be positive, and it would be equal to the one expected in the scenario D + F + U (v1), minus the cost of developing features for “uninterested” group (c1). However, we can be sure that the value would still be

positive because the connection of donors and “fearful” is would be successful and both of them would also benefit from the additional functions of the app.
On the other hand, considering the scenario in which the donors and the uninterested would be willing to download the app (scenario D + U), the expected value would still be positive. It would be composed once again by v1 minus the costs incurred for those functions that would not be used by the donors and the uninterested, mainly represented by the development costs of the chat function (c2). It is worth pointing out that we believe that c2 is greater than c1, as the chatting service is much more complicated to develop than the features for uninterested people. Therefore, the expected value of scenario D + U is lower than the one of scenario D + F.
Lastly, donors’ preferences should be taken into account to assess the marginal value created by the functions designed specifically for this group. As a matter of fact, they are not the main focus of Blooder. However, they are crucial to attract donors and convince them to download and use the app. In particular, if this user group was only willing to download the app if these features are included, then they would have to be considered crucial and cannot be excluded from the project of the app.

4. Hypotheses

As it has been precedently outlined, three main actors are playing a role in the theory - donors, “fearful” non-donors and “uninterested” non-donors - and the perceived value of some elements, which are common to all groups.
For this reason, we divided the hypothesis into four main blocks, one for each macro group.
The “fearful” block was composed by:
Hypothesis 1: *One of the main reasons why young people who can donate blood do not do it is fear.*
It was of the utmost importance to verify our theory that two of the main reasons why young people do not donate blood are fear and disinterest (hypothesis 5). Indeed, if this was not the case, all the subsequent reasoning and solutions would have be insignificant.
If the hypothesis was verified, we would consider each group as substantial and, therefore, as a good subject on which to perform further exploration as a potential target group for the app proposed.
Hypothesis 2: *“Fearful” people may become more inclined to donate blood if they either speak to a regular donor, receive support on the day of the donation by a regular donor or donate together with a regular donor*.
As precedently said, before assessing whether people would download the app or not, we had to find out if the proposed solution would increase their willingness to become donors. If

this hypothesis were true, we could proceed. It is important to notice that this hypothesis was tested not only on young people but on everybody. Indeed, we believe that if we could generalize our theory to everyone and not just young people, our app would be even more valuable.

Hypothesis 3: *Those who find speaking or receiving support or donating together with a regular donor helpful, would do it also on an application.*

This was the most critical hypothesis because its purpose was to see in which scenario we were regarding the fearful group. If the hypothesis were to be correct, it would mean that "fearful" people would find our app useful.

Hypothesis 4: *The application is the best option to develop to help fearful people.*

Even if people found our app valuable, we decided to test if there were other already-existing structures that non-donors could use and whether they were better or more valuable than our idea. Following the theory that we proposed before, we understood that a possible "competitor" were phone calls or messages with volunteers of blood associations. Therefore, their efficiency was tested through an experiment.

The "not interested" block consisted of:

Hypothesis 5: *One of the main reasons why young people who can donate blood are not donors is because they are not interested in it.*

As with fearful non-donors, we wanted to know if we inferred the right thing by claiming that one of the most popular reasons to not donate was not being interested in it. If this hypothesis was correct, we could proceed with our analysis.

Hypothesis 6: *Knowing that many friends or acquaintances donate makes uninterested people more willing to donate.*

This hypothesis is connected to the functionality of the app designed to stimulate peer pressure. Hypothesis 6 is assessed by testing whether it would be useful to show how many friends or acquaintances are registered on Blooder and how many of them give blood.

Hypothesis 7: *Uninterested people would be more likely to learn more or consider donating in the future if one of their relatives or friends invited them to donate or to learn about donating blood.*

Here we wanted to test, more in general, the importance of peer pressure in blood donation. It was important to know whether this mechanism worked in general before testing it specifically on the app. Indeed, only if the hypothesis was accepted, it would make sense to proceed with the analysis.

Hypothesis 8*: Uninterested non-donors would register themself on an app that links donors with non-donors and has other related features if invited by friends.*

With this hypothesis, we shifted to the app dimension and therefore it was crucial to test in which scenarios were located the “uninterested” non-donors. If the hypothesis was true, the app would have resulted to be useful and valuable for this macro category.

The donors’ block was composed by:

Hypothesis 9: *Donors would invite friends.*

This hypothesis was directly linked to the peer pressure scenario. Indeed, if donors would not invite friends, it would be difficult to create the mechanism that we described in the theory. Therefore, if the hypothesis was falsified, we could not proceed in adding the features to the app.

Hypothesis 10: *Donors would help and support the non-donors.*

As we said before, in order for Blooder to function correctly, there would have to be a strong interconnection between donors and fearful donors. Therefore, we wanted to test if donors would like to help potential donors. It is worth noting that not all donors are volunteers in blood associations, so it is not obvious that they would spend their free time helping others. For this reason, we decided not to just assume it, but to test it.

Hypothesis 11: *Donors would do these activities through an app.*

As for the other two categories, after testing that the hypothesis worked in general, we wanted to provide evidence of the fact that the same action would be done also through an app. This hypothesis was then the crucial one to find out whether there is an interest of donors in our idea. If hypothesis 11 and hypothesis 3 were true, we would be in scenarios with positive expected values, and, therefore, we could develop the chatting service and the features related to uninterested people.

The perceived value block:

Hypothesis 12: *The introduction of a feature that sends a notification when there is a shortage of blood in one’s area would also encourage those who would not have done so before to download the app.*

We believed that even those who rejected the idea of the application as described previously might change their mind when the idea of the notification is introduced, because it would make them feel the real importance and urgency of donating blood. If the hypothesis was verified, we would have very strong results to support our idea.

Hypothesis 13: *People would download the app.*

This hypothesis is strictly linked to hypotheses 3, 8 and 11. Indeed it tested the same thing but with a different method (more on this later). Therefore, we decided to consider it separately from the other ones. If hypothesis 13 was falsified, then all the previous positive findings would not count.

5. Data Collection

Data was collected through four different processes.

Firstly, we looked for institutional data on Italian blood donors on websites as “AVIS Nazionale”, “Centro Nazionale Sangue” and “Ministero della Salute”. The aim was to verify our theory about the fact that the proportion of blood donors among young people (age 18-36) was lower than among older people, and whether it was true that the total number of donors and the number of new donors was falling.

Secondly, we contacted 46 volunteers of blood-donation associations such as AVIS and Fidas to ask for more information on the organization of their local associations and on their needs as volunteers and blood donors. We mainly contacted them via Whatsapp and collected the answers to our questions with text messages, but others accepted to have a call. On the phone, we asked them the same questions but we also ranged over related questions. Unfortunately, only 16 volunteers answered and the questions and interviews were conducted in Italian (see Appendix 1, a translation into English is reported).

Thirdly, we developed a survey on Qualtrics composed of 39 questions. The reason for this choice is that we think that blood donation is a topic that may create the social desirability response bias[4], leading people to consciously or unconsciously answer in a more “politically correct” or “moral” way than they would. Therefore, in our opinion, an anonymous unmonitored survey was the best choice, if compared to live interviews or a monitored survey. We are aware that this choice has some limits like low sample size, imperfect randomization and self-selection bias into the survey. Nevertheless, we tried to minimize these issues by distributing the link to the survey without referencing the subject, by posting it on unrelated Facebook groups (ex. concert tickets groups) and by sending it to people from different age groups.

The final sample was composed of 1015 people. Questions were a mix of multiple choices and open questions, and they were written in Italian since only people who can speak Italian are allowed to donate blood in Italy[5]. As our hypotheses targeted different groups, the survey was structured as a descending tree in which different answers to specific questions directed the respondent to one set of questions rather than the other two.

The structure can be summarized as follows. After an initial common block, the survey asks a question to split between donors (at least once in the last two years) and non-donors. We decided to specify between regular donors and other types of donors as there are many

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[4] Krumpal, Ivar (2013). "Determinants of social desirability bias in sensitive surveys: a literature review". Quality & Quantity. 47: 2025–2047.

[5] https://www.donailsangue.salute.gov.it/donaresangue/dettaglioContenutiCns.jsp?lingua=italiano&area=cns&menu=dedicatoA&id=12)

people that stop donating because they forget or they stop caring, and one of the goals of our application is also to keep donors attached to the system. Therefore, we decided to consider occasional donors as non-donors. However, we are aware that there are also other reasons why people may stop donating, like health or age, and we took care of these specific cases in the following part of the survey.
After this question, regular donors proceed in their unique block while non-donors are asked a few questions and then split again. The root of the partition of non-donors is the reason for their choice. Therefore, they are asked: “Why don't you usually donate blood? Indicate the reason you think is most important.”. This question has nine possible answers and each respondent can only choose one. The answers are: 1- “Health reasons”, 2- “I am afraid of the needle”, 3- “I think it might hurt”, 4- “I don't want to go alone / I don't know who to go with”, 5- “I have no time”, 6- ”I have never thought about it”, 7- “I am not interested”, 8- “Other irreconcilable reasons (ex. religious)”, 9- “Other”. Those who answer 1 or 7 are taken to the end of the survey, while the others are split into three macro groups: “Fearful” if they answer either 2, 3 or 4, “Not interested” if they answer 5, 6 or 7 and “Other” if their choice is 9. We chose to give the possibility of choosing only one answer because some combinations would have meant displaying some interviewees too many questions, both those of block “Fearful” and “Not interested”, and we were afraid that people would not complete it or complete it randomly because it lasted too long (we ran some test and, on average, it takes almost 4.5 minutes to fill a survey with both blocks). However, there is a category “Other” that we could not classify ex-ante to which we decided to present both blocks in order not to waste useful data. Since this choice might lead to a biased sample where only interviewees that are more-than-average interested in blood donation or are more sensitive to social issues, we then looked at the distribution of answers in “Response in Progress” with a progress rate higher than 33%. We chose this percentage because we believe that people who did not complete at least 33% might not have had enough time to complete it, or they might not like to answer the more personal questions that indeed start at that threshold. Moreover, we added an optional open box to “Other” to let interviewees clarify their motivation if they want. In this way, after the survey, we reclassified them between “fearful” and “not interested” or other categories, and when this was not possible, we excluded them from the analysis.
After regular donors, “fearful”, “not interested” and “other” answered to their own blocks, the survey brings everyone to a final common block of a few questions that we are interested to ask both donors and non.

The **first common blocks** asked for information that we believed was important to test if the sample was well-balanced in terms of demographic data and some variables that, in our

opinion, influenced the propensity to donate, the propensity to become a donor and in general to be more sensitive on the topic of blood donation. The questions were about: gender, age, number of inhabitants in the city where they regularly lived, the region where they regularly lived, whether they were/had been students of medical/nursing/veterinary courses and whether they have/had relatives or close friends who donate blood.

The **block common to all non-donors** consisted of three questions. The first two referred to subjects that, in our opinion, influenced the propensity to become a donor and in general to be more sensitive on the topic of blood donation. They investigated whether they would be willing/inclined to donate in the future and whether they had ever witnessed or participated in campaigns to raise awareness about blood donation (e.g. at school or in the workplace). The future-propensity can be answered with yes/no/maybe. We chose to add "maybe" in the first three because we preferred to treat undecided people as "no" rather than false positives. As highlighted before, blood donation is a theme that may involve social desirability bias and so we decided to be as conservative as possible. The third question was: "What do you think is the maximum donation frequency?" and the possible answers were five, of which one was the correct answer, four were false and one was "I don't know". We added this question to know how many people were misinformed on the main matter of blood donation that may be key for the propensity to become a donor (the higher the time and effort required, the lower the propensity) and also to check whether knowing that it takes only 2/4 times over a year would make them more inclined to donate. To analytically check this hypothesis, we added a second question that appeared only to those who answered incorrectly or "I don't know", which was "The maximum frequency is actually four times a year for men and twice a year for women. In light of this information, would you be more inclined to donate?". This question was displayed in a randomized way so that we could split the "misinformed" into two groups and perform a sort of difference-in-difference analysis (more on the assumption in the next chapter).

The "not interested" block consisted of the questions listed in Appendix 2.

The first three questions investigated the possibility of people being influenced by friends around the subject of blood donation and had "yes"/"no"/"maybe" as possible answers. We added the "maybe" option for the usual reason of social desirability response bias. The fourth question, regarding what respondents would use the app for, had multiple answers with the possibility of selecting more than one option. The answers were: "Ask information to donors", "Ask information to experts", "Search for information", "Find out about blood-donation associations' events", "Find the closest blood-donation centre" and "None of these". These also included options that we did not need in order to test our hypotheses, but we thought they might be interesting for a second-moment study, in case we actually

decided to develop the idea. The fifth question, regarding existing potential alternatives, was open-ended.

These questions were aimed to discover whether the effect of peer pressure can be considerable also in blood donation and whether there might be interest in our app and, if not, for which reasons.

The "Fearful" block displays the questions in Appendix 3.

The first, second and third questions ask the interviewees what could possibly help them to become donors. The first question is multiple-choice with the possibility of choosing more than one option. The possible answers are "Speaking with a peer person who donates regularly", "Speaking with a volunteer that has donated for many years", "Speaking with an expert", "None of those", and "Other" (with an open box for specifications). We were interested in those choosing the first two options to find out if a connection with donors may help them overcome their fear.

The second and third questions display "Yes", "Yes and I would prefer a peer" and "No". We decided to specify the with-peer option, for a second-moment analysis in case we decided to actually develop the app. For the same reason we differentiated the first question's answer between peer and "mature" donors.

The fourth question asks about whether the interviewee had precedently looked for a service similar to the one of Blooder, and the possible answers were "Yes, and I found it ", "Yes, but I didn't find it" and "No". The fifth and sixth questions, on the same matter, were open. The idea was to find out if there was a demand for the service we wanted to provide.

The seventh question, together with the eighth (yes/no) and the ninth, which was open, had the aim of finding out if people who answered positively to the first three questions would be interested in an application, which in our opinion was not necessarily sequential, and, if not, why. It centred around what services would be used via the app, and it had the following multiple-choice answers: "finding information from regular donors", "receive support on the day of donation", "coordinate the donation to donate together with a regular donor", "look for events organised by blood donation associations", "none of these" and "other (with an open box for suggestions)". There was the possibility of choosing more than one option.

The donors block consisted of the questions in Appendix 4.

The first question asked if the interviewee was a volunteer in an association for blood donation, and it was aimed at controlling the distribution of "propensity to help non-donors and/or the association and/or the cause". While answering the second question, about what made them start giving blood, they could choose between: "a relative or friend who told me about it", "personal motivations", "awareness campaign or advertising", "other" (with open box). These questions, together with the third and the fourth, which were yes/no, were aimed at checking if the peer pressure, of which we talked before, was reciprocated by donors.

The fifth question was aimed at finding out what service the donors would be willing to give to the non-donors, and it was a multiple choice with more-than-one choice option. The answers were: “Answer questions on donation”, “Support these people during their first donation”, “Donate blood together with a person who is donating for the first time or does not want to go alone”, “None of these” and “Other” (with an open box for suggestions). Also in this case we wanted to know whether non-donors needs were matched by the willingness of donors to help. The sixth (yes/no) and the seventh (open) questions checked whether donors would do these activities also through an app.

Interviewees could answer the 8th question, which asked what they would do on an app like Blooder, with more than option, and the options were: “Book the appointment to donate”, “Receive information from your donation centre”, “Find events organised by associations'', “Receive a notification to remind you to donate every 3/6 months'', “Other” (with an open box for specifications). The ninth question asked whether they would invite friends on such an app, and the possible answers were “yes” or “no”. We added these two questions because some features that we wanted to implement in Blooder were aimed at simplifying the donation process (a lot of centres do not have a website or an app) and getting as many donors as possible to sign up and invite friends, even if they do not want to help in supporting non-donors. The idea is to reach non-donors in a way that campaigns and advertisements can't because dedicating time to such commitments is a very sensitive topic, and these features are aimed at attracting them with conveniences they cannot find in other apps or websites.

Finally, there were the three **social value questions,** on the perceived value, that were:

1. “Would you download this app if it also sent you a notification when there was a shortage of blood of a blood type compatible with yours in your area?”
2. “Would you recommend it to your friends (donors and non-donors)?” [shown only to those who answer yes in the previous]
3. “If you would like more information or to download the app, please select “Yes”. You will be redirected to the website”.

We decided to put the first question (yes/no) at the end of the survey to see if people who answered “No” to the previous questions related to downloading the app would change their mind with the introduction of the notification. The second question (yes/no) served the purpose of testing whether the peer effect might work. Finally, in the third question, we decided to add a sort of experiment to control for the social desirability response bias. Indeed, while it is costless to answer in the most morally correct way to questions in a survey, it is more costly to click on a button that directs you to actually get information and subscribe to the app. Therefore, we specified the last question (yes/no) so that people who

answered “Yes” thought that they would be redirected to the website or app store. Therefore, we believe that only those who were really interested in the app selected “Yes”.

6. Data Analysis

In this section, the analysis performed on the survey data and the experiment will be discussed. All the priors on when to accept a hypothesis were decided together before seeing any data. We chose for each hypothesis a threshold and a level of significance. While the threshold changes with each hypothesis, the level of significance is always 0,05. Even if it is not extremely conservative, we decided to put more pressure on the threshold.
We defined “young people” as those younger than 35 years old, as we found in several institutional dataset of blood-donation associations.
The following paragraphs will briefly describe the type of analysis performed, which are quite similar for each hypothesis. A more detailed description of the analyses that were conducted is presented in the result of each hypothesis.
We associated each hypothesis with either one, two or three questions in the survey and we created a dummy that takes value 1 if the answer is “positive” (in the sense that it is the one that would prove the hypothesis) and 0 if the answer is “negative”. Then, we performed a robust regression with the dummy as an explanatory variable and we added several controls to see if the answers depend on them. In case we found that control was statistically significant, we decided we would take it into account in the analysis. Indeed, we know that our sample could not be correctly randomized and since we do not know the real distribution of these controls in the population, we should see whether these variables might interfere with our decision.
The controls were:
-for fearful non-donor: age, gender, propensity to donate in the future or not, whether they do/have done medical studies or similar and the number of inhabitants of the city where they regularly live;
-for uninterested non-donor: age, gender, propensity to donate in the future or not, whether they do/have done medical studies or similar, number of inhabitants of the city where they regularly live, if they have friends/relatives who donate blood and whether they have ever attended a blood donation campaign or not;
-for donors: age, gender, whether they are blood donation associations’ volunteers or not, whether they do/have done medical studies or similar, number of inhabitants of the city where they regularly live.
We added only the controls that might have influenced the answers and generated biased estimators. The controls, except for age and numbers of inhabitants (ordered dummy of

three values), are dummies 0-1 created through answers of the survey. Propensity to donate, in particular, is created through a question asked to all non-donors that is “Are you willing/proposed to donate in the future?” and it is useful to control that results are not overestimated by people who are more sensitive or in some way more interested in the cause. However, we know that it may be linked to the social desirability response bias.
After the robust regression, we either performed:

- a one-tailed t-test on the mean of the explanatory variable if there was no statistically significant control or we do not the real distribution to see if the mean is above the chosen threshold;
- a one-tailed t-test on the constant of the regression with the dummy as the explanatory variable, adding as covariates the controls that resulted statistically significant, to see if the constant is above the chosen threshold

Then we looked at the confidence interval and the p-value of the one-sided t-test. Accordingly, we decided whether the null (mean or constant lower or equal than the threshold) was accepted or rejected.

7. Results

A note before describing the result: when it is not openly stated we consider the alternative hypothesis of the t-test as the mean/constant of y being larger than 0.66. This is due to the fact that our prior was: if positive answers are twice as many as the negative answers for each question, then the hypothesis is true.
Hypothesis 1: *One of the main reasons why young people who can donate blood do not do it is fear.*
In order to test this hypothesis we used the answer of the question “Why don't you usually donate blood? Indicate the reason you think is most important.”. Our prior was that we accept the hypothesis if the percentage of “Fearful” (those who answer 2-“I am afraid of the needle”, 3-“I think it might hurt / I think it might hurt”, 4-“I don't want to go alone / I don't know who to go with”) is more than 33%. We decided so because if the main reasons are fear, apathy and others, the first two should at least represent one-third and one-third of the answers, once health and irreconcilable reasons are taken out. Indeed, we eliminated from the sample “Health Reason” and “Irreconcilable reason”, and people older than 41. We create a dummy “paura” that takes value 1 if the answer was 2,3 or 4 and 0 otherwise (only for non-donors). Then, we performed a robust regression with “paura” as a dependent variable and several dummies to see if it depends on demographic features. Gender is the only stat. sign. coefficient. Indeed, being female increases the propensity to be “fearful” by 13% with respect to being men. As more women answered our survey, we performed a

one-tailed t-test on the value:(0.5*coef_costant + 0.5*(coef_costant + coef_genere), assuming that the non-donors population is equally split between female and male. Our null hypothesis is that this value is lower or equal to 0.33 and we reject it. Therefore the hypothesis is confirmed.

Hypothesis 2: *"Fearful" people may become more inclined to donate blood if they either speak to a regular donor, receive support on the day of the donation by a regular donor or donate together with a regular donor*.

To prove this hypothesis we use data from questions: "What do you think would help you or make you more likely to donate?", "Do you think it would help you or make you more likely to donate if you could get support from a regular donor on the day of donation?" and "Do you think it would help or make you more likely to donate if you could go and donate with a regular donor?". We tested each hypothesis separately. Our prior was that if positive answers are twice as many as negative answers for each question then the single hypothesis is true. Moreover, we decided to accept the overall hypothesis if at least two out of three hypotheses were true. We created a dummy for each question that takes value of 1 if the answers are the one expected (see data collection) and 0 otherwise (only for fearful non-donors). Then, we run a robust regression for each question with the dummy as dependent variables and several controls. For each question, all the covariates are not stat. significant except "propensity to donate in the future". However, since we did not know the real distribution of this variable we proceeded with three simple one-tailed t-tests for each question. The null is the mean of the dummy is lower or equal than 0.66. This hypothesis is rejected only for the question related to "support" and "donate together". We expected that the first hypothesis may be false as fear may not be overcome simply by talking about it. It may require more meaningful actions. Still two out of three hypotheses are true and so the overall hypothesis is true.

Hypothesis 3: *Those who find speaking or receiving support or donating together with a regular donor helpful, would do it also on an application.*

This hypothesis is analyzed through two questions: "If there was an app that connected donors and non-donors, would you use it to:" and "This platform exists. It puts you in touch with donors, clarifies doubts, shares events organised by associations (e.g. Avis, Red Cross), and finds the donation centre nearest to you. Would you sign up?". Even if they sound very similar, our idea is to double-check the answer and test more clearly the demand of the interviewee by passing from a hypothetical case ("if there was..") to a real one ("the platform exists".) We created a dummy "propenso_aiuto" that takes value 1 if they answered that speaking/supporting/donating together would help them in general (previous hypothesis question) and 0 otherwise. Then, we generated a dummy=1 if the interviewee would do one of the previous actions also on the app, and 0 otherwise for each question. On each of them,

we regressed “propenso_aiuto” and the same set of covariates that we used in the previous hypothesis. The only variables that are stat. sign. in both questions are: “propenso_aiuto” and propensity for donating in the future are stat significant, therefore we perform a t-test. We chose as a sample of the t-test only those with “propenso_aiuto” equal to one because it would be incoherent to count people who would receive support on the app but not in general. In this case, the threshold of the t-test is 0.66 and the null is rejected. Therefore, we can infer that hypothesis 3 can be accepted.

Hypothesis 4: *The application is the best option to develop to help fearful people.*

To test this hypothesis we both use theory and data.

For what concerns the alternative: website, telegram group, social media group or page, we rejected them using theory (see theory chapter). We did not test these opinions through questions on the survey for two reasons. Firstly, because we would like a short and effective survey rather than a long one where people start to not pay attention after a while. Secondly, we feared that asking a question like “Would you prefer to speak to a volunteer on Facebook or through an app” would lead people to choose the easy one. However, as we said before, it is not so simple to speak directly to a volunteer on social media. Therefore, this test requires more accurate studies that we can exploit at this moment.

Instead, for the alternative “contacting a volunteer through telephone or WhatsApp” we think that would actually be a good way to communicate. Therefore, we performed a sort of experiment and tried to contact around 4 Avis cell phones for each Italian region for a total of 100 asking for information and then looked at the rate of response. The experiment can be considered random because we choose the first four centres in alphabetic order (for the name of the city) for each region on the Avis website. We also control the number of inhabitants in case our sample was not correctly randomized and the results do not change based on this variable. Our prior is that at least the 80% should answer to be an efficient alternative within 7 days from the first message. 52 answered within the same day, other 10 answered but did not have time to speak within 2/3 days from the message. Another 5 answered the day after the message and the other 8 answered from 2 to 7 days after the message. Moreover, another 1 said he was not part of the Avis (but the number is the one on the website) and the other 2 said that they were not any more volunteers and so not willing to speak. Immediate positive responses represent 52% while total positive responses represent only 75%. Therefore we can accept the hypothesis.

Hypothesis 5: *One of the main reasons why young people who can donate blood are not donors is because they are not interested in it.*

As in hypothesis 1, we decided to accept the hypothesis only if not interested people represent at least ⅓ of motivations for not donating (health and inconciliable reason taken off). Here the dummy takes value 1 when the reasons for not donating are: “I have no time”,

”I have never thought about it/ I don't think about it” and “I am not interested”. What does really matter is having friends or relatives that donates lowering the probability of being disinterested by circa 28% and being a female, which lowers the probability by 9%. The t-test is therefore as the one in hypothesis 1 so that it weights for gender and the null hypothesis (mean <= 0.33) is rejected. Therefore, we accept hypothesis 5.

Hypothesis 6: *Knowing that many friends or acquaintances donate makes uninterested people more willing to donate.*

As before our prior is to accept the hypothesis if the positive answers are twice as many as the negative ones (0,66). We use the answer to “If you knew that many of your friends and acquaintances donated blood, would you be more inclined to inquire or consider donating in the future?”. After creating a dummy that takes value 1 if the answer is yes and 0 otherwise we perform a robust regression with the covariates. Here we also add the interaction between the propensity to donate and having a friend/parent that donates. The only stat sign covariates are the last two but not their interaction. The simple t-test does not reject the null. We also carried out another t-test to see if the null was rejected for those who have friends who donate. Yet, it is not. Therefore we do not accept the hypothesis.

Hypothesis 7: *Uninterested people would be more likely to learn more or consider donating in the future if one of their relatives or friends invited them to donate or to learn about donating blood.*

We used the question: “If a relative or friend of yours invited you to donate or to learn about donating blood, would you be more likely to learn more or consider donating in the future?”. Strangely, having friends or relatives who donate is not stat. sign. The propensity to donate is stat. significant. The simple one-tailed t-test rejects the null hypothesis of the mean lower or equal than 0.66 and so we accept the hypothesis.

Hypothesis 8: *Uninterested non-donors would register themself on an app that links donors with non-donors and has other related features if invited by friends.*

The question used is: “If your relative or friend invited you to an application that puts you in touch with donors, helps you clarify doubts, shows events organised by associations such as Avis or Red Cross and finds the nearest donation centre, do you think you would sign up?”.

The dummy linked to the question depends as before on propensity to donate, on having friends/relatives who donate and on the cohort 26-35 years old. The simple t-test does not reject the null hypothesis meaning that “not interested” people would not register in this app. Hypothesis 8 is false.

Hypothesis 9: *Donors would actually invite friends.*

We test this through the question: “Have you ever invited some of your friends or acquaintances to donate?”. The prior is that the “yes” should be twice as much as the “no”.

In this case, the null hypothesis of the one-tailed test is rejected with a p-value = 0 therefore we accept hypothesis 9.

Hypothesis 10: *Donors would actually help and support the non-donors.*

The dummy tested in this hypothesis takes value 1 if the interviewee answers either “answer to questions", “support” or “donate together” to the question “There are people who do not donate because they are afraid, doubtful or uninformed. Would you devote time to:”. The prior is that at least 66% of donors would do it. The null hypothesis is rejected so hypothesis 10 is true.

Hypothesis 11: *Donors would do these activities through an app.*

We decided to accept this hypothesis if more than 66% of the donors that were willing to help non-donors (previous hypothesis’s question) answered yes to the question “Would you do this/these activity(s) through a dedicated app?”. The simple t-test rejects the null and so the hypothesis is verified.

Hypothesis 12: *The introduction of a feature that sends a notification when there is a shortage of blood in one’s area would also encourage those who would not have done so before to download the app.*

Using the question “Would you download this app if it also sent you a notification when there was a shortage of blood of a blood type compatible with yours in your area?” we create a dummy that is equal to 1 for the yes and 0 for the no. Then we perform a t-test using as a sample the “fearful” and “not interested” non-donors that answered that they would have not downloaded the app in previous questions (hypo 3 and hypo 8). Here, we decided to accept the hypothesis if the one-tailed t-test with null hypo: mean of the dummy <= 0.33 is rejected. The decision to have a less conservative prior was due to the fact that here we are dealing with the less inclined people and would be a victory for us even if we would convince just a few of them (1 out of 3). The null hypothesis of the t-test was rejected. Therefore, the hypothesis is true and introducing these features is confirmed to be very important to stimulate even the more hesitant individuals.

We also run other t-tests for donors and non-donors with a threshold at 0.66 and they also give positive results.

Hypothesis 13: *People would actually download the app.*

As said before, the result may be overestimated due to a social desirability response bias. Therefore we decided to add this double-check that has an intrinsic “effort” so that only really interested people would click yes (see data collection).

Also here the threshold is 0.66 for all the categories except for those who have “propensity to donate” = 0 and those who would have not downloaded the app before the introduction of the “shortage of blood” notification. For the latter, the threshold is 0.33.

After the robust regression, we run several t-tests. The t-test shows that the threshold is passed by donors, non-donors, non-donors with a low propensity to donate and also for people who would not download before the app. Therefore we accept the hypothesis.

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8. Decision

The analysis of the data collected showed sufficient interest in the proposed idea. The interest is particularly relevant among the group of potential donors who are held back by feelings of fear towards the donation of blood, for which we were able to accept all the hypotheses formulated, except one part of hypothesis 2. This suggests that we are in a scenario in which these people would be willing to use the app and would constitute a considerable user base.

The results of the analysis conducted on donors showed optimistic attitudes towards the project of Blooder as well, also considering the comments they left in the open questions of the survey. We were able to verify all the hypotheses formulated, therefore we are in a scenario in which they would use the app with all the proposed features.

On the contrary, the group of non-donors who are uninterested in the topic yielded less optimistic results: the hypothesis that they would download the app cannot be accepted, which is in line with their self-declared lack of interest in blood donation altogether. However, no in-depth analysis was run on this group to determine the possible reasons behind this lack of interest, which might bring to light interesting results and open the door to different solutions to the issue represented by the low number of blood donors. Moreover, once the feature of the notification of blood scarcity was proposed, even those who said that they would have not downloaded the app changed their mind. This signal gave us hope and so in order to deal with this mixed information on uninterested people we decided to choose an “intermediate” action between the proposed one.

Indeed, it should be taken into account that the analysis performed was constrained on both sides of time and economic resources. For this reason, the optimal action to take is to conduct further research and experiments to verify the external validity of our results. In particular, it would be very useful to implement an experiment to assess the actual behaviour of participants rather than their self-declared attitudes or intentions.

In conclusion, if our results were confirmed by future exploration, we would be able to conclude that we are in the scenario in which fearful potential donors and donors like the app and would download it, which would lead us to choose to develop the app with the complete set of features described.

APPENDIX

Appendix 1

1- Is it possible to book a blood donation via the association's website or app?
2- In your opinion, could improvements be made to the association's website to make it more accessible?
3- Is there a way to put potential donors in touch with volunteers to clarify questions or share experiences, in order to encourage donation?
4- When there is a shortage of blood in a certain area, are associations aware of it? If so, how do you communicate it to donors?
5- Can you think of other services/needs related to blood donation that do not exist and that could help donors and/or potential donors?
6- How would you encourage young people to donate?

Appendix 2

1. If you knew that many of your friends and acquaintances donated blood, would you be more inclined to inquire or consider donating in the future?
2. If a relative or friend of yours invited you to donate or to learn about donating blood, would you be more likely to learn more or consider donating in the future?
3. If your relative or friend invited you to an application that puts you in touch with donors, helps you clarify doubts, shows events organised by associations such as Avis or Red Cross and finds the nearest donation centre, do you think you would sign up?
4. Would you use the app to...? [shown only to who answered no to the 3rd]
5. Why not? Explain briefly (optional) [shown only to who answered no to the 3rd]

Appendix 3

1. What do you think would help you or make you more likely to donate?
2. Do you think it would help you or make you more likely to donate if you could get support from a regular donor on the day of donation?

3. Do you think it would help or make you more likely to donate if you could go and donate with a regular donor?
4. Have you ever searched online for direct contact with donors or a service similar to the one described above?
5. What was it about? [shown only to who answered “Yes, and I found it” to the 4th]
6. Why were you not encouraged to donate? Explain briefly (optional) [shown only to who answered “Yes, and I found it” to the 4th]
7. If there was an app that connected donors and non-donors, would you use it to:
8. This platform exists. It puts you in touch with donors, clarifies doubts, shares events organised by associations (e.g. Avis, Red Cross), and finds the donation centre nearest to you. Would you sign up?
9. Why not? Explain briefly (optional) [shown only to who answered no to the 3rd]

Appendix 4

1. Are you a volunteer in a blood donation association?
2. What made you start donating blood?
3. Have you ever invited some of your friends or acquaintances to donate?
4. Do you think it was useful? [displayed only if yes was answered to 3]
5. There are people who do not donate because they are afraid, doubtful or uninformed. Would you devote time to:
6. Would you do this/these activity(s) through a dedicated app?
7. What do you think about the idea? Is there a specific reason why you would / would not sign up?
8. If there was an app for donors and potential donors, would you use it to:
9. If there was an app that would connect donors with potential donors for the purpose of raising awareness, would you invite your friends/relatives (donors and non-donors) to use it? [displayed only if answers to 8 in a positive way]

Results

Hypothesis 1

```
. reg paura i.genere i.eta_cohort i.matinf, robust

Linear regression                               Number of obs     =        306
                                                F(4, 301)         =       1.49
                                                Prob > F          =     0.2045
                                                R-squared         =     0.0203
                                                Root MSE          =     .49894

------------------------------------------------------------------------------
             |               Robust
```

```
. //50 50 uomini e donne
. test (_b[_cons] + 0.5 * _b[2.genere]) = `val'

 ( 1)  .5*2.genere + _cons = .33

       F(  1,   304) =   33.76
            Prob > F =    0.0000

.
. local sign_ = sign((_b[_cons] + 0.5 * _b[2.genere])-`val')

.
. display "Ho: coef <= `val'  p-value = " ttail(r(df_r),`sign_'*sqrt(r(F)))
Ho: coef <= .33  p-value = 7.869e-09
```

Hypothesis 2

>speaking with a peer or a regular donor

```
. ttest q45_coetaneovolontario == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
q45_co~o |     138     .615942    .0415535    .4881436    .5337728    .6981113
------------------------------------------------------------------------------
    mean = mean(q45_coetaneovolontario)                           t =  -1.0603
H0: mean = 0.66                                Degrees of freedom =      137

   Ha: mean < 0.66             Ha: mean != 0.66              Ha: mean > 0.66
 Pr(T < t) = 0.1454         Pr(|T| > |t|) = 0.2909          Pr(T > t) = 0.8546
```

>receiving support on the donation day

```
. ttest `variabile' == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
q46_si~o |     138    .7463768    .0371718    .4366694    .6728722    .8198814
------------------------------------------------------------------------------
    mean = mean(q46_si_esupporto)                                 t =   2.3237
H0: mean = 0.66                                Degrees of freedom =      137

   Ha: mean < 0.66             Ha: mean != 0.66              Ha: mean > 0.66
 Pr(T < t) = 0.9892         Pr(|T| > |t|) = 0.0216          Pr(T > t) = 0.0108
```

>donating together

```
. ttest `variabile' == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
q47_si~o |     138    .7826087    .0352398    .4139736    .7129245    .8522929
------------------------------------------------------------------------------
    mean = mean(q47_si_esupporto)                                 t =   3.4793
H0: mean = 0.66                                Degrees of freedom =      137

   Ha: mean < 0.66             Ha: mean != 0.66              Ha: mean > 0.66
 Pr(T < t) = 0.9997         Pr(|T| > |t|) = 0.0007          Pr(T > t) = 0.0003
```

Hypothesis 3

>“If there was an app that connected donors and non-donors, would you use it to:”

```
. ttest q48_app == 0.66 if propenso_aiuto == 1

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
 q48_app |     117    .8119658    .0362792    .3924201    .7401102    .8838214
------------------------------------------------------------------------------
    mean = mean(q48_app)                                          t =   4.1888
H0: mean = 0.66                                 Degrees of freedom =      116

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0001          Pr(T > t) = 0.0000
```

> “This platform exists. It puts you in touch with donors, clarifies doubts, shares events organised by associations (e.g. Avis, Red Cross), and finds the donation centre nearest to you. Would you sign up?”

```
. reg q57 propensoadonare propenso_aiuto i.genere i.matinf i.eta_cohort i.parentioamici i.dimensionecitta, robust

Linear regression                               Number of obs     =        136
                                                F(11, 123)        =          .
                                                Prob > F          =          .
                                                R-squared         =     0.4283
                                                Root MSE          =     .37409

------------------------------------------------------------------------------
             |               Robust
         q57 | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
propensoadonare |   .2827106   .0886574     3.19   0.002     .1072188    .4582025
 propenso_aiuto |   .5264725    .104808     5.02   0.000     .3190114    .7339335
             |
        genere |
        Donna |   .0623762   .0822952     0.76   0.450     -.100522    .2252744
        Altro |  -.6041066   .1345546    -4.49   0.000    -.8704493    -.337764
             |
        matinf |
           Si |   .0356871   .0629911     0.57   0.572    -.0889998    .1603741
             |
    eta_cohort |
        26-35 |    .195864   .0875058     2.24   0.027     .0226515    .3690764
        36-45 |   .2506603   .0900864     2.78   0.006     .0723397    .4289808
        46-55 |  -.0458013   .1375652    -0.33   0.740    -.3181031    .2265006
    50 in poi |    .151796   .0738947     2.05   0.042     .0055259    .2980661
             |
  parentioamici |
           Si |   .0446267   .0936883     0.48   0.635    -.1408236    .2300771
             |
dimensionecitta |
 Media (<250k) |   .1355717   .1005294     1.35   0.180      -.06342    .3345634
Grande (>250k) |   .0237207   .0788272     0.30   0.764    -.1323129    .1797542
             |
         _cons |  -.1419505   .1332285    -1.07   0.289    -.4056683    .1217672
------------------------------------------------------------------------------

. ttest q57 == 0.66 if propenso_aiuto == 1

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q57 |     117    .7777778    .0386005    .4175278    .7013247    .8542309
------------------------------------------------------------------------------
    mean = mean(q57)                                              t =   3.0512
H0: mean = 0.66                                 Degrees of freedom =      116

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.9986         Pr(|T| > |t|) = 0.0028          Pr(T > t) = 0.0014
```

Hypothesis 5

```
. reg disinteressato i.genere i.matinf i.eta_cohort i.parentioamici i.campagne, robust

Linear regression                               Number of obs     =        400
                                                F(8, 391)         =       6.00
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0980
                                                Root MSE          =     .47813

------------------------------------------------------------------------------
             |               Robust
disinteress~o | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      genere |
      Donna  |   -.120192   .0512856    -2.34   0.020    -.2210219    -.019362
             |
      matinf |
         Si  |  -.0220031   .0602202    -0.37   0.715     -.140399    .0963929
             |
  eta_cohort |
       26-35 |  -.0188886   .0763637    -0.25   0.805    -.1690233    .1312461
       36-45 |   .0570227   .1212443     0.47   0.638    -.1813495     .295395
       46-55 |   .2664562    .101057     2.64   0.009     .0677732    .4651393
  50 in poi  |    .237995   .0681082     3.49   0.001     .1040909     .371899
             |
parentioamici |
          Si |   -.235009     .05418    -4.34   0.000    -.3415296   -.1284883
             |
    campagne |
          Si |  -.0141108   .0515423    -0.27   0.784    -.1154456     .087224
       _cons |   .6446661   .0645545     9.99   0.000     .5177488    .7715834
------------------------------------------------------------------------------
. reg disinteressato i.genere i.parentioamici, robust

Linear regression                               Number of obs     =        400
                                                F(2, 397)         =      11.52
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0529
                                                Root MSE          =     .48623

------------------------------------------------------------------------------
             |               Robust
disinteress~o | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      genere |
      Donna  |  -.0944104   .0497788    -1.90   0.059    -.1922734    .0034526
             |
parentioamici |
          Si |  -.2330832   .0528119    -4.41   0.000    -.3369091   -.1292573
       _cons |   .6724298   .0535601    12.55   0.000     .5671331    .7777266
------------------------------------------------------------------------------

. //50 50 uomini e donne senza amici che donano
. test (_b[_cons] + 0.5 * _b[2.genere]) = `val'

 ( 1)  .5*2.genere + _cons = .33

       F(  1,   397) =   44.14
            Prob > F =    0.0000

.
. local sign_ = sign((_b[_cons] + 0.5 * _b[2.genere])-`val')

.
. display "Ho: coef <= `val'  p-value = " ttail(r(df_r),`sign_'*sqrt(r(F)))
Ho: coef <= .33  p-value = 5.050e-11
```

Hypothesis 6

```
. ttest `variabile' == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
  q55_si |     178    .6123596    .0366211    .4885862    .5400894    .6846297
------------------------------------------------------------------------------
    mean = mean(q55_si)                                           t =  -1.3009
H0: mean = 0.66                                Degrees of freedom =      177

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.0975         Pr(|T| > |t|) = 0.1950          Pr(T > t) = 0.9025

. ttest `variabile' == 0.66 if parentioamici == 1

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
  q55_si |     105    .6857143    .0455216    .4664573    .5954433    .7759853
------------------------------------------------------------------------------
    mean = mean(q55_si)                                           t =   0.5649
H0: mean = 0.66                                Degrees of freedom =      104

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.7133         Pr(|T| > |t|) = 0.5734          Pr(T > t) = 0.2867
```

Hypothesis 7

```
. ttest `variabile' == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
  q59_si |     177    .7514124    .0325779    .4334202    .6871189     .815706
------------------------------------------------------------------------------
    mean = mean(q59_si)                                           t =   2.8060
H0: mean = 0.66                                Degrees of freedom =      176

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.9972         Pr(|T| > |t|) = 0.0056          Pr(T > t) = 0.0028
```

...more on the next page.

Hypothesis 8

```
. reg `variabile' i.parentioamici##propensoadonare i.genere i.matinf i.eta_cohort i.dimensionecitta, robust

Linear regression                               Number of obs     =        176
                                                F(11, 163)        =          .
                                                Prob > F          =          .
                                                R-squared         =     0.2483
                                                Root MSE          =     .45001

------------------------------------------------------------------------------
                             |               Robust
                      q60_si | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-----------------------------+------------------------------------------------
                 parentioamici |
                          Si |   .2507974   .1092425     2.30   0.023     .0350844    .4665104
              1.propensoadonare |   .4165756   .0939674     4.43   0.000     .2310253    .6021259
                             |
parentioamici#propensoadonare |
                        Si#1 |   .0239774   .1414889     0.17   0.866    -.2554101     .303365
                             |
                       genere |
                        Donna |   .0854972   .0704669     1.21   0.227    -.0536485    .2246429
                        Altro |   .0840548   .0970236     0.87   0.388    -.1075304    .2756401
                             |
                       matinf |
                           Si |   .0421343   .0835565     0.50   0.615    -.1228585    .2071272
                             |
                  eta_cohort |
                        26-35 |   .2067977   .0965184     2.14   0.034       .01621    .3973854
                        36-45 |  -.1760231    .156863    -1.12   0.263    -.4857686    .1337225
                        46-55 |  -.0127109   .1359197    -0.09   0.926    -.2811012    .2556794
                    50 in poi |    .045524   .0906109     0.50   0.616    -.1333985    .2244465
                             |
              dimensionecitta |
                Media (<250k) |   .0659103    .081099     0.81   0.418    -.0942297    .2260504
               Grande (>250k) |   .0978909   .0873715     1.12   0.264    -.0746349    .2704168
                             |
                        _cons |  -.0800939   .0924745    -0.87   0.388    -.2626963    .1025086
------------------------------------------------------------------------------

. ttest `variabile' == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
  q60_si |     178    .5280899    .0375229    .5006185      .45404    .6021398
------------------------------------------------------------------------------
    mean = mean(q60_si)                                           t =  -3.5155
H0: mean = 0.66                                Degrees of freedom =       177

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.0003         Pr(|T| > |t|) = 0.0006          Pr(T > t) = 0.9997

. ttest `variabile' == 0.66 if parentioamici == 1

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
  q60_si |     105    .6380952    .0471219    .4828563    .5446506    .7315398
------------------------------------------------------------------------------
    mean = mean(q60_si)                                           t =  -0.4649
H0: mean = 0.66                                Degrees of freedom =       104

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.3215         Pr(|T| > |t|) = 0.6430          Pr(T > t) = 0.6785
```

Hypothesis 9

```
. ttest q37 == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q37 |     382    .9267016    .0133523    .2609675    .9004482    .9529549
------------------------------------------------------------------------------
    mean = mean(q37)                                              t =  19.9743
H0: mean = 0.66                                 Degrees of freedom =      381

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Hypothesis 10

```
. ttest q31_agire == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
q31_ag~e |     382     .960733    .0099507    .1944843    .9411679    .9802981
------------------------------------------------------------------------------
    mean = mean(q31_agire)                                        t =  30.2224
H0: mean = 0.66                                 Degrees of freedom =      381

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Hypothesis 11

```
. reg q35 volontario i.genere i.matinf i.eta_cohort i.dimensionecitta, robust

Linear regression                               Number of obs     =        371
                                                F(10, 360)        =       8.60
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0528
                                                Root MSE          =     .39277

------------------------------------------------------------------------------
             |               Robust
         q35 | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
  volontario |   .0360802   .0513423     0.70   0.483    -.0648884    .1370488
             |
      genere |
      Donna  |   .0227127   .0423554     0.54   0.592    -.0605825    .1060079
      Altro  |  -.0817063   .3427602    -0.24   0.812    -.7557701    .5923574
             |
      matinf |
         Si  |   .0627917   .0551231     1.14   0.255    -.0456121    .1711956
             |
  eta_cohort |
      26-35  |   .0037457   .0776917     0.05   0.962    -.1490409    .1565322
      36-45  |   .2684661   .0475729     5.64   0.000     .1749104    .3620218
      46-55  |   .0798278   .0678825     1.18   0.240    -.0536681    .2133238
  50 in poi  |   .0792793   .0590961     1.34   0.181    -.0369376    .1954963
             |
dimensionecitta |
 Media (<250k)  |  -.0881423   .0497925    -1.77   0.078     -.186063    .0097783
Grande (>250k)  |  -.0068918    .048861    -0.14   0.888    -.1029806     .089197
             |
       _cons |   .7234388   .0681656    10.61   0.000     .5893859    .8574916
------------------------------------------------------------------------------
```

```
. ttest q35 == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q35 |     371    .8032345    .0206678    .3980904    .7625934    .8438756
------------------------------------------------------------------------------
    mean = mean(q35)                                              t =   6.9303
H0: mean = 0.66                                 Degrees of freedom =      370

   Ha: mean < 0.66               Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest q35 == 0.75

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q35 |     371    .8032345    .0206678    .3980904    .7625934    .8438756
------------------------------------------------------------------------------
    mean = mean(q35)                                              t =   2.5757
H0: mean = 0.75                                 Degrees of freedom =      370

   Ha: mean < 0.75               Ha: mean != 0.75                 Ha: mean > 0.75
 Pr(T < t) = 0.9948         Pr(|T| > |t|) = 0.0104          Pr(T > t) = 0.0052
```

Hypothesis 12

```
. reg q30 donatore i.genere i.matinf i.eta_cohort i.dimensionecitta, robust

Linear regression                               Number of obs     =        832
                                                F(10, 821)        =       3.50
                                                Prob > F          =     0.0002
                                                R-squared         =     0.0531
                                                Root MSE          =     .29668

------------------------------------------------------------------------------
             |               Robust
         q30 | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
    donatore |   .1055274   .0216729     4.87   0.000     .0629866    .1480682
             |
      genere |
      Donna  |   .0248641    .021973     1.13   0.258    -.0182658    .0679941
      Altro  |  -.3326049   .1812241    -1.84   0.067    -.6883221    .0231123
             |
      matinf |
          Si |   .0206311    .023051     0.90   0.371    -.0246148    .0658769
             |
  eta_cohort |
       26-35 |   .0652529   .0250499     2.60   0.009     .0160836    .1144222
       36-45 |   .0277863   .0322244     0.86   0.389    -.0354656    .0910383
       46-55 |  -.0310382   .0361369    -0.86   0.391    -.1019698    .0398933
  50 in poi  |  -.0639112   .0311408    -2.05   0.040    -.1250361   -.0027863
             |
dimensionecitta |
 Media (<250k) |  -.0000583   .0255559    -0.00   0.998    -.0502209    .0501042
Grande (>250k) |   .0217127   .0244318     0.89   0.374    -.0262434    .0696687
             |
       _cons |   .8339316   .0304162    27.42   0.000      .774229    .8936342
------------------------------------------------------------------------------
```

```
. ttest q30 == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q30 |     832    .8978365    .0105062    .3030453    .8772147    .9184584
------------------------------------------------------------------------------
    mean = mean(q30)                                              t =  22.6377
H0: mean = 0.66                                 Degrees of freedom =      831

   Ha: mean < 0.66             Ha: mean != 0.66              Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest q30 = 0.33 if q57==0| q60_si == 0

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q30 |     149    .6979866    .0377403    .4606796     .623407    .7725661
------------------------------------------------------------------------------
    mean = mean(q30)                                              t =   9.7505
H0: mean = 0.33                                 Degrees of freedom =      148

   Ha: mean < 0.33             Ha: mean != 0.33              Ha: mean > 0.33
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Hypothesis 13

```
. reg q81 donatore i.genere i.matinf i.eta_cohort i.dimensionecitta, robust

Linear regression                               Number of obs     =        825
                                                F(10, 814)        =       6.70
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0714
                                                Root MSE          =     .41143

------------------------------------------------------------------------------
             |               Robust
         q81 | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
    donatore |   .1399755   .0294213     4.76   0.000      .082225    .1977261
             |
      genere |
      Donna  |  -.0130969   .0292274    -0.45   0.654    -.0704669    .0442732
      Altro  |  -.5596236   .1717133    -3.26   0.001    -.8966766   -.2225706
             |
      matinf |
         Si  |   .0678279   .0337007     2.01   0.044     .0016774    .1339784
             |
  eta_cohort |
      26-35  |   .1553103   .0383386     4.05   0.000     .0800562    .2305645
      36-45  |    .104425   .0509545     2.05   0.041     .0044072    .2044428
      46-55  |   .0837075    .045783     1.83   0.068    -.0061592    .1735742
  50 in poi  |   .0038899    .040473     0.10   0.923    -.0755539    .0833336
             |
dimensionecitta |
 Media (<250k) |  -.0075934   .0361186    -0.21   0.834      -.07849    .0633032
Grande (>250k) |   .0743192   .0343982     2.16   0.031     .0067996    .1418387
             |
       _cons |   .6362717   .0395577    16.08   0.000     .5586245    .7139189
------------------------------------------------------------------------------
```

```
. ttest q81 == 0.66

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q81 |     825    .7648485     .014774    .4243507    .7358494    .7938476
------------------------------------------------------------------------------
    mean = mean(q81)                                              t =   7.0968
H0: mean = 0.66                                 Degrees of freedom =      824

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest q81 == 0.66 if (donatore == 1)

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q81 |     377    .8408488    .0188656    .3663032    .8037536    .8779441
------------------------------------------------------------------------------
    mean = mean(q81)                                              t =   9.5862
H0: mean = 0.66                                 Degrees of freedom =      376

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest q81 == 0.66 if (donatore == 0)

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q81 |     448    .7008929    .0216564    .4583787    .6583319    .7434538
------------------------------------------------------------------------------
    mean = mean(q81)                                              t =   1.8883
H0: mean = 0.66                                 Degrees of freedom =      447

   Ha: mean < 0.66             Ha: mean != 0.66                 Ha: mean > 0.66
 Pr(T < t) = 0.9702         Pr(|T| > |t|) = 0.0596          Pr(T > t) = 0.0298


. ttest q81 == 0.33 if (donatore == 0 & propensoadonare == 0)

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q81 |     123    .4308943    .0448334    .4972267    .3421421    .5196466
------------------------------------------------------------------------------
    mean = mean(q81)                                              t =   2.2504
H0: mean = 0.33                                 Degrees of freedom =      122

   Ha: mean < 0.33             Ha: mean != 0.33                 Ha: mean > 0.33
 Pr(T < t) = 0.9869         Pr(|T| > |t|) = 0.0262          Pr(T > t) = 0.0131

. ttest q81 = 0.33 if q57==0| q60_si == 0

One-sample t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. err.   Std. dev.   [95% conf. interval]
---------+--------------------------------------------------------------------
     q81 |     148    .4324324     .040861    .4970958    .3516815    .5131833
------------------------------------------------------------------------------
    mean = mean(q81)                                              t =   2.5068
H0: mean = 0.33                                 Degrees of freedom =      147

   Ha: mean < 0.33             Ha: mean != 0.33                 Ha: mean > 0.33
 Pr(T < t) = 0.9934         Pr(|T| > |t|) = 0.0133          Pr(T > t) = 0.0066
```