



BLOOD DONATION IN THE EU: EXPLORING BEHAVIOURAL INSIGHTS FOR INNOVATIVE INTERVENTIONS

A literature review and an overview of the blood donation landscape in the EU

EU Policy Lab



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EU Policy Lab

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Abstract

This Science for Policy report contributes to the policy debate on the importance of securing enough blood and blood products to maintain a functional healthcare system. It outlines recent progressions in the field of blood donation, offering new perspectives on factors associated with blood donor motivations, intentions and behaviour. It also summarises the findings from research following social science and behavioural science research agendas in the field of blood donation, including theoretical models and evidence on motivation that leads to blood donor intentions and behaviour. In addition, it encompasses studies testing the effects of behavioural interventions to increase blood donations, such as reminders, active decision elicitation mechanisms (methods or techniques used to actively prompt or solicit a decision from someone) and public pledges to donate blood. Finally, it describes and reports on the current practices used in blood services across the EU-27.

Foreword

Blood donation is a critical component of healthcare systems around the world, including in the European Union, and it is essential for maintaining adequate supplies of blood and blood products to treat patients with a range of conditions, from cancer to blood disorders to trauma. However, despite the importance of blood donation, there are ongoing **challenges in securing sufficient supplies of blood**, due, for example, to the implications of the projected demographic context, or to disruptive crises such as the COVID-19 pandemic. Moreover, there are notable variations in donor motivations and behaviour and barriers to donation that affect the success of blood donation programmes, making it an interesting field to investigate and in which to implement strategies that could lead to positive outcomes.

In the EU, blood donation and transfusion services operate at the national and regional levels, and the blood supply chain can be organised as a nationwide system, a hospital-based system or a mixed system (Gorleer, Bracke and Hustinx, 2020). Blood and blood products are regulated and monitored to ensure that they meet strict quality and safety standards set by EU legislation. These standards include the testing of blood donations for infectious diseases, such as HIV, hepatitis B and C and West Nile virus. However, despite the importance of blood donation, there are ongoing challenges in securing sufficient supplies of blood and blood products across the EU. Factors such as ageing populations, changing lifestyles and the COVID-19 pandemic have affected donor behaviour and availability, making it a complex area for study and intervention.

“By better understanding the factors that drive blood donors to participate and tailoring interventions to the needs of specific donor groups, the EU can help ensure a reliable and sustainable supply of blood and blood products, improving healthcare outcomes for patients across the continent”.

Therefore, research on **donor motivations, intentions and behaviour**, and the effectiveness of various interventions to increase blood donations, is crucial for the EU’s healthcare system. By better understanding the factors that drive blood donors to participate and tailoring interventions to the needs of specific donor groups, the EU can help ensure a reliable and sustainable supply of blood and blood products, improving healthcare outcomes for patients across the continent.

The EU blood legislation adopted in 2002 (Directive 2002/98/EC) obliges Member States to take the necessary measures to **encourage voluntary and unpaid blood donation**, with a view to ensuring that blood and blood components are, as far as possible, provided from such donations. As explained in a recital of that directive, voluntary and unpaid donation is a factor that can

contribute to **high safety standards** and, therefore, to the **protection of human health**; the importance of the work of the Council of Europe in this area is also pointed out. In July 2022, the European Commission published a proposal for a revision of the blood legislation, as part of a broader proposal for a regulation on substances of human origin. This proposal strengthens that approach, clarifying that **financial incentives or inducements to donors are not permissible**. The proposal does, however, allow for Member States to compensate or reimburse donors through fixed-rate allowances, as long as national legislation has set an upper limit for such allowances that ensures that they are financially neutral. This approach is in line with Article 3 of the EU Charter of Fundamental Rights, which prohibits the commercialisation of the human body, and is aligned with the principle of ‘financial neutrality’ recently recommended by the Council of Europe⁽¹⁾.

This literature review contributes to the ongoing debate around blood donation incentives (referring to affirmative measures that stimulate individuals to donate blood) by providing a **comprehensive review of the current state of research on donor motivations and behaviour and the effectiveness of various interventions to increase blood donations**. This Science for Policy report offers insights into the factors that drive blood donors to participate, and also the barriers and challenges that limit donation rates. In addition, it explores the impact of various types of incentives, both monetary and non-monetary, on donor behaviour and provides a closing overview of best practices in blood donation recruitment and retention.

Overall, this review provides a valuable resource for blood donation practitioners, policymakers and researchers alike, offering insights into the latest thinking on donor motivations and behaviour and highlighting key areas for future research and intervention.

⁽¹⁾ Council of Europe Committee on Bioethics (DH-BIO), *Guide for the implementation of the principle of prohibition of financial gain with respect to the human body and its parts from living or deceased donors*, 2018 (<https://rm.coe.int/guide-financial-gain/16807bfc9a>).

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We extend our appreciation to the colleagues at the EU Policy Lab for their invaluable role in nurturing innovation in policy-making, which has facilitated the publication of this report.

Finally, we acknowledge all the researchers and practitioners whose work on blood donation and related areas has contributed to our understanding of this critical healthcare issue. Their dedication and commitment to improving blood donation programmes have inspired us to produce this report, and we hope that our efforts will help to advance this field further.

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Executive summary

The EU has established a comprehensive legal framework that ensures the safety and quality of blood and its components in all stages of the transfusion process, from donation to distribution. This report provides insights on factors that drive blood donation and barriers to donation to help policymakers and practitioners across the EU-27 develop or reinforce effective strategies for a sustainable supply.

Policy context

The EU has a comprehensive regulatory framework for ensuring the safety and quality of blood and blood products used in healthcare. The legal framework defining the quality and safety standards for blood and its components is set out in Directive 2002/98/EC, also referred to as the European blood directive. It covers all steps in the transfusion process, from donation, collection, testing, processing and storage to distribution. Donated plasma, a component of blood, can also be used to manufacture medicinal products such as immunoglobulins or clotting factors. The manufacture of these products is subject to pharmaceutical legislation, whereas the donation, collection and testing of plasma is regulated by blood legislation.

The EU also supports research and innovation in the field of blood donation and promotes international cooperation to address global challenges in blood supply and safety⁽²⁾. In addition, the EU has established a coordinated system for monitoring the safety and availability of blood and blood products across Member States. However, an evaluation of the blood legislation and tissues and cells legislation revealed shortcomings in the light of scientific and technical advancements, and also sociodemographic trends and new epidemiological risks⁽³⁾. As a result, the EU recognised the need to update certain provisions of the legislation to better align with the current landscape and to strengthen the protection of donors as well as that of recipients. To address these issues, in July 2022 the European Commission adopted its proposal for a regulation on standards of quality and safety for substances of human origin intended for human application⁽⁴⁾.

This review of the literature on blood donation behaviour and the EU-27 blood donation overview aimed to provide insights into the factors that drive blood donation behaviour, identify barriers to blood donation and explore best practices for increasing donation rates. This information can help policymakers and blood donation practitioners in the EU to develop effective strategies for ensuring a sustainable supply of safe and high-quality blood and blood products for patients in need.

Key conclusions

This Science for Policy report has produced a comprehensive review of the EU-27 blood donation landscape and contextualised it with a literature review on the key factors that drive blood donation behaviour. The literature review identified a number of relevant studies from social and behavioural science research, including interventions that tested different strategies for promoting blood donation. This report also describes the current practices used in each Member State's blood service and found considerable organisational variation across Member States. The literature review also shows that understanding donor motivations is essential for developing effective and targeted interventions for different categories of donors. In addition, it suggests that more research is needed to explore the potential effects of advancements in information technology on blood donor recruitment and retention. In conclusion, the review provides a foundation for understanding the current state of research in blood donation and provides insights for future research and interventions.

It is hoped that this work will serve as a valuable resource for those interested in further research and policy development in the behavioural drivers in blood donation.

⁽²⁾ For further information on ongoing and completed EU-funded actions, see https://health.ec.europa.eu/blood-tissues-cells-and-organs/blood_en.

⁽³⁾ European Parliamentary Research Service (EPRS) (2022), *Revision of the EU legislation on blood, tissues and cells* ([https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/699492/EPRS_BRI\(2022\)699492_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/699492/EPRS_BRI(2022)699492_EN.pdf)).

⁽⁴⁾ For further information on the proposal for a regulation on substances of human origin, see https://health.ec.europa.eu/blood-tissues-cells-and-organs/overview/proposal-regulation-substances-human-origin_en.

Main findings

The primary objective of this narrative literature review was to provide a comprehensive overview of the latest research in the field of blood donation, highlighting new perspectives on factors strongly associated with blood donor motivations, intentions and behaviour.

Several take-home messages emerged from this review.

- **Blood donors can be classified based on their donation frequency and recency.** Donors are divided into two categories: **new donors** (who have donated for the first time and only once) and repeat donors (who have donated more than once). **Repeat donors** are further divided into **novice donors** (who have donated two to four times) and **experienced donors** (who have donated five or more times). Based on the combination of donation frequency and recency, donors can be classified into six groups: quitters, lapsed weak habit donors, lapsed strong habit donors, active new donors, habit-forming donors (occasional donors) and habitual donors (regular donors).
- **Understanding donor motivations is essential for developing effective and targeted interventions for different categories of donors.** General principles can provide a starting point when considering the challenges facing blood services, such as the need to recruit donors with specific blood phenotypes and replace the loss of older donors with younger donors.
- The use of **behavioural interventions** such as solicitation letters, phone calls, 'warm glow' messages, donor registries, reminders, active decision elicitation mechanisms, and gift vouchers **can be effective in increasing blood donations.**
- More research is needed on the effects of technology advancements, applications and donor management technology on blood donor recruitment and retention.
- Paid days or time off work, refreshments, and small tokens or symbolic gifts are the most common strategies to recognise, reward and incentivise blood donors across EU Member States.
- There is **considerable organisational variation across EU Member States** in terms of blood donation practices, with national health services, hospitals, community blood banks and non-profit organisations being responsible for collections of blood and blood components.
- To increase the rate of current blood donors, blood services need to adopt a multifaceted approach that involves a better understanding of donor motivations, the use of effective interventions and the implementation of appropriate organisational structures and practices.
- Future research should focus on exploring the cognition, motivations and emotions that different incentives and interventions afford relative to each other, and on identifying innovative ways to increase blood donor behaviour, such as the use of technology and social media.

Related and future Joint Research Centre work

This Science for Policy report is part of the work programme of the Competence Centre on Behavioural Insights and will play a critical role in informing the feasibility study of an EU-wide randomised controlled trial aiming to test the findings of the literature review on how to retain and increase the number of blood donors. This trial and its successful implementation has the potential to significantly improve blood donation rates across the EU. The insights and recommendations presented in this report will serve as a valuable reference for designing the trial, including identifying effective interventions to encourage blood donations. Moreover, the results of the trial will provide valuable information for policymakers and practitioners on the most effective ways to increase blood donation rates and ensure a sustainable supply of these substances for healthcare systems.

Disclaimer

The literature review presented herein includes studies that investigate the use of incentives to stimulate blood donations, including those that may not be in line with EU legislation. The inclusion of such incentives in this review was motivated by the goal of providing a comprehensive and exhaustive overview of the literature from a scientific standpoint. However, it is important to note that the inclusion of these studies in the review does not imply endorsement or support of such practices. Readers are encouraged to use their own judgement and consult with relevant authorities regarding the possible use of incentives for blood donations.

The authors of this literature review cannot be held responsible for any decisions made based on the information presented. The information presented in the EU-27 blood donation overview is intended for general information purposes only. The authors have made reasonable efforts to ensure that the information provided is accurate and up to date to the best of their knowledge. However, the authors do not make any representation or warranty, express or implied, as to the completeness, accuracy, reliability, suitability or availability of the information presented in the EU-27 blood donation overview. Therefore, the authors shall not be held liable for any errors, omissions or damages arising from the use or reliance on this information. Users of the EU-27 blood donation overview are advised to verify the accuracy of the information before acting on it and to seek advice where necessary.

1. Introduction

Securing enough blood and blood products is vital for maintaining well-functioning health systems (Bruhin et al., 2020; Ferguson, Murray and O'Carroll, 2019; Healy, 2000). In Europe, each year around 15 million blood donors provide on average 25 million blood units⁽⁵⁾, which are needed for treatments – often life-saving – in patients undergoing surgery, in premature babies, in victims of accidents and in patients with leukaemia, sickle cell anaemia or thalassaemia (Ferguson, Murray and O'Carroll, 2019; Lacetera, Macis and Slonim, 2012). Equally significant is plasma, collected from plasma donors and used to produce plasma-derived medicinal products, which are essential for people with critical conditions such as haemophilia, congenital and acquired immunodeficiencies and other inherited protein disorders (Hartmann and Klein, 2020). The COVID-19 pandemic has caused a decline in the supply of whole-blood donations in many countries, including France⁽⁶⁾, Germany⁽⁷⁾, Ireland⁽⁸⁾ and the United Kingdom⁽⁹⁾ (Chell et al., 2022). In parallel, demand for plasma collections increased because plasma-derived medicinal products were proposed for experimental treatment of COVID-19 (Hartmann and Klein, 2020).

Because many people's lives depend on a constant supply of blood products, which in the EU depends solely on voluntary donors, it is important to understand the nature of donor motivations and behaviour and barriers to donation. Interestingly, there are some enhancements in the blood donation field, such as improved procedures in hospitals for cell salvage and more efficient use of blood, that have helped to decrease the demand for blood in the past 10 years. Furthermore, there is a growing need within blood services to enhance donor–recipient matching for more effective treatment of diseases such as sickle cell anaemia and, therefore, the need to target recruitment to encourage potential donors with specific blood phenotypes, for example Ro Kell (Ferguson, Murray and O'Carroll, 2019; Ferguson et al., 2022; Josephson et al., 2007; Shaz et al., 2008). There are also changes in the blood donor demography that affect supply negatively, in particular the loss of older donors who are not replaced by younger donors (Carter et al., 2011; Greinacher, Fendrich and Hoffman, 2010). Therefore, it is essential to understand donor motivation to develop targeted interventions to address such changes. This review will help understand the current state of play in this area. The main aim of this literature review is to summarise the most recent progressions in the field of blood donation that offer new perspectives on factors that are strongly associated with blood donor motivations, intentions and behaviour.

To build on previous reviews on blood donor motivations (Bednall and Bove, 2011; Carver et al., 2018), this review examines studies testing the effects of behavioural interventions to increase blood donations. Grounded in the work of Godin et al. (2012), we review an additional 11 years of studies on interventions testing the effects of non-incentives (i.e. reminders, active decision elicitation mechanisms, public pledges to donate blood, and similar), non-monetary incentives with some material component (e.g. paid days off work⁽¹⁰⁾ and health checks) and monetary incentives (i.e. cash payments, vouchers, gift cards⁽¹¹⁾ and similar) on promoting blood donation. In contrast to Bagot, Murray and Masser (2019), who concentrated on studies related to the retention of first-time donors, we included studies that concentrate on blood donor recruitment (attracting new donors) and/or blood donor retention (keeping return donors motivated to donate because return donors have lower levels of transfusion-transmissible infections and are easier and are less costly to process). As a major contribution to the literature of blood donor recruitment and retention, we describe and report on the current practices used in blood services across the EU Member States (the EU-27 blood donation overview), thus establishing a link between the reality of EU blood donation systems and the behavioural science findings related to blood donation interventions.

To identify papers that were relevant for this review, we searched Google Scholar, Scopus and PubMed using the software Publish or Perish⁽¹²⁾ and we applied search forwards and search backwards approaches⁽¹³⁾. A

⁽⁵⁾ For more information, consult <https://europeanbloodalliance.eu/press-release-donating-blood-is-an-act-of-solidarity/>.

⁽⁶⁾ For more information, consult <https://www.aa.com.tr/en/europe/france-issues-emergency-call-for-blood-donation/2496374>.

⁽⁷⁾ For more information, consult <https://www.politico.eu/article/blood-donation-squeeze-coronavirus-crisis/>.

⁽⁸⁾ For more information, consult <https://www.irishtimes.com/news/health/blood-transfusion-service-seeks-donations-as-covid-hits-attendance-1.4710763>.

⁽⁹⁾ For more information, consult <https://www.blood.co.uk/news-and-campaigns/news-and-statements/extra-safety-measures-after-coronavirus-uncertainty-causes-drop-in-donations/>.

⁽¹⁰⁾ According to World Health Organization guidelines, offering a paid day off from work as an incentive could render a donation non-voluntary if the incentive is considered excessively large.

⁽¹¹⁾ These vouchers or gift cards may be considered acceptable under World Health Organization guidelines if they are given as a gift or token of appreciation rather than as a form of payment.

⁽¹²⁾ Harzing, A.-W. (2007), 'Publish or Perish' (<https://harzing.com/resources/publish-or-perish>).

⁽¹³⁾ As part of a search backwards approach, we identified and examined the references of studies cited in this review. Similarly, we used a search forwards approach to identify and examine the papers that cited studies included in this review.

total of 6 161 studies were identified, out of which 78 studies were included. The data for the EU-27 blood donation overview were collected from a reference search and a Google search. Member State-specific reports compiled based on these data were sent for fact checking and the integration of missing information to the national competent authorities for blood of the EU Member States.

We distinguish between categories of blood donors, for example new donors, novice donors and experienced donors (Chang, Piliavin and Callero, 1988; Thomson et al., 1998). Because blood donors are not a homogeneous group, we need to appreciate the differences between groups of donors to get a better understanding of which motivations and interventions are likely to be most effective for each group. This enables more targeted or personalised approaches to donor recruitment and retention.

We summarise the findings from research following social science or behavioural science research agendas in the field of blood donation. First, we introduce the theoretical models (e.g. the theory of planned behaviour, stage models and self-determination theory) that serve as a foundation for social science research agendas. Second, we review the evidence on motivations that lead to blood donor intentions and behaviour. As regards behavioural science research agendas, we categorise studies into the following groups based on the type of strategies for promoting blood donation: (1) financially based incentives (i.e. cash payments, vouchers, gift cards and similar), (2) non-monetary incentives (i.e. medals, paid days off work, health checks and similar), (3) non-incentives (i.e. text messages, public pledges to donate blood, and similar), (4) mixed incentives and (5) other behavioural interventions, including applied muscle tension (the intentional contraction of certain muscles in the body, typically the arm muscles, during the donation process).

In addition, we describe the blood donation systems in the EU-27, offering a comprehensive review of their organisation, blood donation models, types of incentives offered to blood and plasma donors, and donor statistics for 2021. For example, we show that there is considerable organisational variation across Member States. In some Member States, a national health service is responsible for collections of blood and blood components; in other Member States, hospitals or community blood banks have this responsibility solely or share it with the Red Cross. In one Member State, blood collection is organised by a non-profit organisation. Furthermore, we found that the most common strategies to recognise, reward and incentivise blood donors among the EU Member States are (1) paid days and/or time off work (used by 63 % of Member States), (2) refreshments (used by 56 % of Member States) and (3) small tokens or symbolic gifts (used by 52 % of Member States). This allows us to link theory and practice directly: Blood centres can inform theory by testing the effectiveness of their strategies, and, conversely, theoretically grounded research can recommend to blood centres the use of strategies that have been tested and found to be effective, explaining the mechanisms through which they work. Similarly, reports on theoretically grounded research can recommend to blood centres the use of strategies that have already been tested and found to be effective, explaining the mechanisms through which they work. Lastly, we calculated that the average reported rate of blood donors in the general population (not the average rate of the population that are eligible to donate) for 22 Member States is 2.41 %, with Ireland having the lowest rate (1.43 %) and Cyprus the highest (6.46 %).

This literature review is structured as follows: Section 2 outlines the methodologies used to identify and describe the relevant literature and the data underlying the EU-27 blood donation overview. Section 3 outlines a typology of blood donors. Sections 4 and 5 describe social science and behavioural science research agendas and their main findings. Section 6 addresses ethical considerations in behavioural interventions. Section 7 presents the blood donation country profiles for individual Member States, and Section 8 concludes.

2. Methodology

2.1. Identification of studies to be included in the literature review

Although our review may not strictly adhere to the classification of a systematic review, we thoroughly followed a systematic workflow, drawing inspiration from the methodologies employed by Godin et al. (2012), Bedhall et al. (2013) and Chell et al. (2018) in the selection of studies to incorporate into our review. With the aim of identifying the factors that are associated with blood donation intentions and behaviour, one author performed a literature search between 14 December 2021 and 10 March 2022 and collected 6 161 studies using the following methods.

- 6 123 studies were identified by searching⁽¹⁴⁾ Google Scholar, Scopus and PubMed using the software Publish or Perish for studies published after 2000. The year 2000 was chosen as a start year for this review to avoid overlap with the studies included in the review conducted by Godin et al. (2012).
- 38 studies were identified using search forwards and search backwards approaches. There were three studies that were published prior to the year 2000 and that were included in this review because of their major contribution (i.e. number of citations or reputation) to the field of blood donor behaviour.

All the papers that matched the search terms were assessed based on title and/or abstract. The schematic representation of the identification, screening and selection process is presented in Figure 1.

A total of 5 246 studies were excluded based on the following exclusion criteria:

- duplicate studies,
- opinion pieces,
- studies not published in English,
- studies from different fields (i.e. haematology, diabetology, transplantation, biology, animal health and similar) that assessed health rather than behavioural outcomes.

The remaining 915 studies were assessed based on their abstracts and 100 studies were chosen to be read in more detail. The studies that were excluded (815) had at least one of the following characteristics.

- The sample size was smaller than 100 (this rule concerns empirical studies only).
- They were one of several studies with similar research questions and consistent findings that were conducted in different countries (e.g. Cameroon, Greece, Saudi Arabia and Trinidad and Tobago). In such cases, the study from an EU Member State was given priority because of our aim to generate insights for the EU, and the similar studies from other countries were excluded.
- They were related to the creation and implementation of a specific blood donation database system or to questionnaires for donors prior to donating.

From the 100 studies that were chosen to be read in more detail, all authors independently identified studies to include in this review and jointly agreed on 78 studies⁽¹⁵⁾ based on their contribution to the field of blood donor behaviour and their recency (a detailed description can be found below). The remaining 22 studies were excluded owing to the narrowness of their research scope, for example focusing solely on demographic characteristics or investigating attitudes and knowledge in undergraduates with roles in health education (rather than in the general population).

We acknowledge the importance of considering under-represented groups in research and reports from the perspective of inclusion, diversity and equality. Although our literature review has a generalist perspective, we recognise that there are under-represented groups that may also be excluded from research and reports. However, owing to the scope and focus of this review, we are unable to cover all under-represented groups comprehensively. We recognise that the exclusion of certain groups from research and reports may have

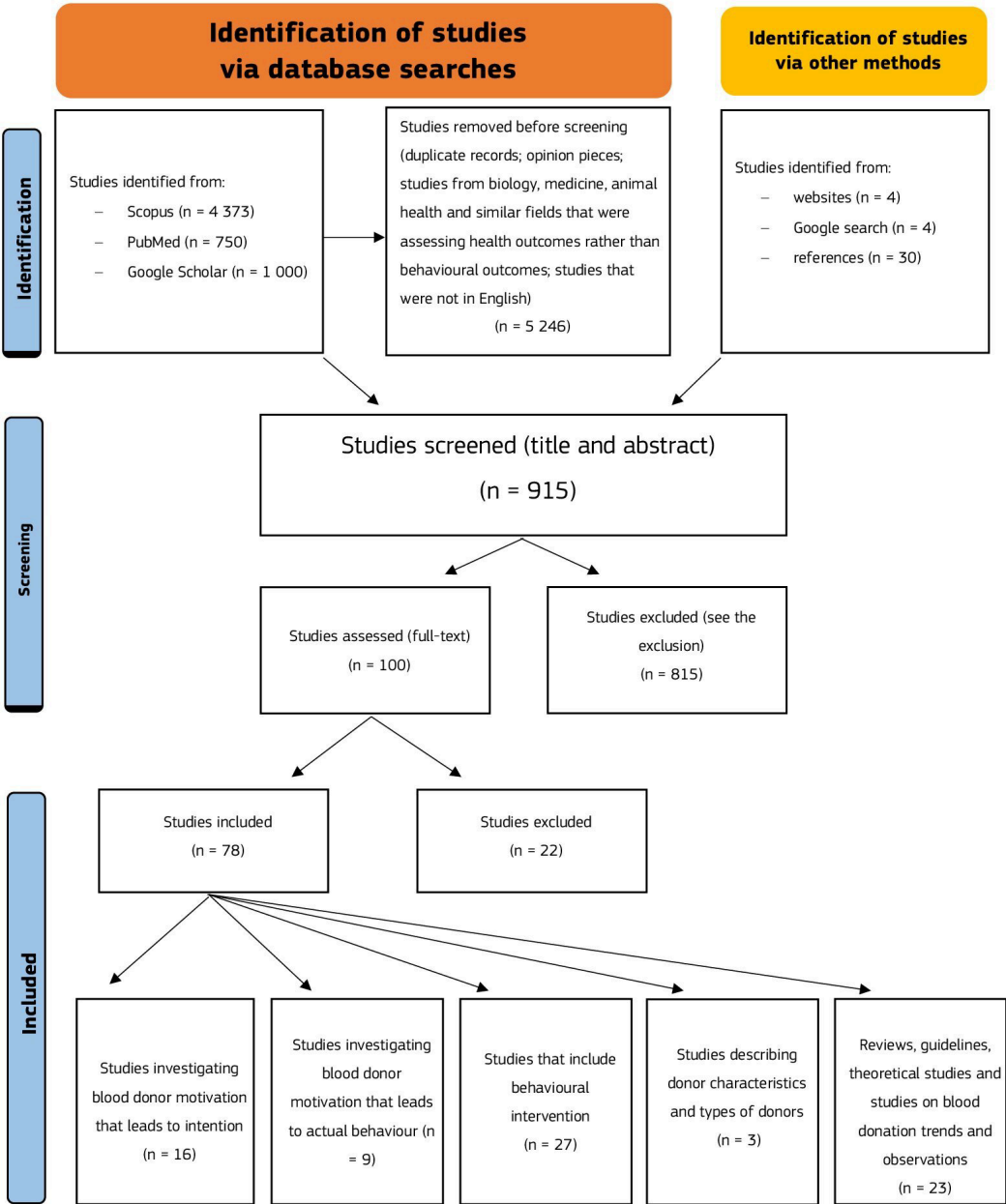
⁽¹⁴⁾ We applied the following Boolean combination of key terms in our search: (blood) AND (donor OR donation) AND (motivation OR attitude OR behavi* OR incentive OR intervention OR retention OR recruitment).

⁽¹⁵⁾ Any disagreements were resolved through peer in depth discussion.

significant implications for our understanding of the social world and for promoting greater equity and inclusion. We acknowledge that exclusion criteria should not be based on factors such as cultural identity or immigrant status, and we have taken steps to ensure that our inclusion criteria are based on the relevance of the study to the research question and the quality of the research design. While we recognise the importance of considering under-represented groups more broadly, our general approach is an important contribution to the literature.

We made an effort to include a comprehensive spectrum of studies, including both published and unpublished sources. However, publication bias might exist within the body of research, and it is advisable to interpret the findings of our review with this consideration in mind.

Figure 1 – Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 flow diagram (Page et al., 2021) – databases, websites, reference lists and other sources searched to identify studies



Note: This figure outlines the identification and screening of studies that were included in this literature review and the categorisation of selected studies based on the research question that the study aimed to answer.

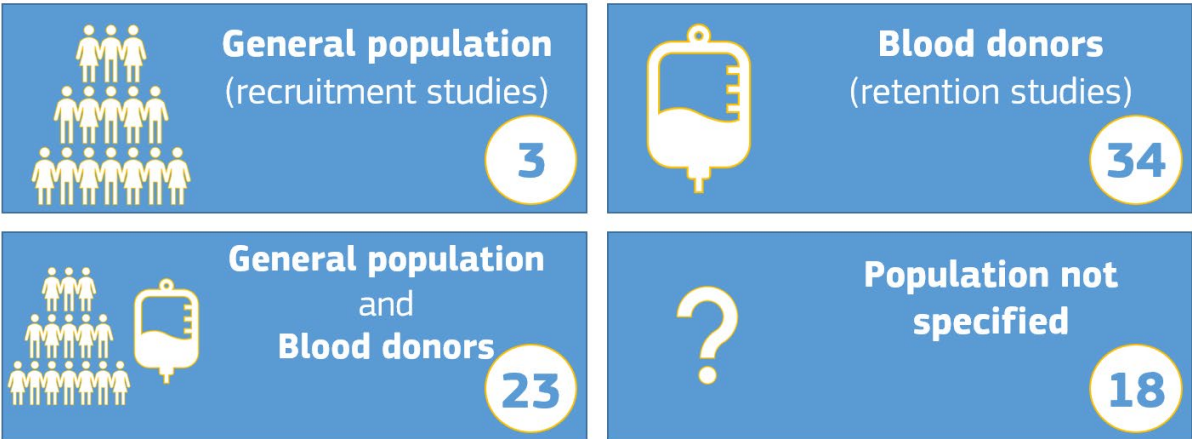
We use the following criteria to describe and categorise studies included in this literature review: research question, targeted population, methodology and the country or countries in which the study was conducted.

Based on the **research question** that a study aims to answer, we divide the selected studies into:

- studies investigating blood donor motivation associated with intentions ⁽¹⁶⁾ (16 studies),
- studies using cross-sectional data and survey data to investigate blood donor motivation associated with actual behaviour (9 studies),
- studies that include behavioural interventions ⁽¹⁷⁾ (27 studies),
- studies describing donors’ characteristics and types of donor (3 studies),
- reviews, guidelines, theoretical studies, studies on blood donation trends and observations (23 studies).

We can categorise studies included in this literature review as follows, according to **targeted population**: recruitment studies (general population), retention studies (blood donors), studies that include both the general population and blood donors and studies that did not specify the targeted population (Figure 2 provides the number of studies per category).

Figure 2 – Categorisation of studies based on targeted population



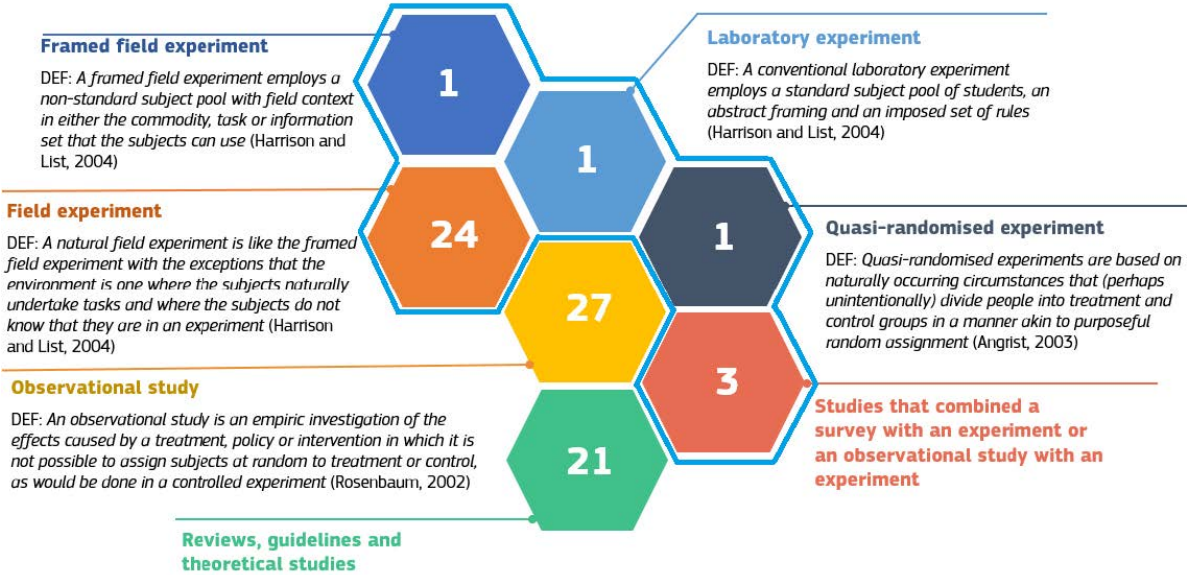
Note: This figure shows the number of studies per category, with the targeted population being the general population, blood donors, both or not specified.

⁽¹⁶⁾ This group includes studies that investigate people’s attitudes towards specific motivation devices and whether they would change their intentions to donate blood if they were offered some specific incentive. A great majority of these studies use survey data.

⁽¹⁷⁾ Behavioural intervention studies use interventions designed to affect people’s actions (e.g. donating blood).

Figure 3 shows the distribution of selected studies based on the **methodology** used to answer the research question.

Figure 3 – Classification of studies based on methodology



Note: This figure shows the number of studies per category, with each category based on the methodology used to answer the research question. The blue line surrounds the methodologies that commonly allow for testing causal relationships, whereas those outside this line are commonly used to establish correlations.

According to the **country or countries in which the study was conducted**, the majority of selected studies were conducted in at least one EU Member State (31 studies). The other studies collected data in Argentina (one study), Australia (three studies), Bosnia and Herzegovina (two studies), Brazil (two studies), Canada (five studies), China (one study), New Zealand (one study), Switzerland (five studies), Thailand (one study), the United Kingdom (one study) and the United States of America (nine studies). In the remaining 16 studies, the country was not specified. A study conducted outside the EU was excluded if it was similar to a study conducted in the EU.

2.2. Data collection for the EU-27 blood donation overview

The EU-27 blood donation overview was developed through a comprehensive data collection process that involved gathering information on various aspects of blood donation systems in the EU Member States. This comprehensive overview includes the following information about the EU Member States:

- blood donation systems (i.e. their organisation, when applicable – the responsibilities of the national blood centres and Red Cross societies, the number of blood establishments and blood banks, the number of fixed locations and mobile sessions, and similar),
- blood donation model (i.e. donor recruitment strategies),
- donor statistics – the most recent statistics on blood donations and donors ⁽¹⁸⁾ (i.e. number of donors, donor gender and age distribution, distribution based on the frequency of donation, and similar),
- the types of incentives offered to blood donors,
- the types of incentives offered to plasma donors,
- the information system used (i.e. technology used to gather, process and store donor data, applications used to inform and remind donors about the upcoming blood drive, and similar).

To get this information, we used Google to search for the websites of the national blood centres, blood establishments, Red Cross societies in the EU and statistical offices of the EU Member States, the European Blood Alliance and the European Directorate for the Quality of Medicines & HealthCare (EDQM). Furthermore, we searched for newspaper articles and research studies related to the functioning of the blood donation systems in the EU Member States.

Once the data had been collected, we produced country-specific reports, which were sent to the national competent authorities for blood in each of the EU Member States via the Communication and Information Resource Centre for Administrations, Businesses and Citizens (CIRCABC) and with the intermediation of the Directorate-General for Health and Food Safety. We received feedback that included fact checking and the integration of missing information from 22 of the 27 Member States. The aggregated report, updated with Member States' feedback, was sent for another round of feedback before publication.

⁽¹⁸⁾ We collected blood donation statistics for 2021, with the exception of those from Germany and Slovakia, for which we used data for 2020.

3. Typology of blood donors based on the frequency and proximity of last donation

Blood is classified as an essential medicine (WHO, 2019⁽¹⁹⁾), and in European countries it is supplied by volunteer donors. The Council Recommendation of 29 June 1998 on the suitability of blood donors and the screening of donated blood in the European Community (98/463/EC)⁽²⁰⁾, and also the most recent *Guide to the preparation, use and quality assurance of blood components* by the EDQM (also known as the EDQM Blood Guide) (EDQM, 2020)⁽²¹⁾, define a donor as ‘a person in normal health with a good medical history who voluntarily gives blood or plasma for therapeutic use’.

Recommended limits on blood donation frequency and the time that needs to elapse between donations primarily exist to protect the health of donors. According to the EDQM Blood Guide, male and female blood donors can donate whole blood a maximum of six times and four times, respectively, per year, with at least 2 months between any two donations.

In addition to protecting donors’ health, the information about blood donation frequency (the number of times a donor gave blood or attended to give blood) and recency (how long ago the last donation took place or last attendance to donate) may reflect the habitual strength of a donor’s behaviour (Ferguson, 2004; Ferguson and Bibby, 2002). In other words, the information about past donor behaviour (donation frequency and recency) can help predict a donor’s future behaviour, especially in the case of donors who donate blood on a regular basis; for those who donate less regularly, intention to donate is a better predictor of donation (Ferguson and Bibby, 2002; Ouellette and Wood, 1998). In addition, a higher frequency of blood donation will enable a donor to identify with the role of being a blood donor (Chell et al., 2021). Thorpe et al. (2020) argue that donor identity becomes a key motivation after a donor’s fifth donation. Lastly, research indicates that donors should not be treated as a homogenous group when conducting research in the field of blood donation and that donors’ blood donation frequency and recency should be taken into account (Ferguson and Bibby, 2002; Ferguson et al., 2007).

Based on blood donation frequency, donors can be categorised as **new donors** (donors who have donated for the first time and only once) or **repeat donors** (donors who have donated more than once). Repeat donors can be categorised further as **novice donors** (donors who have donated two to four times) or **experienced donors** (donors who have donated more than five times). With this information in combination with the information on blood donation recency (see Table 1), we can further classify donors into the following groups.

- **Quitters.** New donors who have not donated in the last year.
- **Lapsed weak habit donors.** Novice donors who have not donated blood in the last year.
- **Lapsed strong habit donors.** Experienced donors who have not donated blood in the last year.
- **Active new donors.** New donors who have donated blood recently (i.e. in the last year).
- **Habit-forming donors.** Occasional donors – novice donors who have donated recently (i.e. in the last year).
- **Habitual donors.** Regular donors – experienced donors who have donated blood recently (i.e. in the last year).

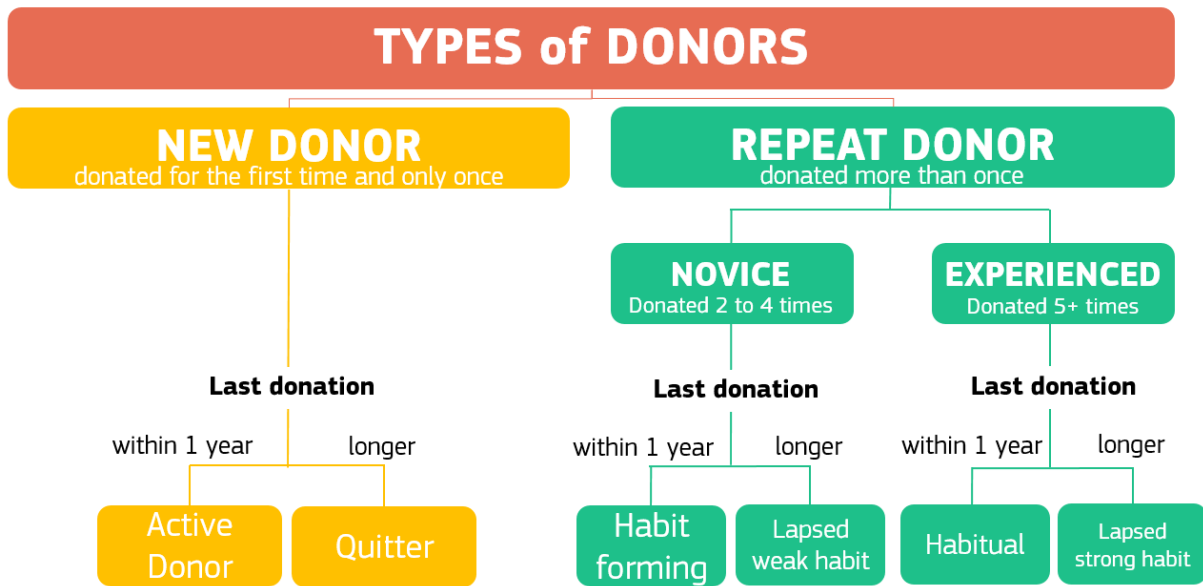
This is of course a cyclical, dynamic, interactive process whereby a new active donor can become a quitter or a habit-forming donor, and a habit-forming donor can become a lapsed donor, and so on. Lapsed donors can be ‘reactivated’.

⁽¹⁹⁾ See the World Health Organization website (<https://www.who.int/publications/i/item/WHO-MHP-HPS-EML-2021.02>).

⁽²⁰⁾ 98/463/EC: Council Recommendation of 29 June 1998 on the suitability of blood and plasma donors and the screening of donated blood in the European Community (OJ L 203, 21.7.1998, p. 14) (<https://op.europa.eu/en/publication-detail/-/publication/11e3e019-12ea-4b04-bf49-ad055158ae74>).

⁽²¹⁾ For more information on the EDQM Blood Guide, see <https://www.edqm.eu/en/-/20th-edition-of-the-edqm-blood-guide-now-available>.

Figure 4 – Typology of blood donors based on frequency and recency of last donation (adapted from Ferguson, 2004)



Note: This figure outlines categorisation of blood donors based on donation frequency and recency (proximity of last donation).

4. Social science research agendas

Social science research agendas in the field of blood donation have focused primarily on theoretical models to explore how cognitive, motivational and emotional factors contribute to predicting donor intentions and behaviour. Overall, these theoretical models have been instrumental in advancing our understanding of the psychological factors that contribute to blood donation behaviour and have provided a foundation for the development of interventions aiming to increase donation rates. However, more research is needed to further validate and refine these models and to explore additional factors that may affect donation behaviour. In this section, we present three theoretical models – (1) the theory of planned behaviour (TPB), (2) stage models and (3) self-determination theory – to explore how cognitive, motivational and emotional factors help to predict donor intentions and behaviour (Ferguson et al., 2007).

4.1. Theory of planned behaviour

There is a long line of research demonstrating that the intention to perform an act is the best predictor of the action. This is the main postulate of the TPB (Fishbein and Ajzen, 1975), with extensive supporting evidence (Biddle, Bank and Slavings, 1987; Lee, Piliavin, and Call, 1999; Randall and Wolff, 1994; Sheppard, Hartwick and Warshaw, 1988). According to the TPB, behaviour can be predicted by intentions, which are influenced by attitudes, subjective norms and perceived behavioural control (Ajzen, 2012; Ajzen and Fishbein, 2000; Fishbein and Ajzen, 1975; Fishbein and Ajzen, 2010). This theory has been applied widely to understand health and prosocial behaviour, including blood donation (Masser et al., 2008).

When applied to the field of blood donation, it has been shown that the intention to give blood is a credible predictor of future donation activity (Bednall et al., 2013; Callero, Howard and Piliavin, 1987). The intention to give blood itself is determined by a blood donor's attitude towards donating blood, their perception of subjective norms related to blood donation and their perception of being sufficiently in control to donate blood (as well as their actual sufficiency of control) (Ferguson, Murray and O'Carroll, 2019; Ferguson et al., 2012; Masser et al., 2008; Masser et al., 2012; Masser et al., 2019; Williams, Sun and Masser, 2019).

In the context of blood donation, attitude relates to what the donor thinks will happen if he or she donates blood (anticipation of consequences of blood donation: cognitive attitudes) and how he or she is going to feel about donating (evaluation of consequences: affective attitudes) (Conner et al., 2013). Subjective norms are related to perceived social approval (of the people who are important to the donor) of their decision to donate or not donate. Perceived behavioural control relates to how feasible the decision to donate blood is and if it is under the donor's own control. Masser et al. (2009) compared several research studies that included both blood donors and non-donors and concluded that the three main predictors of the TPB combined could explain between 31 % and 72 % of the variance in blood donation intentions and between 54 % and 56 % in blood donation behaviour.

Furthermore, a meta-analytic review by Bednall et al. (2013) showed that, after intentions, perceived behavioural control is the strongest predictor of blood donor behaviour.

The TPB can be extended and include descriptive norms, self-efficacy, donor role identity and prosocial factors (Ferguson, Murray and O'Carroll, 2019). Descriptive norms refer to the perception of how many people actually donate blood (Ferguson, Murray and O'Carroll, 2019). Self-efficacy includes perceived confidence to give blood successfully (van Dongen, 2015). Donor role identity describes a set of characteristics or expectations that is defined by a donor's position in society and becomes a dimension of a donor's sense of self (Charng, Piliavin and Callero, 1988). Prosocial factors including pure altruism (incurring pain and costs in terms of time and energy without having any personal benefits for the sake of another person's benefit, i.e. the blood recipient's benefit), personal moral norms (the donor's belief that they need to donate and help someone in need of blood) and 'warm glow' (feelings of positive affect that arise after donating blood (Andreoni, 1990)) are important predictors of donor behaviour.

4.2. Stage models

The transtheoretical model (TTM) of behavioural change describes processes and stages of change (Prochaska and DiClemente, 1983; Prochaska and DiClemente, 1986). According to the authors, processes of change include consciousness-raising, self-liberation, social liberation, self-reevaluation, environmental re-evaluation, counter-conditioning, stimulus control, reinforcement management, dramatic relief and helping relationships. Stages of change include pre-contemplation, contemplation, action and maintenance. Processes enable the transition from one stage to another. A key aspect of this model is the way in which specific processes of change are hypothesised to be more effective in transitioning people from one stage to another.

The TTM of behavioural change has been applied widely to different types of health-related behaviours, including donating blood. In particular, Ferguson (1996) adapted and applied the TTM in the field of blood donation to explain the stages of donor decision-making as follows: (1) pre-contemplative stage (the non-donor who does not plan to donate blood), (2) contemplative stage (the non-donor who becomes aware of the need for blood donations), (3) preparation stage (the potential donor who is prepared to donate blood), (4) action stage (the first-time donor or novice donor) and (5) maintenance stage (the committed and repeated donor). Each person is a non-donor before first donating. After the first donation, they become a new donor, after a second donation a novice donor and after five donations an experienced donor (Ferguson, 2004). Indeed, Ferguson and Chandler (2005) identified three stages of change associated with blood donation: (1) a pre-contemplative stage, (2) a combined contemplation/preparation stage and (3) a combined action/maintenance stage. Because the decision-making process differs in each of those stages, it is advised to tailor stage-specific interventions when encouraging blood donations (Ferguson, Murray and O'Carroll, 2019). Indeed, the TTM has subsequently been applied successfully to understand blood donor behaviour (e.g. Sardi et al., 2019) and as the basis of an intervention to encourage people from the Black community to donate blood (Amoyal et al., 2013).

4.3. Self-determination theory

Self-determination theory describes human personality and motivation and suggests that a person can become self-determined (understood as being able to make choices and exert control over their life) once their needs for competence, relatedness or connection, and autonomy are fulfilled (Deci and Ryan, 2012). This theory emphasises the role of intrinsic motivation in fulfilling self-determination. Intrinsic motivation refers to the motivation to perform an act for the sake of the act being interesting and/or enjoyable. Intrinsic motivation is opposite to extrinsic motivation (e.g. performing an act because of a potential monetary or reputational reward). According to self-determination theory, intrinsically motivated behaviour has a higher chance of being persistent than extrinsically motivated behaviour (Hagger, Chatzisarantis and Harris, 2006).

Applied to blood donation, self-determination theory predicts that donor motivation to donate blood depends on whether their needs for competence, relatedness or connection, and autonomy are fulfilled (France et al., 2017). Therefore, promoting donor competence, relatedness or connection, and autonomy could enhance internal motivation for giving blood. For example, providing donors with information on how to cope with fears and doubts can enhance their feeling of competence (France et al., 2011). Similarly, motivational interviewing can enhance donors' perceived autonomy (Livitz et al., 2017; Livitz et al., 2019). Lastly, relatedness can be enhanced using social media to promote feelings of belonging or connectedness among donors (France et al., 2016).

4.4. Empirical evidence on motivation that leads to intention to donate blood and to actual blood donation behaviour

This section explores attitudes of non-donors and donors towards specific motivation devices and whether they would change their intentions to donate blood if they were offered a specific incentive. In addition, this section summarises findings of cross-sectional and survey studies on donor motivation to donate blood (blood donation behaviour).

Determinants of donors' willingness to donate. Willingness to donate blood is influenced by personal characteristics, beliefs, motivations and cultural context (De Kort et al., 2010; Gorleer, Bracke and Hustinx, 2020; Healy, 2000; Piersma et al., 2017). Using the data from the 2014 Eurobarometer survey that was sent to 27 868 participants from the EU-28, Huis in 't Veld, de Kort and Merz (2019) showed that willingness to

donate varied significantly across Member States. Furthermore, willingness to donate was positively associated with perceived blood transfusion safety and the possibility of helping family or people in need of donated blood. In addition, these two motivators were generating stronger responses than incentives such as refreshments, health tests and reimbursement of travel costs. In terms of the cultural context in which donors were brought up, there is a higher probability that individuals who grew up in a family where blood donation was a common practice will also choose to become blood donors (Pedersen et al., 2015).

Blood donor characteristics. Blood donor characteristics refer to a variety of individual factors that can influence blood donation behaviour, including demographic, health-related and psychological factors. For example, studies have shown that older individuals are more likely to donate blood than younger individuals, older first-time donors are more likely to donate again than middle-aged first-time donors (Masser et al., 2020) and men are more likely to donate than women (France, France and Himawan, 2007). Socioeconomic status, including income and education level, has also been found to be positively associated with blood donation behaviour (Kessler, Grillberger and Brouwer, 2007). Health-related factors, such as perceived health status and knowledge about blood donation, are also important predictors of blood donation behaviour. Individuals who perceive themselves to be in good health and who have knowledge about the benefits of blood donation are more likely to donate blood than those who do not (Kessler et al., 2007). Interestingly, Sirven, Chopard and Errea (2018) showed that risk-averse individuals are less prone to give blood. Risk aversion refers to the tendency of individuals to avoid risky situations and to prefer safe options, even if the potential rewards of risky options are higher. In the context of blood donation, risk aversion can manifest in the form of concerns about the potential health risks associated with the donation process. These risks can include physical discomfort, adverse reactions and the possibility of contracting infectious diseases.

Incentives. One of the earliest large-scale studies on the role of incentives as motivation devices in blood donation was that of Glynn et al. (2003). The authors evaluated potential responses to future incentives in 45 588 American whole-blood donors. The results showed that incentives encouraging donors to donate were cholesterol screening (for 61 % of donors), blood credits, a scheme to recognise donors for reaching donation milestones (for 61 % of donors) and prostate-specific antigen screening (for 73 % of male donors). Furthermore, incentives were shown to be effective in generating more donations if donations were made in the relative anonymity of donation centres (Goette, Stutzer and Frey, 2010).

Social media and blood donation. Social media has been shown to be a significant tool for changing behaviour (Ramondt, Kerkhof and Merz, 2022). The question has been raised if social media can promote blood donation successfully and help in recruiting and retaining blood donors. Sümniç et al. (2018) conducted a study with the aim to evaluate the impact of different strategies, including the use of social media, on donor motivation. This study included sending a questionnaire about demographic characteristics, the number of prior donations and 14 potential motivators for blood donation to whole-blood donors in Germany. A total of 2 920 whole-blood donors participated in the survey. The results showed that more than 7 % of donors reported that they were attracted to donation by social media. Most of these donors were young and female. Importantly, social media was rated as the second most effective motivator to recruit first-time donors, friends and relatives.

To understand barriers to blood donation and associated emotions, Ramondt et al. (2021) conducted a semantic network analysis of messages posted by Dutch non-donors and donors on Facebook and Twitter. Digital data were collected through Coosto and messages including the terms related to blood donors, blood donation and blood collection agencies were searched for. The authors identified the following donation barriers: lifestyle, donation location, medical reasons, no invitation, opening times, physical reactions, pregnancy, blood bank top management remunerations, sexual risk behaviour, time constraints, travel, and waiting times. The results of this study supported some results from other studies, for example that the main barriers for non-donors and lapsed donors were medical reasons and associated emotions (mainly disappointment). However, this approach helped in identifying a new barrier: there was a strong association between blood bank policy on sexual risk behaviour and associated deferral (i.e. exclusion of men who have sex with men) and involuntary non-donation.

Blood donation and COVID-19. Blood donation systems faced another challenge with the COVID-19 pandemic. In addition to governments imposing different types of restrictions, including limited movements, contact tracing, physical distancing and other measures that deterred donors from donating, some donors decided not to donate because they felt unsafe regarding the risk of COVID-19 infection (Bilancini et al., 2022). This led to a decline in the supply of whole-blood donations in many countries, including Ireland, France, Germany and the United Kingdom (Chell et al., 2022). In one of the earliest studies related to intentions and donation-related behaviour during the COVID 19 pandemic, Masser, Hyde and Ferguson (2020)

showed that Australian donors' donation intentions were driven by elements of rational decision-making, despite the sometimes irrational level of fear of contracting COVID-19 from donating blood. Furthermore, their recommendation to blood donation agencies was to build trust with donors through communication and assurance of minimal risk of contracting COVID-19 from donating blood. Using the European setting, Chandler et al. (2021) provided similar evidence of the need for clear communication to donors about safety measures and the minimal risk of contracting COVID-19 when donating blood. Furthermore, donors reported changes in their donation behaviour during the COVID-19 pandemic. Namely, they were donating less than normally, and they had to invest additional effort to donate. The authors show that, among the donors in their sample, the perceived risk of contracting COVID-19 while donation was low; however, the donors for whom this perceived risk was high were less likely to donate.

Reasons why donors lapse or cease donating. It has already been noted that recruiting new donors and retaining experienced donors are equally important activities, with a difference being that the latter is less costly. Therefore, it is important to understand what makes donors lapse or cease donating. The empirical evidence suggests that medical reasons, fear of needles, negligence, lifestyle barriers, perceived inconvenience, lack of marketing communication, lack of knowledge about donating, and negative experiences are the main barriers to donation for lapsed blood donors (Charbonneau, Cloutier and Carrier, 2016). Similarly, Merz, Ferguson and van Dongen (2018) showed that the primary reasons for donors lapsing were anxiety and a lack of information about the donation procedure. Furthermore, among the main life events that increase the chances of donors lapsing, Piersma et al. (2019) found childbirth and losing or starting a job to be the most significant. Conversely, blood transfusion in a family member or the death of a family member reduced the chances of donor lapsing.

Klinkenberg et al. (2018) found reasons for blood donors ceasing to donate to be gender-specific, age-specific and dependent on donor donation frequency. Donors who had ceased donating reported negative physical experiences (predominant in the case of women, younger donors and donors with less experience donating) and inconvenient opening times (mostly reported by male, older and experienced donors) as the main reasons for ceasing to donate blood.

5. Behavioural science research agendas

This section examines the impact of interventions on donor recruitment and retention (Ferguson et al., 2007). The most common methods used in the behavioural sciences to measure this impact are laboratory- and field-based experiments ⁽²²⁾. In this review, we concentrate on the interventions that use incentives and non-incentives. Chell et al. (2018) define an incentive as ‘an extrinsic reward (monetary or nonmonetary) designed to motivate a specific behavioural action (e.g. recruitment, retention, or reactivation) that is offered before an action occurs’. In addition to interventions that tested monetary incentives (i.e. cash payments, vouchers, gift cards ⁽²³⁾ and similar) and non-monetary incentives with some material component (e.g. paid days or time off work, or a health check ⁽²⁴⁾), we included non-incentives, including social/community recognition (i.e. solicitation letters, public pledges to donate blood, and similar) for promoting blood donation.

It is essential to stress once more the importance of understanding the differences in how monetary incentives are treated in the scientific literature, investigating EU and non-EU countries, and in the EU legal framework in the context of blood donation. Whereas the EU Charter of Fundamental Rights requires non-commercialisation of the human body, which translates into a principle of voluntary and unpaid donation in EU legislation, the scientific literature explores a variety of incentives, including those that may be prohibited by EU legislation. In EU legislation, compensation to ensure that donors are not financially disadvantaged by their donation can be acceptable. However, such compensation should never constitute an incentive per se; nor should it constitute an incentive that could cause donors to be dishonest about their medical or behavioural history or to donate more frequently than is allowed, which could pose risks to their own health and that of potential recipients. It is important to note that the inclusion of incentives that are not permitted by EU legislation in this document is solely for scientific purposes and does not imply any form of endorsement. Rather, it is conducted to explore their potential impact on the behaviours and decisions of individuals in various contexts and it reflects a scientific interest in understanding the complex factors that influence blood donation decisions.

Table 1 – Interventions investigated in this review and their associated categories

Non-incentives	Other behavioural interventions	Incentives	
		Monetary	Non-monetary with some material component
<ul style="list-style-type: none"> ✓ Reminders (e.g. solicitation letters, phone calls, email messages, WhatsApp messages, donor registry) ✓ Active decision elicitation mechanisms ✓ Private and public pledges to give blood ✓ Information on blood use ✓ Information about deferral policies 	<ul style="list-style-type: none"> ✓ Applied muscle tension ✓ Distraction techniques (e.g. watching videos or listening to music) ✓ Relaxation techniques (e.g. deep breathing) 	<ul style="list-style-type: none"> ✓ Vouchers and gift cards ✓ Cash payments 	<ul style="list-style-type: none"> ✓ Paid days or time off work ✓ Health checks

⁽²²⁾ An experiment in social sciences refers to a research method that involves the manipulation of one or more independent variables in order to observe and measure the effect on one or more dependent variables, while controlling for extraneous variables. In other words, the experiment involves systematically varying the conditions under which observations are made in order to determine causality between variables. The purpose of conducting experiments in social sciences is to test hypotheses and make inferences about cause-and-effect relationships between variables. These experiments are often conducted in controlled settings and aim to establish a cause-and-effect relationship between the independent and dependent variables while minimising the influence of extraneous factors.

⁽²³⁾ Vouchers and gift cards also have a potential monetary value, but not in the form of a direct cash payment. Their value has to be such that they are not coercive.

⁽²⁴⁾ Health checks can have a monetary value if healthcare is private and costly.

5.1. Interventions testing the effectiveness of non-incentives

Non-incentives are designed to increase the salience of donating blood and boost blood donors' intrinsic motivation (Irving et al., 2020). These interventions can take different forms, including reminders, active decision elicitation mechanisms, public or private pledges to donate blood, and informing the donor once his or her blood is used. Explanations of each of the categories are provided in this section.

5.1.1. Reminders to retain and recruit donors

Reminders, such as emails, letters, text messages, phone calls and similar, are used to inform donors (donor retention) and non-donors (donor recruitment) of blood drive details. They have been shown to be cost-effective tools for encouraging blood donations (Godin et al., 2012, Vuletić Čugalj, 2015). Numerous studies have tested and compared the effectiveness of different types of reminders on increasing blood donation; some of these are detailed below.

Solicitation letters. Specifically, Chamla, Leland and Walsh (2006) tested the effect of a recruitment letter on donor return rate in Dunedin, New Zealand. A total of 318 donors who had donated blood for the first or second time received either a recruitment letter that included information about donor blood type and the percentage of the general population with the same blood type or a recruitment letter with general information. The results of this study showed that donors receiving the more detailed solicitation letter were 34 % more likely to return to donate blood than donors receiving the general information. Using a considerably larger sample size, Vuletić Čugalj (2015) conducted a field experiment with 3 236 blood donors from Sarajevo, Bosnia and Herzegovina, to test the effect of a letter informing donors about potential summer shortages and asking them to donate blood. In addition, the author varied the letter in terms of goal framing⁽²⁵⁾, whether a specific victim⁽²⁶⁾ was identified and the gender of the victim. Interestingly, although the framing of the letter had relatively little effect when donors were allowed to make their donation decision 1 month later, receipt of the letter increased the likelihood of donating by 6.44 percentage points. Similarly, Vuletić Čugalj (2019) showed that when the information on potential blood recipient gender was identified in the blood soliciting letters, 74 % more blood donors donated if the potential blood recipient's gender matched their own. This evidence suggests that blood donation services may use letters soliciting blood donations as a cost-effective policy tool for donor retention. Importantly, special attention should be dedicated to the framing of those letters, taking into consideration the donor's gender to increase effectiveness.

Phone calls. Despite extensive evidence on the short-term effect of reminders on blood donation, little is known about their long-term effects. In an interesting study on the short-term and long-term effects of phone call reminders⁽²⁷⁾, Bruhin et al. (2015) tested their effect on the behaviour of different categories of blood donors (highly motivated donors v donors with a low baseline donation rate). This large-scale study encompassed 40 653 donors from Zurich, Switzerland, who received either a phone call conveying the message that their blood type was needed or no phone call. Results showed that the effect of a phone call reminder had different short-term and long-term effects on highly motivated and irregular donors. The phone call raised the probability of attending a blood drive in highly motivated donors in the short-term by 9.9 %. However, in the long-term this effect decreased by 2.3 % at each future blood drive. For irregular donors the phone call reminder increased their probability to donate by 5.8 % at the upcoming blood drive (short-term effect) and by 2.1 % at the next blood drive (long-term effect). The policy recommendation of this study is that the effects of behavioural interventions on donation rates could vary both over time and across donors and that blood services should take this into account when designing interventions for blood donor recruitment and retention.

Email messages. Ferguson et al. (2023) conducted a field experiment with 5 821 blood donors to test the effectiveness of warm-glow messages in predicting donation within a 3-month period. They also varied the priming of the cooperative identity in their treatments. The results of their intention-to-treat analysis showed

⁽²⁵⁾ In the framing literature, goal frames refer to frames that focus on a motivated goal (Levin, Schneider, Gaeth, 1998). The authors used this framework to test the differences in the perception of loss and gain framing (goal framing) of the letters (Kahneman and Tversky, 1979). In particular, donors were asked to either 'save lives' or 'prevent deaths' by donating blood.

⁽²⁶⁾ Letters soliciting blood donation mentioned either 'a single person in need of blood' (there was a male and a female patient in real need of blood) using their picture and name and why they need blood (identified victim) or 'unidentified people in need of blood' (statistical victims) to test the occurrence of the 'identifiable victim effect' in blood donations (Schelling, 1968; Seyoung and Feeley, 2016).

⁽²⁷⁾ This phone call was made by an administrative assistant, informing the donors that it was important to come and donate at the upcoming blood drive (which happened 2 days later) because there was a scarcity of blood of the donor's blood type on that particular day.

that the message in which they combined warm-glow messaging and priming donor identity was 1.279 times more effective in motivating donors to return to donate blood than the control scenario (no message). The authors further performed an implementation study in which they compared donation attendance in a 3-year period prior to the warm-glow message being sent to all first-time donors in Australia to a 2-year post-implementation period. The warm-glow message induced an increase in the overall donor return rate, especially in those who had not booked their next appointment, suggesting that blood donation services can use this cost-effective approach to sustain the long-term cooperative behaviour of their repeat donors.

WhatsApp messages. Recent advancements in mobile technology have enabled the use of applications for communication with blood donors. Rodrigues Lucena et al. (2020) tested the effectiveness of WhatsApp as a communication tool on blood donor return rates. Authors randomly assigned 548 blood donors who donated blood in one private blood bank in Brazil to either a treatment group (four messages, designed following a strategy of persuasive communication, sent at different time points⁽²⁸⁾ using WhatsApp) or a control group (no message). The authors did not find any effect of WhatsApp messages on donor return rates. To our knowledge, this is the only study that has experimentally tested the effect of a message via WhatsApp on encouraging blood donations. This implies that there is a need for further research with treatments designed to enable testing the effectiveness of the mode of delivery (WhatsApp) independently of the content of delivery (the message itself).

Donor registry. Heger et al. (2020) showed that an invitation to join the Australian Red Cross donor registry⁽²⁹⁾, which included critical shortage appeals, increased the response rate of long-lapsed donors by 66 % in comparison with long-lapsed donors who had not been invited to join this registry. Yet, long-lapsed donors were no more likely to donate when there were no shortages. This result suggests the use of a registry of this type to improve the coordination between donors and blood collection centres and to increase supply during critical shortage periods.

Combining different types of reminders. In a large-scale field experiment encompassing 11 880 Chinese inactive donors (those who had made at least one donation but had not donated within the previous 24 months), Ou-Yang et al. (2020) tested the effect of **phone call reminders versus text message reminders** on inactive donors' redonation rates. They additionally included an altruistic appeal in the text message reminders. The estimated average treatment effect showed that phone calls increased the redonation rate by 2.3 percentage points compared with text messages among compliers (inactive donors who received the treatment and came to donate). Another study with a similar experimental design was conducted in Brazil by Porto-Ferreira et al. (2017). The authors used a non-standard donor pool – non-responding first-time blood donors with reactive serological tests – to test the effectiveness of **text messages, letters and phone calls** requesting return for notification and counselling on return rates. They found that phone calls were more effective than text messages (39.8 % v 28.4 %) in increasing the return rate of non-responding first-time blood donors with reactive serological tests; however, when compared with a letter, the difference in effectiveness was not significant (39.8 % v 34.4 %). The results of these two studies suggest to blood donation centres that, when deciding about the mode of the delivery of a blood donation reminder message, it is more effective to use phone calls than text messages.

5.1.2. Active decision elicitation mechanisms

For many non-donors, donating blood might look like a costly and unpleasant activity. As a result of not reflecting on the prosocial aspect of this activity, potential donors may not decide to donate blood. Stutzer, Goette and Zehnder (2006) hypothesised that engaging people who were not well informed about blood donation in an active decision to donate can convince them to donate. They tested this hypothesis using a field experiment conducted in cooperation with the Red Cross in Zurich, Switzerland. Participants in the control group filled in a questionnaire and received information about the blood drive. Participants in the 'strong active decision treatment' were additionally asked to decide, on the spot, if they were willing to donate blood. Participants in the 'weak active decision treatment' had the option to make or postpone the decision to donate blood. Results showed that the donation rate of participants who were not sufficiently informed about blood donation increases by 8 percentage points after being asked to make an active decision to donate blood (i.e. those in the 'strong active decision treatment' group). In contrast, there was no effect of being asked to make

⁽²⁸⁾ The time points were 1 week after donation, 2 weeks after donation, 3 months after donation and 4 months after donation.

⁽²⁹⁾ The main purpose of this registry was to help coordinate the supply and demand of blood. Long-lapsed donors on the registry were told that the blood service is creating a register and that the donor will be contacted only when there is a need for their blood type and only once or twice per year. It was assumed that this would encourage the donors to make an implicit commitment to donate.

an active decision on participants who were sufficiently informed. Similarly, the ‘weak active decision treatment’ did not have a significant effect on participants regardless of whether or not they were well informed. The results of this study recommend interventions using active decision elicitation mechanisms to target non-donors and early-career donors, especially those who lack sufficient information about blood donation.

5.1.3. Private and public pledges to donate blood

Based on the premise that people tend to behave in socially desirable ways, in particular incurring costs or forgoing benefits to maintain their social image (Bursztyn and Jensen, 2017), Meyer and Tripodi (2021) tested whether appealing to the social image concerns of prospective donors⁽³⁰⁾ can motivate them to donate blood. The authors used a framed field experiment with a 2 × 2 between-subjects design. They varied the visibility of the pledge – private versus public – and the type of the blood collection organisation: the Red Cross versus a commercial blood bank⁽³¹⁾. Participants were customers visiting a German municipal government service centre, some accompanied by friends or family members. The researchers offered participants the opportunity to sign up for blood drives either privately, using a tablet computer visible only to the specific participant, or publicly, asking verbally. The results show that 27 % of these participants pledged privately to donate blood in the following months, but only 1 % actually did so. Making the pledge publicly in front of friends or family members increased the pledge rate by an estimated 16.8 percentage points. Unfortunately, this did not increase actual donation rates. Additional evidence on the effect on blood donations of donors’ social image concerns is provided by Lacetera and Macis (2010). They used an observational study on a sample of Italian blood donors and showed that donors increased the frequency of their donations when approaching the thresholds at which they would be given a reward only where those rewards would be publicly announced in the local newspaper and presented during a public ceremony. This implies that, depending on the mode, public pledging can have a positive effect on donation rate.

5.1.4. Informing donors once their blood is used

Following the blood service practice of Stockholm, Sweden, several blood services from Australia, Denmark, Ireland and the United Kingdom started implementing the strategy of informing blood donors once recipients received their blood (Goette and Tripodi, 2020; Moussaoui et al., 2019). Because this strategy drew a lot of media attention⁽³²⁾ and started to be used extensively in practice, several research studies tried to measure the effectiveness of this type of feedback on blood donation rates⁽³³⁾. However, the evidence is inconclusive.

For example, Fosgaard et al. (2020) conducted a field experiment with 20 365 Danish whole-blood and plasma donors. Participants did or did not receive a text message when their donation was used. The researchers also varied the time of the day when the message was sent. The results show that the text message increased the number of subsequent donations by 3.6 %. In addition, heterogeneity analysis showed that this effect was specific to plasma donors. That is, informing donors by text message that their donation had been used did not have a significant effect on whole-blood donations, but it had a highly significant effect on plasma donations. It is worth noting that Gemelli et al. (2018) found that a non-incentive (a post-donation text message informing the donor of the hospital or town to which their blood was dispatched) had a similar effect on some whole-blood donors – that is, first-time, novice and established donors, but not experienced donors.

Comparably, Pongsananurak et al. (2020) tested the effects of a text message sent to first-time whole-blood donors in Thailand once their blood was dispatched from the transfusion service. In a field experiment with 1 270 donors receiving the text message and 1 270 donors not receiving the text message, the researchers found that the text message significantly increased the donation return rate.

Using a similar research design, Moussaoui et al. (2019) sent text messages to thank 2 064 donors for their donation and to inform them that their blood was ready to be used. Donors in the control group (2 034 donors) did not get a text message. When return rates of donors from the treatment group and from the

⁽³⁰⁾ Out of 596 study participants, 65 had previously donated either through the German Red Cross or at the commercial blood bank.

⁽³¹⁾ In Germany, donors can donate blood voluntarily and without remuneration through the Red Cross or they can receive financial remuneration in return for blood donations through private blood banks.

⁽³²⁾ See, for example, <https://www.independent.co.uk/news/world/europe/blood-donors-in-sweden-get-a-text-message-when-ever-someone-is-helped-with-their-blood-10310101.html>.

⁽³³⁾ There were even some concerns that this type of incentive could have negative effects as it might signal to the donor that blood supply levels are high and there is no need to give blood again (Damingier and Kimmel, 2015).

control group in the 6- to 10-month period from the last donation were compared, it was found that the text message had a small but significant effect – it generated an additional 37 donations for the blood donation centre.

However, there is also evidence for negative effects of this type of non-incentive on blood donation. In particular, Goette and Tripodi (2020) used a sample of 8 591 Italian donors and a 2 × 2 experimental design to test the effect on blood donation rates of providing donors with information once their blood was used ⁽³⁴⁾. Conducted in cooperation with a non-governmental organisation responsible for blood collection, the experiment tested the effect of feedback on previous donation utilisation in an email from the organisation. Orthogonal to this treatment, the authors also varied whether or not the email contained an invitation to schedule an early appointment for the next donation. In contrast to the previously mentioned studies, this one used email messages for correspondence with donors. The results show that providing donors with the information that their previous blood had been used decreased blood donations by 6.9 % over the study period. The authors explained that this type of feedback might have reminded the donor of a past donation (past good action) and postponed the need to engage again in prosocial activity (donating blood). Lastly, asking donors to schedule an early appointment using email correspondence did not have any effect on blood donation rates. Because the evidence on the effectiveness of informing donors that their blood has been used is inconclusive, it is not feasible to make a general recommendation on the use of this type on non-incentive in practice.

5.1.5. Informing deferred donors about deferral policies

To protect donor's and patient's health and to comply with legislation, blood banks follow strict deferral policies. For example, donors will not be allowed to donate if they travelled to a virus-endemic area ⁽³⁵⁾, if their haemoglobin levels are low or if they are underweight. Deferral has a negative impact on donor behaviour, particularly among individuals who are donating blood for the first time (Piersma et al., 2017). Some reasons for deferrals might be temporary and donors would be able to donate in the future. However, not all donors are aware of deferral policies, and they might think or feel that being deferred once prevents them from donating ever again.

With the intention to understand how to increase return rates after deferral, Spekman, van Tilburg and Merz (2022) conducted a field experiment with 660 deferred (whole-blood and plasma) donors from the Netherlands. To measure return within 4 weeks of the donor being invited again and of their deferral expiring, the authors used an experimental design with a control group and four treatment groups. Donors in the treatment groups were offered the opportunity to perform an alternative good deed (design a postcard to a patient receiving a transfusion (treatment 1) or fill out a questionnaire (treatment 2)) or offered an information brochure with additional information about deferral (treatment 3) or given the opportunity to choose one of the good deeds (treatment 4). Their results indicate that providing deferred donors with additional information about deferral has a positive effect on the return rate of whole-blood donors. In contrast, offering an alternative good deed (i.e. designing a postcard for a patient or filling out a questionnaire) and allowing a donor to choose between the types of good deed to perform did not have an effect on deferred donors' return rate. This study suggests that blood donation centres should share information about their deferral policies with donors who have been deferred, as this can encourage them to return for future donations.

⁽³⁴⁾ The authors did not inform donors of the exact date when the blood was used; they informed donors that their previous donation had been used.

⁽³⁵⁾ Müller-Steinhardt, Weidmann and Klüter (2017) showed that the number of German first-time and repeat donors deferred because of travel history increased significantly from 2010 to 2015.

5.2. Interventions testing the effectiveness of non-monetary incentives

Non-monetary incentives with some material component can take the form of goods or services ⁽³⁶⁾ gifted to donors in return for a blood donation (Mortimer et al., 2019).

5.2.1. Paid days off work

Even though a paid day off work is widely used in practice to motivate donors to donate blood and blood products, there is a lack of experimental evidence on the effectiveness of this type of incentive. This is probably because it would be complicated and unfair to offer this incentive to a specific group of donors only. Importantly, there is evidence from an observational study conducted by Lacetera and Macis (2013). Their analysis showed that the incentive of a day off work generates, on average, one extra donation per year from employed donors, which is an increase of around 40 %. A paid day off work can be viewed as a form of payment that has monetary worth, but because it is not a direct payment of cash, we classify this as non-monetary incentive with some material component. Although offering a paid day off work has proven to be an effective incentive for encouraging blood donations, it is important to note that this approach is applicable only to employed donors ⁽³⁷⁾.

5.2.2. Health checks

Goette and Stutzer (2019) and Goette, Stutzer and Frey (2010) tested if offering cholesterol tests in return for blood donations might trigger donor reciprocal behaviour, leading to higher donor response rates (see the chapter 'Mixed strategies' in Goette and Stutzer (2019) for more detail). Neither study found a significant effect of cholesterol tests on encouraging blood donations. To test the effectiveness of offering a comprehensive health check that includes a cholesterol test among other tests ⁽³⁸⁾ on blood donor donation behaviour, Leipnitz et al. (2018) conducted two large-scale field experiments (with 53 257 and 31 522 previous donors) in cooperation with the German Red Cross blood donation service. The researchers reported that offering a comprehensive health test had positive and significant effects on donation rates. In particular, it increased the probability of donating blood by 33 % in comparison with baseline (donors who received a standard invitation). Importantly, repeated exposure to this incentive did not deter donors from making consecutive donations, suggesting the effectiveness of comprehensive health tests to improve donation rates.

5.3. Interventions testing the effectiveness of monetary incentives

Monetary incentives are financial rewards that blood donors receive in return for donations. Whereas standard economic theory predicts that offering monetary incentives should increase the provision of blood donations, alternative theories indicate that this type of incentive might crowd out blood donors' intrinsic motives to donate (Bénabou and Tirole 2003; Bruers, 2022; Titmuss, 1970). An additional concern that has been raised when it comes to offering monetary incentives is that this type of incentive could attract more risk-seeking donors (Goette, Stutzer and Frey, 2010; Kunin, 1959). The empirical evidence on the effect of monetary incentives on blood donation is mixed. As a further reminder, the European Commission proposal for revising the EU blood legislation stresses that blood donation should be founded on the principle of voluntary and unpaid donation, and financial incentives and inducements to donors are not permissible. Compensation, as defined by Member States, to remove the risk of donors being financially disadvantaged by their donation can be acceptable but should never constitute an incentive, as that may cause donors to be dishonest or behave in an unhealthy way (for them or others).

5.3.1. Vouchers and gift cards

Lacetera, Macis and Slonim (2012) provide consistent evidence from an observational study and a natural field experiment that monetary incentives increased blood drive participation. Their field study involved selecting pairs of similar American Red Cross blood drives in Northern Ohio that were randomly assigned to a

⁽³⁶⁾ Note that people can monetise gifts by selling them.

⁽³⁷⁾ There is another concern that has to be addressed before using this approach. This concern is related to equity, because those blood donors who are not in employment, such as unemployed or retired donors, are not being 'compensated' whereas the employed donors are, which is unfair for donors not in employment.

⁽³⁸⁾ This health check includes a comprehensive blood test (i.e. a blood level test including testing of cholesterol, creatinine and uric acid levels). In Germany, this type of health check is offered for free (biennially) to individuals aged > 35 years.

control condition (no incentives) and a treatment condition (USD 5, USD 10 or USD 15⁽³⁹⁾) gift cards for a variety of stores, i.e. Walmart, Target, BP, Buehler's and Giant Eagle). The results of this study showed that blood drive participation rates and the number of blood units collected were significantly greater (and increasingly greater in correspondence with higher gift card value) for donors from treatment groups in comparison to donors from the control group. Notably, offering monetary incentives did not increase the fraction of donors being deferred, and it did not increase the number of 'risky donors' coming to donate blood. Similarly, Goette and Stutzer (2019) showed that offering a lottery ticket in return for blood donation was effective in increasing the probability of donating blood (see the chapter 'Mixed strategies' for more detail). The evidence suggests that providing monetary incentives in the form of vouchers, gift cards and lottery tickets can be an effective strategy for boosting blood donations.

5.3.2. Cash payments

Empirical evidence on the effectiveness of offering cash payments in improving blood donation rates is not unequivocal. For example, the results from an observational study conducted by Weidmann et al. (2014) suggest that monetary compensation can be used as a short-term strategy to recruit new donors as it may increase the probability of donating blood in the first few months after an initial donation. Similarly, using a quasi-natural experiment in Germany in which one blood donation centre stopped remunerating donors for blood donations, Becker et al. (2019) reported that this change in payment significantly reduced collected blood donations.

The evidence from a field study shows contradictory results, particularly for female donors. To test the effect of cash payments, Mellström and Johannesson (2008) conducted a field experiment in which they randomly assigned Swedish students to one of the following three conditions: (1) a control group without compensation, (2) a treatment group where students received SEK 50 for undergoing a health check in order to become a blood donor and (3) a treatment group where students could choose between a SEK 50 payment and donating SEK 50 to charity. The effects were different in men and women. Whereas interventions did not have any effect on male students, female students were significantly less prone to donate if offered cash payments (their supply of blood dropped from 52 % to 30 %).

In addition to mentioning experimental evidence on the effect of interventions on donor behaviour, here we include a study that tested the effect of two types of monetary intervention – a hypothetical cash payment of EUR 10 (treatment 1) and a hypothetical voucher to the value of EUR 10 (treatment 2) – on donor intention to donate. Using a field experiment, Lacetera and Macis (2009) varied these two monetary incentives for 467 Italian donors. The authors reported that a significant number of survey respondents stopped donating if offered EUR 10 in cash in return for making a blood donation, but not if a voucher of the same nominal value was offered instead. The results of this study imply that donors may treat vouchers as a gift exchanges rather than as a financial exchange.

5.4. Mixed interventions

Some studies used a mix of interventions, including non-incentives, non-monetary incentives and/or monetary incentives, when testing and comparing their effectiveness in encouraging blood donations. One of the earliest studies that tested the effects of non-incentives and non-monetary incentives on donating blood (blood drive attendance in particular) was conducted in the United States. The authors compared the effect of informing undergraduate students about the upcoming blood drive with a focus on altruism and the effect of rewards for blood donation on blood drive attendance. Specifically, rewards were coupons redeemable at local merchants and the possibility of winning a raffle (tickets to a Broadway play and a college football game). Significantly more students attended the blood drive if offered rewards in comparison to being informed about altruistic reasons for blood donation (61 % v 29 %).

In another study, Reich et al. (2006) used a field experiment with 6 919 first-time American donors to test the effect of the following strategies on return donation within 6 months: a non-monetary incentive (i.e. a T-shirt as a present) and two non-incentives (i.e. a story about a liver transplant patient who required blood transfusion aimed at donor empathy and altruism, and a complimentary message, such as 'special people like you are crucial to our blood supply', aimed at donor self-esteem). Regardless of the allocated groups, the

⁽³⁹⁾ EUR 4.74, EUR 9.48 and EUR 14.22, respectively.

authors varied the method of contacting donors between emails and phone calls. They showed that the T-shirt incentive did not have a significant effect on return donation, and that appealing to donors' empathy and altruism was significantly more effective than appealing to donor self-esteem. Furthermore, contacting donors by email was significantly less effective than by phone call, which is yet further evidence on the effectiveness of phone calls in comparison to other methods of communication to remind donors about the need for blood.

Similarly, to measure the effect of treatments on the proportion of donors who registered to give blood within 6 months of their last donation, Myhal, Godin and Dubuc (2017) randomised 7 399 donors from Quebec, Canada, to one of the following three treatments: (1) 'action-planning treatment' – at the end of the donation process, donors were invited to write the date of their next donation on a sticky note; (2) 'reward treatment' – donors were given an anti-theft credit card sleeve in return for blood donation; and (3) 'thank you treatment' – donors were thanked after their donation. They found no difference between the three treatments in the proportions of donors who registered to give blood. However, they found that significantly more women registered for the next donation in the 'thank you' treatment group. It is worth noting that techniques such as 'action planning', specifically the use of implementation intentions⁽⁴⁰⁾ and explicit commitment⁽⁴¹⁾ to bridge the intention-behaviour gap, have been shown to significantly increase the return of newly registered donors and also temporarily deferred novice donors (Godin et al., 2013; Wevers et al., 2014).

Using a research design that combined a non-monetary incentive (a cholesterol test in return for blood donation) and a non-incentive (solicitation letters with and without an appeal for blood), Goette, Stutzer and Frey (2010) tested the effects of these strategies on attracting new donors and motivating previous donors. Results showed that neither cholesterol tests nor solicitation letters significantly increased donations from non-donors and previous donors during the study period.

In parallel, using a large-scale field experiment with more than 10 000 previous blood donors, Goette and Stutzer (2019) tested the effects of offering non-incentives (an appeal to donate blood), non-monetary incentives (a cholesterol test) and monetary incentives (a lottery ticket) on the probability of donating blood. The authors reported that offering a lottery ticket increased the probability of donating blood during the study period by 5.6 percentage points compared with the baseline donation rate (46 %). Offering a cholesterol test did not have any effect on the probability of donating blood.

Similar to Goette and Stutzer (2019), Iajya et al. (2013) tested the effects of all three types of strategies combined – non-incentives, non-monetary incentives and monetary incentives – for encouraging blood donations using a large-scale field experiment with 18 500 individuals aged 18–65 years from San Miguel de Tucuman, Argentina. Individuals received either a 'pure control' flyer inviting them to donate or one of the following (combinations of) interventions: (1) an 'information only' flyer that included information on the benefits of undirected donations as opposed to emergency-system donations, (2) an 'information only' flyer and a T-shirt indicating that they donated blood in return for blood donation; (3) an 'information only' flyer and an offer to mention their voluntary blood donation in the 'Socials' page of the local newspaper; or (4) an 'information only' flyer and an offered vouchers for use at a local supermarket in three values (ARS 20, ARS 60 or ARS 100⁽⁴²⁾) in return for their blood donation. Variables of interest were the number of usable units of blood collected and donor turnout. The results of this study showed that only offering incentives of higher value (vouchers worth ARS 60 and ARS 100) in return for blood donation significantly increased the likelihood that an individual made a usable donation compared with the control ('information only') condition. However, it should be taken into consideration that, as these are vouchers, the positive effect may be because these are perceived as a gift exchange rather than a financial exchange (Lacetera and Macis, 2009). The donor turnout was 0.43 % and 0.83 % (significant in both cases) in the ARS 60 and ARS 100 treatments, respectively, when compared with the control condition, confirming that monetary incentives in the form of vouchers are effective in increasing blood donations and also usable donations in a middle-income economy. Thus, again, there was no evidence that financial incentives lead to donations of poorer-quality blood.

⁽⁴⁰⁾ Implementation intentions refer to the specific plans individuals make to follow through on their intentions to donate blood. By creating a concrete plan for blood donation, individuals are more likely to fulfil their intentions and donate blood.

⁽⁴¹⁾ Explicit commitment refers to the act of making a specific pledge to donate blood, such as signing a pledge card at a blood drive or making a verbal commitment to a healthcare provider.

⁽⁴²⁾ Approximately EUR 0.11, EUR 0.33 and EUR 0.5, respectively.

5.5. Other behavioural interventions

Empirical research has identified several factors related to a decreased likelihood of repeat donation, including donor age, gender, education and income (Piliavin, 1990). The study found that younger donors were more likely to be repeat donors than older donors, and that women were more likely to donate blood more frequently than men. Donors with higher levels of education and income were also more likely to donate blood on a regular basis. The study also found that previous negative experiences with donating blood, such as vasovagal reactions, pain or discomfort during donation, were associated with a decreased likelihood of repeat donation. Other factors, such as inconvenience, lack of awareness about the need for blood, and fear of needles, were also identified as barriers to repeat donation.

Applied muscle tension is a technique that involves the tensing and releasing of muscle groups to help reduce the likelihood of vasovagal reactions during blood donation. Vasovagal reactions, which include fainting, dizziness and nausea, are a common occurrence among blood donors and can discourage repeat donations (Thijssen and Masser, 2019). Vasovagal reactions were among the strongest factors that deterred donors from donating again (Ogata et al., 1980).

Ditto et al. (2003) suggested that methods of preventing vasovagal reactions, such as the applied muscle tension technique⁽⁴³⁾, might influence donor retention. The authors tested the effect of this technique using a field study with 605 donors who were randomised to an applied muscle tension treatment condition, a no-treatment control condition or a placebo control condition. Although there was no effect of this technique on male donors, female donors reported significantly fewer donation-related symptoms. This suggests that the use of applied muscle tension could improve donor retention rates, particularly among female donors who are more susceptible to vasovagal reactions. However, a meta-analysis by Fisher et al. (2016) reviewed interventions aiming to reduce vasovagal reactions in blood donors, including the use of the applied muscle tension technique, and found that although applied muscle tension did lead to a small reduction in the risk of vasovagal reactions, the effect was not statistically significant. Therefore, it can be concluded that applied muscle tension may not be as effective in preventing vasovagal reactions as previously thought, and this information should be contemplated when considering interventions to improve donor retention.

Other interventions include distraction techniques, such as watching videos or listening to music, which have been found to be effective in reducing anxiety and pain during donation (Akyol, Kaban and Orsal, 2014; Popovsky, Audet and Andrzejewski, 2008). In addition, relaxation techniques such as deep breathing have also been found to be effective in reducing vasovagal reactions and increasing blood donation (France et al., 2008). Overall, these behavioural interventions have shown promise in improving blood donation behaviour among individuals who experience pain, discomfort and fear during the donation process. However, further research is needed to determine the effectiveness of these interventions in larger and more diverse populations.

⁽⁴³⁾ The applied muscle tension technique consists of repeated contraction of the major muscle groups of the arms and legs.

6. Ethical considerations in behavioural interventions to promote blood donation

As we have assessed in this review, as concerns over public health and well-being continue to mount, behavioural interventions have become a popular approach for promoting blood donation. However, as blood donation decisions are highly personal and culturally influenced, the ethical considerations surrounding these interventions must not be overlooked. Behavioural interventions might be flagged as potentially manipulative and paternalistic and a potential infringement of individual autonomy – either by those implementing them or by those being affected by them. This section serves as a brief reminder of the need to reflect on the ethical implications when designing and implementing behavioural interventions in blood donation programmes. Although we will touch on some key ethical issues, it is important to recognise that this is not an all-encompassing discussion. Rather, it is intended to be a starting point for further dialogue and contemplation on the ethical concerns involved in this area.

When considering the application of behavioural insights into blood donation, it is important to ensure that the interventions implemented increase both personal and social welfare. The aim of these interventions should be to assist individuals who wish to donate blood in translating their preferences into action. In fact, it should be noted that there exists a significant disparity between the intention to donate blood and actual donation rates. Research suggests that without any intervention there is only a 10 % conversion rate in non-donors, indicating that 90 % of non-donors do not act on their expressed preference to donate blood (Ferguson, Edwards and Masser, 2022). A similar trend is observed in the context of opt-in organ donation, where approximately 70 % to 80 % express a desire to opt in but only about 30 % follow through. This implies that there is a substantial proportion of people who wish to donate blood (or organs) but do not, potentially because of a lack of information, cognitive resources or other obstacles. Behavioural interventions are designed to overcome these barriers and promote donation.

In promoting blood donation, as in all behavioural interventions, it is essential to address ethical concerns related to individual welfare, autonomy and dignity and the legitimacy of external influence on personal choices, including the implications of a potentially manipulatory intervention. Although manipulation is a criticism commonly levelled at behavioural interventions, it is crucial to note that an intervention aiming to change behaviour does not inherently equate to manipulation (Sunstein, 2016). It is worth emphasising that an intervention can be considered manipulative only if it is implemented in a covert manner, through the use of deception, concealment or omission of relevant information during the interaction. In other words, if the intervention is carried out in a transparent and open manner, and the people involved are fully informed about the purpose and potential consequences of the intervention, it cannot be regarded as manipulative. Nevertheless, this does not prevent such interventions being considered by some people as manipulative. Ferguson (2021a) has shown that when a message is clear and transparent, people may still perceive it as manipulative, depending on the content of the message. To make sure that behavioural interventions are not perceived as manipulative by those affected, acceptability and perceptions of manipulation of any content should ideally be assessed and considered. This is particularly important when it comes to behavioural interventions aiming to encourage blood donations – which are based on health-related and therefore personal decisions – where individuals' autonomy and consent must be fully respected. Although persuasion as a means to assist people in acting on their preferences is acceptable, undue pressure on individuals to donate can compromise their decision-making process and may lead to regret or resentment. This is one of the reasons why both the legislative framework in the EU and the classical nudging approach share the principle that interventions must not include significant material incentives that may lead to negative health-impacts for donors or others, preserving the freedom of choice.

Therefore, a corollary is that transparency is key when implementing behavioural interventions: recent evidence suggests that transparent nudges can be just as effective, if not more so, than opaque nudges, and that transparent nudges are viewed more favourably than opaque alternatives (Bruns, 2021). In addition, all communication materials or messaging used to incentivise donations should be accurate and transparent, avoiding the use of false or exaggerated claims. Furthermore, to ensure that individuals make informed decisions about donation, clear and comprehensive information should be provided about the risks and benefits involved, and also about any incentives, even if financially neutral, that may be offered. This enables individuals to make informed decisions about whether to donate, based on a realistic understanding of the implications.

Privacy concerns must also be addressed. Any data collected should be anonymised and used solely for the purpose of improving blood donation rates, and blood donors should be aware of this. This helps to build trust

in the blood donation processes and ensures that individuals feel comfortable sharing their information, maintaining their dignity and autonomy in the use of their data.

To guide policymakers there are numerous tools that can be utilised to ensure a thorough application of ethical principles to behavioural interventions. For example, the behaviours, analysis, strategies, interventions and change (BASIC) toolkit developed by OECD (OECD, 2019) is a comprehensive framework designed to support policymakers in conducting behavioural interventions throughout the policy cycle, from the initial stages of policy development to the final stages of evaluation. Unlike previous frameworks, which have mainly focused on the latter stages of the policy cycle, such as experimentation and compliance, the BASIC toolkit places equal emphasis on the behavioural analysis of a policy problem. By doing so, the BASIC toolkit aims to close the gap between policy analysis and behaviour change, providing policymakers with a set of best practice tools, methods and ethical guidelines. Building on this document, OECD published *Good practice principles for ethical behavioural science in public policy* (OECD, 2022) to offer a consistent set of ethical considerations necessary for the responsible application of behavioural science to public policy. The report features a 'three Ps approach': principles, prompts and practices. It presents users with overarching ethical principles that reinforce the responsible use of behavioural insights in public policy, supported by prompting questions, actionable practices and real-life case studies. Another valid tool is the FORGOOD framework (Lades and Delaney, 2022), which recommends that individuals practising nudging consider seven essential ethical dimensions, namely fairness, openness, respect, goals, opinions, options and delegation. This framework aims to encompass the fundamental aspects of the ethical debate surrounding the use of nudges in human behaviour, while also being adaptable for implementation across various public policy contexts.

In conclusion, this section highlights the need to consider the ethical implications of behavioural interventions in blood donation programmes. Although these interventions have shown promise in increasing donation rates, they must be designed and implemented with care to avoid potential criticisms of manipulation, paternalism and infringement of individual autonomy. The use of transparent nudges can be an effective approach in promoting blood donation while preserving individual autonomy, and clear and accurate information should be provided to individuals to ensure informed decision-making. It is essential to contemplate and engage in further dialogue about the ethical concerns involved in this area to ensure that these interventions increase both personal and social welfare while respecting individual autonomy and dignity.

7. EU-27 blood donation overview

With the aim of producing an overview of different kinds of blood donation schemes adopted in the EU-27, we collected the following sets of information for each Member State individually.

Blood donation system. This section contains the information on the type of organisation of blood donation system, including the responsibilities of the national blood centres and Red Cross societies (when applicable), the number and location of blood establishments, blood banks, blood collection units and blood donor associations and the number of fixed locations and mobile sessions.

Blood donation model. This section outlines the blood donation model used by the Member State. According to the World Health Organization, a 'voluntary non-remunerated blood donor gives blood, plasma or cellular components of his or her own free will and receives no payment, either in the form of cash or in kind, which could be considered a substitute for money. This would include time off work other than that reasonably needed for the donation and travel. Small tokens, refreshments and reimbursements of direct travel costs are compatible with voluntary, non-remunerated donation' (WHO and International Federation of Red Cross and Red Crescent Societies, 2010).

Donor statistics. This section contains Member State-specific blood donor statistics for 2021⁽⁴⁴⁾. We provide data on the number of donors, the number of donations of whole blood and blood components, donor gender and age distribution, distribution based on the frequency of donation, and similar.

Types of incentives offered to blood donors. We summarise a variety of incentives used by the Member State to motivate donors to donate whole blood⁽⁴⁵⁾.

Types of incentives offered to plasma donors. We summarise non-incentives, monetary and non-monetary incentives with some material component used by the Member State to encourage plasma donations (when applicable).

Information system. This last section includes information on the technology used by the Member State to gather, process and store donor data, what applications and online systems are used to inform and remind donors about the upcoming blood drive, the usage of electronic donor questionnaires, and similar. This section should help us understand how information technology contributes to better blood donor management and possibly to blood donor recruitment and retention.

The following sections provide the above information for each Member State individually and a closing section summarises the main findings for all Member States.

⁽⁴⁴⁾ Data for 2020 are used for Germany and Slovakia.

⁽⁴⁵⁾ To simplify data collection, we did not make a distinction between 'incentives', which are offered before donating to motivate action, and 'rewards', which are offered as surprises after donating (Chell et al., 2022). We used the term 'incentive' to encompass both.



Austria

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

Whole blood in Austria is mostly collected by blood services of the Austrian Red Cross through the Blood Donation Center for Vienna, Lower Austria and Burgenland, the Blood Center for Upper Austria, the Blood Center for Carinthia, the Blood Center for Vorarlberg and the Red Cross blood centres for Styria, Salzburg and Tyrol.



Population
8 951 520



Blood donations
352 000



Plasma donations
338 063 litres

Donation model

Whole blood donors donate voluntarily and without remuneration. There are no financial incentives or subsidies for the donations of whole blood.

Types of incentives offered to blood donors

- Whole-blood donors sometimes receive small tokens or symbolic give-aways for marketing purposes.

Types of incentives offered to plasma donors

- On average, plasma donors receive EUR 25 for their donation in private donation centres.

Information system

- The Austrian Red Cross is working on a centralised register for blood donations that are collected at the blood establishments that are part of the Austrian Red Cross.
- The Mein Blut application was developed by Netcetera for the Austrian Red Cross in Upper Austria.



Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.
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<https://www.netcetera.com/home/stories/news/20210824-ork-blood-donation-app.html>
<https://volksanwaltschaft.gv.at/artikel/blood-donation-in-austria#:~:text=In%20Austria%2C%20blood%20donation%20is,exclusion%20criterion%20for%20donating%20blood.>
<https://europeanbloodalliance.eu/country/austria/>



Belgium

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Belgian Red Cross has French and Flemish sections with their own blood institutes. The Flemish section has one blood establishment, 11 fixed donation centres and more than 800 mobile collection sites in Flanders and Brussels. The French section has 3 blood establishments, 19 fixed centres and more than 850 mobile collection sites in the Walloon Region and Brussels.



Population
11 521



Blood donors
289 918

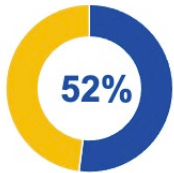


Donations
638 818

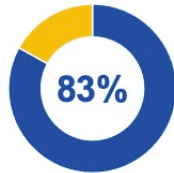
Donation model

Blood donors in Belgium donate voluntarily and without remuneration.

Donor statistics



Female donors



Repeat donors



Types of incentives offered to blood donors

- Refreshments.
- Up to 1 day off work depending on the employer.

Plasma donations

Belgium has set the goal to increase plasma collection by 5 % yearly. To achieve this goal, the following procedures are used:

- opening new centres,
- calling existing donors more often,
- educating the public about plasma and plasma donations.

Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiepking, P. (2023), 'Social norms offer explanation for inconsistent effects of incentives on prosocial behavior', *Journal of Economic Behaviour & Organization*, Vol. 221, June, pp. 429–441.

www.transfusion.be

www.rodekruis.be

<https://europeanbloodalliance.eu/country/belgium/>



Bulgaria

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Bulgarian blood system consists of the following institutions: National Centre of Haematology and Transfusiology, which is the main centre for blood collection; regional centres of haematology and transfusiology; the Center of Transfusion Haematology at the Military Medical Academy, departments of transfusion haematology and hospital transfusion facilities. The Bulgarian Organization of Voluntary Blood Donation is a non-profit association with the main goal of encouraging and promoting blood donations.

	Population		Donations		Blood donors in eligible population
	6 838 937		159 782		3.5 %

Donation model

In accordance with the Bulgarian Blood, Blood Donation, and Blood Transfusion Act, donations of blood and blood components are voluntary and without remuneration. The only exceptions are monetary remunerations for blood donations in emergency cases, for production of vaccines, serums and immunoglobulins, and for research and diagnostic purposes.

Types of incentives offered to blood donors

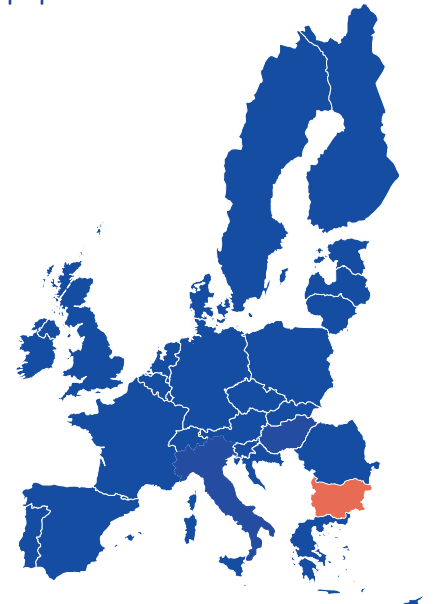
- Restorative and refreshing food and drink in an individual pack.
- Compensation for the direct costs incurred to donate blood (e.g. transportation cost), which should be compatible with the principle of voluntary donation of blood.
- Time off work (2 days, one of them on the day of donation).
- Small tokens (e.g. badges, pens, towels or T-shirts) that should be compatible with the principle of voluntary donation of blood.

Information system

- Blood donation mobile application: Дари Кръв (Donate Blood).

Sources

- <https://nctb.bg/about/2012-03-07-12-50-10/71-otcheti/524-otcheti>
- https://www.bda.bg/images/stories/documents/legal_acts/20210208_ZKKK_english.pdf
- <https://accedia.com/blood-donation-mobile-application/>





Croatia

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood system in Croatia consists of 34 transfusion departments: 7 blood establishments and 27 hospital blood banks. The Croatian Institute of Transfusion Medicine (CITM) is the only independent blood establishment and reference centre for transfusion medicine of the Ministry of Health, and the remaining six blood establishments are part of hospitals. More than 50 % of whole-blood donations and about 65 % of apheresis donations in Croatia are collected by the CITM. Immunohaematology testing is performed in all seven blood establishments, and infectious disease testing (serology) is performed in five of them (the remaining two centres send samples to the CITM). NAT (ID) testing is centralised in Zagreb (CITM) for the whole country.



Population
3 888 529



Blood donors
94 168

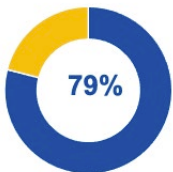


Donations
190 935

Donation model

All donations are voluntary and non-remunerated.

Donor statistics



Male donors



Repeat donors



Types of incentives offered to blood donors

- Refreshments and small gifts are provided.
- Donors can take 1–2 days of paid leave (maximum 10 days per year).
- Men who give blood at least 35 times and women who give blood at least 25 times are rewarded with supplementary health insurance.
- Men who give blood at least 30 times and women who give blood at least 20 times and who live in the capital (Zagreb) have a right to use public transportation for free.

Information system

- The national IT system (e-Delphyn) connects all transfusion centres in the country.

Sources

<https://europeanbloodalliance.eu/country/croatia/>
<https://hztm.hr/>



Cyprus

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

In 2016 all small blood collection and testing sites were merged into a single blood establishment. Cyprus has one of the highest rates of blood donors in the world – around 9% of the country's population are blood donors.



Population
1 215 584



Blood donors
78 475



Donations
300 per

Donation model

Blood donors in the Cyprus donate voluntarily and without remuneration.

Types of incentives offered to blood donors

- Biscuits and refreshments.
- Time off work depending on the employer.
- Medals and diplomas of recognition on Blood Donor Day (14 June).



Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiepking, P. (2023), 'Social norms offer explanation for inconsistent effects of incentives on prosocial behavior', *Journal of Economic Behaviour & Organization*, June, Vol. 221, pp. 429–441.

<https://in-cyprus.philenews.com/news/local/cyprus-has-the-highest-rate-of-blood-donors-in-the-world-health-ministry/>

<https://worldpopulationreview.com/countries/cyprus-population>

https://www.edqm.eu/en/d/247845?p_l_back_url=%2Fen%2Fsearch-edqm%3Fq%3Dcyprus%2Bblood%2Bdonation



Czechia

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Blood donation system in Czechia consists of **public ‘hospital-based’ blood establishments** (68 fixed blood collecting centres and several mobile teams) located within hospitals (approximately one third of them collect plasma by plasmapheresis), around 150 **hospital blood banks** and around 50 **private plasma donation centres**, which collect exclusively plasma for fractionation and cover around two thirds of Czechia’s plasma production.



Population
10 712 000



Donors in public sector: 250 000

Donors in private plasma sector: 100 000



Whole-blood donations: 427 000

Plasma donations: 993 700

Donation model

Whole-blood and plasma donations in the public sector are voluntary and non-remunerated. Plasma donations in private plasma donation centres are remunerated. The law allows for financial compensation for donation (current upper limit is EUR 32) for inconvenience and time lost when donating.

202 750 collected in
public blood
establishments

790 950 collected in
private plasma
donation centres

Types of incentives offered to blood donors

- Refreshments are provided.
- Donors can receive benefits from health insurance companies such as free vitamins.
- Medals of merit are awarded by the Red Cross to return donors (several grades) during ceremonies supported by the authorities.
- Donors can take time off work – employers have to allow the time off necessary for making a blood donation and travel. However, there are still some employers who refuse, resulting in donors donating in their free time. There are also employers who organise blood drives at their companies as a team-building activity.
- Since blood donation falls into the category of ‘projects of public interest’, it is possible to apply for tax deductions to the amount of CZK 450 (EUR 18) per donation. This is only possible if compensation for donation was not given. It is assumed that around 50 % of donors apply for tax relief.

Information system

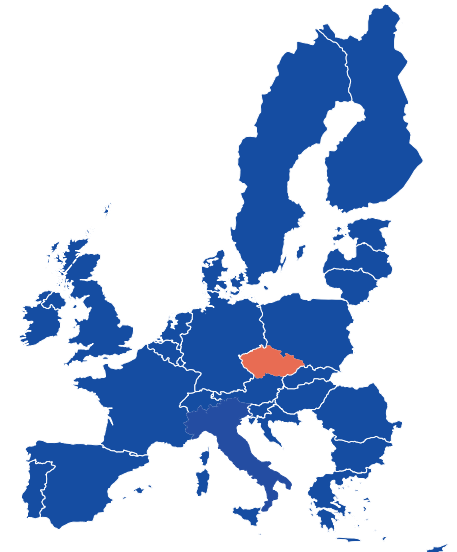
- Software for creating appointments is used in the majority of public and private centres.
- Different types of software for data management with different levels of complexity are available and used.
- An electronic donor questionnaire is available at a few centres.

Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiepking, P. (2023), ‘Social norms offer explanation for inconsistent effects of incentives on prosocial behavior’, *Journal of Economic Behaviour & Organization*, Vol. 221, June, pp. 429–441.

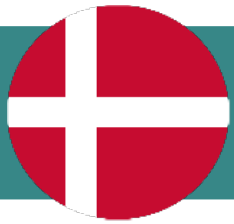
Zimová, R., and Turek, P. (2006). ‘Blood transfusion service in the Czech Republic – Organization, regulation and guidelines, quality and safety, perspectives and challenges’, *Transfusion Medicine and Hemotherapy*, Vol. 33, pp. 407–414.

<https://www.uhkt.cz/blood-donors/whole-blood-donation>



Donor statistics

- 29 300 first-time donors in the public sector.
- 51 900 first-time donors in private-sector plasma centres.



Denmark

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

Denmark consists of five regions that are each legally responsible for the public health of its citizens. Blood establishments are integrated into the public hospital system and blood collection is, in accordance with legislation, allowed only for these public blood establishments. Thus, five blood centres exist, with blood banks and blood depots in various hospitals. All blood in Denmark is provided by these blood centres and they collaborate across the regional borders. The competent authority is the Danish Patient Safety Authority.

All blood donors are organised in a central organisation, 'The Danish Blood Donor Organisation', which is operated by volunteers and is responsible for recruitment and recognition of donors. It has 51 local units across the country. A fixed payment per donation by the blood centres provides the economical basis of these local units to secure a sufficient pool of donors. Mobile blood banks serve rural areas. Blood centres inform donors through text messages or the media to attend their local blood bank in cases of shortages of blood.



Population
5 873 420



Blood donors
183 409



Donations
291 934

Donation model

All blood donations are voluntary, unpaid and uncompensated, as required by the law.

Donor statistics

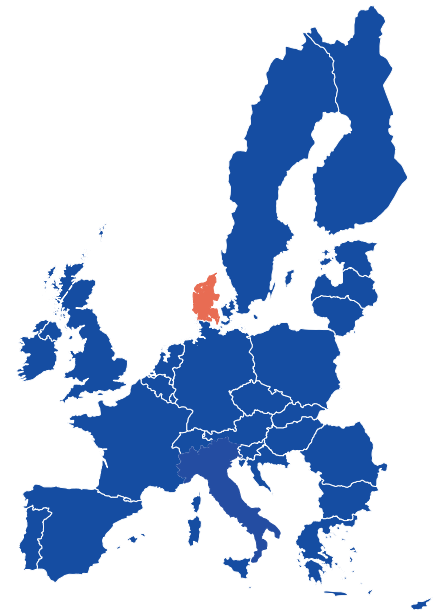
- 121 019 donors gave blood in 2021 (66 % of the registered donors), of whom 22 264 also gave 95 816 plasma donations.
- 14 362 were first-time donors.
- The majority of blood donors are female.
- More than third of the donors are aged 20 to 30 years.

Types of incentives offered to blood donors

- Refreshments (e.g. soft drink or chocolate bar).
- Symbolic gifts for donor anniversaries given by the Danish Blood Donor Organisation (e.g. pin, umbrella, wood art or gratitude letter from the royal patron).
- Public insurance covering expenditure arising from personal injuries to a donor before, during or after donation.

Sources

Rapport over blodproduktområdet 2021 (<https://stps.dk/udgivelser-1/2022/okt/rapport-over-blodproduktomraadet-2021>).



Information system

- Each region has its own blood establishment computer system (ProSang or Blodflödet).
- The Danish Society for Clinical Immunology collects clinical data on donors and recipients.
- An annual report on blood products is published by the Danish Patient Safety Authority.



Estonia

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Estonia comprises two big blood collection and processing establishments in Tallinn and Tartu and two smaller establishments in Kohtla-Järve and Pärnu. North Estonia Medical Centre's Blood Centre in Tallinn is the biggest blood collection and processing facility in Estonia. More than half of all donations are made there.



Population
1 331 796



Whole-blood
donors: 28 211
Apheresis
donors: 684



Whole-blood
donations: 48 348
Apheresis
donations: 3 001

Donation model

Blood donations in Estonia are voluntary and non-remunerated.

Donor statistics

- 2.2 % of the population donated blood.
- 13 % of all donations were from first-time donors which is 0.28 % of the population.
- 37 % of donations are collected by mobile groups operated by blood establishments.
- 50.12 % of donors are male.

Information system

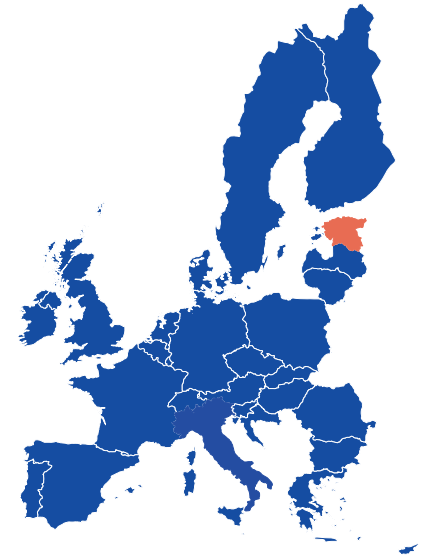
Estonia has its own information system, with donor registry, donor management, e-donor application, blood components quarantine and release functions. This information system is not central and is managed by each blood establishment separately.

Types of incentives offered to blood donors

- The mentality 'donate blood while you are in good health and use it when you need it or someone close needs the blood you donated' is prompted.
- Donors can take paid time off work.
- Slogans such as 'save a life' and 'donor is a lifesaver' on websites and Facebook.
- Donor feedback on how to improve the donation experience is used.
- Courtesy messages are sent on donors birthdays, at Christmas and similar.
- After donating, as a sign of gratitude, the donor can pick a suitable object marked with the blood establishment's logo, such as a towel, a coffee mug, a blanket, socks, a water bottle or shopping bags.
- Donors are given a badge to attach to clothing that certifies 25, 50, 75 or 100 blood donations.
- In cooperation with the Red Cross, donors with 100 donations are nominated to receive the Order of the Estonian Red Cross.
- Free drinks and snacks are provided in the waiting area to strengthen donors and reduce the incidence of adverse reactions.

Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.
https://statistika.tai.ee/pxweb/en/Andmebaas/Andmebaas_04THressursid_04Verekomponendid/?tablelist=true
<https://verekeskus.ee/en/about-us/blood-transfusion-service-in-estonia/>



Additional incentives offered to apheresis donors (one in two blood centres with apheresis equipment offers additional incentives)

- Apheresis donors are referred to as elite or VIP blood donors.
- Apheresis donors can pick two items, or one more valuable item, as a sign of gratitude.
- Taxi costs are covered to and from the blood establishment.
- A more personalised approach is taken: donors are called to donate and are offered snacks and reading materials during the procedure.
- An extended health analysis is provided to apheresis donors.



Finland

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Finnish Red Cross Blood Service is the only blood establishment in Finland. Its main activities include organising blood collections, testing donated blood, manufacturing blood products and distributing them to hospitals all over Finland. It also performs scientific research, for example on blood donors' health and well-being, and operates as a biobank, utilising blood donor samples with informed consent. Blood was donated at 10 fixed locations and at over 1 000 mobile sessions.



Population
5 550 000



Blood donors
113 006



Donations
185 326

Donation model

100 % voluntary and non-remunerated blood donations.
Currently, there are no plasma donations in Finland.

Types of incentives offered to blood donors

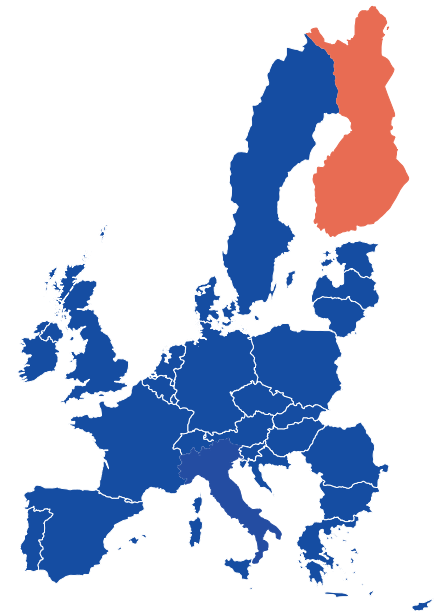
- Refreshments (e.g. coffee, tea, snacks).
- Small gifts (e.g. pens and mugs).
- Recognition for a high number of donations (e.g. 100, 150, 200).
- Reimbursement of travel expenses (only when the donor has been specifically called for an urgent donation).

Information system

- Online appointments system.
- Electronic questionnaire for donors.
- An information system that includes donor registry and management, and blood product management.

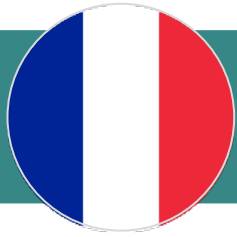
Sources

<https://europeanbloodalliance.eu/country/finland/>
<https://vuosikertomus.veripalvelu.fi/en/statistics.html>
<https://www.statista.com/statistics/521116/total-population-of-finland/>



Donor statistics

- Nearly 16 000 new donors were recruited in 2021.
- Of donors registered to donate, 5.3 % could not donate.
- The most common obstacle to blood donation was low haemoglobin levels (1.8 % of those registered for donation).
- 5 % of donors respond to their donation invitation within 7 days.



France

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

There are 2 blood establishments in France: the French blood establishment (establishment for transfusion in civilian life) and the army blood transfusion center. The French blood establishment (EFS) is a public organization responsible for blood collection, testing, preparation and distribution to around 1 900 healthcare facilities. The EFS has one national headquarters and 13 regional establishments (10 in mainland France, 1 in the Martinique, 1 in Guadeloupe-Guyana and 1 in Réunion Island).



Population
66 410



Blood donors
1 578



Donations
2 840

Whole-blood: 2 440
Plasma apheresis: 768
Platelets apheresis 302 097
Apheresis granulocytes: 97 146

Donation model

French blood donations are voluntary and non-remunerated.

Donor statistics



Female donors



Repeat donors

- 57 % of the French population thinks that better information on blood requirements would encourage them to donate blood.
- 87.7 % of all donations are collected from repeat donors.

Age (years)	% of donors
18–19	4.7 %
20–24	14.7 %
25–29	10.9 %
30–34	9.5 %
35–39	9.2 %
40–44	9.4 %
45–49	10.4 %
50–54	9.7 %
55–59	8.8 %
60–64	7.1 %
65–69	4.6 %
70	0.9 %



Types of incentives offered to blood donors

- Compensation for travel expenses.
- Small gifts (e.g., pens and mugs).

Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

Fonte, D., Blondé, J. and Girandola, F. (2017), 'How to encourage non-donors to be more willing to donate blood? Testing of binding communication based interventions', *Transfus Med*, June, Vol. 27, No 3, pp. 207–212, doi:10.1111/tme.12376, epub 10 November 2016, PMID: 27859798.

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<https://europeanbloodalliance.eu/country/france>

<https://www.statista.com/statistics/1104384/incentives-for-donation-of-blood-france/>

<https://www.statista.com/statistics/459939/population-france/>

Information system

- Data collection (INLOG and Medinfo).
- The creation of appointments to donate blood (System 1 and System 2).
- Electronic pre-donation questionnaire not yet used.



Germany

BLOOD DONATION COUNTRY PROFILES 2020

Blood donation system

The blood donation system in Germany is a three-tier system. The majority of German blood collection is carried out by the German Red Cross (GRC) blood services. The GRC collects around 70 % of all blood donations in Germany and all of those donations are voluntary and non-remunerated. It has seven blood transfusion services, including 28 donation centres and institutes. Furthermore, there are state agencies, which collect another 20 % of all blood donations and are mostly located close to university hospitals. Lastly, there are private donation sites, which are located in East Germany and collect the remaining 10 % of all blood donations in Germany.



Population
83 408



Donations
6 388

Whole-blood:	3 671
Plasma:	838
Red cells:	2 551
Platelets:	092
Granulocytes:	783
Multi component donations:	110 506
Autologous blood donations:	346

Donation model

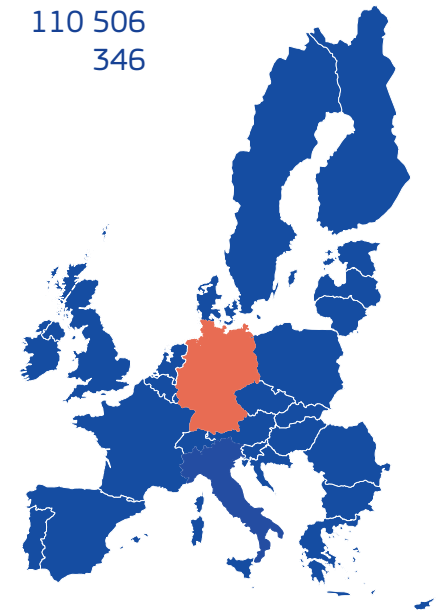
Each blood donation service can decide about offering monetary remuneration for donation.

Donor statistics

- 2-3 % of the German population donates blood.
- 44 whole-blood donations and 33 apheresis donations per 1 000 inhabitants were made in 2020.

Types of incentives offered to blood donors

- Monetary remuneration to cover, for example, travel costs (not all blood services provide blood donors with monetary remuneration).



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<https://europeanbloodalliance.eu/country/germany/>

<https://www.macrotrends.net/countries/DEU/germany/population-growth-rate>



Greece

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood system in Greece is decentralised and comprises 97 blood banks. Each blood bank is an integrated part of a public hospital and it is responsible for recruiting blood donors and collecting, testing and processing blood.



Population
10 370



Blood donations
568 000

Blood donor statistics

- 5.6 % of the eligible population donates blood.

Donation model

All donations are voluntary and non-remunerated.

Types of incentives offered to blood donors

- Medals to individuals who have reached certain donation milestones awarded during annual donor awards ceremonies.
- Public servants granted paid leave from work when making a blood donation.
- Small souvenirs.
- Soft drinks.
- Compensation for travel costs.



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European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

<https://europeanbloodalliance.eu/country/greece/>

<https://shorturl.at/isBSV>

<https://shorturl.at/lquT4>



Hungary

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood system in Hungary comprises 5 regional blood centres and 23 local blood banks. The Hungarian Red Cross is involved in blood donor recruitment.



Population

9 800 000



Donations

397 000

Donation model

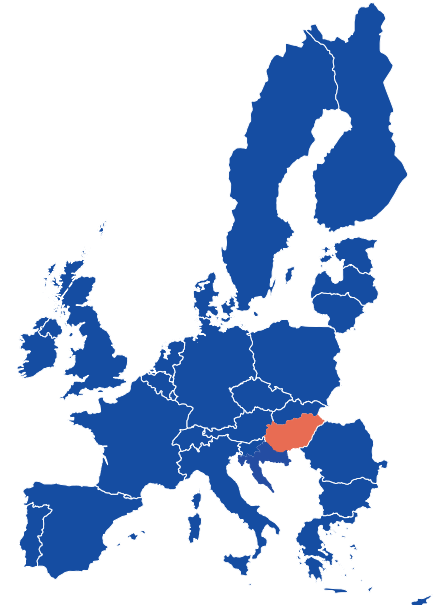
Whole-blood donations are voluntary and non-remunerated.

Types of incentives offered to whole-blood donors

- Calorie and fluid replenishment refreshment.
- Reimbursement of justified and certified travel expenses according to flat rates.

Types of incentives offered to plasma donors

- Monetary remuneration (around HUF 8 000 per donation)



Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

<https://europeanbloodalliance.eu/country/hungary/>

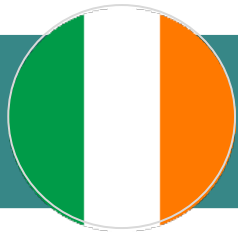
<https://www.karger.com/Article/Pdf/95119>

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.653848/full>

<https://worldpopulationreview.com/countries/hungary-population>



European Commission



Ireland

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Irish Blood Transfusion Service (IBTS) has its headquarters in the National Blood Centre in Dublin. In addition, there are five regional centres, in Cork, Ardee, Limerick, Tuam and Carlow. The IBTS operates a two-pronged donor blood donation approach for whole blood: fixed clinics (three) and mobile clinics (six). The mobile clinics operate around the country 12 months per year, visiting different venues including schools, hotels, and sports and leisure facilities. Since the start of the pandemic, the IBTS has operated an appointment-only donation process rather than the traditional 'walk-in' clinic model previously used. This appointment-only model was introduced to ensure that the IBTS complied with public health pandemic guidelines and in particular guidelines on 'social distancing'. This appointment system has proven to be very popular with donors. Also during the pandemic, the IBTS took a strategic decision to concentrate on asking regular donors to donate, to get these donors through the clinics quickly and efficiently. All marketing aimed at trying to recruit new and first-time donors was stopped, and is due to be resumed in the near future.



Population
4 986 526



Blood donors
72 791



Donations
127 614

Donation model

All donations are voluntary and non remunerated.

Donor statistics

- Approximately 3 % of the eligible Irish population donate blood.
- 55 % of blood donors are male.
- The most common blood group in Ireland is O positive (47 % of the population).

Types of incentives offered to blood donors

- Refreshments.
- Donor merchandise (e.g. pens, pencils, Christmas decorations, shopping trolley coins, and sweets).
- Awards (a silver award for 10 donations, gold for 20 donations, gold drop-shaped lapel pin representing blood for 50 donations and, for 100 donations, a presentation at an awards dinner ceremony and a porcelain pelican).

Information system

- Software solution supplied by MAK-SYSTEMS (Cambridge, MA, USA) (eProgesa 5.0.3).
- eBoss software package for data collection and analysis.
- New online appointment system to be available using the MAK-SYSTEMS software by the end of the year.

Sources

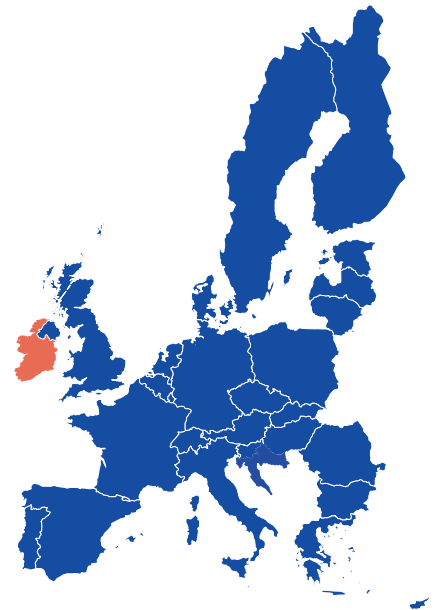
Harrington, M., Sweeney, M. R., Bailie, K., Morris, K., Kennedy, A., Boilson, A., O'Riordan, J. and Staines, A. (2007), 'What would encourage blood donation in Ireland?', *Vox Sanguinis*, May, Vol. 92, No 4, pp. 361–367, doi:10.1111/j.1423-0410.2007.00893.x, PMID: 17456160.

McMahon, R. and Byrne, M. (2008), 'Predicting donation among an Irish sample of donors and nondonors: Extending the theory of planned behavior', *Transfusion*, February, Vol. 48, No 2, pp. 321–331, doi:10.1111/j.1537-2995.2007.01526.x, epub 19 November 2007, PMID: 18028275.

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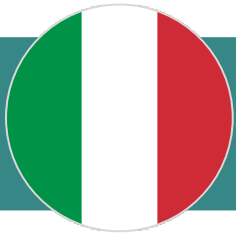
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<https://www.macrotrends.net/countries/IRL/ireland/population-growth-rate>





European Commission



Italy

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Italy is part of the National Health Service. The Italian National Blood Centre (CNS), which was established in 2007, is the technical body of the Italian Ministry of Health for all transfusion activities. The CNS coordinates and monitors the transfusion system from a technical scientific point of view to ensure that specific goals are reached, including regional and national self-sufficiency in blood components and plasma-derived medicinal products (PDMP) and the highest level of safety in all processes related to blood and blood products donation and transfusion, in compliance with EU and national legislation. In addition, the CNS promotes multidisciplinary activities aimed at avoiding unnecessary transfusions (patient blood management) and manages the National Registry of Thalassemia and other haemoglobinopathies. The CNS also actively participates in a number of international projects.

There are 21 regional blood centers that coordinate the related networks of blood establishments and blood collection units. There are four main blood donor associations (AVIS, FIDAS, FRATRES, CRI) that are institutionally involved in both blood donor management and blood collection.



Population

59 236 213



Whole-blood donors:
1 653 268

Apheresis donors:
106 781



Whole-blood donations:
3 021 143

Apheresis donations:
426 738

Donation model

The blood donation system in Italy is built on the voluntary non-remunerative model, relying on altruism and prosociality as the fundamental determinants of the willingness to donate.

Types of incentives offered to blood donors

- Refreshments.
- Paid time off work.
- Symbolic awards.
- Associative medals (medals with an increasing symbolic value, e.g. green medal (basic prize) and diamond medal (highest prize)).

Types of incentives offered to plasma donors

- Refreshments.
- Paid time off work.
- Medals of merit or recognition tokens.
- Small tokens or symbolic gifts.
- Educating public about plasma and plasma donations.

Sources

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<https://europeanbloodalliance.eu/country/italy/>
<https://www.centronazionale sangue.it/italian-national-blood-centre-cns/>
<https://www.donailsangue.salute.gov.it/donaresangue/homeCns.jsp>



Information system

- Sistema Informativo dei Servizi TRASFUSIONALI (SISTRA) – national IT system for blood establishments.
- Each region has its own blood establishment computer system.
- Certain local blood establishments have online appointment systems and/or a blood mobile application.



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Latvia

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Latvian blood donor service consists of 5 blood establishments and 51 hospital blood banks. The cooperation between all these institutions is ensured by legislation and based on agreements. The State Blood Donor Centre is the national blood establishment, located in Riga, with two branches in Rezekne and Liepaja. Being the main institution within the blood donor service of Latvia, the State Blood Donor Centre administrates and coordinates the work of the blood donor service and provides training and specialization for blood service and clinical personnel. The main task of the Latvian blood donor service is to ensure the constant supply of safe blood components and blood products to healthcare institutions. The blood donor service of Latvia has a relatively stable population of donors, around which a well-functioning everyday blood component supply chain has been developed, and the safety of blood products is ensured. Blood service is financed by the government. Overall, Latvia is self-sufficient in blood components for transfusion.



Population
1 866 942



Blood donors
33 323



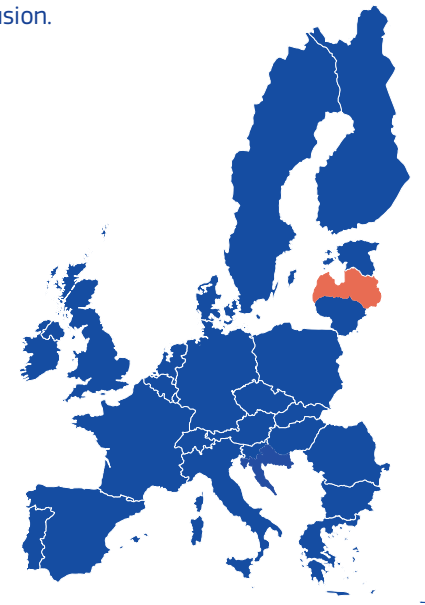
Donations
56 200

Donor statistics

- 54.4 % of all blood donors are women.
- The average donor is 37 years old.
- 42.8 % of all blood donors are regular donors.
- 6 691 are first-time donors (56.4 % women).
- 480 are apheresis donors (37.7 % women).

Types of incentives offered to blood and plasma donors

- A lunch allowance is provided (worth EUR 1.42).
- Donors can take a day off work.
- Donor can choose to be compensated for travel expenses associated with blood donation to the amount of EUR 4.27 (via bank account).
- Donors can receive a coffee voucher (this incentive is part of a current campaign organized in cooperation with a specific company).
- Motivating gifts are given for donating blood for the first time, after reaching a certain number of donations and on birthdays and holidays.
- Special care and effort is invested to make the blood donation experience as enjoyable as possible for each donor.
- Plasma donors are compensated EUR 17.07 (via bank account). Plasma obtained by apheresis is directly used for the production of plasma preparations (not commercial matters) for Latvian patients and, like blood components, is distributed to medical institutions free of charge.



Information system

- The IS ProSang donor database was implemented in 2006.
- A donor portal will be created in the upcoming year. It will contain a feature that informs donors once their blood reaches the recipient. Donors will receive important information on their health status and donation times and reminders about their next visits.

Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.
<https://europeanbloodalliance.eu/country/latvia/>
<https://eng.lsm.lv/article/society/health/donors-will-be-able-to-find-out-where-their-blood-goes-on-new-website.a402363/>
<https://www.macrotrends.net/countries/LVA/latvia/population>



Lithuania

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Lithuanian blood donation system consists of three blood establishments, which are non-profit public institutions: National Blood Center and two hospital-based blood establishments. The National Blood Center collects approximately 65 % of all donations in Lithuania.



Population
2 800 000



Blood and blood
components
donors: 54 120



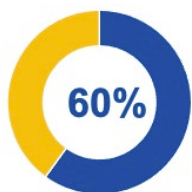
Donations
101 568

Whole-blood:	95 635
Red cells:	2 600
Plasma:	555
Platelets:	2 627
Plasma and platelets:	151

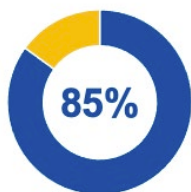
Donation model

All donations in Lithuania are voluntary and non-remunerated.

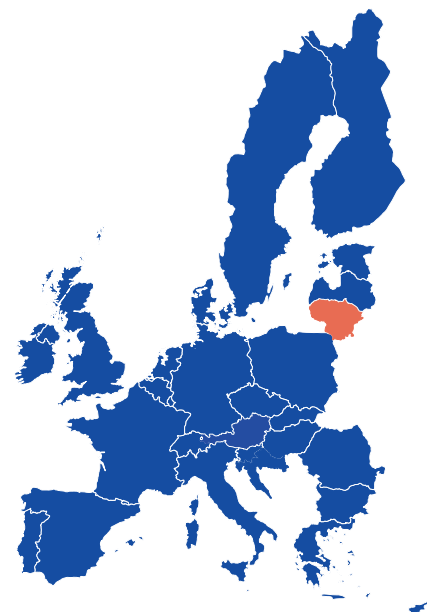
Donor statistics



Donations made
by male donors



Repeat donors



Types of incentives offered to blood donors

- Voluntary donors receive pins, pencils, tea-cups, towels, T-shirts, mugs, postcards and/or backpacks and paid time off work.

Information system

- Two blood establishments use eProgesa; the remaining blood establishment uses a bespoke, in-house IT system.

Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiepking, P. (2023), 'Social norms offer explanation for inconsistent effects of incentives on prosocial behavior', *Journal of Economic Behaviour & Organization*, June, Vol. 221, pp. 429–441.

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

<https://europeanbloodalliance.eu/country/lithuania/>



Luxembourg

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Luxembourg Red Cross operates as a single blood centre to meet the demand for blood components and plasma derivatives. It has a national responsibility to supply all blood and plasma products requested by the hospitals.



Population
634 730



13 719 donors



Whole-blood
donors: 12

Apheresis
donors: 1 021

Homologous whole-blood donations: 18 946
Autologous whole-blood donations: 1
Plasma donations by apheresis: 2 449
Platelet plus plasma donations by apheresis: 969

Donation model

All donations are voluntary and non remunerated.

Donor statistics

- 1 388 are first-time whole-blood donors.
- 46.9 % of all donors are women.

Types of incentives offered to blood and plasma donors

- Refreshments.
- Medals (awarded to individuals who have reached certain numbers of donations).
- Paid time off work (depends on the employer).

Information system

- eProgesa from MAK-SYSTEMS.
- eDMS from MAK-SYSTEMS for the laboratory, connected to eProgesa.

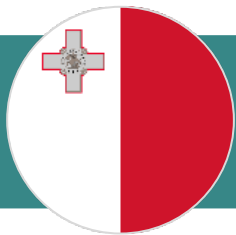
Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.
<https://europeanbloodalliance.eu/country/luxembourg/>
<https://www.croix-rouge.lu/en/>





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Malta

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Malta comprises one government-funded blood establishment and three hospital-based blood banks.



Population

442 784



Donations

18 000

Donation model

All donations are voluntary and non-remunerated.

Types of incentives offered to blood donors

- Refreshments are provided.
- Employers are encouraged to allow workers the required time off work to donate.

Information system

- Mobile application: Blood Donors MT.



Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

<https://europeanbloodalliance.eu/country/malta/>

<https://deputyprimeminister.gov.mt/en/nbts/Pages/home.aspx>

<https://worldpopulationreview.com/countries/malta-population>



Netherlands

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

Blood collection in the Netherlands is organised by a non-profit organization, Sanquin. Sanquin is the only blood organisation in the world to offer the combination of in-house medical, pharmaceutical and scientific knowledge and expertise. Donations are usually made at mobile and fixed locations. In Q4 2022, a new online system for inviting donors to donate blood and making appointments was introduced.



Population
17 475 415



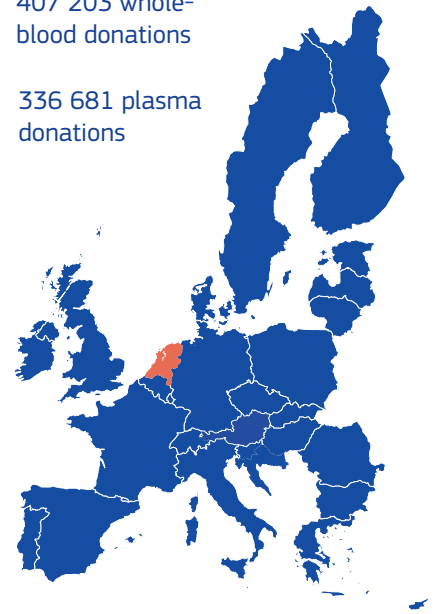
Blood donors
384 352



Donations
743 884

407 203 whole-
blood donations

336 681 plasma
donations



Donation model

Blood donations in the Netherlands are made voluntarily and are non-remunerated.

Types of incentives offered to blood donors

- Refreshments.
- Covered expenses.
- Insurance.
- Donor recognition tokens.
- Opportunity to relax in the donor café.

Recruitment strategies

- Sanquin at Work campaign (cooperating with companies to foster employees to donate blood or plasma during working hours).
- There is a Let You Hear campaign (thanking donors for their donation and encouraging them to talk about their donation experience).
- During December, Sanquin initiated a campaign to donate EUR 1 to Het Vergeten Kind foundation for each blood donation made by their donors.
- There is a League of Legends campaign (launched in 2018 for gaming community; for making their first donation, donors could earn a 'skin', which is a particular virtual game character appearance from Riot Games (Los Angeles, CA, USA). This campaign resulted with 2 500 first-time donors).
- Donor Recruit Donor strategy.

Types of incentives offered to plasma donors

- Saving system for a limited group of plasma apheresis donors (pilot study), plasma apheresis donors receive virtual donor drops, which they can redeem for small gifts related to health or leisure experiences such as book/cinema vouchers, health checks, yoga lessons and power banks. The number of drops saved determines the gift received.

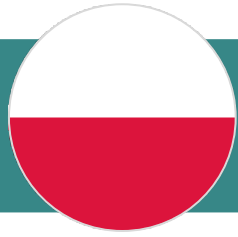
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Timmer, T. C., de Groot, R., Habets, K., Merz, E.-M., Prinsze, F. J., Atsma, F., de Kort, W. L. A. M. and van den Hurk, K. (2018), 'Donor InSight: Characteristics and representativeness of a Dutch cohort study on blood and plasma donors', *Vox Sanguinis*, February, Vol. 114, No 2, pp. 117–128, doi:10.1111/vox.12731, epub 27 December 2018, PMID: 30590867, PMCID: PMC7379571.

<https://www.sanquin.nl/en>

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<https://www.statista.com/statistics/519720/total-population-of-the-netherlands/>



Poland

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Poland comprises 21 regional blood transfusion centres, 1 military blood transfusion centre, and 1 blood transfusion centre of the Ministry of Internal Affairs. The Ministry of Health supervises the entire public blood service in Poland. There are two organisations that are responsible for the national blood service and its activities: the National Blood Center (NBC) and the Institute of Hematology and Transfusion Medicine (IHTM). The IHTM assures the development of scientific research and works in the field of haematology, transfusion medicine and related disciplines, and the NBC focuses on the monitoring and control needs for blood supply, its components and blood products, and supervision of issues related to blood transfusion. Therefore, close cooperation between the NBC and the IHTM is necessary to ensure effective provision of all blood services activities.



Population

38 538 447



Blood donors

615 927

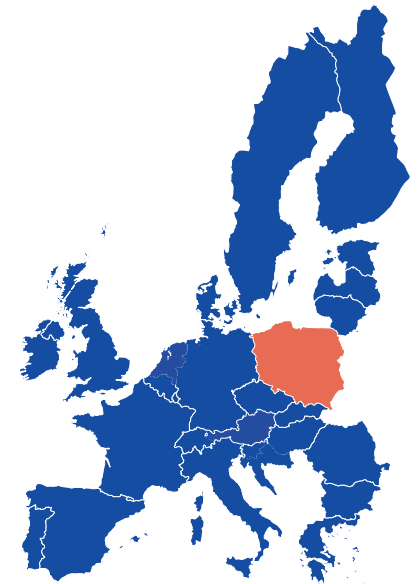


Donations

1 352 885

Types of incentives offered to blood donors

- Refreshments are provided.
- Voluntary donors receive pins, pencils, tea-cups, towels, T-shirts, mugs, postcards and/or backpacks.
- Blood donors who gave at least 5 (female donors) or 6 litres (male donors) of blood are awarded the title 'honoured voluntary blood donor' and given a badge.
- Donors can take paid time off work (starting from 14 March, 2020, honoured voluntary blood donors who donate blood or blood components during the epidemic emergency are eligible for 2 days off from work – the day of donation and the next day).
- Donors who donated blood or blood components at least three times are eligible for an additional certificate entitling them to a 33 % discount on domestic transport by collective and accelerated modes of transport (not applicable to public transport – discounts for donors in public transport are determined individually in each city) and the possibility of using services out of the queue in pharmacies.
- Donors are eligible for a tax deduction.



Donation model

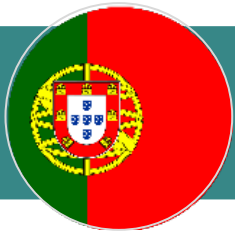
The majority of blood donations collected in Poland are voluntary and non-remunerated; the rest are remunerated.

Information system

Each blood donation centre has its individual information system. It is planned to develop one common system for all blood donation centres.

Sources

Antoniewicz-Papis, J. and Łętowska, M. (2006), 'The Polish Blood Transfusion Service – Quality, guidelines, laws, selected topics of Interest and future challenges', *Transfusion Medicine and Hemotherapy*, Vol. 33, No 5, pp. 401-406, doi: 10.1159/000095006.
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 Health policy programme entitled Ensuring self-sufficiency of Poland in blood and its components for the years 2021–2026.
<https://www.gov.pl/web/nck/>



Portugal

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The Portuguese Institute of Blood and Transplantation (IPST) ensures the collection, processing, storage and distribution of blood and its components. It collects around 60 % of all blood donations in Portugal. The remaining 40% of blood donations in Portugal are collected by hospital blood establishments.



Population
10 344



Blood donors
235 178

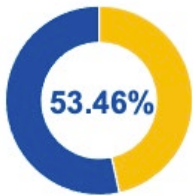


Donations
310 727

Donation model

100% voluntary non-remunerated blood donation.

Donor statistics



Female donors



Repeat donors

Age (years)	% of donors
18–24	16.45 %
25–44	44.38 %
45–65	38.75 %
65	0.42 %



Types of incentives offered to blood donors

- Exemption from paying fees for access to national healthcare (tax cut).

Information system

- ASIS: in-house software developed by IPST.
- SIBAS: commercial software developed by Glint.
- Imaginasoft: commercial software developed by ImaginaSoft.

Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiepking, P. (2023), 'Social norms offer explanation for inconsistent effects of incentives on prosocial behavior', *Journal of Economic Behaviour & Organization*, June, Vol. 221, pp. 429–441.

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<https://europeanbloodalliance.eu/country/portugal/>



Romania

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Romania is organised as a nationally coordinated system, under the Ministry of Health, which acts as the national competent authority. A total of 41 public, civil blood establishments carry out the whole chain of activities, from blood collection to distribution and issuing of blood components to hospitals. The National Institute of Blood Transfusion is coordinating the activity of these 41 blood establishments. In addition, a public military blood establishment, under the Ministry of Defence is in place in Bucharest. Blood components produced by the 42 blood establishments are distributed to around 330 hospitals in the country. Each hospital has its own hospital blood bank.



Population

19 127 774



Blood donors

313 843



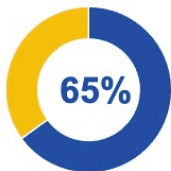
Donations

387 391

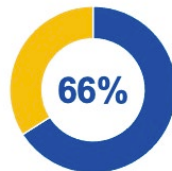
Donation model

Blood donation is voluntary and non-remunerated. Romania is not providing plasma for fractionation.

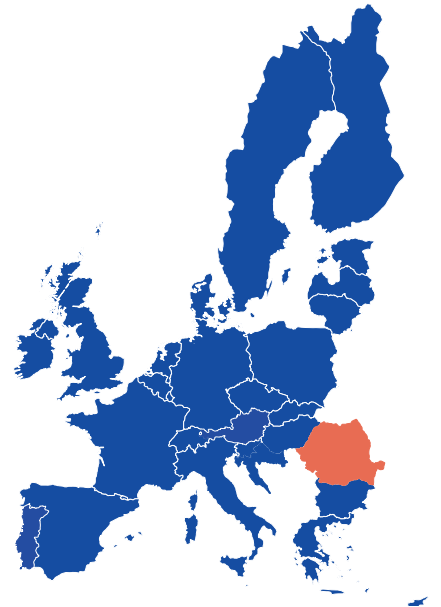
Donor statistics



Male donors



Repeat donors



Types of incentives offered to blood donors

- Food vouchers (EUR 13).
- 1 day off work (the donation day).
- Reimbursement for travel expenses (for donors who need to travel to the donation site).
- 50 % discount for public transportation for 1 month (for donors living in the same town as the blood establishment venue).
- Occasionally, for specific events, free access to cultural or educational events, concerts, etc.

Information system

- All 41 civil blood establishments are using the same software for blood donors and donation activities (national blood donors database).
- Some blood establishments are using a software that covers the entire chain of specific activities.
- The donor questionnaire is filled out on site.
- Appointments are by phone and/or one of two mobile applications – Donorium and BlooDoChallenge – depending on the blood establishment decisions made locally.

Sources

Graf, C., Merz, E.-M., Suanet, B. and Wiekping, P. (2023), 'Social norms offer explanation for inconsistent effects of incentives on prosocial behavior', *Journal of Economic Behaviour & Organization*, June, Vol. 221, pp. 429–441.
<https://www.macrotrends.net/countries/ROU/romania/population>



Slovakia

BLOOD DONATION COUNTRY PROFILES 2020

Blood donation system

Slovak blood donation system comprises two types of blood establishments:

1. The National Transfusion Service of the Slovak Republic (NTS SR) is an organisation within the competence of the Ministry of Health of the Slovak Republic, which carries out around two thirds to three quarters of all blood and blood components collections (around 160 000 yearly) in Slovakia. The NTS SR comprises 3 processing and testing centres (each of them performing whole-blood and blood components processing, pathogen inactivation of plasma and platelets and testing – immunohaematology, virus serology, and HIV-HBV-HCV NAT) and 12 collection centres (each performing the collection of whole blood, plasma, platelets, red cells and certain granulocytes).
2. The rest of blood and blood components collections (around 60 000 yearly) are performed by 31 hospital-based departments of haematology and transfusion, which are usually part of private regional hospitals, and which provide blood for their own use in hospitals. Each of them performs collection of whole blood (some of them collect plasma and platelets as well), basic processing of whole blood and blood components, and testing (immunohaematology and virus serology, but not NAT testing).

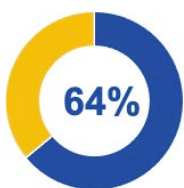


Whole-blood donations: 199 961
Combined platelets and plasma donations: 435
Plasma donations: 40
Platelets donations: 6 014
Red cells donations: 8
Granulocytes donations: 9

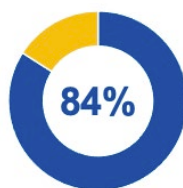
Donation model

Voluntary and non-remunerated donation of whole blood and blood components (plasma and platelets) is mandatory and regulated by law. The Council of Europe's definition of voluntary non-remunerated donation is respected and implemented by the Medicines Act.

Donor statistics



Male donors



Repeat donors

Information system

- IS Rubin, which includes a centralised register of blood donors, is managed by the ICZ.
- A mobile application offers information about donor's previous donation, the predicted time of next donation, and similar information.
- A website and an online appointment

Types of incentives offered to blood donors

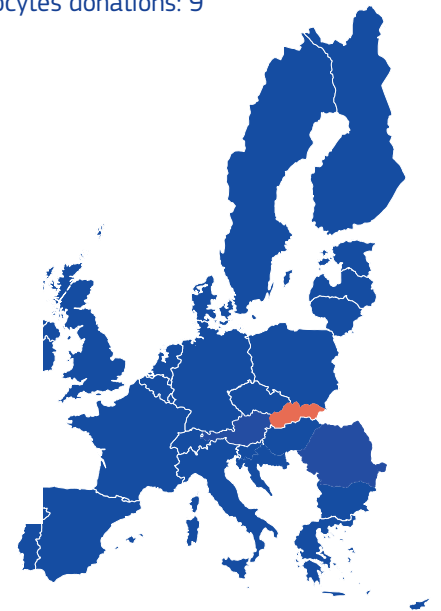
- Sandwich and meal voucher worth EUR 1.5 are provided.
- Blood donors are honoured by the Red Cross of the Slovak Republic according to the number of blood donations; they are given plaques of Dr Ján Jánský and the medal of Prof. Křazovický.
- Some employers offer 1 day off for blood donation.

Sources

<https://english.radio.cz/slovak-plasma-donors-crossing-border-austria-8603209>

<https://data.worldbank.org/indicator/SP.POP.TOTL?locations=SK>

<https://www.iczgroup.com/en/pa-reference/completion-information-system-national-blood-transfusion-service-slovak-republic/>





Slovenia

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood donation system in Slovenia consists of the Blood Transfusion Centre of Slovenia in Ljubljana and associated blood transfusion units in Izola, Jesenice, Nova Gorica, Novo Mesto, Slovenj Gradec and Trbovlje; the Transfusion Medicine Centre at Maribor University Medical Centre and associated blood transfusion units in Murska Sobota and Ptuj; the Transfusion Centre at the Celje General Hospital; and the hospital blood bank at the General Hospital Brežice. The Blood Transfusion Centre of Slovenia works in close cooperation with the Slovenian Red Cross. Through its network of 56 local Red Cross branches, the Slovenian Red Cross provides information about blood donations, educates and recruits blood donors through blood drives. The Slovenian Red Cross organises around 1 150 blood sessions annually, of which over 370 are mobile blood drives.

 Population
2 101 000

 Blood donors
62

 Donations in 2020
75 638

Donation model

100% voluntary non-remunerated blood donation.

Donor statistics



Types of incentives offered to blood donors

- Pre- and post-donation refreshments are provided.
- Donors can take a paid day off work.
- On National Blood Donation Day, President of the Republic of Slovenia Borut Pahor thanked blood donors, saying the following: 'Blood donors are our role models and inspiration. On the occasion of your day, I wish to inform you that we are aware of your noble mission, admire you, and thank you.'

Sources

European Commission (2006), Report on the promotion by Member States of voluntary unpaid blood donations, Brussels.

<https://europeanbloodalliance.eu/country/slovenia/>
<http://www.ztm.si/en/blood-donation/blood-donation-in-numbers/>
<http://www.ztm.si/en/blood-donation/blood-donation-service/>
<https://knoema.com/atlas/Slovenia/Population>



European
Commission



Spain

BLOOD DONATION - COUNTRY PROFILES YEAR 2021

Blood donation system

The blood donation system in Spain consists of 20 blood establishments. The blood establishments are fully incorporated into a unique and common public national health system. They are also responsible for designing programs to promote donations.



Population
47 160



Blood donors
1 133 131



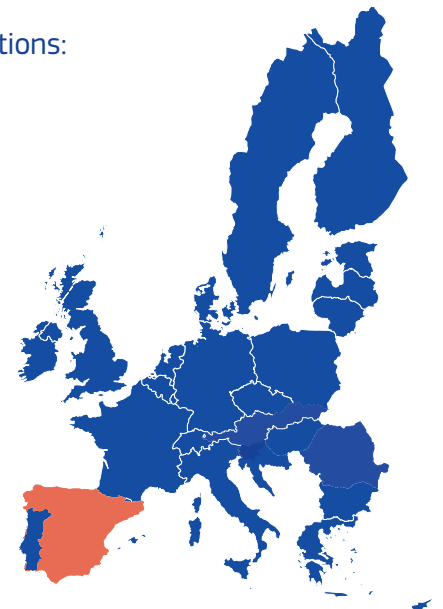
Whole-blood donations:
1 622 610
Apheresis donations:
97 792

Donation model

100% voluntary non-remunerated blood donation.

Donor statistics

- 36.48 donations per 1 000 inhabitants.



Type of donor	% of all donors
New donor	14.9 %
Regular donor	70.6 %
Family/replacement donor	14.5 %

Sources

<https://europeanbloodalliance.eu/country/spain/>

<https://www.sanidad.gob.es/profesionales/saludPublica/medicinaTransfusional/indicadores/indicadores.htm>



Sweden

BLOOD DONATION COUNTRY PROFILES 2021

Blood donation system

The blood services are the responsibility of the individual health care regions in Sweden; there are 21 of them. They are independent, but collaborate when needed.

The non-profit nationwide organisation the Swedish Blood Alliance (SweBA) has a communications department called GeBlod that is responsible for donor recruitment through campaigns in magazines, newspapers and social media and organised blood drives in cooperation with some companies.



Population
9 800 000



Blood donors
198 709



Donations
387 757

Donation model

100% voluntary non-remunerated blood donation.

Donor statistics

Age (years)	Female donors	Male donors
18–24	4 %	3 %
25–44	15 %	20 %
45–64	22 %	29 %
65	3 %	5 %

- 30 136 first-time donors.
- 24 383 plasma donations.

Types of incentives offered to blood donors

- Paid day off work.
- Text message to inform a donor once their blood has reached a recipient.

Information system

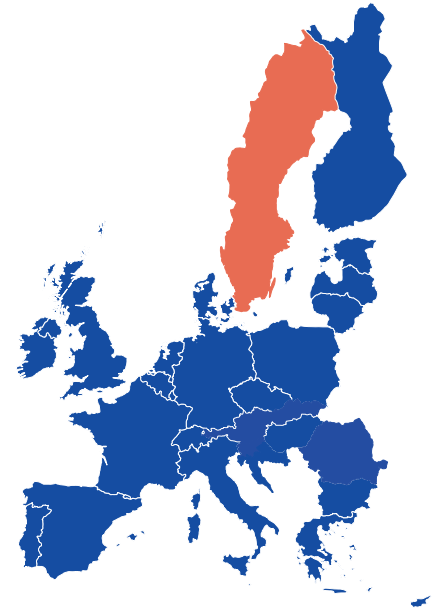
- Comprehensive database – Scandat – that includes 50 years of donor tracking data.

Sources

Edgren, G., Rostgaard, K., Vasan, S. K., Wikman, A., Norda, A., Pedersen, O. B., Erikstrup, C., Nielsen, K. R., Titlestad, K., Ullum, H., Melbye, M., Nyrén, O. and Hjalgrim, H. (2015), 'The new Scandinavian Donations and Transfusions database (SCANDAT2): a blood safety resource with added versatility', *Transfusion*, July, Vol. 55, No 7, pp. 1600–1606, doi:10.1111/trf.12986, epub 9 January 2015, PMID: 25573303.

<https://europeanbloodalliance.eu/country/sweden/>

<https://geblod.nu/>



7.28. Summary of the EU-27 blood donation landscape findings

Blood donation system. By reporting Member State-specific information about blood donation systems, we show how the collection of blood is organised in the EU-27 today. As might be expected, there is considerable organisational variation across Member States. In 13 Member States, a national health service is responsible for collection of blood and blood components. In one Member State blood collection is organised by a non-profit organisation. In the remaining 13 Member States, hospital or community blood banks have this responsibility solely or share it with the Red Cross.

Blood donation model. The compiled data on blood donation models used by Member States show that only Bulgaria (in specific cases ⁽⁴⁶⁾), Germany ⁽⁴⁷⁾ and Latvia provide financial remuneration for whole-blood donations, whereas all other Member States declare to practice a voluntary, non-remunerated blood donation model ⁽⁴⁸⁾. In addition, Austria, Czechia, Germany, Hungary and Latvia offer financial remuneration for plasma donations. See Table 2 – Summary of non-monetary and monetary blood donation incentives used in the EU Member States.

Donor statistics. A general overview of the number of blood donors, the number of whole-blood donations and the ratio of donors in the general population in 2021 for the EU Member States is given in Table 3. The average rate of blood donors in the general population for 22 Member States ⁽⁴⁹⁾ is 2.41 %, with Ireland having the lowest rate (1.43 %) and Cyprus the highest (6.46 %). Notably, in almost all of these 22 countries this rate is lower than 3 %. Unfortunately, we were not able to collect data for the ratio of blood donors in the eligible population (i.e. the number of donors among people who can actually donate blood). Table 4 – Plasma donor statistics for 2021 (subset of Member States) summarises the number of plasma donors and the number of plasma donations in 2021 for several Member States.

Types of incentives offered to blood donors. We summarise a variety of incentives for encouraging blood donations in EU Member States in Table 5. We divide all incentives into non-monetary and monetary incentives, differentiating based on the presence or absence of a monetary value attached to incentives (Chell et al., 2018). Furthermore, we follow Chell et al.'s (2022) typology for incentives used by Member States (see Table 6 for more detail). According to this typology, all strategies to recognise, reward and incentivise blood donations can be described as congruent or incongruent, private or public, and self-regarding or other-regarding. For example, congruent strategies are strategies that directly facilitate blood donation. Furthermore, depending on how visible the acknowledgement of donation is, strategies can be classified as public or private. Lastly, depending on blood donor or blood recipient being the main beneficiary, strategies provided could be categorised as self-regarding or other-regarding. The most used strategies to recognise, reward and incentivise blood donors among EU Member States are a paid day or time off work (used by 63 % of Member States), refreshments (used by 56 % of Member States) and small tokens or symbolic gifts (used by 52 % of Member States). There are some Member States that use interesting strategies that could be replicated in other Member States; for example, the Netherlands uses a variety of campaigns ⁽⁵⁰⁾, Croatia rewards donors with supplementary health insurance and public transportation tickets for donors that reach a certain number of donations, and the Slovenian president acknowledges donors' contribution on a National Blood Donation Day.

Types of incentives offered to plasma donors. The main focus of this literature review is whole-blood donors, but we also collected, where possible, data about plasma donors and plasma donations (see Table 6 for strategies applied to recognise, reward and incentivise plasma donors). It is worth noting that some Member States use innovative strategies to recruit and retain plasma donors. For example, Estonian plasma donors get a refund for taxi costs to and from the blood establishment. In addition, Estonian plasma donors

⁽⁴⁶⁾ Donations of blood and blood components in Bulgaria are voluntary and not remunerated. The only exceptions are monetary remunerations for blood donations in emergency cases, for the production of vaccines, serums and immunoglobulins, and for research and diagnostic purposes.

⁽⁴⁷⁾ Around 10 % of German blood donations are remunerated.

⁽⁴⁸⁾ Some Member States provide whole-blood donors with a day off work ('reasonably needed for the donation and travel'), tax deductions, subsidised public transportation and similar (see Table 3 for the list of countries that use these types of incentives) as part of their voluntary, non-remunerated donation model.

⁽⁴⁹⁾ Belgium, Bulgaria, Czechia, Denmark, Estonia, Ireland, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia, Finland and Sweden.

⁽⁵⁰⁾ Those campaigns were the Sanquin at Work campaign, in which they cooperated with companies to encourage employees to donate blood or plasma during working hours; the Let You Hear campaign, in which they thanked donors for their donation and encouraged them to talk about their donation experience; and the *League of Legends* campaign, which was launched in 2018 for the gaming community and resulted in 2 500 new donors.

are eligible for extended health analysis. Furthermore, as a part of a pilot study, a savings system was introduced to a limited number of Dutch plasma donors: when they donate, they are given a virtual donor drop as a gesture of gratitude, which can be exchanged for a small reward related to a health or leisure experience. The gifts available include items such as book or cinema vouchers, health checks, yoga lessons or power banks, with the specific reward depending on the number of virtual drops accrued.

Information system. Table 7 summarises types of the information technology that Member States use.

Table 2 – Summary of non-monetary and monetary blood donation incentives used in the EU Member States

Member State	Incentives offered to blood donors									
	Non-monetary incentives with some material component				Monetary incentives					
	Refreshments	Medals of merit or recognition tokens	Small tokens or symbolic gifts	Paid time off work	Subsidised public transportation	Food vouchers	Tax relief	Health insurance benefits	Compensation for donor's direct costs	Cash payment
Austria			✓							
Belgium	✓ ⁽¹⁾			✓						
Bulgaria	✓		✓	✓					✓	✓ ⁽²⁾
Croatia	✓		✓	✓	✓			✓		
Czechia	✓	✓		✓			✓	✓		
Denmark	✓		✓							
Estonia	✓	✓	✓	✓						
Finland	✓	✓	✓						✓ ⁽³⁾	
France			✓	✓					✓	
Germany									✓	✓ ⁽⁴⁾
Greece	✓	✓	✓	✓ ⁽⁵⁾					✓	
Hungary	✓								✓	
Ireland	✓	✓	✓							
Italy	✓	✓	✓	✓						
Latvia			✓	✓		✓			✓ ⁽⁶⁾	
Lithuania			✓	✓						
Luxembourg	✓	✓		✓						
Malta	✓			✓ ⁽⁷⁾						
Netherlands	✓	✓						✓	✓	
Poland	✓	✓	✓	✓	✓		✓			
Portugal							✓ ⁽⁸⁾			
Cyprus	✓	✓		✓ ⁽⁹⁾						
Romania			✓	✓	✓	✓			✓	
Slovakia		✓		✓ ⁽⁹⁾		✓				
Slovenia	✓			✓						
Spain										
Sweden			✓			✓				

(1) Up to 1 day off work, depending on the employer.

(2) Donations of blood and blood components in Bulgaria are voluntary and not remunerated. The only exceptions are monetary remunerations for blood donations in emergency cases, for the production of vaccines, serums and immunoglobulins, and for research and diagnostic purposes.

(3) Only in cases where the donor has been specifically called for an urgent donation.

(4) Not all blood services provide donors with monetary remuneration.

(5) Public servants are granted paid leave when making a blood donation.

(6) Blood donors in Latvia donate voluntarily. However, in accordance with Latvian legislation, donors have the option to have their travel expenses associated with blood donation covered up to EUR 4.27 (paid to a bank account).

(7) Employers are encouraged to allow workers the required time off work to donate.

(8) Exemption from paying fees for access to national healthcare (tax cut).

(9) Granting paid leave for a donation depends on the employer.

Note: This table summarises the main findings of the EU-27 blood donation overview related to different types of non-monetary and monetary incentives used to motivate donors to donate blood.

Table 3 – EU Member States' blood donor statistics for 2021

Member State	Population	Median age (years) of population ⁽¹⁾	Number of blood donors	Ratio of blood donors in the general population	Number of whole-blood donations
Austria	8 951 520	43.6			352 000
Belgium	11 521 238	41.8	289 918	2.52 %	638 818
Bulgaria	6 838 937	45.0	159 782	2.34 % ⁽²⁾	
Croatia	3 888 529	44.4	94 168	2.42 %	190 935
Czechia	10 712 000	43.3	250 000	2.33 %	427 000
Denmark	5 873 420	42.2	183 409	3.12 %	291 934
Estonia	1 331 796	42.5	28 211	2.12 %	48 348
Finland	5 550 000	43.3	113 006	2.04 %	185 326
France	66 410 000	42.1	1 578 827	2.38 %	2 840 072
Germany	83 408 554	45.9		⁽³⁾	3 671 838
Greece	10 370 747	45.5			568 000
Hungary	9 800 000	43.6			397 000
Ireland	4 986 526	38.5	72 791	1.46 %	127 614
Italy	59 236 213	47.6	1 653 268	2.79 %	3 021 143
Latvia	1 866 942	43.9	33 323	1.78 %	56 200
Lithuania	2 800 000	44.1	54 120 ⁽⁴⁾	1.93 %	95 635
Luxembourg	634 730	39.6	12 698	2.00 %	18 946
Malta	442 784	40.1			18 000
Netherlands	17 475 415	42.7	384 352	2.20 %	407 203
Poland	38 538 447	41.6	615 927	1.60 %	1 352 885
Portugal	10 344 802	45.8	235 178	2.27 %	310 727
Cyprus	1 215 584	38.0	78 475	6.46 %	300 per day ⁽⁵⁾
Romania	19 127 774	43.0	313 843	1.64 %	387 391
Slovakia	5 447 247	41.4	119 269	2.19 %	206 467
Slovenia	2 101 000	44.0	62 000	2.95 %	75 638 ⁽⁶⁾
Spain	47 160 415	44.7	1 133 131	2.40 %	1 720 402
Sweden	9 800 000	40.6	198 709	2.03 %	387 757

⁽¹⁾ Data were obtained from [Eurostat](#).

⁽²⁾ 3.5 % of the eligible Bulgarian population donates blood.

⁽³⁾ 2–3 % of the German population donates blood.

⁽⁴⁾ Whole-blood and blood component donors.

⁽⁵⁾ 69 374 units in 2022.

⁽⁶⁾ Data for 2020.

Note: This table shows the ratio of donors in the general population in EU Member States and the number of donations in 2021. Because the 'general population' consists of the population that is eligible to donate and the population that it is not eligible to donate (for example, those aged < 18 years, those aged > 65 years or > 70 years depending on the policies of the particular Member State, those with medical conditions that prevent them from donating, and similar), we included additional information on the median age of the population in each Member State. Data for 2020 are used for Germany and Slovakia.

Table 4 – Plasma donor statistics for 2021 (subset of Member States)

Member State	Number of plasma donors	Number of plasma donations
Austria		338 063
Czechia	100 000 in private sector + additional donors in public sector	993 700
Estonia	684	3 001
France		302 097
Italy	106 781	426 738
Germany		2 551 092
Latvia	480 (apheresis donors)	
Lithuania		555
Luxembourg	1 021 (apheresis donors)	3 418
Netherlands		336 681
Slovakia		40
Sweden		24 383

Note: This table shows the number of plasma donors and plasma donations in EU Member States in 2021 that were successfully collected.

Table 5 – Categorising the incentives offered to blood donors in EU Member States using the typology proposed by Chell et al. (2022)

Incentive offered to blood donors in EU Member States	Percentage of Member States using this incentive	Incongruent or congruent	Private or public	Self-regarding or other-regarding
Refreshments	56 %	Incongruent	Private token for generosity	Self-regarding
Medals of merit or recognition tokens	37 %	Incongruent	Public display of generosity	Self-regarding
Small tokens or symbolic gifts	52 %	Incongruent	Public display of generosity	Self-regarding
Paid time off work	63 %	Incongruent	Private token for generosity	Self-regarding
Donors	7 %	Incongruent	Private token for generosity	Self-regarding
Subsidised public transportation	11 %	Incongruent	Private token for generosity	Self-regarding
Food vouchers	11 %	Incongruent	Private token for generosity	Self-regarding
Tax relief	11 %	Incongruent	Private token for generosity	Self-regarding
Health insurance benefits	11 %	Incongruent	Private token for generosity	Self-regarding
Compensation for donor's direct costs	33 %	Congruent	Private token for generosity	Barrier removal
Cash payment	4 %	Incongruent	Private token for generosity	Self-regarding

Note: This table uses the typology proposed by Chell et al.(2022) to categorise incentives offered to blood donors in EU Member States. In addition, column 2 shows how common the usage is of each incentive within the EU Member States.

Table 6 – Summary of non-incentives and non-monetary and monetary incentives used to encourage plasma donations in a selection of EU Member States

Member State	Non-incentives		Non-monetary incentives with some material component					Monetary incentives	
	Educating public about plasma and plasma donations	Opening new plasma centres	Refreshments	Medals of merit or recognition tokens	Small tokens or symbolic gifts	Paid time off work	Saving system	Food vouchers	Cash payment
Austria									✓
Belgium	✓	✓							
Czechia									✓
Germany									✓
Hungary									✓
Italy	✓		✓	✓	✓	✓			
Latvia				✓	✓	✓		✓	✓ ⁽¹⁾
Luxembourg			✓	✓		✓			
Netherlands							✓ ⁽²⁾		

⁽¹⁾ In accordance with Latvian legislation, apheresis procedures are organised only by the state institution (national blood donor centre). Plasma obtained by apheresis is used directly to produce plasma preparations (not commercial matters) for Latvian patients and, like blood components, is distributed to medical institutions free of charge. Plasmapheresis donations are compensated (EUR 17.07 paid into a bank account).

⁽²⁾ As part of a pilot study due to run until July 2023, a savings system for a limited group of plasma apheresis donors was introduced.

Note: This table summarises the main findings of the EU-27 blood donation overview related to different types of non-incentives and non-monetary and monetary incentives used to motivate plasma donors to donate.

Table 7 – Information technology used by EU Member States for blood donor management, donor recruitment and retention

Member State	Information technology
Austria	<ul style="list-style-type: none"> — The Austrian Red Cross is working on a centralised register for blood donations that are collected at the blood establishments that are part of the Austrian Red Cross — The Mein Blut application, developed by Netcetera for the Austrian Red Cross in Upper Austria
Bulgaria	<ul style="list-style-type: none"> — The blood donation mobile application Дари Кръв (Donate Blood)
Croatia	<ul style="list-style-type: none"> — National IT system (e-Delphyn) connecting all transfusion centres in the country
Czechia	<ul style="list-style-type: none"> — Software for creating appointments used in majority of public and private centres — Different software for data management with different levels of complexity are available and in use — An electronic donor questionnaire is available at a few centres
Denmark	<ul style="list-style-type: none"> — Each region has its own blood establishment computer system (ProSang or Blodflödet)
Estonia	<ul style="list-style-type: none"> — Estonia has its own information system with donor registry, donor management, e-donor application, and blood components quarantine and release functions. This information system is not central and is managed by each blood establishment separately
Finland	<ul style="list-style-type: none"> — Online appointments system — Electronic questionnaire for donors — Information system that includes donor registry and management, and blood products management
France	<ul style="list-style-type: none"> — Data collection (INLOG and Medinfo) — The creation of appointments to donate blood
Ireland	<ul style="list-style-type: none"> — Software solution supplied by MAK-SYSTEM software eProgesa 5.0.3 — eBoss software package for data collection and analysis — New online appointment system to be available using the MAK-SYSTEM software by the end of the year
Italy	<ul style="list-style-type: none"> — SISTRA (Sistema Informativo dei Servizi TRAsfusionali) – national IT system for blood establishments — Each region has its own blood establishment computer system — Certain local blood establishments have online appointment systems and/or blood mobile applications
Latvia	<ul style="list-style-type: none"> — The IS ProSang donor database was implemented in 2006 — A donor portal will be created in the coming year. It will contain a feature that informs donors once their blood reaches a recipient. Donors will be receiving important information on their health status and donation times, and reminders about their next visits
Lithuania	<ul style="list-style-type: none"> — Two blood establishments use eProgesa, the remaining blood establishment uses a bespoke, in-house IT system
Luxembourg	<ul style="list-style-type: none"> — eProgesa from MAK-SYSTEM — eDMS from MAK-SYSTEM for the laboratory, connected to eProgesa
Malta	<ul style="list-style-type: none"> — The mobile application Blood Donors MT
Poland	<ul style="list-style-type: none"> — Each blood donation centre has its individual information system. It is planned to develop one common system for all blood donation centres
Portugal	<ul style="list-style-type: none"> — ASIS: in-house software developed by IPST — SIBAS: commercial software developed by Glint — Imaginasoft: commercial software developed by ImaginaSoft
Romania	<ul style="list-style-type: none"> — All 41 civil blood establishments are using the same software for blood donors and donation activities (national blood donors database) — Some blood establishments are using a software that covers the entire chain of specific activities — Appointments are made by phone and/or one of two mobile applications – Donorium and BlooDoChallenge – depending on the blood establishment decisions made locally
Slovakia	<ul style="list-style-type: none"> — IS Rubin, which includes centralised register of blood donors, is managed by ICZ — A mobile application that offers information about a donor's previous donation, predicted time of the next donation and similar — A website and an online appointment system are being developed
Sweden	<ul style="list-style-type: none"> — A comprehensive database – SCANDAT – that includes 50 years of donor tracking data

Note: This table summarises the information technology that different Member States use to gather, process and store donor data; what applications and online systems are used to inform and remind donors about upcoming blood drives; the usage of electronic donor questionnaires; and similar. We excluded Member States for which we could not collect these data.

8. Conclusions

The main aim of this narrative literature review was to summarise the most recent research in the field of blood donation, offering new perspectives on factors that are strongly associated with blood donor motivations, intentions and behaviour. Recognising that interventions can have different effects on different categories of donors (e.g. new donors, experienced donors and inactive donors), understanding donor motivations is essential for developing effective and targeted interventions for these groups. Identifying general principles that are effective provides a strong starting point when facing the challenges of blood services, such as (1) the need for recruiting donors with specific blood phenotypes (e.g. Rh Kell) to enhance donor–recipient matching for more effective treatment outcomes and (2) replacing the loss of older donors with younger donors. That is, how can these general principles be tailored and adapted to meet these challenges, or are completely alternative approaches needed?

We identified 78 studies to include in this literature review that followed either social science or behavioural science research agendas, with some exceptions being literature reviews, theoretical studies, studies about blood donation trends and observations, and guidelines. We summarised studies that followed a social science research agenda that evaluated the effects of different interventions on blood donor intentions. Furthermore, when reviewing studies that followed a behavioural science research agenda, we categorised them into the following groups based on the type of strategies on promoting blood donation that were tested: (1) monetary incentives (i.e. cash payments, vouchers, gift cards and similar), (2) non-monetary incentives with some material component (i.e. paid days off work, health checks and similar), (3) social/community recognition non-incentives (i.e. text messages, public pledges to donate blood and similar), (4) mixed interventions and (5) other behavioural interventions.

In terms of behavioural interventions, Table 8 provides a brief summary of the main findings, with supporting notes.

Table 8 – Summary of the main findings from studies utilising behavioural interventions and following a behavioural science research agenda

Intervention	Effectiveness on behaviour	Additional notes
Solicitation letters	✓	
Phone calls	✓	
Email – warm-glow messages	✓	For return donors, especially those who have not booked another donation appointment
Donor registry	✓	When appeals are made for shortages, but not when blood is not in short supply
Combining different types of reminders	✓	Phone calls and text messages; phone calls and email messages
Active decision elicitation mechanisms	✓	When the donor is not informed about donation
Pledge – public v private	X	Increases pledges, especially in public, but not behaviour
Information when blood is used	Mixed (✓/X)	Can be effective as a text. Emails may not be effective and need to be careful not to crowd out future donation by highlighting the current donation as a prosocial act
Deferred donors – alternative tasks and information	Mixed (✓/X)	Providing an alternative prosocial act was ineffective, whereas information why they were deferred was effective
Paid days off work	✓	This cannot be applied to those who are not employed, and we have to consider if this leads to inequality and bias, or if an equivalent incentive is needed for those not employed
Health checks	Mixed (✓/X)	A cholesterol test was ineffective, whereas a comprehensive health check was effective
Gift vouchers	✓	Maybe because they are perceived as a gift exchange rather than a financial exchange
Money	Mixed (✓/X)	Effective for non-donors, but crowds out donations in women

Table 8 summarises the main findings related to the effects on donor behaviour of different behavioural interventions.

There are several take-home messages. Further research is needed on messages indicating to donors that their blood has been used. It is not clear if the mode of delivery (text or email) makes a difference and if highlighting the prosociality of blood donation can crowd out future donations by morally licensing the donor not to donate. Gift vouchers appear to have value as an incentive, perhaps by highlighting the gift exchange nature of blood donation. However, more work is needed to explore the cognition, motivations and emotions that vouchers afford relative to money. Offering simple paid days or time off work is also effective but raises ethical issues (it (1) may be construed as payment and may be coercive and (2) applies only to those in employment). Simple warm-glow messages are effective to increase return rates from first-time to second-time donors.

Importantly, there is a scarcity of evidence on the effect of the usage of advancements in information technology (i.e. applications, donor management technology and similar) on blood donor recruitment and retention and it would be interesting to understand better if and how information technology can help in this respect.

In addition to summarising results from theoretical and empirical studies, we describe and report on the current practices used across the EU Member States (the EU-27 blood donation overview). Namely, we show that there is considerable organisational variation across Member States. In some Member States, a national health service is responsible for collection of blood and blood components; in other Member States, hospitals or community blood banks have this responsibility solely or share it with the Red Cross. In one Member State, blood collection is organised by a non-profit organisation. Furthermore, we gained an understanding from blood establishments directly that the most common strategies to recognise, reward and incentivise blood donors among EU Member States are paid days off work (used by 63 % of Member States), refreshments (used by 56 % of Member States) and small tokens or symbolic gifts (used by 52 % of Member States). Using the blood donor statistics for 2021 for 22 Member States, we learned that the average rate of current blood donors, at any one time, in the general population was 2.41 %.

8.1. Final thoughts and future direction

8.1.1. Early-stage trials

Although large-scale field studies and randomised controlled trials⁽⁵¹⁾ are described in this report, it has been argued that a ‘clinical trial model’ should be adopted to develop effective behavioural interventions, with early-stage studies and experiments designed to identify new intervention targets that are likely to be effective with no unforeseen consequences (Ferguson, 2021b; Ferguson, 2022). There are examples of early-stage experiments that also show promise. For example, reciprocity messages involving potential donors considering the question ‘Would you accept a blood transfusion to save your life?’ increase non-donor propensity to donate (Ferguson, Edwards and Masser, 2022). Enabling donors to reliably signal to others that they are a good, kind and altruistic person may also be an effective way to attract new donors. Indeed, Lam et al. (2021) investigated how men wearing a blood service bandage versus a plain bandage or no bandage were rated in terms of altruism, generosity and health. Men wearing a branded bandage were rated as more generous, moral and healthy by women. These examples offer potential interventions that can be scaled up to larger trials.

8.1.2. Considering heterogeneity and ethnicity

This review shows clearly that blood donors cannot be considered a homogeneous group. They vary in terms of their donor career progress (e.g. non-donor to novice to habitual donor) and demography. Furthermore, it is imperative to align the characteristics of the donor population with those of the general population to ensure equitable distribution of resources, impartiality and optimal treatment efficacy. For example, at present the number of ethnic minority donors is low and one of the objectives of blood services is to encourage more blood donors from ethnic minority communities (Spratling and Lawrence, 2019). A recently reported approach involves increasing trust among members of a defined community, thereby encouraging them to donate blood (Ferguson et al., 2022). This can be achieved through conditional cooperation, which occurs when individuals cooperate in proportion to the level at which they observe others cooperating (Fischbacher et al., 2001). Thus, behavioural interventions showing people that others in their social group have signed up to donate could be effective. Success in implementing this approach has been demonstrated using Facebook, specifically in regard to individuals enrolling in an opt-in system for organ donation (Cameron et al., 2013). In all cases, a fully co-designed and co-production approach, working with community groups at all stages of development, design and evaluation, should be adopted (Telenta et al., 2020).

8.1.3. Emotions, transitions and cognitions

There is a clear temporal and dynamic aspect to the blood donor career. However, there is also a growing recognition that donors’ emotions change over the course of a single donation, as well as between donations (Ferguson and Masser, 2018; Masser et al., 2020; Williams et al., 2018), which can be modelled and

⁽⁵¹⁾ A randomised controlled trial is a type of field experiment that is commonly used to evaluate the effectiveness of policies or interventions. It is a powerful tool for establishing causality and controlling for other factors that may affect outcomes.

understood using momentary ecological analysis (van Dongen et al., 2020). This approach moves away from models such as the TPB (treating donors more as rational decision-makers) to consider the emotional life of the donor and the reactive components of donation (Masser et al., 2020). This opens up the possibility of exploring, for example, if it is the emotions experienced at the start (arrival), middle (donation) or end (recovery) of the donation process that best predicts who returns to donate. By identifying the specific stage of the blood donation process (arrival, donation or recovery) during which donors are most likely to experience negative emotions, blood donation agencies can develop targeted interventions to help manage those emotions and ultimately increase donor return rates. This information can be obtained through various means, such as surveys or monitoring of physiological responses. Interventions could include educational materials, social support networks or even relaxation techniques to help alleviate donor anxiety and enhance their overall donation experience. Furthermore, it opens the possibility of exploring how donors construct their memories of their previous donation and how these constructed memories influence return rates. Thus, we can move to a more dynamic conceptualisation of the donor and the intervention process.

8.1.4. Exploring mechanisms

As detailed above, it is not clear if the mode of delivery (text or email) makes a difference in messages indicating to a donor that their blood has been used. A simple comparative study could be conducted. Furthermore, it would be useful to better understand if and how information technology (i.e. applications, donor management technology and similar) could help in donor recruitment and retention. It is also not clear if highlighting the prosociality of blood donation crowds out future donations; again, this can be tested. It would also be useful to know if gift vouchers support perceptions that blood donation is a gift exchange and monetary rewards support the perception that blood donation is a financial transaction. This would mean that it would be possible to test if the effectiveness of vouchers is mediated by enhancing the perception that blood donation is a gift exchange.

8.1.5. Caveats

It must be acknowledged that this is a narrative review of the published literature. Therefore, there is likely to be reporting bias, because studies with significant effects are more likely to be published. It would be extremely helpful if blood services worldwide could make available data on the effectiveness of interventions that they have used, so that a fuller and broader understanding of what has been tried and what has been found to be successful, and what has not, could be shared. The studies have predominantly been conducted in the EU on predominantly white communities. Thus, any generalisability to other regions, ethnicities and communities must be made with caution.

8.2. Policy implications

The issue of securing enough blood and plasma donations has been a long-standing concern for healthcare systems globally, including in Europe. There is an ongoing need for an adequate supply of safe and high-quality blood to meet the demands of patients in need. However, there are several challenges that impede the availability of sufficient blood supply, such as the ageing population, changing lifestyle patterns and recent pandemics.

The primary objective of this narrative literature review was to provide a comprehensive overview of the latest research in the field of blood donation, highlighting new perspectives on factors strongly associated with blood donor motivations, intentions and behaviour. With the aim to link theory and practice directly, this review additionally describes blood donation systems in EU Member States, including their organisation, blood donation models, types of incentives offered to blood and plasma donors, and donor statistics for 2021.

There are several take-home messages for policymakers to consider.

- Understanding donor motivations is essential for developing effective and targeted interventions for different categories of donors (e.g. new, experienced and inactive). General principles that are effective can provide a starting point when considering the challenges facing blood services, such as the need to recruit donors with specific blood phenotypes and replace the loss of older donors with younger donors.

- The use of behavioural interventions such as solicitation letters, phone calls, warm-glow messages, donor registries, reminders, active decision elicitation mechanisms, and gift vouchers can be effective in increasing blood donations.
- More research is needed on the effects of technology advancements, applications and donor management technology on blood donor recruitment and retention.
- Paid days off work, refreshments and small tokens or symbolic gifts are the most common strategies used to recognise, reward and incentivise blood donors among EU Member States.
- To increase the rate of blood donation, blood services need to adopt a multifaceted approach that involves a better understanding of donor motivations and the use of effective behavioural interventions.

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Abbreviations

EDQM	European Directorate for the Quality of Medicines & HealthCare
EU	European Union
JRC	Joint Research Centre
TPB	theory of planned behaviour
TTM	transtheoretical model

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