

Research paper

Missing Minorities – A survey based description of the current state of minority blood donor recruitment across 23 countries

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What is known?

1. Due to increasing migration, blood collection establishments are increasingly required to supply blood for patients from different ethnic backgrounds
2. People from minority groups are generally less actively involved in the blood supply than people from the indigenous population
3. Different ethnic groups can differ in blood group and tissue antigen expression, which can cause alloimmunisation if donor and patient are not from the same ethnic background

What this paper adds

1. Knowledge on the proportion of ethnic minority groups in the donor panels in 23 countries
2. Knowledge on current and expected shortages in blood supply in 42 blood supply establishments, with a focus on shortages due to ethnic diversity
3. A first inventory of methods used to recruit minority donors, including barriers and obstacles to recruitment

ABSTRACT

1. Stable national blood supplies from donated human blood are essential to healthcare services worldwide. Migration has increased over the last years and so more and larger minority groups require blood products in their new countries, often with special characteristics that are not present in the majority population. In many countries however, minorities are less active in blood donations. The Missing Minorities (MIMI) project was initiated by the European Blood Alliance to investigate the problem of low donation rates among minorities. The MIMI project group surveyed 42 blood donation organisations worldwide. The results show a great awareness of the topic, but it is also evident that the applied management strategies are at a very early stage in many countries and that many blood donation organisations in Europe, Australia, Canada and the United States are not yet very successful in recruiting and retaining donors from minority groups. This paper also reports on the different methods of minority blood donor recruitment which have been used by the organisations. These methods require more systematic research in order to verify the findings of the most successful strategies identified in this paper. Overall, this paper can be seen as a first step towards better recruitment methods by showing the current situation, but it is also as a call for more research on the topic.

Keywords: Minorities, diversity, blood donation, transfusion, health care, recruitment.

Introduction

Why recruiting minority blood donors is so important

Stable national blood supplies from donated human blood are essential to healthcare services worldwide. Growing migration might pose a threat, since blood collection establishments, whose donors are primarily white European in origin, are increasingly required to supply blood for patients from different ethnic backgrounds (Issitt, 1994; De Kort and Wagenmans, 2011). In 2008, 12.7% of the EU residents aged 15-74 were

foreign born or had at least one foreign-born parent (Eurostat, 2011). This percentage could more than double and exceed 25% of the population across all ages by 2060, although this proportion may vary widely across EU member states (Lanzieri, 2010). The proportion of first and second generation immigrants who are young adults is projected to be far greater than today; they are an important target group for new donors.

Against this background, it is obvious that migrants require blood products in their new countries, often with special characteristics that are not present in the majority population (Beattie and Shafer, 1985; Vichinsky, *et al.,* 1990; Noizat-Pirenne, 2003). Matching donated blood to recipients becomes problematic when people from minority groups are generally less actively involved in the blood supply than people from the indigenous population, as is the case in many countries (Gillum *et al.,* 2008; Atsma *et al.,* 2011).

From a medical perspective, minority underrepresentation can cause problems in the supply of matching blood and tissue products (Castro *et al.,* 2002; Shaz *et al.,* 2008). Various minority groups differ from a country's majority population because of genetic differences in blood group and tissue antigen expression. They often do not differ substantially in terms of regular AB0 or Rhesus CDE blood typing, but they do differ in extended blood typing (e.g. MNS, Kell, Duffy, Kidd) (Beattie and Shafer, 1985; Vichinsky, *et al.,* 1990; Noizat-Pirenne, 2003). In some situations, it can be difficult to find a matching blood product for a patient. Especially for multiple-transfused patients, such as those with thalassaemia or sickle cell disease who require an increasing number of specific blood products. Multiple transfusions may cause the formation of antibodies, which increases the challenge of finding matching blood products (Vichinsky *et al.,* 1990; Castro *et al.,* 2002; Shaz *et al.,* 2008). In order to prevent future problems in the supply of rare or specific blood types, special recruitment of donors with these blood types will become necessary.

Extended red cell typing is important for the supply of blood products. However, it is equally important to find HLA-matching tissues, including organs and stem cells for patients in need of these products. It is noteworthy that in several countries, tissue and, especially, stem cell donors, are being recruited directly from the blood donor base. For this reason, it is of utmost importance that people from minority groups with different extended red cell or HLA typing are represented in the donor base. Diversifying the donor base is necessary to ensure that all persons in need of products of human origin have an equal chance of finding matching products.

Models that predict demographic developments paint a bleak picture for the future balance of blood demand and supply due to an aging population (Greinacher *et al.,* 2007; Ali *et al.,* 2010; Greinacher *et al.,* 2010; Desalvo *et al.,* 2011; Seifried *et al.,* 2011). Complex therapeutic procedures like haematopoietic stem cell transplantation, cardiovascular surgery and solid organ transplantation will be options for an increasing proportion of older patients. It is argued that these procedures will lead to a higher demand for donor blood and blood products, including stem cells and stem cell derivatives. Assuming stable rates per age group until 2020, computer models predict that the demand for in-hospital blood transfusions will increase by approximately 25%, while blood collection will decrease by approximately 27%. The resulting, predicted shortfall is 47% of the demand for in-hospital patients (Greinacher *et al.,* 2011). Therefore, *'modern donor management, recruitment of healthy people currently not donating blood and attempts to make the optimal use of precious blood donations'* (Seifried and Mueller 2011, p. 376) are needed to avoid such shortages. However, the need for blood products actually decreased in the western world over the past five years, because more efficient procedures and technical advances lowered the demand for blood products, compensating for the higher demand due to aging predicted in the abovementioned models [Unpublished benchmarking results in the European Blood Alliance and the Alliance of Blood Operators]. If such improvements in procedures continue to keep up with the expected rising demand of the prediction models, this builds an even stronger case for blood donation organisations to focus on and better matches between donor and recipient. In addition, in some countries, specific ethnic minority groups are large in number but make up only a very small part of the donor population. For these reasons, it might be beneficial to tailor recruitment activities to these groups, to increase the total number of donors in the donor base, thus preventing qualitative and quantitative blood supply problems.

Low numbers of minority participation in many countries are an indication that these groups are not reached by the general recruitment methods used by blood establishments so far. To explore the problems associated with migration and minority populations, the Missing Minorities (MIMI) project was initiated by the European Blood Alliance in 2012. The project aimed to make an inventory of the current state of minority participation and of recruitment efforts, by surveying blood services in the Western world. This paper reports the results of the project assessing the situation in Western countries related to minority blood supply. The demography of each participating country was assessed, as well as the situation related to supply and the demand for common as well as rare blood types. We report which, if any, recruitment methods are currently used by blood collection establishments, and how successful they have been. Based on this assessment a call for further research is formulated.

Research approach

Before the survey and research methods are explained, this paragraph gives a short definition of *'minority*' in a blood donation context. The Oxford Dictionary defines a minority as *'a small group of people within a community or country, differing from the main population in race, religion, language, or political persuasion'* (Oxford University Press, 2015). From a blood supply perspective, this is not a useful definition. Some people from a minority background - or their parents or grandparents - come from former colonies, neighbouring countries, or countries that have strong political connections with their country of residence. Others are refugees, asylum seekers, labour migrants, come from overseas territories, or belong to an ethno-cultural subpopulation within the country. Therefore, for blood supply purposes, the MIMI project defined two types of minority groups that are relevant for blood donation organisations. Type 1 are people from minority groups that differ from a country's majority population in terms of blood

or tissue typing. Often, they do not differ in regular AB0 blood typing, but they do in extended typing. Underrepresentation of this type can lead to qualitative difficulties in the blood supply. Type 2 are people from minority groups that do not differ from a country's majority population in terms of blood or tissue typing, but who form a large group of potential new donors. Underrepresentation of this type can lead to quantitative challenges in the blood supply.

In order to assess the current state of minority blood donor recruitment, the Missing Minorities (MIMI) project group sent out a survey to blood services, assessing demographics, blood supply and demand, and practices in recruiting donors from minority groups in 2012 (Wagenmans, 2012). The questionnaire was developed during two workshop meetings of blood donation practitioners and researchers from eleven European countries. Three major areas of interest (demography, supply and demand, and minority recruitment) were identified by the group, and, subsequently, subgroups formulated the items used in the questionnaire. This survey was not theoretically driven to prove or disprove certain hypotheses, but rather a method to get data on identified national differences and common problems, and to create a first (small) data set for future discussion on recruitment efforts and policies. We sent a total of 54 questionnaires to blood establishments in 34 countries in Europe, the USA, Canada and Australia, represented in the European Blood Alliance and to members of the Alliance of Blood Operators Donor Engagement and Relation Group (ABO-DERG). The questionnaire contained questions on demography, supply and demand, and minority recruitment (table 1).

Results

A total of 42 respondents (78%) from 23 countries (68%) returned a completed questionnaire.

Demography

Regarding the *total population*, 78% of the responding countries reported a projected increase over the next decade, varying from +1.8% (France) to +13.9% (Australia). The populations of the other countries were expected to decrease by -0.1% (Denmark) to -1.9% (Romania). In 86% of the responding countries, ageing of the population was a factor that was expected to influence the composition of the donor base.

Figure 1 shows the percentages of inhabitants with a different blood genotype in the total population and the percentages of minority inhabitants with a blood genotype that did not differ from the general population. The interpretation of the percentages should be done with care, as the data sources used were not perfectly comparable between all countries. Some respondents included 2nd and 3rd generation of migrants whereas others only reported persons who were born abroad).

We found that the percentage of people from minority groups with a different blood genotype varied greatly by country. In some counties, such as the USA (37%), France (25%), Spain Madrid area (16%), England & North Wales (14%) and the Netherlands (12%), the proportion of people with a blood genotype that differed from the general population was reported to be over 10%. Other countries indicated a proportion of 8% (Canada, province of Québec) or between 1% and 5% (Belgium, Denmark, Finland, Germany, Italy, Luxembourg, Portugal, Spain Basque Country and Sweden). Austria, Estonia and Malta reported that people with a different blood genotype made up less than 1% of the total population. Six countries did not provide numbers. Of the reporting countries, 55% expected these numbers to increase over the next 10 years, 15% expected a decrease and 30% foresaw a stable situation.

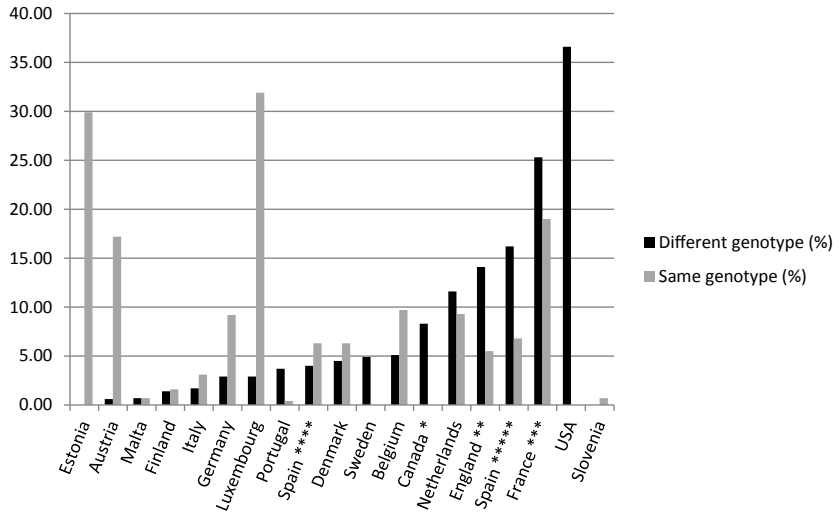
In a small number of countries, the percentages of minority

Table 1: The most relevant questions asked in the questionnaire.

The demography part of the questionnaire assessed the following questions:
- What is the current total population in your country?
- What is the estimated total population in your country in 10 years' time?
- By estimation, how many people in your country have a blood genotype that differs from the general population of your country?
- By estimation, how many minority people in your country have a blood genotype that does not differ from the general population of your country?
- Do you expect these numbers to change over the next 10 years?

The supply and demand section assessed the following items:
- If available, please provide information on the minority groups that are represented in your donor population.
- Do you face shortages in supplying regular blood types (AB0 positive and negative) to hospitals?
- How often does this occur?
- Do you foresee shortages in regular blood types in the next 10 years?
- Do you face shortages in supplying rare or specific blood types to hospitals?
- How often does this occur?
- Do you foresee shortages in rare or specific blood types in the next 10 years?

Questions focussing on minority recruitment:
- Does your organisation currently recruit donors specifically from one or more minority groups present in your country?
- Does your organisation intend to recruit donors specifically from one or more minority groups present in your country?
- Which communication channels, media or other tools are you using to recruit minority donors?
- How successful was this method in recruiting donors from minority groups?
- Which obstacles have you identified in your recruitment efforts?
- Which facilitators have you identified in your recruitment efforts?



Note: * Population data Québec province only;
** Population data for England and Wales.
*** Population aged 18-60;
**** Population data for Basque Country only;
***** Population data for Madrid area only.

Figure 1 Demography General Population

Percentage of general population with a different blood genotype, and percentage of inhabitants who are not of the majority population, but whose blood genotype does not differ from the majority.

inhabitants with a blood genotype that did not differ from the general population constituted more than 15% of the total population (Luxembourg 32%; Estonia 30%; France 19%; Austria 17%). Most countries (Belgium 10%; Denmark 6%; England & North Wales 6%; Germany 9%; the Netherlands 9%; Spain Basque Country 6%; Spain Madrid area 7%) reported a proportion between 5% and 10%. In Finland, Italy, Malta, Portugal and Slovenia these groups made up less than 5% of the population. Eight countries did not provide data; 39% of the reporting countries expected the number of minorities whose blood type did not differ from the general population to be stable over the next decade. An increase was expected by 44%, 11% did not know and 6% (one country) predicted a decrease.

Blood supply and demand

Regarding the *supply* of blood from minority donors we found that the majority of respondents were not able to provide data on the representation of minority groups in their donor base; 67% could not provide data about people whose blood genotyping differed from the general population and 83% could not provide data about people whose blood genotyping did not differ. Figure 2 shows that blood establishments that did provide information on the origin of their donor population reported that minorities were mostly underrepresented in the donor base. For example, 11.6% of the Dutch population consisted of people whose blood genotyping differed from the white Dutch population but it was estimated that only 1% of donors came from minority groups. In Estonia, 29.9% of the inhabitants came from a group whose blood genotyping did not differ from the general population, but only 4.2% of this group was represented in the donor population.

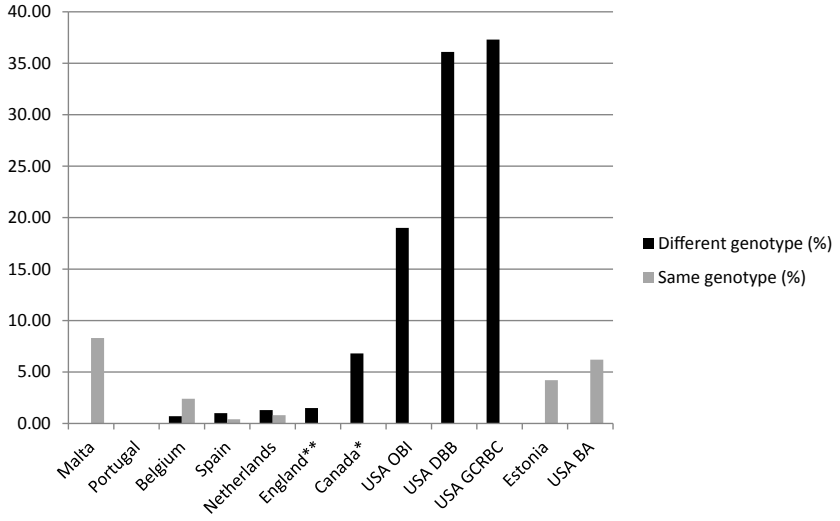
Regarding the *demand* of regular blood types, 54% of the responding blood establishments mentioned shortages in their regular supply, in particular type 0 negative. The frequency of these shortages varied from occasionally to weekly/daily. About half of the respondents expected these shortages to occur over the next 10 years, either to the same extent or more frequently. Shortages in supplying specific or rare blood types to hospitals were reported by 60% of the respondents. Most of them (78%) reported that this happened on an occasional basis; 17%, reported that problems occurred monthly; one respondent (4%) experienced problems on a weekly basis; 53% anticipated further shortages over the next decade, either at the same level or more frequently.

Minority recruitment

Less than half (40.5%) of respondents aimed to recruit donors from one or more minority groups, while 59.5% did not. 12% aimed to recruit donors from all minority groups, while 29% focused on specific groups. The 25 establishments that did not yet recruit minority donors were asked whether they intended to do so in the future. Nine establishments indicated such an intention. Table 2 shows the communication channels, media, or other tools the organisations reported using to recruit minority donors. The methods are shown in the first column. Those used most often to recruit blood donors from minority groups were *'recruitment in religious organisations (e.g. mosques)*', recruitment using *'minority organisations'* and *'individual spokespersons/representatives from the specific minority groups'*.

The recruitment efforts resulted in varying levels of success. Some organisations had just started their minority recruitment and were, therefore, unable to provide data on their success rate. The most successful methods reported were 'commercials on local television', 'minority *organisations'*, and '*recruitment in religious organisations (e.g. mosques)'*.

The reporting organisations identified several obstacles to minority recruitment. The procedures used by blood donation



Note: * Donor data Québec province only; ** Donor data for England and Wales.

Figure 2 Demography Donor Population

Percentage of the donor population with a different blood genotype, and percentage of donors who are not of the majority population but whose blood genotype does not differ from the majority.

Table 2: Use of recruitment methods and overall success rate.

Recruitment method	*Number of organisations*	*Average success (scale: 1-5)*
Commercials on local television	8	3.5
Minority organisations	20	3.3
Recruitment in religious organisations (e.g. mosques)	23	3.2
Commercials on local radio	11	3.2
Minority staff in own organisation	18	3.1
Individuals (e.g. spokes/ representatives) from the specific minority groups	20	2.9
Leaflets	14	2.8
Minority donors (donor-recruits-donor)	12	2.8
Recruitment teams at fairs or events	18	2.7
Social media	11	2.7
Website	14	2.6
Newsletters	8	2.5
Commercials on national radio	4	2.3
General practitioners	3	2.3
Magazines read by minority groups	6	2.0
Commercials on national television	2	1.5
Door-to-door recruitment	2	1.5

establishments could be obstacles. For example, 28.9% of responding organisations reported permanent bans on donation by people from Sub-Saharan African countries and 36.8% prohibited donation by carriers of sickle cell anaemia or thalassaemia. 60.5% of the responding organisations reported that donors were only allowed to donate if they spoke the official language(s) or the languages used by that particular blood establishment.

Two open-ended questions showed that obstacles to recruitment occurred regularly across countries but that they were very diverse. Lack of citizenship or national ID card among minority donors, a high deferral percentage, socio-economic issues, socio-cultural issues, religion, myths about blood donation, knowledge gaps, a lack of trust between minorities and the

blood establishment, a fragmented and hard to reach target audience, organisational paradigm and inertia, and again problems regarding the language barrier, for example recruiting and maintaining bi-lingual staff were all cited as obstacles.

Certain facilitators to minority recruitment were reported. Respondents indicated factors such as the presence of minority staff in the blood donation establishment, bi-lingual staff, motivated staff, the possibility of going through the donation procedure in another language, the use of a recognised community spokesperson and initiatives by minority communities themselves were reported as the main facilitating factors.

Discussion and further research possibilities

The aim of this paper was to report the results of a project assessing the situation in Western countries regarding donated blood from members of minority groups. The demography of each participating country was assessed, as well as the situation related to supply and demand for common as well as rare blood types. We have reported which, if any, recruitment methods are currently used by blood collection establishments, and how successful the respondents felt these methods to have been.

We found that the population composition was subject to changes, and most countries expected an increase in their population in the next 10 years. In line with prior research (Greinacher *et al.,* 2010; Greinacher *et al.,* 2011; Desalvo *et al.,* 2011; Seifried *et al.,* 2011), we find ageing and an increasing number of people from minority groups to be the main factors relevant to blood donor management in the future. The proportion of people eligible for donation will decrease, either because of health reasons or because of age limits set by the blood donation establishments and reflected in the increasing Old-Age-Dependency-Ratio (De Kort and Wagenmans, 2011). However, the demand for blood products needed for elderly people may increase, if access to expected new cellular therapies for the elderly increases. This rise in demand could be compensated by more stringent patient blood management strategies leading to less blood needed per patient. In addition, blood donation establishments reported that the proportion of donors from minority groups, both those with a different or similar genotype from the majority population, was low compared to the proportion in the general population. This is consistent with previous studies which also found an underrepresentation of minorities in the donor base (Gillum *et al.,* 2008; Shaz *et al.,* 2008; Atsma *et al.,* 2011). One reason for this underrepresentation could be that, in many countries, potential blood donors from minority groups are not allowed to donate because they do not speak the official language. It could be made possible to go through the donation process in another language by (i) hiring bi-lingual staff and (ii) translating information materials and, if electronic devices are used, the check-list donors fill out before donation. The finding that many blood establishments do not register country of birth or ethnicity in their databases, either because they are not allowed to legally or because the data has not been of interest so far, is also noteworthy. For our goal of assessing the current state of minority recruitment, we want to highlight this, as it shows that many countries do not yet document the minority blood supply. An interesting topic for further research could be the question of why this is currently not registered and how legal or management barriers could be reduced when minority recruitment becomes more important.

Over half of the respondents reported difficulties in supplying regular blood types, in particular type O negative and 60% reported problems with supplying specific blood types. These quantitative supply challenges could be reduced by enlarging the donor base by recruiting more donors from minority groups. In order to develop such recruitment strategies, the first step should be to look at what other organisations have already done and how successful they have been. In this regard, the MIMI survey has shown that minority blood donor recruitment is still at an early stage and that many blood donation organisations in Europe, Australia, Canada and the United States are not yet very successful in recruiting and retaining donors from minority groups. The overall picture of success in minority recruitment looks rather modest even though some organisations do report successful strategies in recruiting minorities. Low to average self-reported success rates emphasise a need for a systematic approach to the design of theory and evidence based recruitment and retention programs (Bartholomew *et al.,* 2011). Further research in this area is therefore essential. Furthermore, the possibility to engage in international cooperation with foreign countries in which the missing blood type is more frequent could be an interesting approach, even though exchanging blood products will be expensive, time consuming and not without risk especially with regard to disease control. Exchanging knowledge on culture and recruitment strategies with blood services in countries of origin could yield positive results in the long run.

A few studies have already focused on theory and evidence based recruitment programmes for specific minority groups. A French research team has described an anthropological approach to minority recruitment (Grassineau *et al.,* 2007) that helped to develop a message specifically for their target group and which led to more donations. In Germany, researchers compared migrant blood donors with non-donors of this group to find language and trust issues as factors that can be associated with a significantly lower probability of becoming a migrant blood donor (Boenigk *et al.,* 2015). An Australian team has done a series of studies on recruitment of minority groups and has found that minorities often feel as if their blood was not wanted and that improving social inclusion lowers barriers to donation (Polonsky *et al*., 2011a; Polonsky *et al*., 2011b). In the US, community-oriented programs provided education and information, building community connections and increasing the number of blood donors from the target communities (Frye et al., 2014). These approaches can be implemented in different settings and could be useful to anyone seeking a solid methodology to start studying how best to recruit blood donors from a minority group. Most elaborate studies have used a qualitative approach, e.g. interviews with members of the community about health care, blood donation and cultural issues. Interviews and questionnaire studies show that different cultures have different ideas concerning blood, blood donation and healthcare which have to be taken into account when designing recruitment and retention programmes.

Overall, this paper adds to knowledge of national differences in demography, supply and demand of common and rare blood

types, and minority blood donor recruitment, and has collated a first data set to work with. The survey did not test theoretically founded theories of minority recruitment, it merely assessed the current state of minority blood donor recruitment efforts of not-for-profit blood donation operators. For a truly representative study, for-profit blood donation operators would have to be included. In some countries the responding organizations were only responsible for certain regions within their country and they might not always reflect the full national picture. Further research using additional and objective success factors instead of self-reports of managers would be mandatory in order to identify the most effective success factors of recruitment strategies.

In conclusion, this paper can be seen as a call for more research in the topic. We do hope our paper encourages other researchers to continue and elaborate on this topic, and to generously share their methodologies and results in international (open access) journals.

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