

Reasons to end the donor career: a quantitative study among stopped blood donors in the Netherlands

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SUMMARY

Background and Objectives: Previous work has studied barriers to donating blood or plasma among current, lapsed and non-donors. Still, it remains unclear why donors stop donating and end their donor career voluntarily. A thorough understanding of why donors stop is necessary to develop more effective retention strategies and manage the decline in whole-blood donors.

Methods: An online questionnaire that contained questions about reasons to stop donation was sent out to 7098 Dutch whole-blood donors who deregistered from the donor pool in 2015 but who were not permanently deferred for medical reasons (response: $N = 2490$, 35%).

Results: The final sample consisted of 1865 stopped blood donors. Of the stopped blood donors, 28.4% reported that negative physical experiences were (partly) the reason to stop. This stopping reason was more often reported by women than men, those aged 19–33 years compared to older groups and those who had donated five times or less compared to those with more donations. Inconvenient opening times (26.1%) was a stopping reason more frequently reported by men compared to women, those aged 34–50 years compared to their younger and older counterparts and those who had donated more than five times.

Conclusions: We found that the stopping reasons for blood donors are dependent on gender, age and the number of donations. Stopping reasons differ substantially from barriers experienced by current, lapsed and non-donors. More research on preventing negative physical experiences and implementing more flexible opening hours are advised.

Key words: blood donors, demographic differences, donor behaviour, negative physical experiences, opening times, stopping reasons.

Ensuring a sufficient number of blood donors who you can rely on when blood is needed is essential for blood banks (Wevers *et al.*, 2014b). However, many countries face a decrease in the number of blood donors (Williamson & Devine, 2013; Johannsdottir *et al.*, 2016; Volken *et al.*, 2016). As an illustration, in the Netherlands, a steady decrease in the number of whole-blood donors, from approximately 400 000 registered donors in 2011 to almost 340 000 donors in 2015, is visible (Sanquin, 2015). Also, due to ageing of the current blood donor population, it is expected that the decrease of whole-blood donors advances over time if no concrete measures are taken (Zou *et al.*, 2007; Greinacher *et al.*, 2011). Additionally, the ageing general population may lead to increasing demands for blood products (Ali *et al.*, 2010; Greinacher *et al.*, 2011). To be able to meet the demand for blood and blood products in the future, a further decrease in the number of registered donors is undesirable. Hence, we need to gain in-depth knowledge of the reasons to stop being a blood donor. Insight on stopping reasons may serve as important input for developing effective donor-retention strategies.

Various studies have examined barriers to donation among non-donors and current donors, and non-return reasons among lapsing donors. These studies are on voluntary, non-remunerated whole-blood donors. Like in many other Western countries, in the Netherlands, all whole-blood donors are non-remunerated and donate on a voluntary basis. Prior to each donation, donors fill in a Donor Health Questionnaire, which is discussed with staff, and their blood pressure and haemoglobin levels are assessed. In contrast to most other Western countries, in the Netherlands, new donors donate blood only on their second visit. For both non-donors and lapsed donors, Duboz and Cuneo (2010) found that medical reasons were the most common reported barriers to donating blood. Regarding current blood donors, Wevers *et al.* (2014a) found that donors

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regularly postpone donation due to time constraints. There is also evidence that donor reactions (e.g. bruising and fainting) and temporary deferrals had a negative effect on the return rate of blood donors (Newman *et al.*, 2006; Germain *et al.*, 2007). Differences were found for demographic characteristics, such as more frequent haemoglobin (Hb) deferral for women (Custer *et al.*, 2012) and postponing donation due to health-related reasons for older individuals (Misje *et al.*, 2008). Also, first-time blood donors were more likely to lapse when they experienced donor reactions compared to more experienced blood donors (Wiersum-Osselton *et al.*, 2014).

Although donor selection is important for protecting both donors and patients, donors may experience deferral as a barrier or may even end their donor career (Dhingra, 2002). The current study is one of the few studies on blood donors who voluntarily ended their donor career (Veldhuizen *et al.*, 2009). Insight on the stopping reasons of blood donors and the development of more effective donor-retention strategies could help to counter the decrease in blood donors. We developed an online survey that we sent out to stopped whole-blood donors to reach a better understanding of their main stopping reasons. We aimed to answer the following research questions:

- 1 What are the main stopping reasons given by stopped blood donors?
- 2 How do the main stopping reasons differ with regard to gender, age and total number of blood donations?

MATERIALS AND METHODS

Data collection and sample

A stopped blood donor is defined as someone who was registered and may or may not have made donations but has been deregistered from the donor data base and will no longer be invited for donation (De Kort & Veldhuizen, 2010; Veldhuizen *et al.*, 2013). In contrast, lapsed or inactive blood donors remain registered in the donor data base of the blood bank organisation, have donated at least once and may be a focus of specific donor-retention strategies. In total, 18,489 whole-blood donors in the Netherlands stopped in 2015. For the purpose of this study, we selected all whole-blood donors from The Netherlands who stopped in 2015, were eligible to re-register according to their medical history, had at least gone through the medical examination, had provided an e-mail address and had given approval at their last pre-donation screening to be approached for research ($N = 7745$, 41.9%). We chose to select whole-blood donors only because plasma donors experience different trajectories whilst donating, whereas primarily proteins and fluid are donated. Therefore, plasma donors may have different donor experiences and attitudes from whole-blood donors (Veldhuizen & van Dongen, 2013). The survey was designed in an online questionnaire platform (Questback), and invitations to participate were distributed via e-mail. Some of the e-mail invitations could not be delivered ($n = 647$). In the e-mail invitation, it was explained that participation is completely voluntary and anonymous. In total, 7098

stopped blood donors were invited, and 2490 surveys were completed (response rate = 35%). This response rate is a fairly common proportion for surveys among active Dutch blood donors (Romeijn *et al.*, 2016). We excluded participants who did not complete the survey and those who reported that they were ineligible to donate for medical reasons ($n = 306$). Also, persons who were 65 years or older were excluded ($n = 284$) as they are ineligible to (re-)register as a blood donor. Additionally, 35 respondents who had re-registered as blood donors were not included. Our final sample consisted of 1865 stopped blood donors for further analyses. The online survey contained questions regarding demographic characteristics, blood donation history characteristics, stopping reasons, intention to return and motivators that may enhance a return. For analyses, we included stopping reasons, gender, age and number of donations.

Study variables

Stopping reasons. Stopping reasons were assessed by asking the respondent whether certain reasons to withdraw from the donor pool applied to the respondent or not. The possible reasons were partially inspired by the barriers listed in the article of Wevers *et al.* (2014a), e.g. not being able to donate due to work or study and sports or hobbies. Furthermore, stopping reasons of donors that were experienced as important by the blood bank staff – i.e. donor physicians, nurses and call centre personnel – were added to the questionnaire, e.g. being dissatisfied with the organisation or policy of the blood bank organisation or because the donation centre had closed down. In total, 23 possible stopping reasons were included. All statements are shown in Table 1. Respondents were able to rate each reason to stop from 0 (disagree) to 4 (agree). The respondents were able to add another reason to stop in an open-ended question if their reason was not listed. To some of the stopping reasons marked by the respondent, additional multiple choice and open-ended questions were asked, e.g. what kind of negative physical experiences the respondent had experienced or what the respondent does not like about the policy of the blood bank.

Exploratory component analyses. Due to the large number of stopping reasons, we decided to perform an exploratory factor analysis to discover clusters of stopping reasons that answered our second research question. This technique allows us to determine which items cluster together and 'load' on one dimension to reduce dimensionality (Jolliffe, 2014). The factor analyses were conducted with principal components extraction and varimax rotation. The Kaiser–Meyer–Olkin (KMO) Test was higher than 0.80 and Bartlett's test was significant ($P < 0.001$), indicating the usefulness of factor analysis. According to the Kaiser's criterion of eigenvalues > 1 , seven components were extracted. Together, these seven components accounted for 55.6% of the total variance in all the variables. An item was considered to belong to a component if it had a loading higher than 0.40 (Stevens, 2002). In case of cross-loading on more than one component, we selected the component on which the item loaded the highest. For all

Table 1. Overview of statements regarding the possible stopping reasons

I (partly) stopped as a blood donor because:

1. The donation centre I visited closed down.
2. I had one or more negative physical experiences while or after donating, such as pain, dizziness and/or fainting.
3. I found blood donation scary/stressful.
4. The atmosphere at the donation centre was unpleasant.
5. Donating blood took too long.
6. I was not satisfied with the treatment and/or service of the donation centre personnel.
7. I was not satisfied with the organisation and/or policy of Sanquin.¹
8. I am/was hindered due to physical problems, such as difficulties with moving.
9. I am/was hindered due to emotional problems, such as being overstrained or depressed.
10. I have/had little time due to receiving and/or caring for children.
11. I have/had little time due to obligations such as work, homework and/or study.
12. I have/had little time due to hobbies, sports or other leisure activities.
13. I have/had little time due to a sudden or temporary event, such as rehousing or a funeral.
14. I was not able to donate due to the opening times of the donation centre.
15. I do not believe in the purpose of donating blood.
16. I did not receive enough appreciation by Sanquin.¹
17. I received (too) few invitations to donate.
18. I received (too) much invitations to donate.
19. My friends and/or family members also wanted to stop or already stopped.
20. My friends and/or family members thought it was better if I stopped with donating.
21. I find the waiting times at the donation centre too long.
22. I was not eligible to donate once or more times.
23. I believe I contributed enough.

¹Sanquin is the blood bank organisation in the Netherlands.

components, regression scores were calculated and saved as separate variables. The seven components were labelled accordingly: (i) Dissatisfied, (ii) Time constraints, (iii) Having enough of it, (iv) Negative donation experience/association, (v) (Temporary) Personal problem, (vi) Donation centre-related and (vii) Temporary deferral. An overview of all stopping reasons and their factor loadings is shown in the Appendix A1.

Independent variables. Gender was coded as 0 for men ($n = 488$) and 1 for women ($n = 1377$). Age consisted of three approximately equally large categories included as dummy variables in our analyses: 19–33 years old ($n = 638$), 34–50 years old ($n = 598$) and 51–64 years old ($n = 629$). Number of blood donations consisted of two categories: we coded stopped donors who had donated five times or less as 0 ($n = 748$) and those who donated more than five times as 1 ($n = 1117$). We categorised age and the number of donations, so the stopping reasons of different groups can be compared.

Analyses

All analyses were conducted in IBM SPSS Statistics version 21 (Chicago, IL, USA). First, we compared the descriptives of the selected sample to the descriptives of the sample that filled in the survey. Second, descriptives of the proportion of respondents who (partly) agreed with certain stopping reasons (score 3 and 4) were provided. The main stopping reasons were stratified for gender, age and the number of blood donations. For each group, we reported the five most frequently reported stopping reasons in a descriptive overview. Whether these main stopping reasons differed between groups (e.g. between men and women) was tested using χ^2 tests. Finally, the relations of gender, age and donation frequency with the clustered stopping reasons were explored using multiple linear regression analyses.

RESULTS

Comparison sample and respondents

In order to evaluate whether our study sample was representative of the stopped donor population, we compared study respondents with all donors from the population of stopped donors on our independent variables. The proportion of women who completed the questionnaire was somewhat higher (73.8%; $n = 1377$) than the proportion of women who were selected from the donor database (70.3%; $n = 5447$). The survey respondents had a mean age of 42 years ($SD = 13.25$; range = 19–64 years). The mean age of the stopped donors in the database was 43 years ($SD = 14.5$; range = 18–70 years). A substantial proportion of the survey respondents reported that they had donated more than 10 times (39.2%; $n = 732$), and the mean number of years that a person was registered as a blood donor was roughly 6.5 years ($SD = 7.13$); in the sample for this survey in the database, 41.9% donated more than 10 times ($n = 2755$), and the mean number of years of registration as a blood donor is 9 years ($SD = 8.35$).

Most reported stopping reasons

Figure 1 shows the reported stopping reasons as stated by the survey respondents. The reason most frequently reported was experiencing a negative physical event during and/or after donation (28.4%; $n = 529$). Of the respondents who mentioned negative events, 66.1% ($n = 347$) reported feeling dizzy and 42.5% ($n = 223$) reported fainting. Feeling tired was also a frequently reported experience among those who had negative physical experiences (35.8%; $n = 188$). Approximately one in four (26.1%) of the respondents reported having stopped due to inconvenient opening hours of the donation centre (26.1%; $n = 486$) and time constraints due to work or study (23.9%; $n = 446$). Temporary deferral (e.g. for a low Hb or travelling outside Europe) was also reported frequently as a stopping reason (18.8%; $n = 350$).

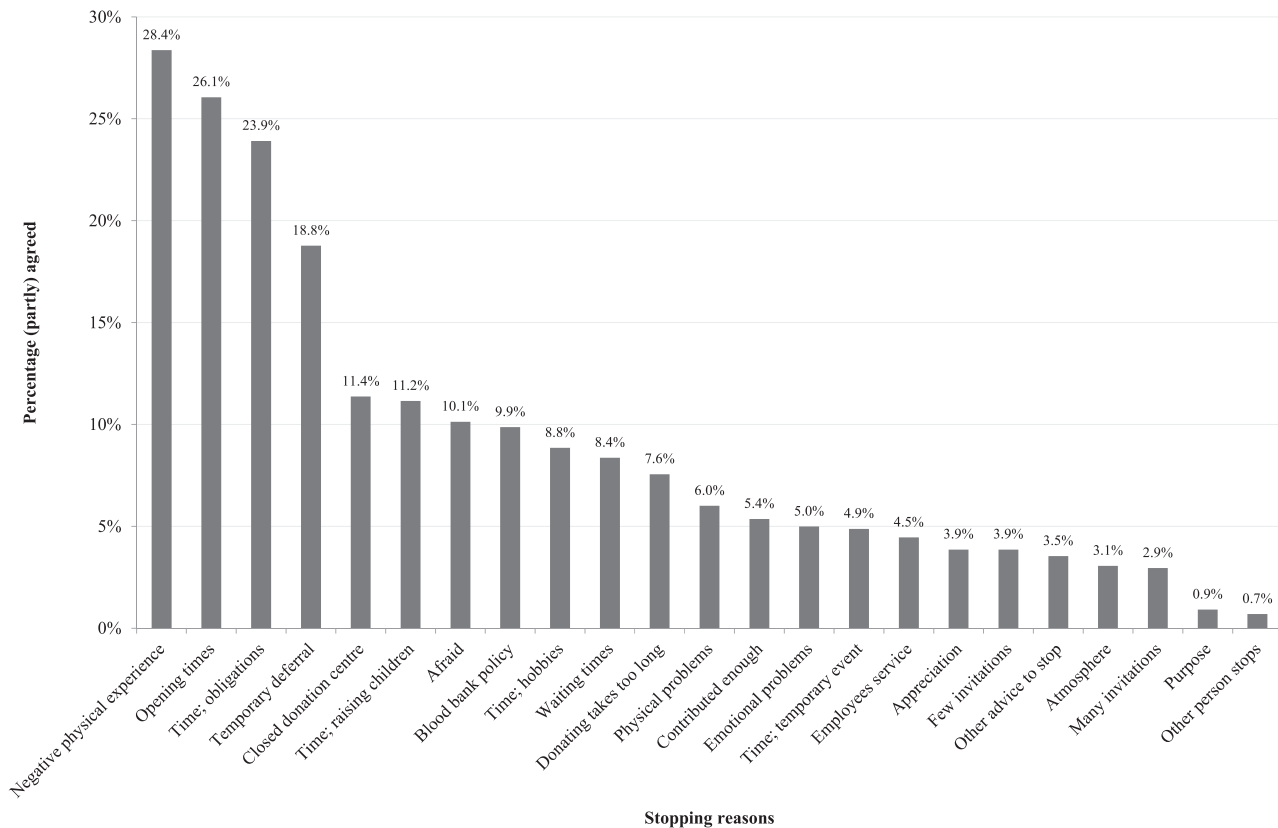


Fig. 1. Percentage of the respondents who agreed or partly agreed with certain stopping reasons ($N = 1865$). χ^2 tests were conducted to determine differences between groups (men vs women; 19–33 years old vs 34–50 years old vs 51–64 years old; ≤ 5 donations vs > 5 donations).

Differences in stopping reasons by gender, age and number of donations

Men and women slightly differed in their most frequently reported stopping reasons (Table 2). Men appeared to be more often dissatisfied with the blood bank's organisation or policy than women (men 18.2%, $n = 89$; women 6.9%, $n = 95$; $P < 0.001$). Women reported negative physical experiences as a stopping reason almost twice as often as men (women 31.8%, $n = 438$; men 18.6%, $n = 91$; $P < 0.001$).

Differences in the most reported stopping reasons were also found between age groups. For a large proportion of the participants aged 19–33 years, negative physical experiences were a main reason to stop (39.5%, $n = 252$; $P < 0.001$), and a temporary deferral was also more often reported by this younger group (25.5%; $n = 163$, $P < 0.001$). Also, for the younger stopped donors, stress and/or fear of donating blood was the stopping reason more commonly reported compared to both the older age groups (15.2%, $n = 97$; $P < 0.001$). For participants aged 34–50, 'no time to donate because of raising children' was a frequently reported stopping reason (20.7%, $n = 124$; $P < 0.001$), and for participants aged 51–64, the closing of the donation centre was a stopping reason frequently reported (15.9%, $n = 100$; $P < 0.001$).

Finally, differences between stopped blood donors with five or less vs more than five donations were explored. The

negative physical experiences were reported twice as much by stopped donors who donated five times or less (40.0%, $n = 299$; $P < 0.001$) compared to those who donated more than five times (20.6%, $n = 230$). On the other hand, inconvenient opening times are reported twice as much by those who had donated more than five times (32.8%, $n = 366$; $P < 0.001$) compared to those who had donated less (16.0%, $n = 120$).

Multivariate linear regression analyses

In Table 3, the results of the multivariate regression models are presented, with the clustered stopping reasons from our exploratory factor analysis as the dependent variables and gender, age and number of donations as the independent variables. Men ($B = -0.25$, $P < 0.001$) and those who had donated more often ($B = 0.24$, $P < 0.001$) were more likely to stop because they were dissatisfied with being a blood donor, the donation centre or the blood bank organisation. Regarding the general time constraints, we observed that men ($B = -0.14$, $P < 0.01$) and those who had donated more than five times ($B = 0.19$, $P < 0.001$) were also more likely to stop due to this reason. The same groups (Men: $B = -0.12$, $P < 0.05$; > 5 donations: $B = 0.15$, $P < 0.01$) were more likely to stop because they had enough of it, and donating blood does not fit their lifestyle. On the

Table 2. Stopping reasons and motivations to return with regards to gender, age and number of blood donations ($N = 1865$)

	Men $n = 488$	Women $n = 1377$	19–33 years old $n = 638$	34–50 years old $n = 598$	51–64 years old $n = 629$	≤5 donations $n = 748$	>5 donations $n = 1117$
Five most reported stopping reasons per group	1 Inconvenient opening times*** (32.2%; $n = 157$)	Negative physical experiences*** (31.8%; $n = 438$)	Negative physical experiences*** (39.5%; $n = 252$)	Inconvenient opening times** (31.1%; $n = 186$)	Inconvenient opening times** (25.1%; $n = 158$)	Negative physical experiences*** (40.0%; $n = 299$)	Inconvenient opening times*** (32.8%; $n = 366$)
	2 Time constraints; obligations (26.6%; $n = 130$)	Inconvenient opening times*** (23.9%; $n = 329$)	Time constraints; obligations*** (28.1%; $n = 179$)	Time constraints; obligations*** (30.3%; $n = 181$)	Negative physical experiences*** (20.3%; $n = 128$)	Time constraints; obligations (22.5%; $n = 168$)	Time constraints; obligations (24.9%; $n = 278$)
	3 Negative physical experiences*** (18.6%; $n = 91$)	Time constraints; obligations (22.9%; $n = 316$)	Temporary deferral*** (25.5%; $n = 163$)	Negative physical experiences*** (24.9%; $n = 149$)	Closed donation centre*** (15.9%; $n = 100$)	Temporary deferral** (22.1%; $n = 165$)	Negative physical experiences*** (20.6%; $n = 230$)
	4 Unsatisfied with policy*** (18.2%; $n = 89$)	Temporary deferral** (20.3%; $n = 280$)	Inconvenient opening times** (22.3%; $n = 142$)	Time constraints; children*** (20.7%; $n = 124$)	Temporary deferral*** (15.1%; $n = 95$)	Afraid*** (17.6%; $n = 132$)	Temporary deferral** (16.6%; $n = 185$)
	5 Donation centre closed** (14.8%; $n = 72$)	Time constraints; children (11.8%; $n = 163$)	Afraid*** (15.2%; $n = 97$)	Temporary deferral*** (15.4%; $n = 92$)	Time constraints; obligations*** (13.7%; $n = 86$)	Inconvenient opening times*** (16.0%; $n = 120$)	Donation centre closed*** (15.1%; $n = 169$)

* $P < 0.05$.** $P < 0.01$.*** $P < 0.001$.

other hand, women ($B = 0.11$, $P < 0.05$), younger adults compared with middle-aged adults ($B = 0.15$, $P < 0.05$) and those who had donated a few times ($B = -0.45$, $P < 0.001$) were more likely to stop because they had a negative association or experience with donating blood. Women were also more likely to stop due to (temporary) personal problems ($B = 0.12$, $P < 0.05$). Men ($B = -0.11$, $P < 0.05$) and those who had donated more than five times ($B = 0.36$, $P < 0.001$) were more likely to stop because of donation centre-related factors, such as the opening hours or the closing down of the donation site. Finally, we found that women ($B = 0.15$, $P < 0.05$) and younger adults ($B = 0.31$, $P < 0.001$) were more likely to quit because of a temporary deferral.

DISCUSSION

Among our survey respondents, 'negative physical experiences' was the most frequently reported stopping reason. This was especially true for women, donors aged 19–33 years and donors having donated five times or less. These groups were also significantly affected by the factor negative donation experiences/associations. 'Time constraints' was also an important stopping reason. Also, men and those having donated more than five times reported this more frequently. Adults aged 51–64 years, however, were less likely to report 'time constraints' as a stopping reason compared to the younger age groups. Limited time to donate blood due to obligations such as work and study was the most frequently reported type of time constraint.

Not only were personal stopping reasons mentioned by the stopped blood donors, but stopping reasons related to (changes in) the blood bank organisation were also found to be important. Men and stopped donors who had donated more than five times in total were more likely to stop due to donation centre-related factors, such as closing down of a centre or inconvenient opening hours. Participants aged 19–33 years were less likely to report

donation centre-related reasons compared to their older counterparts. It should be noted that the explained variance of the clustered stopping reasons by gender, age and donation history is rather low. We suspect that there exist more determinants related to the donor motivation and experiences that further explain stopping to donate, such as pro-social personality characteristics (Steele *et al.*, 2008) or collection site characteristics (e.g. mobile or fixed) (Schlumpf *et al.*, 2008).

The results of the current study extend the results found in other studies regarding barriers to donating and/or reasons to postpone donation. A previous temporary deferral is associated with a higher likelihood of lapsing (Germain *et al.*, 2007), and in our study, it is often pointed out as a reason to stop donation entirely. However, although Wevers *et al.* (2014a) reported time constraints as the central reason to postpone donation, we found that negative physical experiences were a particularly important reason to stop donation and de-register. Although time constraints due to obligations and raising children were often reported as stopping reasons in our study, these proportions are lower compared to studies regarding current and lapsed donors. Wevers *et al.* (2014a) also found that general physical problems were also often reported as a barrier (29%), but in our study, it was not a common reason to stop donating (6%). Certainly, an acute physical problem such as nausea will more commonly lead to a temporary lapse, whereas chronic physical problems may lead to stopping entirely. Finally, Misje *et al.* (2008) found that older blood donors more regularly postpone donation due to health-related reasons. In our study, we did not include a direct measurement of health-related stopping reasons, but participants aged above 50 did not report negative physical experiences, earlier deferral or physical or emotional problems more often than their younger counterparts. Hence, it appears that experienced barriers and reasons to postpone donation are different from reasons to actually end the donor career.

Table 3. Multivariate linear regression models with stopping reasons on gender, age and number of donations (n = 1865)

Variables	Dissatisfied		Time constraints		Enough of it		Negative experience		Personal problem		Donation centre		Temporary deferral	
	B	SE (B)	B	SE (B)	B	SE (B)	B	SE (B)	B	SE (B)	B	SE (B)	B	SE (B)
Women	-0.25***	0.05	-0.11	0.05	-0.12*	0.05	-0.05	0.05	0.12*	0.05	-0.11*	0.05	0.11*	0.05
19-33 years	-0.003	0.06	-0.002	0.06	-0.03	0.06	0.02	0.06	0.03	0.06	-0.15**	0.06	0.22***	0.06
34-50 years	Ref		Ref		Ref		Ref		Ref		Ref		Ref	
51-64 years	0.001	0.06	0.001	0.06	-0.26	0.06	-0.01	0.06	-0.01	0.06	-0.05	0.06	-0.02	0.06
More than five donations	0.24***	0.05	0.12	0.05	0.09	0.05	0.07	0.05	-0.01	0.05	0.36***	0.05	-0.04	0.05
Intercept	0.05	0.07	0.19	0.07	-0.01	0.07	0.16	0.07	-0.09	0.07	-0.07	0.07	-0.15	0.07
Adjusted R (%)	3%		6%		1%		8%		0.2%		5%		1%	

*P < 0.05.
 **P < 0.01.
 ***P < 0.001.

This study has some limitations. First, there may be non-response bias. Although all stopped donors in The Netherlands from 2015 with an e-mail address were selected, 65% of the selected persons did not fill in the survey. Compared to selection from the database, we had a larger proportion of female participants. Also, the survey respondents were generally younger and had made less donations in comparison to the initial sample from the database. These groups do have different stopping reasons compared to the underrepresented groups, such as men and older persons. Therefore, we assume that certain stopping reasons, such as being dissatisfied with the blood bank's organisation or closing down of donation centres, are underrepresented in this survey but do play a more important role with regards to the stopped blood donor population in general.

Second, we aimed to select a very specific target group, namely, donors who were deemed eligible to return according to the donor database. However, quite a number of respondents reported that a medical doctor of the blood bank had indicated to them to end the donor career for medical reasons (n = 339). Others reported that they knew (without a consult) they were ineligible to donate. Although we deleted responses from persons who could not return based on their answers and age, we cannot conclude that the sample is entirely generalisable to healthy stopped donors deemed eligible to return.

Despite the limitations, the results may be generalisable for other countries with voluntary, non-remunerated whole-blood donors, although cross-cultural differences may hamper generalisation to some extent (De Kort *et al.*, 2010). Also, as paid donors and replacement donors may have different motivations during their donor career (e.g. receiving money, saving a family member), our results might be less applicable to blood bank organisations that utilise such donors. For targeted interventions to retain voluntary, non-remunerated blood donors, we advise blood bank organisations to look critically at the groups that they wish to retain. One possibility to retain more male-, middle-aged- or experienced donors would be to implement more extensive and flexible opening hours. For men and middle-aged adults, it can be argued that it is important for them to have the possibility to donate next to their working hours (Cousins & Tang, 2004). Experienced donors may not be able to adapt to changing opening hours and may therefore quit. In retaining more female, younger and inexperienced blood donors, we suggest that it is important to try to prevent negative experiences or implement interventions to better handle such events. Also, follow-up care by blood bank staff, such as calling the day after to ask how a donor is doing, may bring relief to the inexperienced donors who find blood donation scary or stressful (Hoogerwerf *et al.*, 2015). There is evidence that motivational interviews, where the donor reflects on his or her unique motivations for giving blood, via the telephone positively influences the intention to donate again (France *et al.*, 2016).

This study is one of the few that actively approached stopped blood donors to inquire about their stopping reasons. Different

blood bank organisations around the world, with distinct policies and donor populations, likely differ regarding stopping reasons and/or their relative prevalence. Therefore, we suggest that exit studies among the donor population in other countries may be valuable to better understand how certain country-level factors relate to the decision to stop and may further develop our understanding of what the main reasons for blood donors to end their donor careers are.

Although this study mainly focuses on the stopping reasons for blood donors, we found evidence from our survey that some stopped blood donors do have a high willingness to return or indicate certain facilitators that may increase their willingness. This is hopeful for the blood bank as stopping as a blood donor does not appear to be infinite. Stopped donors may be a valuable group for re-recruitment to counter the decrease of the number of blood donors.

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CONFLICT OF INTEREST

The authors have no competing interests.

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APPENDIX

Appendix A1. Principal components analysis of stopping reasons ($N = 1865$)¹

Variables	Rotated factor loadings						
	Dissatisfied	Time constraints	Having enough of it	Negative donation experience/association	(Temporary) personal problem	Donation centre-related	Temporary deferral
Closed donation centre	0.08	−0.07	0.08	−0.06	0.04	0.84	−0.01
Negative physical experience	−0.04	−0.06	0.10	0.77	−0.03	−0.16	−0.16
Afraid	0.16	0.06	0.02	0.78	0.11	0.02	0.04
Atmosphere	0.71	0.02	0.12	0.23	0.15	0.09	0.02
Donating takes too long	0.68	0.32	0.01	0.11	−0.05	0.03	0.21
Employees service	0.76	−0.06	0.09	0.07	0.15	−0.04	−0.02
Blood bank policy	0.57	−0.11	0.30	−0.24	0.00	0.13	−0.25
Physical problems	0.06	−0.09	0.06	0.07	0.70	−0.01	0.04
Emotional problems	0.03	0.15	0.13	0.10	0.69	0.02	0.02
Time; raising children	0.02	0.64	0.05	−0.05	0.13	0.00	0.01
Time; obligations	0.02	0.84	0.06	0.00	0.05	0.14	−0.05
Time; hobbies	0.08	0.71	0.21	0.08	0.05	0.02	0.03
Time; temporary event	0.06	0.33	0.13	−0.08	0.58	−0.04	−0.06
Opening times	0.12	0.40	0.00	−0.09	−0.10	0.69	−0.08
Purpose	0.11	0.03	0.52	0.03	0.18	0.04	0.06
Appreciation	0.58	−0.10	0.46	−0.13	0.05	0.08	−0.12
Few invitations	0.10	0.07	0.43	−0.05	0.01	0.19	0.32
Many invitations	0.23	0.26	0.56	0.01	0.04	−0.05	−0.06
Other stops	0.17	0.01	0.58	0.11	0.21	0.26	0.16
Other advice to stop	−0.05	0.01	0.46	0.35	0.23	0.05	0.12
Waiting times	0.67	0.24	0.12	−0.07	−0.10	0.10	0.23
Temporary deferral	0.06	−0.06	0.09	−0.07	0.03	−0.10	0.85
Contributed enough	0.08	0.17	0.62	0.04	−0.06	−0.15	−0.80

¹Factor loadings in bold are clustered in separate standardised variables.

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