Factors influencing confidential unit exclusions in blood donors

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Background and Objective In many countries blood donors can exclude their donated blood from being transfused in a confidential unit exclusion (CUE) process. We aimed to identify characteristics which might influence the decision for CUE.

Study Design and Methods In a 3-step approach we first enrolled 29 German blood donation centers in 2005 and addressed how the clarity of different CUE forms applied in these centers was rated by first-time blood donors and also assessed three newly designed CUE forms. Second, we performed a survey on the characteristics of the CUE process including 25 centers. Third, we performed an intervention study, in which the CUE form originally applied in the study centre was compared with a newly developed CUE form in a before-after study design with respect to the corresponding CUE rates.

Results (1) Clarity of the CUE forms varied considerably. (2) The CUE rate was higher (P < 0.05) when nurses rather than a physician were involved in informing the donors and when the CUE form was submitted anonymously instead of being handed to a person. (3) Application of the newly designed CUE form which was rated as being very clear resulted in a 31% decrease in the CUE rate.

Conclusions Design of the CUE form and characteristics of the CUE process may considerably influence the CUE rates.

Key words: blood donation, confidential unit exclusion, donor.

Introduction

Transfusion medicine practices have achieved a tremendous reduction in the risk of pathogen transmission by blood products. This is the result of careful donor selection, exclusion of risk groups, improved methods of screening for pathogens, especially viruses, and the introduction of pathogen inactivation procedures. However, there is still a diagnostic window for hepatitis B, hepatitis C and human immunodeficiency virus [HIV], i.e. there is a time in which the virus can be transmitted by the donor’s blood product while all laboratory tests on the donor’s blood remain negative. Furthermore, there might be additional or emerging pathogens which are acquired by risk behaviour for which blood donors are not tested. The only way to recognize donors being at risk during this diagnostic window period is by a careful medical history. However, many high risk situations leading to an increased risk for infection with hepatitis or HIV are within the context of sexual behaviour. Therefore, blood donors might be in a compromising situation at the time of blood donation, which might prevent them from giving the information about high-risk activity, especially if they are accompanied by family members or friends to the donation clinic. A possible solution to this problem is the confidential unit exclusion (CUE). In CUE each donor is given the possibility to declare confidentially whether his or her donation is to be used for transfusion (1).
his or her donation without any of the accompanying persons noticing it.

Confidential unit exclusion is used in several countries, as for example the United Kingdom, Switzerland, Iran, USA and Germany. However, there is little information published on the details of the procedures. In the German blood donation system which consists of several Red Cross blood donation services, independent hospital-based transfusion centers as well as private transfusion services; the CUE is regulated by the National Hemotherapy Guidelines. These guidelines require that all donors are screened by a written questionnaire and that detailed information about the donor's health status and about relevant pre-existing diseases is gathered via direct oral questioning. In the Greifswald transfusion medicine department, every blood donor is seen by a physician in private. Family members or friends are not allowed during physical examination and physician talk. The questionnaire is filled out in public at the waiting room and therefore confidentiality cannot always be secured. Since 1988 CUE is also mandatory [2]. However, the CUE process, including the CUE form, is not predefined in detail. The CUE can be explained to the donor by a physician, a nurse or support staff; the declaration concerning CUE can be recorded using the obligatory health questionnaire or using an extra CUE form for which there is no standard; and the procedure for gathering the CUE form can differ between centers, i.e. the CUE form can be returned to a person or it can be placed anonymously into a poll box. Hence, the question concerning the optimal CUE process arises. In the Greifswald transfusion medicine department, the CUE was filled in by the donor in privacy at the end of the donation process and then deposited into a poll box. Thus the donation process is independent of what the donor finally chooses to indicate on the CUE form.

There are already several studies addressing the effects of CUE. Most of these studies are not concerned with differences between different CUE processes, but with the quality of a specific CUE process or a specific group of these processes. In most of these studies laboratory parameters of persons with CUE are compared with parameters of persons without CUE [3–12]. In some of them the prevalence of markers for infectious disease in blood donors without CUE were at least slightly less frequent than in those with CUE [3–8,10]; the other studies showed no significant differences [9,11,12]. Only one study addressed the extent to which donors understood the CUE form [13]. This study revealed that donors with CUE to a significantly greater rate did not understand the CUE form compared with donors without CUE. Also only one study aimed at comparing different CUE processes [14]. This study revealed that demanding the declaration at the time of donation was better than only giving the opportunity of withdrawing the donation afterwards by a letter of recall.

We addressed the impact of different characteristics of the CUE process on CUE rates by a 3-step approach. First, we investigated how first time blood donors judged the clarity of the CUE forms applied in the different blood donations centers in Germany as well as of three newly developed CUE forms. Second, we performed a survey enrolling different German blood donation centers to identify aspects of the CUE process which may affect the CUE rates. Third, we compared in an intervention study at the blood donation centre Greifswald, whether changing the CUE form to a version which had been rated as very clear by first time blood donors (In study one), reduces the CUE rate.

Study 1: Clarity Rating of the CUE Forms

Material and methods

Material

In preparation of the study concerning the clarity of the CUE forms applied in the different German blood donor centers, all 80 German blood donor centers were asked by e-mail to send copies of their CUE forms to the study centre. A second request was not performed because those who did not respond were assumed to be not willing to participate and further insistence seemed to be inadequate. Beside the study centre (Department of Transfusion Medicine, Greifswald, Germany), 29 centers participated, of which one had to be excluded as this centre used a computer-based CUE process. Hence, 29 centers (36% of 80) were included. The CUE forms of these 29 centers constituted the main part of the material rated in this study 1. In addition, three newly designed CUE forms were investigated. The latter three forms were developed on the basis of the feedback given by donors of the study center, who had excluded their blood from transfusion by CUE. Most of these donors expressed that they had erroneously performed CUE and that the old form was confusing especially because of an overload of information. Therefore, two of the new forms contained essentially less information than the old form.

Study participants

Participants were first time blood donors, i.e. blood donors who were not familiar with any CUE forms. Furthermore, participants had to be native German language speakers. After standard pre-donation physical examination by a physician and explanation of the concept of CUE, these first time donors were asked to participate in the study. All 30 approached first time donors (15 males, 15 females) gave informed consent and participated (participation rate 100%). The mean age was 32.7 years (median 30.5 years, range: 19–57 years).

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Procedure
The study participants received all 32 CUE forms and were asked to rate the clarity of these forms using a categorical scale with the categories 'very clear', 'clear' and 'not clear' in regard to whether the donated blood should or should not be transfused to patients. Each participant had as much time as he or she needed. Additionally, each CUE form was classified by study team according to five different formal characteristics, i.e. [1] format with the three categories 'DIN A4' (German paper size similar to US 'letter' format), 'DIN A5' (1/2 DIN A4) and 'atypical format', [2] colour of writing with the two categories 'black on a plain sheet of paper' and 'coloured', i.e. red and/or green boxes to mark with a cross, [3] modes of printing with the two categories 'only on one side' and 'on both sides', [4] amount of text with the two categories 'much text, description of risk situations' and 'little text, without description of risk situations' and [5] use of icons with the two categories 'icons' and 'no icons'.

Statistical analyses
The differences between the 32 CUE forms were analysed via Friedman's rank analysis. Moreover, for each CUE form two different statistics were computed: [1] the median of the ratings given by the 30 study participants and [2] and the mean rank with respect to these ratings, to explore which formal characteristics of the CUE forms might influence the clarity, cross-tables between the clarity medians and the five different formal characteristics were constructed. Additionally, the relationships between the medians and the formal characteristics were tested statistically using Fisher's exact test. To control the false-positive error rate associated with performing multiple statistical tests the Bonferroni–Holm procedure was applied [15].

Results
The 32 CUE forms differed highly significantly (P < 0.001) with respect to the clarity ratings. Of the 29 forms which were actually applied in routine blood donation, seven had a median rating of 'very clear', 18 a median rating of 'clear', three a median rating between 'clear' and 'not clear' and one a median rating of 'not clear'. The median rating for all three newly developed forms was 'very clear' (see Table 1). Moreover, one of the three newly developed forms had the best mean rank of all 32 rated forms. For format and colour of writing (see Table 1) there was a significant relation [P < 0.05] between formal characteristics and clarity. For 'standard paper size' (format) the clarity seemed to increase with the use of DIN A5 and for 'colour of writing' the clarity seemed to increase with using colours e.g. red or green instead of all black (see Table 1).

<table>
<thead>
<tr>
<th>Table 1 Median clarity ratings and their relation with formal characteristics of the confidential self exclusion forms (study 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median rating*</td>
</tr>
<tr>
<td>Very clear</td>
</tr>
<tr>
<td>Total number</td>
</tr>
<tr>
<td>Format</td>
</tr>
<tr>
<td>DIN A4</td>
</tr>
<tr>
<td>DIN A5</td>
</tr>
<tr>
<td>Atypical</td>
</tr>
<tr>
<td>Colour of writing</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Coloured</td>
</tr>
<tr>
<td>Modes of printing</td>
</tr>
<tr>
<td>One side</td>
</tr>
<tr>
<td>Both sides</td>
</tr>
<tr>
<td>Amount of text</td>
</tr>
<tr>
<td>Much</td>
</tr>
<tr>
<td>Little</td>
</tr>
<tr>
<td>Use of symbols</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

CUE, confidential unit exclusion.
*In brackets column per cent, i.e. per cent within CUE form with the same median clarity rating.
*P-value for Fisher's exact test for independence of rows and columns.
*Includes all three CUE forms newly developed in Breitwies.

Study 2: Survey of the German Blood Donation Centers

Material and methods

Material
For the main survey a questionnaire consisting of two parts was applied. The first section of this questionnaire was designed to gather information about the number of blood donations in each center and the number of discarded blood donations because of CUE, both during the calendar year 2005. The second section of the questionnaire contained questions concerning the persons who informed the donor about the CUE, and the manner in which the donor returned the CUE form. Three questions were relevant in this context. The first question addressed the person who informed the primary donors. Four answer possibilities were given: [1] 'support staff', [2] 'nurse', [3] 'physician' and [4] free text. Multiple answers were allowed. The second question addressed the person who informed the follow-up donors and was combined with the same answer modalities as the first question. The third question addressed the manner in which the CUE form was returned. The answer possibilities
were (1) "into a poll box", (2) "returned to the physician", (3) "returned to the support staff or the nurse" and (4) free text.

Participants and procedure
The questionnaire was sent to those 28 centers which had provided their CUE forms for the first study. It was completed either by the director of the blood donation service or a person authorized by the director. Center data were included in the statistical analysis on number of donations and on number of CUEs in the year 2005.

Statistical analyses
The statistical analyses were concerned with five potential determinants of the CUE rate: (1) the clarity of the CUE form, (2) the extent to which a physician was involved in informing the donor, (3) the extent to which a nurse was involved in informing the donor, (4) the extent to which support staff was involved in informing the donor and (5) the manner of returning the CUE form. The first variable was constructed via the medians of the clarity ratings obtained in the first study. The three variables concerning the involvement of the three different professional groups were constructed by aggregating the answers to the two questions about the person informing the donor. From these answers a single index for each of the three professional groups was built. This index could take on three different values. An index value of zero was assigned when the respective group was not at all involved in informing the donors, an index value of one was assigned when this group was involved in informing either the primary or the follow-up donors, and an index value of two was assigned when this group was involved in informing both the primary and the follow-up donors. The fifth variable was constructed from the answers to the question addressing the manner of returning the CUE form. These answers were condensed into the two categories "returning in a poll box" and "handing to a person".

Several descriptive statistics were computed which all refer to the five variables just described. At first, for each category of these variables the number and percentage of donation centers as well as the number and percentage of donations for which the respective category was realized were computed. For example, for the variable "manner of returning the CUE form" the numbers and percentages of those donation centers in which the CUE form was handed to a person was determined. The same was carried out for those donation centers in which the CUE form was deposited into a poll box. Moreover, for both cases, the numbers and percentages of donations represented by the corresponding centers were calculated. Subsequently, mean, SD, minimum and maximum of the center-specific CUE rates were determined within each category of each of the five variables.

For investigating the effect of the determinants on CUE rates a logistic two-level random intercept model [16] with donations as lower and donation centers as higher level was applied. The five potential determinants were applied as predictors and CUE as criterion. The medians of the clarity ratings as well as the different ways of returning the CUE form were entered in dummy coding, the indices of involvement in informing the donors in the coding are described above. Statistical tests and computations of confidence intervals were performed according to the population average model.

Results
Of the 28 blood donation services approached for participation in the study, 18 donation centers responded immediately, seven donation centers responded after the second request, two donation centers responded after the third request. One center did not respond. Three of the responding 27 donation centers had to be excluded. Two of these three donation centers collected only platelet apheresis donations, and one donation center communicated no absolute numbers of the donors and the CUEs. Including the study center the sample comprised 25 centers at which a total of ~2.9 million blood donations were collected per year. These donations represented about two-thirds of all blood donations in Germany in the year 2005 (4.6 million) [17].

Within the included 25 centers the median ratings concerning the clarity of the CUE forms were "very clear" for 7, "clear" for 16 and between "clear" and "not clear" for 2. Correspondingly, only the three categories "very clear", "clear" and between "clear" and "not clear" were applied as categories within the multivariate analysis. Thereby, the last category was taken as reference category and odds ratios were estimated for the first two categories.

The CUE rates varied between 0.00% and 0.78% with a mean of 0.26%. In the multivariate analysis referring to these CUE rates 2 of all 6 tests yielded a significant result ($P < 0.05$): (1) the CUE rate was higher when nurses or support staff rather than a physician were involved in informing the donor and (2) the CUE rate was higher when the unit exclusion form was deposited anonymously into a poll box instead of being handed to a person (see Table 2).

Study 3: Intervention Study in Greifswald
Materials and methods

Material
In the intervention study two CUE forms were compared. One of these was the CUE form which was originally applied at the study center (Fig. 1); the other (Fig. 2) was
Table 2: Results of the survey on the characteristics of the confidential self exclusion process in 25 German blood donation centers (study 2)

<table>
<thead>
<tr>
<th>Categories</th>
<th>Absolute numbers and percentages per category*</th>
<th>Center-specific CUE rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Donations(n=2555)</td>
<td>Donation centers(n=7)</td>
</tr>
<tr>
<td>Clear rating</td>
<td>1902435 (65.5)</td>
<td>7 (28.0)</td>
</tr>
<tr>
<td>Very clear</td>
<td>128649 (4.9)</td>
<td>1 (4.0)</td>
</tr>
<tr>
<td>Clear in donor information</td>
<td>120641 (4.7)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>Involvement of physician in donor</td>
<td>120641 (4.7)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>Involvement of nurse in donor information</td>
<td>120641 (4.7)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>Involvement of support staff in donor information</td>
<td>120641 (4.7)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>Place card into a pocket box</td>
<td>2837914 (89.0)</td>
<td>22 (88.0)</td>
</tr>
<tr>
<td>Handing form to a person</td>
<td>30216 (1.2)</td>
<td>3 (12.0)</td>
</tr>
</tbody>
</table>

CUE, confidential unit exclusion, statistically significant differences are given in bold.
*Percentages in brackets.
\(n=2555\).  
\(n=7\).  
\(n=25\).  
\(\tilde{n}=25\).  
\(\tilde{n}=25\).  
\(=0.05\) in brackets.  
\(=0.05\) in brackets.  
\(\tilde{n}=25\).  
\(\tilde{n}=25\).

one of the three newly developed CUE forms for which the clarity rating described above was performed. This newly developed CUE form had achieved the best clarity ratings by first time donors (see above). This CUE form was designed using DIN A5 white paper with black large font lettering, red and green coloured boxes for yes and no [my blood can/should not be used for patients] and self-explaining pictograms. It is minimally worded and does not include specific mentioning of risk situations for HIV, hepatitis B and hepatitis C Infections. These risk situations are listed in detail (see Table 3) on the pre-donation questionnaire each donor had to complete and sign before blood donation. Also, we chose a one-sided instead of a two-sided form because readers might forget the first part of the message if they had to turn the page in the middle of the message [18].

Participants and procedure
The study was performed as a before-after study. The old form was applied from January 2006 to April 2007 (16 months), the new from May 2007 to June 2008 (14 months). During these periods all consecutive donors were enrolled. Over the entire study period all other mandatory standard operation procedures of handling the CUE remained the same. This included the verbal explanation to first time donors of the CUE, namely, by a physician before donation and by a nurse to all donors during donation, and the manner of returning the CUE form into a poll box after donation.

Statistical analyses
To investigate the effect of the new CUE form the CUE rate from January 2006 to April 2007 was compared with the
Blood donation at the hospital of the Ernst-Moritz-Arndt University of Greifswald
Institute of Hematology and Transfusion Medicine

AIDS and viral hepatitis require special safety precautions for blood transfusion. You need your help to expedite the access of AIDS as well
as hepatitis B and C.

Every blood product will be screened for HIV and hepatitis viruses but the blood of certain individuals contains viruses that pass the
screening antibodies. They will be destroyed by plasma treatment. Therefore persons belonging to risk groups should not donate
blood as they transmit disease to their blood to transfusion.

Persons with high risk situations for HIV, hepatitis-B and
hepatitis-C are:

- persons with positive AIDS-test
- persons with positive Hepatitis-B test
- persons with positive Hepatitis-C test
- persons who have been exposed to HIV
- persons who have had sex with someone who has been exposed to HIV
- persons who have injected drugs
- persons who have had sexual contact or have transmitted disease during the last 12 months.

If you belong to one of the risk groups listed above please do not take the test as your blood will not be used for patients. Otherwise please mark the 2 ticks.

Usage of my blood

My blood can be used for patients.

My blood can not be used for patients.

Attention! If you do not mark a field your blood will not be transfused in patients
In every way your blood will be accepted of "Only adequate" ("O/A").

Your answer is sealed and physically separated. You may be identified personally in the testing unit.

\[\text{Bildetext: }\]

\[\text{AIDS und Hepatitis-absichern} \]

\[\text{Blutspende im Universitätsklinikum Greifswald} \]

\[\text{Do not give blood if you have had sex with someone who has been exposed to HIV, hepatitis-B or hepatitis-C.} \]

\[\text{Attention!} \]

\[\text{Your blood will be used if you do not mark a field.} \]

\[\text{If you mark your blood to be used for patients, your blood will be used.} \]

\[\text{If you mark your blood not to be used for patients, your blood will be used for other purposes.} \]

\[\text{Strictly confidential} \]

This questionnaire will be handled and handed strictly confidential at our blood donation center.
Please fold the questionnaire before dropping
Thank you for your understanding and your assistance.

\[\text{Strong vertraulich!} \]

Dieser Fragebogen wird im Institut der Blutspendedienstes ausgewertet und stark vertraulich gehalten.
Bitte füllen Sie den Fragebogen vor dem Einwerfen.
Vielen Dank für Ihr Verständnis und Ihre Mitwille.

\[\text{Vorsicht!} \]

Wenn Sie nicht markieren, können Sie Ihr Blut nicht in Ihrer

\[\text{Verwendung meiner Blutspende} \]

\[\text{Wenn Sie nicht markieren, können Sie Ihr Blut nicht in Ihrer} \]

\[\text{Verwendung meiner Blutspende} \]

\[\text{Werfen Sie diesen Fragebogen bitte ein in die WAHLUNGEN.} \]

\[\text{Fig. 1 Confidential unit exclusion (CUE) form used at the blood donation center Greifswald until April 2007, paper size format DIN A5, printed on both} \]

\[\text{sides. The upper panel shows the English translation, the lower panel shows the original German form.} \]

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Blood donation at the hospital of the Ernst-Moritz-Arndt-University of Greifswald

Donated blood should help others to get well. It must not be source of new disease!

**ARE YOU SURE THAT YOU DID NOT EXPERIENCE ANY RISK SITUATIONS?**

☐ **Yes,** I am sure.
- My blood can be used for patients.

☐ **No,** I am not sure.
- My blood should not be used for patients.

If you do not mark or you do mark the red field we have to disapper your blood.

---

Blutangabe im Universitätskrankenhaus der Ernst-Moritz-Arndt-Universität Greifswald

Donated blood will help others to get well. It must not be source of new disease!

**SIND SIE SICHER, DASS SIE SICH KEINEM INFEKTIONSRISEIKO AUSGESETZT HABEN?**

☐ **Ja,** ich bin mir sicher.
- Mein Blut kann für Patienten verwendet werden.

☐ **Nein,** ich bin mir nicht sicher.
- Mein Blut soll nicht für Patienten verwendet werden.

Wenn Sie nichts oder Rot ankreuzen, müssen wir Ihr Blut verwerfen.

Fig. 2 Newly created confidential unit exclusion (CUE) form in Greifswald since May 2007, paper size format DIN A5; printed on one side. The left panel shows the English translation, the right panel shows the original German form.

rate from May 2007 to June 2008 by means of a Chi-squared test.

**Results**

The CUE rate decreased essentially when the new CUE form was introduced. When the original CUE form was applied, i.e. in the time from January 2006 to April 2007, the CUE rate was 0.66% (188 CUEs in 28457 blood donations). In contrast, when the new CUE form was applied, i.e. in the time from May 2007 to June 2008, the CUE rate was only 0.45% (117 CUEs in 26157 blood donations; \( P < 0.001 \)). In neither study period, any of the donations excluded by the CUE process tested positive in any of the screening tests applied (HIV 1 and 2, hepatitis C virus, treponema pallidum antibodies, hepatitis B antigen, nucleic acid testing for HIV and hepatitis C).

**Discussion**

The three inter-related studies presented here showed an effect of the design of the CUE form on the rate of self-excluded blood donations and implied that the characteristics of the CUE process probably also had an impact. In particular we showed that using a CUE form which was regarded as very clear by first time blood donors could reduce the CUE rate by more than 30%. Neither of the studies was a randomized controlled trial. However, with the variables considered here, genuine randomized controlled trials are very difficult to perform and, actually, have not been performed yet. In this respect, the survey on the CUE process and the before-after intervention study corresponded to the best methodological standard which has up to now been realized within this context. The 25 blood donation centers which were eligible for the statistical analyses, accounted for nearly 3 million blood donations per year in Germany and therefore reflected the majority of the 4.6 million annual blood donations in the country. Furthermore, because the statistical analyses focused on relationships between variables and not on univariate statistics, as for example means or medians, a serious bias was unlikely. Our study has a major advantage due to the diversity of the German blood donation system, with many different blood donation services, which all used slightly
The impact of the manner of returning the CUE form on the CUE rate can also be explained in different ways. One explanation refers to the fact that people are more willing to admit socially undesired behaviour the more they feel that anonymity is guaranteed [19,20]. Accordingly, donors are more willing to admit risky behaviour when they return the CUE anonymously. This, in turn, produces an increase in the CUE rates. An alternative explanation for the effect might be that handing the form to a person induced the donors to think more carefully about their answer on the form when compared with depositing the form into a poll box. This, in turn, might reduce the number of erroneous declarations.

Also the effect that changing the CUE form at the blood donor center of Greifswald substantially decreased the CUE rate can be explained from different perspectives. Because the second CUE form received the best clarity ratings in the preliminary study, the nearest at hand explanation consists in attributing this effect to differences in clarity. However, also the first CUE form had a median rating of ‘very clear’, and in the survey of the different German donor centers no statistically significant relation between clarity and CUE rate was found. An alternative explanation refers to the fact that the two CUE forms in the intervention study differ not only with respect to their clarity but also with respect to other aspects. For example, in contrast to the new CUE form the old CUE form contains a list of those events because of which donors should withdraw their donation. This might make donors more sceptical against their donation. Still a different explanation might be that changing the CUE form and monitoring the CUE rates in a study was accompanied with the staff becoming more aware of the relevance of CUEs. This, in turn, might have decreased the CUE rates.

Of course, the CUE rates alone do not reflect the sensitivity and the specificity of the corresponding CUE processes. For this reason, they do not directly reflect the quality of these processes. A reduction of the CUE rate might be caused by a lower rate of false exclusions or by a higher rate of false inclusions, i.e., by a higher specificity or by a lower sensitivity, respectively. To check whether there is an improvement or a deterioration, a new study is required in which the quality of CUE and non-CUE donations and/or the validity of CUE and non-CUE donors’ declarations is additionally assessed in both conditions to be compared. This, however, will require very large sample sizes due to the overall low prevalence of a CUE and even lower prevalences of infectious markers. Considering the results presented here, such studies would be most promising for comparing (1) high physician’s involvement in donor information with low physician’s involvement and (2) anonymous returning of the CUE form with handing it to a person.
Acknowledgements

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Participating centers:
Institut für Transfusionsmedizin, Universitätsklinikum Aachen
Institut für Transfusionsmedizin, Charité Universitätsmedizin Berlin
Klinik für Anästhesiologie, Intensiv-, Notfallmedizin und Schmerztherapie, Evangelisches Krankenhaus Bielefeld gGmbH
Institut für experimentelle Hämatologie und Transfusionsmedizin, Universitätsklinikum Bonn
Institut für Klinische Transfusionsmedizin, Klinikum Braunschweig
Institut für Klinische Transfusionsmedizin, Laboratoriumsmedizin und Medizinische Mikrobiologie, Klinikum Dortmund
Institut für Klinische Hämostaseologie und Transfusionsmedizin, Universitätsklinikum Düsseldorf
Institut für Transfusionsmedizin, Universitätsklinikum Essen
Institut für Laboratoriums- und Transfusionsmedizin, Diakonissenkrankenhaus Hensborg
Abteilung für Labordiagnostik und Transfusionsmedizin, Krankenhaus Freiberg gGmbH
Institut für Klinische Immunologie und Transfusionsmedizin, Universitätsklinikum Gießen
Einrichtung für Transfusionsmedizin/Blutspendedienst, Universitätsklinikum Halle/Wittenberg
Zentralinstitut für Transfusionsmedizin, Blutspendedienst Hamburg
Institut für Transfusionsmedizin, Medizinische Hochschule Hannover
Städtisches Krankenhaus Abt. für Blutspende, Krefeld
Institut für Transfusionsmedizin, Universitätsklinikum Leipzig
Institut für Transfusionsmedizin und klinische Hämostaseologie, Städtischen Klinikum 'St. Georg' Leipzig
Institut für Transfusionsmedizin und Immunhämatologie, Universitätsklinikum Magdeburg
Institut für Transfusionsmedizin und Hämostaseologie, Universitätsklinikum Marburg
Institut für Transfusionsmedizin mit Blutspende, Südharz-Krankenhaus Nordhausen gGmbH
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