

# Attitudes to blood donation in Ngaoundéré, Cameroon

**Student thesis**

by

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## ABSTRACT

### **BACKGROUND**

Adequate blood supplies are lacking in sub-Saharan Africa; however, there is limited knowledge of factors that influence blood donation. The aim of this study was to explore community members' attitudes to blood donation in northern Cameroon.

### **STUDY DESIGN AND METHODS**

Forty-nine in-depth, semi-structured interviews were conducted among consenting, randomly selected 18 years or older community members at a district hospital in northern Cameroon during October and November 2011. Two trained interviewers and a nurse translator conducted the interviews in the language preferred by the interviewee.

### **RESULTS**

Of the 49 community members who completed the interview, 98 % (48/49) had heard of blood transfusions; however, 60 % (29/48) said they had not previously been asked to donate. Ninety-four per cent (44/47) said they would donate if given the opportunity. Thirty-one per cent (15/49) had previously donated blood for family or replacement, and 87 % of these said they would repeat donations. Donors were significantly older and tended to be more often head of family than non-donors. Most subjects preferred relatives or friends as recipients of their donations, and 38 % (18/48) said they would donate for altruistic reasons.

### **CONCLUSION**

The findings suggest that community members in northern Cameroon are willing to donate blood, and improved and accessible donor information and recruitment should be provided. A high proportion of the study subjects had previously donated blood, and safe, repeat donors could be recruited from this population to establish affordable and sustainable blood transfusion services.

## INTRODUCTION

Blood transfusion is a potentially life-saving intervention; however, its access is reserved for relatively few of the world's population.<sup>1,2</sup> In sub-Saharan Africa, blood transfusion services often lack adequate facilities, equipment, trained personnel and blood donors to provide safe blood.<sup>3-7</sup> Pregnant women and children are at high risk of acute, severe anaemia, and there is an urgent need for affordable and sustainable solutions to the prevailing blood shortage.<sup>8</sup>

Transfusion-transmissible infections such as human immunodeficiency virus (HIV), hepatitis B and C and syphilis represent important challenges to blood transfusion services in developing countries.<sup>9,10</sup> The World Health Organization recommends recruitment of volunteer non-remunerated blood donors from low-risk populations by national transfusion services;<sup>2</sup> however, lack of economic and logistic resources constrain most sub-Saharan countries to operate with hospital-based family and/or replacement donor systems.<sup>5,11-13</sup> Recent reports suggest that repeat donors; whether family, replacement or volunteer non-remunerated donors, might represent the most viable alternative to ensure safe blood.<sup>14,15</sup>

Studies indicate that socio-cultural beliefs and scientific misconceptions represent important barriers to blood donations in Africa.<sup>16-27</sup> Fear of learning HIV status, as well as mistrust of confidentiality remain important obstacles to blood donation many places.<sup>16,17,21,23-25,28</sup> Obstacles to and motivational factors for blood donation vary between cultures, and knowledge of local conditions is crucial for donor recruitment and safe and sustainable blood transfusion services.<sup>29,30</sup>

In Cameroon, little is known of local attitudes and preconditions that influence blood donations.<sup>25,31</sup> The aims of this study were to analyse community members' attitudes to blood donation and to explore the characteristics of blood donors in northern Cameroon.

## MATERIALS AND METHODS

### Study site and population

A cross-sectional study was performed during five weeks in October and November 2011 at Oeuvre de Santé de l'Eglise Evangélique Luthérienne au Cameroun (OSEELC); a district hospital in Ngaoundéré, the capital of the Adamaoua region, in northern Cameroon (Figure 1). The hospital serves a region of approximately 300,000 inhabitants and has a total of 220 beds distributed between emergency, medical, surgical, maternal and paediatric wards. Out-patient departments and an ophthalmologic and a dental clinic provide additional health care services for the population. There is no established blood bank at the hospital; however, family donors are common and, if available, paid donors are called to donate.

**Figure 1. The study site is situated in northern Cameroon (Source: Google Maps).**



Cameroon is bilingual with French and English as the two official languages; however, many other languages are commonly in use.<sup>32</sup> Seventy-two per cent of the population is Christian and 21 % Muslim; whereas a substantial proportion of the population practises traditional beliefs.<sup>32</sup> Life expectancy at birth in Cameroon is approximately 52 years, and the under-five mortality rate is 154

per 1000 live births.<sup>33</sup> The national HIV prevalence is estimated at 5.4 % among 15 to 49 year olds, although a strong stigma might be associated with under-estimation of these figures.<sup>34</sup>

## **Interviews**

In-depth, semi-structured interviews were conducted among a random selection of 18 years or older community members; patients, relatives and friends of patients, employees and others present at the hospital. Using a computer programme, the interviewees were randomly selected by hospital ward and patient room and the individuals present in the respective locations.

Interview questions were constructed based on previous studies and clinical experience in the region.<sup>19-27</sup> The interview consisted of a combination of open- and closed-ended questions grouped in three main categories; associations to and knowledge of blood, associations to and knowledge of blood transfusions, and religion and blood transfusions (Table 1). In addition, data were collected on the study subjects' age, gender, marital status, number and age of children, place of residence, education, work, socioeconomic status, health care behavior and past medical history.

The wording, explanations and sequence of the questions were the same for each interview. The order of the questions was organised to make the interviewee feel at as much ease as possible; the first questions were simple; concerning age, gender, etc, followed by questions concerning blood donations, and finishing off with questions concerning religion, education, etc. Control questions were applied for internal quality. The questions were piloted on 10 randomly selected and consenting individuals present at the hospital one week prior to the study, and amendments were made to improve the comprehension and applicability of the interview.

**Table 1. An overview of the interview questions.**

<b>Main questions*</b>	<b>Probe questions†</b>
<b>Associations to and knowledge of blood</b>	
What do you think of when you hear the word “blood”?	-
Where does blood come from?	-
Why do humans have blood?	-
Can blood that is donated or lost from the body be recovered?	-
<b>Associations to and knowledge of blood transfusions</b>	
Have you ever heard of blood transfusions?	-
Have you ever received a blood transfusion?	3
Do you know anyone who has received a blood transfusion?	2
Do you know anyone who has donated blood?	2
Have you ever donated blood for transfusion?	4
What was the motivation for donating / not donating blood?	1
Would you donate blood if you were asked to?	1
Who would you donate your blood for?	2
Which medical information would you want prior to donation?	-
Would you let your child(ren) donate blood?	1
Is blood donation a positive action?	2
Is blood donation a risk for the donor?	1
Could blood donation affect your strength?	1
<b>Religion and blood transfusions</b>	
Which religion do you believe in?	-
Is blood donation negative according to your religion?	1
Is blood donation positive according to your religion?	1
<b>Total‡</b>	<b>51</b>

\*The respondents could provide one or more answers to open-ended questions. †Number of probe questions, such as “When?”, “How often?”, “Why?” / “Why not?”, etc; depending on the respective main question. ‡Total number of questions, including main and probe questions.



The interviewers (SCR and PSS) and a nurse interpreter were trained in interview technique prior to the study, taking local culture and standards into consideration. The interviews were conducted in French, English or the local language Fulfulde, depending on the preferences of the interviewee. In case the subject preferred to communicate in a local language or there were difficulties with communication in French or English, the interviews were performed together with the nurse translator. The interviewers took great care to ensure a comfortable, professional and confidential interview situation (Figure 2). The interviewee was assured that there were no wrong or correct answers, and was encouraged to answer as honestly and comprehensively as possible.

**Figure 2. The interviews were performed in a confidential and pleasant setting.**



**Ethical considerations**

The study was granted permission by the OSEELC Ethics Committee. All study participants gave free and informed consent to be interviewed, and questions were asked in the language preferred by the interviewee. The participant was informed that he or she could withdraw at any time during the interview, without consequences. The interviews were performed out of hearing range of other patients or employees, unless the interviewee preferred otherwise. Data collection did not affect any patient care or treatment. Patient data were anonymised and interview data sheets stored securely.

**Statistical analysis**

Statistical analyses were performed using SPSS version 19.0. String variables were grouped into categories and presented in tables. Age was not normally distributed and the median and interquartile ranges were used to describe the distribution of the data. Student's T-Test was used to study associations following logarithmic transformation of not normally distributed data. Mann-Whitney U Test and Cohen's kappa coefficient were applied when appropriate. A 5 % significance level was used throughout.

## RESULTS

Forty-nine consenting community members present at the hospital completed the interview; 45 % (22) were relatives or friends of patients, 31 % (15) were patients, 16 % (8) were hospital employees and 8 % (4) were other community members. Forty-one per cent (20) of the interviewees were women and 59 % (29) were men. The median age of the women was 27 years (interquartile range (IQR) = 22 - 42 years) and of men 37 years (IQR = 27 - 51 years); the difference between the two groups was not significant ( $p = 0.16$ ). Table 2 shows the study participants' age, home, education, employment and religion with regard to gender.

### **Family and health care seeking behaviour**

Sixty-one per cent (30/49) of the study subjects were married or engaged, 24 % (12/49) were single and 14 % (7/49) were divorced or widowed. Seventy-three per cent (27/37) of the interviewees who had a family of their own were the head of the family, and 74 % (20/27) of these were men.

Seventy-six per cent (37/49) of the study subjects had children; 33 % (16/49) had one to three children and 43 % (21/49) had four or more children. Fifty-one per cent (19/37) of the study subjects had children under the age of five years. Seventy-one per cent (35/49) of the interviewees reported that they often or always sought public or private health facilities for health care, whereas 8 % (4/49) often or always consulted traditional practitioners. Family members of 90 % (44/49) of the subjects and 71 % (35/49) of the subjects themselves had previously been admitted to hospital.

**Table 2. Characteristics of the study subjects with regard to gender.**

	<b>Women</b> n (%) <sup>*</sup>	<b>Men</b> n (%) <sup>*</sup>	<b>Total</b> n (%) <sup>*</sup>
<b>Age (years)<sup>†</sup></b>			
18-24	7 (14)	5 (10)	12 (24)
25-34	5 (10)	8 (16)	13 (27)
35-44	3 (6)	7 (14)	10 (20)
>45	5 (10)	9 (18)	14 (29)
<b>Home location</b>			
Urban	18 (37)	21 (43)	39 (80)
Rural	2 (4)	8 (16)	10 (20)
<b>Education</b>			
No formal education	1 (2)	1 (2)	2 (4)
Madrassa <sup>‡</sup>	6 (12)	3 (6)	9 (18)
Primary school	4 (8)	8 (16)	12 (24)
Secondary school	6 (12)	11 (22)	17 (35)
Higher education	3 (6)	6 (12)	9 (18)
<b>Employment</b>			
Student	4 (8)	5 (10)	9 (18)
Housewife	9 (18)	0 (0)	9 (18)
Farmer	0 (0)	7 (14)	7 (14)
Merchant	3 (6)	4 (8)	7 (14)
Health care professional	3 (6)	5 (10)	8 (16)
Other <sup>§</sup>	1 (2)	8 (16)	9 (18)
<b>Religion</b>			
Islam	10 (20)	11 (22)	21 (43)
Christianity <sup>  </sup>	10 (20)	18 (37)	28 (57)
<b>Total</b>	<b>20</b>	<b>29</b>	<b>49</b>

<sup>\*</sup>Percentage of total = 49. <sup>†</sup>Age was not known for one of the subjects. <sup>‡</sup>Islamic school. <sup>§</sup>One mason, one priest, one teacher, one technician, two taxi drivers, one security guard, one mechanic and one police officer. <sup>||</sup>Twenty-one Protestants, five Catholics, one Baptist and one Adventist.

## Perceptions of blood

The study subjects' associations with blood are shown in Table 3. Fifty-five per cent (27/49) of the respondents believed that foods and/or beverages contribute to the production of blood, 22 % (11/49) believed that blood is produced by the human body, whereas 16 % (8/49) believed that blood is created by God. If donated or lost, 90 % (43/48) believed that blood could be recovered; 70 % (30) with foods, beverages and/or vitamins, 26 % (11) by blood transfusion, 14 % (6) with medication and 14 % (6) by the human body alone.

**Table 3. The study subjects' associations with blood.**

<b>Associations with blood</b>	<b>n = 48*</b>
Physical, liquid, something circulating in the body, veins	23 (48 %)
Life essential	20 (42 %)
Contamination, disease	4 (8 %)
Laboratory exams	3 (6 %)
Accidents	2 (4 %)
God	2 (4 %)
Transfusion	1 (2 %)
Menstruation, labour	1 (2 %)
Family	1 (2 %)
Nothing special	5 (10 %)

\*One subject did not provide any answer.

## Knowledge and previous history of blood donations

Ninety-eight per cent (48/49) of the study subjects had heard of blood transfusions; however, only 56 % (27) of these were familiar with the concept of a blood bank. Thirty-one per cent (15/49) of the interviewed community members had previously donated blood; relatives and friends were the most frequent recipients (73 %, 11/15), whereas the rest were patients who received blood donated by hospital employees. All blood donations were family or replacement donations. Eighty-seven per cent (13/15) of previous blood donors said they would repeat donations.

Table 4 gives an overview over the characteristics of donors and non-donors, respectively. Neither marital status, number of children, having children under the age of five years nor knowing someone who had donated blood were factors associated with having donated blood (data not shown). Only 4 % (2/48) of the study subjects had previously received a blood transfusion.

**Table 4. Characteristics of study subjects who had and had not previously donated blood.**

	Donors* (n = 15)	Non-donors† (n = 34)	<i>p</i> ‡
<b>Age</b> <sup>§</sup>	42	32	0.010
<b>Gender</b>			
Female	4 (8 %)	16 (33 %)	0.18
Male	11 (22 %)	18 (37 %)	
<b>Head of the family</b> <sup>  </sup>			
Yes	12 (32 %)	15 (41 %)	0.065
No	1 (3 %)	9 (24 %)	
<b>Home location</b>			
Urban	14 (29 %)	25 (51 %)	0.11
Rural	1 (2 %)	9 (18 %)	
<b>Education</b>			
Primary school or lower	5 (10 %)	18 (37 %)	0.21
Secondary school or higher	10 (20 %)	16 (33 %)	
<b>Religion</b>			
Islam	4 (8 %)	17 (35 %)	0.13
Christianity	11 (22 %)	17 (35 %)	
<b>Previous hospital admission</b> <sup>¶</sup>			
Yes	15 (31 %)	29 (59 %)	0.12
No	0 (0 %)	5 (10 %)	

\*Study participants who had previously donated blood. †Study participants who had not previously donated blood. ‡Pearson Chi-Square, except Age (Student's T-Test) and Head of family (Fisher's Exact Test). §Median age in years. ||Subjects who had families of their own. ¶Hospital admission of study participant or of participant's family member; *p*-value for both admission types combined.

### Motivators for blood donation

Ninety-six per cent (46/48) of the subjects perceived blood donation as a positive act; 85 % (39/46) for altruistic reasons. Ninety-four per cent (44/47) of the respondents said they would donate blood if given the opportunity. The motivators for blood donation among the interviewed community members are presented in Table 5. The study subjects preferred a family member as a recipient of their blood donation significantly more often than they preferred a blood bank (data not shown).

**Table 5. Motivators for and barriers to blood donation.**

<b>Motivators for blood donation (n = 48)</b>	<b>n (%)</b>
A sick family member	47 (98 %)
Without remuneration *	43 (91 %)†
A sick friend	42 (88 %)
Without remuneration *	36 (86 %)†
A sick patient, unknown to the donor	38 (79 %)
Without remuneration *	31 (82 %)†
A blood bank	24 (50 %)
Without remuneration *	21 (88 %)
To save the life of someone, altruism	18 (38 %)
<b>Barriers to blood donation (n = 48)</b>	
Not been asked to donate blood	29 (60 %)
Lack of nutrients	10 (21 %)
Donor illness	5 (10 %)
Insufficient amount of blood to donate	14 (29 %)
Fatigue, dizziness or illness following donation	7 (15 %)
Too frequent or large donation	5 (10 %)
Fear of transmitting disease to recipient	3 (6 %)
Fear of not recovering after donation	7 (15 %)
Requires spouse's permission	1 (2 %)
Not able to stay away from work	1 (2 %)

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\*Foods and/or beverages or money to buy such. †Percentage of respective subtotal.

Seventy-four per cent (11/15) of those who had previously donated blood did so for altruistic reasons. Ninety-eight per cent (47/48) of the study subjects said that their religion was not a barrier for blood transfusion, and 15 % (7/47) of these meant that their religion promotes or even demands altruism as a motivation for blood donation. Sixty-seven per cent (10/15) of those who had previously donated blood received no remuneration for their donation, whereas 33 % (5/15) were given foods, beverages or money for such. Eighty-four per cent (31/37) of the study subjects who had children would allow them to donate blood, and 39 % (12/31) of these said they would let the child itself choose whether or not to donate.

### **Barriers to blood donation**

Perceived risks for blood donors are shown in Table 5. Among the study subjects who had never been asked to donate blood, 79 % (23/29) said they would do so if given the opportunity. There was no significant difference in the perceived donor risk between those who had and those who had not previously donated blood ( $p = 0.37$ ). Two subjects meant that blood transfusion could have a negative effect if donor and recipient were not friends or family. One woman thought that blood donation was reserved for men only, whereas another respondent feared negative consequences if the donated blood according to the Koran was too strong.



## DISCUSSION

This study provides an account of the attitudes to and knowledge of blood donation in Ngaoundéré, northern Cameroon. Blood donations were well-known to the community members at this district hospital, and the majority was willing to donate blood if given the opportunity. Similar to previous findings; however, more than half of the study subjects had heard of a blood bank or had been informed of how to become a blood donor.<sup>21, 23</sup> A high proportion of the study population had previously donated blood, although there did seem to be a certain discrepancy between the general approval of blood donations and actual blood donations.<sup>23, 24</sup>

Cameroon has no national blood transfusion service and relies to a large extent on first-time family and replacement donors.<sup>5, 31</sup> In keeping with previous studies, altruism, either by itself or prompted by religion, was an important motivator for blood donation in this population, although most study subjects would prefer to donate blood to relatives or friends.<sup>17, 22, 24, 26, 28, 35</sup> Studies suggest that the meaning of altruism as a motivation for donation may vary.<sup>19, 25, 27</sup> In this study, altruism was an important reason also for previous blood donors, and only a minority of these received some kind of remuneration. Although most did not perceive remuneration as a prerequisite for blood donation in this population, some form of non-cash compensation could be expected.

The recruitment of safe and regular blood donors is similarly challenging across cultures and borders, also in developed countries.<sup>36, 37</sup> In addition, beliefs and misconceptions, as well as the effect of transfusion transmissible infections such as HIV, remain important obstacles to blood donation in sub-Saharan Africa.<sup>16-28</sup> In our study, the interviewed community members showed a relatively good level of knowledge of blood, and were to a lesser extent prone to religious or other misconceptions. Concerns for blood donation were largely scientifically relevant, and perceived risks for blood donors were equally distributed between previous donors and non-donors.

This study has several limitations. The sample size was small and the results must be interpreted with caution due to possible type 1 and type 2 errors. The interview consisted of many and often nuanced questions, and although it was piloted and great care was taken to assure an optimal interview setting, intentional and/or unintentional respondent bias might have affected the results. Interviewees were offered an interview location outside the hearing range of others; however, occasionally, the study subject preferred relatives or friends to be present during the interview.

There is a lack of realistic solutions to the prevailing blood shortage in sub-Saharan Africa, and improvement of blood safety needs to be cheap to be feasible.<sup>4, 6, 8, 11, 13, 38</sup> Some reports have provided options for safe blood transfusion services in rural conditions with limited resources, although their sustainability has not been sufficiently explored.<sup>39-42</sup>

Recently, studies have suggested that repetition of blood donations is a pivotal factor for safe blood supplies, and some have suggested recruiting replacement donors for repeat donations.<sup>43-45</sup> In several countries, such as Zimbabwe and South Africa, Pledge 25 Clubs encourage adolescents to repeat donations.<sup>46</sup> Others have suggested to recruit donors at religious gatherings,<sup>47</sup> or to encourage antenatal blood donations by husbands of pregnant wives.<sup>23</sup> The majority of blood donors in this population were willing to repeat donations, mostly motivated by altruism. In line with previous findings, there was a potential to recruit younger, repeat blood donors in this population.<sup>43</sup>

Transfusion transmissible infections are an important hazard to blood transfusion in sub-Saharan Africa; however, reports suggest that blood safety may be feasible in Cameroon.<sup>3, 9, 10, 48</sup>

Furthermore, pre-donation screening and deferred donor programmes have been proposed to increase blood safety.<sup>49-51</sup> Adverse reactions to blood transfusions mostly consist of reactions such as fever, urticarial haematomas, weakness and dizziness.<sup>52, 53</sup>

In conclusion, the findings suggest that community members in Ngaoundéré, northern Cameroon are willing to donate blood, and improved and accessible donor information and recruitment should be provided. A large proportion of the study population had previously donated blood, and many were willing to repeat donations, indicating a potential for recruitment of repeat blood donors. Frequent contact with hospital services suggests that donors might be recruited during admission of family or friends, and foods or beverages seem like a reasonable compensation for blood donation. This study adds to the knowledge of local attitudes to and preconditions for blood donation in northern Cameroon, and potentially to the possibility of establishing affordable and sustainable blood transfusion services in sub-Saharan Africa.

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