Prevalence of transfusion-transmitted infections among blood donors in Koforidua, Ghana, 2016

Holy Alomatu[1,2,&], Bismark Sarfo[3], Ernest Kenu[1], Donne Kofi Ameme[1], Edwin Andrew Afari[1], Samuel Oko Sackey[1], Kofi Mensah Nyarko[4]

[1]Ghana Field Epidemiology and Laboratory Training Program (GFELTP), University of Ghana, School of Public Health, Legon, Accra, Ghana, [2]Ghana Health Service, Eastern Region, Koforidua, Ghana, [3]Department of Epidemiology and Disease Control, School of Public Health, University of Ghana, Accra, Ghana, [4]Sierra Leone Field Epidemiology Training Program, Freetown, Sierra Leone

ABSTRACT

Introduction: Transfusion-transmitted infections (TTIs) are infections of public health concern since they have the potential to be transferred from person to person through blood transfusion. This study determined the prevalence of HIV, HBV, HCV, and syphilis infections and co-infections among blood donors in Koforidua, Ghana. **Methods:** A cross-sectional study was carried out among blood donors who visited St. Joseph Hospital and Koforidua Regional Hospital between January and May 2016. Participants were interviewed on socio-demographic information and behavioral characteristics after which 5ml of blood was drawn from each of them. The blood was tested for HIV, HBV, HCV and syphilis infections using rapid test kits. The prevalence of HIV, HBV, HCV and syphilis were estimated. **Results:** The study recruited 426 blood donors. Their median age was 23 years. Majority, 85.7% (365/426) were males, aged 20-29 years 50.7% (216/426) and 59.1% (252/426) had secondary education. The prevalence of HIV was 4.5%, HBV-13.2%, HCV -8.0% and syphilis -15.3% among blood donors in Koforidua. Coinfections found were HIV - HCV 0.4%, HIV - Syphilis 0.2%, HBV - Syphilis 1.2% and HCV - Syphilis 0.4%. For the blood donors screened, 36.2% (154/426) were positive for one out of the four infections screened. The proportion of co-infection among the blood donors for the pathogenic markers was 2.4% (10/426). **Conclusion:** There is a high level of pathogenic infections among blood donors in the study area as well as co-infections. Syphilis, a bacterial infection is the commonest and HBV-syphilis infections were the commonest co-infection.

KEYWORDS: HIV, HBV, HCV, syphilis, blood donors

[&]CORRESPONDING AUTHOR
Holy Alomatu, Ghana Field Epidemiology and Laboratory Training Program, University of Ghana, School of Public Health, Legon, Accra, Ghana.

san27sly@yahoo.com

RECEIVED
07/12/2020

ACCEPTED
08/04/2024

PUBLISHED
15/04/2024

LINK

www.afenet-journal.net/content/article/7/18/full

CITATION
Holy Alomatu et al . Prevalence of transfusion-transmitted infections among blood donors in Koforidua, Ghana, 2016. J Interval Epidemiol Public Health. 2024 Apr 15; 7(2): 2.
DOI:
https://www.doi.org/10.37432/jieph.2024.7.2.109

Introduction

Transfusion-transmitted infections (TTIs) are infections with the potential of being carried from person to person as a result of blood transfusion [1]. Some of these infections which are common globally among people include malaria, HIV, HBV, HCV, syphilis, Variant Creutzfeldt-Jakob disease (vCJD), human T-cell lymphotropic viruses (HTLV-I/II), Cytomegalovirus (CMV), Parvovirus B19, West Nile Virus (WNV), Dengue virus, and trypanosomiasis [2].

As part of blood safety procedures in Ghana, the common infections screened for mandatorily before blood is termed safe for transfusion are HIV, HBV, HCV and syphilis [3]. These TTIs namely HIV, HBV, HCV and syphilis infections among blood donors are of public health concern [4]. There is a general focus on the safety and protection of recipients of blood and components in blood transfusion practices all over the world. These infections are of great public health concern because of their long-term effect on the individual, community and country at large such as morbidity, disability and mortality when an individual is infecsted with these infections [5]. Preventing transmission of these infectious diseases through blood transfusion is one of the greatest challenges of transfusion medicine [3].

In resource-constrained countries, screening is poorly and incompletely done for these infections [3]. Syphilis in particular is sometimes not screened for especially when the test strips are not available yet the blood is kept for onward transfusion [6].

The current method of pre-donation screening in some transfusion centres in Ghana, specifically St Joseph Hospital and Regional Hospital in Koforidua is that a donor is not screened further if the donor tests positive for any of the infections. The reason for this sequential screening practice is that once a donor tests positive for one of the TTIs during pre-donation screening, even if the screening is continued and s/he tests negative for the other infections, that blood donor cannot be bled. Therefore, the screening process is stopped to conserve the remaining test strips for screening other donors in future. However, this negatively affects the donor and the community at large since the donor could be having some of the other infections and will not receive early and possible medical care. The sequential screening pattern results are a missed opportunity to determine other infections (and co-infections) among blood donors.

This ultimately leads to inaccurate prevalence figures of these infections among blood donors. These inaccurate figures eventually inform policy. This inaccurate prevalence of the infections is arrived at because the sequential pattern of screening does not offer a common denominator to be used to calculate the prevalence of the infections. This is because at one point in time, the laboratory may do a lot more HBV testing than syphilis testing depending on the outcome of the HBV test result. There is no fixed order of the sequential screening though all infections are required to be tested for every sample. This study sought to determine the prevalence of HIV, HBV, HCV and syphilis infections and co-infections among blood donors in Koforidua.

Methods

Study design

We conducted a cross-sectional study among blood donors who visited the blood banks of two hospitals in Koforidua to donate blood between January and May 2016.

Study area

The study was conducted at the Regional Hospital Koforidua and St. Joseph Hospital both in Koforidua in the Eastern Region of Ghana. St Joseph Hospital is a district hospital and a national orthopedic referral facility and the Regional Hospital Koforidua is a referral hospital and both are located in the regional capital of the Eastern Region of Ghana. Though both are referral facilities, they serve as the main health facilities for the localities they are in. The Eastern Region is the third largest region after Ashanti and Greater Accra regions and forms 10.7% of Ghana´s population [7]. The study site was the blood banks of the two health facilities where prospective blood donors visit to donate blood.

Study population

Healthy people within the age range of 17 to 60 years who had satisfied the facility´s blood bank´s initial basic health checks of blood pressure (BP), weight

and haemoglobin (Hb) level were classified as the donor population. The National Blood Service of Ghana Protocol for blood donation requires that a blood donor have a minimum weight of 50kg, a normal BP range of (120-129) mmHg systolic and (80-89) mmHg diastolic and Hb levels of (12.5- 16.0) g/dL for females and (13.0- 16.5) g/dL for males.

Inclusion criteria

All persons aged 17 to 60 years who visited the blood bank to donate blood for any reason; and had been declared fit to donate blood were included.

Exclusion criteria

All persons who had an inter-donation period of less than four months were excluded.

Sample size

The minimum sample size was calculated using the Cochrane formula [8]. At a precision of 0.05, the normal standard deviation was set at 1.96 corresponding 95% confidence interval and prevalence of 50% was assumed. Considering a 10% non-response rate, the minimum sample size for the study was 426.

Sampling procedure

The participants were recruited from St Joseph Hospital and Regional Hospital Koforidua. The sample size was allocated to each participating site proportionate to the volume of blood donations they had in the previous quarter. Participants were recruited consecutively at both sites until the required sample size was reached. Every prospective blood donor who visited the blood bank and satisfied the donor selection criteria was selected once the person consented to be part of the study. Participants were selected daily until the required sample size of 426 was obtained.

Specimen collection and testing

All blood donors were referred to the HIV 1 unit as required by the study protocol for pre-donation counseling to be done. During counseling, the purpose of the study was explained to participants and all their questions were answered. All who agreed to participate signed a consent form before their blood sample was taken. The participant was made to relax in a sitting position. A tourniquet was applied to the upper arm to help make the cephalic vein in the antecubital fossa easily identified for venipuncture. The venipuncture site was cleaned with an alcohol pad. The tourniquet was loosened immediately the needle was well placed in the vein and 5ml of blood was drawn using a syringe and needle. For every participant, 5ml of venous blood was collected into ethylene diamine tetra acetic acid (EDTA) tube which was screened for HBV, HCV, HIV and syphilis using the rapid diagnostic kits as being used by the hospital blood bank.

During this study, HIV, HB, HCV and syphilis testing was done for all potential donors who visited either of the health facilities and agreed to be part of the study. Testing was done according to the National Blood Service of Ghana Protocol [9].

Laboratory procedure

All plasma samples were serologically tested for HIV, HBV, HCV and syphilis infections using rapid diagnostic test kits (RDTs). It was ensured that the same screening test strips were used at both health facilities and all test strips and buffer were stored at the recommended temperatures. Test kits, specimen, buffer and control specimen were brought to room temperature (250°C). Test strips were removed from the sealed foil pouch and used. Two drops of whole blood were introduced into the sample well of test kit and two drops of corresponding buffer added. The results were read within 10 ± 20 minutes but not after 20 minutes for HBV, HCV and syphilis. For First Response HIV 1-2.0, the results were interpreted within 15 minutes.

Two red bands (test and control bands) on the test kit are interpreted as Reactive for either HIV 1 or 2 or both. One red band (Control band) on the test kit is non-reactive. No control band or all bands absent when the specimen had been introduced was read as invalid.

Expiry dates of test strips and accompanying buffers were cross-checked before use. Quality control tests were done daily to validate the accuracy of the test strips with known positive and negative specimens before use for testing donor specimens.

Interview process

Trained HIV counselors administered structured questionnaires during the pre-donation counseling to collect socio-demographic information and behavioral characteristics of the blood donor such as sexual activities, injectable drug use, and tattooing. Regular supervision and random recheck interviews were done by the principal researcher.

Data processing and analysis

Data was entered into Epi-info 3.5.4TM (US Centers for Disease Control and Prevention, Atlanta) by the data entry clerks. The data was then imported into STATA version 13.0 software (developed by StataCorp, Texas) for statistical analysis. Continuous variables such as age were re-categorized into groups and expressed as proportions. The prevalence of each of the four TTIs and various combinations of co-infections were determined.

Ethical considerations

This study received ethical approval from the Ghana Health Service Ethics Review Committee (ID No: GHS-ERC: 03/10/15). Permission was sought from the management of the two hospitals before the study commenced. Informed consent documents were administered to participants after the study had been explained to them and all their questions answered. Participants were given unique identifiers to avoid the use of names.

Results

Socio-demographic characteristics of study participants

A total of 426 blood donors were recruited for the study. Blood donors recruited from St Joseph Hospital were 127 and the remaining 299 were from Regional Hospital Koforidua. The median age was 23 years. The minimum age of study participants was 17 years and the maximum was 54 years.

Majority, 85.7% (365/426) were males and 50.1% (216/426) of the donors were within the age group 20 - 29 years and 59.1% (252/426) of the total blood donors had secondary education. Seventy-two per cent (72.1%) of the donors resided in New Juaben municipality. Family/replacement donors were the majority (52.0%) followed by voluntary donors (26.5%) and 20.7% were Commercial donors (Table 1).

Prevalence of TTIs among blood donors

Among the blood donors screened, 36.2% (154/426) were positive for one out of the four infections screened. The proportion of co-infection among the blood donors for the pathogenic markers was 2.4% (10/426). The infection with the highest prevalence was Syphilis 15.3% (65/426) whilst HIV was the lowest 4.5% (19/426) (Table 2).

Co-infections found were HBV - Syphilis 1.2%, HIV - HCV 0.4%, and HCV - Syphilis 0.4%. The commonest co-infection was HBV-Syphilis co-infections (Table 3). None of the donors had a triple coinfection.

Discussion

This study determined the prevalence of HIV, HBV, HCV, and syphilis infections and their co-infections among blood donors in Koforidua. The study found 15.3% prevalence of syphilis among blood donors in Koforidua, 13.2% prevalence of HBV, 8.0% prevalence of HCV and HIV was the infection with the lowest prevalence being 4.5% using rapid diagnostic test kits.

In a study which reviewed blood donation data in Kintampo Municipality in 2014, the prevalence of HIV among blood donors was found to be similar to that of our study though a different diagnostic method was used [10]. Eastern region had the highest prevalence of HIV 3.7% in Ghana for the year 2015 [11]. In the case of syphilis, a prevalence of 15.3% was recorded, this is higher compared to a reported range of 4.7% to 13.5% among blood donors in Damongo, northern Ghana where secondary data was reviewed [12].

Majority of the study participants were males. This has been found to be the case as far as blood donation is concerned [5]. This study showed that majority of the donors were within the age range of 20-29. This is consistent with a similar study in Ghana among blood donors [13]. The study

identified economic benefits as a reason people in this age category were attracted to blood donation because of the funds attached to commercial donation.

An earlier study by other researchers also found out that a low proportion of people aged 40 years and above participate in blood donation [14-15].

The study found that the majority of donors reside in New Juaben Municipality. This is because the two hospitals are both located in this very municipality and are within the regional capital of the eastern region with a greater population than the other districts.

More than 50% of the recruited blood donors in this study were family or replacement donors. This conforms to an earlier study by Nagalo and colleagues in Burkina Faso, a population with similar characteristics to Ghana, where more than 52% of the people who showed up for blood donation in a study were family/replacement donors [14]. In an earlier study in Ghana, donors also reported donating blood because someone they knew was in need as the main reason for donating [15]. The high proportion of replacement donors could be due to the policy on the replacement of blood at St Joseph Hospital for all recipients of blood to provide relations to donate blood for them while on admission since blood cannot be bought. In many hospitals, blood has always been in short supply and it has always been difficult to get people to voluntarily donate blood to the banks [16]. All these TTI pathogens have almost the same route of infections, hence this study sought to determine co-infections of HIV, HBV, HCV and syphilis among blood donors. Of all the donors during the study period, 36.2% were infected with one pathogen. In a similar study recently in Burkina Faso, prevalence for single pathogen was 29.8% [14]. The prevalence of a single pathogen infection in study is relatively higher. The prevalence of multiple coinfections was found to be 2.4%. This is less in magnitude compared to an earlier study which found prevalence of co-infections to be 3.30% in Burkina Faso [14]. Co-infections of HIV, HBV, HCV and syphilis among blood donors is normally of low prevalence [17]. The commonest co-infection was HBV-Syphilis infections of 1.12% as reported above. There were neither HIV-HBV nor HBV-HCV co-infections reported in our study. However, other studies done in sub-Saharan Africa have reported HBV-HCV pathogenic infections as the commonest specifically in Ethiopia [18-19].

No single blood donor had triple infections of (HBV-HCV-syphilis), (HIV-HBV-syphilis), (HIV-HCV-syphilis) and (HIV-HBV-HCV) This is consistent with findings of a recent similar study in Iran where there was no co-infection of any of the pathogenic markers among the blood donors [20]. However, this is in contrast with a study in Tanzania by Matee and colleagues there were triple co-infections of the pathogens [18].

Even though the pathogens have very similar routes of infection as known from literature, co-infections are generally not common, particularly among blood donors. Blood donors are assumed to be very healthy people [20]. To harbour three or all these infections is possible among people with a medical condition and exhibiting symptoms as such but among blood donors is rare. This is similar to our study finding.

Limitations of study

Behavioral and lifestyle characteristics of blood donors were self-reported during pre-counseling interviews which is very subjective.

Conclusion

The prevalence of the following pathogenic infections HIV, HBV, HCV and syphilis among blood donors in Koforidua were found to be 4.5%, 13.1%, 8.0% and 15.3% respectively. HBV-syphilis infections were the commonest co-infections.

What is known about this topic

- Transfusion-transmitted infections (TTIs) are infections with the potential of being carried from person to person as a result of blood transfusion
- TTIs are common globally

What this study adds

- There is a high level of pathogenic infections of HIV, HBV, HCV and syphilis among blood donors in the study area

Syphilis, a bacterial infection is the commonest and HBV-syphilis infections is the commonest co-infection

Competing interests

The authors declare no competing interests.

Authors´ contributions

Conceptualization: HA, BS, EK, DKA, EAA, SOS, KMN. Data collection: HA, DKA, BS. Analysis and report writing: HA, BS, EK, DKA. Drafting of manuscript: HA, BS, EK, DKA, EAA, SOS, KMN. All authors read and agreed on the final version of the paper.

Acknowledgements

We are grateful to all blood donors who agreed to be part of this study. Our sincere gratitude also goes to all counselors, data clerks and laboratory staff for their contributions to this study.

Tables

Table 1: Socio-Demographic characteristics of blood donors, Koforidua, 2016

Table 2: Prevalence of TTIs seropositivity among blood donors, Koforidua, 2016

Table 3: Prevalence of TTI co-infections among blood donors, Koforidua, 2016

References

1. Chandekar SA, Amonkar GP, Desai HM, Valvi N, Puranik GV.Seroprevalence of transfusion transmitted infections in healthy blood donors: A 5-year tertiary care hospital experience. J Lab Physicians [Internet]. 2017 Oct [cited 2024 Apr 6];9(04):283-7. https://doi.org/10.4103/0974-2727.214246 PubMed | Google Scholar

2. Di Minno G, Perno CF, Tiede A, Navarro D, Canaro M, Güertler L, Ironside JW. Current concepts in the prevention of pathogen transmission via blood/plasma-derived products for bleeding disorders . Blood Reviews [Internet]. 2015 Jul 20 [cited 2024 Apr 6];30(1):35-48. https://doi.org/10.1016/j.blre.2015.07.004 PubMed | Google Scholar

3. World Health Organization. Screening Donated Blood for Transfusion-Transmissible Infections: Recommendations [Internet]. Geneva (Switzerland):World Health Organization; 2010 [cited 2024 Apr 6]. 66 p. Download 9789241547888_eng.pd.

4. Mohammed Y, Bekele A.Seroprevalence of transfusion transmitted infection among blood donors at Jijiga blood bank, Eastern Ethiopia: retrospective 4 years study. BMC Res Notes [Internet]. 2016 Feb 27[cited 2024 Apr 6];9(1):129. https://doi.org/10.1186/s13104-016-1925-6 PubMed | Google Scholar

5. Siraj N, Achila OO, Issac J, Menghisteab E, Hailemariam M, Hagos S, Gebremeskel Y, Tesfamichael D.Seroprevalence of transfusion-transmissible infections among blood donors at National Blood Transfusion Service, Eritrea: a seven-year retrospective study. BMC Infect Dis [Internet]. 2018 Jun 7 [cited 2024 Apr 6];18(1):264. https://doi.org/10.1186/s12879-018-3174-x PubMed | Google Scholar

6. Sarkodie F, Ullum H, Owusu–Dabo E, Owusu–Ofori S, Owusu–Ofori A, Hassall O.A novel strategy for screening blood donors for syphilis at Komfo Anokye Teaching Hospital, Ghana. Transfusion Medicine [Internet]. 2016 Feb 2 [cited 2024 Apr 6];26(1):63-6. https://doi.org/10.1111/tme.12279 Google Scholar

7. Ghana Statistical Service. **2010 Population and Housing Census: National Analytical Report** [Internet]. Accra (Ghana): Ghana Statistical Service; 2013 May [cited 2024 Apr 6]. 409 p. Download 2010_PHC_National_Analytical_Report.pdf.

8. Conroy, RM. **The RCSI Sample size handbook: A rough guide** [Internet]. 2021 May [cited 2024 Apr 6]. 79 p.

9. National Blood Services (GH). **The National Guidelines for the Clinical Use of Blood and Blood Products in Ghana** [Internet]. Accra (Ghana): National Blood Services; 2013 Jun [cited 2024 Apr 6]. 51 p. Download National Guidelines for the Clinical Use of Blood and Blood Products.

10. Walana W, Ahiaba S, Hokey P, Vicar E, Acquah S, Der E, Ziem J.**Sero-prevalence of HIV, HBV and HCV among Blood Donors in the Kintampo Municipal Hospital, Ghana** . BMRJ [Internet]. 2014 Aug 14 [cited 2024 Apr 6];4(12):1491-9. **https://doi.org/9734/BMRJ/2014/12160 Google Scholar**

11. Ghana AIDS Commission. **Country Aids Response Progress Report-Ghana**[Internet]. Accra (Ghana): Ghana AIDS Commission; 2015 Mar 31[cited 2024 Apr 6]. 158 p. Download GHA_narrative_report_2015.

12. Kubio C, Tierney G, Quaye T, Nabilisi JW, Ziemah C, Zagbeeb SM, Shaw S, Murphy WG.**Blood transfusion practice in a rural hospital in Northern Ghana, Damongo, West Gonja District** . Transfusion [Internet]. 2012 May 21 [cited 2024 Apr 6];52(10):2161-6. **https://doi.org/10.1111/j.1537-2995.2003709.x Google Scholar**

13. Ampofo W, Nii-Trebi N, Ansah J, Abe K, Naito H, Aidoo S, Nuvor V, Brandful J, Yamamoto N, Ofori-Adjei D, Ishikawa K.**Prevalence of Blood-Borne Infectious Diseases in Blood Donors in Ghana**. J Clin Microbiol [Internet]. 2002 Sep 1[cited 2024 Apr 6];40(9):3523-5. **https://doi.org/10.1128/jcm.40.9.3523-3525.2002 Google Scholar**

14. Nagalo MB. **Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses and syphilis among blood donors in Koudougou (Burkina Faso) in 2009** . Blood Transfusion [Internet]. 2011 Oct [cited 2024 Apr 6]; 9(4): 419-24. **https://doi.org/10.2450/2011.0112-10 PubMed | Google Scholar**

15. Mohammed S, Essel HB.**Motivational factors for blood donation, potential barriers, and knowledge about blood donation in first-time and repeat blood donors** . BMC Hematol [Internet]. 2018 Dec 20[cited 2024 Apr 6];18(1):36. **https://doi.org/10.1186/s12878-018-0130-3 PubMed | Google Scholar**

16. World Health Organization. **Towards 100% Voluntary Blood Donation: A Global Framework for Action** [Internet]. Geneva (Switzerland): World Health Organization; 2010 Jan 1[cited 2024 Apr 6]. 123 p. Download 9789241599696_eng. **Google Scholar**

17. Matee MI, Magesa PM, Lyamuya EF.**Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses and syphilis infections among blood donors at the Muhimbili National Hospital in Dar Es Salaam, Tanzania**. BMC Public Health [Internet]. 2006 Dec 30[cited 2024 Apr 6];6(1):21. **https://doi.org/10.1186/1471-2458-6-21 PubMed | Google Scholar**

18. Abate M, Wolde T.**Seroprevalence of Human Immunodeficiency Virus, Hepatitis B Virus, Hepatitis C Virus, and Syphilis among Blood Donors at Jigjiga Blood Bank, Eastern Ethiopia** . Ethiop J Health Sci [Internet]. 2016 Mar 30 [cited 2024 Apr 6];26(2):155-61. **https://doi.org/10.4314/ejhs.v26i2.9 PubMed** | **Google Scholar**

19. Biadgo B, Shiferaw E, Woldu B, Alene KA, Melku M.**Transfusion-transmissible viral infections among blood donors at the North Gondar district blood bank, northwest Ethiopia: A three year retrospective study**. Blackard J, editor. PLoS ONE [Internet]. 2017 Jul 5 [cited 2024 Apr 6];12(7):e0180416. **https://doi.org/10.1371/journal.pone.0180416 PubMed** | **Google Scholar**

20. Farshadpour F, Taherkhani R, Tajbakhsh S, Gholizadeh Tangestani M, Hajiani G, Sharifi N, Taherkhani S, Nejadbolkheyr A.**Prevalence and Trends of Transfusion-Transmissible Viral Infections among Blood Donors in South of Iran: An Eleven-Year Retrospective Study**. Paul R, editor. PLoS ONE [Internet]. 2016 Jun 16 [cited 2024 Apr 6];11(6):e0157615. **https://doi.org/10.1371/journal.pone.0157615 PubMed** | **Google Scholar**

Table 1: Socio-Demographic characteristics of blood donors, Koforidua, 2016 (N=426)		
Variable	**Frequency**	**%**
Sex		
Female	61	14.3
Male	365	85.7
Age Category		
17- 19	111	26.1
20-29	216	50.7
30-39	65	15.2
40-59	34	8.0
Marital status		
Married	93	21.8
Single	322	75.6
Other	11	2.6
Religion		
Christianity	402	94.4
Islam	18	4.2
Other	6	1.4
Education		
Tertiary	100	23.5
Secondary	252	59.1
Primary	68	16.0
None	6	1.4
Occupation		
Farmer	148	34.7
Student	214	50.2
Trader	25	5.9
Artisan	39	9.2
Location / Residence		
New Juaben	307	72.1
Akuapim North	21	4.9
Kwahu West	30	7.0
Others	68	16.0
Category of donor		
Voluntary donor	113	26.5
Replacement / Family donor	225	52.8
Commercial donor	88	20.7
Smoking		
No	418	98.1
Yes	8	1.9
Alcohol use		
No	308	72.3
Yes	118	27.7
Condom use		
No	257	60.3
Yes	169	39.7
Multiple sex partners		
No	415	97.4
Yes	11	2.6

Table 2: Prevalence of TTIs seropositivity among blood donors, Koforidua, 2016

Type of infection	Prevalence n (%)		
	Female n (%) N=61	Male n (%) N=365	Overall n (%) N=426
HIV	5 (21.1)	14 (73.7)	19 (4.5)
HBV	1 (1.8)	55(98.2)	56 (13.2)
HCV	2 (5.9)	32 (9.4)	34 (8.0)
Syphilis	7 (10.8)	58 (89.2)	65 (15.3)

Table 3: Prevalence of TTI co-infections among blood donors, Koforidua, 2016		
Co-infections	**Frequency**	**Percentage (%)**
HIV + HBV	0	0.0
HIV + HCV	2	0.5
HIV + Syphilis	1	0.2
HBV + HCV	0	0.0
HBV + Syphilis	5	1.2
HCV + Syphilis	2	0.5
HBV + HCV + Syphilis	0	0.0
HIV + HBV + Syphilis	0	0.0
HIV + HCV + Syphilis	0	0.0
HIV + HBV + HCV	0	0.0