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IATROGENIC HIV VIA BLOOD TRANSFUSION
AND HOSPITALS-USERS' AWARENESS
IN A REGION IN GHANA.

(The size of the problem and change in hospital practice
and knowledge needed)

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Iatrogenic HIV via blood transfusion and hospital-users' awareness in a region in Ghana.

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ABSTRACT

A study was done in the regional and 2 district hospitals in the Ashanti region in Ghana on the problem of transfusion-transmitted HIV infection with regard to
1)   how much transmission has occurred in the past 5 years in children,
2)   the prevalence of HIV infection among blood donors presently, 3) how much clinicians are contributing to the iatrogenic spread by their blood transfusion practices and
4) the potential role of the hospital-using public in reducing the spread of HIV infection in the community.
Over a 6 week period, blood samples were obtained from a group of paediatric patients aged less than 12 years in the regional hospital who had a previous history of admission to the hospital, with and without blood transfusion (cases and controls), within the last 5 years. Samples were also collected from all donated blood in each of the 3 hospitals over a 3 week period in each case. All the blood samples were screened for HIV1 and HIV2 infection using "HIVCHEK 1+2". A sample of 6 positives and 8 negatives was chosen from all the screened samples randomly and were retested for HIV1 and HIV2 using Western Blot ("Biorad" and "New LAV Blot II"). Information for the other aspects of the study was obtained from transfusion patients' clinical records and from an open-ended questionnaire to the hospital users on blood transfusion and AIDS.

There were similar prevalences of HIV infection of about 4% and 5% among children who had received 2 or more blood transfusions within the last 5 years and among blood donors in the three week period of the study.

According to the preset criteria about 25% or more of all blood transfusion episodes in the hospitals were probably avoidable. Surgical practices were associated with many more avoidable blood transfusions than non-surgical medical practices.

About 25% of all the hospital users interviewed resented blood donations and transfusions probably because they did not understand their relation with ill-health. Generally, it was felt that the public needed more information and discussions on the issue of HIV infection and AIDS in the community.

The study draws attention to the problem of HIV screening results based on modern screening test which appear as indeterminate. Malaria may be interfering in West Africa. Within the broad range of estimation, the risk of iatrogenic HIV via blood transfusion is far too high and of serious concern as evidenced not only by the tests on children and

practices.

There is, therefore, a strong need for the development of guidelines for transfusions in all hospitals in the country, and also a need for clinicians to balance the risks and benefits of each transfusion with attempts to reduce the frequency of blood transfusion.

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LIST OF ABBREVIATIONS

AIDS   Acquired Immune Deficiency Syndrome

ARC   AIDS Related Complex

BTS   Blood transfusion Service

ELISA   Enzyme-Linked Immunusorbent Assay

HB   Haemoglobin

HIV   Human Immunodeficiency Virus

MOH   Ministry of Health

WB   Western Blot Technique

WHO   The World Health Organisation

1. INTRODUCTION

1.1 The problem of HIV infection:

WHO has estimated that there are about 6.5 million HIV-infected people in the world (In: UNICEF 1990).

According to WHO 2 million are women of child bearing age, 75% of which are in Africa and the Caribbean where as many men are infected as are the women. Here, heterosexual transmission is the most important mode of spread. Between a quarter and a half of HIV infected women will pass on the infection to their children. Typically in East and Central Africa 1 in 10 of those with AIDS are children less than 5 years old. Most children have acquired it vertically through their parents fulfilling their natural human urge for physical intimacy ,love and procreation.

WHO estimates that about 10 times as many people have contracted HIV infection as those suffering from AIDS which can take over 10 years to develop. WHO also estimated that where 1 in 10 children would be expected to die before 5 years of age without AIDS, and where 20% pregnant women are HIV infected the child mortality rate rises by one third. If the population of infected women is as high as one third, the child mortality rate may rise over a half (Children and AIDS: An impending calamity. UNICEF,1990).

HIV infection and the consequences thereof poses a serious problem to nations as there is no standard treatment or prevention such as immunisation.

In Africa most African countries, government spending on health ranges from $1 to $10 whereas $1 is about the cost of an ELISA test to screen a blood sample for HIV. This added to the cost of health care for each patient with AIDS as the years go by will be an almost impossible heavy financial burden in most economically disadvantaged countries.
 Medico-legal issues concerning the unfortunate case of haemophiliacs and transfusion recipients who have acquired the infection iatrogenically are still being debated in developed countries.

Africa stands to lose valuable trained personnel from schools, hospitals and administrative services to AIDS.

Since the discovery of HIV infection various campaigns have been made about safer sex, safer transfusions and safer skin-piercing procedures because of their potential in spreading the infection.

The risk of seroconversion following needlestick injuries is less than 1% in most industrial countries (McGray 1986) where drug addiction is much more a problem, and is usually associated with unusual parenteral exposure to blood

Unfortunately such information in lacking in most West African countries. More recent reports suggest that injections are of minor importance in the transmission of HIV infection (Lepage and Van de Perre 1986) although it is thought that it might be increasingly more important in hospitalised children (Lepage and Van de Perre 1986; Mann, Francis et al 1986) and influenced by individual preferences for injectable as opposed to oral medication (Michael 1985) and also by hospital hygiene.

Blood transfusions are recognised as an important risk factor in HIV infection both in Europe and America (Curran et al 1984) and also in Africa (Quinn et al 1986; Van de Perre et al 1985; Population Reports 1986, Melbye et al 1984).

In the United States, haemophiliacs and transfusion recipients represent 2.4% of the total cases of AIDS (Update MMWR 1986).

Such information is lacking in Africa although blood transfusions constitute a major form of therapy for children and women in pregnancy and childbirth. These form the majority of the population.

A study in Jamaica concluded that the infection is efficiently transmitted by transfusion of cellular products (Wilks, Mann et al 1989) as well as plasma.

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A strong dose-response association between blood transfusions and HIV seropositivity was found in cases of paediatric malaria and anaemia which may require transfusion (Greenberg et al 1988). The study, however, found no relationship between malaria per se and HIV seropositivity. In most of the cases, however, seroconversion occurred within one week of transfusion which raises a number of fundamental issues that may confound the study design (e.g. lack of HIV test information on donor blood, the need for confirmatory testing, the need to test mothers, and the incubation period for AIDS/ARC which is about 5 years).

1.2 The need for prevention of HIV spread through blood transfusion:

Many people tend to think more of HIV as a sexually-transmitted disease, hence, tending to fail to appreciate fully the importance of other modes of transmission like blood transfusion.

Though the epidemic of AIDS has caused a scare in both physicians and some lay people about blood transfusion and other hospital practices, people resent being tested for HIV for blood donation or for any other reason. In areas where blood is not routinely screened for HIV and other blood-borne pathogens patients who care now tend to prefer blood from relations than from the blood bank pool. Blood, therefore, tends to be collected within a short time of transfusion which limits the time to conduct adequate tests

to ensure safety.

Although screening of blood reduces the risk of HIV
transmission the problem of the "window" period (which is
the period between acquiring the infection and the
appearance of detectable antibodies in the blood stream) in
HIV infection together with other limitations of modern HIV
screening methods creates an imperfection in the screening.
In view of the soaring medical and socio-economic problems
of HIV infection in populations it is a threatening
situation to mankind. Perhaps the need to address the
problem of HIV infection in blood transfusions has never
been more pressing in lesser developed countries.

It has been suggested that screening of donated blood for
transfusion, improvement in the use of sterile procedures by
health workers and the populace, and health education to
modify sexual behaviours are the 3 main control measures
(Quinn et al 1986; Editorial, Lancet 1987).

Suggestions have been made about the need   for physicians
to balance the risks and benefits of transfusion with an
aim to reduce their frequency (Lepage et al 1986). Studies
in Zaire have shown that clinicians have been able to cut
down blood transfusions by 70% in an effort to reduce the
number of blood transfusions and thereby reducing the risk
of transmission of HIV through blood transfusions (In:
Hubley 1990). It is, however, uncertain if this has been
                        age-specific
associated with any changes in mortality.
                        ʌ

There is evidence that public health efforts may have reduced the prevalence of risk practices among individuals in the United States (McKusick et al 1985) and there is considerable agreement that awareness of AIDS is necessary although not sufficient for behaviour change (Becker and Joseph 1988; Emmons et al 1986).

As educational programmes to effect a change in the sexual behaviour of a community achieve variable results due traditional and cultural influences, the most preventable mode of transmission that can be effectively controlled and monitored is safe medical practice, with special reference to blood transfusions.

1.3 Worldwide action to tackle safer blood issues:

The key strategy of the Global Blood Safety Initiative (GBSI) and the Global Programme on AIDS (GPA) under WHO is the promotion of the appropriate use of blood in the prevention of AIDS. This addresses issue like reducing the number of transfusion and hence the risk of HIV infection, ensuring that patients receive appropriate transfusion therapy, and making optimal use of each unit of donated blood.

The extent to which precautions against the transmission of HIV infection are taken in countries with supposedly few

numbers of AIDS cases, however, vary from place to place depending on the availability of equipment and manpower and partly because of the importance attached to the occurrence of HIV infection as compared to other infection that cause high morbidity and mortality in the majority of the population.

1.4 The need for the study in Ghana:

Whereas in the more developed countries protocols have been established for the prevention of the iatrogenic spread of HIV infection many less developed countries either lack any such policy or poorly adhere to it. Yet reports on new cases of the infection have been steadily increasing in various developing countries for lack of complete reporting or an increasing number,of new cases.

1.4.1 AIDS and HIV infection in Ghana:

Ghana, with an estimated population of about 14 million, had reported 145 cases of AIDS by February 1988 (Worldwide AIDS Weekly Surveillance Report 1988). Now there are about 700 HIV seropositives reported in the country (Ministry of Health, Ghana, 1989) of which 85% are females and 15% males, the important risk factor being prostitution outside Ghana. 56% of these cases were reported in the Eastern Region while

20% were reported in the Ashanti Region of Ghana. These 2 regions have 14% and 17% to the total population of the country.

1.4.2   Blood Transfusion Services in Ghana:

Blood transfusion services in Ghana are operated locally on a hospital-based blood bank system. By and large, these blood banks operate independently but with some co-ordination at the national level. Generally, donor recruitment activities tend to be minimal in the blood banks' activities. Most of the blood used in running the services are obtained through 'replacement' donation (so-called directed donation). There is a fee for hospital services in Ghana. However, blood and blood products are in principle not for sale. A fee of about $9.00 is charged for the first unit of blood and $6.00 for each subsequent unit transfused which barely covers the cost of the transfusion kit and processing.

Blood and blood transfusion products generally available in Ghana currently are whole blood, packed red blood cells and fresh-frozen plasma. Derivatives prepared from large blood donor pools are seldom used.

Until 1988 blood was not routinely screened in the hospitals in Ghana for HIV prior to transfusion. Initially, screening was done for only HIV1. Much more recently, HIV2 screening has been added. It is now the policy of the Ministry of

Health, Ghana that all blood and blood products be screened prior to transfusion. Each of the hospitals in 9 out of 10 regions is equipped with HIV screening facilities based on ELISA systems (Wellcozyme). The district hospitals are required to send donor blood samples in batches to the regional hospitals for screening. The positives in the samples are then sent to the national public health laboratories for confirmation by Western Blot technique. Because of operational difficulties and problems of accessibility a few mission hospitals are considering the use of quicker screening methods that are easy to use in their blood banks.

This constraint on the organisation of the HIV screening system provides avenues for lapses in the safety of blood and blood products used. Not all the hospitals screen blood for other infective agents like HBsAg. In some hospitals, because of blood shortages blood could be transfused in emergencies before results of screening are available. It was thought that over 5-10% of blood given in the country may therefore be infective of one agent or the other (Acquaye, Neequaye et al 1989).

The questions being asked now in most countries with apparently few cases of HIV infection is how much attention should be given to the problem in the health plan and health budget now to safeguard the future generation. To answer

this question information is required regarding the prevalence and the tendency to spread by current medical practices.

This study was proposed to examine the current blood transfusion services in a region in Ghana to assess how safe the blood transfusion system was with regard to the transmission of HIV infection. It was hoped that this will help estimate the possibility of spreading HIV infection through the current blood transfusion practices. This would then help in establishing and supporting protocols for the prevention of HIV infection and would also throw some light on cost-effective strategies for the prevention of iatrogenic spread of HIV infection.

1.5   AIMS OF THE STUDY:

The aims of this study were as follows:

To find out the magnitude of the problem of HIV infection in the blood transfusion service in a region in Ghana (see objectives 1-2);

To identify the role of clinicians and other health workers in the fight against the iatrogenic spread of HIV infection (see objectives 3-5); and

To examine the people's attitudes towards blood transfusion and donation and their awareness about HIV infection (see objective 6-7).

1.6   OBJECTIVES OF THE STUDY:

The objectives for the study were as follows:

1. To estimate the number of children who have acquired HIV infection through blood transfusion in the last 5 years.

2. To estimate the prevalence of HIV in blood donors in the region and hence the risk of transmitting HIV infection through blood transfusion if blood is not routinely screened; and to evaluate the reliability of HIVChek 1+2 as a quick and efficient screening method that can be used

3. To find out if blood and blood products transfused meet the current international safety expectations and whether transfusions are carried out under medically appropriate circumstances: This is to find out if some episodes of transfusions are avoidable and if patients receive the appropriate type and quantity of transfusion.

4. To find out which groups of hospital patients are most prone to transfusions of blood and blood products.

5. To compare blood and blood-product transfusion practices in regional and district hospital departments regarding the appropriateness.

6. To identify the attitudes of hospital users concerning blood donation and transfusion; and

7. To identify the perceptions of hospital users concerning their potential role and expectations from the Ministry of Health (MOH) regarding the control of HIV infection based on their understanding of current concepts on AIDS and HIV infection.

An episode of transfusion: A transfusion given within one calender day. This may comprise one or more units of blood.

Indication: A reason or rationale for transfusion based on scientific and medical knowledge.

Criteria: The criteria for blood and blood product transfusion used in this study were those recommended by the Ministry of Health, Ghana (Acquaye et al 1989) and also on the basis of current knowledge (Sibermann et al 1989, Moses et al 1989, Stockman 1986, Elwood et al, Elwood 1973, Viteri and Torun 1974, Becker and Aster 1972, Concensus Conference 1985.).

2. METHODS USED IN THE STUDY:

This whole study was carried out in one Regional an two District hospitals in the Ashanti region of Ghana. The 700-bed Regional hospital carried out 8,000 blood transfusions whereas each of the 150-bed district hospitals carried out a total of about 4,000 blood transfusions annually. The catchment population for the Regional hospital was about 600,000 and a total of about 300,000. The regional hospital in this study was one of the centres for HIV screening by ELISA technique in the country.

The region was chosen because the regional hospital had one of the highest rates of blood transfusion in the country

national the capital town where HIV screening was carried out more efficiently. Another reason was that it ranked second highest in the regional reported cases of HIV seropositives.

The two districts hospitals were selected as 2 of the largest district hospitals in the region that are more easily accessible from the regional hospital.

The choice of the number of districts for the study was limited by the financial support and also by the time available for the study.

In the first and second parts of the study blood samples were screened for HIV using "HIVCHEK 1+2".

HIVchek 1+2 was chosen as the screening method for these studies because of the following attributes (Du Pont):

(i) The unopened-opened kit did not require any refrigeration;

(ii) All components of the kit are stable at room temperature (25 oC) for at least 6 months while in the lyophilized state. In the reconstituted state most of the reagents are stable for 3 months at room temperature except one which lasts 5 days. Refrigeration, however, prolongs its

(iii) The kit contains disposable devices and pipettes for each   test and also all the reagents;

(iv) The test is recommended for either fresh samples of serum   or plasma but could be adapted for use with frozen samples.

(v)   The test result is readable within 10 minutes by the appearance or not of a red colour on a device.

(vi) It is able to screen for both HIV1 and HIV2.

(vii) It is said to have a sensitivity of 99.5% and a specificity
 of 99.9% in comparison with ELISA tests.

2.1 Method to _study_ The Effect of Previous Blood Transfusion
       Practices on the   Spread of HIV Infection

This part of the study was a retrospective case-control study carried out in the regional hospital to establish how much previous blood transfusions practices have contributed to the iatrogenic spread of HIV infection.

department aged between 1 and 12 years who had a history of at least one blood transfusion in the last 5 years. These age limits were set because they are not sexually active and theoretical there will be a less than 1% chance of needlestick HIV infection (see introduction).

The controls were patients of the same age group on admission in the same department who had a history of at least one previous admission in the last 5 years but without a history of blood transfusion. It was thought that these groups of children would be very similar regarding social and environmental characteristics except for a previous history of transfusion. The cases and the controls were picked over a period of 6 weeks as they came on admission.

Blood samples from both cases and controls were screened for HIV-1 and HIV-2 using HIVchek 1+2. HIV seropositives were later confirmed for both HIV-1 and HIV-2 using Western Blot technique.
Differences in HIV positivity between the cases and the controls were compared according to the tests used.

Donated Blood:

This part of the study looked at the problem of HIV infection in the present blood transfusion service.

In this study all blood donated in a period of 3 weeks in each of three hospitals - a regional and 2 district Hospitals - was screened for HIV 1 and HIV 2 using HIVchek 1+2.

A small sample of 6 positives and 8 negatives were then reconfirmed for their HIV status using the Western Blot technique at the Noguchi Memorial Institute for Medical Research Accra, Ghana.
This was on the basis that HIV positives need to be confirmed by more than one reliable test. Also it was likely that a quick screening test may have its flaws in comparison with a more elaborate test like the Western Blot.
The following criteria was used in interpreting the all the Western Blot results in the study(WHO Wkly Epidem Rec 1990):

	HIV-1	HIV-2
POSITIVE	2 env bands +/- pol bands +/- gag bands	2 env bands +/- pol bands +/- gag bands
NEGATIVE	No HIV-1 specific bands	No HIV-2 specific bands

INDETERMINATE	other profiles
	not considered
	  positive or
	  negative
		other profiles
		not considered
		  positive or
		  negative

The prevalence of HIV infection in blood donors for each hospital was estimated within the limits of the tests used in terms of what was real and what was probable.

2.3 Method used to study Blood Transfusion Practices in the Hospitals:

In the third part of the study records of all patients receiving blood transfusions in each of the 3 hospitals were examined over a three week period for the indications for the transfusion based on symptoms, clinical findings and laboratory results. The information was retrieved by structured questionnaire (see appendix).

Based on pre-defined criteria listed below each episode of transfusion was classified as avoidable, unavoidable or indeterminate.

In a similar but more extensive study in Israel (Moses et al 1989) the need for the transfusion was justified by a panel of medical officers. This was not found to be very necessary in this study because of the very limited range of recorded criteria used by the clinicians to justify the transfusion, and also the limited range of blood and blood products used.

Concurrently with this, an observation was made concerning the transfusion policy in each hospital regarding the method of HIV screening, the use of needles, blood-giving sets and bags or bottles for transfusion and their disposal.

The following was the criteria adopted for the study based on and recommendations by the MOH (Acquaye at al 1989) and current clinical knowledge (Silberstein et al 1989, Moses et al 1989, Stockman 1986, Elwood et al, Elwood 1973, Viteri and Torun 1974, Becker et al 1972, Concensus conference 1985).

2.3.1 Criteria for appropriate blood and blood product transfusion used in this study.

Whole blood:

Acute bleeding with symptoms of shock and cerebral anoxia.
Acute haemolysis associated with cerebral anoxia
Overt bleeding with signs of hypovolaemia
Overt bleeding with a decline in haematocrit to 30% or less
Severe external bleeding confirmed by the physician
Bone marrow failure
Sequestration crisis in sickle cell anaemia
Severe hypersplenic states
Chronic anaemia in children with haemoglobin of < 5g/dl with clinical signs of pallor, weakness, jaundice, and signs of cardiac failure such as tachycardia,and air hunger.

Symptomatic refractory anaemia with haematocrit < 30%

Platelets:

Thrombocytopaenia <50,000/l preoperative
Thrombocytopaenia <20,000/l associated with active bleeding and/or sepsis;

Fresh-frozen plasma:

PTT >50 seconds, coagulation disorders;

Cryoprecipitate:

Active bleeding associated with hypofibrinogenaemia

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<u>Justification criteria for blood transfusion:</u>

Subconjunctival pallor, jaundice, tachycardia were classified as subjective criteria.

All laboratory results were classified as objective criteria and signs and symptoms subjective.

All instances of transfusion failing to satisfy the above criteria were considered avoidable. Also a transfusion of 1 unit of whole blood or less given to an adult was considered avoidable.

Where the information was missing or incomplete for the records regarding a particular episode of transfusion indication was considered indeterminate.
The results were classified by region and districts by

virtue of the physical facilities and available manpower in

the hospitals.

Analysis was done manually and by computer using SAS

software.

2.4 Method used to study the Attitudes of hospital-users

Towards Blood Donation and Transfusion, and Awareness about

AIDS/HIV infection.

In this part of the study an open-ended questionnaire was

designed to examine the views of hospital users about blood

transfusions and the problem of AIDS and HIV infection,

their roles in controlling its spread, and their

expectations from the MOH to control the spread.

Interviewees were selected randomly as they turned up at the

out-patients' departments of the various hospitals. The

possible each day during the period of the study.

The sample size in each hospital was weighted with the general out-patient attendance in each hospital and the time available for the study.

The responses obtained were grouped and analysed manually and by computer using SAS software.

2.5   Ethics of the study:

The study was conducted as per hospital routine.
HIV screening tests were carried out anonymously on blood donors.
Screening results were made available to the Blood Banks and in the case of the paediatric cases, to the attending physicians.

2.6   Limitations of the study:

Premature infants were excluded in the study in assessing the appropriateness of blood and blood-product transfusions since it is difficult to apply the set criteria to this group (Stockman 1986).

In principle this study could only be representative of the areas studied but would serve as a guide in areas where

medical practice is thought to contribute to the spread of HIV infection.

The sample confirmed by Western Blot in the study was rather small for the results to be generalised objectively. However, it sought to provide an idea on minimum safety standards in the hospitals.

The district hospitals chosen in this study were on the basis of their proximity to the regional hospital and not by random sampling. This in principle limits the generalisation of the results for the region.

Blood donors might not necessarily live in the geographical areas under study. This might affect the interpretation of results for the area of study. However, it is assumed that the hospitals are accessible to them.

3. RESULTS FROM THE STUDY AND DISCUSSION

3.1 TRANSFUSION-RELATED HIV INFECTION IN THE AREA STUDIED:

3.1.1 HIV INFECTION ACQUIRED THROUGH BLOOD TRANSFUSION IN THE LAST FIVE YEARS IN THIS STUDY:

Over the six week period a total of 28 children were examined who had a history of previous admission to the regional hospital (for details,see Methods section 3.1).

Of these 20 had received at least one transfusion in the last 5 years (i.e. 20 cases). 8 (controls) had a history of at least one hospital admission in the last 5 years but without an episode of blood transfusion (table 1).

Table 1

Transfusion-associated HIV infection in children in last 5 years:

	HIVchek positive	HIVchek negative	Total
Cases	2	18	20
Controls	0	8	8
Total	2	26	28

Two of the cases were found positive for HIV of which one was confirmed positive for HIV-2 by Western Blot. The other was indeterminate.

None of the controls was positive on Western Blot.

The prevalence of HIV infection in children between the ages
of 1 and 12 years in this study was at least 1 in 20 (i.e.
5% : - 95% C.I.=+/-10%). Considering the indeterminates as a
potential positive case makes it 1 in 10 (10%).

3.1.2 PREVALENCE OF HIV INFECTION IN BLOOD DONORS IN THE STUDY.

Over the 3 week period 167 blood donors were screened using
HIVchek 1+2.

11 were positive for HIV i.e. 6.6% (95% C.I.= +/-3.7%)
prevalence. The prevalence in the hospitals ranged from
5.6% to 9.3% (table 2).

Table 2

HIVchek screening results by hospital:

	Negative	Positive	Total	Prevalence
Regional	84	5	89	5.6%
District I	33	2	35	5.7%
District II	39	4	43	9.3%
Total	156	11	167	6.6%

3.1.3 COMPARISON OF "HIVCHEK 1+2" SCREENING RESULTS OF THE STUDY WITH WESTERN BLOT:

For the positives on HIVchek, 50% (3/6) were true positives
and 50% indeterminate on confirmation by the Western Blot

HIVchek positive results were true positives, 17%

indeterminate and 66% false positives (Tables 3a and b).

For the negatives on HIVchek, 13% (1/8) were true

negatives, the rest being indeterminate on WB for HIV-1.With

WB for HIV-2, however, 63% (5/8) turned out to be true

negatives, the remainder being indeterminate (Tables 3a and

b).

Table 3a.

HIVchek versus WB for HIV-1

HIVchek 1+2

		Positive	Negative	Total
WB	Positive	3	0	3
	Negative	0	1	1
	Indeterminate	3	7	10
	Total	6	8	14

Table 3b.
HIVchek versus WB for HIV-2

HIvchek 1+2

		Positive	Negative	Total
WB	Positive	1	0	1
	Negative	4	5	9
	Indeterminate	1	3	4
	Total	6	8	4

It was found that HIV-1 screening by Western blot was

associated with more indeterminates than HIV-2.

Combining the WB results for HIV-1 and HIV-2 in this study,

it was realised that the potential for 'HIVchek 1+2' to pick

out a false negative test was 0%, the potential to pick out

a false positive was 0%. However, only 67% (4/6) of the HIVchek positive results are reliably true on confirmation by WB even though it was unlikely that none of the true positives will be missed.

Of the 64% (9/14) indeterminate results picked by WB in the sample HIVchek 1+2 picked 78% (7/9) as negative and 12% (2/9) as positive (Table 4).

Table 4
HIVchek vrs Western Blot

HIVchek 1+2

		Positive	Negative	Total
WB	Positive	4	0	4
	Negative	0	1	1
	Indeterminate	2	7	9
	Total	6	8	14

3.1.4   DISCUSSION OF RESULTS ON TRANSFUSION-RELATED HIV INFECTION IN THE STUDY:

None of the cases in the first study was on admission for symptoms relating to clinical AIDS suggesting that the infection might have probably been acquired more recently. The positive cases on HIVchek in the study were all aged more than 4 years.

The fact that none of the controls were positive on HIVchek 1+2 testing lends evidence to the significance of the

These prevalence figures would, however, be influenced by blood donor recruitment policies of the various hospitals and individual life styles of blood donors over any period of time.

3.1.4.1 Estimate of risk of transfusion-transmitted HIV infection from study results:

From the first part of this study, the lowest estimate of risk of a child aged between 1 and 12 years being HIV positive following a blood transfusion obtained within the last five years is about 1 in 20 in the area studied. An upper limit of 1 in 10 may be assumed if the indeterminate case is considered potentially positive (hence a range of 5%-10%).

Applying the comparison results of HIVchek 1+2 and Western Blot (Table 4) to the results of the second study (Table 2) the average prevalence of HIV infection in blood donors in the hospitals studied would be at least 4.4% (95% C.I.= +/- 3%).

Incidentally this figure agrees fairly well with the result in the first part of the study.

Practically, the indeterminates on WB may be considered potentially infected until proven otherwise. There is a

school of thought that there might exist a a third strain
of the human immunodeficiency virus (Essex: In Africa Health
1988). This makes it quite irrational to take the risk of
transfusing blood which has an indeterminate status on HIV
screening by Western Blot.

Assuming that all the positives picked by HIVchek 1+2 in
the blood donors were potentially infected an upper limit
for the estimate of the prevalence of HIV infection among
blood donors will be 6% for the hospitals studied.
Considering that these hospitals are some of the major
hospitals in the Ashanti Region this prevalence figure of
4%-6% (+/- 3%) HIV positives in blood donors may not be very
different from the true population mean prevalence for the
period of the study.

 The regional hospital carried out about 8,200 blood
transfusions in the last year and a total of 4,200 in the 2
district hospitals. 55% of all the transfusions in this
study were given to children and 22% for women in relation
to pregnancy and childbirth (see below). It is thus
projected that between 500 and 700 transfusion recipients
would have been infected with HIV between the 3 hospitals
within one year if blood were not screened. Of this 77%
would be women and children.

3.1.4.2 Caution in the interpretation of the data:

From the WB confirmed sample it was estimated that 100% (3/3) of the controls in the first study could be indeterminate on Western Blot for either HIV 1 or HIV 2.

Based on the WB confirmatory results about three quarters of all HIV-negative screened blood samples (by HIVchek which is comparable to ELISA - see above) could be potentially infective for HIV in this population because of their indeterminate status.

Technically, the appearance of indeterminate bands also occur in the process of HIV seroconversion.

It is known that certain immune-complexes in individuals living in hyperendemic areas for malaria and other protozoal and bacterial infections may give false positives or indeterminate WB bands on HIV screening with certain test reagents (Anyiwo 1988).

3.1.4.3 Other comments:

It is obvious that there is some risk of HIV transmission through transfusion of blood screened by modern methods though this is rather difficult to quantify. The risk of HIV infection through transfusing blood that is indeterminate on Western Blot is still not known. If it

acceptable. It has been suggested in the United States that
as many as 1:40,000 blood recipients may be exposed to HIV
through transfusion of ELISA test negative blood (Ward et
al). Though this risk is low people found it difficult to
tolerate.

Applying the strictest possible criteria to the HIV
screening results would result in discarding about three
quarters of all donated blood in the area. This high degree
of wastage will not be acceptable in a blood transfusion
service. The economic feasibility of improving the
efficiency of HIV screening methods in the blood banks for
this reason rather questionable in view of other health
priorities.

The questions being asked are which combinations of HIV
screening tests should be used most practically and how
safe is safe enough. These will need to be answered in
relation to prevailing local circumstances.

Perhaps, stricter criteria need to be applied, especially,
in the West African context regarding the interpretation of
Western Blot results.

Post-transfusion HIV infection has two outcomes: (i) the
disease AIDS, and (ii) infection as indicated by HIV
seroconversion. It is uncertain how many of those infected
will eventually develop AIDS. Estimates using the maximal
likelihood method projects that the mean incubation period

for transfusion-associated AIDS may be 54 months or longer
(Lui et al 1986). Thus we are yet perhaps to see those
children who have developed transfusion-associated AIDS.

These results of the study are stated within the limits of
a   sampling error regarding the small numbers of tests
confirmed by Western Blot.

3.1.4.4. Lapses in the Blood Transfusion Service in the Region:

1) HIV Screening:

The structure of the HIV screening policy requested by the
Ministry of Health for the blood banks in Ghana was probably
on the assumption that each transfusion centre (hospital)
would have reserves of blood and blood products at any
given time. Unfortunately, this is not always the case. The
ELISA systems used in the hospitals take about 3 hours for
the screening results to be ready. This is rather too long a
waiting time for some of the acute emergencies encountered
in the hospitals if there is no readily available pre-
screened blood. One might then argue in favour of saving a
life then than developing AIDS later or luckily never.

Accessibility problems to the regional hospitals make it
difficult for donor blood samples to be sent regularly for
screening. Most of the district hospitals do not have any

hospitals that have various screening methods used on a rather small scale.

It was observed in a district hospital that blood donor samples sent to the regional hospital for HIV screening fell short of the number of transfusions carried out over the same period but the difference could not be accounted for by stores in the blood bank. The regional hospital which was the main screening centre for the region suffered occasional shortages of reagents and breakdown of machinery for HIV screening.

Generally, it appears the Ministry's system for HIV screening does not seem to encourage the district hospitals to use safe screened blood at all times.

Added to these is the main problem of modern blood transfusion services - the antibody negative 'window' period in HIV infection (i.e. the period between the time of infection and the appearance of antibodies in the blood). During this period modern HIV tests fail to detect the occurrence of infection. HIV screening is therefore imperfect even in the best set-ups as a means of interrupting transmission by transfusion. Moreover, the set-up in the area studied makes transmission by transfusion even more probable.

It would also be difficult to compare the results from various hospital blood banks if there is lack of uniformity in screening methods.

2) Donor recruitment:

The blood banks obtain most of their blood through directed donation. In the regional hospital less than 10% of the blood cross-matched for 1989 was obtained through voluntary (outreach) donations. The heavy reliance on directed donation tends to encourage commercial donation and also offsets the need to screen especially in emergency situations since the donor may be assumes to be 'clean'.

3) Blood Bank Staff:

The blood banks operate with 3 categories of workers - the Blood organisers, the Nurses and the Technical staff each of which is accountable to a different professional body under the MOH. This sometimes causes misunderstandings when operational strategies of these bodies tend to be at variance with priorities of the blood bank as a unit.

3.1.5 THE OVERALL SIZE OF THE PROBLEM OF TRANSFUSION-
RELATED HIV INFECTION FROM THE CURRENT STUDY

There is a strong suggestion from these current studies that some HIV infection in the region studied is related to blood transfusions received within the last few years. Currently, there is a prevalence of at least 4% (+/- 3%) HIV positives among blood donors which means that based on the transfusion rates of the hospitals studied (see above) between 500 and 800 transfusion recipients could be at risk

regularly screened. It is, however, difficult to predict a minimum infection rate since the degree of safety cannot be quantified.

There has not been much of such studies in West Africa.Most studies from other parts of Africa report a prevalence of between 4 - 5% in blood donors (Nzilambi et al 1987, Mhalu et al 1987). It is rather uncertain whether these figures are going to increase or level off in the near future as it is difficult to predict people's behaviour. We can at best know what has happened in the past.

3.2. RESULTS ON BLOOD TRANSFUSION PRACTICES IN HOSPITALS

3.2.1 Results on Policy on Transfusion Practices in Hospitals:

It was the policy of the Ministry of Health that all hospitals use disposable equipment i.e. needles, syringes and bags for transfusions.

It was, however, observed that occasionally sterilised bottles were used for collecting blood. This was more especially in the district hospitals.

The use of non-disposable needles and re-use of blood-giving sets for different patients in all the hospitals was, however, never encountered during the period of the study.

3.2.2. Results on Transfusion Practices in Hospitals:

278 transfusion episodes were recorded over a 3 week period in the three hospitals.

This comprised 13% medical cases (37/278), 10% (29/278) surgical cases, 55% (152/278) paediatric cases and 22% (60/278) obstetric and gynaecological cases (Fig 1).

The regional hospital carried out more than three times the number of transfusions in each of the district hospitals over the same period.

Male to female ratio of transfusion recipients was 1:1.2 which is similar to the male to female ratio in the Ghanaian population.

It was found that the predominant indications for blood transfusion in childhood in Ashanti region were nutritional and haemolytic anaemia. In later life, however, haemorrhage became more important than nutritional anaemia. The district hospitals saw many more haemolytic cases than the regional hospital. In 24% of cases the antecedent pathology was indeterminate (fig 2).

3.2.3. Differences in blood transfusion practices between hospitals in the region studied

According to the preset criteria 17% (46/277) of the transfusion episodes were found to be avoidable and 63%

Fig 1. Distribution of transfusions in Hospital Departments

% transfusion

Hospital Departments
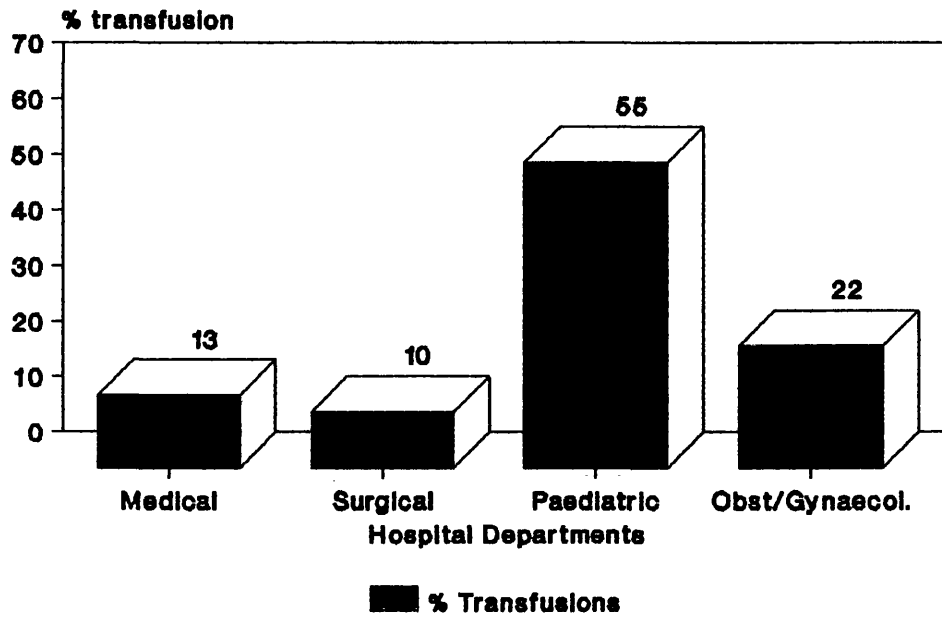
■ % Transfusions

Fig 2. Causes for Blood Transfusions in Hospitals

% transfusion

Cause for transfusion

■ Regional Hospital (n=177)   ▨ District Hospitals (n=100)
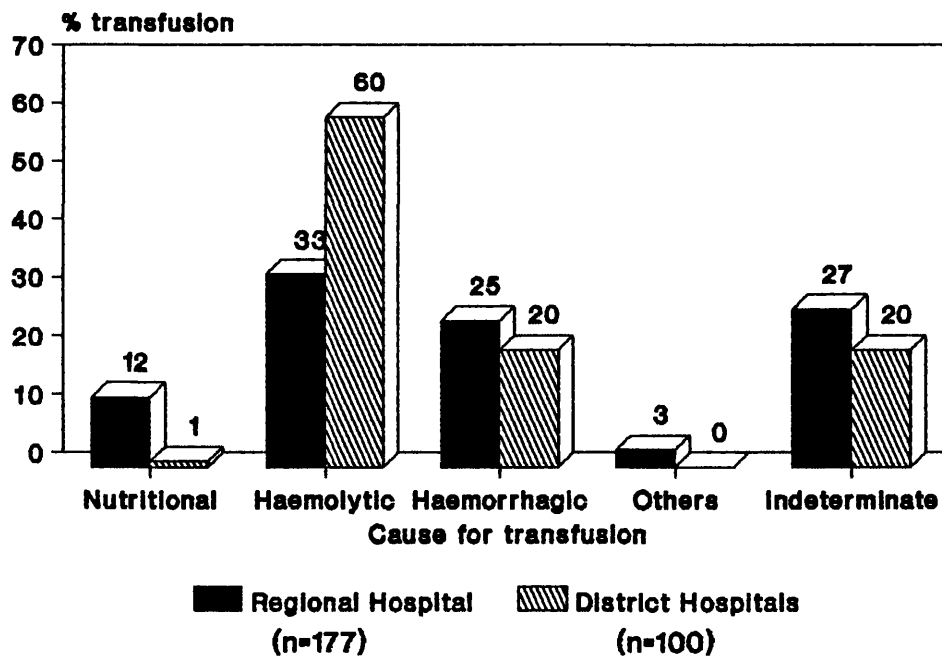
(174/277) unavoidable. In 21% of the episodes the circumstances were indeterminate.

The proportion of indeterminates were similar in both types of hospitals. However, the regional hospital had 19.7% more avoidable transfusions than the district hospitals combined (p< 0.001) (Fig 3).

It was suggestive from the criteria that the indeterminate transfusion episodes lacked appropriate documentation for various reasons.

Assuming that the poor documentation could lead to erroneous justification for the transfusion the indeterminates were classified with the avoidables as unsatisfactory circumstances for the transfusion.   A difference of 19.1% was found for the 2 groups of hospitals regarding the unsatisfactory blood transfusion practices (95% C.I.= 7.9% - 30.3%) in favour of the district hospitals.

For the benefit of the doubt, the indeterminates were excluded from the sample.   Again a difference of 26.5% (95% C.I.= 17.3% - 35.7%) was found in the proportion of avoidables for the 2 types of hospitals in favour of the district hospitals.

Fig 3. Transfusion Practices in in the Hospitals

% transfusion

Unavoidable
(p < 0.001)

Justification for transfusion

Avoidable   Indeterminate

■ Regional Hospital   ▨ District Hospital
(n=177)   (n=100)
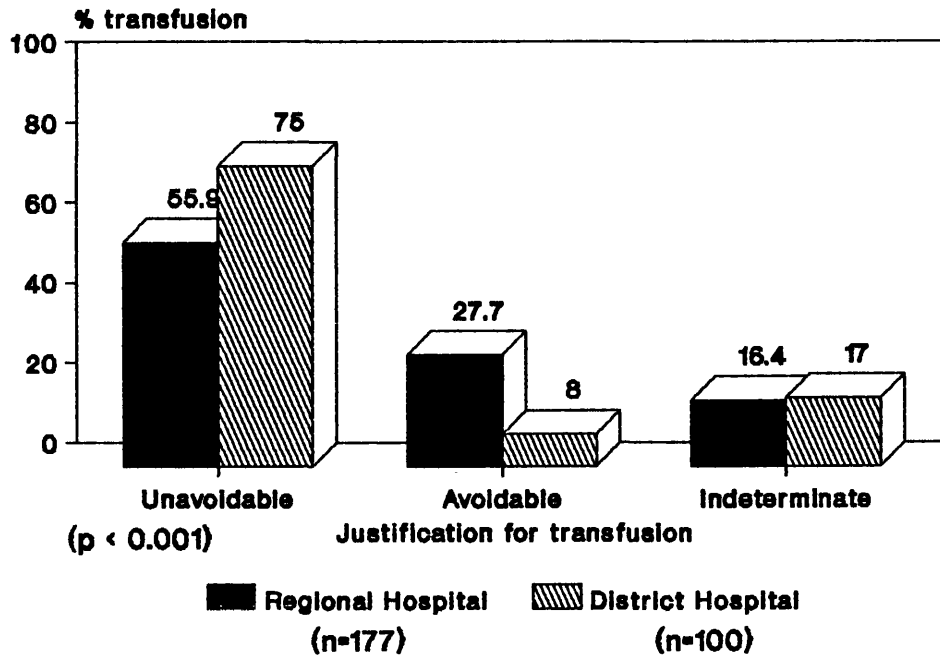
Fig 4. Use of Blood and Blood Components In Hospitals

% transfusion

Regional (n=176)   Districts (n=100)
(p < 0.001)   Hospitals

■ Whole Blood   ▨ Packed Cells
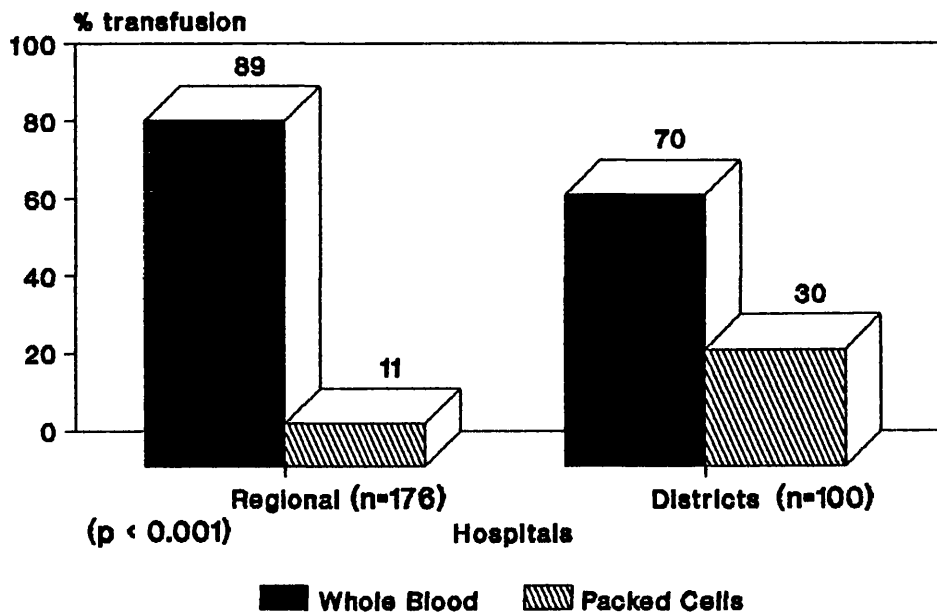
Practices:

Some of the reasons for the avoidable transfusions given include dire emergencies (hence failure to carry out all the necessary preliminary investigations) and unreliable laboratory results.

It was found that the clinicians relied extensively on subjective clinical findings. There was often the tendency to over-estimate the risk involved in withholding a blood transfusion as the indications were often based more on judgement at a single point in time rather than on continuous assessment for deteriorating symptoms.

Studies have shown that anaemia itself does not constitute a contributing factor to mortality (Elwood, Waters et al, 1974 Elwood, Shinton et al 1971), that its symptoms do no correlate with haemoglobin level, and that a rise in haemoglobin level does not produce beneficial results on cardiorespiratory symptoms or psychomotor function when the initial Hb is above 8g/dl (Elwood). In this regard the criteria applied in this study may be found rather loose. Applying stricter criteria, however, would have identified more inappropriate circumstances for blood transfusions. However, in the light of the economic hardships faced by some of the patients in these areas a physician might opt to transfuse rather than delaying and allowing some intercurrent infection like malaria to cause sudden death.

It is probable that the laboratory services were overwhelmed

regional hospital considering the load of out-patients with anaemia.

3.2.5 Results on the Appropriate use of Blood and Blood Components:

About 50% of transfusions in the hospitals (regional/districts) are for anaemia secondary to haemolysis. Thus it would have been expected that there be a high proportion of packed cells used in the transfusions. However, 82% of all transfusions were with whole blood whereas 18% were with packed cells (Fig 4). The districts used more packed cell than the regional hospital probably because they saw more cases of anaemia secondary to haemolysis (see fig 2).

3.2.6 Results on blood transfusion practices within hospital departments:

The surgical and obstetric and gynaecological departments together (surgicals) carried out about twice as much avoidable transfusion and twice as much transfusions under indeterminate circumstances as the medical and paediatric departments together (non-surgicals) (Fig 5, $p< 0.001$).

Grouping the indeterminates and the avoidables for the reason of having been carried out under unsatisfactory circumstances a difference of 23.6% (95% C.I.=12.3% - 34.3%)

Fig 5. Transfusion Practices in Hospital Departments

% transfusions

Unavoidable
(p < 0.001)

Avoidable

Indeterminate

Justification for transfusion

■ Non-surgical
(n=188)

▨ Surgical
(n=89)

Fig 6. Circumstances for Blood Transfusions

% transfusions

Satisfactory
(p <0.001)

Unsatisfactory

Circumstances for transfusion
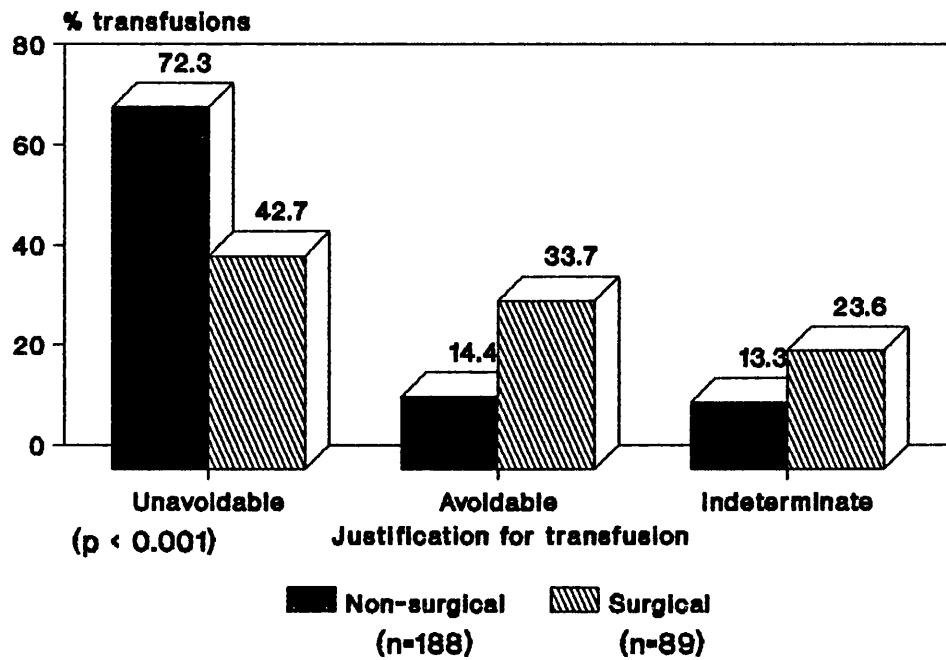
■ Non-surgicals
(n=188)
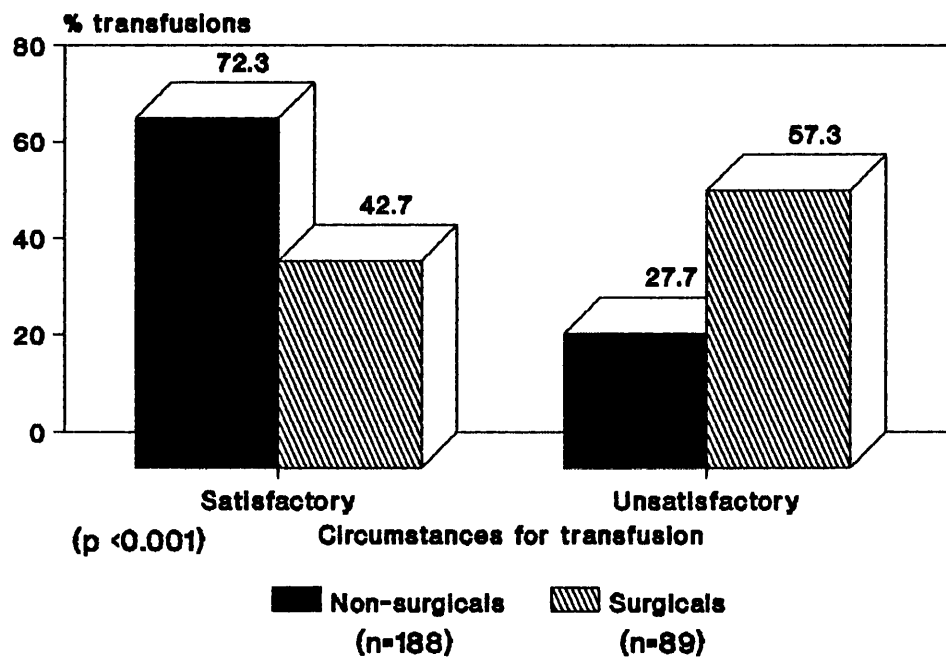
▨ Surgicals
(n=89)

favour of the medicals (Fig 6).

Excluding the indeterminates for the benefit of the doubt a
difference of 27.5% between the proportion of avoidable
transfusions for the surgicals and the non-surgicals was
found in favour of the non-surgicals (95% C.I.=14.4% -
46.6%).

Further view into the practices of the surgical and
obstetric/gynaecology departments did not revealed much
difference between the unavoidable and avoidable blood
transfusions, and also whether it was for an emergency or an
elective case (p>0.5) (Fig 7).

Again, regarding the amount of blood transfused 73% of the
inappropriate amounts transfused were with the surgicals
(general surgery and obst/gynaecology) whereas 27% were with
the non-surgical disciplines (paediatrics/medicine)
(p<<0.01). The surgical practices were associated with
significantly more unsatisfactory circumstances for blood
transfusions than non-surgical practices (Fig 8).

3.2.7 Reasons for the differences:

Pre- and post-operation transfusions carried out by the
surgicals tend to be based more on subjective than objective
circumstances.
The need for transfusion during a surgical procedure is

Fig 7. Blood Transfusion Practices in Elective and Emergency Surgery

% transfusions

```
100 ┬
    │
 80 ┤                        73
    │                        ┌──┐      62.5
 60 ┤                        │██│      ┌──┐
    │                        │██│      │░░│
 40 ┤            37.6        │██│      │░░│
    │            ┌──┐        │██│      │░░│
    │     27     │░░│        │██│      │░░│
 20 ┤     ┌──┐   │░░│        │██│      │░░│
    │     │██│   │░░│        │██│      │░░│
  0 ┴─────┴──┴───┴──┴────────┴──┴──────┴──┴──
      Satisfactory            Unsatisfactory
(p > 0.05)     Circumstances for transfusion
```
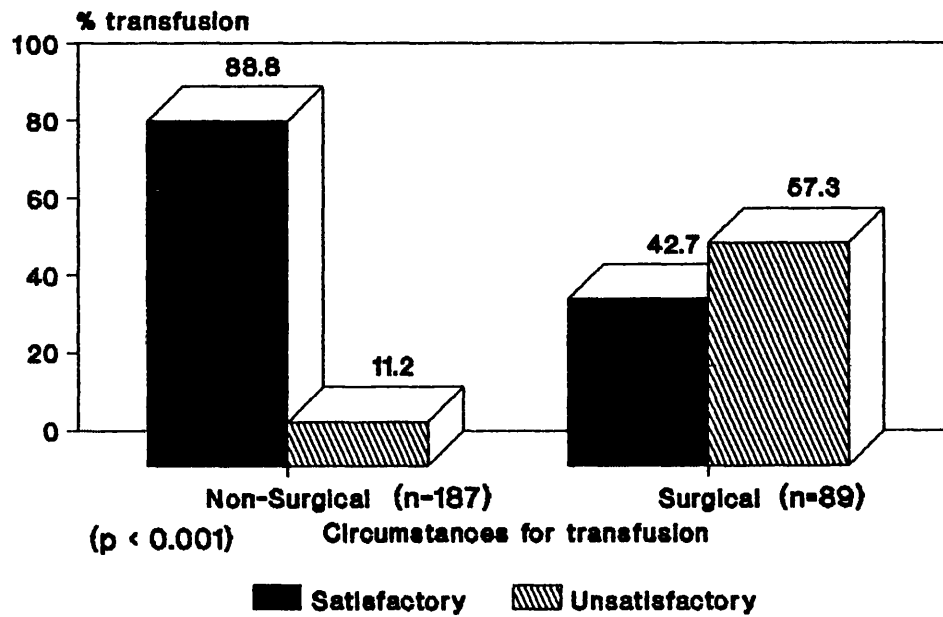
■ Elective Surgery   ░ Emergency Surgery
     (n=15)   (n=32)
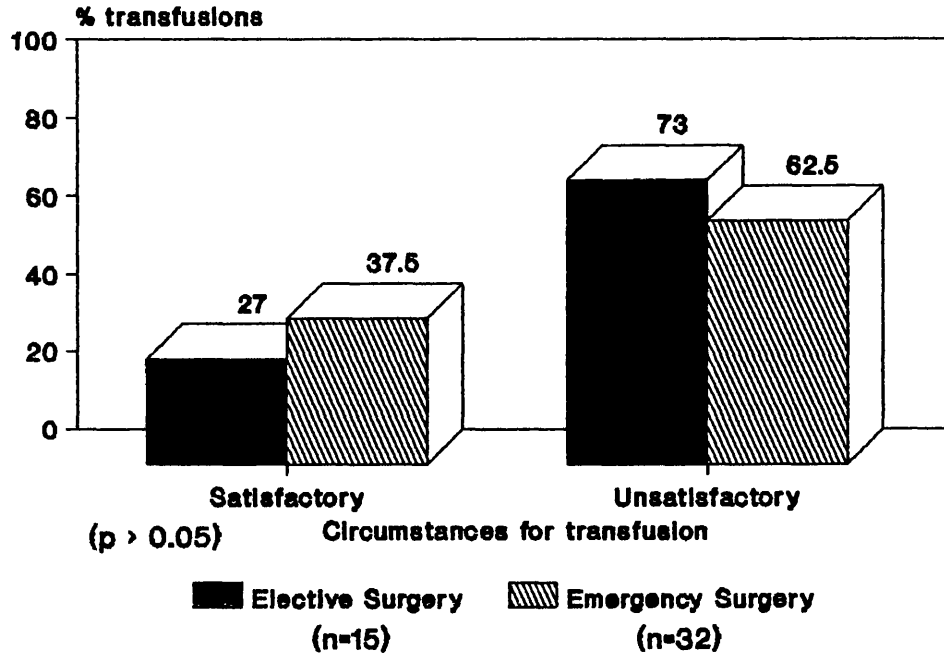
Fig 8. Amount of Blood Transfused in Hospital Departments

% transfusion

```
100 ┬
    │      88.8
 80 ┤      ┌──┐
    │      │██│
    │      │██│                          57.3
 60 ┤      │██│                          ┌──┐
    │      │██│              42.7         │░░│
 40 ┤      │██│              ┌──┐         │░░│
    │      │██│              │██│         │░░│
    │      │██│      11.2    │██│         │░░│
 20 ┤      │██│      ┌──┐    │██│         │░░│
    │      │██│      │░░│    │██│         │░░│
  0 ┴──────┴──┴──────┴──┴────┴──┴─────────┴──┴──
      Non-Surgical (n-187)      Surgical (n=89)
(p < 0.001)     Circumstances for transfusion
```

■ Satisfactory   ░ Unsatisfactory

In principle, the rate of blood transfusions in the surgical disciplines is much higher than in the medicals. Perhaps, this is the reason why the latter shows more flaws in justifying the need for a transfusion.

3.3 RESULTS ON KNOWLEDGE ABOUT BLOOD TRANSFUSION AND AIDS.

211 interviews were conducted on people aged over 16 years. 36% were male and 55% female. This comprised 28% skilled workers, 55% unskilled workers and 15% students/unemployed.

The responses did not differ significantly between occupational groups nor sexes.

3.3.1 Results on knowledge about blood transfusion:

25% of respondents resented blood donation.

55% were misinformed about conditions of ill health associated with blood donation.

38% were misinformed about health hazards associated with blood transfusion.

Discussion:

Estimating that about one half of the potential blood donor population are misinformed in one way or the other about blood transfusion it may be inferred that this could be an underlying reason why 25% of the respondents resented blood donation.

The poor contribution of less than 10% made by voluntary blood donations to the blood bank in the regional hospital in this study is evident of the fact that blood donor activities are on the decline in current blood transfusion services in the region.

The reasons are partly due to transportation and other managerial difficulties.

3.3.2. Results on knowledge on AIDS:

Only 1% of the interviewees had never heard of AIDS.

10% of respondents did not have any idea of how AIDS was acquired.

10% of the respondents thought AIDS was not of primary concern to Ghanaians.

25% had heard of AIDS from other sources apart from the media.

It was quite well known that AIDS was acquired through sexual contact (i.e. 182/210 = 86% respondents).

40% mentioned inoculation i.e. injections shaving sticks whereas 38% mentioned blood transfusion as modes of acquiring HIV infection and AIDS.

Perhaps the issues involving sex are more interesting or alarming to the general public than others in the spread of AIDS.

39% (83/209) gave wrong responses either because they did not know or did not quite understand the issue in question.

45% of respondents (94/209) wanted some more education on the subject of AIDS.

20% (43/209) wanted screening to be done to protect others.

10% (20/209) wanted HIV positive cases to be quarantined.

18% asked for appropriate measures in health centres to protect other patients.

3.3.4 Results on individual measures to prevent spread of AIDS.

30% were quite ignorant of how they could prevent the spread of AIDS.

Only 8% of respondents mentioned the use of condoms. Of these 30% were male and 70% female.

63% (132/210) would limit their sexual contacts and avoid promiscuity.

This suggests that the males themselves are probably not very keen on using condoms as a preventive measure against the spread of AIDS. It is also probable that people are generally not aware about the importance of condoms in the prevention of spread of the disease.

3.3.5 Results on individual actions in the event of HIV infection:

Only 1% would want to spread it if they knew they were infected.

7% would commit suicide if they ever got infected.

44% would see a doctor in hope of treatment (93/210).

23% of respondents would resort to life styles that would avoid spreading it (eg. self isolation).

Some 35% of respondents would resign themselves to fate.

Discussion:

It was observed that there was very little or no information at all on AIDS in the hospitals in the form of posters for the general public. It,however, seems that the media still remains the a very important source of information to this community.

It appeared that many of the people did not really understand the medical and socio-economic consequences of AIDS/HIV infection.

The issue of AIDS is not very commonly discussed in public except for an occasional comment among peer groups. Opinions are very much diverse. Appreciation of the problem is, therefore, variable in this population. It was wondered whether there has been any behavioural change as a result of

students revealed that 10% did not think of AIDS as a sexually-transmitted disease (Omashakin et al 1989) and 90% did not relate it to sex. It was thought that their responses was backed by their understanding of the issue.

4 CONCLUSIONS AND RECOMMENDATIONS:

4.1 HIV infection in the Blood Transfusion Service:

HIV infection is a reality in Ghana. In the area studied in the Ashanti region between 5%-10% of all children who have received blood transfusion within the last 5 years may be positive for the human immunodeficiency virus (HIV).

Currently, there is a prevalence of about 4%-6% HIV positives among healthy blood donors in the area studied which fairly agrees with the number of children that may have transfusion-transmitted HIV infection acquired within the last 5 years.

Blood is not as safe as it is expected to be for transfusion due to lapses in the screening procedure and organisation in the blood transfusion services. Suboptimal use is made of blood and blood components.

4.2 Action to prevent HIV infection in the blood transfusion service:

It is believed that the present system of operation of the blood transfusion services (blood banks) would need to be modified if blood and blood-product transfusion is to remain safe within 'reasonable' limits:

The situation could be improved if these district hospitals were equipped with a quick, cheap but sensitive HIV screening method that can be applied to individual (as

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the sample would need to be sent to the regional centre for confirmation periodically. This will tend to reduce the risk of transfusion-transmitted HIV infection.

Another option is to regionalise the blood transfusion services in the country making them independent of the hospitals, and with strong donor liaison (voluntary donor recruitment) services to ensure a constant large supply of blood at all times. All hospitals in the region would draw their blood requirements periodically from this regional blood transfusion centre in a similar way as drugs and vaccines are obtained.

This would help identify low risk groups for blood donation hence cutting down the degree of wastage in their bleeding sessions.

One of the suggested strategies to reduce the problem of high wastage in screening is the selection of donors at lowest risk of HIV infection using medical (e.g. unexplained weight loss, night sweats, lymphadenopathy) and epidemiologic (infection rates in population groups) criteria. A report, however, suggests that this would eliminate about 70% of prospective blood donors almost all of whom would be HIV antibody negative (Nzilambi et al 1987). In view of this patient-selected donors or directed donation might still be the alternative answer.

Theoretically, this system would be expected to operate at a lower cost of production by virtue of the numbers. It would

components and hence encourage the appropriate use of blood and blood products.

Another approach to the interruption of transmission of infection is inactivation of viruses in blood components. This has the advantage of being virus-variant independent and has been successfully applied to blood derivatives (Prodouz et al, Matthews et al 1988). These methods could be used to augment the safety of donated blood with uncertain or doubtful HIV screening results.

The cost-effectiveness of these approaches is, however, beyond the scope of this study.

The extensive use of modern antigen tests in a blood transfusion service has practical limitations as it can only be used as an adjunct to antibody tests in special cases in the early phase of infection (Anyiwo). Antigen-detection tests may however be a prospect hopefully of the near future.

Whatever the system, there is the need for good documentation to make evaluation and re-planning possible. Also the Ministry of Health (MOH) would in the long run have to address itself to issues on the rights and freedom of blood donors. These include the following:

Whether to inform prospective donors that their blood would be tested;

What should be done about the availability of HIV tests in the community;

How to interpret HIV test results;

Whether and how to notify donors of test results and the confidentiality of test results; and

How to handle recipients of prior unit from these donors.

Because of the changing donor requirements and sexual habits of blood donors it is quite difficult to predict the risk of HIV transmission in a blood transfusion service. We could only know what it might have been. Such studies would need to be done from time to time to allow some predictions for the future.

4.3 The use of Blood in Hospitals:

About a quarter of all blood transfusion carried out in the area studied are avoidable. On the whole a total of about 38% of all transfusion episodes are carried out under unsatisfactory circumstances according to criteria set to justify transfusions in this study. Surgical practices were associated with more frequent unsatisfactory transfusion practices than non-surgical practices. The reason for this seems more of habitual practice than circumstantial as there is no difference in practice between emergency and elective surgery.

4.4 Towards more appropriate use of blood in hospitals:

There is a need to set guidelines for transfusion in all hospital departments which should emphasise the use of lab results and strategies in operative procedure especially regarding haemostasis and blood loss in surgery. This should be based on what is appropriate, acceptable and reasonable in the local circumstances. There is also the need to set minimum safety standards for all the blood banks and a policy of rigid control of their regulations.

One of the suggested strategies in surgical practice is pre-deposit autologous transfusion. Another method is bleeding the patient prior to operation, swelling the blood volume with blood volume expanders, and then carrying out an autologous transfusion at the end of the operative procedure. This process has the advantage of reducing the intraoperative blood loss considerably as a result of haemodilution and is recommended for adult elective surgery, especially.

Pre-transfusion haemoglobin check is a very important deciding factor in whether a patient receives a transfusion or not. It would be appreciated that one haemoglobin count check correctly done to avoid an episode of transfusion means having saved one patient from the risks of transfusion and also means having saved on the cost of processing at least one unit of blood which includes the cost of HIV screening.

for the appropriate clinical circumstances. This should be
supported by an improved infrastructure which is more likely
to be feasible in a blood transfusion service organised on a
regional level.

Modern donor screening for HIV is imperfect in ensuring a
safety of blood for transfusion.   It is uncertain what
degree of safety is acceptable.   To further reduce the risk
of transfusion-transmitted HIV infection physicians need to
balance the risks and benefits of transfusion seriously with
a view to reducing the frequency.

Further enquiry into the circumstances of transfusions in
the surgical disciplines is required.

4.5 Gaps in attitudes and awareness of hospital-users on
AIDS and Blood Transfusions

Up to a half of the respondents in this study are
misinformed on health hazards associated with blood
transfusion or donation and perhaps the quarter who resented
blood donations are a manifestation of this misinformation.

It seems information on AIDS passed across so far through
the media and other sources has not been well received so
far in the area. It is interesting to note that over three
quarters of the respondents had some facts about AIDS as
well as some misconceptions, and during the interview some
would interrupt with questions about the subject but the

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answers had to be suspended until the end.

Other sources of spread of AIDS apart from sexual contact were much less appreciated by the respondents. About a third of respondents were ignorant of how to avoid infection. The use of condoms was not a popular option among the respondents.

About half of them wanted more information on the subject.

4.6 Improving attitudes by increasing awareness:

More research is required into why people resent blood transfusions.It is quite likely that people could be motivated through well-organised educational programmes and publicity in educational institutions, media and public meeting places to donate blood voluntarily. It was interesting to note that there was a desire in this population to know more about AIDS and associated problems. Perhaps this could be capitalised on to initiate and support community-based health information programmes for the future.

There is the need for more open public discussions, especially in peer groups, and the acceptance of the fact that everyone is potentially at risk of HIV infection including health workers.

It is recommended that these studies be done more extensively to provide valuable information for future planning and setting of

health priorities in the control of HIV infection.

A lot of information is required in West African countries on the epidemiology of AIDS and HIV infection. Suppressing information in this regard in the interest of the rights and freedom of individuals might probably be doing more harm than good to mankind.

4.7. Other issues:

A problem cropping up in some hospitals is the reluctance of the laboratory personnel to handle specimens from HIV positive patients for fear of being infected. Fortunately this was not observed in the hospitals studied. It, however, suggests the need to educate all hospital personnel on safety precautions against HIV infection.

Another other observation made that does not relate very much to the aims of this study is the mode of disposal of wastes in the blood bank. Discarded blood was simply poured down the drain in all the hospitals and other materials contaminated with blood was disposed of with other vegetable wastes. This practice is potentially hazardous to children playing around the hospital. HIV is thermolabile (Spine et al) and susceptible to chemical disinfectants (Martin et al 1985). Boiling or leaving in household bleach for more than 30 minutes could be highly effective in preventing nosocomial contamination.

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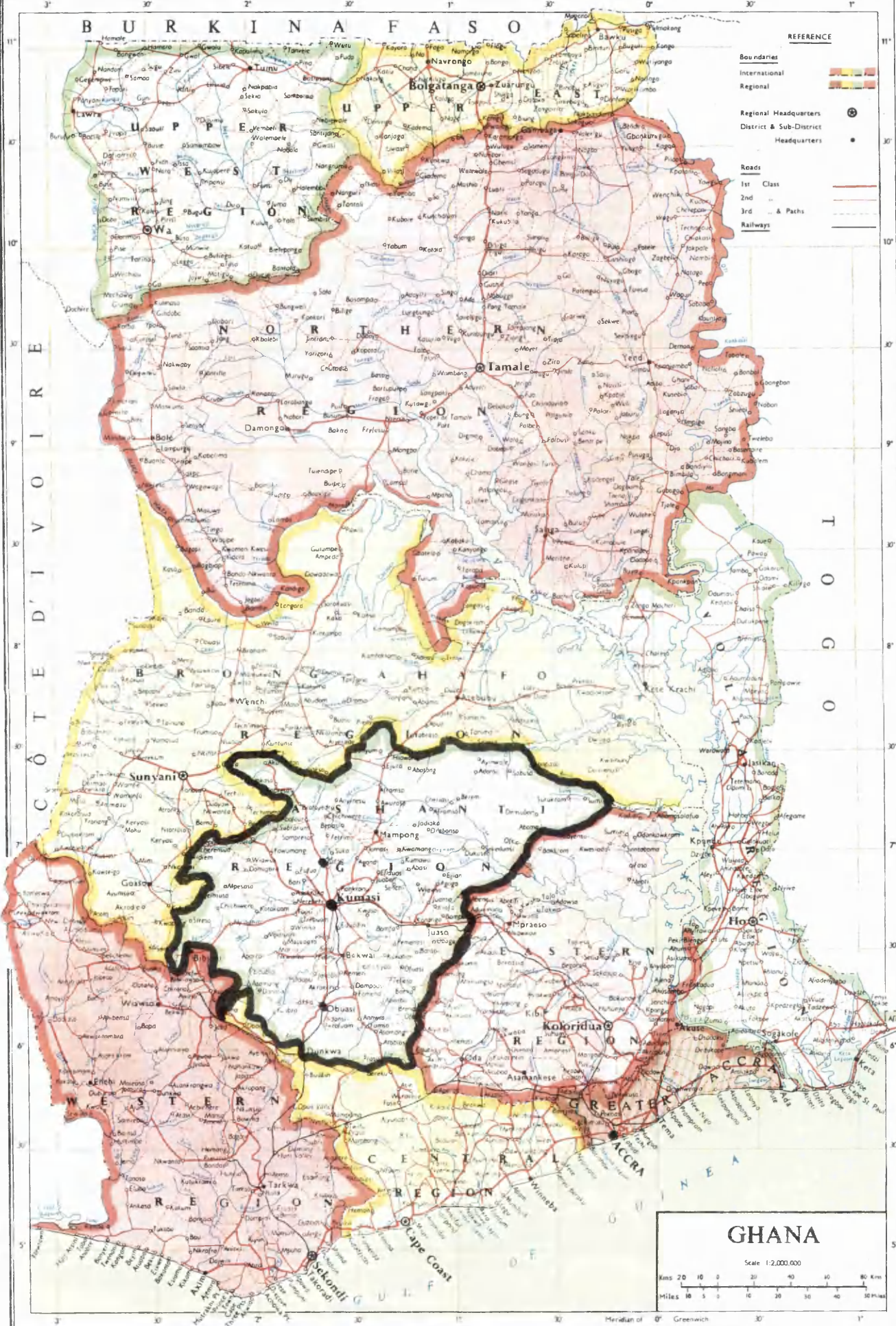Worldwide AIDS Weekly Surveillance Report, Geneva, WHO,
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2.1 History of the Disease AIDS

Acquired Immunodeficiency Disease (AIDS) was first described in 1981 in gay men in the east and west coast of the United States (Centres for Disease Control MMWR 1981, 10 and 30) mainly ion homosexuals and in I.V. drug users. By 1983 and 1984 reports from other places in the world appeared on transfusion associated HIV infection (Andreani et al, Delpre et al Melbye et al, Lissen et al) and by 1984-85 various reports from Africa suggested a heterosexual mode of transmission as well.

HIV infection is now recognised as a major health problem in many Central and East African countries sexual and vertical transmissions being the most important modes of transmission (Serwada et al, Kreiss et al, Mann et al). A similar transmission pattern seem to prevail in most other African countries although documentation is rather poor. Recent reviews and policy statements have emphasised that, with isolated exceptions, most nations lack scientific data on patterns of sexual behaviour in their populations (Turner et al).

For political and social reasons the topic of HIV infection has become a sensitive issue which is hiding valuable information about its epidemiology. Even some countries have failed to accept the reality of the problem until much recently.

GHANA

BURKINA FASO

CÔTE D'IVOIRE

TOGO

Regions: UPPER EAST · UPPER WEST REGION · NORTHERN REGION · BRONG AHAFO REGION · ASHANTI REGION · EASTERN REGION · WESTERN REGION · CENTRAL REGION · VOLTA REGION · GREATER ACCRA

Regional Headquarters: Wa · Bolgatanga · Tamale · Sunyani · Kumasi · Koforidua · Ho · Accra · Cape Coast · Sekondi

TRANSFUSIONS   (i) CASE NUMBER: ☐.☐☐☐☐

RECIPIENT:
NAME _____   DOB _____

(ii) SEX: 1. Male   ☐   (iii) AGE   ☐.☐
            2. Female

(iv) WARD: ☐
     1. Medical   (v) PARITY: ☐
     2. Surgical
     3. Pediatric   (vi) OPERATION: 1. Elective   ☐
     4. Obstetric/Gynaec   2. Emergency

(vii) WORKING DIAGNOSIS _____   ☐☐

(viii) HISTORY OF BLOOD TRANSFUSION IN LAST 5 YEARS   ☐
                  1. Yes   2. No

(ix) SOURCE OF THE BLOOD: ☐
1. Self   2. Blood bank pool 3. Relation   4. Friend

(x) RELEVANT SYMPTOMS: 1. Yes 2. No

Palpitations ☐   Shortness of breath ☐   Jaundice   ☐

Other

(xi) RELEVANT PHYSICAL SIGNS:
PALLOR -1. mild (+)   PULSE RATE: 1.<60/min   ☐
        2. moderate (++)   ☐   2. 60-90/min
        3. severe (+++)   3. 91-130/min
        4. Very severe (++++)   4. >130/min

     Other physical signs:

(xii) RELEVANT LABORATORY RESULTS

HB: 1. 10-12G/DL (mild)   HAEMATOCRIT:
      2. 7-9.9G/DL (moderate) ☐   1. < 30%   ☐
      3. 5-6.9G/DL (severe)   2. > 30%
      4. < 5G/DL   (very severe)

PLATELET COUNT: PARTIAL THROMBOPLASTIN TIME:
1. >50,000/1   ☐   1. <50 secs   ☐
2. 20-50,000/1   2. >50 secs
3. <20,000/1

(xiv)PHYSICIAN'S INDICATION FOR TRANSFUSION:

Unit1 Unit2 Unit3 Unit4 Unit5 Unit6

(xv) TRANSFUSION RECEIVED:
1.   Whole blood
2.   Packed cells
3.   Fresh-Frozen Plasma
4.   Platelets
5.   Cryoprecipitate

☐ ☐ ☐ ☐ ☐ ☐

(xvi) SOURCE OF PRODUCT:
1.   Self
2.   Relation
     Blood bank pool:
3.   commercial donor
4.   voluntary donor
5.   Friend
6.   Other

☐ ☐ ☐ ☐ ☐ ☐

(xvii) HIV SCREENED
     1. Yes 2. No
If Yes,
1. Elisa
2. Western blot
3. Immunoflorecsent (IFAT)
4. Other

☐ ☐ ☐ ☐ ☐ ☐

☐ ☐ ☐ ☐ ☐ ☐

(xviii) WHY NO SCREENING:
1. Emergency
2. Lack of reagent
3. Equipment failure
4. Lack of policy
5. Other

☐ ☐ ☐ ☐ ☐ ☐

(xix)TRANSFUSION KIT:

  NEEDLE

☐ ☐ ☐ ☐ ☐ ☐

  BLOOD-GIVING SET

☐ ☐ ☐ ☐ ☐ ☐

  BOTTLE/BAG

☐ ☐ ☐ ☐ ☐ ☐

1. First use   1. Sterilised
2. Re-use   2. Disinfected
                       3. Just rinsed

(xx) HIV CHEK RESULT: 1. Positive 2. Negative   ☐

HIV SCREENING OF BOTTLED BLOOD

START | | | | | | | DATE | | | | | | |

END | | | | | | |

UNIT OF BLOOD	HIV SCREENING METHOD	SCREENING RESULTS HIV1 HIV2	DATE OF SPECIMEN COLLECTION	COMMENT
	1. Elisa 2. W/blot 3. IFAT 4. HIV Chek1,2 5. HIV Chek1	1. +ve 2. -ve		
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

1

1) Is blood donation good or bad for your health?
....
....

2) Are there any diseases or conditions of ill-health you know
   of that are associated with with donating blood? If so what?
....
....
....
....

3) Are ther any diseases or condition of ill-health you know of
   that are associated with receiving blood (i.e blood transfu-
   sions)? If so what?
....
....
....

4) (a) Have you heard of AIDS? ....
   (b) How did you hear about AIDS? ....
       ....
       ....

5) How does one get AIDS? ....
....
....

6) Should people in Ghana be concerned with the problem of
   AIDS/HIV infection?
....
....

7) What would you like health services to do to reduce or stop
   the spread of AIDS/HIV infection in Ghana? ....
....
....
....

8) What can you do to prevent getting AIDS/HIV infection?
....
....
....
....

9) What would you do if you had AIDS/HIV infection?
....
....
....

Picture 1:   "HIVCHEK 1+2" test devices:

a) before the test

b) after the test showing positive reactions as red
dots in the centre of the block. Reaction is
completed within 10 minutes.
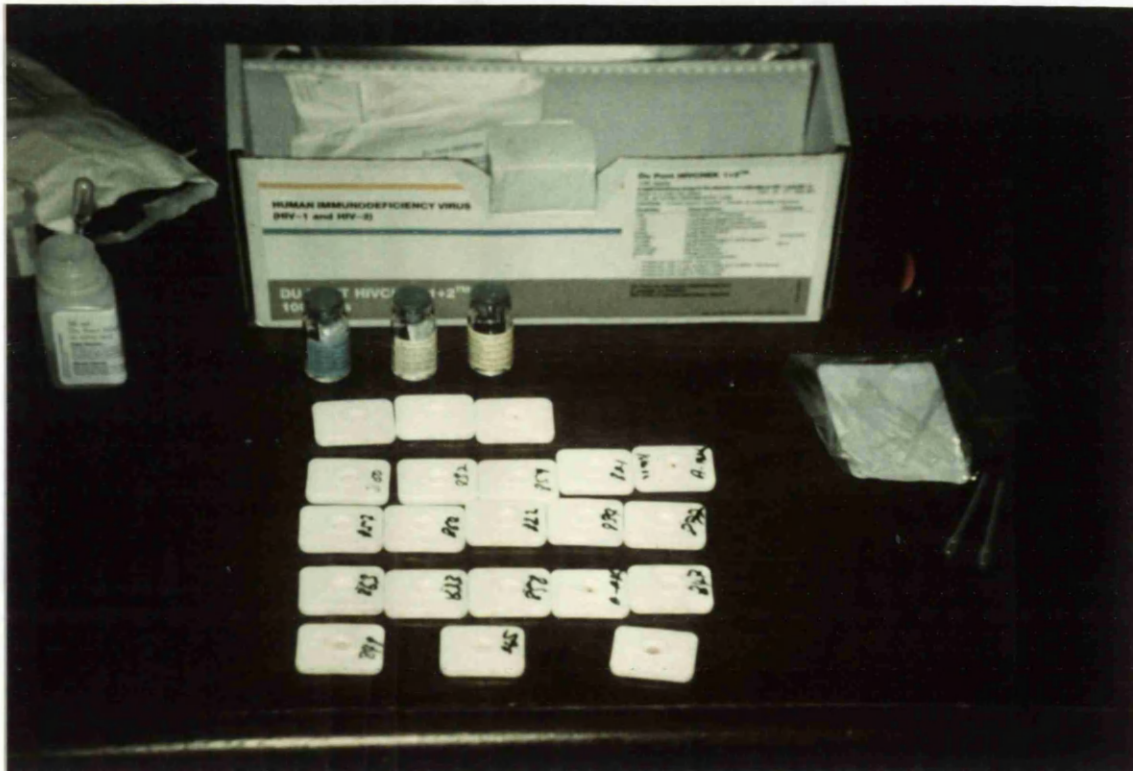
Picture 2:   An interview with a young person about blood donation
             and transfusion and AIDS/HIV infection