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**COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH,  
DEPARTMENT OF HEALTH SYSTEMS MANAGEMENT AND POLICY**

**MASS CAUSALITY BLOOD TRANSFUSION PREPAREDNESS AND APPROPRIATE  
CLINICAL USE BY PUBLIC GOVERNMENT HOSPITALS IN ADDIS ABABA,  
ETHIOPIA; A QUALITATIVE STUDY**

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**ADDIS ABABA UNIVERSITY  
COLLEGE OF HEALTH SCIENCES  
SCHOOL OF PUBLIC HEALTH**

**Mass Causality Blood Transfusion Preparedness and appropriate clinical use  
by Public Government Hospitals in Addis Ababa, Ethiopia; Qualitative Study**

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## **Acronym**

**AAU** - Addis Ababa University

**ASA** –American Society of Anesthesiologists

**BTS** – Blood Transfusion Service

**DCR** - Damage Control Resuscitation

**EDP** - Emergency Donor Panel

**HIV** - Human Immunodeficiency Virus

**HTC** – Hospital Transfusion Committee

**MCE** - Mass Casualty Event

**MHP** - Major Hemorrhage Protocol

**NBBS** –National Blood Bank Service

**NHSBT**- NHS Blood and Transplant

**RBC**- Red Blood Cells

**RDCR**- Remote Damage Control Resuscitation

**SSA** - Sub-Saharan Africa

**VBD** - Voluntary Blood Donation

**VNRBD** - Voluntary Non-Remunerated Blood Donation

**WHO**- World Health Organization

## **Abstract**

### **Background:**

The importance for assessing hospital blood transfusion preparedness is becoming significant as a first line of mass casualty preparedness, due to increasing number of mass casualty phenomenon globally. Transfusion support is a key enabler to the response to mass casualty events. Transfusion demand and capability planning should be an integrated part of the medical planning process for emergency system preparedness.

**Objective:** To assess mass casualty blood transfusion preparedness and appropriate clinical use of blood by public government hospitals in Addis Ababa, Ethiopia 2017.

**Method:** A qualitative research method with content analysis approach was followed. The study was conducted from April 01-30/2018 at selected public government hospitals in Addis Ababa. Using purposive sampling method, key informants which include staffs working at mini blood bank service and hospitals administration body from each hospital were recruited basically until the information is saturated with maximum of 22 participants. Data was collected by in-depth interview using semi-structured interview guides. Notes and audio recording was used to take data and then it was transcribed verbatim and translated. Open code software version 4.02 was used for coding and further analysis. Trustworthiness was assured by strictly following the basic qualitative study principles.

**Result;** Majority of the study participants don't have the information about mass casualty blood transfusion preparedness. There are no real preparedness activities because there is shortage of blood for regular scheduled transfusion. The blood ordering process is not standardized in the transfusing hospitals. This is evidenced by suboptimal documentation of the blood ordering processes. There are no structural and operational blood order guidelines being followed in any of the transfusing hospitals.

**Conclusion** The number of life-threatening injuries shows an increasing trend recently. And so the notion of precious blood gets into a focus of attention. So hospitals in Addis Ababa need mass casualty blood transfusion preparedness. There was substantial variation in the appropriate transfusion practices across public government hospitals and appropriateness was influenced by the department staffs because of lack of training on the appropriate clinical use of blood and poor facilitation of the hospitals. **Key words;** -mass casualty, appropriate clinical use of blood, content analysis



# **1. Introduction**

## **1.1 Background**

Mass casualty events (MCEs), in medical terms, are “single or simultaneous events where the normal major incident response of one or several health organizations must be augmented by extraordinary measures in order to maintain an efficient, suitable and sustainable response(1).” Most are marked by a relatively sudden and dramatic event that causes a surge in numbers of patients.

Mass casualty events are an important health care issue. Despite a plateau in the rate of all types of disasters recorded worldwide in the past eight years, there has been a continued increase in human-made disasters and mass casualty incidents. The mortality from terrorist incidents alone has more than doubled since 2007. Planned mass gatherings such as sporting and religious events also provide the potential for MCEs(2) .

Massive casualty events have the potential to generate many trauma victims; therefore, health care services must be prepared across the continuum of care (3). The delivery of blood transfusion support in the context of these incidents has received increasing interest.

The appropriate management of severe hemorrhage offers a window of opportunity for improving mass casualty event outcomes (4). This opportunity has developed primarily through our further understanding of the role blood and, more specifically, coagulation therapy, plays in - damage control resuscitation (DCR) (5). Driving the focus on optimal transfusion support in damage control resuscitation (DCR) is the increasing use of major hemorrhage protocols (MHPs) to ensure early delivery of red blood cells (RBCs) and hemostatic components. In addition, there has been a wider acceptance of the restricted use of pre hospital non–blood-based fluids, in favor of waiting until major hemorrhage protocol can be provided with in hospitals(6).

The early provision of blood has driven an international movement toward the delivery of these products in the pre hospital environment in an effort to further improve trauma outcomes (7). The practice of pre hospital blood transfusion combined with additional hemostatic adjuncts such as tourniquets and tranexamic acid form part of the new overall paradigm of remote DCR(RDCR)(8). Providing damage control resuscitation and remote damage control resuscitation in the setting of an MCE is still relatively untested. The prospect of delivering blood components in the volumes now expected in major hemorrhage already presents a recognized challenge to MCE planners.

Previous studies have illustrated the effect of applying modern-day MHPs during previously reported MCEs, showing a possible three to four times increase in the demand for hemostatic components in certain events.

The addition of delivering this in the pre hospital setting further complicates the issue and is an aspect of transfusion service preparedness for MCEs that has not been previously discussed. The objective of this research is to review the transfusion preparedness to MCEs by the hospitals and to assess the appropriate clinical use of it.

## 1.2 Statement of the problem

The 2015 World Health organization (WHO) theme blood donor day campaign was “thanks for saving my life” on June 14, strongly encourages more people to donate blood voluntarily and regularly with slogan “Give freely, give often blood donation matters(9)”

Implies blood transfusion is an essential component of health care which saves millions of lives each year and young people are the hope and future of a safe blood supply in the world but, is still challenging for many of those who need safe and timely transfusion as part of their clinical management(10).

The need for blood continues to grow globally as health systems become more developed, with improved diagnostic and treatment options and sophisticated medical and surgical procedures requiring Transfusion compounded by population growth and changing demographics, with ageing populations requiring more medical care (11).

Lack of access to safe blood continues to place an unacceptable burden on health and economic development in many parts of developing world (11). An evidence of WHO, 2014 report indicated that, in low-and middle-income countries, median annual donation per center was 3,100 compared to 15,000 in high income countries which shows an ample access difference of blood between low and high-income countries (12). Literatures identified that many factors are responsible.

This is also influenced by lack of information/ misunderstanding and negative attitudes. In more than 125 countries, blood transfusion services has been largely restricted to major urban cities and universal access is not guaranteed for those in most critical need.

In addition to limited supply, the safety especially with regard to risk of transfusion transmissible infection TTI is also an issue of concerns (12). For this WHO and Council of Europe commends for national health authorities that establishment of a well-organized, nationally coordinated blood transfusion service, collection of blood should only from voluntary, unpaid repeat donors who can assist blood bank to manage blood supplies, and schedule transfusion, results safe blood supply and advocates that 35% of the population should donate blood every year, would be an ideal rate for maintaining a country’s stock of blood at acceptable level.

However due to challenges of recruitment of voluntary, non-remunerated blood donors, in many developing countries like Ethiopia with high maternal mortality rate, high motor

accidents(MCE),and with a large non immune population for malaria are unable to meet their national requirements for blood at all times.

There is lack of research conducted in Ethiopia related to blood preparedness for mass casualties incidents (MCE), and the appropriateness of its clinical use also still remains unchecked.

### **1.3 Significance of the study**

The proportion of injured requiring blood varies enormously and is dependent on the event, hemorrhage control, and availability of blood. The delivery of transfusion support in the context of these incidents has received increasing interest. The appropriate management of severe hemorrhage offers a window of opportunity for improving MCE outcomes. The result of this study will show the gaps and the real blood transfusion preparedness for mass causality events of the public government hospitals and their appropriate use of it. It will be beneficial for: the Community, Health personnel, Planners and policy makers, NGOs use of it to determine appropriate strategies to enhance VBD practice and others who are engaged in Blood donation activities.

Hence, findings will be disseminated to the relevant bodies who are involved in improving the MCE blood transfusion preparedness and appropriate clinical use. The end result of this study would identify the possible gaps and potential area of intervention.

### **1.4 Expected Outcomes**

Sometimes hospitals may face more risks and challenges than other organizations, as results certain disaster events that may affect hospital itself; therefore designing a flexible plan and response system that able to adapt whatever disaster situations is precious.

However, consensus regarding concepts of blood preparedness in health facilities is still lacking, even though various literatures supporting the ideas of assessing preparedness.

Assessing the preparedness not only helps to understand the facilities response strategies and capacity to handle mass causality incidents, but it also it is essential to determine whether hospitals are prepared optimally and to ensure that they remaining operative and continues delivering services effectively during and immediately after occurrence of mass causality situations. Thus, it makes to identify and communicate strong points and shortcomings elements those require improvements to the facilities, which in turn allows to determine measures that enables them to confirm the readiness of institutions during mass causality events. Therefore, the findings from the

study will enable hospitals' authorities to identify the areas of strengths and weakness, or gaps, of preparedness capability that require improvements.

Assessing, capacities and resources is the part of initial measures to organize and securing mass causality response and contingency plans, therefore regional (Addis Ababa Health Bureau),federal blood bank service and Federal(Ministry of Health) health care planner and policy designer may utilize the results if the study. The findings may help them to gain a better understanding to the preparedness status of hospitals in the study area, and identify priorities for improvements to strengthen the capacities and capabilities of hospitals on mass causality blood transfusion preparedness.

There is a lack of documented studies on the healthcare facilities preparedness for MCE controlling in Ethiopia. Therefore, the current study will be expected to establish a data for further research works which is a benchmark for all stake holders including hospital administrations and federal blood bank service.

## **2. Literature review**

### **2.1 Blood transfusion preparedness and its use**

Blood used correctly can be lifesaving, used inappropriately it can endanger life. It is important to remember that blood transfusion is only one part of the patient's management. The decision to transfuse blood or blood products should always be based on a careful assessment of clinical and laboratory indications that transfusion is necessary to save life or prevent significant morbidity (13).

While the responsibility of providing and ensuring access to safe blood lies with the Blood Transfusion Services, the final responsibility for the blood transfusion lies with the clinicians (Anesthetists, Surgeons, Obstetricians, and Physicians) who must make the correct decision depending on the clinical condition of the patient. In the operating room it is most often the anesthetist, rather than the surgeon who makes the decision for blood transfusion. As an anesthetist are involved with a wide range of specialties including Trauma, Intensive Care, and often teach students at the undergraduate and postgraduate level, they may actively facilitate the appropriate clinical use of blood (14).

Blood donation is philanthropic deed in which the blood of a healthy person had been drawn voluntarily for the purpose of transfusion. The donated blood can be life-saving for individuals who have lost large amounts of blood because of serious mass causality accidents, as well as for individuals who have become severely anemic or have very low platelet counts and certain hematological disorders such as leukemia (15).

World Health Organization (WHO) recommends countries to focus on young people to achieve 100% non- remunerated voluntary blood donation by 2020. It also recommends that all countries should be self-sufficient in all blood products and that all blood donation should be voluntary, anonymous, and non- remunerated (16). According to its 2011 report, 107 million blood donations are collected globally; approximately half of these are collected in the high-income countries, home to 15% of the world's population.

Blood donation rate in high-income, middle-income, and low-income countries was 39.2, 12.5, and 4.0 donations per 1000 population, respectively. In low-income countries, up to 65% of blood transfusions are given to children under five years of age, whereas, in high-income countries, the most frequently transfused patient group is over 65 years of age, accounting for up to 76% of all

transfusions. Compared to the 2004 report, 7.70 million blood donations incensement was noticed from voluntary unpaid donors in 2011. However, majority of countries still collect more than 50% of their blood supply from replacement or paid donors (11).

## **2.2 Africa's blood transfusion preparedness**

About 234 million major operations are performed worldwide every year; 63 million people undergo surgery for traumatic injuries (MCE), 31 million for treating cancers, and another 10 million for pregnancy-related complications.

Blood is in short supply in sub-Saharan Africa (SSA), and increased demands for blood and blood components have never been met in the African setting(17). The reasons for such shortage may be due to cultural aversion to wards blood donations and the impact of human immunodeficiency virus (HIV) and its treatment in SSA (18). Others have reported high levels of clinical misuse of blood in SSA (19). There are a number of published reports on the safety of blood transfusion in SSA but little published on the clinical use of blood and blood components. The few studies addressing clinical use of blood are from pediatrics in relation to malaria.

For all of these procedures, blood transfusion is mandatory (20). Moreover, the demand of blood for patient management has been growing dramatically due to the sophistication and advancement of clinical medicine. However, the demand and supply have not yet balanced; the demand is escalating.

Despite recommendations that all blood donations should be voluntary and non-remunerated, replacement and paid donors are common throughout Sub-Saharan African countries (21). Surprisingly, 38 African countries collected fewer than 10 donations per 1000 people. There have been gross inadequacy and inequity in access to blood safety in WHO African region. Concurrently, in Sub-Saharan African countries, the need for blood transfusions is high because of maternal morbidity, malnutrition, and a heavy burden of infectious diseases such as malaria(22).

Many countries have faced MCEs but the literature concerning transfusion support is limited. Blood demand in MCEs has been comprehensively reviewed by Glasgow and colleagues. The publications and reports of transfusion service deliverance for MCEs in North America and Israel are particularly valuable.



These nations have significant experience with a wide range of MCEs and face their own environmental and logistical challenges in mounting an effective response (4). Hess and Thomas and Schmidt both highlighted the issues associated with the US experiences of emergency donation in the immediate aftermath of such events during their reviews of blood and disaster. Colleagues in Israel have also described their substantial experience with delivering transfusion support in MCEs, both providing detailed plans of their transfusion response and offering planning estimates for future MCE blood needs (16).

Dann and coworkers stated in a review of the response to nine individual terrorist MCEs in Israel that the established protocol is to prepare three RBC units for each patient “likely to require blood.” In comparison, Shinar and coworkers reviewed 1645 terrorist attacks, again in Israel, from 2000 to 2005, involving 7497 casualties. These authors, from the Magen David Adom, the national supplier of blood products to Israel, reported a mean number of units supplied per MCE casualty of 1.3 U of RBCs and 0.9 U of other components. Using the total number of casualties as a denominator, that is, “per casualty,” is a much broader descriptor for planners than the units per individual casualty expected to require blood. However, the volume of casualty’s actually requiring blood is relatively small compared to the overall injury burden from an event(13).

Most recently, another group from Israel reported the use of just over 3 units of RBCs “per casualty admitted to hospital,” therefore negating the issues of accounting for all casualties with very minor injuries who may be dealt with at the scene or in minor injury units. The 3 RBC units per admission figure is supported by a separate report from a combat hospital in Iraq, which describes their response to three separate civilian MCEs. The most recent report also stands out in its detailed discussion of component use and attainment of modern-day transfusion ratio deliverance after MCEs affecting civilian communities. Blood use is greatest in casualties involved in terrorist MCEs with injury severity scores greater than 15(ISS>15). Blood use in the most severely injured was 7 to 8 units of RBCs supported by components. UK military and civilian experience suggested even greater requirements for the most severely injured by improvised explosive devices, with median requirements of 16 (9-25) units of RBCs and proportionate amounts of components (15).

The proportion of injured requiring blood varies enormously and is dependent on the event, hemorrhage control, and availability of blood. After the London bombings, only 23 patients received blood during the first 24 hours out of an estimated 700 injured(20). The planning for the Olympics assumed a similarly small proportion.

The Paris attacks in 2015 with shootings at four sites and three explosions have highlighted the requirement to support many more severely injured. However, there was good blood component availability during the crisis, demonstrating that large volumes of components can be rapidly mobilized if already stocked.

### **2.3 Ethiopian Red crosses society**

National Blood Bank service established in 1969 under Ethiopian Red Cross Society (ERCS) until 2012. During that time, 11 blood banks were providing blood through ERCS network (only satisfy part of the country's blood demand). Since 2012, the National Blood Bank Service (NBBS) is transferred to FMOH under a transition strategy to meet the demand of blood supply and integrate the service to other health systems to ensure equitable blood and blood product access to ensure quality and nationally coordinated blood transfusion service (BTS).

NBBS established as independent autonomous federal government organ having its own legal personality since 2014 by Minister of council regulation number 330/2014 Accountable to the FMOH Head office shall be in AA & gives a mandate branch office elsewhere as may be necessary and to oversee transfusion activities across the country to provide adequate, safe and timely prepared blood & its products and other related services to all persons who need blood transfusion in Ethiopia.

The first blood transfusion center was established in 1969. The service has since expanded into a network covering some major hospitals in the country. However, the Ethiopian Red Cross Blood Bank can only meet part of the country's blood demand (10).

In Ethiopia, there have been gross inadequacy and inequity in access to blood. The national requirement for blood in Ethiopia is between 80,000 and 120,000 units per year, but only 43% is collected (23). The percentage of blood collected from VBD and the average annual blood collection rate are extremely low.

Out of the 44 WHO African countries that reported the percentage of voluntary non remunerated blood donation (VNRBD), only 22% of blood is being donated by VBD in Ethiopia; the country is classified among countries that have least number of VBD (Group C, countries with <50% VBD)(13) .

### **3. Objective**

#### **3.1 General objective:**

To explore mass causality blood transfusion preparedness and appropriate clinical use of blood in public government hospitals in Addis Ababa, Ethiopia: from April 01-April 30/2018.

#### **3.2 Specific objective:**

- ✓ To explore blood related preparedness before mass causality incidents.
- ✓ To describe the major problems in appropriate clinical use of blood with in the hospitals.

## 4. Methods and materials

### 4.1 Study area and study period

The study was conducted from April 01-30/2018, at selected public government hospitals in Addis Ababa. Addis Ababa, the capital of Ethiopia and the diplomatic center of Africa, is one of the fastest growing cities on the continent. Its population has nearly doubled every decade. In 1984 the population was 1, 412, 575, in 1994 it was 2,112, 737, and it is currently thought to be 4 million. It is estimated that this number will continue to rise, reaching 12 million in 2024. Its geographic location, combined with its political and socio-economic status have made it a melting pot to hundreds of thousands of people coming from all corners of the country in search of employment opportunities and services.

According to the 2009 E.C health indicators, the total numbers of hospitals in Addis Ababa, the capital city of Ethiopia were 41. About eleven of them are public and are managed under Addis Ababa City Administration Health Bureau and Federal Ministry of Health (FMOH) and the remaining thirty are run by private investors and non-profit organizations. This study will be carried out in 11 public government hospitals.

The reason why the investigator focus on public government hospitals is that, in Addis Ababa after the 2012 blood bank reform the hospitals starts to establish their own blood bank service under the federal blood bank service, at the time of the investigation only the public government hospitals was on work with such basis.

- |                                                 |                                    |
|-------------------------------------------------|------------------------------------|
| ✓ Tikur Anbesa Specialized Hospital             | ✓ Mahatma Gandhi Memorial hospital |
| ✓ Tirunesh Beijing Hospital                     | ✓ St. Paul Hospital                |
| ✓ Alert Hospital                                | ✓ Menilik II Hospital              |
| ✓ Zewditu Memorial Hospital                     | ✓ St. Petrous Hospital             |
| ✓ St Amanuel Specialized Mental Health Hospital | ✓ Yekatit 12 Hospital              |
|                                                 | ✓ RasDesta Hospital                |

## **4.2 Study Population**

The study populations were all public government hospital in Addis Ababa, Ethiopia. Eleven federal and Addis Ababa city administration hospitals in Addis Ababa city were involved in the study. Twenty-two participants (two key informants from each hospital) were interviewed from each hospital.

Purposive sampling technique was used to select key informants among members of hospital management team (medical directors), and mini blood bank focal person was involved on the study.

### **4.3 Study approach**

A qualitative research method with content analysis approach was followed. Using purposive sampling method, key informants which include key staff working at mini blood bank service and hospitals administration body from each hospital was recruited basically until the information is saturated with maximum of 22 participants. Data was collected by in-depth interview using semi-structured interview guides. Notes and audio recording was used to take data and then it was transcribed verbatim and translated.

#### **4.4 Data collection instruments and process**

Interview guide and observational checklists based on the study objectives were developed through literature review and guidelines by. Developed data collection instruments was brought to experts for evaluation and comment; then pilot study was conducted at one of those 11 hospitals, in order to check validity and reliability of the instruments. Based on the findings necessary amendments was made and finalized versions are used for data collection.

The first interviewed guide that includes WHO (2012) recommend indicators related questions on key components of hospital emergency response and gaps was used to interview medical directors and heads of emergence service. The second interview guide was used to interview key staff members working in the mini blood bank, in order to check whether they were informed about appropriate clinical use of blood and to evaluate their use during the interview by observation.

A planned face-to-face in depth interviews of key informants was conducted through using interview guides. All interviews were audio recorded, using tape recorders after getting written consent from the key informants and notes taken by the assigned interviewers. The key informants involved hospital medical directors, and key staff working in mini blood bank service. Following an interview of key informants, observation was done by using checklist.

In closing the interview session their responses were summarized by the interviewer and told to the participants in their points of view, so that any misunderstanding was corrected immediately. Eventually the participants were acknowledged for all their time and cooperation. As needed re visiting the participants were considered for missed information, clarity and additional concerns.

#### **4.5 Data quality assurance**

For the sake of having a quality data the principal investigator himself engages in all activities from interview guide preparation, study participant selection, data collection, checking and transcription of data. Additionally, data quality was maintained by having notes, quality recorder, ease environment, good voice and communication, critically checking and rechecking of records and transcription. Furthermore, colleagues were engaged in transcription and coding of the data. To have a time for internalizing the information and quality data, only one interview was conducted within a day and that data was transcribed immediately after interview. Again the participants were re visited for missed or unclear issues.

#### **4.6 Ensuring trustworthiness**

In ensuring trustworthiness, the four basic criteria of qualitative study were maintained by following respective principles. In establishing credibility, the investigator was take adequate time with participants including revisit of them if required, and study participants were approached friendly with no pressure and interviewed at most comfortable environment. Debriefing and feedback from colleagues and advisors is another strategy that was looked for. Moreover, negative case analysis, triangulation of data in terms of time and place, and interviewer was also considered. To assure transferability the study participants was selected purposively who fulfilled the inclusion criteria. Furthermore, thick description of all the inquire process and findings was made so that any reader of the report will be able to use and researchers may replicate the study at other setting which has possibly similar conditions.

An audit trial, a code-recode strategy and peer examination was used to establish dependability. Documents of all the study process including interview records and notes was kept for doing audit trial by colleagues and peers to see it neutrally. The investigator takes one interview document and code two times, which is a code-recode process, on separate time and checks for similarity of codes. Additionally, codes were done by colleagues and compared for similarity. Confirmability is also established by audit trial and reflexive journal in which the investigator put his pre imagination and let to be seen with the actual one.



## 4.7 Data Analysis

Data analysis was going simultaneously with data collection. Words of participants and their description of issues were internalized. Immediately after finishing the interview session information stored on audio recorder was listened repeatedly and transcribed verbatim by the interviewer. The transcribed data was internalized by reading repeatedly and translated to English language. Then coding and categorization was done by using open code software.

Following interpretative content analysis principles, words of participants and meanings they give to their words will be considered in coding and categorization. At first level words or phrases will be used to form codes, then like codes will come together and second level coding or categorization will be done. Like categories will be brought together to form a theme which represent the whole idea of the categories. Based on the emerged themes latent content analysis was followed to summarize the findings in the participants' points of view.

## 4.8 Definition of terms

**Mass causality:** It is an event where many people get injured and need medical attention.

**Blood transfusion:** The process of putting new blood in to the body of a person.

**Blood preparedness:** The state of being ready or willing to give blood for a patient in need.  
(Readiness to manage blood need)

**Blood Shortages:** A situation when there is not enough of blood needed.

**Scheduling blood:** A plan for blood that lists all the amount and kind in need.in this case schedule blood is for OR.

**Seasonal blood shortage:** A shortage of blood during a particular season. For example, rainy season and fasting seasons are known for shortage of blood because of lack of donors.

**Calibration:** Checking of materials for their functionalities and giving confirmation.

**Continuous monitoring:** Regular follow up for a period of time without interruption.

**Transfusion reaction:** Any kind of medical condition as a result of the blood transfused.

**Appropriate clinical use of blood:** Use of blood in way that is medically acceptable.

**Malpractice of blood transfusion:** In appropriate way of using blood.

#### **4.9 Ethical considerations**

Prior to starting this study, ethical clearance was obtained from Addis Ababa University, Ethical board. An official support letter from the Addis Ababa University, College of Health Sciences, School of public health, health system management department was presented Addis Ababa city Administration Health Bureau, and each hospital administration offices. The actual field work was under taken after permission obtained from each hospital administrations.

The purpose of the study was explained to the informants and an informed written consent was obtained prior to starting interview. All the information gathered from the respondents was kept confidential, and anonymity was assured.

Participations were on the behalf of voluntarism and the key informants were assured that they were fully authorized to withdraw from the study at any time of the involvement.

#### **4.10 Dissemination of results**

After defended on the annual of Addis Ababa University, College of Health Sciences, school of public health graduate students research seminar, the findings of will be disseminated to Addis Ababa University, College of health sciences, Department of Health systems management and policy, Addis Ababa University, College of health sciences Library, Addis Ababa City Administration Health Bureau, Federal blood bank service and to different Organizations that were having a contribution in this study; and also will be submitted to Scientific Journal to be published on reputable journals.

## 5. Result

### 5.1 Back ground of the study participants

The study has involved a total of 16 professionals with different educational status and professional experiences. The following table depicts the general information of the interview participants.

Table -1. General information of in-depth interview participants. April, 2018.

S.no	Variables	No of participants
1.Educational status		
1.	Laboratory technicians	1
2.	Laboratory technologists	7
3.	Medical doctors(different specialty)	8
2.Work experience		
1.	0-2years	2
2.	2-4years	4
3.	4 and above	10

### 5.2 Mass causality blood transfusion preparedness.

The aim of in-hospital management of Mass causality event is to provide as close to the gold standard level of care as possible within the resource constraints generated by the surge casualty demands, but majority of the study participants don't have the information about mass causality blood transfusion preparedness and there is no training related to the subject also there is no any real preparedness activities because there is shortage of blood for regular scheduled transfusion.

An in-depth interview with mini blood bank focal person in one of Addis Ababa hospitals stated that

*“...I think hospitals need mass causality blood transfusion preparedness because hospitals are the higher level to manage such events. In our situation we use 80% of the blood collected from the Addis Ababa city blood bank service, we schedule 50-60 units for OR only, but in general we use 100-150units per day. We face shortage of blood for regular scheduled transfusions and if there is a mass causality event it is difficult to manage”.*

Blood shortage is seasonal because of many reasons especially rainy seasons it is difficult to collect blood. An in-depth interview with medical director at one Addis Ababa public government hospital stated that,

*“For example the number of blood donors decreases during fasting seasons and during summer season there is a shortage because of the schools are closed and people are not willing to give blood because of fear of hypoglycemia, so we can say the shortage is seasonal.”*

The federal blood bank is responsible for supplying blood to all public and private institutions in the whole country. The transport of blood to regional hospitals is centralized and done by the trained staff of the blood bank. Appropriate cold boxes are used for transporting blood with temperature monitoring. Blood stocks management including the cold chain maintenance is done on a daily basis and a minimum of 4-day stock is kept. In addition, procedures are in place for cold chain maintenance. Out of 8 public government hospitals performing blood transfusion, only 1 (9%) has a hospital transfusion committee (HTC). All requests for blood, when patients need transfusion, are sent to the compatibility testing department. It is only when the blood unit is compatible that it is issued to the patient.

In addition to blood safety activities, the federal blood bank has other departments performing specific services for all public and private health institutions, namely, antenatal serology, tissue typing (HLA typing), special investigations, and reagent preparation. The federal blood bank service tries to form mini blood bank at each public government hospitals separated from the laboratory by assigning laboratory technologist as focal person, but the storage system of mini blood banks is not with the standard system for example an in-depth interview with focal person at one Addis Ababa public government hospital stated that,

*“There is no separated room for the blood bank and also there is no refrigerator and other supplies for the blood bank we simply try to manage it with the equipment’s we have for the hospital laboratory.”*

The linkage between hospitals during shortage of blood is existed but some time there was times where blood become expired in some hospitals because of lack of communication with other hospitals in need.

### **5.3 Appropriate clinical use of blood and blood products**

Generally it is difficult to say there is appropriate clinical use of blood in the public government hospitals if we see on different aspects of appropriate clinical use of blood for instance there is a temperature monitoring form which has to be filled in regular bases but it is not filled regularly, the WHO 2012 toolkit stated that a blood bank refrigerator thermometer has to be checked every four hourly but on my observation I see a sheet in one of the hospitals which is not filled for one week.

In most of the hospitals there is malpractice on the use of blood specially the mini blood bank focal persons stated there is malpractice of blood like warming and applying pressure for those malpractices the first reason is lack of training on the appropriate clinical use of blood for medical interns and clinical nurses. one in-depth interview respondent stated that

*In our hospital the medical interns are the one who is responsible for transfusion of patients but they are not trained on the appropriate clinical use of it, they apply pressure to increase the droops, warm and sometimes they even oblivion the blood on the patient side without transfusing.*

The maintenance of the transfusion cold chain within the hospitals has also been affected by inadequate funding to hospitals. Cool boxes are not available in most hospitals to transport blood from the hospital blood banks to the utility stations. Here, a unit of blood can be transported on a tray covered with a small towel, in any available box or in a student or a nurse’s clinical coat. This is made worse by the recurrent power shortages in the hospital blood banks and a poorly developed temperature monitoring culture among the laboratory and clinical staff. The above scenarios compromise the quality of the transfusion cold chain in the hospital setting.

The other stated problem on the appropriate clinical use of blood is the use of blood warmer. the use of blood warmer before transfusion is one of the mechanism to have the appropriate use of blood but I don't find a blood warmer in any of public government hospitals. one in-in-depth interview respondent stated that *...we have a training on the use of blood warmer but I don't even see during my carrier, I don't even think that is available in other hospitals also.*

In most of hospitals in Addis Ababa, there are no written process and procedure guidelines for bedside transfusion practices. This implies that the critical procedures like blood handling, reception at the ward, warming, documentation and patient monitoring are performed inconsistently and under different standards. This is due to shortages in human and financial support towards these activities. However, despite this poor facilitation and staff shortages, the clinicians are dedicated to their work and are willing to be trained to catch up with internationally accepted standards.

There is hospital emergency blood management committee in every hospitals the duty of this committee is to follow the normal activates of the blood bank and to give support in need but in most of the hospitals it is not functional there are many reasons for this from those increased work load and negligence of professionals are the one stated by the interview candidates *....i know there is committee but it is not functional because I don't see any activity's done by this committee , even there is no regular mitting.*

In the light of the foregoing findings of this study, a high prevalence of inappropriate use of blood products was found among the public government hospitals of Addis Ababa. Higher risk of inappropriateness was observed in the Medical intern students while laboratory technologists revealed a good percentage of appropriateness. There was substantial variation in the appropriate transfusion practices across public government hospitals and appropriateness was influenced by the department stuffs because of lack of training on the appropriate clinical use of blood.

#### 5.4 Documentation system

The blood ordering process is not standardized in the transfusing hospitals. This is evidenced by suboptimal documentation of the blood ordering processes. Here, there are no standard operational documents (e.g. blood request forms, transfusion reaction forms). In some hospitals, the communication of this blood order is done verbally whereas in others is by any piece of papers. The major national referral hospital in the city, Tikur anbssa, has a blood request form that is used by all transfusing units. However, this document is inadequately managed. The form is kept in the hospital blood bank, but not at the bedside. Therefore, the blood order information is filled onto the form within the bank, but not at the bedside. This inadequate and dangerous communication of the patient information to the blood bank affects the quality of the blood selection process. There are no structural and operational blood order guidelines being followed in any of the transfusing hospitals. Additionally, the concept of basing surgical blood orders on maximal blood order schedules has not been developed in Addis Ababa hospitals. This results into inappropriate ordering and misuse of blood.

In Addis Ababa, the blood recipients have no experience about transfusion consent because this is a neglected process in the bedside processes. Hemotherapy is dependent on the paternalistic culture which is still prevalent in all hospitals ‘the doctor knows that I or my child needs blood’. So it is very rare for a patient or a patient’s attendant to consent for a transfusion in Addis Ababa’s hospitals.

Most of the hospitals who participated in this study has a documentation system for both requested and transfused blood and blood products but it is not interlinked with other departments of the hospital planning rather they use the documentation for reporting only,

One in-depth interview participant stated that

*The mini blood bank requested and transfused blood documents and registries use only to report for federal blood bank and also it’s not integrated with other hospital annual planning for example there is a gap of documentation system for transfusion reaction a person who transfuse blood don’t record wither there was transfusion reaction or not rather they simply send a request to repeat cross Mach for the person.*



An in-depth interview with mini blood bank focal person at one Addis Ababa public government hospital stated that,

*...we don't check for transfusion reaction we simply give blood to the medical interns and nurses, they are the one who is responsible to follow for the patient during transfusion and there is no mechanism of reporting if there is transfusion reaction. Sometimes they come to us and told as there was transfusion reaction at that time we repeat the cross match and we give the appropriate blood again.*

## **5.5 Summary of results**

The study has involved 16 professionals from public government hospitals located in Addis Ababa because of saturation three hospitals are left from those participants more than 50% of them are above four years of experience on the specified position. Majority of the study participants don't have the information about mass causality blood transfusion preparedness. There is no training related to the subject and there are no real preparedness activities because there is shortage of blood for regular scheduled transfusion.

The federal blood bank service tries to form mini blood bank at each public government hospitals separated from the laboratory but the blood storage system in the mini blood bank is not based on the standard and most of them are not well equipped. The blood ordering process is not standardized in the transfusing hospitals. This is evidenced by suboptimal documentation of the blood ordering processes. There are no structural and operational blood order guidelines being followed in any of the transfusing hospitals. Additionally, the concept of basing surgical blood orders on maximal blood order schedules has not been developed in Addis Ababa hospitals. This results into inappropriate ordering and misuse of blood. Out of eight public government hospitals performing blood transfusion, only 1 (9%) has a hospital transfusion committee (HTC).

In Addis Ababa, the blood recipients have no experience about transfusion consent because this is a neglected process in the bedside processes.

The linkage between hospitals during shortage of blood is existed but some time there was times where blood become expired in some hospitals because of lack of communication with other hospitals in need.

In most of the hospitals there is malpractice on the use of blood specially the mini blood bank focal persons stated that there is malpractice of blood like warming and applying pressure for those malpractices the first reason is lack of training on the appropriate clinical use of blood for medical interns and clinical nurses.

## **6. Discussion**

This study was done to explore the mass causality blood transfusion and appropriate clinical use of blood by hospitals. Accordingly, the study showed different focusing areas. These focusing areas are discussed in the following sections.

Bleeding is the second most frequent cause of death after traffic accidents. Annually around 500 thousand women in the world die during pregnancy and delivery and up to a fourth of them could be saved by blood transfusion. In Addis Ababa people are used to believing that they will get blood whenever they need it (10), but not everywhere in the world this can be taken for granted, when we see our hospitals in the city their blood banks are in difficulty's to fulfill their regular scheduled blood need.

Majority of the study participants don't have the information about mass causality blood transfusion preparedness. There is no training related to the subject for the staffs in the hospitals and also there is no preparedness activity because there is shortage of blood for regular scheduled transfusion. This result in line with the studies from Uganda and South Africa on hospitals mass event blood related capacity evaluation studies (14, 21).

The widespread adoption of lessons learned on the battlefield has led to a more aggressive approach to hemorrhage control. However, the same paradigm has also led to the introduction of cautious fluid resuscitation and the early use of blood components in resuscitation. Such an expectation challenges health care planners and developed blood transfusion services especially when a large surge of patients is involved. Effective pre hospital care and emergency system preparedness across the continuum of care has the potential to reduce morbidity and mortality as well as reduce the demand for blood (18, 21).

A country like ours blood shortage is seasonal so it is must to have the preparedness before the mass events. Transfusion planning has not been a part of mass causality event planning; however, I suggest that integration is essential for both blood demand and supply management this finding is consistent with studies from Botswana, Kenya, Haiti (22).

Transfusion demand planning is primarily designed to meet the normal needs of the population at risk. In addition, consideration must be given to emergency preparedness. Emergency-preparedness must respond to not only the emergency but also ensure the continuity of critical

services. The primary role of the blood transfusion services and hospital blood banks is to provide blood components. The wider use of “massive transfusion” protocols has led to an increased initial demand for “universal” components studies from Kenya, showed the same report from hospitals in Nairobi (22).

Stock management of labile components such as blood and PLTs is a challenge when there is unpredictable demand. Large stock holding in blood services or blood banks is associated with wastage due to time expiry, whereas insufficient stocks may lead to clinical disaster again a study from Uganda also revealed similar results (14). It should be assumed that in the unplanned event the demand for blood components may exceed supply. The use of pre prepared blood shortage plans provides valuable guidance in the event of RBC and PLT shortages. In addition, transfusion triage can provide guidance for both clinicians and the blood transfusion services.

Historically, it has been repeatedly shown that blood demand is greatest within the first few hours of an event and that expectedly this period correlates with the arrival of the most severely injured casualties. Experimental simulation modeling has recently explored the impact of restricting both the total number of RBCs and emergency group O blood in MCEs. Restrictive transfusion protocols appear to increase the overall treatment rates where there are large casualty loads.

The federal blood bank service tries to form mini blood bank at each public government hospitals but they are not well equipped and not following blood safety procedures. Attention must also be paid to cold chain management especially during the transport of blood between organizations and departments. Transfusion is a highly regulated area of health care. The European Blood Directive 2002/98/EC sets standards for the collection, testing, processing, storage, and distribution of human blood and blood components. Requirements of the legislation include the trace-ability of blood used and hem vigilance. These are potentially challenging within the context of MCEs but must be managed. This is consistent with a study finding from Uganda on hospitals in the capital city (13).

Blood used correctly can be lifesaving, used inappropriately it can endanger life. It is important to remember that blood transfusion is only one part of the patient’s management. The decision to transfuse blood or blood products should always be based on a careful assessment of clinical and laboratory indications that transfusion is necessary to save life or prevent significant morbidity

The objective of blood transfusion, as specified by the American Society of Anesthesiologists (ASA) [8] guidelines, is to improve inadequate oxygen delivery secondary to anemia. The primary trigger for transfusions of whole blood is low hemoglobin. The other two common but inappropriate triggers are hypovolemic and the clinician choice. Similar report was seen in India a study done on appropriateness of use of blood products in tertiary hospitals (4).

The use of whole blood as a volume substitute, though inappropriate, is still being practiced. The reason for this may be the availability of blood, and the belief that complications of transfusion occur infrequently and are usually benign. Unfortunately, there are hospitals in the study which have no oversight program for monitoring quality of transfusion practices, which may be one of the reasons for having such a low percentage of appropriate use yet, with high number of utilization. This result is consistent with studies done in Kenya, Uganda and Haiti (15). There might be a so called transfusion committee but does not work efficiently or effectively. There might be a need to evaluate the program in order to assess its effectiveness. Pointed out that the presence of a transfusion committee assures consultation in chemotherapy.

Blood safety survey of WHO [10] found that only 25% hospitals performing transfusions in developing countries and 33% hospitals in transitional countries have a transfusion committee to monitor transfusion practices and to review blood utilization; as compared to 88% hospitals in developed countries. From a general point of view, a decision to transfuse should always be based on an analysis of risk and benefit, and should consider two factors: (1) evaluation of the physiological needs of the patient; and (2) transfusing only blood products that satisfy those physiological needs. , the study found that many inappropriate transfusions of packed red cells were carried out on asymptomatic patients in the perioperative period, although there is no evidence that mild or moderate anemia contributes to perioperative morbidity and mortality.

In most of the hospitals there is malpractice on the use of blood specially there is malpractice of blood like warming and applying pressure for those malpractices the first reason is lack of training on the appropriate clinical use of blood for medical interns and clinical nurses. There is similar report from a study done in Kenya, South Africa, (6).

## **7. Strength and limitation of the study**

### **Strengths of the study**

- The investigator's full engagement in all research activities
- To reach such professionals by itself and trying to get their voice
- As the study is the first local study regarding the issue it tried to establish good base line.

### **Limitations of the study**

- Limited to the Addis Ababa hospitals
- There might be recall bias

## **8. Conclusion and recommendation**

### **Conclusion**

The present time is hasty, full of rush. This often brings about unexpected situations to which man is not prepared. An injury or a disease sometimes hit man like a flash of lightning from a clear sky. The number of life-threatening injuries shows an increasing trend recently. And so the notion of precious blood gets into a focus of attention. So our hospitals need mass causality blood transfusion.

In the light of the foregoing findings of this study, a high magnitude of inappropriate use of blood products was found among the public government hospitals of Addis Ababa. Higher risk of inappropriateness was observed in the Medical intern students while laboratory technologists revealed a good percentage of appropriateness. There was substantial variation in the appropriate transfusion practices across public government hospitals and appropriateness was influenced by the department stuffs because of lack of training and poor facilitation for the appropriate clinical use of blood.

## **Recommendations**

Based on the study's findings the following to recommendations goes to specific actors: -

### **For federal blood bank.**

- Need to develop mass causality blood transfusion preparedness program
- Working on fostering staffs knowledge on mass causality blood transfusion preparedness
- Attention and special focus on the appropriate clinical use of blood and blood products
- Establish good facilitation on the mini blood banks

For the hosting hospitals; -

- All hospitals should urgently get involved in the creation and facilitation of Hospital Transfusion Committees (HTCs).
  - To ensure internationally acceptable health care to blood recipients, Addis Ababa hospitals should develop locally acceptable hospital standards (quality and technical) to streamline the various procedures in the three main processes that is [ordering, component selection and administration].
  - Documentation being a key component of quality improvement should be emphasized by all health facilities administering blood. A culture of documenting all transfusion events should be developed.
  - Training of staff on standard operational documents like Blood request forms, transfusion reaction forms and appropriate clinical use of blood.
  - The formulated standards and guidelines should be communicated to the in-service staff thorough continuous professional development programs.
  - There should be an agreed upon periodic audit of transfusion practices of clinicians, nurses and laboratory technicians. This should be based on a set of agreed upon performance indicators and conducted jointly by members of the HTC and a blood bank staff member. It should always be followed by timely and constructive feedback to the concerned staff or department.
- For Medias, NGOs and other institutions working on blood donation activities
- Give attention on fostering awareness about mass causality blood transfusion and appropriate clinical use.



- For researchers: -
  - Further study to address the nation wide picture on the issue.

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## **Information Sheet and informed consent form**

### **Annex-: Study participant's information sheet**

Greetings! I am Biniyam Worku a masters of public health student from Addis Ababa University, currently am doing a health study about mass causality blood transfusion and its appropriate clinical use. The study concerns about preparedness, related challenges, generally which is about blood use and its appropriateness.

**Aim of the study:** - Its aim is exploring the mass event blood preparedness and the appropriateness of its use, so that the finding will be helpful in designing better health care.

**Process of the study:** - The study includes the medical director and mini blood bank focal persons to be part of this study. No laboratory or other measurements are needed; you are only expected to freely discuss with the interviewer. The conversation may take about an hour and for missed information and further clarification you may be re visited as needed in another day based on your willingness.

**Rights of the participants:** - Your participation is fully based on your willingness. As all the conversation is up to your willingness, you are fully entitled to ask, interrupt, skip questions and withdraw from the study any time you like.

**Confidentiality of the study:** - In any means the information you give will not be used for other purpose beyond this study and always be kept in confidential. During the interview, if you are willing, I will use an audio recorder, which means that what we talk about during the interview will be recorded. This is so that I can remember what we talked about. There is no need to mention your name or other identification. Even the health institution from where you came is not to be mentioned. The audio tape will be kept locked in a cabinet in my house and only the researcher will be allowed to listen to the audio tape. It will thereafter be destroyed.

**Benefit of the study:** - Being participant of this study by itself doesn't have a direct benefit for you. However, this doesn't mean it has no benefit at all. As tried to mention in the beginning your information is helpful for improving health care services.

**Risk of the study:** - Your participation has no risks, in all means you are free of any harm and for that the researcher is responsible and accountable.

So considering the above issues I kindly request to put your response in the next page of consent form. If you have any questions you can contact me through the given address.

Thank you!

Biniyam Worku

Cell phone: - +251912025931

Email: - [biniyamwork92@gmail.com](mailto:biniyamwork92@gmail.com)

Addis Ababa University School of Public Health

## **Study participant's Informed consent form**

I read/listened the above information and I understood that it is a study that doesn't harm me, is based on only my willingness and promise confidentiality of my responses and no harm and special benefits to me. Accordingly based on my understanding, regarding my participation on the study, without any pressure I reached on the following decision.

1. I fully agree to participate

Signature \_\_\_\_\_

Date \_\_\_\_\_

2. I disagree to participate

Signature \_\_\_\_\_

Date \_\_\_\_\_

### **Interviewer**

I assure that I informed and took the consent

Signature \_\_\_\_\_

Date \_\_\_\_\_

Hospital name \_\_\_\_\_

Interviewer name \_\_\_\_\_

Date at which interview conducted \_\_\_\_\_

Starting Time \_\_\_\_\_ ending time \_\_\_\_\_

**Section two: General Information (for Head of emergency service/mini blood bank personnel)**

I- Socio demographic characteristics; -

- Can you tell me about yourself (**probe**: - education level, experience on the position)?
- Can you tell me your experience of an emergency mass causality event (**probe** what was your concern)?

**1. Staff awareness regarding mass causality blood preparedness**

1. Do you know what mass causality blood preparedness is?
2. If yes, what roles does the hospital play in mass causality blood preparedness and response?
3. Did you aware that in your hospital the structure or initiation for management and response of blood preparedness existed?
4. Which facilities do you think need better mass event blood preparedness and response?  
What is your comment?
5. Did you ever orient to your hospitals protocols during mass causality events?
6. Did you aware that your role during mass causality response?
7. Have you ever offered training regarding mass causality blood transfusion in your hospital?
8. How well is this hospital prepared for mass causality blood transfusion?
9. Do you have any further comments on the Hospital blood preparedness plan?

## **2. Blood and blood product transportation/storage**

1. How do you check blood and blood products for expiration date?
2. Are cold chains of the blood and blood products continuously monitored? What is our mechanism for follow up and recorded?
3. Are the thermometers in the refrigerators and freezers calibrated? If yes, what is the interval for calibration?
4. Does the HF transport the blood components accordingly?
5. Is there a focal person assigned? What is his duty?
6. Is there a stock management system? (Bin Card)

## **3. Documentation system**

1. How do you use record of requested and transfused blood and blood products?
2. What is the mechanism you use to record ABO, Rh compatibility testing results?
3. How do you keep record of transfusion reactions?

## **4. Appropriate clinical use of blood**

1. How do you monitor temperature/frequency?
2. Is there consent form usage/practice?
3. How do you manage rule of 30-means of transport to the ward, starting time, completing time?
4. Which one of the malpractice of blood transfusion you see during your carrier?
5. Do you follow for adverse effect to the recipient?
6. Do you believe that there is Proper follow up to recipients?
7. Is there adverse effect management protocol use?

**Section Tow: General information (for medical directors)**

- Can you tell me about yourself (**probe**: - education level, experience on the position)?
- Have you had any direct personal or professional experience of mass causality event  
(Probe: ask interviewee to describe their experience, what were their concerns)

**1. Preparedness Checklist for Hospitals Blood transfusion.**

1. Do you have an Established Hospital Emergency Blood Management Committee (HEBMC)? What are its functions?
2. Do you have Hospital Emergency Blood Management Plan (HEBMP) for managing blood shortages?
3. Is there blood conservation methods/available blood alternatives?
4. What activities done to Ensure Hospital Emergency Blood Management (HEBMP) are integrated into overall hospital emergency plan?
5. Is there Train staff on the contents of the plan and the communication strategy related to blood shortages? If yes what is his activities?

**2. Practice for good blood utilization and inventory management practices**

1. How do you Practice strategies to minimize blood component/product outdating (e.g. participate in redistribution)?
2. Do you have established redistribution linkages?
3. Do you have adopted guidelines for the use of blood components and products to ensure effective utilization?
4. Do you have a periodic audit to review appropriateness of blood ordering (compliance with adopted guidelines)?
5. Do you give training for stuffs on appropriate clinical use?



### Observational check list

Does the mini blood bank have adequate equipment to maintain safe and acceptable standards for handling of human blood and blood components?

S.No	Description/s	yes	No
1.	Blood bank refrigerator (2 to 6 °C)		
2.	Deep freezer (< -18 °C )		
3.	Platelet agitator		
4.	Bench top centrifuge		
5.	Blood grouping or cross matching plate		
6.	Water bath between (37 °C -56 °C)		
7.	Microscope		
8.	Pipettes , test tube and test tube rack		
9.	Cold box for transportation of blood		
10.	Power back up mechanisms		
11.	Availability of register formats (cross match, ABO & Rh grouping)		
12.	Availability of requesting & reporting formats (Blood request, feedback, disposition form)		

## INFORMED CONSENT

My name is Biniyam Worku. I am graduate student at Addis Ababa University. I am conducting a scientific research on the mass causality preparedness among governmental hospitals in Addis Ababa city. Therefore, I would like to inform you that you are one of the potential participants in this study at \_\_\_\_\_ hospital. This study requires you to participate so that important information can be obtained regarding

Mass causality preparedness of \_\_\_\_\_ hospital from your experience at hospital.

Your participation is entirely based on your willingness and your refusal doesn't affect you in any way. If you are willing to participate in the study, we will interview you about mass causality preparedness program at hospital you are currently working.

The information gathered will be used for writing a thesis project report for partial fulfillment of Master's Degree in Health system management at Addis Ababa University. Your participation is only determined by you. Here, I want to assure you that any information obtained from you will remain confidential indefinitely. The participant won't be asked any fee during the participation in any way. You can dropout any time during the study and also you have full right to ask us any questions or clarifications. If, at any time, you have questions about the study, you may contact me at (+251-912025931).

### **Do you want to participate in the study?**

If the participant agrees to participate in the study, have a signed the consent and proceed with interview.

The study investigator has explained to me the nature of the study and I understand that participation is voluntary and I can pull out of the study if I wish to do so. I \_\_\_\_\_, aware that there is no direct material or financial benefit to me accruing from participation in this study. I understand that I will not lose my current privileges by participating in this study. I understand that the information I give is confidential and my name shall not appear on the interview guide. I have had an opportunity to ask questions and I fully understand the objectives of the study. I consent voluntarily to participation.

Name and Signature of Participant \_\_\_\_\_ Date \_\_\_\_\_

If the participant says "No, I don't want to participate in the study", thank him (her) and stop.

Thank you!

## **Annex 2: Declaration**

I, the undersigned, declare that this paper is my original work and has not been presented for master's degree in this or another university and that all sources used for this paper have been fully acknowledged.

**Name: Biniyam Worku Tassew (BSc)**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Place: Addis Ababa University, School of public health, Department Health systems management and policy

This thesis has been submitted with my approval as University advisor

**Dr, MESFIN ADDISSE (MD, MPH)**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Place: Addis Ababa University, School of public health, Department Health systems management and policy