HEALTH SYSTEMS STRENGTHENING ACCELERATOR

Strategies for Generation and use of routine safe blood data for decision-making and performance management

Introduction

Effective generation and use of routine safe blood data are crucial for strategic decision-making and performance management in national blood transfusion services. This knowledge product outlines key strategies to enhance the collection, management, and utilization of safe blood data to improve clinical outcomes and ensure the sustainability of blood services. By implementing the strategies and recommendations outlined in this document, Liberia, Malawi, and Rwanda can enhance their blood data management systems, leading to better planning, resource allocation, and overall service quality. This, in turn, will contribute to improved health outcomes and the sustainability of their national blood services.

Figure 1: Session on blood transfusion data management for performance and decision making at the Cross-country learning session for strengthening safe blood systems in Liberia, Malawi, and Rwanda. Windhoek, Namibia. April, 2024.

Context

Liberia, Malawi, and Rwanda's blood services currently face challenges due to limited historical data on blood collections, requisitions, and issuance, as well as insufficient information on facility-level blood inventory management, clinical use, and transfusion outcomes. Effective data management systems are needed to support strategic planning, monitor national demand, track disease trends, and ensure quality and compliance in blood services. Generating, managing, and utilizing safe blood data is crucial for providing evidence for strategic decision-making and ensuring oversight of service quality and adherence to guidelines.

At present, the blood services in all three countries can track donors and the recipient facilities of specific blood units, but they lack detailed information about facility-level management of blood inventories, such as wastage and expiries, clinical use of blood and blood products, and transfusion outcomes. This gap poses a significant challenge for strategic planning, as blood services must rely on limited historical data and cannot adequately track changing national demands and disease trends. Consequently, they

struggle to plan collection efforts and organizational investments effectively and to monitor and address adverse outcomes.

This knowledge product, informed by the Cross-Country Learning for Strengthening Safe Blood Systems Activity under the USAID-funded Health Systems Strengthening Accelerator project implemented across Liberia, Malawi, and Rwanda, aims to provide approaches for improving safe blood data generation and management. Additionally, insights gained from a cross-country learning visit to the Namibian Blood Transfusion Service (NamBTS) in April 2024 offered innovative strategies and lessons that can be adopted and/or adapted by each country BTS. The visit to NamBTS facilitates and subsequent expert presentations by their staff, Dr. Carla Van Zyl and Mr. Hilary Charuma illuminated the day-to-day data generation and management processes of NamBTS and explored best practices for routine data generation and strategic decision-making in blood transfusion.

Current Challenges

Across the countries (Liberia, Malawi, and Rwanda), blood services lack comprehensive information on facility-level blood inventory management, clinical use of blood and blood products, and transfusion outcomes. This gap hinders strategic planning and the ability to adapt to changing national demands and disease trends. This limited historical data on blood collections, requisitions, and issuance restricts the ability of national blood transfusion services to plan collection efforts and organizational investments effectively.

Problem Statement

Blood services in Liberia, Malawi, and Rwanda lack comprehensive data on facility-level inventory management, clinical use, and transfusion outcomes, hindering strategic planning and adaptation to meet national demands and disease trends.

Objectives

This knowledge product provides strategies for consideration within nascent to well-developed blood transfusion services on data management. Specific objectives of this knowledge product include:

1. **Share Best Practices and Lessons Learned:** To disseminate best practices and lessons learned from successful pilot projects and case studies, particularly the pilot project in Queen Elizabeth Central Hospital in Malawi. And promote the adoption of proven data management practices across the three countries.
2. **Advocate for Integration:** This document can serve as an advocacy tool for the integration of safe blood data indicators into national health management

information systems (HMIS). It also suggests necessary policy reforms to facilitate effective data collection, reporting, and utilization at all levels of the blood services.

3. **Promote Innovation and Scalability:** To encourage innovative approaches to improve data management in safe blood systems. Also to highlight the importance of scalability and sustainability in implementing new data management solutions
4. **To Provide Strategic Recommendations for each country BTS**: This is to enhance their data management systems based on the insights gathered from learnings across countries and from the Namibia Blood Transfusion Service. This document also provides recommended actionable steps to integrate robust data collection and reporting mechanisms into existing health systems.

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Data Management Improvement Needs by Country

Liberia: To establish mechanisms or methodologies that could be used to improve data quality.

Malawi: To establish an integrated data system that supports diverse functions (National, MBTS, Facility level)

Rwanda: To design and implement comprehensive quality data management in blood systems.

Country Strategies

Namibia's Blood Transfusion Service (NamBTS) is reputable for its quality data management systems from supply chain management to patient donor information and the lessons learned from the NamBTS can be adapted for countries who are in different levels of data management implementation. For countries at nascent levels of their safe blood systems like Liberia, here are some of the strategies that countries can adopt/adapt for improved blood systems.

Liberia:

Liberia's blood transfusion services, National Blood Safety Program (NBSP) faces several challenges, including limited availability of safe blood, insufficient voluntary non-remunerated blood donors, and logistical issues in the collection and distribution of blood. The country has been working to enhance its blood transfusion services through various initiatives and collaborations and is very keen on having mechanisms in place to improve

data quality across all levels within the BTS. For example, Liberia, working with the HMIS, has recently integrated limited blood data indicators into the country HMIS system. Some suggested strategies for nascent blood systems like Liberia include:

1. The development of standardized data collection protocols:

Countries need to create and implement standardized protocols for blood data collection at all levels of the health system and ensure consistency and accuracy in data entry by using predefined templates and guidelines. Advocacy to the national HMIS for inclusion of safe blood data will ensure integration of the BTS into the overall health system. Experience from the Namibian BTS shows how the effective use of standard operating procedures for all areas of data collection is beneficial. Some of the standard operating protocols (SOPs) existing within the NamBTS that can be adopted/adapted include SOPs for blood packaging, guidelines for data recording, blood collection, etc.

2. Capacity Building and Training:

Liberia and similar countries should conduct regular training sessions for health facility staff on best practices for data collection, entry, reporting, and management. It is also important for the BTS to facilitate refresher courses to ensure staff are updated on new methodologies and technologies and to ensure that new and/or rotating staff are aware of the policies and protocols.

3. Implement Data Quality Audits:

Establish a routine data quality audit system to regularly assess and verify the accuracy and completeness of collected data, use findings to identify gaps and areas for improvement, and implement corrective measures. For example, audits of packed blood can be done monthly by checking random pack verifications and compare with the information registered for packs. This strategy being used in Namibia has been effective for the validation of data registered for packed blood.

4. Enhance Data Validation Processes:

Introduce validation rules and checks within the data management system to detect and correct errors in real time. Learnings can be adopted from the Malawi Blood Transfusion Service (MBTS) in which the MBTS uses Excel templates to check for errors within the data. Automated tools to cross-check data consistency across different sources and levels can also be adopted/adapted.

5. Stakeholder Engagement and Feedback:

Engage stakeholders, including health facility staff, donors, and policymakers, in regular feedback sessions to discuss data quality issues and possible solutions that are within respective contexts. Incorporation of stakeholder feedback into the continuous improvement of data collection and management processes is also necessary. Furthermore, the BTS can adopt learning from the NamBTS by instituting a board that oversees the decision-making process and data management processes for the BTS.

Malawi:

In Malawi, the main concern of the blood transfusion service (MBTS) is the establishment of an Integrated Data management System. Malawi can be said to be in the intermediate category of data management as it has reached significant levels in blood collection, reaching 87,000 units of whole blood in 2022. This blood, sourced from voluntary non-remunerated blood donors (VNRBD), is supplied to both public and private hospitals throughout Malawi. Strategies that can be adopted/adapted by Malawi and similar countries to improve their data management include.

1. Develop a unified and interoperable Data Management Platform:

Firstly, there is a need to develop standardized and uniform data collection tools across donor sites and facilities, these data can be consolidated into national, MBTS, and facility-level information systems. There is also a need to ensure interoperability with existing health information systems, such as the District Health Information System (DHIS2). Implementation of standards-based data integration practices will enable seamless data exchange between different systems that connect disparate data sources and create a unified view of blood management data.

2. Strengthen Data Governance and Policy Frameworks:

Establishing clear data governance policies that ensure data security, privacy, and compliance with national and international standards is important, there is a need to have defined roles and responsibilities for data management across different levels of the health system validated.

3. Support Data-Driven Decision-Making:

A data-driven decision-making culture needs to be fostered by integrating data analysis and reporting into routine management practices and meetings. Insights from data can be used to inform strategic planning, resource allocation, and performance monitoring.

Rwanda:

In 2022, Rwanda collected approximately 78,838 units of blood, this achievement was supported by the use of innovative technologies, such as drone deliveries through a partnership with Zipline. Advanced national BTSs like Rwanda seek to design and implement comprehensive quality data management systems to improve the use and quality of the data being generated.

1. Develop a Comprehensive Data Management Framework:

Design a holistic data management framework that encompasses data collection, storage, processing, analysis, and reporting and ensure the framework addresses all aspects of blood system data, including clinical use, inventory management, and transfusion outcomes.

2. Invest in Data Management Infrastructure:

Equip health facilities with the necessary data management infrastructure, including hardware and software, like Namibia's Lab Management Information System (LMIS) to support efficient data management. There is the need to implement secure data storage solutions to ensure data integrity and confidentiality.

3. Establish Continuous Monitoring and Evaluation (M&E):

Develop a robust M&E system to track the implementation and impact of data management initiatives. Also, develop performance indicators for regular assessments to measure progress and identify areas for improvement**.**

4. Engage in Continuous Improvement:

Implement a continuous improvement process that regularly reviews and updates data management practices based on feedback and evolving needs. And encourage innovation and experimentation with new data management approaches and technologies.

Cross-Cutting Recommendations

1. Prioritization of Safe Blood Indicators

There is a need for blood transfusion services to establish and prioritize some key indicators for blood safety and usage to guide data collection efforts and strategic planning. Indicators for blood safety, usage, wastage, and hemovigilance (adverse and near-miss events) need to be defined and integrated into the Health Information Management Systems (HIMS) and logistics management systems.

Example: The pilot project at Queen Elizabeth Central Hospital in Malawi focuses on feasible indicators and their implementation, providing a model for other regions. Co-creation of indicators alongside data collection tools has led to the development of comprehensive systems and data collection tools in the hospital. Example indicators include transfusion aggregation per blood group, adverse transfusion reactions, and total number of blood product units ordered from MBTS, among others.

2. Enhancement of Data Collection Systems

In order to improve the infrastructure and processes for routine data collection at both national and facility levels, Blood transfusion services need to implement electronic data management systems that are integrated within existing health information platforms and real-time data capturing across Blood Transfusion Centers. The establishment of protocols for data collection that include tracking of blood sourcing, distribution, storage, and clinical use is also important.

***Example*:** Namibia's safe blood management system showcases the effective integration of various data sources into a centralized system, enhancing data utilization for decision-making.

Figure 1: Mr. Fabrice Ndicunguye from Rwanda BTD presenting at the Cross-country learning session for strengthening safe blood systems Liberia, Malawi, and Rwanda. Windhoek, Namibia. April, 2024.

3. Utilization of Data for Decision-Making

Safe blood data need to be analyzed to identify trends, gaps, and areas for improvement in blood service operations and used to forecast blood demand, plan collection efforts, and allocate resources efficiently. The data can be utilized to manage blood donor notifications, and appointments and monitor the impact of interventions on blood safety and availability.

Example: Blood transfusion services can use data to track adverse outcomes and adjust strategies accordingly to enhance service quality. E.g Rwanda's BTS data is useful for annual planning by the Ministry of Health and National Institute of Statistics of Rwanda (NISR), In Malawi, MBTS data is used in budgeting and lobbying for resources for cost-recovery and blood collection target setting.

4. Capacity Building and Stakeholder Engagement

There is a need across all levels of BTS to conduct regular training workshops and collaborative learning events to build staff capacity, engage key stakeholders, including government bodies, donors, and health facilities, to support data collection and use initiatives, as well as develop advocacy tools and best practices for effective communication and stakeholder engagement.

***Example*:** Collaborative workshops, networks, and interactions can foster knowledge sharing and capacity development among participants, staff and stakeholders from different countries. Well-curated advocacy messages can be used to solicit funds, encourage blood donation and retain blood donors.

5. Development of Monitoring and Evaluation (M&E) Frameworks

Countries should work to establish robust M&E frameworks to continuously assess the effectiveness of blood service operations and data management systems. This can be achieved by developing M&E frameworks that include specific, measurable indicators for blood service performance.

Example: Incorporating lessons from the pilot project at Queen Elizabeth Central Hospital, Malawi, into national M&E frameworks can help scale successful practices. e.g the setup of a laboratory information management system (LIMS) to export and aggregate blood data for proper monitoring.

Conclusion

The effective generation, management, and utilization of safe blood data are essential for the strategic planning and performance management of blood transfusion services in Liberia, Malawi, and Rwanda. Addressing current challenges, such as insufficient information on facility-level blood inventory management, clinical use, and transfusion outcomes, requires a multi-faceted approach. By adopting standardized data collection protocols, enhancing data quality through regular audits, and leveraging innovative technologies and best practices, these countries can significantly improve their blood data management systems.

Lessons learned from successful projects, like those observed at the Namibian Blood Transfusion Service and the Queen Elizabeth Central Hospital in Malawi, provide valuable insights and strategies that can be adapted to local contexts.

Key recommendations include prioritizing safe blood indicators, enhancing data collection systems, utilizing data for informed decision-making, and fostering continuous capacity building and stakeholder engagement.

Implementing these strategies will not only ensure the availability of safe blood but also enhance the overall quality and efficiency of blood services, ultimately improving health outcomes and saving lives. Through continuous learning and adaptation, Liberia, Malawi, and Rwanda and other similar country blood transfusion services can build robust, sustainable blood data management systems that respond effectively to national demands and disease trends.

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