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Ogorchukwu Ochem

ochem.oigorchukwu2017@uniabuja.edu.ng

University of Abuja <https://orcid.org/0009-0002-9687-648X>

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Blood Availability in Nigeria: Fragmentation, Supply Gaps, and the Case for National Coordination

Authors: ¹Ogorchukwu Emmanuel Ochem , ²Mathew Adah Okwoli 

Department of Mechanical Engineering, Faculty of Engineering, University of Abuja, Abuja, Nigeria;

Department of Computer Science, Faculty of Science, Kobe Institute Of Computing, Hyōgo, Japan

***Corresponding Author:** Ogorchukwu Emmanuel Ochem | Email:

ochem.oigorchukwu2017@uniabuja.edu.ng | ORCID: 0009-0002-9687-648X

Abstract

Nigeria faces a reported shortfall in blood collection alongside challenges in timely access to suitable blood. This narrative review and policy analysis explores evidence from within Nigeria, combined with publications from the World Health Organization, relevant legislation and blood safety standards, as well as reports from departments and organizations. The experience of a number of multicentre studies reveals the variability between centers for the preparation of blood components, the use of testing for blood-borne infections, recording of blood issues, and other aspects of blood transfusion. The paper discusses the use of electronic reporting, subnational haemovigilance, and an evolving National Blood Management System. Local studies point to cost barriers to care, and the facility-level studies continue to report commercial donation. Blood availability is a system property: safely collected and clinically appropriate blood must be able to be identified, verified, allocated, transported, and delivered to the patient who needs it in time. Rather than establishing entirely new institutions, blood systems can be strengthened in a phased manner, with the option of expansion depending on local 'operational readiness' and their subsequent performance. However, there is uneven coverage of studies, conflicting data on collection figures, and a lack of data on the implementation and cost of different strategies to increase blood availability, which limits analysis of the national situation and of cause and effect.

Keywords: Nigeria; blood availability; voluntary donation; transfusion safety; national coordination; haemovigilance; health information governance

INTRODUCTION

Nigeria's Blood Availability Gap

Nigeria needs safe blood for patients who need transfusions, and this blood must go through various processes in the health system, starting from collection.

In addition to the collection of blood safely enough to transfuse, there are many other processes that are essential in order to have enough safely tested blood available when needed for clinical use. Therefore, these other processes are discussed in turn in addition to the process of collection. WHO (2026a) describes requirements for nationally coordinated blood services, Voluntary Non-Remunerated Blood Donation (VNRBD), safe blood

for patients, quality-assured blood testing, safe blood storage and logistics, safe allocation of blood for clinical use, safe blood transport, safe blood use for patients, and safe surplus blood disposal.

Nigeria is estimated to require 1.8 to 2 million units of blood each year (WHO, 2026c). In the most recent country communication by WHO for Nigeria, the National Blood Service Agency figures for blood collection for 2024 were given as 371,827 units (WHO, 2026c).

Other official figures do not agree. Blood collected does not equal blood available for transfusion. National Blood Service Agency (NBSA) estimates approximately

1.23 million units are collected annually (NBSA, n.d.-a), while data from the Global status report on blood safety and availability 2025 (WHO, 2026b, Annex 3, p. 85) reports a partial return of 14,505 whole-blood donations for Nigeria in 2023.

Table 1
Official collection figures requiring reconciliation

Source	Figure & period	Appropriate interpretation
WHO (2026c), Nigeria country communication	371,827 units; 2024	Dated collection report; national reporting coverage unspecified.
NBSA (n.d.-a), institutional overview	Approx. 1,230,000 units annual collection; reference year unspecified	Undated estimate; reference year and reporting coverage unspecified.
WHO (2026b), global report, Annex 3	14,505 whole-blood donations; 2023	Partial return; unsuitable for national totals or donor proportions.

Note. Donations, collected units, released components, and transfused products measure different stages.

The sources provide no harmonized series covering them. Blood availability depends on more than collection volume.

Availability of safely collected blood (that has gone through testing, storage, identification, allocation, transport, etc.) is a system property. The fact that blood is safely collected does not necessarily mean that there is enough blood to cover the shortage at other locations within the health care system.

The facility studies are not used to establish nationally representative figures, and claims about Nigerian practice are supported by evidence from within the country. Even where the evidence supports the argument being made, it is not used to establish causation but rather to develop relevant policy options.

This is a narrative review and policy analysis. Coordinated searches were conducted through Consensus in September 2026 for peer-reviewed articles as well as general web searches for relevant WHO documents, Nigerian legislation, blood service official publications, and institutional documents. All sources cited here were selected purposively for relevance, authority, and support for claims made here.

FRAGMENTATION IN NIGERIA'S BLOOD SERVICES

Existing institutions and statutory relationships

NBSA defines the National Blood Service Agency's network of 17 blood collection, testing, and distribution centers located in all six of the country's geopolitical zones (NBSA, n.d.-a).

The governing legislation is the National Blood Service Commission Act, 2021 (hereafter referred to in this paper as 'Commission' for reference to the legislation and its documents; 'Agency' where it is incumbent on this paper to use the current name for the institution established under the legislation and this is not supported by a particular renaming instrument). Section 7 of the legislation establishes functions at the national level for the establishment of standards and for coordination. Section 7 also enables registration of blood donors. Other blood service establishments will be linked to the function of the Commission established by section 7 and, for the purposes of the function in section 13, for such establishments to continue to carry on the business of blood transfusion and/or collection of blood from donors, such establishments will be required to be inspected and certified to meet set standards as may be required from time to time, to supply information relating to their blood transfusion services and activities as and when required and, where relevant, to coordinate with appropriate State Blood Centre(s). (National Blood Service Commission

METHODS

Act, 2021, ss. 7, 13). Thus, a legal framework already exists for the national coordination of blood services.

Multicentre evidence of operational variation

The multicentre survey of government tertiary hospitals in Nigeria was aimed at showing how blood transfusion services in these centers are different from each other.

Umar et al. (2024) conducted a survey of 50 of the 103 government tertiary hospitals in Nigeria. The survey was conducted between June and July 2020. Among other findings, 16 of the participating tertiary hospitals had facilities to prepare blood components, and whole blood was the most frequently requested blood product; 25 of the tertiary hospitals used donor questionnaires.

In a separate survey of 50 government tertiary hospitals, 45 reported some form of inventory management. Among the 44 hospitals using manual inventory records, six reported a mixed manual/electronic approach. Nineteen hospitals reported supplying blood products to neighboring health-care facilities, and 46 (92%) reported some form of donor–recipient traceability in their records. These findings were self-reported and do not establish complete interoperability or reliable end-to-end transfer of blood products.

An inventory system does not necessarily have to be a shared one. Furthermore, the fact that there are interfacility supplies does not mean that these transfers work reliably. Both surveys only covered government tertiary hospitals, and even the samples of these two surveys could have data points in common.

The current evidence about blood services is focused on the functionality and procurement practices. There is no information about whether blood services have been requested for appropriate reasons and provided for. There is also no national analysis about the software compatibility, joint inventory visibility, and system failures between systems.

This term ‘fragmentation’ refers to the way in which services are connected. The number of providers does not have to be problematic, as many can function together in highly coordinated networks when there are clear standards, referral processes, flow of information, and clear roles and responsibilities.

Donation patterns

Blood donor surveys conducted at multiple centers identified family-replacement donation as the major donor category, followed by voluntary and paid (commercial) donors (Umar et al., 2024).

Facility-level studies cannot be used to infer a national donor profile. So far, studies on this topic have been conducted at a number of hospitals in Nigeria. At the Abakaliki-based tertiary hospital, for instance, voluntary donors constituted only 2.65% of all blood donors in the years 2019–2020. Three units came from the national blood service for that study (Nnachi et al., 2022). Similarly, in a tertiary institution in Osun State, Nigeria, out of 11,386 prospective donors’ data collected over the three years (2020–2022), 90.3% were from family-replacement donor sources, while 9.7% were voluntary donors (Tijani et al., 2025). In a study conducted at the Federal Medical Centre, Azare, between January and June 2024, out of the 400 participants, 231 were classified as volunteers, 128 as parental/family donors, while 41 were commercial donors (Habibu et al., 2025).

These studies describe different populations of blood donors and their classification categories. Use of the word “Volunteer” alone does not help to establish whether a donor donates regularly and on a non-remunerated basis. Voluntary donations of blood have increased to 12,568 in 2024 and to 16,344 in 2025 (which corresponds to an increase of about 30.04%), but the coverage for these figures is not specified (WHO, 2026c).

There is currently a lack of data on the current proportions of voluntary non-remunerated donations, family-replacement donations, and paid donations across the country.

Regular voluntary non-remunerated blood donation should be supported by means of donor counseling, treating the donor with respect, maintaining confidentiality, and checking back with confidential information about the donor. Eligible family-replacement donors should be supported to become repeat voluntary non-remunerated donors. Donations by family-replacement and by payment should be reported in

separate categories of donations. Every single donor needs to be assessed for eligibility and tested.

The new donor-sourcing strategy in concrete terms should be monitored, i.e., in terms of availability of usable blood, of the return rate of donors and of possible obstacles in the recruitment process.

Digital coordination

Digital coordination has already begun. The National Blood Management System (NBMS) on the National Blood Service Agency website (NBSA, n.d.-b) outlines the following functions of the online system: Donor Management; Establishment Registration; Inventory Management; and Online Blood Request and Tracking of Blood Movement. The online establishment for donor registration, the license for blood collection centers, and online certification for personnel were inaugurated on June 15, 2026 (Akan, 2026).

Electronic reporting predates the NBMS. Ore et al. (2025b) analyzed donation screening data from the national DHIS2 platform for 13 blood establishments across the six geopolitical zones for 2018–2019. The study examined screening results, not blood inventory, and it could not have assessed inventory exchange through the NBMS, which postdates the study period.

There are other examples of inventory systems that are currently in place at a State level. For example, the Lagos University Teaching Hospital (LUTH, 2026) has described how an existing system is currently used to track blood from collection to transfusion.

It is important to note that the various pieces of information outlined above do not amount to a fully interconnected national system of information. For example, verified information on the number of active facilities running NBMS, coverage of facilities geographically, completion of request workflow, tested interfaces, and independent performance measures for NBMS were not outlined in the reviewed sources.

This review underscores that software and system operation are different; it also highlights the need to evaluate blood inventory information management in the country beyond software development.

CLINICAL AND SAFETY CONSEQUENCES OF SUPPLY DEFICIT

Maternal hemorrhage and access to urgent transfusion

The consequences of delayed access are most visible in emergencies. Oladapo et al. (2016) conducted prospective surveillance over 12 months at each participating hospital, with the participating facilities completing surveillance between 1 June 2012 and 14 August 2013. The study included 42 public tertiary hospitals and recorded 998 maternal deaths and 1,451 maternal near-misses.

A study of 151 transfused parturients at a teaching hospital in Abakaliki in 2012 found a mean decision-to-transfusion interval of 12.0 ± 4.3 hours, and attributed its six deaths to delays in securing blood (Lawani et al., 2013).

These studies are from historical periods and were conducted at tertiary-level referral hospitals or a single study site. Therefore, these studies do not provide estimates of current maternal mortality attributable to lack of blood or establish whether better coordination would improve access. They instead demonstrate the clinical importance of timely transfusion and support prioritizing emergency obstetric care in a pilot.

The pilot activity would record: the date and time the blood request was made; what product(s) were sought; what product(s) were issued; whether transfusion took place; whether the use of blood was urgent; referral status; and the reason for late access. This allows a distinction between stock not being available and problems elsewhere in the process.

Sickle cell disease (SCD)

Sickle cell care presents a different problem: continuity. 24 of 31 hospitals listed blood shortages for regular transfusion and a lack of specialized transfusion services as challenges they currently face. This study approached 73 hospitals (Diaku-Akinwumi et al., 2016).

The study is about 10 years old and does not capture more recent institutional developments in Nigeria's SCD program. Though the study approached 73 hospitals with dedicated SCD clinics, the response rate from the surveyed hospitals limits the generalizability of the findings to the current national level of care for patients

with SCD. Recent developments at LUTH (2026), for instance, include the commissioning of an automated immunohaematology analyzer for blood grouping, antigen detection, and cross-matching.

The extended antigen typing, with previously defined antigens to be tested in a routine manner, as well as the measures to address alloimmunization and iron overload, as recommended by the guideline of the American Society of Hematology (Chou et al., 2020), are concrete information requirements for coordinated transfusion care in patients with SCD.

Transfusion coordination requires a specific set of information, especially where specialized services are in place. Extended antigen profiles, antibody histories, and previous transfusion reactions must travel with the rest of the patient's clinical information. Missing information must clearly be identified as missing and not incorrectly assumed to be a negative result.

This proposal does not assume that every clinic has specialized testing capability nor that all patients with sickle cell disease need chronic transfusion. Rather, the proposal addresses those patients for whom such specialized services are already clinically indicated.

Transfusion-transmissible infections

Safety begins before a unit reaches the patient. Donor source, donor eligibility, screening quality, and safe transmission of confirmed cases to recipients are all separate questions. The above Nigerian studies mainly focus on the first three.

Oreh et al. (2025b) analyzed anonymized donation records from 13 blood establishments across Nigeria's six geopolitical zones for January 2018–December 2019. The study included 98,610 records and used ELISA screening. Overall seropositivity for at least one transfusion-transmissible infection was 10.1%. By donor category, seropositivity was 26.5% among 113 paid donors, 14.5% among 44,097 voluntary donors, and 6.6% among 54,400 replacement donors. Twenty-one establishments were excluded from the study; this exclusion count should not be conflated with donor counts. Because the data come from 13 establishments and one screening method, they cannot be generalized to

all donors or to hospitals that screen with rapid tests alone.

At Azare, commercial donors had higher odds of HIV positivity (AOR 14.63, 95% CI 1.76–121.27), but the very wide interval means the size of the association is uncertain (Habibu et al., 2025). Furthermore, among the Osun State blood donation centers studied, family-replacement donation was associated with higher adjusted odds of hepatitis B positivity than other donation types; however, no significant associations were found for the three other infections studied (Tijani et al., 2025).

These findings reinforce the need for careful examination of donor selection for transfusion, as the studies are not generalizable to all donor categories.

Differing laboratory practices existed among the studied hospitals, with 23 of 50 (46%) hospitals utilizing rapid tests to detect Transfusion-Transmissible Infections (TTI), while the other 27 (54%) of the studied hospitals, in addition to carrying out TTI tests, also utilized ELISA tests for screening donors (Umar et al., 2024).

Voluntary blood donors therefore need to be processed through the full safety process of blood donation, i.e., assessment for eligibility, validated testing for infection, dealing with test results that are reactive, and release of donated blood by authorized personnel.

Each stage in the transfusion process should be tracked independently by the information system. Number of collected donations, tested donations, released donations, discarded donations, and transfused donations should be reported separately. The reason for discarding each donation should be recorded, but the donor's identity should not be exposed.

A positive screening test result does not equal confirmed transmission. Investigation of suspected recipient infections by clinical and laboratory means, including look-back where indicated, is required.

GOVERNANCE, FINANCING, AND DATA PROTECTION

A workable allocation of responsibility

The NBSA should drive agreement on National Standardized Reporting Definitions and a set of core Reporting Requirements that all participating blood

service entities report against on an ongoing basis, supported by all state services, blood establishments, health care providers and patient and donor advocacy groups.

Because stock management is the hospital blood service's responsibility, decisions on stock release and on verifying stock against the listing rest with the hospital. An operating agreement will define who is authorized to release stock, make transport arrangements, address conflicting information about listed stock, and manage and investigate incidents where stock has not met agreed standards. Disputes will be managed through clearly defined processes. The hospital will receive corrective support and, where appropriate, be placed on restricted status until agreed standards are met.

An offer to stock shall only become actionable upon confirmation of supply by the authorized institution or facility.

Financing collection, quality, and access

Funding sources include federal appropriations, grants and/or donations, and fees and service charges provided for under the National Blood Service Commission Act (2021). That legislation alone does not necessarily fund Blood Service activities adequately.

Nigerian studies have documented cost barriers to care. A qualitative study at one Kano hospital found that informal user fees and distrust of the transfusion process limited uptake of maternal anemia care (Kuliya-Gwarzo et al., 2023), and a study of patients with sickle cell disease in south-east Nigeria examined economic burden and catastrophic cost (Amarachukwu et al., 2022). Neither measured the cost of blood, and no study reviewed here established current national expenditure on blood. A qualitative study at one Kano hospital found that informal user fees and distrust of the transfusion process limited uptake of maternal anemia care.

A detailed, transparent, and activity-specific cost to blood services is proposed, encompassing recruitment, collection, testing, processing of blood components, storage, transport, clinical support, IT systems, training and quality control. This will include specific recurrent and capital costs.

This will enable a pilot to test an institutional purchase and/or public subsidy model and measure what households and health care providers must pay for blood services, and verify health care providers' insurance entitlements.

Data protection as part of service design

The Nigeria Data Protection Act, 2023 requires personal data processing to meet the principles in section 24, including lawfulness, fairness, transparency, data minimization, purpose limitation, accuracy, storage limitation, integrity and confidentiality. High-risk processing requires a prior data protection impact assessment (s. 28). A breach likely to put individuals' rights at risk must be notified to the Nigeria Data Protection Commission within 72 hours (s. 40). Cross-border transfers are subject to the conditions in ss. 41–43.

The NBMS website describes the categories of information processed by the platform, including National Identification Numbers, biometric data, and sensitive information related to blood transfusion (NBSA, 2026).

This review proposes identifying who the data controllers and processors are for each function; establishing rules for how many people can access what and for how long they can keep it; an independent and complete security audit before launching to the wider public; using a unique identifier for a donation and keeping identifying information behind a separate function that only matches donations to donors when required; and an access point for people without an identifier to access services, allowing protected, aggregated data for public-facing dashboards.

From Fragmented Records to Coordinated Blood Intelligence

The requirements for the management of blood already exist in Nigeria's Blood Safety Standards (National Blood Service Agency [NBSA], 2021, ss. A5.4, A13.6). What is required now is for information management systems along the blood chain to be able to share data across these systems for traceability of blood products from source to final use.

Although the requirement for traceability exists, the question remains whether the information systems along the blood chain have the ability to exchange the information needed to enable holistic traceability, rather than operating largely as data silos.

Before considering integration, an assessment of the operational systems (NBMS, state-level system, and health facility-level applications) is needed to establish the completeness of the data, how identities are captured and shared, and which interfaces already exist between application systems.

This assessment needs to precede any assumption of interoperability between the blood group's 'information systems'.

1. **Donor management:** eligibility assessment, confidential follow-up, and return donation.
2. **Inventory management:** products, quantities, locations, and verified status.
3. **Clinical request and outcome reporting:** the path from request through issue, receipt, transfusion, return, or other disposition.

Stock checking staff do not need access to information held on donors, and a clinician does not need administrative access to the underlying system, for example, to amend a blood group. Access should be based upon role.

In terms of exchanging data, the key modules would need to supply the following: the name of the establishment that supplied the stock; a unique ID for every donation (as well as every derived product); whether the stock was in the process of being released or still in quarantine; and the date of expiry for all items, as well as any that have been reserved, have been moved, etc. The timestamp for every stock report would also be necessary, along with the name of the user responsible for the report.

"Unknown" must be distinguished from "zero" in data entries. Stock that is reserved must not be shown as available stock. A system-generated match of stock against a request for blood must prompt the user for confirmation prior to release of the stock. A request for blood tests requires a service with specific qualified personnel to perform the test. The location and blood

group of the collecting facility alone are not sufficient to determine a product's suitability.

Interoperability testing should include controlled live or production-like transactions, alongside testing of error, cancellation, return, and downtime scenarios.

Infectious disease transmission events (including suspected events) must be reported and all adverse events investigated and action taken where necessary. Reporting blood transfusion-associated events needs to be linked with investigation and control measure(s) implemented to prevent similar occurrences within the transfusion chain.

It is important to note, however, that even as WHO's global report of blood safety from around the world captures no national haemovigilance system from Nigeria's 2023 report (WHO, 2026b, Annex 10, p. 140), there is current evidence from states and facilities within the country.

From a 2019–2020 survey of 50 hospitals across Nigeria, 27 (54%) of the hospitals had transfusion committees established; 9 (18%) reported regular meetings of the committees, whereas 46 (92%) reported that they had some form of donor–recipient traceability in their records (Umar et al., 2025).

Most recently, a study to determine the level of implementation of blood transfusion services in 98 health facilities across Rivers State, conducted in February 2024, found variance in the extent to which hospital transfusion committees function optimally across the health care facilities (Oreh et al., 2025a).

In a prospective cross-sectional study of blood transfusion adverse events at 30 study facilities in Rivers State, 16 of the facilities completed questionnaires on blood transfusion events involving 359 recipients of 397 blood components over a 5-month period from September 2024 to January 2025. Twenty-four adverse events were reported, of which 23 were unclassified (Oreh et al., 2026).

Reporting is happening. Classification and follow-through are the weaker points. The objectives of the program of action should be met by pairing confidential reporting with specific assignments for investigation and action; and distinguishing between an operational problem such as an unsatisfied order and a

transfusion reaction, and between an event that was suspected to be a transfusion reaction and one that was investigated and found to be a confirmed transfusion reaction.

One needs to be cautious in using the number of reported events as a measure of improvement in blood safety reporting. Reporting improves, but the numbers could increase initially because of better classification and fuller investigation of reported events.

RECOMMENDATION

A Practical Roadmap for Phased National Coordination

The following is proposed as a roadmap rather than a set of announced policies for a government program. First, measurement is required, then testing operationally with a small number of projects. A national platform does not, by itself, solve the underlying coordination defects.

Only after the Reconciliation of the Baseline can a Timetable or Budget be proposed and implementation be stepped up accordingly, i.e., based on Evidence of Readiness.

Phase 1: Reconcile the baseline

NBSA, state services, institutions, and healthcare professionals agree on estimated collections and publish information on the populations covered by reporting: number and type of facilities, time frame, missing data, and rules for revisions of reported data. Donations must be clearly distinguished from components. The method for estimating requirements must be revealed. Services that have been verified, storage capacity, transport, IT systems, and referral links must be mapped. Agreed definitions, data sharing, and a risk assessment. The phase should produce a documented baseline, named responsible organizations, agreed definitions, and a costed pilot plan.

Phase 2: Demonstrate a limited functioning network

Map a small, manageable number of facilities willing to participate, and document their roles and readiness limits to ensure representativeness. Leverage existing platform(s) where suitable. Fund the operational work to process requests, verify stock, transport products, and investigate discrepancies. Start with urgent obstetric

stockouts and then planned sickle cell disease product distributions. Follow each transaction from request to disposition and compare physical stock on hand against system records. Expansion should require safe workflows, adequate data completeness, timely discrepancy resolution, and sufficient staff capacity against thresholds agreed in advance.

Phase 3: Expand with quality and donor retention

Add services as they become ready to integrate. Focus support on labs, staffing, transport, and information requirements as opposed to viewing connectivity as the entire package of intervention. A common reporting specification should be adopted so that different compliant systems can participate while an audit trail is preserved through error correction. A number of distinguishing features for first-time vs. repeat voluntary donors should be supported. Provide feedback to the clinician on appropriate use, request quality, and adverse events. Expansion should depend on clear responsibilities, recurrent financing, and quality arrangements. A pause should trigger investigation and support.

Phase 4: Report nationally and evaluate

Publish coverage and uncertainty. Report measures with coverage, and where uncertainty exists, publish it. Measures should include: verified requests fulfilled as a proportion of total; time taken to issue product and for transfusion; reasons for failure; number of and proportion of usable products released against number of donations received; products expiry/discard with a suitable denominator for each; traceability completed; incident investigation closed; repeat donation by donor; and patient payment made. Emergency and planned activity should be reported separately to enable meaningful comparison. Do not combine provider resource use and charges with household payment and provider reimbursement into a single cost measure. Measures for participating locations and patient groups should, where lawful and proportionate, be compared. Evaluation should retain stable comparison sites or a prospectively specified phased design that accounts for site changes, case mix, reporting completeness, and concurrent investment.

Claims about mortality, cost-effectiveness, or national sufficiency require appropriate data and study designs, with observed effects distinguished from proposed mechanisms.

The first phase therefore needs to focus on what is actually being measured, establish the requisite performance indicators, and achieve sufficiently precise denominators so that a national dashboard provides more than the semblance of precision.

Moving on from the functionality of the software as such, the next phase is to test the operational processes in the various services involved in delivering medical products, one service at a time. This means testing each service end-to-end to determine how long each step actually takes to complete in real life, for example: the time it takes to process a request, verify stock, select suitable products, and have them transported and distributed, with the final point of care fully recorded.

The purpose of the pilot is not to show that national coordination of activities to distribute blood products can work. It is to find out what has to work before coordination is expanded.

This would include the addition of new services that are able to grow alongside supporting infrastructure. Services such as laboratory capacity and staffing, as well as transport and information management, and the oversight needed to ensure quality of all services described above will all require ongoing funds. In addition, the model should clearly indicate whether a rise in first-time donors translates into a stable donor base over time.

Reporting national performance against specified indicators should begin only once operational experience has provided a relevant and comprehensive basis for such reporting. Indicators should be reported in context, incorporating measures of coverage and uncertainty, as single figures or headline news can be misleading.

Limitations

It is important to note that this purposive review is not exhaustive; therefore, sources were selected based on factors including currency, scope, and intent. Furthermore,

multicentre studies included in the review may be limited to specific institutions, time periods, or even rely on self-reported data and capabilities.

While some evidence can be derived from digital records rather than institutional descriptions, independent evaluation of NBMS remains limited. To date, no complete national facility census, collection series, cost study, or interoperability assessment for NBMS was verified in the evidence reviewed.

This limits the ability to quantify how much facility fragmentation contributes to the national supply problem and to predict the value of a well-coordinated NBMS program.

However, these gaps highlight the specific research areas required: reconcile to a common set of denominators, verify the service capability of facilities, cost the blood supply chain from blood collection to the point of transfusion, and implement and prospectively assess changes in access to blood transfusion services.

CONCLUSION

Addressing the challenges facing blood collection in Nigeria requires recognizing the variation in approaches and structures for collecting and distributing blood across the country. Multicentre studies conducted so far identified differences in how blood components are prepared and issued, the extent of screening of blood and its products for infectious diseases, the types of information kept about blood donors, the ways blood is supplied between facilities, and the processes in place to monitor blood transfused to patients. Information from DHIS2 screening reports, as well as haemovigilance reports from Rivers State, provides evidence of how existing practices could be harnessed to improve coordination. While collection targets need to be set to ensure optimal collection, targets alone will not be adequate to determine blood availability. Therefore, while the proposed approach to address the challenges will be to harness the existing statutory framework, it would need to be done in phases, starting with reconciled reports of blood collected and issued, verified capacity to collect and issue blood, clear lines of responsibility for blood collection, costed pilot studies to test them, followed by

an expansion of the approach as each of voluntary blood donation, adequate and quality laboratory services, safe information exchange and adequate haemovigilance are also developed. It is important to evaluate the approach to determine whether it would ultimately lead to improved, timely, and equitable access to safe blood and how much it would cost.

DECLARATIONS

Ethics approval:

This policy analysis was based solely on published literature, legislation, and publicly available institutional documents. It involved no human participants, and no identifiable personal data, so formal ethical review was not required.

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Authors' contributions

Ogorchukwu Emmanuel Ochem conceived the study and drafted the manuscript. Mathew Adah Okwoli critically revised the manuscript for intellectual content. All authors participated in data collection and read and approved the final manuscript.

Competing interests:

None declared.

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None.

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