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Strengthening Anaemia Data Systems in Africa: Challenges, Innovations, and Policy Opportunities

Elodia Cheutou Siewoue
Texila America University, Guyana, South America

Abstract

Anaemia is a major public-health challenge in Africa, affecting over one-third of women of reproductive age and nearly half of pregnant women (World Health Organization (WHO), 2025). Despite global and continental commitments to halve anaemia by 2030, progress has stalled, largely due to weak data systems that hinder timely, evidence-based action. This paper reviews anaemia data in Africa, examining how indicators are collected, integrated, and used within health-information systems. Drawing on the literature, policy frameworks, and country examples, it explores opportunities to strengthen surveillance through digital health innovations and governance reforms. Findings reveal persistent fragmentation between surveys, routine health systems, and laboratory data, leading to incomplete and delayed reporting. Emerging solutions such as the District Health Information System (DHIS2) nutrition modules, improved lab interoperability, mobile community reporting, and regional scorecards offer practical integration pathways. However, anaemia-specific indicators remain absent in several platforms, including the Economic Community of West African States (ECOWAS) Sexual, Reproductive, Maternal, Newborn, Child, and Adolescent Health (SRMNCAH) scorecard. Updating these tools to align with WHO's Comprehensive Framework and the African Union's Anaemia Reduction Framework (2023–2030) is critical. Strengthening anaemia data systems requires investment in governance, interoperability, and analytical capacity rather than creating parallel mechanisms. Embedding anaemia indicators within existing digital-health infrastructures can transform fragmented data into actionable intelligence, enabling governments to monitor progress, address inequities, and accelerate reductions by 2030, contributing to the global target of reducing anaemia among women of reproductive age by 50% from the 2012 baseline.

Keywords: *Anaemia, Dashboards, Data Governance, Digital Health, Policy and Accountability.*

Introduction

Anaemia remains a persistent and widespread public health challenge across Africa, disproportionately affecting women, children, and adolescents. The condition not only undermines individual health and development but also poses significant barriers to socioeconomic progress and the achievement of global health targets. Despite ambitious global and continental commitments such as the World Health Organization's goal and the African Union's pledge to halve anaemia prevalence by 2030, progress has been disappointingly slow. Recent estimates reveal that 37% of women aged 15–49 and 43% of pregnant women in Africa are anaemic [1], highlighting the magnitude and urgency of the problem.

This situation is further complicated by the fragmentation of data systems, which impedes effective monitoring, timely interventions, and robust policy accountability. The central issue addressed in this study is the absence of integrated, reliable, and timely anaemia data

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Corresponding Author: cheutelodia@yahoo.fr

systems in Africa. At present, most countries rely heavily on periodic household surveys and programmatic reporting, such as the Demographic and Health Survey (DHS), Multiple Indicator Cluster Survey (MICS), and Standardized Monitoring and Assessment of Relief and Transitions (SMART). While these surveys, alongside routine health information systems like DHIS2 and laboratory platforms, provide valuable insights, they often function in isolation. The lack of interoperability and real-time data sharing leads to incomplete, delayed, and sometimes inconsistent information, ultimately limiting the effectiveness of decision-making and resource allocation.

Recent years have seen the emergence of digital health innovations, particularly the integration of DHIS2 nutrition modules and improved laboratory interoperability, which offer promising pathways for strengthening anaemia data systems. These advancements have the potential to harmonize data collection, enhance analytical capacity, and support evidence-based policy responses. However, significant limitations persist, including incomplete inclusion of key indicators, ongoing data quality challenges, and weak governance structures that hinder the full realization of these innovations.

Despite these obstacles, there have been notable achievements. The adoption of the African Union Commission's Framework for Accelerating Anaemia Reduction (2023–2030) [2] marks a significant policy milestone, providing a strategic roadmap for countries to align efforts and resources. Additionally, pilot projects integrating anaemia indicators into DHIS2 platforms in some countries, as well as the development of national dashboards for improved data visualization, demonstrate tangible progress toward more effective surveillance and accountability.

This study critically examines the integration of anaemia indicators into national health information systems, assesses current challenges, and proposes actionable strategies to strengthen data governance and interoperability. The novelty of this work lies in its synthesis of regional policy frameworks, digital health innovations, and governance reforms, offering a unified approach to transform anaemia surveillance from fragmented, program-specific reporting to a system-wide mechanism for accountability and action.

Materials and Methods

This study employed a comprehensive desk-based methodology, synthesizing secondary data, policy frameworks, and comparative country experiences to examine the current state and integration of anaemia data systems in Africa.

The research site is defined as the African continent, with particular emphasis on subregions and countries where anaemia prevalence is highest and where digital health information systems are being piloted or scaled. The analysis draws on regional policy initiatives, notably the African Union Commission's Framework for Accelerating Anaemia Reduction (2023–2030), and incorporates national experiences from Benin, Cameroon, Ethiopia, Kenya, Malawi, Niger and Uganda. These countries were cited among 36 countries that participated in a regional webinar series organized by WHO AFRO in August 2025. They were highlighted due to their notable availability of recent anaemia data, the presence of digital health innovations, and documented efforts to strengthen health information systems. The selection reflects both the geographical, language diversities and the momentum for data-driven anaemia surveillance across the continent.

No primary field experiments were conducted. Instead, the study systematically reviewed and triangulated data from multiple sources. Peer-reviewed literature, official reports, and policy documents were identified through targeted searches of databases such as PubMed, WHO Global Health Observatory, and regional repositories. The review included data from Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), and Standardized Monitoring and Assessment of Relief and Transitions (SMART) surveys, as well as routine health information captured through DHIS2 platforms. Additionally, insights were drawn from technical webinars and regional anaemia workshops held in 2025, which brought together health information managers, nutrition focal points, and development partners.

The study did not involve the collection or analysis of biological samples. However, the review critically assessed the role of laboratory information management systems (LIMS), such as OpenELIS and Basic Laboratory Information System (BLIS), in capturing haemoglobin and micronutrient data. The integration of laboratory data with national health information systems was examined through case studies and pilot projects, particularly in Kenya [3], where interoperability between laboratory systems and the DHIS2 platform has been initiated.

Statistical methods were primarily descriptive and comparative. Prevalence rates, coverage indicators, and trends were extracted from the reviewed sources and compared across countries and regions to identify patterns and gaps. The study also evaluated the quality, completeness, and timeliness of anaemia data as reported in national and regional monitoring frameworks. Where possible, data triangulation was used to validate findings and ensure robustness. Limitations related to data comparability, indicator definitions, and reporting practices were acknowledged and addressed in the interpretation of results.

This multi-source, comparative approach enabled a nuanced understanding of the strengths and weaknesses of current anaemia data systems in Africa, providing a solid foundation for the recommendations and policy implications discussed in subsequent sections.

Results

Current Anaemia Data Landscape in Africa

Efforts to monitor and reduce anaemia in Africa rely on multiple data sources that vary in scope, frequency, and reliability. While the region has made significant progress in building digital health infrastructure, data on anaemia remain fragmented, inconsistently collected, and rarely used to inform policy. Understanding the current data landscape is essential for identifying where systems strengthening is most needed and how existing platforms can be leveraged for integrated monitoring.

Population-based Surveys

Population-based surveys constitute the primary source of anaemia prevalence data across African countries. The Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), and SMART nutrition surveys routinely collect haemoglobin data to estimate the prevalence of anaemia among women and children. These surveys follow standardised global protocols and provide disaggregated data by age, sex, and residence, which makes them invaluable for regional and global reporting [4].

However, their major limitation lies in periodicity; most countries conduct them only every five to ten years, making them unsuitable for real-time tracking or annual program monitoring. Furthermore, biomarkers for the underlying causes of anaemia, such as iron, folate, or vitamin B12 deficiencies, are not always measured due to logistical and financial constraints. As a result, while survey data can reveal prevalence trends, they often cannot inform the design or targeting of interventions at subnational or facility levels.

Routine Health Information Systems

Routine data from the District Health Information Software 2 (DHIS2) platform offers a continuous flow of information from health facilities but remains underutilised for anaemia monitoring. In most African countries, anaemia data are captured indirectly, through indicators related to maternal health (e.g., iron–folic acid supplementation), malaria prevention, or child health services. Few systems collect haemoglobin concentration data systematically, and even fewer link clinical diagnoses with laboratory findings.

Several factors limit the effectiveness of HIS data for anaemia surveillance:

1. **Incomplete indicator inclusion:** many DHIS2 versions exclude anaemia as a distinct condition, focusing instead on proxy measures such as supplement distribution or antenatal care coverage.
2. **Data quality issues:** inconsistent reporting, missing denominators, and manual aggregation compromise accuracy
3. **Limited disaggregation:** routine systems rarely capture age-specific or sex-specific data, particularly for adolescents and non-pregnant women, who are emerging as priority groups in the continental anaemia agenda.
4. **Weak interoperability:** laboratory systems, nutrition modules, and community data are often disconnected from DHIS2, resulting in data silos.

Nevertheless, some countries have begun integrating nutrition and anaemia indicators into DHIS2. For example, Ethiopia and Malawi have piloted nutrition dashboards and data validation mechanisms that include iron–folic acid coverage, antenatal haemoglobin testing, and deworming among pregnant women. These early efforts demonstrate the potential for routine platforms to complement periodic surveys, provided that data are harmonized and systematically validated (WHO-Africa Regional Anaemia Webinar Series, 2025).

Laboratory and Micronutrient Data

Laboratory systems represent an underdeveloped but critical source of anaemia-related data [5]. Facility laboratories routinely measure haemoglobin, haematocrit, or red blood cell indices for patients, yet these data rarely feed into national health information systems. The lack of electronic laboratory information management systems (LIMS), coupled with weak connectivity and data standards, limits the aggregation of laboratory-based anaemia results [6].

In a few countries, open-source platforms such as OpenELIS and BLIS have been deployed to capture laboratory data, but integration with DHIS2 remains limited. Where linked, as in pilot projects in Kenya and Rwanda, the combined datasets have enhanced early detection of anaemia trends and supported clinical decision-making. The inclusion of laboratory data is particularly important for identifying anaemia’s multifactorial causes (iron deficiency, infections, or genetic disorders) which cannot be distinguished through surveys alone.

Programmatic and Community-Level Data

Anaemia-related data are also collected through vertical programmes in maternal and child health, malaria, HIV, and nutrition. These include antenatal care registers documenting iron–folic acid supplementation, intermittent preventive treatment for malaria (IPTp), and deworming coverage. Some countries (Benin and Cameroon) have also begun collecting data on adolescent girls through school health and community nutrition programmes. However, reporting from these initiatives is frequently paper-based and fragmented across departments.

The 2025 regional webinars revealed that community-based health workers such as village health teams in Uganda or health surveillance assistants in Malawi, play an essential role in collecting anaemia-relevant data, yet their reports rarely reach national databases. Uganda’s experience [7] demonstrates how community information systems can meaningfully contribute to anaemia reduction when integrated with health and nutrition monitoring [8]. Between 2006 and

2016, the country recorded a 10% decline in anaemia among women of reproductive age, coinciding with the expansion of community health data collection and family planning services [9].

Summary of Data Gaps and Opportunities

Overall, Africa's anaemia data landscape is characterized by fragmented sources, limited interoperability, and weak feedback loops. Periodic surveys provide high-quality prevalence estimates but lack timeliness; routine systems generate continuous data but often exclude essential indicators; laboratory results remain isolated from public-health surveillance; and community-level data are underreported. This fragmentation makes it difficult to monitor anaemia comprehensively, track policy progress, or identify high-risk populations in real time.

However, opportunities for improvement are emerging. The growing adoption of DHIS2 nutrition modules, national data dashboards, and the AUC Framework for Accelerating Anaemia Reduction (2023–2030) has prompted countries to prioritize anaemia indicators within their health information systems. The framework's emphasis on *systems indicators*, including the integration of anaemia data into DHIS2 and the establishment of national scorecards, signals a regional shift toward coordinated, data-driven action. Strengthening interoperability, building analytical capacity, and ensuring data use at subnational levels will be key to realizing this potential.

Integration of Anaemia Indicators into Routine Health Information Systems

The integration of anaemia indicators into routine health-information systems (HIS) has become a cornerstone of efforts to strengthen anaemia surveillance and accelerate progress toward the 2030 global target of halving anaemia prevalence among women of reproductive age. As both the World Health Organization (WHO) and the African Union Commission (AUC) frameworks emphasize, reducing anaemia sustainably requires not only effective interventions but also robust data systems capable of capturing, analysing, and translating information into action.

While most African countries now operate national DHIS2 platforms, anaemia data remain inconsistently captured, poorly harmonized across programmes, and underutilized for policy and programme decision-making. Strengthening integration is therefore both a technical and governance priority, linking the WHO's global guidance with Africa's continental monitoring commitments.

Conceptual Foundations and Rationale for Integration

According to the WHO Comprehensive Framework for the Prevention and Management of Anaemia in Women of Reproductive Age (2023), data systems are central to the fifth domain of action: *data analysis, monitoring, and accountability*. This domain calls for routine collection and disaggregation of anaemia-related indicators, integration into national HIS, and regular use of data for programme review and policy adjustment. The framework advocates a multisectoral monitoring architecture linking health, nutrition, WASH, and education data to reflect the multifactorial nature of anaemia [8].

In parallel, the AUC Framework for Accelerating Anaemia Reduction in Africa (2023–2030) introduces a specific category of systems indicators, including:

1. The inclusion of anaemia metrics within DHIS2 or equivalent HIS platforms;
2. The existence of a national anaemia dashboard or scorecard; and
3. The frequency of national data-quality assessments [2].

Both frameworks converge on the principle that anaemia monitoring must move beyond sporadic surveys toward institutionalized, interoperable, and actionable data systems. This alignment provides the conceptual rationale for integrating anaemia indicators into national HIS platforms where data can be collected continuously, validated, and used to inform interventions at every level of the health system.

Regional Trends and Systemic Challenges

Despite growing interest in data integration, most African countries are still in the early stages of implementation. Three main challenges persist across settings:

1. **Partial integration:** Anaemia indicators in DHIS2 often reflect service coverage (IFA tablets distributed) rather than biological outcomes (haemoglobin concentration), limiting epidemiological precision.
2. **Data fragmentation:** Separate reporting streams for nutrition, maternal health, malaria, and laboratory services undermine coherence.
3. **Limited capacity for data use:** Even when data are available, many subnational managers lack the skills or authority to interpret and act upon them, echoing WHO's observation that "the translation of anaemia data into policy action remains inconsistent" [8]

These gaps highlight that integration must encompass both infrastructure and governance, ensuring that the right indicators are captured, validated, and used for decision-making.

Lessons Learned and Implications

The synthesis of national experiences, webinar outcomes, and global frameworks yields three key insights:

1. **Integration is a governance process, not merely a technical upgrade:** Successful implementation depends on clear leadership, accountability mechanisms, and multisectoral collaboration; principles underscored in both WHO and AUC frameworks.
2. **Comprehensiveness matters:** Integrating only a narrow set of indicators risks perpetuating data gaps. Systems should capture not only programme inputs (e.g., Iron and Folic Acid (IFA) coverage) but also outcomes (haemoglobin levels) and determinants (infections, dietary quality).
3. **Capacity building sustains data use:** Without investment in analytical skills and feedback culture, digital tools cannot translate into improved decision-making.

Ultimately, the integration of anaemia indicators into routine HIS represents a critical step toward the WHO's call for *"an enabling data environment"* and the AUC's vision of *"a continental culture of evidence-based action"*. Together, these frameworks provide both the blueprint and the political momentum for transforming anaemia surveillance into a foundation of accountable, multisectoral public-health governance in Africa.

Data Use, Feedback, and Governance

The utility of integrated anaemia data systems depends not on the quantity of information collected but on the capacity of institutions to transform data into decisions. Across low- and middle-income countries (LMICs), evidence shows that weak data-use culture, fragmented governance, and limited analytical capacity remain major barriers to translating digital health data into policy action [10]. This section explores how African countries interpret and apply anaemia data at national and subnational levels, situating these experiences within broader global research on data use, feedback, and governance.

From Data Collection to Decision-Making

Research in LMICs consistently finds that data quality alone does not ensure data use; decision-makers rely on information when they perceive it as credible, relevant, and timely [11]. Implementation-science frameworks such as the *learning health-system* model emphasize iterative feedback cycles where information is continuously analysed, shared, and applied to guide improvement.

In the African context, many ministries of health have invested heavily in digital data capture through DHIS2, yet the shift from *data reporting* to *data reasoning* remains incomplete. The WHO 2023 Comprehensive Framework for the Prevention and Management of Anaemia in Women of Reproductive Age identifies “data analysis, monitoring, and accountability” as a critical domain of action, calling for regular review meetings and cross-programme dashboards. The AUC 2023 framework extends this to the continental level, recommending quarterly review of anaemia indicators and institutionalized “data-to-action” cycles. Both align with global guidance from MEASURE Evaluation, which underscores that regular feedback, leadership engagement, and accessible visualization tools are the strongest predictors of sustained data use [11].

National-Level Review and Policy Feedback Loops

Several African countries are beginning to embed anaemia indicators within broader nutrition and maternal-health review mechanisms. Ethiopia’s Nutrition Information Technical Working Group triangulates DHIS2 data with survey and logistics information to identify geographic disparities and stock-outs [1]. Niger’s national RMNCAH dashboard produces colour-coded scorecards reviewed jointly by the Ministries of Health and Planning, ensuring that low-performing districts receive technical assistance and targeted support [1].

Comparable lessons emerge globally. In Bangladesh, routine anaemia-screening data integrated into DHIS2 informed revisions of the national micronutrient strategy [12]. In Peru, quarterly review of anaemia dashboards contributed to the country’s well-documented decline in childhood anaemia between 2007 and 2022 [13]. These experiences suggest that structured policy-feedback loops, regular, multi-stakeholder reviews linking data to resource allocation are critical to converting information into results.

Governance Structures and Accountability Mechanisms

Governance frameworks determine how data are validated, who reviews them, and how accountability is enforced. Global analyses of HIS reform highlight that multi-tiered governance, combining national steering committees, technical working groups, and district data-review teams, produces better coordination and sustainability.

In Africa, several ministries have adopted similar models. Kenya’s Nutrition Information Technical Working Group validates anaemia data across departments; Ethiopia and Malawi have institutionalized data-quality audits within their routine supervision checklists. Outside the region, Vietnam’s eHealth strategy offers a parallel example: cross-sectoral data committees oversee interoperability between nutrition, maternal health, and laboratory subsystems, ensuring unified reporting [14].

The AUC framework calls for national anaemia focal points and cross-ministerial committees that include education, agriculture, and finance, mirroring governance lessons from the *Global Health Data Collaborative* and the *Open Government Partnership* movements, which emphasize transparency and multi-actor accountability [2, 15].

Barriers and Enablers of Effective Data Use

A synthesis of African and global evidence identifies five interlinked factors:

1. **Leadership and institutional culture**: Strong leadership commitment fosters what Abou Zahr and Boerma call a *“data-use ethos”* [16], a shared belief that information underpins performance.
2. **Capacity and incentives**: Training coupled with recognition or

performance feedback motivates staff to engage with data [11].

3. **Technological enablers**: Interoperable systems (e.g., DHIS2 + OpenELIS) and mobile feedback applications accelerate data flow.
4. **Partnerships and learning networks**: Regional peer exchanges, such as the Health Data Collaborative, encourage adoption of good practices across countries [1].
5. **Public accountability**: Scorecards and open-data portals enhance transparency and encourage community engagement.

These elements confirm that technology alone cannot ensure data use; sustained institutional learning and accountability are the decisive factors.

Synthesis

Anchoring these reforms in the WHO [8] and AUC [2] frameworks provides legitimacy and alignment with global targets, while insights from implementation science and other regional experiences broaden the evidence base. Strengthening anaemia data governance therefore requires a dual strategy: institutional alignment with established frameworks and adaptive learning from cross-regional practice. Only through this combination can integrated HIS become engines of accountability and equity in the fight against anaemia.

Digital Transformation and Interoperability

The accelerated rollout of DHIS2 and related open-source platforms across Africa has revolutionized data management [17]. Emerging interoperability between DHIS2 and laboratory-information systems such as OpenELIS, BLIS, and OpenMRS allows the automatic transfer of haemoglobin test results from laboratories to national databases. Such linkages enable near-real-time monitoring of anaemia screening and case management and align with WHO's call for connecting clinical, nutrition, and laboratory data streams.

Artificial-intelligence (AI)–assisted analytics are also being piloted in several countries to predict supply needs for iron–folic acid (IFA) supplements and identify geographical clusters of high anaemia prevalence. Projects in Rwanda, Ghana, and Kenya demonstrate that predictive modelling, when coupled with quality routine data, can guide micro-planning and resource allocation [18]. The next step is to ensure that anaemia-specific indicators, particularly those proposed by WHO and the AUC, are embedded within these data pipelines so that predictive tools can generate actionable insights.

Community and Citizen-Generated Data

Community-level data innovations are expanding the visibility of women and adolescents traditionally missed by facility statistics. Mobile-based applications such as CommCare, KoboCollect, and DHIS2 Tracker are being used for household screening, IFA adherence monitoring, and follow-up of anaemic women.

The WHO framework stresses that community engagement and feedback loops strengthen data credibility and foster behavioural change. Scaling up such systems could support routine collection of anaemia data among adolescents, a major gap in current surveillance. Integrating community applications with DHIS2 nutrition modules would provide a seamless data flow from household to national level.

Data Visualization and Performance Dashboards

Data dashboards have become central to national decision-making processes. Most African countries now maintain SRMNCAH or health-sector dashboards that display key performance indicators. However, anaemia indicators are rarely represented. For instance, the ECOWAS–West Africa Health

Organization (WAHO) SRMNCAH scorecard, adopted in 2022 [19], tracks twenty-six indicators across maternal, newborn, child, and adolescent health but excludes anaemia-specific measures. This absence illustrates a broader pattern: while anaemia is recognized as a public-health priority, it has not yet been institutionalized within existing monitoring architectures.

Updating these dashboards and scorecards represents a major opportunity. Integrating anaemia indicators, such as haemoglobin testing at first ANC, IFA coverage, IPTp uptake, deworming, and adolescent micronutrient supplementation would enhance the analytical value of existing tools without creating new reporting burdens. Automated data feeds from DHIS2 to regional scorecards could ensure consistency, comparability, and peer accountability across ECOWAS and beyond.

Open-Data and Regional Learning Initiatives

Global movements such as the Health Data Collaborative, Open Government Partnership, and Global Partnership for Sustainable Development Data (GPSDD) are promoting open-data principles and interoperability standards that can be applied to anaemia information systems [17]. Several African countries have begun publishing DHIS2 data through open portals, enabling civil-society organizations and researchers to monitor health-sector progress.

Adopting open-data standards for anaemia would not only promote transparency but also facilitate cross-country learning. Peer-to-peer data reviews already practiced through regional malaria and immunization scorecards could be extended to anaemia, fostering a culture of accountability and evidence-based dialogue.

Opportunities for Integration and System Strengthening

The above-mentioned innovations create a favourable environment for advancing anaemia surveillance and policy responsiveness. In addition, key opportunities include:

1. Updating national and regional dashboards and scorecards such as the ECOWAS–WAHO SRMNCAH scorecard to incorporate the AUC and WHO anaemia indicator packages.
2. Embedding anaemia modules in DHIS2 nutrition and maternal-health configurations, ensuring interoperability with laboratory systems and community trackers.
3. Developing automated analytics and AI-driven alerts for districts with persistently high anaemia or low coverage of preventive services, using a phased approach that starts with simple threshold-based dashboards within existing systems and evolves with country capacity
4. Institutionalizing quarterly data-to-action reviews focused on anaemia, modelled on SRMNCAH performance dialogues.
5. Fostering regional peer-learning networks under WAHO or the African Union to exchange good practices on data governance and use.

If implemented, these opportunities could close the persistent gap between anaemia policy ambitions and monitoring capacity. They would also situate anaemia surveillance firmly within the broader digital-health transformation of African health systems.

Policy Implications and Recommendations

Strengthening anaemia data systems in Africa is not only a technical exercise but also a strategic governance priority. The integration of anaemia indicators into national and regional health-information platforms provides an entry point for institutionalizing accountability, improving resource targeting, and accelerating progress toward global and continental nutrition targets. Building on the evidence reviewed in previous sections, this discussion highlights key policy implications and outlines a set of actionable recommendations.

1. **From programme to system thinking**
   Efforts to address anaemia have traditionally focused on programme-level interventions such as iron–folic acid supplementation or deworming, rather than the broader health-information systems required to monitor them. The current evidence demonstrates that fragmented monitoring approaches limit accountability and obscure equity gaps. Repositioning anaemia surveillance within digital-health and health-system–strengthening agendas, as advocated by WHO and the AUC, can ensure that data collection becomes a structural, not ad hoc, function of the health sector.
2. **Data governance as a form of policy leadership**
   The institutionalization of anaemia data within DHIS2, laboratory systems, and regional scorecards represents a form of governance reform. It signals political commitment to evidence-based decision-making. Countries that have established strong governance mechanisms, such as national technical working groups, data-quality audits, and regular review meetings are better able to translate data into policy responses according to Country landscape analysis shared during a series of webinar held by WHO in August 2025. The challenge lies in extending this accountability culture to subnational levels and embedding it within routine performance management.
3. **Equity and inclusion in data collection**
   Current data systems disproportionately represent pregnant women while neglecting adolescents, non-pregnant women, and marginalized populations. Integrating anaemia indicators across multiple platforms (maternal health, adolescent health, community surveillance, and laboratory data) can close these visibility gaps. As recommended by WHO, the disaggregation of anaemia data by age, pregnancy status, geography, and socioeconomic status is essential for monitoring progress toward the Sustainable Development Goals and the global nutrition targets on anaemia.
4. **Leveraging existing platforms for efficiency**
   Existing digital infrastructures such as DHIS2, RMNCAH dashboards, and regional scorecards offer ready-made opportunities for anaemia integration. For example, the ECOWAS–WAHO SRMNCAH scorecard, which currently tracks twenty-six indicators, could be revised to include anaemia-related measures aligned with AUC and WHO frameworks. This would create efficiency through convergence rather than proliferation of reporting tools and enhance cross-country comparability.

Potential Barriers to Implement and Strategies to Overcome them

Despite the promise of integrated anaemia data systems, several barriers may impede effective implementation. Funding constraints remain a significant challenge, as sustained investment is required for digital infrastructure, capacity building, and ongoing system maintenance. Political resistance can also arise, particularly where data transparency may expose gaps in service delivery or require shifts in resource allocation. Additionally, limited technical capacity at national and subnational levels can hinder the adoption and effective use of new digital tools. To overcome these barriers, it is essential to advocate for increased domestic and donor funding by demonstrating the long-term cost-effectiveness of robust data systems.

Building political will can be achieved through stakeholder engagement, highlighting the benefits of data-driven decision-making for health outcomes and accountability. Strengthening technical capacity requires targeted training, mentorship programs, and the establishment of peer-learning networks to share best practices and innovations across countries. By addressing these challenges proactively, countries can create an enabling environment for the successful integration and use of anaemia data systems.

Recommendations

The following table 1 presents a set of actionable recommendations designed to address the key challenges identified in strengthening anaemia data systems across Africa. These recommendations are tailored for national governments, regional bodies, and global partners, and are accompanied by their underlying rationale, suggested actions, and expected outcomes. Together, they provide a practical roadmap for integrating anaemia indicators into health information systems, enhancing data quality and use, and advancing progress toward the 2030 anaemia reduction targets.

Table 1. List of Practical Recommendations According to the Type of Stakeholders

Recommendations	**Rationale**	**Actions**	**Expected outcomes**
For national governments			
1. Integrate anaemia indicators into national DHIS2 platforms and HIS frameworks	Most DHIS2 systems currently capture proxy data such as ANC visits or IFA tablet distribution but lack direct anaemia indicators.	• Configure DHIS2 modules to include WHO- and AUC-recommended indicators (e.g., % pregnant women tested for haemoglobin at first ANC, % receiving ≥ 90 IFA tablets, IPTp coverage, deworming, WIFA/MMS distribution). • Ensure metadata consistency standard numerators, denominators, periodicity, and disaggregation by age, pregnancy status, and geography.	Routine availability of disaggregated anaemia data; improved comparability with regional dashboards; ability to track program performance quarterly rather than once per survey cycle.
2. Ensure interoperability between laboratory and DHIS2 systems	Laboratories are the primary source of haemoglobin results but remain digitally siloed. Linking Laboratory Information Management Systems (LIMS) with DHIS2 allows direct, automated data sharing.	• Deploy open-source solutions such as OpenELIS or BLIS and connect them through DHIS2 APIs. • Establish national data-exchange standards (HL7 FHIR or DHIS2 web services). • Conduct regular data-quality audits comparing laboratory records with DHIS2 reports.	Improved accuracy and timeliness of anaemia data; reduced manual reporting; strengthened early-warning capacity for stock-outs or outbreaks.
3. Institutionalize quarterly data-to-action reviews at national and subnational levels	Data-review meetings convert information into decisions.	• Schedule anaemia data reviews alongside SRMNCAH and nutrition meetings. • Include health managers, statisticians, supply officers, and civil-society observers.	Faster response to coverage gaps, stock-outs, or data errors; institutionalized accountability and continuous quality improvement.

		• Document action points and follow-up in the next review cycle.	
4. Invest in data-use capacity building	Analytical and visualization skills remain scarce at district and facility level.	• Develop short courses and on-the-job training in data analytics, dashboard interpretation, and visualization (using DHIS2 Analytics, Power BI, or Tableau). • Pair training with mentorship and feedback to promote sustained application. • Integrate data-use competencies into health-worker job descriptions and performance appraisals.	Enhanced analytical autonomy of district teams; improved accuracy of planning and supervision; a culture of data-driven decision-making.
5. Include anaemia indicators in national performance contracts and accountability frameworks	Linking data reporting to managerial performance motivates adherence and accuracy.	• Embed key anaemia indicators into annual performance contracts for regional and district health officers. • Publicly disclose progress through dashboards or scorecards. • Tie recognition or incentives to improvements in data completeness and indicator performance.	Strengthened accountability chain; increased reporting completeness; visibility of anaemia within broader health-sector priorities.
For regional bodies (AUC, WAHO, SADC)			
1. Harmonize anaemia indicator definitions and metadata across regions	Variability in indicator formulation undermines cross-country comparability.	• Convene regional technical working groups to standardize indicator metadata (definition, computation, disaggregation). • Publish an open regional metadata dictionary aligned with WHO and SDG standards.	Comparable anaemia data across Member States; streamlined regional aggregation and reporting.
2. Update regional dashboards and scorecards to incorporate anaemia indicators	Existing instruments, such as the ECOWAS–WAHO SRMNCAH scorecard, track maternal and child health but omit anaemia.	• Add a concise anaemia module (5–6 indicators) derived from national DHIS2 feeds. • Develop a DHIS2-scorecard integration interface to automate data transfer.	Reduced duplication; synchronized national–regional reporting; greater visibility of anaemia within RMNCAH performance dialogues.
3. Facilitate peer-learning exchanges on anaemia data integration	Peer review accelerates adoption of good practices	• Organize annual or semi-annual regional learning forums under ECOWAS/SADC or AUC. • Document case studies and lessons learned in a regional repository.	Diffusion of innovations; stronger communities of practice; regional convergence on data-governance standards.

4. Coordinate resource mobilization for digital-health interoperability	Interoperability projects often compete for fragmented donor funding.	- Create a joint funding mechanism through AUC to pool partner contributions for DHIS2 customization, API development, and capacity building. - Align digital-health investments with national HIS strategic plans.	Efficient resource use; sustainability of digital-health infrastructure; enhanced regional ownership.
For global partners and donors			
1. Shift from project-based monitoring to system-based investment	Short-term, vertical monitoring initiatives rarely build institutional capacity.	- Direct funding toward HIS architecture, interoperability frameworks, and workforce development. - Require projects to integrate anaemia indicators into national DHIS2 rather than stand-alone databases.	Sustainable systems; lower reporting burden; improved country ownership.
2. Support open-data principles and transparency	Open data strengthen accountability and research collaboration.	- Fund development of public anaemia dashboards with appropriate data-privacy safeguards. - Encourage governments to publish metadata and analytical reports under open licenses.	Enhanced public trust; increased external analysis; broader civic participation in health governance.
3. Fund operational research and implementation science on anaemia data systems	Evidence on how integrated HIS influences outcomes is still limited.	- Sponsor multi-country studies assessing the impact of data integration on service coverage and decision-making. - Create small innovation grants for local universities and health institutes to test new data-use models.	Generation of context-specific evidence; iterative improvement of data-system design; strengthened research capacity in the region
4. Encourage cross-sectoral collaboration	Anaemia is influenced by nutrition, infection, and reproductive health determinants that extend beyond the health sector.	- Promote inter-ministerial data-sharing protocols linking health, education, agriculture, and WASH databases. - Support pilot projects integrating anaemia monitoring into school-health or food-security platforms.	Holistic understanding of anaemia determinants; integrated interventions; stronger alignment with SDG 2 and 3 targets.

Discussion

Implementing the proposed recommendations as a cohesive strategy would fundamentally transform anaemia surveillance in Africa. Rather than remaining a fragmented, programme-specific activity, anaemia monitoring could evolve into a robust, system-wide mechanism grounded in data-driven accountability. By leveraging digital transformation, harmonized indicators, and comprehensive governance reforms, national and regional institutions have the potential to bridge the persistent gap between policy ambitions and measurable outcomes. This integrated approach would not only enhance the quality and timeliness of data but also ensure that information is effectively translated into targeted interventions and resource allocation. Ultimately, it is sustained investment in governance, institutional capacity, and system interoperability, rather than data collection alone, that will determine whether Africa can achieve its ambitious goal of halving anaemia prevalence by 2030.

It is important to acknowledge the methodological limitations of this study. The analysis is based primarily on secondary data sources, including published literature, regional policy frameworks, and comparative country examples. While this approach offers a broad and comprehensive overview of anaemia data systems in Africa, it is inherently limited by the scope and quality of the available data. The absence of primary data collection, such as field surveys, stakeholder interviews, or direct observation, restricts the ability to capture context-specific challenges and the nuanced perspectives of frontline health workers and affected communities. Additionally, reliance on periodic surveys and routine health information systems may not fully reflect recent innovations or emerging barriers. Variations in indicator definitions, reporting practices, and data quality across countries further constrain the comparability and generalizability of the findings.

To address these limitations and advance the field, future research should prioritize the incorporation of primary data collection using mixed-methods approaches, including both qualitative interviews and quantitative surveys, to capture local experiences and implementation challenges. Longitudinal studies are needed to evaluate the sustained impact of digital health innovations and governance reforms on anaemia surveillance and outcomes. Comparative case studies across diverse settings would help identify best practices and context-specific solutions, while assessments of community engagement and feedback mechanisms could shed light on their effectiveness in strengthening data credibility and fostering behavioural change. Addressing these methodological gaps will provide deeper insights and actionable evidence, ultimately guiding the continued strengthening of anaemia data systems in Africa.

Conclusion

Anaemia remains one of the most persistent yet under-monitored public-health challenges in the African region. Despite decades of interventions and political commitments, progress toward the global target of halving anaemia by 2030 has been slow and uneven. This stagnation reflects not only biological and programmatic complexities but also a structural weakness in how data on anaemia are collected, integrated, and used for decision-making. This paper has argued that transforming anaemia surveillance into a reliable, system-wide accountability mechanism is central to reversing this trend.

The review of current data systems reveals that while digital platforms such as DHIS2 have become ubiquitous across African health sectors, anaemia indicators remain largely absent or are reported inconsistently. Population surveys such as DHS, MICS, and SMART provide robust but infrequent prevalence data, leaving countries without real-time information to guide action. Routine health-information systems, laboratory platforms, and regional scorecards, though rich in potential, often operate in silos. Consequently, policymakers lack the integrated intelligence needed to align resources, target interventions, and evaluate progress.

Encouragingly, innovations in digital health, interoperability, and analytics are reshaping this landscape. The emergence of laboratory–DHIS2 linkages, community-based mobile reporting, and performance dashboards has shown that real-time anaemia monitoring is achievable. However, innovation must be accompanied by institutional reform. The WHO *Comprehensive Framework for the Prevention and Management of Anaemia in Women of Reproductive Age* and the AUC *Framework for Accelerating Anaemia Reduction in Africa (2023–2030)* offer complementary roadmaps, but their success depends on national and regional ownership. Integrating anaemia indicators into existing data systems, rather than creating parallel mechanisms, would ensure sustainability and coherence across the digital-health ecosystem.

The analysis also demonstrates that data use is not a purely technical process; it is inherently political and behavioural. Governance structures, leadership commitment, and feedback culture determine whether information translates into action. Embedding anaemia indicators into national performance frameworks, regional dashboards, and cross-sectoral review platforms can elevate anaemia from a neglected nutrition issue to a strategic governance priority. The absence of anaemia measures in tools such as the ECOWAS–WAHO SRMNCAH scorecard underscores the opportunity for immediate reform: updating such platforms to include anaemia indicators could institutionalize accountability across West Africa and beyond.

Ultimately, strengthening anaemia data systems is an investment in evidence-based governance. By building interoperable, inclusive, and analytically capable health-information systems, African countries can transform how progress is tracked, policies are designed, and resources are mobilized. Achieving the 2030 target will require more than supplements and campaigns: it will demand a data revolution grounded in collaboration, transparency, and institutional learning. When anaemia data become timely, integrated, and actionable, they will not only illuminate the problem, they will also accelerate the solutions.

Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this article. The views expressed are those of the author and are independent of any institutional affiliation.

Ethical Approval

This study is based on the analysis of secondary data and publicly available sources, including peer-reviewed literature, policy documents, and official reports. No primary data were collected, and no human participants were involved. Therefore, ethical approval was not required for this study, in accordance with the ethical standards and publication requirements of Texila American University.

Data Availability

All data used in this study are derived from publicly available sources cited in the reference list. No new datasets were generated or analysed during the current study.

Author Contributions

The author conceptualized the study, conducted the literature review, performed the analysis, and drafted and revised the manuscript.

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