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Review

Epidemiologic trends, diagnostic limitations, and public health challenges of enteric fever in sub-Saharan Africa: A narrative review

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ABSTRACT

Objectives: This paper reviews existing literature on the prevalence and epidemiologic trends of enteric fever in sub-Saharan Africa. It also evaluates diagnostic limitations and explores the region's public health challenges related to disease control.

Methods: A comprehensive search across six major databases initially identified 1831 articles. Of these, 40 peer-reviewed articles published between 2000 and 2024 met the inclusion criteria. Data were extracted on country, sample size, diagnostics, and prevalence. Risk of bias was assessed using the Newcastle–Ottawa Scale, whereas the Joanna Briggs Institute checklist was used for quality assessment.

Results: Among the 40 included studies, the highest prevalence of enteric fever was observed in children under 15 years of age (65%). Despite its well-known limitations as a diagnostic test, the Widal test was used in approximately 75% of studies. Only 30% of patients received blood cultures, and fewer than 10% received advanced diagnostics such as polymerase chain reaction or Typhidot. Multidrug-resistant Salmonella Typhi strains were reported in 60% of the studies.

Conclusion: Enteric fever remains a significant public health issue in sub-Saharan Africa, particularly affecting children and vulnerable groups. Barriers, including inadequate diagnostics, fragile health care systems, and low vaccine coverage, hinder efforts to control the disease.

Introduction

Enteric fever is a systemic, life-threatening condition primarily caused by *Salmonella enterica* serovars Typhi and Paratyphi A, B, and C. Enteric fever is typically transmitted via the fecal–oral route, through the consumption of food or water contaminated with the feces of infected individuals [1]. The hallmark clinical feature is a high-grade, continuous fever that may follow a step-ladder pattern. Chills, malaise, generalized weakness, dizziness, and headaches commonly accompany this fever. The non-specific nature of symptoms often overlaps with that of other endemic diseases, including malaria, dengue, and tuberculosis [2,3]. In recent years, sub-Saharan Africa (SSA) has emerged as a significant hotspot for the disease, with an increasing number of sporadic outbreaks reported [4]. In many SSA countries, rapid urbanization has outpaced the development of sanitation and water supply systems, increasing the risk of waterborne and foodborne illnesses [5,6].

Despite efforts to strengthen public health surveillance, underreporting of enteric fever persists due to non-specific clinical symptoms, limited diagnostic capacity, and a general lack of awareness among healthcare workers [7,8]. The Typhoid Fever Surveillance in Africa Program, which systematically collected data across 10 African countries, found incidence rates exceeding 300 cases per 100,000 person-years in some locations, particularly, among children aged 5-15 years [4,9]. Besides its high burden in SSA, diagnostic limitations further worsen the problem. Confirmatory diagnostic modalities such as blood cultures and polymerase chain reaction (PCR) assays are often unavailable or unaffordable [2]. The Widal test, although inexpensive and widely used, has poor sensitivity and specificity, often yielding false positives due to cross-reactivity with non-typhoidal Salmonella and other Gram-negative bacteria [10].

Blood culture remains the gold standard; however, its effectiveness is limited by low sensitivity (∼40-60%) and logistical challenges [11,12]. Molecular diagnostics and rapid serological tests, such as Typhidot and TUBEX, show promise but remain largely inaccessible due to cost and infrastructure constraints [13]. An equally urgent concern is antimicrobial resistance (AMR) and the emergence of antimicrobial-

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resistant strains, including multidrug-resistant (MDR) and extensively drug-resistant (XDR) *Salmonella* Typhi, which has already been documented in East and Central Africa [14]. Indeed, inadequate diagnostics and the empirical use of antibiotics may significantly contribute to the development and spread of resistant strains [15]. AMR restricts treatment options, increases morbidity and mortality, and places additional strain on already overburdened health systems in most low- and middle-income countries [16]. Moreover, public health responses to enteric fever in SSA have been reactive rather than preventive. Surveillance systems are fragmented, and the disease lacks standardized reporting procedures across the region, leading to inconsistent data reporting [17].

Given these multifactorial challenges, this review aims to consolidate available data on enteric fever in SSA. Specifically, it examines regional epidemiologic trends, existing diagnostic limitations, and key public health implications of enteric fever in SSA.

Methods

Search strategy

A comprehensive and systematic search was conducted to identify relevant literature on enteric fever in SSA, with a focus on epidemiologic trends, diagnostic methods, and public health challenges. The search used six major databases: PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, Africa-Wide Information, and the World Health Organization (WHO)'s Institutional Repository for Information Sharing. The search included publications from January 1, 2000 to March 31, 2025 to capture historical data and contemporary findings over a 25-year period.

To ensure a broad and inclusive search, a combination of Medical Subject Headings and free-text keywords was used. Boolean operators such as "AND" and "OR" were used to refine and connect search terms. Keywords included "enteric fever," "typhoid fever," "paratyphoid fever," "*Salmonella* Typhi," and "*Salmonella* Paratyphi" to describe the disease of interest. Geographic terms such as "Sub-Saharan Africa," "Africa south of the Sahara," and specific country names (e.g. Ghana, Nigeria, Kenya, Ethiopia, Uganda, and Senegal) were included to restrict the search to the relevant region. Additional terms such as "prevalence," "incidence," "epidemiology," "outbreaks," "surveillance," "diagnosis," "Widal test," "blood culture," "PCR," "Typhidot," "antimicrobial resistance," "AMR," "vaccination," "health systems," and "sanitation" were included to capture studies on diagnostic methodologies and public health interventions related to enteric fever. The initial search retrieved a total of 1831 records.

Eligibility criteria

Clearly defined inclusion and exclusion criteria were established before screening to ensure relevance and methodological rigor. Studies were deemed eligible for inclusion if they focused on human populations in SSA and reported data on the epidemiology, prevalence, diagnostic methods, or public health interventions related to enteric fever. The causative agents could be *Salmonella enterica* serovars Typhi or Paratyphi. Eligible studies were required to be cross-sectional, cohort, case-control, surveillance-based, or interventional. High-quality systematic reviews and meta-analyses were also included. Only articles published in English between January 2000 and March 2025 were considered to capture the most current trends and developments in the field. Furthermore, studies had to report defined outcomes such as disease burden, diagnostic accuracy, treatment outcomes, or health system interventions related to enteric fever.

Conversely, studies were excluded if they were conducted outside SSA or if they did not explicitly report data relevant to the region. Publications that focused solely on animal models, *in vitro* research, or laboratory-based experiments without a direct clinical or epidemiologic context were also excluded. Furthermore, case reports, editorials, opinion pieces, commentaries, letters to the editor, and dissertations not published in peer-reviewed outlets were omitted from the final review.

Study selection

The selection of studies followed a structured three-phase screening process to ensure methodological rigor and minimize bias. These were based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. In the first phase, two independent reviewers screened the titles and abstracts of all 1831 articles retrieved from the initial search. Duplicates were removed, and studies irrelevant to the research question, such as those unrelated to enteric fever, those conducted outside SSA, or those lacking an epidemiologic or diagnostic focus, were excluded at this stage. This initial screening eliminated 1324 articles, leaving 507 studies for full-text assessment.

In the second phase, the full texts of the 507 retained articles were retrieved and critically assessed against the predefined eligibility criteria. Each article was evaluated for relevance, methodological quality, and the presence of key data on enteric fever epidemiology, diagnostic approaches, or public health systems in SSA. Articles that did not meet the minimum inclusion standards because of insufficient data, unclear outcome measures, or unrelated pathogens were excluded. This phase retained 86 studies for further consideration. In the third and final phase, the reference lists of the 86 shortlisted articles were manually reviewed to identify any additional relevant studies that might have been overlooked during the database searches. This manual screening identified 10 additional articles, bringing the total to 96 potentially eligible studies. After a final round of critical evaluation and consensus discussions among co-authors, 40 articles were selected for inclusion in the review. A summary of the entire process and the PRISMA flowchart is outlined in Figure 1.

Data extraction, quality assessment, and analysis

All 40 articles selected for the final synthesis were critically evaluated using appropriate tools, based on their study designs. For observational studies (including cross-sectional, cohort, and case-control designs), the Newcastle–Ottawa scale was used. This scale assesses three main domains: the selection of study participants, the comparability of study groups, and the confirmation of outcomes or exposures. The Joanna Briggs Institute quality checklist was also used to critically characterize, describe, and contextualize the methodological landscape. This standard suite for scoping review has separate checklists for randomized controlled trials, cohort, case-control, qualitative, prevalence, and quasi-experimental studies, among others. This tool allows you to appraise each study against criteria relevant to its own design. Output is often summarized descriptively (e.g. "The majority of studies were of moderate quality").

Two authors independently appraised each study and assigned a score reflecting methodological strength. For diagnostic accuracy studies, the Quality Assessment of Diagnostic Accuracy Studies tool was used. This tool assesses four areas (patient selection, index test, reference standard, and flow and timing) to identify applicability issues. When systematic reviews or meta-analyses were included, the "A Measurement Tool to Assess Systematic Reviews" checklist was used to evaluate aspects such as the thoroughness of the search, transparency in study selection, and the suitability of the data synthesis.

Two co-authors independently extracted data from the 40 included articles to ensure consistency and reduce the risk of human error. The variables extracted included the following: first author and year of publication; country of study; study design; sample size; population characteristics (e.g. age group, sex distribution); reported prevalence or incidence of enteric fever; diagnostic methods used (e.g. Widal test, blood culture, PCR, and Typhidot); and key findings on epidemiologic trends, diagnostic accuracy, and public health interventions or limitations.

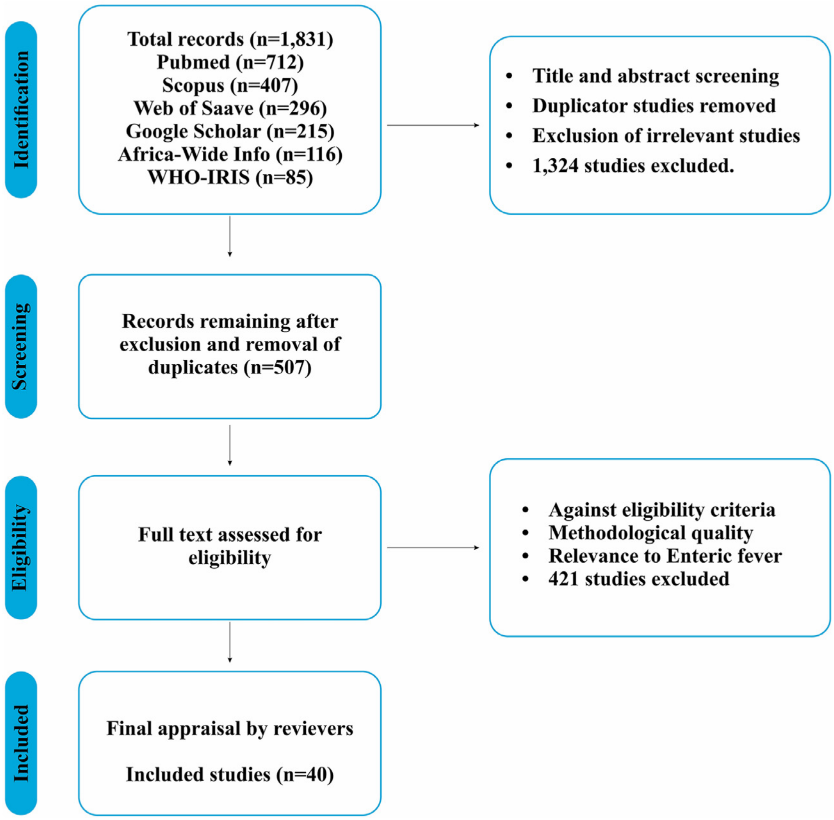

Figure 1. A flow chart diagram providing a detailed representation of the study selection process.
WHO, World Health Organization.

Extracted data were thematically categorized into three main areas: epidemiologic trends, including prevalence estimates by country and demographic group; diagnostic limitations, covering the sensitivity and specificity of commonly used tests; and public health challenges, such as AMR, vaccine coverage, and surveillance capacity. Tables presented quantitative data, whereas qualitative insights were incorporated to provide context to findings across various settings.

Results

Characteristics of eligible studies

From an initial pool of 1831 studies identified across various databases and gray literature sources, this review encompassed a total of 40 peer-reviewed articles conducted across 21 SSA countries, including Nigeria (eight studies), Kenya (six), Ghana (five), Ethiopia (five), Uganda (four); other nations such as Senegal, Tanzania, Zambia, Zimbabwe, and the Democratic Republic of Congo met the inclusion criteria and were included in the final synthesis (Figure 1). These studies varied in design, scope, and geographic distribution, encompassing 21 countries in the SSA region. Most (70%) of the included studies were cross-sectional and focused on hospital-based or community-level surveillance. Also included were retrospective reviews (15%), longitudinal surveillance (10%), and mixed-method approaches (5%). Sample sizes varied across studies, ranging from 150 to 1498 participants, with a median of approximately 790 participants per study. The study populations included schoolchildren, pregnant women, adult outpatient attendees, slum dwellers, and community-based cohorts, thereby capturing diverse exposure contexts. A summary of the included studies is presented in Table 1. Most studies (95%) disaggregated prevalence data by age and sex, enabling subgroup analysis. Several studies (82.5%) also included contextual variables such as water source, type of toilet facilities, handwashing behavior, and socioeconomic status, which are critical for understanding environmental and behavioral risk factors. Notably, only 11 of the 40 (27.5%) studies were explicitly linked to national disease surveillance systems or routine health management information systems, indicating a broader data collection gap.

Epidemiologic trends and prevalence

Epidemiologic data revealed prevalence rates ranging from 1.5% to 15.0%. These rates varied not only between countries but also within them, depending on region, level of urbanization, and season. The highest reported prevalence was found in semi-urban areas of Ethiopia and peri-urban slums in Nigeria and Ghana, exceeding 12%. In contrast, rural districts in Malawi, Zimbabwe, and Cameroon reported lower prevalence rates (<10%), which may have been underestimated due to underreporting or a lack of reliable diagnostic tools. Children aged under 15 years consistently had a higher prevalence than adults, ranging from 5.5% to 16.5%. This finding was reported in 85% of the studies reviewed, underscoring the vulnerability of pediatric populations to contaminated food and water sources. In most studies (80%), adult females had a marginally higher prevalence than males.

Diagnostic methods and limitations

The Widal test was the most frequently used diagnostic tool (reported in 32 studies), primarily due to its low cost and ease of use. However, its diagnostic reliability is often questioned. In many facilities, particularly, in rural clinics, the diagnosis of typhoid was based on a single Widal titer reading without baseline comparisons, further undermining accuracy. Blood culture, the gold standard for typhoid diagnosis, was used in 28 of the 40 studies. However, its application was generally confined to tertiary hospitals and research institutions due to the availability of sterile equipment, trained personnel, and laboratory infrastructure. Even when used, blood cultures exhibited variable sensitivity (40-60%) owing to previous antibiotic use or a low bacterial load. More-

Table 1
Characteristics of included studies (n = 40) reporting enteric fever in sub-Saharan Africa.

Author(s)	Year	Country	Sample size	Key findings	Diagnostic method	Prevalence in children (%)	Prevalence in adult males (%)	Prevalence in adult females (%)	Total prevalence rate (%)
Mensah *et al.*	2019	Nigeria	1302	High incidence in children under 15	Widal test	9.82	7.76	9.02	9.7
Kamau *et al.*	2014	Uganda	797	Limited diagnostic capacity in rural hospitals	Clinical diagnosis	3.07	4.45	4.38	3.8
Obeng *et al.*	2010	Kenya	1236	Rising antimicrobial resistance observed	PCR + Blood culture	2.7	2.2	1.96	2.38
Adeyemi *et al.*	2007	Zambia	1312	High incidence in children under 15	PCR	16.47	16.87	11.94	14.31
Mwangi *et al.*	2020	Zambia	742	Limited diagnostic capacity in rural hospitals	Widal test	14.46	12.03	16.06	14.54
Diallo *et al.*	2006	Cameroon	541	High incidence in children under 15	PCR + Blood culture	13.73	10.57	12.29	12.41
Ndlovu *et al.*	2018	Ghana	568	Limited diagnostic capacity in rural hospitals	Typhidot	5.72	5.08	6.45	5.61
Banda *et al.*	2022	DR Congo	438	Over-reliance on Widal test noted	Blood culture	2.73	2.49	2.86	2.82
Mutua *et al.*	2010	Nigeria	528	Rising antimicrobial resistance observed	Blood culture	11.73	9.46	9.93	10.74
Kagwe *et al.*	2010	Kenya	380	Rising antimicrobial resistance observed	Blood culture	8.91	7.89	7.26	7.44
Tambo *et al.*	2023	Ethiopia	1167	Limited diagnostic capacity in rural hospitals	Clinical diagnosis	3.17	2.67	2.8	3.15
Adebayo *et al.*	2020	Nigeria	190	Limited diagnostic capacity in rural hospitals	Widal + Blood culture	7.65	8.47	7.3	8.18
Owusu *et al.*	2003	Kenya	1201	Seasonal peaks linked with rainy seasons	PCR	1.74	1.62	2.06	1.96
Mugisha *et al.*	2007	Senegal	284	Over-reliance on Widal test noted	Blood culture	12.29	16.01	15.76	13.78
Zuma *et al.*	2023	Ethiopia	350	Over-reliance on Widal test noted	PCR	4.13	4.47	5.33	4.99
Ngoma *et al.*	2002	Kenya	929	Limited diagnostic capacity in rural hospitals	PCR + Blood culture	9.25	8.9	12.26	10.44
Chisala *et al.*	2021	Senegal	1079	Inadequate surveillance infrastructure	Typhidot	5.87	5.65	6.36	5.71
Ibrahim *et al.*	2020	Zimbabwe	1206	Limited diagnostic capacity in rural hospitals	PCR + Blood culture	9.57	7.46	7.15	8.52
Ali *et al.*	2001	Nigeria	1221	Rising antimicrobial resistance observed	PCR + Blood culture	8.64	8.61	8.76	8.88
Abebe *et al.*	2023	Zimbabwe	652	Seasonal peaks linked with rainy seasons	Blood culture	4.37	4.28	4.77	4
Wanjiku *et al.*	2011	Zambia	556	Over-reliance on Widal test noted	Widal + Blood culture	12.25	14.02	13.65	14.59
Mumba *et al.*	2005	Tanzania	954	Improved outcomes with vaccination coverage	Clinical diagnosis	13.69	10.76	10.48	11.96
Tchouassi *et al.*	2001	Ghana	248	Over-reliance on Widal test noted	Typhidot	13.89	13.74	12.92	14.18
Kofi *et al.*	2020	Mozambique	833	Inadequate surveillance infrastructure	Widal test	12.22	15.88	13.27	13.58
Abdullahi *et al.*	2000	Tanzania	875	Inadequate surveillance infrastructure	Clinical diagnosis	10.95	9.76	7.85	9.57
Ochieng *et al.*	2011	Ghana	1110	Limited diagnostic capacity in rural hospitals	Blood culture	16.74	15.83	16.57	13.95
Mkandawire *et al.*	2021	Ghana	762	High incidence in children under 15	Typhidot	3.15	3.07	2.33	2.69
Bakari *et al.*	2011	Cameroon	792	Rising antimicrobial resistance observed	Typhidot	4.13	3.67	3.99	4.15
Eze *et al.*	2024	Senegal	1178	Limited diagnostic capacity in rural hospitals	PCR + Blood culture	1.74	2.01	2.52	2.11
Nguema *et al.*	2016	Zimbabwe	1391	Limited diagnostic capacity in rural hospitals	PCR + Blood culture	5.34	6.56	5.78	5.89
Chilufya *et al.*	2009	Zambia	652	Seasonal peaks linked with rainy seasons	Widal test	6.54	7.98	8.09	6.75
Mugabe *et al.*	2015	Ethiopia	916	Seasonal peaks linked with rainy seasons	Typhidot	5.28	5.61	4.45	5.16
Kone *et al.*	2014	Mozambique	547	Rising antimicrobial resistance observed	Widal test	11.66	15.07	13.09	12.69
Mohammed *et al.*	2014	Tanzania	1020	Over-reliance on Widal test noted	PCR + Blood culture	6.43	6.95	5.2	6.32
Armah *et al.*	2018	Ethiopia	944	Rising antimicrobial resistance observed	PCR + Blood culture	5.47	5.3	6.04	5.29
Abiola *et al.*	2011	Zimbabwe	542	Seasonal peaks linked with rainy seasons	PCR	7.62	10.46	7.35	8.83
Getachew *et al.*	2022	Senegal	356	Improved outcomes with vaccination coverage	Clinical diagnosis	2.97	3.53	3.64	3.4
Ngugi *et al.*	2019	Cameroon	1188	Limited diagnostic capacity in rural hospitals	Clinical diagnosis	11.02	10.46	14.25	12.33
Tadesse *et al.*	2024	Ethiopia	1041	Limited diagnostic capacity in rural hospitals	Widal test	2.26	2.6	2.63	2.51

PCR, polymerase chain reaction.

over, delays in sample collection and processing led to poor diagnostic yields in most settings.

New technologies, such as PCR (in five studies) and Typhidot (in seven studies), were also evaluated. These tests appeared to show greater specificity and sensitivity compared with the Widal test; however, their high costs and equipment requirements limited their scalability. Only two studies described the use of point-of-care diagnostics that could potentially be deployed in rural areas. The diagnostic gap was particularly pronounced in rural regions, where reliance on clinical signs alone led to frequent misclassifications, overdiagnosis, and unnecessary antibiotic use.

Public health challenges

Despite the WHO urging the integration of Typhoid conjugate vaccines (TCVs) into routine immunization schedules, particularly, in high-burden and endemic areas, progress has been slow and limited. None (0%) of the studies examined found TCVs included in a comprehensive, country-wide immunization plan, revealing a crucial gap in typhoid prevention efforts. Several obstacles impede the broader uptake of TCVs in Africa. Cost is a key concern because integrating new vaccines demands considerable financial resources for procurement, distribution, and healthcare infrastructure. Another significant concern is the rise in AMR. More than half of the studies (60%) reported the presence of MDR Salmonella Typhi strains, particularly in Nigeria, Kenya, Ethiopia, and the Democratic Republic of the Congo. Resistance to first-line antibiotics such as chloramphenicol, ampicillin, and trimethoprim-sulfamethoxazole was common. In some instances, resistance extended to fluoroquinolones and third-generation cephalosporins, suggesting a potential emergence of XDR strains in certain regions. Inadequate prescribing practices and self-medication, exacerbated by limited diagnostics, were recognized as key contributors to the proliferation of resistant strains.

Discussion

Despite being a preventable and treatable disease, enteric fever continues to pose a significant public health problem in SSA. Drawing on 40 epidemiologically and geographically diverse studies, this review identifies consistent trends of a high disease burden, poor diagnostic accuracy, increasing AMR, and systemic public health challenges that collectively undermine the effective control of enteric fever. The review also reveals a burden of enteric fever among children aged under 15 years of age in SSA, which aligns with global trends [18,19]. This age group is particularly vulnerable to enteric fever due to poor hygiene practices, immature immune systems, and frequent exposure to contaminated food and water sources [20]. The prevalence of enteric fever among children in this review exceeded 10% in several high-density, low-income urban neighborhoods. Indeed, sanitation, housing, and limited access to safe drinking water remain pivotal risk factors for enteric fever in SSA [21].

Despite widespread endemicity in SSA, the enteric fever diagnostic landscape remains fragmented and unreliable. Despite its well-documented poor specificity, the continued reliance on the Widal test across primary and secondary health facilities underscores the diagnostic dilemma many health systems face in resource-limited settings [22]. Although blood culture remains the reference standard, its implementation is limited to tertiary institutions in most SSA countries due to high costs, infrastructure demands, and the need for skilled personnel [23]. Moreover, even where available in facilities in SSA countries, sensitivity is often low due to delayed health care–seeking behavior and previous antibiotic use [12]. Newer diagnostic methods, such as Typhidot and PCR-based assays, have shown improved performance (in terms of sensitivity and specificity); however, their reach remains highly constrained [24]. Only a handful of urban and research-based facilities routinely use Typhidot and PCR-based assays, highlighting the urban–rural diagnostic divide [25]. This often leads to empirical treatment of enteric fever, which not only jeopardizes treatment outcomes but also contributes to the growing threat of AMR.

AMR emerged as a significant theme throughout this review. Studies conducted in countries such as Nigeria, Kenya, and Ethiopia documented a concerning increase in *Salmonella* Typhi strains resistant to first-line antimicrobials, including chloramphenicol, ampicillin, and co-trimoxazole [26]. Furthermore, resistance to fluoroquinolones and third-generation cephalosporins has been reported in multiple studies, indicating the possible presence of drug-resistant Salmonella strains that are increasingly difficult to treat and often require hospitalization [14]. The public health implications are severe: treatment failure, prolonged illness, high health care costs, and increased mortality in already over-stretched and underfunded health systems.

Another notable finding is the limited uptake of TCVs, which effectively reduces disease burden and AMR by decreasing antibiotic exposure [17]. Although TCVs have received WHO prequalification and are endorsed for use in endemic countries, most SSA nations have yet to include them in their national immunization schedules. This delay is primarily due to the absence of country-specific data on the burden of enteric fever; financial constraints; and competing priorities, including malaria, tuberculosis, and, more recently, COVID-19. Nonetheless, modeling data and field trials suggest that introducing the vaccine, especially in high-incidence urban areas, could substantially lower the prevalence of enteric fever and reduce downstream issues such as AMR and hospital overcrowding [27].

The fragile state of disease surveillance in the SSA region adds to these issues. The review shows that most countries lack mandatory reporting systems for enteric fever, and, where data are collected, it is often incomplete, delayed, or not aligned with WHO standards [5]. The lack of reliable, timely data hampers efforts for resource allocation, vaccine procurement, or policy changes. Unless public health infrastructure is strengthened and health information systems are improved, regional enteric fever control progress will remain sub-optimal. Environmental and social determinants of health, long recognized as major drivers of infectious diseases, remain essential causes of enteric fever in SSA. Overcrowded living conditions, limited access to safe water and sanitation, and poor health-seeking behavior are systemic issues that increase transmission risks and hinder efforts to control enteric fever [28]. Interventions that focus only on clinical or hospital-level improvements will have limited success unless they are complemented by wider efforts to tackle these structural inequalities.

Environmental and socioeconomic factors influencing health are crucial in affecting infectious diseases, such as enteric fever (typhoid and paratyphoid), especially in SSA [9]. These factors create conditions that facilitate the spread of *Salmonella* Typhi and Paratyphi, maintaining high levels of illness among vulnerable populations [13]. Overcrowded urban slums, informal settlements, and refugee camps, characterized by high housing density and poor sanitation, provide ideal environments for fecal–oral infections to thrive. Inadequate waste disposal, open defecation, and contaminated water sources increase exposure risks in these settings, making enteric fever common in many communities. Limited access to clean water and sanitation remains a major challenge, with millions in SSA relying on untreated water from rivers, wells, or unreliable municipal supplies [29]. Even where water infrastructure exists, irregular supply, pipe leaks, and poor maintenance often lead to contamination. Similarly, a lack of proper sanitation forces households to depend on shared latrines or resort to open defecation, raising the risk of waterborne diseases [4,29]. Socioeconomic inequalities worsen these issues because marginalized groups, including low-income families, rural populations, and displaced persons, face greater barriers to accessing clean water and adequate sanitation. Poor health-seeking behavior also plays a significant role in sustaining the transmission of enteric fever. Many individuals in SSA delay or avoid seeking medical care due to financial constraints, limited awareness, or reliance on informal health care providers [30]. Misdiagnosis often occurs as malaria or other febrile illnesses, and the growing issue of AMR complicates management, leading to longer illness durations and increased community spread.

Given these structural challenges, isolated clinical or hospital-based interventions, such as improved diagnostics or antibiotic stewardship, will have limited long-term impact unless integrated into broader public health strategies. The sustainable control of enteric fever requires a multi-sectoral approach that includes water, sanitation, and hygiene (WASH) improvements, strengthened surveillance systems, urban planning and housing policies to reduce overcrowding and improve informal settlements, community engagement, and health education initiatives promoting prompt health care–seeking and vaccination [8,28]. Without addressing these fundamental social and environmental disparities, efforts to eliminate enteric fever in SSA are unlikely to succeed. Policymakers must prioritize intersectoral collaboration across health, water, environment, and urban development ministries to implement sustainable solutions that break transmission cycles and reduce the burden of preventable diseases.

Although this paper reviews articles reporting studies related to enteric fever in SSA, it has several limitations. First, the selection of studies published only in English excludes research conducted or reported in French or Portuguese, which are official languages in some West and Central African countries. This language bias could underrepresent countries such as the Democratic Republic of the Congo, Mozambique, and Angola. Second, despite the narrative focus of this review, significant heterogeneity exists among the included studies. Differences in diagnostic methods, case definitions, age groups, and sampling strategies limit the comparability of results. For instance, studies relying solely on Widal tests may overestimate prevalence compared with those using culture-confirmed diagnoses. This can impede the performance of meta-analyses or pooled incidence estimates. Although efforts have been made to include gray literature and surveillance reports, access to internal government data and unpublished academic work remains limited. In addition, the risk of publication bias must be considered because studies with statistically significant findings are more likely to be published than those with negative or inconclusive results. Moreover, the cross-sectional design of most studies restricts understanding of temporal trends and seasonality because they are confined to the scope of individual data collection periods.

Conclusion

This review emphasizes that substantial diagnostic limitations hinder the diagnosis of enteric fever in SSA. Multidrug-resistant *Salmonella* Typhi strains were identified, underlining the growing threat of AMR. Furthermore, public health challenges, including inadequate WASH infrastructure; fragmented disease surveillance; and limited access to treatment, care, and vaccines (TCVs) were identified. To reduce the disease burden, there is an urgent need for a region-wide, multi-sectoral response focused on expanding access to accurate diagnostics, integrating TCVs into national immunization programs, improving WASH services, and strengthening surveillance systems.

Declaration of competing interest

The authors have no competing interests to declare.

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Ethical considerations

For this investigation, ethical approval was not required.

Author contributions

Emmanuel Kwaku Ofori, Isaac Lawer Kpablitey, and Nathaniel Ebo Aidoo conceptualized and designed the study. Isaac Lawer Kpablitey acquired the data and analyzed it under the supervision of Emmanuel Kwaku Ofori and Seth Kwabena Amponsah. Emmanuel Kwaku Ofori, Isaac Lawer Kpablitey, and Nathaniel Ebo Aidoo drafted the initial manuscript, whereas Seth Kwabena Amponsah significantly revised the initial draft. All versions of this manuscript have been read and approved by all authors.

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