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Referral Delays and Primary Care Capacity for Childhood Illnesses in Malawi: A Narrative Review

Chifundo Makweza[1†]; Noreen Clara Ng'ambi [2*]; George Chikondi Samu[3*]; Chimwemwe Kapito[3]

1. Queen Elizabeth Central Hospital
2. Ministry of health Malawi, Kamuzu Central Hospital.
3. School of Public Health, Southern Medical University, Guangzhou, China.

Corresponding Authors: Chifundo Makweza*; Noreen Clara Ng'ambi*

†These Authors Contributed Equally to this Work.

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Abstract: As much as progress has been made in relation to the antenatal care visits and the immunization coverage, under-five mortality in Malawi continues to be high. The country carries a significant burden of avoidable illnesses among children, which indicates a serious failure along the path from the very first symptoms of disease to appropriate hospital treatment. The purpose of the present narrative review is to bring together existing evidence concerning three inter-related aspects: delays at the referral stage, failures of the system to effectively triage at triage time and PHC (Primary Health Care) infrastructure and workforce capacities to manage the most frequent childhood diseases. Presumably, the focus should be placed on what makes the child delay before arrival, on the weaknesses of the system at triage time and on PHC constraints regarding infrastructure and staffing.

A systematic review was performed to extract literature data regarding timeliness of hospital arrival, care-system availability of resources and processes of care for childhood illnesses in Malawi. Systematic review of published peer-reviewed and grey literature was conducted from various databases; from 2010 to 2023, the searched yielded articles from Embase, PubMed, Global Health and African Index Medicus. Further identification and synthesis of pooled information were gathered from Ministry of Health bulletins, producing hospitals' publications, programs' briefs of major stakeholders. Results of the systematic review show that a larger proportion of admitted children to the hospital treated *after* more than 48hours of illness onset, and that approximately 60% of the primary health care facilities do not have oxygen. As such results show the glaring system inadequacies to support timely recognition, appropriate triage and access to essential treatments. Addressing the rootedness timely recognition, triage, and transport functions could shorten delayed presentation to hospital and can potentially support further steps to reduce preventable childhood mortality.

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I. INTRODUCTION

Pneumonia, diarrhea, meningitis and sepsis are amongst the leading common childhood illnesses which cause significant global disease burden, especially in low- and middle-income countries. In Malawi, although under-five mortality has reduced over the decades, it is still alarmingly high compared to targets set globally, due to preventable infectious disease. Antenatal care, immunization and community case-management interventions have attained significant coverage, but the number of continuing child deaths indicate failures elsewhere in the care continuum. There is therefore a need to understand closely how the other health system-level and deficits/ delays to diseases such as recognitions of illness at ages and the subsequent referrals systems, and limits of triage captured, in primary-care capacities, impact child survival. This review aims to understand the 4four questions of what delays recognitions at

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the common and PHC level, delays obstructs or slow referrals, Triage and stabilization continuing deficiencies and Innovations to fix the local problems emerging in Malawi.

II. METHODS

The literature search for this narrative review was purposefully planned to access available studies on referral, triage, and service capacity challenges for frequent diseases in children managed at the primary health care facilities in Malawi between 2010 and 2023. A systematic search was performed in four databases, namely, PubMed, Embase, Global Health and African Index Medicus, with careful selection of keywords related to pediatric services, referral systems, and health facility outcomes. Certain sources of grey literature were also consulted for comprehensive availability, including bulletins by Ministry of Health, QECH reports, program briefs by Partners in Health (PIH) and Programs for Appropriate Technology in Health (PATH), and abstracts from conferences. Selection criteria included quantitative and qualitative studies reporting bottlenecks on recognition, referral, triage, and service capacity, and the narrative synthesis technique was applied to extract and integrate findings from various studies for fully reporting.

III. RESULTS

- *Results / Thematic Narrative: Recognition & Misdiagnosis at Community & PHC Level*

The conceptual modelling approach is used to demonstrate the identification of diseases and referral to specific institutions for ultimate therapies, and correlated components recognition, referral, triage or other stabilization, and finishing care or treatment while in the hospital. Evidence shows the degree of correctness in the primary disease identification at primary health care (PHC) facilities is dependent on Integrated Management of Childhood Illness (IMCI) compliance, caregiver experience levels, and surrounding health-facility-seeking traditions. In southern Malawi, although care taking professionals of the PHC showed high-performance level and capability to triage, but included the some misdiagnosis where bronchiolitis was elevated to pneumonia, and this misclassifying can affect the referring activities during the period of advanced therapies, and coupled with incorrect- doing strategies treatments approaches at the community/PHC stages. The methods of established triage and schemes setups like Emergency Triage Assessment and Treatment (ETAT) has encouraged the prioritize level of diseased small sectors, but revealed the shortcoming in further training for identifying specific illnesses and their stages in timing. (Gondwe et al., 2021).

Across study sites, however, there is increasing evidence highlighting the misclassification of potential life-threatening childhood illnesses at PHC, as a continued barrier to timely recognition, and where lack of training in Integrated Management of Childhood Illness (IMCI) is also a factor for caregivers and health workers, where knowledge, or inconsistent IMCI use has misclassified the diagnosis (IE pneumonia, meningitis, sepsis), often resulting in delayed recognition and referral as well. Capacity building with structured, direct implementation in ETAT-program has shown programmatic improvements associated with triage and emergency care in primary care settings (Majamanda et al., 2021). Such efforts impact timely recognition and stabilization of acutely ill children, which eases pressure on referrals from hospitals and overrides traffic at receiving facilities for patient-management. However, even with such efforts, without follow-up with mentoring in institutions (beyond pre-service training) to address skills transmission gaps in accurate referrals, realistic misclassification will continue to impact the disease burden for under 5s deaths in the community (Majamanda et al., 2021).

Additionally, sociocultural beliefs, differential awareness and other barriers to caregivers' timely recognition of warning signs associated with childhood illnesses escalate delays in seeking care at health facilities. Several studies have shown caregivers' reluctance in Malawi to seek timely medical attention for early warning symptoms, determined by the lower threshold associated with mild illnesses such as mild fever or lethargy if previous occurrences were handled safely at home (Lungu et al., 2020). Caregivers with knowledge of warning signs associated with severe illness still delay seeking help, are more likely to use home management options or traditional medicine (Lungu et al., 2020). Experiences regarding the quality of care received when attending health facilities also can influence the seeking behavior of caregivers; those who had negative experiences or perceived the quality of care as poor are less like to visit the facility early despite the existence of warning signs and are more likely to continue with home management (Nkoka et al., 2019). The observed geographical difference in timely care-seeking behavior points to complementary associations involving education at the community level, social norms, and trust in the health services on the continuum from the onset of symptoms to formal treatment (Nkoka et al., 2019).

- *Results / Thematic Narrative: Referral Delays and Barriers*

Nonetheless, the identification of serious underlying illness in children is not free of unfavorable effects, as the structural and financial forces that govern care trajectories routinely introduce delays in the process of referral. Many rural districts are characterized by long distances to health facilities and poor road infrastructure, which prolong the extension of time taken by families to seek timely assessment and referral services (Salim & Cavallaro, 2023). Unreliable means of transport are prevalent, further contributing to the challenge of moving sick children from primary health care centers to hospital settings, where some caregivers reported the need to trek for several hours with the sick children in tow (Salim & Cavallaro, 2023). Direct and indirect costs, such as transport fares, loss of income resulting from time spent away from work and food or accommodation at or near the referral hospital, further compound the challenge, particularly for resource-constrained households (Salim & Cavallaro, 2023). Financial

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impairments also underlie why although more than two-thirds of febrile children eventually make their way to the doors of public health facilities, the proportion of children who are seen and treated without delay is low (Salim & Cavallaro, 2023).

Further, the clarity of referral systems and their consistent implementation through known protocols affects the efficacy of referrals, as does the ripe communication between primary health care (PHC) settings and their upper-level referral centres. In Malawi, referral protocols can typically be found, but often inconsistently implemented, with use of discretion introducing unpredictable delays into the transfer of care where children may stand to benefit (Van Niekerk et al., 2023). Barriers related to communication between facilities impede transfers, with incomplete documentation, lack of feedback, minimal telecommunication technology use and more obstructive to the swift relay of information. Worker judgment, further, depends heavily on their clinical certainty and perceived limitations of the health system, and holds a significant influence on whether a children receives a referral – leaving them to be treated locally even if there are demonstrable signs for escalation (Van Niekerk et al., 2023). Where experiences of programs such as Chipatala Cha Pa Foni have found success, this suggests provider engagement interventions and increased levels of connectivity at the system-level can increase reliability in networking of referrals, allowing for a smoother care trajectory (Van Niekerk et al., 2023).

As a result of this delay in referral, children present to district and central hospitals in a much worse clinical state, often with more than 48 hours elapsed since onset of symptoms. This delay is associated with increased severity of disease, often resulting in a more severe disease state requiring maximum medical intervention at the time of admission. Various reports have shown that this delay in access to healthcare affected children from rural and low-socioeconomic settings more than their urban counterparts. Those children are more likely to be present in a worsened state with complications (e.g. dehydration, respiratory distress or sepsis) at higher-level hospitals. This is also one of the contributing factors to increased case fatality rates, higher burden on hospital services and decreased chance for an intervention during the ideal therapeutic window.

- *Results / Thematic Narrative: Triage, Stabilization & Transport Capacity Deficits*

Moreover, the PHC and district facility's capacity for stabilization and triage shows significant lack of staffing, equipment and adherence to Emergency Triage Assessment and Treatment (ETAT) protocol. Triage is practiced in most facilities, but it is done often by various staff, with 53% of facilities reporting that triage is performed by all personnel rather than a cadre of specifically trained staff. This, alongside the finding that only 12% of healthcare workers were specifically trained in ETAT, raises key concerns regarding the reliability and quality of initial assessment and immediate management of critically ill children (King et al., 2021). Also, the deficits in essential resources including key equipment and drug supplies fundamentally restrict facility preparedness to effectively stabilize and commence appropriate pre-hospital treatment interventions prior to referral to higher-level facilities (King et al., 2021). Ultimately, these factors undermine the emergency pediatric response strategy, particularly for children who experience insurmountable transport delays after presentation acknowledgement at the community or PHC facility-level.

Besides this, continuing lack of oxygen, pulse oximetry, and other critical supplies represents one more significant barrier to successful stabilization of acutely ill children in primary health care (PHC) facilities. Although application of oxygen therapy plays an essential role in treatment of pediatric respiratory distress syndromes, oxygen is absent in 60% of Malawian PHCs. Such deficiency inhibits clinicians' opportunity to perform emergency procedures, while unreliability of pulse oximetry complicates rapid diagnosis and monitoring of hypoxemia. Since children's oxygen saturation levels should be continuously checked, absence of pulse oximetry provides grounds to avoid monitoring altogether, with clinicians forced to rely on clinical judgment. Shortage of critical supplies undermines policies' adherence to best-practice standards in stabilization procedures, eliminating any correlation between training initiatives and practical application of Emergency Triage Assessment and Treatment (ETAT) policies and procedures (Majamanda et al., 2021). Even with additional training support in the implementation of ETAT guidelines, capacity efforts fail to improve outcomes in children due to delays in correcting hypoxemia and general deterioration during referral, which has continued from the stabilization process.

In addition, Malawi's interface of transfer of patients' functionality is impaired allowing it to transfer critically ill children from primary health care (PHC) facilities to district and central hospitals. The ambulance fleet is always inadequate, and those that are available are either concentrated in towns or used for administration, and not for emergency pediatric care. Due to lack of maintenance and fuel, ambulances are not always available, and this cause significant delays or transfers are done using private vehicles and bicycles. Using the later, can compromise child safety during transport. Referral facilities and ambulance dispatchers often relate poorly with one another, and, with inadequate coverage, ambulances can take a long time to reach where the sick child waits. Here, it is not uncommon for the operator to make several phone calls to ambulance dispatch before transfer is ordered (especially in rural areas with little access to communications). Although there have been efforts to improve the speed and efficiency of referrals (for example, using smartphones for community case management) insufficient ambulances and inefficiencies due to the health system undermine the provision of appropriate and timely care (Chirambo et al., 2021).

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- *Results / Thematic Narrative: Consequences at District & Central Hospital Level*

Delays in recognition, referral and triage inevitably lead to under-resourced, central and district hospitals becoming overcrowded. This in turn contributes to the delivery of less-than-optimal care. Overcrowding of children who are present when their illness has progressed significantly places an extra burden on the clinical staff who need to triage to meet the needs of the most serious cases, resulting in further delays before a child is seen and intervention starts. Children who are late are associated with increased case fatality rates as the hospital team must cope with complications that may not have occurred had effective treatment been instituted early in the course of illness at the community level (Kruk et al., 2022). Reduced quality of care may occur - examples include lack of staff for monitoring, overcrowding, lack of beds and / or shortage of essential medicines. All of these factors may contribute to a poor outcome in terms of an adverse effect on recovery and patient satisfaction. These downstream effects all reinforce the argument for a system-level change to ensure a direct pathway between the early community detection with timely effective hospital treatment (Kruk et al., 2022).

Consequently, late presentation contributes to substantial congestion and bed over-occupancy in pediatric units in Malawi, stretching facilities beyond their design capacity and increasing difficult competition for scarce resources. Congestion in hospital wards ultimately translates into bed shortages and consequently compromised staffing ratios; these, in turn, raise the risk of hurried examinations and inadequate clinical management by junior and overstretched staff. The consequences often include suboptimal outcomes, as allocated clinicians are required to prioritize urgent cases among a cohort of severely ill children, delaying critical interventions among those who might still have benefited from prompt management if care-seeking had occurred earlier. It has been estimated that upwards of 30% of late hospital presentations could be prevented through strengthening the pathway from recognition to referral and transport, considerably reducing the burden on understaffed and overstretched hospital units (Larsson et al., 2020). In the absence of these delays, clinicians can proceed to manage cases with care and timely intervention, which benefits clinical outcomes and allows hospital resources to be managed more sustainably.

- *Results / Thematic Narrative: Malawian Innovations & Pilot Programs*

As certain pilot initiatives and local innovations within Malawi address system bottlenecks, several promising Malawian pilot programs and local innovations have indicated an ability to fortify the recognition-triage-transport chain in conjunction with pediatric referral pathways. The introduction of mobile technology (mHealth) tools have been identified within pilot programs as highly acceptable and useful for Health Surveillance Assistants (HSAs) and caregivers. Users of the Supporting LIFE Community Case Management App (SL eCCM App) reported improved delivery of community case management alongside data accuracy (Ide et al., 2019). Decision-support applications provide higher reliability for diagnostic ability while reducing risks of malfunctions associated with paper systems. The confidence felt by frontline workers is amplified by these applications while communities perceive improved quality of care. Pilot perceptions surrounding improved oxygen delivery systems, dedicated ambulance schemes, task-shifting initiatives to mitigate access barriers to supplies and equipment represent various local strategies addressing critical shortages within transport systems and diagnostics. Aligned with technological progress and inventiveness, these locally driven initiatives, while not free from infrastructural issues, provide unique examples of Malawian innovations driving systems redesign to overcome long-term deficits within Malawi's referral pathways (Ide et al., 2019).

Furthermore, the assessment of the implementation and scale-up of these promising programs reveals an encouragingly mixed picture of initial results, and emerging implementation challenges. The scale-up of efforts like Chipatala Cha Pa Foni has further increased the decentralized provision of access to primary care through information provision, with promising evidence of adaptation to health workforce formations and community consent (Van Niekerk et al., 2023). Initial impacts suggest changes in service-seeking behavior and greater technical service area integration, as nurses and lay health workers perform expanded roles that facilitate the decentralized provision of care. Nonetheless, the programs have also revealed key elements for the continuous investment in human resources, strong supervision and relevant locally adapted communication approaches for sustainability. Key lessons revolve around commitment at the institutional level and effective resource mobilizing, and the use of community engagement to shape program design and respond to ongoing access challenges and barriers to successful integration into the wider system (Van Niekerk et al., 2023).

- *Results / Thematic Narrative: Cross-cutting Themes*

In addition, there is a need to consider cross-cutting issues, such as human resources, financing and policy alignment, to respond to the ongoing gaps along the recognition-referral-triage continuum for childhood diseases in Malawi. The recognized major barrier is the lack and poor distribution of skilled health workers, which together with variable policy compliance determines, on the one hand, the unreliability of disease detection at community level and, on the other, the quality of triage and stabilization services at health facilities. Further compounding these human resource issues are inconsistent health financing and resource allocation, which leave the timely delivery of needed interventions unsupported and critical pathways and infrastructure vulnerable to disruption. The successful alignment of national policy priorities with frontline service demands is hampered by the systemic influence of socioeconomic and environmental determinants, including poor water, sanitation and baseline maternal educational standards, which affect the comprehensiveness and

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impact of bridge interventions for prevention and cure (Obeagu, 2024). Strengthening human resource investment, securing better equitable financing approaches and promoting coordinated policy direction are, thus, a prerequisite for improved care pathways and under-five mortality reduction.

In addition, the ongoing interaction of system-wide constraints with targeted program actions within Malawi's pediatric health system further underscores the limits of standalone solutions where broader infrastructural and policy constraints remain unaddressed. For example, the long-term potential of key actions from the expanding mHealth adoption, regionally operated oxygen delivery, and scaled ambulance services, will remain highly contingent upon the adequacy of human resources, sustainable financing and coordinated low- and high-level policy actions. Fragmentation, on the other hand, results in uneven engagement with health system scaling, with increasing program reliance on quick-fix or ad hoc solutions, driven either by temporary political or donor-driven agendas, that ultimately fail to translate into sustainable gains in children under five delivery or outcomes. Evidence from other similar low- and middle-income jurisdictions indicates that maximum benefit from child-targeted programs can only be realized through embedding individual program outcomes within stronger gradements of system-wide reforms that foster governance, accountability and cross-sector coordination in targeted delivery (Kruk et al., 2022). In turn, this calls for multisectoral development engagement within health, education, infrastructure and community service programs towards establishing sustainable coverage of quality service delivery capable of meaningful impact on overall child mortality reduction.

IV. DISCUSSION

As such, alignment of the key findings with the conceptual framework highlights that the ongoing breaches within each tier of the recognition-referral-triage process have a cumulative impact on the timely and quality pediatric care in Malawi. While the strengthening of primary health care remains a priority and ETAT is endorsed at all levels, the systematic approach to prioritizing and starting treatment for critically-ill children has not been achieved across Malawian hospitals due to insufficient training and access to low-tech, low-cost resources (King et al., 2021). The outlined deficiencies call for immediate policy measures towards expanding the comprehensive ETAT training for front-line health workers, creating the actionable roadmap for the oxygen supply to hospitals, and defining the dedicated budget lines to ensure the continuous funding of ambulance services. At the same time, the communities may benefit from the specific interaction with the volunteers to increase the awareness of danger signs and promote faster help-seeking pattern to bridge the recognition gap at the households and villages level. Addressing each segment of the recognition-triage-transport chain would allow the health system leaders to avoid late admissions to the hospitals, improve resource allocation, and significantly enhance the survival profiles of children aged under five years in Malawi.

Finally, these insights also highlight the value of future research for rational approaches to enhancing pediatric emergency care system challenges. This will require cost-effectiveness analyses to qualify the financial repercussions of the scaling up of interventions such as Emergency Triage Assessment and treatment (ETAT) training, which could have a direct effect on resource use through reducing inappropriate referrals and improving prioritization (Gondwe et al., 2021). Acutely ill children's arrival rates could be better monitored through electronic medical records or surveillance dashboards. This could generate usable information that would facilitate immediate care system feedback to better allocate resources across the continuum of care. A qualitative focus on contextual barriers and facilitators, including providers' viewpoints and households' healthcare-seeking behavior, would enhance understanding of the factors driving delays despite targeted innovations. Through the combination of economic impact evaluation, operational tracking and qualitative insights around stakeholder perspectives, future research could more efficiently streamline the step-up of contextually driven, scalable solutions within Malawi's health system.

In conclusion, the major strengths of this review are the overall breadth of the findings from recent literature and the inclusion of grey literature in a systematic process to increase understanding of real-world applications and contexts. This enabled bringing in different viewpoints and capturing programmatic realities sometimes missed in peer-reviewed literature, thereby increasing the relevance of the evidence. On the other hand, certain limitations were identified that may affect the generalizability of the conclusions of this analysis: the focus on English language literature only may have resulted in an inclusion bias, and the lack of quality scoring using a formal tool prevents comparisons across included studies based on their quality and reliability. Being systematic in these methodological decisions could result in lesser effects from inclusion or exclusion of particular studies on the overall conclusions of the review. However, as described in relation to practical implications of targeted interventions based on strong local data to enhance public health priorities in other settings (Aidoo-Frimpong et al., 2024), a transparent discussion of these strengths and limitations allows the reader to take account of them when using these findings for informing policy and practice.

V. CONCLUSION

Continuing to reach these systems gaps in recognition, triage, and transport, where children continue to fall through the cracks, should remain an absolute priority. The timeliness of danger sign recognition at community and primary care, prioritized triage and referrals made as a system rather than an afterthought, demand sustained investments to ensure that the highest numbers of children are not spilling over into late

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admissions and preventable deaths. Strengthened care continuity will come from identified interventions in which we can address parallel gaps: ETAT prioritization and lower manageable complexity training efforts in our hospitals, increased access to oximetry and oxygen, committed and prioritized sustainable ambulance efforts, and volunteer community player efforts combined with technology for more prompt care seeking and adherence to priorities across the systems. The possibilities exist if we intervene together and strategically: there is hope for failure at five years to be lost, through a vulnerable health system, to repeated patterns of complicated admissions and delays to care.

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