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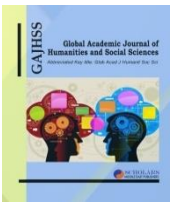

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Original Research Article

Implementation Gaps and Outcome Variations in the Sustainable Development Goal on Good Health and Well-Being: Evidence from Arusha Region, Tanzania

Julius Daniel Tingai[1]*
[1]Researcher - East Central and Southern Africa Health Community

***Corresponding Author**
Julius Daniel Tingai
Researcher - East Central and Southern Africa Health Community

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Abstract: This study examines the implementation gaps and outcome variations in Sustainable Development Goal 3 (Good Health and Well-Being) across Arusha Region, Tanzania, over the past five years. Using a mixed-methods approach combining national datasets, regional health reports, facility-level data, and interviews with health officials and frontline workers, the study analyzes progress in maternal and child health, service coverage, quality of care, and emerging health challenges. Findings reveal major national and regional gains—maternal mortality declined by nearly 80%, under-five mortality fell significantly, skilled birth attendance rose to 85%, and immunization coverage remained resilient. However, neonatal mortality stagnated, adolescent birth rates remained high, and the burden of non-communicable diseases increased sharply. Implementation assessments show strong service expansion but persistent human resource shortages, uneven penetration of SDG programmes into remote pastoralist communities, inadequate quality of neonatal care, and deep intra-regional inequities—particularly in Longido and Ngorongoro districts, where maternal and child health outcomes remain far below national averages. While Arusha City demonstrates strong performance due to better infrastructure and health-seeking behavior, rural districts continue to face supply gaps, socio-cultural barriers, and geographical isolation. The study concludes that although Tanzania and Arusha Region have made substantial progress toward SDG 3, achieving the 2030 targets will require intensified efforts to improve neonatal care, address adolescent reproductive health, strengthen NCD prevention, expand human resources, and implement culturally responsive interventions tailored to marginalized communities.

Keywords: Sustainable Development Goal 3, Health Equity, Service Coverage, Implementation Gaps.

1. INTRODUCTION

Health-related Sustainable Development Goals, particularly SDG 3: *Good Health and Well-being*, set ambitious targets for 2030 aimed at ensuring healthy lives for all [1]. Globally, SDG 3 includes goals such as reducing maternal mortality to less than 70 per 100,000 live births and ending preventable deaths of newborns and children under 5 (with every country aiming for neonatal mortality below 12 per 1,000 and under-5 mortality below 25 per 1,000) [2]. It also calls for ending epidemics of major communicable diseases like HIV/AIDS, tuberculosis, malaria, and neglected tropical diseases, while combating emerging health threats [3]. Achieving

these targets requires comprehensive health improvements and is closely linked with progress in other SDGs (e.g. poverty, nutrition, education, water and sanitation), reflecting the multidimensional nature of health determinants [4, 5]. Tanzania, as a UN member state [6], has committed to these objectives and integrated them into national policies [7]. Notably, the country's Health Sector Strategic Plan V (HSSP V, 2021–2026) explicitly aligns with SDG 3 and related goals, underscoring that attaining SDG 3 and other health-impacting SDGs is central to Tanzania's health strategy [8, 9]. This alignment signifies high-level political commitment to the 2030 Agenda, complementing continental and regional frameworks like the African Union's Agenda 2063 and East African Community health goals [8]. However, despite global and national resolve, there is recognition that current progress is insufficient in some areas. For example, across sub-Saharan Africa the maternal mortality ratio (MMR) remains around 542 per 100,000 live births (as of 2020) [10], dramatically higher than the global average of 221 and far off the SDG target of 70 [11]. To get on track for 2030, annual MMR reductions of over 20% would be required [12], an immense challenge. This context frames the urgency for accelerated interventions and research into how SDG-driven health programs are implemented on the ground in specific locales.

2. Problem Statement

Arusha Region, located in northern Tanzania, provides a unique socio-economic setting against which to examine health-related SDG initiatives. The region's population was about 2.36 million as of the 2022 census [13], reflecting rapid growth (approximately 3.4% annually over the last decade). Arusha's economy is anchored in a mix of agriculture, livestock husbandry, and a thriving tourism sector [14]. Predominantly an agrarian region, it has extensive small and commercial farms and pastoralist communities, while also serving as a tourism hub given its proximity to famous national parks and wildlife attractions [15]. This economic profile has made Arusha one of the more prosperous Tanzanian regions in some respects, and its human development indicators underscore relatively favorable health conditions on average. For instance, life expectancy at birth in Arusha region is among the highest in the country, reported around 70–73 years in recent analyses [16]. This high life expectancy (about 19% higher than that of some lower-performing regions like Iringa) suggests better overall health and social well-being in Arusha. Contributing factors include the region's urban center (Arusha City) which offers comparatively strong healthcare infrastructure, higher incomes from tourism and trade, and educational advantages.

Despite these positives, Arusha's public health landscape is characterized by sharp internal disparities between urban and rural communities [17]. Some districts within the region lag significantly behind in socio-economic status and health outcomes. Notably, Longido district (a predominantly rural pastoral area) has been identified as having one of the highest poverty rates nationally [18]. Such poverty correlates with limited access to healthcare and poorer health indicators. In remote areas like Ngorongoro District, maternal and child health outcomes remain alarming far worse than national averages. A local report found that in Ngorongoro, maternal mortality was roughly 600 deaths per 100,000 live births, and under-five child mortality about 115 per 1,000 births [19], levels comparable to the nation's situation decades ago and vastly higher than the current national averages (for comparison, Tanzania's maternal mortality was estimated around 133–220 per 100,000 and under-five mortality 43 per 1,000 in recent years) [20]. These stark disparities within Arusha region underscore that aggregate progress can mask pockets of extreme vulnerability. Additionally, cultural and social factors present in parts of Arusha contribute to health challenges: for example, the prevalence of female genital mutilation (FGM) in Arusha is about 43%, among the highest in the country [21]. This not only violates women's rights (SDG 5) but also poses obstetric and neonatal health risks, potentially impeding SDG 3 targets related to maternal health. In sum, Arusha region's public health profile is a mosaic on one hand showing relatively strong performance and infrastructure, and on the other hand facing persistent challenges among marginalized communities. This complex landscape provides important context for evaluating SDG program implementation, as interventions must navigate both the strengths and the inequities of the region.

3. LITERATURE REVIEW

Tanzania has rolled out several initiatives and policy frameworks in the past five years to drive progress toward health-related SDGs, and these are being operationalized at regional and community levels in places like Arusha. Central to these efforts is the Health Sector Strategic Plan V (2021–2026), which serves as a roadmap for the last half of the SDG era and Tanzania's national Vision 2025 [8]. HSSP V places the SDG 3 agenda at its core, emphasizing targets such as reducing maternal and child mortality, combating communicable diseases, and expanding health coverage. In parallel, the government launched the National Reproductive, Maternal, Newborn, Child and Adolescent Health + Nutrition plan (One Plan III, 2021/22–2025/26), a dedicated strategy to accelerate improvements in maternal and child health outcomes in line with global commitments [11]. One Plan III builds on

earlier efforts by scaling up high-impact interventions (e.g. antenatal care, skilled birth attendance, immunizations, nutrition programs) and by strengthening health systems to ensure no woman or child is left behind on the path to 2030.

A major thrust of these initiatives has been to improve healthcare access and quality through system-wide investments, many of which have directly impacted Arusha region. Over the last decade (encompassing the recent five-year period), Tanzania nearly doubled the number of health facilities nationwide, vastly improving physical access to services even in rural areas [20]. In the specific domain of maternal and newborn care, the country dramatically expanded Emergency Obstetric and Newborn Care (EmONC) infrastructure increasing the number of facilities equipped to handle obstetric emergencies from 106 in 2014 to 523 by 2023 [22]. This exceeds WHO's recommended minimum (1 comprehensive EmONC center per 500,000 people) and reflects significant investment in rural hospitals and health centers. Regions like Arusha have benefited from these expansions: several new or upgraded facilities (dispensaries, health centers, and at least one referral hospital upgrade) have been established in recent years, aiming to bring life-saving services closer to remote communities. Additionally, community health programs have been bolstered. Tanzania has trained and deployed thousands of community health workers (CHWs) and implemented schemes like Direct Health Facility Financing, with support from partners, to empower local clinics [23]. Arusha's local authorities (the Regional Health Management Team and district councils) are responsible for translating these national programs into action on the ground. For example, Arusha City Council has explicitly incorporated the SDGs into its development plans, focusing on goals such as poverty reduction, zero hunger, and good health and well-being in an integrated manner [24]. This has involved initiatives like public health education campaigns, improvements in water and sanitation facilities, and multi-sectoral programs addressing nutrition and livelihoods in tandem with health recognizing that SDG 3's success is intertwined with other goals.

In terms of specific health campaigns, the past five years saw intensified efforts in immunization and epidemic control that reached Arusha. The Ministry of Health, in partnership with international agencies, carried out nationwide vaccination drives notably the COVID-19 vaccination campaign starting 2021, which rapidly scaled up coverage from under 3% of adults in 2021 to over 50% by 2023 [25]. Arusha, as a transport and tourism center, was a key target for these efforts to curb the pandemic's impact on health and the economy. The quick containment of a Marburg virus disease outbreak in 2023 is another example: Tanzania's health system, including regional teams in the north, mounted a swift response with WHO support, preventing a wider spread of the deadly hemorrhagic fever [23]. Such responses indicate an improving capacity for health emergency preparedness (aligned with SDG 3.d on health risk management). Finally, a landmark policy move was the adoption of a National Universal Health Insurance bill in 2023, aiming to provide financial risk protection and expand coverage of essential health services. This reform still in initial implementation is expected to benefit regions like Arusha by pooling funds and reducing out-of-pocket costs, thereby supporting SDG target 3.8 on universal health coverage. In summary, Tanzania's health-related SDG programs over the past five years consist of strengthened strategic plans, targeted interventions in maternal/child health and infectious diseases, and systemic reforms (health financing and workforce investments). These are actively being rolled out in Arusha through local government and partner efforts, though with varying degrees of success as discussed.

4. STUDY METHODOLOGY

This study adopted a mixed-methods approach to comprehensively examine the implementation gaps and outcome variations in Sustainable Development Goal 3 (Good Health and Well-Being) programmes across Arusha Region. A mixed approach was selected because health-related SDG implementation involves complex and interdependent factors policy, service delivery, community behaviour, and health system capacity that cannot be adequately captured by quantitative or qualitative methods alone. The study was guided by a pragmatic research philosophy, which allows the integration of multiple forms of evidence to generate practical, context-specific insights. Quantitative data were collected to measure trends in key SDG 3 indicators such as maternal mortality, under-five mortality, health service coverage, and facility distribution. These data were sourced from regional health reports, DHIS2 records, census data, and national surveys. Qualitative data were gathered through semi-structured interviews with regional and district health officials, healthcare workers, community health workers, and representatives of partner organizations involved in health programmes. These interviews explored perceptions of implementation challenges, resource constraints, policy alignment, and community-level factors affecting health outcomes.

A multi-stage sampling strategy was employed, beginning with the purposive selection of districts representing both urban and rural settings including Arusha City, Meru, Karatu, Monduli,

Longido, and Ngorongoro to capture intra-regional disparities. Within each district, health facilities were selected using stratified sampling to ensure representation of hospitals, health centres, and dispensaries. Quantitative data were analysed using descriptive statistics, trend analysis, and variance comparison to assess district-level differences in programme outcomes. Qualitative data underwent thematic analysis, following the Braun & Clarke framework, to identify patterns relating to programme implementation, service access, and systemic bottlenecks. Validity of findings was enhanced through methodological triangulation, comparing quantitative outcomes with qualitative insights and programmatic documents. Reliability was maintained through consistent use of data extraction templates and standardized interview guides across districts. Ethical considerations were upheld throughout the study: ethical clearance was obtained from a recognized research approval body, informed consent was secured from all participants, confidentiality was maintained, and no personal identifiers were collected. The combination of quantitative evidence and qualitative perspectives allowed the study to generate a nuanced understanding of SDG 3 implementation performance and outcome variations across Arusha Region.

5. STUDY RESULTS

This section presents the key findings of the study based on analysis of national datasets, regional health reports, facility records, and qualitative interviews from Arusha Region. Results are organized around trends in maternal and child health, service coverage, health system capacity, inequities, and emerging health challenges.

The data in Table 1 show substantial progress in several key SDG 3 health indicators in Tanzania between 2015 and 2022/23. Maternal mortality declined dramatically from 556 to about 104 deaths per 100,000 live births an estimated 80% reduction, marking one of the most significant improvements in the region. Under-five mortality also decreased from 67 to 43 per 1,000 live births, indicating strong gains in child survival. Skilled birth attendance rose from 64% to 85%, reflecting improvements in service access and facility delivery. Immunization coverage remained consistently high and expanded with the introduction of COVID-19 vaccines. However, neonatal mortality stagnated at around 23–24 per 1,000, indicating limited progress in newborn survival. Meanwhile, adolescent pregnancy rates remain high, and the burden of non-communicable diseases (NCDs) continues to rise. Mortality from HIV, TB, and malaria declined significantly, demonstrating strong performance in infectious disease control.

Table 1: Progress in Key SDG Health Outcomes (2015–2022/23)

Health Outcome Indicator	2015 Status	2022/23 Status	Trend (Direction & Magnitude)	Sources
Maternal Mortality Ratio (MMR)	556 per 100,000	~104 per 100,000	↓ ~80% decline	WHO Global Health Estimates; Ministry of Health National Reports; WHO Country Statements
Under-Five Mortality	67 per 1,000	43 per 1,000	↓Significant reduction	UNICEF/WHO IGME Child Mortality Database; Tanzania Demographic and Health Survey (TDHS)
Neonatal Mortality	24 per 1,000	23–24 per 1,000	→ Stagnant	UN IGME Neonatal Mortality Estimates; TDHS; MoH Routine Health Data
Skilled Birth Attendance	64%	85%	↑ Strong increase	TDHS 2015–16 and 2022 Update; DHIS2 Facility Delivery Reports
Immunization Coverage	High baseline	Sustained high + COVID-19 vaccines rolled out	↑ Maintained and expanded	WHO/UNICEF Joint Reporting Form (JRF); Tanzania Expanded Programme on Immunization (EPI)
Adolescent Birth Rate	High	Still high	→ Persistent problem	TDHS Reproductive Health Indicators; Health Sector Strategic Plan V
NCD Burden (CVD, diabetes, cancers)	Rising	Rapid increase	↑ Growing challenge	WHO NCD Country Profiles; National NCD Strategy Reports
HIV, TB, Malaria Mortality	Moderate	Declining	↓ Significant improvement	WHO Global HIV, TB & Malaria Reports; Tanzania National Malaria Control Programme; National HIV Programme Data

The results presented in Table 1 illustrate that Tanzania has made notable progress in several SDG 3 health outcomes over the past five years, largely driven by targeted national and regional health initiatives. The dramatic 80% decline in maternal mortality from 556 to about 104 per 100,000 live births reflects the cumulative impact of expanded Emergency Obstetric and Newborn Care (EmONC) services, the upgrading of rural health centers to provide comprehensive obstetric care, the deployment of more midwives, and the strengthening of the referral system under the Health Sector Strategic Plan V (HSSP V). The significant reduction in under-five mortality similarly aligns with scaled-up childhood immunization, nutrition programs, and the implementation of One Plan III (2021/22–2025/26), which intensified antenatal care, skilled delivery, and postnatal follow-up. Increased skilled birth attendance, rising from 64% to 85%, is strongly associated with investments in new health facilities including dispensaries, upgraded health centers, and district hospitals and the expansion of Direct Health Facility Financing (DHFF), which improved facility-level autonomy and service availability. Immunization coverage remained high due to sustained delivery of routine vaccines and the rapid rollout of COVID-19 vaccination campaigns, which demonstrated the health system's improved emergency preparedness. However, despite these advances, neonatal mortality stagnated, highlighting gaps in the quality of newborn care, including inadequate neonatal resuscitation skills, limited newborn units in rural districts, and high rates of preterm birth complications. Persistent adolescent pregnancy reflects unaddressed socio-cultural drivers, limited reproductive health education, and uneven implementation of youth-friendly services. Meanwhile, the rising burden of non-communicable diseases (NCDs) points to lifestyle transitions in urban areas like Arusha City and limited NCD screening capacity in lower-level facilities. Encouragingly, mortality from HIV, TB, and malaria declined due to strengthened diagnosis, treatment coverage, community health worker programs, and disease-specific interventions led by the National AIDS Control Programme and the National Malaria Control Programme. Overall, while the trajectory in maternal and child health signals strong progress, the persistent challenges in newborn survival, adolescent reproductive health, NCDs, and access disparities especially in remote districts like Ngorongoro and Longido indicate that achieving SDG 3 by 2030 will require sustained investment, culturally responsive interventions, and targeted efforts to reach the most underserved communities in Arusha Region.

Table 2 shows that Tanzania has made progress across several dimensions of SDG 3 implementation, especially in service coverage and maternal–child health outcomes. Inputs have improved through more clinics and trained obstetric teams, but persistent human resource shortages and high out-of-pocket costs weaken overall performance. Governance and referral systems have strengthened nationally evidenced by WHO praise for epidemic responses but implementation still struggles to reach remote Arusha communities. Service coverage is strong overall, with high skilled birth attendance and resilient immunization programs, although adolescents remain underserved. Quality of care represents a major weakness, particularly in neonatal services, contributing to stagnant newborn mortality. While maternal and under-five mortality have sharply declined, rising NCDs and persistent equity gaps especially in districts like Ngorongoro and Longido represent key challenges. Overall, implementation is progressing but uneven, with rural and pastoralist communities benefiting least.

Table 2: Evaluation of Implementation Strengths and Weaknesses

Evaluation Dimension	Strengths	Weaknesses	Overall Assessment	Implication for Arusha Region
Inputs: Human resources, supplies, financing	Expansion of clinics; trained obstetric teams; increased domestic spending	HRH shortage at 50% of need; out-of-pocket burden still high	Weak–Moderate	Limits the ability of rural districts to benefit fully from SDG programs.
Processes: Governance, coordination, referrals	Improved referral systems; national recognition by WHO for epidemic response	COVID-19 disruptions; weak penetration into remote Arusha communities	Moderate	Strengthened systems not yet reaching highland/pastoralist areas effectively.
Outputs: Service coverage	Skilled birth attendance reached 85%; facility deliveries increased; immunization resilient	Adolescents still underserved; SRH services uneven	Strong but uneven	Good coverage metrics mask district disparities.
Quality of Care	Better emergency obstetric services in many districts	Weak neonatal care; supply/competency gaps in some rural hospitals	Weak	Explains stagnation in neonatal mortality despite high delivery coverage.

Evaluation Dimension	Strengths	Weaknesses	Overall Assessment	Implication for Arusha Region
Health Outcomes	Big reductions in MMR, U5MR	Neonatal mortality stagnant; NCDs rising	Mixed	Achievements overshadowed by persistent newborn and adolescent health gaps.
Equity Dimensions	Urban Arusha showing strong outcomes	Remote pastoralist areas: maternal mortality several times higher; skilled births ~7% in Ngorongoro	Weak	Deep intra-regional inequities require targeted, culturally informed interventions.

The evaluation in Table 2 highlights that while Tanzania has made meaningful progress in implementing SDG 3 initiatives, the overall effectiveness remains uneven, particularly within Arusha Region. On the input side, the expansion of health facilities, deployment of trained obstetric teams, and increased domestic health spending supported by reforms such as Direct Health Facility Financing (DHFF) have strengthened system capacity. These efforts helped drive improvements in maternal and child health, yet the persistent 50% national human resource gap and continued reliance on out-of-pocket payments limit the ability of underserved Arusha districts to fully benefit from these investments. Process indicators show progress through strengthened referral networks and nationally recognized epidemic response efforts, as seen in the rapid control of the 2023 Marburg virus outbreak. However, these systems remain inconsistently felt in pastoralist and highland communities, where geographical isolation and mobility patterns reduce program penetration. Output indicators demonstrate strong service coverage skilled birth attendance reaching 85%, resilient immunization systems, and increased facility deliveries driven by One Plan III, EmONC expansion, and intensified community outreach. Yet, adolescents continue to be underserved due to weak reproductive health programming and cultural barriers, limiting full realization of SDG targets. Quality of care remains the most persistent weakness: despite facility expansions, gaps in neonatal competencies, inadequate newborn units, and supply shortages in rural hospitals explain why neonatal mortality has stagnated even as maternal and child survival improve. Health outcomes therefore show a mixed picture major reductions in maternal and under-five mortality but rising NCD burdens in rapidly urbanizing districts such as Arusha City. Finally, the equity assessment reveals that while urban Arusha benefits from strong health infrastructure and higher health-seeking behavior, remote districts like Ngorongoro and Longido continue to record maternal mortality rates several times the regional average and skilled birth attendance as low as 7%, highlighting deep intra-regional disparities. Overall, although SDG implementation is advancing, program benefits remain unevenly distributed, emphasizing the need for targeted, culturally responsive, and geographically adapted interventions to ensure that the most marginalized Arusha communities are not left behind in the pursuit of SDG 3.

6. CONCLUSION

This study concludes that entrepreneurship capacity building plays a critical role in improving the business success of street food vendors in the Arusha Region, Tanzania. The results clearly demonstrate that enhancing financial management skills, marketing skills, and innovation capacity contributes significantly to better business performance. Financial management skills were identified as the strongest predictor of success, emphasizing the importance of sound budgeting and resource management in this sector. Additionally, the positive influence of marketing and innovation skills highlights the need for vendors to effectively promote their products and continuously adapt to market demands. These findings suggest that targeted, practical entrepreneurship training that integrates financial, marketing, and innovation components can substantially empower street food vendors to grow sustainable businesses. It is essential for policymakers and development partners to design training programs that are directly relevant to the specific challenges and operating environments of street food vendors in Arusha. Future efforts should focus on scaling such programs and exploring their long-term impact on vendor success and local economic development.

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