

Integrated diagnosis at the primary care level in Africa's low- and middle-income countries: What is it, what works, and for whom? A Realist Synthesis

Abstract

Introduction

Integrated diagnosis can improve health outcomes and patient experiences through early diagnosis and identification of cases that could otherwise be overlooked. While existing studies showcase the feasibility of integrated diagnosis across diverse conditions, a critical research gap exists regarding the conclusive link between integrated diagnosis at the primary care level and improvements in patient experiences and health outcomes. This review examines the conceptualizations of integrated diagnosis by various actors along the healthcare pathway in low- and middle-income countries (LMICs) and explores the necessary contexts and mechanisms crucial for its effectiveness.

Methods

This study adopts a realist methodology to comprehensively investigate integrated diagnosis. Employing a systematic approach, the research aims to collect, review, and synthesize existing evidence on integrated diagnosis, leveraging a program theory developed through literature review and expert discussions. Primary studies and reviews on integrated diagnosis, multi-disease testing, or integrated healthcare with a diagnostic component were sourced from key databases and global health organization websites. The collected evidence was used to build, refute, and test the evolving theoretical framework.

Results

This study identifies three models of integrated diagnosis interventions: individual/human resource integration, facility or mobile-based integration, and technology integration. The successful implementation of these models relies on an understanding of the values and perceptions of both healthcare workers and patients. This research emphasizes a holistic approach, considering all elements within the health system. Emphasizing a holistic methodology, the research underscores the interdependence of various elements within the health system. By framing contextual factors using the WHO health systems framework, the study positions diagnosis as an integral component of a broader health ecosystem. A key result of the research is the imperative to comprehensively address issues affecting integrated diagnosis interventions. This encompasses considerations such as policy frameworks, diagnostic tools, funding mechanisms, treatment pathways, and human resource management. To improve patient experiences, there is need to cultivate positive relationships with healthcare workers. This involves ensuring elements like respect, confidentiality, accessibility, and timeliness of services are considered. Despite integrated structures, there are potential challenges like increased waiting times that may impact patient uptake of integrated services.

Discussion and Conclusion

The diverse conceptualisations of integrated diagnosis highlight the necessity for clear definitions of each intervention, which is pivotal for the transfer of lessons, program comparisons, and effective measurement of results across different contexts. The success of integrated diagnosis is not a one-size-fits-all scenario; local contexts must guide decisions regarding the approach, conditions, and timing of integration to ensure sustainable outcomes. The review findings indicate that integrated diagnosis may be suitable at the primary care level in LMICs under specific circumstances. Successful implementation hinges on addressing both HCWs and patient perspectives, necessitating adequate time, resources, and a well-defined intervention model.

1. Introduction

This review delves into the concept of integrated diagnosis at the primary care level, a component of integrated health care, aiming to understand its effectiveness under different conditions and for diverse populations. Although there are some widely accepted definitions of integrated health care, implementers must take time to define and interpret it within their own contexts as none of the standard definitions completely align with all circumstances (1). As such, there are variations in conceptualisation, which complicates comparisons, replication, evaluation, and scaling up of integration models across different settings, creating knowledge gaps regarding its true impact (2-4). The review also investigates the necessary contexts and mechanisms for integrated diagnosis to improve patient experiences and health outcomes effectively at the primary care level.

The diagnostic process involves a range of activities, including clinical history and interview, physical examination, testing, and consulting with other clinicians (5). Integrated diagnosis allows health systems to prioritise patients over diseases by identifying multiple pathogens with a single test or offering comprehensive care that addresses the whole person, not just their specific symptoms. It can lead to multiple diagnoses within a single clinical visit and is particularly important for comorbidities such as TB co-infection(6).

1.1 Rationale for the Review

Africa still has the highest disease burden for many communicable and non-communicable diseases (NCDs) (7). Failure to control communicable diseases is, in part, due to challenges in correctly diagnosing and treating cases, especially at primary care facilities. For instance, a significant number of new tuberculosis (TB) cases and people living with HIV remain undiagnosed, missing opportunities for early intervention and prevention (5, 8). Many adults are unaware of their NCD status (9). As life expectancy improves for individuals with HIV due to treatment, there is an increasing risk of comorbidity with NCDs (10). It is estimated that reducing the diagnostic gap for the six tracer conditions for general health system performance, i.e. HIV, TB, diabetes, hypertension, syphilis, and hepatitis B virus infection, could significantly reduce premature deaths and disability-adjusted life-years in LMICs (5). As such, there is a need for improved healthcare delivery models to ensure that patients are not missed or lost to follow-up.

There is an increasing level of political recognition of the importance of an integrated approach to healthcare delivery (11). The Organization for Economic Cooperation and Development (OECD) sees integration as a quality indicator (3). In 2016, WHO developed integrated healthcare guidelines, which encompass various healthcare processes, including integrated diagnosis (12). In 2019, WHO recommended the development of integrated testing services and policies, and there have been policy guidelines for integrating conditions like TB, HIV, and NCDs, where integrated diagnosis can be beneficial (13-15). However, a growing body of literature indicates that the policy focus on integration may not align with the complex realities of service delivery in LMICs (16).

1.2 Objectives and Focus of the Review

The primary objective of this review is to understand what integrated diagnosis at the primary care level means for different stakeholders and explore the specific contexts and mechanisms necessary for the successful implementation of integrated diagnosis interventions.

The achievement of intended outcomes defines success in this context, that is, improved patient experiences and health outcomes at the primary care level in LMICs.

2. Methods

The realist approach is used, which offers tools for synthesising complex evidence from interventions (17-19). Realism posits that individuals are likely to make similar choices about resource utilisation in specific contexts, leading to semi-predictable patterns of behaviour. The realist seeks to uncover these patterns by examining the interaction between context, mechanisms, and outcomes (C-M-O). Mechanisms are the underlying entities, processes, or social structures that operate in specific contexts to generate the desired results (19).

Scoping the literature: A rapid literature review was conducted to develop the theoretical framework to guide the analysis. This framework was then employed as a discussion guide in consultations with experts from global health organisations and academia. The goal was to identify a set of themes that are pertinent to integrated diagnosis interventions in LMICs.

Searching Process: The literature search for this review was an ongoing and iterative process. It began with an initial search of academic databases, such as PubMed, Oxford SOLO database, Google Scholar, and the Cochrane database of systematic reviews, and included global health organizations' websites.

Inclusion criteria: Studies were included if they reported on the diagnosis or screening of two or more diseases or conditions, at the primary care level in LMICs. Studies had to be in English due to translation constraints. All types of study designs and publications, including grey literature, were considered. The review encompassed all diseases and conditions relevant to primary care settings.

Selection and appraisal of documents: An initial extensive search was conducted on integrated health care with a focus on LMICs in the African region. An Excel-based identification tool was developed to evaluate documents for potential inclusion.

Data Extraction: Information was collected on the intervention, the context, and the operational aspects or mechanisms, to identify critical elements that could impact the success or failure of integrated diagnosis interventions. The data was indexed using NVivo qualitative software (Version 12) and categorised as context, mechanism, or outcome (C-M-O). As each paper was reviewed, new codes were developed and continually adjusted to capture themes or concepts that could contribute to theory testing (18, 20).

Analysis and Synthesis Process: During analysis, the results were shared with both methodological and subject experts to ensure the validity and consistency of the inferences drawn. Potential theories were explored to explain the data found focusing on any recurring patterns observed.

The sections of texts from the included studies, which had been coded and captured, formed the raw materials for interpretations. These text sections were used to assess whether they could confirm, refute, or refine the potential theories. The data synthesis followed the generative explanation for causation, where an outcome (O) of interest was seen as generated by relevant mechanism(s) (M) being triggered in a particular context (C) (17, 21). Specifically, recurring patterns that could act as barriers or facilitators to integrated diagnosis were identified and used to test the explanatory powers of the initial program theories.

If initial theories couldn't explain the data, new theories were sought. This process actively sought data that could challenge or refute the initial program theory.

The document flow chart and results of the search are provided in a supplementary file.

3. Results

The review aimed to understand how different stakeholders conceptualised integrated diagnosis. This varied depending on the specific focus of the intervention, such as who, where, how, and why services were integrated (Figure 2). In many instances, integrated diagnosis was primarily associated with the concept of testing and didn't encompass the broader definition of diagnosis. As a result, integrated diagnosis was often used interchangeably with multi-disease testing.

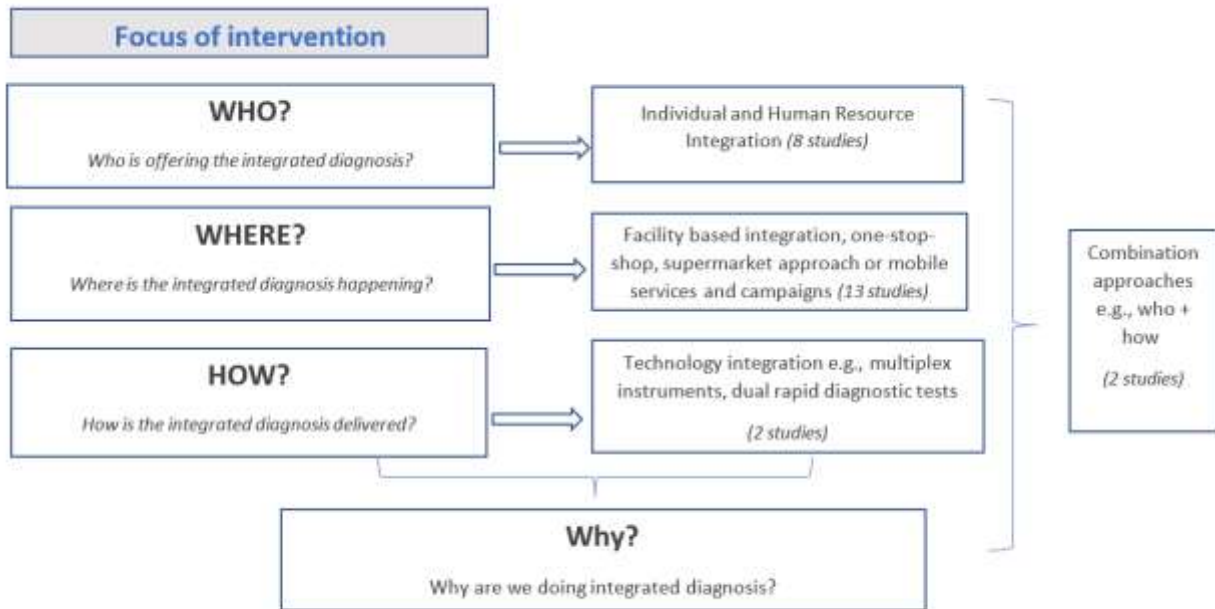


Figure 1: Ways that integrated diagnosis was conceptualised.

3.3.1 Types of integrated services

The WHO defines integrated healthcare as a coordinated approach that ensures individuals have access to multiple healthcare services based on their specific needs. The ultimate aim is to enhance patient experiences and improve health outcomes (22, 23). While the WHO outlines the purpose and objectives of integrated healthcare, it does not prescribe the specific actors, locations, or methods for integration, providing general guidance to facilitate the implementation of integrated healthcare.

The review identified various types of integrated diagnosis:

Facility Integration: This approach involved providing diagnosis for different conditions in a single physical location, often referred to as the "supermarket approach" or "one-stop shop" (2, 9, 24-30). It could include co-located services within the same facility or referral-based services to different buildings. Examples include integrated TB and HIV integration (27), NCD and HIV testing in South Africa (9) and a Chronic Care Clinic model in the Malawi cohort (31).

Facility integration is a common approach, particularly for interventions that were traditionally delivered

as "vertical programs." These programs are now combined and provided as a series of integrated services. (6). This approach is recommended by global health organisations like UNAIDS to maximize health outcomes (6, 32). Facilities that offer regular healthcare touchpoints, such as maternal health services for pregnant women, provide convenient opportunities for integrating other essential diagnostic services like screening and diagnosis for sexually transmitted infections (STIs), cervical cancer, and hypertension. (24, 25, 29, 30, 33). Targeting key populations can also improve testing coverage, especially when high rates of co-infections are observed, such as HIV and TB (34).

Individual or Human Resource integration: In this model, patients consult with one healthcare provider who offers multiple diagnostic services during a single visit (26, 35-41). Individual integration is generally conducted within one facility. The difference between facility and individual integration is that several professionals are involved in facility integration. It can include case management for conditions like Integrated Management of Childhood Illnesses (IMCI) or symptomatic diagnoses (38, 42).

Mobile and Campaign-Based Integration: This subtype of facility-based integration involves mobile clinics or campaigns offering integrated diagnostic services (43-46). Examples include mobile clinics providing HIV and NCD testing in South Africa and Malawi (31, 44) or child health campaigns in various countries (45).

One common challenge with mobile or campaign-based integrated diagnosis interventions is the high rate of loss to follow-up. Despite a significant number of people undergoing diagnosis during these initiatives, there is often a lower rate of individuals proceeding to receive necessary treatment and care. For instance, in a mobile screening effort in Lesotho, which provided HIV testing to 8,396 adults, only 36.6% of those who tested positive for HIV went on to enrol in further HIV care (2).

Technology Integration: This approach focuses on how integrated diagnosis is delivered using technology, with examples of multi-disease testing platforms for TB and HIV testing in Zimbabwe and Malawi (47, 48). The aim is to improve turnaround time for test results and optimize technologies while potentially reducing program costs(49). However, there is a risk with technology integration that the focus may become instrument-centred rather than patient-centred, potentially overlooking the overall healthcare experience.

Combination Approaches: Some models combine different types of integration. For example, facility-based integration for HIV and TB can include a single healthcare provider diagnosing both diseases, resulting in faster initiation of treatment (50).

The patient definition of integrated diagnosis encompasses two key conceptualisations. Integrated diagnosis, according to patients, involves both receiving comprehensive care for multiple conditions from a single healthcare provider and having convenient access to various healthcare services within the same facility (35, 39, 51, 52).

Single Provider: Integrated diagnosis, from the patient's perspective, means having a continuous and seamless provision of care for their conditions. Patients prefer to receive all their care from a single healthcare provider or individual. An example of this is illustrated in a study conducted in South Africa, where patients with comorbidities didn't view their conditions as separate biomedical issues. Instead, they perceived their conditions as a collective experience of chronic suffering and preferred holistic care from a single healthcare professional rather than treating each condition separately (10).

Convenient Access to Multiple Services: Patients also define integrated care as having convenient and easy access to multiple healthcare services. For instance, some patients considered vertical services as integrated services because these services were offered in the same facility despite being available on

different days. (53). Patients considered these services integrated even though the programs were not structurally or functionally integrated.

3.3.2 Contexts and Mechanisms necessary for effective interventions

The second question in the review aimed to explore the contexts and mechanisms that are essential for the success of integrated diagnosis interventions. Integrated diagnosis is a complex healthcare process and comprehending its success factors requires a health systems approach. Additionally, HCWs and patients have distinct perspectives and motivations regarding healthcare, so separate theories or C-M-O models were developed to better understand their roles and participation in the diagnostic process.

A. Health Care Workers (HCWs)

The WHO Health Systems building blocks served as an analytical framework to identify the various contexts required for successful implementation (54). These building blocks include service delivery, health workforce, health information systems, access to essential medicines, health financing, and leadership and governance. Prioritising these elements allows healthcare systems to strive for equitable, affordable, and high-quality care for all. Figure 3 summarises the contextual factors from the studies that align with the six WHO building blocks for health systems.

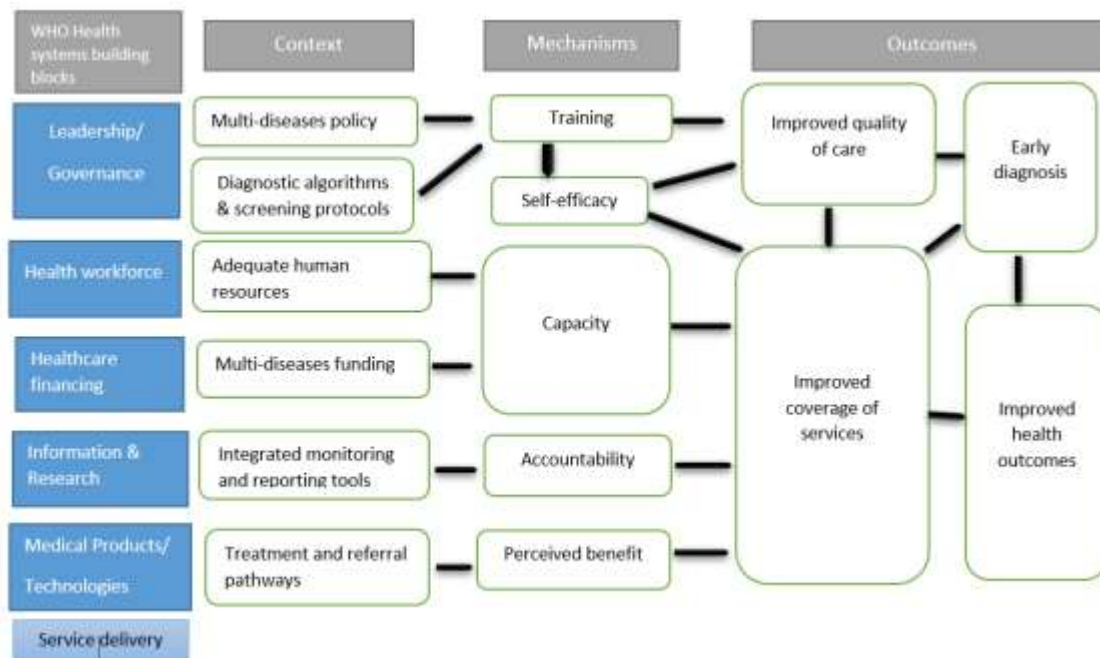


Figure 2: C-M-O configurations for healthcare workers with a mapping of how they align with the WHO health systems framework

1. Leadership and Governance

This building block focuses on the establishment of strategic policy frameworks, effective oversight, accountability, regulations, and incentives (54).

Multi-disease policy: The presence of global or national multi-disease policies or guidelines is an

important step to facilitate the successful design of integrated healthcare interventions (27). Most LMICs rely on guidance from WHO to inform their national policies and donor priorities. For example, the WHO guidelines on NCD integration influenced changes in NCD prioritization within national policies and frameworks (55), leading to increased funding for these interventions. In certain cases, integrated diagnosis interventions were introduced before formal policy formulation. For example, studies on cervical cancer integration proceeded without a national cancer strategy or policy in place (24). The availability of funding resources and training played pivotal roles in motivating healthcare workers in such instances.

Diagnostic Algorithms and screening protocols: The operationalization of multi-disease policies is crucial for effective implementation. For example, the successful integration of HIV and TB in many LMICs is attributed to the presence of WHO guidelines, national policies, operational plans, healthcare worker training, and donor funding to support these efforts (56). When policies are not effectively operationalized, implementation can be suboptimal.

A lack of operationalization can lead to inconsistent healthcare practices. For instance, in Botswana, prior to 2016, there were no national clinical guidelines for NCDs. As a result, adults seeking care for major NCDs like diabetes, hypertension, cardiovascular disease, chronic respiratory disease, and cancer received inconsistent management and referrals depending on HCW's training (57). Even when there is a commitment to integrate services, such as HIV and SRH, in national health policies, significant service gaps and mismatches between claimed and available services are reported due to a lack of standardization (58). In the absence of simple screening or diagnostic checklists or algorithms, healthcare workers may be reluctant to intervene or take action, fearing errors in diagnostic or treatment pathways and potential harm (59).

Training: Training is a crucial mechanism to ensure the effective utilisation of policies, guidelines, and resources. Guidelines alone are insufficient if HCWs are not adequately trained. Training has been shown to positively influence the self-efficacy and engagement of HCWs, enhancing their ability to provide holistic care (60). Examples from Mozambique and Kenya highlight how training can lead to increased job satisfaction, effectiveness, and motivation among HCWs working in integrated healthcare settings, especially when dealing with maternal and child health services and HIV-infected infants (59). In Tanzania, training HCWs, particularly in Integrated Management of Childhood Illness (IMCI), has been linked to improved quality of care, with children managed by trained HCWs receiving better assessments and more appropriate treatment (38).

Training should focus on all aspects including the technical diagnosis of diseases, interpersonal relationships, and patient-centred care. Interprofessional tensions can hinder the smooth continuum of care, especially when HCWs feel others are not fully contributing to integrated interventions (16). Interprofessional collaboration and teamwork are crucial elements in facility-based integration, ensuring coordination among different HCWs, nonprofessional caregivers, and patients (61).

While training is essential, it can be resource-intensive, particularly during program start-up, and may require ongoing mentoring support. Furthermore, if the disease burden is low, HCWs might stop testing, leading to a loss of competencies that need regular practice. Additionally, removing HCWs from frontline services for training can strain already limited resources and may result in longer waiting times and reduced consultation time, potentially compromising service quality (15, 59).

2. Health workforce

The availability of sufficient and responsive health workforce is crucial as it directly influences the quality and delivery of healthcare services (54). It's imperative to assess the material and human resource

capacity to ensure that the integration does not have a negative impact on the staff or patients (6).

Adequate human resources: The fear of increased workload and pressure was a concern among many HCWs when it came to integrating routine HIV testing or TB screening into their existing responsibilities (51, 59). Taking on extra tasks without additional compensation can be challenging unless these additional services become part of routine standard care.

To address staff workloads in the Integra initiative in Kenya and Swaziland, deliberate human resources planning was carried out to prevent staff from becoming overwhelmed. Specific days were allocated for different population target groups. For instance, pregnant women were scheduled to be seen only on Wednesdays, and HIV patients with comorbid conditions like hypertension or diabetes visited the clinic during a designated weekly 'dual diagnosis day' (43). However, it's worth noting that integrated sites didn't consistently yield better health outcomes; results were often mixed (16).

In the case of the Epako clinic in Namibia, the previous practice of setting aside specific days for the ARV clinic led to participants feeling stigmatised, as it became widely known who was HIV positive (62). This issue was resolved through integration, allowing all health services to be provided daily, thus reducing stigma.

3. Healthcare financing

Adequate health financing is a vital building block of the healthcare system, ensuring the availability and accessibility of services while offering financial protection to individuals shielding them from financial hardship associated with the cost of healthcare services (54). Multi-disease funding is crucial for the success of integrated diagnosis interventions, but it needs to be managed and coordinated effectively to prevent negative consequences. The lack of coordination and alignment of funding can hinder the implementation of integrated activities, as demonstrated in the example of TB and HIV testing in Lesotho, where different donors funded these programs with varying reporting requirements (63).

Multi-disease funding: Most LMICs rely on donor support to fund their health programs. Donor funding often focuses on specific diseases or conditions that are considered priorities. This can create a situation where only targeted diseases receive funding and attention, such as the HIV program, while other diseases may be neglected (43, 58). Lack of funding can be a significant barrier to integration, even when there is a recognised need for such, for example with mental health integration (64).

When certain diseases receive more funding and incentives compared to others, it can create disincentives for HCWs. For example, in the case of HIV, nurses who receive incentives may become overloaded with work, as their colleagues may avoid responsibilities related to HIV care. This imbalance in incentives and workload can lead to inefficiencies and dissatisfaction among HCWs. Unbalanced funding can also affect the delivery and sustainability of health programs. If incentives are withdrawn or reduced, HCWs may be less motivated to provide services (45, 60).

In some cases, incentives are provided to patients to encourage them to participate in health services, such as testing or screening for HIV and NCDs in chronic mobile clinics in South Africa (44). This can be effective in promoting early diagnosis and care-seeking behaviour, especially for conditions that may have stigmas or barriers to access. To address funding gaps, some health programs charge user fees for additional diagnoses. However, this approach may limit the uptake of these services, especially among populations with limited financial resources (16).

4. Information and research

The health information system building block includes the production, analysis, dissemination and use of reliable and timely health information (54). To make informed decisions about developing and implementing interventions, it is essential to have access to high-quality and strong evidence (65).

Integrated Monitoring and Reporting Tools: Standard templates, registers, forms, and booklets that encompass all targeted diseases are essential for facilitating successful integrated diagnosis interventions. These tools help ensure that HCWs remain accountable for their work and responsibilities. Using integrated reporting tools that encompass multiple diseases can serve as a mechanism to remind HCWs of their responsibilities, encouraging a holistic approach to healthcare. In the integration of HIV and SRH, the lack of integrated indicators for reporting resulted in separate monitoring and reporting systems. This issue was compounded by weak monitoring and reporting tools for SRH services (6, 41).

Keeping reporting tools simple is crucial to ensure that HCWs are willing to invest the time required to complete them. Overly complex forms can overwhelm HCWs and negatively impact program results (43). Digital tools and innovations can reduce paperwork and streamline reporting processes, allowing healthcare workers to focus more on their actual tasks. Various provider job aids, such as screening tools and flipcharts, have been found effective in supporting integrated diagnosis activities (26).

5. Medical Products/Technologies

Health technology, equipment and an effective supply chain are one of the health system pillars that affect the availability and quality of service delivery (54). The unavailability of commodities and irregular supply of essential consumables and drugs were major barriers to the uptake of integrated HIV, syphilis and malaria services in several countries (59, 65).

Treatment /Referral pathways

The success of integrated diagnosis interventions is not just about diagnosing conditions but also considering the feasibility and complexity of treatment and care once a diagnosis is made. Having well-defined treatment pathways, disease management strategies and referral mechanisms plays a significant role in HCW perception and service uptake. It enhances HCW engagement and instils confidence and trust in patients that their healthcare needs will be met. The availability of treatment for specific conditions, such as HIV or other STIs, influenced testing uptake in Kenya (26). In another case of NCD integration, treatment capacity was unavailable and could not be sustained, affecting the continuation of diagnosis (2, 28).

Referral mechanisms can be problematic even when diagnosis and treatment services are functioning effectively. For example, a pilot project in Malawi integrating hypertension screening into HIV activities showed that while screening was feasible, the linkage to care for hypertension management needed improvement (66, 67).

6. Service delivery

Service delivery is a fundamental component of the healthcare system, characterised by the provision of effective, safe, and high-quality health interventions, which include the necessary infrastructure. Health services should be available to those in need when and where required, all while efficiently using available resources (54). Successful service delivery depends on the effective collaboration of all the other pillars within the healthcare system. Furthermore, the experience and perception of patients or clients in receiving these services play a significant role. However, none of the factors could be neatly aligned to this pillar.

B. Clients and Patients accessing diagnostic services

Community awareness, demand, and acceptability of diagnostic services are essential for the success of integrated diagnosis interventions. Numerous frameworks for patient-centered approaches to health service delivery exist, with the "Caring About Me" framework being one notable example (52) that can help to understand the various factors that contribute to positive experiences within healthcare. Patient perception of care as patient-centered is often rooted in the sense that healthcare providers are actively collaborating with them addressing individual needs and helping self-manage their care.

In LMICs, integrated diagnosis, may not necessarily be about individualizing care or self-management but it is about HCWs collaborating with patients to make them feel supported, heard, respected, and accepted. For example, SRH interventions emphasise creating a non-judgmental, respectful, and accepting environment, leading to positive experiences. Figure 4 illustrates the C-M-Os that can impact the success of integrated diagnosis interventions, with a focus on improving patient experiences.

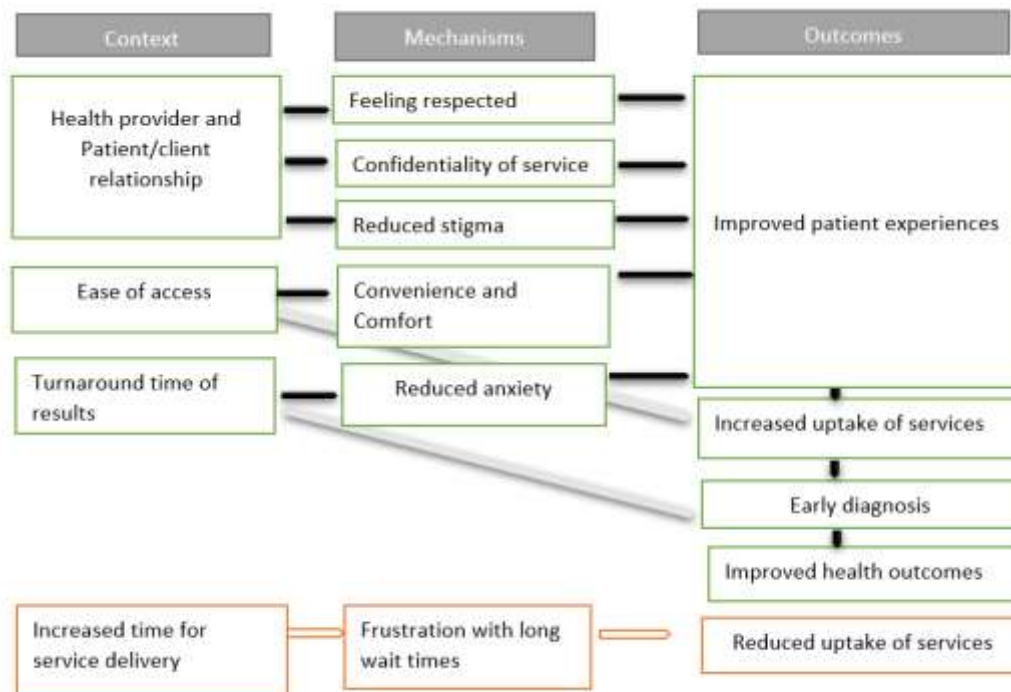


Figure 3: C-M-O configurations for patients to ensure successful integrated diagnosis interventions

Health provider and Patient/client relationship: The perception of respect from HCWs plays a fundamental role in how patients rate the overall quality of their healthcare experience. When patients feel respected, they are more likely to report a positive experience. This underlines the importance of training HCWs to provide patient-centered care (26).

Maintaining confidentiality can reduce the stigma associated with certain diseases, which is highly valued by clients/ patients. For instance, in some situations, a stigma is still attached to positive diagnoses for HIV or NCDs such as cancer (43). To address this, the Epako case study in Namibia provided all services by the same nurse in the same room, ensuring that community members could not discern who was HIV positive, thereby preserving confidentiality(16).

In Swaziland, the integra study found that inadequate privacy in healthcare facilities restricted discussions

of personal matters and complete history-taking. This lack of privacy led to stress during HIV testing for some patients, who were worried about having HIV, which they perceived as a stigmatised disease. Being overheard during testing and the fear of being seen by other patients were significant concerns for many patients (16). While provider-initiated diagnosis has been effective in increasing testing uptake (16), it does not always lead to improved patient experiences. One reason for this is the power imbalances, which can make patients reluctant to refuse suggested diagnoses. In some cases, patients fear negative consequences, such as jeopardising future medical care if they decline a suggested diagnosis. For instance, one study found that approximately 29% of patients believed it would be difficult to refuse HIV testing offered by TB nurses due to concerns about potential repercussions from HCWs (51).

Ease of access to services: Physical space at the facility plays a vital role in the healthcare experience. This includes having private consultation rooms, comfortable waiting areas for extended waits, and straight forward access to the services (16). Sometimes, physical separation of spaces may be necessary to prevent disease transmission and contamination. For instance, in Kenya, the perceived risk of HIV infection affected testing uptake, when HIV services were integrated with SRH services (26).

Turnaround time of results: Faster test result delivery can significantly improve patient experiences by reducing waiting times, which can be challenging and anxiety-inducing for patients (68). Providing same-day results can enhance clients' confidence in the healthcare system. The integrated point of care (POC) testing reduced turnaround times for HIV early infant diagnosis and viral load testing from days to hours (48). Timely test results also help accelerate clinical decision-making, improve the quality of care and optimize health outcomes (9, 68).

Increased time for service delivery: Timely services provide convenience and can lead to better health outcomes, particularly for conditions that require timely treatment. However, integration efforts in healthcare can sometimes unintentionally increase the time spent at facilities, resulting in frustration and reduced uptake of services. Long waiting times can act as a significant barrier to integrated diagnosis interventions. For example, the integration of HIV services with primary healthcare in a Zambian clinic led to a notable increase in waiting times, from 91 to 127 minutes, due to issues related to staff and patient flow (69). A time and motion study revealed that HCWs trained in IMCI spent almost two minutes longer per consultation on average compared to those in comparison facilities (38). This extended time spent with HCWs, addressing multiple conditions, inadvertently made some patients feel guilty about delaying others, discouraging them from discussing other important health concerns (16).

4. Discussion

4.1 Summary of Findings

Integrated diagnosis is perceived differently by various actors along the healthcare pathway depending on the purpose, the individual involved, the technology used or the location of the intervention. Patients have perspectives on integrated diagnosis, which are influenced by factors they value, such as convenience, confidentiality, reduced stigma, and respectful and trusting relationships with healthcare providers.

Integrated diagnosis interventions can enhance service uptake, especially among underserved populations, yet the challenge lies in reconciling quality service delivery with limited healthcare staff and high patient volumes, necessitating strategic trade-offs. A persistent tension exists between enhancing the patient's experience, broadening service access, and achieving cost reductions.

The review showed that challenges in integrated diagnosis interventions are complex and variable, highlighting the need for context-specific approaches to address these issues effectively. CMOs can inform practice and guide decisions to improve the deliberate design of interventions. This realist review has identified two categories of explanatory theories relevant to HCWs and patients. Firstly, for HCWs to successfully implement integrated diagnosis interventions, they need to adopt a health systems perspective that allows for integration across different disease programs. This includes multi-disease policies, funding, diagnostic algorithms, and integrated monitoring and reporting tools. Knowledge and training of HCWs are essential to make these systemic factors operational. Additionally, the health system's capacity needs to be developed, including having an adequate workforce and securing multi-disease funding. Diagnosis alone is insufficient to lead to improved health outcomes. Comprehensive care and treatment must be considered from the outset of the intervention's design. Availability of resources including treatment options build the patient's confidence in the healthcare system. Unfortunately, these are typically available in secondary care settings in LMICs.

There is a tendency to target one aspect of the system for improvement while neglecting other critical factors. For example, introducing new diagnostic technology in a facility without considering the motivation and training of the HCW can result in well-equipped facilities with low service uptake. Diagnosis, while just one component of the healthcare process, is part of a broader health ecosystem.

Integration is not a substitute for solving failed health systems (22, 30). It is also difficult to integrate services not operating at the same level of efficiency. Challenges in implementation can vary even within similar contexts, depending on the specific type of intervention. For instance, some HCWs may be overwhelmed by additional tasks in one facility, while this may be better managed in another facility within the same country (62, 70), which has a significant impact on the success of the intervention (16). In addition, interventions in one part of the healthcare system may unintentionally affect other parts. For example, improved diagnostic capacity for certain diseases may deprioritize others due to an imbalance in resources and increased service utilisation.

It is also important to recognise the broader structural issues that can affect integrated diagnosis interventions. While donors and governments may express support for 'integration' at various levels, they often prioritise disease-specific partnerships and judge success based on disease-specific performance without acknowledging the potential contradiction in their approach (71). Most research has focused on linking frontline services, many implementation challenges are related to gaps in higher-level health system functions. These challenges include the absence of appropriate regulation, unified multi-disease policies and operational frameworks, as well as the lack of coordination and alignment among donors, leading to separate financing streams for integrated services.

Secondly, it is important to consider clients/patients' perspectives and their desire for relationship-based care, confidentiality, ease of access, and timely services to improve their healthcare experiences. None of the things the patients value necessarily come from structural and functional integration. Patients often desire personalised and 'friendly' care to address their multiple health concerns. However, the pressure and rushed care focused on completing routine tasks can hinder their ability to articulate these needs (16). Integration efforts can inadvertently lead to increased waiting times at healthcare facilities, which may deter patients from seeking services.

A challenge with building a robust evidence base on integrated diagnosis is that most of the interventions are small-scale, proof of concepts or feasibility studies that have not yet been scaled up. Integration models are relatively new and lack comprehensive clinical, process outcomes, and cost-effectiveness data. This immaturity hinders the ability to assess their long-term effects (72). Moreover, most integration

programs tend to leverage the HIV program, as a model of successful implementation, which can overshadow other healthcare programs, making them appear less significant by comparisons.

Facility integration is more commonly and feasibly implemented in LMICs at the secondary care level, like district hospitals, whereas primary care facilities such as clinics and health posts encounter challenges related to HCW availability and physical space. Individual integration, though possible, is particularly challenging in resource-constrained primary care settings due to the intensive time and resource requirements, potentially leading to patient frustration and delayed service delivery. Decision-makers must carefully assess the trade-offs between the benefits of individual integration and the challenges in ensuring timely, high-quality patient care.

4.2 Strengths, Limitations, and future research direction

While many reviews broadly examine integrated healthcare, a gap exists in the explicit coverage of integrated diagnosis or multi-disease testing. Studies on integrated diagnosis often lack detailed explanations or discussions on the intervention and the mechanisms driving outcomes. A realist approach becomes valuable in shedding light on how these interventions function and elucidating the necessary elements for enhancing patient experiences and health outcomes.

A single reviewer conducted the review, selecting and appraising articles, posing a potential risk of omitting crucial studies. To mitigate this limitation, feedback and discussions with experts were employed.

Future research in this area should focus more specifically on integrated diagnosis and multi-disease testing. Additionally, longer-term studies involving larger populations are needed to assess the impact of such interventions and their effects on the overall patient healthcare experience.

4.3 Conclusion and Recommendations

The review concentrated on integrated diagnosis interventions in Africa, with potential relevance to LMICs globally. The success of integrated diagnosis is not a one-size-fits-all scenario; local contexts must guide decisions regarding the approach, conditions, and timing of integration to ensure sustainable outcomes. The review findings indicate that integrated diagnosis may be suitable at the primary care level in LMICs under specific circumstances. Successful implementation hinges on addressing both HCWs and patient perspectives, necessitating adequate time, resources, and a well-defined intervention model.

Some recommendations based on a review are:

- Emphasise clear and transparent documentation-. Clear documentation enhances understanding of various integration models and facilitates meaningful comparisons with other interventions.
- Develop performance indicators specific to integrated diagnosis interventions. These indicators are crucial for assessing effectiveness enabling the evaluation of trade-offs with vertical programs, ensuring accountability, and supporting disease surveillance efforts. There is also need for simple multi-disease reporting tools that seamlessly integrate with existing systems.

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