

BMJ Open Capacity building of district health management teams in the era of provincial health administration reform in the Democratic Republic of Congo: a realist evaluation protocol

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ABSTRACT

Introduction In 2006, the Congolese Ministry of Health developed a health system strengthening strategy focusing on health district development. This strategy called for reforming the provincial health administration in order to better support the health district development through leadership and management capacity building of district health management teams. The implementation is currently underway, yet, more evidence on how, for whom and under what conditions this capacity building works is needed. The proposed research aims to address this gap using a realist evaluation approach.

Methods and analysis We will follow the cycle of the realist evaluation. First, we will elicit the initial programme theory through a scoping review (completed in December 2022, using MEDLINE, Health Systems Evidence, Wiley Online Library, Cochrane Library, Google Scholar and grey literature), a review of health policy documents (completed in March 2023), and interviews with key stakeholders (by June 2023). Second, we will empirically test the initial programme theory using a multiple-embedded case study design in two provincial health administrations and four health districts (by March 2024). Data will be collected through document reviews, in-depth interviews, non-participant observations, a questionnaire, routine data from the health information management system and a context mapping tool. We will analyse data using the Intervention-Context-Actor-Mechanism-Outcome configuration heuristic. Last, we will refine the initial programme theory based on the results of the empirical studies and develop recommendations for policymakers (by June 2024).

Ethics and dissemination The Institutional Review Board of the Institute of Tropical Medicine and the Medical Ethics Committee of the University of Lubumbashi approved this study. We will also seek approvals from provincial-level and district-level health authorities before data collection in their jurisdictions. We will disseminate the study findings through the publication of articles in peer-reviewed academic journals, policy briefs for national policymakers and presentations at national and international conferences.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Realist evaluation is a theory-driven approach that seeks to open the 'black box' in order to explain how an intervention brings about outcomes in a specific context.
- ⇒ This context-sensitive approach fits well with evaluating complex interventions (such as capacity building interventions) within complex systems (such as health systems).
- ⇒ Potential limitations of this study include recall bias (for the designers of the intervention), social desirability bias, poor completeness of routine data and the risk of tunnel vision as data collection is guided by the initial programme theory.

INTRODUCTION

Most African countries did not achieve the health-related Millennium Development Goals and are facing challenges in the implementation of Sustainable Development Goals.¹ Africa bears the highest burden of under-5 children's death, maternal mortality ratio, HIV/AIDS, malaria and tuberculosis.² Weak health systems are one of the leading causes of this situation.³ This includes weak leadership and management, resource constraints, reliance on poorly coordinated funding donors, limited public accountability, excessive centralisation of power, political instability and insecurity^{3,4} and low capacity to deal with dynamic environments.⁵

The Democratic Republic of Congo (DRC) is no exception to this situation. It is a post-conflict country with a fragile health system characterised by poor leadership and governance, weak integration, fragmented and inefficient financing and low resilience.^{6,7} As a result, the health outcomes of the population remain worrying. The maternal mortality ratio (846 per 100 000 live births) is one of

the highest in Africa,⁸ and the under-5 mortality rate (70 per 1000 live births) remains high.⁹ The prevalence of HIV/AIDS is stagnating at around 1.2% since 2007,⁸ and the burden of malaria is the second-highest in Africa after Nigeria. The tuberculosis burden is the ninth-highest in the world.¹⁰ Besides this burden of infectious diseases, there are increasing non-communicable diseases. The prevalence of hypertension and diabetes in Kinshasa has been estimated at 11% and 15.5%, respectively.¹⁰

This situation calls for health system strengthening to meet the population's health needs and move towards achieving the Sustainable Development Goals. However, while there is a clear diagnosis of the determinants of health system weakness in several countries, the approaches to address them are not evident.⁴ Among these approaches is decentralisation, one of the major reforms most sub-Saharan countries have been embarked on over the past four decades.^{11–14} It involves the transfer of responsibility for planning, management and decision-making from national to subnational level in order to overcome institutional, physical and administrative barriers to development.^{15–17}

The DRC has been engaged in a decentralisation process since February 2006, after a constitutional reform.¹⁸ Within this framework, the Ministry of Health has developed the health system strengthening strategy, adopted in 2006 and revised in 2010.^{7 18} This strategy considers the development of the district health system as the 'conditional priority for strengthening the health system' in the DRC.¹⁸ It recognises the importance of developing the leadership and management capacities of the district health managers by the provincial health administration (PHA). It emphasises the necessity to reform the PHA to better respond to this mission within the perspective of decentralisation¹⁸ (box 1).

Evidence suggests that leadership and management are crucial for improving the performance of health systems.^{3 19–25} The health districts need effective leadership and management. The health district is considered as the central element of a health system. The proximity of district health managers to their population enables them to adequately capture their needs and priorities and integrate them in health planning ('bottom-up' planning) and, at the same time, translate national policies and resources into effective services to meet population needs ('top-down' planning).^{26–28} Building the leadership and management capacities of district health managers is likely to improve the stewardship and performance of health districts.^{20 29–31} However, capacity building is a complex intervention^{20 32 33} and (still) remains an elusive concept.^{29 34 35}

Capacity building programmes (CBPs) are inherently complex.^{29 36} They bring together various actors (policymakers, managers, providers, funders, patients and communities) from various institutions (national, provincial or district administrations, health facilities, community and funding agencies, etc).^{37–40} These actors have different values, norms, power and their objectives

Box 1 The reform of the provincial health administration in the DRC

The constitution of the DRC embraces the concept of decentralisation in 2006. The Ministry of Health subsequently developed the health system strengthening strategy, which called for reforming the national and provincial health administrations to allow them to better play their roles within the decentralisation context.

The PHA reform consisted of a triple reorganisation. First, the functional reorganisation involved separating the inspection and control function of the provincial level from technical support to the health districts.⁸⁴ Second, the structural reorganisation aimed at transforming the organisational structure of the PHA to suit its role better. Previously characterised by the replication of central structures (65 directorates including vertical programmes), the PHA was restructured into two distinct structures: the provincial health inspectorate, a deconcentrated structure responsible for monitoring and controlling the application of the national's norms and guidelines, and the provincial health division, a devolved structure whose primary function becomes the technical support to the health districts.⁸⁴ In this paper, we will refer to the PHA as the provincial health division. Following positive results of an action-research conducted in the provinces of North Kivu and Oriental Kasai between 2008 and 2011, the PHA reform was scaled up to all the 26 new provinces of the DRC between 2014 and 2015. The structure of the PHA was reorganised around four core professions: the technical support to health districts, the health information, communication and research, the control and inspection and the management of resources.⁸⁴ The new structure of the PHA office includes also working groups, which are ad hoc structures where PHA staff meet to discuss and reflect on specific issues, such as technical support to health districts, health information management, medicine supply to health districts, health financing coordination and epidemiological surveillance. Such an institutional arrangement is expected to enable synergy among staff, participation in decision-making and individual and collective learning.⁸⁴ Third, the cultural reorganisation supposed a gradual shift from a hierarchical culture dominant in public administrations to an adhoc culture better adapted to the complex nature of health systems.

DRC, Democratic Republic of Congo; PHA, provincial health administration.

and expectations may be at odds. Health districts are complex, adaptive and open systems embedded in the larger (social, political and economic) environment with which they constantly interact.^{32 33} These interactions may lead to unpredictable and non-linear behaviours.^{40–43} This complexity explains why a CBP that works in one place may not necessarily work in another or may even not work anymore in the same place in a later stage.⁴⁴

There is no consensus on the definition of capacity building among academics and practitioners. It is considered an umbrella concept associated with a range of (sometimes opposite) meanings.^{34 35 39 45–49} Some authors refer simplistically to training as capacity building,^{31 50 51} while others consider that capacity building should be a systematic approach.^{26 35 46 52} These different views of capacity building, ranging from the reductionist to the more holistic, result in practice in various approaches, models and tools.^{29 34 35 39 45} They also contribute to the methodological challenges associated with CBP evaluation^{49 53} and their effectiveness on organisational

performance.^{34 46 54 55} Capacity building enables an individual or organisation to achieve its stated objectives.⁴⁶ In the health sector, this includes improving the performance of health systems in terms of access, quality, equity and responsiveness.³ However, the link between a CBP and improved organisational performance is by no means straightforward. Several contextual factors shape this relationship at different levels. These factors include individual attributes (eg, motivation, knowledge, skills, self-confidence), organisational characteristics (eg, leadership style, nature of supervision, teamwork, organisational culture) and contextual factors (eg, political, economic, social).^{24 27}

In the DRC, the health system strengthening strategy calls for the ‘technical support’ from PHA staff to district health management teams (DHMTs) members in order to strengthen their leadership and management capacities and subsequently improve the stewardship of their health districts as integrated systems, which offer accessible, equitable, quality healthcare and services responsive to the population’s needs. While in one province, this technical support was overall well appreciated by the DHMT members,⁵⁶ the lack of a clear conceptual model to guide the operationalisation of this technical support was reported in another province.⁵⁷ Moreover, to the best of our knowledge, no study has addressed how, for whom and under what conditions the technical support from the reformed PHA to the DHMTs works (or not) in the DRC.

Study objectives and research questions

Study objectives

The general objective of this study is to understand how, for whom and under what conditions the technical support from the reformed PHA to DHMTs, as a capacity building intervention, works to improve the management capacity of DHMT members and the health district performance in the DRC.

The specific objectives of the study are to:

1. Elicit the assumptions (ie, initial programme theory) underlying the technical support from the PHA to DHMTs.
2. Empirically test the initial programme theory through a set of substudies.
3. Refine the initial programme theory on the basis of the empirical findings.

Research questions

We will address the following research questions:

1. How is capacity building of district health managers being conceptualised, operationalised and evaluated in sub-Saharan Africa? What are the contextual factors that influence the capacity building process?
2. How is the technical support from PHA to DHMTs in the DRC supposed to work from the designers’ perspective? What are the conducive contextual conditions for this support?

3. How is the technical support from PHA to DHMTs implemented in the DRC? What are the contextual conditions that shape this implementation?
4. How do the DHMT members in the DRC perceive the technical support from the PHA staff?
5. What are the outcomes of technical support from PHA to DHMT in terms of management capacities and performance of health districts?

METHODS AND ANALYSIS

The methodological approach

The overall methodological approach of this study is realist evaluation.⁵⁸ We choose this approach because of the complexity of both capacity building programmes and health districts. Realist evaluation goes beyond the ‘does it work’ question to understand ‘what works, for whom and under what conditions’.^{59–62} It seeks to open the ‘black box’ to explain how an intervention brings about outcomes in a specific context.^{60 63} This context-sensitive approach is a best fit for the evaluation of complex interventions.

Realist evaluation is based on scientific realism. It considers that the primary drivers of change are people. Social programmes do not bring about changes but rather offer resources and opportunities to people.⁵⁸ Realist evaluation is theory-driven. It begins and ends with a programme theory. The programme theory is a set of assumptions explaining how the interactions between the intervention and actors within a given context are supposed to trigger the mechanisms that lead to the expected outcomes. Realist researchers use the Context-Mechanism-Outcome configuration as a heuristic tool to elicit the causal pathways underlying the observed outcome. In this study, we will use a finetuned variant of the traditional Context-Mechanism-Outcome configuration, the Intervention-Context-Actors-Mechanisms-Outcomes (ICAMO) configuration, to better differentiate intervention from context and emphasise the role of different actors in the change processes.⁶⁴

We structure our protocol along the realist cycle (figure 1). We followed the RAMESES II guidance for reporting on realist evaluations,⁶⁵ which we adapted to fit the format for a protocol paper (online supplemental table 1).

The intervention

In the DRC, the health sector reform has centred the role of the PHA around the technical support to the health districts. This support aims to strengthen the leadership and management capacities of the DHMT members and thus improve the health districts performance and ultimately the population health outcomes. The underlying assumption was that the development of district health systems depends on the leadership and management capacities of DHMT members.^{7 18} Indeed, the DHMT is in charge of managing the health district daily. The team’s leadership and management capacities determine

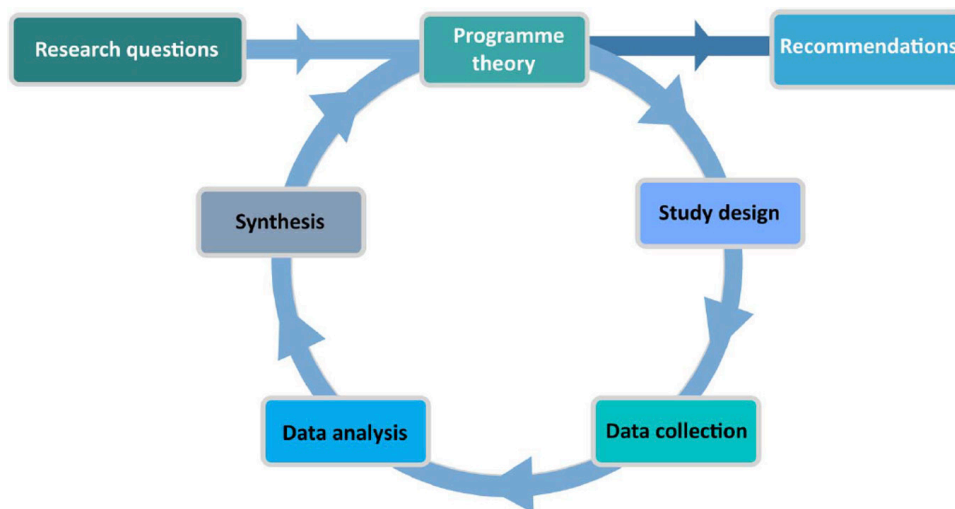


Figure 1 The realist cycle.^{85 86}

the district's performance. Therefore, it is essential to enhance the leadership and management capacities of DHMT members to enable them to carry out their responsibilities effectively. These capacities include coordination of stakeholders, planning and budgeting, monitoring and evaluation, hands-on training and supervision of health workers, health system information management, epidemiological surveillance, resources management (human, financial, material and medicines) and operational (or action) research.⁶⁶ The technical support is expected to build DHMT members' capacities through facilitative supervision, coaching and problem-solving support. It differs from the way supervision is usually organised in the DRC, that is, focusing on inspection and fault-finding.

The PHA reform assigned the technical support role to experienced PHA staff with public health and district management backgrounds. Their number depends on the number of health districts and the availability of qualified personnel at each PHA office. There is one PHA staff member for two to four health districts. PHA staff provide technical support to DHMT members through field visits. These visits are in principle based on problems identified by the PHA staff and/or raised by the DHMT members. Technical support visits are meant to take place on a quarterly basis, but their actual frequency depends on geographical accessibility and the availability of resources. Furthermore, the PHA reform established a technical support working group at the PHA office. It is an ad hoc structure where PHA staff meet to discuss and reflect on technical support issues.

Step 1: eliciting the initial programme theory

As a first step towards developing the initial programme theory (IPT), we conducted a scoping review and a policy document review. This will be followed by a series of interviews with key stakeholders.

The scoping review

In the first step, we carried out a scoping review analysis to understand how CBPs of district health managers

in sub-Saharan Africa have been designed, operationalised and evaluated. The review focused on identifying the underlying assumptions or theories behind CBPs of district health managers. We searched five electronic databases (MEDLINE, Health Systems Evidence, Wiley Online Library, Cochrane Library and Google Scholar). The search strategies are outlined in the online supplemental table 2. We included all primary studies (a) reporting leadership or management capacity building of district health managers (b) in sub-Saharan Africa, (c) written in English or French and (d) published between 1 January 1987 and 13 October 2022.

The scoping review indicated that the main assumption underlying most CBPs is that strengthening leadership and/or management capacities of district health managers would enhance their knowledge and skills, and therefore their competences to implement effective management and/or leadership practices in their workplaces. These enhancements would then improve health system performance (access, quality, equity and responsiveness) and ultimately improve the population's health outcomes.

The scoping review pointed out six main features of an effective CBP for DHMTs: a learning-by-doing approach, an alternation of short workshops and on-the-ground follow-up visits through coaching, mentoring and supervision, a team-based approach, flexibility, supportive interactions between facilitators and participants and a long-term perspective. These intervention features can trigger a set of mechanisms (self-efficacy, mutual trust, perceived support relevance, openness to learning and a sense of ownership) that contribute to the intended outcomes in specific context conditions: adequate decision spaces of DHMTs, a supportive organisational culture, adequate resources, adequate support from the hierarchy and good stakeholder collaboration and involvement.

The scoping review also highlighted an increasing use of the action-learning approach as a capacity building approach. Action learning is grounded in Kolb's

experiential learning theory,⁶⁷ which emphasises real-life experiences as a driver of learning. This theory posits a four-stage learning cycle: concrete experience, reflective observation, abstract conceptualisation and active experimentation. In this learning cycle, concrete experiences lead to reflective observations from which abstract concepts are developed and tested in new experiences. The experiential learning theory is close to two other learning theories which stress the importance of experience and reflection in the learning process: Knowles' *et al* adult learning theory (or andragogy) and Mezirow's transformative learning theory. Knowles' *et al* adult learning theory underlines the centrality of self-direction, experiences (including errors), perceived relevance, problem-centredness and intrinsic motivation in the learning process.⁶⁸ According to Mezirow's transformative learning theory, learning occurs when people transform their values, beliefs and assumptions into new meaningful perspectives through critical reflection. It emphasises six core elements: individual experience, critical reflection, dialogue, holistic orientation, awareness of context and authentic relationships.⁶⁹

Other lessons can be drawn from the scoping review: as the technical support is a learning process, PHA staff can act as learning catalysers within DHMTs. To do so, they need to be motivated and have the management, interpersonal and facilitation competencies to engage DHMT members in successful learning processes using the adult learning principles highlighted in the above three learning theories.

The policy document review

Following the scoping review, we reviewed the health policy documents. They were drawn from the Ministry of Health, supporting partner institutions and previous studies in the DRC. We included 21 documents (online supplemental table 3) based on their relevance, that is, documents that provide appropriate information related to PHA reform and technical support to health districts.⁷⁰ This review provided us with general information about the implicit logic model of the technical support from PHA staff to DHMT members (figure 2).

Using a realist lens, we further thematically analysed these documents to identify any information about the intervention (policy), context, actors, mechanisms and outcomes (table 1).

The preliminary initial programme theory

From the scoping review and the review of programme documents, we formulated the preliminary IPT as follows (figure 3):

1. **If** PHA staff [A] are well trained [I], have regular meetings [I] and are adequately rewarded [I], **then** their motivation, commitment and competencies [O] to provide regular and effective technical support to DHMT members will improve, **because** training improve their self-efficacy [M] as they become more knowledgeable and skilful, meetings enable their reflexivity [M] as they share, reflect on and learn from their experiences and rewards improve their commitment [M]. Contextual conditions for such changes to occur include an optimal functioning of PHA office [C] characterised by effective leadership, which creates a good work climate and promotes positive values, supportive working conditions, adequate resources, shielding of negative political influences and which achieves support from the national Ministry of Health and provincial political leaders.
2. **If** PHA staff are motivated, committed and competent [A], **then** they will provide effective technical support to DHMT members [A] through participative needs assessment, priority setting and goal setting [I], helpful information sharing [I], problem-solving support [I], stimulating meaningful reflection and providing constructive feedback [I]. Such support would increase the DHMT members' motivation and commitment [O] to the technical support process and then improve their management competencies [O] **because** of the resulting positive perceived support [M]. Conducive contextual conditions include an enabling environment for learning [C] which is judgement-free, fault-accepting, non-threatening and less-hierarchical and supportive relationships between PHA staff and DHMT members.

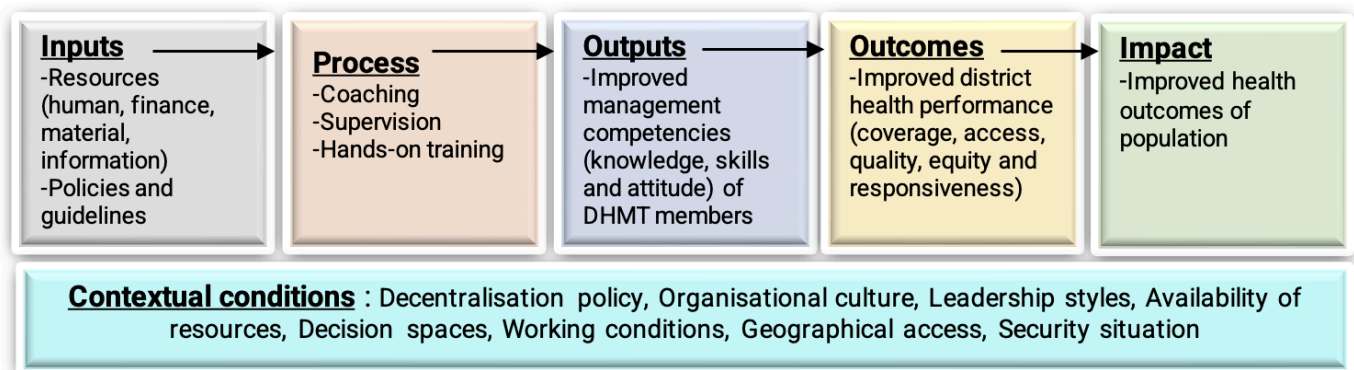


Figure 2 Logic model of technical support from provincial health administration to DHMTs. DHMT, district health management team.

**Table 1** Elements of ICAMO configuration from review of the policy documents

ICAMO elements	Definitions	Findings from review of the policy documents
Intervention	A combination of policy or programme components or strategies, especially those meant to change people's behaviour. ⁸⁷	<p>Technical support from PHA to DHMTs:</p> <ul style="list-style-type: none"> ▶ Approach: competence-based approach. ▶ Activities: hands-on training, facilitative supervision or coaching visits, support to problem solving, support to data analysis, support to understanding and contextualisation of national policies and guidelines, PHA staff meeting for evaluating and programming technical support visits. ▶ Content: based on the actual needs of DHMT members assessed against the official competencies framework. ▶ Frequency of visits: quarter, semester.
Context	Any pre-existing social, economic, cultural, political or other environmental factor that may influence the implementation and/or the actors, and that may shape the outcomes.	<ul style="list-style-type: none"> ▶ Decentralisation policy. ▶ Support from national Ministry of Health. ▶ Support and influence of (provincial) political leaders. ▶ Organisational culture at provincial and district levels. ▶ Leadership at provincial and district levels. ▶ DHMTs' decision space. ▶ Geographical accessibility of health districts and security situation. ▶ Availability of resources (human, financial and material) at provincial and district levels. ▶ Enabling environment for continuous learning at PHA and health district offices.
Actors	The people, groups and institutions who are addressed by the intervention and who are central to its adoption and implementation.	<ul style="list-style-type: none"> ▶ PHA staff and DHMT members attributes (background, experience, knowledge, skills and attitude). ▶ Other stakeholders: healthcare workers, political authorities, funder agencies, community.
Mechanisms	People's reasoning and reactions to resources made available by the intervention, triggered in specific contexts. ⁸⁸	<ul style="list-style-type: none"> ▶ Reflexivity: ability to analyse and learn from one's own practices. ▶ Self-efficacy of PHA staff and DHMT members: perceived capacity to perform skilfully. ▶ Self-determination of DHMT members: perceived work-related autonomy. ▶ Perceived credibility and legitimacy of PHA staff vis-à-vis of DHMT members.
Outcomes		
Short-term	The immediate effect of programme activities. ⁸⁷	<ul style="list-style-type: none"> ▶ Improved leadership and/or management competencies (knowledge, skills and attitudes) and autonomy of DHMT members.
Mid-term	Behavioural changes that follow the immediate knowledge and awareness changes. ⁸⁷	<ul style="list-style-type: none"> ▶ Sound leadership and/or management practices by district health managers: better planning and budgeting, effective use of resources, improved supervision practices, training of health workers, better monitoring and evaluation, teamwork, regular meetings, consensual decision-making, collaboration with stakeholder, etc.
Long-term	Changes on the long-term, such as health status and impact on community and health system. ⁸⁷	<ul style="list-style-type: none"> ▶ Development of health districts as integrated systems that offer accessible, equitable, quality healthcare and services responsive to the population's needs. ▶ Improved health outcomes of the population.

DHMT, district health management team; ICAMO, Intervention-Context-Actors-Mechanisms-Outcomes; PHA, provincial health administration.

3. **If** DHMT members have good management competencies [A], **then** they will improve the performance of their health districts [O] **because** of increased self-efficacy [M] and autonomy [M] in implementing sound management practices [I]. Conducive contextual conditions [C] include effective leadership, which creates a good work climate and promotes positive values within the DHMTs, optimal decision space,

supportive working conditions, adequate resources and the absence of negative political influences.

Refining the preliminary initial programme theory

We will conduct 10–15 interviews with purposely selected stakeholders (policymakers, researchers and technical assistants) involved in the design of PHA reform in order to explore their assumptions and thus better understand

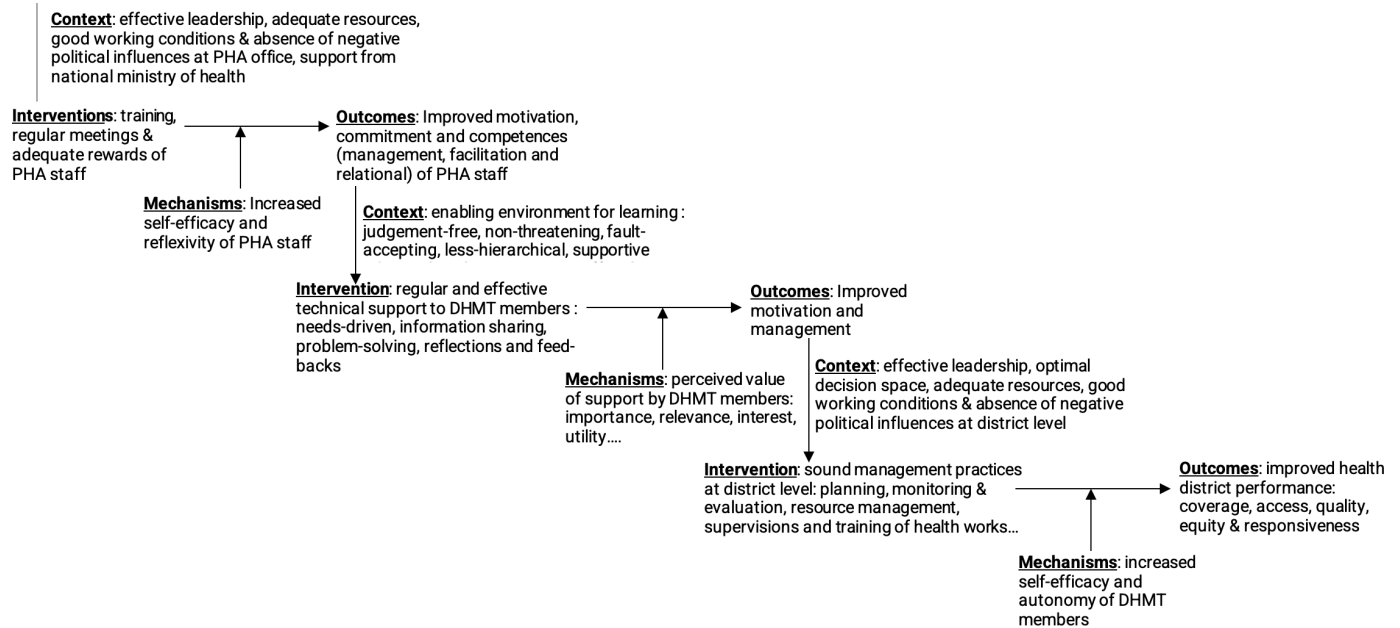


Figure 3 The preliminary initial programme theory. PHA, provincial health administration; DHMT, district health management team.

how and why the intervention would bring about expected changes. We will use an interview guide with open-ended questions. The interviews will be recorded, transcribed verbatim and analysed thematically using ICAMO configuration as a heuristic. The end result will be the final IPT, which will be tested in the subsequent stage of the research.

Step 2: study design

We will conduct a multiple embedded case study, which fits dynamic and complex situations in which multiple actors and factors interact.⁷¹ We define the case as the technical support from PHA staff to DHMT members. The unit of analysis is the PHA and the subunit is the health district. Within each province, we will focus on (1) the actual implementation of the technical support, (2) the perceptions of DHMT members on this technical support, (3) the DHMTs' management capacity, (4) the performance of health districts and (5) the contextual conditions required for effective and sustainable capacity development.

We purposively selected two PHAs (Tshopo and Kasai Central). This purposive selection was informed by the preliminary ICAMO elements, the principle of maximum variation and the extreme case sampling strategy as described by Patton.⁷² Based on these principles, we used the following criteria. (1) The performance of PHA as ranked by the Ministry of Health in its annual report 2021.⁷³ According to this ranking, Kasai Central province has attained the top position for its very high performance, while Tshopo province has been ranked the lowest due to its low performance (box 2); (2) The presence of a funder (respectively, Enabel and World Bank). We have identified the availability of resources as a crucial contextual factor. In the DRC, external aid is the

second source of health system financing (representing 37% of the current health expenditure) after the households who fund 43% of the current health expenditure.⁷⁴ The presence of a funder greatly affects the functioning and performance of the PHA. (3) The geographical location in the country (in the east and centre, respectively). We have identified geographical accessibility as a contextual condition in table 1. It also allows to achieve maximum variation in the selection of units, as different provinces may have significantly different contexts, especially in a country with continental dimensions like the DRC. (4) The geographical access for the PhD candidate as this study protocol is part of a PhD study. Indeed, the feasibility in conducting research is also considered a common criterion to facilitate the data collection for the PhD candidate.

Box 2 The assessment of PHAs' performance by the Ministry of Health in the DRC

The Ministry of Health used a benchmarking approach to evaluate the performance of 26 PHAs in the country. Eleven indicators of the health information management system were used to measure their performance in 2021. These indicators include the rate of outpatient consultations, proportion of referrals at district hospitals, in-hospital mortality beyond 48 hours, in-hospital maternal death audited, four visits of antenatal care at 36 weeks, BCG vaccination coverage, vaccination coverage against measles, DTC-HepB-Hib 3 vaccination coverage, completeness, timeliness and data quality score of DHIS2 reports. The Ministry of Health classified PHA performance as very high (score 90–100%), high (80–89%), average (60–79%), low (50–59%) or very low (<50%). The PHA offices also assess the performance of their health districts in a similar manner. PHA, provincial health administration.

Similarly, in each province, we will select two health districts based on the following criteria: (1) the health district location (urban and rural). We chose this criterion to ensure the maximum variation and to capture the specificities of urban and rural settings that may influence the technical support process and the performance of health districts; (2) the performance of health district as ranked by the PHAs in their annual report 2021 (high and poor) using the benchmarking approach (box 2) and (3) the geographical access for the PhD candidate for the same reasons as mentioned above.

Step 3: data collection

We will collect data through document review, in-depth interviews, non-participant observations and questionnaire. We will also collect routine data from the health information management system and use a context mapping tool.

Document review

A document review will allow us to analyse the technical support process (research question 3) and to assess the DHMTs' management capacity (research question 5). All paper and electronic documents (technical support reports, annual reports, meeting minutes, internal evaluation reports, external independent evaluation reports (if any), etc) available at the PHA and health district offices will be screened.

- ▶ For research question 3, we will gather data related to the actual implementation of the technical support: preparation, frequency, duration, intensity, content, tools, quality process, actors, contextual factors, etc.
- ▶ For research question 5, we will use a scorecard for assessing the DHMTs' management capacity. This scorecard will be developed and piloted in collaboration with PHA cadres to make sure that all included items are relevant to the context of the Congolese health system. It will include items from each core management function assigned to the DHMTs in the DRC: coordination of stakeholders, planning, monitoring and evaluation, supervision of health workers, hands-on training of health workers, health information management, epidemiological surveillance, resources management (human, material, financial and medicines) and research. For each item, we will assign a score from 1 to 4 (1: very poor, 2: poor, 3: good and 4: very good) according to the established criteria.

In-depth interviews

We will carry out in-depth interviews with purposively selected PHA staff and DHMT members to collect data related to the implementation of the technical support (research question 3), the perceptions of the DHMT members about the technical support (research question 4) and the outcomes of the technical support (research question 5). Based on our IPT, we will refine, pilot and use interview guides for PHA staff and DHMT members

(online supplemental material 1). Interviews will be held at the preferred times and places of the respondents.

Non-participant observations

In addition to their in-depth interviews, we will conduct non-participant observations to collect data related to the technical support process (research question 3). Where possible, we will observe the technical support working group meeting at the PHA offices and the technical support visits at the health districts. Using an observation guide, we will collect data related to the nine social situations' dimensions defined by Spradley⁷⁵: space, actor, activity, object, act, event, time, goal and feeling.

Questionnaire

We will use a questionnaire administered to all DHMT members in the selected health districts (exhaustive sampling) to assess their perceptions about the process and outputs of technical support from the PHA cadres (research question 4). Based on our IPT, we will refine a questionnaire (online supplemental material 1) with 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree; 5=strongly agree) and pilot it before use.

Routine data from health information management system

We will collect routine data from health information management system in DHIS2 software and other relevant sources (PHA or districts' annual reports) to assess the health district performance during the last 5 years (research question 5). In collaboration with the PHA cadres, we will develop another scorecard with key performance indicators related to the access, quality and equity of healthcare and services. For each item, we will assign a score from 1 to 4 (1: very poor, 2: poor, 3: good and 4: very good) according to the established criteria.

Context mapping tool

At each PHA and health district, we will develop and use a context mapping tool in order to document key contextual issues that may influence the provincial technical support to DHMTs (research question 3). These issues include organisational culture, organisational structure, decision spaces, availability of resources, key stakeholders and events and their influence on the technical support, etc.

Step 4: data analysis

Realist evaluation is method neutral, that is, it follows the guidance of the disciplines from which the used methods originate. In general, the ICAMO configuration serves as the analytical heuristic.

We will use R software to manage quantitative data from the questionnaire and the health information management system. Analysis will be essentially descriptive (percentage, means or medians with 95% CI). We will use NVivo software to manage the qualitative data from documents reviews, interviews, field-notes and memos. In line with realist principles, we will thematically code

data based on core elements of our IPT. We will perform a framework analysis⁷⁶ as it allows for both a priori and emergent concepts.

In the first round of analysis, we will classify data into categories corresponding to the ICAMO configuration: intervention, context, actors, mechanisms and outcomes. In the subsequent rounds of analysis, we will adopt a retroductive approach in order to identify the link between the observed outcomes and the other elements of the ICAMO configuration. Retroduction in realist approach means 'going back from, below, or behind observed patterns or regularities to discover what produces them'.⁷⁷ This starts from identifying the outcomes (both intended and unintended, positive and negative), and finding out how the actual intervention triggered mechanisms among the actors in specific context conditions, which contributed to the outcomes.

In order to enhance the internal validity of our study's findings, we will use various kinds of triangulation described by Patton,⁷² including (1) the method triangulation by using a mixed methods, (2) theory triangulation by constant searching for rival theories, (3) triangulation of data sources through a scoping review, a document review, in-depth interviews, a questionnaire and routine data from DHIS2, (4) triangulation between study sites, such as between contrasting PHAs or health districts, (5) expert audit review in order to obtain insightful feedback from supervisors, colleagues, peer reviewers, etc and (6) respondent validation.

Step 5: synthesis

We will summarise the findings of each province in reports. Subsequently, we will carry out a cross-province analysis. To do so, we will compare their ICAMO configurations in order to identify similarities or differences and explore how they challenge, refute or confirm the IPT. This will result in a refined programme theory, which provides plausible explanations of how the actual intervention leads to the observed outcomes by activating underlying mechanisms in (a group of) actors under specific contextual conditions. This theory will be discussed with relevant stakeholders for further fine-tuning.

Table 2 provides a summary of the research process (study objectives, research questions, data collection and analysis).

PATIENT AND PUBLIC INVOLVEMENT

There is no patient or public involvement in this study.

ETHICS AND DISSEMINATION

We obtained ethical approvals for this study from the Institutional Review Board of the Institute of Tropical Medicine, Antwerp and the Medical Ethics Committee of the University of Lubumbashi. Approvals from provincial-level and district-level health authorities will be sought and obtained before data collection in their jurisdictions.

We will conduct this study following the principles of the Declaration of Helsinki as amended in 2013.⁷⁸ Written informed consent will be obtained from each participant in the study prior to data collection. We will pseudonymise all quantitative and qualitative data by giving each participant a unique personal identifier to ensure confidentiality. All research data will be stored in a password-protected drives accessible only by the research team members.

We will disseminate the study findings through publication of articles in peer-reviewed academic journals, development of policy briefs for national policymakers and delivering presentation at national and international conferences.

DISCUSSION

The health sector reform in the DRC has assigned the PHA the central role of supporting the development of health districts as integrated systems offering comprehensive, continuous, coordinated care adapted to the population's needs. This role, known as technical support, is carried out by PHA cadres with public health and district management backgrounds and is expected to strengthen the management capacity of DHMT members and improve the performance of health districts. Our study adopts the realist evaluation approach to provide an explanatory account of the mechanisms triggered by the technical support from PHA cadres to improve (or not) the management capacities of DHMT members and the performance of health districts within the specific context of the DRC. This explanatory account will contribute both to policymaking and scientific research. It corresponds to Schmitt's two-pronged causal mechanism claim: increased policy relevance and strengthened causal capacity.⁷⁹

On the one hand, the results of this study will inform policymakers on possible adjustments to the ongoing PHA reform in the DRC, thus contributing to the promotion of (more) evidence-informed health policymaking. Furthermore, this research is in line with the health system strengthening strategy,^{7 18} which recognised the health system's complexity and emphasised the importance of health systems and policy research. On the other hand, the refined programme theory from this study will provide insights for subsequent realist evaluations of capacity building of DHMT members in the DRC and other contexts, thus contributing to cumulative theory development⁸⁰ which may gradually result in a middle range theory.⁸¹ The lessons learnt from this evaluation will feed into methodological discussions to improve the quality of evaluations of complex interventions.

While designing this study, we encountered some challenges. The first was related to the development of preliminary IPT. Indeed, the documents of the health sector reform in the DRC are quite evasive on what can be understood by technical support to DHMT members and the causal pathways by which it improves their management

Table 2 Summary of research process

Study objectives	Research questions	Data collection	Data analysis	Outcomes	Deadline
Eliciting the initial programme theory	How is capacity building of district health managers being conceptualised, operationalised and evaluated in sub-Saharan Africa? What are the contextual factors that influence the capacity building process?	<ul style="list-style-type: none"> ▶ Scoping review. 	<ul style="list-style-type: none"> ▶ Description of included studies. ▶ Best fit framework analysis. 	Mapping of the designs, approaches, underlying theories, evaluation issues and contextual factors.	Completed in December 2022.
	How is the technical support from PHA to DHMTs supposed to work from the designers' perspective? What are the conducive contextual conditions for this support?	<ul style="list-style-type: none"> ▶ Review of policy documents. ▶ In-depth interviews with policy designers. 	<ul style="list-style-type: none"> ▶ Thematic analysis of documents and interview transcripts. ▶ Triangulation and integration of data from different sources into the ICAMO configuration. 	Understanding of intervention, context, underlying mechanisms and intended outcomes.	Document review completed in March 2023. In-depth interviews to be completed by June 2023.
Testing the initial programme theory	How is the technical support from PHA to DHMTs implemented? What are the contextual conditions that shape this implementation?	<ul style="list-style-type: none"> ▶ Documents reviews. ▶ In-depth interviews with PHA staff and DHMT members. ▶ Non-participant observations. ▶ Context mapping tool. 	<ul style="list-style-type: none"> ▶ Thematic analysis of documents, interview transcripts and observation notes. ▶ Triangulation and integration of data from different sources into the ICAMO configuration. 	Understanding the actual implementation of the intervention and the influencing contextual factors.	March 2024.
	How do the DHMT members perceive the technical support from the PHA staff?	<ul style="list-style-type: none"> ▶ Questionnaire. ▶ In-depth interviews with DHMT members. 	<ul style="list-style-type: none"> ▶ Descriptive analysis of quantitative data. ▶ Thematic analysis of interview transcripts. ▶ Triangulation and integration of data from different sources into the ICAMO configuration. 	Understanding of the DHMT members' reasoning about the intervention and its influence on the actual implementation of the intervention.	
	What are the outcomes of technical support from PHA to DHMT in terms of management capacities and performance of health districts?	<ul style="list-style-type: none"> ▶ Documents reviews. ▶ Routine data from HIMS using scorecards. ▶ In-depth interviews with PHA staff and DHMT members. 	<ul style="list-style-type: none"> ▶ Descriptive statistics of quantitative data. ▶ Thematic analysis of qualitative data. ▶ Triangulation and integration of data from different sources into the ICAMO configuration. 	Assessment of the effectiveness (or not) of the intervention.	
Refining the initial programme theory			<ul style="list-style-type: none"> ▶ Integration of empirical findings into the initial programme theory using ICAMO configurations. 	<ul style="list-style-type: none"> ▶ Refined programme theory. ▶ Recommendations for policymakers. 	June 2024.

DHMT, district health management team; HIMS, Health information management system; ICAMO, Intervention-Context-Actors-Mechanisms-Outcomes; PHA, provincial health administration.

capacities. This may be explained by the fact that the technical support is not a specific programme but a part of a larger portfolio of interventions to be carried out to strengthen the health districts. Moreover, the document review showed that the official documents address the context conditions in a rather generic way. They point for instance to the importance of a conducive organisational culture at provincial and district level, without stating the current situation and critically analysing how the current prevailing non-conducive elements can be addressed. The scoping review provided us with insights into the features of effective CBPs and the set of mechanisms that can, in

a given context, lead to the intended outcomes. However, the scoping showed that few studies were carried out in fragile settings, comparable to the DRC, which raises questions about the context conditions required for capacity development processes to work. Second, methods and tools to measure the DHMTs' management capacities and the performance of health districts are not standardised. We will involve PHA staff in designing scorecards to ensure that the included items are relevant to the development of health districts in the context of the DRC. Beyond increasing the research relevance, this co-construction of data collection tools between the researchers

and key health actors may boost their participation in the research and uptake of its findings.⁸²

In conducting this research, we are aware of potential limitations. These include the recall bias, particularly for the designers of the intervention (which is over 5 years old), the social desirability bias, and poor completeness and quality of data because of poor archiving of documents at both PHA and health district offices, as well as insufficient encoding of routine data in the DHIS2 software. We will minimise these limitations and enhance the research credibility through the different triangulations proposed by Patton.⁷² Another limitation is inherent in the realist interview technique. The fact that the IPT guides data collection may expose researchers to the risk of tunnel vision, that is, the tendency to look only for the elements that corroborate the IPT.⁸³ To reduce this risk, we will constantly search for rival theories or alternative explanations throughout the research process.

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REFERENCES

- Aftab W, Siddiqui FJ, Tasic H, et al. Implementation of health and health-related sustainable development goals: progress, challenges and opportunities - a systematic literature review. *BMJ Glob Health* 2020;5:e002273.
- MDG report 2015: assessing progress in Africa toward the millennium development goals; 2015.
- Dorros GL. *Building Management Capacity to Rapidly Scale up Health Services and Health Outcomes*. 2006.
- Alliance for Health Policy and Systems Research. *Strengthening health systems: the role and promise of policy and systems research*. Geneva, 2004.
- Belrhiti Z, Nebot Giral A, Marchal B. Complex leadership in Healthcare: A Scoping review. *Int J Health Policy Manag* 2018;7:1073–84.
- Kalambay H, Wim N, Lerberghe V. Improving health system efficiency: Democratic Republic of the Congo: improving aid coordination in the health sector. 2015. Available: <https://apps.who.int/iris/handle/10665/186673> [Accessed 17 May 2022].
- Ministère de la Santé. Stratégie de Renforcement Du Système de Santé. In: *République Démocratique du Congo*. 2006.
- Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité (MPSMRM). In: *Ministère de la Santé Publique (MSP), ICF International. Enquête Démographique et de Santé en République Démocratique du Congo 2013-2014*. 2014. Available: www.DHSprogram.com
- Institut National de Statistiques. Enquête par Grappes À Indicateurs multiples, 2017-2018, rapport de Résultats de L'Enquête. In: *Kinshasa, République Démocratique du Congo*. 2018.
- Ministère de la Santé. Plan national de Développement sanitaire Recadré pour La Période 2019-2022: Vers La Couverture sanitaire Universelle. In: *République Démocratique du Congo*. 2018.
- Bossert T. Analyzing the decentralization of health systems in developing countries: decision space, innovation and performance. *Social Science & Medicine* 1998;47:1513–27.
- Bossert TJ, Beauvais JC. Decentralization of health systems in Ghana, Zambia, Uganda and the Philippines: a comparative analysis of decision space. *Health Policy Plan* 2002;17:14–31.
- Brinkerhoff DW, Bossert TJ. Health governance: principal-agent linkages and health system strengthening. *Health Policy and Planning* 2014;29:685–93.
- Bossert T, Chitah MB, Bowser D. Decentralization in Zambia: resource allocation and District performance. *Health Policy and Planning* 2003;18:357–69.
- Mills A, Vaughan JP, Smith DL, et al. La Décentralisation des Systèmes de Santé: concepts, Problèmes et Expériences de Quelques pays. *World Health Organization [Internet]* 1991;174. Available: http://apps.who.int/iris/bitstream/10665/40744/1/9242561371_%28p1-p80%29.pdf
- Rondinelli DA, NellisJR, CheemaSG. Decentralization in developing countries. World Bank staff working papers. 1983. Available: <http://documents.worldbank.org/curated/en/868391468740679709/pdf/multi0page.pdf>
- Polton D. Décentralisation des Systèmes de Santé: UN Éclairage International. *Rev Fr Aff Soc* 2004;267–99.
- Ministère de la Santé. Stratégie de Renforcement Du Système de Santé. In: *République Démocratique du Congo*. 2010.
- Filerman G. Closing the management competence gap. *Hum Resour Health* 2003;1:7.
- Tetui M, Hurtig A-K, Ekirpa-Kiracho E, et al. Building a competent health manager at district level: a grounded theory study from Eastern Uganda. *BMC Health Serv Res* 2016;16:665:665..
- Daire J, Gilson L, Cleary S. Developing leadership and management Competencies in low and middle-income country health systems: a review of the literature working paper 4. *Resilient & Responsive Health Systems* 2014.
- Al Khajeh EH. Leadership styles on organizational performance. *JHRMR* 2018;2018:1–10.
- Cleary S, Toit A du, Scott V, et al. Enabling relational leadership in primary Healthcare settings: lessons from the DIALHS collaboration. *Health Policy Plan* 2018;33(suppl_2):ii65–74.
- Belrhiti Z, Van Damme W, Belalia A, et al. Unravelling the role of leadership in motivation of health workers in a Moroccan public hospital: a realist evaluation. *BMJ Open* 2020;10:e031160.

- 25 Bonenberger M, Aikins M, Akweongo P, *et al.* Factors influencing the work efficiency of district health managers in low-resource settings: A qualitative study in Ghana. *BMC Health Serv Res* 2016;16:12.
- 26 Heerdegen ACS, Gerold J, Amon S, *et al.* How does district health management emerge within a complex health system? insights for capacity strengthening in Ghana. *Front Public Health* 2020;8:270.
- 27 Prashanth NS, Marchal B, Kegels G, *et al.* Evaluation of capacity-building program of district health managers in India: a Contextualized theoretical framework. *Front Public Health* 2014;2:89.
- 28 Schneider H, George A, Mukinda F, *et al.* District governance and improved maternal, neonatal and child health in South Africa: pathways of change. *Health Syst Reform* 2020;6:e1669943.
- 29 Aroni A. Health management capacity building. an integral component of health systems' improvement. *European Health Management Association* 2012.
- 30 World Health Organization. Building resilient sub-national health systems – strengthening leadership and management capacity of district health management teams. 2016.
- 31 Mutale W, Vardoy-Mutale A-T, Kachemba A, *et al.* Leadership and management training as a catalyst to health system strengthening in low-income settings: evidence from implementation of the Zambia management and leadership course for district health managers in Zambia. *PLoS One* 2017;12:e0174536.
- 32 Prashanth NS, Marchal B, Devadasan N, *et al.* Advancing the application of systems thinking in health: a realist evaluation of a capacity building programme for district managers in Tumkur, India. *Health Res Policy Syst* 2014;12:42.
- 33 Kwamie A, van Dijk H, Agyepong IA. Advancing the application of systems thinking in health: realist evaluation of the leadership development programme for district manager decision-making in Ghana. *Health Res Policy Syst* 2014;12:29.
- 34 Marchal B, Kegels G. Which role for Medicus Mundi Internationalis in human resources development? current critical issues in human resources for health. 2003.
- 35 Potter C, Brough R. Systemic capacity building: a hierarchy of needs. *Health Policy Plan* 2004;19:336–45.
- 36 Morgan P. The design and use of capacity development indicators. 1997.
- 37 Craig P, Dieppe P, Macintyre S, *et al.* Developing and evaluating complex interventions: the new medical research Council guidance. *BMJ* 2008;337:a1655.
- 38 Petticrew M. When are complex interventions "complex"? When are simple interventions "simple". *Eur J Public Health* 2011;21:397–8.
- 39 Whittle S, Colgan A, Rafferty M. Capacity building: what the literature tells us Dublin. The Centre for Effective Services; 2012. Available: www.effektiveservices.org
- 40 Glouberman S, Zimmerman B. Complicated and complex systems: what would successful reform of Medicare look like? Commission on the future of health care in Canada. 2002.
- 41 Sturmberg JP, O'Halloran DM, Martin CM. Understanding health system reform – a complex adaptive systems perspective. *J Eval Clin Pract* 2012;18:202–8.
- 42 de Savigny D, Adam T. Systems thinking for health systems strengthening Alliance for health policy and systems research. WHO, 2009. Available: http://apps.who.int/iris/bitstream/10665/44204/1/9789241563895_eng.pdf
- 43 The Health Foundation. Evidence scan: complex adaptive systems. The Health Foundation; 2010. Available: <http://www.health.org.uk>
- 44 Prashanth NS, Marchal B, Hoeree T, *et al.* How does capacity building of health managers work? A realist evaluation study protocol. *BMJ Open* 2012;2:e000882.
- 45 Ridge LJ, Klar RT, Stimpfel AW, *et al.* The meaning of "capacity building" for the nurse workforce in sub-Saharan Africa: an integrative review. *Int J Nurs Stud* 2018;86:151–61.
- 46 LaFond AK, Brown L, Macintyre K. Mapping capacity in the health sector: A conceptual framework. *Int J Health Plann Manage* 2002;17:3–22.
- 47 Hawe P, Noort M, King L, *et al.* Multiplying health gains: the critical role of capacity-building within health promotion programs. *Health Policy* 1997;39:29–42.
- 48 Crisp BR. Four approaches to capacity building in health: consequences for measurement and accountability. *Health Promot Int* 2000;15:99–107.
- 49 Land T. Implementing institutional and capacity development: conceptual and operational issues. 2000. Available: [http://www.ecdpm.org/Web_ECDDPM/Web/Content/Download.nsf/0/3459B937E1DC0C53C125798B004BCB40/\\$FILE/00-014E-Land.pdf](http://www.ecdpm.org/Web_ECDDPM/Web/Content/Download.nsf/0/3459B937E1DC0C53C125798B004BCB40/$FILE/00-014E-Land.pdf)
- 50 Gholipour K, Tabrizi JS, Farahbakhsh M, *et al.* Evaluation of the District health management fellowship training programme: a case study in Iran. *BMJ Open* 2018;8:e020603.
- 51 Tabrizi JS, Gholipour K, Farahbakhsh M, *et al.* Developing management capacity building package to district health manager in northwest of Iran: A sequential mixed method study. *J Pak Med Assoc* 2016;66:1385–91.
- 52 United Nations Development Programme. Capacity assessment and development in a systems and strategic management context. 1998. Available: <http://jogh.org/documents/issue202002/jogh-10-020412.pdf>
- 53 International NGO Training and Research Centre. Tracking capacity change. 2016. Available: <http://paths4change.info>
- 54 Finn M, Gilmore B, Sheaf G, *et al.* What do we mean by individual capacity strengthening for primary health care in Low- and middle-income countries? A systematic Scoping review to improve conceptual clarity. *Hum Resour Health* 2021;19:5.
- 55 Brown L, Lafond A, Macintyre K. Measuring capacity building. 2001. Available: www.cpc.unc.edu/measuri/ACKNOWLEDGEMENTS
- 56 Kahindo MJB, Mitangala NP, Tsongo ME, *et al.* Soutien Du Niveau Intermédiaire Du Système au district de Santé: perceptions des Équipes de district de Santé du Nord Kivu À L'Est de la RDC. *Int J Innov Appl Stud* 2021;33:258–71.
- 57 K.d C, B C, Z B, *et al.* n.d. Soutien Du Niveau Intermédiaire Du Système de Santé aux Équipes Cadres des districts Sanitaires: le CAS de la Ville de Lubumbashi. *IJAR*;8:114–39.
- 58 Pawson R, Tilley N. *Realistic Evaluation*. London: Sage, 1997.
- 59 Prashanth NS, Marchal B, Criel B. Evaluating Healthcare interventions: answering the "How" question. *Indian Anthropologist* 2013;43:35–50.
- 60 Blaise P. *Culture qualité et organisation bureaucratique, le défi du changement dans les systèmes publics de santé Une évaluation réaliste de projets qualité en Afrique*. Université Libre de Bruxelles, 2004.
- 61 Marchal B, Dedzo M, Kegels G. Turning around an ailing district hospital: A realist evaluation of strategic changes at Ho municipal hospital (Ghana). *BMC Public Health* 2010;10:787.
- 62 Marchal B, van Belle S, van Olmen J, *et al.* Is realist evaluation keeping its promise? A review of published empirical studies in the field of health systems research. *Evaluation* 2012;18:192–212.
- 63 Ridde V, Robert E, Guichard A, *et al.* L'Approche réaliste À L'Épreuve Du Réel de L'Évaluation des programmes. *Canadian Journal of Program Evaluation* 2012;26:37–59.
- 64 Marchal B, Kegels G, Van Belle S. Theory and realist methods. In: Emmel N, Greenhalgh J, Manzano A, *et al.*, eds. *Doing realist research*. 2017.
- 65 Wong G, Westthorp G, Manzano A, *et al.* RAMESES II reporting standards for realist evaluations. *BMC Med* 2016;14:96.
- 66 Ministère de la Santé Publique RDC. Référentiel de Compétences Intégré de L'Équipe cadre de la zone de Santé. pour LES situations Professionnelles relatives au management de la zone de Santé en RDC. Kinshasa, 2010.
- 67 Kolb AY, Kolb DA. Experiential learning theory: A dynamic, Holistic approach to management learning, education and development. In: *The SAGE Handbook of Management Learning, Education and Development*. SAGE Publications Inc, 2009: 42–68.
- 68 Knowles MS, Holton III EF, Swanson RA. n.d. The adult learner.
- 69 Mezirow J. *Transformative Dimensions of Adult Learning* First edition. San Francisco: Jossey-Bass, 1991.
- 70 Mukumbang FC, Van Belle S, Marchal B, *et al.* Realist evaluation of the antiretroviral treatment adherence club programme in selected primary Healthcare facilities in the metropolitan area of Western Cape province, South Africa: a study protocol. *BMJ Open* 2016;6:e009977.
- 71 Yin R. Case study research design and methods. In: . 5E. Los Angeles: SAGE, 2014.
- 72 Patton MQ. *Qualitative evaluation and research methods* 3rd Edition. Thousand Oaks, California: Sage Publications, 2002.
- 73 Ministère de la Santé Publique Hygiène et Prévention RDC. *Rapport Annuel 2021 du Secteur de la Santé*. Kinshasa, 2022.
- 74 Ministère de la Santé Hygiène et Prévention RDC. *Rapport sur LES Comptes Nationaux de la Santé 2020*. Matadi, 2021.
- 75 Spradley JP. *Participant Observation*. Long Grove, Illinois: Waveland Press, 2016.
- 76 Bryman A, Burgess RG. Analyzing qualitative data. Abingdon, UK, 1994.
- 77 Lewis-Beck M, Bryman A, Futing Liao T. The SAGE encyclopedia of social science research methods. 2455 Teller Road, Thousand Oaks California 91320 United States of America,
- 78 WMA declaration of Helsinki – ethical principles for medical research involving human subjects. 2013. Available: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/> [Accessed 27 Oct 2022].

- 79 Schmitt J. The causal mechanism claim in evaluation: does the prophecy fulfill. *New Directions for Evaluation* 2020;2020:11–26.
- 80 Jagosh J. Retroductive theorizing in Pawson and Tilley's applied scientific realism. *Journal of Critical Realism* 2020;19:121–30.
- 81 Merton RK. *Social Theory and Social Structure* Enlarged Edition. New York: The Free Press, 1968.
- 82 Jagosh J, Macaulay AC, Pluye P, *et al.* Uncovering the benefits of Participatory research: implications of a realist review for health research and practice. *Milbank Q* 2012;90:311–46.
- 83 Astbury B, Leeuw FL. Unpacking black boxes: mechanisms and theory building in evaluation. *American Journal of Evaluation* 2010;31:363–81.
- 84 Kahindo M, Schirvel C, Godelet E, *et al.* Réforme des structures Intermédiaires de Santé en République Démocratique Du Congo. *Sante Publique (Paris)* 2014;26:10.
- 85 Marchal B, Giralt AN, Sulaberidze L, *et al.* Designing and evaluating provider results-based financing for tuberculosis care in Georgia: A realist evaluation protocol. *BMJ Open* 2019;9:e030257.
- 86 Nebot Giralt A, Nöstlinger C, Lee J, *et al.* Understanding the acceptability and adherence to Paediatric antiretroviral treatment in the new formulation of pellets (LPV/R): the protocol of a realist evaluation. *BMJ Open* 2017;7:e014528.
- 87 Mukumbang FC, Marchal B, Van Belle S, *et al.* Using the realist interview approach to maintain theoretical awareness in realist studies. *Qualitative Research* 2020;20:485–515.
- 88 Lacouture A, Breton E, Guichard A, *et al.* The concept of mechanism from a realist approach: a Scoping review to facilitate its Operationalization in public health program evaluation. *Implement Sci* 2015;10:153.