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Enablers and barriers influencing district-level One Health policy implementation in four districts of western Uganda

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Abstract

Background

Translating national One Health policies into routine decentralized action remains challenging, and evidence on subnational institutionalization in Uganda is limited. This study assessed the implementation status, enablers, and barriers of the One Health approach across four districts in Western Uganda.

Methods

A quantitative cross-sectional study was conducted among 49 stakeholders in Mbarara, Kabale, Ibanda, and Kiruhura districts using a structured questionnaire and a scorecard across six domains (governance, collaboration, surveillance, workforce, community engagement, and financing). Domain indicators were scored (0–5 scale) to create a composite implementation index. Perceived enablers and barriers were assessed using Likert scales and summarized as medians and interquartile ranges, with cross-district differences analyzed by Kruskal-Wallis test.

Results

One Health implementation was weak in Mbarara (38.5%) and Kabale (35.4%), and very weak in Ibanda (9.2%) and Kiruhura (9.2%). Major gaps occurred in routine coordination, surveillance integration, workforce training, community engagement, and financing, with zero districts possessing dedicated One Health budgets. Across all districts, resource availability, networks, community engagement, workforce capacity, planning, and communication were consistently perceived as barriers rather than enablers ($p > 0.05$).

Conclusions

National One Health structures have not translated into functional district-level operationalization in Western Uganda. Strengthening decentralized implementation requires integrating One Health priorities into local planning and budgeting, establishing functional coordination mechanisms, building workforce capacity, and unifying surveillance systems.

Background

One Health is an integrated, unifying and multisectoral approach that recognizes the interdependence of human, animal, plant and environmental health and seeks to sustainably balance and optimize health outcomes across these domains (1). Its implementation requires collaboration across disciplines, sectors and levels of governance because many health threats arise from interactions among people,

animals, ecosystems and the environments they share. The approach has consequently become increasingly important for addressing zoonotic diseases, antimicrobial resistance, food safety, environmental health threats and emerging infectious diseases (1, 2). The Quadripartite organizations; the Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme (UNEP), World Health Organization (WHO), and World Organisation for Animal Health (WOAH) have emphasized that One Health should be implemented at community, subnational, national, regional and global levels through effective governance, communication, collaboration and coordination. The One Health Joint Plan of Action (2022–2026) provides a global framework for translating these principles into action through six action tracks addressing health systems, zoonotic diseases, food safety, antimicrobial resistance and the environment (3).

Despite increasing global recognition of One Health, translating the approach from policy and conceptual frameworks into routine multisectoral practice remains challenging (4, 5). A recent systematic scoping review of One Health implementation found that implementation occurs across multiple governance levels but remains uneven in scope and sectoral integration (6). Although most initiatives incorporated multisectoral coordination, collaboration, communication or capacity development, important gaps remained in community engagement, monitoring and evaluation, and environmental-sector participation. These findings suggest that the existence of One Health programmes or coordination mechanisms does not necessarily indicate effective institutionalization or sustained implementation (6). The Quadripartite guidance similarly emphasizes that successful implementation requires more than establishing coordination structures; it requires situation analysis, multisectoral governance mechanisms, implementation planning, resource mobilization, implementation monitoring and systematic learning (2).

These implementation challenges are particularly relevant in low- and middle-income countries, where health systems are frequently organized through sector-specific institutional mandates and where financial, human-resource and infrastructural constraints can limit sustained multisectoral action (5, 7). Decentralization adds another layer of complexity because national policies and strategies must be translated into operational priorities, budgets, surveillance activities and coordinated services at subnational levels. Weak institutional linkages between national and local structures may therefore result in One Health activities being implemented mainly through externally supported or outbreak-specific programmes rather than becoming part of routine district health-system functions (8, 9). Strengthening implementation consequently requires attention not only to national policy development but also to governance, institutional ownership, workforce capacity, financing, information sharing and community participation at the level where health risks are identified and managed (8).

Uganda has established a national One Health architecture intended to promote collaboration among the human, animal and environmental health sectors. The National One Health Platform (NOHP), established in 2016, brings together key government sectors and partners to strengthen coordination, preparedness and response to health threats. The national framework involves the Ministry of Health, Ministry of Agriculture, Animal Industry and Fisheries, Ministry of Water and Environment and Uganda Wildlife Authority, among other stakeholders (10). At subnational level, District One Health Teams (DOHTs) and

district rapid response structures have been promoted as mechanisms for translating national One Health priorities into local action. Uganda's experience therefore provides an important setting in which to examine whether national One Health governance arrangements are being translated into functional district-level implementation (8, 9).

However, the existence of national policies and coordination structures does not necessarily guarantee effective implementation at district level. Recent evidence from Uganda indicates that important gaps remain between One Health policies and their operationalization, including weaknesses in subnational coordination mechanisms, limited institutionalization, inadequate resources and reliance on collaboration that is often activated in response to outbreaks rather than embedded within routine prevention and preparedness systems (8). These challenges are particularly important in districts where interactions among humans, livestock, wildlife and the environment create conditions for zoonotic disease emergence and transmission (11). Understanding the extent to which One Health structures function within such settings is therefore essential for identifying practical constraints to decentralization and institutionalization of the approach.

Western Uganda provides an important context for examining district-level One Health implementation. Mbarara, Kiruhura and Ibanda are situated within Uganda's cattle corridor, where intensive livestock production and frequent human–livestock interactions create important interfaces for zoonotic disease transmission. The region has also rampantly experienced zoonotic disease threats such as anthrax and Rift Valley fever. Kabale, in contrast, has distinctive ecological characteristics and is in the Greater Virunga Landscape, where human activities, domestic animals and wildlife interact across a complex transboundary ecosystem (12, 13). These settings provide an opportunity to assess whether district-level One Health implementation has been sufficiently institutionalized to address diverse human–animal–environment health risks.

Although Uganda has made important progress in developing national One Health policies and coordination structures, evidence on the extent and functionality of implementation at decentralized district level remains limited (8, 9). In particular, there is insufficient empirical evidence describing how governance structures, multisectoral collaboration, surveillance and laboratory linkages, workforce capacity, community engagement and financing function together at district level. There is also limited understanding of whether the factors perceived to enable or hinder One Health implementation differ across districts. Addressing this evidence gap is important because district-level implementation represents the operational interface between national policy and communities, where surveillance, outbreak preparedness, risk communication and disease-control activities are ultimately delivered.

Therefore, this study assessed the implementation status of the One Health approach and examined perceived enablers and barriers to its implementation in four districts of Western Uganda. By examining implementation across governance, coordination, surveillance, laboratory capacity, workforce, community engagement and financing, the study provides evidence on the extent to which One Health

has been translated from national policy into routine district-level practice and identifies priority areas for strengthening decentralized One Health systems.

Methods

Study design and setting

A quantitative cross-sectional study was conducted to assess the status of One Health implementation and identify perceived enablers and barriers to implementation at district level in Western Uganda. The study was conducted in four districts of Mbarara, Kabale, Ibanda and Kiruhura form August to November, 2025. The districts were purposively selected to represent contrasting ecological, livestock-production and human-animal-environment interface contexts relevant to One Health implementation.

Mbarara, Ibanda and Kiruhura are located in Western Uganda and are characterized by substantial livestock production and frequent interactions between human and animal populations (14). Kabale has distinct highland ecological characteristics and is located within the broader Greater Virunga landscape, where interactions among human populations, domestic animals, wildlife and the environment are important for One Health risk management (13). The selection of these districts therefore provided an opportunity to examine the implementation of One Health across different local contexts within the decentralized governance system.

The study focused on district-level One Health implementation across key domains, including governance and coordination, multisectoral collaboration, surveillance and laboratory linkages, workforce capacity, community engagement and financing.

Study population and sampling

The study population comprised stakeholders involved in One Health-related activities at district level. Participants were selected from relevant sectors and institutions involved in human health, veterinary and animal health, environmental health, local government, surveillance, laboratory services and community engagement.

A purposive sampling approach was used to identify participants with direct knowledge or experience of One Health activities within the selected districts. The study initially targeted 15 participants from each of the four districts, giving a planned sample size of 60 participants. However, 59 participants were ultimately enrolled and provided complete data for analysis. The achieved sample comprised 15Nparticipants from Mbarara, 15 from Kabale, 15 from Ibanda and 14 from Kiruhura.

Participants were eligible if they had a professional or operational role relevant to One Health implementation within the district and had sufficient knowledge of district-level One Health activities.

Participants who were unavailable during the study period or who did not provide informed consent were excluded.

Data collection

Data were collected using a structured questionnaire administered to eligible district-level stakeholders (domains derived from Quadripartite One Health Joint Plan of Action) (3). The questionnaire captured information on the availability and functioning of One Health structures and activities, as well as participants' perceptions of factors influencing implementation.

The questionnaire assessed six broad domains of One Health implementation: governance and coordination, multisectoral collaboration, surveillance and laboratory linkages, workforce capacity, community engagement and financing. Participants were also asked to rate factors that could facilitate or constrain implementation using a five-point Likert scale.

The questionnaire was reviewed for content relevance and clarity before data collection. Data were collected by trained members of the research team and checked for completeness and consistency before analysis.

Assessment of perceived enablers and barriers

Perceived factors influencing One Health implementation were assessed using statements covering eight domains: resource availability, collaborative networks, community engagement, workforce capacity, leadership and planning, communication, surveillance and data sharing, and institutional support. Participants rated their level of agreement with each statement on a five-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree).

Items were interpreted according to their wording. For positively worded statements, agreement indicated a perceived enabling condition, whereas agreement with negatively worded statements indicated a perceived barrier. Median scores and interquartile ranges (IQRs) were calculated for each domain. Domain-level differences in participants' responses across the four districts were assessed using the Kruskal–Wallis test, with statistical significance set at $p < 0.05$.

Data analysis

Data were checked for completeness and consistency in Ms excel before analysis in STATA version 16 (StataCorp, College Station, TX, USA). Descriptive statistics were used to summarize participant characteristics and One Health implementation indicators. Frequencies and percentages were calculated for categorical variables, while medians and interquartile ranges were used for ordinal or non-normally distributed scores.

For each district, indicator scores were summed to generate the composite One Health Implementation Index. The district score was expressed both as an absolute score out of 65 and as a percentage of the maximum possible score. District-level implementation categories were assigned according to the predefined classification described above.

For perceived enablers and barriers, Likert-scale responses were summarized using medians and interquartile ranges. The Kruskal-Wallis test was used to assess whether distributions of domain scores differed across the four districts. A p-value < 0.05 was considered statistically significant.

Results

Participant characteristics

A total of 59 stakeholders participated in the study. Participants were drawn from sectors and institutions involved in One Health implementation at district level, including human health, animal health, environmental health, local government and other relevant technical and community structures (Table 1).

Table 1
Description of the study participants by age category (n = 59)

Years at work	Mbarara	Kabale	Ibanda	Kiruhura
< 2 years	2	0	1	2
2–5 years	4	2	3	2
6–10 years	7	8	6	7
> 10 years	2	5	5	3

Status of One Health implementation

The overall level of One Health implementation varied across the four study districts. Based on the 13 indicators derived from the Quadripartite One Health Joint Plan of Action, Mbarara recorded the highest implementation score (25/65; 38.5%), followed by Kabale (23/65; 35.4%). Both districts were classified as having weak implementation according to the study's predefined classification. Ibanda and Kiruhura each recorded a score of 6/65 (9.2%) and were classified as having very weak implementation (Tables 2 and 3).

Across the four districts, substantial variation was observed in the implementation of individual One Health components. Governance and coordination mechanisms, multisectoral collaboration, surveillance and laboratory linkages, workforce capacity, community engagement and financing were not uniformly implemented. Financing was particularly limited, with no dedicated district budget allocation for One Health activities reported across the study districts. The implementation scores indicate that none of the

four districts reached the moderate or strong implementation categories defined in the study. Mbarara and Kabale demonstrated relatively higher levels of implementation than Ibanda and Kiruhura, although implementation remained below 40% of the maximum possible score in all four districts as shown in Tables 2 and 3.

Table 2
One Health Implementation indicator's scores in the study districts.

Domain	Indicator	Mbarara	Kabale	Ibanda	Kiruhura
Governance	District One Health coordination structure exists	5	5	1	1
Governance	One Health included in district plans	1	1	0	0
Coordination	Regular multisectoral meetings	0	1	0	0
Coordination	Joint outbreak investigations	1	2	1	0
Surveillance	Zoonotic disease surveillance system	1	1	0	0
Surveillance	Integration of human and animal surveillance	1	1	0	0
Laboratory	Access to zoonotic diagnostic laboratories	4	1	0	1
Laboratory	Functional sample referral system	5	3	2	2
Workforce	Staff trained in One Health	2	2	0	0
Workforce	Multisectoral outbreak response teams	1	1	0	0
Implementation	Joint zoonotic disease control programs	2	2	0	0
Community engagement	Community awareness programs	2	3	2	2
Financing	Budget allocated for One Health activities	0	0	0	0
Overall score		**25**	**23**	**6**	**6**

Table 3
Description of the implementation status of the study districts

District	Overall score	Percentage (%)	Implementation status
Mbarara	25/65	38.45	Weak
Kabale	23/65	35.38	Weak
Ibanda	6/65	9.23	Very weak
Kiruhura	6/65	9.23	Very weak

Perceived enablers and barriers to One Health implementation

Participants' perceptions of factors influencing One Health implementation were assessed across eight domains: resource availability, collaborative networks, community engagement, workforce capacity, leadership and planning, communication, surveillance and data sharing, and institutional support.

Overall, most assessed domains were perceived as barriers to One Health implementation rather than enabling conditions. Resource availability, workforce capacity, institutional support and leadership and planning were among the domains identified as important constraints. Participants also reported challenges related to collaboration, communication, surveillance and data sharing, and community engagement.

The distribution of perceived barriers was broadly similar across the four districts. The Kruskal–Wallis test showed no statistically significant differences between districts for any of the eight assessed domains (all $p > 0.05$). Thus, although the overall implementation scores differed substantially between districts, the perceived factors influencing implementation did not show statistically significant district-level differences.

Discussion

This study assessed the implementation of the One Health approach and examined perceived factors influencing implementation across four districts of Western Uganda. Using implementation indicators operationalized from the Quadripartite One Health Joint Plan of Action, the study observed that One Health implementation was weak in Mbarara and Kabale and very weak in Ibanda and Kiruhura. None of the districts reached the moderate or strong implementation categories. The findings also showed important deficits across multiple dimensions of One Health implementation, including governance and coordination, multisectoral collaboration, integrated surveillance and laboratory linkages, workforce capacity, community engagement and financing. Most assessed implementation factors were perceived as barriers rather than enablers, while no statistically significant differences were observed between districts in stakeholder perceptions of these factors. These findings suggest that the principal challenge

is not the absence of recognition of One Health, but the limited translation of national and global One Health commitments into routine, adequately resourced and institutionalized district-level practice (8, 15).

The weak implementation observed in all four districts is consistent with growing evidence that the existence of national One Health policies and coordination structures does not necessarily translate into functional implementation at subnational level (7, 16). Uganda has established a National One Health Platform and promoted district-level coordination structures, representing important progress in the institutional development of One Health. However, recent Ugandan evidence indicates persistent gaps between policy development and operationalization, including weaknesses in subnational governance, institutionalization, financing and routine multisectoral collaboration (8, 9). The present findings provide district-level empirical evidence of this implementation gap.

Considerable difference in composite implementation scores observed suggests variation in the extent to which One Health structures and activities had become operational at district level. Mbarara and Kabale achieved less than 40% of the maximum implementation score, while Ibanda and Kiruhura each achieved less than 10%. Thus, even the relatively better-performing districts had not achieved a level of implementation consistent with a fully institutionalized One Health system. This pattern is broadly consistent with evidence from Uganda and other African settings showing that One Health implementation is often strongest at policy and national coordination levels but weaker at operational and decentralized levels. Studies using One Health assessment frameworks have identified persistent weaknesses in planning, information sharing, multisectoral coordination, surveillance integration and resource allocation (7–9, 17). The present study demonstrates that these challenges remain evident when implementation is assessed directly at district level using indicators derived from the Quadripartite One Health Joint Plan of Action.

Governance and leadership are fundamental to One Health because they provide the institutional mechanisms through which different sectors can establish shared priorities, coordinate activities, allocate resources and maintain accountability (18). In this study, governance and leadership were generally perceived as barriers, although perceptions varied between districts. The absence of statistically significant differences across districts suggests that governance-related constraints may reflect broader structural characteristics of decentralized health systems rather than isolated weaknesses in individual districts. This is probably so because district departments continue to operate within sector-specific planning, reporting and budgeting arrangements (19). Although stakeholders may recognize the value of multisectoral collaboration, separate institutional mandates and planning processes can make it difficult to incorporate One Health activities into routine district programmes. Consequently, collaboration may remain dependent on particular individuals, externally supported projects or responses to specific outbreaks rather than being embedded in routine prevention, preparedness and surveillance (4, 6). This is in agreement with a study that reported that One Health governance in Uganda remains stronger on paper than in routine practice, with unclear subnational mechanisms and inadequate institutionalization of multisectoral collaboration (8). Other studies also

have reported evidence that fragmented governance, unclear roles and responsibilities, limited political commitment and weak institutional ownership can constrain One Health implementation in low- and middle-income countries (7, 16, 17). This implies that strengthening One Health at district level requires more than establishing or reactivating coordination committees. District One Health structures require clearly defined mandates, membership and responsibilities, regular multisectoral planning and review, mechanisms for joint decision-making, and integration of One Health priorities into existing district planning and performance-management systems.

Integrated surveillance is a core operational requirement of One Health because effective detection and response to zoonotic and other emerging health threats depend on timely information exchange among human, animal and environmental health sectors (15, 20, 21). The present study identified limitations in surveillance integration and laboratory linkages across the study districts. These findings are important because fragmented surveillance systems can prevent districts from developing a comprehensive understanding of risks that cross sectoral boundaries (19). Regular multisectoral surveillance and review activities could further help transform information collected by individual sectors into a shared district-level risk picture (5, 16). Communication was also generally perceived as a barrier, although participants in Ibanda reported a comparatively more positive perception, thereby highlighting the importance of communication for operationalizing One Health. Effective communication is required not only during outbreaks but also for routine information sharing, joint planning, risk assessment and community engagement (15). Strengthening communication channels between district sectors may therefore contribute to more timely and coordinated decision-making.

Financing emerged as one of the most obvious structural weaknesses in the study. None of the four districts reported a dedicated budget allocation for One Health activities. This finding is particularly important because financing underpins almost every other component of implementation. Where activities depend primarily on externally funded programmes or outbreak-specific resources, implementation can become project-dependent rather than institutionalized within routine district systems (9). Previous studies have similarly identified inadequate financing and logistical support as persistent barriers to One Health implementation, particularly in resource-constrained settings (5, 17, 22). Therefore, incorporating one health priorities into existing district development plans, annual work plans and sector budgets would help shift One Health from a largely programme-based approach toward institutionalized district health-system practice. At national level, the One Health Platform and relevant ministries could support this process by providing clear guidance on priority activities, minimum resource requirements and monitoring indicators for district implementation (15).

Workforce capacity was also identified as an important implementation constraint. Effective One Health requires personnel who understand their own sectoral responsibilities while also possessing sufficient knowledge and skills to collaborate across disciplinary and institutional boundaries (21, 23). The study findings indicate gaps in workforce preparedness and practical experience, consistent with evidence that limited technical capacity and insufficient opportunities for joint training can constrain multisectoral preparedness and response (9). Capacity development should therefore target joint training involving

human health, animal health, environmental health, laboratory, surveillance and local-government personnel to help build shared understanding and practical collaboration. Simulation exercises, joint outbreak investigations and multisectoral surveillance activities may be particularly useful because they allow district teams to develop the operational relationships required during real events (19, 20).

Community engagement was among the factors perceived as a barrier across the study districts. This finding is important because communities are central to prevention, early detection and response to health threats at the human-animal-environment interface (15, 24). Community members may be the first to observe unusual illness in humans or animals, changes in animal mortality, environmental changes or other signals of emerging health threats. Meaningful community participation can therefore strengthen surveillance and risk communication while improving the acceptability and sustainability of interventions (25). Community structures, local leaders, livestock keepers, farmers, wildlife-adjacent communities and other relevant groups should have clearly defined opportunities to contribute to risk identification, communication and decision-making. Community engagement should be incorporated into routine One Health planning rather than activated only during outbreaks (7, 16).

Strengths and limitations

A major strength of this study is the assessment of One Health implementation at decentralized district level using indicators derived from the Quadripartite One Health Joint Plan of Action. This provided a structured basis for assessing multiple dimensions of implementation rather than focusing on a single disease or sector. The inclusion of districts with different ecological and livestock-production contexts also provided a useful basis for examining implementation across multi-sectoral local settings.

The limitation of this study was that it provides a snapshot of implementation at one point in time and causal relationships between identified barriers and implementation performance could not be established. The implementation scores reported were based on stakeholder assessment and may therefore be subject to respondent perceptions and reporting bias.

Conclusion

Although Uganda has established national One Health governance structures, district-level implementation remains weak and uneven across all study districts (Mbarara, Kabale, Ibanda, and Kiruhura). Critical deficiencies span governance, collaboration, surveillance, workforce capacity, community engagement, and financing with a lack of dedicated district funding emerging as the primary constraint. Similar stakeholder perspectives across districts indicate these challenges are systemic. To achieve sustainable One Health institutionalization, Uganda must transition from national policy to decentralized action by embedding One Health into district planning, budgeting, coordination, and surveillance. Doing so will strengthen national resilience against zoonotic diseases, antimicrobial resistance, and emerging health threats.

Declarations

Ethics approval and consent to participate

This study was approved by the Makerere University College of Health Sciences Research and Ethics Committee (Approval Ref: MAKSHSREC-2025-08) in accordance with the guidelines of the Uganda National Council of Science and Technology. Administrative clearances were obtained from district local government authorities in Mbarara, Kabale, Ibanda, and Kiruhura districts.

Consent to participate

Informed consent was obtained from all subjects before their participation in the study. Participants' details were kept confidential by using special data codes.

Consent for publication

Not applicable.

Availability of data and materials

Data used to write-up this study is provided within the manuscript.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JMK, AM and JA conceived and designed the study. JMK, MN, AM, JA, JN, SN and JO coordinated field data collection. JMK and MN analyzed the data and performed statistical tests. JMK, AM, and CK drafted the primary manuscript. All authors critically reviewed, revised, and approved the final version of the manuscript.

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