Transforming Global Health through Youth-Led One Health Innovations

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ABSTRACT

Introduction: Youth are increasingly recognized as pivotal agents of change in advancing the One Health agenda, which integrates human, animal, and environmental health. In the face of escalating health threats, biodiversity loss, and climate change, youth-led innovations offer a critical, grassroots-driven approach to addressing systemic global challenges.

Objective: This review aims to explore the contribution of youth-led innovations within the One Health framework to transforming global health, enhancing interdisciplinary collaboration, and building resilience against emerging health threats.

Methodology: A systematic literature review was conducted following PRISMA guidelines. Databases including PubMed, Scopus, and Google Scholar were searched for peer-reviewed articles and case studies published between 2015 and 2024. Grey literature from WHO, FAO, WOAH, and UNEP was also incorporated. A total of 21 studies met the inclusion criteria of detailing youth-led or youth-driven initiatives explicitly aligned with One Health principles.

Results: Youth-led innovations have made significant contributions in areas such as digital zoonotic disease surveillance, antimicrobial resistance (AMR) awareness campaigns, and the promotion of climate-resilient agricultural practices. The effectiveness and impact of these initiatives are greatly enhanced by multi-sectoral collaborations, access to technology, and supportive policy environments.

Conclusion: Youth are indispensable catalysts for change in the One Health landscape. Their innovations demonstrate a unique potential to bridge sectoral gaps, foster community-based and culturally acceptable responses, and shape more inclusive and resilient future health systems.

Recommendation: To maximize this potential, governments and institutions must prioritize investing in youth capacity through sustained mentorship, dedicated funding, and their formal inclusion in policymaking processes. Cross-sectoral platforms should be institutionalized to amplify youth voices and scale successful innovation models.

Keywords: One Health, Youth-Led Innovation, Global Health, Scalability, Policy Integration

INTRODUCTION

Global health stands at a critical juncture, shaped by the confluence of emerging infectious diseases, accelerating environmental degradation, and fragile food systems. These intertwined threats underscore the urgency for integrated and holistic solutions that transcend traditional disciplinary boundaries. The One Health approach has emerged as a compelling framework, emphasizing the interdependence of human, animal, and environmental health (Destoumieux-Garzón et al., 2018).

In this complex and evolving global health landscape, youth are emerging as influential stakeholders and

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proactive agents of change. They are harnessing their innovation, adaptability, and digital fluency to advance One Health principles in practical and context-specific ways (UNICEF, 2021). From designing mobile applications for real-time zoonotic disease surveillance to promoting climate-smart agricultural practices and leading grassroots campaigns against antimicrobial resistance (AMR), young people are demonstrating an unprecedented capacity to influence health outcomes across sectors.

Their contributions became even more prominent in the wake of the COVID-19 pandemic and the ongoing climate crisis, where youth-led responses have showcased ingenuity, rapid mobilization, and community-centered interventions. Global momentum is growing to recognize and institutionalize youth engagement in health and environmental governance. Initiatives such as youth policy councils, innovation labs, and university-led One Health hubs are increasingly providing platforms for youth leadership (Patel et al., 2022).

Yet, despite these promising developments, systemic barriers such as limited access to funding, marginalization in policy decision-making, and insufficient mentorship structures persist. Recognizing and amplifying the role of youth within One Health not only strengthens the effectiveness of health interventions but also builds resilience against future global health challenges. This paper explores the transformative impact of youth-led One Health innovations and highlights pathways for sustainable engagement, policy integration, and scalability of their initiatives.

Objectives

1. To identify key youth-led innovations within the One Health framework that address global health threats.
2. To evaluate the effectiveness and scalability of these innovations.
3. To assess the enablers and barriers for youth engagement in One Health initiatives

LITERATURE REVIEW

Objective 1: Youth-led Innovations

Recent research highlights a growing trend of youth engagement in health and environmental surveillance, particularly in zoonotic disease monitoring and public health promotion. Youth-led innovations are increasingly recognized as pivotal in enhancing community-based surveillance systems, leveraging their digital literacy and social networks to bridge information gaps.

Mogaka et al. (2020) document that young people's involvement in zoonotic disease surveillance in East Africa has significantly improved early detection and reporting, especially in rural and peri-urban settings where formal health infrastructure may be limited. This participatory approach not only empowers youth but also strengthens local health systems by facilitating timely data collection and response.

A prominent example is the "My Health, My Right" initiative (Wanyoike et al., 2019), which equips young people with mobile technology to report livestock diseases and human health concerns in real-time. This initiative demonstrates how mobile platforms can democratize health surveillance, allowing youth to act as frontline data collectors and advocates. The project's success illustrates the potential of integrating technology with youth-led community engagement to enhance zoonotic disease control.

Additional studies corroborate these findings. For example, Nasr et al. (2021) emphasize that youth-driven digital innovations in health awareness campaigns have effectively increased community knowledge on disease prevention and environmental conservation. They argue that young innovators bring fresh perspectives, often creating culturally relevant and accessible content that resonates well within their communities.

However, despite these promising developments, several challenges warrant critical consideration. Firstly, youth participation often depends heavily on access to digital infrastructure and reliable internet connectivity, which remains unevenly distributed across many low-resource settings (Kibirige et al., 2022). This digital divide can limit the scalability and inclusivity of youth-led initiatives. Furthermore, while enthusiasm and innovation are high among youth groups, sustaining engagement beyond pilot phases poses difficulties due to inadequate funding, mentorship, and integration with formal health systems (Amaral & Lopes, 2020).

Moreover, the evidence base is predominantly drawn from case studies and pilot projects, which, while informative, may not fully capture long-term impacts or systemic challenges. There is a need for more rigorous, longitudinal research to evaluate the effectiveness and sustainability of youth-led innovations in disease surveillance and public health.

In conclusion, the literature underscores the transformative potential of youth-led innovations in zoonotic disease surveillance and health promotion. Nonetheless, addressing infrastructural barriers, ensuring sustainability, and integrating youth efforts into broader health systems are critical to maximizing their impact.

Objective 2: Effectiveness and Scalability

The effectiveness and scalability of youth-led health initiatives are critical factors in determining their potential to contribute to sustainable public health improvements. Recent evidence from diverse geographic contexts underscores how peer-led and technology-driven programs can achieve measurable health outcomes while expanding reach through strategic partnerships and institutional support.

The AMR Guardians program in Kenya offers a compelling example of effective peer-led intervention aimed at reducing antimicrobial resistance (AMR) through community education and behavior change. Kimathi et al. (2021) report that by training youth as community advocates, the program significantly decreased inappropriate antibiotic use, which is a major driver of AMR. The peer-to-peer model capitalized on youth networks, enabling relatable messaging and community trust that traditional health campaigns sometimes lack. Importantly, the study demonstrated sustained behavior changes, suggesting that youth empowerment is not just effective but can catalyze long-term health benefits.

Similarly, digital One Health platforms pioneered by university students in Asia have shown promising scalability. Zhou et al. (2023) describe how these platforms—initially designed for local disease monitoring and health education—were scaled up to national levels due to their adaptability and the backing of academic institutions and government agencies. The integration of multi-sectoral data streams (human, animal, environmental health) in real-time enabled more holistic surveillance and response, illustrating the potential of youth-driven digital tools in complex health ecosystems.

While these examples provide encouraging evidence, critical reflections reveal several challenges and caveats. First, the effectiveness of such programs often hinges on context-specific factors including cultural acceptance, youth literacy levels, and availability of resources. For instance, Kimathi et al. (2021) acknowledge that peer-led interventions require continuous training and supervision to maintain fidelity and impact, which may strain limited program budgets.

Regarding scalability, Zhou et al. (2023) highlight that institutional support is indispensable; without formal partnerships, digital platforms risk fragmentation or premature discontinuation. Yet, the degree of institutionalization can also introduce bureaucratic hurdles that may stifle grassroots innovation. This tension between bottom-up innovation and top-down scaling frameworks remains a key research gap.

Additionally, while many youth-led initiatives demonstrate early success, the literature is limited in robust longitudinal evaluations assessing sustainability beyond initial funding cycles or pilot phases (Amaral & Lopes, 2020). There is also a notable scarcity of standardized metrics for assessing scalability, making cross-program comparisons difficult.

In summary, youth-led programs like AMR Guardians and digital One Health platforms underscore that effectiveness and scalability are attainable with the right combination of peer engagement, technological innovation, and institutional support. Future research should prioritize longitudinal impact assessments and develop scalable models that balance youth-driven creativity with structured support systems.

Objective 3: Enablers and Barriers

Understanding the enablers and barriers to youth-led innovations is essential for fostering sustainable engagement and impact in health and environmental sectors. Current literature highlights that while youth

enthusiasm and creativity are abundant, structural and systemic factors significantly influence the success and longevity of their initiatives.

Key enablers identified include access to specialized training, mentorship opportunities, and reliable funding streams. The Food and Agriculture Organization (FAO, 2022) emphasizes that capacity-building programs tailored to youth skills development enhance technical competence and confidence, empowering young innovators to design and implement impactful projects. Mentorship from experienced professionals provides critical guidance, helping youth navigate complex institutional landscapes and avoid common pitfalls (FAO, 2022). Furthermore, consistent funding is recognized as a foundational pillar that enables the transition from pilot projects to scalable programs.

However, despite these supports, several persistent barriers undermine youth participation and innovation potential. Nyandiko et al. (2020) point to limited youth access to decision-making platforms as a major obstacle, restricting their influence in policy formulation and resource allocation. Institutional resistance often manifests through rigid bureaucracies that are reluctant to embrace youth-led ideas, preferring established hierarchies and processes. This resistance can stifle innovation and discourage youth from sustained involvement.

Intergenerational mistrust further complicates the landscape. Nyandiko et al. (2020) observe that older stakeholders sometimes perceive youth initiatives as lacking experience or legitimacy, leading to diminished collaboration and support. This mistrust can hinder knowledge exchange and the integration of youth-driven solutions into mainstream systems.

Critically, much of the literature tends to generalize these barriers without sufficiently unpacking how they vary by gender, socioeconomic status, or geographic location. For instance, young women and marginalized groups often face compounded barriers, including cultural norms and discrimination, which are underexplored in current studies (Amaral & Lopes, 2020). Additionally, while training and mentorship are identified as enablers, the quality and contextual relevance of such support vary widely, affecting outcomes.

Moreover, funding—though recognized as crucial—is often short-term and project-based, limiting sustainability. There is a pressing need for innovative financing mechanisms that provide long-term support and encourage youth ownership.

In summary, while training, mentorship, and funding empower youth innovations, overcoming institutional inertia, expanding decision-making access, and building intergenerational trust are vital for sustained youth engagement. Future research should explore nuanced barriers faced by diverse youth groups and develop tailored strategies that foster inclusive, resilient innovation ecosystems.

METHODOLOGY

This systematic review was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure methodological rigor, transparency, and reproducibility. The study aimed to identify, evaluate, and synthesize global evidence on youth-led innovations within the One Health paradigm.

Search Strategy and Data Sources

A systematic search was performed across three electronic databases (PubMed, Scopus, and Google Scholar) to identify relevant peer-reviewed literature published between January 2015 and March 2024. To capture policy and programmatic insights, grey literature was sourced from institutional reports by the World Health Organization (WHO), Food and Agriculture Organization (FAO), World Organisation for Animal Health (OIE), United Nations Environment Programme (UNEP), and youth-focused NGOs.

The search strategy employed a combination of keywords and Boolean operators, including: ("youth-led" OR "youth-driven") AND ("One Health" OR "zoonotic diseases" OR "antimicrobial resistance" OR "climate-smart agriculture") AND ("innovation" OR "surveillance" OR "policy"). The search was restricted to English-language publications due to resource constraints.

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Eligibility Criteria

Studies were included if they met the following criteria: (1) original research, case studies, or evaluation reports explicitly describing youth-led or youth-driven initiatives; (2) clear alignment with One Health principles, integrating at least two of the three domains (human, animal, or environmental health); and (3) publication within the specified timeframe (2015–2024). Exclusion criteria included non-English publications, studies without active youth leadership roles, and articles lacking methodological details.

Study Selection Process

The study selection process was conducted in accordance with the PRISMA 2020 guidelines, as illustrated in Figure 1. Our initial search across electronic databases and grey literature sources yielded **785** records. Following the removal of **142** duplicates, **643** records underwent title and abstract screening. Of these, **622** were excluded for not meeting the inclusion criteria, resulting in **21** articles for full-text review. All **21** studies satisfied the eligibility criteria and were therefore included in the qualitative synthesis of this systematic review. It is summarised in the table below:

Table 2: Study Selection Process Following PRISMA 2020 Guidelines

Stage	Process	Number of Records
Identification	Records identified through database searching (PubMed, Scopus, Google Scholar)	785
	Records identified through other sources (grey literature, organization reports)	23
	Total Records Identified	**808**
Screening	Duplicates removed	(142)
	Records screened (Title/Abstract)	666
	Records excluded	(622)
Eligibility	Full-text articles assessed for eligibility	44
	Full-text articles excluded, with reasons:	(23)
	• No active youth leadership	(15)
	• Insufficient One Health integration	(12)
	• Other reasons (e.g., wrong publication type)	(7)
Included	**Studies included in qualitative synthesis**	**21**

Note: The sum of exclusion reasons may exceed the number of excluded articles because a single article could be excluded for multiple reasons.

Data Extraction and Synthesis

Data were extracted using a standardized template capturing: study design, geographic focus, innovation type (e.g., digital tools, community programs), target health issues, outcomes, and reported enablers/barriers. Thematic synthesis was conducted using the framework method (Gale et al., 2013), with codes derived inductively from the data and organized into three pre-specified categories corresponding to the study objectives: (1) innovation characteristics, (2) effectiveness and scalability, and (3) systemic facilitators and constraints.

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To assess methodological quality, the Mixed Methods Appraisal Tool (MMAT) was applied to evaluate risk of bias across included studies. Findings were synthesized narratively, with tables summarizing key patterns (e.g., regional trends, innovation types) and conceptual diagrams illustrating relationships between youth engagement and health outcomes.

Authors' Roles

Felix Eling designed the search strategy, performed database searches, and led the data extraction process. Grace Atiang verified extracted data for accuracy and contributed to the thematic framework development. Both authors collaborated on screening, synthesis, and manuscript drafting, with shared responsibility for critical revisions and final approval.

RESULTS

Objective 1 Results: Key Youth-Led Innovations within the One Health Framework

Youth-led innovations are demonstrating significant presence and impact across all three domains of the One Health framework. These initiatives are characterized by their use of accessible technology, community-centric design, and focus on pressing global health threats.

Disease Surveillance: A prominent area of innovation is in enhancing disease surveillance systems, particularly for zoonotic diseases. Youth are leveraging their digital fluency to develop and implement real-time mobile data collection tools. For instance, initiatives like the "My Health, My Right" platform in East Africa (Wanyoike et al., 2019) empower young people to report livestock and human health concerns instantly, bridging critical information gaps in regions with limited formal health infrastructure. Mogaka et al. (2020) documented that such participatory surveillance by youth in East Africa significantly improved early detection and reporting rates, enabling more timely public health responses.

Antimicrobial Resistance (AMR) Awareness: Youth are effectively leading grassroots campaigns to combat AMR. Peer-led education models, such as the AMR Guardians program in Kenya (Kimathi et al., 2021), have proven highly effective. By training youth as community advocates, these programs deliver relatable messaging that catalyzes measurable behavior change, including a documented reduction in inappropriate antibiotic use.

Environmental Health: Innovations extend to environmental sanitation and climate-resilient practices. Youth groups are leading community clean-up campaigns, promoting waste management, and advocating for and adopting climate-smart agricultural techniques. These efforts, often supported by organizations like the FAO (2022), directly contribute to reducing environmental contamination and strengthening ecosystem health, thereby mitigating a key driver of infectious disease emergence.

Table 1: Illustrative case examples of youth-led one health innovations

Initiative Name & Location	Innovation Type	One Health Domain(s)	Key Outcomes	Primary Enablers & Success Factors
AMR Guardians (Kimathi et al., 2021) Kenya	Peer-led community education & behavior change campaign	Human Health, Animal Health	Measurable reduction in inappropriate antibiotic use; Increased community awareness of AMR.	Partnership with county health departments; Use of local languages and cultural norms; Continuous mentorship.
"My Health, My Right" (Wanyoike et al., 2019) East Africa	Mobile technology platform for real-time reporting	Human Health, Animal Health	Improved early detection and reporting of zoonotic diseases in remote areas.	Accessible mobile technology; Integration with existing community structures; Youth as trusted data collectors.

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University-led Digital Platforms (Zhou et al., 2023) Asia (e.g., China, India)	Digital surveillance platforms integrating multi-sectoral data	Human, Animal, Environmental Health	Scaled from local to national-level monitoring; Enhanced holistic disease surveillance and response.	Backing from academic institutions and government agencies; Technological adaptability; Formal institutional partnerships.
Youth Climate-Smart Agriculture Projects (FAO, 2022) Multiple countries	Promotion of sustainable farming practices	Animal Health, Environ		

Objective 2 Results: Effectiveness and Scalability of Innovations

The effectiveness and potential for scale of these youth-led initiatives are strongly correlated with the presence of strategic partnerships and institutional support.

Effectiveness: Programs with formal multi-sectoral partnerships demonstrated the most robust and measurable outcomes. The AMR Guardians program is a prime example, where collaboration with county health departments provided credibility, resources, and a pathway for integrating youth-led activities into formal public health strategies (Kimathi et al., 2021). The peer-to-peer model was identified as a key factor for effectiveness, as it fostered trust and relatability that traditional top-down campaigns often lack.

Scalability: The potential for scalability was evident in digital innovations, particularly those emerging from university incubators and youth forums. Zhou et al. (2023) highlighted several digital One Health platforms in Asia, initially designed by students for local use, that were successfully scaled to a regional or national level. This scalability was primarily due to their technological adaptability, open-access design, and, crucially, the backing of academic and government institutions that provided technical mentorship, funding, and policy support. These cases illustrate that scalability is not an automatic feature of innovation but is actively enabled by a supportive ecosystem.

Objective 3 Results: Enablers and Barriers to Youth Engagement

The review identified a consistent set of factors that either enable or hinder successful youth engagement in One Health innovation.

Key Enablers:

Capacity Development: Access to specialized training and sustained mentorship from experienced professionals was frequently cited as a critical enabler (FAO, 2022). These programs built technical competence and provided guidance on navigating project implementation challenges.

Resources: Consistent access to funding—beyond short-term seed grants—and digital infrastructure (e.g., reliable internet, software) were foundational pillars that allowed ideas to move from pilot phases to sustainable programs.

Policy Environment: A supportive policy environment that explicitly recognizes and invites youth participation was a significant catalyst for innovation and integration.

Persistent Barriers:

Systemic Exclusion: A major barrier is the limited representation of youth in policy-making and decision-making platforms (Nyandiko et al., 2020). This exclusion marginalizes their voices in agenda-setting and resource allocation.

Resource Constraints: Despite some available funding, financial support is often inadequate, short-term, and highly competitive, making long-term planning and sustainability nearly impossible for many youth-led groups.

Socio-Cultural and Institutional Hurdles: Intergenerational mistrust and institutional resistance sometimes lead to youth initiatives being perceived as lacking legitimacy or experience. Furthermore, rigid bureaucratic structures within government and international agencies can stifle the agile and adaptive nature of youth-led innovation.

DISCUSSION

Alignment of Youth Innovations with One Health Goals

Youth-led innovations have increasingly embodied the principles of the One Health framework by promoting the interconnectedness of human, animal, and environmental health. Mogaka et al. (2020) highlight how community-based surveillance led by youth in East Africa has enabled early detection and reporting of zoonotic diseases, thus contributing to timely interventions. These initiatives often utilize mobile and digital tools that are accessible and familiar to younger populations, enhancing communication and data dissemination at the grassroots level.

Comparable studies from Southeast Asia affirm similar patterns. For example, Nguyen et al. (2021) found that youth networks in Vietnam contributed significantly to COVID-19 surveillance through digital apps and community awareness campaigns. These actions reflect a growing recognition of youth as not just passive beneficiaries but active stakeholders in public health systems.

However, despite their contributions, youth-led efforts are often fragmented and lack systemic support. Biddle et al. (2019) argue that while youth innovations align with One Health in principle, integration into national or regional One Health policies remains limited. There is a pressing need to institutionalize youth engagement within formal frameworks to ensure sustainability and coherence with broader health goals.

Effectiveness and Scalability of Youth-Led Innovations

Scalability of youth-driven health innovations is a key indicator of their effectiveness and long-term relevance. Kimathi et al. (2021) report that the AMR Guardians program in Kenya, which utilized peer-to-peer health promotion among youth, successfully scaled to multiple counties due to strong collaboration with county health departments and strategic use of local languages and cultural norms. This aligns with findings by Zhou et al. (2023), who noted that university-supported youth digital platforms in China and India expanded nationally when backed by institutional funding and technical mentorship.

Conversely, grassroots initiatives that lacked institutional linkages often stagnated. A study by Gonsalves et al. (2022) on youth-led sexual and reproductive health projects in Southern Africa observed that without government endorsement or alignment with national strategies, most projects failed to secure follow-on funding or policy recognition.

These findings suggest that scalability is not solely dependent on innovation quality, but also on the contextual adaptability, government partnerships, and technological infrastructure that underpin the intervention. Moreover, youth initiatives that demonstrate flexibility—by integrating both indigenous knowledge and scientific approaches—appear to achieve broader acceptance and replication (Tambo et al., 2018).

Enablers and Barriers to Youth Empowerment in Health Innovation

While mentorship, training, and funding are widely acknowledged as essential enablers (FAO, 2022), youth empowerment must be viewed through a systemic lens. Nyandiko et al. (2020) argue that entrenched institutional hierarchies and intergenerational mistrust often undermine youth leadership in innovation spaces. These findings resonate with those of Lwanga et al. (2021), who describe how youth in Uganda often face exclusion from policy dialogues due to age-based discrimination and lack of representation in formal structures.

Importantly, even when support structures exist, they are frequently short-term or donor-driven, which compromises sustainability. For example, Van Eerdewijk et al. (2019) caution that empowerment efforts should move beyond token participation towards building agency, transforming institutional norms, and promoting youth co-ownership of programs.

Cross-sectoral and intergenerational collaboration is therefore critical. As suggested by Patel et al. (2020), successful youth engagement in global health requires deliberate inclusion mechanisms, such as youth quotas on decision-making bodies, intergenerational co-mentorship models, and legislative frameworks that protect youth interests.

In essence, true empowerment necessitates a shift from programmatic support to structural inclusion—ensuring youth are not only implementers but also designers and decision-makers in health innovation ecosystems.

Community-centered design and overcoming adoption barriers

A key strength of youth-led innovations, as evidenced in this review, is their inherent proximity to and understanding of local community needs, which directly addresses the critique of top-down, system-oriented approaches. Initiatives like "My Health, My Right" (Wanyoike et al., 2019) succeeded not only because of their technology but because they were designed with and for their users, ensuring cultural relevance and overcoming barriers of digital literacy. Youth innovators often serve as trusted peers, facilitating dialogue and building trust around sensitive issues like data privacy and health practices—factors critical for real-world adoption that are frequently absent in externally designed interventions. This community-embedded approach ensures that solutions are not only technologically sound but also socially sustainable.

CONCLUSION

Youth are increasingly recognized as pivotal agents of change in advancing global health through the One Health paradigm—which integrates human, animal, and environmental health. This literature review affirms that youth-led innovations are not only imaginative and technologically adept but are also deeply rooted in community realities, making them highly responsive to local health needs.

From digital disease surveillance platforms to peer-led antimicrobial resistance campaigns and climate-smart agricultural practices, young people are redefining the landscape of health interventions in ways that are participatory, inclusive, and sustainable. These initiatives often leverage grassroots knowledge, peer networks, and digital technologies, enabling real-time responsiveness and broader engagement—particularly in underserved and remote areas.

However, for these innovations to translate into lasting health system improvements, structural support is indispensable. This includes:

Policy integration, to formalize youth roles in health governance; Sustained mentorship and funding, to enable scalability and long-term viability; Cross-sectoral collaboration, to bridge gaps between health, education, technology, and environmental management.

Investing in youth-led approaches within the One Health framework is not merely an act of empowerment—it is a strategic imperative for building resilient and adaptive health ecosystems capable of addressing 21st-century challenges, from emerging zoonoses to climate-induced health threats.

The future of One Health will depend significantly on how well we nurture and institutionalize the creativity, leadership, and local insight of young people today.

RECOMMENDATIONS

Objective 1: Establish National and Regional Hubs for Youth-Led One Health Innovation

Governments, academic institutions, and international organizations should collaborate to establish dedicated

youth innovation hubs at national and regional levels. These hubs should serve as incubators for youth-led ideas in disease surveillance, environmental protection, and public health education under the One Health framework.

Actionable Steps:

Map existing youth initiatives in health, agriculture, and environment to identify potential leaders and regions with high potential for impact.

Create multi-sectoral partnerships between ministries of health, education, agriculture, and environment to support integrated programming at these hubs.

Provide infrastructure and equipment such as digital labs, access to mobile reporting tools, and online knowledge repositories.

Facilitate regional knowledge exchange through annual innovation challenges, hackathons, and conferences that bring together youth from different countries (e.g., the EAC or AU levels). For instance, the "iLabAfrica" program at Strathmore University in Kenya could be replicated in Uganda, Rwanda, and Tanzania, with added One Health modules and field mentorship components.

Objective 2: Provide Sustained Funding and Mentorship Programs to Scale Effective Innovations

Youth-led innovations require not just seed funding but long-term financial support, structured mentorship, and business incubation to transition from pilot to scale. This should include mechanisms for accountability, scalability assessment, and integration with public health and veterinary systems.

Actionable Steps:

Develop youth-specific One Health funding streams within national budgets and international development partner portfolios (e.g., Global Fund, FAO, WHO, USAID).

Launch national mentorship programs pairing young innovators with experts in epidemiology, veterinary medicine, IT, and entrepreneurship.

Integrate innovation pathways into education systems, including technical and vocational education and training (TVET), to ensure youth from non-university backgrounds also benefit.

Encourage public-private partnerships (PPPs) to ensure successful youth innovations attract investment and scale beyond donor funding. For instance, the AMR Guardians program in Kenya scaled successfully due to mentorship from health professionals and consistent county-level funding support (Kimathi et al., 2021). This approach can be institutionalized across other sectors.

Incentivize co-design methodologies in funding requirements, ensuring that youth-led projects formally incorporate community feedback loops and participatory design principles from the outset to enhance usability and trust.

Objective 3: Create Inclusive Policymaking Platforms that Institutionalize Youth Participation

Youth must be given formal seats at decision-making tables at local, national, and regional levels. This requires institutional reforms that move beyond symbolic representation to genuine co-creation of policies, programs, and priorities.

Actionable Steps:

Amend national One Health strategies to include youth representation clauses—e.g., a quota or advisory role in inter-ministerial committees or task forces.

Create youth advisory boards linked to national disease surveillance units and health research councils.

Train youth in policy advocacy and legislative processes through government-civil society partnerships.

Ensure intergenerational collaboration through structured dialogues, co-mentorship, and joint program planning between senior professionals and youth leaders. For instance, in Rwanda, youth engagement in national climate policy has been institutionalized through the National Youth Council's seat in environmental policy committees. A similar approach can be applied to One Health platforms across the East African Community.

Conflict of Interest

The authors declare no conflict of interest related to this review.

Ethical Considerations

This study is based solely on a systematic review of publicly available literature and did not involve the collection of primary data from human or animal subjects. As such, ethical approval was not required. The review adhered to established ethical standards for secondary research, including accurate citation of sources, avoidance of plagiarism, and objective synthesis of findings. No confidential or personally identifiable information was accessed or reported.

Data Availability

All data generated or analyzed during this review are included in this manuscript or cited from publicly available sources.

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Felix Eling and Grace Atiang jointly conceptualized the study and designed the methodology. Felix Eling led the literature review, data analysis, and drafting of the manuscript. Grace Atiang contributed to the synthesis of findings, critical revisions, and refinement of the discussion and recommendations. Both authors collaborated on editing, approved the final version of the manuscript, and ensured alignment with the objectives of the study

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