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Review

Harnessing Medical-Bioethics Mediation to Advance One Health Governance

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Simple Summary

Health threats such as infectious diseases, antibiotic resistance, and environmental changes involve people, animals, and nature together. Because they cross many areas of society, they often lead to disagreements among farmers, veterinarians, public health officials, environmental groups, and local communities. Such disagreements can slow down disease control, weaken cooperation, and reduce trust. This article explores how medical-bioethics mediation, a method used in hospitals to help doctors and families resolve conflicts, can also help different groups work together in broader health and environmental decisions. Mediation offers a respectful and neutral space where people can express concerns, understand each other's viewpoints, and find solutions that everyone can support. Application of these skills to national planning, disease response, and environmental management, societies may reduce conflict, improve communication, and build trust across sectors. This approach can help create fairer, more effective, and more sustainable decisions that benefit both communities and the natural world.

Abstract

One Health (OH) envisions integrated governance across human, animal, and environmental systems to prevent and respond to complex health threats. Despite its global endorsement, OH implementation often falters due to institutional fragmentation, power asymmetries, and ethical tensions that erode trust and cooperation. This paper proposes the integration of medical-bioethics mediation within OH governance as a structured, relational mechanism to manage conflict, foster ethical deliberation, and strengthen trust among sectors and communities. We develop a conceptual framework to apply the mediation principles of neutrality, confidentiality, respect, and shared problem-solving- beyond clinical ethics toward multisectoral OH contexts. The framework is illustrated through domain-specific examples from zoonotic disease control, antimicrobial resistance, and environmental health. Medical-bioethics mediation can advance conflict transformation, ethical reflection, participatory decision-making, and policy alignment, thereby supporting transparent negotiation of values and institutionalized dialogue of different OH actors. Future research should pilot mediation-based governance models and assess their effects on intersectoral trust, collaborative capacity, and integrated health outcomes.

Keywords: One Health governance; medical-bioethics mediation; conflict resolution; antimicrobial resistance; zoonotic disease control; environmental stewardship; participatory decision-making

1. Introduction

The One Health paradigm calls for coordinated and equitable governance across human health, veterinary medicine, wildlife management, agriculture and environmental sectors to sustainably prevent, detect and respond to threats at the human-animal-environment interface [1–5]. One Health is now recognized as a unifying and transdisciplinary framework that mobilizes multiple sectors and communities to optimize the health of people, animals, and ecosystems through shared responsibility, communication, collaboration, and capacity building. It represents not only an epistemological framework but also a moral commitment to collective care and stewardship across species and systems. Despite increasing adoption by governments and international agencies, implementation remains hindered by fragmented governance structures, inadequate and uneven resource allocation, and weak mechanisms for cross-sectoral coordination and accountability [6]. These barriers are evident in both low-income settings, where limited institutional capacity and funding shortfalls constrain sustained implementation [7] and high-income contexts, where overlapping mandates, siloed governance, and inconsistent financing frameworks continue to impede integration and long-term collaboration [8].

Recent global outbreaks, such as H5N1 avian influenza [9], Rift Valley Fever [10] and COVID-19 [11], have exposed persistent tensions between ministries, local actors, and communities regarding the design and enforcement of disease control measures, including compensation, vaccination, culling, and mobility restrictions [6,8]. Similarly, antimicrobial resistance (AMR) initiatives continue to struggle with harmonizing antibiotic use guidelines across human and animal sectors and reconciling public health imperatives with farmers' livelihoods [12]. Comparable disputes also emerge in the environmental health domain, particularly over wildlife culling, habitat conservation, and industrial pollution, where competing interests often impede coherent policy responses [13]. These frictions are rarely technical in nature. Rather, they stem from ethical, sociopolitical, and cultural divergences, reflecting unequal power structures, governance asymmetries, and enduring distrust among sectors and stakeholders [4,6,8].

Medical-bioethics mediation emerged within clinical ethics and health-care conflict management as a structured, voluntary process that facilitates dialogue between parties in disagreement, helping them identify interests, clarify misunderstandings, and reach mutually acceptable resolutions without adjudication [14–17]. It emphasizes neutrality, confidentiality, respect, and active listening which are principles that enable moral repair and restore trust in strained relationships [18,19]. In clinical practice, mediation trains clinicians to reframe patient and family behaviour, explore multiple perspectives, and distinguish positions from underlying interests [15]. It is a voluntary, flexible, and confidential process that promotes open communication, empathy, and the preservation of relationships [20] where the mediators do not impose solutions and the parties may withdraw at any time. While traditionally applied at the bedside or within hospitals to manage disputes between clinicians, patients, and families, its core philosophy, which is based on structured dialogue, empathy, and shared problem-solving, offers broader relevance. We propose that these principles be extended beyond the clinical setting to guide multisectoral deliberations in OH and public health governance. Applied at the population level, medical-bioethics mediation can function as a preventive and capacity-building tool that fosters equitable communication among ministries, professional groups, and communities, and mitigates polarization before crises escalate. Embedding medical-bioethics mediation within OH governance could thus reinterpret the ethics of care as collective stewardship for shared planetary health, strengthening collaborative decision-making, accountability, and resilience across the human – animal – environment interface.

This paper develops a conceptual framework for integrating medical-bioethics mediation into OH governance and illustrates its relevance through examples from zoonotic disease control, antimicrobial resistance, and environmental health.

2. Theoretical Foundations

2.1. Medical-Bioethics Mediation and the Dubler–Fisher Model

Medical-bioethics mediation draws on clinical ethics practice to address conflict through structured dialogue, and its principles translate directly to the relational challenges of One Health. Mediation emerged in the 1990s to resolve clinical ethics conflicts. The Dubler–Fisher model [14] emphasizes that mediation should foster respect, relationship repair and shared decision-making. The mediator, who is neutral, ensures that all parties are heard, and helps them reframe disputes as joint problems to be solved collaboratively. Mediation promotes open communication, empathy, confidentiality, and can preserve relationships and prevent lengthy litigation [21,22]. Clinicians can be taught to view conflicts from multiple perspectives and to distinguish positions from underlying interests to facilitate resolution [15]. We advocate that the skills of active listening, reframing and identifying shared values are directly transferable to intersectoral OH conflicts, where parties often misunderstand each other’s motivations. In this way, the Dubler–Fisher approach provides a relational method that complements, rather than replaces, existing OH coordination platforms by focusing on repairing trust and redistributing voice.

2.2. Deliberative Democracy

Deliberative democratic theory provides a normative grounding for why OH governance requires spaces for reasoned, inclusive dialogue, that is, spaces that mediation can help structure and safeguard. Deliberative democracy theory supports mediated dialogue as a vehicle for reasoned consensus in pluralistic systems. A review of the literature on deliberative democracy and shared decision-making in healthcare, identified both structural challenges (i.e., professional hierarchies, informational asymmetries, and time constraints) and promising developments, including clearer policy frameworks, training in shared decision-making, and broader public engagement mechanisms [23]. Building on the political theory of deliberation, the deliberative model reconceptualizes democracy as a process grounded in reasoned discussion among free and equal citizens, rather than mere voting or aggregation of preferences [24]. Such deliberative approaches have gained prominence, within healthcare and public health governance, as they enable informed, two-way interaction between decision makers and affected publics, promoting legitimacy, transparency, and social learning [25]. Inclusive deliberation aligns closely with the OH paradigm’s requirement for cross-sectoral negotiation and reflexivity. Medical-bioethics mediation, as a structured deliberative process, can operationalize these democratic principles by ensuring balanced information exchange, equitable participation, and procedurally fair outcomes that will reflect collective reasoning rather than adversarial compromise. This distinctively relational function addresses gaps in existing OH dialogue structures, which often lack mechanisms to correct power imbalances or enable trust-building across sectors.

2.3. Relational Autonomy and Ethics of Care

Relational autonomy and care ethics highlight the interdependence at the core of OH systems and explain why a mediating process grounded in empathy, stewardship, and mutual responsibility is essential. Traditional bioethics emphasizes individual autonomy and negative liberty. Relational autonomy, which is grounded in the ethics of care, reframes autonomy as the positive freedom to act and decide within relationships of mutual dependence. It demands engagement from professionals and institutions to support and co-shape the values of patients and communities. Empirical work in clinical ethics shows that such relational reasoning involves balancing respect for patient preferences with moral responsibility for vulnerable persons, acknowledging dignity, and exercising patience in shared deliberation [26]. Within OH, this perspective extends beyond human relationships: it situates decision making within the interdependence of humans, animals, and ecosystems at the population level. Here, care becomes synonymous with stewardship, a shared moral responsibility for sustaining

the conditions of collective well-being [27,28]. Medical-bioethics mediation, scaled at the population level, is anchored in this ethic and fosters responsive governance, where compassion and accountability guide decisions which are co-produced rather than imposed through hierarchical, top-down control.

Together, these theoretical foundations frame medical-bioethics mediation as both a normative and operational bridge between ethical principles and multisectoral action in OH governance. They show how technical coordination alone is insufficient, and why a relational approach is required to address mistrust, power asymmetries, and value conflict across sectors. With the reframe of conflict not as failure but as an opportunity for relational learning, moral repair, and co-creation, mediation strengthens the ethical resilience of OH systems and supports the development of health governance architectures that are equitable, adaptive, and grounded in shared stewardship.

3. Rationale for Integrating Medical-Bioethics Mediation into One Health

3.1. Management of Diverse Conflicts

Multi-stakeholder OH initiatives frequently confront domain-specific conflicts that hinder cooperation. In zoonotic disease control, farmers, veterinarians, and public health authorities debate culling versus compensation or vaccination mandates. These debates reflect deeper asymmetries in power, knowledge, and perceived risk and are compounded by institutional fragmentation and differing accountability frameworks across sectors [29]. At their root, such tensions are failures of relational care, breakdowns in mutual understanding and stewardship among interdependent actors

Participatory workshops in Burkina Faso's anthrax surveillance initiative exemplify how inclusive dialogue can align epidemiological goals with livelihood priorities, converting adversarial debates into co-developed plans that reinforce trust and shared responsibility. [30]. Importantly, conflicts rarely remain contained within a single domain; disputes over culling or vaccination often intersect with concerns about market disruption, antimicrobial use, and ecological spillover, illustrating how sectoral frictions cascade across the wider OH system. Such examples underscore the need for a governance modality capable of transforming friction into dialogue—a role that medical-bioethics mediation is uniquely positioned to fulfil [31]. Comparable tensions underlie antimicrobial resistance governance, where health protection must be balanced with social and economic realities. Coordinating antibiotic stewardship across human, animal, and environmental sectors requires technical alignment, shared surveillance frameworks and equitable governance mechanisms. Global evidence shows that antimicrobial resistance is driven not merely by drug use but by complex interconnections among human behavior, agricultural practices, and environmental conditions, underscoring the need for integrated One Health governance [32]. Large-scale analyses of the global resistome further demonstrate that AMR patterns are strongly influenced by socioeconomic and environmental determinants, including sanitation, infrastructure, and health system capacity, rather than by antimicrobial consumption alone [33]. These findings emphasize the need to harmonize antibiotic use guidelines across sectors, a task that depends on sustained negotiation, transparent data sharing, and consensus-building mechanisms that align public health imperatives with agricultural, environmental, and economic priorities. They also demonstrate how governance failures in one sector, such as unregulated agricultural antibiotic use, can trigger downstream ecological effects, including contamination of watersheds and soil microbiomes, thereby linking AMR disputes to broader environmental stewardship challenges. For instance, in India, efforts to reconcile veterinary and clinical antibiotic policies have highlighted the importance of iterative cross-sectoral dialogue and institutional learning to achieve durable policy coherence (Chandy et al., 2017).

Finally, environmental health conflicts, from wildlife management to land use and pollution, often expose tensions between scientific authorities and indigenous or local communities whose stewardship knowledge and relational worldviews remain undervalued within dominant governance frameworks. These tensions reflect asymmetries of power, divergent epistemologies, and

the historical marginalization of Indigenous institutions in environmental decision-making. As shown in Australia, the documentation and application of indigenous biocultural knowledge have illuminated both the ethical and practical challenges of integrating traditional ecological insights into contemporary ecosystem governance [34]. The undervaluation of IBK not only constrains equitable participation but also diminishes opportunities for more holistic socio-ecological management rooted in place-based experience. Hence, there is a need for equitable bridging of knowledge systems, through mobilization, translation, negotiation, and synthesis, to cultivate mutual respect, trust, and co-produced knowledge that is legitimate, contextually grounded, and actionable across epistemic boundaries [34,35]. Integration of indigenous and local knowledge into OH and sustainability governance is therefore an ethical imperative and at the same time a pragmatic pathway toward inclusive, adaptive, and resilient environmental stewardship.

Together, these examples reveal that OH governance demands mechanisms capable of mediating ethical disagreement, redistributing voice, and fostering shared accountability, particularly in situations where disputes transcend sectoral boundaries and generate cascading effects across human, animal, and ecosystem health. These are precisely the dimensions that medical-bioethics mediation is uniquely designed to support.

3.2. Ethical and Governance Gaps

Managing these conflicts requires ethical frameworks that integrate human, animal, and environmental interests within a shared moral space. Principles such as autonomy, beneficence, non-maleficence, justice, solidarity, precaution, and intergenerational equity are fundamental to OH governance across zoonotic, environmental, and antimicrobial resistance contexts [36,37]. However, their operationalization across sectors remains inconsistent. Procedural values, such as transparency, deliberation, and participation, are seldom institutionalized, and affected communities are rarely co-designers of interventions [38]. Comparative assessments across Africa and Asia reveal that weak governance, insufficient collaboration, and poor communication between human, animal, and environmental health authorities continue to hinder OH implementation [36,39]. The resulting ethical and relational vacuum underscores the need for structured deliberation mechanisms capable of mediating conflicting values and rebuilding trust across sectors [40]. In this sense, ethical governance in OH is not just compliance - based but deeply relational and requires dialogue and ongoing stewardship to align diverse interests within a common moral horizon.

3.3. Mediation as a Bridge

Transdisciplinary policy analysis emphasizes that identifying and understanding the often-conflicting interests, preferences, and values of multiple actors is a prerequisite for effective negotiation and collective action [41,42]. Analytical tools such as multicriteria decision analysis can structure stakeholder preferences but remain insufficient when dialogue and trust are absent. Transdisciplinary OH foster co-leadership, iterative engagement, and conflict transformation across disciplinary and institutional boundaries[43].

The European Centre for Disease Prevention and Control [44] underscores that effective One Health implementation depends on shared understanding of intersectoral linkages and the trust required for rapid, coordinated responses to complex zoonotic and environmental crises. Coordination failures often arise from insufficient institutionalized communication and weak relational accountability between sectors. These challenges highlight that OH governance is not merely a technical or administrative task but a relational one, requiring continuous negotiation of values, mandates, and responsibilities across human, animal, and environmental domains.

Medical-bioethics mediation operationalizes these insights by providing a structured, interest-based process for dialogue and resolution that prioritizes respect, transparency, and collaboration [27,45]. Unlike existing participatory OH tools, like stakeholder consultations, risk communication platforms, or multisectoral working groups, mediation introduces a neutral third party, explicit confidentiality protections, and a formalized process for reframing disputes, thereby addressing

power asymmetries and mistrust that technical coordination mechanisms often leave unresolved. As a deliberative mechanism, mediation complements technical instruments such as risk assessment and surveillance by addressing the relational and normative dimensions of conflict that often undermine cooperation across sectors. Thus, mediation facilitates ethical reflection in practice and transforms stakeholder interactions from adversarial negotiation toward mutual understanding and shared problem solving.

Medical-bioethics mediation functions primarily as a means to achieve ethical governance rather than a standalone governance model. Its value lies in embedding structured deliberation and relational repair within existing OH institutions rather than replacing them. The embedment of medical-bioethics mediation within OH governance frameworks can thus translate ethical principles, autonomy, justice, solidarity, and participation, into operational practice. Institutionalization of deliberation, transparency, and equitable power sharing through mediation offers a pragmatic route to implement the normative commitments embedded in global One Health strategies. Medical-bioethics mediation within OH bridges the ethical and governance gaps identified earlier and transforms abstract commitments into tangible mechanisms for inclusive decision-making, trust repair, and the co-production of sustainable health futures.

4. Mechanisms of Action

4.1. Conflict Transformation

Conflict transformation does not just resolve disputes but changes the relationships and structures that generate them. Medical-bioethics mediation shifts adversarial dynamics into collaborative problem-solving. In OH settings, mediators can help stakeholders articulate underlying concerns and values (e.g., livelihood, public health, animal welfare, cultural identity) rather than fixed positions (e.g., “no culling”) and reframe issues from zero-sum to shared interests (e.g., disease control benefits everyone). In this way, medical-bioethics mediation can transform distrust into mutual understanding and build durable partnerships. The example of participatory planning in Burkina Faso shows that inclusive dialogue enhances trust and collaborative action [30]. Transdisciplinary policy frameworks likewise stress that understanding conflicting interests is a prerequisite to negotiation and collective action [2].

4.2. Ethical Deliberation Across Species

The OH ethical matrix encompasses human, animal and environmental ethics [46]. Medical-bioethics mediation provides a space for ethical deliberation that integrates these plural values and ensures that the principles of beneficence, non-maleficence, justice and environmental responsibility are considered, and that stakeholders discuss trade-offs transparently. Relational autonomy encourages participants to acknowledge the vulnerability and interdependence of all beings [26]. The extension of the ethics of care beyond human relationships situates “caring for” as a form of collective stewardship and implies an ongoing moral commitment to safeguard shared ecological systems. Through joint ethical deliberation, parties may accept precautionary measures or compensation schemes that balance human and animal interests [27]. Mediation also enables reflection on intergenerational equity and ecological stewardship, which are often neglected in technical risk assessments.

4.3. Participatory Decision-Making

One Health interventions often suffer from top-down implementation while participatory decision-making that increases legitimacy, compliance and sustainability is often absent. The ECDC expert consultation emphasized that community engagement should follow a model that adapts to social and environmental contexts and builds mutual understanding [44]. In this context, medical-bioethics mediation operationalizes participation by convening all affected parties (i.e., farmers,

pastoralists, industry representatives, local leaders, and government agencies) within a structured, neutral process. Neutral facilitators ensure equitable speaking time, clarify scientific information and support joint drafting of agreements. This process embodies deliberative democracy's requirements for balanced information and equal consideration of views [23]. A participatory design of One Health surveillance systems for antimicrobial resistance in Vietnam and *Salmonella* in France showed that structured stakeholder dialogue fostered mutual understanding and joint ownership of surveillance goals [47]. Participatory and mediated dialogue can transform fragmented, sector-based governance into shared stewardship for collective health security.

4.4. Trust Building

Trust must be the cornerstone of effective OH surveillance, outbreak response and policy implementation. Systematic reviews identify ineffective collaboration, poor communication and lack of community engagement as major barriers to OH implementation [7]. The OH Joint Plan of Action notes that poor communication and lack of cooperation between stakeholders impede cross-sector work [36]. Participatory processes, transdisciplinary approaches and ECDC consultations all emphasize trust building. Medical-bioethics mediation is a tool that fosters trust by ensuring confidentiality, respecting cultural differences and demonstrating impartiality [14]. It gives stakeholders voice and control and hence reduces perceptions of power imbalances and increases willingness to share data or comply with interventions. Trust built through mediation also supports future collaborations, creating networks beyond hierarchical chains.

4.5. Policy Harmonization and Institutional Design

Policy disharmony across sectors remains a major challenge in OH governance. Weak coordination mechanisms and unclear delineation of sectoral mandates further hinder implementation, especially in developing countries [7]. Experience from cross-sectoral policy platforms shows that negotiation and iterative dialogue are essential to reconcile conflicting priorities and regulatory cultures [27]. Medical-bioethics mediation can facilitate such negotiations among ministries of health, agriculture, and environment to harmonize policies and align incentives. Transdisciplinary approaches emphasize co-leadership and the joint definition of objectives [2]. Medical-bioethics mediation can also be formalized within national OH platforms or interministerial committees to support the drafting of memoranda of understanding, compensation schemes, or joint surveillance protocols. Incorporation of medical-bioethics mediation within these structures institutionalizes dialogue and shared accountability and transforms ad hoc coordination into a culture of ethical co-stewardship. Ultimately, the legislative or procedural recognition of medical-bioethics mediation signals a political commitment to fairness, transparency, and durable cooperation.

5. Potential Applications

5.1. Outbreak and Emergency Governance

During highly pathogenic avian influenza (H5N1) outbreaks, culling of poultry triggered intense disputes over compensation, livelihood loss, and food security. Structured mediation among veterinary authorities, public health agencies, poultry farmers, and local communities could have clarified scientific evidence, addressed economic concerns, and co-designed compensation mechanisms. The ECDC consultation emphasized, cross-sectoral preparedness and mutual understanding of intersectoral linkages are essential for effective response [44]. Trained mediators within national rapid-response teams would enable real-time negotiation of quarantine measures, vaccination priorities, and resource allocation, while ensuring transparent risk communication and informed dialogue. Such mediators could be institutionally anchored by interfacing directly with existing national One Health committees, Crisis Coordination Centres, and emergency operations

platforms, to provide a neutral relational function that complements their technical and administrative mandates. This positioning would allow mediation to be activated rapidly during crises while remaining integrated within established decision-making structures.

At the international level, the avian influenza experience also reveals how institutional frameworks shape cooperation and conflict. The emergence of the One World, One Health (OWOH) policy paradigm reflected efforts by the WHO, FAO and WOAHA to reconcile overlapping mandates and reduce inter-agency tensions [48] through a shared cognitive frame that aimed to legitimize collaboration while at the same time maintain authority across sectors. This is essentially a process that mirrors the mediating function at the international scale. However, zoonotic crises inevitably expose conflicting narratives and value systems embedded in different disciplines and governance levels [49]. OH approaches, to remain adaptive and legitimate, should embrace such conflicts as opportunities for constructive dialogue rather than impose technocratic consensus. Medical-bioethics mediation offers precisely this capacity to surface divergent perspectives, negotiate trade-offs transparently, and transform contested outbreaks into processes of shared learning and co-governance. Equally important, mediation can help address the moral injury and relational harm experienced by affected communities (i.e., farmers facing livelihood collapse, workers confronting stigma, or households subject to abrupt mobility restrictions) by restoring voice, dignity, and recognition within crisis decision making. In this way, mediation contributes not only to procedural efficiency but also to ethical repair and long-term resilience.

5.2. Antimicrobial Resistance and Health-System Integration

Antimicrobial resistance (AMR) is a global health crisis that threatens the effectiveness of treatment across human, animal, and environmental domains [32] and vividly illustrates the interdependence of these sectors. The excessive antimicrobial use in agriculture, livestock, and human medicine coupled with poor infection control, contaminated waste, and environmental dissemination has accelerated the spread of resistance [50]. The fight against AMR thus requires an integrated, multisectoral One Health response. National AMR committees unite representatives from health, agriculture, environment, and finance ministries, yet divergent mandates and institutional cultures often lead to fragmented action. An Indian scoping review highlights the need for harmonized guidelines and convergence of policies across human and animal sectors [12]. Mediators can convene regular inter-ministerial dialogues that surface tensions over stewardship duties, economic costs, or trade implications and guide participants toward joint policies on antibiotic classification, surveillance, and enforcement.

Medical-bioethics mediation could also extend beyond government to align pharmaceutical industries, veterinarians, and consumers on incentives for non-antibiotic alternatives, or facilitate farmer-regulator dialogues to co-design training and biosecurity measures suited to local realities. In India, widespread unregulated antimicrobial use by farmers, driven by limited knowledge and weak extension services, has been identified as a systemic gap [12]. Structured mediation in such contexts builds trust, links behavioural change to socioeconomic incentives and turns fragmented governance into adaptive learning.

Ultimately, mediation could reinforce the connective tissue of One Health AMR governance as it translates science into shared commitments, bridge disciplines, and sustain collaboration to balance innovation, stewardship, and equity in antimicrobial use.

5.3. Environmental and Socio-Ecological Health

Environmental disputes often pit conservation priorities against community livelihoods and industrial interests. One Health-oriented mediation offers a structured way to reconcile these competing claims through inclusive, evidence-informed dialogue. In cases of conflicts over pesticide use, vector control, water quality, or land conversion, mediators with ecological and health expertise can facilitate identification of co-benefits that simultaneously advance biodiversity protection and disease prevention.

The One Health assessment of Ethiopia's Chebera Churchura National Park illustrates these dynamics. Expansion, deforestation, and illegal logging have degraded habitats and intensified human-wildlife contact, increasing the risks of malaria, trypanosomiasis, and other neglected diseases in nearby communities [51]. Fragmented coordination among environment, health, and agriculture sectors underscored the need for multisectoral partnerships and governance reform, a process that medical-bioethics mediation is specifically designed to sustain. Facilitated dialogue among park authorities, communities, and public-health agencies can co-design livelihood alternatives, equitable compensation, and joint surveillance programs. When grounded in ethical principles of respect, solidarity, and stewardship, such mediation transforms environmental conflict into collaboration. It links biodiversity conservation with health equity and ecological integrity, converting contestation into a process of learning and co-production that strengthens resilience and secures intergenerational responsibility.

6. Illustrative Case Study: Mediated Response to Rift Valley Fever (Conceptual)

Rift Valley Fever (RVF) outbreaks in East Africa present complex challenges: human health authorities prioritize mosquito control to prevent human cases, veterinary authorities order livestock vaccination to protect animals and limit viral amplification, and pastoralists worry that vaccination and movement controls will lead to unpaid livestock deaths and market disruption [52,53]. In a mediated OH process, neutral facilitators trained in public health, veterinary science, and conflict resolution convene representatives from ministries of health, agriculture, and environment, pastoralist elders, women's groups, and NGOs. The mediator begins by clarifying scientific evidence on RVF transmission and articulating the interests of each party. Pastoralists express concerns about compensation and trust while authorities explain regulatory mandates. Guided discussion reveals shared goals of preserving human lives, protecting livestock, and maintaining livelihoods and the parties jointly design a strategy that integrates vector control (e.g., larviciding, community education) with phased vaccination and establishes a transparent compensation mechanism, potentially backed by a regional contingency fund. Elders agree to support vaccination, ministries commit to timely payments, and all actors sign a memorandum of understanding. Follow-up meetings monitor implementation and address emerging issues. Such a process illustrates how mediation transforms adversarial positions into collaborative action.

7. Conclusions

The integration of medical-bioethics mediation into OH governance provides a concrete mechanism to translate ethical principles into operational practice. The greatest challenges of fragmented authority, mistrust, and value conflicts are not purely technical but relational and moral. Medical-bioethics mediation addresses these dimensions directly by institutionalizing dialogue, transparency, and respect across human, animal, and environmental domains. Through facilitated engagement, disagreements become opportunities for ethical reflection, mutual learning, and shared stewardship. This approach fosters decisions that are legitimate, adaptive, and morally grounded, advancing OH from a multidisciplinary aspiration to a lived practice of collective responsibility.

Future research should design and evaluate mediation-based models integrated into existing OH coordination mechanisms to assess their effects on trust, collaboration, and equitable outcomes. Such work could strengthen preparedness and policy coherence while reaffirming the moral foundations of One Health: dialogue, empathy, and shared care for the interdependent community of life.

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Abbreviations

The following abbreviations are used in this manuscript:

OH One Health

References

1. Destoumieux-Garzón, D.; Mavingui, P.; Boetsch, G.; Boissier, J.; Darriet, F.; Duboz, P.; Fritsch, C.; Giraudoux, P.; Le Roux, F.; Morand, S.; et al. The One Health Concept: 10 Years Old and a Long Road Ahead. *Front. Vet. Sci.* **2018**, *5*, 14, doi:10.3389/fvets.2018.00014.
2. Hitziger, M.; Esposito, R.; Canali, M.; Aragrande, M.; Häsler, B.; Rüegg, S.R. Knowledge Integration in One Health Policy Formulation, Implementation and Evaluation. *Bull World Health Organ* **2018**, *96*, 211–218, doi:10.2471/BLT.17.202705.
3. Mackenzie, J.S.; Jeggo, M. The One Health Approach—Why Is It So Important? *TropicalMed* **2019**, *4*, 88, doi:10.3390/tropicalmed4020088.
4. One Health High-Level Expert Panel (OHHLEP); Adisasmito, W.B.; Almuhairi, S.; Behraves, C.B.; Bilivogui, P.; Bukachi, S.A.; Casas, N.; Cedié Becerra, N.; Charron, D.F.; Chaudhary, A.; et al. One Health: A New Definition for a Sustainable and Healthy Future. *PLoS Pathog* **2022**, *18*, e1010537, doi:10.1371/journal.ppat.1010537.
5. Zinsstag, J.; Schelling, E.; Waltner-Toews, D.; Tanner, M. From “One Medicine” to “One Health” and Systemic Approaches to Health and Well-Being. *Preventive Veterinary Medicine* **2011**, *101*, 148–156, doi:10.1016/j.prevetmed.2010.07.003.
6. Elnaïem, A.; Mohamed-Ahmed, O.; Zumla, A.; Mécaskey, J.; Charron, N.; Abakar, M.F.; Raji, T.; Bahalim, A.; Manikam, L.; Risk, O.; et al. Global and Regional Governance of One Health and Implications for Global Health Security. *The Lancet* **2023**, *401*, 688–704, doi:10.1016/S0140-6736(22)01597-5.
7. Yopa, D.S.; Massom, D.M.; Kiki, G.M.; Sophie, R.W.; Fasine, S.; Thiam, O.; Zinaba, L.; Ngangue, P. Barriers and Enablers to the Implementation of One Health Strategies in Developing Countries: A Systematic Review. *Front Public Health* **2023**, *11*, 1252428, doi:10.3389/fpubh.2023.1252428.
8. Faijue, D.D.; Segui, A.O.; Shringarpure, K.; Razavi, A.; Hasan, N.; Dar, O.; Manikam, L. Constructing a One Health Governance Architecture: A Systematic Review and Analysis of Governance Mechanisms for One Health. *European Journal of Public Health* **2024**, *34*, 1086–1094, doi:10.1093/eurpub/ckae124.
9. Koopmans, M.P.G.; Barton Behraves, C.; Cunningham, A.A.; Adisasmito, W.B.; Almuhairi, S.; Bilivogui, P.; Bukachi, S.A.; Casas, N.; Cedié Becerra, N.; Charron, D.F.; et al. The Panzootic Spread of Highly Pathogenic Avian Influenza H5N1 Sublineage 2.3.4.4b: A Critical Appraisal of One Health Preparedness and Prevention. *The Lancet Infectious Diseases* **2024**, *24*, e774–e781, doi:10.1016/S1473-3099(24)00438-9.
10. Ishema, L.; Colombe, S.; Ndayisenga, F.; Uwibambe, E.; Van Damme, E.; Meudec, M.; Rwagasore, E.; Mugwaneza, D.; Van Bortel, W.; Shyaka, A. One Health Investigation and Response to a Nationwide

- Outbreak of Rift Valley Fever in Rwanda – March to December 2022. *One Health* **2024**, *19*, 100854, doi:10.1016/j.onehlt.2024.100854.
11. Amuasi, J.H.; Walzer, C.; Heymann, D.; Carabin, H.; Huong, L.T.; Haines, A.; Winkler, A.S. Calling for a COVID-19 One Health Research Coalition. *The Lancet* **2020**, *395*, 1543–1544, doi:10.1016/S0140-6736(20)31028-X.
 12. Chakraborty, D.; Debnath, F.; Giri, S.; Saha, S.; Pyne, S.; Chakraverty, R.; Majumdar, A.; Deb, A.K.; Bhatia, R.; Dutta, S. Contribution of Veterinary Sector to Antimicrobial Resistance in One Health Compendium: An Insight from Available Indian Evidence. *Front Vet Sci* **2024**, *11*, 1411160, doi:10.3389/fvets.2024.1411160.
 13. Gebreyes, W.A.; Dupouy-Camet, J.; Newport, M.J.; Oliveira, C.J.B.; Schlesinger, L.S.; Saif, Y.M.; Kariuki, S.; Saif, L.J.; Saville, W.; Wittum, T.; et al. The Global One Health Paradigm: Challenges and Opportunities for Tackling Infectious Diseases at the Human, Animal, and Environment Interface in Low-Resource Settings. *PLoS Negl Trop Dis* **2014**, *8*, e3257, doi:10.1371/journal.pntd.0003257.
 14. Dubler, N.N.; Liebman, C.B. *Bioethics Mediation: A Guide to Shaping Shared Solutions*; Vanderbilt University Press, 2011; ISBN 0-8265-1773-0.
 15. Fiester, A.; Stites, S. Using a Mediator’s Toolbox: Reducing Clinical Conflict by Learning to Reconceive the “Difficult” Patient or Family. *MedEdPORTAL* **2023**, *19*, 11324, doi:10.15766/mep_2374-8265.11324.
 16. Meller, S.; Barclay, S. Mediation: An Approach to Intractable Disputes between Parents and Paediatricians. *Arch Dis Child* **2011**, *96*, 619–621, doi:10.1136/adc.2010.191833.
 17. Wilkinson, D.; Barclay, S.; Savulescu, J. Disagreement, Mediation, Arbitration: Resolving Disputes about Medical Treatment. *The Lancet* **2018**, *391*, 2302–2305, doi:10.1016/S0140-6736(18)31220-0.
 18. Bush, R.A.B.; Folger, J.P. *The Promise of Mediation: The Transformative Approach to Conflict*; John Wiley & Sons, 2004; ISBN 0-7879-7483-8.
 19. Fiester, A. Bioethics Mediation & the End of Clinical Ethics as We Know It. *Cardozo J. Conflict Resol.* **2013**, *15*, 501.
 20. Dimitrov, K.; Miteva-Katrandzhieva, T. Mediation in Healthcare: Enhancing Conflict Resolution Between Patients and Physicians Beyond the Courtroom. *Cureus* **2024**, *16*, e75487, doi:10.7759/cureus.75487.
 21. Lee, D.W.H.; Lai, P.B.S. The Practice of Mediation to Resolve Clinical, Bioethical, and Medical Malpractice Disputes. *Hong Kong Med J* **2015**, *21*, 560–564, doi:10.12809/hkmj154615.
 22. Lindsey, J.; Doyle, M.; Wazynska-Finck, K. Navigating Conflict: The Role of Mediation in Healthcare Disputes. *Clinical Ethics* **2024**, *19*, 26–34, doi:10.1177/14777509231196699.
 23. Safaei, J. Deliberative Democracy in Health Care: Current Challenges and Future Prospects. *J Healthc Leadersh* **2015**, *7*, 123–136, doi:10.2147/JHL.S70021.
 24. Dryzek, J.S. *Deliberative Democracy and beyond: Liberals, Critics, Contestations*; OUP Oxford, 2002; ISBN 0-19-925043-X.
 25. Abelson, J.; Forest, P.-G.; Eyles, J.; Smith, P.; Martin, E.; Gauvin, F.-P. Deliberations about Deliberative Methods: Issues in the Design and Evaluation of Public Participation Processes. *Social Science & Medicine* **2003**, *57*, 239–251, doi:10.1016/S0277-9536(02)00343-X.
 26. Heidenreich, K.; Bremer, A.; Materstvedt, L.J.; Tidefelt, U.; Svantesson, M. Relational Autonomy in the Care of the Vulnerable: Health Care Professionals’ Reasoning in Moral Case Deliberation (MCD). *Med Health Care Philos* **2018**, *21*, 467–477, doi:10.1007/s11019-017-9818-6.
 27. Degeling, C.; Johnson, J.; Kerridge, I.; Wilson, A.; Ward, M.; Stewart, C.; Gilbert, G. Implementing a One Health Approach to Emerging Infectious Disease: Reflections on the Socio-Political, Ethical and Legal Dimensions. *BMC Public Health* **2015**, *15*, 1307, doi:10.1186/s12889-015-2617-1.

28. Tronto, J.C. *Moral Boundaries: A Political Argument for an Ethic of Care*; 1st ed.; Routledge, 2020; ISBN 978-1-003-07067-2.
29. Okello, A.; Welburn, S.; Smith, J. Crossing Institutional Boundaries: Mapping the Policy Process for Improved Control of Endemic and Neglected Zoonoses in Sub-Saharan Africa. *Health Policy and Planning* **2015**, *30*, 804–812, doi:10.1093/heapol/czu059.
30. Nana, S.D.; Duboz, R.; Diagbouga, P.S.; Hendriks, P.; Bordier, M. A Participatory Approach to Move towards a One Health Surveillance System for Anthrax in Burkina Faso. *PLoS One* **2024**, *19*, e0304872, doi:10.1371/journal.pone.0304872.
31. Jacobsen, K.H.; Aguirre, A.A.; Bailey, C.L.; Baranova, A.V.; Crooks, A.T.; Croitoru, A.; Delamater, P.L.; Gupta, J.; Kehn-Hall, K.; Narayanan, A.; et al. Lessons from the Ebola Outbreak: Action Items for Emerging Infectious Disease Preparedness and Response. *Ecohealth* **2016**, *13*, 200–212, doi:10.1007/s10393-016-1100-5.
32. McEwen, S.A.; Collignon, P.J. Antimicrobial Resistance: A One Health Perspective. In *Antimicrobial Resistance in Bacteria from Livestock and Companion Animals*; Schwarz, S., Cavaco, L.M., Shen, J., Eds.; ASM Press: Washington, DC, USA, 2018; pp. 521–547 ISBN 978-1-68367-052-0.
33. Hendriksen, R.S.; Munk, P.; Njage, P.; Van Bunnik, B.; McNally, L.; Lukjancenko, O.; Röder, T.; Nieuwenhuijse, D.; Pedersen, S.K.; Kjeldgaard, J.; et al. Global Monitoring of Antimicrobial Resistance Based on Metagenomics Analyses of Urban Sewage. *Nat Commun* **2019**, *10*, 1124, doi:10.1038/s41467-019-08853-3.
34. Ens, E.J.; Pert, P.; Clarke, P.A.; Budden, M.; Clubb, L.; Doran, B.; Douras, C.; Gaikwad, J.; Gott, B.; Leonard, S.; et al. Indigenous Biocultural Knowledge in Ecosystem Science and Management: Review and Insight from Australia. *Biological Conservation* **2015**, *181*, 133–149, doi:10.1016/j.biocon.2014.11.008.
35. Tengö, M.; Hill, R.; Malmer, P.; Raymond, C.M.; Spierenburg, M.; Danielsen, F.; Elmqvist, T.; Folke, C. Weaving Knowledge Systems in IPBES, CBD and beyond—Lessons Learned for Sustainability. *Current Opinion in Environmental Sustainability* **2017**, *26–27*, 17–25, doi:10.1016/j.cosust.2016.12.005.
36. *One Health Joint Plan of Action, 2022–2026*; FAO; UNEP; WHO; World Organisation for Animal Health (WOAH) (founded as OIE);, 2022; ISBN 978-92-5-136957-9.
37. Zinsstag, J.; Schelling, E.; Crump, L.; Whittaker, M.; Tanner, M.; Stephen, C. *One Health: The Theory and Practice of Integrated Health Approaches*; Cabi, 2020; ISBN 1-78924-257-6.
38. Hinchliffe, S.; Bingham, N.; Allen, J.; Carter, S. *Pathological Lives: Disease, Space and Biopolitics*; John Wiley & Sons, 2016; ISBN 1-118-99759-X.
39. Gabriel, R.N.; Shilunga, A.P.K.; Hemberger, M.Y. Key Drivers, Challenges, and Opportunities for the Operationalization of the One Health Approach in Africa: A Systematic Review. *Discov Public Health* **2025**, *22*, 627, doi:10.1186/s12982-025-01028-0.
40. Rock, M.J.; Degeling, C. Public Health Ethics and More-than-Human Solidarity. *Social Science & Medicine* **2015**, *129*, 61–67.
41. Clark, W.C.; Van Kerkhoff, L.; Lebel, L.; Gallopin, G.C. Crafting Usable Knowledge for Sustainable Development. *Proc. Natl. Acad. Sci. U.S.A.* **2016**, *113*, 4570–4578, doi:10.1073/pnas.1601266113.
42. Galvin, K.A.; Reid, R.S.; Fernández-Giménez, M.E.; Kaelo, D.O.; Baival, B.; Krebs, M. Co-Design of Transformative Research for Rangeland Sustainability. *Current Opinion in Environmental Sustainability* **2016**, *20*, 8–14, doi:10.1016/j.cosust.2016.03.003.
43. Mauser, W.; Klepper, G.; Rice, M.; Schmalzbauer, B.S.; Hackmann, H.; Leemans, R.; Moore, H. Transdisciplinary Global Change Research: The Co-Creation of Knowledge for Sustainability. *Current Opinion in Environmental Sustainability* **2013**, *5*, 420–431, doi:10.1016/j.cosust.2013.07.001.

44. European Centre for Disease Prevention and Control. *Towards One Health Preparedness: Expert Consultation 11–12 December 2017.*; Publications Office: LU, 2018;
45. Moore, C.W. *The Mediation Process: Practical Strategies for Resolving Conflict*; John Wiley & Sons, 2014; ISBN 1-118-30430-6.
46. Rodriguez, J. One Health Ethics and the Ethics of Zoonoses: A Silent Call for Global Action. *Veterinary Sciences* **2024**, *11*, 394, doi:10.3390/vetsci11090394.
47. Bordier, M.; Goutard, F.L.; Antoine-Moussiaux, N.; Pham-Duc, P.; Lailier, R.; Binot, A. Engaging Stakeholders in the Design of One Health Surveillance Systems: A Participatory Approach. *Front. Vet. Sci.* **2021**, *8*, 646458, doi:10.3389/fvets.2021.646458.
48. Chien, Y. How Did International Agencies Perceive the Avian Influenza Problem? The Adoption and Manufacture of the 'One World, One Health' Framework. In *Pandemics and Emerging Infectious Diseases*; Dingwall, R., Hoffman, L.M., Staniland, K., Eds.; Wiley, 2013; pp. 46–58 ISBN 978-1-118-55371-8.
49. Waltner-Toews, D. Zoonoses, One Health and Complexity: Wicked Problems and Constructive Conflict. *Phil. Trans. R. Soc. B* **2017**, *372*, 20160171, doi:10.1098/rstb.2016.0171.
50. Velazquez-Meza, M.E.; Galarde-López, M.; Carrillo-Quiróz, B.; Alpuche-Aranda, C.M. Antimicrobial Resistance: One Health Approach. *Vet World* **2022**, *15*, 743–749, doi:10.14202/vetworld.2022.743-749.
51. Guadu, T.; Abera, B.; Tesfay, K.; Berhane, A.; Tafese, A.; Solomon, T.; Debebe, B.; Getachew, M.; Shibabaw, A.; Abiye, A.A.; et al. Biodiversity Threats and Socio-Ecological Dynamics in Chebera Churchura National Park: A One Health Approach. *One Health* **2025**, *21*, 101181, doi:10.1016/j.onehlt.2025.101181.
52. Munyua, P.M.; Njenga, M.K.; Osoro, E.M.; Onyango, C.O.; Bitek, A.O.; Mwatondo, A.; Muturi, M.K.; Musee, N.; Bigogo, G.; Otiang, E.; et al. Successes and Challenges of the One Health Approach in Kenya over the Last Decade. *BMC Public Health* **2019**, *19*, 465, doi:10.1186/s12889-019-6772-7.
53. Rich, K.M.; Wanyoike, F. An Assessment of the Regional and National Socio-Economic Impacts of the 2007 Rift Valley Fever Outbreak in Kenya. *Am J Trop Med Hyg* **2010**, *83*, 52–57, doi:10.4269/ajtmh.2010.09-0291.

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