

A relational turn in one health: A systematic review of environmental determinants, equity, and governance frameworks

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Abstract

Background:

The One Health framework, originally developed for zoonotic disease prevention, has faced criticism for insufficient engagement with environmental and social determinants of health. As transnational crises from climate change, pollution, and biodiversity loss accelerate worldwide, there is an urgent need to re-vision One Health as a more equity-oriented and systems-based approach.

Methods:

Following PRISMA 2020 guidelines, this systematic review examined peer-reviewed review articles published between January 2021 and May 2025 that explicitly applied a One Health lens to environmental determinants of health. The review combined elements of the Mixed Methods Appraisal Tool (MMAT) and the Scale for the Assessment of Narrative Review Articles (SANRA) for quality appraisal. A hybrid synthesis process was employed to identify conceptual innovations and thematic domains.

Results:

Seven studies were included. The most commonly identified environmental determinants of One Health were climate change, biodiversity loss, and water insecurity. Three themes were identified: (i) Taking One Health beyond zoonoses; (ii) Building relational and context-specific approaches centered in equity and Indigenous knowledges; and (iii) Ongoing governance silos and marginalization of environmental actors in favour of biomedical and veterinary voices. Building on these insights, we propose a Relational One Health Framework, which centres justice, governance, and interdependence for health.

Conclusions:

This review conceptualises a Relational One Health Framework which reconceptualises health as an emergent property of interdependent human–animal–environment relationships, through equity and participatory governance. Buoyed by global momentum for “one health governance,” the framework provides a timely pathway for policymakers, practitioners, and researchers to embed environmental determinants within holistic governance of health.

Recommendation:

Future research should expand coverage of databases, integrate empirical case studies, and create integrative metrics that assess both environmental and health equity benefits. In policy platforms, environmental knowledge should be incorporated as a core interest in One Health implementation.

Keywords: One Health, Environmental Determinants, Climate Change, Health Equity, Relational Frameworks, Integrated Governance

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Introduction

The interdependence of human, animal, and environmental health has become increasingly visible amidst global crises of climate change, antimicrobial resistance, biodiversity loss, and emerging zoonoses. The One Health paradigm, understood broadly as an integrative approach that recognises the interdependence of people, animals, plants, and their shared environment (WHO, 2023), has burgeoned in prominence as a guiding framework for cross-sectoral collaborations. While

initially oriented around zoonotic disease surveillance and prevention, further articulations of One Health have arguably emerged, from more biomedical-centric versions to framings which include dimensions of ecological integrity and social justice (Lerner & Berg, 2017; Destoumieux-Garzón *et al.*, 2018; Brown *et al.*, 2024).

Nonetheless, there is mounting recognition within scholarship that One Health must more directly engage with environmental determinants of health.

Environmental determinants refer to the physical, chemical, and biological factors external to a person and all the related factors impacting behaviours, in combination with broader ecological factors and processes such as deforestation, land degradation, climate variability, and pollution. Emerging empirical insights demonstrate that environmental degradation, climate instability, and ecological collapse cumulatively pose immense risks for zoonotic spillover as well as the chronic impacts of low-level exposure, and that environmental stewardship must be a core agenda in health governance (PAHO/WHO, 2023; Shafique *et al.*, 2024). Few empirical efforts have yet tracked and mapped the extent to which One Health scholarship—and in particular the substantive frames established thereby—have substantively engaged environmental determinants. Present reviews of One Health research and practice tend to identify zoonotic pathways but leave broader upstream drivers, including climate change, biodiversity loss, and governance failures, underexamined. At the same time, intersecting insights stemming from cognate paradigms, including Planetary Health and EcoHealth, also pose questions about where and how One Health distinctively contributes (McEwen & Collignon, 2018; Patrick *et al.*, 2024).

This review addresses this gap by synthesizing peer-reviewed literature published from 2021 to 5 May 2025 that applies a One Health lens to environmental determinants of health. The rationale for focusing on this period lies in the fact that the COVID-19 pandemic demonstrated an unprecedented exigency for understanding systemic health–environment linkages, and the Quadripartite One Health Joint Plan of Action (WHO, FAO, WOA, UNEP, 2022) has provided new global policy momentum. By foregrounding environmental determinants, this review aims to understand how One Health is being imagined, practiced, and positioned in relation to justice-oriented and relational approaches. Specifically, the review asks: (i) How is One Health framed in relation to environmental determinants? (ii) Do reviewed studies propose frameworks, policy instruments, or implementation models? (iii) To what extent are equity, governance, and context-specific relational approaches integrated? In so doing, the article speaks to ongoing debates about how to refocus One Health away from a pathogen- and response-driven paradigm to a proactive, systems-based approach to health promotion to address novel and complex crises of the Anthropocene.

Methodology

Study Design

This study employed a systematic review approach to identify and synthesize peer-reviewed literature that applies a One Health framework to address environmental determinants of health. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page *et al.*, 2021) and adapted elements from the Mixed Methods Appraisal Tool (MMAT) and the Scale for the

Assessment of Narrative Review Articles (SANRA) to evaluate methodological quality across diverse review types.

Eligibility Criteria

Articles were included if they met the following conditions:

- Publication Type: Peer-reviewed journal articles (systematic, scoping, narrative, conceptual, or integrative reviews).
- Language: English.
- Publication Period: January 2021 – 5 May 2025, chosen to capture the post-COVID-19 era and align with the launch of the *Quadripartite One Health Joint Plan of Action* (2022), which redefined global priorities for One Health.
- Conceptual Relevance: Explicit reference to the One Health framework or lens.
- Substantive Focus: Discussion of at least one environmental determinant of health (e.g., climate change, biodiversity loss, pollution, land use, or water security).
- Framework Content: Proposal or description of a conceptual model, implementation strategy, or policy perspective.

Exclusion criteria

Studies that merely cited or referenced One Health or were entirely focused on zoonotic infectious disease without considering the environmental context, or excluded studies were empirical papers, commentaries, editorials, and conference abstracts without offering significant conceptual insight in a review context.

Search Strategy

A literature search was conducted using Google Scholar. This was to capture interdisciplinary articles that may not be listed in discipline-specific databases. This approach allowed for the capture of relevant cross-sectoral studies that tend to be excluded from subject-specific databases, but it is also a limitation in terms of reproducibility and comprehensiveness. Future research should broaden the search to several databases (e.g., Scopus, Web of Science, PubMed). The following search string was used: ("One Health" AND ("environmental determinants of health") AND ("framework" OR "implementation" OR "policy")) The search was restricted to publications between 2021 and 5 May 2025. A total of 80 search results were retrieved and screened manually.

Screening and Selection Process

A two-stage screening process was employed:

1. Title and Abstract Screening: Articles were excluded if clearly unrelated to One Health or environmental determinants.
2. Full-Text Review: Remaining articles were assessed in detail against the inclusion criteria.

Seven articles were included in the final synthesis. Articles were excluded for lack of focus on One Health

(n=8), lack of a tangible engagement with environmental determinants (n=6), or did not contain review or framework materials (n=3). Articles indicated as excluded for “other” reasons in the PRISMA flow diagram were duplicates and papers without available full texts. The full list of articles screened and excluded is available in a supplementary file for transparency.

Team Roles and Consensus

Four reviewers (MLC, RCK, RC, and HCHF) independently screened all retrieved records at both the title/abstract and full-text stages. Each article was assessed against the inclusion and exclusion criteria, with discrepancies discussed until consensus was reached. A fifth reviewer (RC) was available to arbitrate in cases of disagreement, although this was rarely required. This independent screening process was designed to minimize selection bias and strengthen transparency.

Data Extraction

A standardized data extraction sheet was used to capture the following elements:

- Title, authors, year of publication
- Type of review
- Region or context
- One Health integration
- Environmental determinants addressed
- Presence of frameworks, models, or implementation strategies

- Evidence use and policy relevance

This allowed for comparative analysis across review types and thematic domains.

Quality Appraisal

Each included study was evaluated using a custom quality assessment tool combining elements of the Mixed Methods Appraisal Tool (MMAT) and the Scale for the Assessment of Narrative Review Articles (SANRA). This hybrid tool considered clarity of objectives, literature transparency, theoretical integration, environmental depth, and conceptual innovation. Given the inclusion of various review types, systematic, scoping, narrative, and conceptual, a custom hybrid quality appraisal tool was developed. This tool combined selected domains from the Mixed Methods Appraisal Tool (MMAT) for assessing methodological rigor and transparency, and the Scale for the Assessment of Narrative Review Articles (SANRA) for evaluating clarity, argument structure, and evidence synthesis.

Each study was assessed across the following domains:

- Clarity of objectives
- Literature search transparency
- Theoretical integration of One Health
- Environmental health relevance
- Conceptual depth or framework development
- Use of evidence and citations

Studies were then categorized as *High*, *Moderate*, or *Protocol* quality based on the overall synthesis of these criteria (Table 1).

Table 1. Hybrid Quality Assessment (MMAT + SANRA Criteria)

Title	Review Type	Clarity of Objectives	Literature Search Transparency	One Health Integration	Environmental Relevance	Framework Presence	Evidence Use	Overall Quality
Relational One Health	Systematic + Conceptual	High	Moderate	Explicit	High	Yes	Thematic synthesis with examples	High
Wildlife health in environmental impact assessments	Narrative Review	High	Low	Partial	High	Yes	Illustrative examples	Moderate
Planetary Health & Education in Brazil	Integrative Review	Moderate	Moderate	Implied	Moderate	No	Thematic discussion	Moderate
A protocol for a scoping review on zoonotic spillover risk frameworks in social-ecological systems	Scoping Review Protocol	High	High	Planned	Moderate	Planned	Not applicable (protocol)	Moderate
A conceptual analysis of the public health-architecture nexus within rapidly developing informal urban contexts.	Conceptual Review	High	Low	Explicit	High	Yes	Contextual argumentation	High

Comparative Analysis and Thematic Synthesis

Data were analyzed using a comparative thematic approach. The team coded and extracted data for recurrent themes and patterns, then compared findings across studies to identify convergences and divergences. Through iterative discussions, three thematic domains were established:

- Redefining One Health beyond zoonoses.
- Advancing relational and context-specific approaches.
- Addressing persistent governance silos.

This thematic synthesis informed both the results and the development of the proposed *Relational One Health Framework*.

Reporting Bias Assessment

We assessed the potential for reporting bias in two ways. First, we compared the characteristics of included and excluded studies to check whether exclusion might have systematically favoured particular perspectives (e.g., biomedical over ecological). Second, we noted that many

of the included studies were conceptual or narrative in design, which inherently limits empirical diversity. While statistical methods such as funnel plots were not applicable due to the small sample size, we explicitly acknowledge the possibility of publication bias and selective reporting in the field. This limitation is addressed in the Discussion under *Limitations*.

Results

Search Results and Study Selection

The search process yielded 80 unique articles. After title and abstract screening, 24 full-text articles were assessed. Following application of inclusion and exclusion criteria, seven studies were retained for synthesis. The most common reasons for exclusion were: lack of explicit One Health framing (n = 8), insufficient engagement with environmental determinants (n = 6), and absence of review or framework elements (n = 3). A supplementary file lists all screened and excluded records.

The PRISMA flow diagram (**Figure 1**) summarizes this process, with exclusions referring to duplicates or inaccessible full texts.

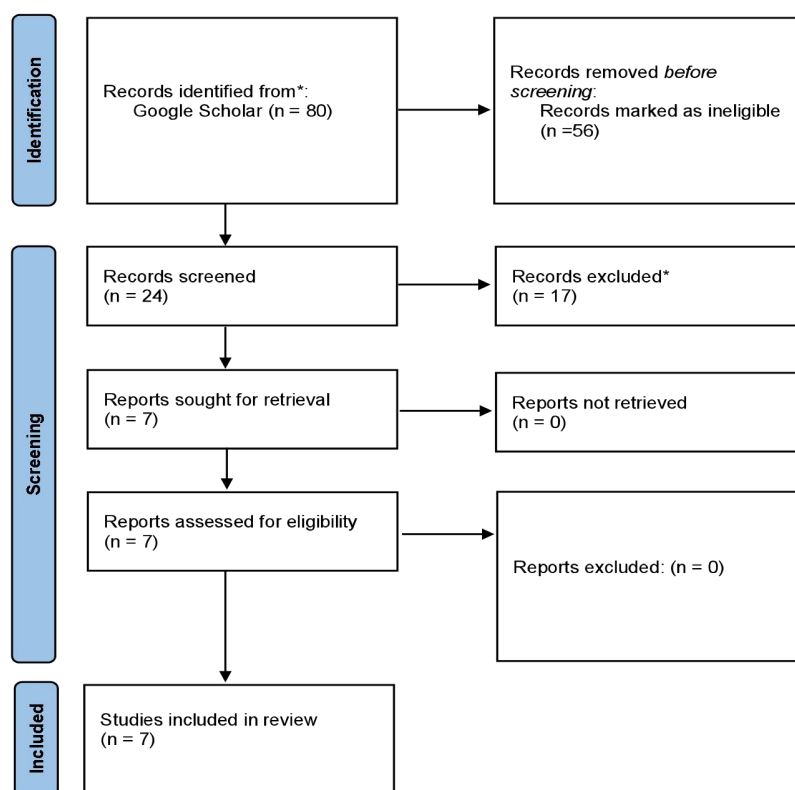


Figure 1. PRISMA Diagram

Characteristics of Included Studies

The included studies comprised a range of review types: narrative review studies (n = 2); conceptual or perspective papers (n = 2); integrative reviews (n = 1); a hybrid systematic–conceptual review (n = 1); and a scoping review protocol (n = 1). The publications ranged from 2021 to 2024, covering global, regional, and country-specific contexts (e.g., South Africa, Brazil,

Canada, Australia). Notably, five of the seven papers we reviewed consisted primarily of conceptual or visionary essays (e.g., Meisner *et al.*, 2024; Patrick *et al.*, 2024; Capps *et al.*, 2023; Price *et al.*, 2022; Gerend & Clow, 2021), and only two consisted of papers informed by empirical evidence, most often through structured review methods (Aleuy *et al.*, 2022; Leal Filho *et al.*, 2022). This mismatch is indicative of the nascent One Health–

environment scholarship, but also points to a lack of empirical grounding of proposed models.

Table 2. Characteristics of Included Studies

Title	Authors	Year	Review Type	Context	Framework Proposed*
Relational One Health: A more-than-biomedical framework	Meisner <i>et al.</i>	2024	Systematic Conceptual +	Brazil, Ethiopia, Israel	Yes (Relational OH)
Wildlife Health in Environmental Impact Assessments	Aleuy <i>et al.</i>	2022	Narrative Review	Australia	Yes (EIA-integrated OH)
Planetary Health and Education in Brazil	Leal Filho <i>et al.</i>	2022	Integrative Review	Brazil	No (education-focused)
Determinants of zoonotic spillover (protocol)	Gerend & Clow	2021	Scoping Protocol	Canada	Planned (spillover mapping)
Public health–architecture nexus in urban contexts	Patrick <i>et al.</i>	2024	Conceptual Review	South Africa	Yes (urban design–health nexus)
Ecogenomics and One Health	Capps <i>et al.</i>	2023	Perspective	Global	Yes (Ecogenomics)
Merging the exposome into “omics” frameworks	Price <i>et al.</i>	2022	Narrative/Action Review	Global	Yes (Exposome-integrated OH)

* “Framework Proposed” indicates whether the article introduced a new or adapted model beyond conventional One Health, rather than simply invoking the One Health paradigm.

Environmental Determinants Addressed

All studies considered environmental drivers, highlighting how their importance is growing within One Health analysis. The most recurrent topics in discussion were climate change and ecological degradation, with Meisner *et al.* (2024) and Patrick *et al.* (2024) describing them as risk amplifiers to disease and compromising factors to ecological resilience. Biodiversity loss and ecosystem disturbance closely followed, as Aleuy *et al.* (2022) denounced the absence of wildlife health consideration in Environmental Impact Assessments. Water insecurity and contamination were also heavily explored by Gerend & Clow (2021) and Leal Filho *et al.* (2022), who stressed water access as an under-

recognised determinant for health resilience. Finally, Patrick *et al.* (2024) emphasised urban built environments such as sanitation infrastructure, housing conditions, and spatial inequality as important environmental determinants mediating vulnerabilities in rapidly urbanised contexts. Together, these indicate that environmental systems should be considered not as indifferent contexts, but as drivers in their own right of health outcomes.

Comparative Positioning of Frameworks

To situate the Relational One Health Framework within broader debates, we compared it with adjacent paradigms:

Table 3. Comparative Positioning of Relational One Health vs. Adjacent Frameworks

Dimension	Planetary Health	EcoHealth	Relational One Health (this study)
Core focus	Human health within planetary boundaries	Human, animal, ecosystem interdependence	Justice-oriented relationships among human–animal–environment
Epistemology	Sustainability science, global systems	Participatory ecology, systems science	Relational ethics, Indigenous and decolonial knowledge
Governance orientation	Global institutions, policy integration	Community-based, multi-sectoral	Equity, power asymmetries, and local agency
Novelty	Emphasizes sustainability education and ecological limits	Advances participatory models	Explicitly foregrounds politics, relationality, and justice

This comparison highlights the overlap and distinctiveness of the Relational One Health model. However, while other frameworks have embedded aspects of relationality within them, the additions of relational ethics and health as an emergent property of socio-ecological power give the explicit Relational One Health framework distinction. It is a framework that strongly positions One Health as governing the socio-ecological system rather than pursuing health as a biophysical outcome alone.

A thematic cross-synthesis of the seven manuscripts distilled three partially overlapping thematic orientations that trace shared opportunities and challenges of embedding environmental determinants in One Health. A first is a clear tendency to *redefine the scope of One Health beyond zoonoses*. Across different entry points, several studies problematize the hegemony of pathogen-centric models and use systems-based framings to articulate health as an emergent property of ecological drivers, including climate instability, biodiversity collapse, and environmental injustice (Meisner *et al.*, 2024; Patrick *et al.*, 2024). For these scholars, socioecological breakdown and governance failure are not an addendum to the environmental context of producing health; they become non-negotiable touchstones for upstream action, providing actionable pathways beyond narrow disease surveillance to confront the root causes of widening social and environmental precarity. A second novel insight running throughout the literature is the amplified role of contextually adaptive and relational ways of working.

Conceptual pieces—in particular, Meisner *et al.* (2024) and Aleuy *et al.* (2022)—foreground the argument that One Health must be co-created with communities in locally specific and culturally meaningful ways. These place-based frameworks centre Indigenous knowledge, relational worldviews and space-time justice, underscoring that top-down, universalized logics rarely reflect lived realities and risk marginalizing the most vulnerable systems and peoples. Finally, despite the rhetorical and policy power of interdisciplinarity, many of these studies echo the endurance of splintered *siloes at the heart of environmental governance*.

Environmental debates – including those of ecologists, conservationists, and community land stewards – remain too often marginalised in discussions of One Health that continue to be dominated by biomedical and veterinary frames (Patrick *et al.*, 2024; Aleuy *et al.*, 2022). This marginalisation represents a serious weakness for One Health as a purportedly integrative approach. Deprived of the insights and situated knowledge of these environmental actors, responses remain partial, whilst critical warning signals – such as changes in wildlife health, land use, or ecosystem stress – go unseen in health systems. Together, these tensions suggest an inflection point for One Health: whilst the field is undoubtedly making important advances in expanding its focus and translating justice-oriented and relational conceptual advances into mainstream discourse, substantial institutional change and methods for

integrating these ideas into practice will be required to translate these insights into practice.

3.5 Conceptual Frameworks and Implementation Strategies

Four of the seven studies included in this review either proposed or critically examined conceptual or implementation frameworks that expand One Health to engage environmental determinants more fully. These frameworks range from a high-level conceptual model to practical tools designed to inform policy and field-level interventions and vary in complexity, purpose, and context, but collectively reflect a growing scholarly and policy-oriented application to embed environmental governance across the design of health systems.

Introducing the Relational One Health framework, Meisner *et al.* (2024) provide a model centered on relational ethics and situated approaches to health and well-being. This framework grants normative importance to social justice, ecosystem interdependence, and indigenous knowledge systems in contrast to other models, which often consider ‘the environment’ or ‘nonhuman nature’ to be a backdrop to human health issues. Their work foregrounds relational ethics and positions the hierarchies in health and well-being in ways that make power dynamics more visible. This framework prioritizes more participatory approaches to health governance with greater attentions to context, which recognize value in multiple ways of knowing and includes those traditionally marginalized in mainstream health science.

Patrick *et al.* (2024) proposed a framework of understanding links between urban spatial design and health equity outcomes through case studies in informal settlements in rapid urbanisation contexts. Their model looks at the built environment as not only the location of health interventions but as determinants of health, exposing and or shielding people from harm, influencing mobility and access to environmental infrastructure (such as water and sanitation). This environmental design lens enriches the One Health discourse by drawing attention to spatial justice and the politics of urban planning.

Gerend & Clow (2021), in their scoping review protocol, outlined a planned conceptual model aimed at identifying zoonotic spillover hotspots through the integration of ecological and social indicators. Although still in development, their proposed framework exemplifies systems thinking by embedding One Health within broader social-ecological contexts. It demonstrates a forward-looking commitment to developing predictive tools that are grounded in interdisciplinary data and methodological transparency.

Leal Filho *et al.* (2022) provided a different but complementary approach by emphasizing the importance of environmental education in operationalizing a sustainability-oriented interpretation of planetary health. While not a formal framework in the diagnostic sense, their work promotes a normative foundation for One Health literacy. They argue that without cultivating awareness and competencies around ecological sustainability, public health systems will struggle to meaningfully engage with environmental risks.

Collectively, these frameworks reveal a field in evolution. Rather than proposing a single, unified model, the reviewed studies offer diverse and context-specific tools that advance the integration of environmental and health systems. Whether focusing on ethics, urban design, education, or predictive analytics, each framework underscores the urgency of expanding One Health beyond its biomedical core into a more holistic and systems-oriented paradigm. This movement toward integrated, governance-informed models reflects a maturation of the field, one that aligns health policy with ecological sustainability and social equity.

Conceptual Framework

To guide the synthesis and interpretation of findings, the study proposes a Relational One Health Framework that captures the complex interdependencies among human, animal, and environmental health (Figure 2). This framework is grounded in the thematic analysis of the included studies, particularly those by Meisner *et al.* (2024), Patrick *et al.* (2024), Mosadeghrad *et al.* (2023), and Aleuy *et al.* (2022), which collectively emphasize ecological interconnectedness, social determinants, and the need for justice-oriented health governance.

Core Components

At its foundation, the framework retains the classical One Health triad of human, animal, and environmental health, but reframes their relationships as mutually constitutive rather than discrete domains. Each component influences and is influenced by the others through feedback loops mediated by ecological, social, and institutional systems. This relational orientation challenges traditional sectoral silos and positions health as an emergent property of interconnected living systems.

Environmental Determinants as Systemic Forces

Surrounding the triad are key environmental determinants of health, including:

- Climate change and ecological degradation
- Biodiversity loss and disruption of natural habitats
- Water insecurity, pollution, and land use change
- Urbanization and built environment stressors

These determinants are not peripheral stressors but primary structuring forces that shape disease risk, resource access, and ecosystem resilience. Their positioning in the outer ring of the framework signifies their systemic influence across all three health domains. Social-Ecological Contexts and Justice Dimensions

The framework introduces a second outer layer: contextual enablers and barriers that mediate how One Health is experienced and governed. These include:

- Governance systems (e.g., intersectoral collaboration, decentralization)
- Cultural and Indigenous knowledge systems
- Socio-political factors, such as power asymmetries, equity, and environmental justice

By integrating these elements, the framework underscores that health outcomes are not simply ecological or biological phenomena, but deeply shaped by social relations, institutional arrangements, and historical marginalization.

Pathways for Implementation

The lower portion of the framework outlines key implementation mechanisms derived from the literature:

- Surveillance and monitoring systems that integrate environmental and health data
- Cross-sectoral collaboration involving ministries of health, agriculture, and the environment
- Participatory governance, emphasizing community leadership and co-creation
- Contextualized innovation, which supports place-based, interdisciplinary solutions

These pathways align with recommendations from Gerend & Clow (2021), and Leal Filho *et al.* (2022), all of whom argue that implementation success depends on relational accountability, institutional inclusivity, and adaptive governance.

Expected Outcomes

The ultimate aim of this framework is to foster:

- Health equity by addressing social and environmental vulnerabilities
- Ecosystem resilience through sustainable land, water, and resource management
- Preventive capacity via upstream interventions that mitigate spillover and system shocks
- Co-benefits aligned with the Sustainable Development Goals (SDGs), including climate action, clean water, and reduced inequalities.

This conceptual framework offers a holistic, justice-oriented model for operationalizing One Health in the context of environmental determinants. It not only synthesizes current theory and practice but also offers a conceptual model still requiring validation for future interdisciplinary research, cross-sectoral policy design, and locally grounded implementation strategies.

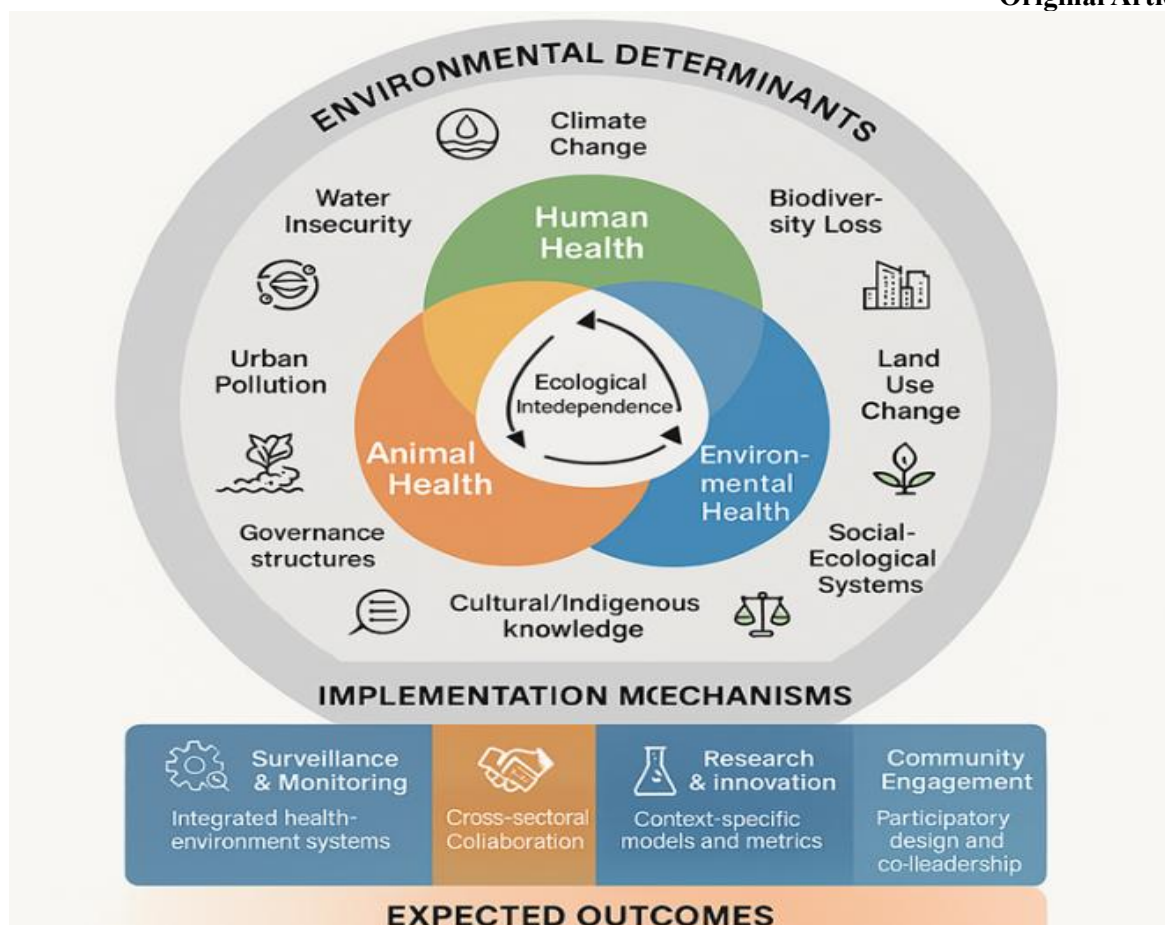


Figure 2. A Relational One Health Framework for Addressing Environmental Determinants of Health.

This framework illustrates how health emerges from relationships between humans, animals, environments, and governance systems. It highlights three interdependent domains: environmental determinants (e.g., climate change, biodiversity, pollution), equity and justice (e.g., Indigenous knowledge, participatory governance, community agency), and governance structures (e.g., cross-sectoral integration, policy reform, institutional accountability). Expected outcomes include more resilient ecosystems, improved health equity, and strengthened governance capacity.

Source: Authors' own work, developed and adapted from insights in Meisner *et al.* (2024), Patrick *et al.* (2024), and Aleuy *et al.* (2022).

Discussion

This review highlights both conceptual advances and persistent barriers in applying the One Health framework towards environmental determinants of health. Recent literature reveals encouraging momentum towards justice-oriented, systems-based models; however, the translation of conceptual advances into operationalization is missing.

One key finding is the reconceptualization of One Health beyond zoonoses. Several papers contest the pathogen-centric One Health paradigm that has dominated the field

for decades, instead situating health outcomes as emergent properties of interlocking social-ecological systems (Meisner *et al.*, 2024; Patrick *et al.*, 2024). This shift is more than rhetorical: it reflects an attitudinal change in which climate instability, biodiversity loss, and ecological injustice are acknowledged as structuring forces of health. The majority of reviewed contributions are, however, conceptual or aspirational, pointing to the urgent necessity of empirical corroboration of these ideas. By centring context-specific and relational approaches, critical considerations for the more equitable and effective operationalisation of One Health are explained. For example, Meisner *et al.* (2024) illustrate how One Health initiatives in Sub-Saharan Africa should be co-constructed with local communities, by incorporating Indigenous knowledge and relational ethics into zoonotic surveillance programmes. And Patrick *et al.* (2024) illustrate environmental determinants within built environments of informal settlements, in which urban design decisions – for example, around sanitation infrastructure or housing density – also determine exposure pathways and health risks. These vignette examples illustrate how the Relational One Health Framework could be applied at different scales: one at the community level by integrating participatory disease monitoring, and one at the urban governance level by

integrating planning. By linking conceptual principles with practical cases, the Relational One Health Framework illustrates pathways to more effectively account for both ecological and social determinants of health.

In terms of novelty, the proposed Relational One Health Framework builds on — but also advances beyond — adjacent paradigms such as EcoHealth and Planetary Health. Whereas Planetary Health emphasises sustainability within biophysical boundaries and EcoHealth advances participatory ecological approaches, Relational One Health explicitly foregrounds the politics of environmental governance, relational ethics, and power asymmetries. By situating health as an emergent property of relationships—between humans, nonhuman species, institutions, and environments—the framework highlights that equity and justice are constitutive of, rather than additive to, health and governance practices. It is this relational focus, therefore, that distinguishes the framework from similar models and, in so doing, justifies its proposal as distinct.

Positionality Statement

As a research team based in Zambia and more broadly as a research team primarily based in the Global South, we come to this review with a strong positionality focused on equity and contextual rootedness. Our positionality is informed by working in contexts in which climate change, biodiversity loss, and health inequities are felt, but contexts in which local situated knowledge and environmental expertise are excluded from frameworks of global governance. This positionality has so shaped our synthesis herein and the articulation of the Relational One Health Framework with its particular expression through justice, participatory governance, and local agency. We recognise that our framing is motivated by and situated in these contexts.

Integrated Implications and Recommendations

The findings of this review have repercussions for research, policy, and practice. If One Health is to move beyond rhetoric, it will need to move from a technical sectoral integration to a values-based approach founded on justice, equity, and ecological sustainability. Three selected strategic directions are specified here;

Policy and Governance Reform

National and global One Health platforms should formally include environmental institutions and data systems alongside health and agriculture, incorporating ecological indicators such as land-use change, biodiversity trends, and water quality into early warning systems and national action plans. Multi-sectoral legal and financing frameworks are critical to ensure these reforms are sustained and that environmental determinants are not regarded as peripheral to but rather constitutive of health.

Operationalization through Local and Context-Specific Models

Place-based approaches are critical to translate One Health into operational practice. Recent examples of community-led surveillance programs in rural or Indigenous settings or participatory urban planning in informal settlements provide concrete entry points to operationalize relational principles. Relevant approaches need to be supported not just as pilot programs but as viable models of co-governance.

Research and Capacity Building

Future research should empirically test such conceptual frameworks as Relational One Health to assess their feasibility, adaptability, and effectiveness in different ecological and policy conditions. The development of interdisciplinary outcome metrics, such as combined indicators of ecosystem resilience and community health equity, will be a priority. Integrated training programs across public health, ecology, veterinary science, and environmental management will build the workforce necessary to implement such approaches.

Conclusion

This systematic review identified opportunities and challenges for advancing a One Health approach to environmental determinants of health. From among a small but emergent body of work, papers during the review time period (2021– 5 May 2025) attempted to reposition One Health beyond zoonotic disease and towards a more relational, interdisciplinary, and justice-oriented approach. Several put forward conceptual models (e.g., relational ethics approaches, urban design, ecosystem-based approaches), but few operationalised or empirically tested these. Gaps in the field identified through this review illustrate the long-standing gap between conceptualisation and implementation in policy and practice.

The proposed Relational One Health Framework offers a novel contribution, conceptualising health as emerging from relationships between humans, animals, environments, and governance systems. Unlike adjacent paradigms such as Planetary Health or EcoHealth, the framework makes questions of power, equity, and relational ethics explicit, highlighting that environmental determinants are not externalities but fundamental drivers of health. Thus, it provides an original and timely conceptual tool for policymakers, practitioners, and researchers grappling with health–environment crises in the Anthropocene.

Limitations of the Study

This review has, however, some limitations that need to be acknowledged. First, the use of Google Scholar as a single database limits the scope of the review. Second, the review includes mostly conceptual/narrative studies, which limits the empirical evidence on the findings. Finally, the sample sizes of the studies in this review were small, a reflection of the early stage of the One Health–environment scholarship. Therefore, the review

should not be generalised, and reviews leveraging multiple databases and implementation studies on One Health and the environment are warranted.

Future Research

Looking forward, future research should empirically assess relational models under diverse ecological and policy settings, develop integrated metrics to bridge environmental and health outcomes, and build out the evidence base through comparative, cross-regional studies. Policymakers can start by incorporating environmental actors and ecological indicators into One Health platforms, while practitioners can pilot context-specific, community-driven approaches for operationalising relational principles. In so doing, One Health can become a truly systems-based, equity-oriented model that meets 21st-century's intertwined ecological and health challenges.

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List of Abbreviations

OH = One Health

ROH = Relational One Health

PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses

MMAT = Mixed Methods Appraisal Tool

SANRA = Scale for the Assessment of Narrative Review Articles

WHO = World Health Organization

FAO = Food and Agriculture Organization of the United Nations

WOAH = World Organisation for Animal Health

UNEP = United Nations Environment Programme

Author Contributions

- **Mubanga Lackson Chipimo** – Conceptualization, methodology design, data analysis, manuscript drafting, and overall supervision of the study.
- **Richard Chirwa** – Data screening, quality appraisal, and critical review of methodology and results.
- **Hentry Chiiso Hamasumo Funduluka** – Data extraction, thematic synthesis, and drafting of the Results section.
- **Ruth Chipampe Kafwanka** – Literature review, integration of environmental health perspectives, and editing of the Discussion and Conclusion.
- **Rodgers Chilyabanyama** – Validation of screening process, and review of final manuscript for methodological accuracy.

All authors read and approved the final manuscript.

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Ethics, Consent to Participate, and Consent to Publish declarations: not applicable.

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