Answer to the Reviewers' Comments

Ms. Ref. No.: GLT-D-23-00044

Exploring the Nexus: Comparing and Aligning Planetary Health, One Health, and EcoHealth

Editor's Comments: I have completed the review of your manuscript and a summary is appended below. The reviewers recommend reconsideration of your paper following major revision. I invite you to resubmit your manuscript after addressing all reviewer comments.

Answer: We are grateful for the chance to submit the revised manuscript, which has undergone extensive editing based on the feedback from the reviewers. We have also made substantial improvements throughout the paper to enhance its quality. We kindly ask you to review the revised manuscript along with the responses to the reviewers' comments provided below.

Reviewer #1:

Comment -1: The paper is well-written and handles an interesting topic while I noticed that the Authors had excluded some prior articles on the topic from their review. I would like to see reference to these prior papers in the introduction indicating the need to additional review and analyses. The Figures that were copied from different sources should be adequately entitled and the sources/references provided. I have several other comments for the authors to consider that are described in more detail below.

Answers: We greatly appreciate your constructive feedback. We will address your concerns by adding references to prior articles in the introduction, providing clear titles and references for figures, and eagerly await your detailed comments to enhance the quality of our manuscript. Your input is invaluable, and we thank you for your time and effort.

Comment on Introduction-1: In the Figure 1 legend, it should be made clear that the figure is borrowed from the IPBES report (i.e., the name of the report should be given). It does not appear to be a modification of it, but a copy.

Commented [MT1]: 1

Answers: Thank you for your valuable comment. Your feedback has been carefully considered, and the figure has been updated with a new version created by the authors, incorporating information from various sources. Please review the revised manuscript.

Comment on Introduction-2: In Figure 2, the sources of the 3 "sub-figures" should be provided. I found the figures from these sites indicating that the authors did not format them themselves:
https://mahb.stanford.edu/recentnews/planetary-health/
https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-

Commented [MT2]: 2

one-health
https://www.ecohealthontario.ca/

Answers: We have replaced the figure as a follow-up to the previous comment. Kindly review Figure 1 in the revised manuscript.

Comment on Introduction-3: I wonder if the description of One Health is the updated one as written here: https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-one-health If the authors are using the older one, it should be stated and justified the use of that.

Answers: Thank you for your suggestion. We have adopted a definition recommended by the World Health Organization (WHO) in 2020 [source: WHO, 'One Health,' https://www.who.int/news-room/q-a-detail/one-health]. The essence of this definition aligns with the broader sense definition proposed by the authors. However, we have incorporated the authors' suggested definition into the revised manuscript. Please review the lines... in the revised manuscript for accuracy."

Comment on Introduction-4: The authors write that one concern related to the different interpretation of the concepts and their use is: "who the experts are in the global South and North and how they are using/applying these concepts". I'm not sure what this means, i.e., is it a concern? Does it matter which experts in the South and North are using these concepts, one could think that it's good that they are used. I wonder if it was meant to say that some unknowns, like who are working for these concepts. Perhaps revising this part would make it more clear to the readers.

Answers: It is essential to determine which experts from different fields are researching three ideas. This helps us understand how these concepts are used by different experts and which areas of expertise focus more on each concept.

These three ideas are studied mainly by a small group of fields rather than considering them from a broader perspective. This highlights the need to know which experts from which fields are using these ideas. This information is vital to identify gaps and differences in knowledge. For example, we have noticed that many experts in the veterinary field primarily use the One Health concept. However, for a more complete understanding, we need involvement from various other fields to tackle the complexities of One Health effectively.

To clarify our question, we've rephrased it: How experts from different disciplines are concentrated in ~~doing research on~~researching these concepts?

Comment on Methodology-1: In Table, 1 I wonder if the search term for EcoHealth for ProQuest is correct: "("EcoHealth" OR "EcoHealth")"? the terms seem the same for me.

Answers: Thank you for pointing that out. The term has been updated to "ecohealth" or "EcoHealth." Please check Table 1 in the revised manuscript.

Comment on Methodology-2: The authors write that: "articles comparing the three concepts or bibliometric analysis of the three concepts were excluded from the results/analysis (but authors have used a few to add robustness to the discussion)". I think it would be important to refer to these articles in the Introduction to show what has been done and to identify the gaps in current research that this review fills.

Answers:…… Commented [MT3]: ?

Comment on Methodology-3: Figure 3. The number don't match. If you start with identified articles (for PH=391) and extract the excluded (for PH=178) you would get 391-178=213. However, the next figure for "eligible articles" for PH is 51. What happened to the (213-51=) 162 articles that were not excluded nor eligible? Please format a flow chart with all steps of the review process including: number of dublicates/ articles after excluding dublicates, excluded after reading/assessing the title or by the 7 listed exclusion criteria. Also, the hand searches articles should be mentioned and included in the flow chart. Please clarify what the "had search" means under the section 2.2.

Answers: Thank you for your valuable comment. We have thoroughly reviewed and revised Figure 3 to address all your concerns. You will now notice that Figure 3 is free from any ambiguity. Your concern about "had search" in Section 2.2, has been addressed in the revised manuscript. Please refer to the lines... Commented [MT4]: 3 Commented [MT5]: ?

Comment on Methodology-4: What search databases provided information about webpages? How were these data used in the review? How do I know how many webpages were used? I would suggest removing webpages from the review as they might not be permanent, and it is difficult to describe them/their contents alongside the articles. Moreover, under the sub-heading 3.0 the Authors write: "The results were based on the final included articles of the systematic literature review", and there is no mentioning of the web pages, or the book chapters mentioned earlier.

Answers: Thank you very much for your excellent suggestion. As per your suggestion, we have removed webpages from the review. We also rewrite the sentences under the sub-heading 3.0. Please check the revised manuscript.

Comment on Results-1: The sub-section 3.1. start quite suddenly with a referral to a trend in PH article count. Could you start the paragraph with a bit more general sentence, e.g., introducing the Figure 4? Also, how did you related the increase in PH articles to the pandemic, was that clear from the contents of the articles? It could be that the concept has got more supporters after being launched in 2015 and the increase is due to widening of the supporter group whereas OH has been "around" much longer as indicated by the article number peaking already in 2017.

Answers: Thank you for the valuable suggestion. In line with your advice, we have rewritten the

introductory paragraph in subsection 3.1, and all your other concerns have also been resolved. Please review the revised manuscript, particularly the section at line...

Comment on Results-2: In the sub-section 3.1 it would be nice to see some examples of the three different types of articles, what themes were handled or what types of projects were presented. Now these results only give the numerical information about the counts of articles.

Answers: Once again, thank you for your excellent suggestion. To address your concern, we have revised the paragraph in subsection 3.1. Please review the lines... in the revised manuscript.

Comment on Results-3: In sub-section 3.2 Figure 5, are the expert fields a summary of the authors of the articles on PH, OH, and EH? It would be interesting to see how the expertise vary between the authors of the three concepts, and it could be visualized by three separate figures presenting numbers and percentages of expert fields for each concept. In the current format it seems that veterinary medicine and animal health dominate, but this is unlikely, e.g., for PH.

Answers: Thank you once more for your excellent suggestion. To address your concern, we have revised the paragraph in subsection 3.2, taking into account the data presented in Figure 5. Please examine the lines... in the revised manuscript for reference.

Comment on Results-4: Figure 6 (Figure legend states now 4 instead of 6). I don't understand the color division of the bars in 6A (legends: "I", "S", "T"). Do these refer to the: "single discipline, multidisciplinary (2 disciplines) or transdisciplinary (2 or more disciplines)", if so, please make it clear in the figure.

Answers: Following your suggestion, we have redrawn Figure 6 using different color codes to enhance the clarity of the information presentation. Please refer to Figure 6 in the revised manuscript.

Comment on Results-5: Figure 6. What are the sections of panel 6C? I think this panel could be removed as the result is not mentioned in the text.

Answers: It has been removed. Please check Figure 6 in the revised manuscript.

Comment on Results-6: Sub-section 3.3. I wonder if this information was obtained from the websites. Could this sub-section be included in the Introduction (where the concepts were described) rather than in the results as this is not part of the literature review (of articles)? Then also the notion of using web sites in the review could be removed from the Methodology section.

Answers: This comment has been taken care of. Please check line…of the revised manuscript. Thanks for helping us make the manuscript better.

Comment on Results-1: Sub-section 3.3. I think it is not necessary to mention a person by name in the text ("It has been advanced by Dr. Samuel Myers and supported by the Rockefeller Foundation". Instead, Dr. Myers' affiliation (Harvard T.H. Chan School of Public Health) or rather the Planetary Health Alliance that he is founding director of, could be mentioned together with the Rockefeller Foundation.

Commented [MT6]: ?

Commented [MT7]: ?

Commented [MT8]: In the Excel file, I could not find the original dataset of Figure 5 that is in the paper. So, I could not make it better. Also, what the reviewer asks us, needs to start from beginning to count the number for each discipline/concept.

? **:Commented [MT9]**

Commented [MT10]: 6

Commented [MT11R10]: Modified!

Commented [MT12]: 6

Commented [MT13R12]: Removed!

Commented [MT14]: ?

Answers: We agree with the reviewer. We have fixed the issue. Please check line……in the revised manuscript.

Commented [MT15]: ?

Comment on Discussion-1: The Discussion starts with a statement "It is interesting to observe that…" that reflects the Authors' opinion rather than repeats the finding. I would suggest re-wording so that the main findings of the review are presented first and then they are reflected to existing literature and research in the filed in general.

Answers: We have modified the starting paragraph of the discussion as per your suggestion. Please check the line…of the revised manuscript.

Commented [MT16]: ?

Comment on Discussion -2: Is the following sentence: "There was a noticeable rise in academic interest in public health during the 2019-2020 academic year, which can be related to the widespread effects of the COVID-19 pandemic." based on the contents of the articles or how can the Authors claim that the increase in the count of publications is linked to the COVID-19 pandemic?

Answers: We have addressed this issue by modifying the sentence. Please check line… of the revised manuscript.

Commented [MT17]: ?

Comment on Discussion-3: On the following: "This means that EcoHealth has better-applied principles in the real world, demonstrating a higher level of practical applicability. One Health and Planetary Health are behind in implementation, suggesting that there may be a disconnect between advocacy and actual action in these domains" some more insights could be obtained if the expert fields were analyzed and presented separately for PH, OH and EH. It may be that the disciplines also vary in their readiness to implement the plans and actions suggested.

Answers: we agree with you. It has been taken care of.

Comment on Discussion -4: I would suggest removing the names of persons from the Discussion (on advocates of the concepts) and focusing on associations/ alliances as well as international agencies.

Answers: Excellent suggestion. It has been taken care of. Please check lines… of the revised manuscript.

Commented [MT18]: ?

Comment on Discussion -5: The two last paragraphs of Discussion section are basically repeating what is seen in Table 5. Some more reflection of the findings would be useful; what do the differences and similarities mean, are they a threats or possibilities? Should we do something about them? (I see that this is reflected a but in the last paragraph of section 5, so maybe these paragraphs could just be removed)

Answers: Thank you very much for your excellent suggestion. Now, the last two paragraphs have been modified as per your suggestions. Please check line….in the revised manuscript.

Commented [MT19]: ?

Comment on Conclusions-1: The first paragraph could be removed as it repeats what has been said several times earlier. The second paragraph goes straight into summarizing findings and feels like a better start to this section.

Answers: We agree with the reviewer. As per your comments, we have deleted the first paragraph. Please check lines …of the revised manuscript.

??? :Commented [MT20]

Reviewer #4:

Comment -1: It is very important that we collaborate to find solutions to environmental threats. The premise of the article is sound, but it can be strengthened by considering several changes or revisions.

Answers: We appreciate that you think the article's main idea is good. We agree that working together to tackle environmental problems is essential. We have made many changes to improve the article, and you can see these in the new version of the document.

Comment -2: There is a previous well-respected paper already published on this topic. I believe it should be cited and your authors should describe how their approach differs, or their findings add to previous literature. Public health guide to field developments linking ecosystems, environments and health in the Anthropocene http://orcid.org/0000-0003-1163-2305Chris G Buse1, Jordan Sky Oestreicher2, Neville R Ellis3, Rebecca Patrick4, Ben Brisbois5, Aaron P Jenkins6,7, Kaileah McKellar5, Jonathan Kingsley8, Maya Gislason9, Lindsay Galway10, Ro A McFarlane11, Joanne Walker12, Howard Frumkin13, Margot Parkes1 Correspondence to Dr Chris G Buse, School of Health Sciences, University of Northern British Columbia, Prince George, BC V2N 4Z9, Canada; chris.buse@unbc.ca

Abstract: The impacts of global environmental change have precipitated numerous approaches that connect the health of ecosystems, non-human organisms and humans. However, the proliferation of approaches can lead to confusion due to overlaps in terminology, ideas and foci. Recognising the need for clarity, this paper provides a guide to seven field developments in environmental public health research and practice: occupational and environmental health; political ecology of health; environmental justice; ecohealth; One Health; ecological public health; and planetary health. Field developments are defined in terms of their uniqueness from one another, are historically situated, and core texts or journals are highlighted. The paper ends by discussing some of the intersecting features across field developments, and considers opportunities created through such convergence. This field guide will be useful for those seeking to build a next generation of integrative research, policy, education and action that is equipped to respond to current health and sustainability challenges. http://dx.doi.org/10.1136/jech-2017-210082

Answer: Thank you for bringing to our attention an important related work (Buse, C. G., Oestreicher, J. S., Ellis, N. R., Patrick, R., Brisbois, B., Jenkins, A. P., ... & Parkes, M. (2018). Public health guide to field developments linking ecosystems, environments and health in the Anthropocene. J Epidemiol Community Health, 72(5), 420-425). We've cited this paper in the revised version of our manuscript to compare how our paper is similar and different from it. Please take a look at the lines... in the revised manuscript.

? :Commented [MT21]

Comment -3: Please review the paper for redundancies. The discussion and conclusion sections are very repetitive.

Answer: Thanks a lot for your helpful feedback. We have fixed the problem and significantly changed the discussion and conclusion parts. Please take a look at the revised manuscript.

Comment -4: Planetary Health, may be the newest science, but it is an old concept. It is important to acknowledge Planetary Health centering Indigenous Knowledge and wisdom traditions. The definition of Planetary Health has also evolved. The authors cite a definition from 1978 (p. 5). The accepted definition can be found on the Planetary Health Alliance website and it is far less anthropocentric.

Answer: Thank you for your comments. We acknowledge that planetary health has deep historical roots, particularly in Indigenous knowledge and wisdom traditions. In our revised manuscript, we've incorporated this idea. Please check the lines… of the revised manuscript. Our manuscript's definition of planetary health is sourced from a specific article, 'Whitmee et al. (2015), The Lancet, page 1978.' We've made this clear in our manuscript.

Commented [MT22]: ?

Comment 5: It would be beneficial to have a limitations section. In this section, the authors could address issues in publishing such as access fees and publication fees that might explain the lower numbers of global South papers in the Planetary Health literature. This is not as big of an issue in One Health where a global North investigator who may have funding through grants partners with global South authors.

Answer: Thank you for your suggestion. We have added a few sentences about it in our discussion. Please review the revised manuscript at the specified line.

Commented [MT23]: ?

Comment - 6: Levels of advocacy and implementation are not just reflected in published articles. Movements may be more evident in organizational membership and robust website participation. For example, Planetary Health has regional hubs and next-generation campus ambassadors all over the world. These robust advocacy and implementation examples do not appear in published articles, but they exist, nonetheless.

Answer: Yes, you are correct. Thank you for bringing this to our attention. We have included a new sentence addressing this concern in the discussion section.

Comment – 7: Given the definition of Planetary Health has been updated, Table 5 will also need to be updated. Planetary Health is defined as transdisciplinary yet One Health is given the

distinction of emphasizing collaboration. Furthermore, one of the five core domains of Planetary Health is systems thinking and complexity, therefore Eco-Health should not have "Considers the complex interactions between ecological, social, and economic systems concerning human and ecosystem health" as a distinction.

Answer: Thank you for your good suggestion. We have modified the ~~t~~Table 5. Please check the revised manuscript.

Comment – 8: You might also mention the Lancet Planetary Health, a whole journal dedicated to the science of planetary health, as a sign of significant impact.
https://www.thelancet.com/journals/lanplh/home

Answer: This has been inserted in the Discussion. Please check the lines…….. of the revised manuscript.

Commented [MT24]: ?

Comment – 9: Readers might benefit from knowing when and under which circumstances to use each of the models. As you describe them, readers might conclude that the concepts can be used interchangeably and that is not the case. Each serves a unique purpose, but that purpose is not clearly stated in the paper.

Answer: The comment has been addressed, and a corresponding paragraph has been incorporated. Please review the revised manuscript for these updates.

Comment -10: There is more that can be said about these different models. I hope your paper can be revised to make these differences more salient.

Answer: Your observation is valid; however, given the current paper's objectives and the reviewer's feedback, we have made significant revisions to the manuscript, as is evident in the updated version.

Exploring the Nexus: Comparing and Aligning Planetary Health, One Health, and EcoHealth

Byomkesh Talukder[1]*, Nilanjana Ganguli[2], Eunice Choi[2], Mohammadali Tofighi[2]

[1] Department of Global Health, Florida International University, USA.
[2] Dahdaleh Institute for Global Health Research, York University, Canada.

* byomkesh.talukder@gmail.com

Abstract

The interconnectedness between humans and ecosystems highlights the need to protect ecosystems for the well-being of humans and the environment. This has led to the emergence of holistic and interdisciplinary concepts like Planetary Health, One Health, and EcoHealth. There is a growing interest ~~about~~ in the differences and implementation of these concepts, including their founders, fundamental questions answered, focus, global distribution of studies, and alignment. This study ~~aims to address~~ addresses these issues to facilitate coordinated health interventions for people and ecosystems. Using electronic databases (Web of Science, PubMed, and ProQuest) and conducting a systematic literature review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), this paper compares the concepts of Planetary Health, One Health, and EcoHealth, providing a comprehensive overview of the findings and insights by examining each field's advocacy, conceptual application, and implementation levels and exploring the contributions of influential individuals and organizations. The results highlight the global interest in and applicability of each concept and ~~point out~~ highlight challenges and opportunities for further advancement. The study concludes by emphasizing the shared goals and interconnections among these fields in addressing complex health issues at the nexus of human health, environmental health, and ecosystem well-being.

Keywords: Planetary Health, One Health, EcoHealth, Advocacy, Distinctions, Resemblances

1.0 Introduction

Humans and ecosystems are connected [1,2,3]. Exploiting ecosystems for survival has shaped and influenced human societies and ecosystems and continues to impact both humans and ecosystems today. Many religions and indigenous communities recognize the importance of protecting ecosystems and advocate for the judicious use of resources [4,5,6]. Humans and ecosystems are interconnected in a complex adaptive system. Ecosystems provide various services to humans, including regulatory services such as pollination, water purification, climate regulation, and so forth, and provisional services such as food, raw materials, medicinal resources, and so on [7,8,9,10,11]. These services are crucial for human health and influence the social determinants of health [12].

Human reliance on ecosystems for survival and health has increased alongside the growth of the global population [13,14]. Achievements in human development, such as longer life expectancies and poverty reduction, have been facilitated by resource usage, including fossil fuels, increased energy consumption, and modified agricultural practices. However, these advances have resulted in detrimental consequences like escalating CO_2 emissions, deforestation, water scarcity, and other environmental damages [14]. As the world's population is projected to reach 9.6 billion by 2050, the demand for food and water will intensify, further straining available resources and exacerbating greenhouse gas emissions, environmental degradation, and the vulnerability of Earth's systems [14].

Regrettably, this exploitation has endangered ecosystem functioning. The industrial revolution in the nineteenth century triggered significant pollution, environmental degradation, and public health concerns through changes in production and manufacturing processes [15]. Presently, 14 out of 18 categories of nature's contributions to human life are experiencing decline, reflecting the strain on ecosystems and their reduced capacity to sustain human civilization, leading to adverse health impacts (see Fig. 1). For instance, air and water pollution have been linked to health issues like cancer and respiratory disorders, and pesticides and improper waste disposal have poisoned millions and contaminated water sources, contributing to the spread of waterborne diseases [16].

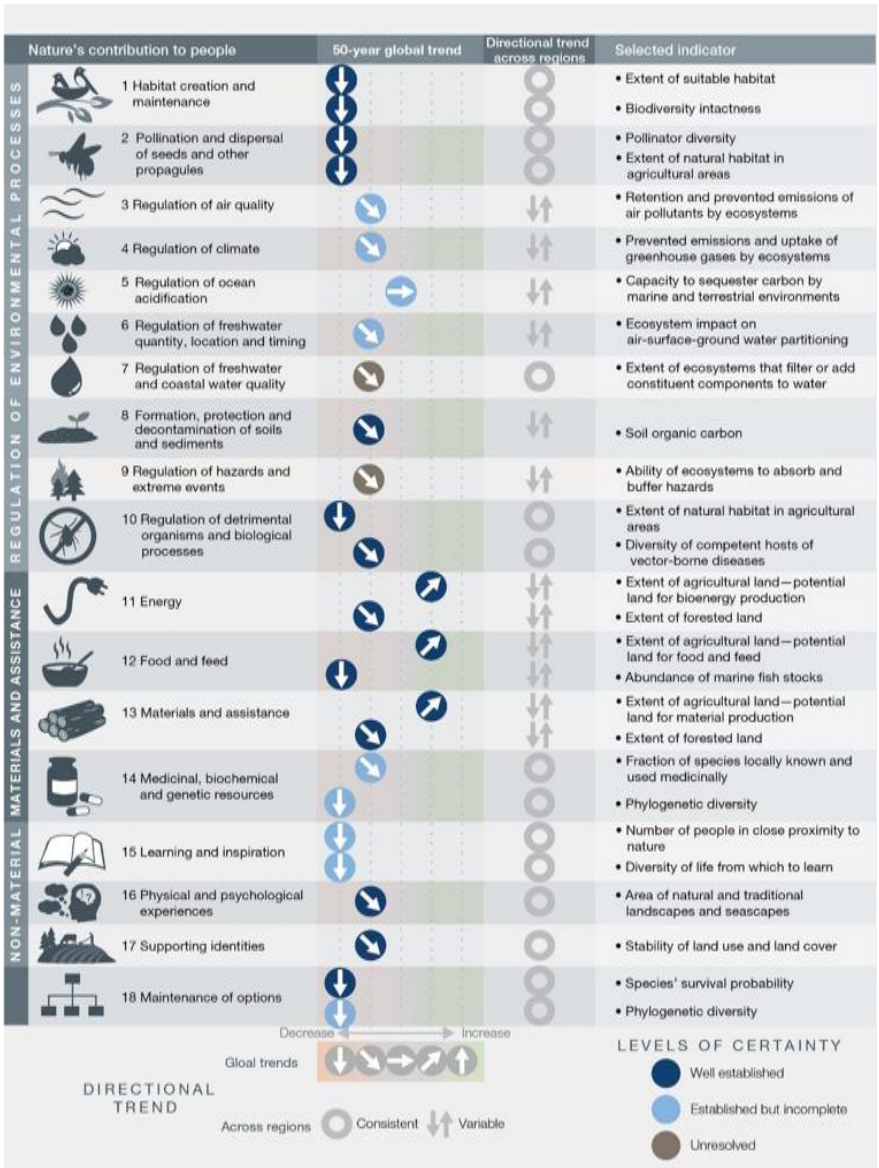


Fig. 1. Global 50-year trends in the capacity of nature to sustain contributions to a good quality of life, showing a decline in 14 of the 18 categories of nature's contributions to people [16].

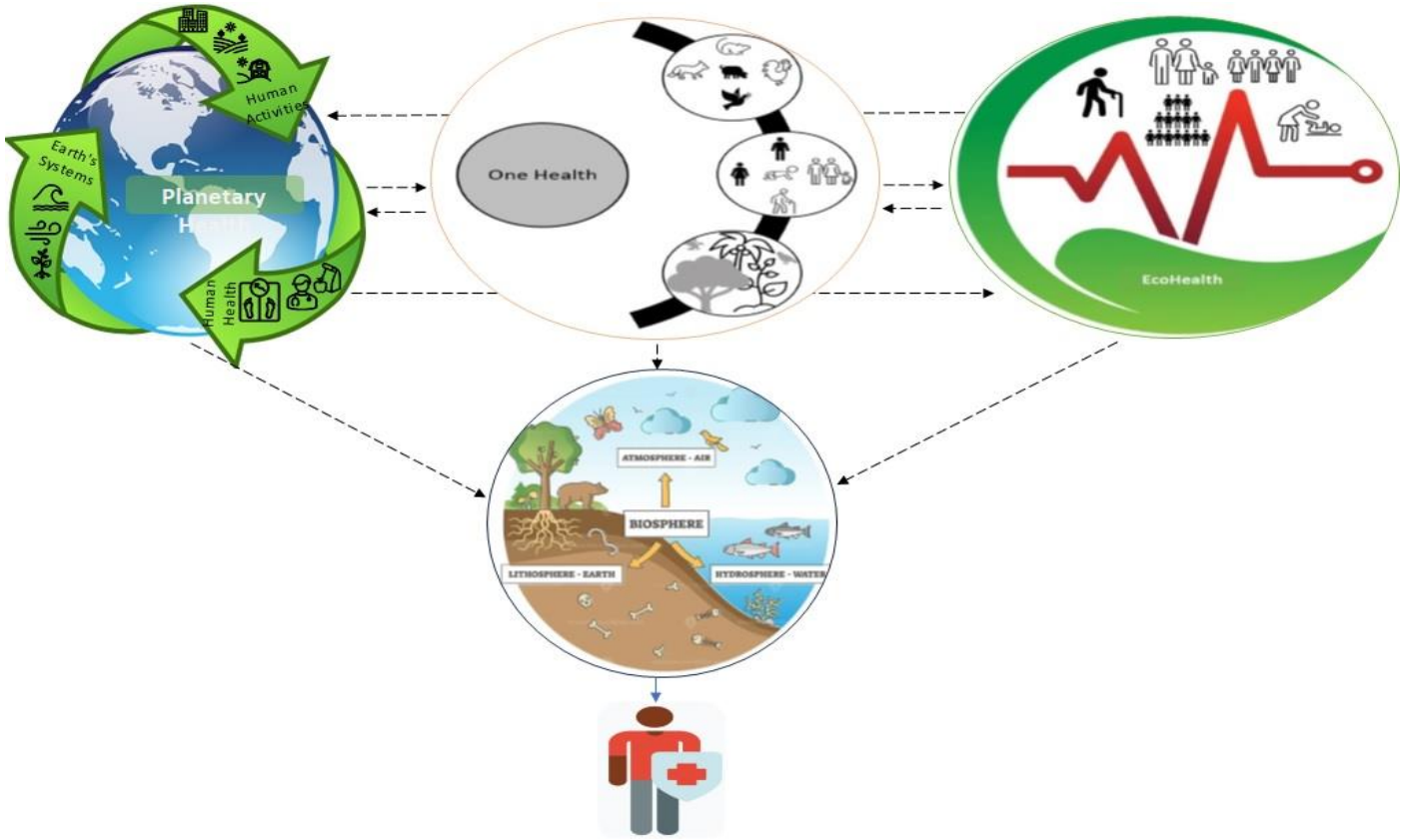
These issues are not new; environmental degradation has been attributed as a contributing factor to the destruction of numerous past societies, such as the collapse of the Indus Valley Civilization (7000 to 600 BCE) [17]. The need to address the unsustainable use of natural resources and mitigate harmful impacts on ecosystems and human health is urgent as well as evident [18]. Environmental movements gained momentum in the twentieth century, ~~leading to the establishment of~~establishing national and international environmental laws and regulations [19]. Scientific research in the latter part of the twentieth century established the link between environmental factors and specific health outcomes, including cancer and respiratory diseases. Accordingly, policies and practices have been developed to reduce exposure to environmental pollutants and minimize their impact on human health [20,21,22]. Concurrently, the concepts of Planetary Health, One Health, and EcoHealth have emerged to address the impacts of ecological degradation on human health.

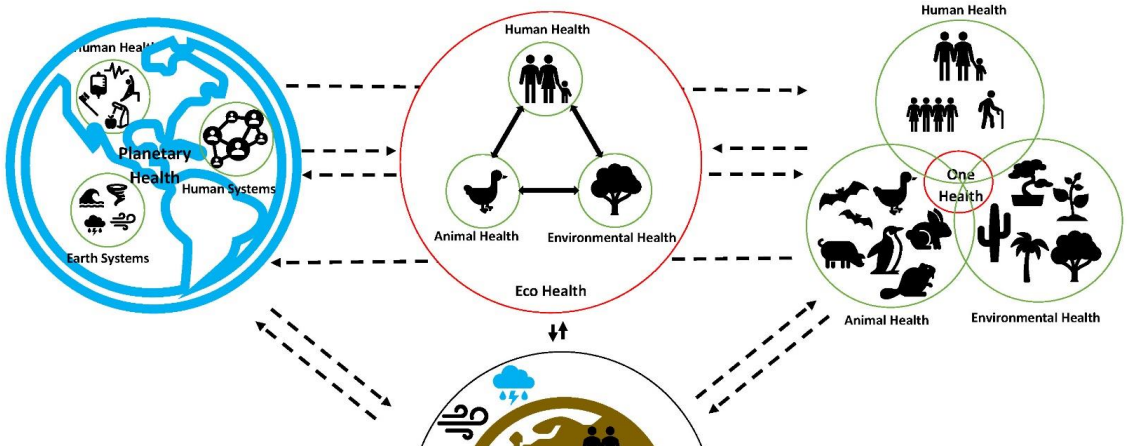
Planetary Health "is the achievement of the highest attainable standard of health, well-being, and equity worldwide through judicious attention to the human systems—political, economic, and social—that shape the future of humanity and the Earth's natural systems that define the safe environmental limits within which humanity can flourish" [14, p.1978]. One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems~~,~~ while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development (23, p.1).

~~One Health "is an approach to designing and implementing programs, policies, legislation, and research in which multiple sectors communicate and work together to achieve better public health outcomes. The areas of work may include zoonotic diseases, antimicrobial resistance, food safety, and emergency preparedness, among others" [23, p.1].~~ EcoHealth "is an approach that integrates natural and social sciences to understand and manage ecosystems and the interactions among human, animal, and environmental health" [24, n. d., p. 1].

Fig. 2 presents a graphical illustration of these concepts. Planetary Health, One Health, and EcoHealth principles are frequently used at the local and regional levels to increase awareness, engage communities, and promote policies and practices that enhance sustainable and resilient health systems of both people and the ecosystems (for Planetary Health, see [25,26,27]; for One Health see [28,29,30,31,32]; for EcoHealth see [33,34,35,36]. However, different groups of experts and global platforms emphasize these concepts differently, leading to various concerns. These include: (i) how they differ in advocacy, conceptual application, and implementation~~;~~ (ii) How experts from different disciplines are concentrated in ~~doing research on~~researching these concepts. ~~who the experts are in the global South and North and how they are using/applying these concepts~~; (iii) where the studies of these concepts are concentrated. Other concerns are: (i) who the founders and organizations are that are working to advance the concept; (ii) what fundamental questions are answered by these concepts; (iii) how they differ in terms of focus and scope, emphases, and critical considerations; and (iv) how the studies differ in distinction, resemblance, and alignment. Finding the answers to these questions ~~in order to~~ to successfully

design coordinated interventions to address human and ecosystem health is the objective of this study.


Human Activities
Earth's Systems
Planetary Health
Human Health
One Health
EcoHealth
ATMOSPHERE - AIR
BIOSPHERE
LITHOSPHERE - EARTH
HYDROSPHERE - WATER


Planetary Health
Human Systems
Earth Systems
Human Health
Animal Health
Environmental Health
Eco Health
Human Health
One Health
Animal Health
Environmental Health

2.0 Methodology

To fulfill the objective of the study, data were gathered and visualized by the following steps.

2.1 Identify and Sort Articles

Following the guidelines of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses [37], a rigorous literature search was conducted by combining keywords like "Planetary Health", "One Health", "EcoHealth" using the Boolean operators "AND/OR" in three electronic data sources: Web of Science, PubMed, and ProQuest (see Table 1). The search mainly focused on peer-reviewed articles written in English and published between January 2015 and June 2021 onwards. The year 2015 was selected as the starting point to align with the official launch year of "Planetary Health," which is the newest among the three concepts [14]. This approach ensured fairness in the search results, aiming for an equal number of articles per concept. Later, a few other articles from 2022 were also included by hand search.

Table 1. Database and Keywords ~~used~~ Used for Identifying Articles

Concept	Source	Keywords
Planetary Health	*WOS*	TITLE: ("Planetary Health") AND TOPIC: (concept* OR approach*)
		AB = ("Planetary Health") AND TS = (approach* OR concept*)
	PubMed	("Planetary Health" [Title/Abstract]) AND (concept* OR approach*)
	ProQuest	ti ("Planetary Health") AND (concept* OR approach*)
		ab ("Planetary Health") AND noft (concept* OR approach*)
One Health	*WOS*	TITLE: ("One Health") AND TOPIC: (concept* OR approach*)
		AB = ("One Health") AND TS = (approach* OR concept*)
	PubMed	("One Health" [Title/Abstract]) AND (concept* OR approach*)
	ProQuest	ti ("One Health") AND (concept* OR approach*)
		ab ("One Health") AND noft (concept* OR approach*)
EcoHealth	*WOS*	TITLE: ("ecohealth " OR" EcoHealth") AND TOPIC: (concept* OR approach*)
		AB = ("~~e~~E~~e~~coHealth" OR "ecohealth") AND TS = (approach* OR concept*)
	PubMed	("~~e~~E~~e~~coHealth"[Title] OR "EcoHealth"[Title/Abstract]) AND (concept*[Title] OR approach*[Title])
	ProQuest	ti ("~~e~~E~~e~~coHealth" OR "EcoHealth") AND noft (concept* OR approach*)
		ab ("~~e~~E~~e~~coHealth" OR "EcoHealth") AND noft (concept* OR approach*)

~~A predefined research protocol with clearly defined inclusion and exclusion criteria for identification, screening, eligibility, and inclusion (see Fig. 3) was developed by the authors.~~ The authors developed a predefined research protocol with clearly defined inclusion and exclusion criteria for identification, screening, eligibility, and inclusion (see Fig. 3) based on PRISMA principles [37]. The predefined protocol was verified by running pilot searches and further adjusted to keep the size of the dataset manageable yet highly representative of the three concepts.

The first step of the screening process was to export the articles (with full records) from all three databases to Zotero software and merge the results per concept and store them in three separate folders (one for each concept). Duplicates were eliminated, ~~which brought the sample size to 2169 articles for One Health, 170 articles for EcoHealth, and 183 articles~~ bringing the sample size to 2169 articles for One Health, 170 for EcoHealth, and 183 for Planetary Health.

To fulfill the objective of the study, ~~mainly~~ both review papers and empirical research were included in the search results. A few book chapters ~~and~~ reports, and website information were also included.

The research protocol required adjustment after the pilot searches were run. This was mainly due to the high number of hits for One Health, which has gained a lot of momentum. In order to keep the sample size manageable, a special exclusion criterion of "less than 10 citations" was applied only to the One Health results.

The last sorting phase was based on title and abstracts and consisted of a few inclusion and exclusion criteria: (i) only articles focussed on either advocating or applying one or more of the three concepts were included; (ii) theoretical papers on the three concepts were excluded; (iii) articles comparing the three concepts or bibliometric analysis of the three concepts were excluded from the results/analysis (but authors have used a few to add robustness to the discussion); (iv) articles in which the concepts were only mentioned and were not the focus of the article were excluded; (v) articles that considered "Planetary Health", "One Health" and "EcoHealth" not as concepts but in the general sense to refer to the health of the planet, a health problem, or the health of the ecosystem were excluded; (vi) articles that were linked to the same project especially in the case of One Health and EcoHealth, were excluded; and (vii) articles were excluded if there was no access to the full article.

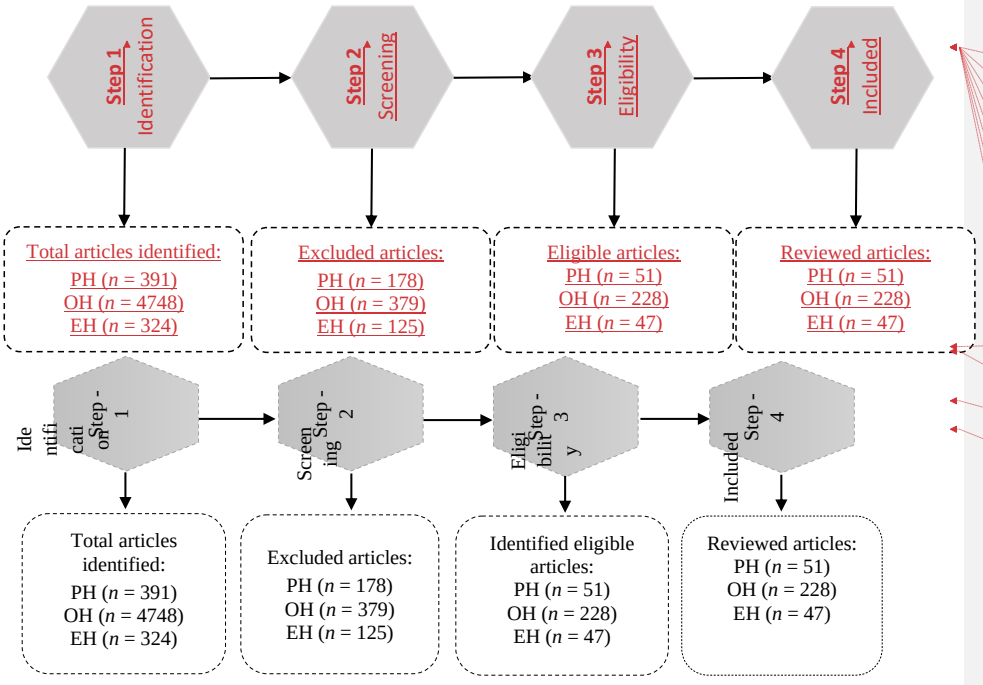


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Fig 3. Steps of systematic literature review.
Note: PH = Planetary Health; One Health = One Health; EH = EcoHealth

As depicted in Fig. 3, at the end of the final screening phase, 228 articles for One Health, 47 articles for EcoHealth, and 52 articles for Planetary Health were deemed to find the answer ~~of~~ to (i) how Planetary Health, One Health, and EcoHealth differ in advocacy, conceptual application, and implementation; (ii) How experts from different disciplines are concentrated in ~~doing research on~~researching these concepts. ~~who the experts are in the global South and North and how they are using/applying these concepts~~; (iii) where the studies of these concepts are concentrated.

2.2 Data Extraction and Compilation

Included articles were exported in Excel sheets to create a database from the articles about "advocacy," "conceptual application," and "implemented" based on the following predefined criteria, as shown in Table 2.

Table 2. Criteria for "Advocacy," "Conceptual Application," and "Implemented."

Category	Criteria
Advocacy	Articles advocating one of the concepts for a defined local, regional, or global issue. For example, "One Health for Antimicrobial Resistance (AMR) surveillance in the ~~global context~~Global Context."
Conceptual Application	Articles that explicitly discuss the conceptual application of the concepts in the investigation or intervention of a defined local, regional, or global health issue. Applications range from conceptual models, application of theoretical frameworks, technological solutions, and educational workshops to vaccination programs/projects. For example, "Labelling plant-based meat as an intervention to promote the Planetary Health diet."
Implemented	Articles based on research-to-action projects, or, in other words, a concept funded and implemented, whether field-based or virtual (think-tank), to solve a local, regional, or global health issue. For example, "The Lawa project to control Opisthorchiasis in northeast Thailand ("EcoHealth" project)."

Following the sorting of the articles per category, key variables identified were publication year, journal name, title of study, authors' names, authors' disciplines, authors' locations, study location (for implemented), type of health issue (communicable or non-communicable disease; type of communicable disease (zoonotic, vector-borne, infectious, parasitic); NGO or government involvement (in funding or research team member); type of study (investigation or intervention): top-down (no community involvement) or bottom-up (community involvement in data collection, implementation and reporting) approach; and single discipline, multidisciplinary (2 disciplines) or transdisciplinary (2 or more disciplines). The articles were coded by authors' locations and authors' disciplines for Global North and South collaboration and single discipline (1 discipline), interdisciplinary (2 disciplines), or transdisciplinary (3 or more disciplines), respectively.

Besides 52 articles, other articles were ~~hand-searched~~ hand-searched to identify (i) the founders and organizations working to advance the concepts; (ii) fundamental questions addressed by the concepts, and (iii) focus and scope, emphasis, and critical considerations, and (v) distinctions, resemblances, and alignment of the concepts.

2.3 Data Presentation

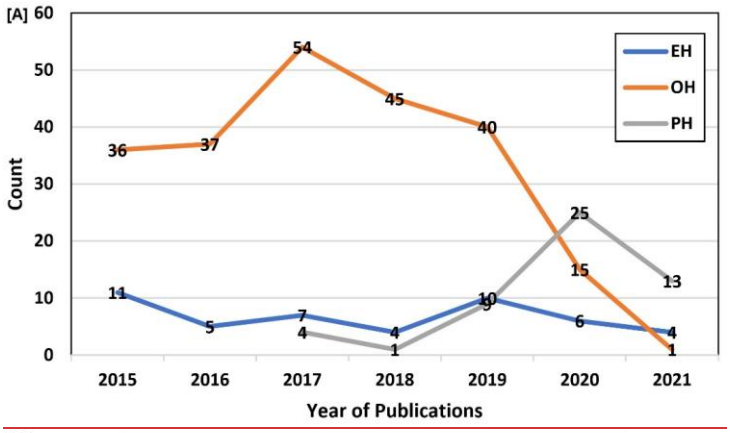
Using Microsoft Excel's Analyze Data option, multiple visual charts and maps were developed (as discussed in the results) to compare the three concepts based on the level of interdisciplinary collaboration, Global North-South collaboration, popularity (number of studies, disciplines, location), stage (advocacy, conceptual application, or implemented), main health issue, location of the project (for implemented), policy potential (NGO or government involvement) and methodology approach (expert level or community-level participation).

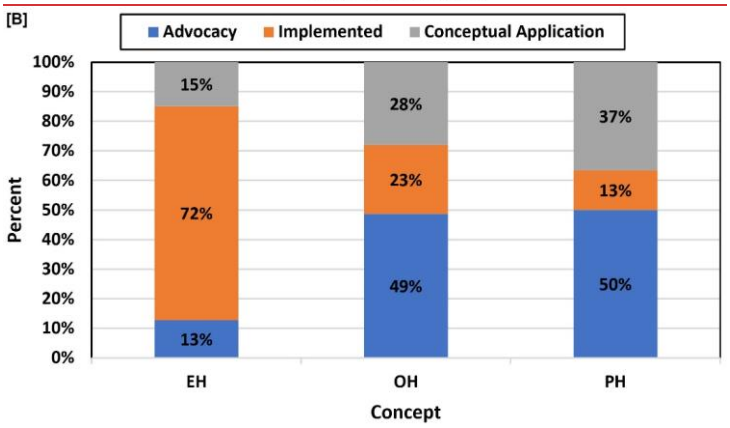
3.0 Results

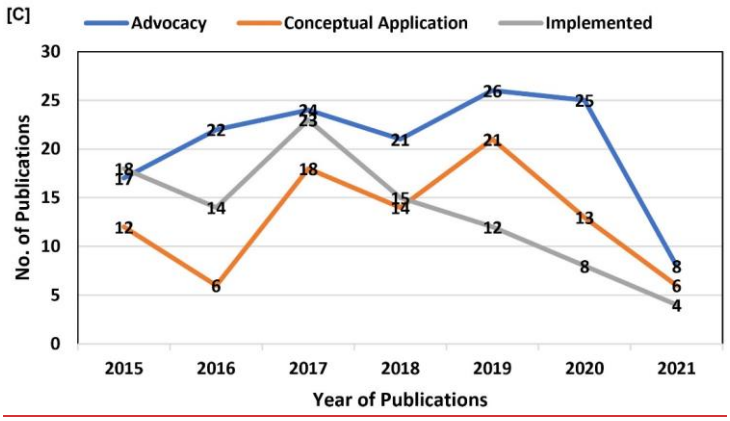
The results were based on the final included articles of the systematic literature review.

3.1 Advocacy, Conceptual Application, and Implemented

There was a significant hike in academic interest in Planetary Health in 2019-2020 due to the pandemic (Fig. 4[A]). One Health and Planetary Health are very close in the percentage of articles ~~that focussed~~focussing on advocacy (49% and 50%, respectively), with EcoHealth lagging considerably behind with only 13%. However, the reverse was true for implemented, with EcoHealth leading significantly (Fig. 4[B]). Advocacy dominated throughout the study period, with a rise in 2019-2020 and a steady decrease in articles on application within the same period (Fig. 4[C]). This decrease could be related to limitations due to travel restrictions caused by COVID-19.







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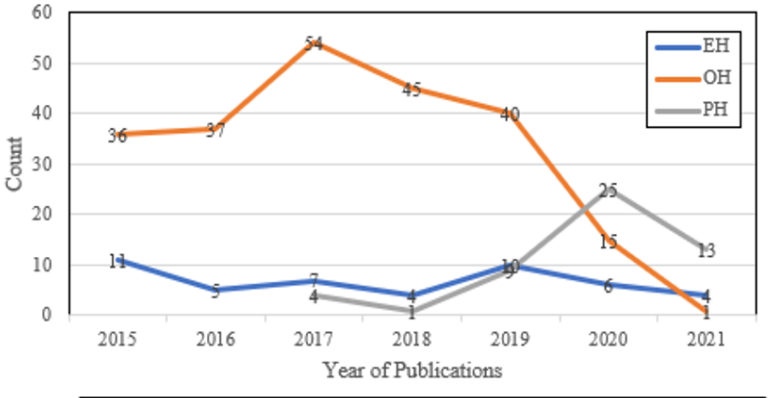

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Fig. 4. [A] Number of publications per concept in 2015-2021, [B] Percentage of articles by category per concept, [C] Number of articles per category by publication year.

3.2 Involvement of Experts from the Global South and North

In terms of author's expertise, veterinary medicine is the most frequently occurring academic expertise in the sample, which could be associated with the significantly high number of articles about One Health versus EcoHealth and Planetary Health (Fig. 5). There was a considerable amount of transdisciplinary collaboration in the articles on all three concepts, but it is essential to draw attention to the disciplines that are in partnership and to discover if there are any gaps. For example, 35% of articles featured collaborations between authors from the Global North and South, with most of the cooperation in One Health (Fig. 6[A]), and a sharp difference in the percentage of studies led independently by ~~global~~ Global North versus ~~global~~ Global South (Fig. 6[B]). Fig. 7[A] and 7[B] show the geographical locations of the authors; it is encouraging to see the broad global reach of the three concepts.

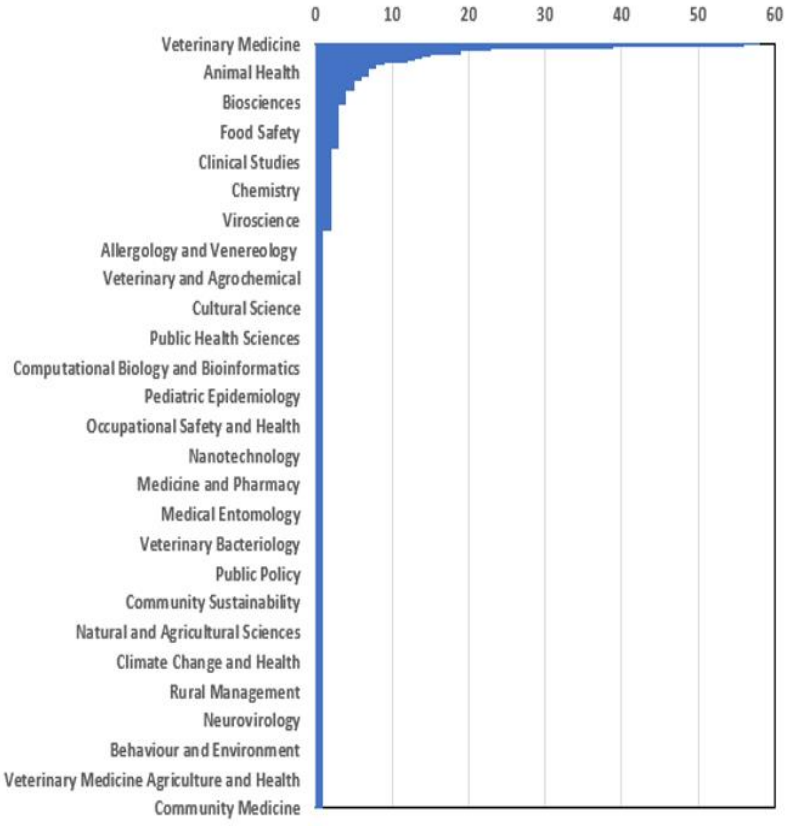
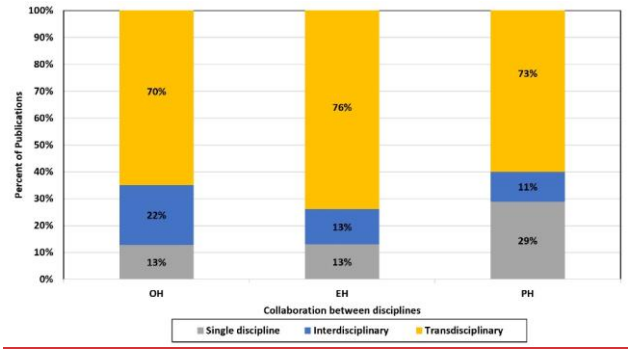


Fig. 5. Number of publications per discipline~~s~~ of the authors



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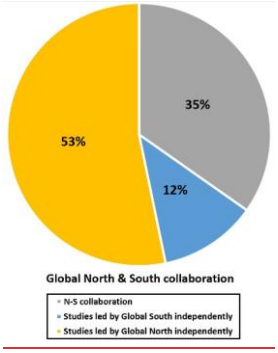

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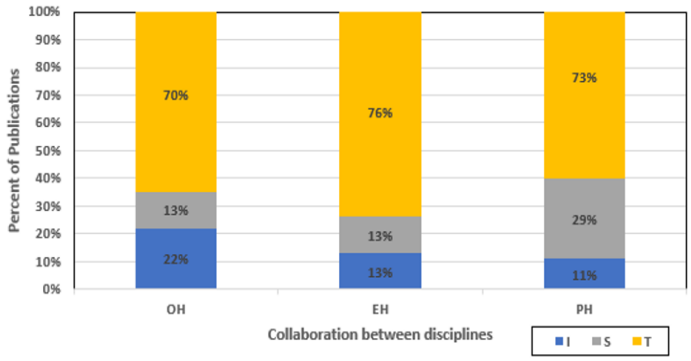

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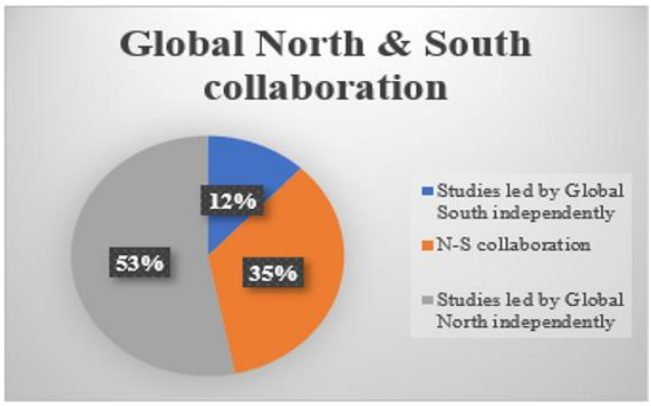

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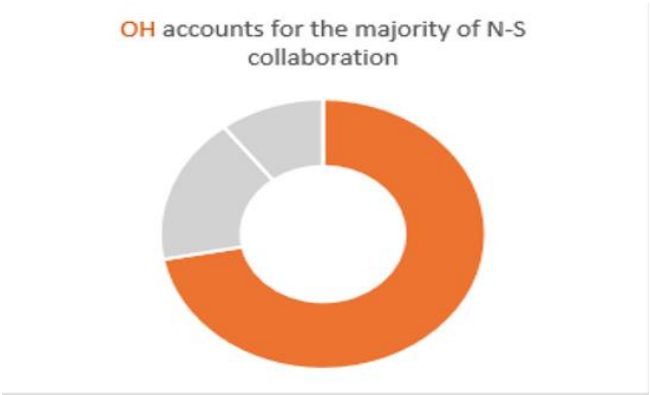

Fig. 46. [A] Percentage of publications collaborated between disciplines from 2015-2021, [B] Percentage of articles collaborated in Global North and South~~, [C] Dominance of One Health in Global North and South collaboration~~

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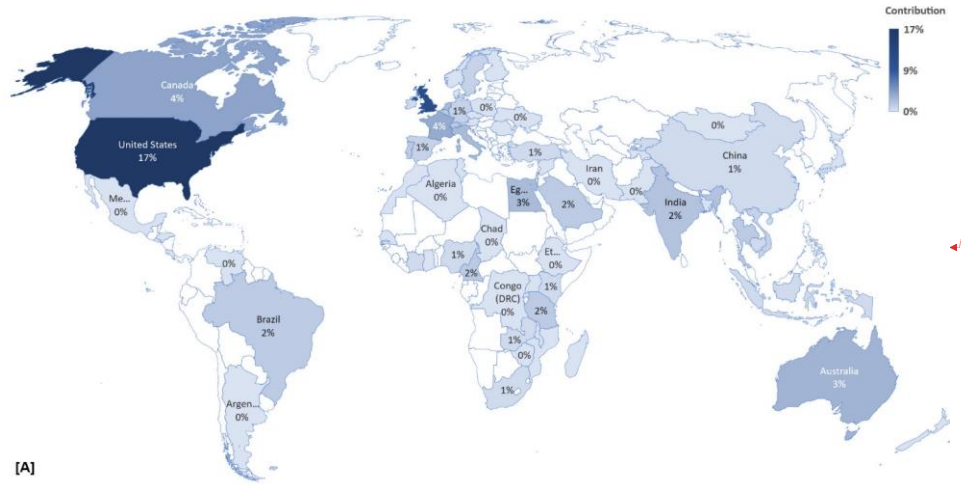

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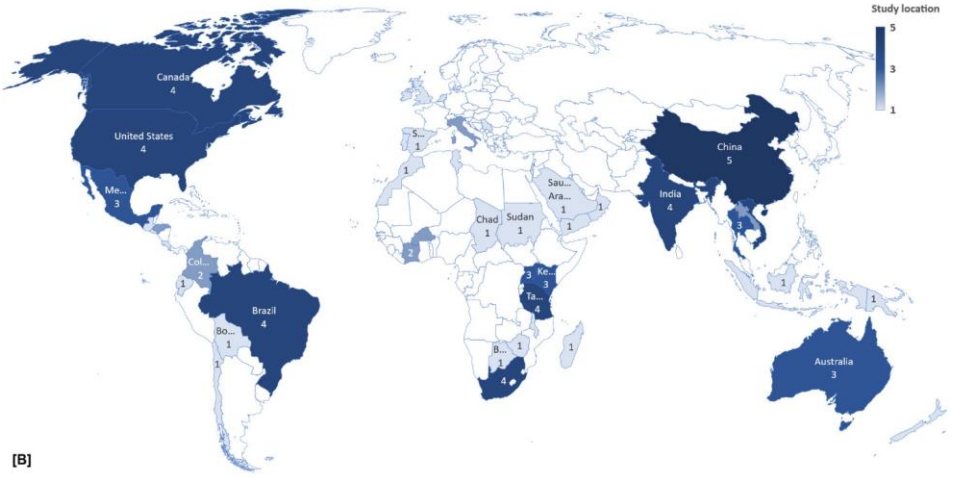

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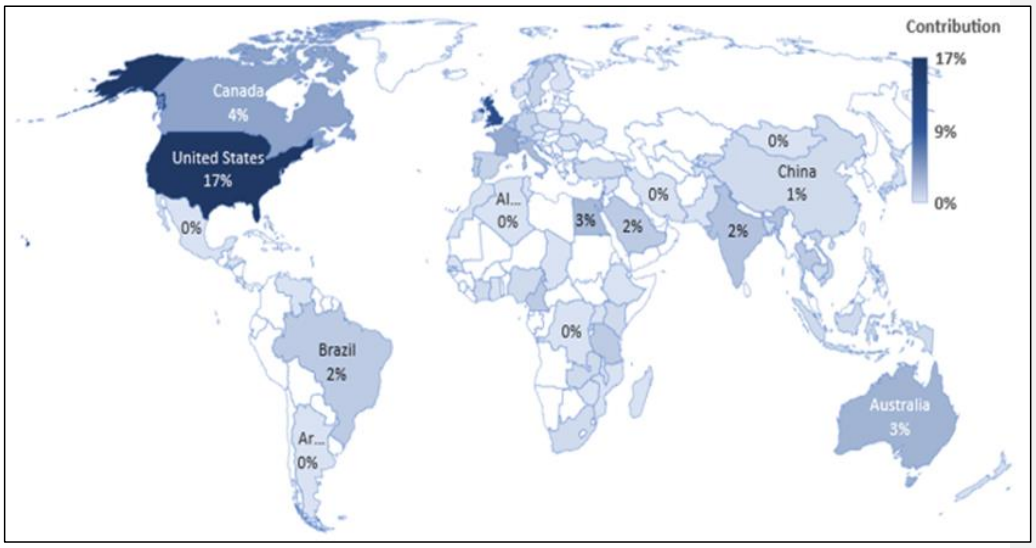

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Fig. 7. [A]. Overall locations of authors, [B] Study location (only for implementation of the concepts)

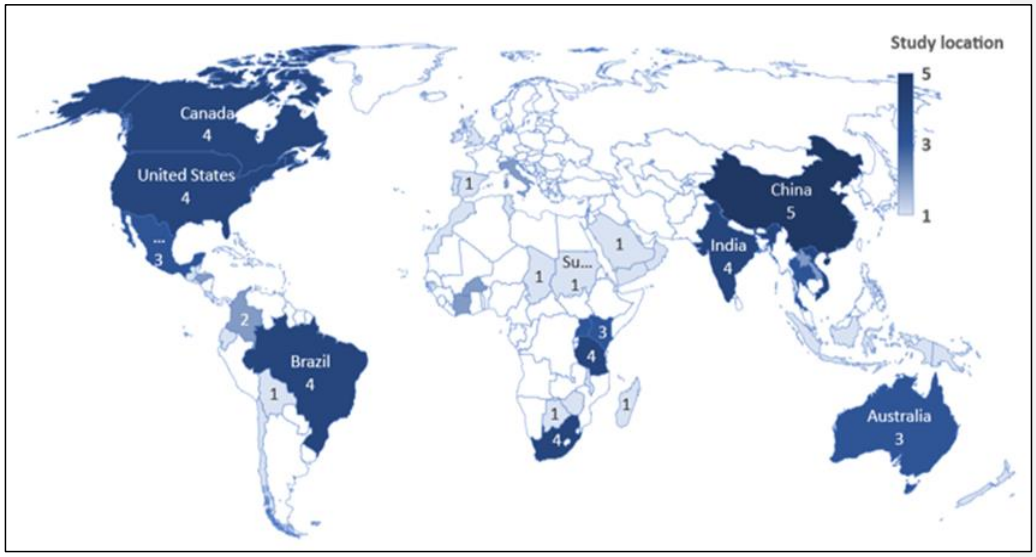

Fig 7[B]. Study location (only for implemented of the concepts)

3.3 Founders and Organizations Working to Advance the Concepts

Planetary Health is a multidisciplinary field that draws on expertise from various disciplines. It has been advanced by Dr. Samuel Myers and supported by the Rockefeller Foundation (. Several organizations and UN agencies such as the World Health Organization (WHO), United Nations Environment Programme (UNEP), Food and Agriculture Organization (FAO), United Nations Development Programme (UNDP), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Educational, Scientific and Cultural Organization (UNESCO) and United Nations Human Settlements Programme (UN-Habitat) work together to promote Planetary Health through research, policy development, and international collaboration.

One Health is a collaborative and interdisciplinary concept that has significantly advanced by through the role of Dr. Calvin Schwabe, a veterinarian and epidemiologist, Dr. Roger M. K. M. Hoekstra, a veterinary pathologist, and Dr. Laura H. Kahn, a physician. The One Health Commission, One Health Initiative, and Centers for Disease Control and Prevention (CDC) are significantly promotingsignificantly promote One Health concepts. International organizations such as the WHO, FAO, UNEP, UNDP, and the World Organization for Animal Health (OIE) also advocate this concept to address animal and human health.

While it is difficult to attribute the founding of EcoHealth to specific individuals, several key figures have made significant contributions to its development, including Dr. Bruce Wilcox, an environmental scientist, and Dr. Margaret Chan, former WHO Director-General. Several organizations and initiatives are dedicated to promoting and advancing the field, such as the International Association for Ecology and Health (IAEH), Consortium for Ecosystem Health Sciences (CEHS), and EcoHealth Alliance. Several UN organizations contribute to the principles of EcoHealth through their respective mandates and activities, including UNEP, WHO, FAO, UNDP, and UNESCO.

3.4 Fundamental Questions Addressed by the Concepts

The fundamental questions addressed by these concepts provide a framework for research, policy development, and practice. They guide efforts to understand, analyze, and address the complex issues at the intersection of human health, environmental health, and ecosystem well-being. By addressing these questions, we can gain insights, develop evidence-based solutions, and promote collaboration to create a healthier and more sustainable future for both people and the planet. Table 3 presents the fundamental questions addressed by each conceptseach concept addresses and some representative articles that pose these questions.

Table 3. Fundamental Questions Addressed by Planetary Health, One Health, and EcoHealth Concepts.

Concepts	Fundamental Questions	References
Planetary Health	How do environmental changes affect human health?	[38]
	What are the underlying drivers of environmental change and their impact on health?	[39]
	How can we address health disparities and promote equity within the context of Planetary Health?	[40]
	How can we transition to sustainable and resilient systems ~~that promote both~~promoting human health and environmental well-being?	[41]
One Health	How do zoonotic diseases emerge and spread, and how can we prevent and control them?	[42]
	What is the impact of antimicrobial resistance (AMR), and how can we combat it?	[43]
	How can the health of ecosystems and biodiversity conservation contribute to human and animal health?	[44]
	How can interdisciplinary collaboration improve public health outcomes?	[45]
EcoHealth	How do ecosystem changes and disruptions affect human health?	[46]
	How can traditional ecological knowledge be integrated with scientific research to inform EcoHealth interventions?	[47]
	What are the social, economic, and political factors shaping people's interactions with the environment and health?	[48]
	How can EcoHealth contribute to sustainable development and improved health outcomes?	[49]

3.5 Focus and Scope, Emphases, and Critical Considerations

The focus and scope, emphases, and critical considerations of these concepts vary, as shown in Table 4. Understanding them enables a more holistic approach to addressing the interconnections between human health, environmental health, and ecosystem well-being.

Table 4. Focus and Scope, Emphases, and Critical Considerations of Planetary Health, One Health and EcoHealth

Concepts	Focus and Scope	Emphases	Critical Considerations
Planetary Health	Explores the health of human civilization and its interdependent relationship with the planet [50]	Global perspective, sustainability [51]	Interconnectedness between human well-being and the health of the planet, climate change mitigation and adaptation, biodiversity conservation, environmental sustainability, social justice, and equity, systemic approach to address global health challenges [14]
One Health	Recognizes the interconnectedness of human, animal, and environmental health [44]	Collaboration across multiple disciplines [45]	Zoonotic disease prevention and control, shared health threats between humans and animals, multisectoral collaboration and integration (e.g., human health, veterinary medicine, environmental science), integrated surveillance and research [52]
EcoHealth	Considers the ecological, social, and economic aspects of health [48]	Ecosystem and community well-being [53]	Complex interactions between ecological, social, and economic systems, understanding health as a product of interactions among humans, animals, and the environment, focus on community involvement and participation, local context, and systems thinking [54]

3.6 Distinctions, Resemblances, and Alignment

The distinctions, resemblances, and alignment of Planetary Health, One Health and EcoHealth are presented in Table 5. Distinctions are variations or divisions within a concept, involving understanding unique qualities that differentiate its components. Resemblances refer to similarities between different facets of a concept, understanding shared traits that distinguish its elements. Alignment is the process of ensuring consistency and coherence between various parts of a concept, integrating them to achieve a common objective. Exploring distinctions, resemblances, and alignment aspects individually promotes clarity, collaboration, and synergy. The identification of these factors enables effective resource allocation, facilitates interdisciplinary cooperation, and informs policy development and holistic decision-making processes for addressing complex health and environmental issues.

Table 5. Distinctions, Resemblances, and Alignment of Planetary Health, One Health and EcoHealth.

Criteria	Concepts		
	Planetary Health	One Health	EcoHealth
Distinctions	It focuses on the interdependent health of human civilization and the natural systems that support it [14]	Recognizes the interconnectedness of human, animal, and environmental health [55]	Considers the complex interactions between ecological, social, and economic systems concerning human and ecosystem health [56]
	Emphasizes the role of climate change, biodiversity loss, and environmental degradation on human health [57]	Promotes collaboration among multiple disciplines [58]	It focuses on understanding health as a product of interactions among humans, animals, and the environment [59]
	Calls for a systemic approach to address global health challenges [60]	Emphasizes integrated surveillance, research, and policy to address shared health threats between humans and animals [44]	Highlights the importance of the local context, community involvement, and systems thinking in EH research and practice [61]
Resemblances	Recognizes the interconnectedness of human, animal, and environmental health [62]	Shares the emphasis on the importance of ecological interactions and zoonotic disease prevention and control [63]	Emphasizes community involvement and participation in understanding and managing health [48]
Alignment	Aligns with One Health and EcoHealth in acknowledging the importance of ecosystems, climate change, and sustainability [62,64]	Aligns with Planetary Health and EcoHealth in acknowledging the interconnectedness of health and ecosystems [62, 65]	Aligns with Planetary Health and One Health in recognizing the importance of ecological and social determinants of health [66]

4.0 Discussion

~~It is interesting to observe that~~Interestingly, One Health and Planetary Health show similar levels of advocacy, at 49% and 50%, respectively. This suggests that One Health and Planetary Health have received significant attention and support in raising awareness and promoting their importance in academic discourse. On the other hand, EcoHealth is far behind, with only 13% of articles featuring some kind of advocacy. There was a noticeable rise in academic interest in public health during the 2019-2020 academic year, which can be related to the widespread effects of the COVID-19 pandemic. This shows that the pandemic sparked a greater understanding of the linkages between human health and the planet's health.

There are significant implementation efforts in the EcoHealth articles. This means that EcoHealth has better-applied principles in the real world, demonstrating ~~a higher level of~~more practical applicability. One Health and Planetary Health are behind in implementation, suggesting that there may be a disconnect between advocacy and actual action in these domains. Advocacy has constantly dominated the study period, rising in 2019-2020, but in that same period, fewer articles were published that focused on how to apply these ideas. This decrease may be linked to travel bans during the epidemic that might have hampered fieldwork and valuable research efforts. In addition, the number of articles primarily focusing on the application may have decreased because researchers were limited to conducting studies from their homes or offices.

Dr. Samuel Myers has substantially contributed to the advancement of Planetary Health, which is regarded as a multidisciplinary field that draws on knowledge from numerous disciplines. Drs. Calvin Schwabe, Roger M. K. M. Hoekstra, and Laura H. Kahn are credited with substantially contributing to One Health, which is regarded as a collaborative and interdisciplinary idea. Despite not having a clear founder, influential people, including Drs. Bruce Wilcox and Margaret Chan, have pushed EcoHealth. Through research, the creation of policies, and international cooperation, numerous UN agencies, including WHO, UNEP, FAO, UNDP, UNFCCC, UNESCO, and UN-Habitat, are playing significant roles in advancing each of these health concepts.

The fundamental questions that Planetary Health, One Health, and EcoHealth address differ slightly. Planetary Health investigates the state of civilization as a whole and how interdependent it is on the environment. It adopts a global viewpoint with a focus on sustainability. Recognizing the relationship ~~of~~ between human health and biodiversity loss, climate change, sea level rise, melting of glaciers, desertification, and increase of temperature, addressing climate change through mitigation and adaptation strategies, promoting biodiversity conservation, ensuring SDGs, promoting social justice and equity, and taking a systemic approach to addressing global health challenges are some of the critical aspects in Planetary health. On the other hand, One Health acknowledges how linked environmental, animal~~,~~ and human health are and focuses on interdisciplinary cooperation. Preventing and controlling zoonotic diseases, understanding the shared health risks posed by humans and animals, encouraging multisectoral collaboration, and integrating the study of human health, veterinary medicine, and environmental science are some of the crucial aspects of One Health. ~~To better understand and address health concerns at the interface of humans, animals, and the environment, One Health also emphasizes integrated monitoring and research initiatives~~One Health also emphasizes integrated monitoring and research initiatives to better understand and address health concerns at the interface of humans, animals, and the environment. Finally, EcoHealth considers ~~the ecological, social, and financial facets of health~~health's ecological, social, and financial facets, emphasizing the health of the ecosystem and the community. Understanding the intricate relationships between ecological, social, and economic systems and realizing that interactions between people, animals, and the environment produce health are crucial aspects of environmental health. EcoHealth strongly emphasizes the value of ~~participating in the community~~community participation, considering the local context, and using systems thinking techniques. Considering these factors will enhance health outcomes, accomplish sustainable development, and promote the health of communities and ecosystems. The answers to the fundamental questions of each area provide a context for each field's research, policymaking, and practice, offering perceptions and evidence-based

remedies and encouraging cooperation to address complex problems at the nexus of human health, environmental health, and ecosystem well-being.

Veterinary medicine is the most frequently occurring academic specialty among the sampled articles, which is consistent with the higher number of One Health articles compared to EcoHealth and Planetary Health articles. Veterinary medical knowledge and the focus of One Health on zoonotic disease prevention and control are related. However, it is crucial to note that all three approaches featured ~~a great deal of~~much cross-disciplinary cooperation. This shows that scientists working across different sectors actively interact and advance knowledge in these areas.

Only 35% of worldwide collaborations included ~~researchers from the Global North and South~~Global North and South researchers, with One Health showing the highest level of cooperation. ~~To promote a more balanced and inclusive approach to solving global health concerns, more collaboration between academics from various geographic locations is needed~~More collaboration between academics from various geographic locations is needed to promote a more balanced and inclusive approach to solving global health concerns, especially between researchers from the global North and South. The proportion of studies independently led by the Global North as opposed to the Global South also differed noticeably. This disparity raises the possibility of an imbalance in research ~~and underscores~~. It underscores the need for more participation and leadership from the Global South in setting the research agenda and addressing regional health issues. All three concepts showed evidence of cooperation. This indicates that researchers from diverse disciplines are actively collaborating and contributing to the understanding and advancement of these fields.

It is exciting to see the broad global applicability of the three concepts, as reflected by the authors' localities. This result indicates that researchers and practitioners from various world regions ~~are actively advancing~~actively advance One Health, EcoHealth, and Planetary Health knowledge and practice. These ideas are applicable in various situations due to their worldwide reach, which also emphasizes the joint efforts ~~being made~~ to address the intricate relationships between human health, environmental health, and ecosystem well-being.

Planetary Health is distinguished by its focus on the interdependent health of human civilization and the natural systems that support it. It emphasizes the role of climate change, biodiversity loss, and environmental degradation on human health, calling for a systemic approach to address global health challenges. One Health recognizes the interconnectedness of human, animal, and ecological health ~~and promotes~~. It promotes collaboration among multiple disciplines ~~with a focus~~focusing on integrated surveillance, research, and policy to address shared health threats between humans and animals. On the other hand, EcoHealth considers the complex interactions between ecological, social, and economic systems concerning human and ecosystem health. It focuses on understanding health as a product of interactions among humans, animals, and the environment, highlighting the importance of the local context, community involvement, and systems thinking.

Despite their distinctions, there are resemblances and alignments among the concepts. They all recognize the interconnectedness of human, animal, and environmental health and emphasize the importance of ecological interactions and zoonotic disease prevention and control. They also highlight the importance of community involvement and participation in understanding and managing health.

Planetary Health aligns with One Health and EcoHealth in acknowledging the importance of ecosystems, climate change, and sustainability. One Health aligns with Planetary Health and EcoHealth in acknowledging the interconnectedness of health and ecosystems. EcoHealth aligns with Planetary Health and One Health in recognizing the importance of ecological and social determinants of health.

Focused Area	**Public health guide to field developments linking ecosystems, environments and health in the Anthropocene**	**Exploring the Nexus: Comparing and Aligning Planetary Health, One Health, and EcoHealth**
Main Focus	Guides readers through seven field developments in environmental public health research.	Compares and analyzes three concepts: Planetary Health, One Health, and EcoHealth.
Number of Concepts Compared	Lists and explains seven different field developments.	Focuses on comparing and contrasting three specific concepts.
Terminology	Discusses field developments to provide clarity on overlaps in terminology and ideas.	Emphasizes the differences in concepts, including their founders, questions answered, and focus areas.
Research Methodology	Provides a guide based on historical context and core texts or journals.	Conducts a systematic literature review using PRISMA methodology.
Inclusion of Influential Figures	Highlights core texts or journals.	Explores the contributions of influential individuals and organizations.
Scope of Comparison	Covers a broader range of field developments in environmental public health.	Focused on a specific comparison of three interconnected health concepts.
Emphasis on Global Distribution	Not specified.	Highlights global interest and applicability of each concept.
Call to Action	Mentions the guide's usefulness for building integrative research, policy, education, and action.	Concludes by emphasizing shared goals and interconnections among the fields in addressing health issues.

5.0 Conclusion

Planetary Health highlights sustainability and addresses global health issues by offering solutions for reducing climate change, conserving biodiversity, and promoting social justice. It also focuses on the interconnection of human civilization and the environment. One Health encourages interdisciplinary collaboration to combat zoonotic illnesses and shared animal and human health hazards because it recognizes the connections between the environment, animal health, and human health. ~~In order to~~To improve health outcomes and advance sustainable development, EcoHealth ~~takes into account~~considers the ecological, social, and economic elements of health, with special emphasis on community involvement and systems thinking.

The findings of this study reveal interesting insights into the Planetary Health, One Health, and EcoHealth concepts. While One Health and Planetary Health have gotten ~~a lot of~~much attention and support in academic debate, EcoHealth is behind in support. The COVID-19 epidemic has sharply raised scholarly interest in public health and brought attention to the connections between human health and the ~~health of the environment~~environment's health. In the research on One Health and Planetary Health, however, there appears to be a gap between advocacy and implementation, indicating a need for closer coordination ~~between the two~~. Reputable UN

~~organisations~~ organizations like WHO, UNEP, FAO, UNDP, UNFCCC, UNESCO, and UN-Habitat actively advance these subjects through research, policy development, and international collaboration. All three approaches demonstrate cross-disciplinary collaboration, showcasing active communication and knowledge expansion among researchers from other fields.

To address global health issues more inclusively and balance the research agenda, there has to be increased collaboration between the global North and South. Furthermore, it is good to note that Planetary Health, One Health, and EcoHealth are applicable globally as represented by active contributions from scholars and practitioners ~~around the world~~worldwide. Despite their differences, the three concepts have a lot in common ~~when it comes to~~regarding understanding how intertwined human, animal, and environmental health are. ~~In order to~~To understand and manage health, each strongly emphasizes ecological relationships, zoonotic disease prevention, and the value of community involvement. They also concur that it is essential to understand the roles of ecosystems, climate change, and socioeconomic determinants of health in the ~~wellbeing~~ well-being of Earth and its people.

The similarities between Planetary Health, One Health, and EcoHealth can create confusion, highlighting the need to clarify the relative focus of each. However, their alignments highlight the scope of collaboration rather than competition among experts. The concepts complement each other in terms of scientific research and converting research findings into policies and programmes.

The paper titled "Exploring Planetary Health, One Health, and EcoHealth: Bridging the Gap in Environmental Public Health" underscores the growing significance of comprehending the intricate connections between public health, ecosystems, and the environment in the Anthropocene era, marked by substantial human impact on the planet. It introduces a guide that compares and aligns three key concepts: Planetary Health, One Health, and EcoHealth. These concepts are examined in detail, highlighting their distinct scopes and emphases. Planetary Health addresses global environmental changes and their health effects, while One Health focuses on the intersection of human and animal health, particularly zoonotic diseases. EcoHealth emphasizes socio-ecological systems in health outcomes. The paper also acknowledges influential figures in each field and emphasizes their global relevance and shared goals, advocating for interdisciplinary collaboration and policy integration to address complex health challenges. Ultimately, the paper stresses the imperative of understanding the relationships between ecosystems, environments, and health and fostering cooperation among these fields for a healthier, more sustainable future.

Lerner, H., & Berg, C. (2017). A comparison of three holistic approaches to health: one health, ecohealth, and planetary health. Frontiers in veterinary science, 4, 163. [The paper by (2017) provides a comprehensive comparison of three holistic approaches to health: One Health, EcoHealth, and Planetary Health. The authors explore the similarities and differences between these approaches, shedding light on their theoretical and conceptual foundations.]

[de Castañeda, R. R., Villers, J., Guzmán, C. A. F., Eslanloo, T., de Paula, N., Machalaba, C., ... & Bolon, I. (2023). One Health and planetary health research: leveraging differences to grow together. *The Lancet Planetary Health*, *7*(2), e109-e111.] The paper by de Castañeda et al. (2023) titled "One Health and planetary health research: leveraging differences to grow together" published in The Lancet Planetary Health, explores the relationship between One Health and planetary health research. The authors discuss how these two approaches can complement each other and contribute to a more comprehensive understanding of the complex interactions between human, animal, and environmental health. the paper by de Castañeda et al. (2023) highlights the potential for collaboration and integration between One Health and planetary health research. By leveraging their differences, researchers can gain a more comprehensive understanding of the complex interactions between human, animal, and environmental health. This integrated approach is essential for addressing global health challenges and promoting the health and well-being of both humans and the planet.

The paper by Lerner & Berg (2017) provides a comprehensive comparison of One Health, EcoHealth, and Planetary Health. It analyzes the similarities and differences between these approaches at a theoretical and conceptual level, offering insights into their respective focuses and scopes. Zinsstag (2012) discusses the convergence of EcoHealth and One Health, highlighting the potential for integration and collaboration between these two approaches. The paper explores the shared principles and goals of EcoHealth and One Health, emphasizing the importance of interdisciplinary research and action in addressing complex health challenges. Brooks et al. (2020) examine the advances in toxicology for addressing 21st-century chemical pollution. The paper mentions Planetary Health, EcoHealth, and One Health as multidisciplinary initiatives that embrace systems thinking to examine the connections between environmental quality, animal health, and human health. Nguyen-Viet et al. (2021) evaluate the strengths, challenges, and opportunities of agriculture-related EcoHealth projects in low-resource settings in Asia. The paper highlights the transdisciplinary nature of EcoHealth and its potential for promoting sustainable agriculture and food security.

the unique purpose of planetary health is to understand and address the interconnectedness between human health and the health of the planet. It seeks to promote equity, justice, and intergenerational responsibility while integrating knowledge from various disciplines to address pressing global challenges [Asaduzzaman et al., 2022; David et al., 2021; Guzman et al., 2021; Klünder et al., 2022; Redvers et al., 2022; Wabnitz et al., 2020].

the unique purpose of One Health is to promote the integration and collaboration of multiple disciplines to achieve optimal health outcomes for humans, animals, and the environment. By recognizing the interconnectedness of human, animal, and environmental health, One Health aims to prevent and control zoonotic diseases, improve disease surveillance and response, and promote sustainable practices. Collaboration and a transdisciplinary approach are crucial for the successful implementation of One Health [(2013). One health: the human-animal-environment interfaces in emerging infectious diseases.. https://doi.org/10.1007/978-3-642-36889-9

(2015). One health: the theory and practice of integrated health approaches.. https://doi.org/10.1079/9781780643410.0000
Baum, S., Machalaba, C., Daszak, P., Salerno, R., & Karesh, W. (2017). Evaluating one health: are we demonstrating effectiveness?. One Health, 3, 5-10. https://doi.org/10.1016/j.onehlt.2016.10.004
Davis, M., Rankin, S., Schurer, J., Cole, S., Conti, L., & Rabinowitz, P. (2017). Checklist for one health epidemiological reporting of evidence (cohere). One Health, 4, 14-21. https://doi.org/10.1016/j.onehlt.2017.07.001
Herten, J., Bovenkerk, B., & Verweij, M. (2018). One health as a moral dilemma: towards a socially responsible zoonotic disease control. Zoonoses and Public Health, 66(1), 26-34. https://doi.org/10.1111/zph.12536
Takashima, G. and Day, M. (2014). Setting the one health agenda and the human–companion animal bond. International Journal of Environmental Research and Public Health, 11(11), 11110-11120. https://doi.org/10.3390/ijerph111111110
Zinsstag, J., Schelling, E., Waltner-Toews, D., & Tanner, M. (2011). From “one medicine” to “one health” and systemic approaches to health and well-being. Preventive Veterinary Medicine, 101(3-4), 148-156. https://doi.org/10.1016/j.prevetmed.2010.07.003]

the unique purpose of ecosystem health is to promote sustainable practices, inform consumers about the environmental impact of their choices, and contribute to the conservation and preservation of natural resources. Ecosystem health assessments provide valuable information for environmental management and sustainable development. By focusing on the health of ecosystems, we can ensure the long-term well-being of both the environment and human populations. [Shen, W. and Li, Y. (2022). Multi-scale assessment and spatio-temporal interaction characteristics of ecosystem health in the middle reaches of the yellow river of china. International Journal of Environmental Research and Public Health, 19(23), 16144. https://doi.org/10.3390/ijerph192316144

Sörqvist, P., Haga, A., Langeborg, L., Holmgren, M., Wallinder, M., Nöstl, A., ... & Marsh, J. (2015). The green halo: mechanisms and limits of the eco-label effect. Food Quality and Preference, 43, 1-9. https://doi.org/10.1016/j.foodqual.2015.02.001

Yilmaz, Y., Üngüren, E., & Kaçmaz, Y. (2019). Determination of managers' attitudes towards eco-labeling applied in the context of sustainable tourism and evaluation of the effects of eco-labeling on accommodation enterprises. Sustainability, 11(18), 5069. https://doi.org/10.3390/su11185069]

Asaduzzaman, M., Ara, R., Afrin, S., Meiring, J., & Saif-Ur-Rahman, K. (2022). Planetary health education and capacity building for healthcare professionals in a global context: current opportunities, gaps and future directions. International Journal of Environmental Research and Public Health, 19(18), 11786. https://doi.org/10.3390/ijerph191811786

David, P., Dévédec, N., & Alary, A. (2021). Pandemics in the age of the anthropocene: is 'planetary health' the answer?. Global Public Health, 16(8-9), 1141-1154. https://doi.org/10.1080/17441692.2021.1893372

Guzman, C., Aguirre, A., Astle, B., Barros, E., Bayles, B., Chimbari, M., ... & Zylstra, M. (2021). A framework to guide planetary health education. The Lancet Planetary Health, 5(5), e253-e255. https://doi.org/10.1016/s2542-5196(21)00110-8

Klünder, V., Schwenke, P., Hertig, E., Jochem, C., Kaspar-Ott, I., Schwienhorst-Stich, E., ... & Coenen, M. (2022). A cross-sectional study on the knowledge of and interest in planetary health in health-related study programmes in germany. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.937854

Redvers, N., Celidwen, Y., Schultz, C., Horn, O., Githaiga, C., Vera, M., ... & Blondin, B. (2022). The determinants of planetary health: an indigenous consensus perspective. The Lancet Planetary Health, 6(2), e156-e163. https://doi.org/10.1016/s2542-5196(21)00354-5

Wabnitz, K., Gabrysch, S., Guinto, R., Haines, A., Herrmann, M., Howard, C., ... & Redvers, N. (2020). A pledge for planetary health to unite health professionals in the anthropocene. The Lancet, 396(10261), 1471-1473. https://doi.org/10.1016/s0140-6736(20)32039-0

Brooks, B., Sabo-Attwood, T., Choi, K., Kim, S., Kostal, J., LaLone, C., ... & Zhang, X. (2020). Toxicology advances for 21st century chemical pollution. One Earth, 2(4), 312-316. https://doi.org/10.1016/j.oneear.2020.04.007

Brooks, B., Sabo-Attwood, T., Choi, K., Kim, S., Kostal, J., LaLone, C., ... & Zhang, X. (2020). Toxicology advances for 21st century chemical pollution. One Earth, 2(4), 312-316. https://doi.org/10.1016/j.oneear.2020.04.007

Buse, C., Gislason, M., Reynolds, A., & Ziolo, M. (2021). Enough tough talk! it's time for the tough action(s) to promote local to global planetary health. International Journal of Health Promotion and Education, 59(5), 271-275. https://doi.org/10.1080/14635240.2021.1956796

Lerner, H. and Berg, C. (2017). A comparison of three holistic approaches to health: one health, ecohealth, and planetary health. Frontiers in Veterinary Science, 4. https://doi.org/10.3389/fvets.2017.00163

Lerner, H. and Berg, C. (2017). A comparison of three holistic approaches to health: one health, ecohealth, and planetary health. Frontiers in Veterinary Science, 4. https://doi.org/10.3389/fvets.2017.00163

Schmeller, D. (2022). conservation biology meets medical science. Nature Conservation, 46, 39-40. https://doi.org/10.3897/natureconservation.46.79204 Zinsstag, J. (2012). Convergence of ecohealth and one health. Ecohealth, 9(4), 371-373. https://doi.org/10.1007/s10393-013-0812-z

References

[1] MEA (Millennium Ecosystem Assessment). (2005). *Ecosystems and human well-being* (Vol. 5, p. 563). Washington, DC: Island press.

[2] Pausas, J. G., & Keeley, J. E. (2009). A burning story: the role of fire in the history of life. BioScience, 59(7), 593-601.

[3] McNeill, J. R., & Engelke, P. (2016). *The great acceleration: An environmental history of the Anthropocene since 1945*. Harvard University Press.

[4] Negi, C. S. (2005). Religion and biodiversity conservation: not a mere analogy. *The International Journal of Biodiversity Science and Management, 1*(2), 85-96.

[5] Dudley, N., Higgins-Zogib, L., & Mansourian, S. (2009). The links between protected areas, faiths, and sacred natural sites. *Conservation Biology*, *23*(3), 568-577.

[6] Pascua, P. A., McMillen, H., Ticktin, T., Vaughan, M., & Winter, K. B. (2017). Beyond services: A process and framework to incorporate cultural, genealogical, place-based, and indigenous relationships in ecosystem service assessments. Ecosystem Services, 26, 465-475.

[7] Daily, G. C., & Matson, P. A. (2008). Ecosystem services: From theory to implementation. *Proceedings of the national academy of sciences*, *105*(28), 9455-9456.

[8] Bennett, E. M., Peterson, G. D., & Gordon, L. J. (2009). Understanding relationships among multiple ecosystem services. *Ecology letters*, *12*(12), 1394-1404.

[9] Carpenter, S. R., Mooney, H. A., Agard, J., Capistrano, D., DeFries, R. S., Díaz, S., ... & Whyte, A. (2009). Science for managing ecosystem services: Beyond the Millennium Ecosystem Assessment. *Proceedings of the National Academy of Sciences*, *106*(5), 1305-1312.

[10] Lee, M., & Diop, S. (2009). Millennium ecosystem assessment. *An Assessment of Assessments: Findings of the Group of Experts Pursuant to UNGA Resolution 60/30, 1*, 361.

[11] Perrings, C., Naeem, S., Ahrestani, F., Bunker, D. E., Burkill, P., Canziani, G., ... & Weisser, W. (2010). Ecosystem services for 2020. Science, 330(6002), 323-324.

[12] Hancock, T., Spady, D. W., & Soskolne, C. L. (2016). *Global change and public health: addressing the ecological determinants of health.* Ottawa, ON, Canada: Canadian Public Health Association.

[13] Corvalan, C., Hales, S., McMichael, A. J., & Butler, C. (2005). *Ecosystems and human well-being: health synthesis* (Vol. 1). World Health Organization.

[14] Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., ... & Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *The lancet*, *386*(10007), 1973-2028.

[15] McMichael, A. J. (2000). The urban environment and health in a world of increasing globalization: issues for developing countries. *Bulletin of the world Health Organization*, *78*, 1117-1126.

[16] Watson, R., Baste, I., Larigauderie, A., Leadley, P., Pascual, U., Baptiste, B., ... & Mooney, H. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. *IPBES Secretariat: Bonn, Germany*, 22-47.

[17] Diamond, J. (2011). Collapse: how societies choose to fail or succeed: revised edition. Penguin.

[18] UNEP (United Nations Environment Programme). (2011). International Resource Panel, United Nations Environment Programme. Sustainable Consumption, & Production Branch. *Decoupling natural resource use and environmental impacts from economic growth.* UNEP/Earthprint.

[19] Rootes, C. (2004). Environmental movements. *The Blackwell companion to social movements*, 608-640.

[20] Smith, G. D., Hart, C., Blane, D., & Hole, D. (2003). Adverse socioeconomic conditions in childhood and cause-specific adult mortality: prospective observational study. In *Health inequalities* (pp. 191-204). Policy Press.

[21] Doll, R., Peto, R., Boreham, J., & Sutherland, I. (2004). Mortality in relation to smoking: 50 years' observations on male British doctors. *Bmj*, *328*(7455), 1519.

[22] Chapman, K. R., Mannino, D. M., Soriano, J. B., Vermeire, P. A., Buist, A. S., Thun, M. J., ... & Beasley, R. (2006). Epidemiology and costs of chronic obstructive pulmonary disease. *European Respiratory Journal*, *27*(1), 188-207.

[23] WHO (World Health Organization). (2021~~0~~). Tripartite and UNEP support OHHLEP's definition of One Health. ~~One Health.~~ Retrieved from Tripartite and UNEP support OHHLEP's definition of "One Health" (who.int) ~~https://www.who.int/news-room/q-a-detail/one-health~~

[24] International Association for Ecology and Health (IAEH). (n.d.). What is EcoHealth? Retrieved from https://ecohealth.net/what-is-ecohealth/

[25] WHO (World Health Organization). (2019). Ten threats to global health in 2019. Retrieved from https://www.who.int/emergencies/ten-threats-to-global-health-in-2019

[26] GLFF (Global Alliance for the Future of Food). (2020). Statement on the Planetary Health Emergency. Retrieved from https://futureoffood.org/statement-on-the-planetary-health-emergency/

[27] LPHC (The Lancet Planetary Health Commission). (2021). Safeguarding human health in the Anthropocene epoch: Report of The Lancet Planetary Health Commission. The Lancet, 397(10292), 1573-1628.

[28] WB (World Bank Group). (2021). Health, Nutrition, and Population. Retrieved from https://www.worldbank.org/en/topic/health

[29] UN (United Nations). (2021). Sustainable Development Goals. Retrieved from https://sdgs.un.org/goals

[30] WOAH (World Organization for Animal Health). (2021). One Health. Retrieved from https://www.oie.int/en/for-the-media/onehealth/

[31] GHSA (Global Health Security Agenda). (2021). About GHSA. Retrieved from https://www.ghsagenda.org/about/

[32] FAO (Food and Agriculture Organization of the United Nations). (2021). Antimicrobial resistance (AMR). Retrieved from http://www.fao.org/antimicrobial-resistance/en/

[33] IPES-Food. (2016). From Uniformity to Diversity: A Paradigm Shift from Industrial Agriculture to Diversified Agroecological Systems. International Panel of Experts on Sustainable Food Systems. Retrieved from https://www.ipes-food.org/pages/UniformityDiversityReport

[34] UNEP (United Nations Environment Programme). (2018). Environment and health. Retrieved from https://www.unep.org/explore-topics/health

[35] Landrigan, P. J., Fuller, R., Acosta, N. J., Adeyi, O., Arnold, R., Baldé, A. B., ... & Zhong, M. (2018). The Lancet Commission on pollution and health. *The lancet*, *391*(10119), 462-512.

[36] GEO (Global Environment Outlook). (2019). Global Environment Outlook - GEO-6: Healthy Planet, Healthy People. Retrieved from https://www.unep.org/resources/global-environment-outlook-geo-6-healthy-planet-healthy-people

[37] Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Reprint—preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Physical therapy*, *89*(9), 873-880.

[38] Myers, S. S. (2017). Planetary health: protecting human health on a rapidly changing planet. *The Lancet*, *390*(10114), 2860-2868.

[39] Pathak, N., & McKinney, A. (2021). Planetary health, climate change, and lifestyle medicine: threats and opportunities. *American Journal of Lifestyle Medicine*, *15*(5), 541-552.

[40] Valentine, N., Ajuebor, O., Fisher, J., Bodenmann, P., Baum, F., & Rasanathan, K. (2022). Planetary health benefits from strengthening health workforce education on the social determinants of health. *Health Promotion International*, *37*(3), daac086.

[41] Iyer, H. S., DeVille, N. V., Stoddard, O., Cole, J., Myers, S. S., Li, H., ... & Golden, C. D. (2021). Sustaining planetary health through systems thinking: Public health's critical role. SSM-Population Health, 15, 100844.

[42] Berthe, F. C. J., Bali, S. R., & Batmanian, G. J. (2022). Putting Pandemics Behind Us: Investing in One Health to Reduce Risks of Emerging Infectious Diseases. World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/956a58be-ddd8-572f-8aac-df5ab453d7b2/content

[43] McEwen, S. A., & Collignon, P. J. (2018). Antimicrobial resistance: a one health perspective. *Antimicrobial resistance in bacteria from livestock and companion animals*, 521-547.

[44] Mackenzie, J. S., & Jeggo, M. (2019). The One Health approach—Why is it so important?. *Tropical medicine and infectious disease*, *4*(2), 88.

[45] Errecaborde, K. M., Macy, K. W., Pekol, A., Perez, S., O'Brien, M. K., Allen, I., ... & Pelican, K. (2019). Factors that enable effective One Health collaborations-A scoping review of the literature. *PLoS One*, *14*(12), e0224660.

[46] Bayles, B. R., Brauman, K. A., Adkins, J. N., Allan, B. F., Ellis, A. M., Goldberg, T. L., ... & Ristaino, J. B. (2016). Ecosystem services connect environmental change to human health outcomes. *EcoHealth*, *13*, 443-449.

[47] Finn, S., Herne, M., & Castille, D. (2017). The value of traditional ecological knowledge for the environmental health sciences and biomedical research. *Environmental health perspectives*, *125*(8), 085006.

[48] Lisitza, A., & Wolbring, G. (2018). EcoHealth and the determinants of health: Perspectives of a small subset of Canadian academics in the EcoHealth community. *International Journal of Environmental Research and Public Health*, *15*(8), 1688.

[49] Lisitza, A., & Wolbring, G. (2016). Sustainability within the Academic EcoHealth Literature: Existing Engagement and Future Prospects. *Sustainability*, *8*(3), 202.

[50] Horton, R., & Lo, S. (2015). Planetary health: a new science for exceptional action. *The Lancet*, *386*(10007), 1921-1922.

[51] Pongsiri, M. J., Bickersteth, S., Colón, C., DeFries, R., Dhaliwal, M., Georgeson, L., ... & Ungvari, J. (2019). Planetary health: from concept to decisive action. *The Lancet Planetary Health*, *3*(10), e402-e404.

[52] Ghai, R. R., Wallace, R. M., Kile, J. C., Shoemaker, T. R., Vieira, A. R., Negron, M. E., ... & Barton Behravesh, C. (2022). A generalizable one health framework for the control of zoonotic diseases. *Scientific Reports*, *12*(1), 8588.

[53] Bunch, M. J. (2016). Ecosystem approaches to health and well-being: Navigating complexity, promoting health in social–ecological systems. *Systems research and behavioral science*, *33*(5), 614-632.

[54] Webb, J., Raez-Villanueva, S., Carrière, P. D., Beauchamp, A. A., Bell, I., Day, A., ... & Vaillancourt, C. (2023). Transformative learning for a sustainable and healthy future through ecosystem approaches to health: insights from 15 years of co-designed ecohealth teaching and learning experiences. *The Lancet Planetary Health*, *7*(1), e86-e96.

[55] Zinsstag, J., Schelling, E., Crump, L., Whittaker, M., Tanner, M., & Stephen, C. (Eds.). (2020). *One Health: the theory and practice of integrated health approaches.* CABI.

[56] Harrison, S., Kivuti-Bitok, L., Macmillan, A., & Priest, P. (2019). EcoHealth and One Health: A theory-focused review in response to calls for convergence. *Environment international*, *132*, 105058.

[57] Halonen, J. I., Erhola, M., Furman, E., Haahtela, T., Jousilahti, P., Barouki, R., ... & Antó, J. M. (2021). A call for urgent action to safeguard our planet and our health in line with the Helsinki declaration. *Environmental research*, *193*, 110600.

[58] Destoumieux-Garzón, D., Mavingui, P., Boetsch, G., Boissier, J., Darriet, F., Duboz, P., ... & Voituron, Y. (2018). The one health concept: 10 years old and a long road ahead. *Frontiers in veterinary science*, 14.

[59] Bergquist, R., Brattig, N. W., Chimbari, M. J., Zinsstag, J., & Utzinger, J. (2017). Ecohealth research in Africa: Where from—Where to?. *Acta tropica*, *175*, 1-8.

[60] de Paula, N. (2021). Planetary health diplomacy: a call to action. *The Lancet Planetary Health*, *5*(1), e8-e9.

[61] Duboz, R., Echaubard, P., Promburom, P., Kilvington, M., Ross, H., Allen, W., ... & Binot, A. (2018). Systems thinking in practice: participatory modeling as a foundation for integrated approaches to health. *Frontiers in veterinary science*, *5*, 303.

[62] de Castañeda, R. R., Villers, J., Guzmán, C. A. F., Eslanloo, T., de Paula, N., Machalaba, C., ... & Bolon, I. (2023). One Health and planetary health research: leveraging differences to grow together. *The Lancet Planetary Health*, *7*(2), e109-e111.

[63] UNEP and ILRI (United Nations Environment Programme and International Livestock Research Institute) (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya.

[64] Lerner, H., & Berg, C. (2017). A comparison of three holistic approaches to health: one health, ecohealth, and planetary health. *Frontiers in veterinary science*, *4*, 163.

[65] Roger, F., Caron, A., Morand, S., Pedrono, M., Garine-Wichatitsky, M. D., Chevalier, V., ... & Binot, A. (2016). One Health and EcoHealth: the same wine in different bottles?. *Infection Ecology & Epidemiology*, *6*(1), 30978.

[66] Morand, S., Guégan, J.-F., Laurans, Y. (2020). From One Health to Ecohealth, mapping the incomplete integration of human, animal and environmental health. Iddri, Issue Brief N°04/20.