



REVIEW OF THE FINAL EVIDENCE REPORT

BIODIVERSITY AND PANDEMICS REQUEST

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BACKGROUND INFORMATION FOR REVIEWERS

This form was created to review the draft report: " Building on existing relevant work on research agendas and knowledge gap analysis, identifying interdisciplinary research and action priorities, that contribute to a strategic research agenda on biodiversity and pandemics addressing the critical interlinkages between relevant sectors needed to make future actions more effective."; prepared by the Eklipse Expert Working Group (EWG) on Biodiversity and Pandemics request (<http://eklipse.eu/request-biodiversity-pandemics/>).

This knowledge synthesis has been requested by the European Commission's Directorate-General for Research & Innovation (EC-DG RTD), and followed by:

European Commission's Directorate-General for Environment (EC – DG ENV),

European Commission's Directorate-General for Agriculture and Rural Development (EC-DG AGRI), European Commission's Directorate-General DG Health Emergency preparedness and Response Authority (EC – DG HERA),

PREZODE (Preventing ZOonotic Disease Emergence),

One Health High-Level Expert Panel (OHHLEP),

Norwegian Veterinary Institute (NRI),

Project HERA (Health Environment Research Agenda for Europe)

Following the method protocol, the Biodiversity and Pandemics EWG has now drafted their work: a report that aims to support the development of a strategic research agenda on biodiversity and pandemics, jointly with relevant agencies and initiatives, and aligned with relevant sectoral policy agendas. This additional knowledge can contribute to the development, promotion and implementation of adequate and timely policy frameworks.

The draft report can be found on the Eklipse website and is open for consultation and review until July 21st, 2023. The final editing and formatting of in-text references and the reference list will be undertaken after the report's review. Eklipse is committed to ensuring the usability of all its products and is therefore organising an open review process of this draft report engaging a range of stakeholders. Thank you very much for your willingness to participate in this extended peer-review. This is an essential and critical phase to ensure the usability of the developed output.

- Deadline to submit your review: July 21st, 2023 at midnight CEST-

Guidelines:

Before starting the review process, we advise you to first go through the whole survey and to please read the following instructions:

1) The text will be language edited by a professional editor once the review is completed, so please do not worry about clumsy wording or typos; only indicate if there are problems of understanding.



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- 2) The review form is composed of 5 pages. On this first page, please fill in your name and email address. Please note that in case you want your review to stay anonymous, your name and email will only be communicated to the Eclipse Management Body (EMB).
- 3) On section 2, please find general questions on the report to help improve the usability of the report.
- 4) On section 3, please add specific comments on the report, section by section—for example, the title, the knowledge synthesis framework and methodology, results, etc.
- 5) On section 4, please comment on Annexes.
- 6) On section 5, you can add further comments or general appreciation.
- 7) PLEASE add your specific comments for each section of the document, with REFERENCE TO PAGES.
- 8) Please note that by submitting your review, you will still be able to edit your responses and this until the end of the review period (July 21st, 2023). So if you are not finished with your review but would like to come back to it later, please click on “submit” your review (it is, in a way, a “save” button). You will then receive an email from Google form with an edit link.

Inquiries

If you need help or more information during the review process, please feel free to contact Eclipse at emb@eclipse.eu.

Eclipse is a science-policy mechanism in the public interest. The lawful basis for processing your personal data under the EU's General Data Protection Regulation (GDPR) will be a public task. Our privacy policy (<http://eclipse.eu/privacy-policy/>) contains further information on the purpose and lawful basis for processing your personal data.



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ANSWERS FROM REVIEWERS

1. WOULD YOU LIKE TO BE ACKNOWLEDGED AS A REVIEWER IN THE FINAL REPORT AND HOW?

Reviewer x1: No, I prefer to be anonymous

Reviewer x2: Yes (i.e. Last name, First name AND affiliation)

Reviewer x3: Yes (i.e. Last name, First name AND affiliation)

Reviewer x4: Yes (i.e. Last name, First name AND affiliation)

Reviewer x5: Yes (i.e. Last name, First name AND affiliation)

Reviewer x6: Yes (i.e. Last name, First name AND affiliation)

Reviewer x7: Yes but only through my affiliation (i.e. NO name)

Reviewer x8: No, I prefer to be anonymous

Reviewer x9: Yes (i.e. Last name, First name AND affiliation)

Reviewer x10: No, I prefer to be anonymous

Reviewer x11: to be confirmed

Reviewer x12: to be confirmed

Reviewer x13: to be confirmed

2. DOES THE DISCUSSION ADDRESS THE QUESTION OF THE REQUEST AND ARE THE CONCLUSIONS SUPPORTED BY THE RESULTS PRESENTED IN THE REPORT?

Reviewer x1: no comment



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Reviewer x2: Yes, the discussion is a thorough consideration of the issues given the scope of the call and draw on the findings presented.

RESPONSE: Thank you for your feedback.

Reviewer x3: Of the objectives state on page 15 the discussion had a strong focus on objective 3. It would be helpful to have a little more focus on objective 1 even though 3 does build on it. As objective 2 was adequately addressed in the results it was valid not to address it that much in the discussion.

RESPONSE: We are integrating more of objective 1 into the discussion.

Reviewer x4: Yes, the discussion and the conclusions address the problem

RESPONSE: Thank you for your feedback.

Reviewer x5: Superficially and not in any deeply insightful way

RESPONSE: We are editing the discussion and hope it will be found to be more insightful.

Reviewer x6: The discuss does address the request and the conclusions are supported by the results although more details should be provided on how the results were obtained (cf specific comments)

RESPONSE: Thank you for your feedback, we will address the comments in the results section.

Reviewer x7: Yes it does. However some sentences are too long and its hard to keep focus. So i recommend to use shorter sentences to be more clear

RESPONSE: We are editing to shorten sentences and make them clearer and easier to follow.

Reviewer x8: Yes, they do.

RESPONSE: Thank you for your feedback.

Reviewer x9: The three main objectives of the request were to 1) review and summarize current state of evidence and knowledge, 2) synthesize knowledge on the ongoing research initiatives with focus on funding programs, and 3) validate and extend results collected in objective 1 with large # external experts; prioritize research recommendations. For the most part, the discussion addresses the questions posed in the request. However, I think this document would be strengthened by incorporating a more clearly delineated section



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for policy recommendations, using direct and concrete language. In this way, policy implementation will be more likely to succeed.

RESPONSE: We improved the section on policy recommendations.

Reviewer x10: no comment

Reviewer x11:

- I'd push the role of social sciences and the humanities more centrally, esp. in the policy recommendations.
- I'd use Covid as an example on several occasions to make the presented material more concrete (it currently appears only in the conclusion).
- The broader piece seems to emphasize attempts to control W/D/H interfaces and disease spillover. This is clearly an important goal, but also one that is not completely obtainable. I'd draw on disaster studies to argue that even in cases of those hazards that cannot be predicted or prevented (e.g. earthquakes), social and cultural factors are key, and the same could be made here. For example, one could argue that the main problem in the "Western" response to Covid was not biomedical but social and cultural.
- I'd place more emphasis on disseminating the products of such research back into communities and societies, both during the project and after it is concluded.

RESPONSE: Thank you, we have implemented these comments.

Reviewer x12: no comment

Reviewer x13: no comment

3. DOES THE CONCLUSION ADDRESS THE QUESTION OF THE REQUEST AND ARE THE RECOMMENDATIONS SUPPORTED BY THE RESULTS PRESENTED IN THE REPORT?

Reviewer x1: no comment

Reviewer x2: Yes they are well evidenced by the findings of the report and are clearly relevant to the call - the summary points could be summarised in fewer words though or there could be greater use of bold font to highlight key points.



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RESPONSE: Thank you for your feedback, we will take it into consideration for the final layout.

Reviewer x3: The conclusion focused on ways to make future actions more effective - the need to integrate social sciences into biodiversity + pandemics research was clearly supported by survey results - the need to transition from short (3-4 years) projects into long-term projects was clearly supported by the expert group's thought that building genuinely participatory interdisciplinary projects takes time and is not possible to do effectively in short projects - the idea of a transformative change from reactionary approach to addressing root causes was a logical conclusion for increasing effectivity even though the expert group did not seem to reach such a consensus

RESPONSE: Thank you for your feedback.

Reviewer x4: Yes the conclusion seems sufficient



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RESPONSE: Thank you for your feedback.

Reviewer x5: The conclusions were weak and not clearly stated.

RESPONSE: We are editing the conclusion to strengthen and clarify our main points and hope you will find it more insightful.

Reviewer x6: The conclusion does address the request and the conclusions are supported by the results although more details should be provided on how the results were obtained (cf specific comments)

RESPONSE: Thank you. We have responded to and are addressing specific comments regarding the results.

Reviewer x7: Yes it does.

RESPONSE: Thank you.

Reviewer x8: Yes. The conclusion and recommendations are adequate.

RESPONSE: Thank you.

Reviewer x9: Yes, but I found that the recommendations were difficult to identify and often seemed buried within paragraphs of text. To facilitate navigation of this document, it would be helpful to incorporate bullet points or sub-sections. To ensure that the recommendations section results in effective policy implementation, each recommendation should be specific. Outlining at which level of government this recommendation would involve and how the recommendation would be operationalized is needed for many recommendations. One recommendation that I really liked in this document, which I felt was sufficiently explained in great detail, was the recommendation that funding calls in the fields of biodiversity and pandemics be announced in both natural and social sciences, naming several social science disciplines. I also liked how there was a discussion of implications this recommendation might have for project design and implementation. On the following page, three additional research needs are outlined without further detail or explanation. Are these research needs expanded upon elsewhere? How might these research needs be addressed?

Further, the “General Policy Recommendations” section on page 56 needs restructuring. The first two paragraphs, presented as bullet points, simply outlines two different modes of action for addressing pandemic risk. Bullet points should be used in this section, but each bullet point should represent a recommendation and the additional text in the paragraph should include details on how this policy recommendation can be executed. For the third bullet point on page 56, it says “the role of social and humanities sciences needs to be framed differently...” and it discusses limitations around the way that W/D/H interfaces are incorporated into management of disease transmission, but there is no specific recommendation for how to address this moving forward. Many of the policy recommendations are too vague. For instance, on page 57, the last paragraph before the list of “more specific needs related to policy



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design” indicates that integrated health approaches should be used, balancing a top-down and bottom-up approach and ensuring training opportunities. Related to the point immediately above it (about community-based knowledge systems), identify ways this training and “integrative health approach” can benefit local communities... for instance, extending training opportunities to in-country partners. If a project is truly “One Health”, aspects of environmental health should be included as well as human and animal health. Are there specific policy recommendations related to incorporating environmental health, so as to reduce the number of studies where the majority of work performed is pathogen characterization in vertebrate species?

RESPONSE: Thank you, we have now implemented these suggestions.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

4. DOES THE REPORT REPRESENT A COMPREHENSIVE EVIDENCE SYNTHESIS UNDER THE TOPIC OF BIODIVERSITY AND PANDEMICS? IF NOT PLEASE PROVIDE FURTHER INFORMATION.

Reviewer x1: no comment

Reviewer x2: The evidence synthesis is as comprehensive as could be achieved within the time and resource constraints of the call. The literature search was conducted following best practice guidelines for evidence synthesis and impressively searched a range of languages other than just English, plus looked at the grey literature. There is thorough documentation of the searching and screening of documents. Something that is not seen often enough is the combination of different synthesis approaches, so it is great that this report combines a scoping review with expert elicitation using a survey and focus group.

RESPONSE: Thank you for this positive comment and appreciation of the evidence synthesis.

Reviewer x3: The topic is so broad that making a comprehensive evidence synthesis is difficult. I see this as a useful starting point to build on but would prefer to see an extended version of the results of the scoping review to get a more thorough understanding of the current knowledge. The version in the draft focuses understandably on the gaps but perhaps a paragraph about the aspects that are well-researched would be an useful add.



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RESPONSE: We agree that this report is a useful starting point, hence the scoping review. The well-researched areas can be seen in Figure 5, with the dark green colour indicating the percent of included studies (>60%) that addressed that topic. We have now added a paragraph highlighting the well-researched areas.

Reviewer x4: Yes it seems well comprehensive

RESPONSE: Thank you.

Reviewer x5: I found this a rather uninspiring read: way to long and with little attempt at synthesis or insight. It seemed to be much more concerned with process than analysis and supplied very little that isn't already in the published scientific literature.

RESPONSE: We hope the revisions we have made throughout the document have addressed your concerns. A large part of our mission is to synthesise what is already published in the literature, while also supplementing that information through the survey and focus group discussion.

Reviewer x6: Overall yes, but more details should be given to better understand the synthesis presented (cf specific comments).

RESPONSE: Thank you. We address the specific comments regarding details that should be provided.

Reviewer x7: Yes.

RESPONSE: Thank you.

Reviewer x8: Yes, the report is quite comprehensive.

RESPONSE: Thank you.

Reviewer x9: Yes

RESPONSE: Thank you.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment



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Reviewer x13: no comment

5. ARE APPROPRIATE AND UP-TO-DATE PEER-REVIEWED REFERENCES USED IN THE REPORT? DO YOU KNOW OF ANY ADDITIONAL REFERENCES, OR EXAMPLES WHICH THE REPORT SHOULD MENTION (PLEASE BE AS PRECISE AS POSSIBLE AND PROVIDE REFERENCES)?

Reviewer x1: no comment

Reviewer x2: I cannot comment on this across all fields but references seemed to be appropriate and up-to-date for areas that I am familiar of.

RESPONSE: Thank you for your feedback.

Reviewer x3: no comment

Reviewer x4: Perhaps more up-to-date references could be used

RESPONSE: We have _____ added _____ specific references suggested by other reviewers, many of which are recent. We hope this will address your concern.

Reviewer x5: Page 10. I have a problem with Parmesan (2019) and earlier as evidence supporting climate driven changes in species range abundance as the work from this group consistently fails to consider to land-use change and agricultural development. Most of their evidence for range change is given by increases in average altitudinal range, BUT this would be driven by land-use development at low altitudes. Page 10. Similarly the Kock and Casceres-Escobar (2022) study is flawed as they restrict zoonoses to only include events where transmission occurs directly from the zoonotic reservoir, whence Covid and HIV pandemics would not be included. Much better to quote Dobson et al Science (2020) and Bernstein et al (2022) which present quantitative and viable evidence for the drivers of spillover pandemics.

RESPONSE: Climate change can affect biodiversity in the absence of land-use change depending on the sensitivity of species and the resources they rely on to climatic conditions. However, we have added additional references and mention the potential interplay of land-use change and climate change. We have added references to Dobson et al. and Bernstein in the introduction but also maintain that Kock and Caceres-Escobar 2022 as it is an appropriate citation.

Reviewer x6: 425 studies and 20 reports were included in the studies but I failed to find the detailed list of these references.



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RESPONSE: We have added the list of studies into the Appendix.

Reviewer x7: No

RESPONSE: We have added references according to suggestions from the other reviewers. As no further detail or suggestions are provided, we hope this addresses your concerns.

Reviewer x8: Whilst the references are current and appropriate, I think the following will be adequate for the report.

Corlett, R. T., Primack, R. B., Devictor, V., Maas, B., Goswami, V. R., Bates, A. E., et al., Impacts of the coronavirus pandemic on biodiversity conservation. *Biol. Conserv.* 2020. 246:108571. doi: 10.1016/j.biocon.2020.108571.

Morand, S. and Lajaunie, C., Biodiversity and COVID-19: A report and a long road ahead to avoid another pandemic. *One Earth* 4, July 23, 2021, Elsevier Inc. 920-923.

Sugai L.S.M., Pandemics and the Need for Automated Systems for Biodiversity Monitoring. *J Wildl Manage.* 2020 Nov;84(8):1424-1426. doi: 10.1002/jwmg.21946. Epub 2020 Aug 26. PMID: 32904967; PMCID: PMC7461419.

RESPONSE: Thank you very much for your feedback and additional references, which we have now included.

Reviewer x9: Yes

RESPONSE: Thank you.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment



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6. ARE THE FIGURES APPROPRIATE AND HELPFUL? WHAT IMPROVEMENTS WOULD YOU SUGGEST; E.G. IS THE NUMBER OF FIGURES HELPFUL OR SHOULD SOME BE REMOVED; ARE THE FIGURES SUPPORTED BY APPROPRIATE TEXT?

Reviewer x1: no comment

Reviewer x2: Figures could be improved in general for their readability (increase font size in all) and quality (increase dpi or resolution). I have made specific suggestions. I think there are an appropriate number of figures - I don't think any are particularly redundant.

RESPONSE: We are working on improving the quality and readability of the figures.

Reviewer x3: The figures were helpful and I would not remove any. If possible, it would be useful to add something about the estimates on pandemic spillover risks by region to the map of Figure 4 to bring a better understanding on the relevant geographic gaps. For example this reference has some maps that could be helpful: Walsh, M.G., Sawleshwarkar, S., Hossain, S. and Mor, S.M., 2020. Whence the next pandemic? The intersecting global geography of the animal-human interface, poor health systems and air transit centrality reveals conduits for high-impact spillover. *One Health*, 11, p.100177. Based on that the lack of studies from Central America and Indonesia are alarming.

RESPONSE: Thank you for your comment. We agree that the lack of studies from Central America and Indonesia is concerning. Unfortunately estimating pandemic risk by region is beyond the scope of this report.

Reviewer x4: The figures seem quite enough

RESPONSE: Thank you.

Reviewer x5: 1) Review current state of evidence of knowledge. I'm not convinced this has been achieved, the review looks superficial: a histogram of when the studies were undertaken and a map of where the work was done. This falls short of what is needed.

RESPONSE: In addition to the histogram and map, the narrative summary (Figure 5) synthesises the current state of evidence in the form of a matrix. The broad scope of the study makes it difficult to summarise data extracted from 425 articles efficiently.

Reviewer x6: Fig. 5 is a great synthesis but hard to read because of the small character size

RESPONSE: Thank you for pointing that out. Figure 5 is now presented in a landscape format with increased character size and more distinct colour shading of the cells.



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Reviewer x7: Yes

RESPONSE: Thank you.

Reviewer x8: I suggest that axes of Figure 3 should be labelled while figure 9 can be converted into a table. Figure 9 is not quite clear.¹⁴

RESPONSE: Axes have been added to Figure 3.

Reviewer x9: I didn't find Figure 5, the narrative summary of the scoping review in a format of a relationship matrix between policy recommendations and knowledge gaps, to be particularly supportive of the conclusions and recommendations provided. For instance, there are tremendous gaps identified in the matrix related to health systems policy recommendations. These are minimally discussed in the conclusions section. How does this matrix help prioritize areas for policy work? Figure 4 would be strengthened if the map incorporated additional metrics to highlight the imbalance between efforts in the Global North and the topic at hand (biodiversity and pandemics). This map could really help drive home the point that many studies are being performed in the US and Europe, while the areas with greatest biodiversity are lacking infrastructure and support to conduct similar studies.

RESPONSE: Figure 4 has been changed to a heatmap to better identify the regions where research in Biodiversity and Pandemics is lacking.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

7. ARE THE TABLES APPROPRIATE AND HELPFUL? WHAT IMPROVEMENTS WOULD YOU SUGGEST? E.G. ARE THE MAIN FINDINGS SUPPORTED BY THE RESULTS INCLUDED IN THE REPORT.

Reviewer x1: no comment

Reviewer x2: I have provided specific recommendations where I believed tables could be improved.



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RESPONSE: Thank you. We have addressed the specific recommendations and responded to those comments.

Reviewer x3: no comment

Reviewer x4: The tables seem quite enough

RESPONSE: Thank you.

Reviewer x5: The tables were mainly explaining the abbreviations used in the report

RESPONSE: Thank you.

Reviewer x6: A table summarizing the main characteristics (sector of activity, discipline, ...) of the experts contacted could be added. A summary of the journals (category, discipline, name) and the authors (affiliation, geographic origin) of the 425 studies selected would help to have an overview of where this knowledge is coming from.

RESPONSE: The geographical distribution of the article source has been mapped in Figure 4 to give an overview of the evidence source. [Response here]

Reviewer x7: Yes

RESPONSE: Thank you

Reviewer x8: I suggest that serial numbers (S/N) can be added to the 1st column of the tables. For instance, in table 1, it gives an idea of the number of Requesters at a glance. It will also give an idea of the number of languages at a glance.

RESPONSE: Thank you for your feedback.

Reviewer x9: Yes

RESPONSE: Thank you.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment



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Reviewer x13: no comment

8. IS THE TEXT AND WRITING STYLE EASY TO FOLLOW AND UNDERSTAND (I.E. SELF-EXPLANATORY, FREE OF JARGON)? IF NOT, WHERE DO YOU SEE A NEED FOR LANGUAGE REVISION, OR MORE CLARITY? PLEASE INDICATE ANY SUGGESTIONS IN THE SECTIONS CONCERNED WITH THE PAGE AND LINE NUMBERS.

Reviewer x1: no comment

Reviewer x2: In general yes - I think generally there could be an improvement in the clarity and conciseness of writing in the executive summary and conclusion. These are the places that policy-makers and funders will most likely read and they need to be as sharp and snappy as possible. Could a lay summary be included maybe? Highlighting the key points using bold and italic text more and getting to the key messages is vital - I think the conclusion in particular felt a little too 'jargony'. If I have found specific places I have included them in the relevant sections below.

RESPONSE: We have edited the executive summary and conclusion for clarity and to reduce potential jargon. While we have not included a specific lay summary, we believe the key points are more clearly highlighted.

Reviewer x3: Yes, the writing was mostly easy to follow and concise.

RESPONSE: Thank you.

Reviewer x4: The language used and the style seem easy to follow and understand

RESPONSE: Thank you.

___Reviewer x5 :Constant use of W/D/H interface creates tedious repetition which reduces clarity and annoys those who hate unnecessary jargon! Why not just call it the "spillover interface".

RESPONSE: We have decided to retain the term W/D/H interface, which we believe is more accurate than "spillover interface" as these are not necessarily interfaces of spillover. However, for increased clarity, we have added this term to the Abbreviations section.

Reviewer x6: It was easy to follow



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RESPONSE: Thank you.

Reviewer x7: no comment

Reviewer x8: The report was easy to follow, I only found the sentence below on Page 9 not quite understandable:
The other mode of action relates to the need for systems transformation, targeting the drivers of the W/D/H interface creation, expansion and change. This is a far more complex and wicked path, but it is proactive against the pandemic risk.

RESPONSE: We have edited this sentence for clarity.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

9. TITLE (COVER PAGE)

Reviewer x1: I would reduce the length of the title. I suggest the following: IDENTIFYING INTERDISCIPLINARY RESEARCH AND ACTION PRIORITIES, THAT CONTRIBUTE TO A STRATEGIC RESEARCH AGENDA ON BIODIVERSITY AND PANDEMICS. ADDRESSING THE CRITICAL INTERLINKAGES BETWEEN RELEVANT SECTORS NEEDED TO MAKE FUTURE ACTIONS MORE EFFECTIVE.

RESPONSE: Agreed, we have reduced the title although the precise configuration is still under discussion within the group.

Reviewer x2: If this is the title: 'BUILDING ON EXISTING RELEVANT WORK ON RESEARCH AGENDAS AND KNOWLEDGE GAP ANALYSIS, IDENTIFYING INTERDISCIPLINARY RESEARCH AND ACTION PRIORITIES, THAT CONTRIBUTE TO A STRATEGIC RESEARCH AGENDA ON BIODIVERSITY AND PANDEMICS ADDRESSING THE CRITICAL INTERLINKAGES BETWEEN RELEVANT SECTORS NEEDED TO MAKE FUTURE ACTIONS MORE EFFECTIVE.' I suggest it needs shortening!



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RESPONSE: Agreed, we have reduced the title although the precise configuration is still under discussion within the group.

Reviewer x3: no comment

Reviewer x4: Seems fine

RESPONSE: Thank you, in response to other reviewers we have shortened the title although the precise configuration is still under discussion within the group.

Reviewer x5: Fails to live up to this

RESPONSE: We have revised the title and hope the revisions throughout the report have brought the title and content into better alignment.

Reviewer x6: no comment

Reviewer x7: Can the " requested and followed by" acronyms deleted? They can be find in the abbreviation. Tis corner of the cover iss very crowded.

RESPONSE: We have deleted the acronyms here.

Reviewer x8: Apart from the fact that the text is not properly formatted, it is okay.

RESPONSE: Thank you, the final formatting of the text will be done for the final report.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment



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10. GLOSSARY

Reviewer x1: No change suggested

RESPONSE: Thank you.

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to add

RESPONSE: Thank you.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

Reviewer x8: Adequate

RESPONSE: Thank you.

Reviewer x9: Zoonosis: should represent infectious diseases transmitted between animals and humans (bidirectionally)

RESPONSE: This is incorrect, zoonosis refers to a disease originating in a non-human vertebrate animal.

Reviewer x10:

- Epidemic: I suggest to use a different definition, as “widespread occurrence” does not capture the fact that an epidemic is characterized by an increased incidence in a certain area in a specific period of time. [Here](#) a nice definition is given: **Epidemic** refers to an increase in the number of cases of a disease above what is normally expected in that population in that area.
- Evidence: I do not find this definition very informative, maybe not needed to define what “evidence” is?
- Evidence approach: An approach that contributes towards better understanding of the problem, and the various factors that may lead to its successful delivery.



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- Evidence-based: refers to any concept or strategy that is derived from or informed by objective evidence
- Evidence-based research: What about just defining “evidence based approach/research” instead of “evidence approach”, “evidence based” and “evidence based research”?
- Prevention of spillover: “Refers to preventing the critical first step”; The critical first step of?
- Spillover Transmission of a pathogen from a reservoir population to a novel population; Maybe worth it to also define what a reservoir population is?
- Zoonotic spillover: Transmission of a pathogen from an animal to a human being; As stated now, is not clear the difference between zoonosis and zoonotic spillover.
- Zoonosis: An infectious disease that is transmitted from animals to humans; It could also be the other way around (from animals to humans), I would keep the definition more generic referring to “transmission between animals and humans”, see zoonotic disease | EFSA (europa.eu)

RESPONSE: Zoonotic spillover is a transmission of pathogens from animals to a humans being or from humans to animals as well; while the Zoonosis is the infectious disease related.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

11. ABBREVIATIONS

Reviewer x1: No change suggested

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to add

Reviewer x5: Constant use of W/D/H interface creates tedious repetition which reduces clarity and annoys those who hate unnecessary jargon! Why not just call it the “spillover interface”.



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RESPONSE: We have decided to retain the term, W/D/H interface as this interface represents more than a “spillover interface”. For increased clarity, we have included W/D/H in the Abbreviations section.

Reviewer x6: no comment

Reviewer x7: TUBITEK abbreviation could be added.

RESPONSE: TUBITAK is defined next to the member affiliated with the organisation. As this organisation is not a requester and not further referred to in the report, we do not believe it is relevant to include in the Abbreviation section.

Reviewer x8: W/D/H: wild animal / domestic animal / human should be added

RESPONSE: We have added W/D/H interface to the abbreviation section.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

12. EXECUTIVE SUMMARY (PAGE 9)

Reviewer x1: no comment

Reviewer x2: Page 8 under subheading ‘Transdisciplinary science at the wild animal / domestic animal / human interfaces’. The recommendations here seem sound but seem to be missing anything about solutions or management. Points i) to v) are all talking about diagnosing the threats and pressures, but in a classic Driver, Pressure, State, Impact & Response (DPSIR) framework I would expect to see some focus on knowledge gaps relating to the Response. It would be great to provide some recommendations around how we need more research on managing spillover events (although of course prevention is the best cure!). I think this could be made much more explicit throughout the executive summary.



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RESPONSE: The executive summary has now been rewritten.

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ex sun has same sentences with the discussion. I suggest to remove duplicate sentences.

RESPONSE: We have removed most of them.

Reviewer x8: The following text can be excluded from the executive summary and featured in the main text:

Studying the W/D/H interfaces is needed not only across space but also longitudinally through time. There is a need to understand: i) how host and non-host populations (and their interactions) adapt to changing W/D/H interfaces; ii) the consequences these changes have on pathogen transmission dynamics and other aspects of epidemiology; iii) the risk of spillover at these interfaces; iv) how to assess the pandemic potential of a given spillover event; and finally v) to study processes at multiple spatial scales simultaneously to understand emerging threats and properties when translating from one scale to another.

RESPONSE: The executive summary has now been rewritten.

Reviewer x9: no comment

Reviewer x10:

- “number of different studies “; could you please add a footnote mentioning the content of these studies?
- **The role of the social sciences and local communities** – “ensure transdisciplinarity”; If you use interdisciplinarity and transdisciplinarity to mean different things, maybe worth it to define them in the glossary?
- **Policy recommendations: from incremental to transformative** – “one can always try to predict pathogen spillover at the W/D/H interfaces and this is necessary.”; Suggest to reformulate this sentence



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RESPONSE: We have implemented these suggestions.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

13. INTRODUCTION (PAGES 10-14)

Reviewer x1: Need to unify citation criteria. I found Author et al., year and Author et al. year. Page 11.

RESPONSE: Thank you for pointing this out, we have made the citation format consistent.

Reviewer x2: Page 11 in 2.1 Background, sentence starting: ' Similarly, strongly worded policies with ...' Does this need some referencing or evidence behind it?

RESPONSE: We have edited this sentence for clarity and added references.

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Clear and gives the background of the work group.

RESPONSE: Thank you for your feedback.

Reviewer x8: It is well written.



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RESPONSE: Thank you for your feedback.

Reviewer x9: no comment

Reviewer x10:

- *"Biodiversity, the variety of life on Earth, plays a crucial role in delivering essential ecosystem services and regulating ecological functions. These services and functions are pivotal in supporting human societies, economies and food systems, as well as maintaining crucial life support systems";* Missing reference to the fact; well-being of the planet is a strange formulation, as well-being is a 'human' concept
- *"... and the occurrence of pandemics.";* References?
- *"has drawn again the attention to the link between biodiversity loss and infectious diseases.";*
- . see CBD COPXII/21 <https://www.cbd.int/doc/decisions/cop-12/cop-12-dec-21-en.pdf> 2014 was an Ebola outbreak and attention was drawn to the link between biodiversity loss and emergence of disease
- . is it biodiversity loss or increased contact between wild fauna and human beings, for various reasons? Note that encroachment is the higher ranked policy recommendation in the survey...
- . This should be rewritten as there are clear divergences in the scientific community regarding the origin of COVID. It is however true that the pandemic triggered a regain of attention regarding the risks of zoonoses.
- . How? We don't know for sure where it came from, how it got from bats to humans. Much less whether/how it was linked to the "loss" of biodiversity. Some explanation/evidence would be useful to support the claim. The link mentioned in the next sentence is just a possibility, but does not mean that biodiversity loss actually played a role in COVID-19, or that it would not/could not have happened just the same without loss of biodiversity.
- *"novel zoonotic pandemic";* Again this formulation "zoonotic pandemic" excludes the fact that the pandemic might be the outcome of a lab accident
- *"and acceleration of biodiversity loss.";* And contacts between wild fauna and human beings/domestic animals...
- *"The pandemic has revealed a broad range of science-policy challenges and knowledge gaps related to biodiversity and pandemics. Addressing these could reduce the risk of future pandemics while also better preparing us for the next crisis that emerges. Current knowledge gaps range from the role of wildlife trade and consumption in the emergence of zoonotic diseases (Kock and Caceres-Escobar, 2022), to the knock-on effects of climate change on biodiversity (Parmesan et al., 2019) and subsequent disease emergence, and the role of microbial communities in ecosystem functioning and resilience (Delgado Baquerizo et al., 2021). While research has been conducted on each of these topics, there is an urgent need for further investigations to determine their scope and driving mechanisms, as well as to determine how to manage and mitigate the risk these factors pose.";* More than anything, the pandemic has highlighted a disfunctioning scientific community further affected by strong interferences from private and public sectors. The only reasonable recommendations today regarding the pandemic are therefore those published last month in "The Origins



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of Covid-19 — Why It Matters (and Why It Doesn't)" <https://www.nejm.org/doi/full/10.1056/NEJMp2305081> . For a "Draft evidence report" about "biodiversity and pandemics", it is expected to be as neutral and objective as possible. The whole report should be updated to match this reality.

- *"In terms of biodiversity, a pressing knowledge gap is the **impact of climate change** on species distribution and adaptation. Research has shown that climate change is driving significant changes in the geographic distribution of many species, which can have cascading effects on ecosystems and human societies (Parmesan et al., 2019)."; I think that knowledge in this field as been evolving fast. Consider adding more recent sources.*
- *"Another knowledge gap in biodiversity research is understanding the **role of microbial communities** in ecosystem functioning and resilience. Microbes play crucial roles in nutrient cycling, soil formation, and ecosystem stability, but we have only just begun to scratch the surface of understanding the diversity and function of these communities (Delgado-Baquerizo et al., 2021). More research is needed to fully understand the role of microbes in ecosystem processes and how to manage microbial communities to promote ecosystem health. In the context of biodiversity and pandemics, knowledge gaps include understanding the **role of wildlife trade and consumption** in the emergence of zoonotic diseases."; missing reference to the fact that wild fauna harbours micro-organisms that can be very different from those of domestic animals or human beings, with in inherent risk of transmission of pathogens./diseases when contacts exist. Obvious but useful to be reminded...*
- *The COVID-19 pandemic has highlighted the need to address the risks associated with wildlife trade and consumption, but more research is needed to fully understand the scope of the problem and how to mitigate the risks (Kock and Caceres-Escobar, 2022)."; As much as the need to have proper safety measures in high security labs... the number of new labs has exploded since covid...*
- *"... spread of diseases. "; This sentence is vague and misleading. Maybe make a clearer link between evidence based policies and the translation of research outcomes to policy recommendations. This sentence is vague and misleading. Maybe make a clearer link between evidence based policies and the translation of research outcomes to policy recommendations.*
- *"Biodiversity loss has been linked to an increased risk of zoonotic disease transmission (Keesing et al., 2010, Gibb et al., 2020)."; I would add more recent references, there are many publications from Ostfeld and Keesing on the topic*
- *"[Eklipse](#) and the [European Commission - Knowledge Centre for Biodiversity \(EC-KCBD\)](#)"; Eklipse link wrong and KCBD correct one https://knowledge4policy.ec.europa.eu/biodiversity_en*
- Table requesters –
- DG Agriculture and Rural Development (EC - DG AGRI): Responsible for EU policy and research on agriculture and rural development and deals with all aspects of the common agricultural policy (CAP). Chef de file on agriculture and forestry related research.
- Project HERA (Health Environment Research Agenda for Europe): EU funded project that involves 15 European countries, an international organisation and a European NGO, including 24 partners in total who



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finished in 2022 and already published in 2022 the EU Research agenda for the Environment, Climate and Health 2021-2030: [HERA 2030 Agenda — HERA \(heraresearch.eu\)](https://heraresearch.eu).

RESPONSE: We have edited the introduction to address your concerns, including clarifying or expanding phrasing where needed and adding references.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

14. METHODOLOGICAL FRAMEWORK (PAGES 15-30)

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Good and understandable.

RESPONSE: Thank you.

Reviewer x8: The report is quite long. Section 2.5 seems like a repletion. The preliminary info is not essential.



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RESPONSE: We have deleted this section.

Reviewer x9: no comment

Reviewer x10: I suggest to revert the order: of chapter 3 and 4 and 5. Start with discussion/recommendation and results and then methodological framework, as I think this is what is of the biggest interest for most readers.

- "*People-based methods*"; What about "*expert-based*" methods instead?

RESPONSE: We have decided to keep the order of the main sections as the main recommendations and points of discussion are included in the executive summary, allowing readers to easily and quickly access our main conclusions and recommendations. We also believe it is better for readers to first see the methods that allow us to arrive at our results and recommendations.

We also retain "people-based methods" as the terminology adopted by Eclipse.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

15. METHODS - LITERATURE -BASED METHOD: SCOPING REVIEW (PAGES 16-21)

Reviewer x1: Need to unify citation criteria. I found Author et al., year and Author et al. year. Pages 16-17

RESPONSE: Thank you for your feedback, we will take it into consideration in the final version of the report.

Reviewer x2: Under page 18 in Grey literature searches, paragraph starting: 'We excluded reports from non-governmental organisations or those that focussed exclusively on the One Health approach'. Can some justification for doing this be added here - whether this was time constraints or otherwise? The sentences that come afterwards are a bit confusing too. On page 19, on Estimating the comprehensiveness of the search, it then states: 'Reports from organisations relevant to biodiversity, pandemic prevention and One Health/Ecohealth included in the search.' which seems slightly contradictory to me.



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RESPONSE: Thank you for pointing this out. We have clarified the paragraph on page 18 and the sentence on page 18 as follows,

“Due to time constraints, we excluded reports from non-governmental organisations or those that focussed exclusively on the One Health approach. Except, for the One Health Theory of Change report from the OHHLEP as it aims at strengthening the scientific evidence base, fostering knowledge exchange in assessing the status of biodiversity and its relevance to health; reviewing traditional/indigenous forms of knowledge and inputs of marginalised groups and ensuring inclusive approaches or assessing spillover drivers and identify relevant risk reduction options.”

“Reports from organisations relevant to but not exclusively on biodiversity, pandemic prevention and One Health/Ecohealth were included in the search.”

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: The keyword search and text mining process is not fully clear.

“We conducted text mining from abstracts of articles included in the previous literature search” More details on the previous literature search used as source for this scoping review should be given. How were the keywords combined for the search ? Any structured search algorithm ?

RESPONSE: We have shifted the table of keywords used for electronic bibliographic searches from the annex to Table 3 in the main manuscript. The previous literature search mentioned in the sentence has clarified.

“included in the previous literature search, conducted by Eclipse on the subject ‘Biodiversity and Pandemics’ for the development of this request. Reviewer x7: Good

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment



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Reviewer x10:

- **“Table 2- Phenomenon of interest - Impact of biodiversity on disease outbreaks and pandemics, and the effect of pandemics on biodiversity.”**; And disease outbreaks? Or for this part on the effects on biodiversity you focused specifically on pandemics?
- **“quasi-automated literature search method ”**; Can you make more explicit the fact that you used litsearchr to help you in developing the search strings for your new scoping review? Here for example sounds a bit cryptic, if the reader is not familiar with litsearchr, he could think that you used a tool to automatize the literature review, while the aim here was to automatize the development of the search strategy, that than you performed on the three bibliographic databases and the additional sources (if I understood correctly
- **“... Annex 1 ”**; From the annex it is not very clear to me how the different topics were searched for in the databases, can you add the strings for each database?
- Organisational websites - **“The list of websites is inclusive but not restricted to the following”**; What does this means? That you used additional websites? And if yes, why they are not listed?
- **Grey literature searches – “For feasibility...”**; You mean, considering the time constraints?
- **“We excluded reports from non-governmental organisations or those that focussed exclusively on the One Health approach, ...”**; It is not very clear how far one health was addressed: here exclude reports ‘exclusively (?) focused on One Health approach’ are excluded, and then reports from OH in the searching method are included (page 19). In addition, OH approach is among the policy recommendations listed in Table 5 for the online survey (page 25) and in other parts of the report.
 - **Estimating the comprehensiveness of the search –**
 - . *Search not limited to the English language*
 - . *More than two bibliography electronic databases searched*
 - . *Reports from organisations relevant to biodiversity, pandemic prevention and One Health/Ecohealth included in the search.*
 - . *Forward citation chasing the selected literature to ensure the comprehensiveness of the search. “*; Maybe this could be rephrased in a bit more discursive way? Like “To ensure the comprehensiveness of the research...”, and then you list the various approach used. Also the title sounds a bit weird “estimating the comprehensiveness of the search”, I would not use the term “estimate”.
- **Search record database –**
 - . reformulation: “All the references retrieved from the literature search were exported into Zotero version 6.0.16, a citation manager software. We used the R package “Revtools” version 0.4.1. for duplicate removal.”
 - . **“single-stage article screening strategy ”**; “single-stage article screening strategy” sounds a bit cryptic, what do you mean? That articles were divided among the two reviewers and each article was screened by a single reviewer only? But if this is the case, why below in the chapter “Consistency checking” you say that you checked for conflicts during the screening? It is not clear to me what you did, can you be more specific also separating between the title abstract screening, the full text screening and the data extraction step?
 - . **“Rayyan.ai (<https://rayyan.ai/>) to simultaneously screen ...”**; again, why simultaneously if each person screened different articles (except for the pilot)?



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- . *“Once the screening decisions agreed, ...”*; Do you mean that you performed the test again with the “adjusted” criteria until there was a disagreement below 10%?
- **Inclusion criteria** -
 - . *“Studies discussing the following topics were included for data extraction...”*; Which kind of studies? (see also my other comment below).
 - . *“Impact of biodiversity on disease outbreaks, zoonotic spillovers, and cross-species pathogen transmission.”*; In table 2 you say on “disease outbreaks and pandemics”, please check for consistency in the different parts of the text
 - . *“Relationship between agro-biodiversity or agricultural biodiversity and disease transmission.”*; Is the the role of microbial communities in ecosystem functioning and resilience (one of the main knowledge gaps, page 11) considered/included under this criterion (or the first one)?
- **Exclusion criteria**
 - . *“Experimental and in vitro studies which were unrelated to biodiversity.”*; This means that there are also “experimental studies and in vitro studies” that were instead related to biodiversity and that were included? Or you mean that you excluded all the experimental studies? I would be more specific on the type of studies that you included in the inclusion criteria
 - . *“Marine studies on diseases which have no transmission potential to humans.”*; Maybe you can just summarize point 2/3/5 saying that you excluded all studies not concerning zoonotic diseases?
 - . *“Clinical trials unrelated to biodiversity.”*; Again, is this part necessary? I guess you just excluded all clinical trials?
- **Data extraction - Table 4.**
 - . *“ENG/ CHI/ FRE/ ESP”*; Weren’t more than four the languages included?
 - . *“Virus/ Bacteria/Protozoan...”*; Can you provide (here or in an annex) the full list? (Same for the other sections where you put “...”)
 - . *“Validation - Quality of evidence/Reviewer confidence “*; Which are the criteria based on which the quality of evidence was assessed? Did you have specific criteria for each study type? (as the body of evidence was very heterogeneous)



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RESPONSE: The “Phenomenon of interest” Table 2 has now been modified to reflect the board scope of the review in detail.

“Impact of biodiversity on disease outbreaks, zoonotic spillovers, cross-species pathogen transmission, and pandemics, and the effect of pandemics on biodiversity.”

The sentence has been modified to clarify the intent of using litsearchr and the list of keywords used in the electronic bibliographic searches has been shifted from the Annex to Table 3 in the main text.

“The use of a quasi-automated method to identify keywords reduced the time to conduct the search and ensured the transparency and reproducibility of the search by using text-mining and keyword co-occurrence networks.”

The organisational websites not listed in the main text can be found in the electronic annex along with the data extraction of the organisational reports. We listed 6/20 to give the reader an overview on the type of websites searched.

The sentence in the grey literature search was modified as followed:

“Due to time constraints, we excluded reports from non-governmental organisations or those that focussed exclusively on the One Health approach. Except, for the One Health Theory of Change report from the OHHLEP as it aims at strengthening the scientific evidence base, ...”

“Estimating the comprehensiveness of the search” has been changed to “Ensuring the comp...”

The sentences under “Search record database” have been reformulated.

We have reformulated the paragraphs under “Screening strategy” and “Consistency checking”. We used a single-stage abstract screening strategy as mentioned and in cases where the abstract was given a decision “maybe” by one of the reviewers, both the reviewers went through the full-texts to come to a decision. The term “simultaneously” has been removed. The pilot screening was an iterative process and until the disagreement was below 10%, eligibility criteria was revised.

We have added the types of studies as suggested.

Soil microbiome was considered with the third inclusion criteria along with agrobiodiversity.

Exclusion criteria: We have summarised points 2 and 5 together and clarified point 3.

We included more than the four languages in the searches and we have added them to the table.

The full list of pathogens have been provided.



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Systematic reviews and maps were given high scores for the quality of evidence. Opinions and perspectives were excluded from this rating. As this was a scoping review, the aim was to be inclusive rather than restrictive based on the quality of evidence.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

16. METHODS - INITIATIVES– BASED METHOD: INITIATIVES SCOPING (PAGE 22)

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Good

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment



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Reviewer x10: *"Description of the method and Approach to organise Knowledge and Data"*; Is this subsection necessary? (as it is the only one for 3.2, I would probably remove it)

RESPONSE: We agree and have made this change.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

17. METHODS - PEOPLE -BASED METHODS: ONLINE SURVEY AND ONLINE FOCUS GROUP (PAGE 22-29)

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: It would be helpful to know a geographic distribution of the persons the survey was sent to, to know if their distribution was as biased towards United States and Europe as that of the ones who responded (figure 6).



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RESPONSE: The distribution is given below; [All people who received the questionnaire (based on the initial list + additional in the second sheet)]

Africa 28, 9,03%

Asia 15, 4,84%

Europe 175, 56,45%

Middle East 16, 5,16%

Norht America 48, 15,48%

Oceania 13, 4,19%

South America 15, 4,84%

Reviewer x4: Seems adequate

RESPONSE: Thank you.

Reviewer x5: no comment

Reviewer x6: How was established the the first 2 lists of 12 policy recommendations and 12 gaps in knowledge ?
How is it related to results presented in Fig. 5 ?

RESPONSE: We used the outputs of the scoping review to create these two lists. Figure 5 shows the relationship matrix between the policy recommendations and the knowledge gaps from the included articles of the scoping review and highlights the areas in need of action.

Reviewer x7: Good.

RESPONSE: Thank you.

Reviewer x8: Minor editing e.g deleting the duplicate sentence (1st two lines) on page 29.

RESPONSE: We have corrected this error.

Reviewer x9: no comment



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Reviewer x10:

- **Organisational websites** – “... The list of websites is inclusive but not restricted to the following.”;

What does this mean? That you used additional websites? And if yes, why they are not listed?

- **Description of the method - Online survey**

. “The online survey was sent to a selected number of participants (n=301). The list was populated, using a structured process; ...”; ?

. “acknowledge the many surveys participants are probably currently exposed to, leading to “survey fatigue”. Pilot tests on the survey were run by colleagues of EWG members to assess the time taken to complete the survey.”; I would just write ...and to avoid “survey fatigue”

- **Section 1. Eclipse privacy policy and GDPR agreement.**

. “Before starting to answer the survey, each participant had to agree with the following items by ticking boxes:

.By answering the following survey, I agree with the collection, storage and use by the Eclipse team of the information provided by me. I retain the right to ask Eclipse to delete all my personal data at any moment. For further information: <http://eklipse.eu/privacy-policy/>

. I declare that the information provided is under my own personal capacity and does not involve my affiliation’s opinion. “; Maybe not necessary to be so detailed here, considering that the whole survey has been attached as an annex...?

- **Table 6.** “ List of research knowledge gaps in the online survey”; it’s quite strange that the impact of CC on the geographic distribution of species (biodiversity, adaptive responses of species...), is not explicitly listed among the research gaps in the survey, while on the contrary it is among the main research gaps (e.g. page 11). Is it embedded under the ‘modelling’ heading (even if it can probably not be limited to modelling)?

- **Focus Group Discussion**

. “ To support the facilitator, members of the EWG were allocated tasks such as “typing participant contributions on notes on the board”, “organising participant contributions on notes on the board,” and “introducing the FDG”.; Wondering again if this level of detail is necessary, probably this sentence could be synthesized.

. “ Then, small groups of three to four participants were asked to brainstorm on the title and main objectives to make a “pitch” of a virtual or ideal interdisciplinary project that would gather at least three items on the list of research gaps, in order to illustrate how multiple research gaps could be addressed, as well as the duration and funding that would be needed.”; This sentence is very long, a bit difficult to read

. “The final outputs...”, sentence repeated twice



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RESPONSE: Thank you for your feedback, we will take your comments into consideration while finalizing the report.

We have deleted the text of the privacy / GDPR agreement as suggested. We have edited the sections of the Focus Group Discussion for clarity and deleted the repeated sentence.

While we identify a priori discuss the impact of climate change on the geographic distribution of species as a research gap in the introduction of the report, the research gaps proposed for the survey were based on the main research gaps we identified via the scoping review. We did not find that this issue was a primary research gap in the scoping review and therefore it is not included explicitly in Table 6. The topic "Modelling" could of course include the impact of climate change on species distribution but in this context is not limited to that question.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

18. LIMITATIONS OF THE METHODS (PAGE 29-30)

Reviewer x1: no comment

Reviewer x2: Table 7 section 3.4 page 29-30 - should this table also include the original protocol for the people-based method, as is done for the literature?

RESPONSE: A brief summary of the original protocol is included for the people-based method section of Table 7 in the case of changes. The duration of the availability of the survey and use of an online focus-group discussion were highlighted as general limitations but were not actually modified from the original protocol.

Reviewer x3: no comment

Reviewer x4: Seems adequate



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RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: All meetings were done online. My personal opinion, i find face to face meetings more effective.

RESPONSE: A face-to-face meeting might have had advantages but due to people being based in different continents and lack of a budget for travel or accommodation of participants (as well as the carbon footprint), this was not an option.

Reviewer x8: no comment

Reviewer x9: no comment

Reviewer x10: **Limitations and changes to the original methodology protocol - Table 7.**

. *“Due to time constraints, a full systematic review was not feasible to meet the deadlines proposed.”*; Well, I think that given the broadness of the topic addressed and considering your aims, a scoping review was actually more appropriate than a systematic review, regardless of the time constraints.

. *“Two instead of three members of the EWG were involved in the screening process.”*; Same problem as above, do you mean in general, or to review simultaneously?

. *“Simplified data collection on initiatives”*; Can you make more explicit what is meant here?

RESPONSE: We have deleted the phrase “Simplified data collection on initiatives” and added detail on specific information that was not collected.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment



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19. RESULTS - LITERATURE -BASED METHOD: SCOPING REVIEW (PAGES 31-35)

Reviewer x1: I suggest using a bigger font size for Figure 2. flow chart. Page 31.

RESPONSE: We have increased the font size for Figure 2.

Reviewer x2: Figure 5 could be placed on a separate page in landscape orientation to improve readability.

RESPONSE: We have made this change.

Reviewer x3: It would be useful to get more text on the results of the scoping review. Figure 5 is useful but there is a lot to take in.

RESPONSE: We have now differentiated the colours for the “knowledge gaps” and “irrelevant” categories.

Reviewer x4: no comment

Reviewer x5: no comment

Reviewer x6: More details on the intermediate steps leading to the 47582 studies identified should be given.

Is the list of the 425 studies and 20 reports included in the study presented somewhere ?

Fig.5 Policy recommendations are too small to read

How were the 15 Research gaps and 35 Policy recommendations of Fig 5 were identified ? Directly from the use of the text mining tool in R “tm” version 0.7-11) ?

What are the raw outputs off the text mining process and how does that lead to the results presented in Fig.5 ?

RESPONSE : The included studies and reports can be found in the electronic annex. The figure is to be formatted in a landscape format to improve readability with an easier legend and more distinct shading of the boxes. The policy recommendations and research gaps were prioritised and then categorised based on the frequency of citation in the included studies. During data extraction the articles were categories based on the topic of research gap such as animal health and policy like collaborative research. Text mining was used to extract keywords and also establish the frequency of the keywords.

Reviewer x7: Good



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RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment

Reviewer x10:

– **Literature-based method: Scoping review -**

. *“Finally, we included 425 studies and 20 reports from organisational websites for data extraction.”*; Would it be possible to for Eklipse to provide the list of these 425 studies and 20 reports? Yes, these should be attached in an annex.

Figure 2. *“Prisma flow chart detailing the records screened and included for data extraction.”*; In the PRISMA should be present the number of studies (with reasons) excluded at the different stages of the literature review (i.e. tiab screening and full text screening), is it possible to add this information? Looking at the PRISMA, I realize again that it is not clear to me how and to which aim the “automation tools” were used in this research, can you specify better in the methodology section? Also, I was wondering if you decided to exclude books and books chapters from the beginning or you did because they were not accessible? (as it seems here) In the methods, the type of articles object of the review should be clearly stated (e.g., if you decide to include only primary peer reviewed research articles, or also reviews, conference proceedings, books... etc.) The reasons for exclusion when you list the “reports excluded” are not self-explaining, for example “marine studies”... I would at least report the full motivation for exclusion in the caption, so one can understand what you mean without going back to the methods

. *“Although Europe had studies (18/425 included studies) at a continental scale, we observed a lack of evidence at a smaller scale.”*; N and percentage like you wrote for the US? I may have misunderstood something : reference is made earlier and later in report to 12 policy rec and 12 research gaps, but this table shows other numbers... is there a good reason for this inconsistency?

. *“ This relationship matrix is a tool for policymakers to help them identify interdisciplinary research and action priorities that contribute to a strategic research agenda on biodiversity and pandemics.”*; The results from the table should be explained in the text, and I think a specific example on how to read the table would also help the reader.

. *“Red cells in the matrix are research areas that are poorly studied in interaction with mentioned policy recommendations and would require further research prior to translation into appropriate policy recommendations and actions.”*; But in the picture I see “knowledge gaps / **irrelevant association**”, can you explain in the main text what this means providing examples? Also, I think irrelevant associations should have a different colour than knowledge gaps



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. *We observed that there was uncertainty among a few research gaps...”;* From which results you make this observation? Is this based on the quality assessment of the studies?

. *“The Technical Information on Biodiversity and Pandemics (SBSTTA, Note by the Executive Secretary, CBD) highlights the fact that:...”;* I would add detail information here. During the technical meetings, namely the SBSTTAs leading towards the COP15 CBD Convention Biological Diversity meeting last December, the topic on Biodiversity and pandemics was part of dedicated discussion, also in order to support the Kunming-Montreal GBF. Please note that the topic was 'biodiversity and health' not specifically pandemics.

RESPONSE: The list of the 425 articles and 20 reports can be accessed from the electronic annex.

We have decided not to modify the PRIMSA diagram as there is a lot of information packed in there already. We choose not to review books and chapters due to time constraints.

The 12 knowledge gaps and recommendations for the people-based methods as explained in paragraph below the PRISMA diagram is restricted to the data extraction of 200 included articles. This was done to develop the online survey in time. The data from the remaining 425 articles was extracted later to develop the narative summary.

We have now differentiated the colours for the “knowledge gaps” and “irrelevant” categories.

Uncertainty in evidence due to conflicting studies and uncertainty expressed in the study itself.

Thank you for pointing that out.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

20. RESULTS - INITIATIVES-BASED METHOD: INITIATIVES SCOPING (PAGES 35-42)

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment



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Reviewer x4: Seems adequate

RESPONSE: Thank you for your feedback.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Good

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment

Reviewer x10:

- Research funding -

. *"We found two primary sources of funding dedicated specifically to the topic of biodiversity and pandemics that use this terminology: The Horizon Europe Cluster 6 (Food, Bioeconomy, Natural Resources, Agriculture and Environment) BIODIV-01-17: "Interlinkages between biodiversity loss and degradation of ecosystems and the emergence of zoonotic diseases". "*; better include the full ref with year: CL6-2023-BIODIV-01-17,

. *"The PEPR funding initiative from the French PREZODE initiative broadly focuses on global change, human impact, and emerging zoonotic diseases. The call was opened in February 2023. Letters of Intention were required by April 2023 and final project submission will occur in September 2023. Improving knowledge of the relationship between biodiversity loss and pathogen circulation is specifically mentioned as one of six goals within the program's Axis 2, "Strengthening our knowledge on potential reservoir populations and of system-based approaches to understand zoonotic diseases emergence in a changing environment". This initiative funds consortiums led by French research teams with funding of 1-3€ million per project given to French institutions for a duration of 3-5 years."*; what overall budget?

. Addition:

"SOPHIE project (Seas, Oceans & Public Health in Europe) should be mentioned <https://sophie2020.eu/>"



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Main output: a SRA proposing a comprehensive overview of the required research and capacity to develop Oceans and Human Health in Europe. It sets out existing evidence that the health of seas, oceans and humans are inextricably linked. Interlinking marine biodiversity exploration, conservation and biomedical research, well-being – tourism , food safety & security.

This SRA focuses on three main target action areas: Sustainable seafood and healthy people; Blue spaces, tourism and well-being; and Marine biodiversity, biotechnology and medicine. It also outlines policy, relevant research needs, public and stakeholder attitudes, and capacity and training requirements in relation to these three areas will cement Ocean Human Health as a meta-discipline in Europe:

Sustainable Seafood a Healthy People: food from the ocean is for fish and seafood to be healthy, nutritious, safe and accessible to all, whilst ensuring sustainability of fisheries and aquaculture (concerns, toxic contaminants, Food and pathogens: In Europe it occurred several events of contamination that caused selling and consumption of products forbidden,;

Marine biodiversity, medicine and biotechnology: Our vision is a more targeted approach to explore, identify and obtain what marine biodiversity can provide to biotechnology, medicine and disease prevention, whilst demonstrating the critical importance of marine biodiversity and its protection. Marine biodiversity, especially hot spots systems such as deep sea communities, vents and shallow coral reefs, is source of potential cure / drugs. PCR test for SRAS and then COVID were made from enzymes found in extreme environment bacterias for instance, several drugs...1 to 2/3 of marine species yet to describe and identify. Potential drugs bearer is often available in small quantities (need to closer the links with biotech for amplification) and in specific ecosystems: risk of overexploitation for extraction of compounds in addition to environmental changes (T, acidification) are threatening these ecosystems. In addition to human activities such as fishing, trawling, mining and chemical pollution. Case for ensuring better protection and restoration and advanced ecosystem based management of human activities. Biobanks, such as the European Blue Biobank, enable the storage of biological specimens and facilitate sustainable access to marine biodiversity. They are an important component of the bio-discovery pipeline and can be consulted as part of a bio-prospecting campaign. If used properly, these infrastructures can help reduce over-collection of the same species. Biobanks can be an approach to conserve biodiversity, but they need to be expanded to be a more comprehensive representation of marine biodiversity and to not only represent cultivable marine organisms.

. THE SRA is ready to use proposal for research multisectors / meta discipline in Europe on particular marine biodiversity link to health and medicines.

- **Preparedness and / or Implementation Funding-** At EU level, I guess DG INTPA has relevant programmes to strengthen capacity building on one health/pandemic prevention (see SWM below)*
- **Conservation initiatives -***



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. “Another potentially relevant program focused on species conservation is the Sustainable Wildlife Management Programme (SWM) (<https://www.swm-programme.info/>) from the FAO, along with CIFOR, CIRAD, and the Wildlife Conservation Society (WCS), which provides funding for wildlife conservation, thus maintaining species diversity through the lens of sustainable use and management.”; Please note that SWM is funded by the European Union with co-funding from the French Facility for Global Environment (FFEM) and the French Development Agency (AFD).

– Relevant European Agencies -

. “Although it has not yet issued calls related to biodiversity and pandemics, we also identify the European Health and Digital Executive Agency (HaDEA) as a potentially relevant EU agency. HaDEA manages calls related to health. Current funding calls are within the Horizon Europe and Digital Europe programs. Other programs (without current funding calls) within HaDEA include EU4Health, the Single Market Program: Food, and Connecting Europe Facility.”; HADEA being an executive agency, it does not design/launch calls, but manages programmes/projects that Parent DGs (EC services) delegates to HADEA. Indeed, I would start talking of Agencies (given the first paragraph) and then move to HADEA specifying it is an Executive agency

. “European Centre for Disease Prevention and Control, established in 2005, is an EU agency aimed at strengthening Europe's defences against infectious diseases. “; Other decentralised agencies are relevant as well, in particular EFSA (animal health, including wildlife) and EEA...

. “Its mission is to identify, assess and communicate current and emerging threats to human health posed by infectious diseases. Its main objectives are to:

- search for, collect, collate, evaluate and disseminate relevant scientific and technical data;
- provide scientific opinions and scientific and technical assistance including training;
- provide timely information to the Commission, the Member States, Community agencies and international organisations active within the field of public health;
- coordinate the European networking of bodies operating in the fields within the Centre's mission, including networks that emerge from public health activities supported by the Commission and operating the dedicated surveillance networks;
- exchange information, expertise, and best practices, and facilitate the development and implementation of joint actions.”; I do not think listing the ECDC objectives is needed here. I would instead cite some example of the ECDC work that is related to zoonoses and could be relevant to the context of this report (e.g. the work on avian flu, which is also done in collaboration with EFSA, the reports are available on their websites)



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RESPONSE: We have included the full reference for year for all Horizon Europe clusters.

We have added the total budget for Prezode (30€ over five years).

Thank you for bringing the SOPHIE initiative to our attention. However, we found that while this initiative deals with biodiversity and health, primarily through increased well-being and the development of potential medicines, it does not directly address the connection between biodiversity and pandemics. Therefore we have not included this with the Initiatives.

We have added information about DG INTPA.

We have changed the description of funding for the SWM to specify that it is funded by the European Union with co-funding from the French Facility for Global Environment (FFEM) and the French Development Agency (AFD).

We have noted that HaDEA is an executive agency and moved this section to after the description of other relevant agencies.

We have now included EFSA and the EEA to the relevant agency section. The section on the ECDC has been edited in line with the suggestion.

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

21. RESULTS - PEOPLE-BASED METHODS: ONLINE SURVEY AND ONLINE FOCUS GROUP DISCUSSION (PAGES 42-51)

Reviewer x1: I suggest improving quality of Figure 9. Page 49

RESPONSE: Thank you, we will improve the figures.

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Seems adequate



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Reviewer x5: no comment

Reviewer x6: What are the sector of activity (all academics ?, some members of private companies or conservation NGO ?) and discipline of the selected experts ? A map is provided for the geographic origin (Fig.6) but a presentation of other key features of the expert is lacking.

RESPONSE: This information can be found in Annex 5.

Reviewer x7: Good

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment

Reviewer x10:

- **Online survey** -

. *“The main driver of biodiversity loss and interface creation across the world is land use change for agriculture. A large part of this agriculture is intensive and aims at feeding humans and domestic animals which will feed humans. The need to transform **Food Systems** globally was the third most cited item and relates to the environment and biodiversity crises. Here participants indicated that this item is deeply linked to the risk of pandemics and that it constitutes a root cause of the pandemic risks associated with biodiversity.”; Agriculture is the only driver identified? I think that the others should also be mentioned (even if not the main ones). The way this para is written does not give the full picture of biodiversity loss*

. *“Overall, the EWG decided that these items did not bring major additionality to the list of items from the preliminary work done by the Scoping review. ”; Additions?*

- **Results of Section 3 - Session 1: Introduction**

. *“During session 1, The facilitator welcomed the participants and after presenting a few rules of conduct gave the floor to a member of the EWG to summarise the background and objectives of the Eklipse request and of this FGD. After this short introduction, participants and EWG members facilitating the FGD were provided*



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a space on the virtual board followed by a minute or two to introduce themselves. Prior to the discussion, the results of the survey ..."; I think that all this information with the procedure, surveys, minutes, sessions, etc, etc should go in an Annex. The most important part should be the outcomes, recommendations. The report as it is now gives more emphasis on the procedure than the result. Agree on putting these detailed information in the annexes. There was another point before in the report where I highlighted that the info provided were too much detailed. Methods are relevant, but in the main text they should be kept concise and clear, leaving additional details to the annexes.

- Results of Section 3 - Session 2: Policy recommendations

- . "In session 2, the facilitator asked a set of selected questions. During the first session the experts discussed the policy recommendations from the survey. The discussion started with one member of the EWG introducing the topics proposed in the survey and the survey prioritisation results. Then the experts were asked to discuss the proposed policy recommendations, highlighting any surprising results, adjustments needed and important items missing. Next in order, a discussion followed on the priorities given in the survey, captured by asking the experts what they thought the main criteria were for those priorities. In summary, participants suggested that policy recommendations were too broad as presented and needed to be simplified to provide more concrete policy recommendations for achieving broad aims. It was also noted that separate recommendations and research priorities may be needed for currently circulating versus emerging pathogens and zoonotic diseases. Participants generally agreed that the proposed policy recommendations lacked sufficient integration and reference to social sciences, community involvement, and economic and social drivers. Feedback from policy actors would probably be needed for this section."; All these are way too detailed. These are like the minutes of the sessions. Please add then in Annex*
- . "This title sets the interdisciplinary frame for the whole thing. We build into the project a core component of socio-economic-political science in relation to externalities. "; I would put this text on the feedbacks (and also Figure 9) in the annexes, and here provide a more concise and clearly written summary of the suggested ideas and key points addressed during the two focus groups.*
- . "It focuses on public health but is strongly linked to issues related to wildlife, livestock and ecosystem changes. We're looking at an initial period of 10 years potentially, maybe eight, with 12M€ of funding, followed by a 20-year implementation period including monitoring and real-time actions with further funding of potentially 20M€ or more. The focus here responds to the needs on the ground, including addressing the impacts of encroachment and habitat loss. A big element of this is understanding the social elements of why there is loss, how people are modifying their environment and why and what the economic, social and policy drivers are for habitat loss at a national level, but also how communities manage themselves with potentially unwritten policy at another level. Governance will be at all those multiple geographical scales. Secondly, this consortium would have a very specific focus on the biology of the pathogens at these encroached interfaces and a focus on wildlife, livestock and humans and the broader environment in which all of those things sit. We would have to deconstruct those parts of it much more before we would get the funding obviously. This is within a context of very strong Data Systems that support decisions and with real-time policy feedback: tinkering with developing policy interventions at different scales and testing those policy interventions to see*



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what real world impact they have, which is why the timescale is so long, and then altering that policy very proactively to make sure that it's working in the most beneficial way. This speaks to the priorities of national governments which signed up to the priorities of Africa CDC, WHO, WOA, UNEP and FAO through the OHHLEP mechanism in particular. “; Budget looks too small for something looking very ambitious...at what scale? How many locations?

- Results of Section 3 - Session 5: Wrap up and next steps

“We found the social sciences were being brought in not just by the social scientists in the group. Recognizing the importance of a better integration of social sciences to address some of the biggest knowledge gaps is necessary because what's happening at the biological level cannot explain everything. “; Indeed, but assessing the respective weight of social sciences (e.g; behaviour) compared to ecology of diseases in disease emergence is a challenge in itself...

RESPONSE: Agriculture is stated as the main driver but not the only driver. The other items were almost all covered by the given items already. The suggestion to transfer some text in to the annex is reasonable and we will do it, thank you. The proposed projects' budget and timeline could be insufficient but these are the work of the participants and EWG did not intervene.

Reviewer x11:

- *“Biodiversity is ubiquitous and not concentrated in protected areas.”; yes but some areas are clearly far more biodiverse than others (e.g. the tropics).*

RESPONSE: Thank you for your comment. We agree and we will emphasise on those areas.

Reviewer x12: no comment

Reviewer x13:

- Page 52.

. These events or spillovers happen between individuals, are local, and are extremely difficult to predict and reconstruct retroactively.

. the most commonly cited global drivers are globalisation, including of food systems and the associated movements of animal and animal products, the transformation of natural habitats into agricultural land (i.e., land-use change), landscape fragmentation, and human-induced climate change;

RESPONSE: Thank you for your suggestion.



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22. DISCUSSION (PAGES 53 - 57)

Reviewer x1: no comment

Reviewer x2: In general, a consideration of the issue of parachute science may be useful here. e.g., Miller et al. 2023: <https://doi.org/10.1111/conl.12947>, Asase et al. 2021: <https://doi.org/10.1111/csp2.517>.

RESPONSE: Thank you.

___Reviewer x3: The lack of participants in Middle East, Indonesia, North Africa and Central America shown in figure 6 is worrisome, especially in combination with the lack of studies Figure 4 shows. If this is a real reflection of lack of capacity and not just a bias due to lack of collaborators among the people sending the survey, should capacity building in those specific areas be included in the discussion/recommendations?

RESPONSE: Although we made an effort to send the survey to diverse participants by including the corresponding authors from articles identified in the scoping review as well as through our personal and professional contacts, researchers we knew of or those who were connected to via social media, we were unable to cover every region of the globe and there was some bias toward researchers based in (although not necessarily nationals of) Europe and the USA. While capacity building in general is an important point that we raise, we do not feel that we have enough evidence to discuss the need in specific countries or regions.

Reviewer x4: Seems adequate

RESPONSE: Thank you.

Reviewer x5: I found this a rather uninspiring read: way to long and with little attempt at synthesis or insight. It seemed to be much more concerned with process than analysis and supplied very little that isn't already in the published scientific literature.

RESPONSE: We hope that the extensive edits and changes have alleviated some of your concerns. As noted above, a large part of our mission here was to synthesise the scientific literature, while adding the perspective of experts through the survey and focus group so naturally a large part of our findings are published in the scientific literature.

Reviewer x6: no comment

Reviewer x7: Good



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RESPONSE: Thank you.

Reviewer x8: On page 52, the 1st part in this session seemed like repetitions....

RESPONSE: The text has been improved.

Reviewer x9: page 52: “local epidemiologic events (e.g., pathogen inter-species spillover) that can trigger or not an amplifying transmission process”. Change this to (e.g., cross-species transmission) and remove “or not”.

RESPONSE: Thank you.

Reviewer x10:

- **Discussion and recommendations-** Please move in the beginning of the report
- *“The group consisted of scientists with relevant expertise in the natural, biomedical and social sciences, and the methods employed included studies of the scientific literature (both published and grey literature), existing funding schemes/initiatives, as well as studies involving external experts.”; How many?*
- **Research gaps and science policy recommendations** - I find the whole chapter difficult to read and identify the main messages/ findings. Please see also comments below and try to put together the main outcomes with short sentences and in the form of actual suggestions. The background information is of course important but the suggestions should be clearer identified and not lost in the text.

. *“Biodiversity is the basis of Life on earth that supports life systems, at the source of the success of human societies even if biodiversity has remained an externality in economic systems. ”; This sentence is difficult to read, suggest to rephrase it*

. *“ a mixture of global and local drivers: the most commonly cited global drivers are globalisation, including globalisation of food systems and the associated movements of animal and animal products,...”; And associated practices (e.g. chemical treatments)*

. *“There is, therefore, a need for more understanding of W/D/H interfaces in order to be better prepared to prevent spillover events or to detect their first signs.”; There is a lot of information in this paragraph and the recommendations are difficult to be extracted. Please gather the recommendations and the research gaps together so that it is easier to read.*

. *“Studying W/D/H interfaces is needed in different contexts but also longitudinally over time. There is a need to understand i) how host and non-host populations adapt to changing W/D/H interfaces; ii) the consequences*



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that these changes have on different pathogen epidemiological dynamics;” Does this include the capacity for pathogens to evolve and jump species barriers?

- . *“ These “interface” studies cannot be pure biomedical studies, as many have been, without missing crucial information and producing biased and incomplete knowledge. “; Please make a proposal, rather than saying what should not be. It is not clear to me what you are suggesting here, what do you mean with “cannot be pure biomedical studies”? And which is the crucial information that is being missed?*
- . *“The main finding with regard to research gaps is the need for a transdisciplinary science approach at the interface between human/anthropogenic and natural/wild environments, combining on equal terms the social and natural science methods and insights. While the broad knowledge of ecology”; ...and epidemiology?*
- . *“The full breadth of the social sciences - anthropology, sociology, political science, economics, history, and archaeology - are needed not only to successfully communicate with local communities living at the potential biodiversity - spillover interface, but also to understand the mechanisms of past, present and future disease emergence in the context of colonialism, political ecology, market dynamics, and extractive economies.”; Still relevant nowadays?*
- . *“Such calls should still require the involvement of natural scientists and vice versa. Furthermore, the need to co-design research on the relationship between biodiversity and pathogen emergence with local stakeholders requires an expertise in engagement engineering or participatory sciences, which are found within the social sciences.”; As per my comment above, what about people working in public health? We are talking about infectious diseases*
- . *“... (albeit a priori not with a high pandemic risk),..”; ?*
- . *“the EWG recommends that as with projects based elsewhere, those with a European aspect should involve community co-designed field research. “; This sentence is not clear, in general I see this paragraph connected to the strength of EU international policies related to biodiversity, (or to the global polices), however the link is not evident in the text.*

- **General policy recommendations**

- . **Transformative vs incremental pathways:** What are incremental pathways? Not familiar term
- . *“in the context of the current planetary emergency (interdependent climate change and biodiversity loss), the health of humans and animals is at stake. The root causes of these crises are known: human unsustainable activities across the globe, driven by the unsustainable use of resources (fossils and natural), land transformation for pure extraction or agriculture, and food and consumption systems based on economic models in which biodiversity is not accounted for (i.e., an externality). “; There is background information that does not belong in this chapter on the recommendations. I would expect to have a chapter with*



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concrete suggestions. Eg. Promote a, b, c, invest in this and this. And these recommendations to be in a more structural form with bullet points, short sentences to grasp the readers attention. Both extensive and intensive agriculture are harmful.

- . *“As these crises take hold, the zoonotic spillover and pandemic risks increase”*; This may well be true, but:
1) it does not obviously follow from the previous statements. In fact, one could as well drawn to the opposite conclusions. E.g., had the bat species that host SARS COV2 gone extinct, the risk of that virus causing a pandemic could have been greatly reduced, if not eliminated. Similarly, no bird flu without birds. I’m not suggesting that less biodiversity means less risk, but that suggesting biodiversity loss as a driver is not obvious. 2) Assuming that there is an increased risk of pandemics along with the other crises, that does not imply causality. E.g., the pandemic risk is likely to increase for the sheer increase in human population (and its density in cities), increased travel and increased trade, without regard to changes in biodiversity, or even if biodiversity as such becomes a lesser source (e.g., due to its decline and disappearance). Is it not possible that an increased risk of pandemic and the decline in biodiversity have common drivers, without necessarily a causality between the two? The encroachment of humans in habitat where species which carry viruses live enables the spill-over ie biodiversity loss, deforestation lead to increase disease risk That is a one-sided reading of just one mechanism. It can increase some risk factors, but not necessarily overall risk. Deforestation leads to extinctions, thus probably also to the disappearance of diseases for which the extinct species are obligate hosts. Therefore, deforestation can also reduce certain pandemic risk factors. I do not believe that an overall increase of risk from these factors is well substantiated. Which does not mean it is not true, but the I don't believe that the selective arguments justify the firm statement about increasing risk.
- . *“While the effects can be global, the causative mechanism is local through the expansion and evolution of W/D/H interfaces.”*; Not necessarily rapid. I think this is a bit speculative. It could also be due to human activities affecting the epidemiology and spillover risk without "penetrating the depths of biodiversity". Also, contacts with pathogens could just be greater due to increased prevalences &/or exposure rates subsequent to human activities. What is the first mode of action? It is in the last 2 sentences of the paragraph above. These 2 paragraphs should be merged (and condensed...)
- . *“The second mode of action relates to the need for systems transformation, ...”*; Transformative change? which systems need to be transformed?
- . *“Both modes of action are probably necessary but the balance should shift more and more towards transformative policies that increase resilience against zoonotic spillover and pandemic emergence rather than incremental pathways that only seek to manage or control risks after spillover has occurred.”*; Not clear
- . *“In other words, one can always try to predict pathogen spillover at W/D/H interfaces and this is necessary, but without trying to mitigate risky human influences on natural habitats hosting biodiversity and the transformation of food systems so that they don’t act as pathways and amplifiers for “wild” pathogens, the risks of pandemics will always increase and their occurrence will remain largely unpredictable.”*; This sentence should be split in two for more clarity, as it is in the executive summary. This is not a word!
- . *“The role of the **social and humanities sciences** needs to be framed differently in policies related to integrated approaches to health (e.g., One Health, EcoHealth),...”*; Both terms should not be mixed: One Health is an



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approach while EcoHealth is an NGO. EcoHealth is regularly cited in this document and one should keep in mind its president played a major role in preventing objective discussions on the origin of Covid and discredited to a large extent the work of EcoHealth.... This might give a "stamp" to the report...

- *"Without this dimension of W/D/H interfaces, management and mitigation measures will not be adapted to local socio-cultural contexts and will miss their impact. This aspect has not received the attention required by policymakers and funding agencies."*; Please continue the sentence with the specific recommendation
- *"... a top-down approach which is necessary to manage the relationship between biodiversity and pandemics at national and international scales."*; I've made these edits to clarify the difference between this top-down approach and the local/indigenous approach espoused elsewhere in this document.
- *"Prioritisation of wildlife and ecosystem health."*; In some countries (including in the UK), "environmental health" relates to food hygiene, health & safety, etc. and is heavily legislated for.

RESPONSE: Thank you, we now implemented these comments.

Reviewer x11:

- p.53. As for an argument for the role of the social sciences/humanities you can use Covid where bio-medical research was clearly insufficient to solve the problem (e.g. vaccine hesitancy, masking)
- p. 54: . This sentence is not integrated well in its P: *"Similarly, an increasing number of funders encourage or require the participation of local communities and civil society in research projects"*
- . Are history and archaeology social sciences (*"The full breadth of the social sciences"*) in the EU? I thought this was the case only with history in some US institutions.
- . *"This means more recognition of justice regarding indigenous knowledge system"*; not sure the connection between [environmental?/social?] justice and indigenous knowledge systems is intuitive, this could use clarification
- . first paragraph that begins on the page repeats ideas outlined above.
- . at the very end of the page (*"regardless of whether these diseases have pandemic potential"*) - shouldn't there be some prioritization of diseases to study?
- p. 55: EID - acronym appears without explaining what it is (Emerging Infectious Diseases) so just put those parenthesis in the line above.
- . Europe & risk of emerging diseases - this is partially the result of the relatively low biodiversity in Europe.



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. "could be interesting." - strengthen this part

- p. 56: re: "*Transformative vs incremental pathways*", the way I see this the emphasis is on spillover and pathogen dynamics from its natural sciences side; yet one could raise additional issues - such as the importance of managing a spillover event from a social-cultural perspective. The pandemics-biodiversity connection is important for the broader public to understand to avoid e.g. scapegoating, thus helping concentrate efforts and not spend time, energy and attention on blaming others.

. Putting on a policy hat, I'd like to get a better sense of how the "*Transformative vs incremental pathways*" title gives me a general policy recommendation

RESPONSE: Thank you, we have implemented the comments.

Reviewer x12: No comments

Reviewer x13:

- P. 53

. These "interface" studies cannot be pure biomedical studies, as many have been, or they will omit crucial information and produce biased and incomplete knowledge.

- p. 54: regardless of whether these diseases are perceived to have pandemic potential
- p. 55: After Jones et al 2008, I'd also cite: <https://iopscience.iop.org/article/10.1088/1748-9326/ab8dd7/meta> and <https://www.nature.com/articles/s41586%20-022-04788-w>

. Few European studies on the relationship between biodiversity and past pandemics

- p. 57:

. Better consideration on how local production of specific commodities can be improved. The relevance of this is unclear to me, sorry!

. Creation of a wildlife health agency integrated with human and domestic animal health. But what about the OIE?

RESPONSE: Thank you, we have implemented the comments.



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23. CONCLUSION (PAGE 58)

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Seems adequate

RESPONSE: Thank you.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Good

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment

Reviewer x10:

. “... and people-based methods.”; ‘expert-based’ instead? Or ‘expert opinions’?

- . “... particularly within biodiverse areas,”; Why? It wasn’t the case for COVID-19: “A report based on multiple anonymous sources inside the US government says that researchers working inside the Wuhan Institute of Virology (WIV) were the first to be infected with the virus”. <https://www.forbes.com/sites/ericmack/2023/06/15/covid-19-patients-zero-in-wuhan-identified-boosting-lab-leak-theory/>. Wuhan has a population of around 12 million, probably not a biodiversity hotspot.

. “... within low and middle-income countries (LMICs).”; While developed countries have massive livestock operations. It seems that it is beyond livestock. A case in point is this piece (came out after my earlier comment): [U.S. Animal Industries Pose Disease Risks to People, Report Says - The New York Times](#)



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[nytimes.com](https://www.nytimes.com)). "It was very unclear what people even meant by wet markets, except that they were something that exists only in other countries," "the new report highlights the extent to which Americans engage in many of these same high-risk practices. There are at least 130 live bird markets in the northeastern United States alone, the report notes; roughly 25 million birds pass through them every year. There have already been multiple outbreaks of highly pathogenic bird flu at live bird markets in the United States this year, the report says," The new report "should change the narrative" that spillover is a "foreign" problem, said Dr. Suresh Kuchipudi, an expert on zoonotic disease at the University of Pittsburgh School of Public Health, who was not involved in the report. "The risk of disease transmission is not really confined to a particular geography or cultural practice," he added. "It can happen wherever there is frequent wild or domestic animal and human interactions."

. "The Covid-19 pandemic has had a profound impact on the world. Yet now, over three years since it began and as the worst effects appear to recede, the world risks slipping back to complacency and business-as-usual without addressing the underlying factors, namely the anthropogenic degradation and encroachment of natural habitats and increasing contact at the W/D/H interface, driving pathogen spillover that may lead to the next pandemic. "; This sentence should be reworded. Covid-19 story should not be used as if it was the result of the underlying factors mentioned in the sentence. Covid-19 put emphasis on the risk of pandemics. The underlying factors were highlighted through other emerging threats.

. "the world risks slipping back to complacency "; I do not wish to feed this complacency, but do we know what kinds of actions could have prevented COVID-19?

. "namely the anthropogenic degradation "; Was anthropogenic degradation involved in COVID-19?

. "W/D/H interface"; Have domestic animals been involved in COVID-19?

. "This moment presents an opportunity to make transformational change to address these drivers by addressing the main underlying drivers of spillover and disease emergence: land-use change, climate change, poverty, and inadequate health services."; Although this may appear aspirational, it is the only way to build resilience to prevent future disease spillover and pandemics, rather than merely attempting to manage and mitigate largely through small, piecemeal reactive actions.

. "By addressing the root causes, we may decrease the risk for the next pandemic and, in doing so, preserve biodiversity while safeguarding the health of our planet and its inhabitants."; This does not look very targeted or convincing. It seems like wishful thinking and suggests an ideological conflation of issues. We have all kinds of reasons to attain these goals, if at all possible. Reducing pandemic risk would be a (fringe) benefit, if it worked. However, we had more devastating pandemics like the Black Death and the Spanish Flu at a time when we had much less biodiversity lost and much less climate change. If these factors were the main drivers behind pandemics, then humanity would have been decimated by now, if not wiped out altogether. Also, would the "root causes" include the increase of global population? If so, how would that be addressed?

RESPONSE: We implemented these comments and reworked the second paragraph of the conclusions.



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Reviewer x11: *No comment*

Reviewer x12: no comment

Reviewer x13: ___No comments

24. REFERENCES (PAGE 59)

Reviewer x1: I suggest reading and adding this publication: Nuñez MA, Pauchard A & Ricciardi, A. In press. Invasion Science and the Global Spread of SARS-CoV-2. Trends in Ecology & Evolution

RESPONSE: Thank you for your comment.

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Perhaps more up-to-date references could be used

RESPONSE: We have added more recent references suggested by other reviewers.

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: There are Some format mistakes

RESPONSE: Thank you for your feedback, we will take into consideration for the final version of the report.

Reviewer x8: You might want to supply the doi of all the publications that have them, instead of just a few.

RESPONSE: Thank you for your feedback, we will take into consideration your comment.

Reviewer x9: no comment

Reviewer x10: No comments



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Reviewer x11: No comments

Reviewer x12: No comments

Reviewer x13: No comments

25. ANNEX 1

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

RESPONSE: Thank you

Reviewer x8: Okay

RESPONSE: Thank you

Reviewer x9: no comment

Reviewer x10: No comments

Reviewer x11: No comments

Reviewer x12: No comments



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Reviewer x13: No comments

26. ANNEX 2

Reviewer x1: I suggest using bigger font size for figure on page 62

RESPONSE: Thank you for your comment, we will take into consideration for the final version of the report.

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

RESPONSE: Thank you.

Reviewer x8: Okay

RESPONSE: Thank you.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment



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Reviewer x13: no comment

27. ANNEX 3

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

RESPONSE: Thank you

Reviewer x8: Annex 4 should be placed before Annex 3, application before approval

RESPONSE: Thank you for your feedback, we will take it into consideration.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment



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28. ANNEX 4

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

Reviewer x8: Annex 4 should be placed before Annex 3, application before approval

RESPONSE: Thank you for your feedback, we will take it into consideration.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

29. ANNEX 5

Reviewer x1: no comment

Reviewer x2: no comment



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Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

RESPONSE: Thank you .

Reviewer x8: Okay

RESPONSE: Thank you .

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

30. ANNEX 6

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment



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Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok

RESPONSE: Thank you .

Reviewer x8: Okay

RESPONSE: Thank you .

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

31. ANNEX 7

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment



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Reviewer x7: Ok

RESPONSE: Thank you .

Reviewer x8: Okay

RESPONSE: Thank you .

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

32. ANNEX 8

Reviewer x1: no comment

Reviewer x2: no comment

Reviewer x3: no comment

Reviewer x4: Nothing to comment

Reviewer x5: no comment

Reviewer x6: no comment

Reviewer x7: Ok



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RESPONSE: Thank you .

Reviewer x8: Okay

RESPONSE: Thank you .

Reviewer x9: How are the papers in Annex 8 different than the broader group of papers identified during the systematic literature review? Please clarify how these were pulled out/selected for Annex 8. Are the rest of the papers available elsewhere?

RESPONSE: The papers in Annex 8 are only the 20 organisational reports -- not peer-reviewed articles -- for example reports from the WHO, UN, UNEP, etc that were found via searching organisational websites. Once formatting and editing is finalized, in the final report, an annex or link to a repository will be included with all the peer-reviewed articles included in the scoping review.

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

33. HOW DID YOU GET TO KNOW ABOUT THIS CALL FOR REVIEW?

Reviewer x1: Email from Eklipse

Reviewer x2: Email from Eklipse

Reviewer x3: Colleague

Reviewer x4: Email from Eklipse

Reviewer x5: Email from Eklipse

Reviewer x6: Email from Eklipse



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Reviewer x7: Colleague

Reviewer x8: Colleague

Reviewer x9: Email from Eclipse

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment

34. ANY OTHER COMMENTS?

Reviewer x1: no comment

Reviewer x2: It may be cheeky, but it would be worth mentioning that the Eclipse mechanism is not funded and researchers that undertook this review of the evidence did so alongside all their other commitments without any compensation. The report that has been produced is a credit to the team who worked unpaid, albeit with the support of the Eclipse team. If there are to be future reviews of the evidence, a suggestion for funders could be to properly fund such reviews, potentially through mechanisms such as Eclipse that have a robust process and structure to them to guarantee improved rigour in syntheses carried out.

RESPONSE: Thank you for your review and comments.

Reviewer x3: The report is very useful and thorough. I want to thank the expert working group for their effort.

RESPONSE: Thank you for your positive comment, it is very much appreciated.

Reviewer x4: no comment

Reviewer x5: Thank you for asking for my comments, I'm afraid they are not very helpful as I found this a rather uninspiring read: way to long and with little attempt at synthesis or insight.



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RESPONSE: We thank you for your time and comments which prompted fruitful discussions among authors. We hope the extensive revisions we have made addressed your concerns.

Reviewer x6: no comment

Reviewer x7: Thank you for your efforts. This work hopefully will close the gaps in future.

RESPONSE: Thank you for this positive comment.

Reviewer x8: The report is timely and commendable.

RESPONSE: Thank you for this positive comment.

Reviewer x9: no comment

Reviewer x10: no comment

Reviewer x11: no comment

Reviewer x12: no comment

Reviewer x13: no comment