What do the 2022 UN Biodiversity Conference outcomes mean for the ocean and ocean research? A focus on marine biodiversity and human health (Part 3)

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Following a previous blog post (https://oneoceanhub.org/what-does-the-global-biodiversity-framework-and-other-2022-un-biodiversity-summit-outcomes-mean-for-the-ocean-and-ocean-research-part-1/) on the Global Biodiversity Framework (GBF) adopted at the UN Biodiversity Conference of the Parties (COP 15, held on 7-19 December 2022 – Montreal, Canada) and a Lancet Comment on COP15 (https://doi.org/10.1016/S0140-6736(23)00130-7), (https://doi.org/10.1016/S0140-6736(23)00130-7) this blog post reflects on the implications of the COP15 discussions and decisions on human health and biodiversity for the ocean, ocean-dependent human rights and ocean research.

We reflect in particular on two key points:

- the ocean and marine biodiversity should not be overlooked (https://oneoceanhub.org/connecting-the-one-health-approach-to-the-ocean-climate-nexus/) in any international policy debates on human health; and
- international human rights law offers helpful clarifications on how the marine biodiversity-human health nexus can be taken into account in these processes.

This post considers the current policy landscape and its blind spots, reflects on key ongoing policy processes at the World Health Organisation (WHO) and concludes with some initial reflections on a future global action plan on biodiversity and human health to be adopted under the Convention on Biological Diversity (CBD) in 2024.

1. The current policy landscape and its blind spots

Awareness of the interlinkages between biodiversity loss and its risks to human health has grown in policy arenas over the last decades.

The 2015 CBD/-WHO State of Knowledge Review on Biodiversity and Health (https://www.who.int/publications/i/item/9789241508537) outlined several points of interdependence between human health and biodiversity that are still not sufficiently known to the general public. For instance, the Review underscored that biodiversity loss:

- increases risk and impact of infectious disease transmission, due to enhanced opportunities for contact at the human-animal-environment interface and through changing vector abundance, composition, and/or distribution;
- has negative effects on psychological, cognitive, and physiological health (whereas exposure to diverse green spaces can serve as a treatment for depression, anxiety and behavioural problems, as well as reducing recuperation times and improving recovery outcomes in hospital patients with non-communicable diseases);
- weakens the human microbiome's immune-regulatory role and contributes to onset of non-communicable diseases (e.g., diabetes, asthma, multiple sclerosis, inflammatory bowel diseases);
- results in lost opportunities for discovery of medicines and biomedical breakthroughs, affecting treatment in nearly every domain of medicine; the marine environment is a rich source of biomedically active molecules.
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Similarly, in 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment Report (https://www.ipbes.net/global-assessment) on Biodiversity and Ecosystem Services took this forward and defined "nature's contributions to people (https://www.ipbes.net/glossary-tag/natures-contributions-people)" as (1) dietary health, (2) environmental exposure, (3) exposure to communicable diseases, (4) hazard risk reduction including exposure to extreme weather, drought or fire, (5) psychological health, and (6) use of natural compounds in medicinal products and biochemical compounds.

However, **international debate on biodiversity-human health disproportionately focuses on terrestrial rather than marine biodiversity and ecosystems**. Marine conservation is generally absent from this conversation at various stages, including evidence-building, policy-making (https://sustainabledevelopment.un.org/outcomedocuments/agenda21), and risk management planning (see also here (https://www.unep.org/resources/publication/one-health-joint-plan-action-2022-2026)). It can be observed that the health community involved in these conversations is not familiar with the full spectrum of marine and coastal ecosystem services that contribute to health and wellbeing or the risks and drivers of degradation in these ecosystems.

Against this background, the Kunming-Montréal Global Biodiversity Framework (https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf) includes the link between biodiversity and human health under its general considerations, whereby the GBF is to be implemented with consideration of the One Health (https://oneoceanhub.org/connecting-the-one-health-approach-to-the-ocean-climate-nexus/) approach, among other holistic approaches that recognise these interlinkages. Adding to previous COP decisions calling for the integration of health considerations in National Biodiversity

Strategies and Action Plans (NBSAPs), CBD COP15 decision15/29calls on parties to *specifically* integrate the One Health approach among other holistic approaches, into NBSAPs, and national health plans; and to support capacity-building and development for mainstreaming biodiversity and health interlinkages into implementation of the GBF.

Collaboration needs to move beyond the current focus on terrestrial environments and extend to the ocean as the future of planetary and human health and wellbeing is dependent on a thriving ocean genome and environment. There is also potential to unlock new benefits of marine biodiversity for biodiscovery including the development of pharmaceuticals, nutraceuticals, cosmeceuticals and other health products; , which have historically been sourced from marine microbes, plants and invertebrates; climate change may have unpredictable impacts leading to substantial biodiversity loss removing opportunities for discovery.

2. WHO negotiations

CBD COP decision 15/29 (https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-29-en.pdf) noted the need for consistency between the ongoing efforts to draft and negotiate a WHO treaty to strengthen pandemic prevention, preparedness and response (the Pandemic Treaty), as well as ongoing negotiations on potential amendments to the International Health Regulations (2005), and the CBD, and called to take actions for a sustainable and inclusive recovery from the COVID-19 pandemic that contribute to the conservation and sustainable use of biodiversity, minimising risk of future diseases of zoonotic origin, taking into account the One Health approach among other holistic approaches.

Negotiations for the WHO Pandemic Treaty – which are, ambitiously, set to conclude by the Seventy-Seventh World Health Assembly in May 2024 – have implications for global biodiversity governance and will influence the development and legal arrangements for aspects of the biodiversity-health field. The treaty text as currently formulated pays limited attention to environmental drivers of pandemic risk and contains numerous blindspots; lack of marine issues being one. There is no reference, for example, to marine issues within the current zero draft text (https://apps.who.int/gb/inb/pdf_files/inb4/A_INB4_3-en.pdf)(February 2023 (https://apps.who.int/gb/inb/pdf_files/inb4/A_INB4_3-en.pdf)) and the one mention to water (in the context of 'safe drinking water') is contained in a non-operative recital.

While an entire chapter of the zero draft Treaty text is devoted to the concept of One Health, its current definitional content (see e.g. article 4, guiding principles and rights, zero draft (https://apps.who.int/gb/inb/pdf_files/inb4/A_INB4_3-en.pdf)) represents an outmoded conceptualisation of One Health (https://oneworldonehealth.wcs.org/About-Us/History.aspx), focusing on zoonoses, antimicrobial resistance, and other elements of infectious disease which are terrestrial based. More generally, the implementation of the treaty commitments, once agreed, will depend on existing public health infrastructures and frameworks that do not have mandate, capacity, or knowledge (or willingness?) to consider marine issues on top of terrestrial surveillance/programming, as it currently exists. There is a risk that Pandemic Treaty negotiations may further lock in a narrow focus for implementation since the current zero draft (February 2023) commits parties to develop One Health Action Plans with a focus on antimicrobial resistance.

Negotiations on amendments to the WHO's international Health Regulations follow the same logics of the Pandemic Treaty negotiations, neglecting any reference to marine issues aside from recognising (https://apps.who.int/gb/wgihr/pdf_files/wgihr1/WGIHR_Compilation-en.pdf)the disease risks posed by conveyances and passengers at sea which are already a central element of the IHR. While an amendment (https://apps.who.int/gb/wgihr/pdf_files/wgihr1/WGIHR_Compilation-en.pdf) (to Article 44, IHR) noting the relevance of the CBD for the sharing of pathogen samples and related genetic sequence data has been proposed, there is also no overarching recognition of the need for collaboration with the CBD. While the need for collaborative surveillance to detect public health events including zoonotic spillover and antimicrobial resistance is noted in a proposed amendment (https://apps.who.int/gb/wgihr/pdf_files/wgihr1/WGIHR_Compilation-en.pdf) (to Annex 1), this reflects the same outdated conception of One Health as demonstrated in the negotiations on the Pandemic Treaty and neglects marine issues, given the emphasis in the proposed amendment to risks, 'within the territory of the State Party.'

Clearly, the proposed Pandemic Treaty, and the revised International Health Regulations, have the potential to establish new norms and steer implementation of health policy in a range of different contexts. These instruments will also (newly) concretise the paradigm of 'health emergencies' as well as the relevance of the human-animal-environmental health nexus for human health generally and pandemic preparedness specifically.

A future CBD global action plan on biodiversity and health cannot omit a link to the ongoing WHO negotiations, but must promote a broader understanding of health extending to the ocean, in recognition of the vital importance of a thriving ocean genome and environment for human health. This could be possible through a planetary health (http://www.planetaryhealthalliance.org/planetary-health) governance framework and by expanding the existing One Health focus and political architecture to include marine biodiversity. This is particularly relevant to national implementation, where, despite significant funding boosts during COVID-19, One Health Action Plans have remain siloed in their domains, objectives, and operation, and at the same time the ministries of health charged with employing them do not typically have mandates that extend to marine environments. More generally, institutional structures which support and embed learnings across the biodiversity and health regimes should be facilitated with a view to avoiding blind spots and promoting coherence (Ruckert et al, 2021 (https://www.graduateinstitute.ch/sites/internet/files/2021-11/policybrief-onehealth-v3.pdf)).

3. Marine bio-medical innovation

As we discuss in a separate blog post **(Part 2)**, CBD COP 15 also made progress on access and benefit-sharing from digital sequence information (DSI), and that is also true for the new Agreement on marine biodiversity of areas beyond national jurisdiction (https://www.un.org/bbnj/sites/www.un.org.bbnj/files/draft_agreement_advanced_unedited_for_posting_v1.pdf). These are also critical developments for the marine biodiversity-human health nexus, particularly from the perspective of marine bio-medical innovation. On the one hand, marine biodiscovery can contribute to biodiversity conservation, including for ecosystem monitoring and modelling to inform biodiversity management and ocean climate mitigation and adaptation, which can have knock-on effects one everyone's health. On the other hand, marine biodiscovery can also contribute to society through research on neglected and locally relevant pathogens, and other human health priorities.

But there are vast inequities in ocean science with uneven participation in research and innovation between high, low and middle-income states. Rich in biodiversity but with constrains on research capacity, technology, finances, and intellectual property rights, low and middle-income states are vital custodians of the ocean genome and their equitable participation in ocean research, including marine bio-medical discovery, is paramount to enabling One Health and other holistic approaches.

In effect, 20 years of access and benefit-sharing (ABS) policy development and implementation have resulted in few successes of fair and equitable benefit sharing with critical evidence emerging and calls to rethink its expansion (e.g. see Berlin and Berlin 2004 (https://meridian.allenpress.com/human-organization/article/63/4/472/71634/Community-Autonomy-and-the-Maya-ICBG-Project-in?searchresult=1), Chinsembu and Chinsembu 2020 (https://www.mdpi.com/2079-9276/9/7/83), Laird et al. 202 (https://www.science.org/doi/10.1126/science.aba9609)0.) Increasingly, researchers from low and middle-income countries are looking for partnerships towards interdisciplinarity and symmetrical participatory structures to enable equitable, innovative, locally relevant ocean research, including marine bio-medical innovation.

The implementation of the GBF therefore requires an approach that both centres the ecological health of marine biodiversity and ecosystems and facilitates transformative scientific cooperation, based on fair research partnerships (https://oneoceanhub.org/publications/policy-brief/), mutual capacity building and technology co-development (https://oneoceanhub.org/publications/policy-brief-mutual-learning-through-capacity-building-on-marine-biological-diversity-of-areas-beyond-national-jurisdiction/), to enable the equitable and effective participation of all states in ocean science. Lessons learnt in fair scientific cooperation for marine bio-discovery need to inform a future global action plan on biodiversity and human health. Deeper forms of genuine partnerships, based on respect, mutual learning and iterative consent and fair and equitable benefit-sharing approaches, need to be co-developed with Indigenous and local knowledge holders (https://www.strath.ac.uk/research/strathclydecentreenvironmentallawgovernance/benelex/researchoutputs/learningmodules/moduleontraditionalknowlec Governments should invest in international research programmes to support such activities.

4. Contributing to a future global action plan

CBD Parties have been working towards (https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(22)00127-9/fulltext) developing a broad global action plan on biodiversity and human health, recognising the issues of equity, including through the fair and equitable sharing of benefits from genetic resources, digital sequence information (DSI) and Traditional Knowledge associated with genetic resources, which is now expected to be considered at the next COP16 in late 2024. Marine and coastal biodiversity benefits, and risks of marine biodiversity loss, must be included as a standalone item in this plan.

To complement this, there needs to be greater uptake of marine biodiversity considerations in health policy and public health planning, advocacy, and health security (https://www.cfr.org/report/managing-health-risks-climate-change) and risk management in order to ensure that the future CBD global action plan gives due consideration to marine biodiversity-health issues. To that end:

- One Health policies, and negotiations on pandemic preparedness and health emergencies, need to reflect interlinkages between marine biodiversity loss and health and wellbeing;
- The field of planetary health needs to boost its evidence on marine and coastal biodiversity loss.

For instance, metrics on health outcomes, global environmental burden of disease, and the global burden of disease from climate change should be developed to incorporate communicable and noncommunicable diseases related to marine biodiversity loss.

The adoption in 2024 of both the Pandemic Treaty (midyear) and a global action plan on biodiversity and health (end of year), as anticipated, will have a significant influence on biodiversity governance, including on each other. In addition to these policy processes, we also need to consider the marine biodiversity-human health nexus in other governance processes, such as:

- Deep-seabed mining (https://onlinelibrary.wiley.com/doi/10.1111/reel.12471);
- Plastics treaty (https://oneoceanhub.org/reflections-on-the-new-un-process-to-develop-a-treaty-on-plastics/) negotiations (see also here (https://oneoceanhub.org/wp-content/uploads/2022/06/Information-sheet_5_.pdf));
- Discussions on blue food, such as seaweed (https://www.sciencedirect.com/science/article/pii/S2211912423000160?casa_token=h74l-vvmf2cAAAAA:BLLNeaJ_qyg9QBafVbR-crc355szV22Z9c-mAVC30dxPA7fORB6yDur5ee5G7WqLmP48edtzmA), for instance under the UN Food Systems Coordination Hub (https://www.unfoodsystemshub.org/about-us/mission/en).

Along the lines of other One Ocean Hub research (https://oneoceanhub.org/an-overview-of-state-obligations-towards-marine-biodiversity-under-the-right-to-health/) on human rights and the ocean, consideration of international human rights law can support the identification of concrete steps for States and stakeholders to contribute to the systematic incorporation of the marine biodiversity-human health nexus into policymaking and regulatory frameworks. This includes the need to:

- Give due consideration to marine and coastal biodiversity among the underlying environmental determinants of health — as well as to the human right to health — in both ocean and health policy and planning processes;
- Build consideration of the human health-marine biodiversity nexus into governance structures and regulatory frameworks (for example, facilitate collaboration between entities responsible for public health and marine biodiversity protection respectively, and ensure that impact assessment processes are integrated and include the knock-on impacts of environmental harm on human health);
- Facilitate public participation in decision making concerning all aspects of ocean governance, in particular ensuring active outreach and engagement with vulnerable and traditionally marginalised communities;
- Ensure actions to protect marine biodiversity do not negatively impact enjoyment of the human right to health (for example, restricting Indigenous communities' access to traditional medicines);
- Ensure health co-benefits in ocean-based climate adaptation and mitigation actions, and in ocean conservation and sustainable use approaches;

- Address the unintended negative impacts of health interventions on marine biodiversity (for example, antibiotic resistance from pharmaceutical pollution) and
- Incorporate marine ecosystem concerns into public health policies and education curriculums.

All these steps can be helpful in maximising the opportunity to adopt preventive measures for human health based on strengthening the resilience of socio-ecological systems – as called for in earlier CBD COP decisions (https://www.iisd.org/publications/health-global-environment-agenda-policy-guide) on biodiversity and health. This could be a crucial contribution of bringing together the global and public health, human rights, biodiversity and ocean communities.