Connecting global priorities - biodiversity and human health
Key messages

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- Biodiversity provides many goods and services essential to life on earth. The management of natural resources can determine the baseline health status of a community. Environmental stewardship can contribute to secure livelihoods and improve the resilience of communities. The loss of these resources can create the conditions responsible for morbidity or mortality.
- Biodiversity supports human and societal needs, including food and nutrition security, energy, development of medicines and pharmaceuticals and freshwater, which together underpin good health. It also supports economic opportunities, and leisure activities that contribute to overall wellbeing.
- Land use change, pollution, poor water quality, chemical and waste contamination, climate change and other causes of ecosystem degradation all contribute to biodiversity loss and, can pose considerable threats to human health.
- It is important for the health sector to recognize that Human health and well-being are influenced by the health of local plant and animal communities, and the integrity of the local ecosystems that they form.
- Infectious diseases cause over one billion human infections per year, with millions of deaths each year globally. Approximately two thirds of known human infectious diseases are shared with animals, and the majority of recently emerging diseases are associated with wildlife.
- Public health policies must ensure that the impacts of ecosystem alteration are assessed and reflected in strategies by meaningfully engaging with different sectors, disciplines and local communities. The Sustainable Development Goals and post-2015 development agenda provide unique momentum and opportunity to develop coherent, coordinated, cross-sectoral action.

Water quality

- Freshwater ecosystems, such as rivers, lakes and wetlands, face disproportionately high levels of threats to biodiversity due largely to demands on water. In some regions, up to 95% of wetlands have been lost.
- More than one-third of the accessible renewable freshwater on earth is consumptively used for agriculture, industrial and domestic use, often leading to chemical pollution of natural water sources and posing public health threats.
- The threats posed to freshwater and other ecosystems that regulate water quantity and quality cannot be viewed in isolation from their impacts on human health and well-being.
- Maintaining or restoring healthy ecosystems is a cost-effective and sustainable way to promote water quality while also benefitting biodiversity.
- The disruption of water ecosystems including freshwater, coastal and marine ecosystems (such as lakes and ponds, rivers, streams, wetlands, mountains glaciers and oceans) and the introduction of aquatic invasive species (species that are accidentally or voluntarily

introduced in non-native habitats that have negative repercussions on our economies, environment and health) contribute both to biodiversity loss and to the burden of waterborne, water-related and other infectious diseases, primarily affecting populations in low-income countries who are the most ill-equipped to address them.

Air pollution

- Air pollution poses significant threats to biodiversity, contributes to the economic burden and to the rise in noncommunicable diseases including cardiovascular diseases and cancer, respiratory diseases and chronic obstructive pulmonary diseases.
- In Europe alone, the economic cost of air pollution in deaths and diseases has recently been estimated to exceed $1.6 trillion a year.
- Combined, indoor and outdoor air pollution account for some 7 million deaths each year, with the largest proportion in low- and middle-income countries.

Climate change

- Direct effects of climate change on health may include stroke and dehydration associated with heatwaves, negative health consequences associated with reduced air quality and the spread of allergens.
- Effects are also mediated through the impacts on ecosystems and biodiversity. Such effects may include decreased food production and changes in the spread of climate sensitive waterborne and water related, food borne and vector borne diseases.
- There may be synergistic effects of climate change, land use change, pollution invasive species and other drivers of change which can amplify impacts on both health and biodiversity.

Food security and Nutrition

- In addition to under-nutrition (inadequate caloric intake), micronutrient deficiencies affect roughly 2 billion people globally and disproportionately impact children and pregnant women.
- One of the greatest challenges facing our planet is the need to feed the 9 billion people expected to inhabit the Earth by 2050; to do this we need diverse food sources that are rich in macro and micronutrients.
- Biodiversity loss (including loss of species and genetic diversity) can contribute to food and nutrition insecurity in a number of ways. For example, biodiversity loss make plants and crops more vulnerable to disease, increasing the need for chemical fertilizers and pesticides which in turn can also contribute to numerous public health threats including antibiotic resistance and noncommunicable diseases.

Increased threats to medicinal plants, animals and other medicinal resources impact human health

- Wild plant populations are declining, with one in five species estimated to be threatened with extinction in the wild.
- Animals used for food and medicine are more threatened than those not used.
- Overharvesting, habitat alteration, and climate change are among major drivers of declines in commercially important wild plant resources used for food and medicinal purposes. These

pose a threat both to the wild species and to the livelihoods of collectors, who often belong to the poorest social groups.

- Millions of people rely on traditional medicine dependent on biological resources and well-functioning ecosystems.
- Globally, an estimated 60,000 species are used for their medicinal, nutritional and aromatic properties, with more than 500,000 tons of material from such species traded every year. Estimates suggest that the global trade in plants for medicinal purposes reaches a value of over USD2.5 billion.

Others important considerations

- Land use change through deforestation is the leading driver of disease emergence in humans. In the specific case of Ebola, the virus is highly devastating to both human and Great Ape populations, representing both a human health and biodiversity threat. Ebola outbreaks have occurred from hunting and consumption of infected wildlife, which in turn poses a pressure on wild populations. While the cause of the initial 'spill over event' is not clearly known for the recent outbreak but landscape change in the affected area is significant in recent years.
- The environmental changes that drive biodiversity loss, such as deforestation and climate change, may also contribute to the emergence of other major global health threats, such as malaria, which cost hundreds of thousands of lives and tens of billions of dollars annually.
- Biodiversity is an important source of genetic resources used for the development of many treatments, vaccines and a range of biotechnology products used in both modern and traditional medicines, as well as agriculture and industry. These include, for example, artemisinin as a treatment for malaria, and digitalis for heart disease.
- There is strong evidence for the benefits of interaction with nature – including domestic animals, and wild animals in wild settings – in treatments for depression, anxiety, and behavioural problems.
- Exposure to nature is particularly important to childhood development and new emerging research demonstrate that exposure to microbial biodiversity may also be linked to positive health outcomes associated with inflammatory and other noncommunicable diseases.
- Some studies have found that green spaces, and those that promote biological complexity, may also have direct benefits for human health and well-being by stimulating physical activity.

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