Summary produced by ChatGPT, model GPT4o, from “Connecting global priorities: biodiversity and human health: a state of knowledge review”.

The document provides numerous causal links between biodiversity and human health, presenting both beneficial and adverse effects through various ecological, biological, and socio-cultural mechanisms. Here’s an exhaustive list of these links:

* Ecosystem Services and Health: Biodiversity supports ecosystem services such as food, water, and fuel provision, as well as climate regulation, all essential for human survival and health. Declines in these services (e.g., pollination, pest control) can undermine public health by reducing food security and clean water availability​​.
* Nutritional Health and Food Security: Agricultural biodiversity contributes to dietary diversity and resilience, especially in small-scale farming systems. Loss of crop diversity from agricultural intensification can reduce food security, increase vulnerability to food shortages, and diminish nutritional quality​​.
* Infectious Diseases and the Dilution Effect: Higher biodiversity in ecosystems can reduce disease transmission, a concept known as the dilution effect, where diverse ecosystems limit pathogen-host interactions. Conversely, biodiversity loss, especially in disturbed habitats, increases exposure to zoonotic diseases (e.g., hantavirus, Lyme disease)​​.
* Urban Green Spaces for Physical and Mental Health: Access to biodiverse green spaces promotes physical activity, reduces stress, and improves mental health, particularly in urban areas. People with access to such spaces report better mental health outcomes, lower rates of non-communicable diseases (NCDs), and reduced exposure to pollution​​.
* Microbial Biodiversity and Immune Health: Microbial diversity from natural environments is vital for immune regulation. Reduced exposure due to urbanization and intensive agriculture contributes to chronic inflammatory diseases, obesity, and certain cancers, as beneficial microbial interactions are diminished​​.
* Traditional Medicine and Biodiversity: Many traditional medicines rely on plant and animal species. Loss of these species due to deforestation and habitat destruction restricts access to natural treatments, affecting health systems in communities dependent on natural remedies​.
* Climate Change and Disease Vectors: Climate shifts due to biodiversity loss modify disease vector habitats (e.g., for malaria and dengue), increasing the spread of vector-borne diseases. Such shifts impact both direct infection rates and the spread of pathogens, thereby complicating public health responses​.
* Air Quality and Biodiversity: Forests and other biodiverse ecosystems play a significant role in air purification. Deforestation reduces this ability, leading to poorer air quality and increased respiratory issues among human populations​​.
* Invasive Species and Public Health: Invasive species, often exacerbated by global trade and climate change, affect biodiversity and pose direct health risks (e.g., diseases, allergies). The spread of such species can facilitate pathogen transmission, impacting both human and ecosystem health​.
* Psychosocial Well-being: Regular interaction with nature has been shown to reduce depression, anxiety, and stress. Additionally, diverse green spaces enhance social cohesion, which contributes to overall psychological health, particularly in densely populated areas​​.
* Pest and Disease Control in Agriculture: Biodiversity in agriculture supports natural pest and disease control, reducing dependency on harmful pesticides. The use of pesticides not only affects wildlife but has severe health impacts on humans, including acute poisonings and chronic illnesses​.
* One Health and Integrated Ecosystem Management: A holistic “One Health” approach, emphasizing the interconnected health of humans, animals, and ecosystems, benefits biodiversity conservation and helps mitigate disease emergence by managing biodiversity in a way that also addresses public health needs​.
* Pharmaceutical Discoveries: Many medicinal compounds are derived from biodiversity. Loss of species reduces the potential for discovering new drugs, impacting global health and the development of treatments for diseases like cancer and infections​.
* Mental Health Benefits from Biodiversity: Studies have shown that biodiversity-rich environments, such as forests, have a positive impact on mental well-being and recovery from stress and illnesses, contributing to longer life expectancy and improved quality of life​.
* Biodiversity and Resilience to Environmental Change: Biodiverse systems are more resilient to climate change and environmental disturbances. This resilience ensures sustained ecosystem services that are crucial for public health, including stable food and water supplies​​.

These links demonstrate that biodiversity and human health are interdependent, with biodiversity loss posing significant risks to various aspects of health, from disease susceptibility to mental well-being and food security.