

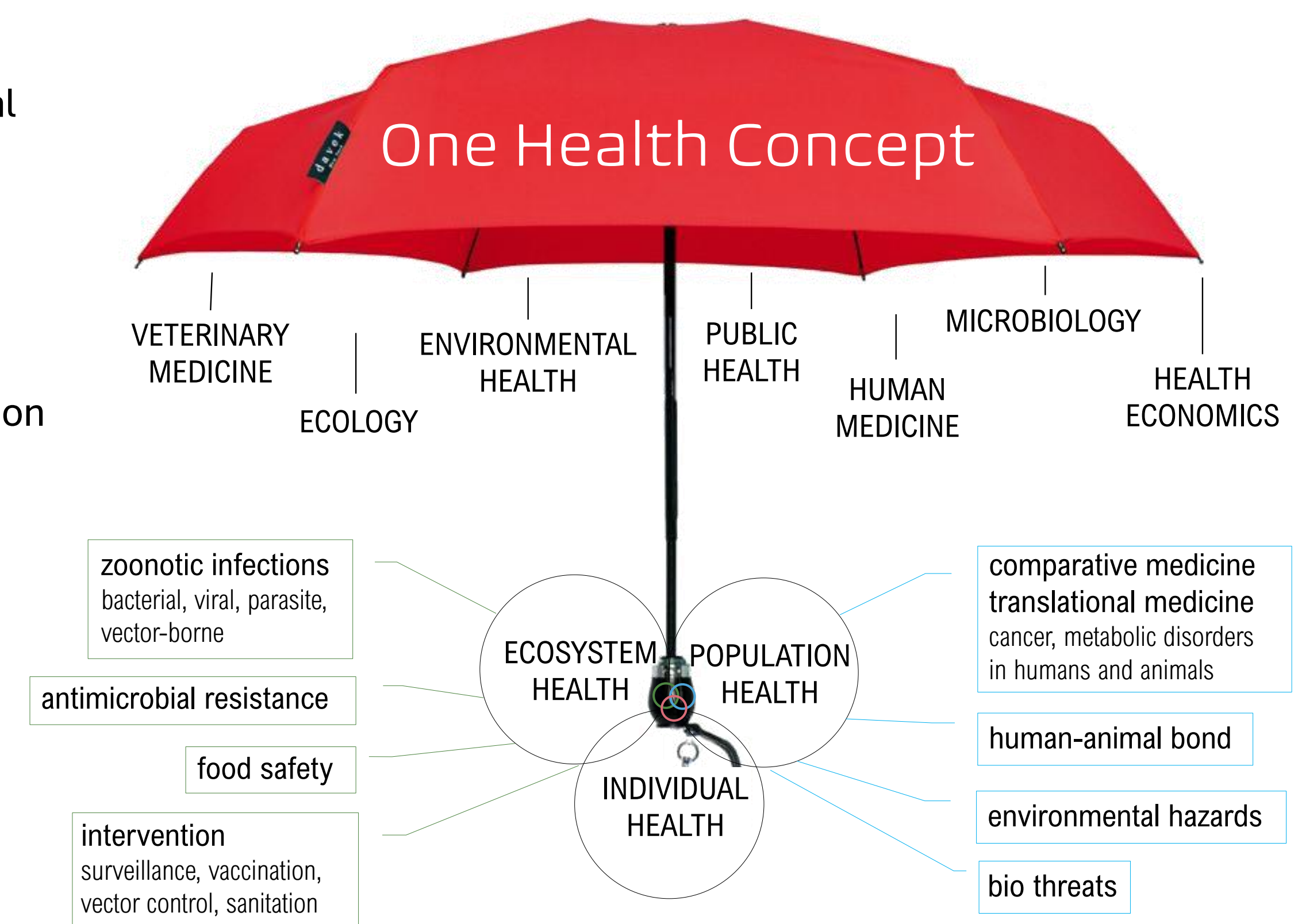


# BIRD's EYE VIEW of the ONE HEALTH concept

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- Emerging infectious diseases (EIDs) are one of the major global threats and they put a heavy burden on public health and countries' economies.
- Wild birds pose a potential threat to animal and human health by spreading infectious diseases - natural reservoirs for viruses, and their seasonal migrations likely play a role in the broad-scale circulation of pathogens
- Climate change, habitat encroachment, and rapid development in Arctic ecosystems result in changes of host-pathogen relationships and increasing risk of infection spillovers into humans
- Over 60% of existing human diseases are of animal origin (Woolhouse et al. 2005)
- The COVID-19 pandemic has re-focused attention on mechanisms that lead to zoonotic disease spillover and its transmission
- Wildlife trade and associated markets promote zoonotic disease emergence - risks from spillover associated with hunting, trade, and consumption of wild animals and introduction via visitors from distant areas
- Diseases with zoonotic origins connected with wild animal trade & consumption: HIV, SARS, Ebola virus disease, Avian Influenza A (Keatts et al. 2021)
- Evidence exists that Iceland may be a location where avian influenza viruses (AIVs) from different continents interact, reassort and create new strains (Dusek et al. 2014; Hall et al. 2014; Lee et al. 2020)
- Extensive study of coronaviruses (CoVs) has documented their diversity in bats and birds (Chu et al. 2011; Wille et al. 2020)



## BIRDS ARE RESERVOIRS TO, e.g.:

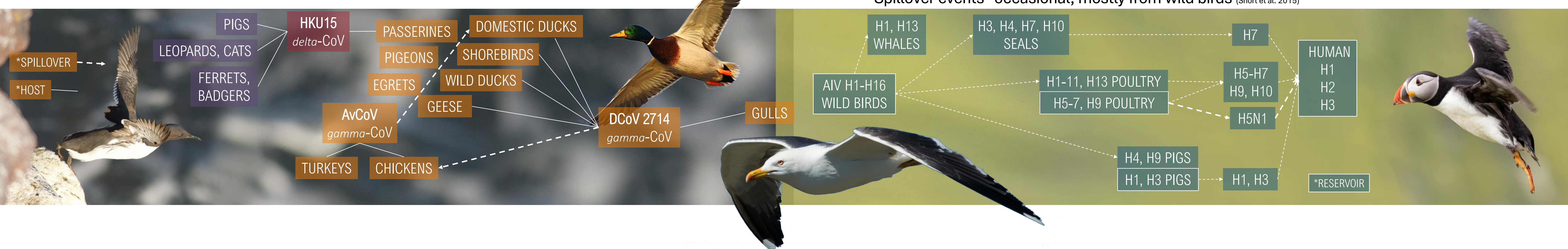
West Nile Virus, tick-borne encephalitis virus, Newcastle disease virus, Louping-ill virus, *Salmonella enterica*, *Campylobacter jejuni*, *Mycobacterium avium*, *Chlamydia psittaci*



Wild waterfowl, shorebirds, and gulls have extensive migration routes across the Atlantic ocean (Dusek et al. 2014)

To date, coronaviruses have been detected in 108 species of wild birds (Wille et al. 2020)

Reservoirs and inter-species transmission events of avian influenza viruses. Spillover events -occasional, mostly from wild birds (Short et al., 2015)

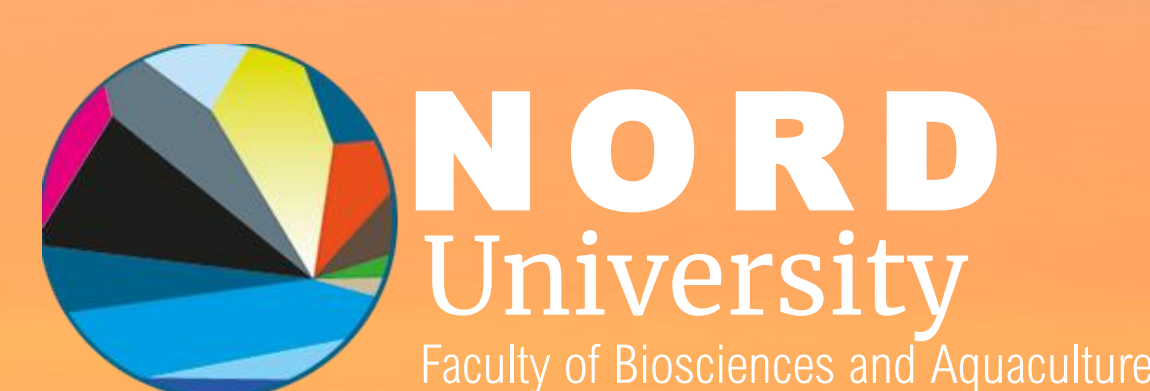
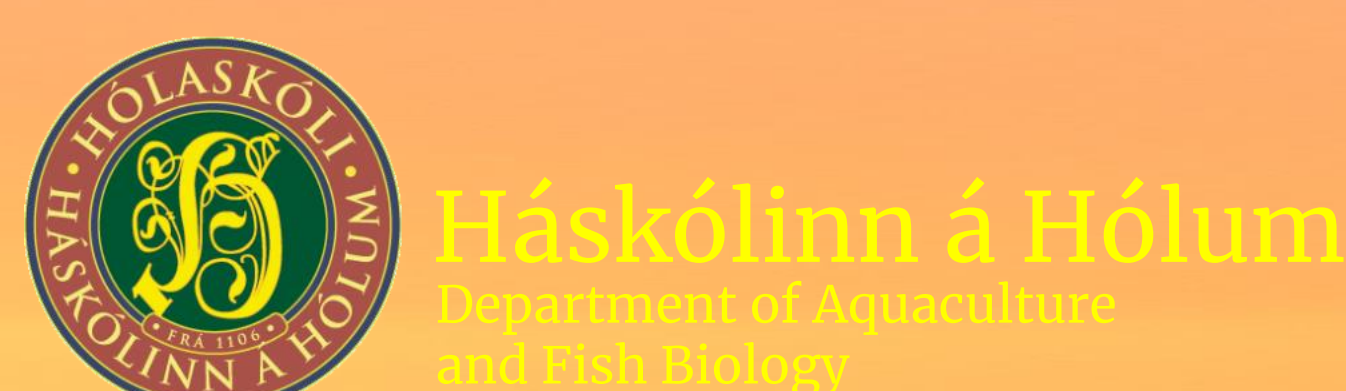


## Project goals:

- Investigation of virus prevalence in Icelandic seabirds and an analysis of results from the One Health perspective
- Assessment of pathogens' pandemic potential (low pathogenic or high pathogenic subtypes), and possible presence of CoVs in birds hosting AIVs (co-infections)
- PCR analysis of cloacal and oropharyngeal swabs for presence of viral RNA
- Blood plasma analysis for presence of viral antibodies against AIVs and CoVs with ELISA immunoassay
- Increase of awareness within local communities regarding the potential of traditional hunting practices to facilitate the transmission of zoonotic diseases
- Identifying essential data to inform decisions and policy interventions
- Creating international cooperation to establish multi-disciplinary approach of future research

## Methodology

- Biometric measurements
- Collection of cloacal and oropharyngeal swabs, stored in viral transport medium (VTM)
- Collection of blood samples into EDTA tubes (0.5ml) and subsequent plasma separation
- Samples from common guillemots and Brünnich's guillemots were collected during annual monitoring of colonies by Náttúrustofa Norðausturlands, Grimsey and Latrabjarg
- Samples from Atlantic puffins were collected from ten colonies during annual monitoring by Náttúrustofa Suðurlands



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