

# Land use, deforestation and human health: Insights on COVID-19

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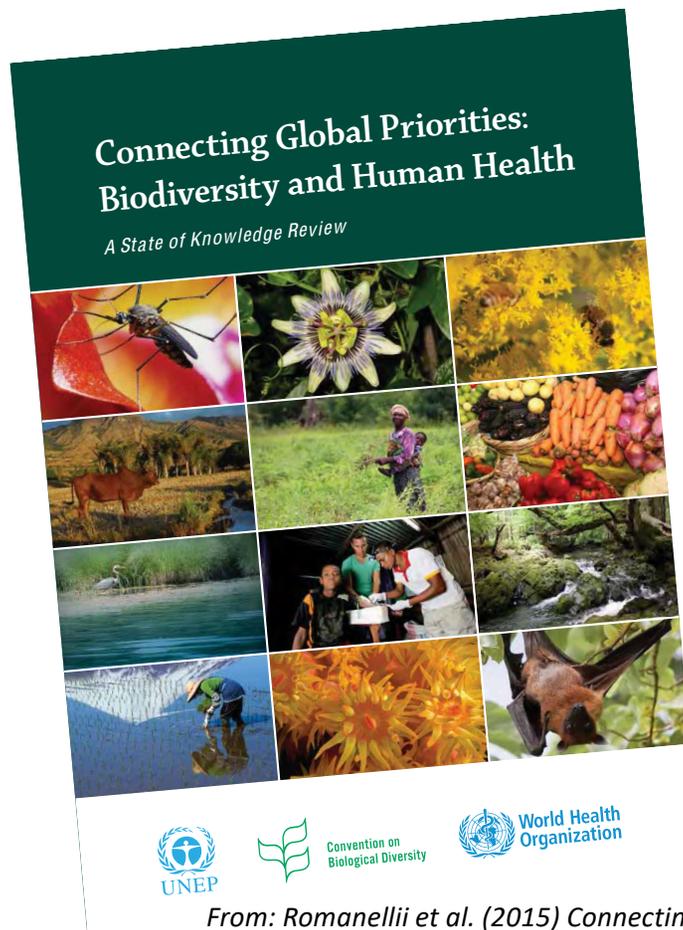


# Key points:

1. Degradation of ecosystems has complex effects on diverse aspects of human health
2. Ecological degradation increases the overall threat of zoonotic disease outbreaks originating from wildlife
3. Preventing deforestation and reducing pathogen spillover is affordable
4. WCS recommends closing commercial wildlife trade, supporting sustainable food resources for indigenous people and implementing scalable animal sourced food security programs for urban and peri-urban communities



# Degradation of ecosystems and human health



- Freshwater & wetlands
- Air quality
- Green spaces: mental and physical fitness
- Agricultural diversity
- Food security
- Infectious disease
- Biomedical discoveries
- Traditional medicine
- Nutrition
- Cultural dimensions of health
- Microbial diversity



Convention on  
Biological Diversity

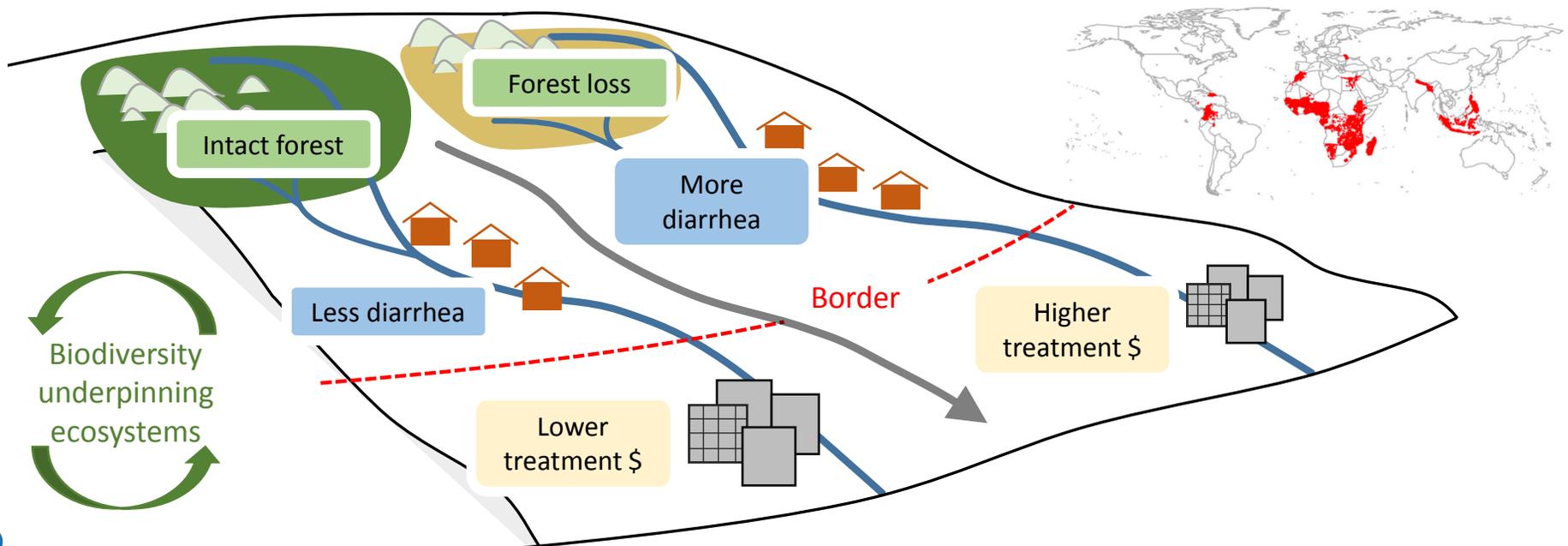


World Health  
Organization

From: Romanelli et al. (2015) *Connecting Global Priorities: Biodiversity and Human Health* WHO Press; see also Whitmee et al. 2015

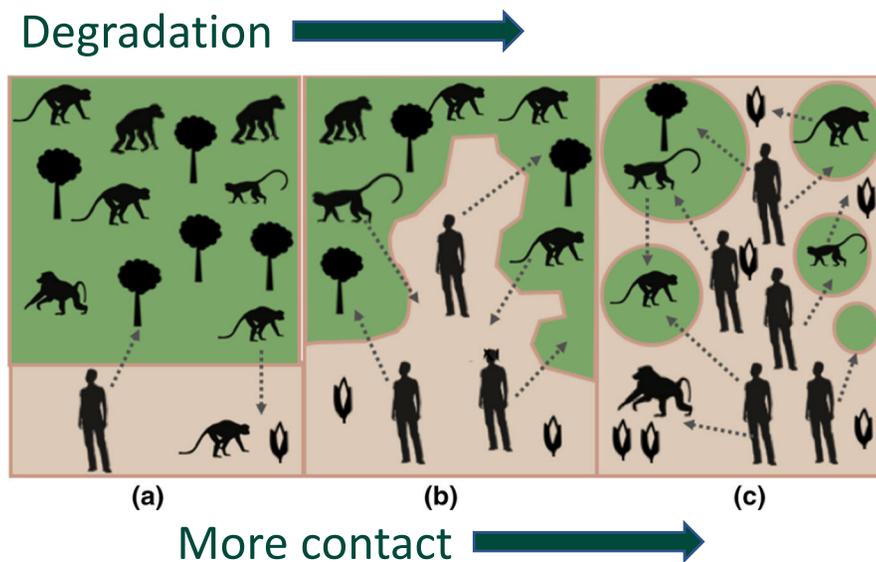
# Degradation of ecosystems and human health

35 country study found increasing upstream forest cover by 30% would reduce childhood diarrheal risk as much as improved sanitation and hygiene



From: Herrera et al. (2017) Nature Comms; Sam Bickersteth CC BY-NC-SA 4.0

# Degradation and zoonotic disease outbreaks originating in wildlife



## Degradation multipliers:

Roadbuilding

Mining

Logging camps

Urban/settlement expansion

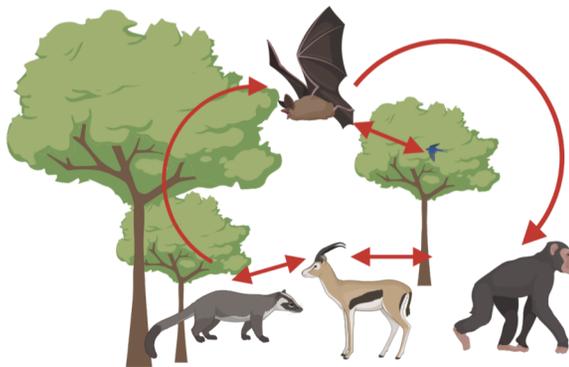
Migration

War

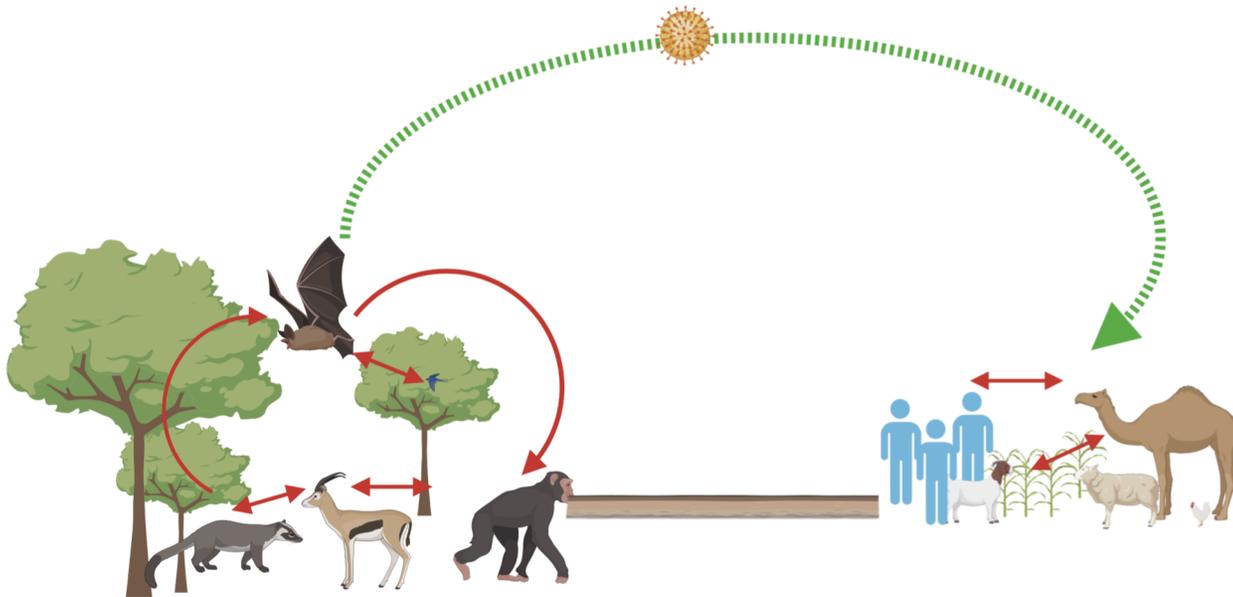
Monocultures (crop/livestock)



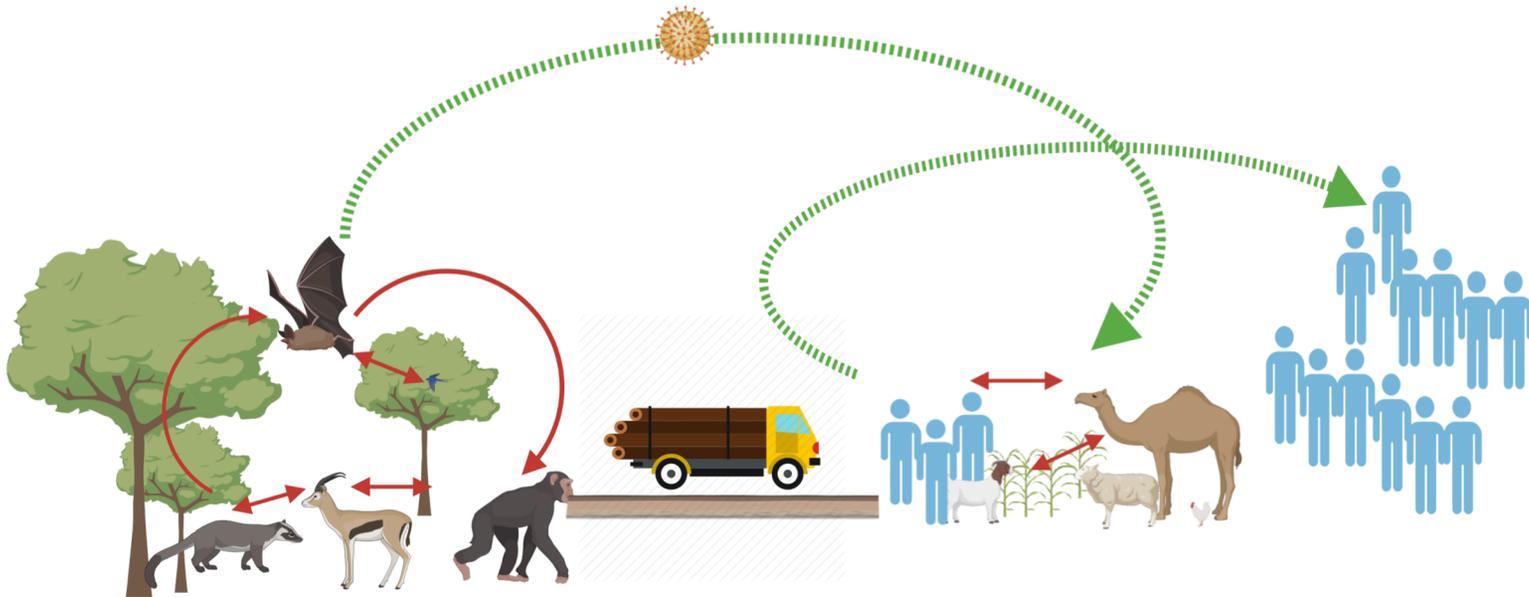
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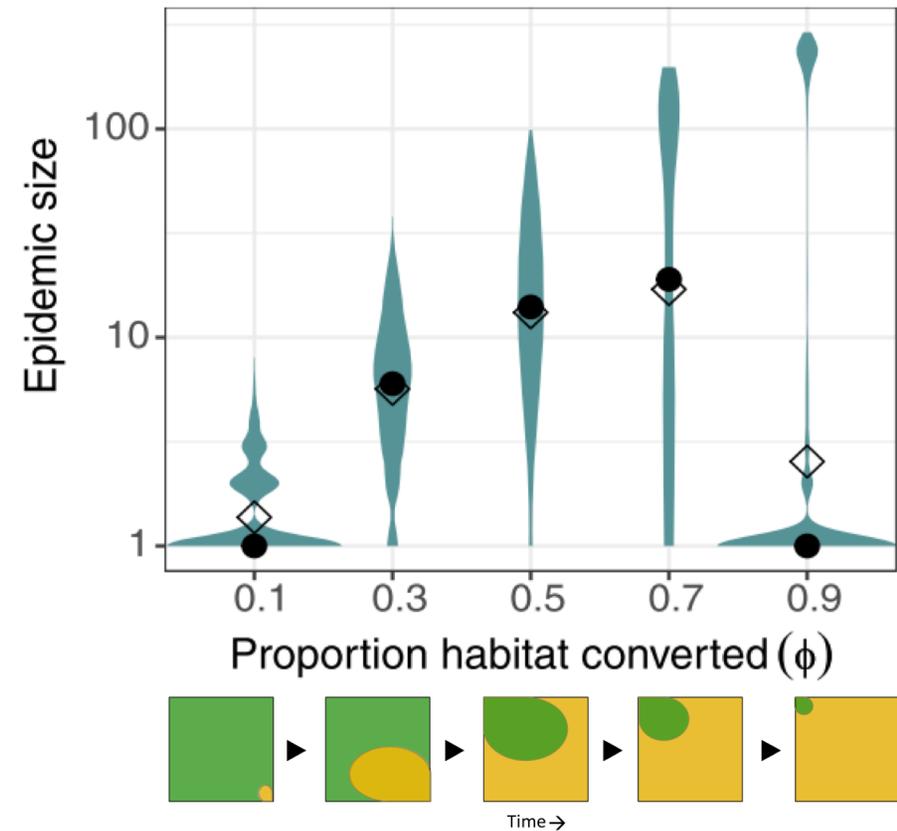
- Nipah virus – higher forest fragmentation in endemic zone (Hahn et al. 2014)
- Hendra virus - declining eucalyptus habitat has altered flying fox foraging behavior and increased spillover risk of (Giles et al. 2018)
- Ebola virus - correlation between outbreaks and fine-scale measures of forest fragmentation, consistent with suspected transmission pathways from forest-dwelling bats to forest-edge human communities (Rulli et al. 2017)
- *Plasmodium knowlesi* malaria - deforestation has altered the dynamics of the entire system, impacting vector habitats as well as abundance and distribution of macaques and humans



From: Gortazar et al. 2014, PLOS Pathogens; Bloomfield et al. 2020, Landscape Ecology; Kuisma et al. 2019



# Degradation and zoonotic disease outbreaks originating in wildlife



From: Faust et al. 2018; See also Allen et al. 2017 and Wilkinson et al. 2018

# Preventing deforestation and reducing pathogen spillover is affordable

## POLICY FORUM

ECOLOGY AND ECONOMICS: COVID-19

### Ecology and economics for pandemic prevention

Investments to prevent tropical deforestation and to limit wildlife trade will protect against future zoonosis outbreaks

What would it cost to protect 40% of forests at highest risk for virus spillover?



**\$9.6  
billion/  
year**

Option A - direct forest-protection payments to outcompete deforestation economically



**\$1.5  
billion/  
year**

Option B – remove subsidies for clearing, restrict private clearing, and support indigenous territorial rights



From: Dobson et al. 2020

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What would it cost to protect 40% of forests at highest risk for virus spillover?

Better than nothing! This amount of prevented deforestation returns a \$8-17 billion surplus due to carbon benefits alone!



*From: Dobson et al. 2020*

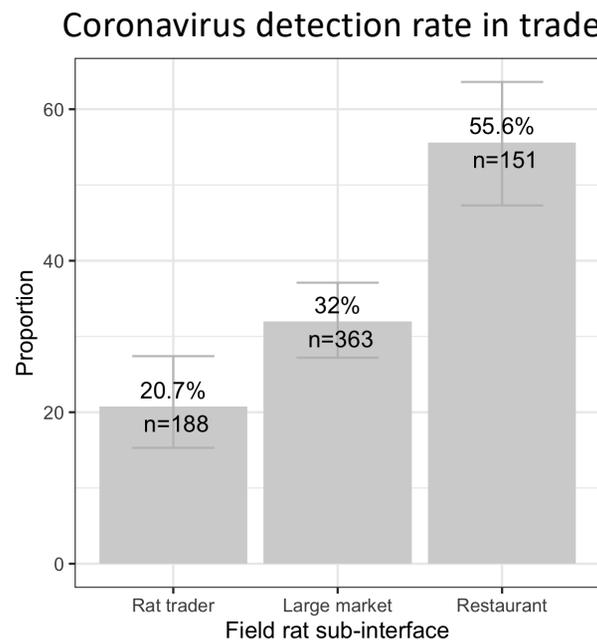
# WCS recommends closing commercial wildlife trade and supporting subsistence food needs

The wildlife trade increases (1) contact and virus (2) mixing and (3) amplification



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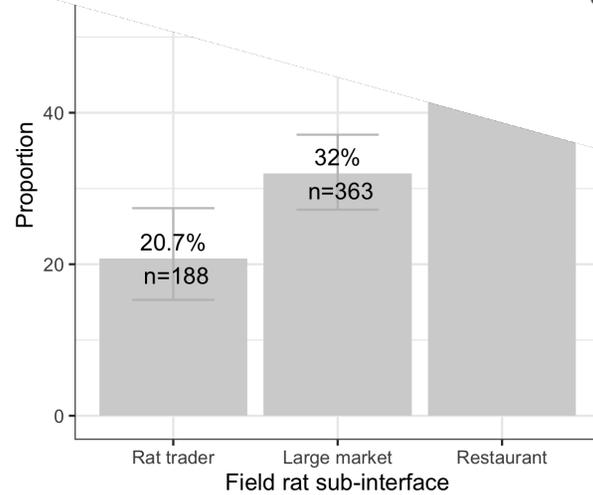
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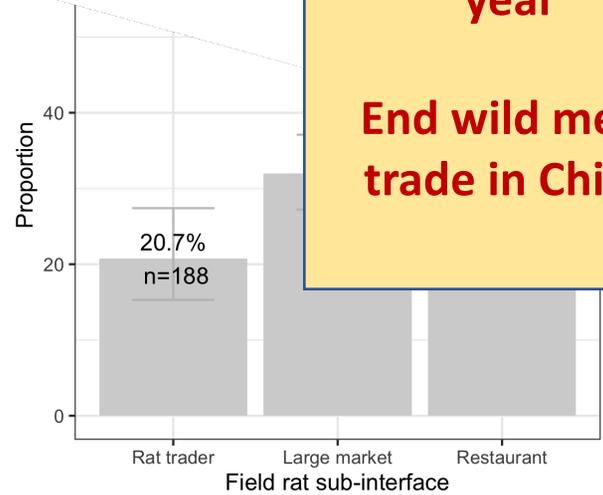
The wild  
(2) mi

# Vietnam bans wildlife trade to curb risk of pandemics



# WCS recommends closing commercial wildlife trade and supporting subsistence food needs

ENVIRONMENT JULY 23, 2020 / 11:21 PM / 4 DAYS AGO  
The wild meat trade and virus  
(2) million  
**Vietnam bans wild meat trade to curb risk of pandemics**



**\$20 billion/ year**  
**End wild meat trade in China**



# WCS recommends closing commercial wildlife trade and supporting subsistence food needs



‘Ebola and Covid-19 have taught us that we cannot continue with "business as usual." We must change our eating habits and scale down the trade in bushmeat as much as we can. To do that, we need support from the global community to protect the health of all people in Central Africa now and in the future.’



From: <https://edition.cnn.com/2020/07/28/opinions/africa-wildlife-diseases-wcs/index.html>

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## Additional resources:

- [wcs.org/coronavirus](https://wcs.org/coronavirus)
- [oneworldonehealth.wcs.org](https://oneworldonehealth.wcs.org)
- [solson@wcs.org](mailto:solson@wcs.org)

