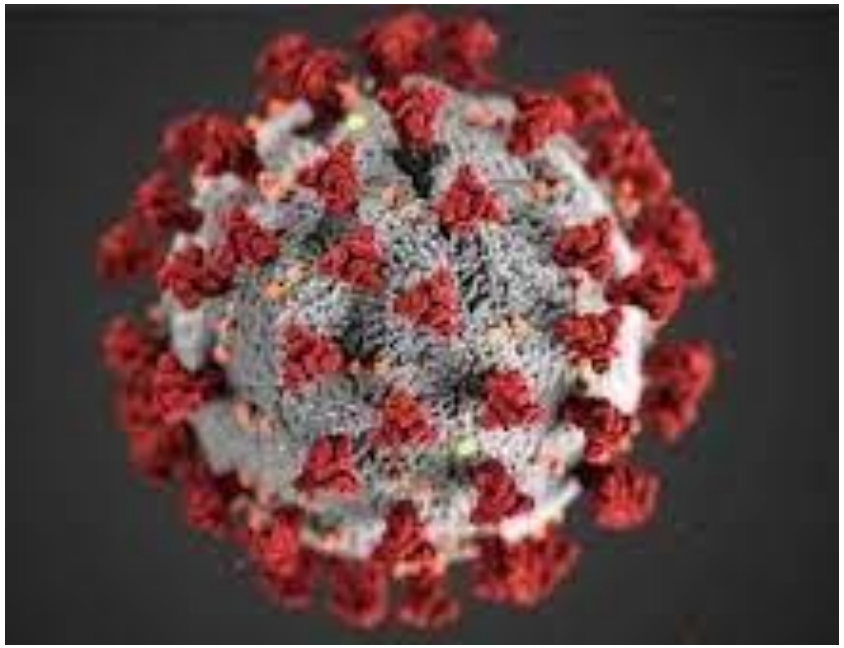
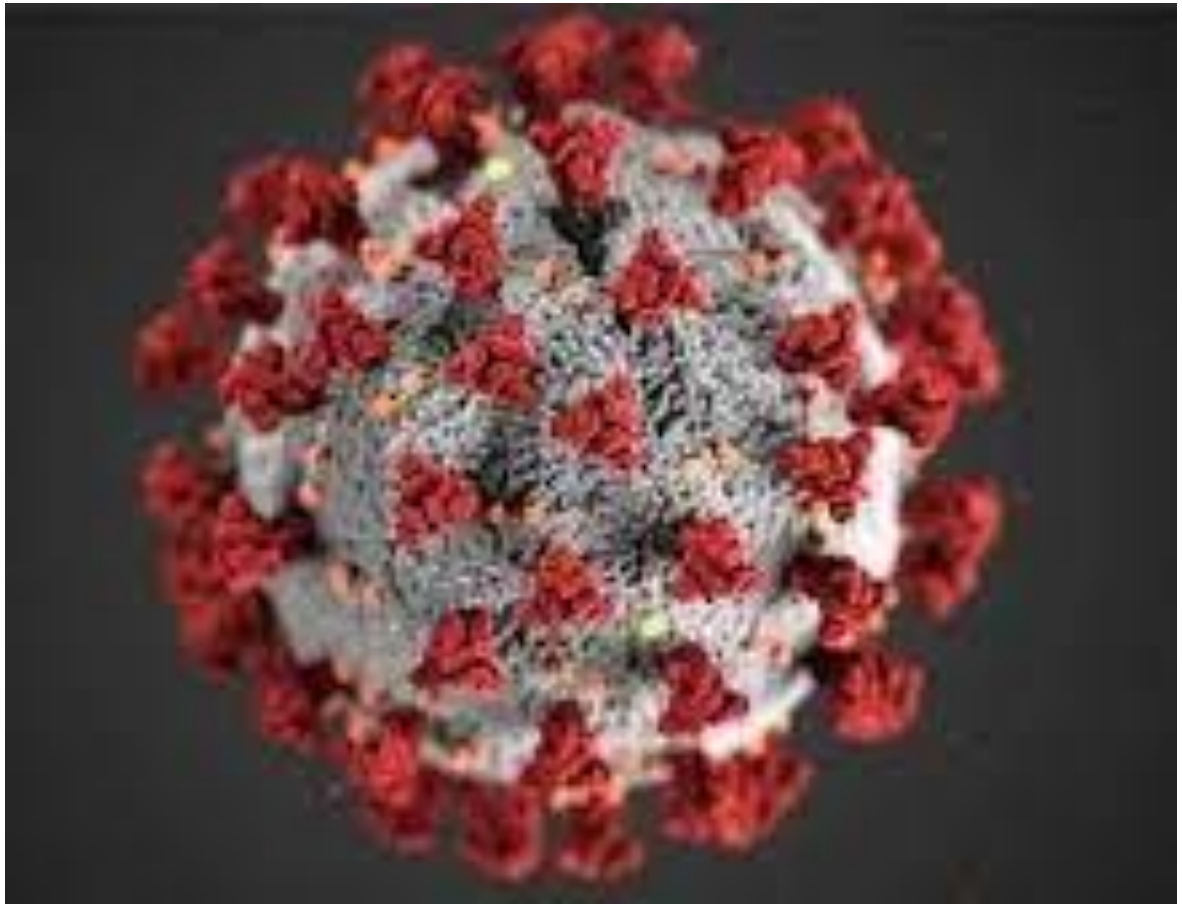
Covid and Wildlife

Slides (mainly) by (soon to be) Dr. Tricia Fry



Covid and Wildlife Management

- Why?
- What we know?
- What don’t we know?
- What is next?

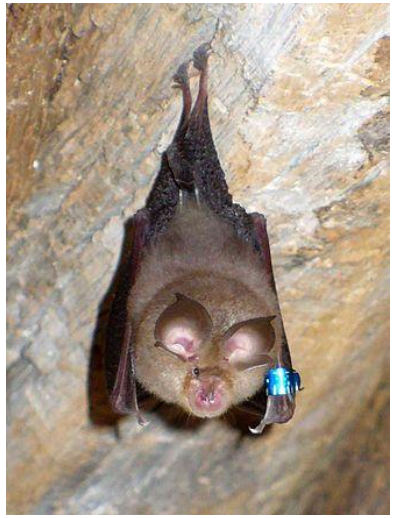


Pathogen: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

What we know…

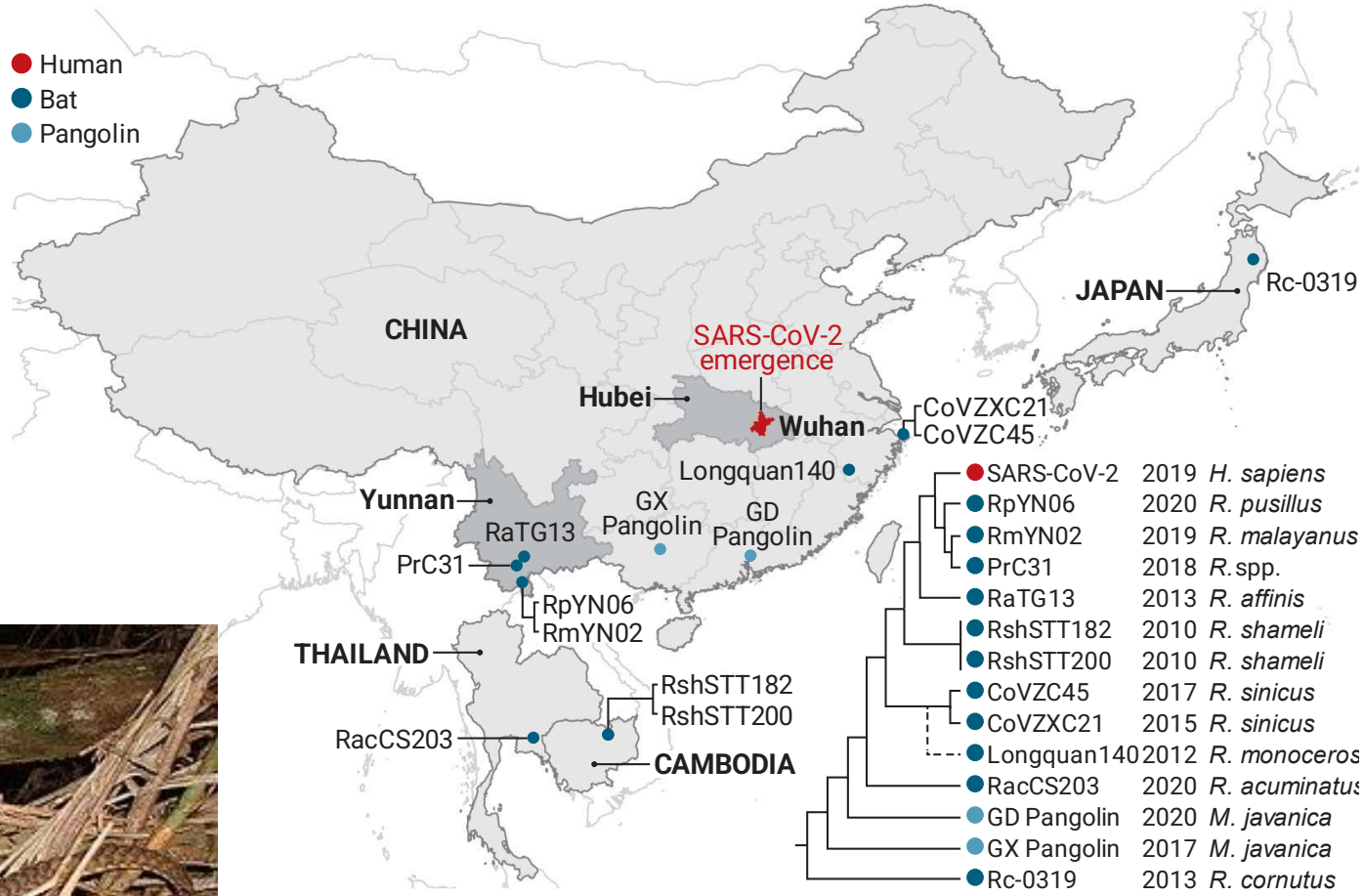
Originated in bats, with evidence of bridge host being responsible for spillover into humans.

Rapid mutation.



Horseshoe bat (Rhinolophidae)

Sunda pangolin (*Manis javanica*)



Lytras et al. (2017) Science 373, Issue 6558 pp. 968-970
DOI: 10.1126/science.abh0117

What we know…

Species that have been infected

- Domestic animals
- Felids
- Mustelids
- Rodents
- Bats
- Deer

Environmental contamination possible

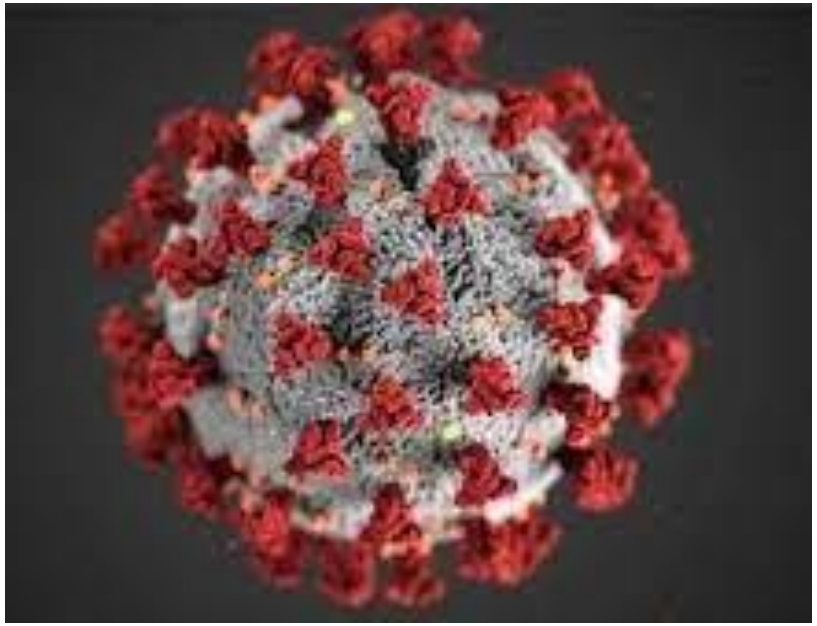
American Mink (*Neogale vison*)

Delahay, R.J., de la Fuente, J., Smith, G.C., Sharun, K., Snary, E.L., Flores Giron, L., Nziza, J., Fooks, A.R., Brookes, S.M., Lean, F.Z. and Breed, A.C., 2021. Assessing the risks of SARS-CoV-2 in wildlife. *One health outlook*, *3*(1), pp.1-14.

Why do we care if SARS-CoV-2 is in wildlife?

- Understanding origins
- Does it cause pathologies?
- Spillback –transmitting infection back to a potential maintenance host
- Spillover – transmission between new species
- ‘New and improved’ viruses

What we don't know….



A lot….

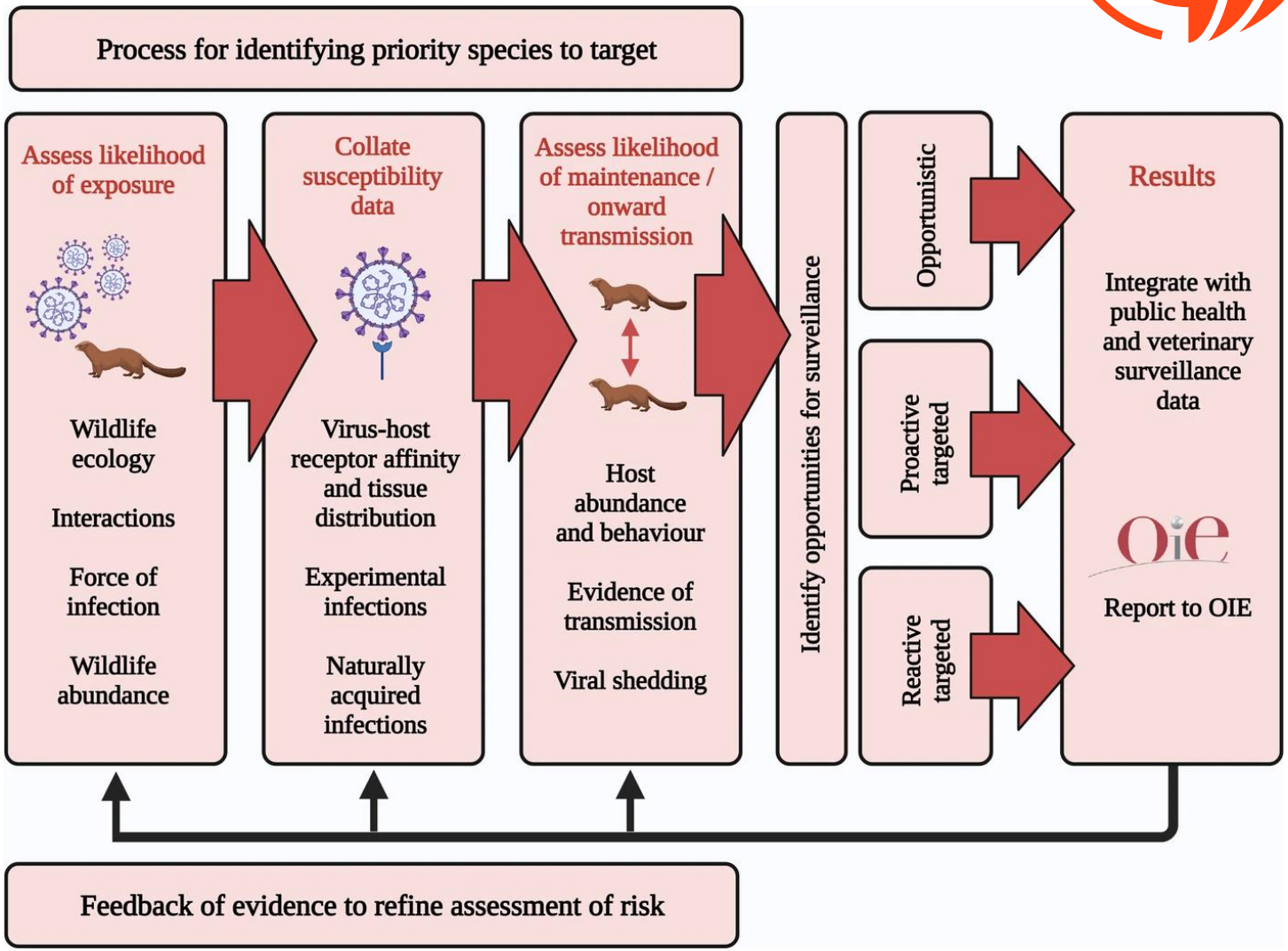
So, we do

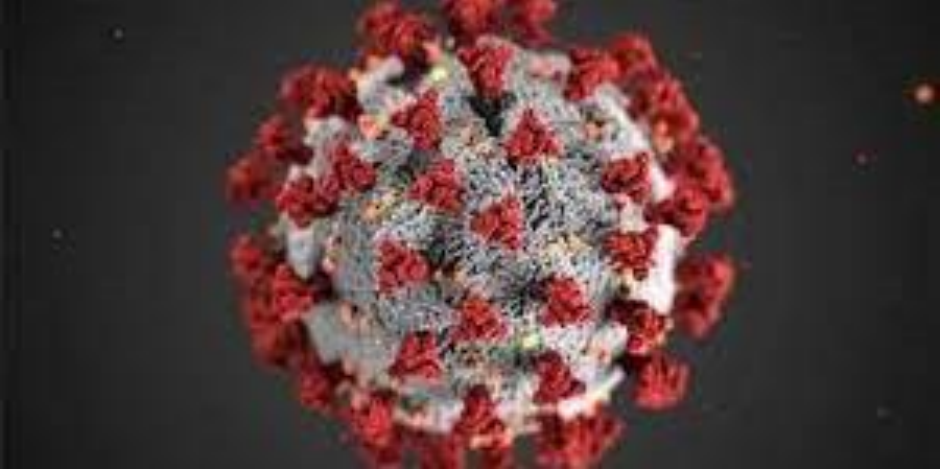
- **Lab research** – including experimental infections
- **Genomic analysis**
- Think about population densities and risks
- **Systematic Surveillance** – actively survey tissue and samples from a variety of species in many locations
- **Risk Assessment** and **Structured Decision Making**

Surveillance Strategies

World Organisation for Animal Health

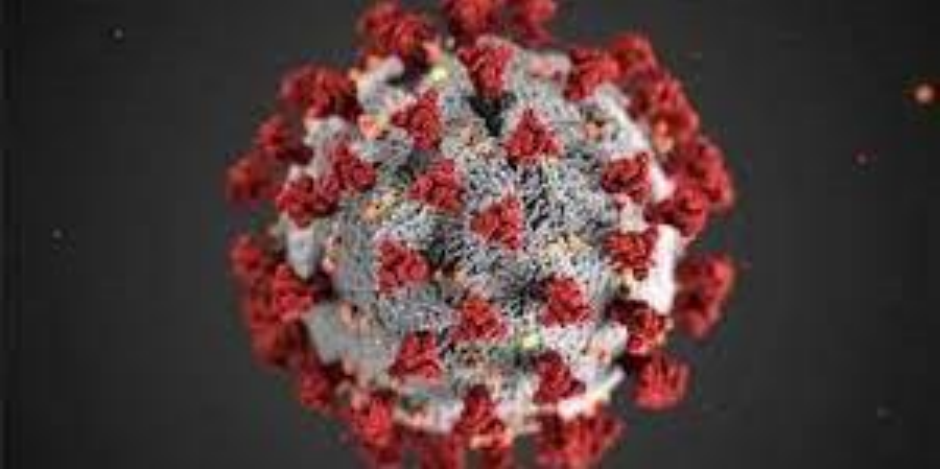
Founded as OIE





What's next's…

- SARS-CoV-2 pandemic continues to be driven by human-to-human transmission with no evidence that domestic or wild animals are playing an important role, but ….
- reservoir of infection in a wild animal population poses a significant risk to public health if it had potential to spillback into communities the burden of infection had been reduced through con
- opportunity for evolutionary adaptation of the virus, which could potentially (positively or negatively) influence transmission dynamics and the effectiveness of diagnostics and vaccines
- Pay attention – and learn for the future



Ecology suggests that diseases will continue to become more prevalent

- **Increased population density**
  - more rapid transmission, selection against reduced virulence
  - more frequent invasion of new habitats → more epizootics
- **Widespread movement** → more rapid transmission of new diseases
- **Evolution of drug resistance** across pathogen strains, antibiotic resistance leads to greater virulence
- **Climate change**→ increased ranges of pathogens ad their vectors