

Parasites that Threaten Mammals from Around the World: An interactive dashboard inspired by the GMPD

Parasites can have astonishing effects on their hosts. Just recently, over 200,000 saiga (antelope native to Central Asia) died course of a few days. [Researchers called these events](#) “unprecedented and unworldly”. A bacterium, *Pasteurella multocida*, isolated from the blood of these animals was the cause.



Saiga, a species previously decimated by poaching, are endangered like many other wild animals. Threatening factors like poaching and habitat make animals more vulnerable to parasites. On top of being threatened by other factors, mammals are more likely to be impacted by parasitism as well [IUCN](#). Since the the number of endangered animals is on the rise, understanding patterns of parasitism is important for conservationists and wildlife managers.

This dashboard is intended to be a resource for conservationists and undergraduate classrooms to visualize patterns of disease in threatened mammals.

EXPLORE:

- Which mammals are most vulnerable to parasites?
- Which characteristics are associated with vulnerability to parasites?

Why are animals from some taxonomic families especially vulnerable to parasites?

These interactive plots illustrate how mammals from some taxonomic families are more vulnerable to deadly parasites. In particular, carnivores in the Canidae, Otariidae, and Phocidae were likely to have deadly parasites. In ungulates, many families have a high proportion of threatened species overall but those in Bovidae were most likely to have deadly parasites.

These families include all major groups of domesticated livestock (dogs, cats, goats, sheep, cattle, and pigs) showing the dangers of cross-species transmission that pets and livestock pose to closely related wild species.

Caption for host figure: The proportions of hosts that are threatened versus not threatened varies (*Non-Threatened*) by host family and other grouping variables. Of the *threatened* species, *ThreatOther* shows the

proportion threatened by a factor other than disease while ThreatDisease shows the proportion threatened by disease and other factors. Finally, some of the species were not threatened according to IUCN but still had diseases negatively affecting local populations (*Disease*). Data were collected from the IUCN species descriptions (for details see Pederson et al., Conservation Biology, 2007).

Why are some parasites more threatening?

These interactive plots illustrates how viruses and bacteria are some of the most deadly parasites for wild mammals, consistent with the idea that as host populations decrease, viruses and bacteria are better suited than macroparasites to spread across a wider range of hosts. We see indication of this by investigating the identities of these parasites: some of the most deadly bacteria and viruses (morbilliviruses, *Mycobacterium bovis*, and anthrax) affect many different host species. In addition, the sub-lethal affects of many helminths on hosts may not be explicitly captured in this database.

The second interactive plot (**not included in pilot dashboard**) shows that many threatening parasites are transmitted by close contact as opposed to transmitted by vectors or contaminated soil or water. Threatening parasites transmitted via close contact are often those associated with spillover from domesticated animals. These patterns hold relevance from a conservation standpoint: minimizing cross-species contact and overlap in resources used by wild and domesticated animals may reduce wildlife diseases.

Data shown on this page were collected from IUCN species descriptions (for details see Pederson et al., Conservation Biology, 2007).

```
## # A tibble: 8 x 3
## # Groups:   Group [2]
##   Group      type      n
##   <fct>      <chr>  <int>
## 1 carnivores Disease      5
## 2 carnivores NonThreatened 75
## 3 carnivores ThreatDisease   5
## 4 carnivores ThreatOther    14
## 5 ungulates  Disease      9
## 6 ungulates  NonThreatened 37
## 7 ungulates  ThreatDisease   9
## 8 ungulates  ThreatOther    26
```

```
## # A tibble: 2 x 2
##   Group      n
##   <fct>  <int>
## 1 carnivores 101
## 2 ungulates  74
```















