

Infectious Disease Hazards for Deployed Working Dogs

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Disease and Non-Battle Injury

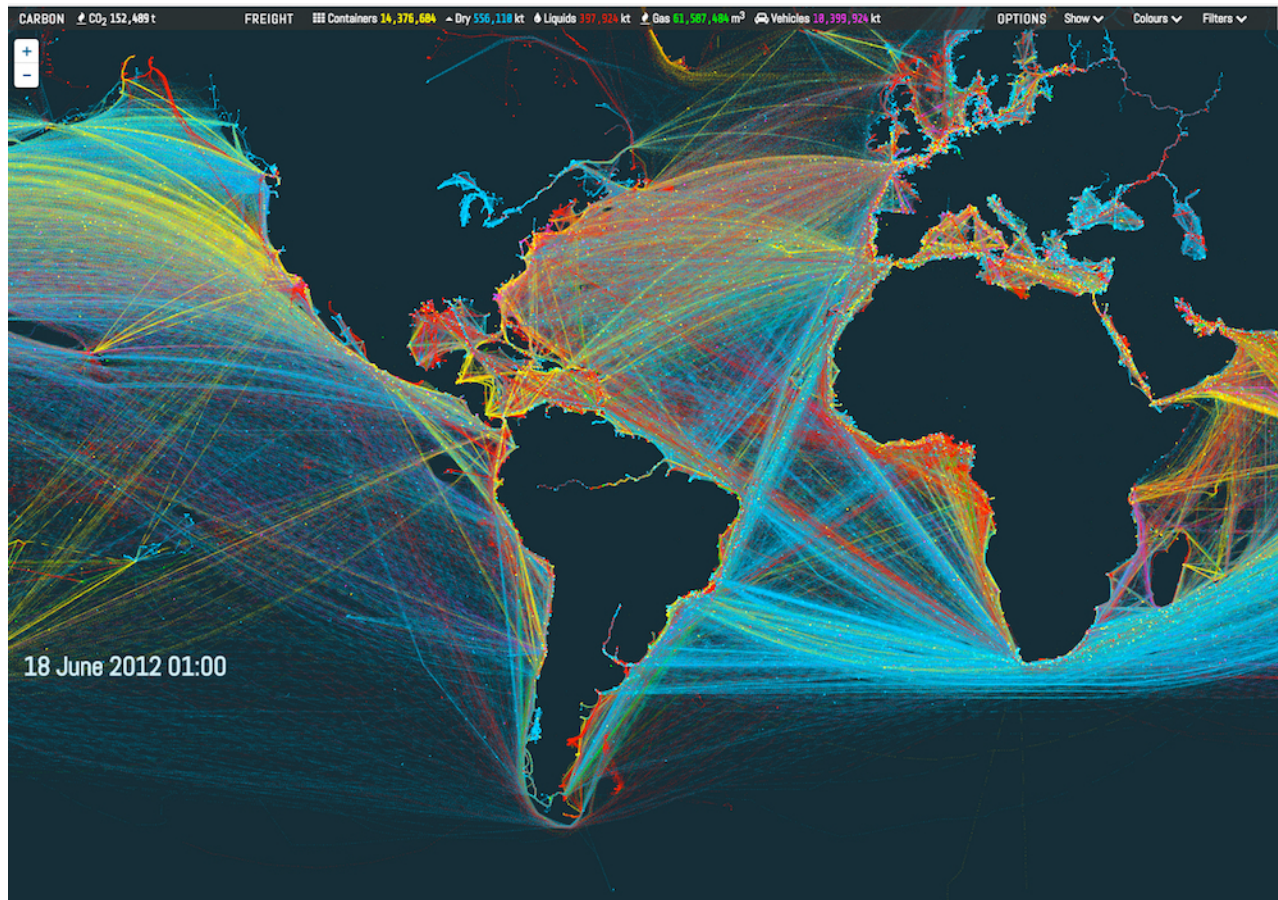
- Historically in conflicts, death from disease exceeded battle injury related deaths
- Advances in field sanitation and preventive medicine have reversed this trend, so that in many instances, battle related injury has overcome DNBI
- US Example:
 - Civil War (US, Union) 140k (BD) 224k (DNBI)
 - WWII 292k (BD) 114k (DNBI)



The perfect storm is brewing



Globalization



Urbanization

**Movement to cities
from rural areas**

- **27 Megacities**
 - 10 Million +
- **By 2025 over 60%
will live in urban
areas**



Conflict/Terrorism

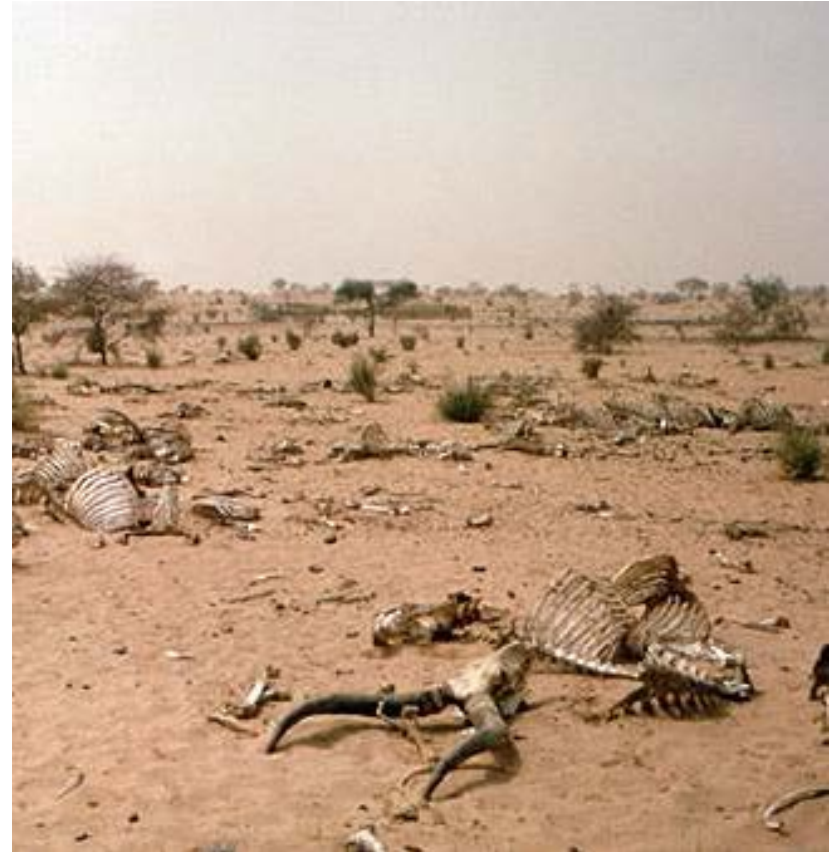
- Failed and failing states
- Competition for power
- Displaced persons



Environmental trends

Global warming

- Desertification
- Tropical disease



Natural disasters



Emerging Diseases

Increasing emerging
and re-emerging
diseases

- 335 1940-2004
- 60 % zoonotic
 - 72% from wildlife



Our dogs at risk...



Worldwide deployments...



Worldwide deployments...



Worldwide deployments...



Worldwide deployments...



Worldwide deployments...



High density housing...



Susceptible populations...



Disease and Non-Battle Injury

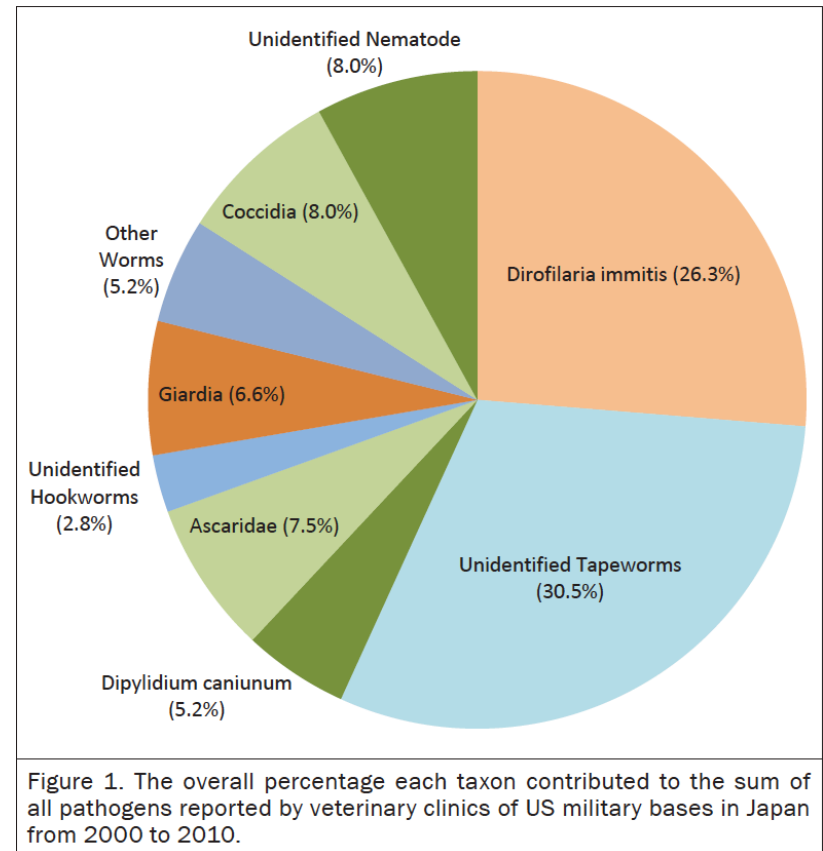
Takara and Hall 2014

- 1350 MWD patient encounters in Iraq theater (2003-2011)
- Dermatologic 25%
- Soft tissue injury 21%
- Alimentary 17%
- Musculoskeletal 14%
- Infectious <1%



Disease and Non-Battle Injury

- Reeves, et. al., 2013
- Veterinary Diseases Review for Mainland Japan, 2000-2010
- 5418 records,
16,764 veterinary visits



Disease and Non-Battle Injury

Watier-Grillot, et. al. (2013)

- **Reported trypanosomiasis in French MWDs**

Davoust, et. al. (2013)

- **Reported results of surveillance and disease associated with Leishmania**

Killian J (2007)

- **Reported results of surveillance for Leishmania in US MWDs deployed to Mediterranean basin**



Infectious diseases of concern

Vector-borne disease

- Accounts for 17% of all infectious disease
- More than 1 billion cases annually in humans, with more than 1 million human deaths
- Increases in range of vectors and human/vector interfaces contribute to the rapid increase in infections



Vector-borne disease

Ticks

- Lyme disease (*Borrelia bergdoferi*)
- Rickettsial diseases (Ehrlichiosis, Anaplasmosis, Rocky Mountain Spotted Fever)
- Babesiosis
- Tularemia
- Tick borne encephalitis (Central Europe)

Vector-borne disease

Mosquitoes

- Malaria
- West Nile virus
- Dengue
- Chikungunya

Sandflies

- Leishmaniasis



Vector-borne disease

Tsetse flies

- Trypanosomiasis

Fleas

- Plague
- Rickettsiosis

Triatomines (“kissing bugs”)

- Chagas disease



Babesiosis...



- Anemia characteristic of *B. gibsoni* and less virulent strains of *B. canis*

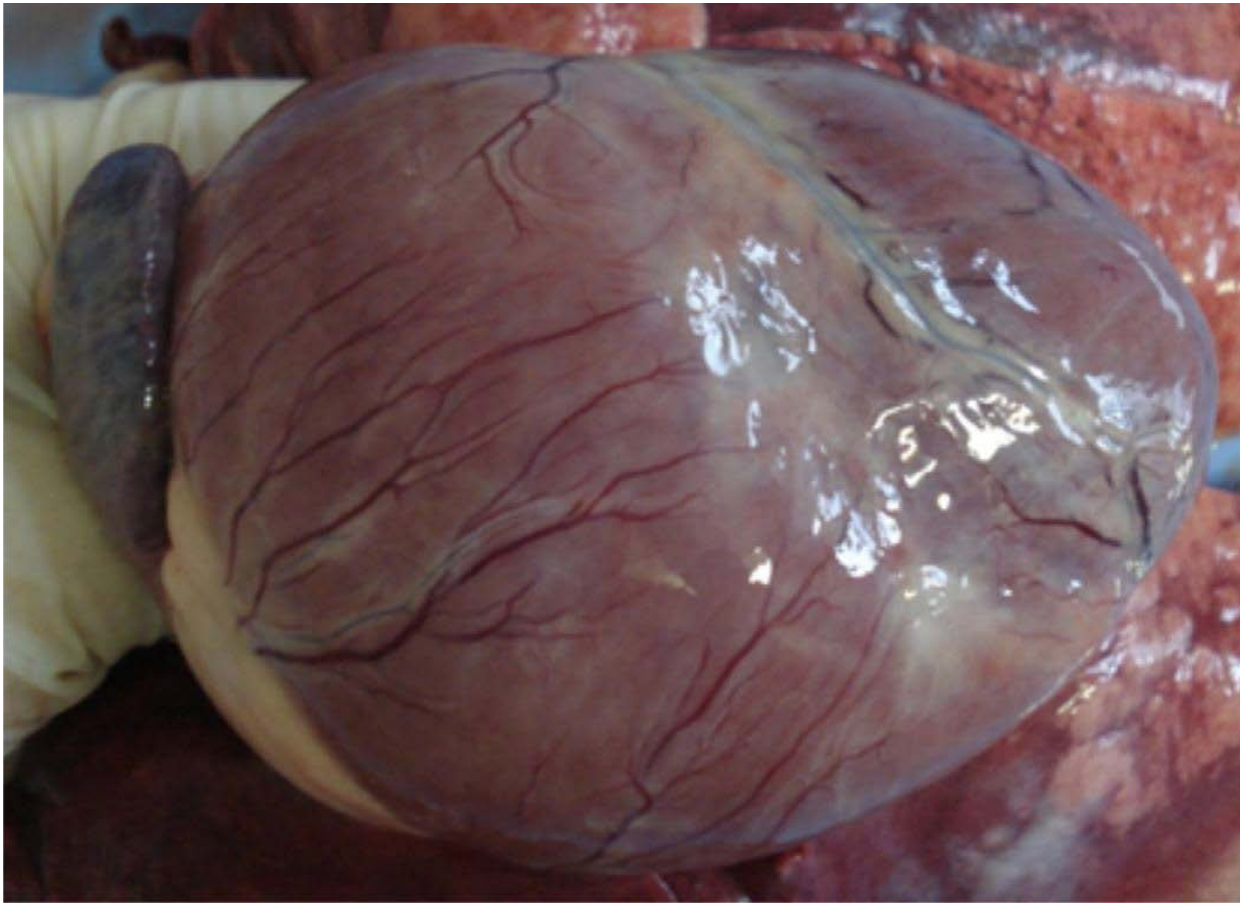
Leishmaniasis...



Ehrlichiosis...



Chagas disease...



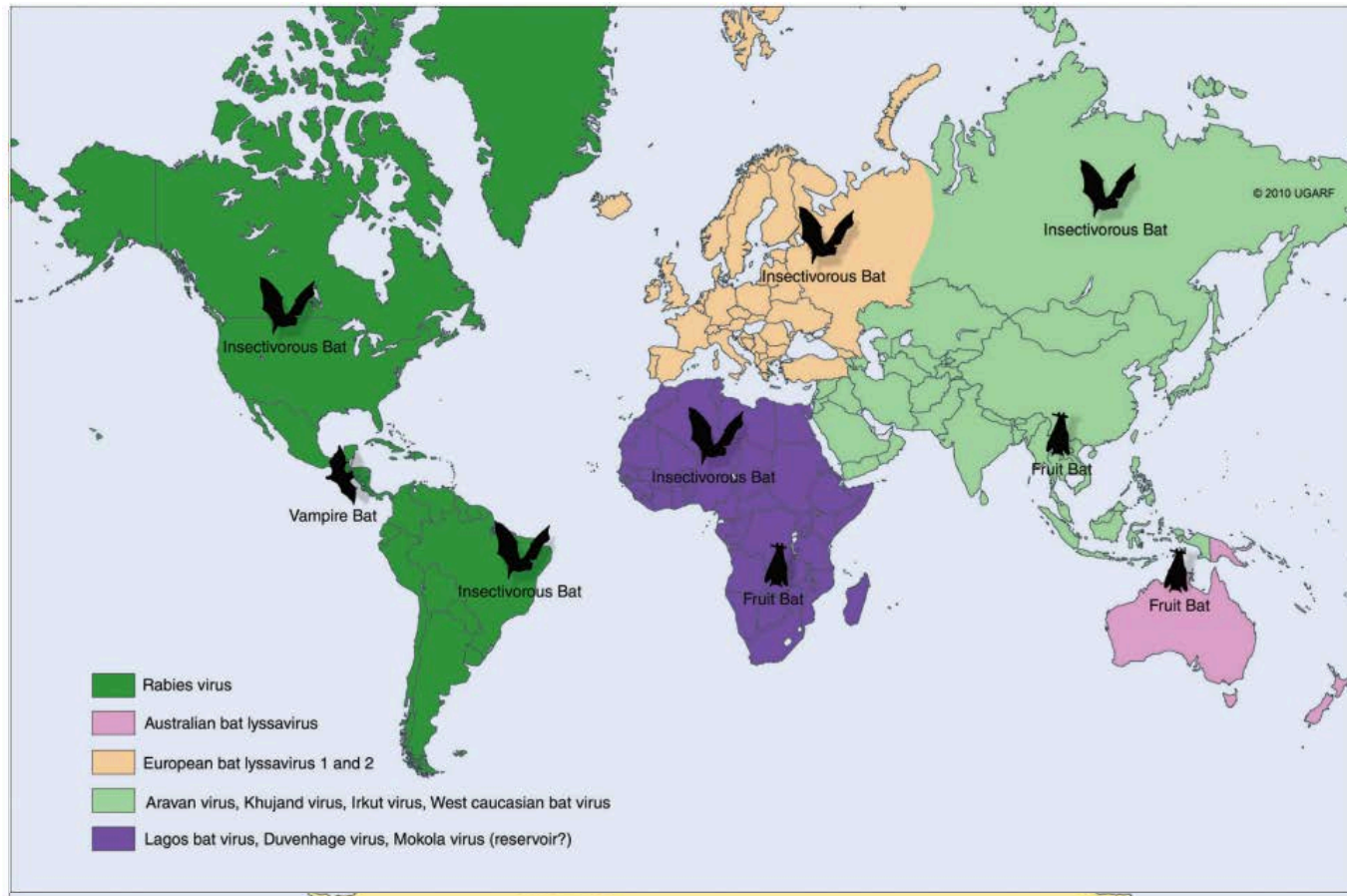
Infectious diseases of concern

Viral

- Canine Distemper
- Canine Parvovirus
- Canine parainfluenza and influenza
- Rabies



Rabies vectors



Rabies...

- 55-100,00 human cases annually
- >27,000 animal cases annually
- 1 human death every 10 minutes
- Tropical regions of Asia and Africa



Infectious diseases of concern

Bacterial

- Leptospirosis
- Salmonella
- Campylobacter
- Staphylococcus (also MRSA/MRSP)
- Respiratory: *Bordetella*, *Mycoplasma*
- Plague (*Yersinia*)
- Tularemia (*Francisella tularensis*)



Infectious diseases of concern

Fungal

- Histoplasmosis
- Blastomycosis
- Coccidiomycosis
- Aspergillosis
- Cryptococcus



Prevention is key

- Be informed of the hazards
- Build and maintain effective preventive medicine programs for our working dogs
 - Vaccination strategies
 - Parasite control strategies
 - Fleas
 - Ticks
 - Heartworm
 - Gastrointestinal
 - Surveillance
- Prompt identification and treatment of ill dogs



Resources

- <http://www.oie.int/our-scientific-expertise/specific-information-and-recommendations/animal-disease-information/>
- <http://www.wormsandgermsblog.com/resources-pets/>
- <https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html>



Building a database

- Potential for IWDBA database of informational handouts for veterinary professionals, handlers and trainers
- Searchable by region, disease
- Collaborative effort





Ideas and thoughts appreciated!

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