Infectious Disease Hazards for Deployed Working Dogs

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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

"The Perfect Storm Event"

"She's Comin' On Boys, and She's Comin' on Strong"
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...
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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

Figure 1. The overall percentage each taxon contributed to the sum of all pathogens reported by veterinary clinics of US military bases in Japan from 2000 to 2010.
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 burgdorferi*)
• 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…

• 55-100,000 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 (*Frasnicella 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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