

ILLEGAL WILDLIFE TRADE INCREASES PROBABILITY OF ZOOONOTIC DISEASE SPREAD IN UNITED STATES

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What can we do to increase resilience within the United States in regard to public health emergencies?

BACKGROUND INFORMATION

Useful Definitions

- Zoonosis (Zoonotic Disease): A zoonosis is an infectious disease that has jumped from a non-human animal to humans.
- Bushmeat: meat obtained by hunting wild animals especially in Africa and Asia.
- Anticipatory Intelligence: Anticipatory intelligence involves collecting and analyzing information to identify new, emerging trends...which challenge long-standing assumptions and encourage new perspectives, as well as identify new opportunities and warn of threats... – National Intelligence Strategy of the United States of America: 2019, page 9.

Agencies that have jurisdiction over combatting illegal wildlife trade (IWT)

- United States Fish and Wildlife Service (FWS)
- Centers for Disease Control and Prevention (CDC)
- United States Department of Agriculture (USDA)
- Customs and Border Protection (CBP)

METHODS



- Anticipatory Intelligence
- Literature
- Interviewing Professionals
 - Dr. Emily Pieracci – Zoonoses Team lead at the CDC
 - Dr. Samantha Gibbs – Wildlife Veterinarian with FWS
 - Dr. Francis Massé – lecturer in the Department of Geography and Environmental Science at Northumbria University
 - Dr. Rosaleen Duffy – professor in the Department of Politics and International Relations at Northumbria University



FINDINGS

BUSHMEAT IN THE US



Estimates suggest 7.5 tons of bushmeat are sold on the US black market daily

We can say with 100% certainty that we underestimate the amount of bushmeat that enters the US –
Dr. Emily Pieracci,
CDC



There are cultural and needs based drivers of bushmeat trade that make it a difficult problem to tackle



Zoonotic disease can result from handling, preparing, or consuming bushmeat

EXOTIC PET INDUSTRY

Past Examples

- 71 cases of monkeypox caused by prairie dogs
- Customs officers infected with psittacosis from parakeets
- African Pygmy hedgehogs have caused salmonellae infections

Current Threats

- Influenza
 - Wild and domestic cats
 - Dogs
 - Horses
 - Ferrets
 - Birds
- Influenza can travel from animal to human and vice versa

Potential Future Consequences

- More public health emergencies
 - Future influenza pandemics
 - Infection of local animal populations
 - Food supply shortages





CONCLUSION

A reevaluation of how agencies in the United States fund projects to combat IWT and increased collaboration between FWS, CDC, USDA, and CBP are necessary steps to mitigate against the spread of zoonotic disease in the US.

CITATIONS

- Bair-Brake, H., T. Bell, A. Higgins, N. Bailey, M. Duda, S. Shapiro, H. E. Eves, N. Marano, and G. Galland. "Is That a Rodent in Your Luggage? A Mixed Method Approach to Describe Bushmeat Importation into the United States." *Zoonoses and Public Health* 61, no. 2 (March 2014): 97–104. <https://doi.org/10.1111/zph.12050>.
- Belay, Ermias D., James C. Kile, Aron J. Hall, Casey Barton-Behravesh, Michele B. Parsons, Stephanie Salyer, and Henry Walke. "Zoonotic Disease Programs for Enhancing Global Health Security." *Emerging Infectious Diseases* 23, no. 13 (December 2017). <https://doi.org/10.3201/eid2313.170544>.
- Chomel, Bruno B., Albino Belotto, and François-Xavier Meslin. "Wildlife, Exotic Pets, and Emerging Zoonoses1." *Emerging Infectious Diseases* 13, no. 1 (January 2007): 6–11. <https://doi.org/10.3201/eid1301.060480>.
- Code of Federal Regulations, Title 42: 475–481. <https://www.law.cornell.edu/cfr/text/42/chapter-IV/subchapter-F>
- Dell, BreeAnna M., Marcy J. Souza, and Adam S. Willcox. "Attitudes, Practices, and Zoonoses Awareness of Community Members Involved in the Bushmeat Trade near Murchison Falls National Park, Northern Uganda." Edited by Wanda Markotter. *PLOS ONE* 15, no. 9 (September 28, 2020): e0239599. <https://doi.org/10.1371/journal.pone.0239599>.
- Dr. Emily Pieracci, zoonoses team lead of the Quarantine and Border Health Services Branch of the CDC, interview with the author. March 8th, 2021.
- Dr. Francis Massé (lecturer in the department of Geography and Environmental Sciences at Northumbria University), interview with the author. 18th February, 2021.
- Dr. Rosaleen Duffy (professor in the department of Politics and International Relations at Northumbria University), correspondence with the author. March 1st, 2021.
- "Examples of Human Infections with Avian Influenza A Viruses with Possible Limited, Non-Sustained Human-to-Human Transmission." Centers for Disease Control and Prevention. 10th April, 2017. <https://www.cdc.gov/flu/avianflu/h5n1-human-infections.htm>
- Gray, Thomas N. E., Nick Marx, Vuthyavong Khem, Dean Lague, Vincent Nijman, and Suwanna Gauntlett. "Holistic Management of Live Animals Confiscated from Illegal Wildlife Trade." Edited by Susan Cheyne. *Journal of Applied Ecology* 54, no. 3 (June 2017): 726–30. <https://doi.org/10.1111/1365-2664.12916>.
- Messenger, Ali M., Amber N. Barnes, and Gregory C. Gray. "Reverse Zoonotic Disease Transmission (Zooanthroponosis): A Systematic Review of Seldom-Documented Human Biological Threats to Animals." Edited by Bradley S. Schneider. *PLoS ONE* 9, no. 2 (February 28, 2014): e89055. <https://doi.org/10.1371/journal.pone.0089055>.
- Office of the Director of National Intelligence [ODNI] (2019). National intelligence strategy of the United States of America (Rep.). https://www.dni.gov/files/ODNI/documents/National_Intelligence_Strategy_2019.pdf?utm_source=Press%20Release&utm_medium=Email&utm_campaign=NIS_2019
- Smith, Kristine M., Simon J. Anthony, William M. Switzer, Jonathan H. Epstein, Tracie Seimon, Hongwei Jia, Maria D. Sanchez, et al. "Zoonotic Viruses Associated with Illegally Imported Wildlife Products." Edited by Bradley S. Schneider. *PLoS ONE* 7, no. 1 (January 10, 2012): e29505. <https://doi.org/10.1371/journal.pone.0029505>.
- Thakur and Kniel, eds. "Emerging Foodborne and Agriculture-Related Viruses." In *Preharvest Food Safety*, 205–25. American Society of Microbiology, 2018. <https://doi.org/10.1128/microbiolspec.PFS-0007-2014>.
- Toland, Elaine, Monica Bando, Michèle Hamers, Vanessa Cadenas, Rob Laidlaw, Albert Martínez-Silvestre, and Paul van der Wielen. "Turning Negatives into Positives for Pet Trading and Keeping: A Review of Positive Lists." *Animals* 10, no. 12 (December 10, 2020): 2371. <https://doi.org/10.3390/ani10122371>.
- "1918 Pandemic." Centers for Disease Control and Prevention. 20th March, 2019. <https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html>

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