

## Chronic Wasting Disease: An Urgent Need for Critical Preparedness

**Summary.** Despite mounting evidence demonstrating the potential for chronic wasting disease (CWD) to transmit from cervids (members of the deer family) to other species—including humans and production animals—no contingency plans exist at a national or international level to address the possibility of spillover, which would trigger a global-scale crisis.

- 1) Exposure to CWD prions is increasing, and distinct strains, each of which can have a unique host range, are continuing to emerge.
- 2) Documented transmission of CWD to humans or production animals such as cattle would result in an overnight crisis with significant implications for public health, agriculture and trade, wildlife health, and beyond.
- 3) No state, federal, or international agency is adequately preparing for this potential crisis.
- 4) CIDRAP, together with expert partners, will provide a blueprint for preparedness and response, so that—should a species crossover event occur—we will not be left vulnerable.

**CWD Threats.** CWD in cervids (e.g., deer, elk, moose, reindeer) has been confirmed in at least 30 US states, 4 Canadian provinces, 3 European countries, and South Korea. While this invariably fatal disease is a recognized and expanding threat to the health of cervid populations worldwide, the risks posed to other populations—including humans and animal agriculture—are growing in tandem with the disease. Analogous to bovine spongiform encephalopathy (BSE)—or “mad cow” disease—the ongoing proliferation of CWD carries with it enormous implications relevant to public health, food security, trade, and wildlife conservation. Examples demonstrating this point include:

- **Increasing frequency of exposure to CWD prions** among cervids, humans, and other animal species, including human consumption of 15,000 infected cervids each year ([Osterholm 2019](#)).
- **Ongoing propagation of novel CWD strains**, each of which can have distinct host ranges ([CIDRAP 2019](#)).
- **Detection of CWD prions in the skeletal muscle** of infected cervids, unlike BSE—where prions were largely confined to central nervous system tissue ([Daus 2011](#), [Li 2021](#)).
- **Evidence of CWD transmission in animal models** such as humanized mice and cynomolgus macaques, demonstrating human adaptation and the zoonotic potential of CWD prions ([Czub 2017](#), [Hannaoui 2022](#)).
- **Evidence that pigs can contract CWD**, including preliminary results from an ongoing study involving the US Department of Agriculture, which found two suspect positive cases of prion disease among feral swine living in a CWD-endemic region of Arkansas ([Feral Swine Task Force 2019](#)).
- **Trade restrictions imposed** by the Norwegian Ministry of Agriculture and Food on hay and straw imports from the US and Canada, which can no longer be sourced from a state or province that has detected CWD ([World Trade Organization](#)).
- **CWD spread can significantly affect hunting.** Alongside its deep-rooted cultural and traditional significance, hunting is a critical mechanism for managing wildlife populations

and disease—with more than 6 million deer harvested across the US each year (National Deer Alliance). However, CWD has reduced hunter participation ([Lyon 2010](#)).

- **Wildlife health and conservation.** Because of the tenacity of CWD and the ever-growing cost associated with it, state wildlife agencies have identified it as the “most important existential challenge confronting agencies in the 21<sup>st</sup> century” ([Thompson & Mason 2022](#)).

Owing to the severity and significant consequences that will emerge should CWD transmission to humans occur, a proactive and anticipatory approach is essential. In the case of BSE, transmission to humans wasn’t recognized until 1996—a decade after the disease was first detected in cattle. Failure to acknowledge and prepare for this possibility left officials piecing together a response in real-time, and it diminished public trust. We must prepare for this possibility with CWD now.

**CWD at CIDRAP.** As a trusted source of science-based information, the Center for Infectious Disease Research and Policy (CIDRAP)—which is already home to an online [CWD Resource Center](#) and has longstanding experience in crisis management and emergency preparedness planning—is uniquely suited to lead an effort that can fill the void in critical CWD preparedness.

In response to the overall absence of current, comprehensive, and authoritative information on this topic, CIDRAP launched its [CWD Response, Research and Policy Program in 2019](#). Since its inception, this program has focused on the organization and coordination of cross-disciplinary leadership and expertise to identify priority issues and provide up-to-date, reputable material to stakeholders. As it stands, CIDRAP’s CWD Program receives critical advice and input on initiatives and information from a [60-member Expert Advisory Group](#), which features nationally and internationally renowned experts and leaders in areas such as wildlife health and management, conservation, agriculture, prion biology and diagnostics, human health, and beyond. No other center incorporates all these disciplines focused on CWD risks, and even the CDC features the CIDRAP CWD Resource Center on its list of CWD resources.

With adequate support, CIDRAP is positioned to build off its existing status as a leading source of CWD information and—as it has done in the past with topics such as COVID-19, influenza, Ebola, and antimicrobial resistance—is equipped to facilitate the critical collaborative leadership, assessments, and preparedness documents that are needed. Akin to CIDRAP’s work on various infectious disease roadmaps—including the latest Coronavirus Vaccine Roadmap project—review of the existing barriers and knowledge gaps is needed for multiple areas relevant to CWD. Thus, CIDRAP will convene five working groups, bringing together leading experts to proactively address and prepare for a CWD crisis. High-priority working group topics include:

- CWD, human medicine, and public health
- Human, cervid, and production animal testing and surveillance
- Agriculture and trade
- Disposal issues
- Wildlife health and conservation

**Result.** We will develop a blueprint for preparedness and response planning documents, including authoritative risk communication, education, and outreach material. The budget for year one activities is \$1,632,612. The anticipated budget for four years is \$6,742,493.



Center for Infectious Disease Research and Policy

## CWD Program: Expert Advisory Group Members

*Members of the CWD Expert Advisory Group provide critical input and direction into all CIDRAP CWD-related activities, but they do not necessarily endorse the content of this website or statements made by CIDRAP staff.*

- **Wiktor Adamowicz, PhD**, Professor and Vice Dean, Agricultural, Life and Environmental Sciences, Department of Resource Economics and Environmental Sociology, University of Alberta
- **Kip Adams, MS**, Chief Conservation Officer, National Deer Association
- **Judd Aiken, PhD**, Professor, Centre for Prions and Protein Folding Diseases, Agricultural, Life and Environmental Sciences, Department of Agriculture, Food and Nutritional Sciences, University of Alberta
- **Sir Roy Anderson, PhD, FRS, FMedSci**, Professor of Infectious Disease Epidemiology, School of Public Health, Faculty of Medicine, Imperial College London & Immediate Past Director, London Centre for Neglected Tropical Disease Research
- **Brian Appleby, MD**, Professor and Director, National Prion Disease Pathology Surveillance Center, School of Medicine, Case Western Reserve University & Medical Director, Creutzfeldt-Jakob (CJD) Foundation
- **Shannon Bartelt-Hunt, PhD, PE**, Professor and Chair, Department of Civil and Environmental Engineering, University of Nebraska-Lincoln
- **Travis Bartnick, MS**, Wildlife Biologist, Great Lakes Indian Fish and Wildlife Commission
- **Jason Bartz, PhD**, Professor and Chair, Department of Medical Microbiology and Immunology, School of Medicine, Creighton University
- **Sylvie Benestad, PhD**, Senior Researcher, Norwegian Veterinary Institute
- **Vincent Béringue, PhD**, Research Director, French National Research Institute for Agriculture, Food, and Environment
- **Trent Bollinger, DVM, DVSc**, Professor, Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan & Regional Director, Canadian Wildlife Health Cooperative
- **Michelle Carstensen, PhD**, Wildlife Health Program Supervisor, Minnesota Department of Natural Resources
- **Neil Cashman, MD**, Professor of Medicine, Division of Neurology, University of British Columbia & Academic Director, Vancouver Coastal Health ALS Clinic
- **Larisa Cervenakova, MD, PhD**, Senior Biomedical Consultant & Former Medical Director, Plasma Protein Therapeutics Association
- **David Clausen, DVM**, Former Chair, Wisconsin Natural Resources Board



- **John Collinge, MD, FRCP, FRS**, Professor and Head, Department of Neurodegenerative Disease, Institute of Neurology & Director, MRC Prion Unit, University College London & Director, NHS National Prion Clinic, National Hospital for Neurology and Neurosurgery
- **Louis Cornicelli, PhD**, Senior Analyst, Southwick Associates
- **Michael Coulthart, PhD**, Head, Canadian Creutzfeldt-Jakob Disease Surveillance System, Public Health Agency of Canada
- **Matt Dunfee**, Special Programs Director, Wildlife Management Institute & Director, Chronic Wasting Disease Alliance
- **Douglas Duren**, Conservationist, Land Manager, Farmer and Frequent Contributor, The MeatEater
- **Craig Engwall, JD**, Senior Legal and Program Advisor, Minnesota Board of Water and Soil Resources & Former Executive Director, Minnesota Deer Hunters Association
- **John Fischer, DVM, PhD**, Professor Emeritus & Former Director of the Southeastern Cooperative Wildlife Disease Study, University of Georgia
- **Sabine Gilch, PhD**, Associate Professor and Prion Disease Research Chair, Department of Comparative Biology and Experimental Medicine, Faculty of Veterinary Medicine, University of Calgary
- **Colin Gillin, DVM**, State Wildlife Veterinarian, Wildlife Health and Population Lab, Oregon Department of Fish and Wildlife
- **Justin Greenlee, DVM, PhD**, Research Veterinary Medical Officer and Prion Disease Scientist, National Animal Disease Center, Agricultural Research Service, US Department of Agriculture
- **Samia Hannaoui, PhD**, Research Associate, Calgary Prion Research Unit, Faculty of Veterinary Medicine, University of Calgary
- **Allen Herbst, PhD**, Prion Biologist and Diagnostic Biochemist, National Wildlife Health Center, US Geological Survey
- **Edward Hoover, DVM, PhD**, University Distinguished Professor, Prion Research Center, College of Veterinary Medicine and Biomedical Sciences, Colorado State University & Member, National Academy of Sciences
- **Travis Kirkwood**, Senior Policy Coordinator, Strategic Policy Integration Sector, Assembly of First Nations
- **Qingzhong Kong, PhD**, Associate Professor, Departments of Pathology, Neurology, and Environmental Health Sciences, School of Medicine, Case Western Reserve University
- **Terry Kreeger, DVM, PhD**, Instructor, Center for Wildlife Studies & Former State Wildlife Veterinarian, Wyoming Game and Fish Department
- **Peter Larsen, PhD**, Co-Director, Minnesota Center for Prion Research and Outreach & Assistant Professor, Department of Veterinary and Biomedical Sciences, College of Veterinary Medicine, University of Minnesota



- **Russell Mason, PhD**, Executive in Residence, Michigan Department of Natural Resources & Adjunct Professor, College of Agriculture and Natural Resources, Michigan State University
- **Candace Mathiason, PhD**, Associate Professor and Research Head, Department of Microbiology, Immunology, and Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University & Director, Infectious Disease Research and Response Network & Co-Founder/Director, Women in Science Network
- **Debbie McKenzie, PhD**, Professor, Centre for Prions and Protein Folding Diseases, Department of Biological Sciences, University of Alberta
- **Rodrigo Morales, PhD**, Associate Professor, Mitchell Center for Alzheimer's Disease and Brain Disorders, Department of Neurology, McGovern Medical School, University of Texas
- **Keith Munro, PhD**, Wildlife Biologist, Ontario Federation of Anglers and Hunters
- **Tracy Nichols, PhD**, Program Manager and Science Officer, Cervid Health Program, Animal and Plant Health Inspection Service, US Department of Agriculture
- **Nick Pinizzotto, MA**, President and CEO, National Deer Association
- **Brent Race, DVM**, Veterinary Staff Scientist, Laboratory of Persistent Viral Diseases, Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases, National Institutes of Health
- **Darrel Rowledge**, Director, Alliance for Public Wildlife
- **Hermann M. Schaeztl, MD, PhD**, Professor and Head, Prion Biology and Immunology, Calgary Prion Research Unit, Faculty of Veterinary Medicine, University of Calgary
- **Joni Scheftel, DVM, MPH**, State Public Health Veterinarian, Minnesota Department of Health
- **Lawrence Schonberger, MD**, Assistant Director for Public Health and Chief, Prion and Public Health Office, Division of High-Consequence Pathogens and Pathology, Centers for Disease Control and Prevention
- **Krysten Schuler, PhD**, Wildlife Disease Ecologist and Assistant Research Professor, Department of Public and Ecosystem Health, College of Veterinary Medicine, Cornell University
- **Claudio Soto, PhD**, Director, Mitchell Center for Alzheimer's Disease and Related Brain Disorders, & Professor, Department of Neurology, McGovern Medical School, University of Texas
- **Iga Stasiak, DVM, DVSc**, Wildlife Health Specialist, Saskatchewan Ministry of Environment
- **Chad Stewart, MS**, Deer, Elk, and Moose Management Specialist, Michigan Department of Natural Resources
- **Kelly Straka, DVM, MPH**, Wildlife Section Manager, Minnesota Department of Natural Resources
- **Paul Strengers, MD**, Healthcare Consultant and Member of the Expert Committee on Biological Standardization, World Health Organization



- **Jason Sumners, MS**, Deputy Director, Resource Management, Missouri Department of Conservation
- **Glenn Telling, PhD**, Director, Prion Research Center & Professor, College of Veterinary Medicine and Biomedical Sciences, Colorado State University
- **Michael Tonkovich, PhD**, Deer Program Administrator, Ohio Department of Natural Resources Division of Wildlife
- **Jørn Våge, PhD**, Senior Researcher and Chronic Wasting Disease Coordinator, Norwegian Veterinary Institute
- **Scott Weber, VMD**, Communications Liaison and Senior Research Investigator, Wildlife Futures Program, University of Pennsylvania School of Veterinary Medicine
- **David Westaway, PhD**, Adjunct Professor, Institute for Neurodegenerative Diseases, Department of Neurology, University of California, San Francisco
- **Margaret Wild, DVM, PhD**, Professor, Department of Veterinary Microbiology and Pathology, College of Veterinary Medicine, Washington State University & Former Chief Wildlife Veterinarian, National Park Service
- **Tiffany Wolf, DVM, PhD**, Co-Director, Minnesota Center for Prion Research and Outreach & Assistant Professor, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota
- **Mark Zabel, PhD**, Professor of Microbiology, Immunology, and Pathology & Associate Dean for Research, College of Veterinary Medicine and Biomedical Sciences, Colorado State University