PARALLELS BETWEEN COVID-19 AND CHRONIC WASTING DISEASE: BIOSECURITY STOPS DISEASE SPREAD

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Benjamin Franklin pointed out that nothing is certain but death and taxes. Nevertheless, at least when it comes to wildlife disease management, there are absolutes. For one thing, as the prophet of tolerance also pointed out, "an ounce of prevention is worth a pound of cure."

Unfortunately, and despite the best of intentions, disease outbreaks happen from time to time, as we are experiencing now. When these occur, regardless of the infectious disease or whether it affects humans or other animals, there are biosecurity actions that can be implemented to effectively manage and ultimately defeat the outbreak. The first and most important of these actions is rapid and accurate surveillance that reveals disease prevalence across the landscape. Understanding the intensity, extent, and directionality of infection is prerequisite to the implementation of timely management strategies that can effectively impact the disease.

Using COVID-19 as an illustration, unprecedented efforts now are underway to develop rapid, effective, and sustainable surveillance. Concurrently, management strategies that emphasize behavioral change (e.g., physical distancing, wearing masks, travel bans, quarantines, self-isolation, limits on public gathering, business closures) have been implemented. Not surprisingly, and consistent with centuries of data, the available evidence indicates these strategies are lowering infection and mortality rates and buying much needed time for the development and distribution of therapeutic interventions and vaccines.

What's true for coronavirus is applicable to the management of any infectious disease, regardless of the infectious agent (viruses, bacteria, or prions). Essentially, the four time-tested and universally accepted principles are:

1. Start with prevention.
2. Minimize the potential for disease spread.
3. Conduct surveillance to detect disease early.
4. Manage the disease in affected areas.

In the case of COVID-19, we have seen these principles at work through the unprecedented travel bans and school and business closures that *prevent* the movement of anything infectious, including individuals. As a society, we have embraced spatial and temporal separation of individuals to *minimize* infectious contacts that cause the disease to spread. We have implemented widespread *surveillance* to identify the current geographic distribution and prevalence. When the virus is identified, contact tracing is used to rapidly remove infected and potentially infected individuals from contact with the general population to *manage* the outbreak.

If these principles sound familiar, it's because you've likely heard them before. Those of us who are interested in deer and deer hunting have been applying these same concepts to chronic wasting disease (CWD). In fact, the Association of Fish and Wildlife Agencies (AFWA) emphasized these universal principles in the *Multistate Guidelines for Chronic Wasting Disease Management in Free-Ranging While-tailed Deer, Mule Deer, and Elk.* This reference document was released nearly 16 years ago and signed by 26 state agency directors.

Parallel to what the daily news is on COVID-19, the AFWA guidelines also highlight the importance of research aimed at the development of more efficient and economical testing and, if possible, the development of pharmaceutical interventions and the essential need to provide timely and accurate information to stakeholders.

What follows illustrates how the four principles apply to the management of infectious wildlife diseases, with special emphasis on the management of CWD.

While we often lament that CWD has continued to expand in geographic scope and is now present in at least 26 states, four Canadian provinces and in Europe and Asia, we have to remember that the disease is often limited to parts of states and is still at low prevalence in many areas. That leaves a vast swath of the globe that does not have CWD at present. We must do everything in our power to ensure that our (human) actions do not cause outbreaks resulting in the further spread of disease. There are vanishingly few examples of where a disease has been eliminated after being introduced into free-ranging wildlife. So if you don't have it, don't get it! Precautionary measures like bans on movement of live animals, their parts and products, are critical to preventing and minimizing potential disease spread.

Knowing if the disease is present hinges on the availability of reliable, efficient, and economical testing.

Surveillance also informs us about the growth or decline of disease, as well as the geographic distribution and effectiveness of interventions. As with COVID-19, when it comes to CWD, there are a limited number of laboratories qualified to perform diagnostic tests, and the testing demand exceeds capacity. In consequence, the turnaround time for test results is unacceptably and impractically long, and consequently, movement of the disease on the landscape outpaces our information. To resolve this limitation, research is ongoing to develop faster and less-expensive tests, with the end goal of rapid assays integrated with standardized sample collection regimes across jurisdictional borders. The hunting public is demanding progress, and therefore, there is reason to be optimistic. Unfortunately, the same cannot be said for therapeutic interventions as vaccines, even if developed for CWD, would be difficult to distribute to free-ranging deer, elk, and moose. So unlike COVID-19, the likelihood of a vaccine or other therapeutic for CWD remains out of reach. Without research funding, we are unlikely to make substantial progress toward any meaningful solutions.

After surveillance identifies an outbreak, management strategies that suppress infection can be implemented—and the earlier, the better. The common feature of these strategies is that they aim to reduce or (preferably, if possible) eliminate contacts between infected and uninfected individuals. In the case of COVID-19, this reduction is being accomplished through physical distancing, quarantines, travel bans, and the closure of venues where

WILDLIFE HEALTH: THE CHRONIC WASTING DISEASE INITIATIVE

Surveillance, testing, managing, and response activities are imperative to better understanding Chronic Wasting Disease (CWD). The Club has played an influential role with our American Wildlife Conservation Partnership (AWCP) allies and state and federal agencies to mobilize federal and state actions on CWD. Working with our Conservation Grants Committee, which has dedicated its budget to leveraging funding for research, the policy team has steered the efforts of our community to effective advocacy for federal funding, revision of the USDA Herd Certification Program, support for state-level policies and legal defenses, control over interstate movement of deer and elk, and engagement with deer farmers. Here's a summary of what happened in 2020, and what we will be working on in 2021.

ACE ACT

Signed into law on October 30, 2020, after passing the House and Senate with overwhelming bipartisan support, the America's Conservation Enhancement Act (ACE Act) will address Chronic Wasting Disease (CWD) by:

- **Commissioning and authorizing $7.4 million in funding for an interagency study regarding the pathways and mechanisms of the transmission of CWD in the United States; and**
- **Establishing and authorizing up to $5 million annually for a CWD task force to develop and implement an interstate action plan for collaborative state and federal actions to combat the disease.**

APPROPRIATIONS

The establishment of a USDA-DOI Task Force in the ACE Act was a first step toward an official federal policy. Our focus for the federal role has been to secure a reliable and sufficient share of federal funding to complement the approximately $2 million that CWD states are putting toward surveillance and response. Specifically, the Club is asking that the Animal and Plant Health Inspection Service (APHIS) allocate no less than $24 million directly to state departments of wildlife, and $6 million to state departments of agriculture for CWD activities. However, congressional appropriations have lagged and last year, APHIS diverted $1.5 million of the $5 million it was appropriated and offered the remaining $3.5 million for a wide variety of low priority uses. The Club will be working with agencies and on Capitol Hill to secure necessary appropriations and to ensure that funds are being used effectively in the fight against CWD. In addition, we will work to secure a hearing in the House and Senate Agriculture Committees in the new congressional session to focus on CWD issues.

CWD RESEARCH

The Club Board of Directors has authorized a continuing effort on CWD research using funds from the Conservation Grants Committee. The chair of that committee, Boone and Crockett Professor of Wildlife Conservation Joshua Millspaugh, has in turn worked with Professional Member Matt Dunfee and the CWD Alliance to match Club funds. Our partners at the Rocky Mountain Elk Foundation have matched each Club dollar and, with help from the Bass Pro Shops and Cabela's Outdoor Fund, an additional research project was added for a total of three current projects. Collectively these projects focus on monitoring and determining spread of CWD.

crowds might gather. In the case of CWD, analogous steps include lowering deer population densities and prohibitions on baiting, feeding, and use of attractants. Ideally, these measures would be taken before the disease is identified, but hunters' desires often trump risk minimization recommendations. Likewise, the intent of specialized hunting regulations and targeted removals is the removal of infected or 'high risk' animals (obviously, eliminating contacts with uninfected animals). By way of illustration, the available evidence indicates older-age bucks are more likely to be infected with CWD. This correlation has led to regulations that preferentially target older-age bucks under the assumption that since older males are more likely to be infected, they also are more likely to spread disease. Similarly, some states have implemented hunting regulations designed to target age or sex cohorts most likely to travel long distances under the assumption that these dispersing animals may transmit disease into new locations. Unfortunately, both surveillance and management is complicated by the fact that, like coronavirus-infected individuals, CWD-positive deer are infectious but asymptomatic for very long periods of time.

Finally, and despite the demonstrated utility of the biosecurity principles highlighted here, lack of public acceptance remains a significant challenge, much like the current resistance to wearing masks to prevent COVID-19 transmission. This frustrating reality most likely reflects the fact that, in order to work, biosecurity strategies take time. Hunters, by design, must learn patience, but this lack of immediacy is frustrating and can amplify mistrust of health authorities or government in general. As a consequence, priority must be placed on unambiguous and transparent communication by experts, supplemented whenever possible with modelling to illustrate the likely benefits of implemented practices. For COVID-19, the Centers for Disease Control cautioned that transparent and accurate communications were essential to maintaining credibility needed for public support of management interventions and disease control. For CWD, the same is true, if not more so, insofar as disease suppression efforts will continue to be a central feature of deer management for the foreseeable future. COVID-19 just gave us a crash course that parallels our current journey with CWD. Armed with this knowledge, we can all work toward a successful outcome.

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What's true for coronavirus biosecurities is applicable to the management of any infectious disease, regardless of the infectious agent (viruses, bacteria, or prions). Those of us who are interested in deer and deer hunting have been applying these same concepts to chronic wasting disease (CWD). BELOW: Nick Pinizzotto wearing a mask in the lab and in the field.