

**Abstract:**

Chronic wasting disease (CWD) is a contagious prion disease affecting four species of free-ranging and captive cervids in North America. Geographic detection and distribution of CWD notably increased after 2002, although the disease has been present in North America since at least the 1960s. CWD is characterized by a prolonged course of individual infection, lengthy epizootics that last for decades, and delayed population effects until after prevalence has reached a sufficient level. We comprehensively reviewed and synthesized the available literature on CWD to assess the current state of the science on disease dynamics and population impacts. We examine transmission dynamics and mechanisms, geographic spread, infection patterns, genetics of hosts, disease effects on demographic rates and ultimately the effects on population growth rates. The early phase of a CWD epizootic is characterized by slowly increasing prevalence and geographic spread, but these eventually accelerate and lead to declines in survival and recruitment that drive population reductions. The threshold for these population impacts depends on species-specific demography, genetics, transmission and numerous factors influencing cervid infection and mortality. As prevalence and spread continue to accelerate, management actions to mitigate CWD impacts will be challenging, costly and will likely require changes in how we manage CWD.