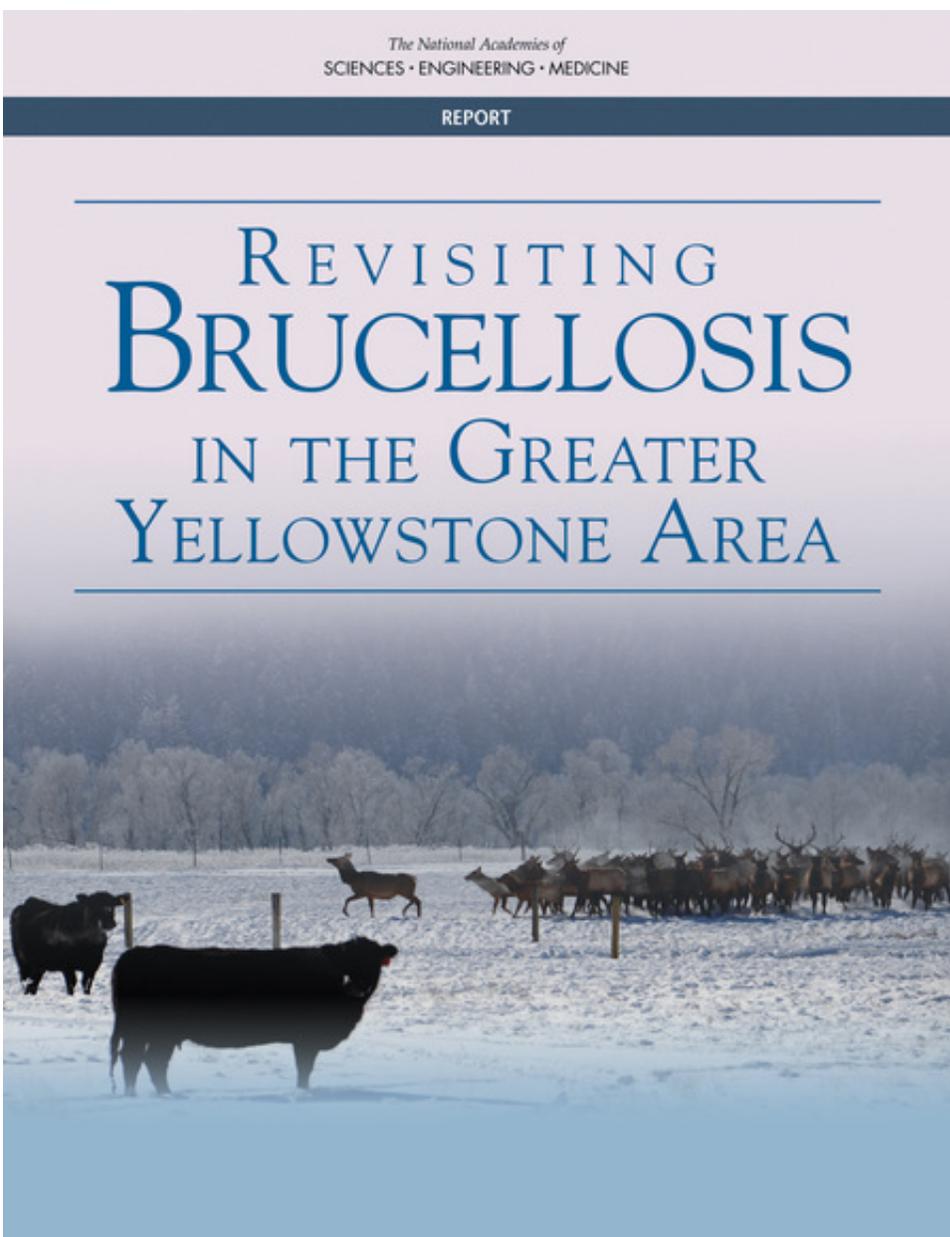


New report calls on federal and state collaboration to address brucellosis transmission from elk

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Efforts to control brucellosis in the Greater Yellowstone Area (GYA) should focus on reducing the risk of transmission from elk, which are now viewed as the primary source of the infection in new cases occurring in cattle and domestic bison, says a new report by the National Academies of Sciences, Engineering, and Medicine. Federal, state, and tribal groups should work in a coordinated and transparent manner to address brucellosis in multiple areas and jurisdictions.

Brucellosis is found in cattle, bison, and elk and can result in late-gestation abortion, decreased milk production, and loss of fertility. Other animals can be infected by coming into contact with infectious materials (such as aborted fetuses or afterbirth), and *Brucella abortus* – the bacterial pathogen that causes [brucellosis](#) – can spread to calves through nursing. *Brucella abortus* is not considered a major public health threat in the U.S., but there are potential economic consequences. States must maintain brucellosis-free status, among other criteria, to sell live cattle.

Since the Academies' first report on brucellosis in the GYA issued in 1998, the disease has re-emerged in cattle and domestic bison herds in the region. Between 1998 and 2016, 22 cattle herds and five privately owned bison herds were affected in Idaho, Montana, and Wyoming; all other states in the U.S. are free of the disease.

"One of the most significant changes in our understanding of brucellosis since 1998 is that the disease in the Yellowstone area can be traced genetically and epidemiologically to transmission from elk, not bison," said Terry McElwain, Regents Professor in the Paul G. Allen School for Global Animal Health at Washington State University and chair of the

committee that conducted the study and wrote the report. "Federal and state agencies should focus on controlling transmission from elk, including undertaking modeling efforts that can characterize and quantify the risk of brucellosis transmitting and spreading from and among elk."

To manage brucellosis in a complex ecosystem like that of the GYA, stakeholders and experts across disciplines will need to coordinate and cooperate to understand the costs and benefits of actions taken to control the spread of brucellosis. The committee said it is critical to incorporate participation by leadership at highest levels of federal and state agencies in initiating and coordinating discussions and making decisions.

The infected elk populations have spread beyond the traditionally accepted boundaries of the GYA. In addition to the challenges of locating them, there is no effective brucellosis vaccine for elk, unlike for cattle and bison. In the past, the National Park Service, U.S. Department of Agriculture, members of local tribal groups, and the three GYA states worked together to manage the risk of transmission from wild bison to domestic cattle and bison. A similar joint effort is needed to reduce transmission of brucellosis between elk and livestock.

Under a 2010 interim rule to regionalize brucellosis control, the three GYA [states](#) created designated surveillance areas (DSAs) to monitor the disease in specific zones and to reduce the economic impact in unaffected areas. Brucellosis has been detected outside the original DSAs, resulting in expansion of surveillance boundaries.

Currently, there is lack of uniformity in rules and standards in detecting infected cattle, which has resulted in an uneven approach to surveillance and setting boundaries that accurately reflect risk. If DSA boundaries are not expanded in a timely manner in response to wildlife cases of brucellosis, there is an increased probability that exposed or infected

livestock may not be detected in time to prevent the further spread of infection as they are marketed and moved across the country. The committee recommended establishing uniform risk-based standards for expanding surveillance boundaries in response to finding brucellosis in wildlife.

To make timely and data-driven decisions for reducing the risk of brucellosis, the committee also recommended federal and state agencies adopt an active adaptive management approach – a decision-making process to reduce uncertainty of outcomes over time. This approach should include hypothesis testing and mandated periodic scientific assessments that would equip the responsible entities with the necessary information to make decisions for managing brucellosis transmission.

While eradicating brucellosis in wildlife from the GYA remains a distant goal, the committee said the focus should be on making significant progress toward reducing or eliminating brucellosis transmission from wildlife to domestic species. In order to achieve this, federal and state agencies should consider several different management options that can reduce the risk of brucellosis transmission. Such tools include reducing the elk population by hunting, contraception trials in elk, and conducting tests on elk for brucellosis infection and subsequently removing them.

Another tool highlighted in the report is the potential to close supplemental feedgrounds for elk. Evidence suggests that incremental closure of feedgrounds could reduce the prevalence of the disease in the broader elk population and could benefit overall elk health in the long term. The committee recommended that state and federal land managers take a strategic, stepwise, science-based approach to analyzing and evaluating how the closure of feedgrounds would affect elk health, risk of transmission to cattle, and brucellosis prevalence.

The committee also recommended developing a bio-economic model to

address the complex nature of managing brucellosis in the Greater Yellowstone ecosystem. Such a model would provide a framework for decision making that would take into account the socio-economic costs and benefits of reducing [transmission](#) from wildlife to domestic [cattle](#) and bison, the reports says.

More information: Revisiting Brucellosis in the Greater Yellowstone Area. [www.nap.edu/catalog/24750/revi ... ter-yellowstone-area](http://www.nap.edu/catalog/24750/revi...ter-yellowstone-area)

Provided by National Academy of Sciences

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