

Determinants of Hunter Behavior in Response to Chronic Wasting Disease in Four States

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Chronic Wasting Disease (CWD)

- ◉ Transmissible disease: deer, elk, moose
- ◉ Similar to mad cow (BSE), scrapie (sheep)
- ◉ Cause: abnormal brain protein (prion)
- ◉ Lose body functions, emaciation, always fatal
- ◉ Free-ranging: 11 states, 2 Canadian provinces
 - CO, IL, KS, NE, NM, NY, SD, UT, WI, WV, WY
 - Manitoba, Saskatchewan
- ◉ Captive: other states & countries (S. Korea)
- ◉ Not known to *naturally* transmit to humans



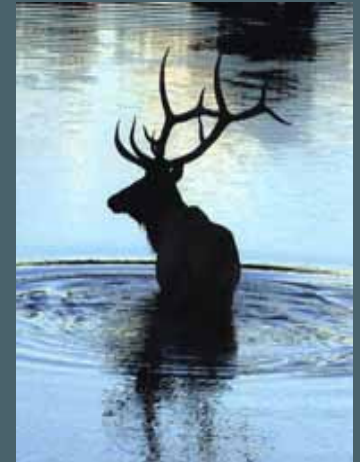
CWD Concern

- ⦿ Perceptions of CWD erode hunter confidence, willingness to hunt where CWD
 - WI, 2002: 60,000 less hunters (\$3M drop licenses)
- ⦿ Exacerbate effects of current hunting decline
 - less revenue from license sales
 - impact ability to manage game species
 - funds diverted from programs to manage CWD
 - social & economic impact on rural communities



Risk Theory – Determinants of Behavior

1. Prevalence
2. Severity
 - human impact
 - hypothetical risk (no death vs. death)
3. Perceived personal risk
 - degree to which individuals believe they may be exposed to a hazard or danger
4. Other factors influencing behavior
 - if CWD currently in state
 - resident vs. nonresidents



Research Questions

To what extent do:

- ◉ prevalence
- ◉ potential human health impact
- ◉ perceived personal risk
- ◉ presence of CWD in state
- ◉ residency

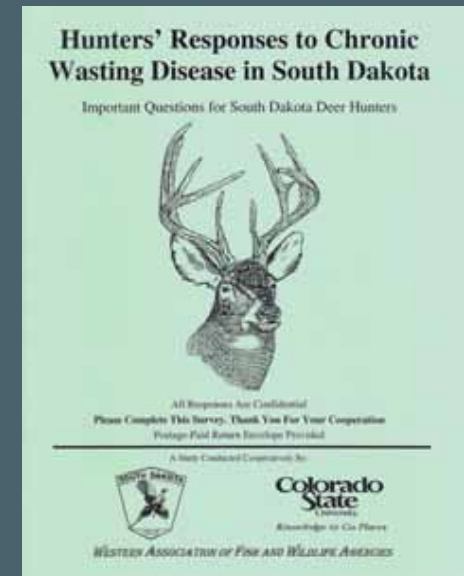
influence probability of quitting hunting
in a given state



Methods

Mail survey: resident, nonresident hunters

- 2003 rifle deer hunters
 - 3 mailings (July – October, 2004)
 - 4 states (AZ, ND, SD, WI)
 - $n = 3,519$ (840 to 980 per state)
 - 44% response rate
 - nonresponse check ($n = 785$), no substantive differences
 - data weighted to reflect hunter populations

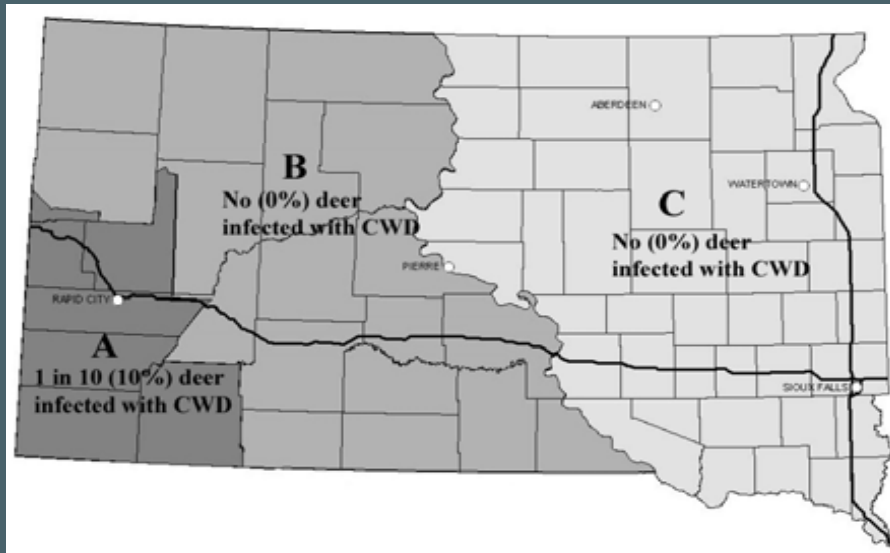


Predictor Variables

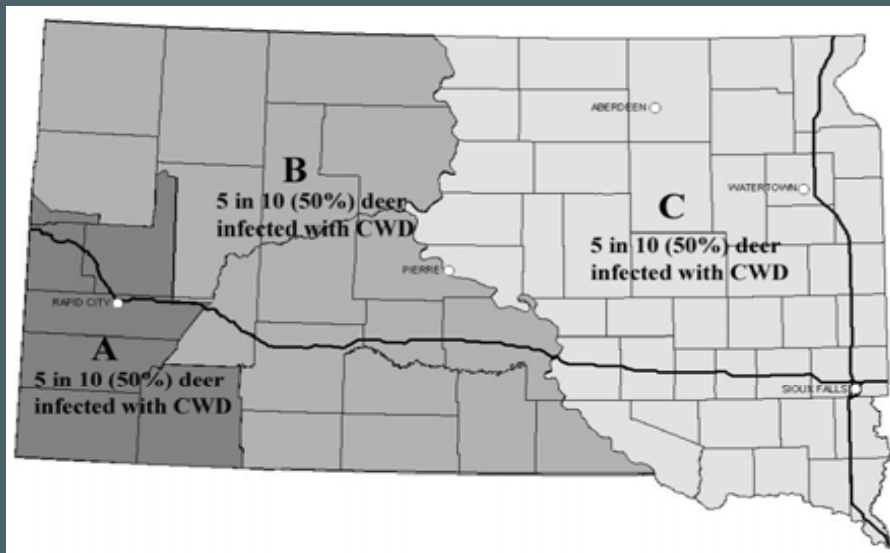
- ◉ Prevalence of CWD in state
- ◉ Hypothetical human impact of CWD
- ◉ Perceived personal risk
- ◉ Location of hunting participation (i.e., state, residency)



Prevalence & Human Impact: 6 Hypothetical Scenarios



No evidence CWD poses a health risk to humans



Evidence shows CWD can be *transmitted to humans* & hunters have *died* from CWD

Hypothetical Scenarios

Scenario	Prevalence Zone A (%)	Prevalence Zone B (%)	Prevalence Zone C (%)	Human Impact
1	10	0	0	No
2	30	10	0	No
3	50	30	10	No
4	50	50	50	No
5	10	0	0	Death
6	50	50	50	Death

Perceived Personal Risk

6-item standardized index (Cronbach alpha = .91)

- ⦿ Because of CWD, I have concerns about eating deer meat
- ⦿ Because of CWD, how concerned are you about your own personal health?
- ⦿ How much risk do you feel is associated with:
 - inadvertently eating meat from animal with CWD?
 - contracting a disease caused by CWD?
 - becoming ill from CWD?
 - death from CWD?

Dependent Variable: Hunter Response

Given the scenario, what would you do?

- hunt deer in zone in state I hunt in most often
- hunt deer in state, but switch to different zone
- give up deer hunting in state, but hunt in another state
- give up deer hunting altogether

Stop hunting deer in state

Bivariate Results

Independent Variable	% Likely to quit hunting because of CWD*	Estimated odds of quitting	<i>r</i>
Entire sample	27	.37	
Prevalence			.37
10% zone A, 0% zone B, 0% zone C	13	.15	
30% zone A, 10% zone B, 0% zone C	9	.10	
50% zone A, 30% zone B, 10% zone C	24	.31	
50% zone A, 50% zone B, 50% zone C	52	1.08	
Human impact			.25
No	19	.24	
Yes	43	.74	

* All Chi-square values significant at $p < .001$

Bivariate Results

Independent Variable	% Likely to quit hunting because of CWD*	Estimated odds of quitting	<i>r</i>
Perceived personal risk			.17
No risk	19	.23	
Slight risk	30	.43	
Moderate risk	40	.66	
Extreme risk	46	.86	

* All Chi-square values significant at $p < .001$

Bivariate Results

Independent Variable	% Likely to quit hunting because of CWD*	Estimated odds of quitting	<i>r</i>
CWD state			-.05
No (AZ, ND)	30	.42	
Yes (SD, WI)	25	.33	
Residency			-.05
Nonresident	29	.41	
Resident	24	.32	

* All Chi-square values significant at $p < .001$

Logistic Model

Predictor	B	Odds ratio	<i>p</i> -value
Constant	-2.73	.07	< .001
Prevalence	.05	1.05	< .001
Human impact	1.19	3.28	< .001
Perceived personal risk	.66	1.94	< .001
Resident	-.42	.66	< .001
Arizona	.03	1.03	.599
North Dakota	.34	1.40	< .001
Wisconsin	-.27	.77	< .001

Log-linear Model

Significant interactions	<i>df</i>	Partial χ^2	<i>p</i> -value
2-way associations			
12 significant interactions			
3-way associations			
Quit Hunting * Prevalence * Human Impact	3	173.99	<.001
Quit Hunting * Prevalence * CWD State	3	50.64	<.001
Quit Hunting * Perceived Risk * CWD State	3	21.10	<.001
Quit Hunting * Perceived Risk * Resident	3	16.06	.001
Quit Hunting * CWD State * Resident	1	5.74	.017
Perceived Risk * CWD State * Resident	3	55.05	<.001
4-way associations			
Quit Hunting*Prevalence*Human Impact*CWD State	3	12.77	.005

Summary

- ◉ Prevalence, human impact, perceived risk increase likelihood of quitting
 - ◉ if prevalence increases dramatically, participation decreases substantially
 - ◉ if high prevalence combined with human death from CWD, decline even greater
 - ◉ human impact & perceived health risk largest effect on behavior
- ◉ Nonresidents more likely to quit, North Dakota hunters *most likely to quit*, Wisconsin hunters *least likely*



Summary

- Decision to quit hunting interacts with all five predictors; all predictors influence hunter behavior
- Illustrates complexity of understanding hunter behavior in response to CWD
- Highlights importance of moving beyond bivariate analyses



Implications

- ⦿ Psychological factors (human impact, perceived risk) play substantial role in hunter decisions to hunt
- ⦿ Hunter response to CWD function of interaction among multiple variables
- ⦿ Reinforce need for managers to:
 - continue to inform hunters about CWD
 - stress no link between CWD & human health



Questions or Comments?

