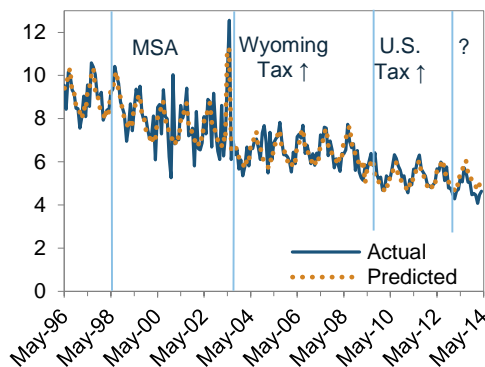


Putting a Statistical Model in Context: Making Sense of Unexpected Evaluation Findings in the Absence of Formal Research

A statistical model of per capita cigarette tax stamp purchases showed an unexplained decline beginning in 2012.

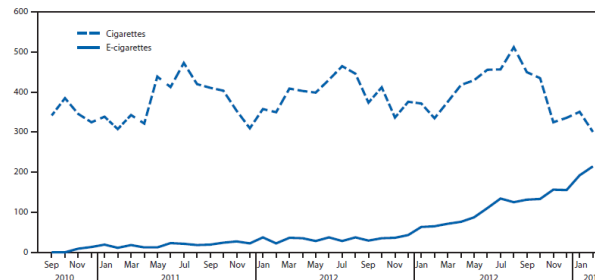
Unexplained Decline in Cigarette Consumption



This decline was not accounted for by declines in adult or high school smoking prevalence rates, which have been declining at a *steady* rate.

Because the lead author follows CDC on social media, he was aware of data showing a coincidental increase in calls to poison control centers regarding e-juice, the liquid used in electronic nicotine delivery systems (ENDS). This was the first piece of information linking (ENDS) to the decline in cigarette consumption.

CDC Data for Poison Control Calls



National surveys provided additional evidence showing that the decrease in cigarette consumption coincided with increased popularity of ENDS, based on adult and youth prevalence rates.

Lesson Learned

According to Hill's criteria of causation, the available evidence suggests that **ENDS are a plausible factor to explain Wyoming's decline in cigarette consumption.**

Hill's (1965) Criteria of Causation

Strength: Large increases in every indicator of ENDS popularity

Consistency: Various indicators of ENDS popularity

Specificity: Mixing national and state data is problematic

Temporality: The timing consistently coincides

Dose-response curve: Increases in ENDS popularity are greater than decrease in consumption

Plausibility: Substituting ENDS for cigarettes is a key public health concern

Coherence: Partial substitution or addition of ENDS to a smoking habit would explain the difference in rates

Experiment: Wyoming consumption data may serve as a pilot for analysis with a national data source

Analogy: The increased popularity of ENDS may decrease cigarette consumption in a way that compares to a small tax increase.

Laran H. Despain,
Associate Research Scientist

Nanette M. Nelson,
Associate Research Scientist

Annual Conference of the American
Evaluation Association

Chicago, IL, November 11, 2015



References for Full Poster

CDC. (2015). Tobacco use among middle and high school students—United States, 2011–2014. *MMWR*, 64, 381–385.

CDC. (2014a). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, GA: USDHHS, CDC.

CDC. (2014b). Notes from the Field: Calls to Poison Centers for Exposures to Electronic Cigarettes—United States, September 2010–February 2014. *MMWR*, 63, 292–293.

Hill, A. B. (1965). The environment and disease: Association or Causation? *Proceedings of the Royal Society of Medicine*, 58, 295–300.

King, B.A., Patel, R., Nguyen, K., & Dube, S.R. (2015). Trends in awareness and use of electronic cigarettes among U.S. adults, 2010–2013. *Nicotine & Tobacco Research*, 17, 219–227. doi: 10.1093/ntr/ntu191

McMillen, R.C., et al. (2014). Trends in electronic cigarette use among U.S. Adults: Use is increasing in both smokers and nonsmokers. *Nicotine & Tobacco Research*, 17, 1195–1202. doi: 10.1093/ntr/ntu213

WYSAC. (2014). *Prevention Needs Assessment [Data File 2001–2014]*. Laramie, WY: Wyoming Survey & Analysis Center, University of Wyoming.

WYSAC. (2014). *Tax revenue and cigarette consumption in Wyoming: May 1996–April 2014* by N. M. Nelson, & M. Kato. (WYSAC Technical Report No. CHES-1442). Laramie, WY: Wyoming Survey & Analysis Center, University of Wyoming

Putting a Statistical Model in Context: Making Sense of Unexpected Evaluation Findings in the Absence of Formal Research

Contact the authors

Laran H. Despain, 307-766-2342

ldespain@uwyo.edu

Nanette M. Nelson, 307-399-0496

nnelso13@uwyo.edu

The poster and this handout are also both available at AEA's eLibrary

<http://tinyurl.com/om8bmzg>

For more about our data connecting tobacco prevention policies, including using structural analysis as an exciting new way to approach the model, please consider the following session at this year's conference:

Method Comparisons

November 13, 1:45 - 3:15, Skyway 284

The WYOMING SURVEY & ANALYSIS CENTER at the University of Wyoming seeks to provide clear, accurate and useful information to decision-makers through applied social research, scientific polling, information technology services, and rigorous program evaluation. Without bias and with the highest standards of validity, WYSAC collects, manages, analyzes, and reports data through research contracts for the public and private sector in Wyoming and throughout the nation.

WYSAC's staff includes professional researchers with degrees in criminal justice, statistics, political science, psychology, sociology, information technology, economics, business, and other policy-relevant disciplines.

Our offices provide complete facilities for policy research, including a fully equipped call center for computer-aided telephone interviewing and the hardware and software for automated data entry by optical scanning.