

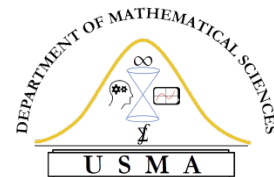


UNITED STATES MILITARY ACADEMY
WEST POINT

Causal Inference in Introductory Statistics Courses

Kevin Cummiskey, Bryan Adams, James Pleuss, Dusty Turner,
Nicholas Clark, Krista Watts

Department of Mathematical Sciences, West Point, New York





- Goal is to perform inference under *changing* conditions, such as those induced by treatments or external interventions.¹
- Requires causal assumptions provided by investigator.
- Frequently use graphical aids called causal diagrams.

1. Pearl J. (2010). An introduction to causal inference. *The international journal of biostatistics*, 6(2), 7.
doi:10.2202/1557-4679.1203



- Why discuss causal inference in introductory courses?
 - Supports GAISE recommendations¹
 - Develops statistical and multivariable thinking
 - Gives students experience with investigative process
 - Fosters active learning

1. Carver R, Everson M, Gabrosek J, Horton N, Lock R, Mocko M, Rossman A, Rowell GH, Velleman P, Witmer J, Wood B. Guidelines for assessment and instruction in statistics education (GAISE) college report 2016.



- What topics in causal inference should we teach?
 - Difference between associational and causal relationships
 - Confounding
 - Causal diagrams
 - Methods for confounding adjustment



- Further discussion
- Example student activity
- Instructor resources
- For more information, see
<https://github.com/kfcaby/causalLab>