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A few approaches to mediation analysis

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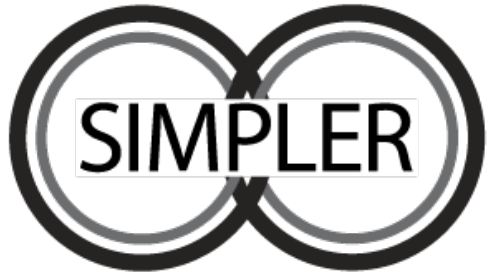
Institutionen för kirurgiska vetenskaper

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The Medical Epidemiology research group



Swedish Infrastructure for Medical Population-Based
Life-Course and Environmental Research

www.simpler4health.se



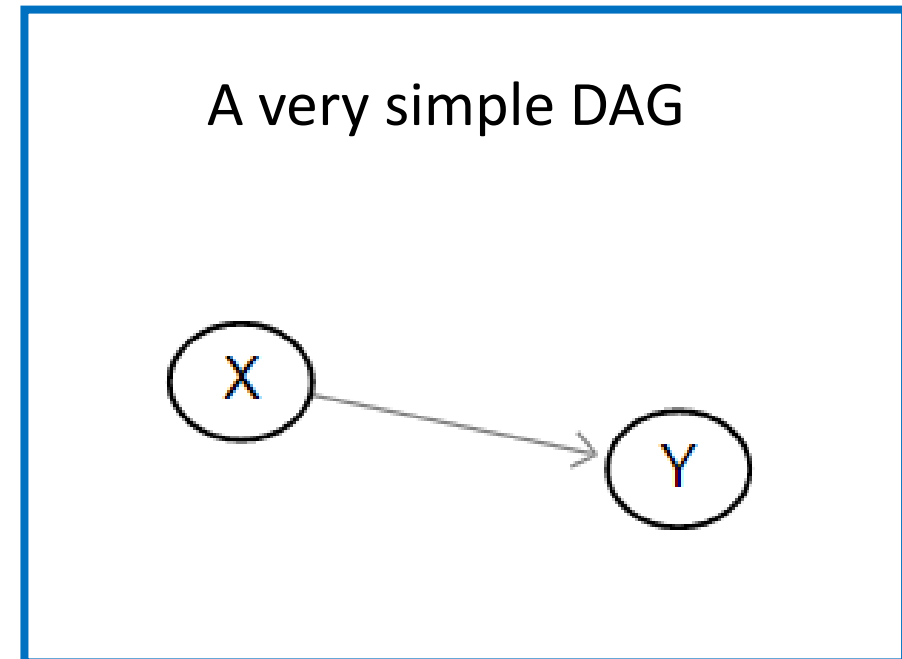
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Research interests

- Lifestyle factors (diet, physical activity)
- Obesity, metabolism, type 2 diabetes
- Cardiovascular disease
- Fracture
- Epidemiological methods
 - Causal inference methods

Causal diagrams (directed acyclic graphs, DAGs)

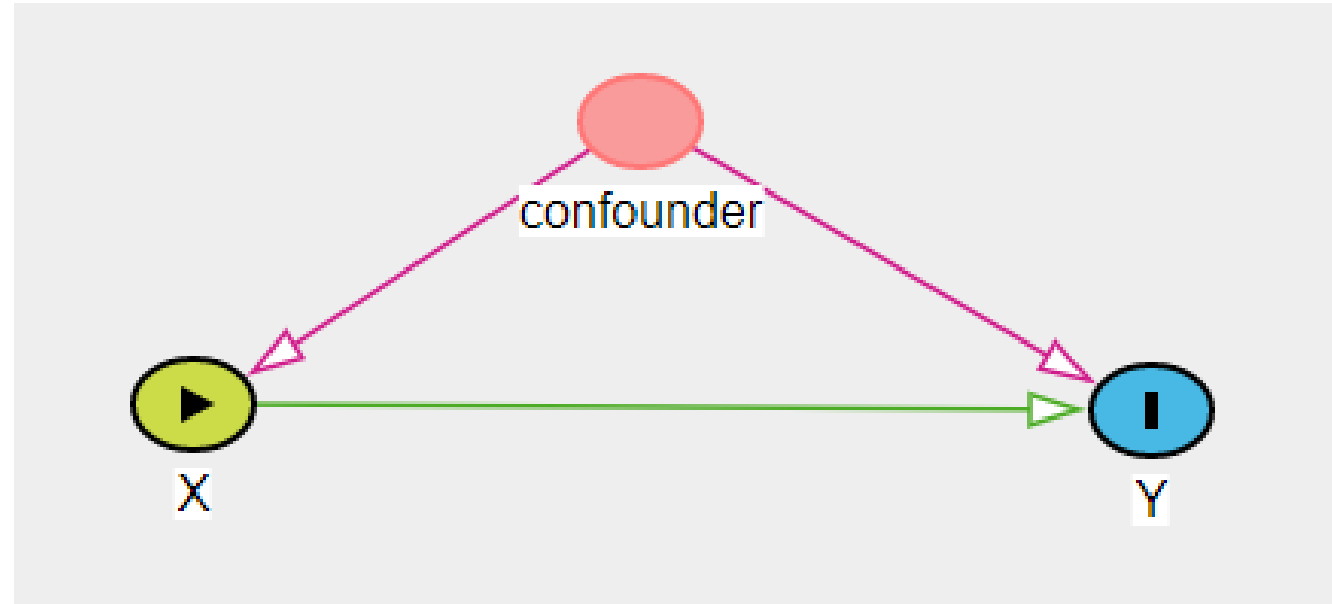
- Illustrate the underlying causal assumptions
- An arrow indicates a causal effect of one factor on another
- A useful tool for epidemiologists
 - Selection of confounders
 - Mediation analysis
 - Graphical presentation of biases
 - Mendelian randomisation





Causal diagrams - paths

- A path is a consecutive sequence of arrows, disregarding directionalities
- Can be unblocked or blocked
- An unblocked path can either represent a causal effect or transmit a correlation that is not causal (biasing path)

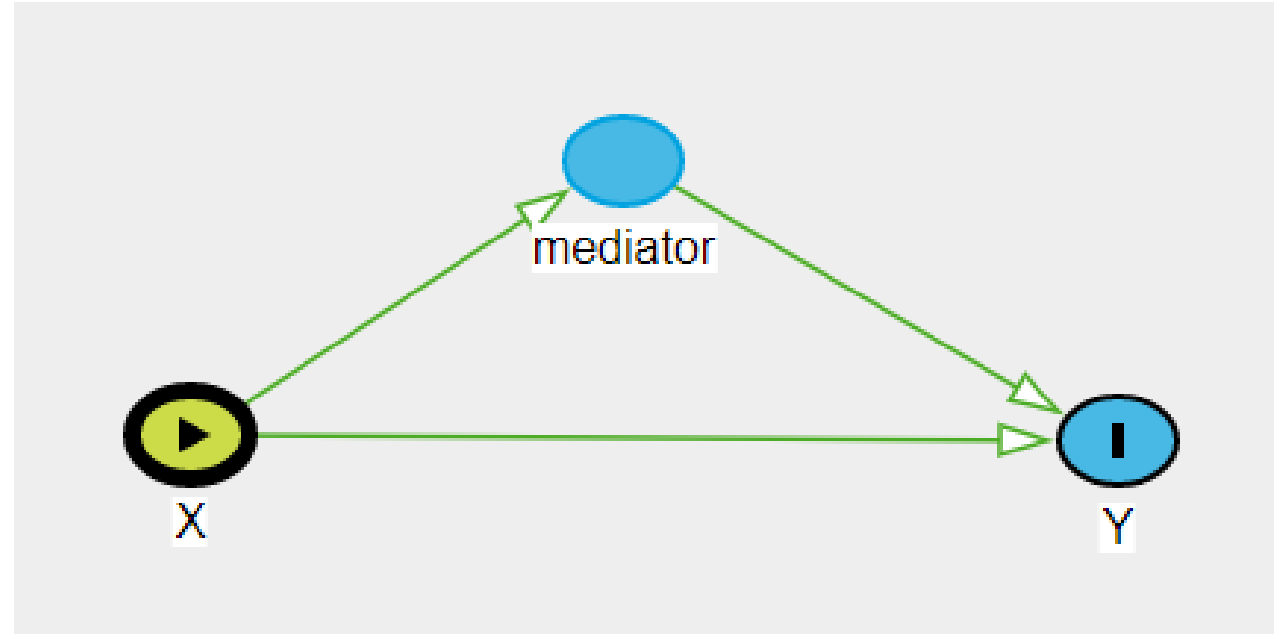


- A confounding path is unblocked if unconditional on the confounder
- Biasing path
- Path is blocked by conditioning on confounder



Causal diagrams - paths

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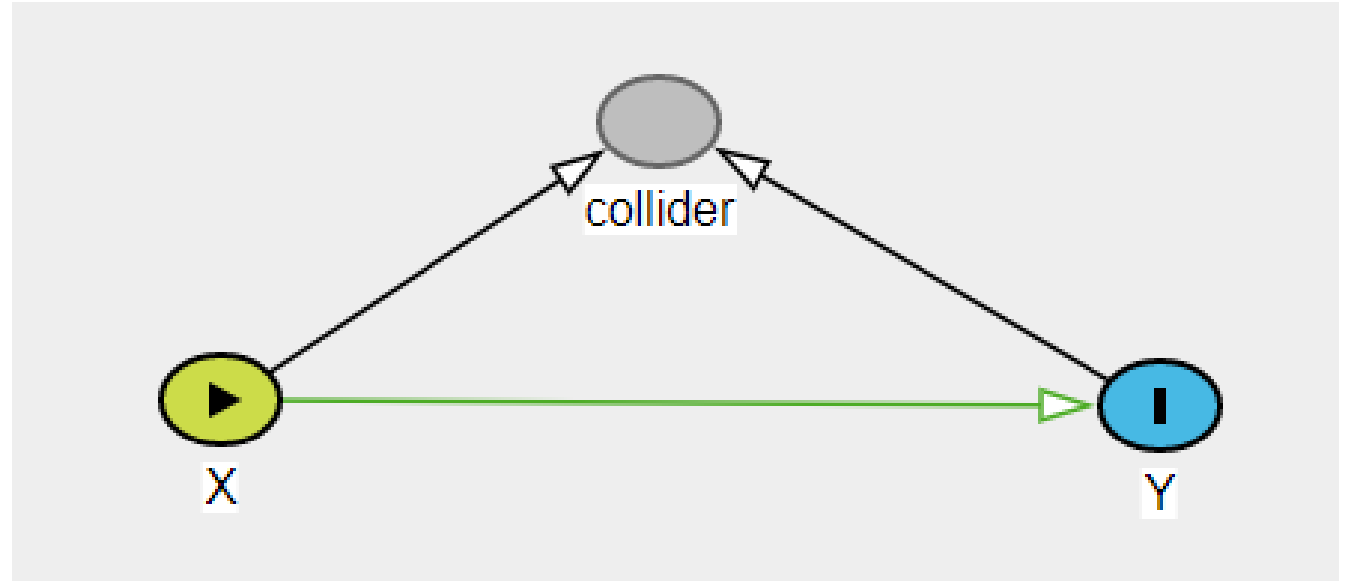


- The path via the mediator represents an indirect causal effect – path is unblocked
- Causal path
- Path is blocked by conditioning on mediator



Causal diagrams - paths

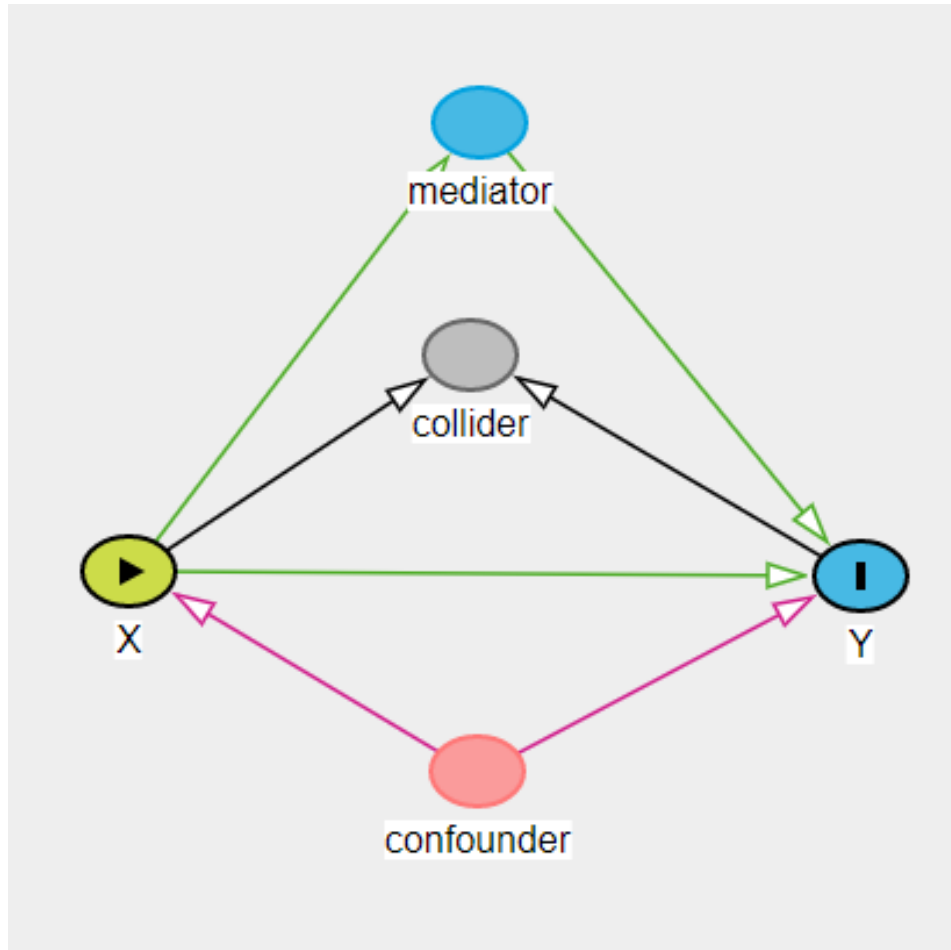
- A path is a consecutive sequence of arrows, disregarding directionalities
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- The collider path is blocked (arrows collide)
- The path is unblocked by conditioning on the collider → biasing path
- Collider bias, Berkson's bias



Causal diagrams



- Need to illustrate all factors and all causal effects
- A node can also represent more than one variable (a vector of variables)
- Illustrates your causal assumptions
- Is based on knowledge in your research field



Causal diagrams in mediation analysis

