**Lab**

**Concepts of Causal Mediation Analysis**

**P1822 – Statistical Methods for Causal Inference**

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Mediation – Concepts and Identification

1. Consider the following population of individuals and suppose we knew all the potential outcomes, let’s review the definition of causal contrasts relevant in mediation analysis:

Type M0 M1 Y00 Y10 Y01 Y11

1 0 10 1 0 1

2 1 1 0 1 0 0

3 0 1 0 0 0 1

4 1 0 1 1 0 1

5 0 1 0 1 1 1

6 0 0 0 0 1 1

For individuals of type 4, 5 and 6 (1, 2 and 3 were analyzed in the lecture),

1. Give the outcomes that would have actually occurred if persons of that type were exposed.
2. Give the outcomes that would have actually occurred if persons of that type were unexposed:
3. Then calculate
4. the total effect,
5. both controlled direct effects, and
6. the natural direct and indirect effects for individuals of types 4, 5 and 6.

2. Consider the causal diagram below.

A

M

Y

C

L

1. Are the controlled direct effects (CDE) identified in this causal diagram? Why or why not?
2. Are the natural direct (NDE) and indirect effects (NIE) identified in this causal diagram? Why or why not?
3. Could this diagram have come from a trial in which treatment A was randomized within strata of C? Why or why not?