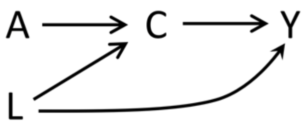
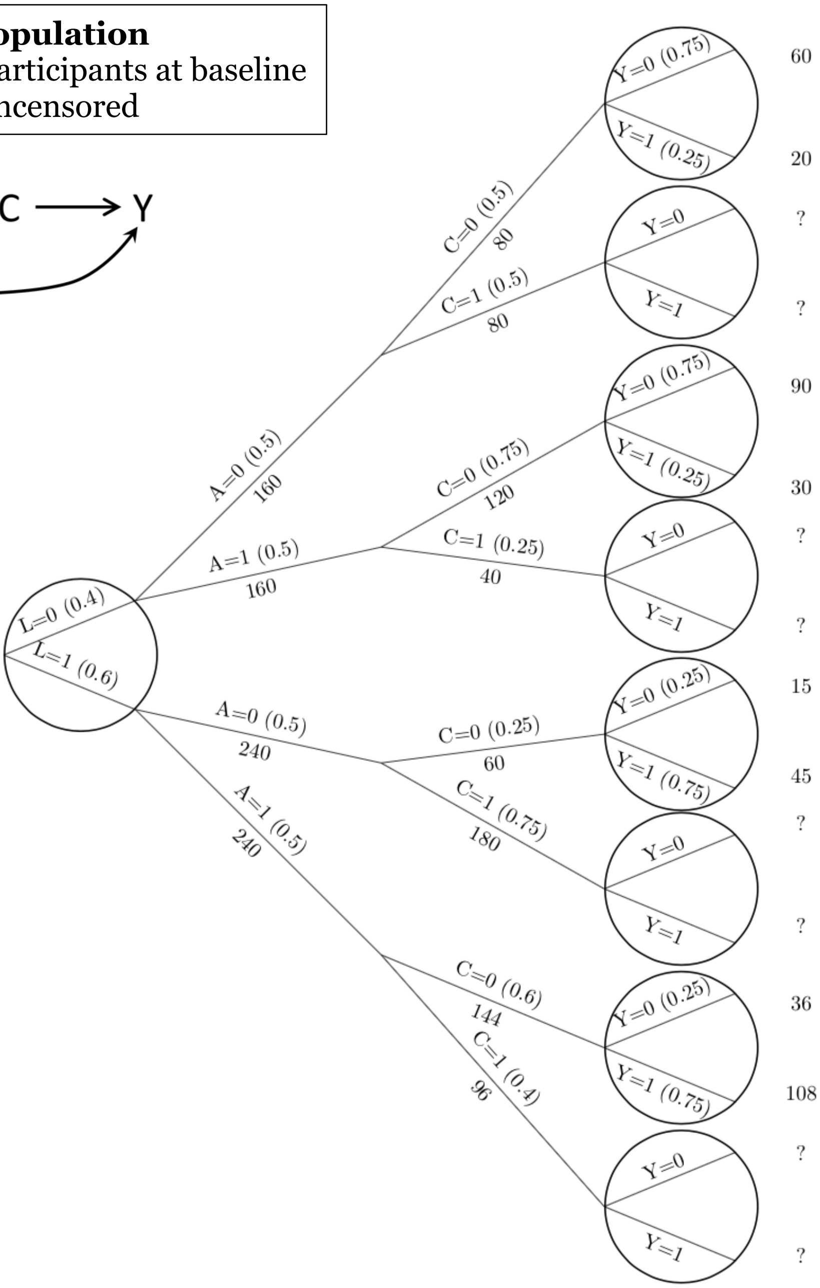
# EPI289. Models for Causal Inference

## Inverse probability weights for selection bias:
## A worked example using nonstabilized and stabilized weights

**Study population**
N=800 participants at baseline
N=404 uncensored

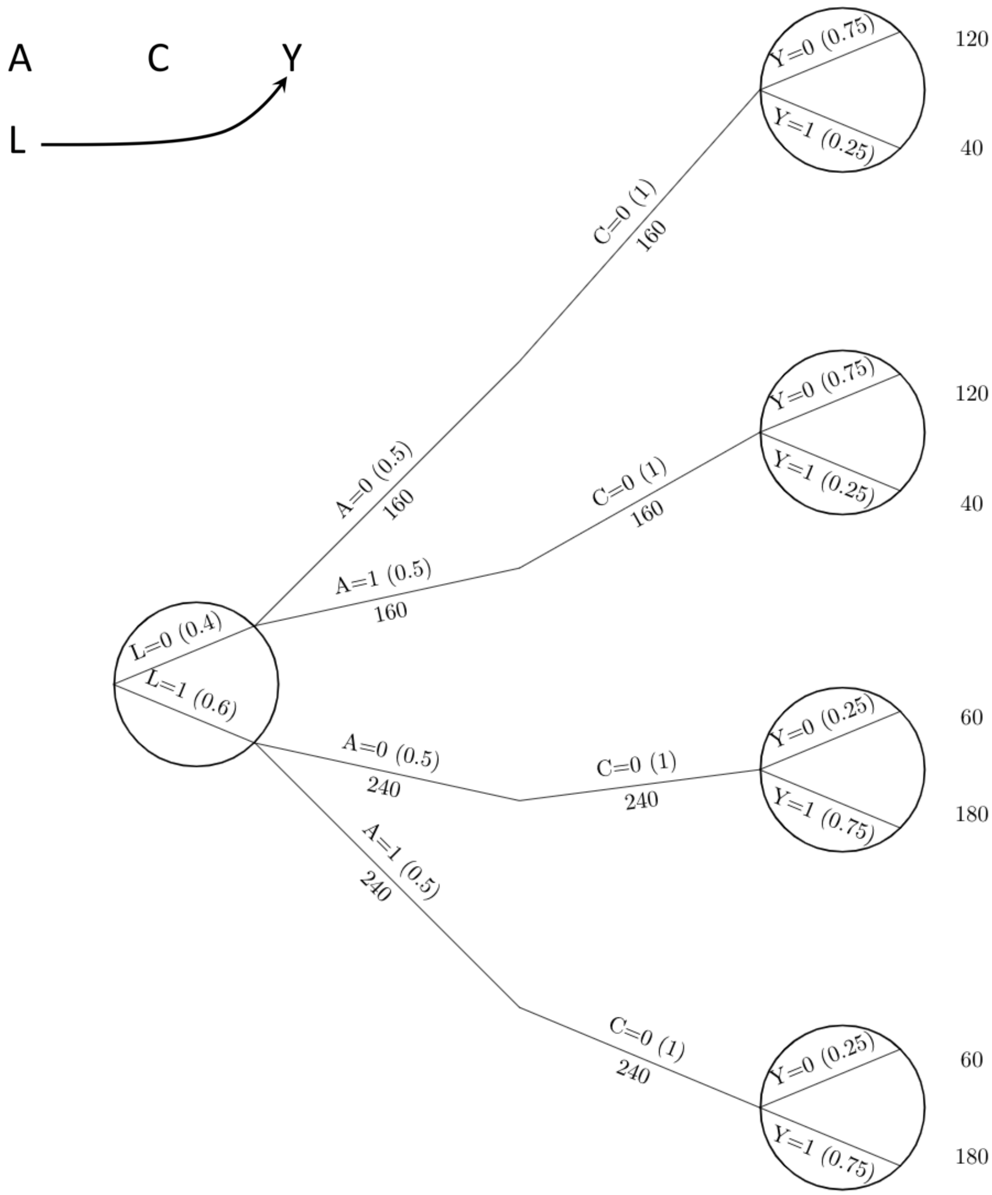



In analysis restricted to the uncensored (C=0),
Risk difference = [(30+108)/(144+120)] – [(20+45)/(60+80)] = 0.0584 ≈ 0.06 (6 deaths per 100 people over the study period)

**Pseudo-population**
**(nonstabilized weights for censoring)**
N=800

$$W^C = \frac{1}{\Pr\left[C = 0 | A, L\right]}$$




1/0.5=2

1/0.5=2

1/0.75=4/3

1/0.75=4/3

1/0.25=4

1/0.25=4

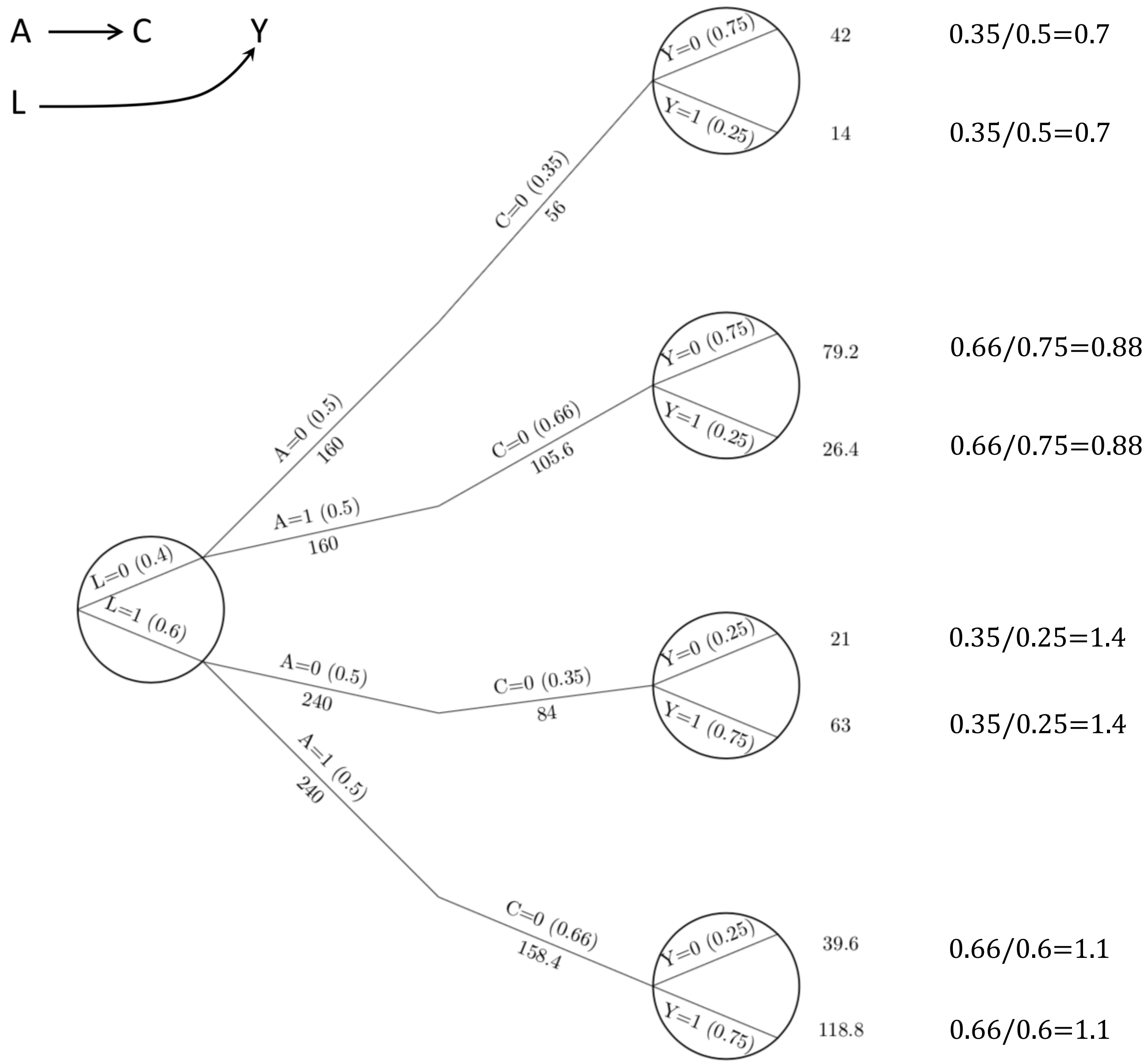
1/0.6=5/3

1/0.6=5/3

- Nonstabilized weights were applied to the uncensored in the original population
- The size of the pseudo-population is n=800 (as if nobody was censored)
- Risk difference = [(180+40)/(180+60+40+120)] – [(180+40)/(180+60+40+120)] = 0
- We have removed the arrows from A→C and L→C
  - Pr[C=0|A=0] = Pr[C=0|A=1] = 1
  - Pr[C=0|L=0] = Pr[C=0|L=1] = 1

**Pseudo-population**
**(stabilized weights for censoring)**
N=404

$$SW^C = \frac{\Pr[C=0|A]}{\Pr[C=0|A,L]}$$




- Stabilized weights were applied to the uncensored in the original population
- The size of the pseudo-population is n=404 (selection, but no selection bias)
- Risk difference = [(118.8+26.4)/(118.8+39.6+26.4+79.2)] – [(63+14)/(63+21+14+42)] = 0
- We have removed the arrow from L→C
  - Pr[C=0|L=0] = (56+105.6)/320 = 0.505
  - Pr[C=0|L=1] = (84+158.4)/480 = 0.505
- The arrow from A→C remains
  - Pr[C=0|A=0] = 0.35
  - Pr[C=0|A=1] = 0.66