

10/25/11 Used slides again \rightarrow Example of Abadie & CVD
 \hookrightarrow Looks like Maya's slides

On randomization: $A \perp Y|w$

* this is for each index time point.

* we know within clusters through that obs are correlated

\hookrightarrow account for this in IPTW by taking cumulative $p(A_i|w_i)$

10/27/11 Recap: we discussed

$$L(t) = f_{L(t)}(\bar{L}(t-1), \bar{A}(t-1), U_{L(t)}), t = 0, \dots, k+1$$

$$A(t) = f_{A(t)}(\bar{L}(t), \bar{A}(t-1), U_{A(t)}), t = 0, \dots, k$$

$$\vec{O} = (L(0), A(0), L(1), A(1), \dots, L(k), A(k), L(k+1))$$

$$\text{Can now look at } \bar{L}_{\bar{a}}(t) = f_{\bar{L}(t)}(\bar{L}_{\bar{a}}(t-1), \bar{a}(t-1))$$

$$\hookrightarrow \text{would have } L(0) = \bar{L}(0)$$

$$\bar{L}_{\bar{a}}(1) = f_{\bar{L}(1)}(L(0), a(0), U_{L(1)})$$

$$\bar{L}_{\bar{a}}(2) = f_{\bar{L}(2)}(L(0), \bar{L}_{\bar{a}}(1), a_0, a_1, U_{L(2)})$$

$$\bar{L}_{\bar{a}}(k+1) = f_{\bar{L}(k+1)}(\bar{L}_{\bar{a}}(k), \bar{a}(k), U_{L(k+1)})$$

$$\text{So } \Rightarrow \bar{L}_{\bar{a}} = (L(0), \bar{L}_{\bar{a}}(1), \dots, \bar{L}_{\bar{a}}(k+1))$$

\hookrightarrow from this, can determine causal effect = function of prob $\bar{L}_{\bar{a}}$
 ↓ for a collection of \bar{a}

$$\text{example: } E(Y_{\bar{a}_1}) - E(Y_{\bar{a}_2})$$

Causal effects = Parameters (functions) of counterfactual dist and U's

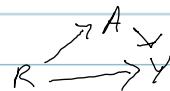
written as $\psi^F(P_{U,X}) \Rightarrow \psi^F: \mathcal{M}^F \rightarrow \mathbb{R}$

Problem: We don't observe the U's, only the A(t)'s and L(t)'s

Some literature analyzes by assigned Tx (W, R, A, Y) , i.e. Principal Stratification

- ↳ they look at $E[Y_{R=1} - Y_{R=0} | A_0 = 0, A_1 = 1]$
- * Requires assumptions beyond RA
- Another problem: ... missed it
- Key Point: Mark says not good though

When used ex: $E[Y_{R=1} - Y_{R=0} | A_0 = A_1 = 1]$



* would assume $R \rightarrow A$ effect = 0 and
 our estimate is a direct effect.

Batteries running low

Challenge: we might want to identify $P(\bar{L}_a = \bar{l})$

↳ need sequential RA: $A(t) \perp L_a | \bar{A}(t-1), \bar{L}(t)$

Recall: $A(t) = f_{A(t)}(\bar{A}(t-1), \bar{L}(t), U_{A(t)})$

conditioning on this results in only $U_{A(t)}$
 being random, $\bar{A}(t-1), \bar{L}(t)$

i.e. $U_{A(t)} \perp U_{A(s)}$ for $s > t$ means SRA holds

↳ stronger assumption

gives you identifiability of whole dist of L_a .

If instead, want $P(Y_a = y)$,

SRA: $A(t) \perp Y_a | \bar{A}(t-1), \bar{L}(t)$

* sufficient for param $P(Y_a = y)$

So, let's look at $P(L_a(t) = l(t)) | \bar{L}_a(t-1) = \bar{l}(t-1)) \stackrel{\text{SRA}}{=} P(L(t) = l(t)) | \bar{L}(t-1) = \bar{l}(t-1), \bar{A}(t-1) = \bar{a}(t-1)$