Dealing with Spillovers: Intestinal Worms in Kenya

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- Once infected, worms eventually die on their own if there's no reinfection (after 1-2 years)
- treatments kill the infection in 1 dose

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- Children are both infected more and spread them more due to poor hygeine
- If your neighbors have active infection, you are more likely to contact these worms
- This means if we treat your neighbors, it should also lower your risk of infection

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- But, its not so clear that most worm infections cause that much sickness
- So, we look at schooling attendance as a measure for health

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- So, randomization at school level. 1/3 of schools receive deworming pills in 1998, 1/3 in 1999, 1/3 in 2000.

Baseline situation

- Worms tests were run at baseline
- 92% had some worm infection
- 37% had severe worm infection
- Note: Is this an accurate estimate of how much worm infection is among children in community?
- Should kids who aren't in school have more or less infection than those in school?

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- Participation is high: 78% participation in 1998, 72% in 1999

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- G_2 students also sicker and shorter than G_1 students in 1999. Overall, it looked like a success.

Within School Spillovers

So, if we want to find out the effect of treatment on the treated versus treatment on the untreated. Think about after we've collected the data in 1999. We already know who is going to get treated from group 2, but they haven't been treated yet.:

$$TOT : \bar{Y}_{1999}^{T,G_1} - \bar{Y}_{1999}^{T,G_2}$$

That is, compare the worm level of those who received treatment in group 1 schools 1 year after they had received it (in 1999) to the worm count of people in Group 2 schools who we know are going to receive treatment later than year
If we want to measure treatment on the untreated

$$TOUT : \bar{Y}_{1999}^{UT,G_1} - \bar{Y}_{1999}^{UT,G_2}$$

That is, we can measure the health of those who went untreated in group 1 with those who we know will go untreated in group 2

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- For this to be true, we should check whether the rules changed, or whether the people who chose treatment in 1999 look like the people who chose treatment in 1998.
- For the untreated: we have two types: People who chose to be untreated, and girls over 13 who are always untreated. We can definitely compare girls over 13 between G_1 and G_2 schools – since we chose schools randomly, and girls don't have a choice in being over 13, on average girls over 13 should be the same in both schools. But for the others, we again have to check that they look similar

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    - Not too surprising – among students, which group would we expect to have the best hygeine (and lowest worm risk) to begin with?

Schooling Effects

Still don't know if these lower worm counts translate into a better lifestyle. Look at school attendance rates.

Group	G_1	G_2	G_3
1999, $b+g<13$	84%	73%	77%
1999, $g>13$	86%	80%	81%
2000, $b+g<13$	71%	72%	66%
2000, $g>13$	63%	65%	59%

See that treated groups are more likely to be in school than control. Still see big externalities on girls over 13.

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- Cost effectiveness?
- One deworming treatment costs $.49.
- Find that the cost is $5 per Disability-Adjusted life-year, but 76% of that effect is through spillovers. If they didn't measure spillovers, they'd have missed most of the benefit of the program!