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PROFESSOR:

So where we left it last time is the access to family planning, the access to contraception, et cetera, did not play such an important role in keeping people's families small. It doesn't mean that it's not a good thing to do. It certainly helps people time their fertility. It makes them happier and all other good things, but it was not the main determinant of family size.

And so then the next question, obviously, is then what is the determinant of family size? If people are not constrained by their lack of access to contraception to choose the family size that they want, how do they decide to choose their family size?

And there are, I think, only two big classes of factors that might matter. One is social factors, so both what the community thinks is right, what the country thinks is right, what your husband thinks is right. And the other is the cost and benefits of having sex, which is pleasant, and having babies, which you might or might not want to have at a specific time of your life.

So both of these things are traded off in some ways. And the issue is whether people do that effectively, whether they do that voluntarily, whether there is some correction coming from society or something like that.

So social norms clearly play a role. So one example is this example of Matlab, in Bangladesh, where this program was introduced, and a community worker came and tried to persuade woman.

One thing that has happened is that, at the beginning of the program, the introduction was very, very slow. The take-up of contraception was very, very slow. And then it started to explode, the take-up started to explode. And then it comes down again.

So you get a little bit of an s-shape in adoption of the contraception. And what kind of mechanism would explain, what kind of social mechanism explains this kind of diffusion curve? You must have seen that, either in other classes or you can think about it.

AUDIENCE:

Viruses.

PROFESSOR: Exactly. This is how viruses spread. This is also how iPads spread or any new innovation. And why does it spread in this way? Why does it have this shape?

AUDIENCE: If it's contagious, initially, then a smaller group of people haven't. I guess that people that interact with each other at some point. I mean it kind of depends on something, I don't exactly know. I don't know the exact mechanism.

PROFESSOR: Right. But you get the drift. It spreads mostly like viruses or new products, which spread mostly by infection. At the beginning, no one is infected, so the innovation or the virus doesn't spread. And then more and more people get infected. So they get chances to infect more people. So there is a sudden take off. And then after a while, everybody is infected. So the infection has nowhere to go anymore. So that's why we find this kind of mechanism, both for viruses and for new things.

So the fact that in Matlab the contraception had the same spread, at first very slow and then a sudden take off and then flattening out again, when the take-up was larger, suggests there may have been a contagion phenomenon going on.

So to look at it more directly, there's a paper by Kaivan Munshi, who looked at what happened, whether people do the same thing that their neighbors do. And so the first thing you can do is to say, well, if there are 20 women in my neighborhood and 19 have adopted the contraception, am I more likely to adopt then if there is 0 who have adopted?

And when you do that, you find that indeed people, who had more people who adopted around them, were also more likely to adopt. So is that necessarily a sign that they're learning from each other? What else could be going on?

AUDIENCE: It could just be a copycat effect. So it's not necessarily that you're learning, but you're just doing as you see someone else do.

PROFESSOR: Exactly. So the learning could in a broad sense. First, it doesn't have to be learning something. It could just be pure imitation, where you're trying to figure out what's the fashionable thing to do. So there is no learning going on. That's right. So this is going to be difficult to separate, but even beyond that? Yeah?

AUDIENCE: I guess if more people around you are doing it, there is greater demand in the area. [INAUDIBLE] supplies, but it's just inaccessible.

PROFESSOR: Right. So there might be this effect, which is it might be that, in response to the first demand from the people, there is an excess in supply. Or it could even be that it turns out that the community health worker is better in that particular village.

And so, because she's better and more energetic, she got your neighbors to adopt and, also, yourself to adopt. And the fact that you adopt when your neighbor adopts is not a sign that there is a causal effect of neighbor's adoption on you, which could be coming from copycat or coming from learning, but just that there is one common factor that leads them to adopt and leads you to adopt.

So what he does is that he does something very ingenious. He exploits the fact that most of these villages have Hindus and Muslims. And there is only one community health worker for both communities. But Hindus don't speak to Muslims-- certainly not about contraception. And Muslims don't speak to Hindus.

So now he's looking at, if it was the certain hypothesis that the reason why our actions are correlated is because of the community health worker. Should I see that, if I'm a Muslim woman, there is also a correlation between my adoption and that of the Hindu woman if it's due to the community health worker.

AUDIENCE: Can you restate the question?

PROFESSOR: So if it is due to the community health worker, should I see a relationship between the adoption of the Muslim woman and the adoption of Hindu woman?

AUDIENCE: Yes.

PROFESSOR: Yes. If it is due to the community health worker, because she's serving both communities, we should see this correlation. Sorry, one more came. Thank you. Good effort. But if it is due to the social learning, should we see a relationship between the adoption of the Hindu woman and adoption of the Muslim woman?

No. So if it's due to the people learning from each other or even copying each other, they can't copy the Muslims, because they never will ask them if they are Hindu and vice versa.

So he does that. And what he finds is that the correlation is only within community, which is an indication that, probably, people are trying to figure out what's the social norm around the

social group or are copying each other. And it's just not a joint effect of the community health worker.

Another way in which you would peak at the social norm is by watching what's on TV. And there is a very nice paper on the telenovelas in Brazil. So Brazil is a very Catholic country and, until relatively recently, was not a very free society, until about 15, 20 years ago. And it was certainly not particularly encouraging family planning.

But the telenovelas, which are like soap operas, became very, very popular. And they became very popular, in part, because they were quite good. And the reason why they were quite good-- I'm told, because I'm yet to watch one, my Portuguese being not quite up to crack-- is that a lot of people who would otherwise have been artists in other fields could not really do it very easily in Brazil, so they all went and did telenovelas.

And they were aired on one channel, called Rede Globo, which was not available everywhere at the beginning, which progressively spread.

So what this article did is that they looked at the diffusion of the Rede Globo all over Brazil and compared the number of children that a women had before and after the introduction of Rede Globo in places where it got introduced. So exploiting, in that way, the progressive introduction.

Of course, the cities got it first and then the more rural areas. So places that got it first, in general, had fewer children. But if we compare before and after you get it, in places that get it and places that don't, then we get a sense about what is the effect of Rede Globo.

And what they found is that the women, who were of reproductive age after Rede Globo was introduced, had fewer children in their lifetime than the places that were in reproductive age before Rede Globo came.

And another thing that was kind of cute, as a result of that, is that many of the kids that were born in this area were born after the characters of the telenovelas. Yeah?

AUDIENCE: [INAUDIBLE] these telenovelas, the main characters have few children?

PROFESSOR: Yes. Exactly. The reason why this happened is that the telenovelas were promoting, not necessarily for the sake of it, but the main characters in the telenovelas were people, some of them with 0 children, if they had children, with a small family.

So they were promoting a model of like a modern woman who had few children, which kind of helped or contributed to slowly shift the norm. Yes, Brazil expertise.

AUDIENCE: So it was is like the main channel. Like if there is one that people actually don't have to pay, necessarily, for it, you just get it for free, if you just have a TV So part of the access to that channel comes with some areas that are growing into big cities, becoming a little bit more industrialized. So that could be another thing, stuff like that. People are getting access to the TV channel, that means that the country as a whole is becoming more and more industrialized. And they are sort of adapting how many kids they have to fit the model a little bit better.

PROFESSOR: Right.

AUDIENCE: So the actual cause could be different. Maybe it's not just the fact that they were watching TV, but the fact that they gained access to it and what that implies.

PROFESSOR: So what you are saying is that TV came on the tail of other changes in the same areas?

AUDIENCE: Right. Some places becoming a little bit more urban and how that's changed.

PROFESSOR: Yeah. So that's a very good point, which is always with this different and difference kind of strategy. The always are worried about that. At least we are not comparing directly the city to the rural areas, but we are comparing the rural areas as they are becoming industrial enough or developed enough to get the channel.

Because, presumably, the channel decided to come when there was enough people who were rich enough to buy a television. And therefore, they may have been looking, not only at the level of development of the place, but how it was moving. And if that is the case, then we could be picking part of those trends.

So that is something where we could never be completely sure, because we haven't randomized. So those underlying trends, we don't observe them. And so it's quite possible that you are right. So these doubts remain.

What the author does is try to look at whether there are trends in fertility before, that the fertility was already a little bit declining before the channel came in. Which we would probably observe, if the stories you're talking about is the one, which is, as I see that the place is becoming more industrialized, richer et cetera, I'm putting the TV there, as the president of

Rede Globo.

And they don't see that. They see kind of shift in trend around the introduction of the television. But you might be entirely right. That's also why I like the first name thing, that the kids were named after the people in the series. Because that is less likely to be coming from industrialization in general and more likely to be coming from the fact that you've seen them. But that's very well taken.

AUDIENCE: Did they observe a lag? Like the introduction of the TV show and the shift in [INAUDIBLE].

PROFESSOR: Right. Exactly. So that's exactly what they are exploiting. They are trying to look at, particularly, it doesn't reduce the fertility of people who were already past their prime fertile age when the TV came. It reduces only the fertility of women who were in their late teens and then early 20s when the TV came, and whose views were shaped by this.

And this is exactly this timing that helps, to some extent, discriminate between the idea that the TV caused the reduction of the fertility and your perfectly legitimate point that, in fact, in part it could also be that TV is just a proxy for the social progress happening.

So these are all indications that something, which is probably not particularly surprising, is in something as fundamental and deep as how many children you want to have. The social norms around you-- these are very local, your village, your community, your family, your mother-in-law, or society as a whole, as reflected to you by TV-- matter.

But there are also just plain, simple, cost-benefit calculations about do I want a kid at this time, do I want to take the risk of a kid at this time by having unprotected sex, et cetera, et cetera. And one thing that I want to argue is that people are very good at making those calculations.

And in the sense the key group to look at for a test case of this are adolescent girls. Because in these countries and elsewhere, we kind of suspect adolescent girls to be not the best at making those calculations, necessarily, which is why we see some teenage pregnancies. And so if they can calculate, then it would mean that, presumably, people can calculate them.

Another reason why it's very interesting to look at adolescents, in particular, in Africa, is not only teenage pregnancy, but teenage pregnancy as a sign that you've had unprotected sex, which puts you at risk for a STDs, sexually transmitted diseases, in particular, HIV.

So adolescents have been called the window of hope in the fight against HIV, because A, they

are uninfected. And once you're infected with HIV, you're infected. You can't disinfect the people, so it's better to catch them early.

Second-- and that goes back to the point that you made earlier about was there a lag-- people's sexual preferences, their habits, et cetera, have not yet been formed. And maybe it's right time to catch them to influence their behavior early, and then they'll keep those patterns for the rest of their life.

So there is a lot of effort, the world over, to develop programs to try to teach kids to have a safer sex life. And UNICEF worked on a lot of these programs. But unfortunately, in a lot of countries, there is some pressure to have this program being mainly concerned about abstinence and faithfulness.

So the strategy that is employed in eastern South Africa is called ABCD. So the A is for abstain, B for be faithful, C is for use a condom, and D is or you die. So that kind of encapsulates the HIV prevention strategy.

But in primary schools, and primary school in Kenya goes till grade eight, and people start school late and repeat a lot. So really, kids are like 16, 17, they're still in primary school. So think of primary and junior high.

There was a policy decision that was made in Kenya, which is still a pretty religious country, that condoms could not be discussed in school. So the ABCD program is really an ABD program, abstain or be faithful.

And, in fact, it's a program, which is all day long, to scare kids away and to say, look everybody's dangerous. HIV is everywhere. The most dangerous kid is the kid you meet in a disco. I'm not making any of this up. I've read the little UNICEF books, where you have this little cartoon of a girl going to a disco and meeting this boy and having sex and then getting HIV.

So this is the type of thing that they are trying to put into people's heads. So basically, the message becomes, abstain until you are of age to get married and then get married.

Now the big danger with that is that kids decide, well, fine. I don't want to die. But I don't want to abstain. So let me get married. And the reason why it's so dangerous is that means that kids could get married early.

For girls, it means they would have children early. And so we would have very early pregnancies, which means that they would interrupt their schooling, which means that they would be, typically, quite a bit younger than their husbands, which changes their status in the family, as we are going to see in a minute, et cetera.

So we decided to try and test the impact of the ABCD program against doing nothing and against another strategy, which is to basically make it a little bit easier for kids to stay in school. How do you make it a bit easier for kids to stay in school? You just pay the cost of staying in school, which now is just like the uniform.

So we ran an experiment with Pascaline Dupas and Michael Kremer, a pretty big experiment, 376 schools, which were assigned to one of four groups. One was a control group. One was a uniform group.

And the other thing we did is we wanted to test the ABCD strategy, so we accelerated the training of teachers. Because, in principle, every school is supposed to experience the ABCD strategy, but, in practice, the teachers are very shy about talking about HIV. They don't want to be branded as an HIV teacher. People are still pretty prudish about the whole thing.

So teachers won't do anything about HIV AIDS prevention until they get training to do it. So the government has a team of trainers. And they went, and they trained the people. And that way the teacher started to teach.

So we had four groups. One, the teachers got trained. One, the kids got a free uniform. And in one group, they got both. And these are some of our girls. And then we followed the kids, all the way, from 2002 to 2011.

So what I'm going to show you is really the results that are coming. The results are as of yesterday. So you get like prime news. Not yesterday, because I had the slides on two days ago, but like less than a week ago.

And what do we find? So this are simple means. And I tell you what is significant in the means and what's not. This is your probability to complete primary school in the four groups.

So what is not surprising in this graph? Can you read? You have the control group, uniform, teacher training, and then both is the uniform and teacher training. So what is not particularly surprising in this graph?

AUDIENCE: They all exceed the control group.

PROFESSOR: That they all exceed the control group. And, in particular?

AUDIENCE: [INAUDIBLE]?

PROFESSOR: Both exceed just teacher training. And?

AUDIENCE: That both is-- oh, sorry. I was going to say what's surprising.

PROFESSOR: Yeah, what is surprising is fine, too.

AUDIENCE: It's the fact that both is less than uniforms.

PROFESSOR: Exactly. So what is not surprising is uniform is much more than everybody else. In fact, control and teacher training are pretty much the same. I mean, they are not statistically different. Uniform is much more.

I mean, you have to take care of the scales, here. These are not huge effects. But getting a uniform, which costs like a few dollars, really nothing, increased completion rates of primary school by about 6%.

What is surprising is that both is less than uniform. You would think that it would at least be just the same, because at least they have a uniform. So why is both less than uniform? Not to answer the question, we are going to continue and see what else we're seeing in this data and then come back to try and figure out what's happening.

That's a second thing which is happening is whether or not you are ever pregnant by age 17. It's like, if you're ever pregnant or pregnant by age 17, it will give you the same result. So what is not surprising here? We can just describe the results. Yeah?

AUDIENCE: The surprising part is that teacher training is the highest.

PROFESSOR: Yeah, so the quite surprising part is that teacher training is the highest. So remember, this is an abstinence program. The abstinence program is leading to a slight increase in the number of pregnancies. That is not the sign of a successful program.

Which is the program that seems to be doing the best?

AUDIENCE: Uniforms.

PROFESSOR: The uniform program is great. But what do we have, again, that is surprising, here? That both is above. So not only the teacher training does nothing, but it undoes some positive effect of the uniform program, both in terms of school attendance and in terms of teenage pregnancy.

So now let's look at the STD infection. So we tested for HIV. And we tested for HSV2. HSV2 is a form of herpes. It's less bad than HIV. It's not going to kill you.

But it has the same characteristic, which is once you have a biomarker for it in your body, it never goes away. You have the antibody for it, so we know that you've had it at some point in your life.

It's also good to diagnose it, because it needs to be treated. It's also bad to have HSV2, because, as other sexually transmitted diseases, it greatly increases the chance that you get HIV.

The transmission rate of HIV, if you have sex with an infected partner, is higher if you have another STD. Because there are lesions in your body that the virus uses to get in.

So what do we find with HSV2? So the reason we don't use HIV is that one of the great news of this project is no one has HIV. We have about 1% of HIV infection. So that's very, very low, across all groups. So that's good. But there is much more of HSV2. It's about 9% in the control group. And here, what do we see, with this graph? So that is the result that is brand, brand new. The other results, we already had. That's the reason that this is completely new.

AUDIENCE: If they had a uniform, it makes you more likely to [INAUDIBLE].

PROFESSOR: Somewhat more likely, yes. So you can call it the same, that both uniform and teacher training don't help. Those are all pretty similar in terms of standard error. But it doesn't help.

So having a uniform makes you stay in school longer. It makes you less likely to a teenage pregnancy. But you're not less likely to have sexually transmitted diseases. Teacher training, again, is not doing anything good.

And then what now makes a difference is the both program, where, if you have the two together, you're significantly less likely to be infected with HSV2. So what do you think is happening? Any kind of story you can try?

AUDIENCE: [INAUDIBLE].

PROFESSOR: Yeah, but when we wrote the book, I didn't know this. So you will have to make one more. We can start with that, then you can retell the story of the book. And then you can say why that explains that as well.

AUDIENCE: So my understanding was that the uniforms kept the students in school. And as a result, they had less time to do other things, like have sex, which could potentially give them diseases. So it makes sense to me why both would be more effective in reducing how many people were HSV2 positive, because you would be more likely to be in school and then you'd be getting the training from the teacher in respect what they should not be doing in order to avoid that.

PROFESSOR: So that is possible. So Ben's idea is that, oh, you spend more time school. And therefore, you have more time to learn what the teacher is telling you. And therefore, that should be the most effective. But if that was the story, we should see all of them going down a little, and both going down the most, right?

So there is something else. Yeah?

AUDIENCE: Because it has to do with getting married. So it still kind of goes along with school, where I think the people with the uniforms seem to be able to stay in school. And so they don't get pregnant. Because I assume the pregnancy would come from when they get married. But they're probably, maybe having safe sex. Or, I guess, unsafe sex.

PROFESSOR: Unsafe sex, yeah.

AUDIENCE: They're still having sex, so they're still getting diseases, but they're not getting pregnant and dropping out of school. Whereas with both, it may be a category where they're getting married. And so now they only have one partner. So they're less likely to get diseases but not getting pregnant.

PROFESSOR: Exactly.

AUDIENCE: For this particular result, are you tracking the students who actually dropped out and got married?

PROFESSOR: Yeah. We tracked everyone. That's why it took us forever and something like \$2 million. But we attempted to track all of the cohort that was in the initial program. Of course, a lot of them have moved. So if they went to Nairobi, we went to Nairobi to look for them. If they went to

Uganda, we went to Uganda to look for them.

So the first wave of them, we managed to find about 60%. And then in the remaining 40% of them, we really put all of the means to find them and found about 80% of them. And so the effective tracking rate was about 85%. And this has accounted for that. So we have all the married people, the ones that have dropped out, the ones that didn't drop out. They're all here.

So anybody wants to build on the story? So the story that I think is happening is something very similar to what you are [INAUDIBLE]. Basically, you can have two kinds of sex. You can have casual sex. And you can have sex with a regular partner.

And then you can choose whether or not you want to use a condom or you don't want to use a condom. So you can choose your level of protection. Let's say you don't like it so much. You should like it. But let's say, they don't like it so much.

And so there is some cost of using more protection. But the advantage of condoms is that you're less likely to get an STD, and you're less likely to get pregnant.

And then what people look at is the cost and benefits of pregnancy, of a pregnancy now, as a teenager. And the cost of an STD. There is no benefit of getting an STD. And the probability that they might get pregnant and the probability that they might get an STD.

And the cost and benefit of pregnancy is the value of having the child. You might like to have a child more if you have partner to have a child with than if you have to raise them alone. So the value of a child in marriage might be higher than the value of a child with a casual partner.

And then on the cost side is foregone earnings, because if you have child, you have to take care of the child. They kick you out of school anyway. You can absolutely not go to school when you're pregnant. In fact, they just passed a law saying that schools cannot evict children that are pregnant.

When this was happening, it was the end of your schooling if you had a child. So the cost of the pregnancy is that you're losing a chance to further your education if you wanted to.

So that's kind of the parameter of what's happening. Now we have the girls, and they are thinking, well. And of course, people like to have sex, girls, too. So they are like weighing, like, what should I do? How much sex should I have? Should I use contraception? And should I

have a regular partner that might lead to a marriage? Or should I have casual partners that are not going to lead to marriage?

And what the teacher training program is telling them, if you have casual sex, you're very, very, very likely to get an STD. It does change their probability that they might get an STD. But if you have sex within marriage, you're safe. You're fine.

In fact, it might do the two things at the same time. Maybe, girls have not realized the difference between casual sex and married sex. But after the teacher training program, they think married sex is very safe. And they think that casual sex is very risky.

And the truth is that married sex is not necessarily that safe, because the candidate for marriage, for a young girl, is usually not a young boy, who would be unable to support a child. It's usually an older man, what they call a "sugar daddy", who is able to provide for the girl and then provide for the child.

And the girls are convinced that the "sugar daddies" are faithful to themselves and their wives. But that might not be entirely true. And so the actual risk of infection in married sex and in casual sex might not be that different.

But when the teacher training program arrived, they feel, oh, my god, I have to stop having casual sex. That's very dangerous. Let me reduce, a little bit, the sex I'm going to have. But let me also move towards married sex.

And by doing that, they're much more likely to become pregnant, because, within marriage, they think it's fine to have a kid. And also, they think that, within marriage, they don't need to be protected as much. So for these two reasons, the pregnancy rate will tend to increase if anything.

On the other hand, they also have less sex, so that balances out, which is why we have a slight increase in the number of pregnancies, in the teacher training group, instead of seeing a decrease. Because we see a reduction in sex, but that's counterbalanced by a shift towards this single relationship.

And because the single relationships are actually not that safe, we also don't see much in terms of reduction in HSV2 infection.

Now in the uniform group, suddenly the cost of staying in school has become much lower. So

staying in school becomes an option, something you can actually do. So then you feel, OK, I'm going to try and stay in school. But then I really shouldn't get pregnant.

So you will move from married sex to casual sex, use more contraception, both because you don't want to have a kid and because you don't want to be pregnant. And that's going to reduce. So you're going to dropout less. You're going to have fewer kids. Yep?

AUDIENCE: Why does the teacher training still have like a large percentage of kids with HSV2 positives?

PROFESSOR: Because the reality is that married sex is not that less dangerous, in terms of HSV infection, than casual sex.

AUDIENCE: But you're saying there's not a statistical difference between training and both.

PROFESSOR: Oh, there is. So teacher training does nothing. So, oops. There is no difference between teacher training and control group. That's because with teacher training people switch towards married sex. And they think that's safe. But that's not really. Because they're having sex with sugar daddies who are maybe themselves infected.

So they do that, which is why they have more kids. But they think that it's safe. But it's not safe, which is why you get no. And then I'm going to talk about both in a moment.

So I've done teacher training. I've done uniform and now both. Well, what is happening with both is that, on the one hand, you think casual sex is very dangerous. You want to avoid it. On the other hand, you don't want to get pregnant. So married sex is not great at all.

So you can't substitute. The teacher training program only pushes you towards one kind of sex. And therefore, so that you don't have to reduce your sex so much. The uniform program pushes you towards the other kind of sex. And you don't also reduce your sex so much.

But the both program, the can't substitute, because neither of them are so great as an option. So your only option is either to reduce sex or to increase protection or both, which is why we get the biggest effect on HSV2, but we don't get the biggest effect on pregnancy. Because we don't have this switch towards casual sex, which really doesn't have very many pregnancies at all.

So that, I think, is what is going on, which is we get exactly these patterns of results. Yeah?

AUDIENCE: Sorry. So you're saying that you don't see this as all with respect to pregnancy? You don't

necessarily have a shift towards casual sex there?

PROFESSOR: So this is what we have for pregnancy. For pregnancy, with the both, they stay like at the same level. So you don't have these big shift. You really have very few pregnancies in casual relationships.

AUDIENCE: Does that tell us anything about which one, uniform or teacher training, which is more [INAUDIBLE] to be more responsible to?

PROFESSOR: So both of them, in a sense, I think, teacher training, they were responsive to both of them. But in the way that I just described, in terms of their thinking about it. But in terms of the effect you're trying to get, well, if you're interested in schooling or in teenage pregnancy, asking people to stay in school is the best thing.

If you're interested in preventing HIV/AIDS and other STDs, then you want to add some training. That doesn't make it for a very, very easy policy lesson, because that slightly depends on your objective. But for a very fundamental reason, which is it corresponds to the way people decide and how they decide.

So it seems the biggest policy answer to that is that you shouldn't have programs that are lying to people. It just doesn't help. So the way the program is structured is to try and make the girls as scared as possible of casual sex.

But it would be a little bit better to insist on helping them to find a way to protect themselves, both against pregnancy and against HSV2. So I think that's kind of the lesson that comes out of this. Yep?

AUDIENCE: So along those lines, how do these results reconcile with the fact that the teacher training doesn't actually emphasize contraception anymore, like safe sex at all?

PROFESSOR: Yeah. These results are a direct consequence of the fact that the teacher training doesn't influence contraception. So they won't tell you anything. It's not an evaluation of teacher training in general. This is an evaluation of the way it is done in Kenya and in most of East Africa, which is explicitly ignoring the condoms. Yeah?

AUDIENCE: Sorry. What I mean is like, in this last finding, the argument goes that, if you have both teacher training and uniforms, then people are more likely to not be married but have safer casual sex.

PROFESSOR: And fewer sex in general.

AUDIENCE: And have fewer sexual partners.

PROFESSOR: Less sex, also. Both things will happen on this one. Because when you have just teacher training, people have the option to switch towards the married sex. When you just have the uniform, people have the option to switch toward the casual sex. But here, they don't have the option to switch, because they are scared of married sex, because they don't want children. And they're scared of casual sex, because they don't want an STD. And they think the probability is high with casual sex.

So the only thing they can do, because they can't substitute between these two activities, is either to have less sex or to use more contraception. And the teacher training, itself, is not teaching them about contraception. But they all know, at some level, that it's available, and that it prevents both pregnancy and STDs, to a point.

So this doesn't tell us you shouldn't train the teachers. I think this tells us you train the teachers with information that is actually useful, actionable, which might not be such revolutionary thinking. But when you spend a lot of time in education/health circle in Kenya, you realize it's actually a pretty big, pretty controversial statement.

So Pascaline Dupas, when she was still a Ph.D. student, she worked in this project, to do something else, which we talk about also a little bit in the book, which is the sugar daddy project. And what the sugar daddy project is, is to tell the kids that it is not true that sex with older people is safe.

In fact, older people are much more likely to infected with HIV than younger people. So that's the information that was given, plus a nice video about a girl who managed to trap someone who wants to be a sugar daddy and something like that, a very short, very quick intervention. A little film produced by UNICEF and then these statistics, which is your chance to get an STD.

The infection rate of older men is much higher than the infection rate of younger men. And sadly, the infection rate of girls is also higher than that of boys, for the reason that girls are more likely to have sex with older men, who are likely to be infected.

So you are telling the girls, you should really have sex with the boys, because they are safer than the men, not quite in so many words, but making the information available. And you're also telling the boys that these innocent looking girls actually are probably more risky than you

think.

And this intervention was actually quite effective at reducing sex with older partners, as indicated by the number of pregnancies with older dads. It reduced the pregnancy with older dads by 66%, 2/3.

So this is also another sign of the fact that, if you tell people the right thing, like people will react to what it is you tell them. If you tell people the wrong thing, they're also going to react to it. But they'll not react to it in a way that is very. You don't get that many more HSV2, and you get many more kids who are married with older men and have children too early.

So that's, maybe, the biggest lesson from this finding is you should tell people the truth and assume that they will be able to make the right decisions. You don't have to scare them away into doing things. So that's for that.

So I guess the key lesson is fertility decisions are like others. We need to try and understand them. And this is one area where policies have been based on the assumption that people are idiots. And that's, I think, a very bad assumption in general and particularly, perhaps, in this area, because it's a very important decision that people are much more likely to take, with a lot of thinking and with a lot of you.

So that brings us, pretty naturally, into the next topic, which is, if it's a decision, inherently, fertility decisions are decisions that are made by a man and a woman. But if we think about it, a lot of the other decisions we talked about in this class are also decisions that are being made by a man and a woman. And we completely ignored that our discussions so far.

I've always talked about parents decide how many, whether to immunize their kids, how much to feed them, how many years of education they should get, et cetera. And in this, I've ignored the dynamic of the family. So now I want to spend a bit of time-- not much, but the rest of this lecture-- to talk about family decisions.

So the question, here, we're going to ask is, how do families decide? So when we mean family, we mean who? Like who decides? The dad decides. The mom decides. The mother-in-law decides. The kids, what do kids have to play? They are relevant to all sorts of decisions that are taken jointly by parents.

Until now, we've ignored it. We've assumed that there was something called, a family. And yet

the family, we know, is a group. So in what case would it be legitimate to ignore the fact that the family is a group of people?

There are two cases where we could say, well, we know it's a group, but we can ignore it.

AUDIENCE: I would think all families are the same?

PROFESSOR: All family members. Like if we think that all family members are the same, they all have the same preferences, so they all want the same thing. So anybody who has been part of a family, does this sound like a good approximation to a family, the way a family functions?

AUDIENCE: No.

PROFESSOR: Not really. I think it's not the case that there are no conflicts within families. People have different views about how everything should be done. And the second way in which we could ignore the fact that it's a collection of individuals is?

AUDIENCE: [INAUDIBLE]?

PROFESSOR: If one person made all the decisions. So we had the mother or the father is like the person who makes all the decisions for everyone, possibly taking into account people's preferences, but not giving them a voice in how the decision is being made. Does that sound a plausible model of the family?

AUDIENCE: At certain ages.

PROFESSOR: Sorry?

AUDIENCE: At certain ages.

PROFESSOR: At certain ages, of course, like the infant is not really in control, so someone decides for them. Norm?

AUDIENCE: Probably on the gender breakdown, so the guys will decide, or the male in the family will decide for the females.

PROFESSOR: Right. So it might be that in some societies, there is really a lot of control by the guys in the family, as you say. But that will depend. Their society's say, you take Pakistan or part of India, which will be more patriarchal than Africa, where the African family is like-- it depends where, of course-- where there is more equality between genders. So no one, maybe, is like in a

position to really, fully decide.

So maybe the assumption that one person decides for everyone is more plausible in some cases, but we feel that it's not going to be always true. And in a lot of cases, the family is not one person. The family is a collection of people. And they are trying to fight it out.

So women and men have different preferences. For example, one area where they have very different preferences is how many children they want to have. So, for example, there was a study in Zambia-- that I'm going to show you in a moment-- showing that women want to have much fewer children than men.

So one reason, of course, would be that it's Zambia and the probability of dying in childbirth is not 0, while if you're the woman, you're more likely to be the one who is paying the cost of that. So as Norm mentioned, the family is patriarchal in many developing countries, so maybe men take lot of decisions.

But even there, you have, usually, a little sphere, like how to buy the food, et cetera, where it's really the woman who decides and where bargaining could be taking place.

So how do we test this? How do we know? How we can we try and see whether the family is patriarchal, is unitary, either everybody agrees or someone decides for everyone?

So if the family behaves like one individual, we could analyze the decision problem of a family-- for example, how much food to buy, whether to send the kids to school, how many children to how, et cetera-- like the problem of one single person.

So the only thing that should matter to a single person, and, therefore, to the family in this context, is the family's overall income, the prices of things-- how expensive it is to buy whichever types of thing, school fees, et cetera-- and information that you have, to everyone in the family.

But if the family is not unitary. It's what we call this model, where one person decides for everyone or everybody agrees. We call this the unitary model, like there is unity in the family. So if the family is not unitary, than other things are going to start to matter.

So, for example, it's not only the overall income that is going to matter, but who brings what share. Because they can now, say, well, if you don't do what I want to do, then I'm just going to take my income and go away.

So now it's not the overall income that's going to matter, it's the share of the income. So again, we could see men taking much more decisions, that's because they are bring more of the income. And we could see, maybe, that when woman bring more income, they would be able to take more decisions.

The second thing that might matter is private information. So if you know that the family is not unitary, and you find something out, you might keep it for you. Because that gives you some power to make some decisions.

So let's look at whether we find evidence that private information, that is information that one member has and not the other, makes a difference in decisions and whether it's who brings the income to family matters as well. Let's look at these two things.

So private information, let's look at fertility. So I was telling this data from Zambia showing that women want to have fewer kids than men. And in fact, they report hiding contraceptives from their husbands.

So in that case, you could ask a question. If I provide information to women about contraceptives, would it make a difference if I provide it to the woman alone or if I provide it together to women and men? So under the unitary model, what would we expect?

AUDIENCE: Whoever the head of the household is, [INAUDIBLE].

PROFESSOR: Yeah, whoever we give it to, even if it's not the head, we give it to the woman, she's going to tell the husband. So it should make no difference. Or maybe it would even have a bigger effect to give it to the men, because they are more likely to understand, they're more likely to be involved, et cetera.

So a lot of family planning policies are now saying, we have to involve the men. Because after all, the men have something to do with contraception. That's the idea. Let's involve the men, and they would be more likely to be informed.

On the other hand, if it is the case that women are more likely to want fewer children, then involving only the woman, it gives her an option to hide the contraception from her husband and, therefore, potentially, to have fewer kids. So it could really cut both ways.

In the unitary model, you would expect no difference or maybe doing it to both together would

be better. Or it would have a larger effect, because the information would be more likely to be diffused in the family. Under the non-unitary model, maybe the woman would matter more.

So what do you think is happening? What's your bet?

AUDIENCE: The women use it more when their husbands don't know.

PROFESSOR: Right. What they find is that women use it much more when their husband doesn't know. So they did that? Well, they ran an experiment where they provided people a voucher to skip the queue. Because in Zambia, in principle, you are allowed to have contraception, et cetera.

But in practice, it takes a long time. The nurse calls you. Once you've come, if you don't have your clothes for an examination. So people don't really go to the family planning. So here, it's a voucher for first class treatment, no need to bring your clothes and a good, nice setting.

So they did that. I don't know if it was half. But they separated the group in two, one where they gave the voucher to the wife, alone, and one where they gave it to wife and husband together.

And so the question is whether women are more likely to take care of their contraception, whether they're more likely to be able to control their fertility in one case than in the other.

So that's what they find for the take-up of the voucher. So the first two columns are whether or not you redeemed a voucher. And the second two are whether or not you get an injection of contraception, which is a method of contraception that you can hide easily. Because you got the injection. No one knows that you are not fertile for the next three months.

And what you find is that people are more likely to redeem the voucher in the individual treatment than in the couple treatment. And they are more likely to receive the concealable method in the individual treatment than in a couple treatment.

So the effects are of the order of, let's say, 55% received a voucher in individual versus 42%. So these are not negligible effects. So it seems that it matters how you provide information.

It matters also for the number of kids that people have. So this is the fraction of births, in the months following the treatment, among women, who said, at baseline, that they did not want any more births. So you can think of them as unwanted pregnancies.

So six months later, of course, you should see no effect. The couple treatment, which is the red line, is a little below, but that's not due to the treatment, because it's six months later. And

then at nine months, the couple cross. And the red line is above the blue line for a few months, which reflects about three months of Depo-Provera use.

And then what happened is that the effect on that, it disappears subsequently. And it goes up a lot for both. And the reason is that there was a policy change in Zambia. All of the injectable were taken away from the market. So any effect of the treatment goes away, because after your first injection, you could not get the second one.

So we should expect an effect in the 9 to 14 month, after the treatment, which is exactly what we find. So if we look at the number of unwanted births that were prevented-- I actually don't remember exactly the number. But it's a fair number of unwanted births that were prevented by going from couple treatment to the woman only treatment.

So that's the first indication that the family is not unitary, because who you are giving information to changes the outcome. So people hide information. The second information is what economists call bargaining power.

So even when the information set is the same for both partners, they might start to bargain over a family decision, who works, how hard, how many children to have, how much to feed the children, how much to educate the children, et cetera.

So the bargaining power is your ability to weigh-in on the family decision, if the family decision are the process of these discussions. So what would affect a woman's bargaining power, other than the information she has? So we already mentioned an income. What else could be there? If you have good eyesight, you can read it on the slide, but you can also think about it instead.

AUDIENCE: Maybe divorce policy?

PROFESSOR: Absolutely right. Divorce policy will affect bargaining power. And how does it work?

AUDIENCE: Depending on how they allocate the family resources after divorce, I don't know there. But I know in the past, in the US, they would allocate it mostly to the man. And now, in a lot of states, it's 50-50.

PROFESSOR: Exactly. If you live in a divorce regime, where all of the assets, and maybe the control over the children, goes to the man, then for a woman to divorce is a disaster. So when she takes decisions, when they bargain, they are thinking, what is my outside option?

And if I'm thinking my outside option is absolutely horrible, then I have to agree to whatever the husband is proposing. So the divorce laws are going to make a difference. How much of the common assets can the woman get back, and how much control of kids could she have?

And in fact, it's been shown, in the US, that when the change that you talked about was implemented, it was implemented in different states at different times.

So you can trace what happened to women, in particular, to decisions that are more in the interest of the woman. You can see that the decisions, within the household, improved in favor of the woman when the divorce law improved to give women more rights. So divorce law is one.

AUDIENCE: Actually, like health? So if the husband is in really bad health, the woman probably has a lot of power in the family.

PROFESSOR: If the husband has bad health, the woman has more power. Yes, that could be one. Maybe because his outside option is now very bad, because A, he couldn't get married to someone else, because he is so sick. B, he couldn't get by himself, so he has to kind of be nice so that she will continue to take care of him.

AUDIENCE: So this slightly related to a lot of them. If you came from a wealthy family or came from a family with a status, the husband couldn't get anything from the family, but just so as not to embarrass himself in the society?

PROFESSOR: Yes, exactly. So the family you're coming from will influence bargaining power, because, maybe, not wanting to embarrass himself. Also, because it could be a threat that my very strong brothers are going to break your kneecaps if you don't behave with me.

So that creates like an outside option. Also, in case of divorce, again, it gives you a chance to come back to something, whereas if you have no family, then you have no options. So that's very good, your family, where people came from. What else could we have?

AUDIENCE: The relative level of education [INAUDIBLE]. If she's just been to high school, [INAUDIBLE] make that economic decision. She may not have the mental leverage to say, what I'm saying makes more sense.

PROFESSOR: Yes. So that's very good. So the relative level of education will matter, both because, again, it creates some different outside options, because with a high school dropout, what would you

do? You're kind of dependent.

And the other point you're making, which is not about outside options, but even your ability to bargain. You might not feel confident. When someone tells you that I know better, you might feel like, yeah, maybe you know better. Good.

AUDIENCE: Is it possible to consider that a woman could tell her husband, we won't have intercourse if you don't do this and that.

PROFESSOR: Yeah. Not only is it possible, but I think that's a pretty frequent bargaining technique. So, in that case, if that's the bargaining technique, then you would think how attractive each partner is and how long they've been in a relationship and things like that are going to matter. Because the level of the threat is also whether or not you think it's a problem or you could figure something else out if necessary.

What else would we have? Well, one more is your ability to earn an independent income. So that's related to the point you're making about education. But it could also be just labor market opportunities for men and women.

So for example, if you live in a society where women cannot get jobs, because say there is [INAUDIBLE], then what will the woman do without husbands? There would be a big problem. Whereas if you live in a society like here, where you could get a job, if you needed to, then that changes your level of outside options, and, therefore, changes the way the negotiations would be made.

Another one is the marriage market. Is it possible for a woman to get married or for a man to get married after a divorce? There are some places where it's harder. What is the gender ratio, how many women there are for men?

If you are in, for example, an immigrant community, where the ratio of men to woman is very skewed, because a lot of men have come, new men have come, then the woman can threaten to get married to any of those available boys within the community. That would increase their bargaining power within the family compared to a situation which is more even.

People said that about China, today, that one kind of strange consequences of the fact that the gender ratio are completely skewed, due to selective abortion and things like, it means that women, actually, are in short supply. And therefore, it's getting easier to marry them. And they have a lot of bargaining power within the family, because there's no substitute for them.

So all of these things would matter. So let's focus on one, for the purpose of this, which is how much money women and men bring to the family, and, in particular, how much money they would have access to should they leave the marriage. That's going to matter for family decisions.

So policy makers are very convinced it's the case. So for example, all the cash transfer programs that exist in Latin America, to encourage schooling and health-- like the PROGRESA program in Mexico, that we discussed in the case of education-- they tend to always give the money to women. On the ground that A, women will make a bigger use of the money, and B, that's going to increase their bargaining power and, therefore, increase all decisions.

So there is very benign sexism going on around in the policy world that women are generally better people, which I don't necessarily disagree with. But it should be looked into a little bit.

So another one that is very much inspired by this is microcredit. Microcredit claims, the world-wide, are almost all women. Part of the reason is that women are believed to be better at repaying. But part of the reason is also that it was believed that it was a way to introduce some changes, within their families, by giving power to the family.

So does it matter who gets money or doesn't get money? I want to give one example to prove my point that women are better people than men. Looking at one example where money went into the household, either with the men or with women, which is the end of Apartheid in South Africa.

They took a pension program, which existed for white people, which was, for white people, a very small pension program, in that it was not a lot of money for them. And also, almost no one was eligible, because you couldn't be eligible if you had a private pension. And most people have private pensions.

So it was smallish program on the side, a little bit like we have here with minimum, old-age security. But at the end of Apartheid, the new government had to make a decision about, should we can the program or should we expand it to the black South Africans? Of course, they're not going to keep two separate programs.

And they decided to expand it, because it was believed, rightly, that the older people, who would be eligible for this program, are precisely the people who suffered the most from

Apartheid, for their entire lifetime.

So they expanded the program. And every man above 65 and every woman about 60 is eligible for the program unless they have a private pension. And very few of the black people had a private pension. So about 85 to 90% percent of people who are eligible actually get the program.

So the old-age pension program, which is still there today, it's a huge, huge deal. It's a lot of money. And it's very important for the families. And, of course, a lot of the older people don't live alone. They live with children or they live with grandchildren. And in particular, in South Africa, it is quite frequent that you have skip-generation households, where you have a grandparent, no parent, and the kids.

This is for two reasons, one is HIV/AIDS, which has killed a lot of the middle generation. And the other is the way the society was structured under Apartheid, people couldn't bring their family when they went to work in the city. So they went alone, and they left the kids behind with the grandparents.

So for this reason, about a quarter of kids, aged 0 to 5, live with a grandparent. And that grandparent can either be a man or it can be a woman.

And the question we can ask is, does it make a difference, when this pension program comes in, in 1993, if you happen to live with no one or with a grandparent, who becomes eligible, or with a grandfather or a grandmother?

So of course, one problem is that the families who have a grandfather are different from the family who don't have a grandfather. So what we can look at is, let's take a sample of kids who live with a grandfather, but let's compare the one who lives with a grandfather who is, let's say, 55, versus one who is 65 or a grandfather who is 50 to 64 versus 66.

So in both cases, there is a grandfather. But one is just short of being eligible. And one is just eligible. So other characteristics of the family should be more or less constant. It just happened that your age is a good thing.

And of course, people couldn't really predict that this pension was coming, so the kid lives with a grandfather and, oh, he becomes just eligible or is not yet eligible. The same thing with the grandmother but around 60.

So this is what this is doing. This is looking at weight for height. So this is short trend measure of nutrition. As soon as you start eating better, you weight for height improves. And in orange, we have the boys, and, in yellow, we have the girls.

And you can see that. So what can you see? Can you interpret this?

AUDIENCE: So this bar is higher for eligible grandmothers that took all their grandsons in.

PROFESSOR: [INAUDIBLE]

AUDIENCE: Heavier grandsons and granddaughters. And my guess is that, because they're eligible earlier, they have more to give earlier.

PROFESSOR: So this is right after eligibility in both cases. So we don't have a longer time. Yeah?

AUDIENCE: Well, it's just to show that grandmothers seem to care more about their grandchildren than grandfathers do when they become eligible. And then you can also see the bias. So for grandmothers, it seems like they treat girls better. And grandfathers also treat girls better.

PROFESSOR: So, basically, we don't have much for the grandfathers. So the grandfather doesn't seem to be using the money to be feeding the kids. And we have up a much larger effect for the grandmothers, particularly for the girls. And some effects for the boys, but only half the size.

AUDIENCE: Now why is it the case that the grandsons are worse off when their eligible grandfathers [INAUDIBLE]?

PROFESSOR: So if we had the confidence interval bar on this graph, you would see that this is not significant. So this is kind of same-ish. No eligible grandparents and the bars for eligible grandfather are around the same magnitude.

What is really different is the girls with the grandmother. And the boys to some extent, but it's about half the size.

AUDIENCE: So could there be an effect in that, when you have an eligible grandfather, they're older, so that they'll have to spend more of their pension on like their own stuff?

PROFESSOR: Yes. So that could be that. The grandfather is older. And also, men live less longer than women. So actually, a 65-year-old man is quite a bit older than a 60-year-old woman. So that could be a reason. So we can start looking at this kind of stuff, for example.

Also, they might want to save more of their pension if it's a grandfather, because he's going to die very soon. So it's more like a transitory income shock than a permanent income shock. So you might want to say, let's save it.

So we looked at saving, too, to control. And we couldn't find a difference in savings. The savings seem to be the same. But you're right, it could be explained by that, that the grandfathers need to be spending the money on themselves, where the grandmother doesn't need to.

AUDIENCE:

Also, could it potentially be the case that the grandmothers may be alone in the household, with their grandchildren, therefore they would not have to spend anything on other people. Whereas, maybe in the culture, it's more likely that a grandfather has to take care, also, of his wife, therefore when he becomes eligible, there is a greater fraction of his income that also goes to a wife.

PROFESSOR:

That's a good question. That can be tested. Because you can look at all of the family size configurations. And you seem to find these difference regardless of who is who is who.

What is interesting, which helps answering your question, is the grandmother could be the mother's mother or could be the father's mother. So you can look at, the pension goes to the mother's mother or to mother's father or to father's mother or to the father's father.

Which one do you think matters? Under your hypothesis, if it's only due to the health issue, what should we see? That mother's mothers and mother's fathers should be the same and then the father would be lower, because they need more money. And then, in practice, what do we see?

These high bar is only their mother's mother. So it's only the pension translating to higher health of the kids if it's a maternal grandmother of a girl. So that seemed to have something to do with these gender lines.

And that doesn't mean that the grandmother doesn't do other things for the kids. But in terms of how they decide to feed the kids, it's really the identity of the kid that matters a lot.

So let me show you one last thing, which is these results seem to show, relatively clearly, that the family is not unitary. So who brings in the resources matters.

They actually do not show that women are better people than men, because we don't know

what men do. Maybe they spend more on the education of the children. I only showed you a very partial window into the family. So the only conclusion we can take from this is that families are not unitary.

So the next question we might want to ask is, are they efficient? In that, they are bargaining with each other, but are they bargaining in a way that they are first maximizing the size of the pie and then deciding to split the pie? Or are they bargaining in a way that the women would be willing to reduce the pie as long as she could get a higher share of it?

You understand the difference? So two people who would just meet and who don't know each other, will tend to interact with each other like in the prisoner's dilemma, that you might have seen in game theory, which is they will try to grab as much of the pie as they can, even if it makes the pie lower.

But two people who know each other very well, who are in it for the longer run, might decide that cooperating to make the size of the pie the biggest possible is the first thing they should do and then think about how to share it.

And this is actually an idea we can test, because households are engaged not only in consumption but also in production. So if the direct analogy is to first maximize the size of the pie and then decide how you're going to divide it, are they maximizing the production that they can have.

And one way to look at that is farming, because in a lot of countries women and men grow different plots of land. So in Burkina Faso, the study, by Chris Udry, looking at households in which each member is farming their own little plot. And an efficient household should first use the inputs the most efficiently possible and then decide on the basis of people's bargaining power how to share the product.

Once we condition for the quality of the plot and the crop planted, we shouldn't see that the women get fewer fertilizer or less labor or less input or less seeds.

And in fact, instead this paper tested it and found that women get significantly less of every input, including fertilizer. And fertilizer has very concave returns. So there is really no point of putting more fertilizer on a field of the men, when you could put a little bit on the field of a woman, from the point of view of family production.

And that's not what you see. You see all of the fertilizer being spent on the men's field and very little on the women's fields. Which suggests that the family is not efficient, because they could become richer by just reallocating resources among themselves.

So this suggests that the family is not only not unitary, but it is also not fully efficient. Which leads us to this question, what role does the family play? What is the family inefficient? And what implications does have to policy, which we'll take up after you become all refreshed from the vacation.