What Are the Types of CRT Designs?

Liz Turner:

The cluster randomized trial designs is these two broad classes, the regular parallel arm and the stepped wedge that we're now going to talk through. The stepped wedge designs have a feature that could be considered they have a complete design or an incomplete design. Now in complete designs, measurements are taken from every cluster at every time point. You can imagine in many situations that could be a lot of measurements.

Let's imagine a simple example of eight clusters with a one-year intervention and four clusters had been randomly allocated to control, and four clusters that had been randomly allocated to intervention. At the end of a year, we measure outcomes on the individuals in these clusters in order to get some information on estimating the intervention effect, so this is a parallel design.

Now, in some of our parallel cluster randomized trial designs, we may have baseline outcomes measured. We may have other covariates measured at baseline and we may be able to use and leverage some of those pieces of information when estimating a treatment effect.

Imagine we had this specific example of an incomplete stepped wedge design. You see there are exactly the same number of measurements across the eight clusters. But the period or the duration of the trial is much longer because this is spread now over four years, say, versus the one year of the parallel design. This is one specific example of an incomplete stepped wedge design.

Now in contrast, the complete design would take measurements on all of those eight clusters and the individuals in those clusters, the participants in those clusters at each of the time points. It may be that if the intervention has a one-year duration, we may also consider those periods after that one year duration to better correspond to what we may call a post-intervention period, and we may use the information in those periods differently.

In the parallel arm design, remember, we may not even have some baseline information available to us at time zero. We're estimating the intervention effect basically using between cluster information, so vertical information.

In contrast, let's take a look at this specific example of a stepped wedge design. In this case, I've looked at the complete one. We would be able to estimate intervention effect using both vertical and horizontal information. The vertical information is between cluster, whereas the horizontal information is within cluster information. There's kind of these two different lenses we could place on how we're obtaining and leveraging the information in the system of this stepped wedge design, which I think actually is really quite interesting when we start to think about where information comes from to estimate treatment effects.