

## Answer Key to Suggested Activity Questions for Part 7

Reading Murray DM, Pennell M, Rhoda D, Hade EM, Paskett ED. Designing studies that would address the multilayered nature of health care. Journal of the National Cancer Institute Monographs. 2010(40):90-6. PMC3482955.

Rhoda DA, Murray DM, Andridge RR, Pennell ML, Hade EM. Studies with staggered starts: multiple baseline designs and group-randomized trials. American Journal of Public Health. 2011;101(11):2164-9. PMC3222403.

Pennell ML, Hade EM, Murray DM, Rhoda DA. Cutoff designs for community-based intervention studies. Statistics in Medicine. 2011;30(15):1865-82. PMC3127461.

### Questions

1. Under what conditions can a multiple baseline design be a good alternative for a group-randomized trial? When is it a poor alternative?

A multiple baseline design can be a good alternative if the intervention effect is expected to be large and rapid and if the effect is expected to be consistent across the groups or clusters. It is a poor alternative if the intervention effect is expected to be small or gradual, or if the effect is expected to vary in magnitude or time course over the groups or clusters.

2. Under what conditions can a quasi-experimental design be a good alternative for a group-randomized trial? When is it a poor alternative?

If the intervention is to be delivered to groups or clusters, a quasi-experimental design has all the features and problems associated with a GRT without having the benefit of randomization. It can be a good alternative if randomization is not possible, but otherwise, but address the same design, analysis, and power issues and in the same way, as a GRT.

3. Under what conditions can a stepped-wedge design be a good alternative for a group-randomized trial?

A stepped wedge design can be a good alternative if there are political pressures to provide the intervention to all groups or clusters during the course of the study and if the intervention effect is expected to be rapid and persistent. It is not a good alternative if the intervention effect is expected to be gradual or to fade over time.

4. Under what conditions can a regression discontinuity design be a good alternative for a group-randomized trial?

A regression discontinuity design can be a good alternative if randomization is not possible and if there is a quantitative measure that can be administered to all units of assignment in advance of the study and used to identify a cutpoint to separate the units assigned to the intervention from those assigned to the control condition.

5. What is the major argument presented in these papers regarding the alternative designs that have been proposed for the evaluation of multi-level interventions?

A GRT remains the best comparative design whenever the investigator wants to evaluate an intervention that operates at a group level, manipulates the social or physical environment, or cannot be delivered to individuals. GRTs provide better or equal quality evidence and are either more efficient or take less time than the alternatives.