

Lab: Experimental Study Design

Drinking Water Intervention

Read: Colford, J. M., Jr., Wade, T. J., Sandhu, S. K., Wright, C. C., Lee, S., Shaw, S., et al. (2005). A randomized, controlled trial of in-home drinking water intervention to reduce gastrointestinal illness. *Am J Epidemiol*, 161(5), 472 – 482.

Questions

1. Experimental studies and observational studies both make causal comparisons of exposed and non-exposed groups. Clarify the primary advantage of using a randomized experiment for this purpose. (50 word maximum)
2. Why was blinding employed in the Colford et al. study? Give examples of improper influences that would have occurred without blinding? (100 words maximum)
3. Colford employed a number of procedures to blind installers, participants, and investigators. Describe three of the procedures employed for this purpose. (100 words maximum)
4. Use the data in Table 4 of the article to calculate the following crude rates of “highly credible gastrointestinal illness” (HCGI). Show your calculations in each instance. [Recall: rate = the number of episodes divided by person-time]
 - (a) Rate of HCGI during cycle A among active device participants.
 - (b) Rate of HCGI during cycle A among sham device participants.
 - (c) Rate of HCGI in both cycles combined among active device participants.
 - (d) Rate of HCGI in both cycles combined among sham device participants.
5. Use results from the preceding question to calculate the crude rate ratio comparing sham device users to active device users for both cycles combined. Let the active device users serve as the reference (nonexposed) group for the calculation. [Recall: RR = rate in exposed / rate in non-exposed].
6. How do your calculation in question 5 compare with the results from the authors’ multivariate RR associated with the device for episodes of highly credible gastrointestinal illness adjusted for additional covariates (reported in Table 5 on p. 479)?
7. Calculate the crude rate difference for HCGI in both cycles combined comparing sham device participants to active device participants. Discuss your findings.