

Note that when the risk ratio is less than unity, the relations above calculate the opposite bounds. The near 95% confidence bound (the lower bound if the risk ratio is greater than unity or the upper bound if the risk ratio is less than unity) provides a clear intuitive message about how close to the null value ($RR=1.0$) the results of any observational study could be. This is much more informative than simply saying that the associated probability of rejecting the null was 0.01.

EPIDEMIOLOGIC FORMS OF BIAS

There are three forms of systematic distortion or bias distinguished according to the logical flaw: selection bias, misclassification, and confounding. For detailed explanations of these concepts, see Freeman and McGowan^{8,9,13} and Freeman, Goldmann, and McGowan.¹⁷

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REFERENCES

1. Hennekens CH, Buring JE. *Epidemiology in Medicine*. Boston, MA: Little, Brown & Co; 1987.
2. Rothman KJ. *Modern Epidemiology*. Boston, MA: Little, Brown & Co; 1986.
3. Kleinbaum DG, Kupper LL, Morgenstern H. *Epidemiologic Research: Principles and Quantitative Methods*. Belmont, CA: Lifetime Learning Publications; 1982.
4. Rothman KJ, Boice JD Jr. *Epidemiologic Analysis With a Programmable Calculator*. Boston, MA: Epidemiology Resources; 1982.
5. Fleiss JL. *Statistical Methods for Rates and Proportions*. 2nd ed. New York, NY: John Wiley and Sons; 1981.
6. Eickhoff TC, Brachman PS, Bennett JV, Brown JF. Surveillance of nosocomial infections in community hospitals, I: surveillance methods, effectiveness, and initial results. *J Infect Dis* 1969;120:305-317.
7. Freeman J, Rosner BA, McGowan JE Jr. Adverse effects of nosocomial infection. *J Infect Dis* 1979;140:732-740.
8. Freeman J, McGowan JE Jr. Methodologic issues in hospital epidemiology, I: rates, case finding, and interpretation. *Rev Infect Dis* 1981;3:658-667.
9. Freeman J, McGowan JE Jr. Methodologic issues in hospital epidemiology, II: time and accuracy in estimation. *Rev Infect Dis* 1981;3:668-677.
10. Brawley RL, Weber DJ, Samsa GP, Rutala WA. Multiple nosocomial infections: an incidence study. *Am J Epidemiol* 1989;130:769-780.
11. Baker CJ, Melish ME, Hall RT, Castro DT, Vasan U, Givner LG. Intravenous immune globulin for the prevention of nosocomial infection in low-birth-weight neonates. *N Engl J Med* 1992;327:213-219.
12. Doebbeling BN, Stanley GL, Sheetz CT, et al. Comparative efficacy of alternative hand-washing agents in reducing nosocomial infections in intensive care units. *N Engl J Med* 1992;327:88-93.
13. Freeman J, McGowan JE Jr. Methodologic issues in hospital epidemiology, III: investigating the modifying effects of time and severity of underlying illness on estimates of the cost of nosocomial infection. *Rev Infect Dis* 1984;6:285-300.
14. Freeman J, Hutchison GB. Prevalence, incidence and duration. *Am J Epidemiol* 1980;112:707-723.
15. Freeman J, McGowan JE Jr. Day-specific incidence of nosocomial infection estimated from a prevalence survey. *Am J Epidemiol* 1981;114:888-901.
16. Freeman J, Hutchison GB. Duration of disease, duration indicators, and estimation of the risk ratio. *Am J Epidemiol* 1986;124:134-149.
17. Freeman J, Goldmann DA, McGowan JE Jr. Methodologic issues in hospital epidemiology, IV: risk ratios, confounding, effect modification, and the analysis of multiple variables. *Rev Infect Dis* 1988;10:1118-1141.

CDC and SHEA Training Course in Hospital Epidemiology

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The CDC and the Society for Healthcare Epidemiology of America (SHEA) will cosponsor a hospital epidemiology training course on May 18-21, 1996, in New York City. The course, designed for infectious dis-

ease fellows, new hospital epidemiologists, and infection control practitioners, provides hands-on exercises to improve skills in detection, investigation, and control of epidemiologic problems encountered in the hospital setting, as well as lectures on fundamental aspects of hospital epidemiology. Co-chairs of the course are Dr.

William J. Martone, Dr. Timothy Lane, and Ms. Gina Pugliese. Additional information is available from the SHEA Meetings Department, 875 Kings Hwy, Suite 200, Woodbury NJ 08095-3172; telephone (609) 845-1720; fax: (609) 853-0411.