IV. Enforcing Ethics

To help prevent unethical statistical practices, many organizations have established ethical guidelines for their members or for authors whose works they publish. The American Statistical Association, for example, ratified their "Ethical Guidelines for Statistical Practice," which provides ethical guidelines in eight general topics including Responsibilities to Research Subjects, Responsibilities in Publications and Testimony, and Responsibilities to Other Statisticians. The complete text of the Ethical Guidelines can be can be found on the web site www.amstat.org.

The Common Rule has been established in the United States as the standard of ethics for biomedical and behavioral research involving human subjects. This is the baseline standard for any government-funded research and virtually all academic institutions. Central to the Common Rule are these requirements:

1. That people who participate as subjects in covered research are selected equitably and give their fully informed, fully voluntary written consent; and
2. That proposed research be reviewed by an independent oversight group referred to as an Institutional Review Board (IRB) and approved only if risks to subjects have been minimized and are reasonable in relation to anticipated benefits, if any, to the subjects, and the importance of the knowledge that may reasonably be expected to result.

The detailed text of the Common Rule can be found on the U.S. Department of Health & Human Services web site at www.hhs.gov.

Journals and granting agencies often require data sharing before studies are published or funded. This requirement allows for comprehensive peer review of the methodologies and results to minimize the chance that unintentional errors or unethical behavior is somehow influencing the study findings. A 2009 analysis by Thomson Reuters for *Times Higher Education* found that peer-reviewed science journal retractions have increased tenfold over the past two decades, indicating that the practice of researchers policing one another is becoming more effective.

As noted earlier, U.S. law now requires pharmaceutical and medical device manufacturers to disclose payments for goods and services provided to physicians and teaching hospitals to improve transparency between researchers and funding sources. Many journals also require disclosure of financial relationships for studies that are published. With greater transparency comes greater scrutiny to ensure that study findings are not being distorted because of financial relationships.

As consumers of data, each of us should hold researchers to high ethical standards. It is important to have a healthy skepticism when statistics are cited in support of a finding. We should ask questions such as these:

- Who is reporting about the study and do they have any financial or personal interest in the outcome?
- How were the sample data obtained? What is the potential for bias?
- Have these findings been reviewed or replicated by peers or anyone else?
- What specifics do they provide about the methods used? What is the margin of error, confidence interval, *P*-value, and so on?

Researchers must always adhere to the highest ethical standards in their work. We should all strive to behave ethically as follows:

- Be complete and honest about findings, even if the results are not what was expected or desired.
- Seek the advice of professionals when unsure about which statistical analyses are correct.