

## LYING FIGURES

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Our faith in statistics and number-juggling has never been strong. It was not bolstered the other night while watching a TV commercial on rat poison. A new, super-foam rat killer was touted as being able to kill 140 times its weight in rats. Estimating that a small dab of poisonous foam has a weight hardly measurable by housekeeping standards, we wondered whether even a midget rat might suffer the pangs of indigestion after consuming it.

Statistics have always fascinated us since the time as a senior medical student we took on an Owl Club project of meeting all the morning eight o'clock, junior-senior lectures in order to count the attendance and correlate it with the attendance given by individual lecturers and specialty departments. The findings of the project were presented at the annual senior-faculty banquet where they got a cool reception. We remember that Dr. Ochsner and his Department of Surgery drew the best attendance (about 58% of the combined class number) with the rest of the departments trailing miserably. This was due undoubtedly to a form of dictatorial hypnosis, and to the "Great White Father's" compulsive habit of stopping in mid-sentence and pulling out his watch as each individual late-comer attempted to slip quietly into the auditorium. He would then announce to the sleepy gathering, and on each occasion with the same cheerful sarcasm, that Mister So-and-So could not expect to keep "banker's hours" in the practice of medicine. The report was not popular with Ochsner, and less popular with the other departments. However, we like to think that it did accomplish its mission of pointing up one weakness in the medical school curriculum, since not too many years later the eight o'clock lectures were finally abandoned.

Several months ago, Lippincott's *Medical Science* editorialized on statistics in medicine and presented an excellent and amusingly written article by Dr. Marshall Brucer on "Statistical Lying." The paper discussed the four kinds of statistical populations dealt with in medicine: the population of equally probable events; the population of possible events; the population of unlikely events; and the population of unpredictable events. The first three correspond to the "classical statistical distributions," Bernouilli, Gaussian and Poisson. The fourth classification is the most important and common type of statistics utilized by medicine; it is, however, because of its nature, especially subject to errors of sampling even in the hands of professional statisticians. It becomes more unreliable when subjected to errors of interpretation by persons unfamiliar with statistical methods.

The true statistician, primarily a collector of quantitative data, recoils in horror when he sees some of the interpretations put on his painstaking efforts by those intent on proving something. The claims of the pros and cons in the lung cancer-cigarette controversy illustrate this quite plainly. In another field, and one loaded with political overtones, the proponents of government medicine frequently use vital statistics to batter the opposition in attempts to demonstrate that American, free-enterprise medicine is not doing the job when compared to medicine in socialized countries.

For example, the socialized medicine boys are fond of telling us that in Sweden the infant mortality rate is lower than in this country, and that life expectancy in Sweden (73 years) is greater than in the United States (70.4 years). These figures, based on statistics, are supposed to demonstrate the superiority of government controlled, socialized medicine. To a knowledgeable statistician such comparisons are worse than useless; to a smart, or even an ignorant politician, they are most helpful.

The basic error in comparing Swedish and American statistics is that in this instance, one is comparing data obtained from two entirely different statistical populations or "distributions." Sweden is a small nation of homogeneous population, whereas the United States is a vast nation of heterogeneous population. When a more legitimate comparison is made between Sweden and the people of Swedish ancestry in Minnesota, the figures of both infant mortality and life expectancy favor this country. In the example of infant mortality, additional error occurs because of differences in definition. In Sweden an infant is not considered a live-birth unless it actually breathes; in the U.S., an infant is considered a live-birth if it born with a heartbeat, even if it never takes a spontaneous breath. Thus, an infant whose heart beats for two minutes after birth and then stops, but who takes no breath, would be classified as a live birth here and a stillbirth there. As a stillbirth it would not be included in Sweden's infant mortality figures, but as a neo-natal death it would be included in ours. Other errors are introduced because the Swedes also permit legalized abortion for socio-economics reasons. In their abuse of statistics, the proponents of socialized medicine never mention the fact that the Swedish fetal (ante-natal) mortality is considerably higher than our own. Many of these same factors also affect the life expectancy rates. Every time a newborn with a heartbeat only dies at two minutes, ten minutes or thirty minutes here, it reduces the average overall life expectancy figure; in Sweden, as a stillbirth, it is not counted at all.

These discrepancies were indicated by the Swedish delegate to the World Medical Association who pointed out the impossibility of equating the populations of the two nations. He remarked, "People who do compare such things are hunting for headlines."

In the words of Dr. Mark Altschule, editor of *Medical Science*, "Statistics may be used only to transform a possibility into a probability. Statistics may provide a guide to medical research but can never provide a conclusive decision about anything. They should not be allowed to give a false sense of security about the significance of observation. The results of statistical studies should always be received with skepticism."

Dr. Brucer's article in *Medical Science* reminds us that the use of statistics in medicine, while often essential, is frequently a source of error and misconception. He cautions, therefore, that it is extremely important for physicians to be familiar with statistics, and particularly with their uses and abuses.