(1) Gustav Herdan (1955)
Statistics of Therapeutic Trials
Amsterdam: Elsevier

Preamble
Gustav Herdan's book *Statistics of Therapeutic Trials* was the first published textbook on clinical trials and appeared about seven years after publication of the streptomycin trial; it therefore has a special place in history and deserves attention especially as little may be known about the author or his work in medical statistics (see below).

The book appears as an isolated venture into medical statistics surrounded by Herdan's publications in other areas such as Heisenberg's uncertainty relation as a case of stochastic dependence, language in the light of information, a new derivation of Yule's characteristic K, language as choice and chance, and an inequality relation between Yule's characteristic K and Shannon's entropy H.

Further details of Herdan's life and publications can be found in KH Best and G Altmann (2007), XXX. Gustav Herdan (1897-1968). *Glottometrics* 15, 92-96, the source for the summary above.

In his book (page 24), Herdan describes treatment allocation by alternation, which he calls the method of alternates, but adds, "It is also possible to use the method of random numbers for forming the two groups. Random numbers provide a theoretically correct method of randomisation which is, however, of limited use in clinical work." This view would change as many of the texts included in this synopsis demonstrate. It is not surprising that this first text on clinical trials includes significance testing.

Aims
In place of the conventional mathematical approach to medical statistics, this book has adopted a medical approach because of the advantages this entails as regards both study and application. Medical statistics in its conventional form is taught as a sort of simplified mathematics. What is meant by this is that the subject is developed as a mathematical system. These presentations start, as a rule, with simple mathematical concepts such as the average, the standard deviation; they will then explain certain standard forms of distribution of data, proceed from there to the theory of statistical testing and, finally, go over to bi- and multi-variate procedures. There is much to recommend this method, provided the reader has sufficient mathematical stamina. It has, however, disadvantages, the greatest of which is its generality, which is inseparable from mathematics. Generality, though one of the beauties of mathematics, is also its greatest stumbling block. Although illustrations from medical practice will usually be given as the course proceeds, yet in the end, the student will, in a given medical situation, have at his disposal a number of statistical methods and will be at a loss as to which method is most suitable in the given case.

This suggests as an alternative approach to medical statistics to start with the medical situation and try to allocate to certain typical situations the statistical methods which are most suitable for dealing with them individually. The system of medical statistics then becomes one of medical, instead of mathematical, concepts, and the mathematics are introduced ad hoc, by and by, as the situation requires. This has the advantage of substituting for the somewhat loose and often ill-fitting mathematical garment which the statistician tries

to drape around the stately body of medicine, a neater and closer-fitting one. The mathematics then, instead of being ready-made, are cut to measure.

This, however, requires restriction of the subject to one of the five great sub-classes of medical statistics: vital statistics, statistical evaluation of therapeutic trials, pathological statistics dealing with the correlation of symptoms and lesions, medical genetics and biological standardisation. Of these five classes, the second has been selected as the subject of this book (Preface, pages v-vi).

Contents (xvi+367 pages)

Author

The author, Gustav Herdan MSc, PhD, LLD (1897-1968)., is lecturer in medical statistics at the University of Bristol, Bristol, England. He was a jurist, statistician and linguist with a PhD from the German University, Prague, in sinology (East Asian languages) and English philology. In 1938, he migrated to England to study mathematics and statistics, and in 1948 he became a lecturer in statistics at the University of Bristol. In 1955 he was lecturer in medical statistics also in Bristol. Herdan was a pioneer of quantitative linguistics who developed mathematically formulated statistical language laws reflected in his observation that "the masses of linguistic forms….are a part of the physical universe, and as such are subject to the laws which govern mass assemblies of any kind... This is how the need for statistical linguistics arises." Using methods from information theory and cybernetics, he became, together with Guiraud and Muller, an originator of the upsurge of quantitative linguistics in the decade from 1950. He dealt with a variety of themes including authorship determination, stylometrics, language change and blending, applications of information theory, type-token relation, word length and frequency distributions, interrelations between text length and vocabulary size, and between stylistics and language typology. He presented numerous language laws, among others the Zipf and Zipf-Mandelbrot, the Poisson, and the lognormal distributions. According to Best and Altmann, many ideas can be found in Herdan's writings but he may have relied in his linguistic efforts too much on his own linguistic knowledge, and avoided any cooperation with linguists – as opposed to his activities in medicine, where he concentrated on statistics and cooperated with other scientists.