POSSIBLE MANIFESTATIONS OF WORSENING ENVIRONMENTAL POLLUTION

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1. Introduction

On the assumption that many mathematical statisticians are not well acquainted with the kinds of data available to describe health, I propose to review those aspects of health which may be affected by the environment, and to make some comments on the measurement of the environment, as well as the statistical, or rather metastatistical, problems involved in establishing an association between environment and health.

2. Definition and measurement of environment

It is possible (and useful for some purposes) to define the "environment" of a human being as everything outside of his epidermis. Such a view would define the smoking habits of parents, for example, as part of their children's environment. It would also define the presence of an efficient ambulance service as part of the environment of the population of a city. In both these cases, the life expectancy of an individual may be effected by the factors mentioned, thus both are examples of environmental characteristics which affect health.

For our purposes, however, it is clearly expedient to take a narrower view, and to define "environment" as the sum total of the physical phenomena which an individual encounters: food, water, air, and other substances with which he comes in contact.

Those aspects of this environment which are thought to be harmful, or potentially harmful, are now often monitored more or less systematically. However, several qualifying comments must be made about the nature of the monitoring process.

First, the purpose of monitoring is usually to implement public policy regarding maximum levels of pollution. As a result, monitoring is often designed not to estimate the average level of pollution, but to detect violations of some maximum permissible level. It therefore tends to take the form of what might be called "suspicion" sampling. For example, a large proportion of our data on