EPIDEMIOLOGICAL APPROACH TO EVALUATION
OF TOXIC EFFECTS

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This paper is a short survey on epidemiological strategies
and techniques in the evaluation of toxic effects.
Emphasis is put on outcome and exposure indicators, as
well as evaluation of effects, with the understanding that
epidemiological research should be added to knowledge from
experimental and other scientific activities in the
field (1).

Outcome Indicators

Epidemiology often deals with binary types of variables,
e.g. cancer/no cancer, exposure to agent X/no such
exposure. In this case, the outcome indicators refer to
what Miettinen (unpublished document, 1979) calls
"measures of occurrence" (of disease, sign, symptom,
etc.): that is, outcomes in the health-disease system.

The basic epidemiological outcome indicators are
prevalence and incidence rates. Prevalence rate is the
proportion of subjects with an outcome condition
(disease, etc.) out of the target group or population at
issue. For example, in a group of 343 rayon viscose
workers exposed to carbon disulfide (CS_2), 16.8%
reported angina pectoris (AP) in a standardized interview
done in 1967 (2). This percentage is the prevalence rate
of AP in this group at that time. Whether or not this
finding indicates something of the effect of CS_2 is
obscured until answers have been given to such questions
as: What would the prevalance have been without
exposure? Have some of the workers stopped working in the
plant because of disease? What are the determinants other
than CS_2 exposure that may affect the rate? Answers to
these questions were attempted in the study by Hernberg
et al. (2).

Incidence rate is either directly related to person-time
space (incidence density or force of morbidity) or is
cumulative (Miettinen, unpublished document, 1979). The
incidence rates are based on new ("incident") cases (of