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Abstract Book

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MODELLING THE COMPLEXITY

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In epidemiological research, observational studies often collect a great bulk of information over many variables and analyze each dependent variable one at a time. This approach does not face the problem of the correlation among the different variables, the dependent or independent ones. Structural Equation Models (SEM) developed in the fields of biometrics and econometrics can be applied in epidemiological studies to solve this problem. This method allows to evaluate causal hypotheses on a set of inter-correlated non-experimental data. It requires the specification of a series of simultaneous hypotheses about the relationship of selected variables, including "causal" and confounding variables, on the other variables. The consistency of such simultaneous hypotheses can be evaluated by goodness-of-fit statistics.
We adopted this method for the statistical analysis of the "Mercury Multicenter Project", an observational study aimed to the identification of biological variables associated with different types of Hg exposure. In fact, this dataset includes information on occupational exposure to Hg and non-occupational exposure to Hg through dental amalgams and fish consumption. Using the SEM we developed a model based on the hypothesis that the sociological and the demographic variables, the Body Mass Index, the variables related to the lifestyle, the fish dietary intake, amalgam restorations and the occupational exposure to Hg define a not observable "latent" variable that collects the available information about the exposure to Hg.
This latent variable can modify the measured values of the exposure variables (HgU/Creat e HgB) that in turn can modulate the different functional variables.