Alexander MacInnis, Lorene Nelson, Kristin Sainani
Health Research and Policy (Epidemiology), Stanford University

Abstract

Estimates of autism prevalence have increased exponentially over the past few decades, yet it is currently unknown and controversial how much of the measured increase reflects an increase in true case prevalence and how much is due to changes in non-etiologic factors such as diagnostic criteria, diagnostic practice, awareness, availability of services and social pressures. The time trend in autism case prevalence by birth year, adjusted for diagnostic year, has direct implications for understanding the variable causative (etiologic) factors. An increase in birth year true case prevalence would imply an increasing effect of etiologic factors, that is, the environmental broadly defined, as opposed to inherited genetic factors. A clear understanding of the time trend may lead to strategies for prevention and treatment, greatly reducing human suffering. The birth year case trend can also serve to predict the numbers of adults who will require support services in the future, which tends to be very expensive, and this may inform policy planning.

We have data from the California Department of Developmental Services showing the incidence of initial diagnosis of autism (autistic disorder) by diagnostic year, birth year and sex in California from 1980 through 2017. Our previous work showed that Age Period Cohort methods are not suitable for addressing the problem. Survival analysis (time series) methods enable us to estimate the parameters of a model of the birth year trend in true case prevalence, correcting for both diagnostic year and age effects. A Python program uses a search method to estimate to fine accuracy the six parameters the model. Preliminary results show a close fit between the data and the model.