

## Open Population Capture-Recapture Models and Diabetes in Otago, New Zealand

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The aim of our research is the development of open population capture-recapture models to estimate both prevalence and incidence and to monitor those estimates over time. The standard way of estimating prevalence of diabetes using lists is through closed population capture-recapture methods. These may use two lists or may use several. Prescribed capture-recapture models can be used for the multi-list analysis or, alternatively, loglinear models which allow for the modelling of specific dependencies between lists. They are, typically, analyses of lists from a particular point in time (to meet the assumption of a closed model - that is, no one joins or leaves the lists). We accessed four data sources of people with diagnosed diabetes resident in Otago, New Zealand. We applied these closed models to this data and our estimates of prevalence overall were 3.65% (with a confidence interval of 3.54% to 3.78%). Our open population model allows us to exploit information that has previously not been included in standard models. Firstly, we used data available over several years rather than just looking at a single snapshot. This means that for each person there are several observations over a period of years allowing us to monitor estimated prevalence. Secondly, we can allow for people who join the lists subsequent to the start of the study period and those who may leave the lists before the study end. That means that we can estimate the probability of remaining on the lists from one time period to the next. We also have diagnosis date which allowed us to estimate incidence and monitor that over time. The results from the open population model will be presented. This new method will assist with monitoring chronic diseases in a cost effective way.