UNCERTAINTY ASSESSMENT OF NET TRANSITION PROBABILITIES OF RISK FACTORS IN CHRONIC DISEASE MODELLING ESTIMATED FROM CROSS SECTIONAL DATA

J. van de Kassteele[1], H.C. Boshuizen[1], and R.T. Hoogenveen[1]

[1]National Institute for Public Health and the Environment (RIVM), PO Box 1, 3720 BA Bilthoven, The Netherlands.

A problem in chronic disease modelling is the estimation of annual transition probabilities to move from one state of a categorical risk factor to another. Transitions can be easily obtained from a cohort study, but a problem is that such data may not be available. However, under the assumption of no period effects, cross sectional prevelance data could be used instead. Another problem may be that these age dependent prevalence data are only given in five year intervals. The question is how to estimate annual transition probabilities, including their uncertainties. Our approach consists of two steps: 1) interpolate five year interval prevalence data to annual prevalence data using multinomial P-splines, 2) from these data estimate net transition probabilities. This can now be formulated as a transportation problem which is solved using the simplex algorithm from linear programming theory. Uncertainties are assessed by parametric bootstrapping. We illustrate our method using BMI data.