

*MULTISTATE LIFE-TABLES AS REPEATED MEASURE MODELS**C.R. HEATHCOTE*

A multistate life-table typically describes the evolution of a cohort from birth at time $t = 0$ to death at or before some maximum age $t = m$. The entries in the table are the counts of the number of individuals in each of several states for ages $t = 0, 1, \dots, m$, with the states falling into two categories, an "alive" or transient set numbered say $1, 2, \dots, a$, and a "death" or absorbing set numbered $a+1, a+2, \dots, a+d$. The a transient states may for example be a different states of health and the d absorbing states different risks of death. For a cohort of $\ell(0)$ individuals we then have $\ell(0)$ repeated counting measures over $[0, m]$ in the sense that the data consist of individual life indicators for $t = 0, 1, \dots, m$. Relevant references are Chiang (1968) and Chapter 8 of Crowder and Hand (1990). We shall be concerned with probabilistic structure and not inference, and hope to show how life tables can be placed into the context of the workshop.

Life tables are usually displayed as a series of rows indexed by age t but it is convenient for our purposes to stand this arrangement on its side and interpret the life table counts as a realisation of a stochastic process with the usual convention of (discrete) time running from left to right as in Table 1. For convenience time and age are measured on the same scale and from the same origin.