SUMMARIES OF RESEARCH DISCUSSION PAPERS

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BIAS IN DECREMENTAL RATE ESTIMATES

BY L. A. ROBERTS

(Paper No. 38 deposited in the Library in March 1986)

THE extent of bias in period and cohort estimates of decremental rates depends upon both the shape of the survival function l_x and the distribution of exposure over the rate interval.

Bias is approximately minimized when exposure is uniform over the rate interval, and can increase markedly with uneven exposure. A consequence is that cohort estimates do not minimize bias when competing decrements operate unevenly over the rate interval, although cohort estimates can still be expected in general to minimize mean square error.

The ratio of the proportional bias in the initial rate estimate to that in the central rate estimate is relatively insensitive to the distribution of entrants and competing decrements; it does however depend strongly upon the curvature of the survival function. When a survival function is either concave, or convex with a lower curvature than the exponential, initial decremental rate estimates are more biased than central rate estimates; the converse is the case when the survival curve is more convex than the Balducci function. An important conclusion is that when the force of decrement is decreasing with age, m type rates should be estimated from data, and q type rates deduced from the m estimates if they are required.

Illustrations are provided from some standard U.K. life tables.

ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

BY C. D. DAYKIN, M.A., F.I.A., F.S.S

(Paper No. 39 deposited in the Library in April 1987)

THE potential impact of Acquired Immune Deficiency Syndrome (AIDS) is such as to be of considerable concern to actuaries. Many aspects are, of course, subject to a considerable degree of uncertainty, since the spread of the disease is still in its

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