CORRESPONDENCE

DISTRIBUTION OF DEATHS IN THE FIRST YEAR OF LIFE

(*To the Editors of the* Journal of the Institute of Actuaries)

SIRS,

The information collected for the E.L.T. No. 10 regarding the distribution of deaths in the first year of life fills a gap in the statistics required for the calculation of monetary and other functions.

The distribution of deaths for each 3 months in the first year of life is as follows:

Months	Males	Females
0–3	66 %	65 %
3–6	14 %	14 %
6–9	11 %	11 %
9–12	9 %	10 %

These results confirm the figures given by Blossom in *J.S.S.* Vol. III, Pt. 4, p. 241.

From the above figures curves may be drawn roughly to represent the distribution of deaths in the first year of life. On this estimate it appears some $48\frac{1}{2}$ % of the deaths among males in the year occur in the first 4 weeks of life, and 66 % in the first 3 months. Adjusted values of $\overline{C}_0$ may then be calculated by approximate evaluation of $\int_0^1 v^x d_x\, dx$. The application of these results to the No. 9 (Males) Table with $3\frac{1}{2}$ % interest gives $\overline{C}_0 = 8923$.

Comparison with other values is of interest:

d_0	8996
$\overline{C}_0$—see *J.I.A.* Vol. LIX, p. 172	10066
$\overline{C}_0 = v^{\frac{1}{2}} d$	8843
Adjusted value as above	8923

The exaggerated effect on $\overline{C}_0$ of the special value of μ_x at age 0 is clearly illustrated in the second value. The value of $\bar{a}_0$ becomes 21·756 instead of 21·424. Other functions involving the mortality of the first year of life would be modified similarly.

The value of $\overset{\circ}{e}_0$ by E.L.T. (9) Males No. 9 is given as 55·62 in App. IV of the Report on the 1921 Census.

If the years of life lived by those who die age 0–1 is denoted by X then
$\mathring{e}_0 = \dfrac{\mathring{e}_1 \times l_1 + l_1 + X}{l_0}$ and from the E.L.T. No. 9 (Males) $\mathring{e}_0 = 55 \cdot 58 + X/l_0$.
In order to produce the value quoted, X must be 4000 years for the 8996 who die.

Actually on the basis of distribution of deaths in the No. 10 Census X would be about 2000 and $\mathring{e}_0$ becomes $55 \cdot 60$ instead of $55 \cdot 62$.

I am, Sirs, etc.

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