

CORRESPONDENCE

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

Mortality of European members of the Services in India

SIRS,

In the discussion following the reading of Professor Vaidyanathan's paper on *Mortality of Indian Assured Lives* (*J.I.A.* Vol. LXX, p. 15), Mr D. C. Fraser remarked that it would be of interest and value if the results of the successive investigations which had been made into the mortality of the members of the Indian Civil Service could be recorded.

The investigations referred to by Mr Fraser were made in connexion with the periodical valuations of the Indian Civil Service Family Pension Fund, which was established in 1881 for the benefit of the widows and orphans of members of the Indian Civil Service. A similar scheme, the Indian Military Service Family Pension Fund, was started in 1873 for the provision of pensions for the widows and orphans of military, medical, naval and ecclesiastical officers in the service of the Government of India. This scheme was closed at the end of 1914 to new entrants, for whom the Indian Military Widows' and Orphans' Fund was then established. All new entrants into the respective services are required to contribute under the appropriate scheme, membership of which is compulsory.

In the Indian Civil Service scheme, certain of the pensions are supplemented by payments from the Government, but apart from these additions, the Fund is self-supporting and is maintained by contributions paid by the members.

The military schemes are entirely self-supporting and normally involve no charge on Government funds. The benefits, which are smaller than those of the civil scheme, are additional to those granted by Royal Warrant from Indian revenues to the widows and families of military officers in the service of the Government of India.

In 1928 a fourth Fund, the Superior Services (India) Family Pension Fund, was instituted to secure suitable provision for the widows and orphans of European and Anglo-Indian members of certain Civil Services other than the Indian Civil Service. This Fund, entry into which is now confined to officers appointed to the Indian Police, is also self-supporting. Its provisions are on much simpler lines than those of the older schemes which are of great complexity, involving many interesting actuarial problems. In view of its recent establishment, the experience of the Superior Services scheme so far available is limited, and the Fund is mentioned only to avoid any misconception regarding the constitution of the membership of the Indian Civil Service Family Pension Fund.

Following the discussion referred to above, inquiries had been received from various quarters regarding the mortality experience of the members of the Indian Services. Through the courtesy, which actuaries will desire to acknowledge, of the Secretary of State for India, it is possible for details to be made available to the actuarial profession of the mortality experience of the members of the schemes.

Tables are accordingly enclosed showing the experience in the three quinquennial periods of the members of (1) the Indian Civil Service scheme between 1 April 1918 and 31 March 1933, and (2) the combined military schemes between 1 April 1919 and 31 March 1934.

Table 1. Indian Civil Service Family Pension Fund

Mortality experience of European officers between 1 April 1918 and 31 March 1937
 Expected deaths on basis of Government Life Annuitants, 1900-20 (Males) ultimate table

| Age group | Exposed to risk | Actual deaths | Expected deaths | Ratio Actual/Expected | Exposed to risk | Actual deaths | Expected deaths | Ratio Actual/Expected |
|---------------|-----------------|---------------|-----------------|-----------------------|-----------------|---------------|-----------------|-----------------------|
| 1918-23 | | | | | | | | |
| Under 25 | 30 | — | ·1 | ·00 | 61 | 1 | ·3 | 3·33 |
| 25 & under 30 | 571 | 3 | 2·5 | 1·20 | 382 | 2 | 1·6 | 1·25 |
| 30 " " 35 | 1083 | 7 | 5·3 | 1·32 | 700 | 5 | 3·5 | 1·43 |
| 35 " " 40 | 1155 | 6 | 6·8 | ·88 | 1056 | 6 | 6·4 | ·94 |
| 40 " " 45 | 1098 | 10 | 7·9 | 1·27 | 1101 | 5 | 7·8 | ·64 |
| Under 45 | 3937 | 26* | 22·6 | 1·15 | 3300 | 19 | 19·6 | ·97 |
| 45 & under 50 | 1491 | 12 | 13·0 | ·92 | 1053 | 5 | 9·2 | ·54 |
| 50 " " 55 | 984 | 12 | 11·1 | 1·08 | 1439 | 8 | 16·7 | ·48 |
| 55 " " 60 | 485 | 3 | 7·8 | ·38 | 924 | 17 | 15·0 | 1·13 |
| 45 " " 60 | 2960 | 27 | 31·9 | ·85 | 3416 | 30 | 40·9 | ·73 |
| 60 " " 65 | 61 | 2 | 1·4 | 1·43 | 450 | 9 | 11·0 | ·82 |
| 65 " " 70 | — | — | — | — | 50 | 2 | 1·8 | 1·11 |
| 70 " " 75 | — | — | — | — | — | — | — | — |
| 75 & over | — | — | — | — | — | — | — | — |
| 60 & over | 61 | 2 | 1·4 | 1·43 | 500 | 11 | 12·8 | ·86 |
| Total | 6958 | 55* | 55·9 | ·98 | 7216 | 60 | 73·3 | ·82 |
| 1928-33 | | | | | | | | |
| Under 25 | 181 | 1 | ·7 | 1·43 | 74 | — | ·3 | ·00 |
| 25 & under 30 | 495 | 3 | 2·0 | 1·50 | 548 | 3 | 2·4 | 1·25 |
| 30 " " 35 | 374 | — | 1·9 | ·00 | 324 | 1 | 1·7 | ·59 |
| 35 " " 40 | 672 | 4 | 4·1 | ·98 | 320 | 2 | 1·9 | 1·05 |
| 40 " " 45 | 1002 | 6 | 7·1 | ·85 | 549 | 3 | 3·9 | ·77 |
| Under 45 | 2724 | 14 | 15·8 | ·89 | 1815 | 9 | 10·2 | ·88 |
| 45 & under 50 | 1050 | 7 | 9·2 | ·76 | 784 | 5 | 7·0 | ·71 |
| 50 " " 55 | 1013 | 9 | 11·8 | ·76 | 794 | 6 | 9·1 | ·66 |
| 55 " " 60 | 1328 | 37 | 22·1 | 1·67 | 755 | 10 | 12·6 | ·79 |
| 45 " " 60 | 3391 | 53 | 43·1 | 1·23 | 2333 | 21 | 28·7 | ·73 |
| 60 " " 65 | 836 | 13 | 20·7 | ·63 | 974 | 28 | 25·0 | 1·12 |
| 65 " " 70 | 394 | 15 | 15·5 | ·97 | 539 | 20 | 21·6 | ·93 |
| 70 " " 75 | 38 | 2 | 2·1 | ·95 | 223 | 17 | 13·6 | 1·25 |
| 75 & over | — | — | — | — | 10 | 1 | ·9 | 1·11 |
| 60 & over | 1268 | 30 | 38·3 | ·78 | 1746 | 66 | 61·1 | 1·08 |
| Total | 7383 | 97 | 97·2 | 1·00 | 5894 | 96 | 100·0 | ·96 |

* Excluding four deaths due to the 1914-18 war.

Table 2. Indian Military Service Family Pension Fund and
Indian Military Widows' and Orphans' Fund

Combined mortality experience of European officers between 1 April 1919 and 31 March 1937
Expected deaths on basis of Government Life Annuitants, 1900-20 (Males) ultimate table

| Age group | Exposed to risk | Actual deaths | Expected deaths | Ratio Actual/Expected | Exposed to risk | Actual deaths | Expected deaths | Ratio Actual/Expected |
|---------------|-----------------|---------------|-----------------|-----------------------|-----------------|---------------|-----------------|-----------------------|
| 1919-24 | | | | | | | | |
| Under 25 | 8085 | 94 | 29.4 | 3.20 | 1164 | 4 | 4.3 | .93 |
| 25 & under 30 | 6722 | 52 | 28.4 | 1.83 | 4707 | 22 | 20.2 | 1.09 |
| 30 " " 35 | 4275 | 23 | 21.3 | 1.08 | 4102 | 10 | 20.4 | .49 |
| 35 " " 40 | 4682 | 35 | 27.8 | 1.26 | 3533 | 14 | 21.0 | .67 |
| 40 " " 45 | 3991 | 38 | 28.3 | 1.34 | 4404 | 22 | 31.5 | .70 |
| Under 45 | 27755 | 242 | 135.2 | 1.79 | 17910 | 72 | 97.4 | .74 |
| 45 & under 50 | 2845 | 21 | 24.8 | .85 | 3726 | 33 | 32.4 | 1.02 |
| 50 " " 55 | 3040 | 45 | 35.3 | 1.27 | 2623 | 23 | 30.2 | .76 |
| 55 " " 60 | 2609 | 37 | 42.9 | .86 | 2744 | 46 | 45.3 | 1.02 |
| 45 " " 60 | 8500 | 103 | 103.0 | 1.00 | 9093 | 102 | 107.9 | .95 |
| 60 " " 65 | 1798 | 43 | 45.3 | .95 | 2276 | 58 | 57.6 | 1.01 |
| 65 " " 70 | 1130 | 42 | 45.6 | .92 | 1510 | 52 | 60.8 | .86 |
| 70 " " 75 | 706 | 37 | 45.2 | .82 | 840 | 58 | 53.6 | 1.08 |
| 75 & over | 421 | 62 | 45.9 | 1.35 | 614 | 76 | 74.0 | 1.03 |
| 60 & over | 4055 | 184 | 182.0 | 1.01 | 5240 | 244 | 246.0 | .99 |
| Total | 40310 | 529 | 420.2 | 1.26 | 32243 | 418 | 451.3 | .93 |
| 1929-34 | | | | | | | | |
| Under 25 | 1188 | 7 | 4.4 | 1.59 | 884 | 9 | 3.4 | 2.65 |
| 25 & under 30 | 1834 | 6 | 8.0 | .75 | 1244 | 9 | 5.3 | 1.70 |
| 30 " " 35 | 4918 | 24 | 24.7 | .97 | 1416 | 10 | 7.1 | 1.41 |
| 35 " " 40 | 4286 | 19 | 25.2 | .75 | 3177 | 19 | 18.8 | 1.01 |
| 40 " " 45 | 3594 | 24 | 25.6 | .94 | 2341 | 11 | 16.7 | .66 |
| Under 45 | 15820 | 80 | 87.9 | .91 | 9062 | 58 | 51.3 | 1.13 |
| 45 & under 50 | 4235 | 31 | 37.1 | .84 | 2086 | 13 | 18.3 | .71 |
| 50 " " 55 | 3454 | 38 | 39.6 | .96 | 2430 | 20 | 28.0 | .71 |
| 55 " " 60 | 2405 | 29 | 39.8 | .73 | 1750 | 20 | 28.5 | .70 |
| 45 " " 60 | 10094 | 98 | 116.5 | .84 | 6266 | 53 | 74.8 | .71 |
| 60 " " 65 | 2440 | 52 | 62.3 | .83 | 1307 | 27 | 33.5 | .81 |
| 65 " " 70 | 1885 | 80 | 76.5 | 1.05 | 1213 | 44 | 49.3 | .89 |
| 70 " " 75 | 1172 | 70 | 74.8 | .94 | 824 | 53 | 52.6 | 1.01 |
| 75 & over | 825 | 94 | 104.6 | .90 | 596 | 87 | 76.0 | 1.14 |
| 60 & over | 6322 | 296 | 318.2 | .93 | 3940 | 211 | 211.4 | 1.00 |
| Total | 32236 | 474 | 522.6 | .91 | 19268 | 322 | 337.5 | .95 |

Note. The experience is subsequent to the 1914-18 war, but in the period covered includes deaths from all causes.

Valuations at 31 March 1937 of all the Funds were required for a special purpose; the tables also include the results of the respective experiences during the four years and three years since the preceding quinquennial valuations.

The tables show the exposed to risk and the deaths in five-yearly age groups, and also the expected deaths, calculated throughout on the basis of the Government Life Annuitants, 1900-20, table as a convenient standard for comparative purposes. The ratios have been inserted in all cases, although for some groups their significance is limited by the smallness of the numbers involved.

The figures relate to the members of the family pension schemes, and include both serving and retired officers. Subsidiary totals are given for three broad age groups:

- (1) Under age 45, consisting in the main of serving members.
- (2) Age 45 to age 60, the range within which retirement ordinarily takes place on completion of the normal full period of service.
- (3) Age 60 and over, consisting almost entirely of retired members, since very few officers, civil or military, remain in service beyond age 60.

I am, Sirs,

Your obedient Servant,

D. A. PORTEOUS

Government Actuary's Department
Caxton House East
Tothill Street
London, S.W. 1

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