

S.P. 118. (XI.)

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UNION OF SOUTH AFRICA

UNIE VAN SUID-AFRIKA

SIXTH
CENSUS

SESDE
SENSUS

OF THE POPULATION OF THE UNION
OF SOUTH AFRICA, ENUMERATED

VAN DIE BEVOLKING VAN DIE UNIE
VAN SUID-AFRIKA, OPGENEEM

5th MAY, 1936

5 MEI 1936

VOLUME XI

BOEKDEEL XI

**SOUTH AFRICAN
LIFE TABLES**

**SUID-AFRIKAANSE
LEWENSTABELLE**

Nos. E. 3. (EUROPEANS)
AND
C. 1. (COLOURED PERSONS)

Nos. E. 3. (BLANKES)
EN
C. 1. (KLEURLINGE)

PUBLISHED BY AUTHORITY

UITGEGEE OP GESAG

Price 2s.

Prys 2s.

PRINTED IN THE UNION OF SOUTH AFRICA BY THE GOVERNMENT PRINTER, PRETORIA
GEDRUK IN DIE UNIE VAN SUID-AFRIKA DEUR DIE STAATSDRUKKER, PRETORIA
1939.

U.G. No. 49, '39
G.P.-S.9319-1939-1,200.
Cost of Printing } £79. 8s. 0d.
Koste van Druk }

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ARRANGEMENT OF CENSUS REPORTS
INDILING VAN SENSUSVERSLAG

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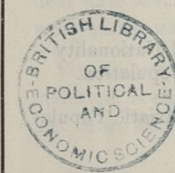
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ARRANGEMENT OF CENSUS REPORTS,
1936.

The tabulated results of the Census will be issued in twelve parts. Each part will be published from time to time not necessarily in numerical order as the information becomes available.

ISSUED TO DATE :—

- Volume I.—Sex and Geographical Distribution of All Races of the Population (with Maps and Diagrams).
„ II.—Ages of the European, Asiatic and Coloured Population (with Graphs of Age and Sex Constitution).
„ III.—Marital Condition—European, Coloured and Asiatic Population (with Graphs).
„ IV.—Languages : Official and Home Languages Spoken—European, Coloured and Asiatic Population (with Maps and Graphs).
Supplementary to Volume IX (Ages and Marital Condition—Natives).
„ VIII.—Dwellings in Urban Areas.
„ X.—Unemployment—European, Coloured and Asiatic Population.
„ XI.—South African Life Tables—Nos. E. 3. (Europeans) and C. 1. (Coloured Persons).

TO BE ISSUED :—

- Volume V.—Birthplaces, Period of Residence and Nationality—European, Coloured and Asiatic Population.
„ VI.—Religions—European, Coloured and Asiatic Population.
„ VII.—Occupations and Industries—European, Coloured and Asiatic Population.
„ IX.—Natives (Bantu) and Other Non-European Races—Distribution, Ages, etc.
„ XII.—Final Report.

INDELING VAN SENSUSVERSLAE,
1936.

Die getabelleerde resultate van die Sensus sal in twaalf dele uitgegee word. Namate die informasie beskikbaar gestel word, sal die dele van tyd tot tyd gepubliseer word, nie noodwendig in numerieke orde nie.

TOT OP DATUM UITGEGEE :—

- Boekdeel I.—Geslags- en Geografiese Indeling van Alle Rasse van die Bevolking (met Kaarte en Diagramme).
„ II.—Leeftyte van die Blanke, Asiatische en Kleurlingbevolking (met Grafieke van Leeftyds- en Geslagsamestelling).
„ III.—Huwelikstaat—Blanke, Kleurling- en Asiatische Bevolking (met Grafieke).
„ IV.—Tale : Offisiële en Huistale wat gepraat word—Blanke, Kleurling- en Asiatische Bevolking (met Kaarte en Grafieke).
Aanhangsel van Boekdeel IX (Leeftyte en Huwelikstaat—Naturelle).
„ VIII.—Huisvesting in Stedelike Gebiede.
„ X.—Werkloosheid—Blanke, Kleurling- en Asiatische Bevolking.
„ XI.—Suid-Afrikaanse Lewenstabelle—Nos. E. 3 (Blankes) en C. 1. (Kleurlinge).

IN VOORBEREIDING :—

- Boekdeel V.—Geboorteplekke, Verblyfsduur en Nasionaliteit—Blanke, Kleurling- en Asiatische Bevolking.
„ VI.—Godsdienste—Blanke, Kleurling- en Asiatische Bevolking.
„ VII.—Beroepe en Nywerhede—Blanke, Kleurling- en Asiatische Bevolking.
„ IX.—Naturelle (Bantoes) en Ander Nie-blanke Rasse—Indeling, Leeftyte, ens.
„ XII.—Eindverslag.

PREFACE.

SOUTH AFRICAN LIFE TABLES.
Nos. E. 3. and C. 1.

The contents of this Volume will be embodied in the final report on the Census of 1936.

Publication is being effected now in this separate volume to make the material available to the public earlier than would otherwise be the case.

The subject matter is of special interest to those concerned with actuarial work, public health, and allied sciences.

The life tables published herein are based on the population census results of 1936 and mortality during the years 1935-1937.

For the first time in South Africa, life tables for the non-European section of the population known as "Coloured persons" have been constructed. It was not possible to calculate the mortality rates for young Coloured children with the same degree of accuracy as in the case of Europeans, as complete vital statistics were not tabulated before the year 1935. It was, however, possible to do this for the first two years of life and a method of interpolation between those years and the middle part of the table, the construction of which presented no serious difficulty, was utilized whereby the actual and expected deaths did not materially differ from each other.

The mathematical computations embodied herein were performed by the late Mr. C. W. Pearsall, M.A., Technical Assistant Director of Census, who completed the work just prior to his decease.

I am indebted to Mr. M. C. v. T. Barker, B.Econ., who assisted Mr. Pearsall, for the explanatory notes which appear in this volume.

E. P. PEARCE,
Acting Director.

Census and Statistics Office,
Pretoria,
September, 1939.

VOORWOORD.

SUID-AFRIKAANSE LEWENSTABELLE.
Nos. E. 3. en C. 1.

Die inhoud van hierdie Boekdeel sal in die finale verslag oor die Sensus van 1936 opgeneem word.

Publikasie word tans in hierdie afsonderlike boekdeel uitgevoer ten einde die materiaal vroeër vir die publiek beskikbaar te stel as wat anders die geval sou wees.

Die inhoud is van spesiale belang vir diegenes wat in wiskundige werk, volksgesondheid en verwante wetenskappe betrokke is.

Die lewenstabelle hierin gepubliseer, is op die resultate van die bevolkingsensus van 1936 en die sterfte gedurende die jare 1935-1937 gebaseer.

Vir die eerste keer in Suid-Afrika is lewenstabelle ten opsigte van die nie-blanke gedeelte van die bevolking bekend as „kleurlinge” opgestel. Dit was nie moontlik om die sterftesyfers vir jong kleurlingkinders met dieselfde mate van juistheid as in die geval van blankes te bereken nie, aangesien volledige lewenstatistieke nie voor die jaar 1935 getabelleer is nie. Dit was egter moontlik om dit vir die eerste twee lewensjare te doen, en gebruik is gemaak van 'n metode van interpolasie tussen dié jare en die middelste gedeelte van die tabel, die opstelling waarvan geen ernstige moeilikheid opgelewer het nie; en sodoende het die werklike en die verwagte sterfgevälle nie veel van mekaar verskil nie.

Die wiskundige berekenings wat hierin opgeneem is, is uitgevoer deur wyle Mnr. C. W. Pearsall, M.A., Tegniese Assistent-Direkteur van Sensus, wat die werk net voor sy afsterwe voltooi het.

Vir die verduidelikende aantekeninge wat in hierdie boekdeel voorkom, is ek verskuldig aan Mnr. M. C. v. T. Barker, B.Econ., wat Mnr. Pearsall bygestaan het.

E. P. PEARCE,
Waarnemende Direkteur.

Kantoor van Sensus en Statistiek,
Pretoria,
September 1939.

REPORT

ON THE

SIXTH CENSUS OF THE POPULATION OF THE UNION OF SOUTH AFRICA, 5th MAY, 1936.

VOLUME XI. SOUTH AFRICAN LIFE TABLES Nos. E. 3. AND C. 1.
(E. indicates European and C. Coloured Persons.)

Introductory.—In the report on the South African Life Table No. E. 2 (U.G. No. 41 of 1930), a reference was made to all previous South African Life Tables which were known to have been published. Subsequently Mr. G. C. McLaren, in 1934, constructed one based on the mortality experience of the South African Mutual Life Assurance Society for the nine years 1924 to 1933.

Permission has been granted to publish some of the details of this Table for the sake of comparison with the National and other Tables based on South African mortality experience. These comparisons, as well as a table comparing our National Table with those of England and Wales, New Zealand, Australia and Eire, will be found incorporated at the end of this report.

It would have been possible to calculate another Life Table for Europeans, based on the Population Census of 1931, but owing to the depression and the consequent curtailment of the work of the Office of Census and Statistics, the idea was abandoned.

A ten-year interval between such calculations is, however, not great, and few countries have prepared them at shorter intervals. The opportunity has been taken of the first complete enumeration of the population since 1921 to construct Life Tables not only for the Europeans but also, for the first time, for the Coloured Population, that is, for Non-Europeans other than Natives and Asiatics.

SOUTH AFRICAN LIFE TABLES Nos. E. 3. AND C. 1.

In order to afford a direct comparison with South African Life Tables Nos. E. 1. and E. 2., the Life Tables published here have been constructed by the same methods as used for the previous Life Tables, except for ages 0 to 15 and 91 years and over; the methods employed for these ages are dealt with below. The Tables are again based on a three years (1935 to 1937) mortality experience centred on the Population Census of 1936.

It was assumed that the days of birth of persons of each year of age from one year upwards at the date of the Census, the 4th May, 1936, were evenly distributed through the year. With

that assumption a calculation from vital and migration statistics was made and adjusted figures for the population living on the 30th June, 1936, were obtained. The uniform geometrical increase in each age group assumed by Mr. King was not thought to be suitable for South Africa, where there is known to be an uneven distribution of population, and for this reason his method was not followed in obtaining the figures for the mean population, although in this short period it did not involve any great discrepancy.

There is a tendency in every Census for some persons to make incorrect statements of age, and as far as this tendency is confined to an inclination for round numbers (such as figures terminating in 0 and to a less degree in 8, 2 and 5), these inaccuracies can be largely smoothed out by adopting a satisfactory quinquennial grouping and then redistributing the figures in each group in due proportion. The same tendency has been observed in the case of the ages rendered in returns of death. It would seem therefore that the same psychological cause operates both where persons are asked to give their own ages and where persons are required to declare the ages of deceased people. It would appear that these misstatements are on the whole due to ignorance of the exact year of age. A person might say his age was about 50 or about 60 and return it as 50 or 60, or he might say it was between 50 and 60 and return it as 55, or again he might say he was getting on to 60 or was a bit over 60 and might return it as 58 or 62.

Where, however, there are deliberate misstatements of age all tending to be understatements in one period of life and overstatements in another no mathematical formula, however ingenious, will remove the error, unless, of course, the degree of misstatement is known. All that can be hoped is that greater accuracy will result from the spread of the knowledge that the information is not asked for out of idle curiosity but is utilized for scientific calculations of national interest.

From a careful examination of the population and mortality returns it appeared best to group ages into quinquennial groups on the basis of those whose final digit was either 4-8 and 9-3 or else 2-6 and 7-1. There seemed to be little to choose between the two; at certain periods of life one appeared to be slightly better than the other. As, however, the grouping of 4-8, 9-3 was utilized in the construction of Life Tables Nos. E. 1. and E. 2., it was decided to retain it for Life Tables Nos. E. 3. and C. 1.

The mean population as at the 30th June, 1936, and the average number of deaths over the three years 1935 to 1937 were, therefore, arranged in quinquennial age groups for the age periods 4-8, 9-13, 14-18, etc., as far as 99-103 years. From these age groups the central ages 11, 16, 21, etc., to 101 years were obtained for both the population and the deaths by the formula $U_{x+2} = .2W_x - .008\Delta^2 W_{x-5}$ where U_{x+2} is the population or deaths at the age $(x+2)$, and W_x is the sum of five values of the population or deaths for ages x to $(x+4)$. From these results the central death rate, m_x , was calculated in order to arrive at the probability of dying in the course of a year, i.e., q_x , by the formula $q_x = \frac{2m_x}{2+m_x}$ for each race and sex at the ages 11, 16, 21, etc., to 101 years.

The values of q_x obtained in this way for the ages 91 to 101 years were, however, not utilized. Other values were calculated by means of the Newton-Sheppard Formula of Adjusted Differences, which is given below. By this method it was found possible to bring the tables to a close at an earlier age and so meet the criticism of Mr. D. Spence Fraser, F.F.A., A.I.A., that the tables should be more in accordance with facts, and should not show people alive at ages well over 100 years.

The intervening values of q_x were obtained from functions of log $(q_x + .1)$ by Osculatory Interpolation by means of curves of the third order, which had the same first differential coefficient at their points of contact at the ages 16, 21, 26, etc.

The formulae were:—

$$\begin{aligned}\delta U_1 &= .2\Delta U_0 + .12\Delta^2 U_0 - .016\Delta^3 U_0 \\ \delta^2 U_1 &= .04\Delta^2 U_0 - .016\Delta^3 U_0 \\ \delta^3 U_1 &= .024\Delta^3 U_0\end{aligned}$$

where the symbol δ is used for annual and Δ for quinquennial differences. This gave a complete table for q_x from age 16 to age 105 years.

It is extremely difficult in a small community such as that of South Africa to be certain in the first place whether the few persons that attain great age give their ages correctly, and secondly whether it is merely a fortuitous sample not representing a normal distribution. The end of the table can therefore only be regarded as a reasonable approximation.

Young Children.—An examination of the ages of young European children was made, comparing the statistics derived from records of births and deaths with the 1936 Census figures brought down to the end of June, 1936. The following table gives the results:—

NUMBER OF CHILDREN LIVING ON THE 30TH JUNE, 1936.

AGE.	MALE.			FEMALE.		
	Births Minus Deaths.	Adjusted Census.	Differences.	Births Minus Deaths.	Adjusted Census.	Differences.
Under one year.	22,715	22,795	— 80	22,072	21,940	132
1-2	21,682	21,406	— 276	20,954	20,636	318
2-3	20,944	20,960	— 16	20,104	20,248	— 144
3-4	20,390	20,851	— 461	19,606	20,056	— 450
4-5	21,237	21,126	111	20,494	20,502	— 8

A very marked improvement again took place in the declaration of ages of young children in the 1936 Census as compared with the 1926 Census, the sum of the differences in the above table for males and females combined being less than 0.4 of the sum of the differences in a similar table prepared for 1926. This is

due to the great improvement in the statement of ages that occurred on account of date of birth being asked for in addition to age. The net difference is difficult to explain, and may be partially due to immigration, as the migration returns reveal a net gain of children aged under 5 years who entered the Union from July, 1931, to June, 1936, and who would have been under 5 years of age in June, 1936.

The method adopted in the case of young children for finding the probability of dying within one year is somewhat different from that used previously in the construction of Life Tables, and though it will be seen that the result does not differ considerably from that obtained by the older and simpler method, the new method is thought to be more accurate. Although the formula when expressed in symbols looks formidable, it is really extremely simple when read from a tabular graph. These Life Tables are based on the mortality of the three years 1935-37 and the problem is to find the number of persons exposed to risk in each year of life in order to obtain the probability of dying in the course of each year. In only one case was any adjustment considered necessary. There is a break in the sequence of population owing to the great increase in births which occurred just after the Boer War; this break has continued ever since. The small adjustment was, however, found to affect only the fifth place of decimals of the probability of dying in one year in one quinquennial group.

The following are the formulae used for computing q_x for children aged under one year:—

$$\begin{aligned}q^0 \text{ months} &= D_{20 \text{ to } 15}^0 \div \left\{ B_{20 \text{ to } 15} - \frac{1}{20} (B_{20} - B_{11}) \right\} \\ q^{1 \text{ to } 2 \text{ months}} &= D_{20 \text{ to } 15}^1 \div \left\{ B_{20 \text{ to } 15} - \frac{1}{3} (B_{20} - B_{11}) \right\} \\ q^{3 \text{ to } 5 \text{ months}} &= D_{20 \text{ to } 15}^3 \div \left\{ B_{19 \text{ to } 14} + \frac{1}{4} (B_{20} - B_{11}) \right\} \\ q^{6 \text{ to } 8 \text{ months}} &= D_{20 \text{ to } 15}^6 \div \left\{ B_{19 \text{ to } 14} - \frac{1}{4} (B_{19} - B_{13}) \right\} \\ q^{9 \text{ to } 11 \text{ months}} &= D_{20 \text{ to } 15}^9 \div \left\{ B_{18 \text{ to } 13} + \frac{1}{4} (B_{19} - B_{13}) \right\}\end{aligned}$$

The sum of the values q^{0-m} , $q^{(1-2)m}$, $q^{(3-5)m}$, $q^{(6-8)m}$, and $q^{(9-11)m}$, gives the required q_0 .

$D_{20 \text{ to } 15}$ and $B_{20 \text{ to } 15}$ represent the deaths and births, respectively, for the years 1935 to 1937, the half-yearly figures being numbered 1 to 20 commencing with the first half-year of 1928.

It was not possible to calculate the mortality rates for young Coloured children of under one year of age with the same degree of accuracy as in the case of European children, as complete vital statistics for Coloured persons are only available from 1935. An assumption, therefore, was made that births were lower in 1934 than in 1935 by the difference between the births in 1935 and in 1936.

The same principle was used in computing the probabilities of dying in the course of a year of European children aged 1 to 5 years, allowance being made for immigration. The following is the formula used for q_2 :—

$$q_2 = D_{20 \text{ to } 15}^{2 \text{ to } 3} \div \left[B_{15 \text{ to } 10} + \frac{1}{4} \left\{ \left(B_{16} - B_{10} \right) - \left(B_{15} - B_9 \right) \right\} - \left(D_{15 \text{ to } 10}^{0 \text{ to } 1} + D_{17 \text{ to } 12}^{1 \text{ to } 2} \right) + \text{immigration} \right]$$

$D_{20 \text{ to } 15}^{2-3}$ represents the deaths of children aged 2 to under 3 years during 1935 to 1937.

On account of the lack of vital statistics for Coloured persons prior to 1935, it was only possible to calculate their mortality rates for the first two years of life by the above method. For ages 3 to 5 years the formula $q_x = \frac{d_x}{P_x + \frac{1}{2}d_x}$ was used.

The column q_x has now been completed for ages 0 to 5 and 16-19 years. The calculations of q_6 to q_{15} and q_{91} and over were completed by the previously mentioned Newton-Sheppard formula of adjusted differences published in Volume LVIII, Part I, of the *Journal of the Institute of Actuaries* for March, 1927, and is repeated below.

"If the function U_x takes the values $U_a, U_b, U_c, U_d, \dots$ corresponding to the values a, b, c, d, \dots of x the scheme of adjusted differences can be exhibited as below:—

X	U_x	First Adjusted Differences.	Second Adjusted Differences.	Third Adjusted Differences.
a	U_a	$(\alpha\Delta)(ab)$	$(\alpha\Delta)^2(abc)$	$(\alpha\Delta)^3(abcd)$
b	U_b	$(\alpha\Delta)(bc)$	$(\alpha\Delta)^2(bcd)$	
c	U_c	$(\alpha\Delta)(cd)$		
d	U_d			

where $(\alpha\Delta)(ab) = (U_a - U_b) \div (a - b)$

$$(\alpha\Delta)^2(abc) = \{(\alpha\Delta)(ab) - (\alpha\Delta)(bc)\} \div \frac{1}{2}(a - c)$$

$$(\alpha\Delta)^3(abcd) = \{(\alpha\Delta)^2(abc) - (\alpha\Delta)^2(bcd)\} \div \frac{1}{3}(a - d) \dots (1)$$

The scheme can be continued to any extent, the r th difference $(\alpha\Delta)^r(a \dots r)$ being equal to the difference of the two adjoining $(r-1)$ th differences divided by $\frac{1}{r}(a-r)$.

Denoting ordinary differences by Δ , adjusted differences by $(\alpha\Delta)$, and divided differences by δ , the relations between the three kinds of differences may be stated thus:—

(1) For values of the function corresponding to values of x differing by unity,

$$\Delta^n = (\alpha\Delta)^n = \delta^n \times \lfloor^n.$$

(2) When the values of x differ by a constant t ,

$$\Delta^n = (\alpha\Delta)^n \times t^n = \delta^n \times t^n \times \lfloor^n.$$

(3) When the values of x are at unequal intervals, ordinary differences do not enter into the comparison and we have simply

$$(\alpha\Delta)^n = \delta^n \times \lfloor^n."$$

The following example illustrates the application of the above system of adjusted differences in calculating the values of q_6 to q_{15} for European males for the present Life Table. (See also an actuarial note in the *Journal of the Institute of Actuaries*, Volume LVIII, Part III, of November, 1927, page 311.)

VALUES OF q_x FOR EUROPEAN MALES BETWEEN THE AGES 5 AND 16 YEARS.

$U_0 = q_{11}$ so that the given values are U_6, U_8, U_9 and U_{11} .

(It is convenient, where there is a gap of 11, to multiply by 11 in order to avoid fractions other than 2^s, 3^s and 5^s.)

y	$U_y \times 10^6$ $\times 11$	Adjusting Factors and Adjusted Differences.			$U_y \times 10^6$	q_x
		First.	Second.	Third.		
6	25,850				2,350	.00235
		(-1) 3,080				
5	22,770		$(-5/2) 608.6$		2,070	.00207
		(-5) 1,254		$(-12/3) 21.83$		
0	16,500		$(-11/2) 521.3$		1,500	.00150
		(-6) -1,613.3		$(-10/3) 21.83$		
-6	26,180		$(-5/2) 448.5$		2,380	.00238
		(1) -2,734.72		$(-4/3) 21.83$		
-5	23,445.27		(1) 419.4		2,131.3	.00213
		(1) -2,315.27		(1) 21.83		
-4	21,130		(1) 441.27		1,920.9	.00192
		(1) -1,874		(1) 21.83		
-3	19,256		(1) 463.1		1,750.5	.00175
		(1) -1,410.8		(1) 21.83		
-2	17,845.1		(1) 484.94		1,622.2	.00162
		(1) -925.94		(1) 21.83		
-1	16,919.16		(1) 506.7		1,538.1	.00154
		(1) -419.16		(1) 21.83		
0	16,500		(1) 528.61		1,500	.00150
		(1) 109.4		(1) 21.83		
1	16,609.4		(1) 550.4		1,509.9	.00151
		(1) 659.8		(1) 21.83		
2	17,269.3		(1) 572.27		1,569.9	.00157
		(1) 1,232.16		(1) 21.83		
3	18,501.49		(1) 594.1		1,681.9	.00168
		(1) 1,826.27		(1) 21.83		
4	20,327.7		(1) 615.94		1,847.9	.00185
		(1) 2,442.2		(1) 21.83		
5	22,769.9		(1) 637.7		2,069.9	.00207
		(1) 3,079.9				
6	25,849.9				2,349.9	.00235

In forming the table by summation of the differences, each difference is to be multiplied by its adjusting factor before use.

Thus in the column of Second differences—

$$521.3 = 608.6 + (-12/3) \times 21.83$$

$$448.5 = 521.3 + (-10/3) \times 21.83, \text{ etc.}$$

The adjusting factor for the n th difference arising from the $(n+1)$ values $a_0, a_1, a_2, \dots, a_n$ of y is $(a_n - a_0) / n$.

In comparing South African Life Table No. E. 3. with previous National Tables a further improvement is shown up to age 32 years for males and thereafter a slight decline is indicated. The Table for females, however, shows an improvement up to age 38 years, a slight decline between ages 39 and 48 years, with a further improvement up to age 75 years, followed by a decline for the higher ages.

The South African Mutual Life Table 1924-33, which may be regarded as representing healthy males in South Africa, shows a very marked improvement over the 1845-95 Table prepared by the same Company.

The Life Tables for Coloured persons show, as was expected, a very low expectation of life as compared with the European Tables, the complete expectation of life being 18.77 and 22.20 years lower for Coloured males and females respectively.

A smoother mortality curve might have been obtained for Coloured females by using ten-year intervals in the grouping of ages, but that would have smoothed out the outstanding features of the heavy death rate due to diseases of pregnancy in the twenties, which bring the female death rate well above that of the males.

In comparing South African Life Table No. E. 3. with those of other countries, it must be remembered that one may be comparing the European population of the Union with the entire population of another country as in the case of England and Wales. It is probable that the European population of the Union is living, on the average, at a higher standard than the population of England and Wales.

The complete expectation of life for England and Wales according to Life Table No. 10 (1930-32), however, compares remarkably well with that of South African Life Table No. E. 3. Both of these Life Tables are still well below those of New Zealand and Australia in the expectation of life.

For convenience of reference the various symbols used herein are explained below:—

The function q_x denotes the probability of dying within a year after attaining the age x . All the other columns of the Life Table were calculated from it. The function p_x , the probability of living one year from age x , together with q_x is equal to unity. The column p_x was, therefore, obtained by subtracting the figure for each age in the column q_x from unity.

The column l_x gives the number surviving according to the Life Table to the exact age x . The first value of the table is called the radix, and for the South African Life Table the radix is 100,000 at the age 0. The column is obtained by a continued multiplication by the value of p_x . The column d_x , the number dying in the course of a year of those that entered it, is formed from the differences between each pair of figures in the l_x column. The column L_x is the number of years lived in the year of age x to $(x+1)$, and, therefore, represents the mean population between ages x and $(x+1)$. It is assumed that except for the year 0 to 1 the deaths that occur in each year of life are uniformly distributed over the year of age. In the case of the first year of life more deaths occur in the first few months than in the latter part, so in order to arrive at the value of L_0 the following method was adopted:—

From the mortality rates of children under one year of age we can arrive at the number of months lived by those who died before attaining the age of one year, by assuming that those who died before reaching the age of one month have lived half a month; that those who died at ages 1 month to under 3 months have lived 2 months and so on as illustrated in the following example for European male children:—

$q(0$ to under 1 month) =	$.0277056 \times 0.5 =$	$-.0138528$
$q(1$ " 3 months) =	$-.0108425 \times 2.0 =$	$-.0216850$
$q(3$ " 6 ") =	$-.0118195 \times 4.5 =$	$-.0531878$
$q(6$ " 9 ") =	$-.0087932 \times 7.5 =$	$-.0659490$
$q(9$ " 12 ") =	$-.0072449 \times 10.5 =$	$-.0760715$

	12	-2307461
		-0192288
		$\times 100,000$

Years lived..... = 1,923
Plus the number surviving at exact age 1 year..... = 93,359

$L_0 = 95,282$

The remaining values of the column L_x are the midpoints of each two consecutive values of the function l_x .

The column T_x is the population of the Life Table above the moment of age 0. This is obtained by the continued summation of L_x .

The column e_x^0 is the complete expectation of life, or the total future lifetime which on the average will be lived by a person aged exactly x . It is obtained by dividing each figure in the column T_x by the corresponding figure in the column l_x .

VERSLAG

OOOR DIE

SESDE SENSUS VAN DIE BEVOLKING VAN DIE UNIE VAN SUID-AFRIKA, 5 MEI 1936.

BOEKDEEL XI: SUID-AFRIKAANSE LEWENSTABELLE Nos. E. 3. en C. 1. (E. stel voor blankes, en C. kleurlinge.)

Inleiding.—In die verslag oor die Suid-Afrikaanse Lewenstabelle No. E. 2 (U.G. No. 41 van 1930) is verwys na alle vorige Suid-Afrikaanse Lewenstabelle waarvan die publikasie bekend was. Sedert dié tyd het Mnr. G. C. McLaren in 1934 een opgestel wat op die sterfte-ervaring van die Suid-Afrikaanse Onderlinge Lewens-versekering-geenootskap vir die nege jaar 1924 tot 1933 gebaseer is.

Verlof is verleen om party van die besonderhede van hierdie tabel te publiseer vir vergelyking met die Nasionale en Ander Tabele op Suid-Afrikaanse sterfte-ervaring gebaseer. Hierdie vergelykings, asook 'n tabel wat onse Nasionale Tabel met dié van Engeland en Wallis, Nu-Seeland, Australië en Eire vergelyk, is aan die end van hierdie verslag opgeneem.

Dit sou moontlik gewees het om nog 'n Lewenstabelle vir blankes, op die Bevolkingsensus van 1931 gebaseer, te bereken, dog weens die depressie en die gevolglike inkorting van die werk van die Kantoor van Sensus en Statistiek is die idee opgegee.

'n Tussenpoos van tien jaar tussen sodanige berekenings is egter nie lank nie, en min lande het hulle met korter tussenpose uitgevoer. Die geleentheid van die eerste volledige opname van die bevolking sedert 1921 is te baat geneem om Lewenstabelle op te stel nie slegs vir die blankes nie, maar ook, vir die eerste keer, vir die kleurlingbevolking, d.w.s., vir ander nie-blankes, behalwe natuurlike en Asiate.

SUID-AFRIKAANSE LEWENSTABELLE Nos. E. 3. EN C. 1.

Ten einde 'n regstreekse vergelyking met die Suid-Afrikaanse Lewenstabelle Nos. E. 1. en E. 2. moontlik te maak, is die Lewenstabelle wat alhier gepubliseer word, op dieselfde wyse opgestel as in die geval van die vorige Lewenstabelle, behalwe ten opsigte van leeftye 0 tot 15 en 91 jaar en daarbo; die metodes vir hierdie leeftye toegepas, word hieronder behandel. Die Tabele is weer gebaseer op 'n sterfte-ervaring van drie jaar (1935 tot 1937) met die Bevolkingsensus van 1936 as uitgangspunt.

Dit is aangeneem dat tydens die Sensus, 4 Mei 1936, die geboortedae van persone van elke leeftyd vanaf een jaar en daarbo gelyk oor die jaar versprei is. Met daardie veronderstelling is 'n

berekening uit lewens- en volkstrekk-statistiek gedoen, en gewysigde syfers vir die bevolking op 30 Junie 1936 in die lewe, verkry. Die gelykvormige geometriese toename in elke leeftydsgroep deur Mnr. King veronderstel, is nie vir Suid-Afrika, waar dit bekend is dat daar 'n ongelyke bevolkingsdistribusie is, geskik geag nie; en om hierdie rede is sy metode nie by die verkryging van die syfers vir die gemiddelde bevolking toegepas nie, hoewel dit in hierdie kort tydperk geen groot verskil meegebring het nie.

By elke Sensus is daar 'n neiging by party persone om onjuiste opgawes van hulle leeftye te doen, en vir sover hierdie neiging beperk is tot die keuse van ronde syfers (soos getalle wat met 'n 0, en in 'n minder mate met 8, 2 of 5 eindig), kan hierdie onjuisthede grotendeels uitgeskakel word deur die toepassing van 'n bevredigende vyf-jaarlikse groepering en 'n eweredige herdistribusie van die syfers in elke groep. Dieselfde neiging is ook opgemerk in die geval van leeftye in opgawes van sterfgevallen verstrekk. Dit blyk derhalwe dat dieselfde psigologiese oorsaak aan die werk is sowel waar persone gevra word om hulle eie leeftye op te gee as waar die leeftye van oorlede persone geëis word. Dit lyk of hierdie verkeerde opgawes in die reël aan onkunde ten opsigte van die juiste leeftyd te wyte is. 'n Persoon kon byvoorbeeld sê dat sy ouderdom ongeveer 50 of 60 is en dit as 50 of 60 opgee; of hy kon sê dat dit tussen 50 en 60 is, en dit as 55 opgee; of hy kon weer sê dat hy al amper 60 of iets oor die 60 is, en sy ouderdom dus as 58 of 62 opgee.

Waar daar egter opsetlike verkeerde voorstellings omtrent die leeftyd is, almal met die neiging om in een tydperk van die lewe die leeftyd te laag te stel, en in 'n ander tydperk te hoog, kan geen matematiëse formule, hoe vernuftig ook al, die fout uitkakel nie, tensy, natuurlik, die mate van verdraaiing bekend is. Al wat 'n mens kan hoop, is dat daar groter juistheid sal ontstaan uit die verspreiding van die kennis dat die informasie nie uit ydelde nuusgierigheid gevra word nie maar vir wetenskaplike berekenings van nasionale belang gebruik word.

Uit 'n sorgvuldige ondersoek van die bevolking- en sterfte-opgawes het dit raadsaam geblyk om leeftye in vyf-jaarlikse groepe op die basis van dié met 'n finale syfer of 4-8 en 9-3 of anders 2-6 en 7-1 te groepeer. Die een was blykbaar so goed as die ander; op seker leeftye het die een 'n bietjie beter as die ander gelyk. Aangesien die groepering van 4-8, 9-3 in die opstelling van die Lewenstabelle Nos. E. 1. en E. 2. gebruik is, is besluit om dit ook vir Lewenstabelle Nos. E. 3. en C. 1. te behou. Derhalwe is die gemiddelde bevolking soos op 30 Junie 1936 en die gemiddelde

getal sterfgevallen oor die drie jaar 1935 tot 1937 in vyf-jaarlikse leeftydsgroepe verdeel ooreenkomstig die leeftydspanne 4-8, 9-13, 14-18, ens., tot by 99-103 jaar. Van hierdie leeftydsgroepe is die middel-leeftye 11, 16, 21, ens., tot 101 jaar vir die bevolking sowel as vir die sterfgevallen verkry deur middel van die formule $U_{x+2} = .2W_x - .008\Delta^2 W_{x-5}$, waar U_{x+2} die bevolking of die sterfgevallen op die leeftyd $(x+2)$ is, en W_x die som is van vyf waardes vir die bevolking of die sterfgevallen vir leeftye x tot $(x+4)$. Uit hierdie resultate is die sentrale sterftesyfer, m_x , bereken ten einde q_x , d.w.s., die waarskynlikheid van in die loop van 'n jaar te sterwe, deur middel van die formule $q_x = \frac{2m_x}{2 + m_x}$ vir elke ras en geslag op die leeftye 11, 16, 21, ens., tot op 101 jaar vas te stel.

Die waardes van q_x vir die leeftye 91 tot 101 jaar op hierdie wyse verkry, is egter nie gebruik nie. Ander waardes is bereken deur middel van die Formule van Gekorrigeerde Differensies van Newton-Sheppard, wat hieronder gegee word. Op hierdie wyse is dit moontlik bevind om die tabelle op 'n vroeër leeftyd te sluit en aldus die kritiek van Mnr. D. Spence Fraser, F.F.A., A.I.A., te voorkom, dat die tabelle meer ooreenkomstig die feite behoort te wees en nie persone op leeftye ver oor die 100 jaar in die lewe behoort te toon nie.

Die tussenkomende waardes van q_x is verkry van funksies van $\log(q_x + .1)$ deur Oskulerende Interpolasie deur middel van krommes van die derde ordes, met dieselfde eerste differensiaal-koëffisiënt by hulle raakpunte op die leeftye 16, 21, 26, ens.

Die formules was as volg:—

$$\begin{aligned} \delta U_1 &= .2\Delta U_0 + .12\Delta^2 U_0 - .016\Delta^3 U_0 \\ \delta^2 U_1 &= .04\Delta^2 U_0 - .016\Delta^3 U_0 \\ \delta^3 U_1 &= .024\Delta^3 U_0 \end{aligned}$$

waar die simbool δ vir jaarlikse en Δ vir vyf-jaarlikse differensies gebesig word. Dit gee 'n volledige tabel vir q_x vanaf leeftyd 16 tot leeftyd 105 jaar.

In 'n klein gemeenskap soos dié van Suid-Afrika is dit uiters moeilik om seker te wees in die eerste plek of die paar persone wat 'n hoë onderdom bereik, hulle leeftye korrek opgee, en in die tweede plek of dit sommer iets toevallig is, wat nie 'n normale distribusie verteenwoordig nie. Die end van die tabel kan dus slegs as 'n redelike benadering beskou word.

Jong Kinders.—'n Ondersoek van die leeftye van jong blanke kinders is ingestel deur die statistieke uit opgawes van geboortes en sterfgevallen verkry, te vergelyk met die 1936-sensus-syfers tot aan die end van Junie 1936 bygewerk. Die volgende tabel gee die resultate:—

GETAL KINDERS OP 30 JUNIE 1936 IN DIE LEWE.

Leeftyd.	MANLIK.			VROULIK.		
	Geboortes min sterfgevallen.	Gekorri-geerde sensus.	Differen-sies.	Geboortes min sterfgevallen.	Gekorri-geerde sensus.	Differen-sies.
Onder een jaar..	22,715	22,795	- 80	22,072	21,940	132
1-2.....	21,682	21,406	276	20,954	20,636	318
2-3.....	20,944	20,960	- 16	20,104	20,248	- 144
3-4.....	20,390	20,851	- 461	19,606	20,056	- 450
4-5.....	21,237	21,126	111	20,494	20,502	- 8

In die 1936-sensus het daar weer 'n opmerklige verbetering in die opgawe van leeftye van jong kinders plaasgevind in vergelyking met die 1926-sensus. Die som van die differensies in bostaande

tabel vir mans- en vrouspersone saam was minder as 0.4 van die som van die differensies in 'n dergelike tabel in 1926 opgestel. Dit is toe te skrywe aan die groot verbetering in die opgaaf van leeftye deurdat die datum van geboorte bo en behalwe die leeftyd vereis is. Die netto differensie is moeilik om te verklaar, en kan gedeeltelik te wyte wees aan immigrasie, aangesien die volkstrekkings 'n netto wins toon van kinders onder die 5 jaar wat tussen Junie 1931 en Junie 1936 die Unie binnegekom het, en wat in Junie 1936 onder die 5 jaar sou gewees het.

Die metode wat in die geval van jong kinders toegepas word vir die berekening van die waarskynlikheid van binne een jaar te sterwe, verskil enigszins van dié wat vroeër in die opstelling van Lewenstabelle gebesig is; en hoewel dit sal blyk dat die resultaat nie veel verskil van dié wat deur die ouer en eenvoudiger metode verkry is, word hierdie metode as meer akkuraat beskou. Hoewel die formule in simbole uitgedruk imponerend lyk, is dit in werklikheid baie eenvoudig wanneer dit van 'n tabellariëse grafiek afgelees word. Hierdie Lewenstabelle is op die sterftesyfers van die drie jaar 1935 tot 1937 gebaseer en die probleem is om die getal persone te bereken wat in elke lewensjaar aan gevaar blootgestel is, ten einde die waarskynlikheid van in die loop van die jaar te sterwe, vas te stel. In slegs een geval is 'n korreksie nodig geag. Daar is 'n breuk in die opvolging van bevolking weens die groot toename in geboortes wat kort na die Boere-oorlog plaasgevind het; hierdie breuk duur nog steeds voort. Die klein vereffening is egter bevind slegs die vyfde desimaal van die waarskynlikheid van in een jaar te sterwe in een vyf-jaarlikse groep te affekteer.

Die formules wat gebruik word om q_x vir kinders onder een jaar te bereken is as volg:—

$$\begin{aligned} q^0 \text{ maande} &= \frac{D^0 \text{ maande}}{D_{20 \text{ tot } 15}} \div \left(B_{20 \text{ tot } 15} - \frac{1}{2}(B_{21} - B_{14}) \right) \\ q^1 \text{ tot } 2 \text{ maande} &= \frac{D^1 \text{ tot } 2 \text{ maande}}{D_{20 \text{ tot } 15}} \div \left(B_{20 \text{ tot } 15} - \frac{1}{3}(B_{20} - B_{11}) \right) \\ q^3 \text{ tot } 5 \text{ maande} &= \frac{D^3 \text{ tot } 5 \text{ maande}}{D_{20 \text{ tot } 15}} \div \left(B_{20 \text{ tot } 15} + \frac{1}{4}(B_{21} - B_{11}) \right) \\ q^6 \text{ tot } 8 \text{ maande} &= \frac{D^6 \text{ tot } 8 \text{ maande}}{D_{20 \text{ tot } 15}} \div \left(B_{20 \text{ tot } 15} - \frac{1}{4}(B_{19} - B_{13}) \right) \\ q^9 \text{ tot } 11 \text{ maande} &= \frac{D^9 \text{ tot } 11 \text{ maande}}{D_{20 \text{ tot } 15}} \div \left(B_{20 \text{ tot } 15} + \frac{1}{4}(B_{19} - B_{13}) \right) \end{aligned}$$

Die som van die waardes q^{0m} , $q^{(1-2)m}$, $q^{(3-5)m}$, $q^{(6-8)m}$, en $q^{(9-11)m}$, gee die benodigde q_0 .

$D_{20 \text{ tot } 15}$ en $B_{20 \text{ tot } 15}$ verteenwoordig onderskeidelik die sterfgevallen en geboortes vir die jaar 1935 tot 1937; die half-jaarlikse syfers is van 1 tot 20 genommer, beginnende met die eerste half-jaar van 1928.

Dit was onmoontlik om die sterftesyfers vir jong kleurling-kindere van onder die een jaar met dieselfde mate van noukeurigheid as in die geval van blanke kinders te bereken, aangesien volledige lewenstatistieke vir kleurlinge slegs sedert 1935 beskikbaar is. Derhalwe is aangeneem dat daar in 1934 net soveel minder geboortes dan in 1935 was, as daar in 1935 minder dan in 1936 was.

Van dieselfde beginsel is gebruik gemaak by die berekening van die waarskynlikheid van in die loop van 'n jaar te sterwe in die geval van blanke kinders van 1 tot 5 jaar, wat met inagneming van immigrasie. Die formule vir q_2 gebruik, is as volg:—

$$q_2 = \frac{D^2 \text{ tot } 3}{D_{20 \text{ tot } 15}} \div \left[B_{15 \text{ tot } 10} + \frac{1}{4} \left(\left(B_{16} - B_{10} \right) - \left(B_{15} - B_{9} \right) \right) - \left(\frac{D^{0 \text{ tot } 1}}{D_{15 \text{ tot } 10}} + \frac{D^{1 \text{ tot } 2}}{D_{17 \text{ tot } 12}} \right) + \text{immigrasie} \right]$$

$D_{20 \text{ tot } 15}^{2-3}$ verteenwoordig die sterfgevallen van kinders van 2 tot onder 3 jaar gedurende 1935 tot 1937.

As gevolg van die afwesigheid van lewenstatistieke vir kleurlinge voor 1935 was dit slegs moontlik om hulle sterftesyfers vir die eerste twee lewensjare deur bogenoemde metode te bereken. Vir leeftye 3 tot 5 jaar is die formule $q_x = \frac{d_x}{P_x + \frac{1}{2}d_x}$ gebruik.

Die kolom q_x is nou vir leeftye 0 tot 5 en 16 tot 90 jaar voltooi. Die berekening van q_6 tot q_{15} en van q_{91} en daarbo is voltooi deur middel van die voorgenoemde Formule van Gekorrigeerde Differensies van Newton-Sheppard, gepubliseer in Boekdeel LVIII, Deel I, van die „Journal of the Institute of Actuaries” vir Maart 1927, en word hieronder weergegee.

„As die funksie U_x die waardes $U_a, U_b, U_c, U_d, \dots$ aanneem ooreenkomstig die waardes a, b, c, d, \dots van x , kan die reeks gekorrigeerde differensies as volg getoon word:—

X	U_x	Eerste Gekorrigeerde Differensies.	Tweede Gekorrigeerde Differensies.	Derde Gekorrigeerde Differensies.
a	U_a	$(a\Delta)(ab)$		
b	U_b	$(a\Delta)(bc)$	$(a\Delta)^2(abc)$	$(a\Delta)^3(abcd)$
c	U_c	$(a\Delta)(cd)$	$(a\Delta)^2(bcd)$	
d	U_d			

$$\begin{aligned} \text{waar } (a\Delta)(ab) &= (U_a - U_b) \div (a - b) \\ (a\Delta)^2(abc) &= \{(a\Delta)(ab) - (a\Delta)(bc)\} \div \frac{1}{2}(a - c) \\ (a\Delta)^3(abcd) &= \{(a\Delta)^2(abc) - (a\Delta)^2(bcd)\} \div \frac{1}{3}(a - d) \dots (1) \end{aligned}$$

Die reeks kan sover nodig uitgebrei word, die r^{de} differensie $(a\Delta)^r$ ($a \dots r$) is gelyk aan die differensie van die twee naburige $(r-1)^{\text{de}}$ differensies gedeel deur $\frac{1}{r}(a-r)$.

As ons gewone differensies met Δ , gekorrigeerde differensies met $(a\Delta)$, en gedeelde differensies met δ voorstel, dan kan die verhoudings tussen die drie soorte differensies aldus gestel word:—

(1) Vir waardes van die funksie ooreenkomstig die waardes van x wat met 1 verskil,

$$\Delta^n = (a\Delta)^n = \delta^n \times \perp^n.$$

(2) Wanneer die waardes van x met 'n konstante t verskil,

$$\Delta^n = (a\Delta)^n \times t^n = \delta^n \times t^n \times \perp^n.$$

(3) Wanneer die waardes van x ongelyke intervalle het, kom gewone differensies nie in die vergelyking voor nie, en het ons eenvoudig

$$(a\Delta)^n = \delta^n \times \perp^n.$$

Die volgende voorbeeld illustreer die toepassing van bogenoemde stelsel van gekorrigeerde differensies by die berekening van die waardes van q_6 tot q_{15} vir blanke manspersone vir die teenswoordige Lewenstabelle. (Sien ook 'n wiskundige aantekening in die „Journal of the Institute of Actuaries,” Boekdeel LVIII, Deel III, van November 1927, bladsy 311.)

WAARDES VAN q_x VIR BLANKE MANS-PERSONE TUSSEN DIE LEEFTYE 5 EN 16 JAAR.

$U_0 = q_{11}$ sodat die gegewe waardes U_6, U_5, U_0 en U_{-6} is. (Wanneer daar 'n gaping van 11 is, is dit gerieflik om met 11 te vermenigvuldig ten einde breuke behalwe $2^a, 3^a$ en 5^a te vermy.)

y	$U_y \times 10^6$	Korrigerende Faktore en Gekorrigeerde Differensies.			$U_y \times 10^6$	q_x
		Eerste.	Tweede.	Derde.		
6	25,850	(-1) 3,080			2,350	.00235
5	22,770		$(-\frac{6}{2}) 608.6$		2,070	.00207
0	16,500	(-5) 1,254		$(-\frac{12}{3}) 21.83$	1,500	.00150
-6	26,180	(-6) -1,613.3		$(-\frac{19}{3}) 21.83$	2,380	.00238
-5	23,445.27	(1) -2,734.72		$(-\frac{4}{3}) 21.83$		
-4	21,130		(1) 419.4		2,131.3	.00213
-3	19,256	(1) -2,315.27		(1) 21.83		
-2	17,845.1		(1) 441.27		1,920.9	.00192
-1	16,919.16	(1) -1,874		(1) 21.83		
0	16,500	(1) 463.1		(1) 21.83	1,750.5	.00175
1	16,609.4	(1) -1,410.8		(1) 21.83		
2	17,269.3		(1) 484.94		1,622.2	.00162
3	18,501.49	(1) -925.94		(1) 21.83		
4	20,327.7	(1) 506.7		(1) 21.83	1,538.1	.00154
5	22,769.9	(1) -419.16		(1) 21.83		
6	25,849.9		(1) 528.61		1,500	.00150
		(1) 109.4		(1) 21.83		
		(1) 659.8		(1) 21.83	1,509.9	.00151
		(1) 572.27		(1) 21.83	1,569.9	.00157
		(1) 1,232.16		(1) 21.83		
		(1) 594.1		(1) 21.83	1,681.9	.00168
		(1) 1,826.27		(1) 21.83		
		(1) 615.94		(1) 21.83	1,847.9	.00185
		(1) 2,442.2		(1) 21.83		
		(1) 637.7			2,069.9	.00207
		(1) 3,079.9				
					2,349.9	.00235

By die opstel van die tabelle deur middel van 'n opsomming van die differensies, moet elke differensie voor dit gebruik word, met sy korrigerende faktor vermenigvuldig word.

Dus in die kolom van 2^{de} differensies—

$$521.3 = 608.6 + (-\frac{12}{3}) \times 21.83$$

$$448.5 = 521.3 + (-\frac{19}{3}) \times 21.83, \text{ ens.}$$

Die korrigerende faktor vir die n^{de} differensie wat uit die $(n+1)$ waardes $a_0, a_1, a_2, \dots, a_n$ van y ontstaan is $(a_n - a_0) / n$.

By 'n vergelyking van die Suid-Afrikaanse Lewenstabel No. E.3 met vorige Nasionale Tabele word daar 'n verdere verbetering tot die leeftyd 32 jaar vir manspersone, en daarna 'n geringe verval getoon. Die vrouetabel toon egter 'n verbetering tot die leeftyd 38 jaar, en 'n geringe verval tussen leeftye 39 en 48 jaar; met 'n verdere verbetering tot die leeftyd 75 jaar en daarna 'n verval vir die hoër leeftye.

Die Lewenstabel van die Suid-Afrikaanse Onderlinge Lewensversekering-genootskap vir 1924-33, wat beskou kan word as verteenwoordigend van gesonde manspersone in Suid-Afrika, toon 'n heel aansienlike verbetering bo die 1845-95-tabel deur dieselfde Maatskappy opgestel.

Soos te verwagte was, toon die Lewenstabelle vir kleurlinge 'n baie lae lewensverwachting in vergelyking met dié van die Tabele vir blankes. Die gemiddelde lewensverwachting is 18.77 en 22.20 jaar minder vir manlike en vroulike kleurlinge onderskeidelik.

Deur gebruik te maak van tienjaarlikse tussenpose in die leeftyds-groepering kon mens 'n gladder sterfteskromme vir vroulike kleurlinge verkry het, dog dit sou die uitstaande kenmerke van die hoë sterftesyfer tussen die leeftye van 20 en 30 jaar as gevolg van swangerskapkwale, wat die vroulike sterftesyfer ver bo dié van die manspersone bring, uitgeskakel het.

By 'n vergelyking van die Suid-Afrikaanse Lewenstabel No. E. 3. met dié van ander lande, moet onthou word dat ons miskien die blanke bevolking van die Unie met die gehele bevolking van 'n ander land soos in die geval van Engeland en Wallis vergelyk. Dit is waarskynlik dat die blanke bevolking van die Unie gemiddeld op 'n hoër standaard dan die bevolking van Engeland en Wallis lewe.

Die gemiddelde lewensverwachting vir Engeland en Wallis volgens Lewenstabel No. 10 (1930-32) kan egter gunstig vergelyk word met dié van die Suid-Afrikaanse Lewenstabel, No. E. 3. Albei hierdie Lewenstabelle is nog ver onder dié van Nu-Seeland en Australië wat lewensverwachting betref.

Vir gerief by die naslaan word die verskillende simbole wat hier gebruik word, hieronder verduidelik :-

Die funksie q_x verteenwoordig die waarskynlikheid van binne 'n jaar na die leeftyd x bereik is, te sterwe. Al die ander kolomme van die Lewenstabel is daarvan bereken. Die funksie p_x , die waarskynlikheid van een jaar na leeftyd x te lewe, saam met q_x is gelyk aan 1. Die kolom p_x is dus verkry deur die syfer vir elke leeftyd in die kolom q_x van 1 af te trek.

Die kolom l_x gee die getal oorblywendes volgens die Lewenstabel tot die presiese leeftyd x . Die eerste waarde van die tabel word die grondgetal genoem, en vir die Suid-Afrikaanse Lewenstabel is die grondgetal 100,000 op leeftyd 0. Die kolom

word verkry deur middel van 'n voortgesette vermenigvuldiging met die waarde van p_x . Die kolom d_x , die getal wat in die loop van 'n jaar sterwe uit dié wat die jaar begin het, word opgestel uit die differensies tussen elke paar syfers in die kolom l_x . Die kolom L_x is die getal jare geleef in die lewensjaar x tot $(x + 1)$, en verteenwoordig dus die gemiddelde bevolking tussen die leeftye x en $(x + 1)$. Dit word veronderstel dat behalwe vir die jaar 0 tot 1 die sterfgevallen wat in elke lewensjaar plaasvind, gelyk oor die lewensjaar versprei word. In die geval van die eerste lewensjaar gebeur daar meer sterfgevallen gedurende die eerste paar maande as in die laaste gedeelte, dus is die volgende metode toegepas ten einde die waarde van L_0 vas te stel :-

Uit die sterftesyfers vir kinders onder een jaar oud kan ons die getal maande bepaal wat diegene van hulle geleef het wat oorlede is voordat hulle die leeftyd van een jaar bereik het, deur aan te neem dat dié van hulle wat oorlede is voor hulle die leeftyd van een maand behaal het, 'n halwe maand geleef het; dat dié wat op die leeftyd van 1 maand tot onder 3 maande oorlede is, 2 maande geleef het, en so voorts, soos in die volgende voorbeeld vir manlike blanke kinders uiteengesit :-

q (0 tot onder 1 maand)	=	-0277056×0.5	=	$-.0138528$
q (1 " 3 maande)	=	-0108425×2.0	=	$-.0216850$
q (3 " 6 ")	=	-0118195×4.5	=	$-.0531878$
q (6 " 9 ")	=	-0087932×7.5	=	$-.0659490$
q (9 " 12 ")	=	-0072449×10.5	=	$-.0760715$
				12
				<u>-.2307461</u>
				$\times 100,000$
				$-.0192288$

Jare geleef.....	=	1,923
Plus die getal wat op die presiese leeftyd van 1 jaar nog in die lewe is.....	=	93,359
		<u>$L_0 = 95,282$</u>

Die orige waardes van die kolom L_x is die gemiddelde van elke 2 agtereenvolgende waardes van die funksie l_x .

Die kolom T_x is die bevolking van die Lewenstabel bokant die leeftyd x . Dit word verkry deur die voortgesette opsomming van L_x .

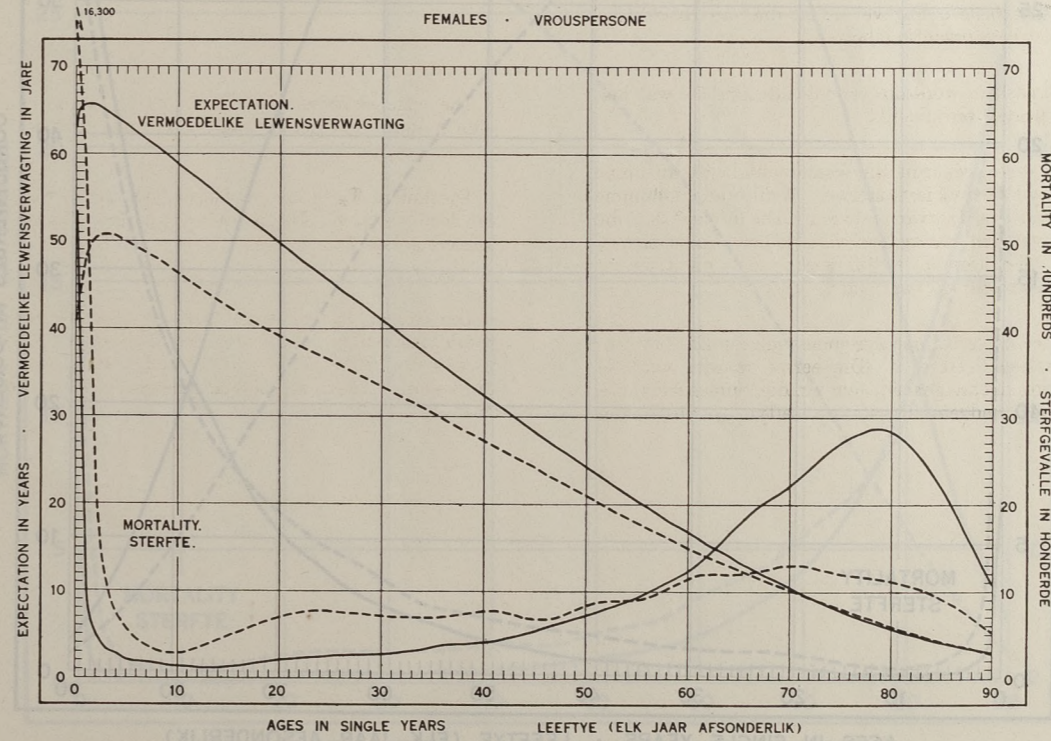
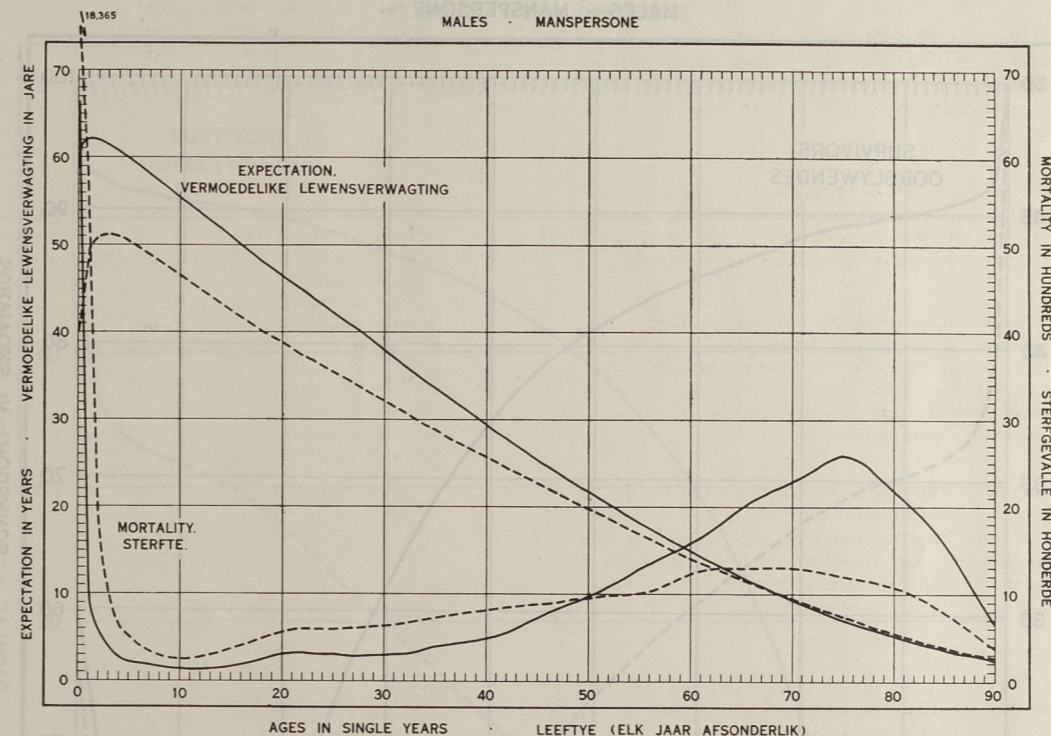
Die kolom e_x^0 is die gemiddelde lewensverwachting, of die totale gemiddelde toekomstige lewensduur van elke persoon wat presies die leeftyd x het. Dit word verkry deur elke syfer in die kolom T_x deur die ooreenkomstige syfer in die kolom l_x te deel.

EXPECTATION OF LIFE (e_x^0) AND MORTALITY (d_x) OF MALES AND FEMALES AT EACH YEAR OF AGE.

VERMOEDELIKE LEWENSVERWAGTING (e_x^0) EN STERFTE (d_x) VAN MANS- EN VROUSPERSONE OP ELKE LEWENSJAAR.

South African Life Tables, 1936 (Nos. E. 3. and C. 1.).

Suid-Afrikaanse Lewenstabelle, 1936 (Nos. E. 3. en C. 1.).

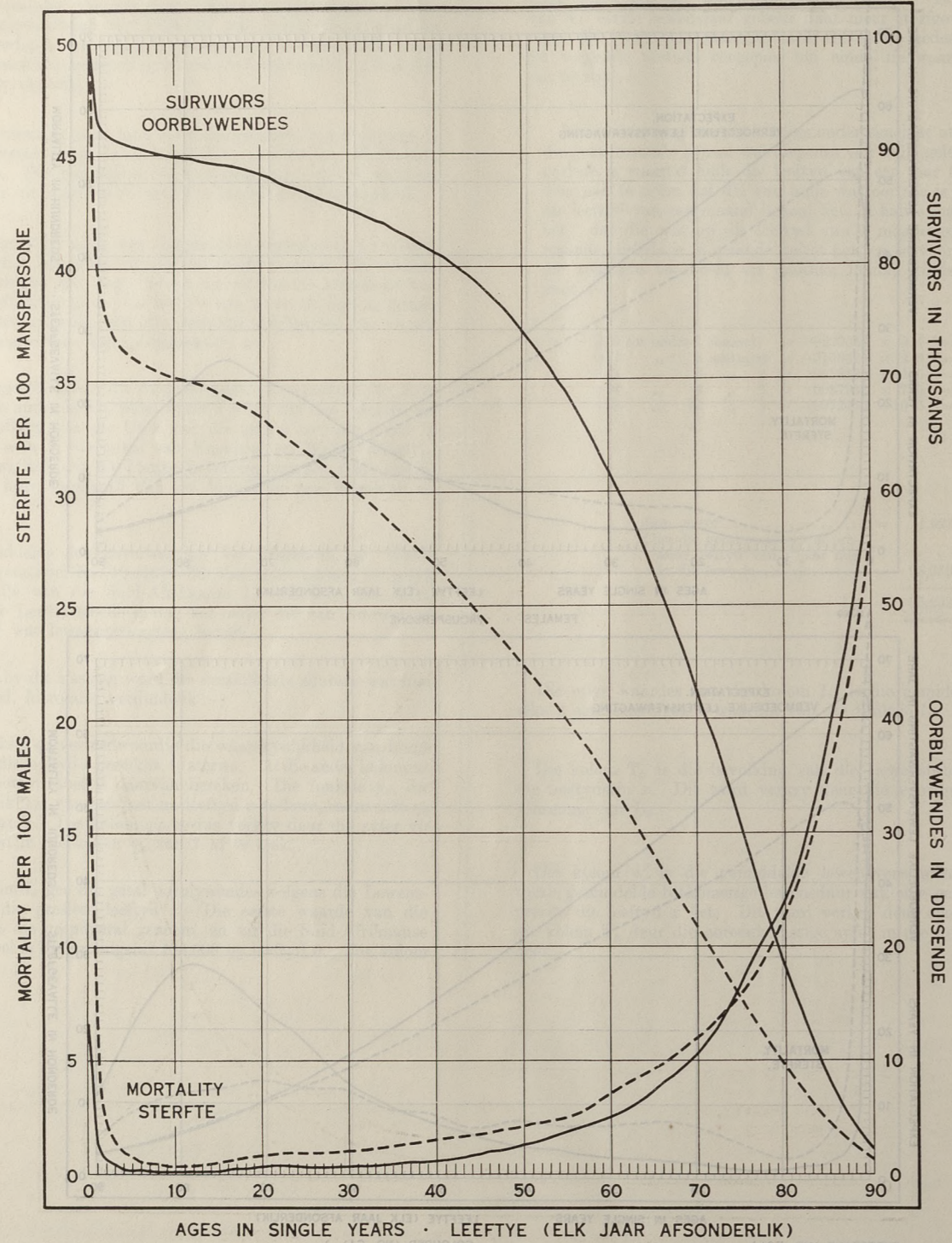


EUROPEANS (NO. E.3) } COLOURED (NO. C.1)
 BLANKES (NO. E.3) } KLEURLINGE (NO. C.1)

PROBABILITY OF DEATH PER 100 MALES ($100q_x$) AND SURVIVORS OF 100,000 MALES BORN (l_x) AT EACH YEAR OF AGE.
 South African Life Tables, 1936 (Nos. E. 3. and C. 1.).

WAARSKYNLIKE STERFGEVALLE PER 100 MANSPERSONE ($100q_x$) EN OORBLYWENDES VAN 100,000 MANS-PERSONE GEBORE (l_x) OP ELKE LEWENSJAAR.
 Suid-Afrikaanse Lewenstabelle, 1936 (Nos. E. 3. en C. 1.).

MALES · MANSPERSONE

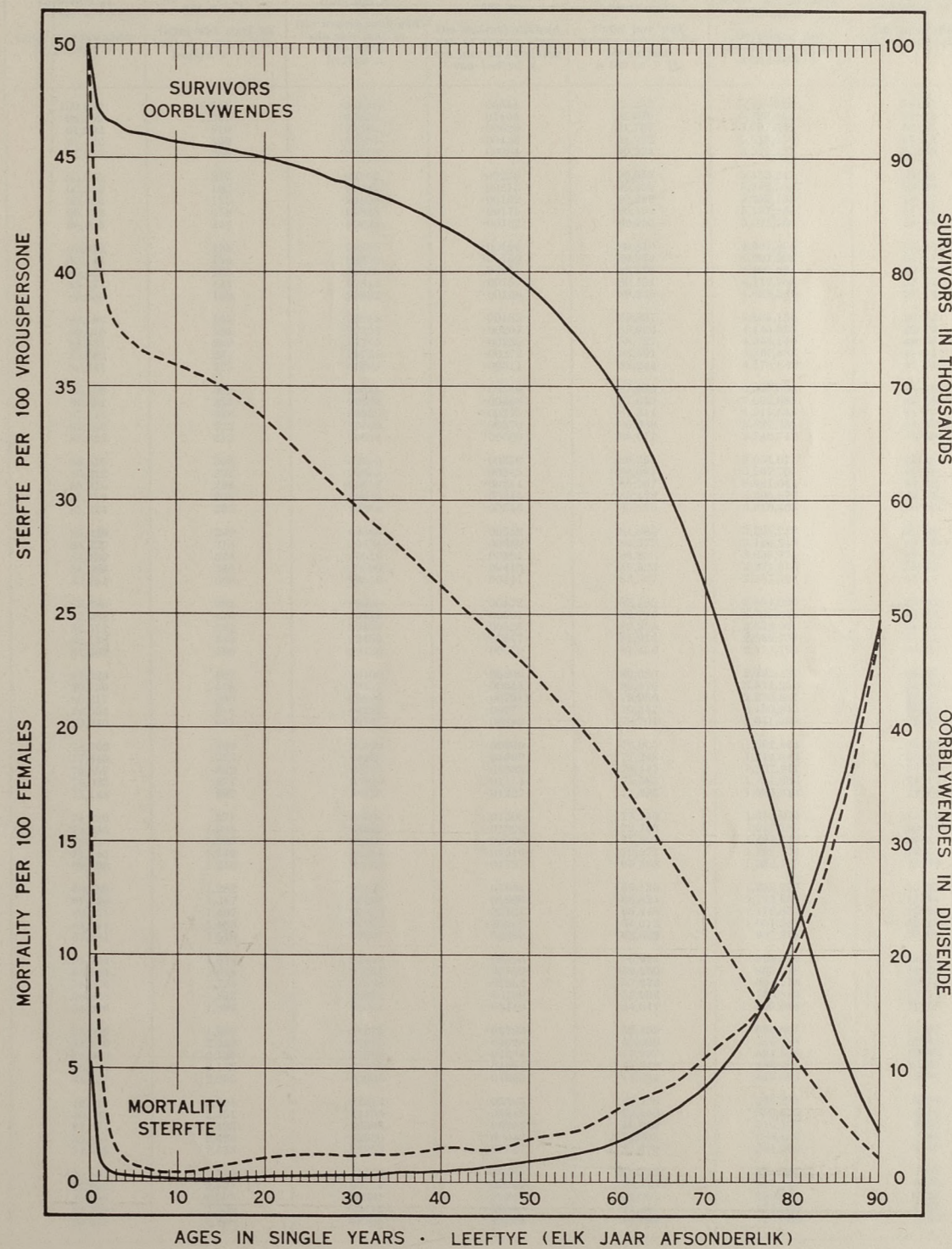


EUROPEAN (NO. E. 3.) } COLOURED (NO. C. 1.) }
 BLANKES (NO. E. 3.) } KLEURLINGE (NO. C. 1.) }

PROBABILITY OF DEATH PER 100 FEMALES ($100q_x$) AND SURVIVORS OF 100,000 FEMALES BORN (l_x) AT EACH YEAR OF AGE.
 South African Life Tables, 1936 (Nos. E. 3. and C. 1.).

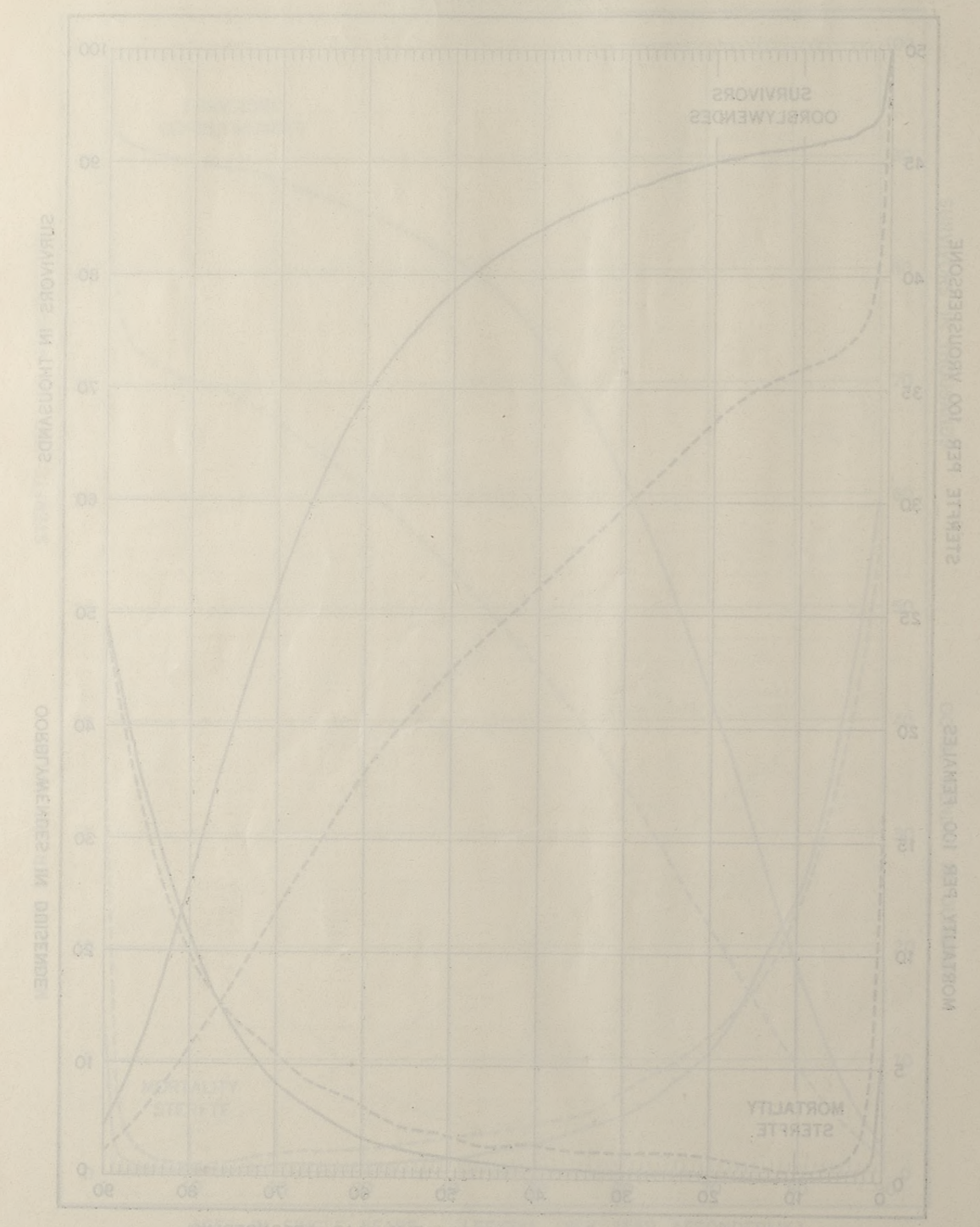
WAARSKYNLIKE STERFGEVALLE PER 100 VROUSPERSONE ($100q_x$) EN OORBLYWENDES VAN 100,000 VROUS-PERSONE GEBORE (l_x) OP ELKE LEWENSJAAR.
 Suid-Afrikaanse Lewenstabelle, 1936 (Nos. E. 3. en C. 1.).

FEMALES · VROUSPERSONE



EUROPEAN (NO. E. 3.) } COLOURED (NO. C. 1.) }
 BLANKES (NO. E. 3.) } KLEURLINGE (NO. C. 1.) }

WAARSKYNIKE STERIGEVALLE PER 100 VROUWSPERSONE
 PROBABILITY OF DEATH PER 100 FEMALES (100%) AND
 SURVIVORS OF 100 000 FEMALES BORN AT EACH
 YEAR OF AGE FROM 1925 TO 1929 IN THE UNION OF
 SOUTH AFRICA (LIFE TABLE No. E. 3) (EUROPEAN MALES)



AGES IN SINGLE YEARS - LEEFTYD (ELK JAAR AFSONDERLIK)
 EUROPEAN (NO. E. 3) (EUROPEAN MALES)
 BLANKES (NO. E. 3) (BLANKE MANSPERSONE)

TABLE 1. (a) LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA. EUROPEAN MALES.

TABEL 1 (a) LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA. BLANKE MANSPERSONE.

(x)	l_x	d_x	p_x	q_x	L_x	T_x	e_x^o	(x)
Age.	Number of survivors at age x.	Number dying after age x but before age x + 1.	The probability of living one year from age x.	The probability of dying within a year after attaining age x.	Number of years lived in the year of age x to (x + 1).	Population of the Life Table above the moment of age x.	The complete expectation of life.	Leeftyd.
	Getal oorbywendes op leeftyd x.	Getal wat sterf na leeftyd x maar voor leeftyd x + 1.	Die waarskynlikheid van een jaar te lewe vanaf leeftyd x.	Die waarskynlikheid van te sterwe binne een jaar na bereiking van leeftyd x.	Getal jare wat gelewe word in die lewensjaar x tot (x + 1).	Bevolking van Lewenstabel bo die leeftyd x.	Die gemiddelde lewensverwachting.	
0	100,000	6,641	.93359	.06641	95,282	5,895,024	58.95	0
1	93,359	1,367	.98536	.01464	92,015	5,700,742	62.12	1
2	91,992	570	.99380	.00620	91,707	5,707,066	62.04	2
3	91,422	399	.99564	.00436	91,222	5,615,359	61.42	3
4	91,023	258	.99716	.00284	90,894	5,524,137	60.69	4
5	90,765	216	.99762	.00238	90,657	5,433,243	59.86	5
6	90,549	193	.99787	.00213	90,453	5,342,586	59.00	6
7	90,356	173	.99808	.00192	90,269	5,252,133	58.13	7
8	90,183	158	.99825	.00175	90,104	5,161,864	57.24	8
9	90,025	146	.99838	.00162	89,952	5,071,760	56.34	9
10	89,879	138	.99846	.00154	89,810	4,981,808	55.43	10
11	89,741	135	.99850	.00150	89,674	4,891,998	54.51	11
12	89,606	135	.99849	.00151	89,538	4,802,324	53.59	12
13	89,471	141	.99843	.00157	89,401	4,712,786	52.67	13
14	89,330	150	.99832	.00168	89,255	4,623,385	51.76	14
15	89,180	165	.99815	.00185	89,097	4,534,130	50.84	15
16	89,015	184	.99793	.00207	88,923	4,445,033	49.94	16
17	88,831	209	.99765	.00235	88,727	4,356,110	49.04	17
18	88,622	241	.99728	.00272	88,501	4,267,383	48.15	18
19	88,381	275	.99689	.00311	88,244	4,178,882	47.28	19
20	88,106	305	.99654	.00346	87,953	4,090,638	46.43	20
21	87,801	323	.99632	.00368	87,640	4,002,685	45.59	21
22	87,478	328	.99625	.00375	87,314	3,915,045	44.75	22
23	87,150	322	.99630	.00370	86,989	3,827,731	43.92	23
24	86,828	313	.99640	.00360	86,671	3,740,742	43.08	24
25	86,515	303	.99650	.00350	86,344	3,654,071	42.24	25
26	86,212	297	.99655	.00345	86,063	3,567,707	41.38	26
27	85,915	296	.99656	.00344	85,767	3,481,644	40.52	27
28	85,619	295	.99656	.00344	85,472	3,395,877	39.66	28
29	85,324	295	.99654	.00346	85,176	3,310,405	38.80	29
30	85,029	299	.99648	.00352	84,880	3,225,229	37.93	30
31	84,730	310	.99634	.00366	84,575	3,140,349	37.06	31
32	84,420	324	.99616	.00384	84,258	3,055,774	36.20	32
33	84,096	345	.99590	.00410	83,923	2,971,516	35.33	33
34	83,751	369	.99559	.00441	83,567	2,887,583	34.48	34
35	83,382	394	.99528	.00472	83,185	2,804,026	33.63	35
36	82,988	416	.99499	.00501	82,780	2,720,841	32.79	36
37	82,572	434	.99474	.00526	82,355	2,638,061	31.95	37
38	82,138	449	.99453	.00547	81,913	2,555,706	31.11	38
39	81,689	466	.99430	.00570	81,456	2,473,793	30.28	39
40	81,223	487	.99400	.00600	80,980	2,392,337	29.45	40
41	80,736	519	.99357	.00643	80,476	2,311,357	28.63	41
42	80,217	563	.99299	.00701	79,936	2,230,881	27.81	42
43	79,654	614	.99229	.00771	79,347	2,150,945	27.00	43
44	79,040	671	.99151	.00849	78,704	2,071,598	26.21	44
45	78,369	729	.99070	.00930	78,005	1,992,894	25.43	45
46	77,640	783	.98991	.01009	77,248	1,914,889	24.66	46
47	76,857	832	.98918	.01082	76,441	1,837,641	23.91	47
48	76,025	877	.98846	.01154	75,587	1,761,200	23.17	48
49	75,148	922	.98773	.01227	74,687	1,685,613	22.43	49
50	74,226	971	.98692	.01308	73,740	1,610,926	21.70	50
51	73,255	1,025	.98601	.01399	72,743	1,537,186	20.98	51
52	72,230	1,085	.98498	.01502	71,687	1,464,443	20.27	52
53	71,145	1,149	.98384	.01616	70,571	1,392,756	19.58	53
54	69,996	1,216	.98263	.01737	69,388	1,322,185	18.89	54
55	68,780	1,282	.98136	.01864	69,139	1,252,797	18.21	55
56	67,498	1,347	.98004	.01996	66,824	1,183,658	17.54	56
57	66,151	1,407	.97873	.02127	65,448	1,116,834	16.88	57
58	64,744	1,463	.97741	.02259	64,012	1,051,386	16.24	58
59	63,281	1,518	.97601	.02399	62,522	987,374	15.60	59
60	61,763	1,579	.97444	.02556	60,974	924,852	14.97	60
61	60,184	1,648	.97261	.02739	59,360	863,878	14.35	61
62	58,536	1,728	.97048	.02952	57,672	804,518	13.74	62
63	56,808	1,812	.96811	.03189	55,902	746,846	13.15	63
64	54,996	1,897	.96551	.03449	54,047	690,944	12.56	64
65	53,099	1,980	.96271	.03729	52,109	636,897	11.99	65
66	51,119	2,059	.95972	.04028	50,090	584,788	11.44	66
67	49,060	2,126	.95666	.04334	47,997	534,698	10.90	67
68	46,934	2,183	.95349	.04651	45,842	486,701	10.37	68
69	44,751	2,235	.95005	.04995	43,634	440,859	9.85	69
70	42,516	2,291	.94613	.05387	41,370	397,225	9.34	70
71	40,225	2,351	.94155	.05845	39,050	355,855	8.85	71
72	37,874	2,423	.93603	.06397	36,662	316,805	8.36	72
73	35,451	2,496	.92960	.07040	34,203	280,143	7.90	73
74	32,955	2,553	.92253	.07747	31,679	245,940	7.46	74
75	30,402	2,580	.91512	.08488	29,112	214,261	7.05	75
76	27,822	2,567	.90741	.09226	26,538	185,149	6.65	76
77	25,255	2,505	.90081	.09919	24,003	158,611	6.28	77
78	22,750	2,409	.89413	.10587	21,545	134,608	5.92	78
79	20,341	2,298	.88701	.11299	19,192	113,063	5.56	79

TABLE 1 (a) LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA.—(continued).

EUROPEAN MALES.

TABEL 1 (a) LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA.—(vervolg).

BLANKE MANSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent ages from 80 to 103. Descriptions include 'Number of survivors at age x', 'Number dying after age x but before age x + 1', etc.

TABLE 1. (b) LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA.

EUROPEAN FEMALES.

TABEL 1 (b) LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA.

BLANKE VROUSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent ages from 0 to 79. Descriptions include 'Number of survivors at age x', 'Number dying after age x but before age x + 1', etc.

TABLE 1 (b) LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA.—(continued).

EUROPEAN FEMALES.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent age groups from 80 to 105. Descriptions include 'Number of survivors at age x', 'Number dying after age x but before age x + 1', etc.

TABEL 1 (b) LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA.—(vervolg).

BLANKE VROUSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent age groups from 80 to 105. Descriptions include 'Number of years lived in the year of age x to (x + 1)', etc.

TABLE 2 (a) LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA.

COLOURED MALES.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent age groups from 0 to 79. Descriptions include 'Number of survivors at age x', 'Number dying after age x but before age x + 1', etc.

TABEL 2 (a) LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA.

KLEURLING MANSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent age groups from 0 to 79. Descriptions include 'Number of years lived in the year of age x to (x + 1)', etc.

TABLE 2. (a) LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA.—(continued).

TABEL 2 (a) LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA.—(vervolg).

COLOURED MALES.

KLEURLING MANSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent ages from 80 to 102. Includes descriptions for each column such as 'Number of survivors at age x' and 'The complete expectation of life'.

TABEL 2 (b) LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA.

TABEL 2 (b) LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA.

COLOURED FEMALES.

KLEURLING VROUSPERSONE.

Table with 9 columns: (x), lx, dx, px, qx, Lx, Tx, ex, (x). Rows represent ages from 0 to 79. Includes descriptions for each column such as 'Number of survivors at age x' and 'The complete expectation of life'.

TABLE 2 (b) LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA.—(continued).

TABEL 2 (b) LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA.—(vervolg).

COLOURED FEMALE.

KLEURLING VROUSPERSONE.

Table with 9 columns: (x) Age, lx, dx, px, qx, Lx, Tx, ex, (x) Leef tyd. Rows include ages 80-104 with corresponding mortality and life expectancy data.

TABLE 3.—COMPARISON OF VARIOUS SOUTH AFRICAN LIFE TABLES AT CERTAIN AGES.

TABEL 3.—VERGELYKING VAN VERSKILLENDE SUID-AFRIKAANSE LEWENSTABELLE OP SEKERE LEEFTYD.

Table with 15 columns: Age, Males (Union of South Africa, European-Blanks, Coloured), Females (Union of South Africa, European-Blanks, Coloured), Johannesburg, S.A. Mutual, S.A. Mutual. Rows include ages 0-100.

(a) COMPLETE EXPECTATION OF LIFE (ex).—GEMIDDELDE LEWENSVERWAGTING (ex).

Table with 15 columns: Age, Males, Females, Johannesburg, S.A. Mutual, S.A. Mutual. Rows include ages 0-100.

(b) RATE OF MORTALITY.—STERFTESYFER (1,000qx).

Table with 15 columns: Age, Males, Females, Johannesburg, S.A. Mutual, S.A. Mutual. Rows include ages 0-100.

(c) NUMBER OF SURVIVORS.—GETAL OORBLYWENDES (lx).

Table with 15 columns: Age, Males, Females, Johannesburg, S.A. Mutual, S.A. Mutual. Rows include ages 0-100.

(d) PROBABILITY OF SURVIVING 10 YEARS.—WAARSKYNLIKHEID VAN NOG 10 JAAR TE LEWE (10px).

Table with 15 columns: Age, Males, Females, Johannesburg, S.A. Mutual, S.A. Mutual. Rows include ages 0-100.

TABLE 4.—COMPARISON OF LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA WITH THOSE OF OTHER COUNTRIES AT CERTAIN AGES.

TABEL 4.—VERGELYKING VAN LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA MET DIE VAN ANDER LANDE OF SEKERE LEEFTYDE.

Age.—Leeftyd.	European.—Blankes. Males.—Manspersone.					European.—Blankes. Females.—Vroupersone.				
	Union of South Africa. Unie van Suid-Afrika. No. E. 3.	New Zealand. Nieu-Seeland. N. 2, 25, 26, 27.	Australia. Australië. 1932-34.	England and Wales No. 10. Engeland en Wallis. 1930-32.	Eire. 1925-27.	Union of South Africa. Unie van Suid-Afrika. No. E. 3.	New Zealand. Nieu-Seeland. N. 2, 25, 26, 27.	Australia. Australië. 1932-34.	England and Wales No. 10. Engeland en Wallis. 1930-32.	Eire. 1925-27.
(a) COMPLETE EXPECTATION OF LIFE (e_x^0).—GEMIDDELDE LEWENSVERWAGTING (e_x^0).										
0	58.95	63.99	63.48	58.74	57.37	63.06	66.57	67.14	62.88	57.93
1	62.12	65.72	65.49	62.25	61.15	65.60	67.87	68.67	65.48	60.83
2	65.09	68.09	68.00	62.21	61.32	65.53	67.27	68.12	65.37	60.97
3	64.42	64.38	64.25	61.62	60.88	64.89	66.52	67.34	64.76	60.54
4	60.69	63.53	63.43	60.89	60.24	64.12	65.71	66.50	64.03	59.90
5	59.86	62.66	62.57	60.11	59.50	63.30	64.83	65.64	63.24	59.17
10	55.43	58.11	58.02	55.79	55.20	60.23	61.92	62.77	60.57	54.92
20	46.43	48.93	48.81	46.81	46.40	49.72	50.96	51.87	49.88	46.36
30	37.93	40.15	40.00	38.21	38.39	40.98	42.16	42.77	41.22	38.60
40	29.45	31.54	31.11	29.62	30.43	32.44	33.47	34.04	32.55	30.83
50	21.70	23.30	22.83	21.40	22.67	24.30	25.01	25.58	24.18	23.19
60	14.97	15.79	15.57	14.43	15.75	16.82	17.23	17.74	16.50	16.36
70	9.34	9.67	9.60	8.62	10.20	10.50	10.49	10.98	10.02	10.72
80	5.20	5.08	5.22	4.74	5.81	5.75	5.75	6.01	5.46	6.47
90	2.40	2.38	2.90	2.63	3.27	2.93	2.72	3.05	2.98	3.74
100	1.11	1.07	1.10	1.48	1.81	1.43	1.02	1.02	1.65	2.08

(b) RATE OF MORTALITY.—STERFTESYFER (1000 q_x).

0	66.41	41.18	45.43	71.86	77.16	53.48	33.64	36.42	54.55	63.46
1	14.64	5.67	7.75	15.30	18.91	14.02	5.92	6.45	13.45	18.46
2	6.20	3.78	3.78	6.57	9.13	5.55	3.68	3.29	6.03	9.40
3	4.36	2.44	2.87	4.41	5.96	3.52	2.88	2.41	4.07	5.94
4	2.84	2.00	2.14	3.59	4.31	2.92	1.19	3.36	4.47	4.47
5	2.38	1.77	1.84	3.43	3.31	2.19	1.48	1.58	2.98	3.59
10	1.54	1.14	1.19	1.46	1.47	1.47	1.02	0.87	1.34	1.95
20	3.46	2.34	2.19	3.16	4.01	2.33	2.06	1.83	2.08	4.41
30	3.52	3.21	2.71	3.40	5.29	3.17	3.08	2.79	3.19	5.96
40	6.00	4.82	4.60	5.62	7.05	4.98	3.91	4.02	4.40	7.47
50	9.08	9.27	9.66	9.24	11.30	9.24	7.89	7.44	11.39	11.39
60	25.56	19.73	22.16	24.15	24.28	17.98	15.85	14.66	17.79	23.94
70	53.87	48.75	50.82	60.35	49.13	42.41	40.33	38.02	44.51	46.47
80	120.95	123.84	126.59	145.00	113.89	108.29	107.83	101.06	118.58	100.44
90	309.71	302.79	249.86	286.14	226.90	248.43	258.71	233.91	250.61	196.81
100	599.60	628.10	552.70	483.50	406.21	488.51	623.53	586.53	441.07	355.39

(c) NUMBER OF SURVIVORS.—GETAL OORBLIWENDES (l_x).

0	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
1	93,539	95,832	95,457	92,814	92,284	94,652	96,636	96,358	94,545	93,654
2	91,992	95,338	94,717	91,394	90,539	93,325	96,064	95,736	93,273	91,925
3	91,422	94,921	94,359	90,794	89,712	92,807	95,710	95,421	92,711	91,061
4	91,023	94,689	94,088	90,394	89,177	92,480	95,434	95,191	92,334	90,520
5	90,765	94,509	93,887	90,069	88,798	92,210	95,252	94,993	92,024	90,117
10	89,579	93,795	93,193	89,023	87,715	91,355	94,649	94,424	91,082	88,933
20	88,106	92,360	91,797	87,245	85,630	89,939	93,392	93,341	89,383	86,415
30	85,029	89,847	89,566	84,416	81,686	87,456	91,008	91,174	86,792	81,944
40	81,223	86,413	86,539	80,935	76,975	84,005	87,911	88,175	83,690	76,827
50	74,226	80,937	81,061	74,794	70,657	78,005	83,680	83,680	78,958	70,204
60	61,763	70,994	69,950	63,620	59,927	69,342	74,896	75,565	69,666	59,666
70	42,516	51,542	50,086	43,361	42,533	52,314	58,449	59,629	53,144	42,820
80	18,043	23,416	22,223	16,199	15,550	26,193	29,100	31,539	24,869	21,189
90	2,177	2,655	2,935	1,609	3,400	4,311	4,811	5,808	3,611	4,694
100	7	7	44	15	91	58	25	73	64	220

(d) PROBABILITY OF SURVIVING 10 YEARS.—WAARSKYNLIKHEID VAN NOG 10 JAAR TE LEWE ($_{10}p_x$).

0	.89870	.93795	.93193	.89023	.87715	.91355	.94649	.94424	.91082	.88933
1	.98277	.98470	.98502	.98003	.97623	.98450	.98672	.98853	.97169	.97169
2	.96508	.97279	.97570	.96757	.96594	.97239	.97447	.97678	.94826	.94826
3	.95524	.96178	.96620	.95876	.95233	.96054	.96597	.96711	.94226	.94226
4	.91385	.93663	.93670	.92412	.91792	.93572	.94749	.94902	.91536	.91536
5	.83290	.87715	.86293	.85060	.84814	.88216	.89809	.90302	.88434	.88434
10	.68837	.72901	.71993	.68156	.67075	.75443	.78134	.77699	.71766	.71766
20	.42438	.45431	.44370	.43758	.45064	.50069	.49787	.52892	.46795	.46795
30	.21066	.11338	.13207	.09933	.17390	.16459	.16533	.18415	.14520	.21513
40	.00335	.00264	.01499	.00957	.02683	.01334	.00520	.01257	.04680	.04680
50										
60										
70										
80										
90										
100										

TABLE 5.—STATISTICS ON WHICH LIFE TABLE No. E. 3 OF THE UNION OF SOUTH AFRICA IS BASED.

TABEL 5.—STATISTIEK WAAROP LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA GEBASEER IS.

Age: Years.	1936 : Population Census Figures Adjusted to 30/6/36.	European Males.—Blanke Manspersone.				1936 : Population Census Figures Adjusted to 30/6/36.	European Females.—Blanke Vroupersone.				Leeftyd: Jare.
		Deaths Registered in Each of 3 Years : Sterigevalle Geregistreer in Elk van 3 Jare: 1935, 1936 and/en 1937.					Deaths Registered in Each of 3 Years : Sterigevalle Geregistreer in Elk van 3 Jare: 1935, 1936 and/en 1937.				
	1936 : Volkstelling- syfers Bygewerk tot 30/6/36.	1935.	1936.	1937.	Total. Totaal.		1935.	1936.	1937.	Total. Totaal.	
0	22,795	1,745	1,607	1,603	4,955	21,940	1,252	1,265	1,275	3,792	0
1	21,406	361	301	312	974	20,636	310	306	284	900	1
2	20,960	159	102	136	397	20,248	120	110	111	341	2
3	20,851	101	79	96	276	20,056	86	58	70	214	3
4	21,126	80	45	57	182	20,502	57	63	60	180	4
5	22,068	45	48	62	155	21,494	51	52	34	137	5
6	22,376	57	44	44	145	21,255	41	38	36	115	6
7	21,865	34	44	26	104	20,617	38	43	38	119	7
8	21,268	38	32	43	100	20,576	28	40	27	95	8
9	20,716	33	31	21	90	20,117	30	28	30	88	9
10	20,854	31	33	30	94	20,098	35	24	38	97	10
11	20,570	32	28	31	91	19,662	22	31	25	85	11
12	20,208	45	24	32	101	19,454	26	23	26	75	12
13	20,174	35	39	25	99	19,707	21	33	30	84	13
14	20,743	42	36	31	109	20,129	25	27	25	77	14
15	20,522	47	44	27	118	19,900	34	25	24	83	15
16	19,774	42	36	36	114	19,135	29	33	23	82	16
17	19,437	53	49	53	155	19,107	34	37	38	109	17
18	19,375	50	43	33	126	18,602	35	30	41	106	18
19	19,052	56	55	51	162	18,703	43	31	54	128	19
20	18,065	68	66	67	201	17,872	47	42	48	137	20
21	17,531	70	75	68	213	19,001	46	49	43	138	21
22	19,243	70	72	97	239	19,250	48	97	40	53	22
23	19,122	72	69	75	216	19,638	58	56	46	160	23
24	18,806	72	67	78	217	18,712	57	47	51	155	24
25	19,240	65	74	58	197	18,905	58	58	56	172	25
26	18,524	67	53	66	186	18,236	63	53	47	163	26
27	18,027	60	64	67	1						

TABLE 5.—STATISTICS ON WHICH LIFE TABLE NO. E. 3 OF THE UNION OF SOUTH AFRICA IS BASED.—(continued).

TABLE 5.—STATISTIEK WAAROP LEWENSTABEL No. E. 3 VAN DIE UNIE VAN SUID-AFRIKA GEBASEER IS.—(vervolg).

Table with columns for Age: Years, 1936: Population Census Figures Adjusted to 30/6/36, European Males—Blanke Manspersone, 1936: Population Census Figures Adjusted to 30/6/36, European Females—Blanke Vrouspersone, and Leeftyd: Jare. Rows list ages from 80 to 107.

TABLE 6.—STATISTICS ON WHICH LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA IS BASED.

TABLE 6.—STATISTIEK WAAROP LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA GEBASEER IS.

Table with columns for Age: Years, 1936: Population Census Figures Adjusted to 30/6/36, Coloured Males—Kleurling Manspersone, 1936: Population Census Figures Adjusted to 30/6/36, Coloured Females—Kleurling Vrouspersone, and Leeftyd: Jare. Rows list ages from 0 to 79.

TABLE 6.—STATISTICS ON WHICH LIFE TABLE No. C. 1 OF THE UNION OF SOUTH AFRICA IS BASED.—(continued).

TABEL 6.—STATISTIEK WAAROP LEWENSTABEL No. C. 1 VAN DIE UNIE VAN SUID-AFRIKA GEBASEER IS.—(vervolg).

Age: Years. Leeftyd: Jare.	Coloured Males.—Kleurling Manspersone.				Coloured Females.—Kleurling Vrouspersone.						
	Deaths Registered in Each of 3 Years: Sterfgevälle Geregistreer in Elk van 3 Jare: 1935, 1936 and/en 1937.				Deaths Registered in Each of 3 Years: Sterfgevälle Geregistreer in Elk van 3 Jare: 1935, 1936 and/en 1937.						
	1935.	1936.	1937.	Total. Totaal.	1935.	1936.	1937.	Total. Totaal.			
80.....	629	120	88	81	280	605	93	81	87	261	80
81.....	224	22	10	12	44	221	13	8	12	33	81
82.....	168	20	20	23	63	167	17	12	21	50	82
83.....	146	15	9	17	41	143	18	13	19	50	83
84.....	138	17	27	16	60	153	23	17	31	71	84
85.....	182	41	32	34	107	195	38	24	25	87	85
86.....	140	14	11	19	44	147	25	22	25	72	86
87.....	102	13	11	22	46	95	14	13	16	43	87
88.....	83	15	18	22	55	92	12	12	19	50	88
89.....	68	9	10	12	31	76	16	8	10	34	89
90.....	141	45	27	33	105	139	47	27	26	100	90
91.....	41	6	6	7	19	40	7	3	7	17	91
92.....	26	2	2	2	6	25	8	8	6	22	92
93.....	18	3	5	8	16	24	4	5	6	15	93
94.....	20	3	—	2	5	25	5	4	2	11	94
95.....	30	11	12	8	31	39	8	10	11	29	95
96.....	30	2	2	3	7	27	5	7	11	23	96
97.....	17	4	3	6	13	16	2	2	4	8	97
98.....	20	7	2	3	12	26	8	7	4	19	98
99.....	17	3	5	5	13	12	1	2	3	6	99
100.....	21	6	8	8	22	38	13	16	12	41	100
101.....	7	4	—	—	8	7	3	2	1	6	101
102.....	7	—	—	—	7	7	3	3	3	9	102
103*.....	10	1	1	2	4	4	3	1	3	7	103*
ALL AGES..... ALLE LEEFTYE.....	389,306	9,842	8,709	9,577	28,128	384,111	9,274	8,381	8,847	26,502	ALL AGES. ALLE LEEFTYE.

* Deaths at ages over 103 years have been distributed among ages 84 to 98 years.
* Sterfgevälle op leeftye oor 103 jaar is ingedeel tussen leeftye 84 tot 98 jaar.

104	10	1	1	2	4	4	3	1	3	7	103*
105	10	1	1	2	4	4	3	1	3	7	103*
106	10	1	1	2	4	4	3	1	3	7	103*
107	10	1	1	2	4	4	3	1	3	7	103*
108	10	1	1	2	4	4	3	1	3	7	103*
109	10	1	1	2	4	4	3	1	3	7	103*
110	10	1	1	2	4	4	3	1	3	7	103*
111	10	1	1	2	4	4	3	1	3	7	103*
112	10	1	1	2	4	4	3	1	3	7	103*
113	10	1	1	2	4	4	3	1	3	7	103*
114	10	1	1	2	4	4	3	1	3	7	103*
115	10	1	1	2	4	4	3	1	3	7	103*
116	10	1	1	2	4	4	3	1	3	7	103*
117	10	1	1	2	4	4	3	1	3	7	103*
118	10	1	1	2	4	4	3	1	3	7	103*
119	10	1	1	2	4	4	3	1	3	7	103*
120	10	1	1	2	4	4	3	1	3	7	103*
121	10	1	1	2	4	4	3	1	3	7	103*
122	10	1	1	2	4	4	3	1	3	7	103*
123	10	1	1	2	4	4	3	1	3	7	103*
124	10	1	1	2	4	4	3	1	3	7	103*
125	10	1	1	2	4	4	3	1	3	7	103*
126	10	1	1	2	4	4	3	1	3	7	103*
127	10	1	1	2	4	4	3	1	3	7	103*
128	10	1	1	2	4	4	3	1	3	7	103*
129	10	1	1	2	4	4	3	1	3	7	103*
130	10	1	1	2	4	4	3	1	3	7	103*
131	10	1	1	2	4	4	3	1	3	7	103*
132	10	1	1	2	4	4	3	1	3	7	103*
133	10	1	1	2	4	4	3	1	3	7	103*
134	10	1	1	2	4	4	3	1	3	7	103*
135	10	1	1	2	4	4	3	1	3	7	103*
136	10	1	1	2	4	4	3	1	3	7	103*
137	10	1	1	2	4	4	3	1	3	7	103*
138	10	1	1	2	4	4	3	1	3	7	103*
139	10	1	1	2	4	4	3	1	3	7	103*
140	10	1	1	2	4	4	3	1	3	7	103*
141	10	1	1	2	4	4	3	1	3	7	103*
142	10	1	1	2	4	4	3	1	3	7	103*
143	10	1	1	2	4	4	3	1	3	7	103*
144	10	1	1	2	4	4	3	1	3	7	103*
145	10	1	1	2	4	4	3	1	3	7	103*
146	10	1	1	2	4	4	3	1	3	7	103*
147	10	1	1	2	4	4	3	1	3	7	103*
148	10	1	1	2	4	4	3	1	3	7	103*
149	10	1	1	2	4	4	3	1	3	7	103*
150	10	1	1	2	4	4	3	1	3	7	103*
151	10	1	1	2	4	4	3	1	3	7	103*
152	10	1	1	2	4	4	3	1	3	7	103*
153	10	1	1	2	4	4	3	1	3	7	103*
154	10	1	1	2	4	4	3	1	3	7	103*
155	10	1	1	2	4	4	3	1	3	7	103*
156	10	1	1	2	4	4	3	1	3	7	103*
157	10	1	1	2	4	4	3	1	3	7	103*
158	10	1	1	2	4	4	3	1	3	7	103*
159	10	1	1	2	4	4	3	1	3	7	103*
160	10	1	1	2	4	4	3	1	3	7	103*
161	10	1	1	2	4	4	3	1	3	7	103*
162	10	1	1	2	4	4	3	1	3	7	103*
163	10	1	1	2	4	4	3	1	3	7	103*
164	10	1	1	2	4	4	3	1	3	7	103*
165	10	1	1	2	4	4	3	1	3	7	103*
166	10	1	1	2	4	4	3	1	3	7	103*
167	10	1	1	2	4	4	3	1	3	7	103*
168	10	1	1	2	4	4	3	1	3	7	103*
169	10	1	1	2	4	4	3	1	3	7	103*
170	10	1	1	2	4	4	3	1	3	7	103*
171	10	1	1	2	4	4	3	1	3	7	103*
172	10	1	1	2	4	4	3	1	3	7	103*
173	10	1	1	2	4	4	3	1	3	7	103*
174	10	1	1	2	4	4	3	1	3	7	103*
175	10	1	1	2	4	4	3	1	3	7	103*
176	10	1	1	2	4	4	3	1	3	7	103*
177	10	1	1	2	4	4	3	1	3	7	103*
178	10	1	1	2	4	4	3	1	3	7	103*
179	10	1	1	2	4	4	3	1	3	7	103*
180	10	1	1	2	4	4	3	1	3	7	103*
181	10	1	1	2	4	4	3	1	3	7	103*
182	10	1	1	2	4	4	3	1	3	7	103*
183	10	1	1	2	4	4	3	1	3	7	103*
184	10	1	1	2	4	4	3	1	3	7	103*
185	10	1	1	2	4	4	3	1	3	7	103*
186	10	1	1	2	4	4	3	1	3	7	103*
187	10	1	1	2	4	4	3	1	3	7	103*
188	10	1	1	2	4	4	3	1	3	7	103*
189	10	1	1	2	4	4	3	1	3	7	103*
190	10	1	1	2	4	4	3	1	3	7	103*
191	10	1	1	2	4	4	3	1	3	7	103*
192	10	1	1	2	4	4	3	1	3	7	103*
193	10	1	1	2	4	4	3	1	3	7	103*
194	10	1	1	2	4	4	3	1	3	7	103*
195	10	1	1	2	4	4	3	1	3	7	103*
196	10	1	1	2	4	4	3	1	3	7	103*
197	10	1	1	2	4	4	3	1	3	7	103*
198	10	1	1	2	4	4	3	1	3	7	103*
199	10	1	1	2	4	4	3	1	3	7	103*
200	10	1	1	2	4	4	3	1	3	7	103*

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