

THE CAUSES OF DEATH AMONG THE SOUTH AFRICAN-BORN AND IMMIGRANTS TO SOUTH AFRICA

GEOFFREY DEAN, M.D., F.R.C.P., *Senior Physician, Eastern Cape Provincial Hospital*

Geographical differences in the pattern of disease can shed great light on the environmental and genetic factors responsible for them. In South Africa I have been very impressed by certain major differences in the prevalence of certain diseases among the White South Africans compared with England and Wales. There are also some marked differences between the prevalence of certain diseases and causes of death among the White South African-born compared with immigrants from Britain and other European countries. Lung cancer, for example, is less than half as common among the South African-born as it is in Britain, but British male immigrants have a higher risk of lung cancer than the South African-born but a lower risk than the men who remain in Britain.^{1,2} Multiple sclerosis is common in the United Kingdom and Europe and among White immigrants to South Africa but uncommon among the South African-born.³ Porphyrria variegata is very common among the South African-born but it is almost unknown in South Africa among immigrants from Europe and Great Britain.^{4,5}

POPULATION OF SOUTH AFRICA

The population of South Africa consists of just over 3 million of White stock, 1½ million 'Coloured' or mixed breed, living mainly in the Cape, half a million Asians, 90% of whom are South African-born Indians living in Natal, and 11 million African or Bantu people. The White population consists of roughly 1 million of British stock and 2 million Afrikaners who are descendants of the colonists who settled in the Cape in the 17th century. The Afrikaners are predominantly of Dutch extraction with an admixture of French Huguenots and Germans. Certain of the early Afrikaner families have increased very rapidly so that today 1 million of our 3 million White population hold 40 family names which they have received from 40 original settlers 12-14 generations ago.

Nevertheless the White population of South Africa has come from the same genetic pool as England and Wales, i.e. of predominantly Western European stock, Dutch, English, German and French, with a small admixture of Jewish immigrants and a scatter of people from the rest of Europe.

The principal limitation of mortality statistics is that detailed statistics for individual diseases are lacking among the groups showing the most extreme variation in their conditions of life, e.g. among the Bantu in South Africa. A second limitation is that mortality statistics can provide a direct measure of the incidence of disease only for those diseases which have a high mortality rate. For diseases with a low mortality rate, e.g. rheumatoid arthritis, they are of little value, and for many infections mortality data are a poor index of incidence. Less than 10% of people suffering from peptic ulceration die from it,⁶ and in multiple sclerosis the disease is mentioned on the death certificate as the primary cause of death in less than half of those who suffer from the disease.

Mortality statistics are collected in the normal routine of medical practice and the level of diagnosis varies from country to country. Among the White South Africans, however, the level of medical attention, and the ratio of doctors and specialists to the population at risk, is

as high as in England and Wales and the doctors have been trained in the English tradition by teachers who have nearly all been trained in Britain.

Dr. Joseph Berkson, the chief statistician at the Mayo Clinic, pointed out to me that it would be very valuable to make a comparison of all causes of death among White South African-born, immigrants from Britain and other White immigrants compared with deaths in England and Wales. Dr. H. M. Stoker, the Director of the Bureau of Statistics, Pretoria, kindly agreed to decode the cards for all deaths during the 3 years, 1951, 1958 and 1959, and for certain important causes of death longer periods were decoded. These deaths were then analysed by sex, 5-year age groups, place of residence and place of birth. For simplicity place of residence was divided into 3 groups, the 5 major cities of South Africa, other urban areas and rural areas. Place of birth was also divided into 3 major groups: born in South Africa, immigrants from the United Kingdom, and other White immigrants—these are nearly all from Europe with a few from other African States and elsewhere.

In order to compare death rates among White South Africans with the Coloured and Asiatic population, reference is made to the Bureau of Census publication *Deaths, South Africa and South West Africa 1958 and earlier years*. This covers the 10 years 1949-1958.

A comparison of the age structure of the immigrant population contrasted with the South African-born (Table I, Figs. 1 & 2) shows that the immigrant population is an

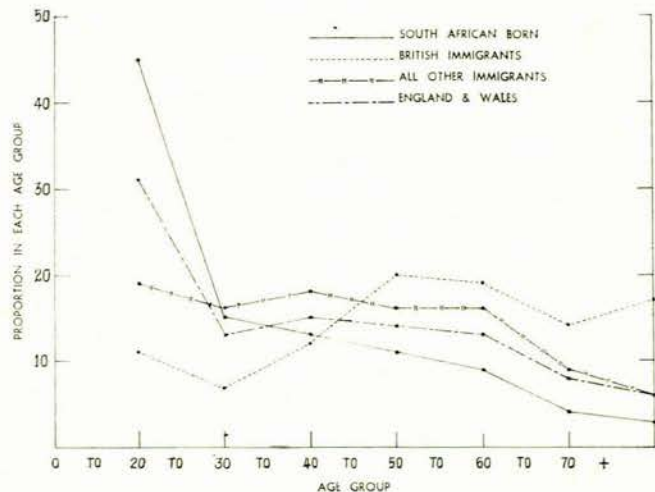


Fig. 1. Males. The age distribution of White SA-born, British immigrants and other White immigrants, based on the 1960 population census, and England & Wales, based on the 1959 population census.

older population than the South African-born. Because many immigrants came to South Africa between 1900 and 1914 there is today a higher proportion of immigrants over the age of 60 years.

The *International Statistical Classification of Diseases, Injuries, and Causes of Death* (6th revision) has been used to compare the deaths between the different White groups. Because in many groups the numbers are small, the abbreviated classification (B. classification) of 50 main

causes of death is shown in the tables. Whenever it was thought worth while to subdivide these groups this has been done. Table II shows the death rates per 100,000 at risk for White South African-born males and females for 1949-1958 and for the Coloured people (mixed breed) and Asiatics for 1950 and 1958. No reliable statistics are available for the Bantu.

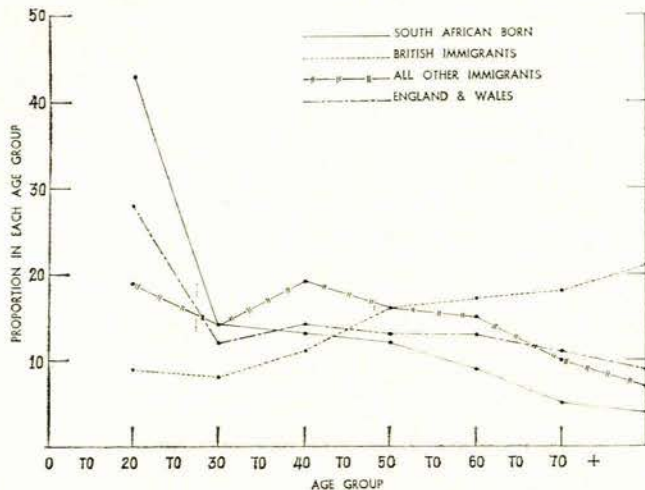


Fig. 2. Females. The age distribution of White SA-born, British immigrants and other White immigrants, based on the 1960 population census, and England & Wales, based on the 1959 population census.

The neonatal death rate among the Bantu in the cities 15 years ago was about 500 per 1,000, i.e. about one-half of the Bantu babies died in the first year of life, usually from gastroenteritis or pneumonia. The rapid increase in the Bantu population is largely due to the fall in the neonatal death rate owing to improved housing and medical services. The neonatal death rates in my own city, Port Elizabeth, since 1950 are depicted in Fig. 3.

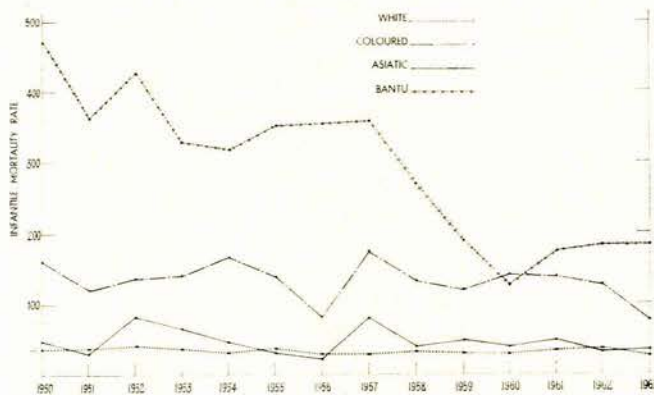


Fig. 3. Neonatal deaths for Whites, Coloureds, Asiatics and Bantu in the Port Elizabeth Municipal area (1950-1963).

When comparing the percentage of deaths from any cause the difference in age structure between the South African-born White population, White immigrants from Britain and Europe, and England and Wales must be kept in mind. Whenever there has been a significant difference in the death risk from any disease, and the numbers are large enough, the age Standardized Mortality Ratio (SMR) has been calculated. Table III shows actual deaths and percentage deaths for each group in the B. classification for 1951 and 1958-59 (averaged) for White

South Africans divided into South African-born, immigrants from the United Kingdom and other White immigrants, compared with England and Wales (1959).

ABBREVIATED LIST OF 50 CAUSES OF DEATH (B. LIST)

Infections

B 1. Tuberculosis of respiratory system (001-008). Almost all these deaths are classified under Code 002, *pulmonary tuberculosis*. The risk of dying from this cause has fallen considerably between 1951 and 1959, no doubt because of the use of streptomycin and isoniazid (INH). It is a more common cause of death in men than in women and more common among the White South African-born in the city than in the country. When age standardized comparisons are made, the rate is the same in male immigrants as in the South African-born and lower in 'other White immigrants' than in British immigrants. In contrast to the low tuberculosis death rates in the White population it is a common cause of death in the Coloured and Bantu people: this reflects the difference in living standards.

B 2. Tuberculosis, other forms (010-019). Tubercular meningitis is the commonest cause of death in this group. Because it affects young people, chiefly under the age of 20, it is more common in the South African-born. Among the White population it is becoming a very uncommon cause of death.

B 3. Syphilis and its sequelae (020-029). These are becoming uncommon causes of death. They are twice as common a cause of death in men as in women, and aneurysm of the aorta (022) accounts for 80% of syphilitic deaths in White South Africans but less than half of the syphilitic deaths in England and Wales. Aneurysm of the aorta as a cause of death is twice as common in the city as in the country. *Tabes dorsalis* (024), on the other hand, is an uncommon disease among White South Africans; in the 10 years 1949-1958 there were only 12 deaths from this cause, all male. Among the Coloured people there were 24 deaths (17 male, 7 female) and among the Asians 2 male deaths.⁷ General paralysis of the insane (025) is also relatively uncommon in White South Africans. In the 10 years 1949-1958 there were 63 White deaths (47 male, 16 female). Among the Coloured people there were 123 deaths (95 male, 28 female) and among the Asians 8 (7 male, 1 female). Among the White population it was more common among the immigrants than the South African-born. Both *tabes* and *GPI* have become very uncommon diseases in South Africa. Syphilis is a more common cause of death in the non-White population than in the White, except in the Indians in Natal who seldom die from syphilis.

B 4. Typhoid (040). This is very uncommon, the few deaths are mostly from rural areas.

B 5. Cholera (043). There were no deaths during 1949-1959.

B 6. Dysentery—all forms (045-048). This is an uncommon cause of death among the White population but a common cause of death among Coloured, Asian and Bantu infants. Amoebic dysentery is common in Natal and is a more common cause of death among the White and Asian population than bacillary dysentery, although only a small proportion of those who have amoebic dysentery die from it.

B 7. Scarlet fever and streptococcal sore throat (050-051). These are very uncommon causes of death. In fact scarlet fever is today rarely diagnosed in South Africa.

B 8. Diphtheria (055). This disease is still occurring although the incidence has fallen with increasing inoculation; it is more common than in Britain because fewer children have been inoculated against it, and more common among the non-White than the White population of South Africa.

B 9. Whooping cough (056). This is becoming an uncommon cause of death among White children although it often causes death in the Coloured and Bantu children.

B 10. Meningococcal infections (057). These are becoming an uncommon cause of death and the disease itself would appear to be less common, although more common than in England and Wales.

B 11. Plague (058). This occurs very rarely; 2 White deaths and 7 deaths in Coloured people were recorded during 1949-1958.

B 12. Acute poliomyelitis (080). Since the introduction of the Sabin vaccine there has been a dramatic fall in the incidence although it is still more common than in England and Wales. It is more common among the White population, (454 deaths—266 males, 188 females) than among the Coloured, (81 deaths), or Asians (16 deaths), 1949 - 1958.

B 13. Smallpox (084). Few deaths due to smallpox were recorded during 1949 - 1958; this is attributable to vaccination.

B 14. Measles (085). This is an uncommon cause of death among White children but not an uncommon cause of complications that lead to death among African and Coloured children.

B 15. Typhus and other rickettsial diseases (100 - 108). These very rarely cause death, although tick-bite fever is fairly common.

B 16. Malaria (110 - 117). This is an uncommon cause of death in South Africa today.

B 17. All other diseases classified as infective and parasitic. A number of infections still occur in South Africa that are seldom seen in Britain but they are relatively uncommon causes of death among the White population; they include tetanus, leprosy, malaria, encephalitis and hydatid disease. Infectious hepatitis accounts for an average of 13 White deaths a year (1949 - 1958).

NEOPLASMS

B 18. Malignant neoplasms (140 - 205). Malignant neoplasms are becoming an increasingly common cause of death but this is largely due to the greater expectancy of life and the higher proportion of the population that reaches the cancer age groups. However, one cancer does show a genuine increase in men, i.e. cancer of the bronchus (162, 163) (Table IV, Figs. 4, 5). Cancer mortality for selected sites has been

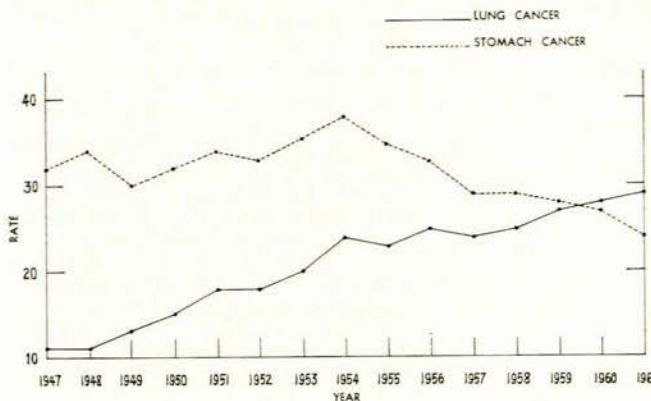


Fig. 4. Lung and stomach cancer rates per 100,000 living for White South African females.

compared in 24 countries by Segi⁸ and in Table V is shown the age-adjusted death rates for malignant neoplasms of selected sites by sex in 1952 - 1953, 1954 - 1955 and 1955 - 1956 in White South Africans and England and Wales. The figures in brackets show the rank order among the 24 countries.

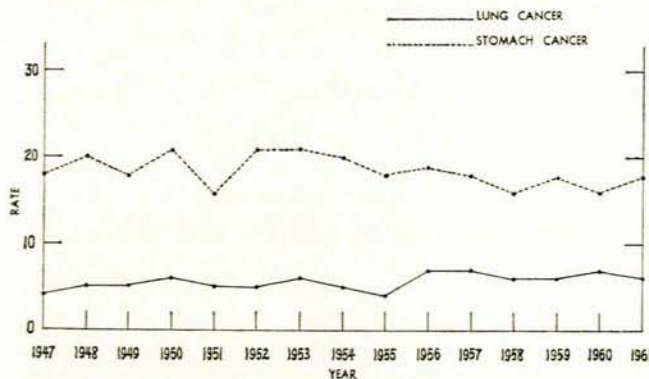


Fig. 5. Lung and stomach cancer rates per 100,000 living for White South African males.

The total deaths for the various cancers and the percentage of all deaths for each cancer is shown for the White South African-born, British immigrants, other White immigrants and England and Wales (Table VI). When there have been important differences, longer periods of time have been taken and the SMR has been calculated.

Stomach

Cancer of the stomach (151) was the commonest cancer in South African-born men although it has been overtaken in frequency by cancer of the bronchus. In the 10 years 1950 - 1959, 3,488 South African-born men and 2,077 South African-born White women died from stomach cancer. If the SMR for South African-born White men is 100, the SMR for men in England and Wales was 72. British male immigrants (507 deaths) have a SMR of 62 based on the population at risk in 1955. During this period there has been a fall in the South African and United Kingdom stomach cancer rate (Table IV). The United Kingdom immigrants keep the lower rates of the country of their origin. The difference between the observed and expected incidence among the British immigrants and the South African-born is statistically significant ($P > 0.0001$). Other White immigrants had 419 deaths in 10 years, and an SMR of 78 based on the 1955 population at risk. In women the SMR for England and Wales was 76. British female immigrants (295 deaths) had a SMR of 59 (1955 population at risk). Again the difference between the observed and expected incidence among the British immigrants and the South African-born is statistically significant ($P > 0.0001$). Other White immigrants (227 deaths) had a SMR of 87 (1955 population). Therefore South African-born White men and women have a higher risk of dying from stomach cancer than men and women in England and Wales. British immigrants to South Africa keep the lower level of risk of dying from stomach cancer that prevails in England and Wales.

The SMRs for stomach cancer in the South African-born is a little higher in the 5 largest cities (SMR 116) than in the other urban areas (SMR 108) and the rural areas (SMR 82), where the SMR for all South African-born is 100. In the Coloured and Asian people stomach cancer is the commonest cancer causing death in both men and women.

Lung

Cancer of the lung (162, 163) is the cancer most commonly causing death in men in England and Wales. In S.A. men, until 1960, it was the second most common cancer except in British male immigrants, among whom it was the most common cancer causing death. In 1947 - 1956 the total male South African-born deaths were 1,532 or a yearly average of 153. In the following 3 years 1957 - 1959 there were 800 deaths or a yearly average of 267. In male immigrants from Britain in 1947 - 1956 the yearly average was 59; in 1957 - 1959 it was 78.

In Table VII is shown that in the 5 largest cities of South Africa, the other urban areas and the rural areas, male and female British immigrants, aged 45 - 64, have a higher risk of lung cancer than the South African-born or other White immigrants. For men the difference is statistically significant ($P > 0.000001$). In both the South African-born and the immigrants there is a higher risk in the cities—more particularly in Durban—than in the other urban areas. The lowest risk is among the South African-born in rural areas.¹

Lung cancer rates in women are only one-quarter the rates in men. The rates are lower than in England and Wales (SMR 130). The lung cancer rates are higher among British women immigrants, aged 45 - 64, than in the South African-born but the differences are not statistically significant.

Although lung cancer is the second most common cancer causing death in Coloured and Asian men, it is less than one-third as frequent as stomach cancer. Among Asian men there were only 70 lung cancer deaths between 1949 and 1958, an average of 7 a year.

Large Bowel

Cancer of the large bowel (153). The large intestine, caecum and colon is the third commonest site for cancer deaths in White South African men and women combined. When the standardized mortality ratios are compared for the 7-year period (1951, 1954 - 1959) based on the 1955 population at risk, men in England and Wales have a slightly higher risk (SMR 127) than the South African-born men, and male

immigrants from Britain have a higher risk (SMR 145). Other immigrants also have a high risk (SMR 150). In England and Wales the SMR for women is 127 compared with the South African-born 100; female immigrants from Britain have a SMR of 113 and other female immigrants slightly higher (SMR 132). There is a higher rate for the South African-born men in the cities (SMR 122) than in the other urban (SMR 111) and the rural areas (SMR 77), where the SMR for all South African-born males is 100.

Cancer of the rectum (154) is much more common in the United Kingdom and in immigrants from Britain. The SMR for England and Wales was 265 for males (1955). For the 7-year period (1951, 1954-59) male immigrants from the United Kingdom had a SMR of 170 and other White male immigrants 138. The SMR for women in England and Wales was 204. Female immigrants from the United Kingdom had a SMR of 132 and other White female immigrants 153 (based on 1955 populations).

Cancer of the pancreas is a little more common in White South African men than in England and Wales but the difference is not statistically significant.

Female Organs

Cancer of the breast. The commonest cancer causing death in White women is cancer of the breast (Code 170). The SMRs for a 3-year period show that there is little difference between the South African-born (SMR 100), England and Wales (SMR 108), immigrants from the United Kingdom (SMR 93) or immigrants from elsewhere (SMR 112). Cancer of the breast is relatively uncommon in the Coloured, Asiatic and Bantu population.

Cancer of the uterus (171-174). Cancer of the cervix (171) is at least as common in South African-born women as in England and Wales (SMR 99) but British (SMR 62) and other immigrants (SMR 61) have a lower risk. There is probably a social class difference—on average the immigrants are of a higher social class, marry later and have fewer children than the South African-born or those who remain in Britain. A great difficulty in making worth-while comparisons arises in this group because 48% of the deaths from cancer of the uterus in White South African women are coded 174, i.e. unspecified as to site. It is very difficult to know what percentage of these deaths should be classified as carcinoma of the cervix (171) and carcinoma of the body of the uterus (172). Oettlé has made a special study of this problem and concluded that South African White women follow the pattern of Westernized nations with a higher death rate from cancer of the cervix and of the body of the uterus. The Coloured and Bantu on the other hand have a very high incidence and death rate from cancer of the cervix, as high as among the Negroes of the United States, while they have a low incidence of cancer of the body of the uterus. Chorionepithelioma (173) is relatively common in the Bantu.⁹

Cancer of the ovary (175) is slightly more common a cause of death in England and Wales (SMR 124). However, the numbers are small and the difference is not highly significant and many factors can give a false indication of the true prevalence.

Cancer of the prostate (177) is the third most common cancer in men. It is more common among South African-born White men than in England and Wales (SMR 74). It is a cancer which mainly affects old men, which accounts for the large number in the United Kingdom immigrants.

Cancer of the oesophagus (150) is more common in South African-born White men than in England and Wales and in White immigrants. Among the White population it is more frequent in Natal than in the Orange Free State.¹⁰ This cancer is very common indeed among the Bantu in certain areas, particularly in the Transkei.¹¹

Cancer of the liver (155) is more common among White South Africans than in England and Wales and perhaps reflects the higher level of liver damage and cirrhosis. It is a common cancer among the South African non-White population.

Cancer of the bladder (181) is relatively common in South Africa and accounts for over 100 male deaths a year.

Skin Cancer

Melanoma (190) and *epithelioma (191)* cause death twice as often among the South African-born White population as in England and Wales, and the prevalence of epithelioma among White South Africans is considerably higher than this

because it is usually easily curable and only a small proportion who have this cancer die from it.

Leukaemia (204) appears to be more common in the South African-born; the SMR for males in England and Wales was 70 and for females 79. A detailed analysis for a large number of years of the various types of leukaemia may prove interesting.

For the remaining cancers no significant differences can be seen or the numbers involved are too small.

In conclusion the cancers that show a significant and interesting difference in the Standardized Mortality Ratios among the White population of South Africa are cancer of the lung, stomach, large bowel and rectum, prostate, skin, and perhaps leukaemia. Among the Coloured and Asians, cancer of the stomach and the cervix of the uterus are common and cancer of the lung is relatively uncommon. Among the Bantu cancer of the cervix, liver and oesophagus are common. There are certainly environmental factors responsible for these differences and knowledge of these factors should lead to a better understanding of the aetiology of these cancers and in this way show how they can be prevented.

B 19. Benign and unspecified neoplasms (210-239). This is a mixed group of 20 benign neoplasms. The number of deaths in the sub-groups are small.

OTHER CAUSES OF DEATH

B 20. Diabetes Mellitus (260)

This is a rather more common cause of death among the well-fed White South Africans than in England and Wales. The risk of dying from diabetes is higher among the non-European immigrants of Johannesburg, perhaps because the disorder is more common among those of Jewish race. Diabetes is a more common cause of death among the Indians of Natal, probably because their metabolism is not genetically accustomed to the high-carbohydrate diet, rich in sugar, which is available in Natal.¹²

B 21. Anaemia (290-293)

This is not commonly recorded as a cause of death. Pernicious anaemia is uncommon.

B 22. Vascular Lesions affecting the Central Nervous System (330-334)

Standardized Mortality Rates show there is no significant difference between England and Wales, White South African-born and immigrants from Britain or Europe. It is a more common cause of death in women than in men—the latter have a longer expectation of life. Cerebral haemorrhage (331) accounts for about half of the deaths, cerebral embolism and thrombosis (332) a quarter and most of the remainder (334) are ill-defined. Subarachnoid haemorrhage (330) accounts for just under 5% of these deaths. Mortality from vascular lesions of the central nervous system is higher, age standardized, among the Coloured and Asian than among the White population of both sexes.¹³

B 23. Non-meningococcal Meningitis (340)

This is an uncommon cause of death but it is more common than in England and Wales, and more common among Coloureds and Asians than among the White population.

B 24. Rheumatic Fever (400-402)

This is an uncommon cause of death. Because it occurs in children it affects mainly the South African-born. It is relatively uncommon today and the prophylactic use of oral penicillin discourages recurrences. It is a more common cause of death among the Coloured and Bantu.

B 25. Chronic Rheumatic Heart Disease (410-416)

This is becoming less common as a cause of death and is less common among White South Africans than it is in England and Wales. Few immigrants come to South Africa with chronic rheumatic heart disease. It is more common among the the non-White population.

CARDIOVASCULAR

B 26. Arteriosclerotic and Degenerative Heart Disease (420-422)

Arteriosclerotic Heart Disease including Coronary Thrombosis (420)

This accounts for 90% of the male deaths in this group and most of the remainder are coded as 'other myocardial degeneration' (422). With more accurate diagnosis the number of deaths classified as 'myocardial degeneration' is decreasing both in South Africa and in the United Kingdom. These

deaths are now more frequently classified under code 420 rather than 422. For purposes of comparison 420-422 is best taken as one group (Table VIII, Fig. 6). There are very few deaths classified 'chronic endocarditis' not classified as 'rheumatic' (421). Among White South Africans there is a marked preponderance of male over female deaths from arteriosclerotic heart disease.

South African-born

Table VIIIA shows that there has been a steady increase in deaths from arteriosclerotic heart disease among White South Africans since 1949 when the present classification was introduced. Part of the South African increase is due to ageing of the population at risk, because deaths from coronary artery disease increase in incidence with increasing age, but part of the increase is real. The expected deaths in 1959, based on the 1951 death rates applied to the 1960 Census population figures, would have been 3,305 for males and 1,885 for females. The actual deaths from this cause (B 26) in 1959 was 3,936 males and 2,165 females. In my opinion this increase is not due to increased diagnostic skill over the years but is a genuine increase. In England and Wales there has been only a slight increase below the age of 65 in men, with a fall over the age of 65 in men and in all age groups in women (Table VIII A).

White South Africans have a much higher death rate from arteriosclerotic heart disease (420-422) than occurs in England and Wales below the age of 70, and a higher rate than in the USA below the age of 60 in men and below 50 in women.¹³ Between the ages of 45 and 54 the risk of death

from arteriosclerotic heart disease is twice as high in men and three times as high in women among the White South African-born compared with England and Wales (Table VIII A). This may be partly a 'social class' difference because the non-White is the proletariat of South Africa.

A comparison has been made between the coronary thrombosis actual and expected deaths for the South African-born and immigrants to South Africa from the United Kingdom, for the 10 years 1950-1959 based on the 1955 population at risk. The risk of death from arteriosclerotic heart disease between the ages of 45 and 69 is only 60% in England and Wales compared with the South African-born (male 63%, female 57%). This is shown in Table IX.

Immigrants

The British immigrants to South Africa aged 45-69 have a lower death risk from arteriosclerotic heart disease than the South African-born but a higher death risk than the average for England and Wales (81% of the South African-born: male 87%, female 80%). It is worth noting that most of the British immigrants settle in the cities where the South African-born rate is higher than in the country, which emphasizes their lower coronary thrombosis death risk than the South African-born; furthermore the British immigrants as a group belong to a higher social class than the South African-born and in the United Kingdom the higher social class have a higher risk of coronary thrombosis. Other White immigrants have no significant difference in risk to the South African-born White population (Table IX).

Described in another way, if there was the same high death rate from arteriosclerotic heart disease in England and Wales between the age of 45 and 69 that occurred among the White South African-born, there would have been about 27,000 more deaths per year (18,000 male, 9,000 female) from this cause between these ages in England and Wales (27,164 deaths in 1959).

Yearly Increase

Arteriosclerotic heart disease (420-422) accounted for 30% of the male and 15% of the female deaths among the White South African-born in 1951; there has been a steady increase since then so that by 1961 40% of the male and 24% of the female deaths in the White South African-born in this 'middle age' group were from coronary artery disease. 90% of these male deaths in 1961 were certified as coronary thrombosis (420). Among British immigrants to South Africa in the same age group the risk of death from coronary artery disease was lower than among the White South African-born, for instance 33% of the male and 21% of the female deaths in British immigrants in this age group were from arteriosclerotic heart disease in 1959.

Among South African-born White men the risk of dying from coronary artery disease is greater in the cities (SMR 118) than in the other urban areas (SMR 102) and greater in the other urban areas than in the rural areas (SMR 87). For this comparison the SMR for all White South African-born male deaths has been taken as 100.

Asians in South Africa, chiefly the Indians of Natal, have a high death rate from arteriosclerotic artery disease but not as high as in the White South African-born. The Asian death rate from this cause would be even higher if they did not have such a high death rate from vascular diseases of the central nervous system, higher than in the White population.¹³ The Coloured population have a much lower age standardized death rate from arteriosclerotic heart disease, and among the Bantu the risk of death from this cause is extremely small.¹⁴

Other Diseases of the Heart

B 27. Other Diseases of the Heart (430-434)

Because of improvement in the standard of diagnosis this group is rapidly diminishing because most of these deaths are now classified as B 26. Formerly they were classified on the death certificate as deaths from acute myocarditis (431).

B 28. Hypertension with Heart Disease (440-443)

The SMRs show little difference between the South African-born, immigrants and the inhabitants of England and Wales. It is a little less common among immigrants to South Africa perhaps because of selective emigration from Britain. It is more common among the non-White population.

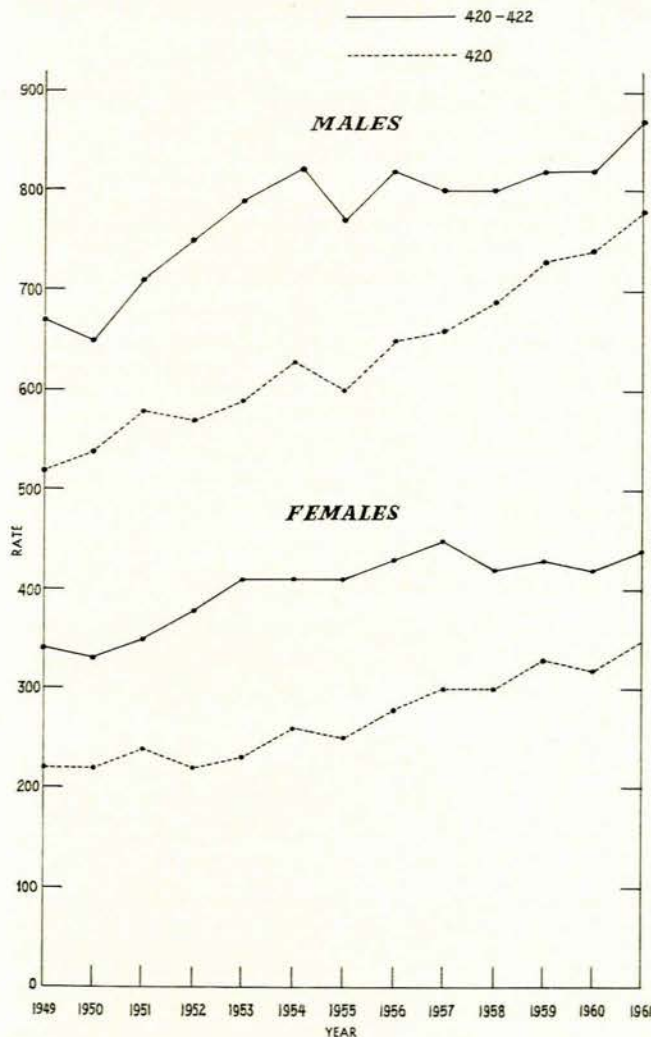


Fig. 6. Arteriosclerotic heart disease deaths (B 26, 420-422) and coronary artery disease deaths (420) for White South Africans.

B 29. Hypertension without mention of the Heart (440-447)

The SMR shows a slightly increased risk among the South African-born over the immigrants. It is more common among the non-White population.

CHEST DISEASE

Pneumonia and Bronchitis

B 30. Influenza (480-483). This is a disease of epidemic years but in most years the death rate from influenza among White South Africans is less than in England and Wales. Influenza with pneumonia (480) is the commonest sub-group.

B 31. Pneumonia (490-493). It is a slightly more common cause of death among all groups of White South Africans than in England and Wales, chiefly among the elderly. Bronchopneumonia is a very common cause of death among the Coloured, Asian and Bantu people.

B 32. Bronchitis (500-502). It is an uncommon disorder in South Africa compared with England and Wales. If the SMR for the White South African-born is 100 the SMR for England and Wales is 342 (373 males, 324 females), thus 3½ times as high. The SMR for British immigrants is 78 (80 males, 73 females). The British immigrant to South Africa has an age standardized risk of dying of bronchitis only one-quarter of that among men left behind in Britain and this difference is statistically highly significant. Bronchitis is a little more common at the coastal areas than in the highveld. It is interesting that although White South African men smoke more than men in England and Wales, their risk of dying from bronchitis is much less and the British immigrant who settles in South Africa loses the high British risk of dying from chronic bronchitis.

GASTRO-INTESTINAL

Peptic Ulceration

B 33. Ulcer of the stomach and duodenum (540-541). These 2 causes of death are best taken separately. Only a small proportion of those who suffer from peptic ulcer die from it.

Ulcer of the stomach (540) is 3 times as common a cause of death in men as in women (775 male, 250 female deaths 1949-58). It is less common in the rural areas, and women in rural areas have a low death rate from this cause. In the cities there is no statistically significant difference between SMRs for the South African-born, British immigrants and England and Wales, although other European immigrants have a lower incidence. There were 189 male and 50 female deaths, 1949-58, among the Coloured.

Ulcer of the duodenum (541) is 5 times more common as a cause of death in men than in women (392 male, 77 female deaths 1949-58). It is more common in the cities than in the rural areas and in the cities there is no significant difference between the risk in South African-born, British immigrants and England and Wales. Duodenal ulcer is uncommon among the Coloured (46 male, 10 female deaths 1947-56) and among the Asian and Bantu.

B 34. Appendicitis (550-553). This condition is becoming an uncommon cause of death in South Africa and in Britain. My clinical impression is that it is also becoming a less commonly diagnosed disorder.

B 35. Intestinal obstruction and hernia (560, 561, 570). There is no difference between the risk of dying of this condition in England and Wales and in South Africa.

B 36. Gastritis, duodenitis and colitis (543, 571, 572). There are 2 important diseases in this group.

Gastroenteritis (571) accounts for nearly all the deaths in B 36. As a cause of death it is relatively common in White South African infants, and therefore the South African-born, and more frequently causes death than in England and Wales. It is very common among the non-White South Africans. There are over 5,000 deaths (2,627 male, 2,513 female in 1958)⁷ a year among the Coloured, mostly infants. This is over 20 times the rate, age corrected, among White South Africans. The rate among the Bantu is not known but it is certainly higher still. This is an appallingly high cause of death among the Coloured and Bantu people. The rate in Asians is not much higher than among the White South Africans.⁷

Ulcerative colitis is uncommon in South Africa compared with England and Wales. In the 3 years 1951, 1958 and 1959 there were only 36 deaths from this cause among White

South Africans (16 male, 20 female): 32 of these were in South African-born and 4 in immigrants. The ulcerative colitis death rate for England and Wales is 3 times higher than among White South Africans. Morbidity from ulcerative colitis also appears to be much less in South Africa.

VARIOUS OTHER DISEASES

Parenchymatous Organs

B 37. Cirrhosis of the liver (581). The risk of dying from cirrhosis of the liver, age standardized, is 3 times greater in White South Africans, both South African-born and immigrants, than in England and Wales. Where the SMR for all South African-born is 100, the SMR for England and Wales was 31. There is no significant difference between the male immigrants and the South African-born men; the female immigrants have a slightly lower risk than the South African-born women but the difference is not significant at the 5% level. In all South Africans deaths from cirrhosis of the liver are more common in men than in women. Cirrhosis of the liver is probably a more common cause of death than would appear from the death certificates.

B 38. Nephritis and nephrosis (590-594). Chronic nephritis (592) is more common among White South Africans, both the South African-born and immigrants, than in England and Wales although in both countries it is becoming a less common cause of death. Acute nephritis is more common among the Coloured and Bantu than among White South Africans among whom it is relatively uncommon.

B 39. Hyperplasia of the prostate (610). The SMR shows that there is no significant difference in incidence between the groups.

Pregnancy and Childbirth

B 40. Complications of pregnancy, childbirth and the puerperium (640-652, 670-689). Almost all these deaths are in South African-born women. The greater risk of death from this cause in White South African women compared with England and Wales is partly due to the higher birthrate in South Africa, but nevertheless the White South African women have a higher risk of toxæmia of pregnancy and of postpartum haemorrhage than do women in England and Wales. Only 4 immigrant women died from these causes in 1951, 1958 and 1959.

B 41. Congenital malformations (750-759). This group is confined to the South African-born. There is no significant difference in risk between the White South African-born and England and Wales. Congenital malformations of the circulatory system is the commonest subgroup.

B 42. Birth injuries, postnatal asphyxia and atelectasis (760-762). Birth injuries (760) and postnatal asphyxia (762) account for about equal numbers of deaths. The rate is a little higher than in England and Wales. There is no significant urban-rural difference.

B 43. Infections of the newborn (763-768). Diarrhoea of the newborn accounts for the higher death rate in South African babies compared with England and Wales.

B 44. Other diseases peculiar to infancy and immaturity, unqualified (769-776). Immaturity (776) accounts for most of this group followed by ill-defined diseases peculiar to early infancy (773). The risk is higher than in England and Wales.

Senility

B 45. Senility without mention of psychosis, ill-defined and unknown causes (780-795). Senility (794) and ill-defined causes (795) account for nearly all in this group in the proportions of 60 to 40. A higher proportion are certified in this group in the rural areas than in the cities, and a much higher number among the non-Whites than the Whites. In the South African cities and among the immigrants there are the same proportion of deaths from senility, age standardized, as in England and Wales. The higher rate among the South African-born is due to this cause appearing more frequently as the cause of death on the death certificate in other urban and rural areas compared with the cities of South Africa, but the differences are not great.

Rarer Diseases

B 46. All other diseases: residual. This includes a very large number of disorders but the number of deaths in many

groups is small. Nevertheless certain important differences between South Africa and England and Wales are apparent.

Other metabolic diseases (289) average about 19 deaths a year (7 male, 12 female) for the 10 years 1950-1959, and of these deaths about half are from porphyria variegata. All these porphyric deaths are among the South African-born and they almost certainly represent less than 50% of the deaths each year from this disease, because the study of porphyric family histories shows that many patients who died from what, in retrospect, was clearly acute porphyria were misdiagnosed at the time, often as encephalomyelitis. Porphyria variegata is common in South Africa because a small nucleus of early settlers have increased rapidly since the 17th century, and all those who have inherited the dominant gene of porphyria variegata, about 8,000 alive today, have inherited this gene from Gerrit, the son of Jan, or Ariaantje, the daughter of Jacob, who married at the Cape in 1688. The high prevalence of this disease among the South African-born is due therefore to genetic factors, the rapid increase of the early Boer population—although the acute porphyria that causes death is precipitated by environmental factors, usually barbiturates or sulphonamides.¹⁵

Multiple sclerosis (345), or disseminated sclerosis. This disease is particularly interesting from the epidemiological viewpoint in South Africa. It was first reported in 1948 that there was a very low incidence among the White South African-born population³ and a prevalence survey, under the aegis of the Multiple Sclerosis Society of New York, has been undertaken since then. Between 1947 and 1960 this disease has been coded correctly as the principal cause of death 20 times in the White population of South Africa, 10 South African-born, 10 immigrants. Study of the death certificates of known MS patients showed that it had been coded as a subsidiary cause of death in 10 further patients and in 25 it had not been mentioned at all. It is worthy of note that a study of the death certificates in which multiple sclerosis has been coded as the principal cause of death will reveal less than half of the patients who die with multiple sclerosis.

There are 55 known multiple sclerosis deaths (20 male, 35 female) between 1948 and 1960; 28 (13 male, 15 female) of these were immigrants from Britain or Europe and 27 (7 male, 20 female) were South African-born. The survey of the prevalence of MS in South Africa will be the subject of a separate paper.¹⁶ It is sufficient to say here that while the death certificates only record a portion, less than half, of the deaths in patients with MS they do show that the disease is relatively common in immigrants from the United Kingdom and very uncommon among the White South African-born. It does occur occasionally in the Coloured and Asiatic people but there has been no substantiated case of MS in the Bantu in South Africa.

Encephalitis and myelitis (343) accounts for 30-40 White deaths a year in South Africa, and is 5 times more common than in England and Wales. A proportion of these deaths are undoubtedly from acute porphyria. This group included a number of diseases which are often not very clearly diagnosed when the patient dies.

Pulmonary embolism and infarction (465) is a more common cause of death among White South Africans, both South African-born and immigrants, than in England and Wales. In 1958-59 the average for each year was 115 male and 146 female deaths. The SMR for England and Wales was 23 for males and 17 for females, when the White South African-born male and female has an SMR of 100.

Pneumoconiosis (523) is 3 times more common as a cause of death in the South African-born and in British immigrants than in England and Wales, due no doubt to the large number of men working in the gold and diamond mines. These men do not have a higher risk of lung cancer than average.

Asthma (241) causes death twice as often among White South Africans—South African-born and immigrants—as in England and Wales. **Deaths from epilepsy (353)** are more common among the South African-born than among immigrants or in England and Wales. On the other hand **paralysis agitans (350)** and **motor neurone diseases (356)** appear to be less common among the South African-born: however, the numbers are too small to draw firm conclusions. Deaths from **rheumatoid arthritis (722)** are about the same in South Africa

and England and Wales, although my clinical impression is that there is less morbidity from this disease in South Africa. For other causes of natural death either no significant differences were present or the numbers are too small to draw any conclusions.

ACCIDENTS, POISONING AND VIOLENCE

BE 47-50. External Causes

External causes or violence in the wide sense accounts for a very high proportion of deaths among South Africans compared with England and Wales. In 1962, accidents, poisoning and violence accounted for 38%, or roughly one-third, of all male deaths among White South Africans below the age of 40, and there has been a steady increase since 1946 (Table X). Violent deaths were responsible for 12% of all male deaths in South African-born and White immigrants other than British immigrants and 4% of male deaths in British immigrants (1958, 1959). This of course is partly due to the older average age of the British immigrant.

BE 47. Motor vehicle accidents (810-835). These accidents account for more than 4% of all White male deaths in South Africa and just over 1% of White female deaths (Table X, Fig. 7). 24% of these deaths occur below the age of 20 and 74% below the age of 45. There is no significant difference between city and rural dwellers. The risk for the White South African-born male is twice the risk of England and Wales (SMR 45, 1958-59). The male immigrant from Britain has a smaller risk than the South African-born (SMR 70) and other White immigrants have above the average risk (SMR 167). The high mortality rate for motor vehicle acci-

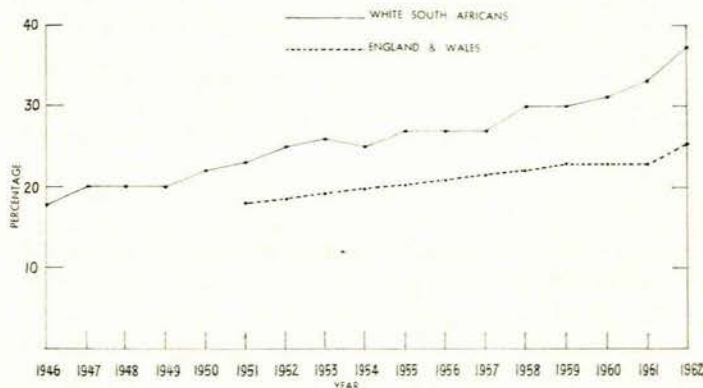


Fig. 7. Deaths from violent causes (BE 47-50, 800-999). Percentage of total deaths for White South African and England and Wales, males only, under 40 years.

dents in South Africa is partly due to the high ratio of motor cars to the White population and the high mileage covered, often at high speed, by the average White South African. Alcohol also contributes to the high motor accident rate. Motor vehicle accidents also account for a high mortality among the non-White population.

BE 48. All other accidents (800-802, 840-965). The SMR for England and Wales was 76 to the South African-born 100 (1958, 1959). British immigrants had the same risk as the South African-born (SMR 97) and other White immigrants had a higher risk (SMR 187). 70% of the deaths in this group occur below the age of 45 years.

The commonest other accidents are accidental falls. In White South Africans 2 other subgroups account largely for the higher death rates, drowning (e.g. 115 male and 23 female deaths, 1959) and violent death unspecified as to whether it was accident, suicide or homicide (93 male and 31 female deaths, 1959).

Suicide

BE 49. Suicide and self-inflicted injury (970-979). About half of these deaths in White South Africans take place between the ages of 20 and 45; suicide occurs at a younger average age in South Africans than in England and Wales. For men the SMR for all ages in England and Wales is 65 to the South African-born 100. There is no significant

difference between the SMRs of the South African-born and immigrants. In women, on the other hand, the SMR in England and Wales is 143 or higher than the South African-born. Again there is no significant difference between the South African-born and British immigrants but non-British immigrants appear to have a lower risk. Because in South Africa the successful suicide rate is higher than England and Wales in men and lower in women, the ratio of male to female suicides in South Africa is about 4 : 1 (2,400 male, 647 female, 1949-58) whereas in England and Wales it is 3 : 2. By far the most common way of committing suicide in England and Wales is by gas, usually domestic gas; one-half of the suicides are by this means. It is followed in frequency by hanging, poison, drowning, and in less than 5% by firearms. In South Africa, half of the male suicides and one-third of the female suicides are by firearms, both among the South African-born and the immigrants. In women poison, usually barbiturates, is a slightly more common way of committing suicide than firearms. In men, after firearms and poison—often carbon monoxide from a car—suicide by hanging is the next most common method. The outstanding difference in suicide methods between South Africa and England and Wales is that firearms is the most common method in South Africa and gas in England and Wales. Suicide is much less common among the Coloured (220 male, 75 female deaths 1949-58), Asian (246 male, 153 female) and Bantu.

BE 50. Homicide and operations of war (980-999). In men in England and Wales in 1959 there were 103 deaths from this cause and in White South Africans 81 deaths; a much higher rate in White South Africans, both among the South African-born, (65 deaths), and the immigrants (16 deaths). All the subgroups are more common causes of death among the White South Africans but in men assaults by firearms and by stabbing actually exceed in total number the deaths in the same groups in England and Wales. In these 2 groups in 1959 there were 47 deaths in White South Africans and 24 deaths in England and Wales. Among the Coloured (204 deaths in 1958) and Bantu, the death rates from homicide are more than 3 times higher than among White South Africans.

COMMENT

There are a number of marked differences in the mortality pattern of the White South African-born and White immigrants from the United Kingdom and from elsewhere, compared with England and Wales. The age standardized comparisons are shown in Table XVI.

Cancer of the lung is the most common cancer causing death in men in Britain and among White South Africans. In South Africa, as in Britain, the lung cancer risk increases proportionately with the number of cigarettes smoked, and yet among White SA-born men it is only half as common as in Britain. British male immigrants, aged 45-64, have a higher risk than White SA-born men but a lower risk than occurs in Britain (Table VII).² On the other hand British immigrants lose the high British risk of dying from bronchitis although on arrival in South Africa they, on average, increase their cigarette consumption.

Stomach cancer is more common among the South African-born than in England and Wales; however the rate is falling slowly. British immigrants keep the lower British levels. There is a high prevalence of stomach cancer among the Coloured people.

Cancer of the rectum is twice as common in Britain as among the White South African-born and *cancer of the colon* is also more common in Britain. British immigrants to South Africa have a risk of cancer of the rectum and colon which falls between the British and White South African risk. The excessive use of liquid paraffin and purgatives may be related to the high risk of these cancers in Britain.

Cancer of the cervix is at least as common among the South African-born White women as in England and

Wales; it is difficult to make exact comparisons because so many cancers of the uterus are included in 'uterus site unspecified'. It is less common among British and other White immigrants, but is a very common cancer among the Coloured and Bantu South Africans. This is another cancer in which environmental factors, i.e. age of commencement of sexual intercourse and the social hygiene of the consort or consorts, are the most important cause.

Liver cirrhosis and cancer. The higher incidence of liver cirrhosis and cancer of the liver in White South Africans is probably related to the higher intake of alcohol and perhaps more frequent infective hepatitis in South Africa.

Skin cancer. The increased risk of skin cancer among White South Africans is undoubtedly due to excessive exposure to sunlight. Epitheliomas and rodent ulcers are the commonest cancers in South Africa, particularly among men, but most of these cancers are easily curable. Nevertheless, the mortality from skin cancer among the South African White population is twice the mortality in England and Wales.

Arteriosclerotic heart disease. There is a very high death rate from arteriosclerotic heart disease among the South African-born White population, particularly men below the age of 65. It is of great interest that immigrants from the United Kingdom have a coronary thrombosis risk only a little higher than occurs in England and Wales, although most of these immigrants settle in the cities where the South African-born have a higher risk than the average for the country as a whole. Furthermore, the British immigrants have this lower risk although as a group they belong to a higher social class than the South African-born and this class usually has a greater risk of coronary thrombosis. British immigrants on arrival in South Africa increase their cigarette consumption to South African levels,² but perhaps keep some of the eating habits they practise in Britain. Brock and Bronte-Stewart¹⁴ compared the mortality from coronary thrombosis between the White, Coloured and Bantu population at the Cape. Their work, and that of Walker,¹⁰ strongly suggests that a high-calorie, high-animal-fat diet is the most important single factor in predisposing to coronary thrombosis among White South Africans, although there are undoubtedly other factors such as obesity, lack of exercise, smoking and hypertension. The Indians of Natal have a coronary thrombosis risk that is almost as high as that among White South Africans. Study of the factors responsible for the high coronary thrombosis rates among the younger age groups of the White and Indian population in South Africa is urgently needed.

Multiple sclerosis will be considered elsewhere.¹⁶ It is very uncommon among the White South African-born who remain in South Africa but common in immigrants from Britain and from the rest of Europe.

Pulmonary embolism is a more common cause of death in South Africa than in England and Wales and this may be due to the warm weather and the greater fluid loss and haemoconcentration that can occur after an operation in South Africa.

Death from external causes, particularly motor car and other accidents, accounts for far too high a proportion of deaths among South African men, usually in the prime of their lives.

SUMMARY

1. The Bantu have neither the medical attention nor the necessary level of certification to make detailed comparisons with the other South African groups possible. It is known that their death rate is very high and until very recently the neonatal death rate exceeded 50%. It has now dropped in the cities to less than 20%, with a resultant explosive increase in the Bantu population since the birth rate remains high. *The Bantu should be taught now the advantages of limiting the size of their families and that smaller families, among whom nearly all the children survive, will result in higher living standards.* Otherwise the Bantu population explosion will throw such a strain on the available food and other resources of the country that social misery and lower standards of living must inevitably follow.

2. The Coloured people, mostly in the Cape, who are derived from cross-breeding between the early European settlers and their Malay, Indian, Hottentot and Negro slaves, occupy an intermediate position in the social scale between the White and the Bantu. They have largely adopted a Western way of life and their mortality statistics are fairly reliable. They have an extremely high infantile death rate, over 5,000 deaths a year from gastroenteritis alone, but not as high as among the Bantu. *They have a standard of living which is far too low for such a wealthy country as South Africa and have a very high compensating birth rate.*

3. The Asian community consists chiefly of the Indians of Natal. They are often traders and middlemen. Their closely knit family life protects them from some of the hazards of poverty, and their expectation of life is much better than occurs in India. However, *they have a high death rate from hypertension, strokes, coronary artery disease and diabetes (Figs. 8, 8a).*

4. *White South Africans have a poor expectation of life compared with the countries from which their fore-*

bears came. The life tables of the White, Coloured and Asians of South Africa have been compared with England and Wales and the Asians have been compared with all of India in Table XI.¹⁷ South African-born White men and women in spite of, or because of, their high standard of living have a higher mortality up to the age of 65 than men and women in the countries from which their ancestors came—the Netherlands, England and Wales, Germany, France and other Western nations of Europe—and also a higher mortality than in Canada, Australia and New Zealand (Tables XII, XIII).

5. *The death rate in the White population is higher in the cities than in rural areas of South Africa.* e.g. in 1951 when the age-standardized death rate for all White South African-born male deaths was 100 (6,694 deaths), the SMR for the cities was 131 (expected deaths, at the age-standardized rates for all South African-born men—1,292, actual deaths—1,689). The rural areas had a SMR of 88 (expected deaths 2,430, actual 2,145) and other urban areas come in between with a SMR of 96 (Fig. 9).

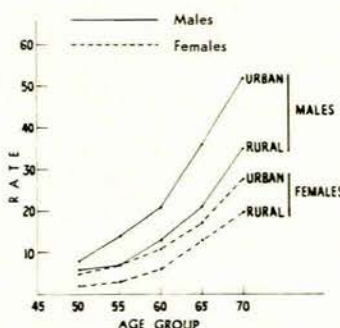


Fig. 9. Urban/Rural Difference in Death Rates, White South African-born Males and Females, 1959.

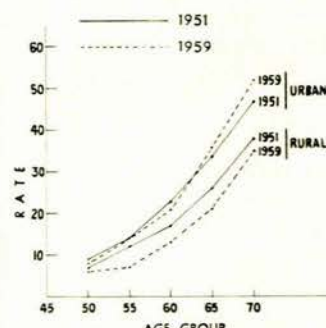


Fig. 10. Comparative Death Rates for White South African Males, Urban and Rural Areas in 1951 and 1959.

6. *Immigrants from the United Kingdom have a lower mortality than the South African-born but not as low as among those who remain in England and Wales.* Other immigrants from Europe occupy an intermediate position (Table XV). Most of the United Kingdom immigrants to South Africa settle in the 5 largest cities where the death rate is higher than in the country as a whole.

7. *There is little cause for complacency about the death rates among South African-born White men in middle age, in fact between the ages of 60 and 70 the risk of death for men has increased (Table XVI).* The risk of death is increasing in the cities and towns for South African-born White men over the age of 60 but it is still falling in rural areas (Fig. 10). The increasing death rate for men in England and Wales, over the age of 55, has also been noted by the Chief Medical Officer of the Ministry of Health of England and Wales (1963).²⁰ In South Africa the increase in coronary artery disease, and in England and Wales the increase in lung cancer, are major factors in the increasing death rate in middle-aged men.

8. Age-standardized comparisons of a number of the most important diseases showed marked differences between the White South African-born, immigrants from the UK, and residents of England and Wales (Table XVI).

These differences, where statistically significant, are summarized below:

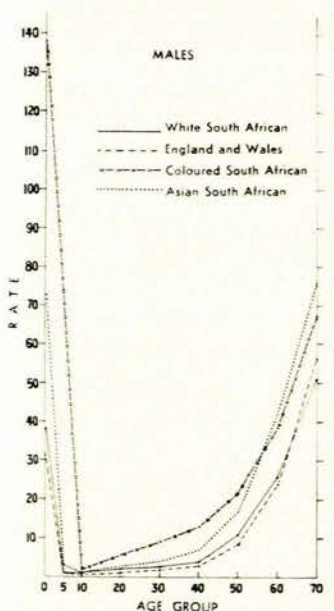


Fig. 8. Comparative Death Rates per 1,000 Living, 1951. White, Coloured and Asian South Africans, and England and Wales.

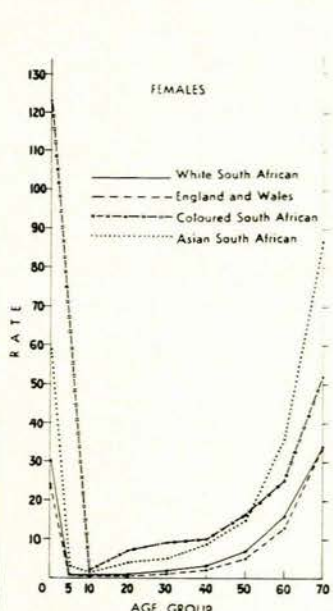


Fig. 8a. Comparative Death Rates per 1,000 Living, 1951. White, Coloured and Asian South Africans, and England and Wales.

WHITE SOUTH AFRICAN-BORN COMPARED WITH RESIDENTS
OF ENGLAND AND WALES

Mortality rates for which SA-born were significantly higher than England and Wales *Mortality rates for which SA-born were significantly lower than England and Wales*

Men

Cancer of stomach	Cancer of large intestine
Cancer of liver	Cancer of rectum
Cancer of prostate	Cancer of lung
Melanoma	Bronchitis
Other cancer of the skin	Ulcerative colitis
Leukaemia	Multiple sclerosis
Heart disease	
Cirrhosis of liver	
Pulmonary embolism	
Porphyria variegata	
Accidents, poisonings and violence	

Women

Cancer of stomach	Cancer of large intestine
Cancer of liver	Cancer of rectum
Cancer of uterus and cervix uteri	Cancer of breast
Melanoma	Cancer of ovary
Other cancer of the skin	Bronchitis
Leukaemia	Ulcerative colitis
Heart disease	Multiple sclerosis
Cirrhosis of liver	
Pulmonary embolism	
Porphyria variegata	

WHITE SOUTH AFRICAN-BORN COMPARED WITH
BRITISH IMMIGRANTS

Mortality rates for which SA-born were significantly higher than British immigrants *Mortality rates for which SA-born were significantly lower than British immigrants*

Men

Cancer of stomach	Cancer of large intestine
Cancer of liver	Cancer of rectum
Heart disease	Cancer of lung
Porphyria variegata	Multiple sclerosis
Accidents, poisonings and violence	

Women

Cancer of stomach	Cancer of rectum
Cancer of liver	Cancer of ovary
Cancer of uterus and cervix uteri	Multiple sclerosis
Heart disease	
Porphyria variegata	

CONCLUSION

It has been suggested that the difference in the mortality pattern between the White South African-born, White immigrants to South Africa, and England and Wales might be constitutional in origin and not environmental.^{20,21} The differences are certainly not genetic because, except for a few relatively uncommon causes of death such as porphyria variegata, the British and other White immigrants show a pattern of mortality that lies between that of their countries of birth—where they spent the first part of their lives—and their country of adoption. Second and subsequent generations of English-speaking White South Africans have much the same mortality pattern as the more established White South Africans. Environmental factors would appear to play the major role in accounting for the difference in the mortality pattern between the United Kingdom and Western Europe, White immigrants to South Africa and the native-born White South Africans. Constitutional differences in the population at risk, due to competing causes of death, may also play a part. It is becoming increasingly possible to identify 'High Risk Groups' for different causes of death. Those in these groups can often be advised how they should alter their way of life and so lessen their risk.

While the infections and diseases of poverty are being rapidly overcome in South Africa and the expectation of life of the Bantu, Coloured and Indian population is rising, there is no room for complacency as far as the health of the White population is concerned. Although the White South African has a better expectation of life than the other racial groups it is lower than in the Western countries of Europe, Canada, New Zealand or Australia. One-third of all male deaths in White South Africans below the age of 40 are from violence—the motor car, alcohol and easy access to lethal weapons are the main contributory factors. There is an increase in the death rate in South African-born White men, aged over 60, living in the cities and towns, mainly due to coronary artery disease. The middle-aged Indian population also has a high death rate from coronary thrombosis, hypertension, and the complications of diabetes. *In my opinion, the White population of South Africa should give much more attention to the effects of our affluent way of life on our health, in particular our high-calorie diet rich in animal fat, the excessive use of the car and lack of daily exercise, excessive smoking and alcohol, and the problem of increasing urban air pollution.*

Studies of the environmental factors responsible for the major differences in morbidity and mortality among people of different social patterns in South Africa should be undertaken now before changes in the social order result in the adoption of a standard mode of life.

This research was made possible by the cooperation of Dr. H. M. Stoker, Director of the South African Bureau of Census and Statistics. My thanks are also due to Mr. Geldenhuis, in charge of Health Statistics, Mr. Maynard, in charge of Population Statistics, and Mr. Holliday who is in charge of the machine rooms at the Bureau of Census and Statistics.

This work was first undertaken following the suggestion of Dr. Joseph Berkson, of the Mayo Clinic, that the differences in the prevalence of lung cancer in the White South African-born compared with British immigrants might be constitutional and not environmental. I am most grateful to Dr. Berkson for persuading me to undertake this most fascinating study.

I would like to thank Mr. G. F. Todd of the Tobacco Research Council, Dr. Richard Doll, of the Medical Research Council and Dr. H. Gonin of the Mathematical Statistics Department of the University of South Africa, Pretoria, for advice about statistical methods.

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TABLE I. THE AGE DISTRIBUTION OF WHITE S.A.-BORN, BRITISH IMMIGRANTS AND ALL OTHER WHITE IMMIGRANTS, AND ENGLAND AND WALES, BASED ON THE 1951 POPULATION CENSUS

Age group	Males								Females							
	South African-born		British immigrants		All other immigrants		England and Wales*		South African-born		British immigrants		All other immigrants		England and Wales*	
	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total	1951 Population census totals	Per-cent. of total
0-19	515,517	44%	8,073	11%	10,639	14%	6,363	30%	499,366	43%	7,004	9%	9,784	15%	6,148	27%
20-29	186,117	16%	6,636	8%	9,744	13%	3,107	15%	186,784	16%	5,801	8%	9,730	15%	3,120	14%
30-39	167,329	14%	13,318	17%	12,523	17%	3,187	15%	170,665	15%	10,684	14%	11,249	17%	3,262	14%
40-49	135,930	12%	13,612	18%	15,461	21%	3,257	15%	137,780	11%	12,451	17%	12,292	18%	3,340	15%
50-59	80,652	7%	11,971	15%	11,434	15%	2,423	11%	86,392	7%	13,503	18%	10,500	16%	2,831	12%
60-69	52,115	4%	11,320	14%	7,993	11%	1,729	8%	58,580	5%	12,438	17%	7,688	11%	2,249	10%
70+	29,970	3%	13,325	17%	6,990	9%	1,189	6%	35,715	3%	12,561	17%	5,872	8%	1,803	8%
Total	1,167,630		78,255		74,784		21,255		1,175,282		74,442		67,115		22,753	

*England and Wales figures in thousands.

TABLE IA. THE AGE DISTRIBUTION OF WHITE S.A.-BORN, BRITISH IMMIGRANTS AND ALL OTHER WHITE IMMIGRANTS BASED ON THE 1960 POPULATION CENSUS, AND ENGLAND AND WALES BASED ON THE 1959 POPULATION CENSUS

Age group	Males								Females							
	South African-born		British immigrants		All other immigrants		England and Wales*		South African-born		British immigrants		All other immigrants		England and Wales*	
	1960 Population census totals	Per-cent. of total	1960 Population census totals	Per-cent. of total	1960 Population census totals	Per-cent. of total	1959 Population census totals	Per-cent. of total	1960 Population census totals	Per-cent. of total	1960 Population census totals	Per-cent. of total	1960 Population census totals	Per-cent. of total	1959 Population census totals	Per-cent. of total
0-19	625,191	45%	7,246	11%	17,468	19%	6,824	31%	603,008	43%	6,523	9%	16,009	19%	6,526	28%
20-29	201,454	15%	4,756	7%	14,862	16%	2,918	13%	202,044	14%	5,391	8%	11,436	14%	2,856	12%
30-39	177,972	13%	8,265	12%	16,774	18%	3,230	15%	178,839	13%	8,079	11%	16,040	19%	3,267	14%
40-49	157,146	11%	12,907	20%	15,209	16%	3,013	14%	162,565	12%	11,015	16%	12,790	16%	3,108	13%
50-59	117,167	9%	12,642	19%	14,846	16%	2,909	13%	122,854	9%	12,253	17%	11,980	15%	3,133	13%
60-69	60,621	4%	9,405	14%	8,487	9%	1,833	8%	73,529	5%	12,565	18%	8,525	10%	2,456	11%
70+	38,412	3%	11,024	17%	5,452	6%	1,275	6%	51,590	4%	14,589	21%	6,104	7%	2,156	9%
Un-specified	328		20		41				282		40		20			
Total	1,378,291		66,265		93,139		22,002		1,394,711		70,455		82,904		23,502	

*England and Wales figures in thousands.

TABLE II. CAUSES OF DEATH IN SOUTH AFRICAN WHITE, COLOURED AND ASIATIC PEOPLE
Rate (per 100,000 population)

Cause of death (Sixth revision)	Male														Female																										
	Rate (per 100,000 population)														Rate (per 100,000 population)																										
	White							Coloured							Asiatic							White							Coloured							Asiatic					
	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1950	1958	1950	1958	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1950	1958	1950	1958													
All causes	1,015	985	1,007	953	987	1,002	936	998	981	987	2,097	1,825	1,237	920	752	756	753	692	726	718	675	721	727	726	1,963	1,555	1,048	706													
B 1 Tuberculosis of respiratory system	27	25	20	15	11	10	10	10	9	9	322	125	81	16	15	13	12	7	5	4	3	4	3	4	326	79	73	13													
B 2 Tuberculosis, other forms	5	5	5	3	2	3	2	2	1	1	63	29	22	7	4	4	3	3	2	1	1	1	1	1	61	23	29	6													
B 3 Syphilis and its sequelae	8	7	5	6	5	7	6	5	4	2	35	13	5	4	4	4	4	2	2	2	2	2	2	2	32	9	4	1													
B 4 Typhoid fever	2	1	0	1	0	0	1	0	0	0	5	2	4	—	1	1	1	0	0	0	0	0	0	0	4	1	4	1													
B 5 Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—													
B 6 Dysentery, all forms	1	1	1	2	1	1	1	1	1	1	5	5	12	4	1	1	1	0	1	0	1	1	0	0	2	2	16	2													
B 7 Scarlet fever and streptococcal sore throat	0	0	0	—	0	—	0	0	—	—	—	—	—	—	0	0	0	0	—	—	0	—	—	—	0	—	—	—													
B 8 Diphtheria	4	5	5	3	3	3	2	3	2	1	5	8	4	7	4	4	5	3	—	3	2	3	2	2	5	7	8	4													
B 9 Whooping cough	2	1	2	1	0	1	1	1	0	0	32	14	9	3	3	2	2	1	1	1	1	1	1	1	44	17	7	1													
B 10 Meningococcal infections	3	2	2	1	1	1	0	1	1	1	3	3	1	2	1	1	1	0	1	1	0	0	1	1	2	2	1	0													
B 11 Plague	—	—	0	—	—	—	—	—	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—													
B 12 Acute poliomyelitis	1	1	1	0	1	2	2	6	5	1	0	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—													
B 13 Smallpox	1	0	0	—	—	—	—	—	—	—	1	0	—	—	0	0	1	0	1	1	1	5	3	0	0	—	—	—													
B 14 Measles	2	1	2	0	1	1	2	1	1	2	8	18	2	6	2	1	1	0	1	0	1	1	1	1	8	20	1	5													
B 15 Typhus and other rickettsial diseases	0	0	0	0	0	—	0	—	—	0	—	—	—	—	0	0	0	0	0	0	—	—	—	—	—	—	—	—													
B 16 Malaria	1	1	1	1	1	—	0	0	0	0	1	—	—	—	0	1	0	0	1	0	0	0	—	—	0	—	—	—													
B 17 All other diseases classified as infective and parasitic	6	8	6	3	3	3	3	4	4	5	21	21	8	7	5	7	4	3	2	3	3	3	3	3	16	18	11	4													
B 18 Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissues	119	122	134	131	132	147	138	143	143	146	65	86	32	30	112	115	116	114	122	116	114	118	124	123	67	76	39	24													
B 19 Benign and unspecified neoplasms	3	4	4	2	3	1	3	4	3	2	2	1	2	2	3	4	4	4	4	3	3	3	4	3	3	2	2	2													
B 20 Diabetes mellitus	6	7	7	6	5	7	6	6	6	6	2	3	14	10	15	15	13	12	11	12	12	11	11	12	7	8	9	12													
B 21 Anaemias	3	3	2	2	1	1	1	2	1	2	2	1	3	1	2	4	3	3	3	2	2	3	2	2	2	2	4	6													
B 22 Vascular lesions affecting central nervous system	66	73	73	70	79	79	69	77	71	81	60	73	71	82	87	95	98	87	96	95	90	97	102	105	88	101	58	54													
B 23 Non-meningococcal meningitis	4	3	3	2	3	2	2	2	2	2	2	11	12	4	3	2	2	2	2	2	1	1	2	1	10	7	7	6													
B 24 Rheumatic fever	1	0	0	1	0	0	1	0	0	0	13	2	0	—	0	1	0	1	1	1	0	0	0	0	2	1	1	2													
B 25 Chronic rheumatic heart disease	9	7	8	5	4	5	2	3	3	3	14	6	15	12	10	9	9	6	6	5	3	4	4	4	23	13	15	14													
B 26 Arteriosclerotic and degenerative heart disease	203	200	216	232	245	254	240	254	252	250	70	88	95	98	104	103	111	119	131	134	133	140	148	138	53	62	52	54													
B 27 Other diseases of heart	15	14	16	8	4	4	2	2	2	7	21	9	17	6	14	14	14	8	3	3	2	1	2	3	22	6	16	1													
B 28 Hypertension with heart disease	29	27	22	18	21	19	19	15	15	9	29	18	35	21	29	30	30	23	24	24	22	20	13	37	23	15	18	—													
B 29 Hypertension without mention of heart	5	6	6	7	9	7	6	7	9	12	4	21	7	15	7	7	7	7	8	8	8	9	9	16	7	30	3	13													
B 30 Influenza	4	8	5	4	2	4	2	3	5	3	15	6	7	3	3	5	2	3	2	3	2	2	4	3	11	5	5	2													
B 31 Pneumonia	67	60	62	54	54	57	44	57	55	59	337	232	219	153	53	50	47	41	42	45	36	42	46	48	322	223	211	138													
B 32 Bronchitis	17	19	18	12	14	14	11	11	13	16	49	18	41	10	12	10	9	7	6	6	4	5	5	7	35	9	34	8													
B 33 Ulcer of stomach and duodenum	8	8	7	7	9	8	8	8	10	10	5	4	4	5	2	2	2	2	2	2	3	4	3	1	1	1	1	1													
B 34 Appendicitis	4	4	5	2	3	3	3	2	2	1	2	1	2	1	2	2	2	2	2	1	1	1	1	1	0	—	—	—													
B 35 Intestinal obstruction and hernia	6	7	5	6	8	7	6	6	6	6	6	5	3	4	6	6	6	6	5	5	6	5	5	6	4	3	4	2													
B 36 Gastritis, duodenitis, enteritis and colitis, except diarrhoea of the newborn	26	21	20	19	20	16	16	15	12	13	308	390	108	62	19	18	17	19	17	16	14	12	11	11	298	368	94	63													
B 37 Cirrhosis of liver	11	7	12	11	10	9	7	7	8	8	5	6	7	6	4	4	6	5	4	3	4	5	4	4	2	2	1	2													
B 38 Nephritis and nephrosis	26	21	22	13	17	15	14	16	15	14	34	18	27	14	22	18	18	15	16	13	12	14	11	11	32	19	27	10													
B 39 Hyperplasia of prostate	16	13	17	17	16	17	15	12	11	10	6	7	5	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—													
B 40 Complications of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	5	6	5	6	4	4	3	2	3	25	18	25	16													
B 41 Congenital malformations	10	13	10	12	11	10	12	13	13	12	14	17	8	10	9	7	8	9	11	10	10	11	13	11	10	14	9	7													
B 42 Birth injuries, postnatal asphyxia and atelectasis	16	15	18	18	15	16	17	16	16	17	30	34	20	25	10	11	11	11	11	12	10	11	8	12	21	21	11	18													
B 43 Infections of the newborn	5	4	4	4	3	5	4	3	4	3	35	35	18	17	3	3	3	3	3	3	3	2	3	2	24	29	15	16													
B 44 Other diseases peculiar to early infancy, and immaturity, unqualified	39	31	29	31	30	29	29	31	29	30	155	98	65	50	28	24	23	23	24	25	19	22	21	21	130	84	62	38													
B 45 Senility without mention of psychosis, ill-defined and unknown causes	39	33	34	38	47	45	43	50	50	43	86	143	74	76	39	34	31	38	46	48	47	50	45	41	78	118	53	57													
B 46 All other diseases	102	110	110	94	96	98	95	102	96	99	127	125	101	67	75	89	87	69	63	70	68	68	72	111	92	70	49	—													
BE 47 Motor vehicle accidents	26	26	25	31	33	29	30	31	39	43	24	38	18	29	6	6	6	7	8	7	9	9	11	5	8	4	5	—													
BE 48 All other accidents	44	44	44	42	41	40	38	44	40	38	57	62	35	31	18	19	18	17	20	18	17	20	15	16	22	27	38	20													
BE 49 Suicide and self-inflicted injury	18	14	15	14	19	18	19	18	18	19	3	5	15	11	5	5	5	5	4	5	4	4	5	6	2	1	7	6													
BE 50 Homicide and operations of war	5	3	4	4	4	4	4	4	4	4	14	26	8	9	1	1	2	1	2	1	1	2	2	2	6	4	1	4													

There are no reliable death rates for the Bantu population.

TABLE III. CAUSES OF DEATH IN THE WHITE SOUTH AFRICAN-BORN, WHITE IMMIGRANTS FROM THE UNITED KINGDOM AND FROM ELSEWHERE AND ENGLAND & WALES

Code	Cause	Male															
		SOUTH AFRICAN-BORN				UNITED KINGDOM-BORN IMMIGRANTS				ALL OTHER IMMIGRANTS				ENGLAND & WALES			
		1951		Average 1958/59		1951		Average 1958/59		1951		Average 1958/59		1951		Average 1958/59	
No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths		
B																	
1	Tuberculosis of respiratory system	216	2.15	120	1.01	31	1.60	19	1.06	13	.96	6	.41	7,903	2.80	2,784	1.03
2	Tuberculosis, other forms	64	.64	15	.12	5	.26	—	—	2	.15	—	—	923	.33	224	.08
3	Syphilis and its sequelae	47	.47	22	.19	14	.72	6	.34	9	.66	4	.28	1,265	.44	640	.24
4	Typhoid fever	4	.04	4	.03	—	—	—	—	—	—	—	—	5	—	2	—
5	Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	Dysentery, all forms	13	.13	10	.08	1	.05	2	.11	—	—	—	—	41	.02	17	—
7	Scarlet fever and streptococcal sore throat	—	—	—	—	—	—	—	—	1	.07	—	—	27	.01	10	—
8	Diphtheria	60	.60	19	.16	—	—	—	—	—	—	1	.07	15	—	2	—
9	Whooping cough	26	.26	6	.05	—	—	—	—	—	—	—	—	212	.08	12	—
10	Meningococcal infections	19	.19	10	.08	—	—	—	—	1	.07	—	—	156	.05	84	.03
11	Plague	1	.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	Acute poliomyelitis	13	.13	10	.08	1	.05	2	.11	—	—	—	—	110	.04	56	.02
13	Smallpox	1	.01	—	—	—	—	—	—	—	—	—	—	3	—	—	—
14	Measles	21	.21	16	.14	—	—	—	—	—	—	—	—	173	.06	36	.01
15	Typhus and other rickettsial diseases	4	.04	—	—	—	—	—	—	—	—	—	—	10	—	1	—
16	Malaria	4	.04	1	.01	2	.10	1	.06	2	.15	—	—	—	—	—	—
17	All other infective and parasitic diseases	72	.71	57	.48	4	.21	5	.28	3	.22	4	.26	591	.21	482	.17
18	Malignant neoplasms	1,274	12.67	1,664	14.06	288	14.87	337	18.81	212	15.60	234	16.06	44,632	15.84	51,259	18.97
19	Benign and unspecified neoplasms	48	.48	26	.22	4	.21	5	.28	3	.22	2	.13	899	.32	540	.20
20	Diabetes mellitus	67	.66	68	.58	15	.74	10	.56	16	1.18	16	1.14	1,219	.43	1,126	.42
21	Anaemias	23	.23	21	.18	3	.16	4	.22	3	.22	1	.07	635	.23	579	.22
22	Vascular lesions affecting central nervous system	667	6.63	893	7.54	185	9.55	180	10.04	116	8.54	140	9.61	29,003	10.29	31,098	11.51
23	Non-meningococcal meningitis	37	.37	28	.24	2	.10	2	.11	—	—	—	—	227	.08	188	.07
24	Rheumatic fever	4	.04	4	.03	—	—	—	—	—	—	—	—	164	.05	67	.02
25	Chronic rheumatic heart disease	102	1.01	54	.46	5	.26	1	.06	4	.29	2	.13	4,076	1.45	2,524	.93
26	Arteriosclerotic and degenerative heart disease	1,962	19.49	2,948	24.90	514	26.53	483	26.95	389	28.62	421	28.90	72,950	25.89	73,968	27.37
27	Other diseases of heart	165	1.64	88	.75	27	1.39	8	.44	14	1.03	10	.69	3,346	1.19	5,745	2.13
28	Hypertension with heart disease	214	2.13	115	.97	58	3.00	23	1.28	26	1.92	11	.76	8,019	2.84	4,915	1.82
29	Hypertension without mention of heart	59	.59	128	1.08	11	.57	23	1.28	11	.81	14	.96	2,005	.71	3,396	1.26
30	Influenza	56	.56	45	.38	3	.16	7	.39	6	.44	2	.13	7,393	2.63	2,557	.95
31	Pneumonia	652	6.48	674	5.69	116	5.99	136	7.59	83	6.11	92	6.31	11,596	4.11	12,501	4.63
32	Bronchitis	169	1.68	180	1.52	48	2.48	30	1.67	27	1.99	18	1.24	22,717	8.06	20,260	7.50
33	Ulcer of stomach and duodenum	62	.62	95	.80	27	1.40	25	1.40	8	.59	14	.96	4,276	1.52	3,257	1.21
34	Appendicitis	45	.45	17	.14	4	.21	1	.06	8	.59	3	.20	679	.24	446	.16
35	Intestinal obstruction and hernia	52	.52	70	.59	10	.52	16	.89	8	.59	6	.41	1,542	.56	1,407	.52
36	Gastritis, duodenitis, enteritis and colitis of the newborn	251	2.48	189	1.60	9	.50	4	.22	4	.29	4	.26	1,231	.43	974	.36
37	Cirrhosis of liver	109	1.08	89	.75	24	1.24	10	.56	24	1.76	13	.89	615	.22	630	.23
38	Nephritis and nephrosis	216	2.15	156	1.32	45	2.32	17	.95	32	2.35	15	1.03	3,245	1.15	2,041	.76
39	Hyperplasia of prostate	147	1.46	88	.75	46	2.37	32	1.79	36	2.65	18	1.24	4,553	1.62	3,541	1.31
40	Complications of pregnancy, childbirth and the puerperium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41	Congenital malformations	123	1.22	186	1.57	1	.05	—	—	1	.07	2	.13	2,425	.86	2,546	.94
42	Birth injuries, postnatal asphyxia and atelectasis	233	2.31	202	1.71	1	.05	—	—	1	.07	—	—	2,709	.96	2,772	1.03
43	Infections of the newborn	18	.18	61	.52	—	—	—	—	1	.07	—	—	665	.24	541	.20
44	Other unqualified diseases of early infancy and immaturity	387	3.85	453	3.83	—	—	—	—	—	—	2	.13	3,076	1.09	2,248	.83
45	Senility without mention of psychosis	343	3.41	513	4.33	55	2.84	98	5.47	49	3.61	68	4.67	3,749	1.33	2,853	1.06
46	All other diseases	1,017	10.11	1,132	9.56	290	14.97	226	12.61	154	11.33	161	11.05	20,197	7.18	18,529	6.86
BE																	
47	Motor vehicle accidents	285	2.82	527	4.45	20	1.03	22	1.23	30	2.21	72	4.94	3,396	1.21	4,224	1.56
48	All other accidents	499	4.95	529	4.47	43	2.20	36	2.01	40	2.95	67	4.60	6,121	2.17	5,924	2.19
49	Suicide and self-inflicted injury	168	1.66	245	2.07	20	1.04	19	1.06	16	1.18	24	1.65	2,831	1.01	3,146	1.16
50	Homicide and operations of war	47	.47	60	.51	5	.26	2	.11	6	.44	10	.69	99	.36	106	.04
		10,063		11,838		1,937		1,792		1,359		1,457		281,724		270,258	

TABLE IIIA. CAUSES OF DEATH IN THE WHITE SOUTH AFRICAN-BORN, WHITE IMMIGRANTS FROM THE UNITED KINGDOM AND FROM ELSEWHERE AND ENGLAND & WALES

Code	Cause	Female															
		SOUTH AFRICAN-BORN				UNITED KINGDOM-BORN IMMIGRANTS				ALL OTHER IMMIGRANTS				ENGLAND & WALES			
		1951		Average 1958/59		1951		Average 1958/59		1951		Average 1958/59		1951		Average 1958/59	
No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths		
B																	
1	Tuberculosis of respiratory system	149	1.91	45	.51	7	.53	4	.30	6	.74	3	.31	4,128	1.54	952	.37
2	Tuberculosis, other forms	39	.50	14	.16	5	.38	1	.07	1	.12	—	—	852	.32	206	.08
3	Syphilis and its sequelae	39	.50	12	.14	9	.68	3	.22	2	.25	—	—	506	.18	360	.14
4	Typhoid fever	7	.09	2	.02	—	—	—	—	—	—	—	—	7	—	—	—
5	Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	Dysentery, all forms	9	.12	6	.07	2	.15	1	.07	—	—	—	—	—	—	—	—
7	Scarlet fever and streptococcal sore throat	2	.02	—	—	—	—	—	—	—	—	—	—	33	.01	16	—
8	Diphtheria	62	.79	22	.25	—	—	—	—	—	—	—	—	39	.02	8	—
9	Whooping cough	27	.35	9	.10	—	—	—	—	—	—	—	—	18	—	2	—
10	Meningococcal infections	14	.18	9	.10	—	—	—	—	—	—	—	—	244	.09	14	—
11	Plague	—	—	—	—	—	—	—	—	—	—	—	—	142	.05	68	.03
12	Acute poliomyelitis	9	.12	6	.07	2	.15	—	—	—	—	—	—	81	.04	41	.02
13	Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	7	—	—	—
14	Measles	15	.19	10	.11	—	—	—	—	—	—	—	—	144	.06	38	.01
15	Typhus and other rickettsial diseases	2	.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	Malaria	4	.05	1	.01	2	.15	—	—	1	.12	—	—	—	—	2	—
17	All other infective and parasitic diseases	43	.54	46	.52	3	.23	5	.37	3	.27	4	.41	537	.20	451	.18
18	Malignant neoplasms	1,192	15.28	1,466	16.58	206	15.46	232	17.31	134	16.45	184	18.89	41,448	15.49	45,202	17.59
19	Benign and unspecified neoplasms	48	.61	39	.44	5	.38	2	.15	2	.25	3	.31	988	.37	697	.27
20	Diabetes mellitus	136	1.75	151	1.71	24	1.80	12	.90	19	2.33	15	1.54	2,484	.93	2,128	.83
21	Anaemias	30	.39	26	.29	8	.60	7	.52	4	.49	4	.41	1,203	.45	1,109	.43
22	Vascular lesions affecting central nervous system	953	12.22	1,199	13.56	215	16.14	228	17.02	129	15.83	156	16.02	39,443	14.73	44,566	17.34
23	Non-meningococcal meningitis	25	.32	18	.20	—	—	—	—	—	—	—	—	168	.06	138	.05
24	Rheumatic fever	10	.13	3	.03	—	—	—	—	—	—	—	—	214	.08	62	.02
25	Chronic rheumatic heart disease	111	1.42	59	.68	5	.38	4	.30	—	—	3	.31	6,777	2.53	4,728	1.84
26	Arteriosclerotic and degenerative heart disease	1,011	12.96	1,602	18.12	277	20.79	300	22.39	176	21.60	224	23.00	69,778	26.07	64,997	25.29
27	Other diseases of heart	157	2.01	50	.57	20	1.50	6	.45	7	.86	5	.51	3,749	1.40	7,135	2.78
28	Hypertension with heart disease	296	3.80	164	1.86	63	4.73	20	1.49	35	4.31	12	1.23	8,921	3.33	6,914	2.69
29	Hypertension without mention of heart	68	.87	172	1.95	12	.90	22	1.64	8	.98	11	1.13	2,000	.75	3,697	1.44
30	Influenza	23	.30	40	.45	7	.53	6	.45	3	.38	3	.31	8,416	3.15	2,575	1.00
31	Pneumonia	529	6.78	610	6.90	65	4.88	100	7.46	54	6.64	55	5.65	10,900	4.07	12,663	4.93
32	Bronchitis	92	1.18	75	.85	23	1.73	12	.90	8	.98	8	.82	14,268	5.33	8,964	3.49
33	Ulcer of stomach and duodenum	18	.23	31	.35	4	.30	10	.75	2	.25	4	.41	1,354	.51	1,473	.57
34	Appendicitis	25	.32	10	.11	2	.15	4	.30	1	.12	—	—	493	.18	300	.12
35	Intestinal obstruction and hernia	70	.90	68	.77	8	.60	15	1.12	5	.62	8	.82	1,587	.59	1,517	.59
36	Gastritis, duodenitis, enteritis and colitis of the newborn	223	2.86	162	1.83	7	.53	5	.37	4	.49	5	.51	1,404	.53	1,363	.53
37	Cirrhosis of liver	57	.73	53	.60	11	.83	5	.37	8	.98	3	.31	502	.18	559	.22
38	Nephritis and nephrosis	193	2.47	127	1.44	36	2.70	13	.97	16	1.97	12	1.23	3,272	1.22	1,841	.72
39	Hyperplasia of prostate	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40	Complications of pregnancy, childbirth and the puerperium	72	.92	34	.38	1	.07	—	—	1	.12	2	.20	566	.21	309	.12
41	Congenital malformations	105	1.34	156	1.76	—	—	2	.15	—	—	—	—	2,204	.82	2,354	.92
42	Birth injuries, postnatal asphyxia and atelectasis	141	1.81	151	1.71	1	.07	—	—	—	—	—	—	1,689	.63	1,735	.68
43	Infections of the newborn	10	.13	44	.50	—	—	—	—	—	—	—	—	435	.17	353	.14
44	Other unqualified diseases of early infancy and immaturity	307	3.94	317	3.59	—	—	—	—	—	—	—	—	2,158	.81	1,715	.67
45	Senility without mention of psychosis	308	3.94	488	5.52	70	5.25	99	7.39	30	3.68	55	5.65	5,968	2.23	5,180	2.01
46	All other diseases	855	10.96	903	10.21	170	12.76	172	12.84	129	15.83	119	12.22	21,220	7.93	21,311	8.29
BE																	
47	Motor vehicle accidents	62	.80	152	1.72	10	.75	12	.90	5	.62	22	2.26	1,114	.42	1,508	.59
48	All other accidents	184	2.36	194	2.19	44	3.30	30	2.24	15	1.85	41	4.21	4,474	1.67	5,509	2.14
49	Suicide and self-inflicted injury	52	.67	68	.77	6	.45	5	.37	5	.62	9	.93	1,638	.61	2,107	.82
50	Homicide and operations of war	17	.22	26	.30	2	.15	3	.22	2	.25	2	.20	83	.04	122	.05
		7,801		8,840		1,332		1,340		815		974		267,656		256,989	

TABLE IV. LUNG AND STOMACH CANCER RATES FOR WHITE SOUTH AFRICANS

Year	Males				Females			
	Lung cancer		Stomach cancer		Lung cancer		Stomach cancer	
	Actual no. of deaths	Death rate per 100,000 living	Actual no. of deaths	Death rate per 100,000 living	Actual no. of deaths	Death rate per 100,000 living	Actual no. of deaths	Death rate per 100,000 living
1947	143	11.7	418*	31.6*	51	4.2	240*	18.2*
1948	146	11.6	451*	34.1*	59	4.7	262*	19.9*
1949	171	13.3	396	29.9	57	4.5	231	17.5
1950	193	14.8	425	32.2	77	5.9	275	20.9
1951	246	18.5	455	34.4	68	5.1	239	15.7
1952	250	18.5	435	32.9	69	5.1	271	20.6
1953	278	20.2	376	27.3	79	5.7	270	20.5
1954	333	23.8	499	37.8	72	5.1	260	19.7
1955	329	23.0	465	35.2	62	4.3	237	18.0
1956	357	24.6	436	33.0	94	6.5	249	18.9
1957	368	23.9	450	29.2	101	6.5	277	17.9
1958	380	24.7	441	28.7	91	5.9	241	15.7
1959	409	26.6	432	28.1	94	6.1	280	18.1
1960	433	28.1	422	27.4	106	6.8	248	16.0
1961	466	30.1	349	22.3	95	6.1	280	18.1
1962	456	29.9	411	26.6	95	6.1	221	14.2

Rates: 1947-1956 based on 1951 census figures;
1957-1962 based on 1960 census figures.

*Stomach and duodenum.

TABLE V. AGE ADJUSTED DEATH RATES FOR MALIGNANT NEOPLASMS FOR 12 SELECTED SITES: RATE PER 100,000 POPULATION BY SEX, IN WHITE SOUTH AFRICANS AND IN ENGLAND & WALES

Code	Site	Union of South Africa						England and Wales					
		Male			Female			Male			Female		
		1952-53	1954-55	1956-57	1952-53	1954-55	1956-57	1952-53	1954-55	1956-57	1952-53	1954-55	1956-57
(1) 150	Oesophagus	3.84	4.56	4.35 (10)	1.09	1.00	1.05 (20)	4.97	4.61	3.73 (15)	2.20	2.31	2.27 (7)
(2) 151	Stomach	34.1	37.1	33.05 (9)	19.07	16.08	17.00 (16)	28.06	27.05	26.08 (18)	16.00	15.02	14.03 (18)
(3) 152/3	Intestine	9.6	10.6	12.01 (8)	9.09	11.00	11.06 (11)	15.02	14.02	13.03 (5)	14.05	13.08	13.01 (8)
(4) 154	Rectum	5.0	4.7	4.06 (19)	3.08	3.01	3.09 (16)	11.08	11.03	10.07 (3)	6.03	6.01	5.06 (5)
(5) 155/6	Liver and biliary passages	6.96	7.20	6.97 (6)	7.72	6.66	7.30 (8)	3.78	3.44	3.38 (20)	3.25	3.18	3.09 (21)
(6) 157	Pancreas	5.71	6.31	7.26 (3)	4.42	4.19	4.06 (11)	6.13	6.28	6.36 (10)	3.92	3.89	4.01 (12)
(7) 162/3	Lung	22.2	26.1	28.3 (9)	5.05	4.07	6.06 (4)	44.5	50.05	54.08 (2)	6.02	6.05	6.09 (3)
(8) 170	Breast	—	—	—	20.08	21.04	21.08 (6)	—	—	—	23.03	23.02	23.00 (3)
(9) 171-174	Uterus	—	—	—	15.08	13.07	14.06 (5)	—	—	—	11.04	10.07	10.7 (17)
(10) 175	Ovary and fallopian tube	—	—	—	6.20	5.15	5.63 (14)	—	—	—	7.48	7.75	7.98 (3)
(11) 177	Prostate	15.2	16.8	15.00 (5)	—	—	—	10.09	11.04	11.08 (17)	—	—	—
(12) 204	Leukaemia and aleukaemia	4.73	5.73	6.79 (5)	3.87	3.94	4.03 (14)	4.74	4.85	5.11 (18)	3.50	3.54	3.70 (18)
B18	All malignant neoplasms	130.02	144.07	158.00 (7)	118.09	113.00	117.02 (9)	164.08	168.05	170.09 (5)	116.00	114.05	113.04 (14)

Taken from *Cancer Mortality for Selected Sites in 24 Countries* by Mitsuo Segi. Note: The figures in brackets show the rank order in 24 countries.

TABLE VI. MALIGNANT NEOPLASMS: PERCENTAGES OF TOTAL DEATHS FOR THE YEARS 1958 AND 1959 AVERAGED FOR ALL WHITE SOUTH AFRICANS AND ENGLAND & WALES (B. 18)

Code	Organ	Male												Female											
		South African-born		UK-born		All other immigrants		England & Wales		South African-born		UK-born		All other immigrants		England & Wales									
		No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths	No. of deaths	% of total deaths								
141	Tongue	17	.14	6	.33	3	.21	361	.13	5	.05	1	.08	—	—	148	.06								
150	Oesophagus	43	.36	13	.72	9	.61	1,334	.49	9	.10	5	.37	5	.51	974	.38								
151	Stomach	347	2.93	50	2.79	43	2.95	7,932	2.93	207	2.34	31	2.31	22	2.26	6,162	2.40								
153	Large intestine	104	.88	35	1.95	23	1.58	3,655	1.35	127	1.44	30	2.24	22	2.26	5,487	2.14								
154	Rectum	36	.31	15	.84	9	.61	3,095	1.14	42	.47	7	.52	6	.62	2,551	.99								
155	Liver	81	.68	7	.39	9	.61	591	.22	88	.99	4	.31	9	.92	890	.35								
157	Pancreas	77	.65	19	1.06	11	.75	2,031	.75	55	.62	13	.97	7	.72	1,799	.70								
162/3	Bronchus and lung	273	2.31	77	4.35	46	3.16	17,611	6.52	71	.83	16	1.20	5	.62	2,831	1.10								
170	Breast	4	.04	1	.06	1	.07	68	.02	276	3.12	41	3.06	38	3.90	8,828	3.43								
171	Cervix uteri	—	—	—	—	—	—	—	—	94	1.06	8	.60	5	.51	2,628	1.02								
172/4	Uterus	—	—	—	—	—	—	—	—	87	.99	10	.75	15	1.53	1,430	.55								
175	Ovary	—	—	—	—	—	—	—	—	80	.91	13	.97	10	1.02	2,915	1.13								
177	Prostate	153	1.29	42	2.34	22	1.51	3,602	1.33	—	—	—	—	2	.21	481	.19								
180	Kidney	22	.18	3	.16	5	.34	732	.27	17	.19	—	—	—	—	—	—								
181	Bladder	85	.72	12	.67	10	.70	2,011	.74	19	.22	7	.52	3	.31	909	.35								
190/1	Melanoma and other tumour of skin	44	.37	5	.28	2	.13	416	.15	30	.34	1	.08	1	.10	444	.17								
193	Brain	40	.34	2	.11	7	.48	1,063	.39	24	.27	2	.16	4	.42	809	.31								
200	Lymphosarcoma	26	.22	3	.17	2	.13	534	.19	24	.27	5	.37	2	.21	435	.17								
201	Hodgkin's disease	25	.21	3	.17	2	.13	508	.18	13	.14	1	.08	1	.11	333	.13								
204	Leukaemia	85	.72	9	.51	6	.41	1,308	.47	65	.74	7	.52	6	.62	1,152	.45								
Residual	All other	202	1.70	35	1.90	24	1.64	4,607	1.69	134	1.49	30	2.24	19	1.86	4,005	1.56								
	Total	1,664	14.05	337	18.80	234	16.02	51,459	18.96	1,467	16.58	232	17.35	184	18.91	45,201	17.58								

TABLE VII. LUNG CANCER DEATHS IN THE SOUTH AFRICAN WHITE POPULATION (Male)

Age	1947—1956*						1957—1959†						
	South African-born		United Kingdom-born		All other immigrants		South African-born		United Kingdom-born		All other immigrants		
	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+	
Johannesburg	110	60	58	73	59	70	Five main cities	154	92	77	69	30	45
Cape Town	78	33	48	49	18	19							
Durban	77	38	62	89	19	20							
Pretoria	49	28	8	10	5	10							
Port Elizabeth	21	15	10	8	1	4							
Five main cities	335	174	186	229	102	123							
Other urban areas	342	250	58	84	47	30	154	92	77	69	30	45	
Rural areas	167	160	18	14	8	15	191	178	36	43	20	21	
Total	844	584	262	327	157	168	69	64	3	3	4	—	—
							414	334	116	115	54	66	

*Based on 1951 census

†Based on 1960 census

Actual and expected number of lung cancer deaths

Age	1947—1956						1957—1959										
	British immigrants			Other immigrants			British immigrants			Other immigrants							
	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+					
	Actual	Ex-pected	Actual	Ex-pected	Actual	Ex-pected	Actual	Ex-pected	Actual	Ex-pected	Actual	Ex-pected					
Johannesburg	58	44.7	73	82.5	59	67.5	70	75.7	Five Main Cities	77	45.8	69	62.8	30	52.1	45	46.9
Cape Town	48	28.5	49	39.0	18	26.6	19	24.9		69	62.8	30	52.1	45	46.9		
Durban	62	47.3	89	96.4	19	22.6	20	28.1		36	20.1	43	32.9	20	17.6	21	17.0
Pretoria	8	5.5	10	11.2	5	8.6	16	8.9		3	2.0	3	3.5	4	5	1	1.0
Port Elizabeth	10	4.9	8	7.5	1	2.8	4	4.3		116	67.9	115	99.2	54	70.2	67	64.9
Five main cities	186	130.9	229	236.0	102	128.1	123	141.9		77	45.8	69	62.8	30	52.1	45	46.9
Other urban areas	58	44.9	84	74.6	47	35.3	30	35.8	36	20.1	43	32.9	20	17.6	21	17.0	
Rural areas	18	6.0	14	13.6	8	3.9	15	8.6	3	2.0	3	3.5	4	5	1	1.0	
Total	262	181.8	327	325.6	157	167.3	168	186.3	116	67.9	115	99.2	54	70.2	67	64.9	
χ^2	56.1		5.5		11.7		10.0		34.2		3.1		—7.4		0.9		
P	0.000001		Between 0.5 and 0.7		Between 0.1 and 0.2		Between 0.1 and 0.2		0.00001		Between 0.3 and 0.2		Between 0.05 and 0.02		Between 0.7 and 0.5		

TABLE VIII. LUNG CANCER IN SOUTH AFRICA: (MEN AGED 45—64, 1947—56): ESTIMATED LUNG CANCER MORTALITY RATES PER 100,000 PER ANNUM

Region	Place of birth	Non-smokers	Cigarettes-only smokers			Pipe-only smokers	All other smokers	Total
			1—20 per day	25—45 per day	50+ per day			
Five main cities	S.A.	19	29	100	180	48	139	77
Five main cities	U.K.	(13)	61	234	249	93	109	143
Other urban	S.A.	—	28	74	139	18	66	48
Other urban	U.K.	—	50	76	(258)	—	46	71
Rural	S.A.	(8)	13	51	(135)	35	30	30
Rural	U.K.	—	—	(86)	(172)	—	—	94
Total	S.A.	8	25	83	156	30	59	50
	U.K.	(20)	56	158	245	42	89	113

TABLE VIII. LUNG CANCER DEATHS IN THE SOUTH AFRICAN WHITE POPULATION (Female)

Age	1947—1956*						1947—1956										
	South African-born		United Kingdom-born		All other immigrants		British immigrants			Other immigrants							
	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+	45—64	65+					
Five main cities	75	55	31	44	18	34	Five main cities	31	27.7	44	55.3	18	26.7	34	36.7		
Other urban areas	91	91	17	13	7	11											
Rural areas	51	56	2	3	3	3											
Other urban areas	17	11.4	13	22.0	7	8.5										11	10.9
Rural areas	2	1.8	3	4.0	3	1.7										3	2.6
Total	217	202	50	60	28	48										50	40.9
χ^2							2.8		—6.1		—2.8		—0.2				
P							Between 0.3 and 0.2		Between 0.05 and 0.02		Between 0.3 and 0.2		Between 0.9 and 1.0				

*Based on 1951 census

TABLE VIII. DEATHS DUE TO ARTERIOSCLEROTIC HEART DISEASE (B.26 420-422) AND DUE TO CORONARY ARTERY DISEASE (420) FOR WHITE SOUTH AFRICANS*

Year	420-422		420		Year	420-422		420	
	Males	Females	Males	Females		Males	Females	Males	Females
1949	669	335	524	215	1956	816	425	653	275
1950	654	329	539	224	1957	804	450	657	295
1951	708	352	580	242	1958	804	417	689	302
1952	755	375	568	223	1959	821	425	728	331
1953	790	408	588	232	1960	821	418	736	322
1954	815	414	627	259	1961	865	439	782	348
1955	771	408	602	251	1962	894	442	860	379

*Rates per 100,000 living aged 40+

TABLE VIII A. ARTERIOSCLEROTIC & DEGENERATIVE HEART DISEASE: COMPARISON OF ENGLAND & WALES AND THE WHITE SOUTH AFRICAN-BORN (B 26)

Code number	Actual deaths							
	Males				Females			
	1951		1959		1951		1959	
	England & Wales	White South African-born	England & Wales	White South African-born	England & Wales	White South African-born	England & Wales	White South African-born
420	37,654	1,591	52,193	2,740	21,777	685	32,729	1,334
421	1,340	5	1,506	80	1,065	14	1,520	78
422	32,658	366	19,001	234	44,613	312	29,975	282
Total 420/422	71,652	1,962	72,700	3,054	67,455	1,011	64,224	1,694

Age group	1951				1959			
	England & Wales		White South African-born		England & Wales		White South African-born	
	Actual deaths	Rates per 100,000 living	Actual deaths	Rates per 100,000 living	Actual deaths	Rates per 100,000 living	Actual deaths	Rates per 100,000 living
Males								
45-54	4,835	167	349	343	6,258	197	597	405
55-64	11,727	573	522	764	14,509	609	752	919
65-69	10,203	1,310	288	1,308	9,883	1,228	439	1,655
Females								
45-54	1,327	42	86	81	1,199	36	184	119
55-64	5,491	216	202	270	5,268	186	304	339
65-69	6,979	669	146	587	6,187	546	252	742

TABLE IX. ARTERIOSCLEROTIC AND DEGENERATIVE HEART DISEASE IN WHITE SOUTH AFRICANS, 1950-1959 (B.26, CODE 420-422) COMPARED WITH ENGLAND & WALES 1959

(The expected deaths at the White South African-born rates and the Age Standardized Mortality Ratios (SMR) based on the South African populations at risk in 1955)

	Male				Female			
	Actual SA-born deaths 1950-1959	England & Wales 1959	UK-born immigrants 1950-1959	All other immigrants 1950-1959	Actual SA-born deaths 1950-1959	England & Wales 1959	UK-born immigrants 1950-1959	All other immigrants 1950-1959
Age 45-54								
Actual deaths	4,772	6,258	359	479	1,403	1,199	79	108
Expected deaths (at SA-born rates)		12,978	508	590		3,966	140	134
Percentage of SA-born or SMR		48	71	81		30	56	81
Age 55-64								
Actual deaths	6,277	14,509	805	938	2,548	5,268	330	350
Expected deaths (at SA-born rates)		22,054	954	866		9,739	416	306
Percentage of SA-born or SMR		66	84	108		54	79	114
Age 65-69								
Actual deaths	3,468	9,883	619	657	1,996	6,187	359	284
Expected deaths (at SA-born rates)		13,319	713	536		8,412	401	249
Percentage of SA-born or SMR		74	87	123		73	89	114
Age 45-69								
Actual deaths	14,517	30,650	1,783	2,074	5,947	12,654	768	742
Expected deaths (at SA-born rates)		48,351	2,175	1,992		22,117	957	689
Percentage of SA-born or SMR		63	82	104		57	80	108

TABLE X. DEATHS FROM VIOLENT CAUSES (BE 47-50 CODE 800-999)

Year	Males								Females							
	-40 years		+40 years		-40 years		+40 years		-40 years		+40 years		-40 years		+40 years	
	White South African	White South African	England & Wales	England & Wales	White South African	White South African	England & Wales	England & Wales	White South African	White South African	England & Wales	England & Wales	White South African	White South African	England & Wales	England & Wales
	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths	Violent deaths	% of total deaths
1946	580	18%	404	5%					155	6%	181	3%				
1947	637	20%	448	5%					172	7%	220	3%				
1948	692	20%	491	5%					175	7%	179	2%				
1949	707	20%	488	5%					173	7%	206	3%				
1950	679	22%	457	5%					176	8%	211	3%				
1951	699	23%	477	5%	5,109	18%	7,338	3%	162	7%	243	3%	1,577	7%	5,732	2%
1952	734	25%	496	5%					164	8%	226	3%				
1953	783	26%	549	5%					204	10%	277	4%				
1954	717	25%	555	5%					201	10%	238	3%				
1955	750	27%	542	5%					171	10%	242	3%				
1956	837	27%	573	5%					204	10%	301	3%				
1957	842	27%	669	6%					183	9%	289	3%				
1958	897	30%	664	6%					223	11%	316	3%				
1959	967	30%	700	6%	5,124	23%	8,332	3%	245	13%	344	4%	1,601	10%	7,778	3%
1960	976	31%	727	6%					267	14%	348	4%				
1961	983	33%	804	6%					259	14%	367	4%				
1962	1,022	38%	787	6%					292	15%	434	4%				

TABLE XI. LIFE TABLES: ENGLAND & WALES, SOUTH AFRICAN WHITE, COLOURED AND ASIAN—ALSO SOUTH AFRICAN ASIAN AND ALL INDIA

Age	Rates of mortality (1,000 qx)																	
	South African White and England & Wales						SA Coloured				SA Asian		SA Asian and All India					
	Male			Female			Male		Female		Male		Female		Male		Female	
	S. Africa E 5	England & Wales 11	England & Wales S. Africa	S. Africa E 5	England & Wales 11	England & Wales S. Africa	Male C 3	Female C 3	Male A 2	Female A 2	Male A 1	Female A 1	Male 1946	Female 1946	Male 1941-50	Female 1941-50		
0	37.9	32.7	0.9	30.1	25.1	0.8	138.0	123.3	71.8	59.1	83.6	76.2	190.0	175.0				
5	1.3	0.8	0.6	1.1	0.6	0.5			3.0	3.2	3.7	5.0	17.1	20.6				
10	0.6	0.5	0.8	0.6	0.4	0.6	2.2	2.4	1.1	1.5	1.9	2.1	13.1	13.1				
20	2.0	1.3	0.6	1.0	0.8	0.8	6.2	7.3	3.1	4.2	6.3	7.6	10.5	7.8				
30	2.5	1.6	0.6	1.6	1.3	0.8	9.3	8.8	4.2	5.3	6.4	7.5	14.1	16.7				
40	4.3	2.9	0.7	3.0	2.3	0.8	13.0	9.7	6.7	8.5	10.1	11.6	20.2	24.3				
50	10.9	8.5	0.8	6.9	5.2	0.8	21.9	15.9	16.9	15.1	21.7	20.1	32.3	31.3				
60	25.9	23.7	0.9	14.4	12.7	0.9	38.5	25.4	41.9	36.3	40.4	41.2	57.3	50.0				
70	50.6	56.5	1.1	35.2	35.3	1.0	67.3	52.4	76.3	86.6	82.4	81.9	104.4	88.2				

Note: qx's are from the life tables published after each census. They refer to the probability that a life at a certain exact age will die within one year.

TABLE XII. SOUTH AFRICAN WHITE AND FIVE OTHER COUNTRIES

Age	Rates of mortality (1,000 qx) 1951 census											
	Male lives						Female lives					
	South Africa (White)	England & Wales	Canada	Australia	New Zealand	Netherlands	South Africa (White)	England & Wales	Canada	Australia	New Zealand	Netherlands
0	37.89	32.66	43.3	32.0	25.0	27.8	30.05	25.10	34.2	25.2	20.0	21.5
5	1.30	0.81	1.0	1.1	0.8	1.0	1.13	0.58	0.8	0.8	0.5	0.8
10	0.62	0.52	0.8	0.7	0.5	0.5	0.60	0.35	0.5	0.5	0.3	0.3
20	2.01	1.29	1.7	1.7	1.6	0.9	1.01	0.83	0.9	0.9	0.7	0.6
30	2.48	1.57	1.9	1.9	1.6	1.1	1.56	1.27	1.3	1.7	1.1	0.9
40	4.27	2.90	3.3	3.4	2.7	2.1	2.97	2.27	2.6	2.8	2.1	1.8
50	10.92	8.50	8.5	9.2	7.3	5.8	6.93	5.24	5.6	6.4	5.5	4.3
60	25.89	23.69	20.7	22.8	19.5	14.7	14.38	12.71	13.1	13.6	13.2	10.4
70	50.63	56.51	44.4	52.6	47.2	36.8	35.18	35.32	33.1	36.1	32.8	33.10

Rates expressed as percentage of South African Deaths												
0	100	86.3	114.3	84.4	66.0	73.4	100	83.4	113.6	83.7	66.4	71.4
5	100	61.5	77.0	84.6	61.5	76.9	100	54.5	72.7	72.7	45.5	72.7
10	100	83.3	133.3	116.7	83.3	83.3	100	66.7	83.3	83.3	50.0	50.0
20	100	65.0	85.0	85.0	80.0	45.0	100	80.0	90.0	90.0	70.0	60.0
30	100	64.0	76.0	76.0	64.0	44.0	100	81.2	81.2	106.3	68.8	56.3
40	100	67.4	76.7	79.1	62.8	48.9	100	76.7	86.7	93.3	70.0	60.0
50	100	78.0	48.0	84.4	67.0	53.2	100	75.4	81.2	92.8	80.0	62.3
60	100	95.1	79.9	88.0	75.3	56.8	100	88.2	91.0	94.4	91.7	72.2
70	100	111.7	87.8	104.0	93.3	73.7	100	100.3	94.0	102.6	102.6	94.0

TABLE XIII. MALE STANDARDIZED DEATH RATES x 1,000 IN DIFFERENT COUNTRIES FOR THE AGE-SPANS INDICATED. STANDARD POPULATION—POPULATION OF GREAT BRITAIN, MALES, 1951 CENSUS

Age-span	Great Britain	South Africa (Whites)	Canada	Netherlands	France	West Germany	East Germany	Sweden
0-4	5.9	8.6	8.2	4.5	7.3	9.0	11.1	4.9
5-19	0.6	1.1	0.8	0.6	0.7	0.9	0.9	0.7
20-49	2.4	4.1	2.9	1.8	3.5	3.0	2.7	2.1
50-64	17.8	20.6	16.3	11.5	18.1	16.8	15.7	11.9
65-79	64.6	61.6	52.8	45.3	59.7	62.3	59.2	47.4
80 and over	176.7	145.2	159.1	157.5	181.0	190.7	184.6	172.5
Standardized Rate x 1,000 all ages	11.4	12.7	10.8	8.6	12.1	12.2	11.7	9.2

TABLE XIV. DEATH RATES IN THE WHITE SOUTH AFRICAN-BORN, IMMIGRANTS FROM THE UNITED KINGDOM, AND OTHER WHITE IMMIGRANTS, AND ENGLAND AND WALES

Specific death rates per 1,000 lives

Age group	White SA-born	UK immigrants to SA	England & Wales	All other White immigrants to SA	Specific death rates per 1,000 lives				
					White SA-born	UK immigrants to SA	England & Wales	All other White immigrants to SA	
Males—1951					Females—1951				
20—44 ..	3.2	2.4	2.1	4.0	2.1	1.7	1.7	2.0	
45—49 ..	9.1	7.0	6.3	8.6	5.3	2.5	4.2	4.7	
50—54 ..	13.6	12.3	11.2	11.6	5.2	8.6	6.5	7.2	
55—59 ..	21.8	20.0	18.5	20.5	12.9	9.8	10.1	10.9	
60—64 ..	31.2	28.0	30.1	37.2	20.2	15.0	16.4	20.6	
65—69 ..	44.4	45.1	48.0	47.2	45.5	24.2	28.2	29.7	
70+ ..	94.3	90.6	114.7	102.1	76.3	72.1	90.2	81.4	
Males—1959					Females—1959				
20—44 ..	3.4	3.9	1.6	2.5	1.6	0.9	1.2	1.4	
45—49 ..	8.2	5.0	5.1	6.3	5.2	2.6	3.4	4.1	
50—54 ..	13.4	12.0	9.4	7.3	6.8	4.7	5.3	7.5	
55—59 ..	19.1	17.8	17.2	22.5	10.2	8.5	8.4	9.4	
60—64 ..	33.3	28.8	27.9	28.7	18.0	9.7	13.6	16.3	
65—69 ..	49.8	41.2	43.2	40.2	27.3	25.0	22.8	28.8	
70+ ..	78.8	81.7	105.1	104.9	90.4	80.3	78.1	118.5	

TABLE XV. DEATH RISK IN THE 5 MAIN CITIES, OTHER URBAN AREAS AND RURAL AREAS OF SOUTH AFRICA

Death rates per 1,000 living for White South Africans in 1951 (1951 census) and 1959 (1960 census)

Age group	Male													
	South African-born						United Kingdom-born				Other immigrants			
	5 Main cities		Other urban		Rural		5 Main cities		Other urban		5 Main cities		Other urban	
	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959
45—49 ..	10.7	8.9	9.1	10.2	7.4	4.6	9.8	3.9	—	6.5	9.1	6.3	—	7.6
50—54 ..	17.7	18.4	12.2	15.7	9.1	6.1	13.4	13.1	9.3	12.9	10.4	7.1	9.1	8.0
55—59 ..	30.8	29.4	21.3	22.6	16.7	8.8	21.7	17.1	15.3	20.9	22.9	23.1	10.6	24.9
60—64 ..	39.8	50.1	33.5	42.4	24.6	15.5	26.1	30.2	29.5	28.7	34.8	29.9	31.7	30.7
65—69 ..	64.6	69.6	42.6	60.3	37.3	29.0	47.3	43.7	42.2	42.8	43.4	40.9	44.6	42.6
70+ ..	119.3	129.2	88.1	115.4	91.9	58.5	107.5	111.6	74.6	104.0	102.9	128.3	83.0	153.1
	Female													
	South African-born						United Kingdom-born				Other immigrants			
	5 Main cities		Other urban		Rural		5 Main cities		Other urban		5 Main cities		Other urban	
	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959	1951	1959
45—49 ..	6.1	5.7	5.4	6.8	4.3	2.2	*	4.1	*	*	3.4	3.6	*	5.8
50—54 ..	12.1	10.3	8.7	7.6	6.2	2.8	10.6	3.9	5.5	6.0	8.4	7.9	2.5	7.9
55—59 ..	18.7	16.2	12.8	12.6	9.3	3.7	8.9	10.0	11.5	7.1	12.4	10.4	6.4	10.1
60—64 ..	31.5	31.0	22.2	22.2	12.5	7.3	14.4	10.8	16.7	9.4	23.3	16.9	7.8	8.9
65—69 ..	45.9	46.0	30.2	33.8	18.5	11.4	30.1	29.6	17.8	24.1	34.0	33.2	18.9	27.8
70+ ..	130.2	129.4	70.1	92.3	61.7	35.9	83.9	66.2	55.3	78.3	94.9	102.6	60.1	94.1

Note: There are comparatively few immigrants in rural areas.

*Less than 10 deaths.

There is an older population at risk over the age of 70 among the immigrants than among the South African-born.

TABLE XVI. CERTAIN AGE-STANDARDIZED COMPARISONS BETWEEN WHITE SOUTH AFRICAN-BORN, IMMIGRANTS FROM THE UNITED KINGDOM, WHITE IMMIGRANTS FROM ELSEWHERE AND ENGLAND AND WALES

B group	Code number	Cause	Age	White South Africans									
				Years (census year in brackets)	South African born		United Kingdom born		All other immigrants		England and Wales		
					Actual deaths	S.M.R.	Actual deaths	S.M.R.	Actual deaths	S.M.R.	Actual deaths	S.M.R.	Year
Males													
B 18	151	Cancer of stomach	All ages	1950/1959 (1955)	3,488	100	507	62	419	78	7,930	72	1955
	153	Cancer of large intestine	All ages	1951-1954/1959 combined (1955)	635	100	224	145	148	150	3,611	127	1955
	154	Cancer of rectum	All ages	1951-1954/1959 combined (1955)	256	100	102	170	54	138	3,059	265	1955
	155	Cancer of liver	All ages	1951-1958-1959 combined (1960)	231	100	27	62	35	(115)	1,661	25	1951-1958-1959 combined
	162/3	Cancer of lung	45-64	1947/1956 (1951)	844	100	262	144	157	(94)	6,452	252	1951
	(See Table VII)		65+	1947/1956 (1951)	584	100	327	(101)	168	(90)	4,052	160	1951
	(See Table VII)		45-64	1957/1959 (1960)	414	100	116	171	54	(77)	9,398	249	1958/1959 average
	(See Table VII)		65+	1957/1959 (1960)	344	100	115	(116)	66	(103)	7,592	212	1958/1959 average
	177	Cancer of prostate	All ages	1951-1958-1959 combined (1960)	410	100	107	(106)	62	(108)	3,590	74	1959
	190	Melanoma	All ages	1951-1958-1959 combined (1960)	29	100	7	—	1	—	398	58	1951-1958-1959 combined
191	Other cancer of skin	All ages	1951-1958-1959 combined (1960)	92	100	9	—	8	—	923	35	1951-1958-1959 combined	
204	Leukaemia	All ages	1951-1958-1959 combined (1960)	246	100	26	—	22	—	3,600	70	1951-1958-1959 combined	
B 26	420-422	Arteriosclerotic and degenerative heart disease (See Table IX)	45-54	1950/1959 (1955)	4,772	100	359	71	479	81	6,258	49	1959
		Arteriosclerotic and degenerative heart disease	55-64	1950/1959 (1955)	6,277	100	805	84	938	108	14,509	77	1959
		Arteriosclerotic and degenerative heart disease	65-69	1950/1959 (1955)	3,468	100	619	87	657	123	9,883	85	1959
B 32	500-502	Bronchitis	All ages	1958/1959 (1960)	360	100	61	(80)	36	(74)	20,259	373	1958/1959 average
B 37	581	Cirrhosis of liver	All ages	1958/1959 (1960)	178	100	21	(91)	26	(120)	630	28	1958/1959 average
B 46	465	Pulmonary embolism	All ages	1951-1958-1959 combined (1960)	278	100	48	(100)	27	(75)	630	23	1959
BE 47/50	800-999	Accidents, poisonings and violence (external causes)	0-69	1951-1958-1959 combined (1960)	3,515	100	157	85	350	124	10,379	46	1959
Females													
B 18	151	Cancer of stomach	All ages	1950/1959 (1955)	2,077	100	295	59	227	87	6,146	76	1955
	153	Cancer of large intestine	All ages	1951-1954/1959 combined (1955)	793	100	210	(113)	130	132	5,542	127	1955
	154	Cancer of rectum	All ages	1951-1954/1959 combined (1955)	244	100	72	132	46	153	2,602	204	1955
	155	Cancer of liver	All ages	1951-1958-1959 combined (1960)	251	100	15	29	23	(82)	2,547	29	1951-1958-1959 combined
	162/3	Cancer of lung	45-64	1947/1956 (1951)	217	100	50	(122)	28	(76)	874	130	1951
	(See Table VII)		65	1947/1956 (1951)	202	100	60	(74)	48	(96)	1,030	144	1951
	170	Cancer of breast	All ages	1951-1958-1959 combined (1960)	766	100	110	(93)	88	(112)	8,828	108	1958/1959 average
	172/4	Cancer of uterus	All ages	1951-1958-1959 combined (1960)	286	100	36	(73)	34	(112)	1,430	52	1958/1959 average
	171/4	Cancer of cervix uteri and uterus combined	All ages	1951-1958-1959 combined (1960)	567	100	60	68	51	(86)	4,058	60	1958/1959 average
	175	Cancer of ovary	All ages	1951-1958-1959 combined (1960)	204	100	44	148	39	187	2,914	124	1958/1959 average
190	Melanoma	All ages	1951-1958-1959 combined (1960)	37	100	3	—	1	—	563	57	1951-1958-1959 combined	
191	Other cancer of skin	All ages	1951-1958-1959 combined (1960)	41	100	3	—	5	—	744	55	1951-1958-1959 combined	
204	Leukaemia	All ages	1951-1958-1959 combined (1960)	184	100	18	—	19	—	3,247	79	1951-1958-1959 combined	
B 26	420-422	Arteriosclerotic and degenerative heart disease (See Table IX)	45-54	1950/1959 (1955)	1,403	100	79	56	108	81	1,199	29	1959
		Arteriosclerotic and degenerative heart disease	55-64	1950/1959 (1955)	2,548	100	330	79	350	114	5,268	61	1959
		Arteriosclerotic and degenerative heart disease	65-69	1950/1959 (1955)	1,996	100	359	89	284	114	6,187	85	1959
B 32	500-502	Bronchitis	All ages	1958/1959 (1960)	150	100	25	(73)	17	(103)	8,964	324	1958/1959 average
B 37	581	Cirrhosis of liver	All ages	1958/1959 (1960)	106	100	9	(61)	6	(53)	559	37	1958/1959 average
B 46	465	Pulmonary embolism	All ages	1951-1958-1959 combined (1960)	332	100	48	(86)	39	(113)	723	17	1959

The difference between the South African-born death rates and England and Wales are statistically significant ($P > 0.05$) for all causes listed. The difference between the South African-born death rates and Immigrants to South Africa are statistically significant ($P > 0.05$) except when in brackets. The White South African populations at risk are at the census years 1951 or 1960, or the estimated mid-census populations 1955. (The population year is in brackets)