Maps of some Standardised Mortality Ratios for Australia for 1965-66 compared with 1959-63

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Authorship This work was initiated by the senior author and he has been continuously in touch with it, but nearly all the computations and analysis are due to the junior author.

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INTRODUCTION

The atlas of disease mortality for 1965/66 represents an extension of the work already published by Learmonth and Nichols. The present study was undertaken to see if areal patterns would be repeated and significant enough to justify further analysis.

Statistics for the Commonwealth of Australia for causes of death based on the International Classification of causes of Death (ICD) were not available in published form in sufficient detail for mapping. However the Bureau of Census and Statistics again kindly agreed to supply tabulations of mortality data according to the abbreviated list of 50 Causes of Death with subdivisions by Statistical divisions by sex and by age groups for 1965 and 1966.

For comparability with the previous study the same causes of death were selected for analysis, namely

Malignant Neoplasm of the digestive organs and peritoneum
ICD 150-159 incl.

Malignant Neoplasm of the bronchus, trachea and lung
ICD 162-163 incl.

Vascular lesions affecting the central nervous system
ICD 330-334 incl.

Arteriosclerotic and degenerative heart disease
ICD 420-422 incl.

Hypertensions with and without heart disease
ICD 440-443, 444-447 incl.

General arteriosclerosis and other diseases of the circulatory system
ICD 450-456, 460-468 incl.

Pneumonia
ICD 490-493 incl.

The statistics for causes of death in 1965 and 1966 were averaged for the two years. The Standardised Mortality Ratios (S.M.R.) were calculated from this average and the 1966 population census data for each Statistical Division. Some adjustments

had to be made to take account of changes in the boundaries of some Statistical Divisions between 1965 and 1966. The method used for calculating the S.M.R. is the same as in the previous paper and is shown in Appendix A. The present study could not be extended to include 1967 as death statistics for that year included aborigines and were not comparable with 1966 death statistics or Census data.

Isopleth maps were again used to show the general areal trends. For mapping, the S.M.R. were grouped into octiles on the frequency distribution curve and the dividing values between the octiles used as the values of the isopleths. The S.M.R. were plotted by eye in the centre of each statistical division and accorded the ratio for the whole Division. The isopleths were then interpolated in the normal convention.

Most of the shortcomings and drawbacks inherent in the methods and raw data outlined in the last paper are still applicable and impose limitations on the conclusions. First, the raw data depends on the accuracy of individual certificates of cause of death. The only accurate diagnosis of cause of death involves autopsy and laboratory diagnosis whereas actually it is often assessed subjectively. This type of inaccuracy is most prevalent in the older age groups.

The application of the method of standardised mortality ratios for an area the size of Australia with a small unevenly distributed population, is liable to give anomalous results, especially in sparsely peopled areas. Very small total population in such areas is apt to produce maps showing marked random variations of no real analytical significance. These areas are particularly widespread in the "inland". This is liable to cause a problem in the present study where deaths are only being averaged over two years. Also in Australia, as in most countries, statistics are published in relation to administrative areas, in this instance, Statistical Divisions. These are often of considerable area and frequently displaying very little homogeneity. Urban and rural areas are often grouped together within statistical divisions and many probable differences are veiled by such groupings.

The corresponding isopleth maps prepared for the two papers were overlaid and the areas where high values overlapped were drawn on a third map. These maps have been included in this paper. There is also a map showing the location of statistical divisions, see fig. 29.

Commentary on the maps

The following comments on the maps are intended to draw attention to the patterns obtained and their correspondence with those of the previous paper. Wherever possible suggestions have been made about the patterns and their relationship with known or possible related factors.

Malignant Neoplasm of the digestive organs and peritoneum (figs. 1 - 4)

This disease accounts for 5 to 6 per cent. of total deaths per annum with little difference between the sexes. The death rates for 1965/66 were 0.49/1000 for males and 0.46/1000 for females. These rates are consistent with the last study.

Grouping S.M.R. into octiles showed a concentration in the lower octile for both sexes (5 groups below the national average). Again areas with high S.M.R. tended to be localised and discontinuous for males and semi-continuous for females. The statistical distribution evoked as an explanation in the last paper no longer holds and the areal distribution may be of some significance.

Areas of high female values extend in a belt across Victoria into N.S.W. from the coast to the tablelands and into south-east Queensland excluding an area around Brisbane. Brisbane in contrast with other State capitals has low values. An area of high values occurs around Perth and extends to south-west Western Australia. There are also a number of isolated "inland" areas with high values.

The male map diverges from that of females. High values are less extensive in Victoria, limited to a small area around Melbourne. They are discontinuous with high values in N.S.W. which occur to the west of female high value areas. In Tasmania there is a belt of high values south to north through the island. On the female map this was a trough of low values, otherwise the island had high values.

1959/63 compared with 1965/66

On the female maps high value areas overlap on the two series in south-east Australia, around Perth and Adelaide and to a limited extent in Tasmania. The A.C.T. and Brisbane correspond reasonably well with low values on both maps.

There is less overlap of areas with high S.M.R. on male maps. They have in common high values around Perth, central N.S.W., east Victoria and about Launceston in Tasmania.

Malignant Neoplasm of the bronchus, trachea and lung (figs. 5 - 8)

Again this disease is more characteristic of males than females. In 1965/66 it accounted for 3.8 per cent. of male deaths per annum and 0.7 per cent. of female deaths with death rates of 0.37/1000 for males and 0.05/1000 for females. Both these rates represent an increase on the preceding study.

Grouping of S.M.R. into octiles was weighted in the lower octiles; particularly in the case of females where there were a large number of zero values recorded. The female values were particularly dispersed (0 - 768).

As in the last analysis two groups of high values can be distinguished -

(a) relatively densely populated areas; these are now metropolitan only

(b) scattered areas sparsely populated.

The female map diverges from the male, as previously, except for high values at Perth and Sydney.

1959/63 compared with 1965/66

High value areas on the male maps overlap particularly in the metropolitan areas of Sydney and Melbourne and in some "inland" areas. Female maps bear a slight resemblance with small areas of high values around Sydney, Melbourne, Brisbane, Perth and Launceston in common. High values do overlap in a few "inland" areas as well.

Vascular lesions affecting the central nervous system (figs. 9 - 12)

This disease accounts for 18 per cent. of female deaths and 10 per cent. of male deaths. There has been a slight decrease in the percentage of female deaths since the previous study.

The death rates for 1965/66 were 1.00/1000 for males and 1.39/1000 for females. These are comparable with the previous figures.

Both distributions of S.M.R. about the national average are skew with five octiles below 100. Female S.M.R. were more dispersed than those for males.

The maps for males show little relation between population density and high values. A belt of high values extends north into N.S.W. from Gippsland and from the central coast swings inland across N.S.W. to meet high values running north east from Adelaide. There are also high values in south-west Queensland, Rockhampton and Brisbane. In Tasmania there is a belt of high values along the west coast of the island. A.C.T. makes an intrusion of low values.

High female values are less extensive than for males: again there is a fairly wide belt in N.S.W. although it does not extend as far west as for males and excludes the Hunter Manning Division. In contrast with the map for males A.C.T. does not form an intrusion of low values. In Victoria there are high values in the north-west of the state and at Melbourne. The area of high values in South Australia is considerably less than on the male map. In Tasmania there is a larger area of high values.

1959/63 compared with 1965/66

The male maps show some overlap in N.S.W., South Australia, Queensland and a little in Victoria and Western Australia.

Female maps have less in common - only small areas in N.S.W., South Australia, Victoria and Tasmania.

Arteriosclerotic and degenerative heart disease (figs.13 - 16)

This heart disease accounted for 32 per cent. of total deaths in 1965/66; 35 per cent. of all male deaths and 29 per cent. of females.

The death rates, slightly higher than in the previous study, were 3.59/1000 male and 2.26/1000 female.

The octile groupings are skew with a concentration of S.M.R. in the lower ranges. Dispersion is not as great as for other diseases but is more marked for females than for males.

The map of male S.M.R. shows high values around the Melbourne and East Central Divisions. In N.S.W. there is a belt of high values extending from the South to North Coast Divisions and west to the Slopes. A.C.T. forms a low value intrusion in this high

value area. The Adelaide and Central Divisions in South Australia also show high values and in Tasmania high values occur along the west coast and through the southern part of the island to the South Eastern Division. There are a few "inland" areas with high values. Perth and Brisbane have rather high values (third highest octile) giving all capitals high values.

On the female map high values occur around Melbourne in much the same area as on the male map. Again there is an area of high values in N.S.W. but the very high values not as extensive as on the male map. They extend from the South Coast to the Hunter and Manning Divisions and inland to the Central Tablelands and South West Slopes. The A.C.T. is an area of low values on both maps. There are again high values in southern Tasmania. Adelaide and Perth have rather high values (third octile) but Brisbane and northern N.S.W. on the female map show low values. There are more "inland" areas on the male map but in south-east Australia both maps have a similar pattern.

The dominance of N.S.W. in south-east Australia is again a feature of this disease. There has been little comment on the suggestion offered in the last paper that this could be linked with State boundaries through the training of doctors in medical schools supplying the bulk of practitioners to particular States. One Australian medical worker has noted that differences in diagnosis and coding of arteriosclerotic heart disease have been observed between countries and over time in accordance with what is thought to be the local pattern of the disease. Although he thinks such variations within a single country are unlikely. (Wells 1969)

1959/63 compared with 1965/66

On male maps high value areas overlap in N.S.W., Victoria, South Australia and Tasmania, showing a concentration in south-east Australia.

Female maps show overlap in N.S.W. but the main feature is the corresponding of high values in a number of "inland" areas.

Hypertensions with and without heart disease (figs. 17 - 20)

This disease accounts for 2 per cent. of total deaths annually (1.6 per cent. of male deaths and 2.7 per cent. of females). This is slightly lower than in the last study.

The death rates are higher for females than males, 0.16/1000 male and 0.21/1000 female. These rates show a decline since the last study.

Again there is a wide dispersion of S.M.R. (0 - 566 for males, 0 - 340 females). The distribution about the national average is skew for males but females are more evenly placed.

Both maps again have a concentration of high values in N.S.W. and Victoria but they are more balanced with "inland" areas than are the preceding heart diseases. The distribution of high values on the male map in N.S.W. and Victoria is not continuous, but two blocks with a north - south alignment. One extends north from Melbourne to the Riverina and the other north from the border through coastal and tableland areas of N.S.W. In the north of the State it broadens and covers the Slopes. The Northern Tablelands and the A.C.T. Divisions have low values in areas otherwise characterised by high values. The southern half of Tasmania has high values except for an area around Hobart. Other "inland" high value areas occur in the Peninsula and South West Divisions of Queensland, and the Central and Southern Agricultural Divisions of Western Australia. Perth, Adelaide, Brisbane and Hobart all have low values.

The female map also has a number of high valued "inland" areas. Some such as the Southern Agricultural Division of Western Australia and the Peninsula and South West Divisions of Queensland are in common with the male map but there are also high values in the Kimberley and North West Divisions of Western Australia, and the North Western Division of Queensland. The high values on the female map are predominantly coastal. The eastern half of N.S.W. has high values which extend north into Queensland through the Downs Division, skirting around Brisbane to Maryborough. The N.S.W. Slopes have low values but not the A.C.T. on this map. In Victoria the high values lie west of Melbourne and swing east north of Melbourne across to the Gippsland Division.

There is overlap on the maps for both sexes in N.S.W. and Victoria as well as some "inland" areas. This disease generally does not record high values in the metropolitan areas.

1959/63 compared with 1965/66

Male maps show some overlap in N.S.W., very little in

Victoria (just the north of Gippsland), some in Western Australia in high values in the Southern Agricultural Division and some in Queensland - Maclay and South West Divisions.

The female map shows rather more overlap and as with the last disease some of this overlap is in "inland" areas. Victoria and N.S.W. show similar patterns and this continues into south-east Queensland. Other areas of Queensland (the Peninsula and South West Divisions) also have high values in common. The Southern Division of Tasmania and the Northern Agricultural Division of Western Australia also had high values in both studies.

General arteriosclerosis and other diseases of the circulatory system (figs. 21 - 24)

As in the previous study this disease accounts for between 3 per cent. (male) and 4 per cent. (female) of total deaths annually. The death rates for 1965/66 are 0.30/1000 for males and 0.31/1000 for females.

The range of S.M.R. is even greater than in the last study with S.M.R. for males 0 - 310, and females 0 - 640. The octile groupings are changed in this study with female values more unevenly distributed than males around the national average. There is a concentration of S.M.R. in the lower octiles and high values on both maps are not very extensive.

The distribution of high values in south-eastern Australia is similar on maps for both sexes. High values cover most of western Victoria and continue into N.S.W. running north east from Melbourne. The high values in N.S.W. are in two blocks with north - south orientation. There is little correspondence of high values on the two maps for Tasmania. Both maps have similar high value areas in South Australia (Adelaide and South East Divisions) and some "inland" areas. In Western Australia those in common on the two maps are the Southern and Northern Agricultural Divisions. Another feature of maps for both sexes is low values in Sydney. The A.C.T. has high values for this heart disease for both sexes.

1959/63 compared with 1965/66

Low values for Sydney are characteristic for both studies. Male maps overlap for a large proportion of Victoria and a small area of N.S.W. There is some overlap in Western Australia -

Perth and the Northern and Southern Agricultural Divisions. Tasmania and Queensland have rather different patterns. High values on the female map are less extensive in the latest study. There is some similarity in the pattern in Victoria and N.S.W. with a corridor of low values running inland from Sydney, splitting the high value areas. The areas of high values around Adelaide, Perth and Brisbane are inconsistent between the two series but some "inland" areas are common to both. These are the Peninsula Division of Queensland and the Southern and Northern Agricultural Divisions of Western Australia.

Pneumonia (figs. 25 - 28)

Pneumonia accounts for 3.6 per cent. of total deaths per annum. The death rates for 1965/66 were 0.35/1000 for males and 0.29/1000 for females.

Pneumonia, unlike the other diseases studied, is an infectious disease, though often a secondary infection and involving more than one pathogen. Its transmission is possibly more directly linked with environmental conditions especially the virus form of pneumonia.

As some types of pneumonia tend to be mildly epidemic in form, a great range of ratios can be expected. This is more so for females (0 - 1273) than males (0 - 386). The dispersion of S.M.R. is far greater than in the last paper, although this time the S.M.R. were more evenly distributed around the national average with only a slight concentration of octiles above 100. Even so a large extent of the continent is again characterised by high ratios. These areas are generally "inland", which may point to less immunity and greater susceptibility to the disease. As a large extent of the continent is affected by high ratios perhaps the significance here rests with the low ratio areas.

Although the distributions for both sexes are generally similar there is some difference in Queensland and N.S.W. The very high ratios (two uppermost octiles) occur in the sparsely populated areas, consistent with the previous study. There are two areas with low values in Western Australia on both maps and the patterns of low values in South Australia, south-west N.S.W. and Victoria are related. However, there is some difference in northern N.S.W. and Queensland. The male map shows generally high values in N.S.W. and Queensland with a coastal strip of low values extending along the Queensland coast. On the female map

in Queensland low values swing inland to cover half the State and extend south into north-west N.S.W. The male map has high values around Sydney and low values for other capitals. Hobart is the only capital with high female values.

The over-all pattern of greatest intensity lying inland, and diminishing on approach to the Metropolitan areas is brought out, implying perhaps certain factors of distance from major centres of population, transport routes, etc.

1959/63 compared with 1965/66

The male maps overlap reasonably well in the south of the continent. In Queensland however the pattern of low values has changed to a coastal belt rather than a wide band running east - west across the State.

The female map corresponds well in the west but in the east there is only slight resemblance in the high - low ratio patterns. There are less high values in the east on the latest map.

Conclusions

1) As noted in the Introduction, the utmost caution must be used in attaching too much significance to the distribution patterns revealed by this simple exercise in mapping data with many inherent drawbacks, and even more with correlating them with other areal distributions.

2) The various distribution maps representing mortality from the various circulatory diseases for the most part have marked family resemblances, with generally a balance of high values in "inland" areas and in the more densely peopled and urbanised areas. Vascular lesions in both sexes and Arteriosclerotic and degenerative heart diseases are the exception with concentrations in more densely peopled areas.

3) Within the relatively densely peopled south-east of Australia, there are some variations within this group of maps that may be significant. Six of the eight maps (i.e. excluding General Arteriosclerosis etc) show high ratios mainly in N.S.W. General arteriosclerosis on the other hand shows high values extending over a large part of Victoria.

Comparison of these maps in the two papers shows that overlap of high value areas tends to be coastal and mainly in the south-east of the continent, with the exception of arteriosclerotic and degenerative heart disease female, hypertension male and general arteriosclerosis etc. male. There is also a surprising amount of overlap in some "inland" areas.

4) The maps of Malignant Neoplasms of the bronchus, trachea and lung show a concentration of high values in inland areas where the population is sparse although there are high ratios in the more densely peopled and more urbanised areas. In contrast to some of the heart diseases there is little relationship of "inland" high value areas in the two papers or between the sexes.

5) Similar considerations apply to maps of malignant neoplasms of the digestive organs.

6) High values on the male cancer maps appear to be extending further into N.S.W. and at the same time the area of high values around Melbourne has declined. However it is difficult to know if this feature is due to change in the pattern of occurrence of the disease or merely the method of mapping.

7) The maps of Pneumonia are again the one exception to the rest of the series, and show a marked inland and rural bias. This is surely significant, but not surprising, since this is the one important cause of mortality mapped which fairly clearly and generally involves a pathogen or pathogens.

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APPENDIX A

Tables to demonstrate the method of computing Standardised Mortality Ratios

AUSTRALIA

DISEASE Malignant Neoplasms of digestive organs and peritoneum.

ICD Nos. 150 - 159

DEATH RATES

AGE	Mean Deaths from M.N. of digestive organs etc. in Australia 1965/66		1966 Population (Australia)		Death Rates per 1000 (Standard Rates)	
	MALES	FEMALES	MALES	FEMALES	MALES	FEMALES
0-4	4.0	2.0	585949	557195	0.0068	0.0035
5-14	3.5	2.5	1151789	1097555	0.0030	0.0022
15-24	15.5	10.5	973557	928610	0.0159	0.0113
25-34	30.5	33.0	739990	693429	0.0412	0.0475
35-44	135.5	138.5	793999	744314	0.1706	0.1860
45-54	352.5	410.5	666843	652463	0.5286	0.6290
55-64	891.0	726.5	491690	486675	1.8121	1.4927
65 +	4393.5	6631.5	412542	573862	10.6498	11.5559

STATE New South Wales

DISEASE Malignant Neoplasms of digestive organs and peritoneum

Statistical Division Sydney

ICD Nos. 150 - 159

STANDARDISED MORTALITY RATIOS

AGE	Population 1966		Death Rates per 1000		Expected Deaths per year	
	MALES	FEMALES	MALES	FEMALES	MALES	FEMALES
0-4	115568	109825	0.0068	0.0035	0.2889	0.3843
5-14	223894	214204	0.0030	0.0022	0.4701	0.0000
15-24	216366	212281	0.0159	0.0113	1.2116	0.7854
25-34	167019	159225	0.0412	0.0475	5.4114	4.3627
35-44	182458	175486	0.1706	0.1860	25.1609	19.7948
45-54	155439	157123	0.5286	0.6290	67.9423	53.5789
55-64	107657	115412	1.8121	1.4927	139.2435	102.9128
65 +	87953	141397	10.6498	11.5559	384.4953	457.1789
			Total Expected Deaths per year =		624.2240	638.9978

MALES FEMALES

$$S.M.R. = \frac{\text{Actual Deaths}}{\text{Expected Deaths}} \times 100$$

MALES: $\frac{631}{624.2240} \times 100$ S.M.R. = 101.08

FEMALES: $\frac{660}{638.9978} \times 100$ S.M.R. = 103.28

Figure 1. Malignant Neoplasms of the digestive organs and peritoneum.
ICD 150-159 MALE 1965/66

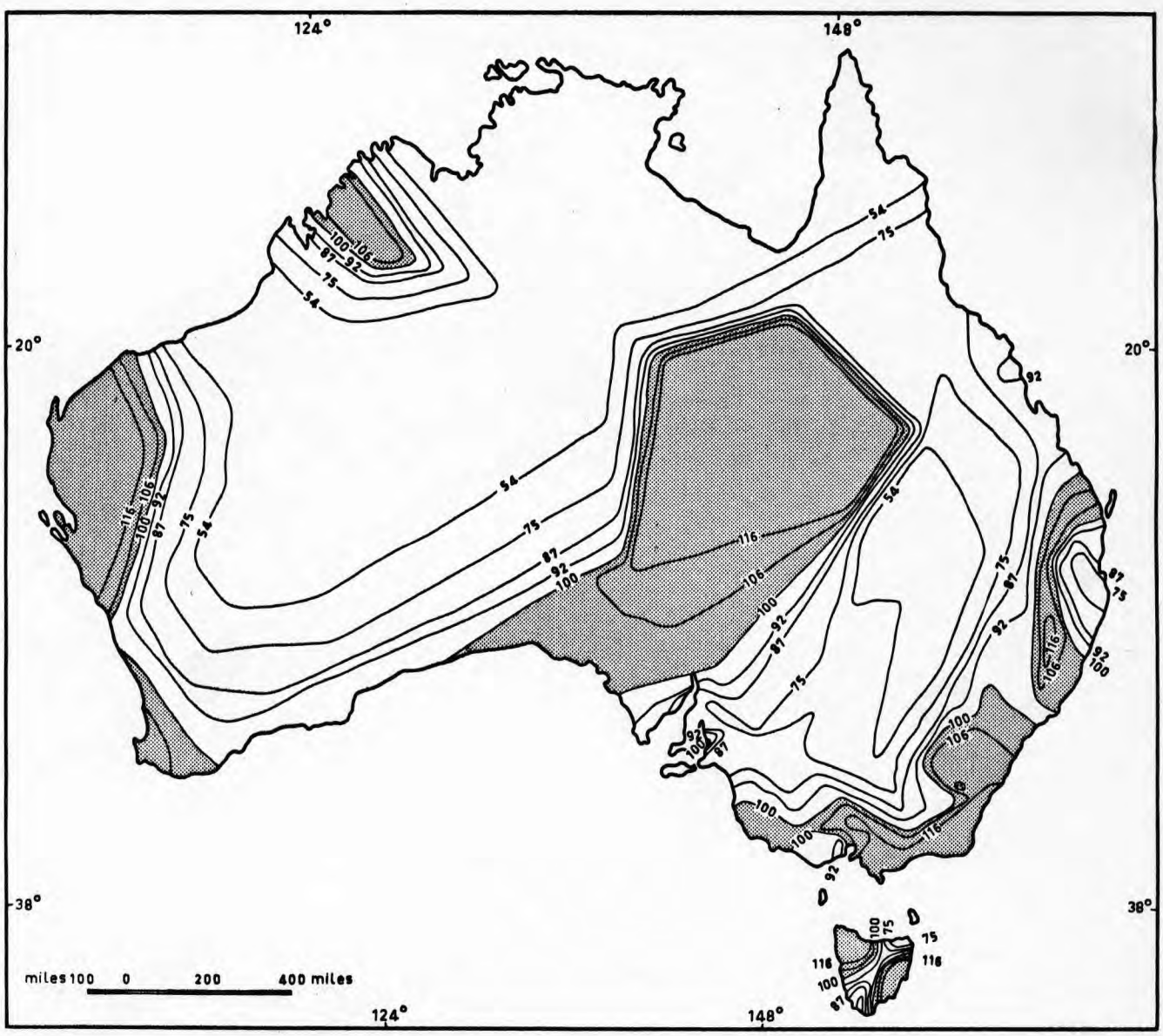


Figure 2. Malignant Neoplasms of the digestive organs and peritoneum.
ICD 150-159 FEMALE 1965/66

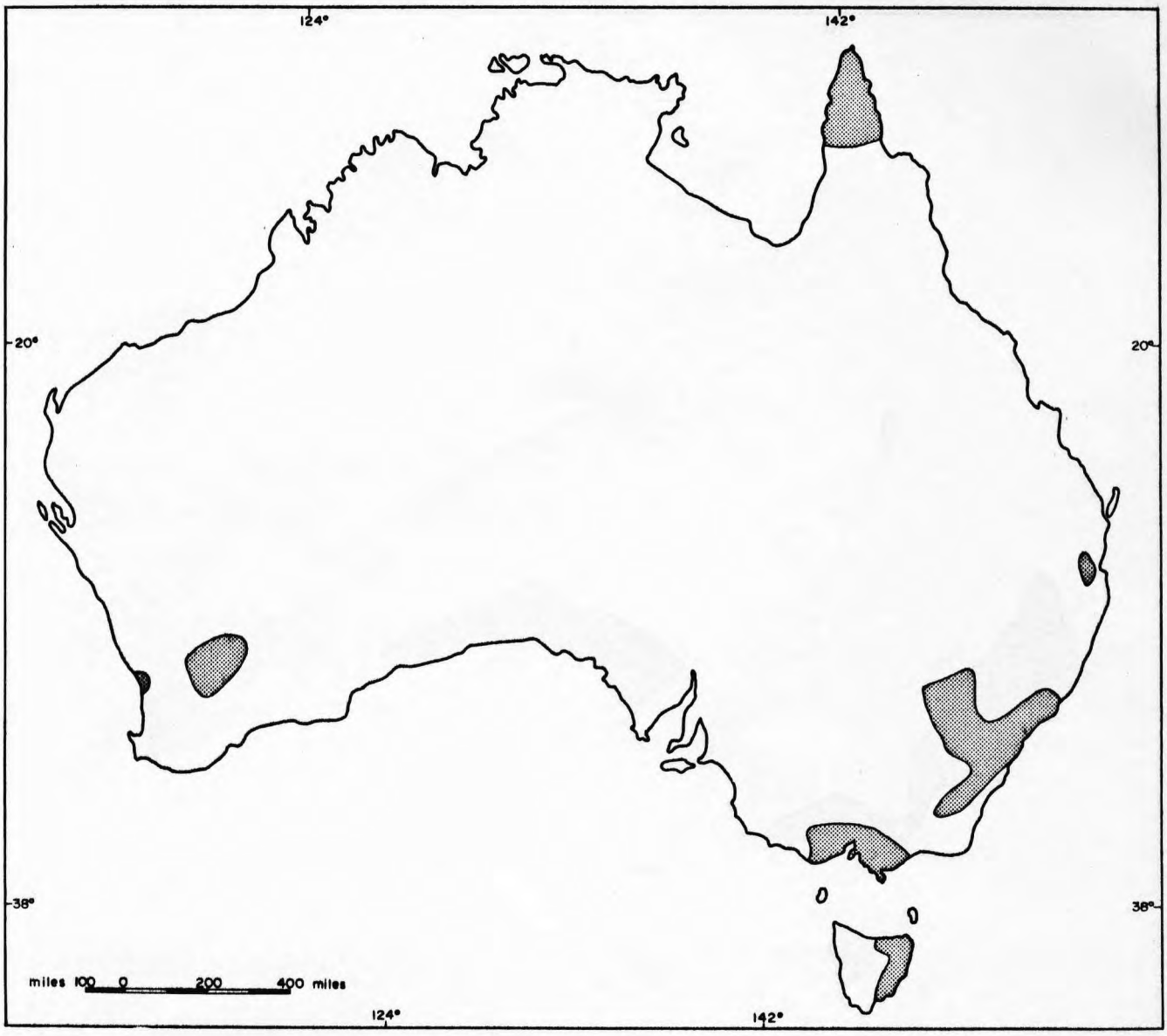


Figure 3. Malignant Neoplasms of the digestive organs and peritoneum. ICD 150-159. Areas with high S.M.R. in 1959/63 and 1965/66: MALE

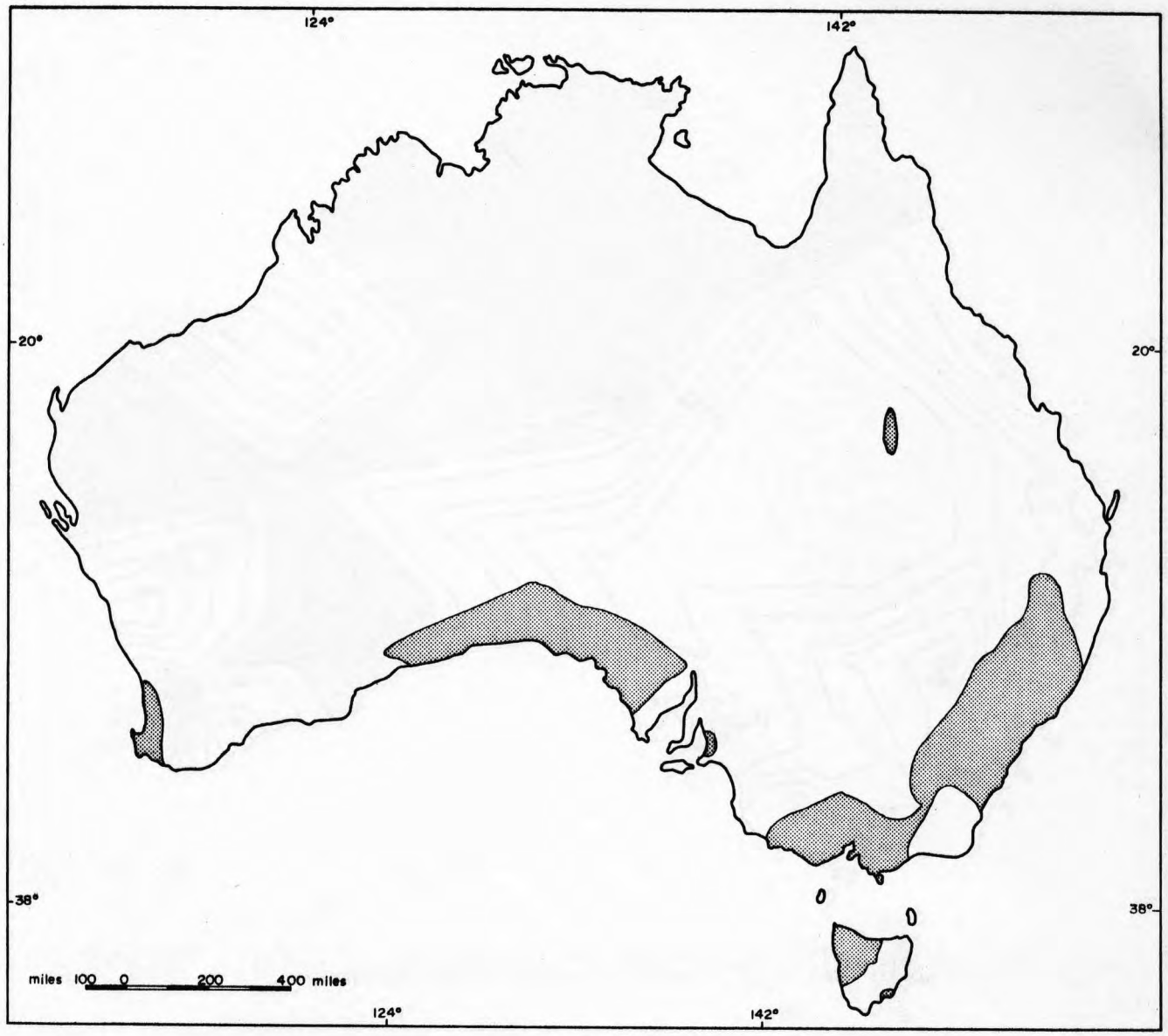


Figure 4. Malignant Neoplasms of the digestive organs and peritoneum. ICD 150-159. Areas with high S.M.R. in 1959/63 and 1965/66: FEMALE

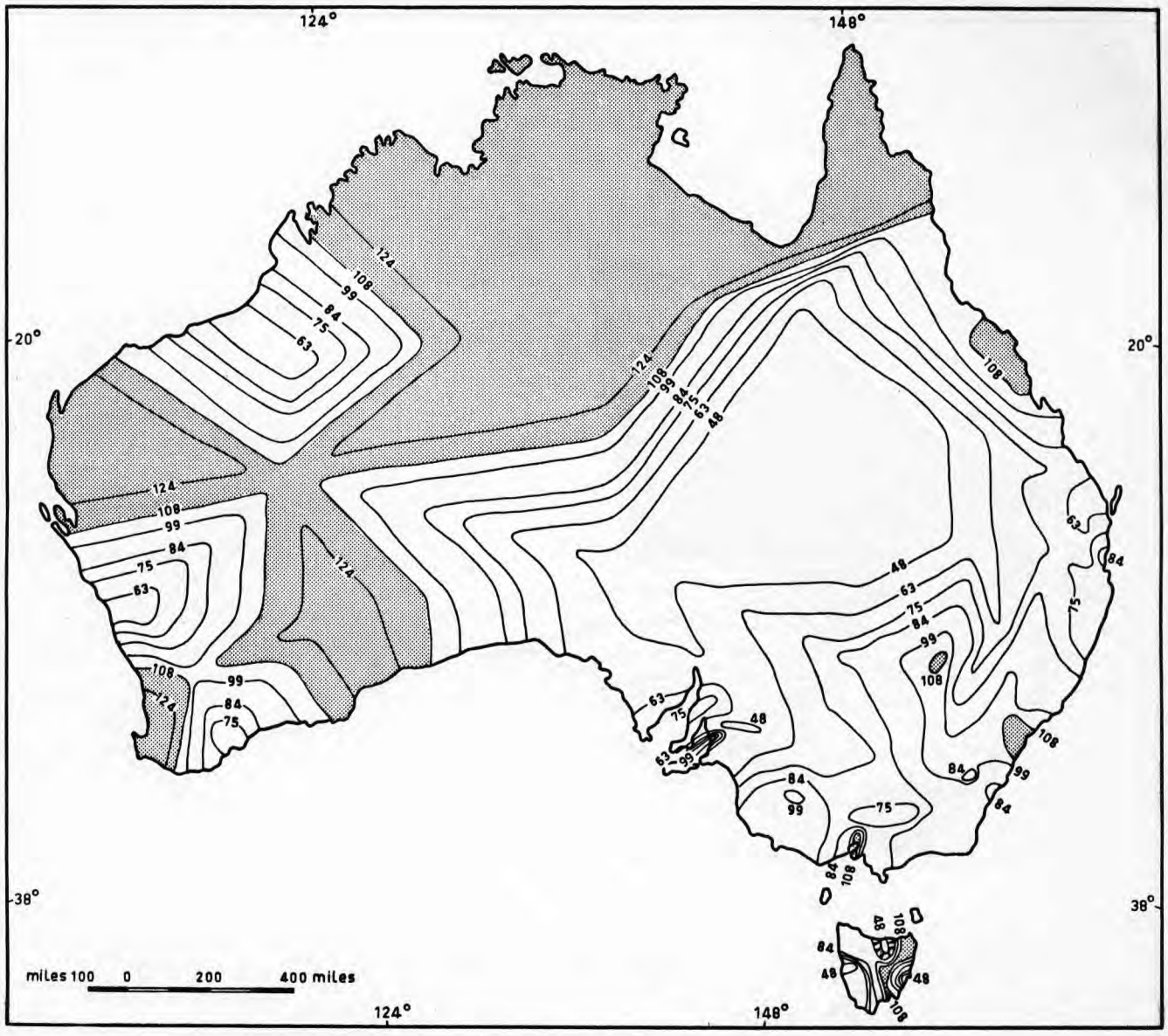


Figure 5. Malignant Neoplasms of the bronchus, trachea and lung.
ICD 162-163 MALE 1965/66

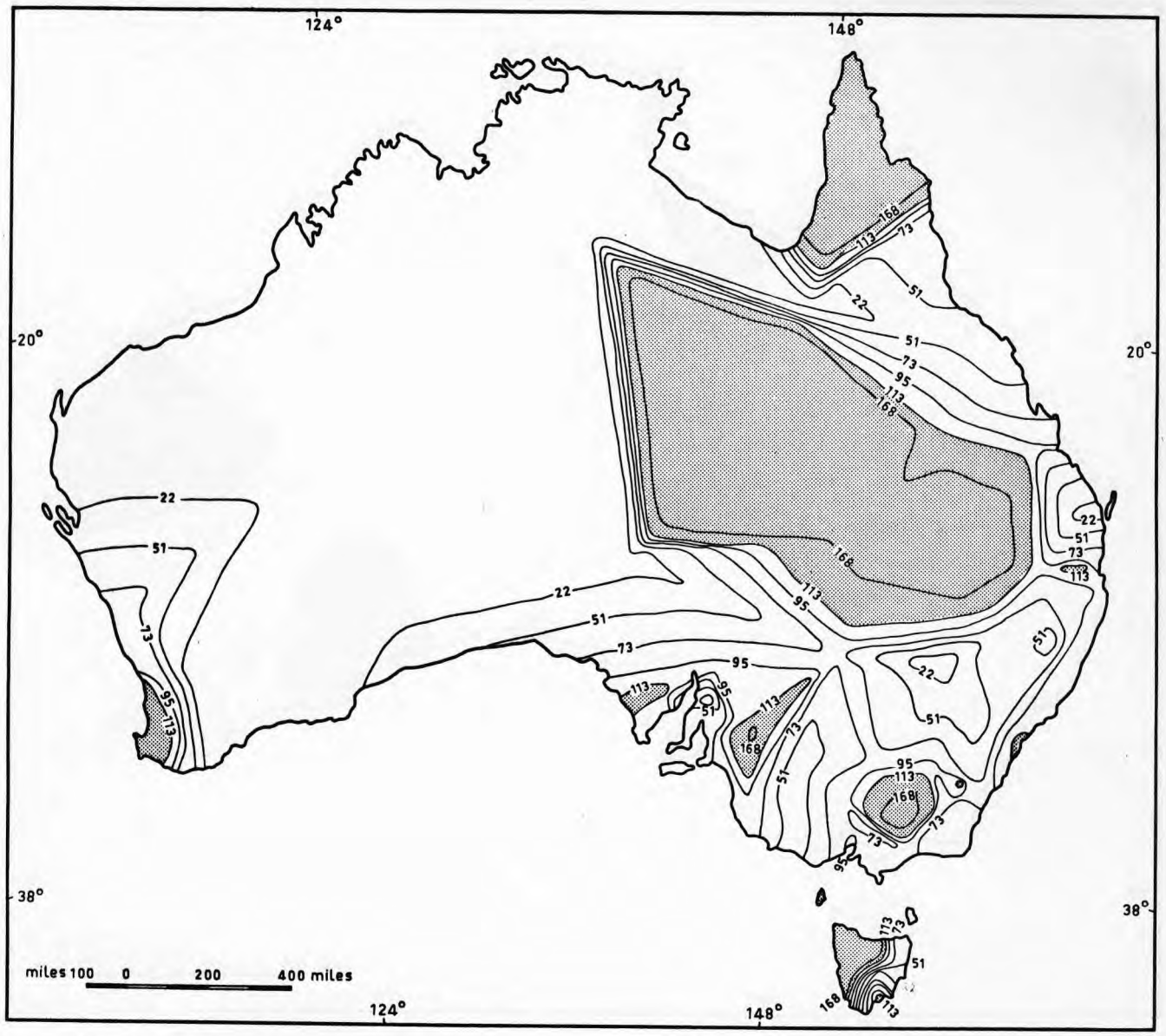


Figure 6. Malignant Neoplasms of the bronchus, trachea and lung.
ICD 162-163 FEMALE 1965/66

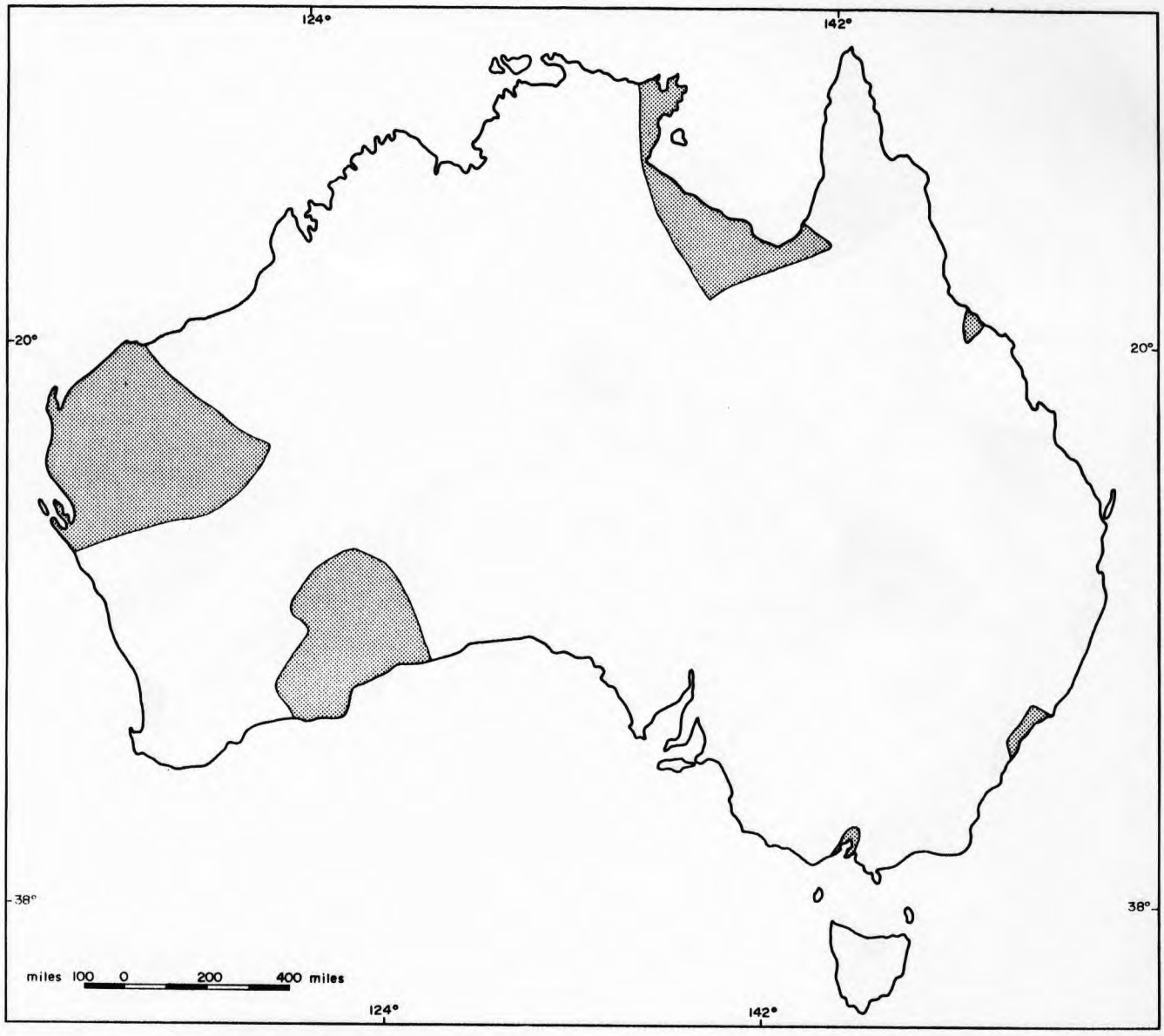


Figure 7. Malignant Neoplasms of the bronchus, trachea and lung. ICD 162-163: Areas with high S.M.R. in 1959/63 and 1965/66: MALE

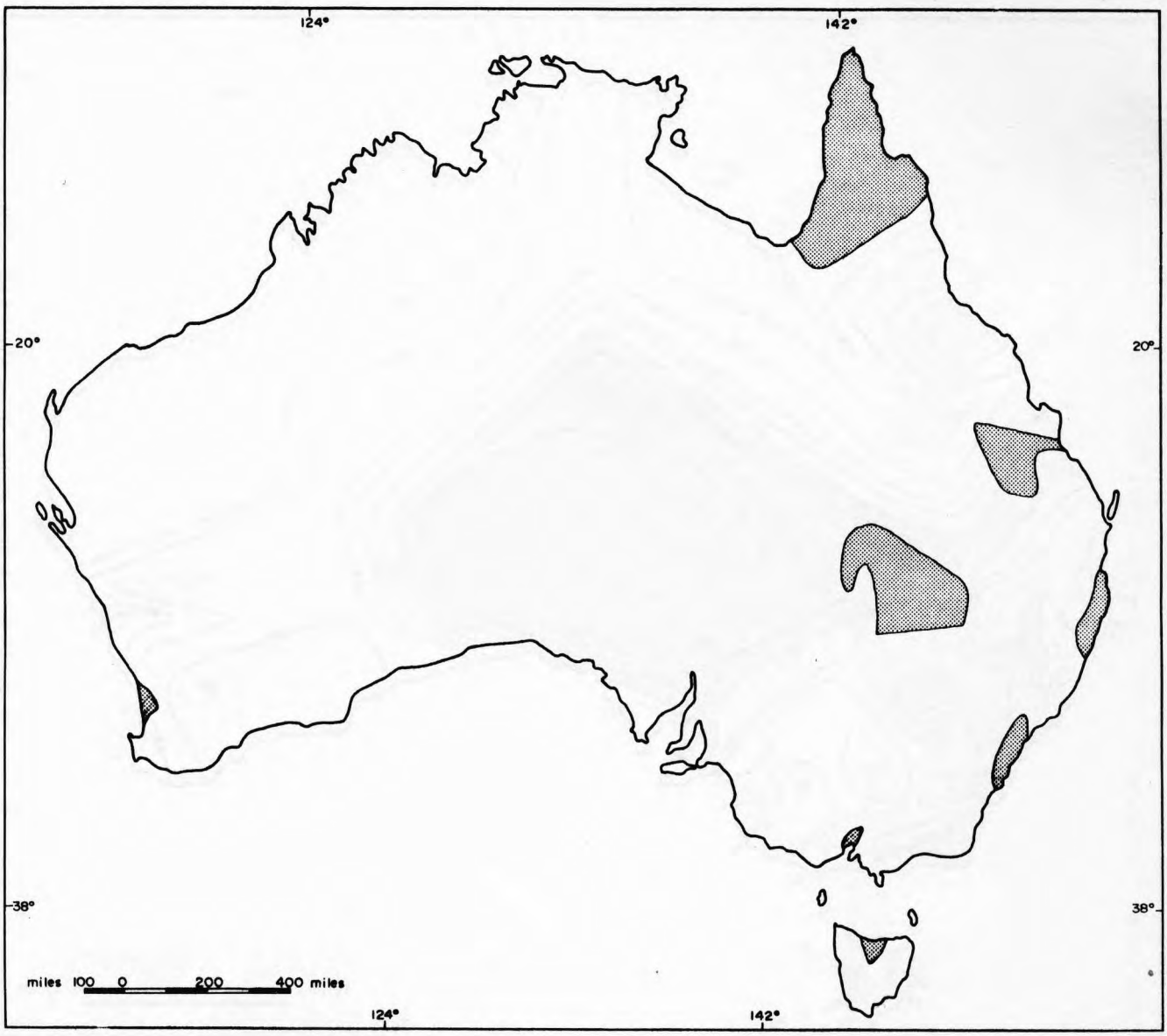


Figure 8. Malignant Neoplasms of the bronchus, trachea and lung.
ICD 162-163: Areas with high S.M.R. in 1959/63 and 1965/66.
FEMALE.

Figure 10. Vascular lesions affecting the central nervous system.
ICD 330-334 FEMALE 1965/66

Figure 12. Vascular lesions affecting the central nervous system.
ICD 330-334: Areas with high S.M.R. in 1959/63 and 1965/66.
FEMALE.

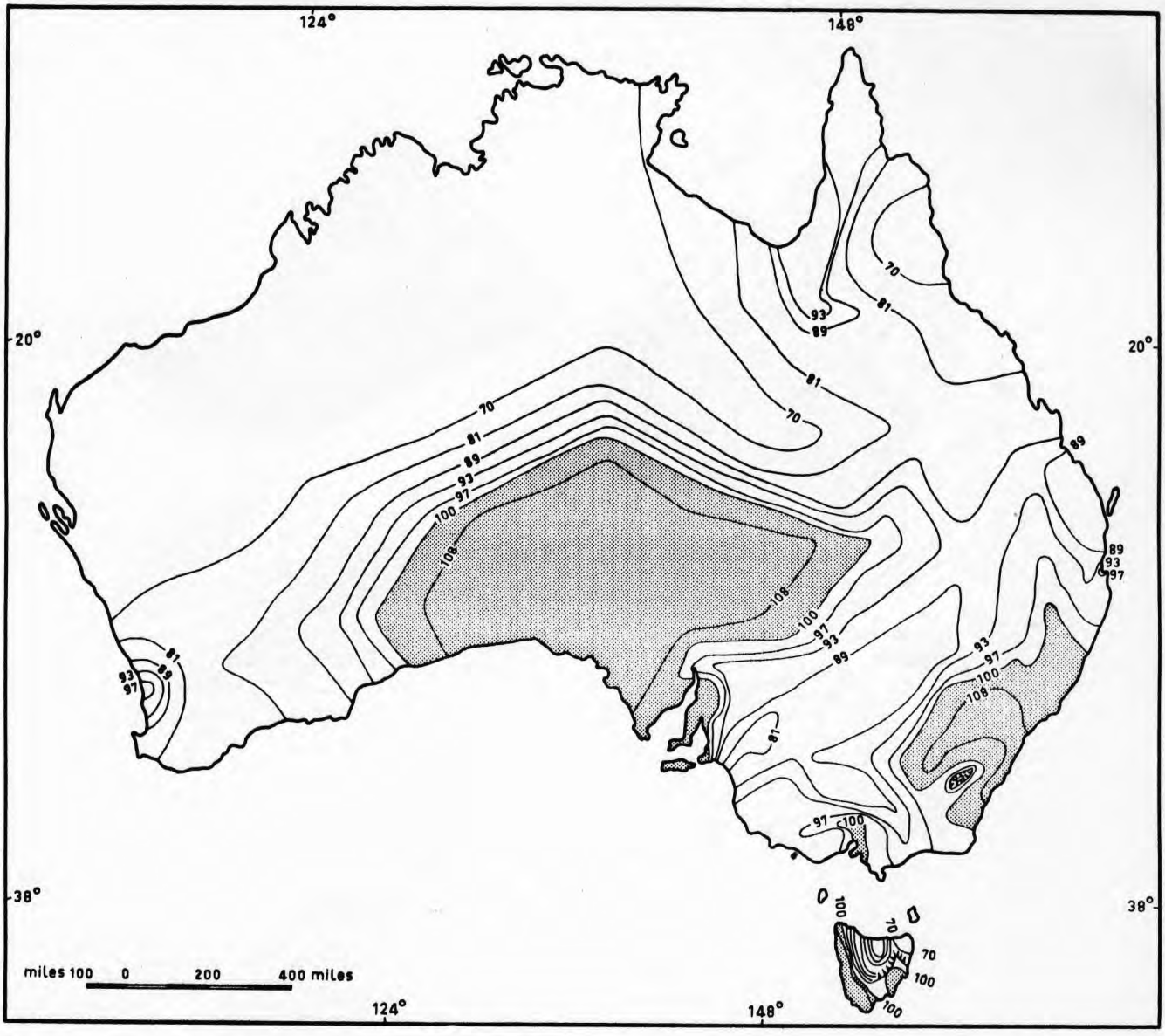


Figure 13. Arteriosclerotic and degenerative heart disease. ICD 420-422
MALE 1965/66.

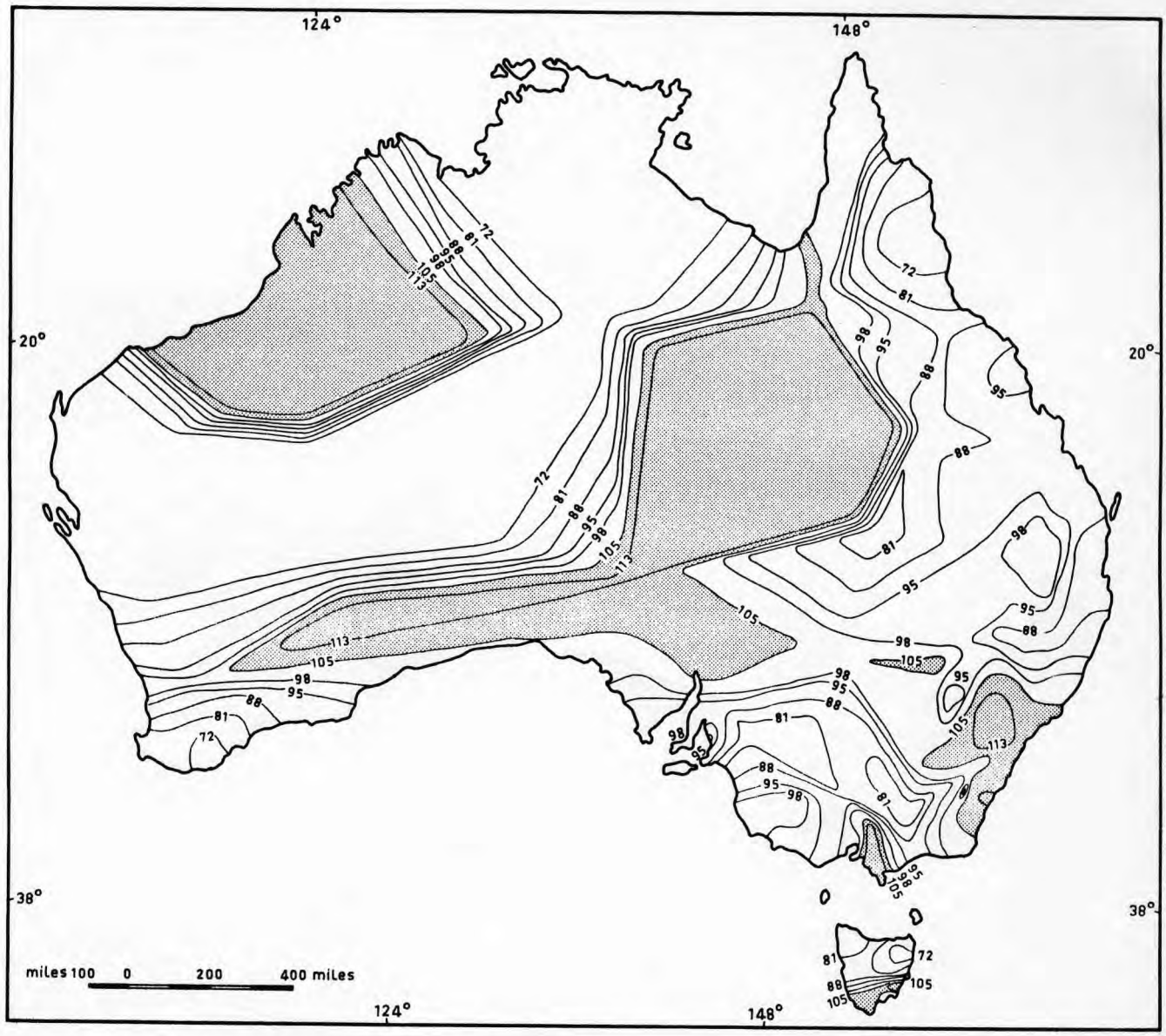


Figure 14. Arteriosclerotic and degenerative heart disease. ICD 420-422
FEMALE 1965/66.

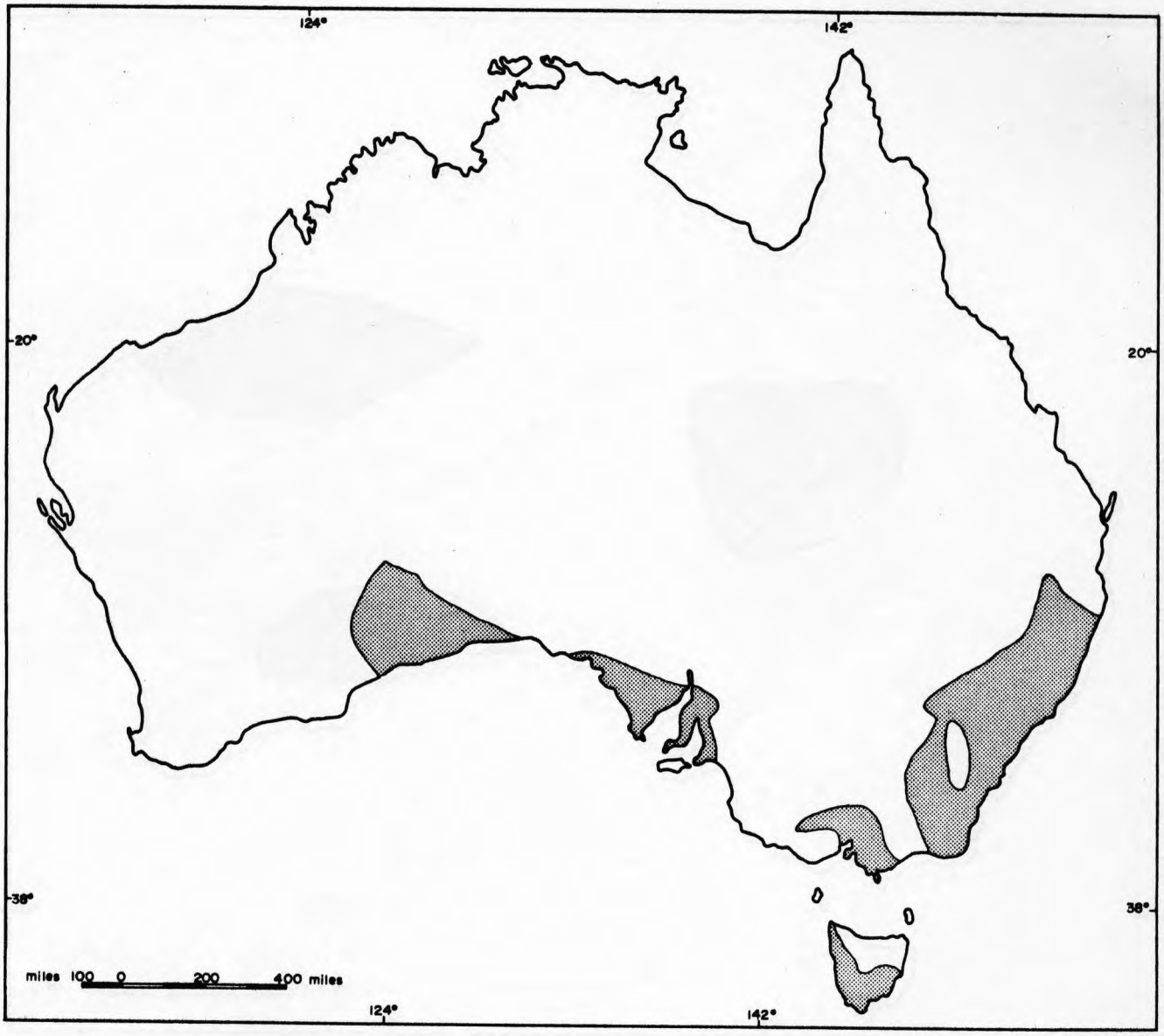


Figure 15. Arteriosclerotic and degenerative heart disease. ICD 420-422
Areas with high S.M.R. in 1959/63 and 1965/66: MALE

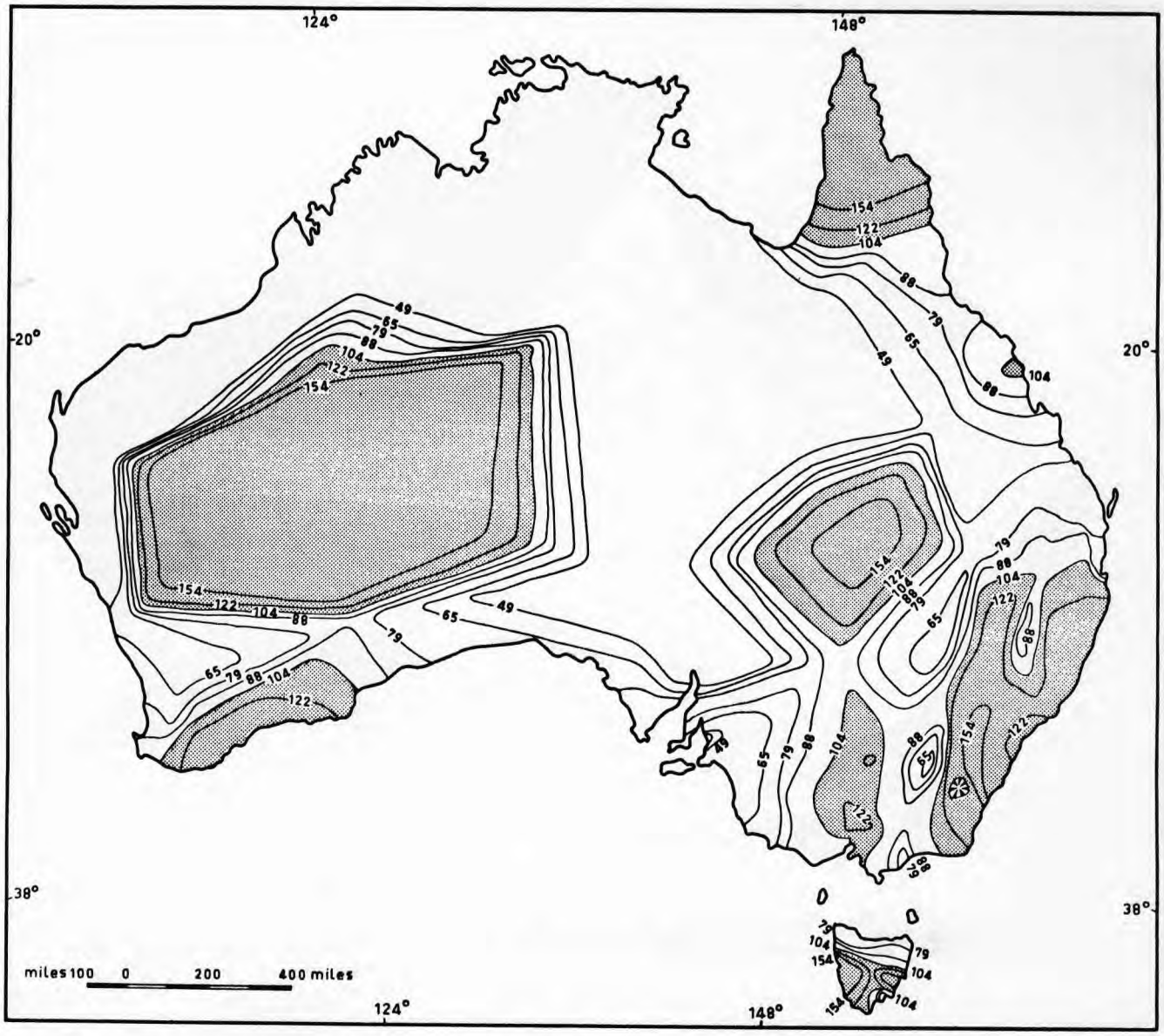


Figure 17. Hypertensions with and without heart disease. ICD 440-443, 444-447 MALE 1965/66

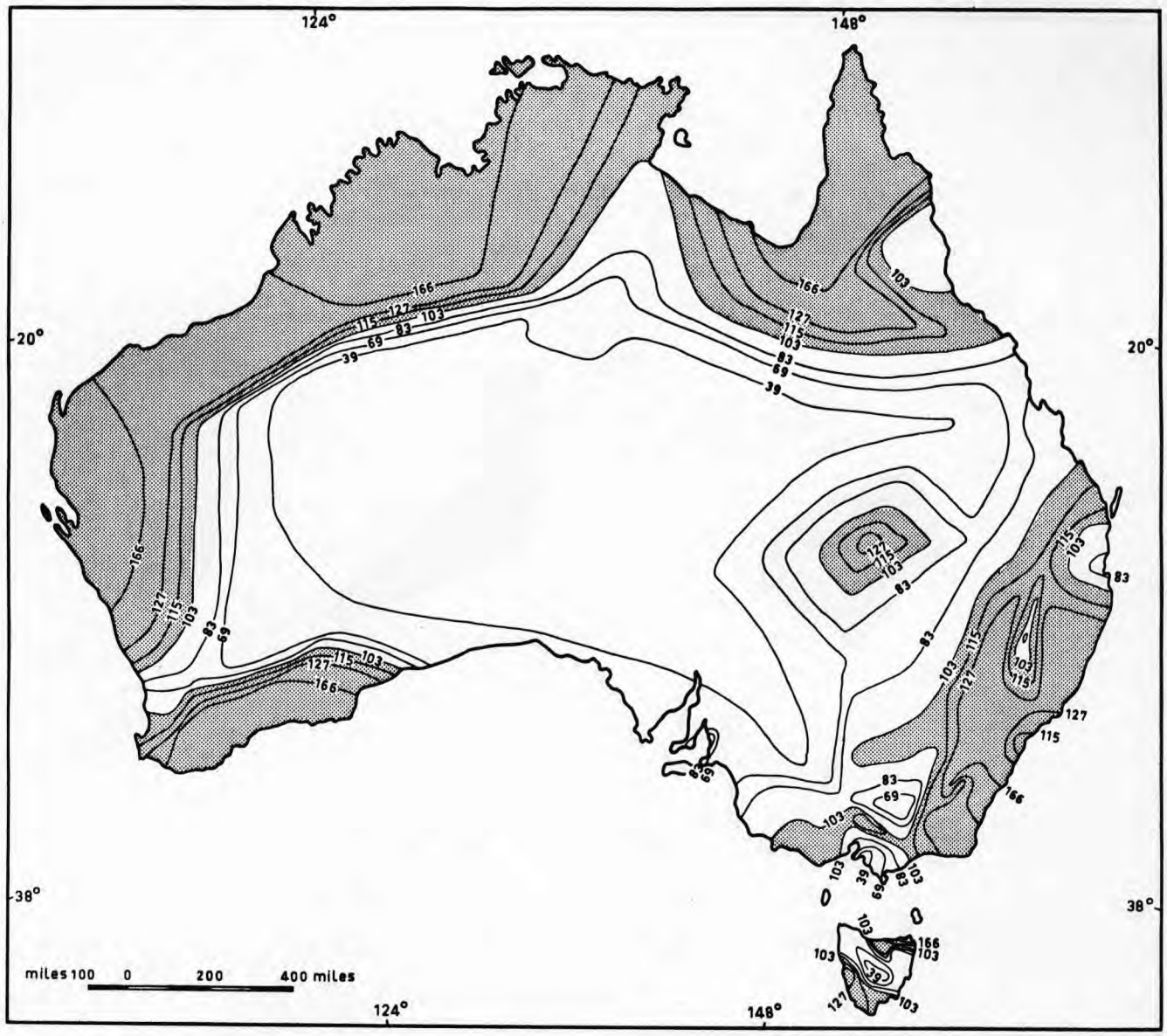


Figure 18. Hypertensions with and without heart disease. ICD 440-443, 444-447 FEMALE 1965/66

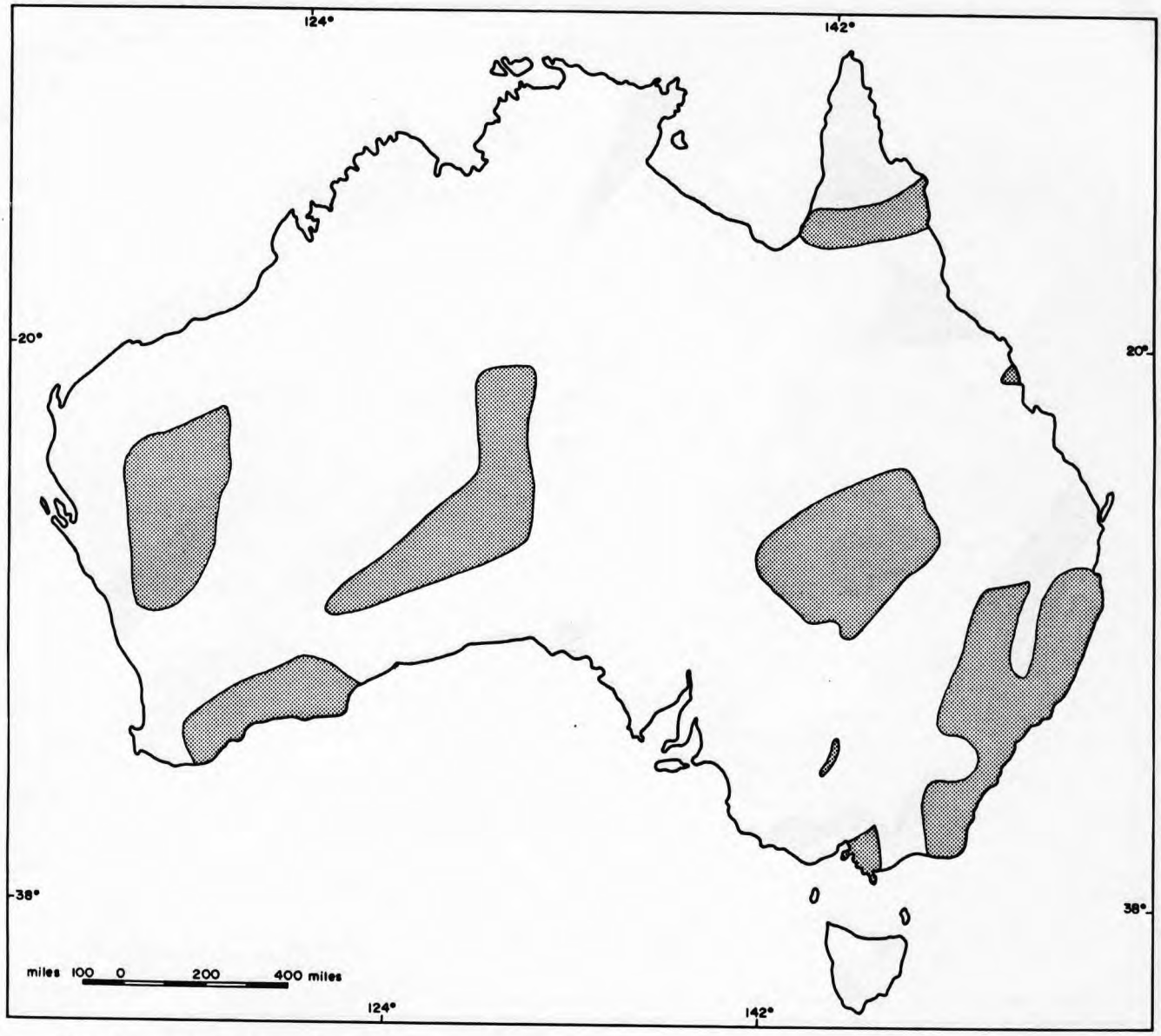


Figure 19. Hypertensions with and without heart disease. ICD 440-443, 444-447: Areas with high S.M.R. in 1959/63 and 1965/66: MALE

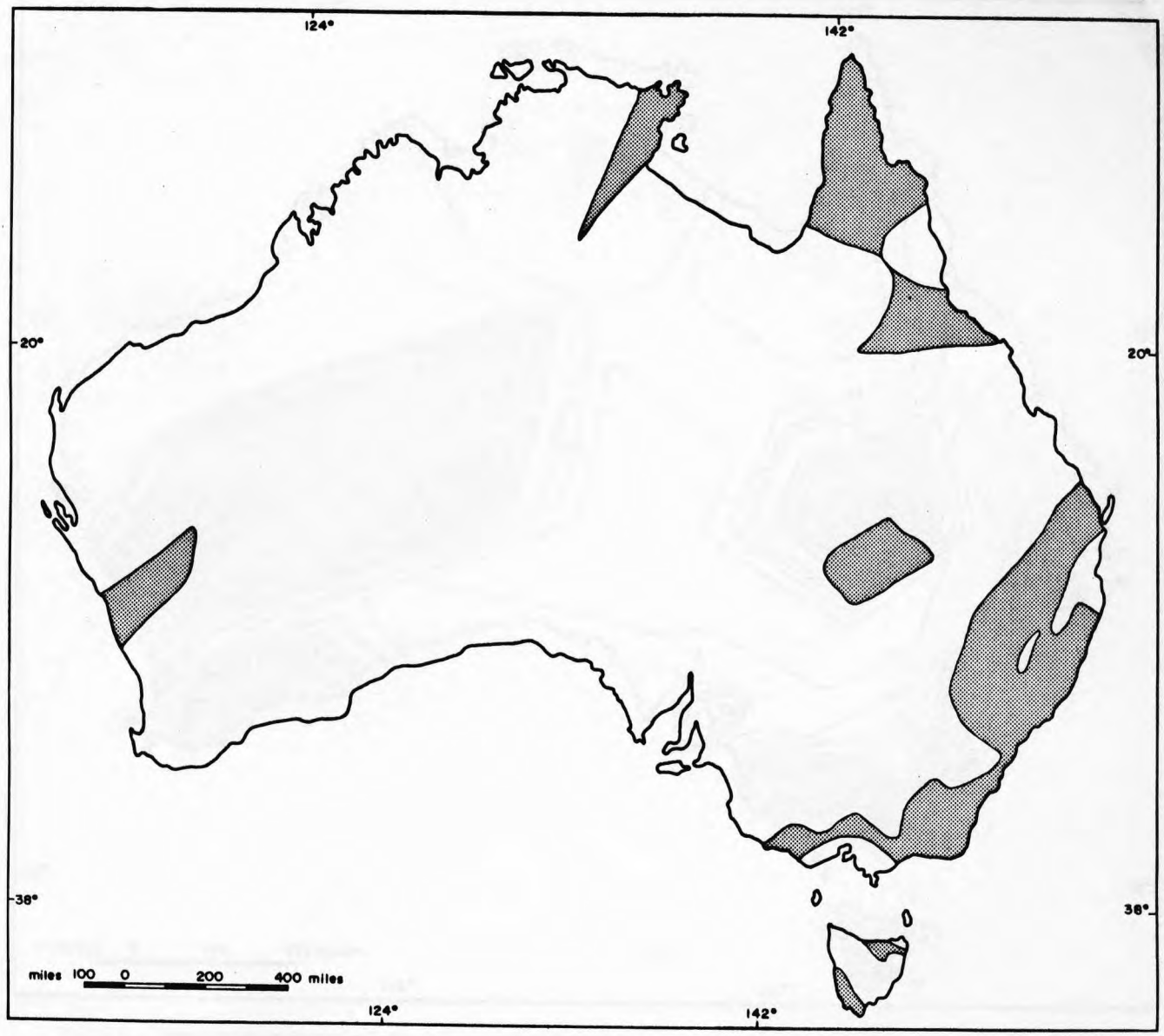


Figure 20. Hypertensions with and without heart disease. ICD 440-443, 444-447: Areas with high S.M.R. in 1959/63 and 1965/66: FEMALE

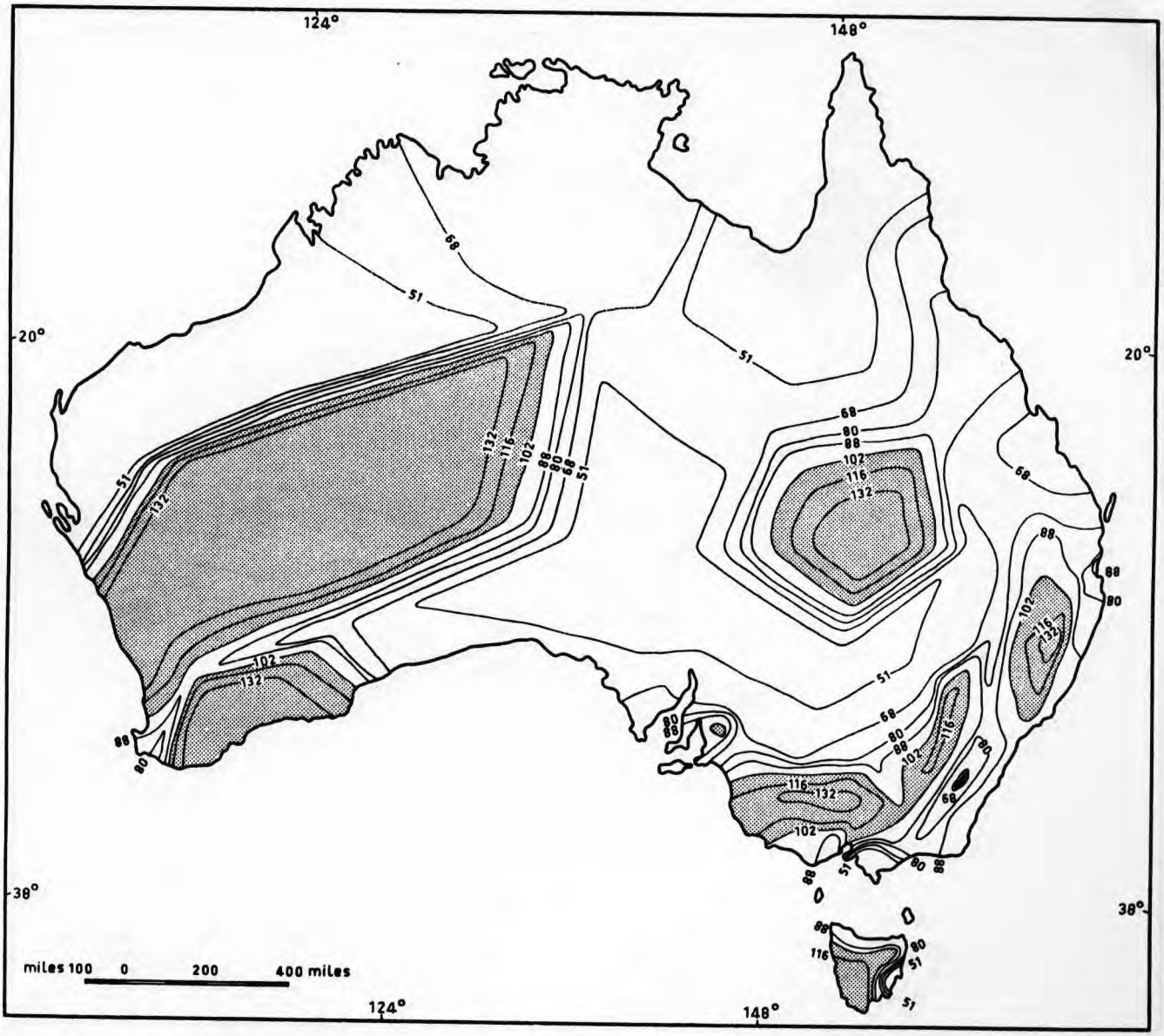


Figure 21. General arteriosclerosis and other diseases of the circulatory system. ICD 450-456, 460-468 MALE 1965/66

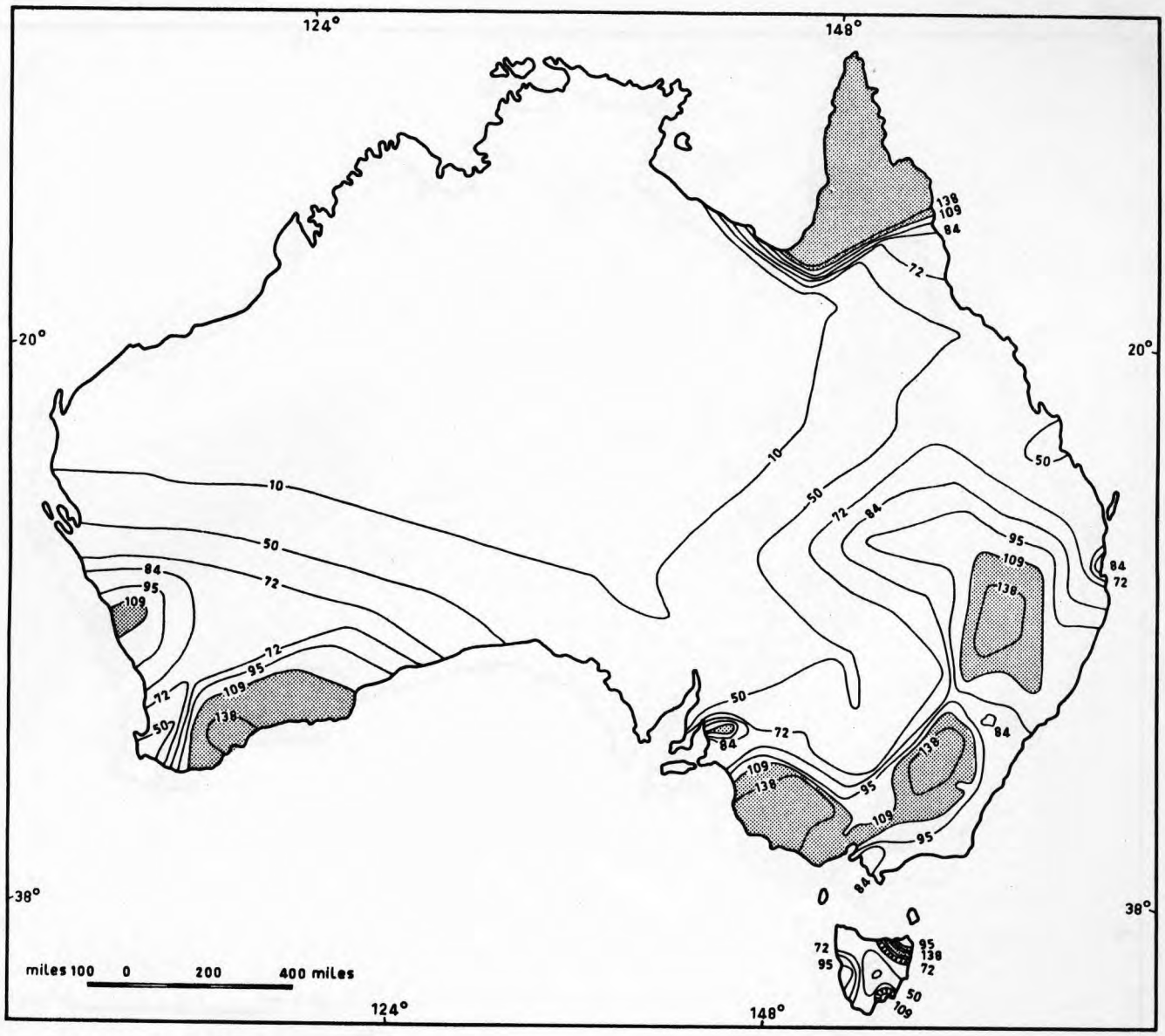


Figure 22. General arteriosclerosis and other diseases of the circulatory system. ICD 450-456, 460-468 FEMALE 1965/66

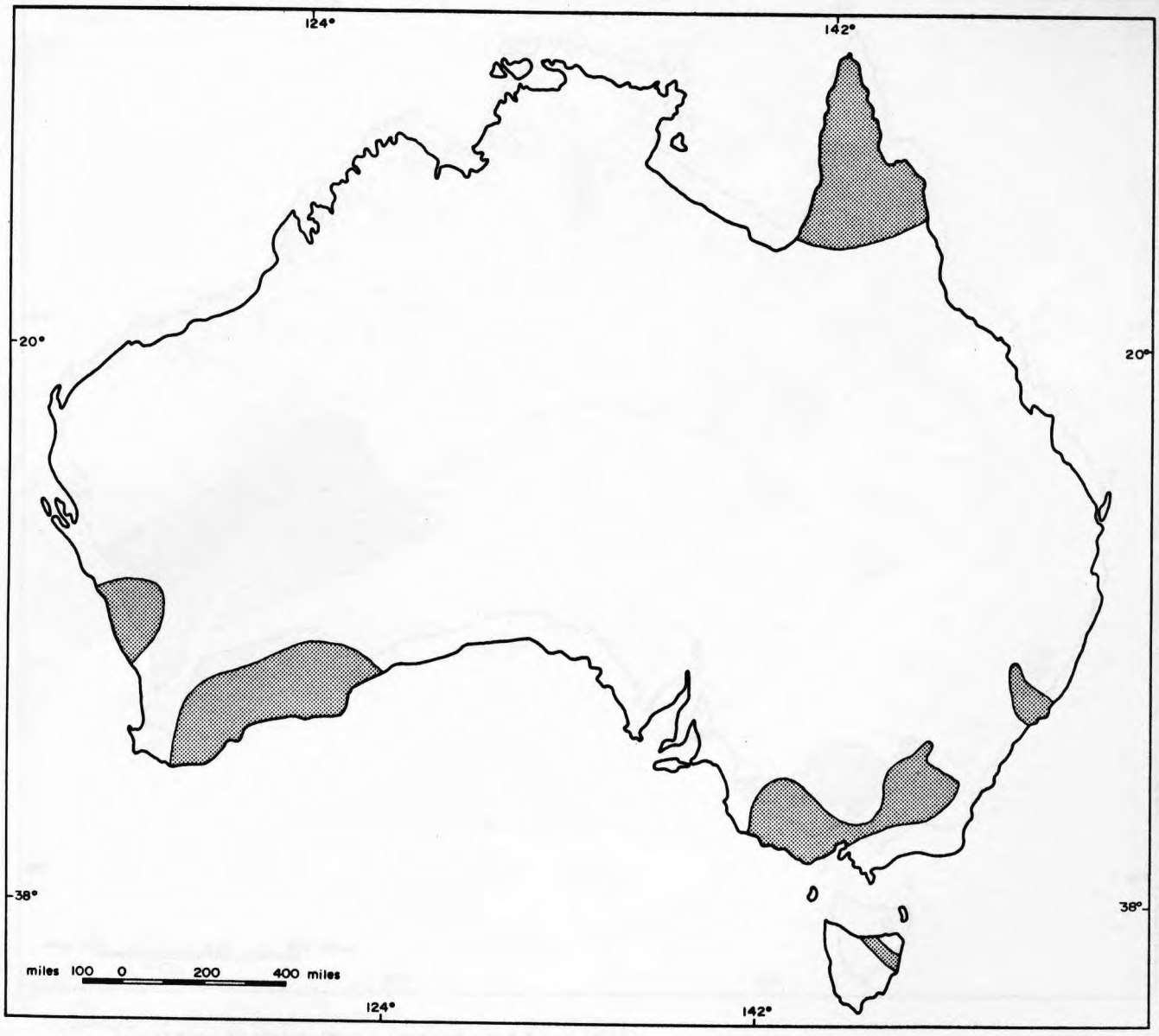


Figure 23. General arteriosclerosis and other diseases of the circulatory system. ICD 450-456, 460-468 : Areas with high S.M.R. in 1959/63 and 1965/66: MALE

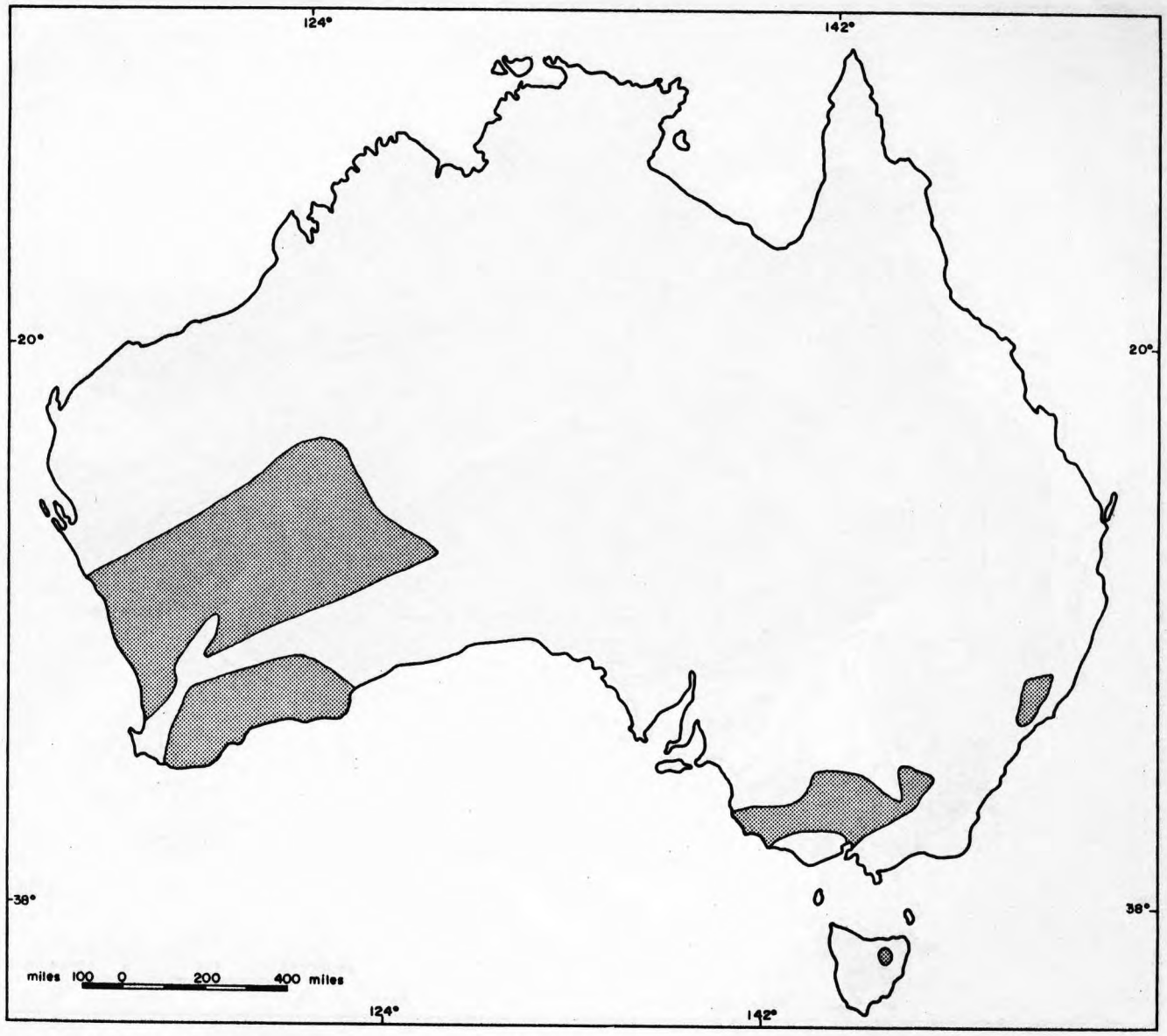


Figure 24. General arteriosclerosis and other diseases of the circulatory system. ICD 450-456, 460-468: Areas with high S.M.R. in 1959/63 and 1965/66: FEMALE

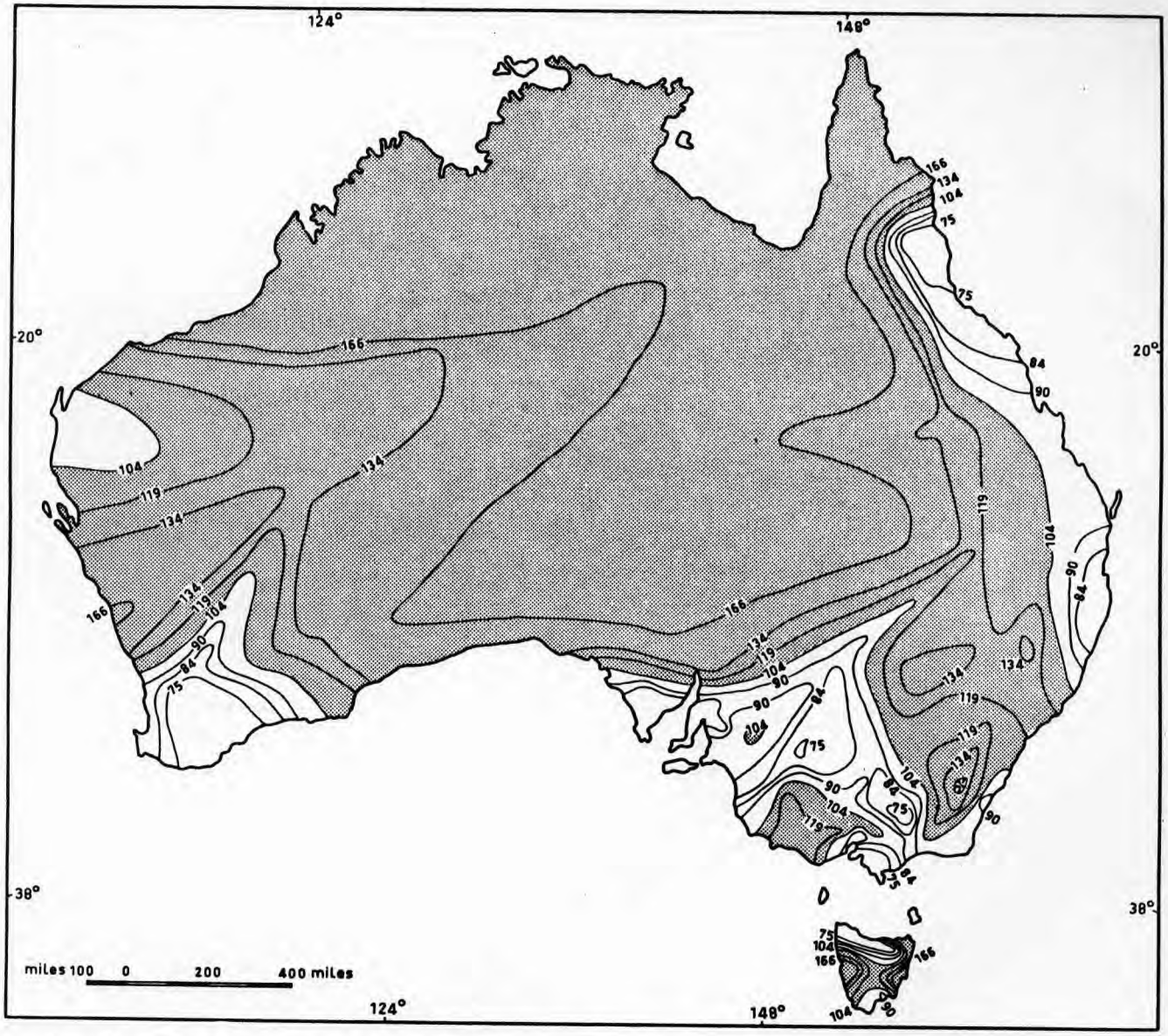


Figure 25. Pneumonia. ICD 490-493. MALE 1965/66

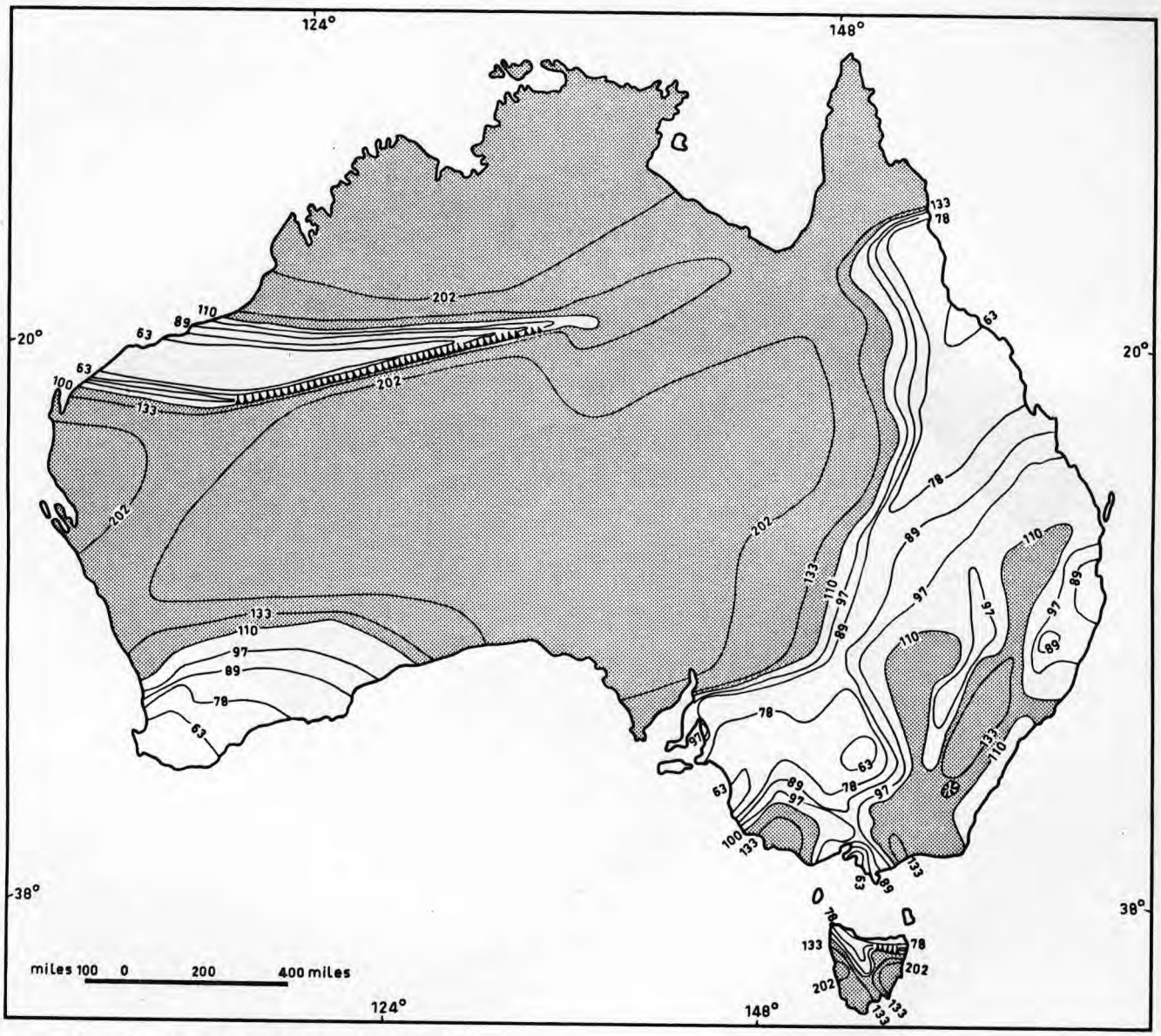


Figure 26. Pneumonia. ICD 490-493. FEMALE 1965/66

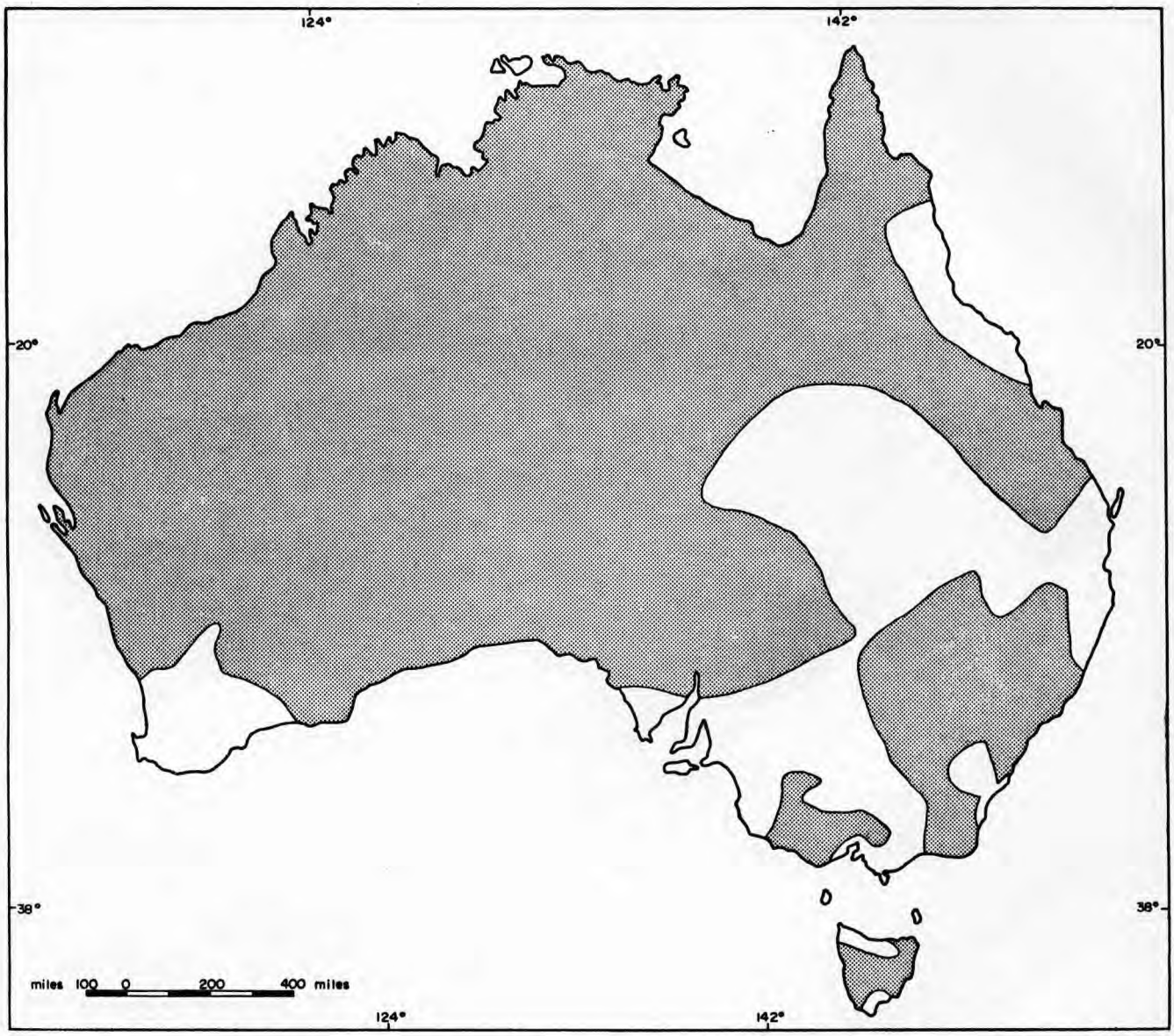


Figure 27. Pneumonia. ICD 490-493: Areas with high S.M.R. in 1959/63 and 1965/66: MALE

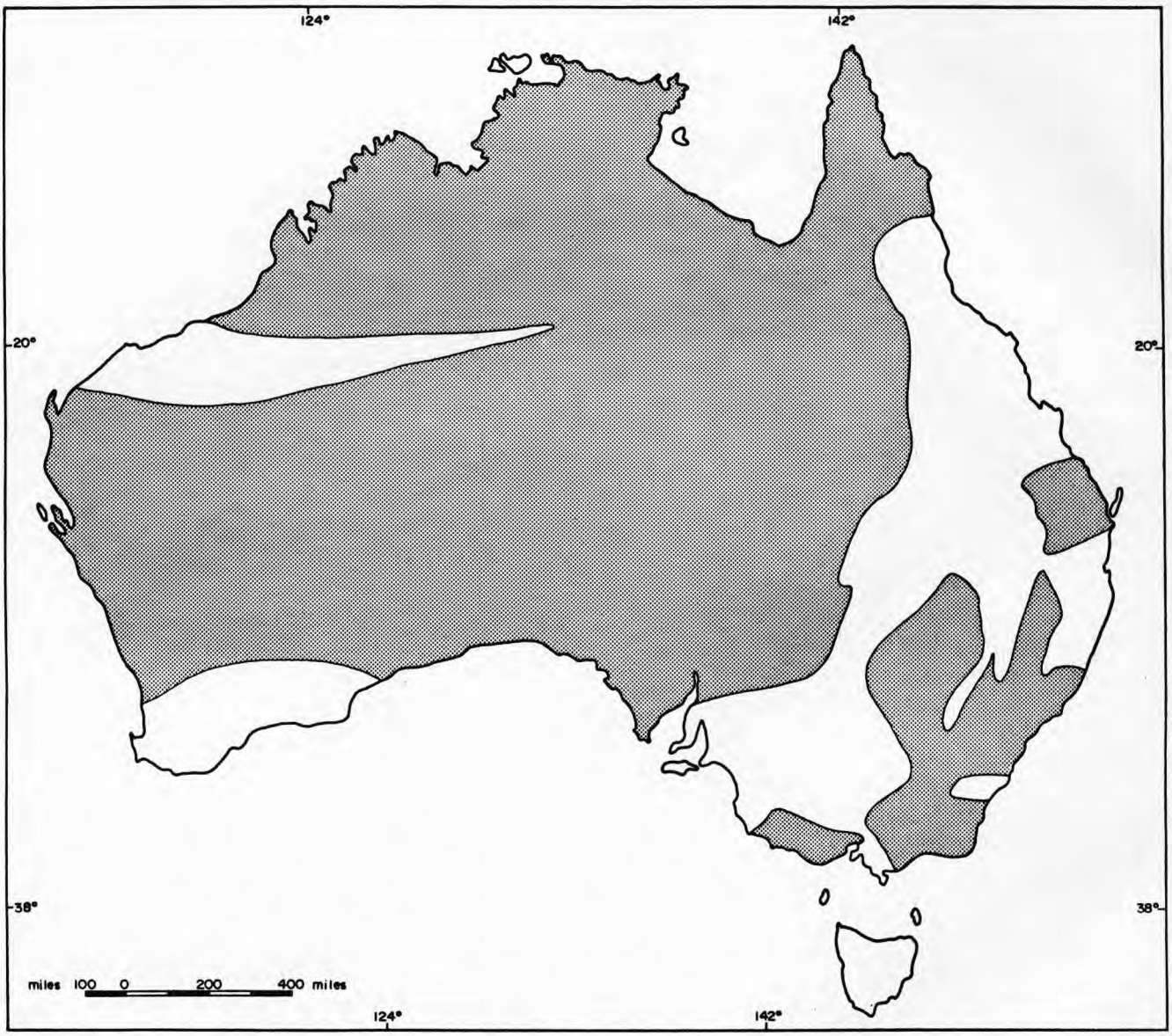


Figure 28. Pneumonia. ICD 490-493: Areas with high S.M.R. in 1959/63 and 1965/66: FEMALE

STATISTICAL DIVISIONS OF AUSTRALIA

New South Wales

1. Sydney
2. North Coast
3. Hunter and Manning
4. South Coast
5. Northern Tableland
6. Central Tableland
7. Southern Tableland
8. North Western Slope
9. Central Western Slope
10. South Western Slope
11. North Central Plain
12. Central Plain
13. Riverina
14. Western

South Australia

1. Adelaide
2. Central
3. Lower North
4. Upper North
5. South Eastern
6. Western
7. Murray Mallee
8. Remainder of State

Tasmania

1. Hobart
2. North Central
3. North Western
4. North Eastern
5. North Midland
6. Midland
7. South Eastern
8. Southern
9. Western

Queensland

1. Brisbane
2. Moreton
3. Maryborough
4. Downs
5. Roma
6. South Western
7. Rockhampton
8. Central Western
9. Far Western
10. Mackay
11. Townsville
12. Cairns
13. Peninsula
14. North Western

Western Australia

1. Perth
2. South West
3. Southern Agricultural
4. Central Agricultural
5. Northern Agricultural
6. Eastern Goldfields
7. Central
8. North West
9. Pilbara
10. Kimberley

Victoria

1. Melbourne
2. West Central
3. North Central
4. Western
5. Wimmera
6. Mallee
7. Northern
8. North Eastern
9. Gippsland
10. East Central

A.C.T. Australian Capital Territory N.T. Northern Territory

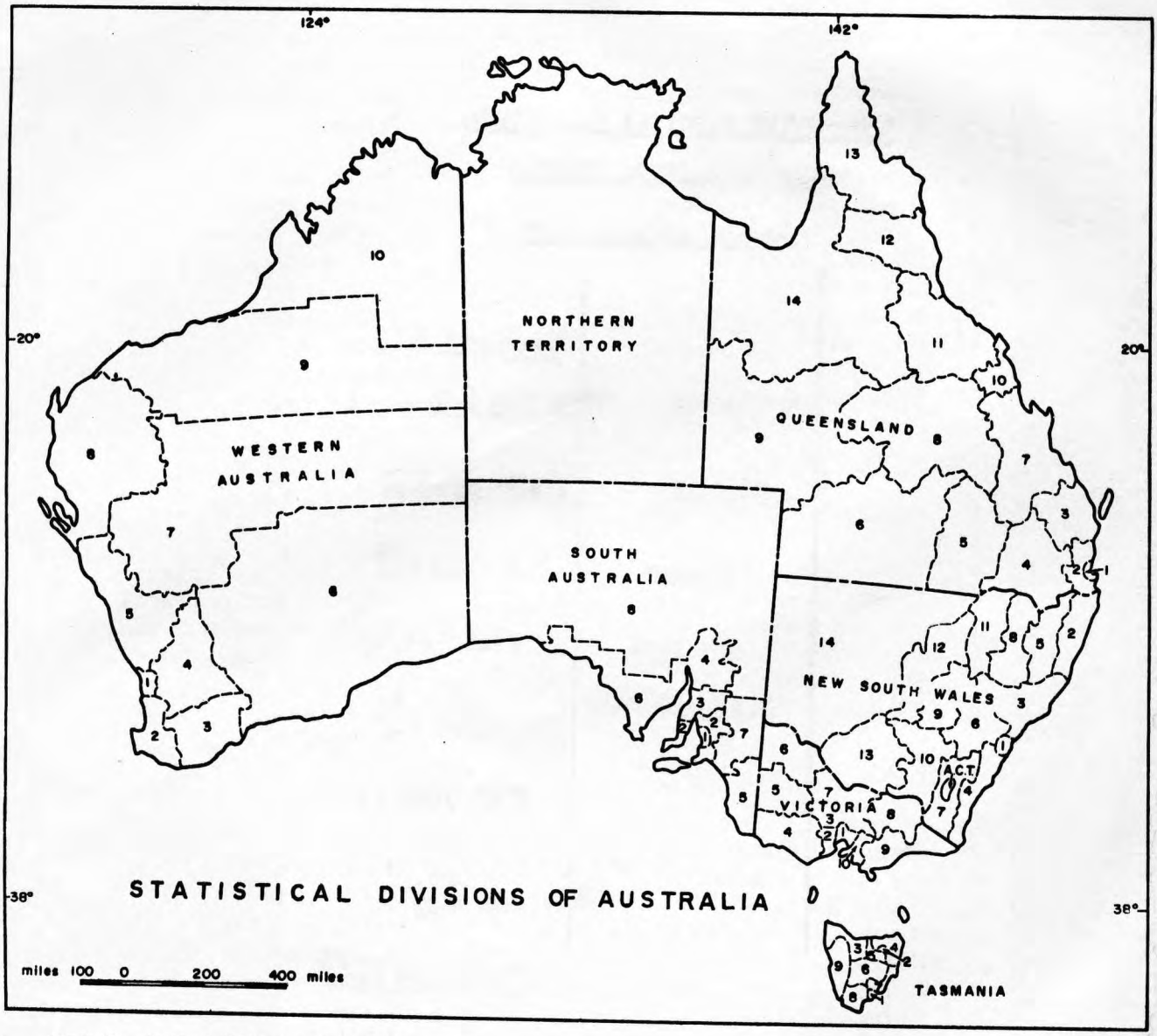
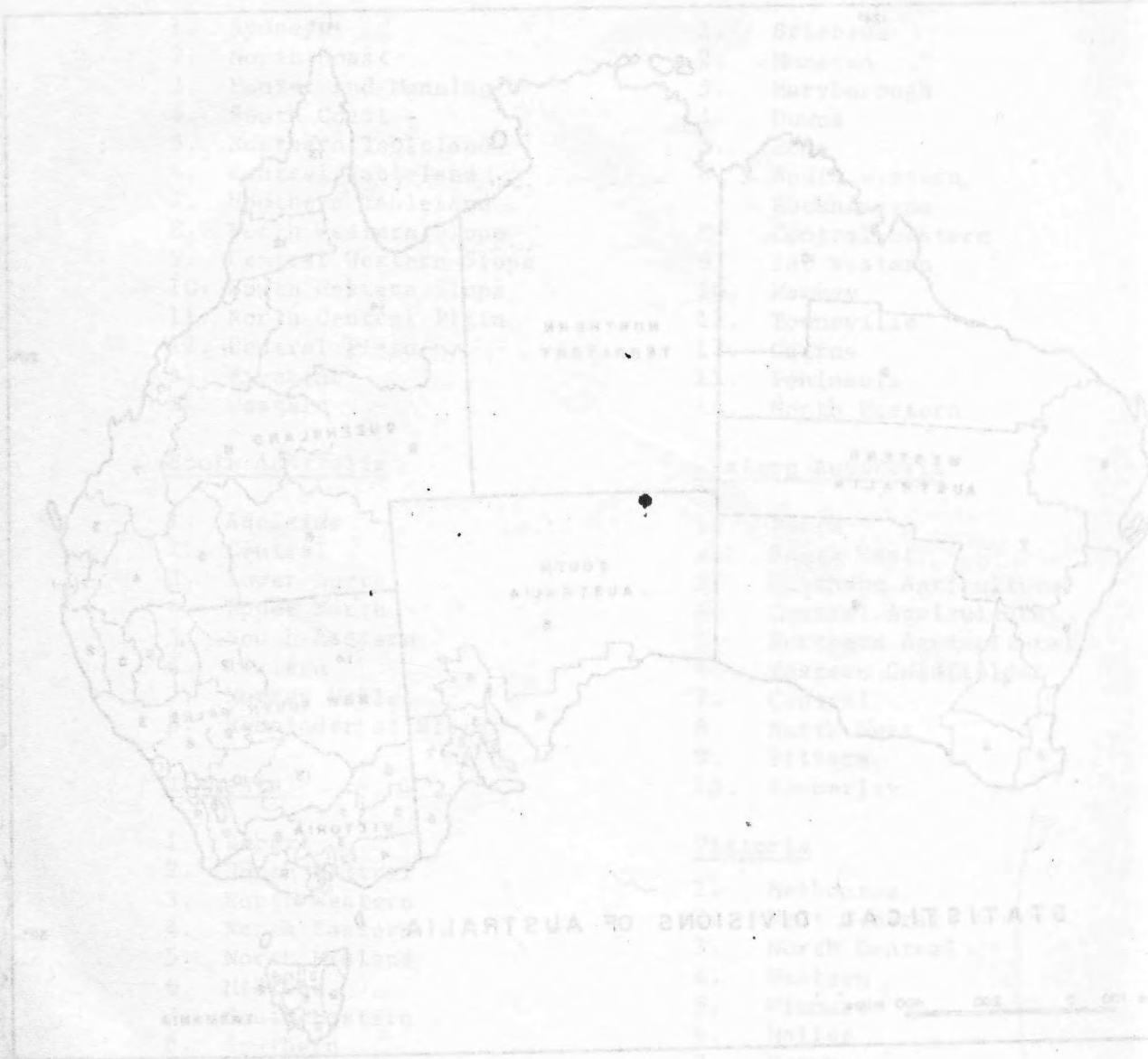


Figure 29. Statistical Divisions of Australia.



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DEPARTMENT OF GEOGRAPHY

(School of General Studies)

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