Bull. Org. mond. Santé
Bull. Wld Hlth Org. } 1957, **16**, 267-276

CANCER MORTALITY IN VARIOUS COUNTRIES

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SYNOPSIS

A statistical analysis by sexes was made of the deaths in 1950 and 1951 in eight countries (Australia, Canada, England and Wales, France, Israel, Japan, the Netherlands and the USA) from cancer in the following sites: buccal cavity and pharynx, digestive organs and peritoneum, respiratory system, breast (female), uterus, genital organs (male) and urinary organs. Comparisons between countries were made on the basis of age-adjusted and age-specific death rates. Substantial variations were found for the specific sites of the disease: they are presented in detail in the tables and graphs.

In a recent publication [1] the authors studied trends in cancer mortality in Canada for the period 1941-1953. The analysis included the deaths, by sexes, which had been assigned to nine of the major sites of cancer and leukaemia. The results of this study indicated that, during the period under review, significant changes had occurred in the numbers of deaths assigned to certain sites. These changes may be listed as follows:

(1) *Buccal cavity.* A significant decrease in mortality was noted in males but no significant change was found in females.

(2) *Stomach.* Significant decreases in mortality were found in each sex.

(3) *Respiratory system.* A significant increase in male mortality was revealed but no significant change in female mortality was found.

(4) *Urinary organs.* Male mortality showed a significant increase but no significant change in female mortality was noted.

(5) *Breast (female).* No significant change in mortality was found.

(6) *Uterus.* A significant decrease in mortality was found for deaths ascribed to cancer of the corpus and cervix uteri combined.

(7) *Leukaemia.* Significant increases in mortality for each sex were noted.

These findings prompted an interest in an investigation among various countries of the world, and this paper presents mortality rates for eight different countries. The data which have been used have been taken from

[1] Phillips, A. J. & Owchar, M. (1955) *Mortality trends in Canada for various sites of cancer*, Toronto

the *Annual Epidemiological and Vital Statistics* reports of the World Health Organization for the years 1950 and 1951. The coding of deaths in 1949 and earlier years is based upon the 1938 revision of the International Lists of Diseases and Causes of Death, and since the 1948/1949 revision brought about certain changes, especially in the field of cancer, it is inadvisable to combine directly the data based upon the two revisions. For this reason, only the years 1950 and 1951 have been considered. Such a limited period has made it impossible to calculate trends in cancer mortality but it is hoped that, as additional annual data become available, such a study will become possible.

The following countries have been included in the present study: Australia, Canada, England and Wales, France, Israel (Jewish population), Japan, the Netherlands and the USA. Deaths assigned to all sites of cancer and to the following specific sites have been analysed (International List numbers are shown):

Buccal cavity and pharynx (140-148), male and female
Digestive organs and peritoneum (150-159), male and female
Respiratory system (160-165), male and female
Breast (170), female only
Uterus (171-174)
Male genital organs (177-179)
Urinary organs (180-181), male and female.

For all sites of the disease the mortality rates for the various countries have been age-adjusted (standardized) to Canada's 1951 census population. The age-adjustment of the cancer mortality rates for the various countries permits direct comparisons to be made, since this procedure accounts for variations in the age structures of the respective populations.

The rates shown in Table I are the average of the rates calculated for the years 1950 and 1951, and it will be noted that, in so far as mortality from all sites of the disease is concerned, there is some variation between countries. In only one instance, Israel, is the female mortality rate higher than the male. For specific sites of cancer, shown in Tables II and III, the variation between countries becomes more pronounced. This has been shown graphically in Fig. 1–6. For example, the high male mortality rate in Japan for cancer of the digestive organs (Fig. 1) is in direct contrast to the relatively low mortality rates in this country for male genital cancer (Fig. 3) and urinary cancer (Fig. 4). The variation in male mortality for cancer of the respiratory system is shown in Fig. 2 where the highest rate occurred in England and Wales and the lowest in Japan. Fig. 5 and 6 illustrate the analyses of female mortality from cancer of the breast and uterus. The relative absence of deaths from breast cancer among Japanese women, and the low mortality rate in Israel for cancer of the uterus, may be noted.

TABLE I. AGE-ADJUSTED CANCER * MORTALITY RATES PER 100 000 FOR VARIOUS COUNTRIES: AVERAGE 1950-1951

Country	Male	Female
Canada	120.9	116.1
Japan	113.1	91.1
France	137.8	103.0
Netherlands	144.4	129.5
England and Wales	163.4	117.8
USA	124.5	113.1
Israel	101.9	113.6
Australia	120.3	100.8

*** Includes International List numbers 140-199, excludes lymphatic and haematopoietic tissues (200-205)**

TABLE II. AGE-ADJUSTED CANCER MORTALITY RATES PER 100 000 IN MALES BY SITES FOR VARIOUS COUNTRIES: AVERAGE 1950-1951

Country	Buccal	Digestive system	Respiratory system	Genital system	Urinary system
Canada	5.2	64.4	17.9	13.6	8.4
Japan	1.5	98.2	6.0	0.9	1.6
France	5.2	76.2	21.6	10.2	4.5
Netherlands	2.2	79.6	27.9	14.3	5.9
England and Wales	6.1	79.1	45.5	13.4	9.0
USA	5.0	57.1	22.2	16.0	8.4
Israel	1.0	58.1	17.2	7.3	7.8
Australia	4.8	63.0	17.6	16.2	6.5

TABLE III. AGE-ADJUSTED CANCER MORTALITY RATES PER 100 000 IN FEMALES BY SITES FOR VARIOUS COUNTRIES: AVERAGE 1950-1951

Country	Buccal	Digestive system	Respiratory system	Breast	Uterus	Urinary system
Canada	1.2	50.6	4.1	22.8	15.7	4.4
Japan	0.7	54.9	2.6	4.0	23.4	0.9
France	0.6	48.1	4.1	13.1	13.1	2.0
Netherlands	0.8	67.4	4.3	24.0	11.7	3.4
England and Wales	1.8	52.7	7.2	23.9	12.3	3.4
USA	1.2	42.6	4.6	21.8	18.2	4.0
Israel	0.3	54.8	6.5	14.7	8.8	3.7
Australia	1.3	45.2	3.7	20.0	11.6	3.0

FIG. 1. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE DIGESTIVE ORGANS IN MALES IN VARIOUS COUNTRIES

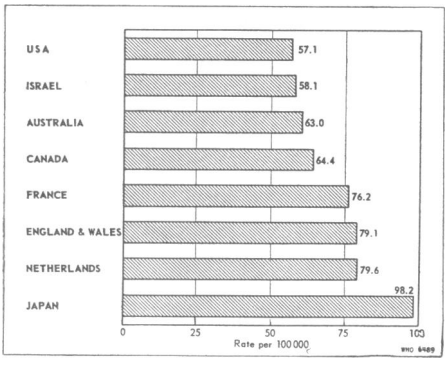


FIG. 2. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE RESPIRATORY SYSTEM IN MALES IN VARIOUS COUNTRIES

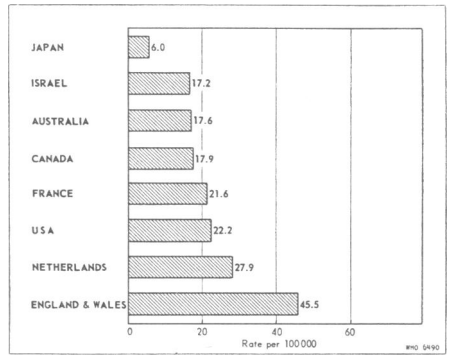


FIG. 3. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE GENITAL ORGANS IN MALES IN VARIOUS COUNTRIES

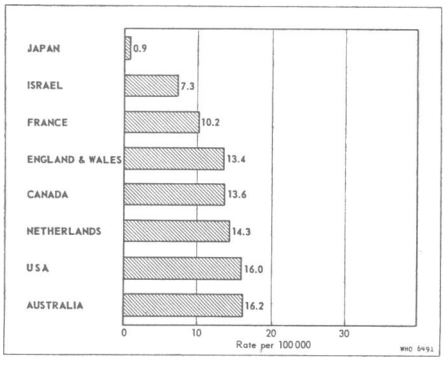


FIG. 4. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE URINARY ORGANS IN MALES IN VARIOUS COUNTRIES

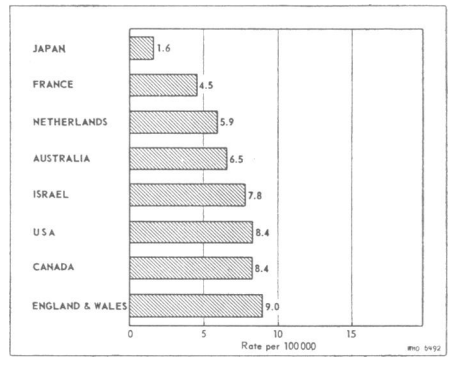


FIG. 5. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE BREAST IN FEMALES IN VARIOUS COUNTRIES

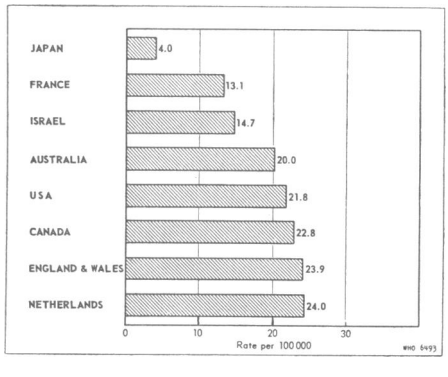


FIG. 6. AGE-ADJUSTED MORTALITY RATES FOR CANCER OF THE UTERUS IN VARIOUS COUNTRIES

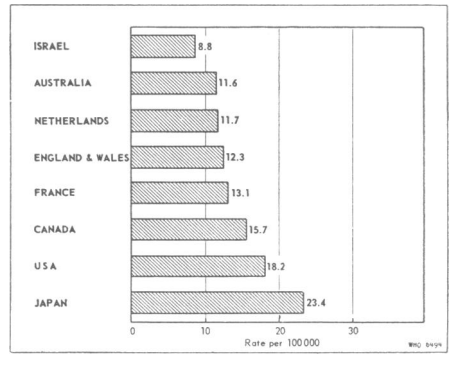


TABLE IV. AGE-SPECIFIC DEATH RATES PER 100 000 FROM CANCER OF THE DIGESTIVE ORGANS IN MALES IN VARIOUS COUNTRIES: AVERAGE 1950-1951

Age (years)	Canada	Japan	France	Nether-lands	England and Wales	USA	Israel	Australia
—25	0.5	0.5	0.6	0.5	0.6	0.6	0.2	0.5
25-	2.6	3.9	2.1	3.2	3.0	2.4	1.9	2.3
30-	4.1	10.8	3.5	5.4	5.9	4.6	5.6	5.9
35-	10.0	22.7	9.6	12.1	13.7	9.9	9.7	10.6
40-	21.5	50.3	23.8	21.1	28.1	19.7	12.9	17.3
45-	48.0	100.8	57.4	45.6	57.4	41.1	33.2	35.6
50-	73.8	179.8	114.2	84.0	98.6	79.1	73.0	73.1
55-	139.6	307.1	186.0	145.9	171.5	137.4	119.9	133.5
60-	233.3	459.0	288.2	255.1	279.5	216.6	222.3	216.6
65-	365.8	625.5	458.7	428.4	438.4	319.3	358.6	350.2
70-	507.1	616.9	627.9	686.8	669.2	441.2	482.1	521.4
75	770.0	—	756.7	1102.4	908.2	625.3	692.9	798.5

TABLE V. AGE-SPECIFIC DEATH RATES PER 100 000 FROM CANCER OF THE DIGESTIVE ORGANS IN FEMALES IN VARIOUS COUNTRIES: AVERAGE 1950-1951

Age (years)	Canada	Japan	France	Nether-lands	England and Wales	USA	Israel	Australia
—25	0.4	0.5	0.5	0.3	0.4	0.4	0.2	0.4
25-	1.7	4.9	1.6	3.2	2.7	2.0	2.1	2.9
30-	5.7	11.9	3.2	5.4	5.2	4.8	4.7	4.9
35-	11.0	22.5	9.5	11.9	11.8	9.3	12.3	9.8
40-	22.9	41.6	17.1	19.4	20.1	18.8	14.9	19.9
45-	41.6	66.4	34.9	41.3	37.3	34.0	26.6	26.2
50-	68.8	105.7	57.8	72.0	64.6	60.6	67.1	54.5
55-	109.1	163.0	105.0	126.3	105.1	99.2	100.7	85.2
60-	165.3	238.0	172.5	197.8	172.6	154.3	150.2	131.2
65-	253.9	326.1	269.1	354.0	273.4	210.0	306.8	238.3
70-	393.7	343.9	389.4	538.0	416.9	312.0	505.5	361.4
75	623.9	—	567.8	972.6	679.0	512.6	720.9	612.2

TABLE VI. AGE-SPECIFIC DEATH RATES PER 100 000 FROM CANCER OF THE RESPIRATORY SYSTEM IN MALES IN VARIOUS COUNTRIES: AVERAGE 1950-1951

Age (years)	Canada	Japan	France	Nether-lands	England and Wales	USA	Israel	Australia
—25	0.3	0.1	0.4	0.2	0.3	0.2	—	0.2
25-	0.3	0.5	0.9	0.8	1.9	0.8	0.9	0.2
30-	1.4	0.4	1.4	1.8	3.7	1.7	2.3	1.2
35-	3.6	1.6	3.8	6.3	10.5	4.7	1.0	1.8
40-	7.0	3.1	11.0	17.9	25.1	11.7	5.9	6.8
45-	19.5	5.7	31.9	34.9	61.7	27.8	10.4	15.8
50-	39.4	11.7	61.5	72.6	119.1	54.1	36.2	39.8
55-	62.4	20.7	90.5	108.9	177.4	83.9	50.1	61.9
60-	87.9	28.3	101.3	131.4	231.9	112.7	61.1	88.6
65-	115.0	43.7	110.5	140.8	256.2	122.0	131.4	115.5
70-	100.9	38.3	111.6	160.7	236.4	122.6	119.1	118.4
75	91.5	—	91.1	136.5	176.0	104.1	141.7	88.4

TABLE VII. AGE-SPECIFIC DEATH RATES PER 100 000 FROM CANCER OF THE BREAST IN FEMALES IN VARIOUS COUNTRIES: AVERAGE 1950-1951

Age (years)	Canada	Japan	France	Nether-lands	England and Wales	USA	Israel	Australia
—25	0.1	—	0.2	—	0.1	0.8	—	0.1
25-	1.5	0.5	0.7	2.1	1.5	1.6	1.7	0.9
30-	5.7	1.8	2.7	5.1	4.9	6.0	4.8	4.4
35-	16.5	3.9	7.9	13.3	14.6	14.2	16.8	9.1
40-	28.7	6.8	14.3	25.7	29.0	27.2	31.9	21.9
45-	42.9	9.0	22.9	39.9	46.0	40.5	42.1	37.9
50-	54.7	11.0	31.4	56.1	56.9	52.3	26.5	47.3
55-	63.9	12.7	40.4	69.8	71.1	64.7	33.8	60.6
60-	78.4	14.3	45.6	90.0	85.0	77.2	49.0	67.6
65-	94.5	14.6	53.9	116.6	97.8	82.3	55.2	88.3
70-	113.8	15.7	65.0	128.7	115.4	105.0	53.8	102.5
75	147.8	—	97.7	157.8	168.1	151.9	71.2	146.7

TABLE VIII. AGE-SPECIFIC DEATH RATES PER 100 000 FROM CANCER OF THE UTERUS IN VARIOUS COUNTRIES: AVERAGE 1950-1951

Age (years)	Canada	Japan	France	Nether-lands	England and Wales	USA	Israel	Australia
-25	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2
25-	2.3	2.9	1.7	1.3	1.0	2.9	—	1.2
30-	6.5	8.5	4.5	3.5	3.7	6.9	3.6	3.3
35-	11.7	22.6	9.3	5.9	6.0	14.7	2.8	5.9
40-	20.1	41.3	15.9	11.9	12.1	24.8	3.2	11.6
45-	34.1	63.9	25.2	18.5	19.9	35.9	11.3	17.7
50-	36.8	74.1	33.2	33.0	31.4	44.9	10.2	30.1
55-	46.5	78.4	42.4	34.8	45.5	54.6	26.9	35.5
60-	55.3	84.0	49.3	44.0	49.2	64.4	35.1	45.0
65-	56.6	83.9	55.1	46.8	55.7	70.2	60.4	53.6
70-	72.3	61.7	62.4	63.9	58.6	80.0	69.0	58.7
75	92.6	—	62.2	73.0	70.1	99.1	53.4	73.2

In order to investigate further the variations in the sites of cancer among countries, certain sites have been selected for special study. These are: digestive organs (male and female), respiratory system (male), breast (female) and uterus. For these the age-specific death rates have been calculated as shown in Tables IV-VIII. Once again the rates shown are the average of two years, 1950 and 1951. Fig. 7–10 illustrate the results of these analyses.

Table IV shows that the higher male mortality rate in Japan for cancer of the digestive organs begins to appear in the 30- to 34-year age group and continues to 70 years of age. This is illustrated in Fig. 7, together with the experience in the other countries. For females, Table V shows that the death rates in Japan are again higher over the same age range. Table VI presents the male age-specific death rates for cancer of the respiratory system, and shows that the highest rate exists in England and Wales while the lowest rate is in Japan. Fig. 8 illustrates the results of the analyses for this site. In mortality from cancer of the breast (see Table VII and Fig. 9), the rates in Japan are much below other countries, and there appears to be a lower mortality trend in Israel and France also. The lowest mortality rate for cancer of the uterus appears in Israel, as is shown in Table VIII and Fig. 10. This is probably to be expected, since deaths from cancer of the cervix uteri are included and such deaths are relatively rare in a Jewish population. The rates for Japan appear to increase more rapidly with age than in other countries.

FIG. 7. AGE-SPECIFIC MORTALITY RATES FOR CANCER OF THE DIGESTIVE ORGANS IN MALES IN VARIOUS COUNTRIES

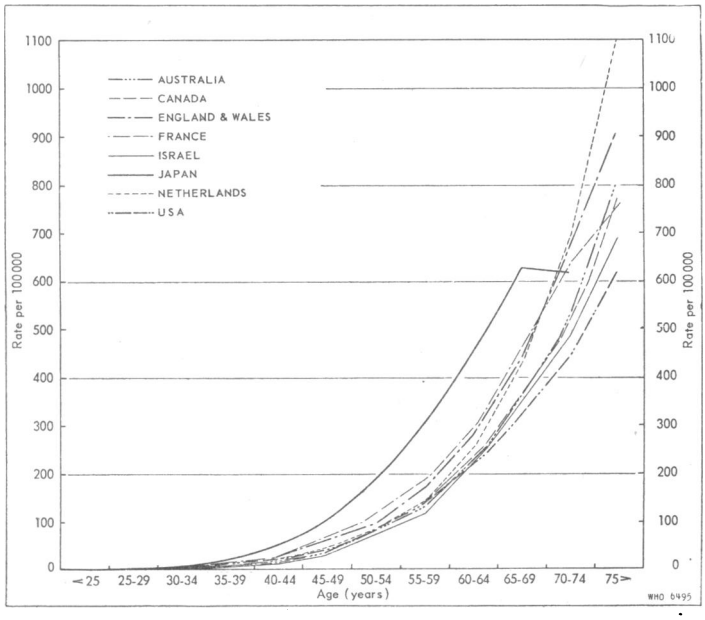


FIG. 8. AGE-SPECIFIC MORTALITY RATES FOR CANCER OF THE RESPIRATORY SYSTEM IN MALES IN VARIOUS COUNTRIES

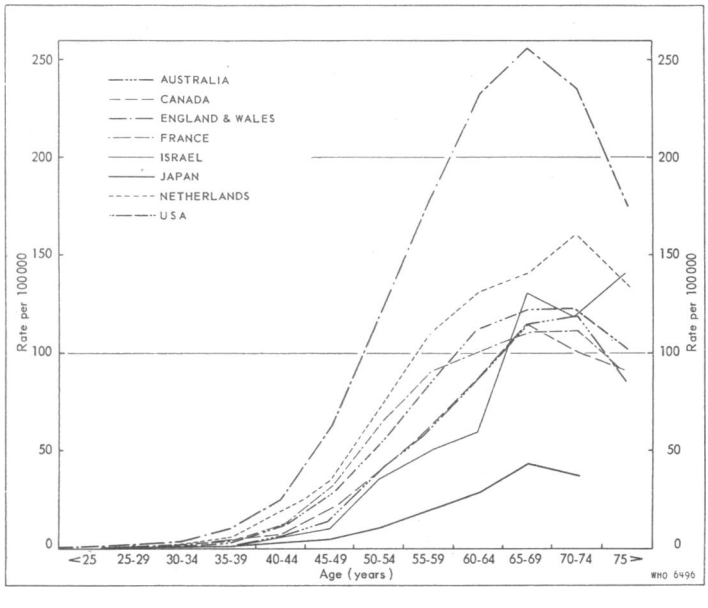


FIG. 9. AGE-SPECIFIC MORTALITY RATES FOR CANCER OF THE BREAST IN FEMALES IN VARIOUS COUNTRIES

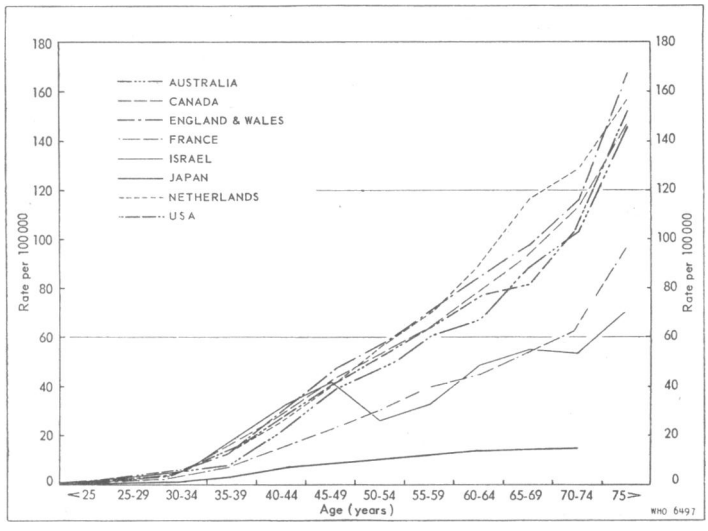
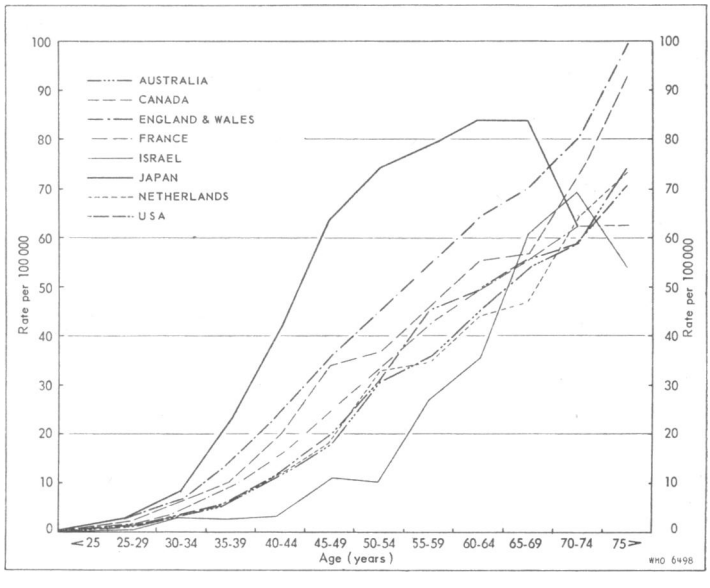


FIG. 10. AGE-SPECIFIC MORTALITY RATES FOR CANCER OF THE UTERUS IN VARIOUS COUNTRIES



ACKNOWLEDGEMENTS

The authors wish to acknowledge the assistance of Mrs Olga Brockhausen of the Manitoba Cancer Relief and Research Institute, Winnipeg, Canada, in the preparation of the graphs.

RÉSUMÉ

Les auteurs présentent les résultats de l'analyse statistique de la mortalité par tumeurs malignes dans huit pays (Angleterre et Pays de Galles, Australie, Canada, Etats-Unis d'Amérique, France, Israël, Japon, Pays-Bas), d'après les données parues dans les *Statistiques épidémiologiques et démographiques annuelles* publiées par l'OMS, pour 1950 et 1951. L'analyse porte sur les rubriques suivantes : Tumeurs malignes de la cavité buccale et du pharynx, homme et femme — Tumeurs malignes de l'appareil digestif et du péritoine, homme et femme — Tumeurs malignes de l'appareil respiratoire, homme et femme — Tumeur maligne du sein, femme — Tumeur maligne du col utérin — Tumeur maligne d'organes génitaux de l'homme — Tumeur maligne du rein, de la vessie et d'autres organes urinaires, homme et femme.

La comparaison entre pays a été faite sur la base des taux de mortalité spécifique pour l'âge et des taux standardisés par rapport au recensement de la population canadienne pour 1951. Diverses localisations ont été choisies pour une analyse plus poussée : appareil digestif, homme et femme; appareil respiratoire, homme; sein et utérus, femme. L'examen des tableaux et graphiques dans lesquels sont résumées ces données indique de grandes différences entre les pays. C'est ainsi, par exemple, que chez les Japonais, on relève un taux particulièrement élevé de décès par tumeur de l'appareil digestif, et, en revanche, un taux très faible de décès par tumeur des organes génitaux et urinaires. On trouve également parmi eux, le taux de décès le plus faible de tous les pays considérés dans cette étude, par tumeur de l'appareil respiratoire; le taux le plus élevé pour cette dernière localisation s'observe en Angleterre et Pays de Galles. On remarque également le taux très faible de décès par tumeur du sein chez les Japonaises et par tumeur de l'utérus chez les Israéliennes.