

2. Processing and presentation of the data

Processing of the data

The data used to create the tables presented in this book were generally submitted as listings of individual anonymous cases with the following variables (minimum):

1. a registration number which identifies the patient or the case
2. sex
3. ethnic group or race (optional)
4. age
5. date of incidence
6. site of the tumour
7. morphology of the tumour
8. behaviour of the tumour
9. basis of diagnosis

The processing of such data followed a regular procedure established in the Unit of Descriptive Epidemiology of IARC that is described in more detail in the *Cancer Incidence in Five Continents* series (Parkin *et al.*, 1997, 2002). When necessary, the data-sets were first converted into a full ICD-O-2 coding schema, then passed through the IARC-CHECK program (Parkin *et al.*, 1994) for verification. After validation, the records were converted to ICD-10 for presentation purposes. It should be noted that many cancer registries in Africa used the Canreg system, a software program developed at IARC and designed for population-based cancer registries. The data entry module of Canreg is based on the ICD-O-2 coding schema, and incorporates the same edits as those performed by the IARC-CHECK program, so that many data-sets had already been checked before submission. This simplified and speeded up the data validation process.

Presentation of the data

The largest set of tables in this book presents data on age-specific and age-standardized incidence, either by population (cancer registry) or as summary tables by cancer site.

Tables of incidence by registry

Population-at-risk: Whenever possible, registries were asked to provide data on population at risk by sex and age for as many years as possible, so that an accurate denominator corresponding to the period of the incident cases (person-years at risk) could be calculated. For those registries able to supply this information, the annual average population during the period covered appears at the foot of the table.

The age-specific incidence table: The numbers given in the body of the tables are the number of cancer cases registered during the corresponding period by sex, site and age-group. An example is given in Table 1. The column headings are defined as below:

SITE: A shortened version of the full ICD-10 title describing each site or site grouping.

ALL AGES: The total number of cases by site and for all sites.

AGE UNK: The number of cases of unknown age. They are included in the total number of cases and in the calculation of the crude rate. They are also taken into account in the computation of the world age-standardized and cumulative incidence rates.

MV (%): This is the proportion of cases known to be diagnosed by a microscopic method (either histology or cytology) and expressed as a percentage of all cases registered, including cases of unknown age or of unknown basis of diagnosis.

0-, 15-, , , 65+: The number of cancer cases registered by age-groups.

CRUDE RATE: The crude average annual incidence rate, calculated by dividing the total number of cases (including unknown age) by the corresponding population at risk (all males or all females) and expressed per 100 000 person-years.

%: The proportional frequency of each site to the total of all sites excluding C44 (other skin).

CR64: The cumulative incidence rate up to age 64 years. This is the sum over each year of age of the age-specific incidence rates, taken from birth to age 64. The cumulative rates are computed using five-year age-bands 0-, 5-, 10-, ..., 64-, 65+, and have been adjusted to account for cases of unknown age (Parkin *et al.*, 1997).

ASR (W): The world age-standardized incidence rate. It is calculated by the direct method, using the world standard population and five-year age-bands 0-, 5-, 10-, ..., 64-, 65+, and has been adjusted to account for cases of unknown age (Parkin *et al.*, 1997). Note that the result would be slightly different if the ASR were calculated using the data presented in the table by 10-year age bands.

ICD-10: The ICD-10 code(s) corresponding to the site or group of sites given in the left-hand column.

Average annual population: If the user wishes to calculate the annual incidence rate per 100 000 for a particular age group, cancer site and sex, the number of cancer cases should be divided by the average annual population and the number of years for which the data are presented, then multiplied by 100 000.

For those registries that did not supply information on population at risk, a simplified version of the table, without summary rates, is presented.

Childhood table: Whenever possible (notably if sufficient cases were recorded), data on childhood cancer are presented by registry. The layout of the table follows that used in International Incidence of Childhood Cancer Vol. II (Parkin *et al.*, 1998) with a limited number of cancer types defined by the *International Classification of Childhood Cancer* (Kramarova *et al.*, 1996). The data are presented for the three age-group (0–4, 5–9, 10–14 years) and for both sexes combined only. An example is given in Table 2. The column headings are defined as below:

NUMBER OF CASES: The number of cases by age-group and the total age 0–14 years.

M/F: The ratio of the number of cases in males to that in females.

Overall REL. FREQ.(%): The percentage contribution of each cancer type (or group) to the total case series.

Table 1. Elsewhere (1995-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - MALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	142	1	97	4	2	5	10	20	40	60	1.2	2.0	0.11	1.9	C00-06
Salivary gland	30	3	97	-	2	4	4	5	3	9	0.3	0.4	0.02	0.4	C07-08
Nasopharynx	416	6	97	15	73	67	62	81	69	43	3.5	5.9	0.35	4.4	C11
Other pharynx	111	1	95	1	1	3	9	16	40	40	0.9	1.6	0.11	1.5	C09-10,C12-14
Oesophagus	63	0	75	-	-	2	7	8	17	29	0.5	0.9	0.05	0.8	C15
Stomach	465	7	90	2	11	19	54	91	107	174	3.9	6.6	0.38	6.1	C16
Colon, rectum and anus	495	10	89	1	13	58	77	82	106	148	4.2	7.0	0.40	6.2	C18-21
Liver	65	2	55	3	-	1	5	4	18	32	0.6	0.9	0.05	0.9	C22
Gallbladder etc.	115	4	70	-	-	2	5	11	34	59	1.0	1.6	0.09	1.6	C23-24
Pancreas	76	0	54	-	1	1	9	10	16	39	0.6	1.1	0.05	1.0	C25
Larynx	332	9	94	2	1	3	17	59	99	142	2.8	4.7	0.28	4.6	C32
Trachea, bronchus and lung	1252	48	85	-	2	22	87	207	398	488	10.6	17.8	1.12	17.3	C33-34
Bone	162	2	85	34	48	16	20	4	18	20	1.4	2.3	0.09	1.5	C40-41
Melanoma of skin	34	2	100	1	1	3	4	6	8	9	0.3	0.5	0.03	0.4	C43
Other skin	504	19	98	6	8	14	46	67	117	227	4.3	0.36	6.8	C44	
Mesothelioma	26	1	100	-	-	1	6	4	8	6	0.2	0.4	0.03	0.3	C45
Kaposi sarcoma	21	0	100	-	-	3	-	2	4	12	0.2	0.3	0.01	0.3	C46
Peripheral nerves	6	0	100	4	1	-	-	-	1	-	0.1	0.1	0.00	0.1	C47
Connective and soft tissue	101	1	90	21	11	10	16	8	17	17	0.9	1.4	0.07	1.1	C49
Breast	51	1	94	-	-	2	6	12	12	18	0.4	0.7	0.04	0.7	C50
Penis	1	0	100	-	-	-	-	-	-	1	0.0	0.0	0.00	0.0	C60
Prostate	385	31	92	1	-	2	5	16	70	260	3.3	5.5	0.17	5.5	C61
Testis	54	1	87	3	10	11	16	6	2	5	0.5	0.8	0.04	0.5	C62
Kidney	76	2	89	27	1	2	3	11	17	13	0.6	1.1	0.06	0.9	C64
Renal pelvis, ureter and other urinary	35	4	80	-	1	3	1	3	12	11	0.3	0.5	0.03	0.5	C65-66,C68
Bladder	649	56	87	3	6	18	32	71	185	278	5.5	9.2	0.51	8.9	C67
Eye	44	1	95	25	1	-	3	4	1	9	0.4	0.6	0.02	0.5	C69
Brain, nervous system	214	3	79	54	16	28	33	28	23	29	1.8	3.0	0.15	2.2	C70-72
Thyroid	77	1	92	1	9	9	15	12	12	18	0.7	1.1	0.06	0.9	C73
Hodgkin disease	163	2	100	39	33	35	19	16	11	8	1.4	2.3	0.10	1.4	C81
Non-Hodgkin lymphoma	422	5	100	85	44	41	60	47	76	64	3.6	6.0	0.32	4.5	C82-85,C96
Multiple myeloma	56	0	98	-	3	1	7	7	18	20	0.5	0.8	0.05	0.7	C90
Lymphoid leukaemia	153	1	96	75	9	5	10	9	17	27	1.3	2.2	0.08	1.5	C91
Myeloid leukaemia	97	1	99	22	8	11	16	13	7	19	0.8	1.4	0.06	1.0	C92-94
Leukaemia, unspecified	34	1	97	11	3	5	4	3	2	5	0.3	0.5	0.02	0.3	C95
Other and unspecified	622	21	79	55	34	51	64	97	133	167	5.3	8.8	0.50	7.6	O&U
All sites	7549	247	89	495	353	458	732	1040	1718	2506	63.9		5.82	94.6	ALL
All sites but C44	7045	228	88	489	345	444	686	973	1601	2279	59.7	100.0	5.45	87.8	ALLbC44
Average annual population				1036708	655833	489168	303293	201329	141181	123886					

Table 1. Elsewhere (1995-1998)

NUMBER OF CASES BY AGE GROUP AND SUMMARY RATES OF INCIDENCE - FEMALE

SITE	ALL AGES	AGE UNK	MV (%)	0-	15-	25-	35-	45-	55-	65+	CRUDE RATE	%	CR 64	ASR (W)	ICD (10th)
Mouth	64	0	97	1	1	1	10	12	14	25	0.5	0.8	0.05	0.8	C00-06
Salivary gland	24	1	88	1	1	2	5	7	2	5	0.2	0.3	0.02	0.3	C07-08
Nasopharynx	188	3	93	17	22	34	32	28	35	17	1.6	2.4	0.16	1.9	C11
Other pharynx	26	0	88	1	-	-	3	6	8	8	0.2	0.3	0.02	0.3	C09-10,C12-14
Oesophagus	33	0	79	-	1	1	4	2	7	18	0.3	0.4	0.02	0.4	C15
Stomach	284	4	87	1	4	28	46	50	70	81	2.4	3.7	0.24	3.4	C16
Colon, rectum and anus	463	20	92	1	20	46	81	69	100	126	3.9	6.0	0.37	5.4	C18-21
Liver	82	3	63	-	2	1	7	13	24	32	0.7	1.1	0.07	1.1	C22
Gallbladder etc.	491	6	84	1	1	9	60	98	148	168	4.2	6.4	0.44	6.3	C23-24
Pancreas	82	4	57	-	1	1	8	11	20	37	0.7	1.1	0.06	1.1	C25
Larynx	23	1	83	-	-	2	1	3	6	10	0.2	0.3	0.02	0.3	C32
Trachea, bronchus and lung	154	6	86	-	1	3	14	18	44	68	1.3	2.0	0.12	2.0	C33-34
Bone	125	3	88	32	34	10	16	9	10	11	1.1	1.6	0.07	1.1	C40-41
Melanoma of skin	38	1	100	2	1	2	3	8	8	13	0.3	0.5	0.03	0.5	C43
Other skin	270	10	95	5	12	15	18	40	53	117	2.3	-	0.18	3.3	C44
Mesothelioma	8	0	100	-	-	2	2	-	2	2	0.1	0.1	0.01	0.1	C45
Kaposi sarcoma	7	0	86	-	-	-	-	-	4	3	0.1	0.1	0.01	0.1	C46
Peripheral nerves	5	0	100	1	1	-	1	-	-	-	0.0	0.1	0.00	0.0	C47
Connective and soft tissue	87	2	94	8	16	20	12	9	6	14	0.7	1.1	0.05	0.8	C49
Breast	1995	35	96	-	7	199	600	540	360	254	17.0	25.9	1.90	23.1	C50
Vulva	12	0	83	-	-	-	2	3	4	3	0.1	0.2	0.01	0.2	C51
Vagina	18	0	89	1	-	2	1	4	6	4	0.2	0.2	0.02	0.2	C52
Cervix uteri	1146	26	96	-	4	46	220	336	321	193	9.8	14.9	1.19	14.2	C53
Uterus	213	7	96	-	3	7	29	42	61	64	1.8	2.8	0.19	2.7	C54-55
Ovary	200	5	95	3	12	27	36	49	38	30	1.7	2.6	0.18	2.3	C56
Placenta	0	0	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.0	C58
Kidney	79	2	91	39	-	3	8	7	12	8	0.7	1.0	0.05	0.8	C64
Renal pelvis, ureter and other urinary	40	1	78	-	4	4	5	7	10	9	0.3	0.5	0.03	0.5	C65-66,C68
Bladder	109	8	82	-	-	-	6	11	32	52	0.9	1.4	0.08	1.5	C67
Eye	37	1	92	20	1	-	1	2	5	7	0.3	0.5	0.02	0.4	C69
Brain, nervous system	118	3	86	25	14	17	16	17	18	8	1.0	1.5	0.09	1.2	C70-72
Thyroid	321	11	94	2	36	59	50	65	49	49	2.7	4.2	0.26	3.4	C73
Hodgkin disease	92	0	100	19	22	19	13	7	6	6	0.8	1.2	0.05	0.8	C81
Non-Hodgkin lymphoma	283	4	100	38	32	36	38	31	54	50	2.4	3.7	0.21	3.0	C82-85,C96
Multiple myeloma	49	0	100	-	1	2	8	7	9	22	0.4	0.6	0.03	0.6	C90
Lymphoid leukaemia	76	0	99	42	6	4	6	1	5	12	0.6	1.0	0.04	0.7	C91
Myeloid leukaemia	94	0	98	13	8	22	9	13	19	10	0.8	1.2	0.08	1.0	C92-94
Leukaemia, unspecified	25	0	96	8	1	2	1	3	6	4	0.2	0.3	0.02	0.3	C95
Other and unspecified	601	16	81	39	30	51	76	116	115	158	5.1	7.8	0.47	7.0	O&U
All sites	7962	183	92	320	299	679	1448	1644	1691	1698	67.8	-	6.86	93.0	ALL
All sites but C44	7692	173	92	315	287	664	1430	1604	1638	1581	65.5	100.0	6.68	89.6	ALLbC44
Average annual population				1002804	643707	482465	313292	214201	144816	132591					

Processing and presentation of the data

RATES PER MILLION: The age-specific and crude incidence rates are calculated by dividing the number of cases of a specified age-group by the corresponding population at risk (both sexes combined) and expressed per million person-years. The ASR (see above) is the truncated age-standardized rate for the age range 0–14 years, again using the direct method and expressed per million person-years.

MV (%): See definition above.

Summary tables

Summary rates: The tables which appear in the section of the volume reviewing results for specific cancers present the summary incidence rates (crude, world age-standardized and cumulative), by sex and tumour type. There is a table for each site or grouping of sites presented in the age-specific tables. A summary table presents data for the African cancer registries that provided data on population at risk together with non-African populations extracted from *Cancer Incidence in Five Continents Vol. VIII* (Parkin *et al.*, 2002) for comparison purposes. The cancer registries are grouped by geographical area. Results from registries which are pathology-based are italicized, since they represent only minimum estimates of incidence.

Similar tables for childhood cancers accompany the chapter on childhood cancer. They present the crude and age-standardized rates by sex and for both sexes combined (expressed per million person-years), the total number of cases and the sex ratio (M/F).

For minor sites for which there is no chapter, data on summary rates are available on the CD-ROM (see below).

Percentage distribution of microscopically verified cases by histological type: These tables show the frequency of different histological subtypes within the total of microscopically verified (see the definition of MV (%) above) cases for nine tumour types. These tumour types and their associated histological sub-groups are fully described in *Cancer Incidence in Five Continents Vol. VII* (Parkin *et al.*, 1997). The information is presented for those African cancer registries that provided data originally coded to ICD-O, and for both sexes combined. The total number of registrations at the site is also printed to indicate the proportion of cases with microscopic verification.

CD-ROM

The CD-ROM that comes with this book contains a Windows™-based program called **CinA** to analyse the data contained in the present volume. With this software, users can examine the data with more flexibility and greater detail than in the printed tables. The data are stored in the traditional form of number of cases by sex and five-year age-groups (0-, 5-, ..., 64-, 65+). The standard three-digit ICD-10 anatomical sites used in the book have been replaced by a set of 80 categories based on a combination of ICD-10 three- or four-digit site codes and, for three tumours, of ICD-O-2

morphological subtypes (Table 3). Users can also create their own groupings, both of registry populations and of diagnostic units, which are then retained in the database. Only African registries that supplied data on population at risk are included in the database, together with some non-African populations extracted from *Cancer Incidence in Five Continents Vol. VIII* for comparison purposes.

There is considerable flexibility too in defining the indices to be calculated; thus the usual summary rates (crude, cumulative, world age-standardized) can be calculated over any chosen age range. The software also performs some elementary statistical tests, e.g. for homogeneity, trend and significance of ratio of age-specific rates in two populations. Finally, the software has inbuilt graphic capabilities for displaying age-specific rates as line graphs and the summary indices as bar charts; both may be exported as bitmap or JPEG files to a suitable software for reproduction.

System requirements:

- A PC running Microsoft Windows™ 95/98/Me/NT/2000/XP
- Microsoft Windows™ NT/2000/XP recommended
- 64 Mb of RAM recommended
- 10 Mb hard-disk space required

Installation:

1. Insert the disk in your CD-drive.
2. Double-click the e:\setup.exe file (e being the letter that identifies your CD-ROM drive: change if necessary).
3. Follow the instructions on the screen.

The installation procedure copies the program and all the necessary data files (the so-called 'database') in a specific binary file so that **CinA** can run without the CD-ROM.

References

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Table 2. Childhood cancer, Elsewhere (1995-1998)

	NUMBER OF CASES				<i>M/F</i>	REL. FREQ.(%)	RATES PER MILLION					ASR	%MV
	0-4	5-9	10-14	All		Overall	0-4	5-9	10-14	Crude			
Leukaemia	49	69	53	171	<i>1.7</i>	21.0	18.6	25.3	19.0	21.0	20.9	98.3	
Acute lymphoid leukaemia	35	47	29	111	<i>1.8</i>	13.6	13.3	17.2	10.4	13.6	13.7	99.1	
Lymphoma	49	75	57	181	<i>2.2</i>	22.2	18.6	27.5	20.4	22.2	22.0	100.0	
Hodgkin Disease	9	29	20	58	<i>2.1</i>	7.1	3.4	10.6	7.2	7.1	6.8	100.0	
Burkitt lymphoma	0	1	2	3	<i>2.0</i>	0.4	-	0.4	0.7	0.4	0.3	100.0	
Central nervous system	13	28	24	65	<i>2.1</i>	8.0	4.9	10.3	8.6	8.0	7.7	83.1	
Neuroblastoma	25	20	8	53	<i>2.5</i>	6.5	9.5	7.3	2.9	6.5	6.9	98.1	
Retinoblastoma	29	10	1	40	<i>1.2</i>	4.9	11.0	3.7	0.4	4.9	5.5	100.0	
Wilms tumour	35	20	8	63	<i>0.7</i>	7.7	13.3	7.3	2.9	7.7	8.3	96.8	
Bone tumour	5	16	45	66	<i>1.1</i>	8.1	1.9	5.9	16.1	8.1	7.3	90.9	
Connective tissue	7	10	12	29	<i>2.6</i>	3.6	2.7	3.7	4.3	3.6	3.5	86.2	
Kaposi sarcoma	0	0	0	0	-	-	-	-	-	-	-	-	
Germ cell tumours	9	2	2	13	<i>0.9</i>	1.6	3.4	0.7	0.7	1.6	1.8	100.0	
Other	34	37	63	134	<i>1.2</i>	16.4	12.9	13.6	22.6	16.4	15.9	81.3	
All	255	287	273	815	<i>1.5</i>	100.0	96.7	105.2	97.7	99.9	99.7	93.7	

Table 3. List of cancers available in the *CinA* program

01	All sites (C00–97)	41	Corpus uteri (C54)
02	All sites but skin (C00–97 but C44)	42	Uterus unspecified (C55)
03	Oral cavity and pharynx (C00–14)	43	Ovary (C56)
04	Mouth (C00–06)	44	Placenta (C58)
05	Lip (C00)	45	Male genital organs (C60–63)
06	Salivary glands (C07–08)	46	Penis (C60)
07	Nasopharynx (C11)	47	Prostate (C61)
08	Other pharynx (C09–10,C12–14)	48	Testis (C62)
09	Digestive organs (C15–26)	49	Urinary tract (C64–68)
10	Oesophagus (C15)	50	Kidney (C64)
11	Stomach (C16)	51	Bladder (C67)
12	Colon (C18)	52	Squamous cell carcinoma
13	Rectum, rectosigmoid junction and anus (C19–21)	53	Transitional cell and adenocarcinoma
14	Liver (C22)	54	Other specified morphology
15	Gallbladder (C23)	55	Unspecified morphology
16	Pancreas (C25)	56	Other urinary organs (C65–66, C68)
17	Respiratory organs (C30–39)	57	Eye, brain and central nervous system (C69–72)
18	Larynx (C32)	58	Eye (C69)
19	Trachea, bronchus and lung (C33–34)	59	Retinoblastoma
20	Bone (C40–41)	60	Squamous cell carcinoma of the conjunctiva
21	Bone of limbs (C40)	61	Brain, central nervous system (C70–72)
22	Other bones (C41)	62	Meninges (C70)
23	Skin (C43–44)	63	Brain (C71)
24	Melanoma of skin (C43)	64	Thyroid and other endocrine glands (C73–75)
25	Other skin (C44)	65	Thyroid (C73)
26	Mesothelial and soft tissues (C45–49)	66	Adrenal gland (C74)
27	Mesothelioma (C45)	67	Lymphoid tissues (C81–96)
28	Kaposi sarcoma (C46)	68	Non-Hodgkin lymphoma (C82–85,C96)
29	Peripheral nerves (C47)	69	Burkitt lymphoma (C83.7)
30	Peritoneum and retroperitoneum (C48)	70	Mycosis fungoides (C84.0)
31	Connective and soft tissue (C49)	71	Hodgkin disease (C81)
32	Breast (C50)	72	Immunoproliferative disease (C88)
33	Female genital organs (C51–58)	73	Multiple myeloma (C90)
34	Vulva (C51)	74	Leukaemia (C91–95)
35	Vagina (C52)	75	Lymphoid leukaemia (C91)
36	Cervix uteri (C53)	76	Myeloid leukaemia (C92–94)
37	Squamous cell carcinoma	77	Chronic myeloid leukaemia (C92.1, C93.1, C94.1)
38	Adenocarcinoma	78	Leukaemia, cell unspecified (C95)
39	Other specified morphology	79	Other and unspecified cancers (C80, C97)
40	Unspecified morphology		