# Chapter 10. Reporting of results

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The main objective of a cancer registry is to produce statistics on the occurrence of cancer in a defined population. Findings and conclusions must be documented in reports of various types for dissemination among users of registry data, so that tabulation, examination and interpretation of the collected information become important parts of a cancer registry's activities. Use of the data and their presentation in various types of report are fundamental in justifying the setting-up of a cancer registry.

Cancer registry information is typically communicated by means of cancer incidence reports, subject-oriented (special) reports, and articles in scientific journals. The different types of report thus range from tabular presentations of the data to more sophisticated analyses which generate and test hypotheses concerning, for example, cancer occurrence and results of treatment. The reporting of data from the cancer registry also indirectly contributes to improving the quality of the registration process itself, since it is a common experience that errors and inconsistencies in the registry's input operations come to light when the data are tabulated. This chapter briefly describes the types of report which typically emerge from a cancer registry, emphasizing aspects of tabular and graphical presentation of data.

## *The cancer incidence report*

The cancer incidence report represents the basic presentation of cancer registry data. It constitutes the key feedback product to reporting physicians, health authorities and the public on the occurrence of cancer. The cancer incidence report thus serves an important function as part of the health information system of a country or region. Furthermore, the tabular data contained in the incidence report are the basis for virtually any reporting of data from the cancer registry.

Before deciding on the contents of the incidence report, it is important to consider whether it will be produced annually, or be based on incidence information for several consecutive years. While the annual reporting of data gives a continuous feedback system, it must be realized that cancers of most sites in most registration areas are so rare that annual numbers will be heavily influenced by random fluctuations. It may therefore be preferable to report data only when numbers have accumulated over a period of, for example, three to five years, depending on the person-years accrued in

the population and the number of cancers, or to present grouped data for broader categories of sites. A further alternative is to supplement annual reports with a more detailed report every five years, which will provide more stable results, including figures on specific sites.

It is of the utmost importance to decide what information is to be communicated, and the format best suited to fulfil this purpose. The types of tables and their formats can then be designed; graphical presentations add variety and often prove a considerable aid to those who have difficulties in reading tables. In considering the format of the presentation it must be remembered that comparability is a key issue in cancer statistics and that cancer registration is a long-term operation. The format of data presentation should therefore be maintained for a long period of time and provide sufficient detail to allow easy comparisons with results from other registries. If the format has to be changed, information should be given to enable the reader to convert the figures published in previous reports.

The cancer incidence reports should contain the following parts which may be more or less elaborate depending on whether the report is annual or, for example, e.g., quinquennial:

(*a*) Background information
(*b*) Presentation and evaluation of results
(*c*) Tabular section

The report should provide background information to assist the reader in interpreting the results and facilitating comparisons with other registries. The data should be presented in a tabular section of the report. Finally the report may contain graphical material which highlights important messages from the tabulations.

## Background information

*Description of the registry and registration procedures*

An outline of the organization of the cancer registry should be given at least every few years with a reference to where this is to be found in other years. The professional staff of the registry should be listed with their specific fields of interest or responsibility, e.g., epidemiologist, statistician, oncologist.

A description of the registration procedure should include information on the sources of cases included in the registry and the reporting procedure being used (see Chapter 5). A list of reportable diseases should be given, although it could be abbreviated with reference, for example, to the International Classification of Diseases (ICD-9) (WHO, 1977). A brief description of the registration and coding procedures will assist the reader in evaluating the quality of the material presented.

A clear definition of the cancers included in the report should be given, since these may differ from the diseases reported to the registry. The definition should be limited to rubrics 140–209 and 230–239 of ICD-9 (WHO, 1977; see Chapter 7), although these will be usually specified in terms of the codes for topography and morphology of the International Classification of Diseases for Oncology (ICD-O) (WHO, 1976b). If a cancer registry uses a tumour classification which differs from the ICD, it should

include a table of the classification every few years. For certain sites, the registry may receive information on tumours for which there is some controversy as to whether they are to be regarded as cancer or not, and the report should clearly state whether such tumours are included in the tables or not. For example, it is difficult to distinguish benign papillomas (also called transitional cell carcinoma grade 0) of the urinary tract (ICD-O: M 8210/1) from invasive tumours of the bladder, and the World Health Organization recommends that all bladder neoplasms be considered together (Mostofi *et al.*, 1973). The general rule should be to tabulate the data in such a fashion as to allow the reader to remove controversial diagnoses from a tabulation, if desired.

A clear statement of the definitions used in reporting should be made, particularly when there is no generally accepted ruling. For instance, it should be clarified whether cancers detected from death certificates only and as incidental findings (e.g., at autopsy or screening) are included in the incidence tabulations, whether cytological diagnoses are included under microscopic confirmation, whether benign and undefined tumours of the nervous system are reported together with those diagnosed as malignant, whether bladder tumours include papillomas etc. The definition and handling of multiple primaries should be described in the incidence report.

Many registries receive reports and keep records of the various lesions which are recorded as premalignant or of doubtful malignancy. Such cases should not be included with the cancer tabulations since they fall outside the rubrics provided for malignant tumours in the ICD. When complete registration of such non-malignant conditions is achieved, they could be tabulated separately in the incidence report.

*Population covered by registration*

The incidence report should contain a definition and possibly a description of the geographical area covered by the registry.

When information is provided in the incidence report for subdivisions of the population, e.g., geographical regions within a country or ethnic groups, the source of the population at risk should be fully documented. When urban/rural rates are given, the definitions used for urban and rural areas must be specified.

It is essential to describe the origin of population denominator data, including references. A table should be included in the tabular section giving population data by the same age groups and other subdivisions used in the tabular presentation of the incidence data. In addition to such a table in the tabular section of the report, a graphical presentation in the form of a population pyramid may be helpful in the background part of the incidence report.

*Statistical terms*

A detailed description is given in Chapter 11 of the statistical methods most often used in cancer registries, including those used in the preparation of data for incidence reports. A brief section must be included in any cancer incidence report describing statistical terms and the standard population used for age-standardization. The World Standard Population (see Chapter 11) is now widely used for direct standardization. The universal use of this standard will enable the reader to make comparisons between data reported from different registries.

**Evaluation of findings**

The main objective of the periodic incidence report is the communication of results from the cancer registration process, and they should be presented in such a way as to allow the reader to draw his or her own conclusions as to their significance.

Information should be provided which will facilitate the reader's use of the data in the report. It should therefore give observations and precautions which seem evident to the registry but may not be easily appreciated by the reader, who does not have the intimate knowledge of the registration methods used.

A brief narrative should provide information on any subtle change in reporting or registration procedures which may have a bearing on validity of diagnosis and completeness of coverage. In reporting the cancer registration results, particular attention should be paid to the following.

(1) *Consistency of the number of cases in each calendar year.* It is common that new registries initially show an increasing number of cases, and it is wise to delay reporting of rates until numbers are stable. Sometimes, however, numbers fall in the second or third years of operation, suggesting that prevalent as well as incident cases were initially being notified and registered. Depending on the method of data collection, registries may find that the number of cases recorded in the last incidence year falls short of those in previous years. Too large a difference may indicate that publication is premature. A sudden, marked decrease in numbers may indicate a breakdown in reporting. Attention must be drawn to the existence of random fluctuations in the number of cases that may occur, especially for cancers of less common sites.

(2) *Site distribution.* Any changes in frequency by site (e.g., inconsistent figures or disappearance of a particular tumour) must be investigated carefully before their validity is accepted. Such a phenomenon may be due to a variety of factors, ranging from coding errors to interest by the medical profession in a recently described tumour.

(3) *Indices of validity of diagnosis.* Two indices are generally used: the percentage of cases with microscopic confirmation, and the percentage of cases that are registered on the basis of death certificates only. In addition to providing information on the validity of the diagnostic information in the registry, these indices also help to evaluate the completeness of coverage. Thus, under-reporting is probable if histological confirmation nears 100% for all sites together, or if a large proportion of all cases (i.e., over 15%) of cases is known only from death certificates. Conversely, a very low number (under 1%) of cases known only from death certificates might mean that not all of the death certificates with the diagnosis of cancer have reached the registry (unless there is a very efficient follow-back procedure; see Chapter 5).

In addition, the percentage of all cases diagnosed as undefined primary site may be worth investigation. A high percentage, arbitrarily set at 10%, might indicate inadequate diagnostic services, low utilization of available services, or poor documentation of results.

(4) *Demographic data.* A considerable percentage of cases with sex, age or residence unknown suggests incomplete notification, and that requests by registry staff for further information are inadequate.

(5) *Differences compared with similar areas.* Under-reporting must be suspected if rates for all cancers are considerably lower than those reported from similar areas elsewhere.

**Tabular presentation**

The key part of the incidence report is the tabular section. Tables are commonly presented together in one section, immediately following the narrative parts.

The objective of a table is to express the results in a simple form, which will allow the reader to draw conclusions, either directly or by some future calculations. The construction of tables is greatly facilitated by computerization, but may be accomplished after entering the information onto punch cards of various sorts (an example is provided in the *WHO Handbook for Standardized Cancer Registries (Hospital Based)* (WHO, 1976a)).

The basis of the tabular presentation of cancer registry results is the frequency distribution, i.e., a table showing the frequency with which individuals with some defined characteristic or characteristics are present. Some general rules regarding the construction of tables have been given by Bradford Hill (1971). Summary guidelines are given below, together with some examples of typical tabular presentations from an incidence report.

(1) The contents of the table as a whole and the items in each separate column should be clearly and fully defined.

(2) If the table includes rates, the denominator on which they are based should be clearly stated.

(3) The frequency distributions should be given in full.

(4) Rates or proportions should not be given alone without any information as to the number of observations upon which they are based.

(5) Full particulars of any deliberate exclusions of registered cases must be given, the reasons for and the criteria of exclusion being clearly defined.

In the basic frequency distribution, the number of cases registered during the specified time period are distributed according to site of cancer (ICD), age and sex. An example is given in Table 1. The information on age should be given by five-year age-groups. For the first five years of life, ages 0 and 1–4 years may be used. When numbers are small, ten-year age-groups may be used; these must follow the WHO recommended age intervals, i.e., 0–4, 5–14, 15–24, 25–34 etc. Anatomical site should be given according to the three-digit level of the ICD. The tabulation should also include the histologically defined categories of the ICD (see Chapter 7)—tabulation by the topography axis of the ICD-O alone is insufficient for reporting. Any departure from the ICD classification should be indicated clearly by means of a footnote.

This basic frequency distribution can be accompanied by a similar table giving age-, sex- and site-specific annual incidence rates, such as Table 2 (for calculation of rates see Chapter 11). It is preferable to give age-specific rates only for data accumulated over several years, since annual numbers of cases in most tumour categories will be too small to justify computations. For each cancer site the report

should give crude as well as age-standardized rates for all ages. Consideration should be given to the inclusion of the cumulative incidence rate, which is a most useful summary measure for comparison of populations. This rate approximates to the lifetime expectancy of a given cancer, and is easily understood by the general reader.

The fundamental tables may be supplemented with similar tables for subsets of the population, for example, urban and rural areas, geographical subdivision (e.g., regions, countries, municipalities), ethnic groups, and race. The denominator population should be presented in identical tables.

The validity of diagnosis in the incidence report should be documented by tabulating the basis of diagnosis by site. As a minimum this should include the proportion of histologically verified tumours and those known from death certificates only, as shown in Table 3.

## Graphical presentation

Graphs have the advantage of attracting attention more readily than a table, they show trends or comparisons more vividly and provide results that are more easily remembered—one picture (graph) is worth a thousand words. Statistical tables are unique in presenting a lot of information in a very condensed format, as well as in the precision of the information provided by exact values. However, "even with the most lucid construction of tables such a method of presentation always gives difficulties to the reader" (Bradford Hill, 1971). Graphs can bring out hidden facts and stimulate analytical thinking, but it is important that some basic principles are not forgotten:

(1) The sole object of a diagram is to assist the intelligence to grasp the meaning of a series of numbers by means of the eye, i.e. the amount of data presented in one graph should be limited.

(2) Graphs should always be regarded as subsidiary aids to the intelligence and not as the evidence of associations or trends. That evidence must be largely drawn from the statistical tables themselves. Graphs are thus not acceptable alone; tabular information forming the basis of graphs must be presented.

(3) By the choice of scales, the same numerical value can be made to appear very different to the eye.

(4) The problem of scale is also important in comparisons within a graph.

(5) Graphs should form self-contained units, the contents of which can be grasped without reference to the text.

Examples of some frequently used graphical presentations are given below. For a more in-depth description of graphs and their construction, the reader should consult, for example, Bradford Hill (1971).

The *bar-graph*, or *histogram*, is commonly used for the illustration of frequencies, proportions and percentages both of nominal and ordinal data. The bars may be either horizontal or vertical and the bars represent magnitudes by their length. An example of the presentation of number of new cases of cancer of various sites (normal data) is given in Figure 1. Ordinal data should, as the name implies, be ordered in some definite way, such as in age-groups.

**Table 1. Numbers of new cases of cancer in Denmark, 1983–87, by primary site and age. Males.**

| ICD 9th Revision | Site | Age-groups (years) 0- 4 | 5- 9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90+ | Age unknown | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | Lip | . | . | . | . | . | . | 1 | 9 | 18 | 23 | 47 | 41 | 81 | 82 | 89 | 75 | 55 | 16 | 15 | 0 | 552 |
| 141 | Tongue | . | . | . | . | . | . | 1 | 3 | 10 | 16 | 24 | 25 | 28 | 29 | 18 | 10 | 9 | 3 | 1 | 0 | 177 |
| 142 | Salivary gland | . | . | 0 | 0 | 1 | 1 | 2 | 6 | 2 | 3 | 10 | 15 | 12 | 10 | 19 | 10 | 14 | 7 | 0 | 0 | 112 |
| 143-5 | Mouth | . | 0 | . | . | 1 | 1 | 0 | 4 | 18 | 24 | 30 | 42 | 65 | 68 | 36 | 26 | 16 | 12 | 7 | 0 | 350 |
| 146 | Oropharynx | . | . | . | . | . | 1 | 0 | 4 | 14 | 19 | 25 | 25 | 37 | 35 | 25 | 18 | 12 | 2 | 1 | 0 | 218 |
| 147 | Nasopharynx | . | . | 0 | 0 | 4 | 2 | 1 | 1 | 1 | 11 | 9 | 15 | 10 | 14 | 16 | 7 | 6 | 1 | . | 0 | 98 |
| 148 | Hypopharynx | . | . | . | . | . | . | . | . | 6 | 8 | 13 | 15 | 17 | 18 | 18 | 14 | 7 | 2 | 2 | 0 | 120 |
| 149 | Pharynx unspec. | . | . | . | . | . | . | . | 1 | 2 | 1 | 0 | 4 | 2 | 0 | 4 | 3 | 0 | . | 1 | 0 | 18 |
| 150 | Oesophagus | . | . | . | . | .. | . | 1 | 5 | 8 | 25 | 53 | 81 | 105 | 127 | 146 | 95 | 59 | 25 | 7 | 0 | 737 |
| 151 | Stomach | . | 0 | . | 1 | 1 | 3 | 5 | 21 | 37 | 76 | 103 | 168 | 295 | 369 | 452 | 453 | 321 | 210 | 54 | 0 | 2569 |
| 152 | Small intestine | . | 1 | . | . | 0 | 2 | 2 | 4 | 5 | 6 | 5 | 10 | 11 | 20 | 39 | 25 | 18 | 5 | 2 | 0 | 155 |
| 153 | Colon | . | 2 | 0 | 3 | 4 | 13 | 18 | 46 | 47 | 85 | 149 | 288 | 437 | 671 | 798 | 785 | 540 | 261 | 86 | 0 | 4233 |
| 154 | Rectum | . | . | . | 1 | 1 | 2 | 12 | 21 | 53 | 85 | 179 | 285 | 431 | 571 | 637 | 563 | 349 | 196 | 72 | 0 | 3458 |
| 155 | Liver | 3 | 2 | 1 | 1 | . | 0 | 3 | 6 | 12 | 19 | 31 | 72 | 90 | 138 | 152 | 128 | 56 | 47 | 13 | 0 | 774 |
| 156 | Gallbladder etc. | . | . | . | 0 | . | 1 | 1 | 3 | 7 | 6 | 7 | 31 | 40 | 58 | 88 | 66 | 39 | 22 | 8 | 0 | 377 |
| 157 | Pancreas | . | . | . | . | . | 3 | 7 | 13 | 21 | 47 | 93 | 131 | 224 | 302 | 359 | 295 | 223 | 93 | 31 | 0 | 1842 |
| 158 | Peritoneum | 5 | . | 2 | 3 | 7 | 5 | 5 | 5 | 7 | 10 | 8 | 8 | 17 | 15 | 19 | 17 | 11 | 5 | 3 | 0 | 152 |
| 160 | Nose, sinuses etc. | . | 0 | 1 | 1 | . | 1 | 3 | 5 | 6 | 7 | 14 | 12 | 24 | 31 | 22 | 18 | 14 | 7 | 3 | 0 | 169 |
| 161 | Larynx | . | . | . | . | . | 2 | 3 | 15 | 22 | 42 | 79 | 123 | 202 | 181 | 153 | 107 | 46 | 13 | 5 | 0 | 993 |
| 162 | Bronchus, lung | . | . | . | 1 | 6 | 4 | 7 | 45 | 113 | 254 | 584 | 1072 | 1854 | 2157 | 2250 | 1769 | 878 | 297 | 61 | 0 | 11352 |
| 163 | Pleura | . | . | . | . | . | 1 | 0 | 6 | 10 | 9 | 17 | 21 | 43 | 35 | 44 | 35 | 20 | 7 | 3 | 0 | 251 |
| 164 | Other thoracic organs | 1 | . | 1 | 3 | 3 | 5 | 2 | 1 | 2 | 5 | 6 | 7 | 8 | 12 | 16 | 2 | 3 | 1 | . | 0 | 78 |
| 170 | Bone | 0 | 3 | 9 | 13 | 7 | 7 | 5 | 7 | 4 | 7 | 8 | 9 | 15 | 5 | 12 | 2 | 6 | 3 | 2 | 0 | 124 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 171 | Connective tissue | 1 | 3 | 5 | 11 | 10 | 10 | 8 | 10 | 12 | 4 | 5 | 13 | 20 | 22 | 28 | 16 | 17 | 8 | 9 | 0 | 212 |
| 172 | Melanoma of skin | . | . | 0 | 8 | 23 | 33 | 57 | 94 | 109 | 101 | 114 | 119 | 139 | 139 | 100 | 71 | 35 | 27 | 8 | 0 | 1177 |
| 173 | Other skin | . | 1 | 4 | 3 | 15 | 29 | 69 | 187 | 281 | 332 | 472 | 732 | 1047 | 1304 | 1390 | 1213 | 842 | 452 | 169 | 0 | 8542 |
| 185 | Prostate gland | . | . | . | . | . | . | . | . | 6 | 14 | 75 | 229 | 530 | 1022 | 1489 | 1565 | 1127 | 520 | 154 | 0 | 6731 |
| 186 | Testis | 3 | . | 2 | 46 | 145 | 207 | 201 | 178 | 119 | 90 | 59 | 43 | 25 | 15 | 20 | 2 | 4 | 3 | . | 0 | 1162 |
| 187.1-4 | Penis | . | . | . | . | . | 1 | 3 | . | 8 | 8 | 11 | 16 | 27 | 25 | 27 | 26 | 18 | 9 | 7 | 0 | 186 |
| 187.5-9 | Other male genital | . | . | . | . | . | . | . | . | . | . | 3 | . | 5 | 3 | 6 | 5 | 7 | . | . | 0 | 29 |
| 188 | Urinary bladder | 0 | . | 1 | . | 7 | 12 | 15 | 29 | 55 | 92 | 205 | 380 | 640 | 849 | 919 | 783 | 504 | 238 | 49 | 0 | 4778 |
| 189 | Other urinary | 19 | 4 | 1 | 0 | 1 | 3 | 14 | 22 | 42 | 62 | 115 | 192 | 268 | 316 | 320 | 262 | 161 | 72 | 21 | 0 | 1895 |
| 190 | Eye | 10 | 1 | 1 | 1 | 0 | 1 | 6 | 4 | 8 | 13 | 9 | 5 | 21 | 17 | 15 | 7 | 9 | 5 | 1 | 0 | 134 |
| 191-2 | Brain, nerv.system | 20 | 30 | 29 | 25 | 33 | 38 | 64 | 91 | 85 | 95 | 117 | 154 | 178 | 184 | 147 | 99 | 42 | 9 | 2 | 0 | 1442 |
| 193 | Thyroid gland | . | 4 | 1 | 1 | 5 | 5 | 12 | 4 | 13 | 7 | 12 | 12 | 16 | 24 | 21 | 19 | 13 | 1 | 0 | 0 | 170 |
| 194 | Other endocrine | 7 | 0 | 1 | 2 | 2 | 1 | 0 | 2 | 3 | 3 | 3 | 5 | 4 | 11 | 9 | 7 | 3 | . | . | 0 | 63 |
| 200,2 | Non-Hodgkin Lymphoma | 7 | 16 | 9 | 25 | 18 | 25 | 27 | 59 | 69 | 53 | 82 | 121 | 156 | 185 | 182 | 181 | 96 | 49 | 7 | 0 | 1367 |
| 201 | Hodgkin's disease | 1 | 4 | 10 | 24 | 40 | 36 | 31 | 27 | 31 | 21 | 30 | 14 | 17 | 26 | 23 | 16 | 11 | 4 | 1 | 0 | 367 |
| 203 | Multiple myeloma | . | . | . | . | . | . | 2 | 4 | 10 | 16 | 24 | 35 | 70 | 109 | 111 | 123 | 63 | 23 | 6 | 0 | 596 |
| 204 | Lymphoid leukaemia | 45 | 30 | 17 | 19 | 10 | 7 | 6 | 7 | 14 | 11 | 34 | 55 | 93 | 110 | 136 | 127 | 104 | 40 | 16 | 0 | 881 |
| 205 | Myeloid leukaemia | 7 | 1 | 6 | 3 | 7 | 11 | 26 | 24 | 27 | 27 | 27 | 56 | 76 | 97 | 98 | 105 | 54 | 25 | 8 | 0 | 685 |
| 206 | Monocytic leukaemia | 2 | . | 0 | 0 | . | . | . | 1 | 0 | 1 | 2 | 0 | 1 | 5 | 2 | 5 | 4 | 1 | . | 0 | 24 |
| 207 | Other leukaemia | 0 | . | 1 | 2 | 1 | 0 | 2 | 6 | 3 | 1 | 6 | 7 | 6 | 6 | 16 | 14 | 9 | 5 | 5 | 0 | 90 |
| 208 | Leukaemia, cell unspec. | 1 | . | 1 | 1 | . | . | . | . | 0 | . | 2 | 5 | 4 | 7 | 15 | 10 | 9 | 5 | 3 | 0 | 63 |
| 195-9 | Primary Site Uncertain | 4 | 2 | 2 | 6 | 3 | 5 | 16 | 32 | 36 | 47 | 110 | 173 | 234 | 321 | 372 | 338 | 236 | 124 | 58 | 0 | 2119 |
| | All Sites | 136 | 104 | 105 | 204 | 355 | 478 | 638 | 1014 | 1360 | 1792 | 3013 | 4873 | 7637 | 9757 | 10873 | 9533 | 6077 | 2859 | 903 | 0 | 61711 |
| | All Sites but 173 | 136 | 103 | 101 | 201 | 340 | 449 | 569 | 827 | 1079 | 1460 | 2541 | 4141 | 6590 | 8453 | 9483 | 8320 | 5235 | 2407 | 734 | 0 | 53169 |

a) Age-standardized incidence rate per 100 000. World Standard Population
b) Cumulative rate (%) 0-64 years
c) Cumulative rate (%) 0-74 years

**Table 2. Average annual age-specific incidence rates, crude rates (all ages), age-standardized rates (ASR) and cumulative rates in Denmark 1983–87 by primary site and age. Males.**

| ICD 9th Revision | Site | Age-groups (years) 0- 4 | 5- 9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90+ | Age unknown | Crude Rate | ASR World[a] | 64[b] | 74[c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | Lip | . | . | . | . | . | . | 0.1 | 0.9 | 1.9 | 3.1 | 7.1 | 6.4 | 12.8 | 14.9 | 19.3 | 23.5 | 31.2 | 20.6 | 54.9 | 0 | 4.3 | 2.9 | 0.16 | 0.33 |
| 141 | Tongue | . | . | . | . | . | . | 0.1 | 0.3 | 1.0 | 2.1 | 3.6 | 3.9 | 4.4 | 5.3 | 3.9 | 3.1 | 5.1 | 3.9 | 3.7 | 0 | 1.4 | 1.0 | 0.08 | 0.12 |
| 142 | Salivary gland | . | . | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.6 | 0.2 | 0.4 | 1.5 | 2.3 | 1.9 | 1.8 | 4.1 | 3.1 | 8.0 | 9.0 | 0.0 | 0 | 0.9 | 0.6 | 0.04 | 0.07 |
| 143-5 | Mouth | . | 0.0 | . | . | 0.1 | 0.1 | 0.0 | 0.4 | 1.9 | 3.2 | 4.5 | 6.5 | 10.3 | 12.4 | 7.8 | 8.1 | 9.1 | 15.4 | 25.6 | 0 | 2.7 | 2.0 | 0.13 | 0.24 |
| 146 | Oropharynx | . | . | . | . | . | 0.1 | 0.0 | 0.4 | 1.5 | 2.5 | 3.8 | 3.9 | 5.8 | 6.4 | 5.4 | 5.6 | 6.8 | 2.6 | 3.7 | 0 | 1.7 | 1.3 | 0.09 | 0.15 |
| 147 | Nasopharynx | . | . | 0.0 | 0.0 | 0.4 | 0.2 | 0.1 | 0.1 | 0.1 | 1.5 | 1.4 | 2.3 | 1.6 | 2.5 | 3.5 | 2.2 | 3.4 | 1.3 | . | 0 | 0.8 | 0.6 | 0.04 | 0.07 |
| 148 | Hypopharynx | . | . | . | . | . | . | . | . | 0.6 | 1.1 | 2.0 | 2.3 | 2.7 | 3.3 | 3.9 | 4.4 | 4.0 | 2.6 | 7.3 | 0 | 0.9 | 0.7 | 0.04 | 0.08 |
| 149 | Pharynx unspec. | . | . | . | . | . | . | . | 0.1 | 0.2 | 0.1 | 0.0 | 0.6 | 0.3 | 0.0 | 0.9 | 0.9 | 0.0 | . | 3.7 | 0 | 0.1 | 0.1 | 0.01 | 0.01 |
| 150 | Oesophagus | . | . | . | . | . | . | 0.1 | 0.5 | 0.8 | 3.3 | 8.0 | 12.5 | 16.6 | 23.1 | 31.7 | 29.7 | 33.5 | 32.2 | 25.6 | 0 | 5.8 | 3.8 | 0.21 | 0.48 |
| 151 | Stomach | . | 0.0 | . | 0.1 | 0.1 | 0.3 | 0.5 | 2.0 | 3.9 | 10.1 | 15.5 | 26.0 | 46.6 | 67.0 | 98.3 | 141.6 | 182.3 | 270.1 | 197.5 | 0 | 20.1 | 12.2 | 0.53 | 1.35 |
| 152 | Small intestine | . | 0.1 | . | . | 0.0 | 0.2 | 0.2 | 0.4 | 0.5 | 0.8 | 0.8 | 1.5 | 1.7 | 3.6 | 8.5 | 7.8 | 10.2 | 6.4 | 7.3 | 0 | 1.2 | 0.8 | 0.03 | 0.09 |
| 153 | Colon | . | 0.2 | 0.0 | 0.3 | 0.4 | 1.3 | 1.9 | 4.4 | 4.9 | 11.3 | 22.4 | 44.6 | 69.0 | 121.9 | 173.5 | 245.5 | 306.7 | 335.7 | 314.5 | 0 | 33.2 | 20.0 | 0.80 | 2.28 |
| 154 | Rectum | . | . | . | 0.1 | 0.1 | 0.2 | 1.2 | 2.0 | 5.6 | 11.3 | 26.9 | 44.2 | 68.1 | 103.7 | 138.5 | 176.0 | 198.2 | 252.1 | 263.3 | 0 | 27.1 | 17.0 | 0.80 | 2.01 |
| 155 | Liver | 0.4 | 0.2 | 0.1 | 0.1 | . | 0.0 | 0.3 | 0.6 | 1.3 | 2.5 | 4.7 | 11.2 | 14.2 | 25.1 | 33.0 | 40.0 | 31.8 | 60.5 | 47.5 | 0 | 6.1 | 3.9 | 0.18 | 0.47 |
| 156 | Gallbladder etc. | . | . | . | 0.0 | . | 0.1 | 0.1 | 0.3 | 0.7 | 0.8 | 1.1 | 4.8 | 6.3 | 10.5 | 19.1 | 20.6 | 22.2 | 28.3 | 29.3 | 0 | 3.0 | 1.8 | 0.07 | 0.22 |
| 157 | Pancreas | . | . | . | . | . | 0.3 | 0.7 | 1.2 | 2.2 | 6.3 | 14.0 | 20.3 | 35.4 | 54.9 | 78.0 | 92.2 | 126.7 | 119.6 | 113.4 | 0 | 14.4 | 8.9 | 0.40 | 1.07 |
| 158 | Peritoneum | 0.7 | . | 0.2 | 0.3 | 0.7 | 0.5 | 0.5 | 0.5 | 0.7 | 1.3 | 1.2 | 1.2 | 2.7 | 2.7 | 4.1 | 5.3 | 6.2 | 6.4 | 11.0 | 0 | 1.2 | 0.9 | 0.05 | 0.09 |
| 160 | Nose, sinuses etc. | . | 0.0 | 0.1 | 0.1 | . | 0.1 | 0.3 | 0.5 | 0.6 | 0.9 | 2.1 | 1.9 | 3.8 | 5.6 | 4.8 | 5.6 | 8.0 | 9.0 | 11.0 | 0 | 1.3 | 0.9 | 0.05 | 0.10 |
| 161 | Larynx | . | . | . | . | . | 0.2 | 0.3 | 1.4 | 2.3 | 5.6 | 11.9 | 19.1 | 31.9 | 32.9 | 33.3 | 33.5 | 26.1 | 16.7 | 18.3 | 0 | 7.8 | 5.4 | 0.36 | 0.69 |
| 162 | Bronchus, lung | . | . | . | 0.1 | 0.6 | 0.4 | 0.7 | 4.3 | 11.9 | 33.9 | 87.7 | 166.1 | 292.8 | 391.8 | 489.1 | 553.1 | 498.7 | 382.0 | 223.1 | 0 | 89.0 | 57.0 | 2.99 | 7.40 |
| 163 | Pleura | . | . | . | . | . | 0.1 | 0.0 | 0.6 | 1.0 | 1.2 | 2.6 | 3.3 | 6.8 | 6.4 | 9.6 | 10.9 | 11.4 | 9.0 | 11.0 | 0 | 2.0 | 1.3 | 0.08 | 0.16 |
| 164 | Other thoracic organs | 0.1 | . | 0.1 | 0.3 | 0.3 | 0.5 | 0.2 | 0.1 | 0.2 | 0.7 | 0.9 | 1.1 | 1.3 | 2.2 | 3.5 | 0.6 | 1.7 | 1.3 | . | 0 | 0.6 | 0.5 | 0.03 | 0.06 |
| 170 | Bone | 0.0 | 0.4 | 1.0 | 1.3 | 0.7 | 0.7 | 0.5 | 0.7 | 0.4 | 0.9 | 1.2 | 1.4 | 2.4 | 0.9 | 2.6 | 0.6 | 3.4 | 3.9 | 7.3 | 0 | 1.0 | 0.8 | 0.06 | 0.08 |
| 171 | Connective tissue | 0.1 | 0.4 | 0.5 | 1.1 | 1.0 | 1.0 | 0.8 | 1.0 | 1.3 | 0.5 | 0.8 | 2.0 | 3.2 | 4.0 | 6.1 | 5.0 | 9.7 | 10.3 | 32.9 | 0 | 1.7 | 1.3 | 0.07 | 0.12 |
| 172 | Melanoma of skin | . | . | 0.0 | 0.8 | 2.2 | 3.4 | 5.9 | 8.9 | 11.4 | 13.5 | 17.1 | 18.4 | 22.0 | 25.3 | 21.7 | 22.2 | 19.9 | 34.7 | 29.3 | 0 | 9.2 | 7.1 | 0.52 | 0.75 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 173 | Other skin | . | 0.1 | 0.4 | 0.3 | 1.4 | 3.0 | 7.1 | 17.8 | 29.5 | 44.3 | 70.9 | 113.4 | 165.4 | 236.9 | 302.2 | 379.3 | 478.2 | 581.4 | 618.0 | 0 | 67.0 | 43.4 | 2.27 | 4.96 |
| 185 | Prostate gland | . | . | . | . | . | . | . | . | 0.6 | 1.9 | 11.3 | 35.5 | 83.7 | 185.7 | 323.7 | 489.4 | 640.1 | 668.9 | 563.2 | 0 | 52.8 | 28.8 | 0.66 | 3.21 |
| 186 | Testis | 0.4 | . | 0.2 | 4.5 | 14.0 | 21.3 | 20.8 | 16.9 | 12.5 | 12.0 | 8.9 | 6.7 | 3.9 | 2.7 | 4.3 | 0.6 | 2.3 | 3.9 | . | 0 | 9.1 | 8.1 | 0.61 | 0.65 |
| 187.1-4 | Penis | . | . | . | . | . | 0.1 | 0.3 | . | 0.8 | 1.1 | 1.7 | 2.5 | 4.3 | 4.5 | 5.9 | 8.1 | 10.2 | 11.6 | 25.6 | 0 | 1.5 | 1.0 | 0.05 | 0.11 |
| 187.5-9 | Other male genital | . | . | . | . | . | . | . | . | . | . | 0.5 | . | 0.8 | 0.5 | 1.3 | 1.6 | 4.0 | . | . | 0 | 0.2 | 0.1 | 0.01 | 0.02 |
| 188 | Urinary bladder | 0.0 | . | 0.1 | . | 0.7 | 1.2 | 1.6 | 2.8 | 5.8 | 12.3 | 30.8 | 58.9 | 101.1 | 154.2 | 199.8 | 244.8 | 286.3 | 306.1 | 179.2 | 0 | 37.5 | 23.2 | 1.08 | 2.85 |
| 189 | Other urinary | 2.7 | 0.5 | 0.1 | 0.0 | 0.1 | 0.3 | 1.4 | 2.1 | 4.4 | 8.3 | 17.3 | 29.7 | 42.3 | 57.4 | 69.6 | 81.9 | 91.4 | 92.6 | 76.8 | 0 | 14.9 | 10.0 | 0.55 | 1.18 |
| 190 | Eye | 1.4 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.6 | 0.4 | 0.8 | 1.7 | 1.4 | 0.8 | 3.3 | 3.1 | 3.3 | 2.2 | 5.1 | 6.4 | 3.7 | 0 | 1.1 | 0.9 | 0.05 | 0.09 |
| 191-2 | Brain, nerv.system | 2.9 | 3.7 | 3.1 | 2.4 | 3.2 | 3.9 | 6.6 | 8.7 | 8.9 | 12.7 | 17.6 | 23.9 | 28.1 | 33.4 | 32.0 | 31.0 | 23.9 | 11.6 | 7.3 | 0 | 11.3 | 9.1 | 0.63 | 0.96 |
| 193 | Thyroid gland | . | 0.5 | 0.1 | 0.1 | 0.5 | 0.5 | 1.2 | 0.4 | 1.4 | 0.9 | 1.8 | 1.9 | 2.5 | 4.4 | 4.6 | 5.9 | 7.4 | 1.3 | 0.0 | 0 | 1.3 | 1.0 | 0.06 | 0.10 |
| 194 | Other endocrine | 1.0 | 0.0 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.2 | 0.3 | 0.4 | 0.5 | 0.8 | 0.6 | 2.0 | 2.0 | 2.2 | 1.7 | . | . | 0 | 0.5 | 0.4 | 0.02 | 0.04 |
| 200.2 | Non-Hodgkin Lymphoma | 1.0 | 2.0 | 1.0 | 2.4 | 1.7 | 2.6 | 2.8 | 5.6 | 7.2 | 7.1 | 12.3 | 18.7 | 24.6 | 33.6 | 39.6 | 56.6 | 54.5 | 63.0 | 25.6 | 0 | 10.7 | 7.6 | 0.45 | 0.81 |
| 201 | Hodgkins disease | 0.1 | 0.5 | 1.1 | 2.4 | 3.9 | 3.7 | 3.2 | 2.6 | 3.3 | 2.8 | 4.5 | 2.2 | 2.7 | 4.7 | 5.0 | 5.0 | 6.2 | 5.1 | 3.7 | 0 | 2.9 | 2.5 | 0.16 | 0.21 |
| 203 | Multiple myeloma | . | . | . | . | . | . | 0.2 | 0.4 | 1.0 | 2.1 | 3.6 | 5.4 | 11.1 | 19.8 | 24.1 | 38.5 | 35.8 | 29.6 | 21.9 | 0 | 4.7 | 2.8 | 0.12 | 0.34 |
| 204 | Lymphoid leukaemia | 6.4 | 3.7 | 1.8 | 1.9 | 1.0 | 0.7 | 0.6 | 0.7 | 1.5 | 1.5 | 5.1 | 8.5 | 14.7 | 20.0 | 29.6 | 39.7 | 59.1 | 51.5 | 58.5 | 0 | 6.9 | 5.2 | 0.24 | 0.49 |
| 205 | Myeloid leukaemia | 1.0 | 0.1 | 0.6 | 0.3 | 0.7 | 1.1 | 2.7 | 2.3 | 2.8 | 3.6 | 4.1 | 8.7 | 12.0 | 17.6 | 21.3 | 32.8 | 30.7 | 32.2 | 29.3 | 0 | 5.4 | 3.7 | 0.20 | 0.39 |
| 206 | Monocytic leukaemia | 0.3 | . | 0.0 | 0.0 | . | . | . | 0.1 | 0.0 | 0.1 | 0.3 | 0.0 | 0.2 | 0.9 | 0.4 | 1.6 | 2.3 | 1.3 | . | 0 | 0.2 | 0.1 | 0.00 | 0.01 |
| 207 | Other leukaemia | 0.0 | . | 0.1 | 0.2 | 0.1 | 0.0 | 0.2 | 0.6 | 0.3 | 0.1 | 0.9 | 1.1 | 0.9 | 1.1 | 3.5 | 4.4 | 5.1 | 6.4 | 18.3 | 0 | 0.7 | 0.5 | 0.02 | 0.05 |
| 208 | Leukaemia, cell unspec. | 0.1 | . | 0.1 | 0.1 | . | . | . | . | 0.0 | . | 0.3 | 0.8 | 0.6 | 1.3 | 3.3 | 3.1 | 5.1 | 6.4 | 11.0 | 0 | 0.5 | 0.3 | 0.01 | 0.03 |
| 195-9 | Primary Site Uncertain | 0.6 | 0.2 | 0.2 | 0.6 | 0.3 | 0.5 | 1.7 | 3.0 | 3.8 | 6.3 | 16.5 | 26.8 | 37.0 | 58.3 | 80.9 | 105.7 | 134.0 | 159.5 | 212.1 | 0 | 16.6 | 10.5 | 0.49 | 1.18 |
| | All Sites | 19.4 | 12.8 | 11.3 | 20.0 | 34.2 | 49.2 | 66.0 | 96.5 | 142.8 | 239.1 | 452.6 | 755.0 | 1206.1 | 1772.4 | 2363.6 | 2980.8 | 3451.7 | 3677.4 | 3302.2 | 0 | 484.0 | 312.0 | 5.52 | 6.20 |
| | All Sites but 173 | 19.4 | 12.7 | 10.8 | 19.7 | 32.8 | 46.3 | 58.9 | 78.7 | 113.3 | 194.8 | 381.7 | 641.6 | 1040.8 | 1535.5 | 2061.4 | 2601.5 | 2973.4 | 3096.0 | 2684.2 | 0 | 417.0 | 268.6 | 3.26 | 1.24 |

a) Age-standardized incidence rate per 100 000. World Standard Population
b) Cumulative rate (%) 0-64 years
c) Cumulative rate (%) 0-74 years

**Table 3. Verification of diagnosis (%) in newly diagnosed cases of cancer in Denmark, 1983–87, by primary site. Males.**

| ICD 9th Revision | Site | Total number of cases | Histology[a] | Autopsy without histology | Operation or endoscopy without histology | Other specified and unknown | Death certificate only |
|---|---|---|---|---|---|---|---|
| 140 | Lip | 552 | 99.8 | 0.0 | 0.0 | 0.2 | 0.0 |
| 141 | Tongue | 177 | 99.4 | 0.0 | 0.0 | 0.0 | 0.6 |
| 142 | Salivary gland | 112 | 96.4 | 0.9 | 0.0 | 0.9 | 1.8 |
| 143-5 | Mouth | 350 | 99.4 | 0.0 | 0.0 | 0.0 | 0.6 |
| 146 | Oropharynx | 218 | 99.1 | 0.5 | 0.0 | 0.5 | 0.0 |
| 147 | Nasopharynx | 98 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 148 | Hypopharynx | 120 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 149 | Pharynx unspec. | 18 | 94.4 | 0.0 | 0.0 | 5.6 | 0.0 |
| 150 | Oesophagus | 737 | 93.8 | 0.3 | 1.9 | 1.9 | 2.2 |
| 151 | Stomach | 2569 | 90.6 | 0.4 | 3.1 | 2.9 | 3.0 |
| 152 | Small intestine | 155 | 96.1 | 0.6 | 1.9 | 0.6 | 0.6 |
| 153 | Colon | 4233 | 91.3 | 0.4 | 4.2 | 2.1 | 2.0 |
| 154 | Rectum | 3458 | 95.0 | 0.2 | 1.9 | 1.7 | 1.2 |
| 155 | Liver | 774 | 92.0 | 0.4 | 0.6 | 5.7 | 1.3 |
| 156 | Gallbladder etc. | 377 | 84.1 | 0.3 | 6.1 | 7.2 | 2.4 |
| 157 | Pancreas | 1842 | 76.0 | 1.1 | 9.3 | 9.8 | 3.8 |
| 158 | Peritoneum | 152 | 96.7 | 0.0 | 1.3 | 1.3 | 0.7 |
| 160 | Nose, sinuses etc. | 169 | 96.4 | 0.6 | 0.0 | 1.8 | 1.2 |
| 161 | Larynx | 993 | 98.5 | 0.1 | 0.1 | 0.2 | 1.1 |
| 162 | Bronchus, lung | 11352 | 87.1 | 0.4 | 0.5 | 8.3 | 3.7 |
| 163 | Pleura | 251 | 95.2 | 1.2 | 0.0 | 2.0 | 1.6 |
| 164 | Other thoracic organ | 78 | 85.9 | 0.0 | 2.6 | 5.1 | 6.4 |
| 170 | Bone | 124 | 91.1 | 0.0 | 3.2 | 3.2 | 2.4 |
| 171 | Connective tissue | 212 | 96.7 | 0.0 | 0.9 | 0.9 | 1.4 |
| 172 | Melanoma of skin | 1177 | 99.3 | 0.1 | 0.2 | 0.1 | 0.3 |
| 173 | Other skin | 8543 | 99.1 | 0.0 | 0.1 | 0.7 | 0.1 |
| 174 | Breast | 89 | 92.1 | 0.0 | 0.0 | 6.7 | 1.1 |
| 185 | Prostate gland | 6731 | 88.7 | 0.2 | 1.4 | 7.2 | 2.4 |
| 186 | Testis | 1162 | 98.7 | 0.0 | 0.1 | 0.7 | 0.5 |
| 187.1-4 | Penis | 186 | 96.2 | 0.0 | 1.1 | 1.6 | 1.1 |
| 187.5-9 | Other male genital | 29 | 96.6 | 0.0 | 0.0 | 3.4 | 0.0 |
| 188 | Urinary bladder | 4778 | 98.1 | 0.1 | 0.4 | 0.4 | 0.9 |
| 189 | Other urinary | 1895 | 91.3 | 0.4 | 1.1 | 4.7 | 2.5 |
| 190 | Eye | 135 | 96.3 | 0.0 | 0.7 | 2.2 | 0.7 |
| 191-2 | Brain, nerv.system | 1442 | 80.9 | 0.6 | 0.8 | 14.1 | 3.6 |
| 193 | Thyroid gland | 170 | 98.2 | 0.0 | 0.0 | 0.6 | 1.2 |
| 194 | Other endocrine | 64 | 85.9 | 0.0 | 0.0 | 9.4 | 4.7 |
| 200,2 | Non-Hodgkin Lymphoma | 1367 | 98.2 | 0.0 | 0.1 | 0.4 | 1.3 |
| 201 | Hodgkin's disease | 367 | 98.4 | 0.0 | 0.0 | 0.0 | 1.6 |
| 203 | Multiple myeloma | 596 | 92.1 | 0.0 | 0.0 | 0.7 | 7.2 |
| 204 | Lymphoid leukaemia, | 881 | 94.0 | 0.0 | 0.1 | 1.1 | 4.8 |
| 205 | Myeloid leukaemia, | 685 | 97.2 | 0.0 | 0.0 | 0.3 | 2.5 |
| 206 | Monocytic leukaemia | 24 | 87.5 | 0.0 | 0.0 | 0.0 | 12.5 |
| 207 | Other leukaemia | 90 | 90.0 | 1.1 | 0.0 | 1.1 | 7.8 |
| 208 | Leukaemia, cell unspec. | 63 | 63.5 | 0.0 | 0.0 | 3.2 | 33.3 |
| 195-9 | Primary Site Uncertain | 2119 | 64.0 | 0.5 | 1.3 | 24.7 | 9.5 |
| | All Sites | 61714 | 91.4 | 0.3 | 1.3 | 4.7 | 2.3 |
| | All Sites but 173 | 53171 | 90.2 | 0.3 | 1.5 | 5.3 | 2.7 |

[a] Includes cytology, and bone marrow and peripheral blood examination for haematological malignancies

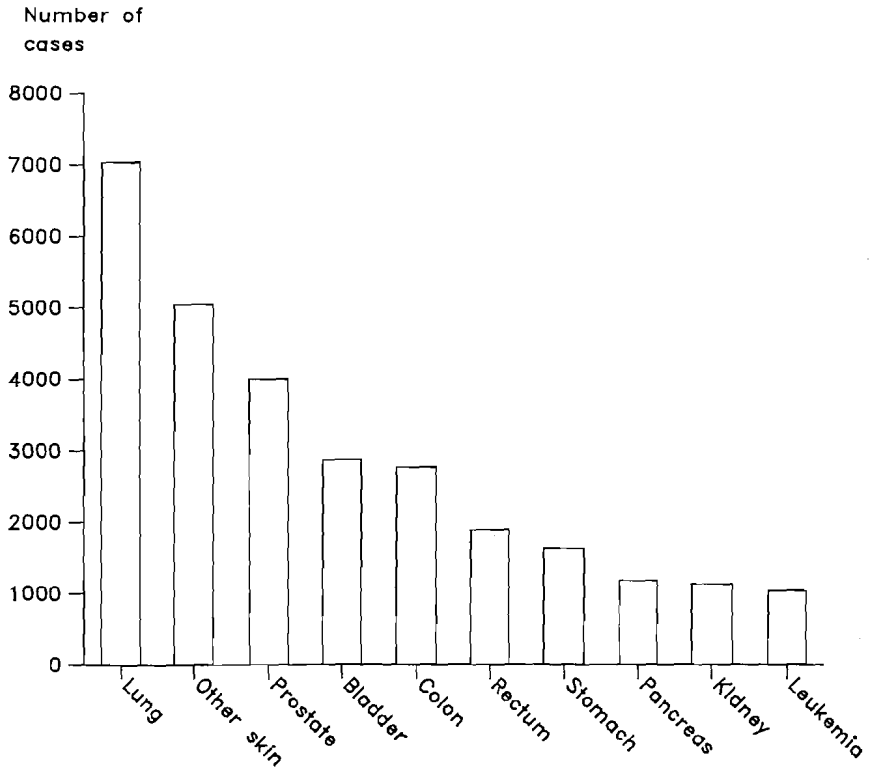


**Figure 1. Number of new cancer cases in Denmark, 1983–85; the ten most frequent sites in males**

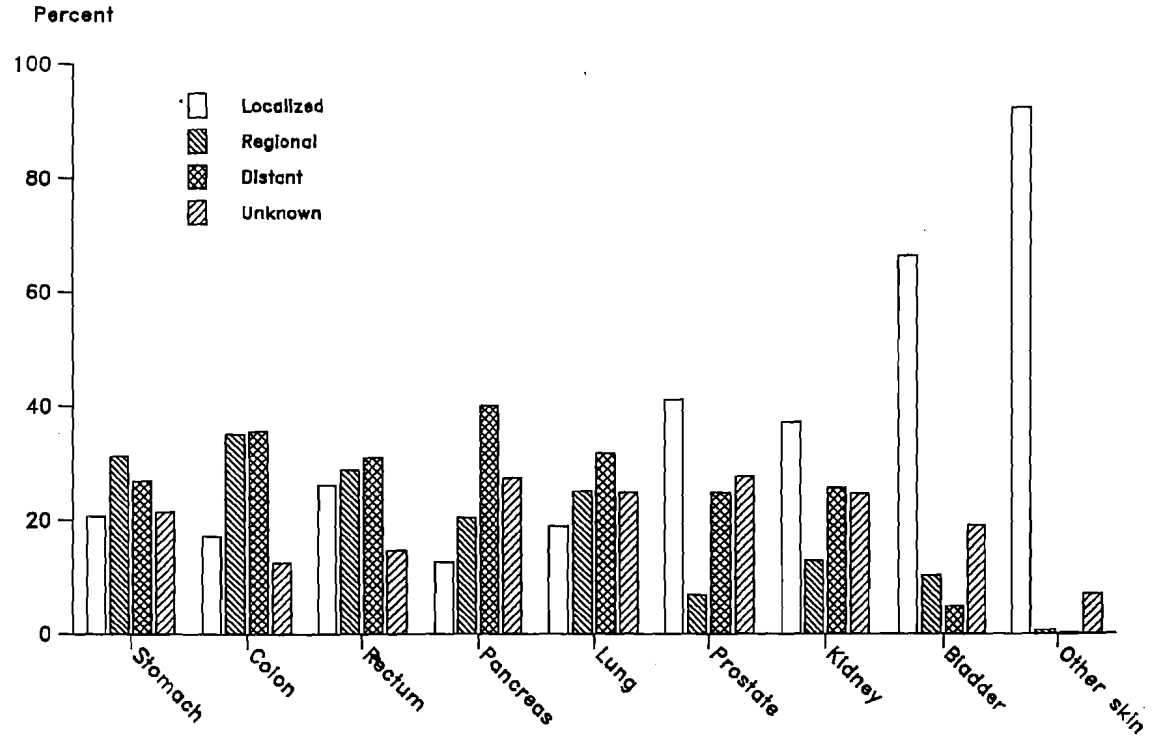


**Figure 2. Stage distribution of cancer of selected sites in males in Denmark, 1983–85**

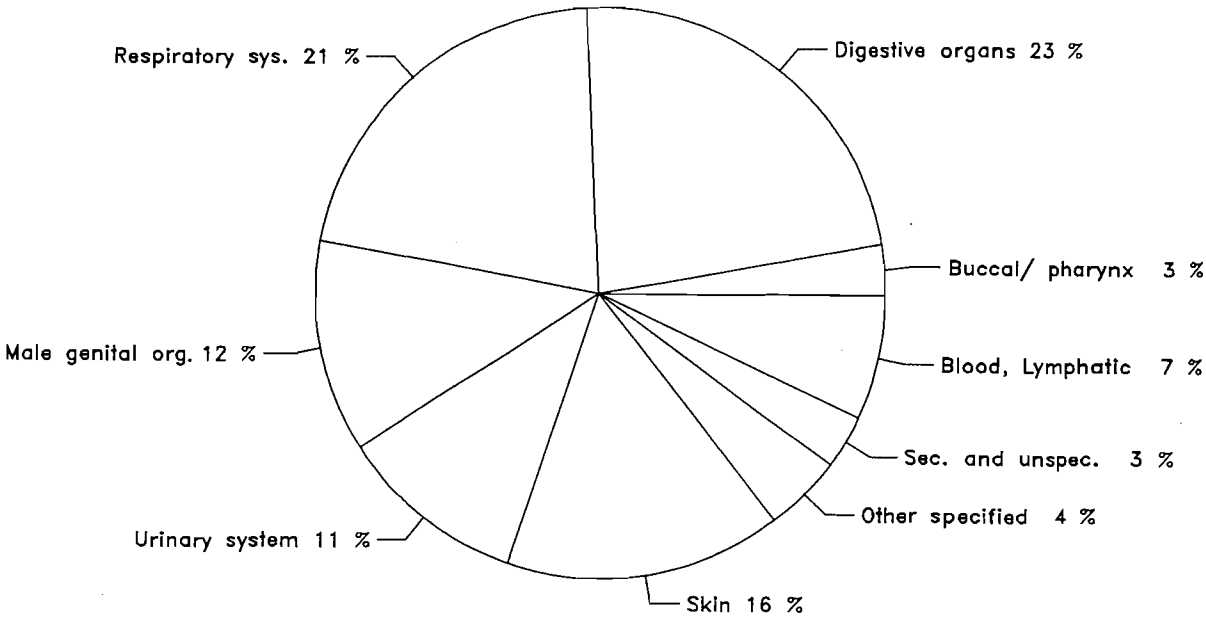


**Figure 3. Proportional distribution of cancer in males in Denmark, 1983–85**
Pie chart

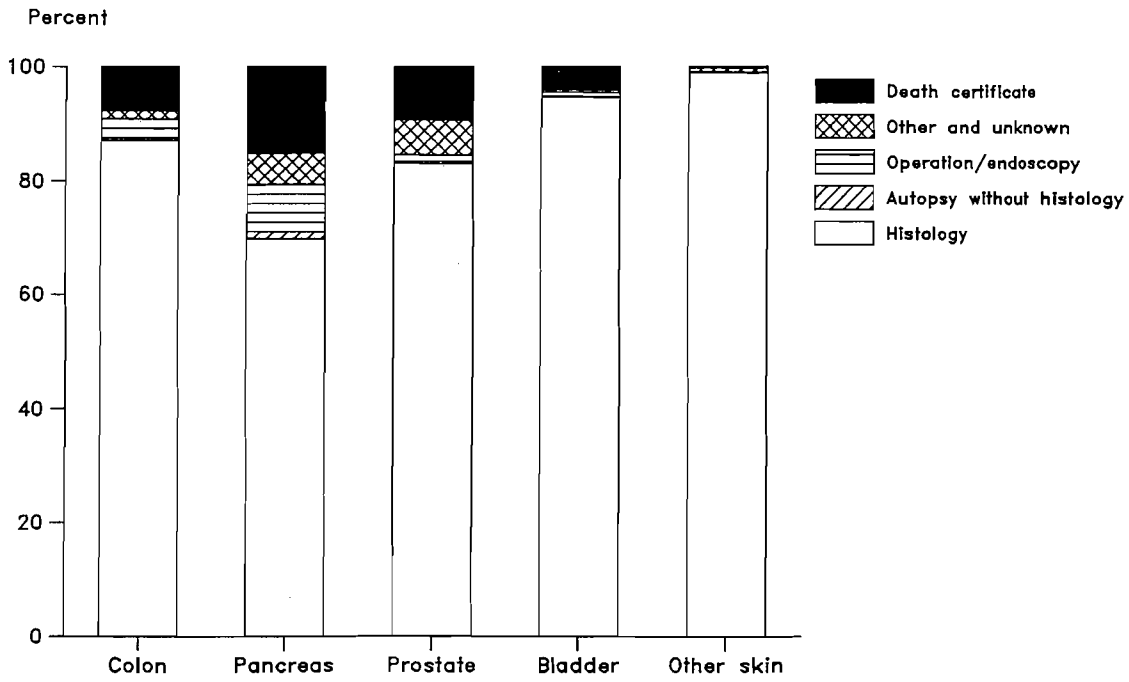


**Figure 4. Proportions of cancer of selected sites in males diagnosed by different methods prior to follow-back of cases first known from death certificates in Denmark, 1983–85**
Component band-graph

A bar-graph can be used to portray more than one variable, such as in a stage-treatment distribution, using different colours or cross-hatchings for different variables. An example is shown in Figure 2. However, it is important not to overload the graph.

The contribution which different components make to the whole may be graphically presented by the *pie chart*. This is simply a circle that has been divided

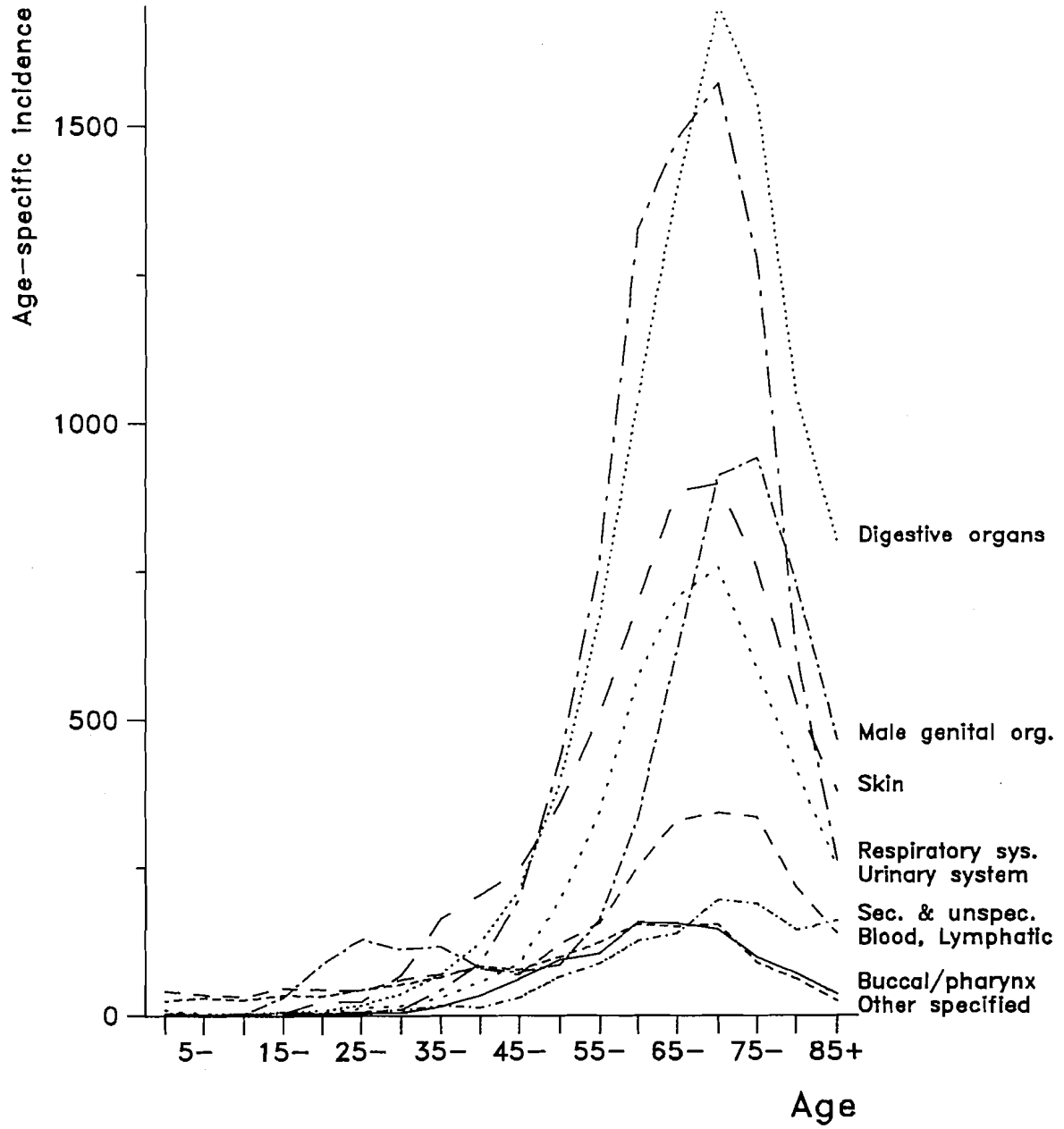


**Figure 5. Age-specific incidence curves for cancer of selected sites in males in Denmark, 1983–85**
Line-graph

into wedges, each representing the percentage of one variable compared to the entire sample. Percentages are converted to degrees, since the entire circle (360°) represents 100%, i.e. 1% = 3.6°. The entire circle (pie) can then be divided by means of a protractor. An example is shown in Figure 3.

Another way to illustrate the size of components of a whole is by means of the *component band-graph*. It can be used for the analysis of nominal and ordinal data but instead of bars it has bands. It is particularly useful for the comparison of various components of independent groups, and it can be either vertical or horizontal, whichever is easier to read. An example is shown in Figure 4.

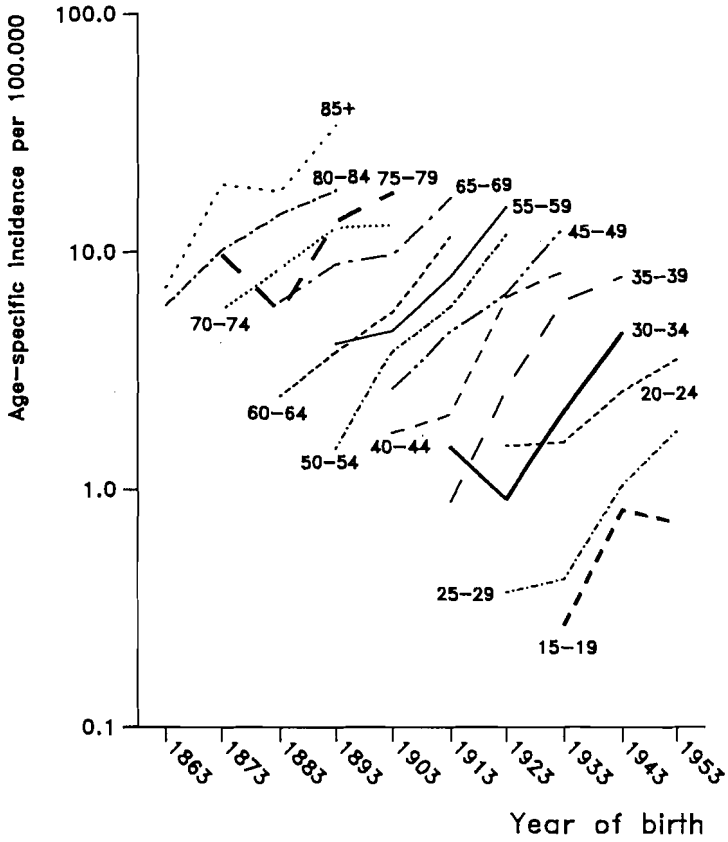


**Figure 6. Age-specific incidence rates of skin melanoma in males by birth cohort in Denmark**
Line-graph

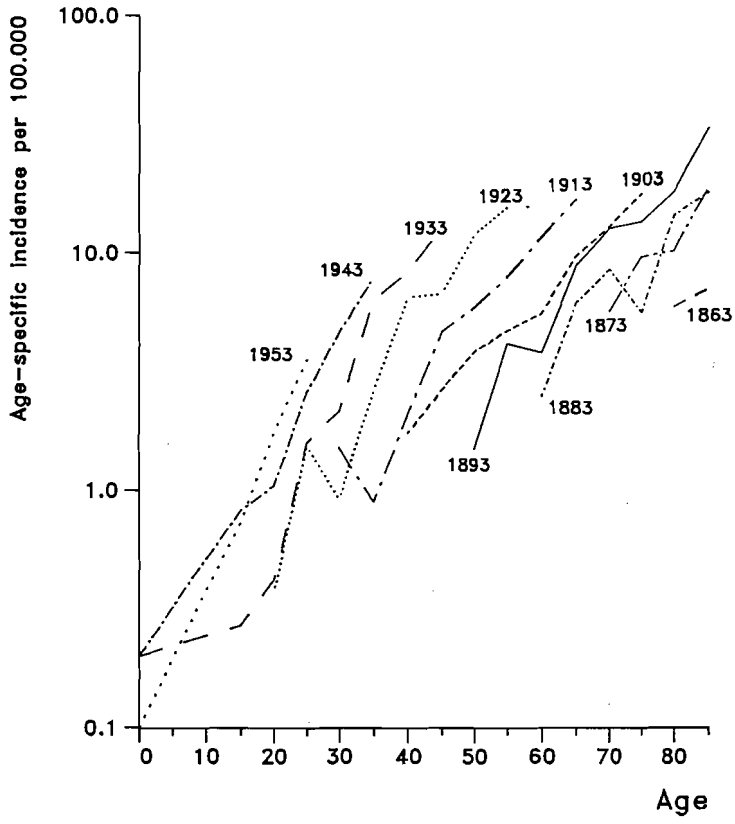


**Figure 7. Age-specific incidence rates of skin melanoma in males by birth cohort in Denmark**

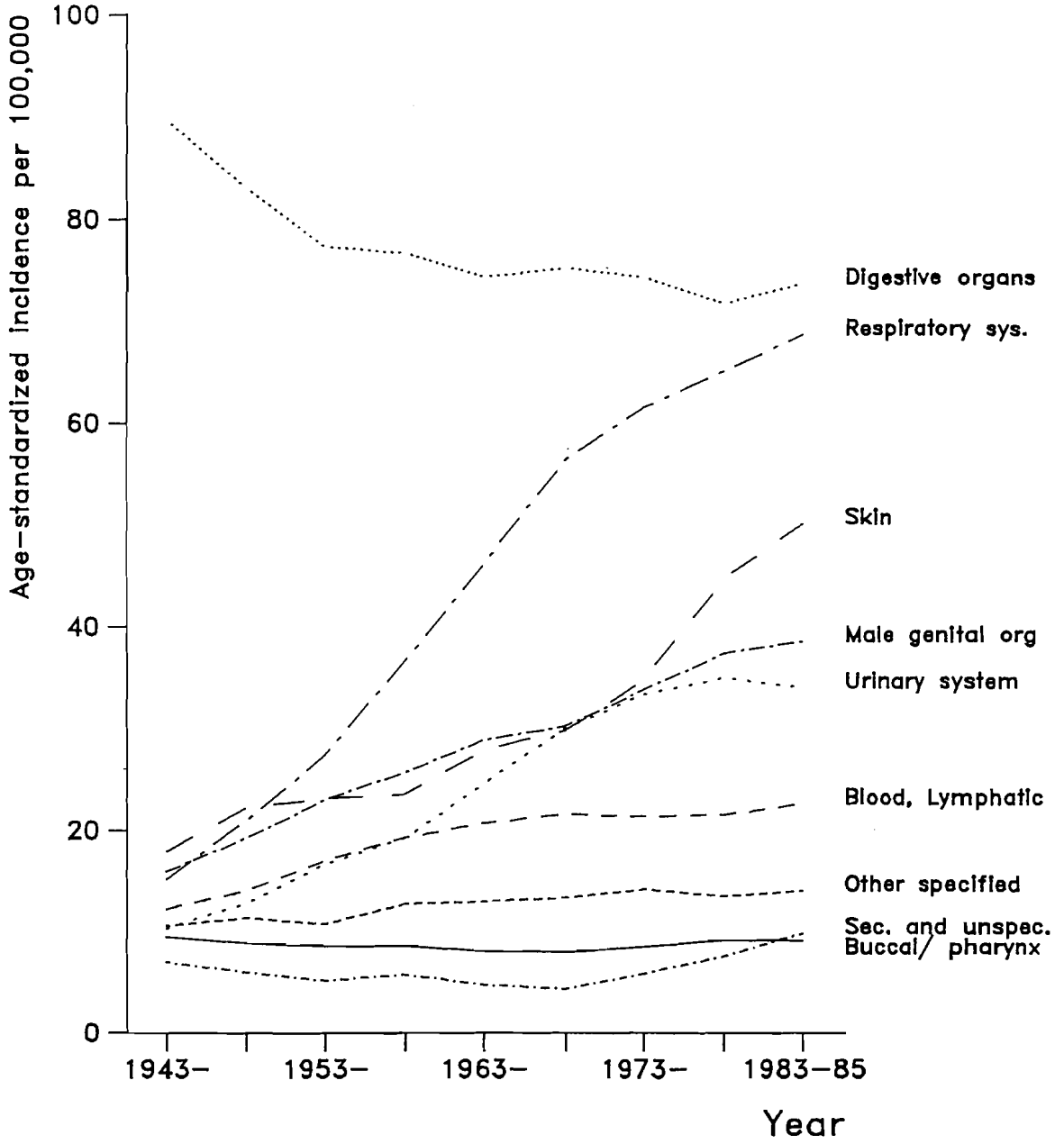


**Figure 8. Trends in age-standardized incidence rates of cancer of selected sites in males in Denmark, 1943–85**
Line-graph, arithmetic scale

Age-specific incidence rates are most commonly plotted by *line-graphs*. Such plots can be done either on an arithmetic or a semilogarithmic scale (with ages on the arithmetic and rates on the logarithmic axis). On the logarithmic scale the relative increases or decreases in rates are of identical magnitude, irrespective of the absolute values. Plotting of age-specific incidence rates will quickly reveal differences in age curves for different sites, as in Figure 5, or for different time periods. Trends in age-specific incidence rates are also best presented by line-graphs. This can easily be combined with a graphical presentation of age-specific rates for birth cohorts as illustrated in Figure 6. An alternative approach is the presentation of age-specific incidence rates for individual birth cohorts, as shown Figure 7. The annual age-

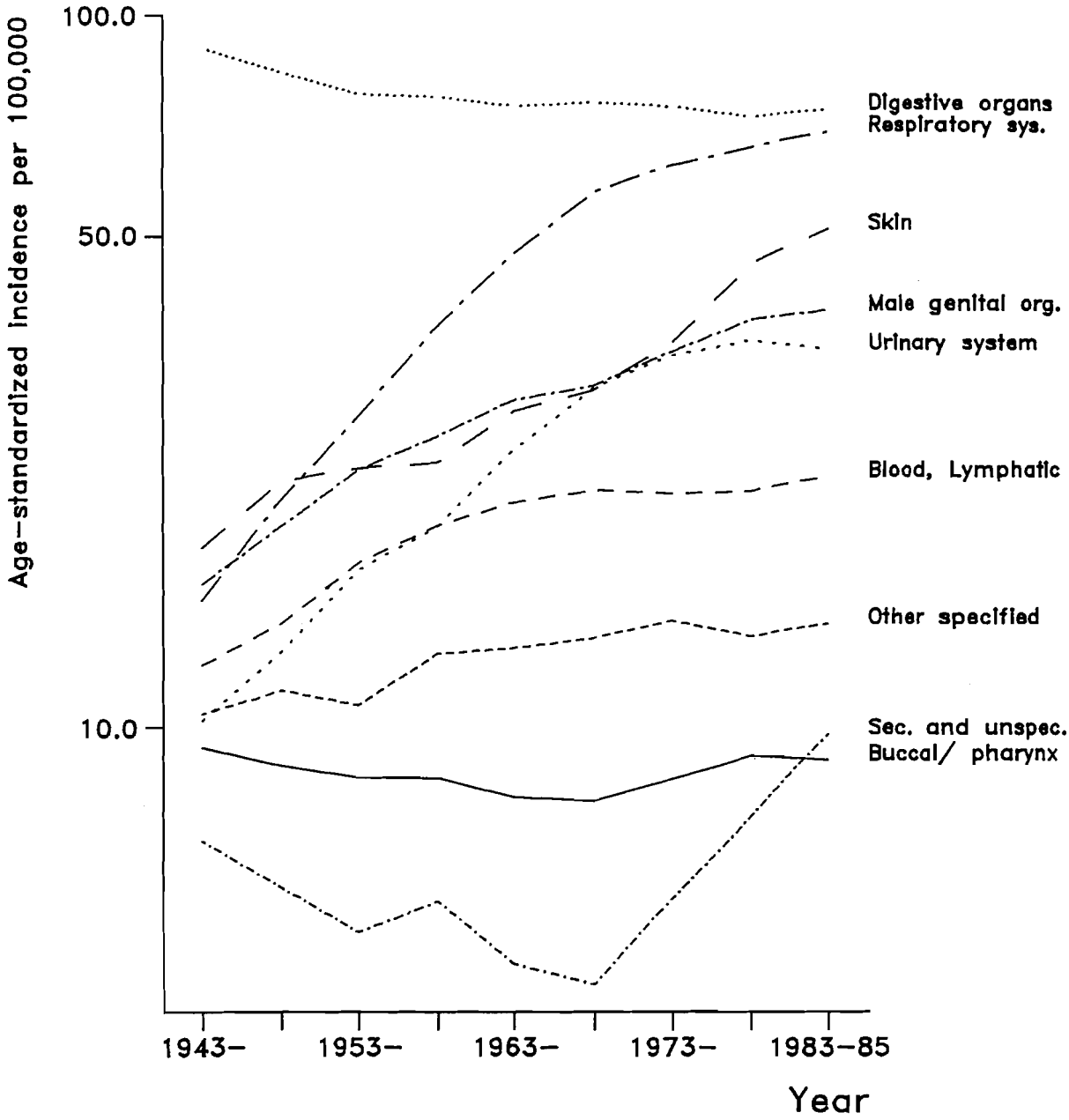


**Figure 9. Trends in age-standardized incidence rates of cancer of selected sites in males in Denmark, 1943–85**
Line-graph, logarithmic scale

standardized incidence rates can be plotted with both scales being arithmetic, as in Figure 8; by plotting the same data using the logarithmic scale for the rates, as in Figure 9, it is possible to compare the rate of increase between sites.

For rare cancer sites, large fluctuations can take place in the annual rates simply because of small numbers of cases. A three-year moving average rate can be calculated, which smoothes out the fluctuations and provides a clearer picture of what is actually taking place. The number of cases for a three-year period is added together and so are the population figures for the same three years in order to derive an average three-year rate. This can then be done for subsequent three-year periods (excluding the earliest year and including the most recent). An example is given in Figure 10.

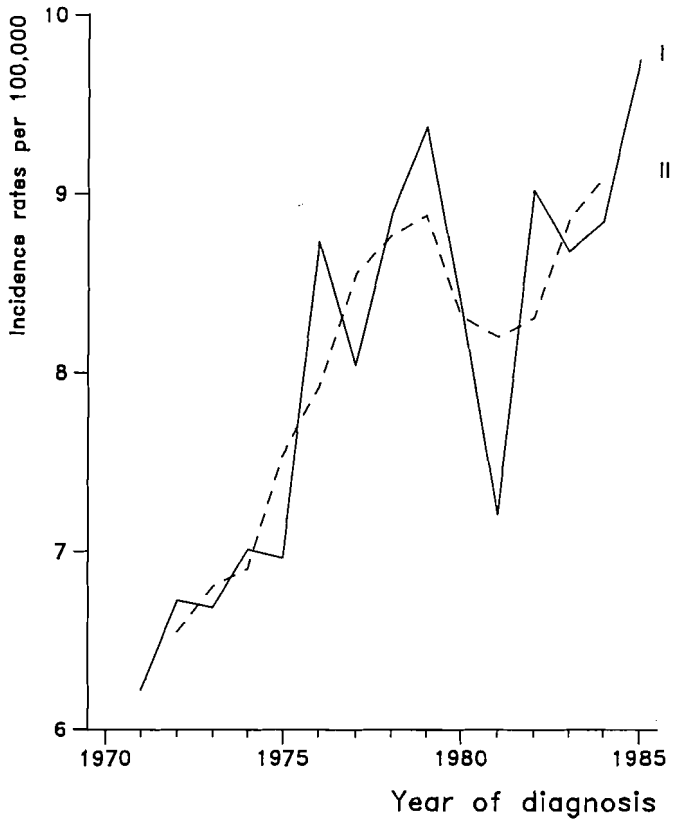


**Figure 10. Trends in age-standardized incidence rates of testis cancer in Denmark, 1971–85**
Annual rates (I) and three-year moving average (II)

## *Special reports*

Numerous issues related to cancer etiology, the natural history of cancer and survival can be addressed by means of cancer registry data. Furthermore, the cancer registry will normally possess the computing facilities and statistical skills necessary for such analyses. It is thus natural that the registry acts as an epidemiological or biostatistical research institute. As mentioned in Chapter 3, such special studies may give detailed comparisons of cancer incidence in different geographical regions, for different ethnic groups, and they may examine time trends in incidence, and survival. Special studies might also deal with the registration process itself and the validity of data, or comprise more detailed study of histological distribution of tumour types within a given site.

Studies of this kind should be encouraged. They may be reported in special monographs from the registry or as a supplement to a scientific journal, the latter often ensuring a wider international distribution. Other studies lend themselves to reporting as articles in scientific journals, and such reporting will help to establish the reputation of the registry for the quality of its work.

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