
International Smoking Statistics

Web Edition

A collection of worldwide historical data

Methods

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Preface

International Smoking Statistics is a collection of smoking data covering most of Europe and various other economically developed countries. The second edition (published by Wolfson Institute of Preventive Medicine and OUP, 2002, www.oup.co.uk/isbn/0-19-850856-5) included data for 30 countries up to 1995. Since 2006, work has been ongoing to make individual country updates available online. Please register at www.pnlee.co.uk if you wish to be informed when updates are posted.

The methods used in the web edition are essentially unchanged from those of the second edition, although some minor changes are included in this Methods chapter.

The two main types of data presented are sales data and survey data. We give the results of the original authors as closely as possible, whilst presenting them in a uniform format.

Sales data give the total national consumption of tobacco. Data on sales of cigarettes and of all tobacco products are presented, usually from about 1920. Estimates of the consumption of hand-rolled cigarettes are included where possible, as are data on the types of manufactured cigarettes sold. The Tobacco Research Council provided most of the sales data until 1973, while later sales data were obtained from government and industry sources.

Survey data provide information on the prevalence and amount of smoking according to age and sex. These were obtained from a wide variety of surveys. Some survey data are available for the early part of the 20th century, but for most countries they are available only from the 1950s or 1960s onwards.

In additional tables we calculate further statistics by combining sales and survey data using certain standardized assumptions. The figures are intended to provide an easily interpretable summary of the data presented in the tables, and the commentary has deliberately been kept to a minimum.

Downloads

Updates currently available to download from www.pnlee.co.uk/iss.htm include:

Methods, including

Appendix I: *Estimated size of adult population;*

Appendix II: *Comparisons of manufactured and hand-rolled cigarettes and differences in the way they are smoked;*

Appendix III: *Consumption category estimation;*

Comparisons between countries;

Updated country chapters (see *Countries considered*, p. 6 for current list);

Tables from each updated chapter, in Excel format.

Supplement 1: *Estimation of sex-specific smoking statistics by standardized age groups and time periods.* [The web edition comprises a brief Update Note, together with tables (in Excel format only) for the countries with a

chapter in the web edition. The original Supplement 1 to the second edition (an extended version of Appendix IV to the second edition) is also available and gives a full description and tables for the other countries];

Also available from the same source are:

Supplement 2 to the second edition: *Estimating past smoking habits by an indirect method. An investigation into a method based on recall, with application to Great Britain.* [This supplement is an extended version of Appendix V to the second edition];

IMASS, a comprehensive Excel database system, based on WHO mortality data and smoking statistics from Supplement 1. The IMASS system includes powerful routines for creating graphs and tables.

Acknowledgements

We would like to acknowledge the tobacco industry for their financial support and for providing some of the sales data in International Smoking Statistics.

We would also like to thank the many government and research organizations and individuals who supplied much of the information included.

We thank Yvonne Cooper, Pauline Wassell and Diana Morris for maintenance of our references database.

We are indebted to G. F. Todd, past director of the Tobacco Research Council, who, shortly before he died in 1988, had prepared a draft report from which the first edition of International Smoking Statistics developed.

Professor Nicholas Wald was an editor of earlier editions, and we thank him for his support and encouragement.

We alone bear the responsibility for the analysis and interpretation of the data presented.

Countries considered

The countries included in the Web Edition are shown in the list below, marked 'w'. Other countries are shown with their chapter number from the second edition (Forey *et al* (2002)). Countries were chosen for the first edition on the expectation that sufficient age- and sex-specific smoking data could be collected to enable a useful study of the relationship with mortality statistics, and in the second edition coverage was extended to most of Europe. Chapters in the second edition relate to political boundaries as they existed pre-1990, with the exception of Germany where the former Democratic and Federal Republics are presented in a single chapter. Chapters in the Web edition relate either to current or to historical boundaries.

w	Australia	w	Italy
w	Austria	w	Japan
3	Belgium	18	Netherlands
4	Bulgaria	w	New Zealand
w	Canada	20	Norway
6	Czechoslovakia	21	Poland
w	Denmark	22	Portugal
w	Finland	23	Romania
w	France	w	Spain
w	Germany	w	Sweden
11	Greece	w	Switzerland
12	Hungary	w	UK (United Kingdom)
13	Iceland	w	USA (United States of America)
14	Ireland	29	USSR (Union of Soviet Socialist Republics)
15	Israel	30	Yugoslavia

Further data for the United Kingdom are available in an earlier book (Wald and Nicolaides-Bouman (1991)), which includes more detailed information on smoking in the UK.

Main sources of data

The two main types of data presented are sales data and survey data. Sales data give the total national consumption of tobacco. Survey data provide information on the prevalence and amount of smoking according to age and sex. We give the results of the original authors as closely as possible, whilst presenting them in a uniform format. We calculate further derived statistics by combining the sales and survey data using certain standardized assumptions. Each chapter contains the following tables for the specified country, unless otherwise stated (a few tables are missing because of lack of data).

Sales data tables

- 1.1 Total annual sales of tobacco products before 1974
- 1.2 Total annual sales of tobacco products for 1974 onwards
- 1.3 Percentage sales of tobacco in different forms (by weight)
- 2 Sales of cigarettes (including estimated number of hand-rolled cigarettes) and of all tobacco products, total and per adult
- 3 Characteristics of manufactured cigarettes sold (filter, tar, nicotine)

Survey data tables

- 4 Prevalence of smoking according to age and sex
- 5 Number of cigarettes smoked per smoker per day according to age and sex

Additional derived data tables

- 6 Number of cigarettes smoked per person per day according to age and sex
- 7 Number of cigarettes smoked per person per day, sales-adjusted, according to age and sex
- 8 Summary of adult smoking according to sex

Further explanation of the tables is given below.

Sales data

Data on tobacco sales up to 1973 were obtained from the Tobacco Research Council Research Paper 6 (RP6) (Beese (1968), Beese (1972), Lee (ed) (1975)) unless otherwise stated. Later data, and data for countries not represented in that report, were obtained from government or industry sources. Full citations of the sources are given in the *References* for each country.

We use the term **sales** of tobacco products, although in some cases the data may refer to estimated **consumption**. Since tobacco products are generally high-value items, there is likely to be little wastage; and, since tobacco products are subject to taxation, data on legally sold products are widely available and generally reliable. Thus there may be little difference between sales and consumption. However differences may arise due to factors such as smuggling and other illicit sales, home-grown tobacco, cross-border sales or stocks held by retailers. These factors are treated differently in the different countries and may be described briefly in the *Notes* for each country. In particular, a substantial increase in illicit sales has been reported in recent years in several countries.

Tables 1.1 and 1.2 show the total national sales of all types of tobacco known to be used in each country. Tobacco products such as manufactured cigarettes and cigars are shown by both number and weight; in most countries the weights have been estimated by us for 1974 onwards. This estimation was made to allow calculation of an estimate for total tobacco consumption, which is a useful measure in comparing consumption between different countries as the market share of the various products can differ considerably. For a few countries, this weight estimation was based on data on the average weight of a cigarette. However, there has generally been little such information available and therefore we have used a constant weight per cigarette, cigar, etc. to convert numbers to weight, derived from the average weights of the products between 1970 and 1973 for each country as given in RP6, or 1 g per cigarette for countries not represented in RP6. A drawback of this method is that it cannot reflect certain changes in the cigarette market. Changes such as the switch from plain to filter cigarettes,

variation in the weight of standard cigarettes and the varying market share of king size cigarettes will have had an effect on the weight of an ‘average’ cigarette. Estimates of total tobacco consumption are only presented if we are reasonably confident that data on all relevant types of tobacco are available.

Data are included on smokeless tobacco, which takes various forms in different countries. Chewing tobacco, chewed or held in the cheek or lower lip, is available in three main types—loose leaf, plug, and twist. Snuff has a much finer consistency and is held in the mouth without chewing; it may be moist or dry. Dry snuff may also be taken nasally, but this practice is now very limited. Snuff in small pouches the size of tea bags was introduced in some countries, and subsequently banned in many of them.

Table 1.3 is based on the data by weight in Tables 1.1 and 1.2, and includes data for selected years only. For some countries, additional tables are included to cover other aspects of tobacco consumption, such as sales of cigarette papers.

Table 2 provides information relevant to manufactured and hand-rolled cigarettes, and to the total of all tobacco products; the data are shown as total (annual) national sales for the year and average daily sales per adult (aged 15 years and over). Sales of manufactured cigarettes (by number) and of total tobacco consumption (by weight) are taken from Tables 1.1 and 1.2 (see comments above). Hand-rolled cigarettes are not sold as such, being made by the smoker, so that data on the numbers of hand-rolled cigarettes are essentially estimates of consumption rather than sales. When no data are available from other sources, we have estimated numbers of hand-rolled cigarettes where possible from 1950 onwards, and hence the total number of cigarettes smoked. Our estimates of hand-rolled cigarette consumption are usually based on the sales of loose tobacco, and are described in *Notes* for each country. See also Appendix II.

Data describing some characteristics of the manufactured cigarettes sold are shown in Table 3. This includes the percentage of manufactured cigarettes sold as filter cigarettes, and the sales-weighted average machine yields of tar and nicotine.

In Tables 1-3, blank indicates that data are not available; dash (–) indicates that data are not available but are assumed to be negligible. For those countries where the only sales data available refer to manufactured cigarettes by number, Tables 1.1 and 1.2 are not presented, as the same information can be found in Table 2. Tables 1.3 and 2 are also presented graphically as Figures 1 and 2 respectively.

Data from alternative sources, and data which cannot reasonably be presented in our standard tables, are sometimes given in the *Notes*.

Survey data

Prevalence of smoking and cigarette consumption per smoker

These data have been obtained from a variety of sources. Only data for men and women separately have been included. Nationally representative surveys have been used where possible. Other sources are included when nationally representative surveys do not exist (or are not made available by trade sources) for some countries or for all years, or they provide little detail. Sources providing international comparisons are also included. Some surveys are based on specific regions or racial groups. Surveys of teenagers are frequently based on pupils at school, who may not be representative of teenagers who have left school. Control

also those who smoke other products but not cigarettes; unless specifically stated in the *Notes* it does not include those who use smokeless tobacco products but who do not smoke, or those who smoke only non-tobacco products.

‘Product unspecified’ may mean that the questionnaire did not specify the product, leaving it to be self-defined by the respondent, for example in reply to the question ‘Do you smoke?’, or that the description available to us was not specific.

No attempt has been made to include data on smokers of hand-rolled cigarettes only, or of other products only, or by type of manufactured cigarette (e.g. filter/plain, high/low tar, dark/blond tobacco), although brief mention of such results is sometimes made in the *Notes*.

Where necessary, further details of the product definition are given in the *Notes*.

Frequency Definitions of the frequency of smoking also vary; some are limited to regular or daily smokers (which can generally be regarded as synonymous for adult smokers), some relate to smoking the day before the survey, and some are self-defined. In the table providing data on the prevalence of smoking (Table 4), a frequency code has been used as follows:

R	regular smokers
A	all smokers (regular and occasional)
U	frequency unspecified

Further details of the frequency definition are given in the *Notes* for teenage surveys (if available), and where necessary for adult surveys. Where estimates of prevalence for both regular and all smokers are available, both are presented; for cigarettes per smoker, the estimate per regular smoker is presented.

Estimated In Table 5, a code ‘E’ may be given in the column under ‘*Estimated*’, and indicates that the data are derived as explained in *Consumption category estimation*, p. 11.

Age groups The age groups used in Tables 4 and 5 are single years of age from 12 to 19, 5-year age groups from 20-24 to 75-79, and 80+. The overall age range covered by each survey, and the breakdown into age groups are indicated by the boundaries in the row. For ages 20 or over, original authors usually provide data by intervals of 5 years or more and there is then no problem in fitting the estimated prevalence of smoking or cigarette consumption into the available space. Exceptionally, data are provided for narrower age ranges, necessitating averaging of estimates and/or widening of boundaries. This is indicated in the *Notes* where it applies, as are cases where the lowest age group also includes persons below the age of 12. Occasionally, where the ‘*All ages*’ data (see next paragraph) refer to a wider age range, the gap(s) in the age-specific data are indicated by the code *.

All ages Some surveys provide data relevant to the whole age group studied as well as for each age group. These estimates are included, where applicable, in the column under ‘*All ages*’. The age range to which they are applicable is indicated by the boundaries to the results by age. (For estimates relevant to all adults’ ages, see *Summary of adult smoking* on p. 13).

We do not include standard errors or confidence intervals for the estimates because they are rarely given by the original authors and cannot readily be calculated for multistage survey designs. However we include sample sizes and response rates in the *Notes*, as a general indicator of reliability.

Additional derived data

Consumption category estimation

In many studies, information is not presented directly on the numbers of cigarettes smoked per smoker per day. Instead, the distribution of smokers according to various categories of number smoked (e.g. 1-9, 10-19, 20-29, 30+ cigarettes per day) is given. Todd (1978) introduced a method for estimating the mean consumption level for each consumption category and hence estimating the average consumption per smoker. We have used a modification of this method, described in Appendix III. In the table on cigarette consumption per smoker (Table 5), the code 'E' in the column under '*Estimated*' indicates that this estimation has been used. Details of the different consumption categories used are given in the *Notes* to the tables. This estimation will be less reliable when based on few categories, and cases where only two categories were available are indicated in Table 5 by the code *.

This method has also been applied to some surveys of teenage smoking and to surveys of weekly (rather than daily) consumption, where its validity is unproven.

Cigarette consumption per person

The cigarette consumption per person (the number of cigarettes smoked per person per day averaged over both smokers and non-smokers) is given in Table 6. These estimates have generally been calculated by Todd (1978) or by us, by multiplying the percentage of cigarette smokers in the population by the cigarette consumption per smoker, although in a few cases these data were given by the original author.

For some surveys, the prevalence of smoking is not available on an exactly equivalent base to the consumption per smoker, but the estimate has been presented as the best available. Such problems are indicated by the code *. For instance, we may have combined the prevalence of smoking **of any product** with the cigarette consumption **per cigarette smoker** to estimate the cigarette consumption per person. This estimate will be reasonable provided that the percentage of other smokers is small; otherwise it gives an overestimate. The extent to which this is a problem varies with both country and sex—in many countries more men than women smoke other products.

The year, source number, product code and the age groups shown in the tables on cigarette consumption per person, are all as described for Tables 4 and 5 (see p. 9). A frequency code is not generally needed (calculations were based on regular smokers if possible; if otherwise, this is mentioned in the *Notes*).

Percentage of total sales

It is well known that the total consumption of cigarettes, when grossed up from survey findings, is almost invariably substantially lower than the total sales of cigarettes. The degree of this understatement is indicated in the column under '*% Total sales*' in Table 6, where the consumption implied by the survey is given

as a percentage of the total sales. The method of calculating this percentage is as follows:

The calculation was carried out only for surveys which covered both sexes and an age range of at least 21-64. The method was applied regardless of whether or not surveys were representative of the general population in the whole country.

We filled gaps in the consumption per person data for ages 15-20 or 65 years and over, by assumed extensions to the age distribution which are shown either in the *Notes* for each country (for chapters issued up to January 2011), or in an extended version of Table 6 in the Excel Tables file (for more recently issued chapters). This process is unlikely to cause material bias, since the assumed extensions apply only to a relatively small proportion of the population. Smoking by persons aged under 15 was ignored in calculating the total consumption implied by the survey, except where the lowest age group ‘overlapped’ the age of 15. Such data have little effect on the total consumption. If a survey provided data both by age and for all ages, the data by age were used in the calculation.

Population data were as described in *Population*, p. 14. Where population estimates for single years of age were required, they were assumed to be one-fifth of those for the 5-year age group.

The survey-based consumption data (cigarettes per person) were combined with the population data to calculate the total national consumption by adults implied by the survey. This figure was compared with the sales estimate for the period of the survey. In some cases, there was a problem in aligning the type of product smoked, as recorded in the survey, with the available sales data. The product used is indicated by an adjustment code in the ‘% Total sales’ column as follows.

Adjustment code	Explanation
M	Survey data relate (or probably relate) to manufactured cigarette consumption; adjustment was made to sales of manufactured cigarettes
T	Survey data (probably) relate to total cigarette consumption (manufactured and hand-rolled); adjustment was made to our estimate of total cigarette consumption
m	Survey data (probably) relate to total cigarette consumption; no estimate of hand-rolled cigarette consumption is available, but it is believed to be rare and so adjustment was made to sales of manufactured cigarettes
A	Survey data relate to consumption of all products (grams per person per day); adjustment was made to sales of all products; rarely used
--	Calculations previously made by Todd (1978) on a very similar basis, or by original authors, and not recalculated.

The percentage total sales was then calculated. This can be interpreted as an indication of the under/overstatement of the survey.

Sales-adjusted cigarette consumption per person

For those surveys from Table 6 which met the criteria (both sexes and an age range of at least 21-64), the estimates for cigarette consumption per person adjusted to match total sales are provided in Table 7. The percentage total sales is repeated to indicate the degree of adjustment that has been applied. The adjusted

figure is calculated by dividing the unadjusted figure by the percentage total sales. This method assumes that the degree of understatement is uniform over both sexes and all age groups. This assumption may not always be justifiable, but in general adjusted figures probably give a more realistic picture of consumption than unadjusted figures.

Summary of adult smoking

Table 8 presents a summary of adult smoking according to sex but not according to age. It gives estimates of the prevalence of smoking of cigarettes and of all products, and estimates of cigarette consumption per person, both original (unadjusted) and adjusted to match total sales.

All surveys in Tables 4, 6, and 7 covering an age range of at least 21-64 are included (required for both sexes in the sales-adjusted part of the table). The source number is given (see also p. 9) so that the survey can be found in the age-specific tables and the *Notes* for each country. The product codes are also as shown in the age-specific tables (see also p. 9), but the frequency of smoking is indicated by the type style (regular or daily smokers in normal type, all smokers in bold and unspecified in italics, see also p. 10). The estimated percentage of total sales implied by the survey (used as adjustment factor) is given as provided in the tables on cigarette consumption per person (see also p. 11).

Any gaps in the cigarette consumption per person data for ages 15-20 or 65 years and over are filled in by assumed extensions to the age distribution as described in *Percentage of total sales*, p.12. We used a similar procedure to extend the prevalence data. The age-specific data are then combined with the population data to calculate the average for the whole adult range (aged 15 years and over).

In some cases, the original 'All ages' estimates (see also p. 10) could transfer directly to Table 8, but our method uses age-specific data and WHO population data in preference if they are available. Thus the estimates shown in Table 8 reflect the age distribution of the population rather than of the survey sample. This can sometimes lead to an apparent anomaly when comparing Tables 4-7 with Table 8.

For some surveys, no data on consumption per person were available in Table 6, but data on the percentage of cigarette smokers were specified in Table 4. Using the additional assumption that the consumption level per female smoker is 80% of that per male smoker, it was then possible to divide the total sales-based consumption figures into separate estimates for each sex. Such estimates are shown in parentheses. They have occasionally been included even if based on smoking of unspecified products, but only where it was reasonable to assume that they related to cigarettes.

Table 8 is also presented graphically in Figures 3 and 4. No distinction is made in these Figures for frequency of smoking.

For chapters issued after January 2011, a customisable version of Figure 3 is also included, allowing the reader to select data and vary the plotting symbol according to source, sex, product and/or frequency.

Also for chapters issued after January 2011, the Excel tables workbook includes extended versions of Tables 4 and 6. As well as repeating the original age-specific and 'All ages' data, these tables show the assumed extensions to the age distribution, and also the adult (age 15+) estimates from Table 8.

Estimates by standardized age groups

The different age groups used in Table 4 are often difficult to interpret. In Appendix IV to the second edition, a method is described to estimate the prevalence of smoking from data presented in Table 4 of each country, according to a set of standard age groups. Standardized data facilitate comparison with, for instance, mortality trends, as these are commonly presented by 5-year age groups. The method is extended in Supplement 1 to cover cigarette consumption per person from data in Tables 6 and 7 of each country. An Excel spreadsheet system IMASS (International Mortality and Smoking Statistics) (Forey *et al* (2004)) includes the estimated standardized smoking data from Supplement 1, mortality data from WHO and facilities for creating graphs and tables, and is available separately from www.pnlee.co.uk.

Indirect estimates of past smoking habits

In Appendix V to the second edition (and more fully in Supplement 2), an indirect method of estimating past smoking habits is described. Indirect estimates are given for the UK and are compared with the direct estimates presented in the UK chapter (Chapter 27 in the second edition), leading to the conclusion that indirect estimation represents a useful approach when direct estimates are not available. Appendix V also lists references to papers which have presented indirect estimates for the countries in the second edition.

Population

Population data are taken from WHO estimates, usually available by sex and 5-year age group for 1950 onwards. In earlier years, RP6 was used for total populations, and Alderson (1981) for the age- and sex-specific distribution. Occasionally, other sources were used, and are noted in Appendix I.

Abbreviations

Abbreviations used in the *Notes* for each country are explained when first mentioned within each chapter, apart from RP6 (Research Paper 6 of the Tobacco Research Council, London, see Beese (1968,1972) and Lee (1975) in *References* p. 17) and WHO (World Health Organization) which are used throughout.

Glossary

Adult. Person aged 15 years or over.

All tobacco products. The total of all types of tobacco sold (e.g. manufactured cigarettes, cigars, cheroots, loose tobacco for pipes, hand-rolling and chewing)

Cigarettes per person per day. The number of cigarettes smoked per day averaged over both smokers and non-smokers.

Cigarettes per smoker per day. The number of cigarettes smoked per day averaged over smokers only.

Consumption. Estimated consumption of tobacco products may be based either on sales data or on survey data. Differences between the two sources would be expected—from sales data due to wastage, smuggling, cross-border sales or stocks held by retailers, and from survey data due to mis-reporting or lack of representativeness.

Consumption category estimation. A method of converting data given in the form of the distribution of smokers in categories of numbers of cigarettes smoked (e.g. 1-9, 10-19, 20-29, 30+ cigarettes per day), into an estimate of the average number of cigarettes smoked per smoker.

Derived data. Data obtained as results of calculations carried out by the authors of International Smoking Statistics, using certain standardised assumptions described in this *Methods* chapter.

Frequency. How often smokers smoke (e.g. daily, at least once a week, has smoked in the last month). See also *Regular smoking*.

Hand-rolled (HR) cigarettes. Cigarettes made by the smoker using loose tobacco and cigarette papers or tubes. Also known as *roll-your-own (RYO)*. Before the advent of cigarette making machinery, factory-made cigarettes were hand-rolled or hand-filled, but these methods ceased to be used by the early 20th century, and for the purposes of this work, such cigarettes are counted as manufactured cigarettes.

Manufactured cigarettes. Factory-made packeted cigarettes.

Nicotine. See *Yield*.

Prevalence of smoking. The percentage of the population who smoke the specified tobacco product.

Regular smoking. In surveys of adults, smoking daily or smoking an average of 1 or more cigarettes per day are usually considered regular smoking, although some surveys use other definitions which we describe in the specific *Notes on sources of survey data*. In surveys of teenagers, no standard definition of a regular smoker is assumed and each definition is given in the *Notes*; smoking at least once a week is commonly used.

RP6. A report by the Tobacco Research Council, London, which is a major source of sales data for the years up to 1973. See *References*, p. 17.

Sales data. Information on the sales, for the whole country, of tobacco products to the public. Usually obtained from government (taxation) or industry sources, they often refer to duty-paid sales (i.e. excluding illicit sales).

Sales-adjustment. A method of adjusting survey data, so that, when grossed up, it matches the total sales for the whole country.

Sales-weighted. An average that is weighted to take account of the market share of each cigarette brand. See also *Yield*.

Smokeless tobacco. Tobacco that is chewed, held in the mouth or sniffed, rather than burned.

Survey data. Information on the smoking habits of the population in the country, usually obtained from interview surveys. Within International Smoking Statistics, only data relating to males and females separately are considered.

Tar. See *Yield*.

Total cigarettes. The total of manufactured and hand-rolled cigarettes.

Yield. The cigarette mainstream smoke yield of tar, nicotine or carbon monoxide, measured on a smoking machine under standard conditions. Standards have varied between countries and over time (e.g. US Federal Trade Commission (FTC) 1966, ISO method 1977 revised 1991), but most involve a smoking regime of one 35 ml puff of 2 seconds duration, taken once per minute to a butt length of 23 mm for a plain cigarette, or the longer of 23 mm or the filter tipping overwrap + 3 mm for a filtered cigarette (Baker (2002)). Data presented in International Smoking Statistics are usually sales-weighted average machine yields of tar, nicotine or carbon monoxide (commonly abbreviated as *SWAT*, *SWAN* or *SWACO*).

References

Papers referred to in the *Notes* for each country are listed separately in the *References* for each country, where full citations of the sources are given. A paper marked with § indicates that we have not obtained the paper, but have taken information quoted by another author.

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Appendix I

Estimated size of adult population

Males and females aged 15 years and over, thousands, selected years.

Year	Armenia			Australia ¹			Austria		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1906				1 485	1 311	2 797			
1910				1 643	1 450	3 093			
1915				1 776	1 600	3 376			
1920				1 907	1 772	3 679			
1925				2 085	1 973	4 057	2 363	2 634	4 998
1930				2 354	2 230	4 584	2 399	2 674	5 073
1935				2 481	2 365	4 846	2 444	2 735	5 179
1940				2 652	2 563	5 215	2 419	2 714	5 133
1945				2 814	2 740	5 553	2 413	2 807	5 221
1950				3 013	2 990	6 003	2 414	2 942	5 357
1955				3 291	3 237	6 528	2 435	2 958	5 393
1960				3 604	3 568	7 171	2 489	3 005	5 494
1965				3 994	3 987	7 981	2 529	3 037	5 566
1970				4 444	4 457	8 902	2 543	3 038	5 581
1975				4 968	5 012	9 980	2 647	3 121	5 768
1980				5 423	5 496	10 919	2 762	3 203	5 965
1985				5 958	6 082	12 041	2 890	3 302	6 193
1990	1 190	1 326	2 515	6 585	6 725	13 310	3 019	3 363	6 382
1995				6 998	7 181	14 179	3 179	3 456	6 635
2000				7 472	7 715	15 187	3 175	3 471	6 646
2005				7 936	8 183	16 119	3 326	3 590	6 916

Year	Azerbaijan			Belarus			Belgium		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925									5 900
1930									6 200
1935									6 300
1940									6 500
1945									6 600
1950							3 338	3 495	6 833
1955							3 375	3 561	6 936
1960							3 360	3 592	6 951
1965							3 483	3 708	7 191
1970							3 552	3 809	7 361
1975							3 685	3 939	7 624
1980							3 798	4 058	7 856
1985							3 866	4 144	8 010
1990	2 278	2 506	4 785	3 605	4 282	7 888	3 945	4 216	8 161
1995									
2000									
2005									

Year	Bosnia and Herzegovina ²			Bulgaria			Canada		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920						3 462	3 424	3 369	6 793
1925						3 793	3 288	2 938	6 225
1930						4 093	3 609	3 251	6 859
1935							3 899	3 573	7 472
1940							4 195	3 908	8 104
1945							4 454	4 225	8 679
1950							4 873	4 753	9 625
1955							5 323	5 237	10 560
1960				2 882	2 935	5 817	5 975	5 863	11 838
1965				3 096	3 142	6 238	6 531	6 526	13 057
1970				3 252	3 300	6 552	7 385	7 488	14 873
1975				3 368	3 434	6 802	8 282	8 453	16 735
1980				3 408	3 492	6 900	9 068	9 368	18 436
1985				3 494	3 598	7 092	9 743	10 161	19 905
1990				3 493	3 660	7 154	10 256	10 769	21 024
1992	1 681	1 720	3 401						
1995				3 345	3 557	6 901	11 600	12 017	23 617
2000				3 321	3 565	6 886	12 233	12 678	24 911
2005							13 080	13 526	26 605

Year	Croatia ²			Czechoslovakia ³			Czech Republic		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925				4 669	5 185	9 854			
1930				4 898	5 404	10 301			
1935									
1940				5 732	6 164	11 896			
1945				4 412	4 801	9 213			
1950				4 407	4 811	9 218			
1955				4 543	4 952	9 495			
1960				4 758	5 177	9 936			
1965				5 076	5 496	10 572			
1970				5 287	5 726	11 013			
1975				5 441	5 904	11 345	3 646	3 955	7 601
1980				5 563	6 035	11 598	3 727	4 043	7 771
1985				5 615	6 103	11 718	3 762	4 089	7 851
1990				5 806	6 293	12 099	3 899	4 241	8 139
1992	1 837	2 008	3 846						
1995							4 036	4 374	8 410
2000									
2005									

Year	Denmark			Estonia			Finland		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920	1 070	1 159	2 229				1 030	1 068	2 098
1925	1 137	1 232	2 368				1 121	1 164	2 285
1930	1 210	1 301	2 511				1 186	1 231	2 417
1935	1 321	1 403	2 724				1 262	1 339	2 600
1940	1 399	1 465	2 864				1 292	1 401	2 693
1945	1 477	1 536	3 013				1 304	1 444	2 748
1950	1 548	1 606	3 154				1 309	1 511	2 820
1955	1 599	1 661	3 259				1 368	1 567	2 935
1960	1 680	1 746	3 426				1 447	1 636	3 083
1965	1 780	1 847	3 627				1 572	1 753	3 325
1970	1 858	1 923	3 781				1 647	1 826	3 472
1975	1 918	1 991	3 909				1 749	1 926	3 674
1980	1 982	2 073	4 055				1 815	1 994	3 809
1985	2 037	2 134	4 171				1 887	2 064	3 951
1990	2 085	2 180	4 264	557	664	1 220	1 927	2 096	4 023
1995	2 115	2 206	4 321				1 990	2 146	4 136
2000	2 131	2 219	4 350				2 046	2 190	4 236
2005	2 159	2 240	4 399				2 102	2 233	4 335

Year	France ¹			Georgia			Germany and West Germany ⁴		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1865	13 797	14 485	28 282						
1870	13 380	14 047	27 427						
1875	13 304	13 967	27 271						
1880	13 591	14 268	27 858						
1885	13 830	14 519	28 349						
1890	13 928	14 622	28 550						
1895	13 935	14 630	28 565						
1900	14 117	14 820	28 937						
1905	14 233	14 942	29 175						
1910	14 349	15 064	29 413				23 878	24 508	48 386
1915	12 127	12 973	25 101						
1920	14 309	15 672	29 981						
1925	14 901	16 727	31 629				22 013	26 297	48 310
1930	15 325	17 022	32 348				22 674	27 088	49 762
1935	15 085	16 672	31 757				23 301	27 837	51 138
1940	14 338	15 977	30 315						
1945	14 263	16 090	30 353						
1950	15 288	17 044	32 331				16 613	19 846	36 459
1955	15 561	17 247	32 807				18 037	21 224	39 261
1960	16 028	17 610	33 638				19 241	22 558	41 800
1965	17 376	18 898	36 274				21 204	24 496	45 700
1970	18 589	20 019	38 608				21 660	24 932	46 593
1975	19 596	20 936	40 532				22 692	25 851	48 543
1980	20 405	21 766	42 172				23 673	26 693	50 366
1985	21 124	22 777	43 900				24 462	27 329	51 792
1990	21 984	23 728	45 712	1 894	2 191	4 085	25 643	27 990	53 633
1995	22 711	24 484	47 195				32 925	35 473	68 397
2000	22 931	24 876	47 807				33 528	35 824	69 352
2005	23 889	25 873	49 761				34 302	36 375	70 677

Year	East Germany			Greece			Hungary ³		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920						3 300	2 626	2 877	5 503
1925						4 000	2 754	2 996	5 750
1930						4 300	2 950	3 178	6 129
1935						4 600	3 109	3 327	6 436
1940						4 900	3 230	3 448	6 678
1945						5 000			
1950	6 018	8 168	14 187	2 571	2 816	5 388	3 312	3 698	7 010
1955	6 090	8 076	14 165	2 811	3 066	5 876	3 463	3 834	7 297
1960	5 901	7 705	13 606	2 941	3 213	6 154	3 526	3 931	7 456
1965	5 683	7 281	12 964	3 034	3 331	6 365	3 694	4 092	7 786
1970	5 809	7 265	13 074	3 185	3 442	6 626	3 905	4 281	8 186
1975	5 955	7 249	13 204	3 318	3 568	6 886	4 011	4 387	8 398
1980	6 160	7 287	13 447	3 597	3 846	7 443	3 980	4 383	8 362
1985	6 228	7 210	13 438	3 815	4 045	7 860	3 969	4 391	8 360
1990	6 082	6 886	12 968	3 996	4 204	8 200	3 906	4 362	8 268
1995				4 254	4 439	8 693	3 946	4 430	8 376
2000							3 909	4 413	8 322
2005									

Year	Iceland ¹			Ireland			Israel		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920			64			2 200			
1925			67			2 100			
1930			72			2 100			
1935			80			2 100			
1940			90			2 200			
1945			90			2 100			
1950	49	50	99	1 075	1 042	2 118	399	377	776
1955	52	53	105	1 035	1 016	2 050	521	512	1 033
1960	57	57	114	979	978	1 957	612	607	1 219
1965	63	63	126	988	991	1 979	765	763	1 527
1970	69	68	138	1 009	1 015	2 024	878	884	1 762
1975	77	76	152	1 067	1 080	2 147	1 148	1 173	2 321
1980	83	83	165	1 178	1 187	2 366	1 277	1 314	2 591
1985	89	89	178	1 241	1 265	2 506	1 404	1 450	2 855
1990	95	96	191	1 258	1 288	2 546	1 573	1 629	3 202
1995	101	102	202	1 337	1 387	2 724	1 906	2 001	3 906
2000									
2005									

Year	Italy ¹			Japan			Kazakhstan		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1881	9 036	9 657	18 692						
1905	10 776	11 225	22 001						
1910	11 047	11 738	22 785						
1915	11 620	12 448	24 068						
1920	12 483	13 254	25 737	18 110	17 791	35 900			
1925	13 317	14 133	27 450	18 961	18 764	37 726			
1930	13 725	14 732	28 457	20 299	20 214	40 514			
1935	14 226	15 301	29 527	21 844	21 864	43 708			
1940	14 817	15 839	30 656	22 711	22 807	45 519			
1945	15 676	16 800	32 476	22 966	23 063	46 029			
1950	16 697	18 103	34 800	25 865	27 902	53 767			
1955	17 596	18 855	36 451	28 682	30 795	59 477			
1960	18 237	19 525	37 763	31 542	33 810	65 352			
1965	18 981	20 392	39 373	35 430	37 679	73 109			
1970	19 546	21 045	40 590	38 001	40 473	78 474			
1975	20 412	21 979	42 391	40 945	43 320	84 264			
1980	21 432	23 087	44 519	43 442	46 040	89 482			
1985	22 111	24 004	46 115	45 816	48 529	94 345			
1990	23 137	25 022	48 159	48 763	51 556	100 319	5 492	6 056	11 549
1995	23 268	25 182	48 450	50 747	53 685	104 432			
2000	23 382	25 397	48 779	52 085	55 176	107 261			
2005				52 681	56 086	108 767			
Year	Kyrgyzstan			Latvia			Lithuania		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925									
1930									
1935									
1940									
1945									
1950									
1955									
1960									
1965									
1970									
1975									
1980									
1985									
1990	1 325	1 434	2 759	948	1 142	2 091	1 342	1 556	2 897
1995									
2000									
2005									

Year	Macedonia ²			Moldova			Netherlands		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925									5 000
1930									5 500
1935									5 900
1940									
1945									
1950							3 523	3 628	7 150
1955							3 706	3 830	7 536
1960							3 956	4 088	8 044
1965							4 355	4 466	8 820
1970							4 687	4 794	9 481
1975							5 033	5 170	10 203
1980							5 405	5 585	10 991
1985							5 726	5 947	11 672
1990				1 463	1 685	3 148	5 995	6 230	12 225
1992	712	720	1 432						
1995							6 192	6 424	12 616
2000							6 363	6 601	12 964
2005									

Year	New Zealand			Norway			Poland ¹		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920	442	410	852						
1925	476	454	930						20 892
1930	540	520	1 060			2 000			
1935	580	563	1 143			2 200			
1940	609	609	1 218			2 300			
1945	614	650	1 264			2 400			
1950	681	681	1 362	1 213	1 261	2 474	8 137	9 392	17 529
1955	734	736	1 470	1 255	1 295	2 550	8 797	10 041	18 838
1960	796	800	1 596	1 310	1 347	2 657	9 255	10 413	19 668
1965	887	894	1 781	1 383	1 419	2 801	10 289	11 431	21 720
1970	949	970	1 920	1 442	1 487	2 928	11 313	12 442	23 755
1975	1 071	1 090	2 161	1 502	1 552	3 054	12 451	13 569	26 021
1980	1 129	1 153	2 281	1 561	1 619	3 180	12 917	14 023	26 939
1985	1 215	1 256	2 471	1 628	1 694	3 322	13 282	14 422	27 704
1990	1 259	1 325	2 583	1 686	1 753	3 438	13 681	14 862	28 543
1995	1 373	1 451	2 824	1 720	1 791	3 510	14 277	15 512	29 790
2000	1 442	1 537	2 979				14 972	16 254	31 226
2005	1 569	1 675	3 244						

Year	Portugal			Romania ^{1,3}			Russia		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920						11 063			
1925						11 939			
1930						12 281			
1935						12 948			
1940			5 300						
1945			5 600						
1950	2 782	3 146	5 928						
1955	2 939	3 314	6 254	5 987	6 565	12 552			
1960	2 935	3 362	6 298	6 350	6 897	13 247			
1965	2 997	3 480	6 477	6 743	7 255	13 998			
1970	2 844	3 316	6 159	7 258	7 742	15 001			
1975	3 124	3 721	6 845	7 716	8 168	15 884			
1980	3 383	3 940	7 323	7 926	8 354	16 280			
1985	3 618	4 027	7 645	8 349	8 774	17 122			
1990	3 738	4 138	7 876	8 655	9 083	17 738	52 318	62 198	115 417
1995	3 873	4 280	8 152	8 752	9 285	18 037			
2000	4 057	4 458	8 514	8 873	9 464	18 337			
2005									

Year	Serbia & Montenegro ²			Slovakia			Slovenia ²		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925									
1930									
1935									
1940									
1945									
1950									
1955									
1960									
1965									
1970									
1975				1 796	1 948	3 744			
1980				1 836	1 992	3 827			
1985				1 835	2 014	3 867			
1990				1 916	2 077	3 993			
1992	3 836	4 076	7 912				767	837	1 604
1995				1 994	2 160	4 153			
2000									
2005									

Year	Spain			Sweden			Switzerland		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920	6 886	7 502	14 388	2 016	2 159	4 175			
1925	7 190	7 817	15 007	2 131	2 272	4 403			
1930	7 614	8 257	15 871	2 247	2 370	4 617	1 440	1 602	3 042
1935	8 039	8 820	16 859	2 386	2 481	4 867	1 498	1 661	3 159
1940	8 473	9 495	17 967	2 497	2 573	5 070	1 542	1 701	3 243
1945	9 001	10 032	19 033	2 579	2 639	5 218	1 623	1 791	3 414
1950	9 627	10 692	20 319	2 660	2 722	5 382	1 706	1 899	3 604
1955	10 069	11 088	21 157	2 735	2 802	5 537	1 793	1 988	3 781
1960	10 450	11 541	21 991	2 872	2 934	5 805	1 927	2 121	4 048
1965	10 844	12 214	23 058	3 029	3 085	6 114	2 133	2 311	4 444
1970	11 789	12 821	24 610	3 155	3 211	6 366	2 272	2 446	4 718
1975	12 232	13 305	25 537	3 205	3 293	6 498	2 368	2 559	4 927
1980	13 383	14 399	27 782	3 283	3 399	6 682	2 439	2 640	5 079
1985	14 322	15 275	29 597	3 347	3 487	6 834	2 568	2 761	5 329
1990	15 158	16 123	31 280	3 441	3 583	7 024	2 691	2 874	5 565
1995	15 841	16 850	32 691	3 507	3 656	7 163	2 801	2 998	5 799
2000	16 621	17 618	34 239	3 548	3 690	7 238	2 885	3 076	5 961
2005	18 135	18 973	37 107	3 670	3 788	7 457	3 024	3 214	6 238

Year	Tajikistan			Turkmenistan			UK ⁵		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1905							13 928	15 041	28 969
1910							14 971	16 153	31 125
1915							14 077	16 875	30 952
1920							15 432	17 624	33 056
1925							15 369	17 394	32 763
1930							16 124	18 136	34 260
1935							16 862	18 848	35 711
1940							17 164	19 680	36 844
1945							15 303	20 362	35 664
1950							18 539	20 509	39 048
1955							18 528	20 724	39 253
1960							19 010	21 141	40 151
1965							19 952	21 821	41 773
1970							20 216	22 119	42 334
1975							20 508	22 364	42 872
1980							21 154	22 963	44 117
1985							21 974	23 749	45 723
1990	1 544	1 604	3 148	1 083	1 150	2 233	22 392	24 090	46 482
1995							22 873	24 350	47 224
2000							23 609	24 789	48 398
2005							23 960	25 476	49 436

Year	Ukraine			USA			USSR		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1900				27 108	27 009	54 116			
1905				29 814	29 706	59 520			
1910				33 809	31 819	65 627			
1915				36 708	34 345	71 053			
1920				37 530	36 278	73 808			
1925				40 832	39 507	80 338			
1930				43 835	42 644	86 479			
1935				46 347	45 854	92 201			
1940				48 839	48 947	97 786			
1945				51 496	52 306	103 802			
1950				54 222	55 993	110 215			
1955				56 268	59 325	115 593			
1960				59 973	63 564	123 537			
1965				64 622	69 288	133 910			172 875
1970				69 567	75 697	145 264			182 100
1975				77 130	83 973	161 103			190 725
1980				84 183	91 735	175 918			199 125
1985				89 572	97 228	186 800	93 962	112 452	206 414
1990	18 357	22 385	40 742	93 670	101 188	194 857	98 496	115 718	214 214
1995				98 760	106 270	205 030	101 014	117 604	218 618
2000				107 199	113 969	221 169			
2005				114 943	120 767	235 710			

Year	Uzbekistan			Yugoslavia ³		
	Males	Females	Total	Males	Females	Total
1920						
1925				3 891	4 204	8 095
1930				4 169	4 452	8 621
1935				4 477	4 780	9 257
1940						
1945						
1950				5 289	5 957	11 246
1955				5 799	6 412	12 211
1960				6 115	6 672	12 787
1965				6 575	7 126	13 701
1970				7 168	7 690	14 858
1975				7 695	8 184	15 879
1980				8 191	8 677	16 868
1985				8 597	9 017	17 613
1990	5 913	6 253	12 166	8 999	9 423	18 422
1995						
2000						
2005						

Notes on sources of population data

Data before 1950

Unless otherwise stated (see *Other notes* below), for the countries considered in the Web Edition (see p. 6 for current list), adult population estimates are calculated from the total population taken from Lee P.N. (1975) (RP6), and the age × sex distribution taken from Alderson M. (1981). For the other countries, data on the adult population are taken from RP6. Data in RP6 are given on an annual basis to the nearest hundred thousand, while Alderson (1981) gives data to nearest thousand for 5-year periods (e.g. data in thousands for the period 1946-1950 are taken to apply to each year within that period, and are effectively to nearest 200 per year). Estimates are shown here to the nearest thousand.

The following source notes were given in RP6:

	The population figures have been obtained either from the publications of the United Nations and the World Health Organisation or from official sources in the country of origin.
Canada	1920-24 The Canadian Year-Book. 1925-57 Canadian Statistical Review, 1957 and 1958. 1958-1973 Statistics Canada, Census Division.
Finland	Central Statistical Office of Finland.
Germany	1926-39 <i>Bevolkerung und Wirtschaft</i> , 1871-1957, published by the Western Germany Federal Statistics office, Wiesbaden. 1949-63 United Nations Demographic Yearbook. 1964-73 <i>Statistisches Jahrbuch für die Bundesrepublik Deutschland</i> , published by the Western Germany Federal Statistics office, Wiesbaden.
Netherlands	1923-52 <i>Bevolking van Nederland</i> ; <i>Leeftijd en Geslacht</i> , 1953-73 <i>Maandstatistiek van Bevolking and Statistisch Zakboek</i> , all published by the Netherlands Central Bureau of Statistics.
Norway	Central Bureau of Statistics Norway.
Switzerland	<i>Annuaire Statistique de la Suisse</i>
USA	1920-45 <i>Historical Statistics of the United States</i> , 1789-1945, published by the United States Department of Commerce. 1946-72 United Nations Monthly Bulletin of Statistics and United Nations Demographic Yearbook.

The following notes were given in Alderson (1981):

Canada	1901-20 data for Ontario only. 1901-1930 data for registration area only.
USA	1901-32 data for expanding registration area.

Data for 1950 onwards

Unless otherwise stated (see *Other notes* below), data are taken from the WHO Mortality Database, <http://www3.who.int/whosis>.

For Israel, up to 1974, data refer to Jewish population only, thereafter to total population. The Jewish population was 89% of the total population in 1975.

Other notes

- 1 Data before 1950 (before 1920 for Australia, before 1930 for France and Iceland) are estimated from total population given by <http://www.library.uu.nl/wesp/populstat/populhome.html>
- 2 US Census Bureau International Data Base (IDB), <http://www.census.gov/>
- 3 Data before 1950 are taken from Alderson M. (1981). Data are based on 5-year periods (e.g. data for the period 1946-1950 are taken to apply to each year within that period).
- 4 Data for 1950-1990 refer to West Germany (Federal Republic), otherwise to Germany as a whole. Data for 1910 estimated from the totals given in Mitchell (1978), with the adult/total proportion from the 1925 RP6 (sexes-combined) data applied. Data for 1925-1938 estimated from the total given in RP6 with the sex \times age distribution from the 1950 WHO data applied.
- 5 Data before 1950 are taken from Todd (1962).

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- Mitchell B.R. (1978). *European historical statistics 1750-1970*, Abridged edition. Macmillan Press Limited, London.
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Appendix II

Comparisons of manufactured and hand-rolled cigarettes and differences in the way they are smoked

In the UK in the past, most manufactured cigarettes were 70 mm in length and filled wholly with tobacco. Today, the vast majority have filters, and they are also available in longer lengths (e.g. 85 mm and 100 mm). Generally, the longer the cigarette, the longer is the filter. Although few direct data are available on the average weight of tobacco in cigarettes, comparison of the total sales by number and by weight (see Tables 1.1 and 1.2 of UK chapter) suggests that the weight had remained at about 1.0 g from 1920 to 1960, but then decreased to 0.7 g in 1975 and rose again to 0.8 g by 1985.

Fine-cut tobacco purchased for use in hand-rolled cigarettes was usually taxed and priced at a rate lower per cigarette than the tobacco in manufactured cigarettes, and the smoker who made his own cigarettes generally did so at least in part to economize, even when the two types of cigarettes contained the same amount of tobacco. However, he economized further by putting less tobacco, and sometimes very much less, into each cigarette. Estimates of 0.8 g per cigarette in the 1930s, falling to 0.5 g in the early 1980s, have been used by the TAC (Tobacco Advisory Council), based on sales of tobacco and consumer survey findings.

Another motive for smoking hand-rolled cigarettes is the availability of stronger blends of tobacco. With the phasing out in recent decades of the brands of manufactured cigarettes with the highest tar delivery, a smoker determined to have a full-flavoured cigarette can only obtain one by making his own.

The tobacco used for hand-rolled cigarettes contains more moisture than that in manufactured cigarettes. This is essential; otherwise the tobacco would be too brittle to handle satisfactorily when it is made into cigarettes. The higher moisture content has two consequences. First, the tobacco has a stronger flavour than it would have had at a lower moisture content. Second, the hand-rolled cigarette is liable to go out when it is placed in any ashtray between puffs, encouraging the smoker to take more frequent puffs or to hold the cigarette longer in his mouth.

Another difference between the ways in which hand-rolled and manufactured cigarettes are smoked is that the former are frequently smoked down to a short butt length. The length to which a manufactured cigarette can be smoked is limited by the length of the filter.

Many of these considerations also apply to other countries.

Data on the average weight of tobacco in manufactured cigarettes are rarely given directly. Comparable data for sales of manufactured cigarettes by both weight and number are available for only a few countries and limited years. The weight of tobacco per cigarette, given directly or estimated from these data since 1950, is summarized as follows:

	Estimated weight of tobacco per manufactured cigarette (g)							
	1950	1960	1970	1975	1980	1985	1990	1995
Australia					0.82	0.79	0.74	
Canada	1.46	1.28	0.95	0.89	0.83	0.81	0.77	0.71
Denmark	1.25	1.24	1.27		1.00			
Finland								
Russian-type	0.45	0.44	0.40					
Other	1.08	0.92	0.99					
Overall*	0.79	0.79	0.97		0.60			
Germany	1.10	1.08	0.98					
Greece	1.14	1.14	1.14	1.14	1.14	1.00	1.00	1.00
Ireland	1.00	1.00	0.86		0.80	0.84		
Japan		1.00	1.00					
New Zealand		1.10					0.84	0.76
Norway	1.20	1.09	1.09		1.00			
Sweden	1.11	1.04	0.81		0.70	0.68		
UK	0.97	0.98	0.76		0.80	0.83		
USA	1.30			0.85	0.80	0.79	0.79	0.76

This shows a generally decreasing tobacco content for most countries. A recent increase is seen in Ireland and the UK. The pattern in Finland is influenced by the decreasing sales of Russian-type cigarettes with low tobacco content. A similar effect with decreasing papyrosi sales is seen in USSR (see *Notes on sources of sales data*, p. 745 of second edition (Forey *et al* (2002))).

A tax differential between manufactured and hand-rolled cigarettes exists in several countries. Lower cost is an important motive for the smoking of hand-rolled cigarettes as can be seen in Germany (Junge *et al* (1989)) and Norway (Mørck *et al* (1982)).

Few data are available on the average tobacco content of hand-rolled cigarettes (or of the extent of use of filters, tubes, or manual cigarette makers). The average tobacco content of a hand-rolled cigarette has been assumed to be 1.25 g in Flemish-speaking Belgium (Joossens (1981)) and the Netherlands (de Haas (1973)), and 1.0 g by other sources in the Netherlands (de Haas and de Haas-Posthuma (1980), Stichting Volksgezondheid en Roken (Foundation for Smoking and Health) (Successive years)), Germany (Todd (1986)), and Canada (Millar (1983)). Rickert *et al* (1985) in Canada, in an experiment testing 13 popular brands of fine-cut tobacco, made up cigarettes by manually inserting the tobacco into filter tubes using a manual filter cigarette maker. The average weight of cigarettes was 1.4 g. Dymond (1996) gives the average weight of a hand-rolled cigarette as 0.8 g in Finland, 0.76 g in France, 0.778 g in Germany, 0.78 g in Netherlands, 0.9 g in Norway and 0.49 g in UK; and gives the moisture content of fine-cut tobacco as usually 16-18% and sometimes as high as 22% (much higher than that of manufactured cigarettes). Mørck *et al* (1982) estimated that 10% of hand-rolled cigarettes in Norway and 87% in Denmark were filter cigarettes.

More recently, a review of studies into consumer making methods in Europe and Canada was published by the Coresta task force on roll-your-own (fine cut) tobacco (1999). Simple hand-rolling was the most common method used in Belgium/Luxembourg, France, Germany, Ireland, Netherlands, Norway and UK, while use of a hand-held rolling machine was the most common in Finland. Tubing (using a machine to insert the tobacco into a pre-made tube with or without a filter) was the principal method used in Canada, Denmark and Sweden. Use of loose filters was 70% in Finland, 20% in Sweden, 10% in Germany and

5% in UK. In the UK, the weight of tobacco used was around 0.4 to 0.5 g and the cigarette diameter between 5 and 6 mm, while in Finland, France, Germany and the Netherlands the weight was 0.7 to 0.9 g and in Norway 0.9 to 1.1 g, all with diameter 7 to 8 mm.

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Appendix III

Consumption category estimation

The method used in International Smoking Statistics (since its first edition Nicolaides-Bouman, 1993) to estimate the means of consumption categories of numbers of cigarettes smoked per day was introduced by G. F. Todd in 1986 (Todd, 1986). This was a modification of an earlier published method (Todd, 1978).

The 1978 method used a standard distribution based on detailed frequency distributions of male and female cigarette smokers that had applied in the UK. This distribution separated those who smoked a number of cigarettes ending with five or zero from those who smoked a number in the intervening categories. The standard distribution was modified when detailed distributions from the New Zealand Censuses of 1976 and 1981 became available. By combining the two censuses, data on over 700 000 male and 600 000 female smokers were available in 11 consumption categories (1-4, 5-9,, 45-49, and 50+ cigarettes per day). This enabled better distributions to be constructed for those smoking larger numbers of cigarettes.

The 1986 standard distribution is given below:

1986 standard distribution			
Consumption category	Male smokers	Female smokers	Assumed mean of consumption category
	%	%	
1-4	7	10	2.5
5	4	5	5
6-9	6	10	7.5
10	13	17	10
11-14	7	8	12.5
15	8	11	15
16-19	4	4	17.5
20	25	20	20
21-24	6	5	22.5
25	4	3	25
26-29	2	1	27.5
30	5	2	30
31-34	1	1	32.5
35	1	0	35
36-39	0	0	37.5
40	4	2	40
41-44	0	0	
45	0	0	
46-49	0	0	
50	2	1	50
51-59	0	0	
60	1	0	60
61+	0	0	
	100	100	

Use of the standard distribution assumes that, for the country, age, and sex group in question, the shape of the distribution within each consumption category (e.g. 16-24 cigarettes per day) was the same as in the standard distribution. This

procedure seems reasonable where consumption categories are small, e.g. 1-5, 6-10, 11-20, 21-30, and 31+. Its validity where few consumption categories were used, e.g. 1-14 and 15+, is less certain. On rare occasions when consumption categories used non-standard dividing points (e.g. 8-12) we split the standard category by assuming a uniform distribution over the standard category. When the first category does not have a specific lower bound (e.g. <5), we assume a lower bound of 1, which may lead to an overestimate due to inclusion of non-daily smokers.

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