International Smoking Statistics

Web Edition

A collection of worldwide historical data

Methods

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Contents

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, including extended versions of Tables 4 and 6 and a customisable version of Figure 3;
>
> 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 all the included countries (although for countries with chapters only partially updated in the web edition, the original Supplement tables have been reproduced without being updated). 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].

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];

An updated version of Appendix V Bibliography. [This bibliography lists published papers that use an indirect method for estimating past smoking habits based on recall];

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.

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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'. Those marked 'w*' have been only partially updated in the Web Edition. All countries from the second edition (Forey *et al* (2002)) have now been included. 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 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. All successor countries are included in the Czechoslovakia, USSR and Yugoslavia chapters.

w	Australia	w	Italy
w	Austria	w	Japan
w	Belgium	w	Netherlands
w*	Bulgaria	w	New Zealand
w	Canada	w	Norway
w*	Czechoslovakia	w	Poland
w	Denmark	w	Portugal
w	Finland	w*	Romania
w	France	w	Spain
w	Germany	w	Sweden
w	Greece	w	Switzerland
w	Hungary	w	UK (United Kingdom)
w	Iceland	w	USA (United States of America)
w	Ireland	w*	USSR (Union of Soviet Socialist Republics)
w*	Israel	w*	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, some pre-1920 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

populations from case-control studies have sometimes been used where no other data are available. Studies of occupational groups have generally not been used. Even surveys based on large regions cannot necessarily be regarded as typical of the country, since the region may have been selected for study for reasons related to smoking habits.

While we have tried to include all survey data of value, choices are inevitably arbitrary and there may be omissions. Readers aware of other data are welcome to contact the authors, so that the data can be considered for inclusion in any future editions.

The prevalence of smoking (the percentage of the population who currently smoke cigarettes or any tobacco products) is given in Table 4. Cigarette consumption per smoker is given in Table 5. These data are presented according to sex and, if available, according to age group.

Each row of Tables 4 and 5 includes age-specific data from one survey. Results for males and females are presented on facing pages. A blank row indicates that the survey did not report that sex. Estimates of the prevalence of smoking are presented to the nearest whole number, and of cigarette consumption per smoker to two significant figures (if available). At the beginning of the row we have given the year in which the survey was carried out, the source number assigned to that survey and a code for the tobacco products used. Additionally in Table 4 only, a code for the frequency of smoking is given (data in Table 5 being assumed to refer to regular smokers), while in Table 5 only, an indication that values are estimated may be given. Thus the table header for Table 4 is:

Year	Source	Product	Frequency	Age Groups																				All ages
				12	13	14	15	16	17	18	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+	

Further explanation is given in the following sections.

Year The last two digits of the year of each survey, or mid-point year if carried out over a longer period, is shown in the tables. We may have combined results from separate waves of a survey if carried out in the same year.

Source Each source of survey data—either an individual survey or a series of surveys repeated over a number of years—is cited by a source number. This number is shown in the tables for cross-reference to the accompanying *Notes*, where details of the source publication are given, together with a brief description of the survey scope and methodology if available. Full citations of the sources are given in the *References* for each country.

Product The definitions of smoking used in different surveys vary so much that comparisons are not straightforward. A product code has been used to identify the smoking habits considered by the survey:

- MC manufactured cigarettes
- TC total cigarettes (manufactured and hand-rolled)
- UC cigarettes (type unspecified)
- A any tobacco product
- U product unspecified

The definition of **cigarette smokers** includes those who smoke either cigarettes only or cigarettes and other products (pipe, cigars, etc.). The definition of **smokers of any product** includes all cigarette smokers, and

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 (where regular is commonly defined as smoking weekly), 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 in an extended version of Table 6 in the Excel Tables file. 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.11. 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.

A customisable version of Figure 3 is included in the Excel tables workbook, allowing the reader to select data and to vary the plotting symbol according to source, sex, product and/or frequency.

The workbook also 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 used in 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).

Carbon monoxide. See *Yield.*

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, either manually or using a machine, and using loose tobacco and cigarette papers or tubes, sometimes with filters. Also known as *roll-your-own (RYO)* or *make-your-own (MYO)* See also Appendix II. 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. ignoring illicit and cross-border 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 questionnaire or interview surveys. Within International Smoking Statistics, only data relating to males and females separately are considered.

SWACO, SWAN, SWAT. See *Yield*.

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*).

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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	1 082	1 176	2 257	5 958	6 082	12 041	2 890	3 302	6 193
1990	1 123	1 210	2 333	6 585	6 725	13 310	3 019	3 363	6 382
1995	1 269	1 417	2 685	6 998	7 181	14 179	3 179	3 456	6 635
2000	1 394	1 536	2 930	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	Azerbaijian			Belarus			Belgium [1]		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920							2 708	2 751	5 459
1925							2 921	2 952	5 873
1930							3 095	3 095	6 190
1935							3 181	3 227	6 408
1940							3 202	3 264	6 467
1945							3 230	3 295	6 525
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	2 125	2 350	4 475	3 481	4 198	7 680	3 866	4 144	8 010
1990	2 232	2 461	4 693	3 585	4 271	7 856	3 945	4 216	8 161
1995	2 398	2 590	4 988	3 659	4 378	8 037	4 024	4 291	8 315
2000	2 675	2 934	5 609	3 741	4 402	8 143	4 089	4 358	8 446
2005	3 029	3 270	6 299	3 797	4 475	8 271	4 210	4 473	8 683

Year	Bosnia and Herzegovina [2]			Bulgaria [1]			Canada		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920				1 757	1 716	3 473	3 424	3 369	6 793
1925				1 946	1 900	3 846	3 288	2 938	6 225
1930				2 092	2 043	4 135	3 609	3 251	6 859
1935				2 233	2 161	4 394	3 899	3 573	7 472
1940				2 440	2 358	4 798	4 195	3 908	8 104
1945				2 680	2 601	5 281	4 454	4 225	8 679
1950				2 636	2 658	5 294	4 873	4 753	9 625
1955				2 725	2 797	5 521	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
1993	1 695	1 727	3 422						
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				3 211	3 469	6 679	13 080	13 526	26 605
2010				3 116	3 389	6 505			

Year	Croatia [2]			Czechoslovakia [3]			Czech Republic		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920									
1925				4 671	5 185	9 856			
1930				4 898	5 404	10 301			
1935				5 571	5 818	11 390			
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	3 785	4 144	7 928
1990				5 806	6 293	12 099	3 899	4 241	8 139
1993	1 835	2 007	3 842						
1995	1 841	2 014	3 855				4 036	4 374	8 410
2000	1 661	1 852	3 513				4 135	4 452	8 587
2005	1 776	1 958	3 734				4 214	4 506	8 720
2010	1 787	1 959	3 747				4 388	4 623	9 011

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	532	647	1 179	1 887	2 064	3 951
1990	2 085	2 180	4 264	556	664	1 220	1 927	2 096	4 023
1995	2 115	2 206	4 321	513	626	1 139	1 990	2 146	4 136
2000	2 131	2 219	4 350	505	618	1 123	2 046	2 190	4 236
2005	2 159	2 240	4 399	514	626	1 141	2 102	2 233	4 335
2010				512	623	1 136			

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	1 809	2 122	3 931	24 462	27 329	51 792
1990	21 984	23 728	45 712	1 903	2 122	4 025	25 643	27 990	53 633
1995	22 711	24 484	47 195	1 691	2 122	3 814	32 925	35 473	68 397
2000	22 931	24 876	47 807	1 605	2 122	3 727	33 528	35 824	69 352
2005	23 889	25 873	49 761	1 727	2 122	3 849	34 302	36 375	70 677
2010							34 468	36 310	70 778

Year	East Germany			Greece			Hungary [1]		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920				1 614	1 730	3 344	2 638	2 890	5 528
1925				1 937	2 076	4 013	2 815	3 062	5 877
1930				2 108	2 224	4 332	3 009	3 241	6 250
1935				2 246	2 346	4 592	3 150	3 370	6 520
1940				2 412	2 499	4 911	3 309	3 533	6 842
1945				2 412	2 499	4 911	3 248	3 426	6 674
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	3 908	4 367	8 275
1995				4 311	4 476	8 787	3 976	4 477	8 454
2000				4 543	4 702	9 245	3 909	4 413	8 322
2005				4 676	4 832	9 508	3 986	4 535	8 521
2010				4 761	4 921	9 682			

Year	Iceland [9]			Ireland			Israel		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1850	19	22	41						
1860	21	24	44						
1870	21	25	46						
1880	23	27	49						
1890	22	26	48						
1900	24	27	51						
1905	25	28	53						
1910	27	30	57						
1915	28	32	59						
1920	30	33	63	1 121	1 084	2 205			
1925	32	35	66	1 085	1 049	2 134			
1930	35	38	72	1 048	1 014	2 062			
1935	38	41	79	1 104	1 053	2 157			
1940	42	43	85	1 116	1 059	2 175			
1945	45	46	91	1 098	1 078	2 176			
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	107	108	216	1 458	1 504	2 962	2 180	2 311	4 491
2005	115	116	230	1 621	1 657	3 277	2 416	2 550	4 966
2010	126	126	251				2 678	2 813	5 491
2015	132	132	264						

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	5 049	5 675	10 724
1990	23 137	25 022	48 159	48 763	51 556	100 319	5 424	5 990	11 414
1995	23 268	25 182	48 450	50 747	53 685	104 432	5 505	6 059	11 565
2000	23 382	25 397	48 779	52 085	55 176	107 261	5 078	5 684	10 763
2005				52 681	56 086	108 767	5 404	6 053	11 456
2010				53 027	56 666	109 693			

Year	Kyrgyzstan			Latvia [5]			Lithuania		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920				495	649	1 144			
1925				628	750	1 379			
1930				663	794	1 457			
1935				666	800	1 466			
1940									
1945									
1950									
1955									
1960									
1965									
1970									
1975									
1980				893	1 103	1 997			
1985	1 193	1 320	2 513	912	1 120	2 032	1 271	1 489	2 760
1990	1 305	1 418	2 723	951	1 146	2 097	1 328	1 543	2 871
1995	1 351	1 439	2 790	902	1 097	1 999	1 298	1 529	2 827
2000	1 552	1 636	3 188	876	1 073	1 949	1 279	1 521	2 800
2005	1 716	1 804	3 520	858	1 050	1 909	1 244	1 493	2 737
2010				807	993	1 800	1 165	1 414	2 579

Year	Macedonia [2]			Moldova			Netherlands [1]		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920							2 224	2 304	4 529
1925							2 473	2 559	5 032
1930							2 680	2 770	5 450
1935							2 906	2 993	5 898
1940							3 125	3 200	6 325
1945							3 256	3 342	6 598
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				1 418	1 649	3 067	5 726	5 947	11 672
1990				1 460	1 684	3 144	5 995	6 230	12 225
1993	718	727	1 445						
1995				1 485	1 700	3 185	6 192	6 424	12 616
1998	763	775	1 537						
2000				1 310	1 483	2 793	6 363	6 601	12 964
2005				1 378	1 547	2 924	6 539	6 785	13 324
2010				1 410	1 562	2 972	6 735	6 971	13 705

Year	New Zealand			Norway [1]			Poland [1]		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920	442	410	852	835	928	1 763	8 875	10 244	19 118
1925	476	454	930	901	990	1 891	9 522	10 991	20 514
1930	540	520	1 060	948	1 035	1 983	10 128	11 691	21 819
1935	580	563	1 143	1 013	1 096	2 109	10 954	12 643	23 597
1940	609	609	1 218	1 082	1 157	2 239	8 823	10 183	19 006
1945	614	650	1 264	1 151	1 217	2 367	7 999	9 233	17 232
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	1 753	1 819	3 572	14 972	16 254	31 226
2005	1 569	1 675	3 244	1 828	1 888	3 715	15 240	16 636	31 876
2010				1 973	1 997	3 970	15 638	17 008	32 646

Year	Portugal			Romania [1, 3]			Russia		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920				5 357	5 729	11 086			
1925				5 781	6 183	11 964			
1930				5 947	6 360	12 306			
1935	2 289	2 648	4 937	6 270	6 705	12 975			
1940	2 438	2 795	5 232	5 241	5 605	10 846			
1945	2 575	2 925	5 500	4 573	4 918	9 492			
1950	2 782	3 146	5 928	5 527	5 973	11 500			
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	49 878	60 744	110 623
1990	3 771	4 175	7 946	8 655	9 083	17 738	51 993	61 959	113 952
1995	3 924	4 330	8 254	8 752	9 285	18 037	53 115	62 699	115 813
2000	4 091	4 487	8 578	8 873	9 464	18 337	54 460	64 216	118 676
2005	4 261	4 642	8 903	8 814	9 438	18 251	55 350	66 207	121 556
2010	4 235	4 726	8 961	8 770	9 420	18 190	54 929	66 243	121 172

Year	Slovakia			Slovenia [2]			Spain [1]		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920							6 886	7 502	14 388
1925							7 190	7 817	15 007
1930							7 614	8 257	15 871
1935							8 039	8 820	16 859
1940							8 473	9 495	17 967
1945							9 001	10 032	19 033
1950							9 627	10 692	20 319
1955							10 069	11 088	21 157
1960							10 450	11 541	21 991
1965							10 844	12 214	23 058
1970							11 789	12 821	24 610
1975	1 796	1 948	3 744				12 232	13 305	25 537
1980	1 836	1 991	3 827				13 383	14 399	27 782
1985	1 836	1 963	3 798				14 322	15 275	29 597
1990	1 908	2 052	3 960				15 158	16 123	31 280
1993				770	840	1 610			
1995	1 994	2 160	4 153	778	848	1 627	15 841	16 850	32 691
1998									
2000	2 087	2 260	4 347	797	867	1 664	16 621	17 618	34 239
2005	2 158	2 337	4 495	834	882	1 716	18 135	18 973	37 107
2010	2 214	2 386	4 600	866	894	1 761			

Year	Sweden [6]			Switzerland [1]			Tajikistan		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1920	2 016	2 159	4 175						
1925	2 131	2 272	4 403						
1930	2 247	2 370	4 617	1 440	1 602	3 042			
1935	2 386	2 481	4 867	1 498	1 661	3 159			
1940	2 497	2 573	5 070	1 542	1 701	3 243			
1945	2 579	2 639	5 218	1 623	1 791	3 414			
1950	2 660	2 722	5 382	1 706	1 899	3 604			
1955	2 735	2 802	5 537	1 793	1 988	3 781			
1960	2 872	2 934	5 805	1 927	2 121	4 048			
1965	3 029	3 085	6 114	2 133	2 311	4 444			
1970	3 155	3 211	6 366	2 272	2 446	4 718			
1975	3 205	3 293	6 498	2 368	2 559	4 927			
1980	3 283	3 399	6 682	2 439	2 640	5 079			
1985	3 347	3 487	6 834	2 568	2 761	5 329	1 283	1 337	2 620
1990	3 441	3 583	7 024	2 691	2 874	5 565	1 460	1 521	2 980
1995	3 507	3 656	7 163	2 801	2 998	5 799	1 586	1 647	3 233
2000	3 548	3 690	7 238	2 885	3 076	5 961	1 773	1 802	3 575
2005	3 670	3 788	7 457	3 024	3 214	6 238			

Year	Turkmenistan			UK [7]			Ukraine		
	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	926	992	1 918	21 974	23 749	45 723	17 789	22 100	39 889
1990	1 055	1 122	2 177	22 392	24 090	46 482	18 249	22 322	40 570
1995	1 298	1 372	2 670	22 873	24 350	47 224	18 515	22 369	40 884
2000				23 609	24 789	48 398	18 461	22 158	40 619
2005				23 960	25 476	49 436	18 136	21 912	40 048
2010				25 079	26 311	51 391			

Year	USA [1]			USSR [8]			Uzbekistan		
	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	64 013	85 225	149 238			
1965	64 622	69 288	133 910	69 285	89 959	159 245			
1970	69 567	75 697	145 264	76 355	96 254	172 609			
1975	77 130	83 973	161 103	83 908	103 215	187 123			
1980	84 183	91 735	175 918	90 381	108 972	199 353			
1985	89 572	97 228	186 800	93 962	112 452	206 414	5 231	5 548	10 779
1990	93 670	101 188	194 857	98 496	115 718	214 214	5 864	6 203	12 067
1995	98 760	106 270	205 030	101 159	117 954	219 113	6 644	6 956	13 600
2000	107 199	113 969	221 169	103 920	120 994	224 914	7 532	7 812	15 343
2005	114 943	120 767	235 710	107 039	124 602	231 642	8 644	8 880	17 525

Year	Yugoslavia (Federal Republic)			Yugoslavia (Former) [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						
1955						
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				8 999	9 423	18 422
1995	3 975	4 111	8 086			
2000	4 029	4 168	8 196			
2005	4 098	4 243	8 340			

Notes on sources of population data

Data before 1950

Unless otherwise stated (see *Other notes* below), 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). 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: Bevolkerung und Wirtschaft, 1871-1957, published by the Western Germany Federal Statistics office, Wiesbasen. 1949-63: United Nations Demographic Yearbook. 1964-73: Statistiches Jahrbuch für die Bundesrepublik Deutschland, published by the Western Germany Federal Statistics office, Wiesbaden.
Netherlands	1923-52: Bevolking van Nederlqnd; Leeftijd en Geslacht, 1953-73: Maandstatistiek van Bevolking and Statistisch Zakboek, all published by the Netherlands Central Bureau of Statistics.
Norway	Central Bureau of Statistics Norway.
Switzerland	Annuaire Statistique de la Suisse
USA	1920-45: Historical Statistics of the United States, 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), the data are taken from the WHO Mortality Database, http://www3.who.int/whosis. For Israel, up to 1974, the data refer to the Jewish population only, thereafter to the total population. The Jewish population was 89% of the total population in 1975.

Other notes

1 Data before 1950 (before 1920 for Australia and USA, for 1920 for Belgium, before 1923 for Netherlands, before 1927 for Norway and Spain, before 1930 for France and Iceland, before 1940 for Switzerland) are estimated from the total population given by http://www.populstat.info/

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 are 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 are estimated from the total given in RP6 with the sex × age distribution from the 1950 WHO data applied.

5 Data up to 1935 are from Central Statistical Bureau of Latvia. Statistics of the 1920s - 1930s. Population VS080. http://data.csb.gov.lv/pxweb/en/vest/?rxid=82baaf63-946c-4069-ab94-88cd07ebe07e. Data were given at 5-year intervals and have been interpolated to give estimates for individual years.

6 Data before 1950 are from Statistics Sweden, http://www.scb.se/Pages/ProductTables____25809.aspx.

7 Data before 1950 are taken from Todd (1962).

8 Data up to 1980 and after 1990 are taken from UN World population prospects: the 2015 revision, http://esa.un.org/unpd/wpp/Download/Standard/Population/. Data were given at 5-year intervals and for individual republics, and have been summed and interpolated to give overall estimates for individual years.

9 Data for Iceland pre 1950 from Statistics Iceland, http://www.statice.is/. Data pre 1900 shown at 10-year intervals to reduce table size.

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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. 80 of the USSR chapter).

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 was 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. Mørck *et al* (1982) estimated that 10% of hand-rolled cigarettes in Norway and 87% in Denmark were filter cigarettes.

In the 1990s, Dymond (1996), quoting the European Smoking Tobacco Association (ESTA) and a UK industry survey, gave 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 gave the moisture content of fine-cut tobacco as usually 16-18% and sometimes as high as 22% (much higher than that of manufactured cigarettes). They also reported that Dutch handrolled cigarettes are typically conical, French and German slightly conical, and UK and Norwegian near-cylindrical. Diameter ranged from 5.8 mm in UK to 8 mm in Finland. Simple hand-rolling was the predominantly used method (at least 70%) in 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

used by 50% in Sweden, by 10-20% in Finland, Germany, Netherlands, and Norway, and not at all in France, Ireland and the UK. Use of loose filters was 70% in Finland, 20% in Sweden, 10% in Germany and 5% in UK.

Another 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). Groups of smokers were recruited and asked to make cigarettes which were then weighed and measured. In addition to the countries reported by Dymond (see previous paragraph), tubing was the principal method used in Canada and Denmark while in Belgium/Luxembourg tubing was used by 34% and simple-handrolling by just over half. 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. One UK study compared cigarettes made using the consumer's own tobacco with those made when free test tobacco was provided; 0.050 g more free-issue tobacco was used, suggesting that the studies in Germany, Netherlands and Norway using only free-issue tobacco may overestimate the true weight.

Two later studies recruited volunteer smokers of either hand-rolled or manufactured cigarettes; the hand-rolled smokers made cigarettes and both groups then smoked using a smoking topography machine. Shahab *et al* (2008) in the UK reported an average weight of 0.511 g and diameter 5.8 mm for the hand-rolled cigarettes, compared with 0.660 g and 7.5 mm respectively for factory-made cigarettes. 66% of the hand-rolled smokers used filters, and there was an equal split between those who rolled tapered and cylindrical cigarettes. Although the hand-rolled smokers found more difficulty in using the topography machine, it was reported that hand-rolled smokers appeared to puff less hard but for longer than the smokers of manufactured cigarettes. The following year in New Zealand, Laugesen *et al* (2009) reported that when study participants smoked their own cigarettes, the weight per hand-rolled cigarette was 0.455 g compared with 0.714 g per factory-made cigarette, and the amount actually burned was also less (0.361 g vs 0.552 g) but the smoking pattern did not differ significantly.

Another similar study in the USA reported separately those who smoked simple hand-rolled and those who smoked personal machine made (PMM) cigarettes (Koszowski *et al* (2014)). In this study (and in a preliminary study of making practices by Rosenberry *et al* (2013)), the weight was around 0.4-0.5 g per hand-rolled cigarette, and 1.0 g per PMM cigarette, compared with 0.9 g per manufactured cigarette. Puff volume, duration and velocity did not differ by cigarette type, but puffs per cigarette and time to smoke were significantly smaller for hand-rolled than for PMM or manufactured cigarettes.

Based on two nationally representative questionnaire-based studies in Italy in 2011-2012, which enquired about the weight of tobacco pack usually purchased and the number of cigarettes made from that pack, Gallus *et al* (2013) estimated that the mean weight of a hand-rolled cigarette was 0.88 g (median 0.63 g) when both regular and occasional smokers were included, or 0.74 g (median 0.63 g) based only on regular smokers.

Gallus *et al* (2014) reported on the Pricing Policy And Control of Tobacco in Europe (PPACTE) study conducted in 2010. Around 18 000 people in 18 countries were asked about their smoking habits and expenditure, and asked to show their latest pack. Restricting to those who smoked exclusively hand-rolled

cigarettes, the weight per cigarette was estimated from the cost and weight of the pack shown, and the number of cigarettes and weekly expenditure reported. Noting that these estimates may be biased by the high proportion of smokers excluded due to missing data or implausible results (<0.1g or >3.0g) and the complexity of the computational method, they reported a median weight around 0.5 g in Ireland and UK, 0.6 g in Greece, 0.9 g in France and >1g in Finland and Spain. They also reported that the weight did not vary significantly with sex, age or level of education, but was lower (median 0.69 g) in those smoking 20+ per day than in those smoking <20 per day (median 0.86 g).

Gallus *et al* (2014) also reviewed industry publications, showing that, in international reports, Imperial Tobacco assumed a figure about 0.7 g in 2009, Philip Morris International 0.75 g in 2010-2012, and KPMG's Project Star 0.73 g for make-your-own and 0.6 g for roll-your-own in 2013. For the UK, a 2012 Japan Tobacco International report used a figure of 0.4 g.

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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:

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.

The data available for Eurobarometer survey 72.3 (survey year 2009, Papacostas, 2012) allowed calculation of a similar distribution on more recent, international data. These data relate to some 9 000 people in 30 countries, and give actual (not grouped) numbers of cigarettes smoked. As shown in the tables below and overleaf, this gave a distribution similar to the 1986 standard distribution and similar mean values for those consumption categories consisting of more than one value. Being based on a relatively small sample, these estimates will not be used in place of the 1986 standard distribution. However, the similarity of the estimates lends confidence to the use of the 1986 standard distribution in our consumption category estimation process.

Comparison of the 1986 standard and 2009 Eurobarometer (EB) distributions

	Male smokers		Female smokers	
Consumption category	**1986 standard distribution**	**EB distribution**	**1986 standard distribution**	**EB distribution**
	%	**%**	**%**	**%**
1-4	7	7.0	10	12.4
5	4	5.2	5	8.3
6-9	6	7.0	10	9.2
10	13	16.0	17	21.3
11-14	7	3.9	8	4.3
15	8	12.8	11	13.4
16-19	4	2.6	4	2.5
20	25	30.5	20	21.2
21-24	6	0.8	5	0.3
25	4	4.0	3	2.5
26-29	2	0.4	1	0.2
30	5	4.9	2	2.6
31-34	1	0.0	1	0.0
35	1	0.5	0	0.5
36-39	0	0.1	0	0.1
40	4	3.0	2	1.1
41-44	0	0.0	0	0.0
45	0	0.3	0	0.0
46-49	0	0.0	0	0.0
50	2	0.4	1	0.0
51-59	0	0.0	0	0.0
60	1	0.5	0	0.0
61+	0	0.0	0	0.0
	100	100.0	100	100.0

Comparison of mean values in the 1986 standard and 2009 Eurobarometer (EB) distributions

Consumption category	Assumed mean of consumption category, 1986	Mean of EB distribution	
		Male	Female
1-4	2.5	2.4	2.7
6-9	7.5	7.0	6.9
11-14	12.5	12.4	12.3
16-19	17.5	17.6	17.8
21-24	22.5	23.1	22.6
26-29	27.5	27.3	27.3
31-34	32.5	32.5	32.6
36-39	37.5	36.5	38.0

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