

CHAPTER 4

MEMBER STATES OF THE EUROPEAN UNION AND THE EUROPEAN ECONOMIC AREA

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4.1: AUSTRIA

Introduction

Austria is situated in south-central Europe, constituting part of the Eastern Alps and the Danube region, extending 573 km from west to east and 294 km from north to south. It covers an area of 83,900 km² and its border has an overall length of 2,706 km, of which 816 km are shared with Germany, 466 km with the Czech Republic, 107 km with the Slovak Republic, 356 km with Hungary, 330 km with Slovenia, 430 km with Italy, 166 km with Switzerland and 35 km with Liechtenstein.

Austrian territory can be divided into five sections: Eastern Alps (western, central and southern parts – about 60% of Austria), Alpine and Carpathian Foothills (central/northern parts), Pannonian Lowlands (eastern parts), Vienna Basin (surrounding Vienna), and Granite and Gneiss Highlands (Bohemian Massif in the north). The highest mountain is the Grossglockner (3,798 m) in the Hohe Tauern. The main river is the Danube with a 350 km section of its course running through Austria.

Austria is divided into nine administrative provinces: Burgenland, Carinthia, Lower Austria, Upper Austria, Salzburg, Styria, Tirol, Vorarlberg and Vienna. These provinces are further subdivided into administrative districts. In total there are 99 districts of which 15 are classified as urban and 84 as rural. Apart from the capital town of Vienna, with its 1.56 million inhabitants (population density 3,765 per km²), there are 24 towns with over 20,000 inhabitants. Austria had a total population of about 8,030,000 in 2001. Since 1960 the population has increased by 14%, but a constant two-thirds of the population has been living in urban areas over the last 40 years. The overall population density was 96 per km² in 2001, but it varies among the provinces from 53 (Tirol) to 135 (Vorarlberg).

NUTS 2 level corresponds to the nine provinces, whereas NUTS 3 level divides Austria into 35 units, of which 27 consist of one or

several administrative districts (note that Vienna represents only one unit) and eight consist of at least one administrative district and a part of another administrative district (judicial district).

The national language is German (spoken by about 90% of the population), but many other languages are spoken by various ethnic groups (e.g. Croatian, Hungarian, Slovenian, Turkish).

Mortality data collection

For each death, the registrar must draw up a death certificate which is to be filled in by the coroner stating the cause of death. This death certificate must then be forwarded to the Austrian Central Statistical Office, where the data are centrally processed and coded. The Austrian Central Statistical Office's data files on deaths cover all those persons listed in the resident population who have died in Austria.

In Austria coding is conducted according to the International Classification of Diseases (ICD) of the World Health Organization. Prior to 1979, cause of death was coded according to the 8th revision of the ICD, from 1980 to 2001 the 9th revision was used, and since 2002 the 10th revision has been employed. The coded cause of death is the *underlying cause of death*, or in case of external causes, gives the circumstances of the accident or the effect of violence which caused the fatality.

The overall autopsy rate in 2001 was 24.5%. Among children under one year who died, an autopsy was performed in 67.4 % of the cases. The older the deceased were, the lower was the autopsy rate: only 13.5% of persons aged over 85 had an autopsy performed. The autopsy rates vary also by region: the east of Austria and large cities carry out more autopsies than the rest of Austria.

Population statistics

In Austria, censuses have been carried out every 10 years, the latest in 2001. For years between

the censuses, population size and composition were estimated by counting the births, deaths and migration reported to the Austrian Central Statistical Office. These estimates were revised after a new census. From 2002 onwards the population data have been extracted from the recently established Central Population Register (Zentrales Melderegister, ZMR)

Statistical publications

Statistisches Jahrbuch Österreichs 2002, Eds. Statistik Austria. Wien. 2002.

Jahrbuch der Gesundheitsstatistik 2000, Eds. Statistik Austria. Wien, 2002.

Rauchgewohnheiten 1997, Eds. Statistik Austria. Wien. 2002.

Österreichisches Todesursachenatlas 1988/94, Eds. ÖSTAT. Wien, 1998.

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4.2: BELGIUM

Introduction

Belgium has an area of 30,500 km² and extends over 230 km from north to south and over 290 km from east to west. About 60% of the land surface is used for agriculture and 20% is wooded (figures for 1990-2000). The Meuse flows out of the French Vosges, through eastern Belgium (Namur and Liege) into the Netherlands. About 45% of the land surface is used for agriculture and 20% is wooded. The capital is Brussels (population around 950,000 in the period 1993-1998).

The population of Belgium grew from 10,068,000 in 1993 to 10,192,000 in 1998, with an average density of 332 inhabitants per km² for that period. By 2007, the population had risen to 10,585,000, with a density of 347 inhabitants per km². Belgium is divided into three regions: the Flemish region, the Walloon region and the Brussels Capital region. In the Flemish region (58% of the population), the official language is Dutch; in the Walloon region (33%) it is French. The Brussels Capital area (9%) is a region where French and Dutch have an equal status. There is a fourth language region where German is spoken, in the North-East of the Walloon region (70,000 inhabitants).

Until the beginning of 1995, Belgium was also divided into nine provinces: Antwerp, Brabant, West Flanders, East Flanders, Hainaut, Liege, Limburg, Luxembourg and Namur. Since 1st January 1995, Belgium has consisted of 10 provinces: the province of Brabant was divided into 2 parts: the Flemish Brabant and the Walloon Brabant. In this atlas, the 10 provinces have been taken into account plus the region of Brussels Capital that is neither part of the Flemish Brabant nor of the Walloon Brabant.

Population estimates

Up to 1991, Belgium carried out a census of population every ten years. In October 2001, a

large socio-economic survey, covering the whole population, was carried out.

Belgium has a centralised and computerised population register. It was created in 1970 with the collaboration of some communes (geographic entities) on a voluntary basis and was progressively developed. It became compulsory for all the communes on 1st January 1985 according to the law of 8th August 1983. Since 1st January 1989, population figures have been based on the data from the population register.

Each year, the National Institute of Statistics (NIS) receives in March all the population movements of the preceding year (births, deaths, migrations, nationality changes) from the National Population Register. New population figures are then estimated. These results are given the date of 1st January of the relevant year.

The communes have to transmit the data to the national register within 15 days of the declaration of the occurrence but, when the NIS receives the data from the National Register in March, some communes have not yet transmitted all their data from the preceding year. Therefore, a column called "statistical adjustment" has been added to the tables regarding population movements. In this column, we find the balance of the movements of two years earlier that could not be taken into account the year before when the NIS received the data.

Births must be declared at the commune where the event took place within 15 days and deaths within 3 days. For both, if the last day is a Saturday, a Sunday or a public holiday, the time limit is extended up to the following working day. If someone moves, he/she must declare it at the commune where he is moving. For all events, the commune of residence is informed through the register. Of course, not everyone respects the obligation of declaration. If the commune notices that a person has left the area of the commune without having declared his departure,

he/she will be officially struck off the population register after a police inquiry. These cases appear in a special column in the table regarding population movements.

Identity cards are renewed at least every ten years. This contributes to the update and some verification of the population register. No system is perfect, but Belgian population figures can be considered to be of good quality and reliable.

Some population features

Age distribution of the population

The average percentage of population in each age group for the period 1993 to 1998 is:

0-14	15-64	65 and over
18.0%	66.1%	15.9%

Life expectancy

According to life tables for 1995-1997, life expectancies (years) at different ages are:

At	Males	Females
Birth	74.3	80.9
20	55.2	61.6
40	36.4	42.2
60	19.1	23.9

Total fertility rate (births per woman)

1993	1994	1995	1996	1997
1.61	1.56	1.56	1.59	1.60

Infant deaths (per 1,000 live births)

1993		1994		1995		1996		1997	
M	F	M	F	M	F	M	F	M	F
9.44	6.52	8.52	6.52	7.31	4.64	6.06	4.47	6.02	5.09

Foreign population

The average foreign population in 1993 to 1998 was 912,800 or 9% of the total population. The population whose citizenship belongs to a member state of the EU represents just over 60% of the total foreign population. Those with French and Italian citizenship represent 56% of the EU foreign population (18% French and 38% Italian) while those with Moroccan and Turkish citizenship represent 62% of the foreign population outside EU (39% Moroccan and 23% Turkish).

Obtaining Belgian citizenship

From 1st January 1993 to the end of 1997, 124,560 foreigners obtained Belgian citizenship, an average of 24,900 per year. Even if they keep their former citizenship, they are included in the statistics as Belgian citizens.

Mortality data collection

Anonymous death certificates were introduced in Belgium in 1930, but were not in general use throughout the country until 1954. The death certificate in use in 1993-1997 (covered by this atlas) was introduced in 1979, and slightly modified in 1983. There are two versions – one for recording stillbirths and deaths of infants up to one year of age and the other for deaths of people older than one year.

The death certificate is divided into four sections (A, B, C and D). Only section A contains the name and address of the deceased. Sections B and D contain the information on age, sex, etc., necessary for compiling general mortality statistics. The certifying doctor, exclusively, uses section C to report the cause of death; the doctor seals this section.

Section A is detached from the death certificate and retained by the communal administration. Sections B, C and D are sent to the Health

Administration of the Ministry of the Flemish Community for deaths in the communes of the Flemish region, and to the Ministry of the French-speaking Community for deaths in the communes of the Walloon region. In 1993-1997, the communes of the Brussels capital region sent their certificates to a Health Inspector of the National Ministry of Health. In these administrations, a medical civil servant codes the underlying cause of death according to the International Classification of Diseases (ICD), 9th revision, and enters the code number on section B. Section C is then detached and sections B and D are sent to the National Institute of Statistics.

A few remarks about certification and coding of causes of death

A physician is the only person appointed by the law to fill out the death certificates. It can be the treating physician or a physician who comes to certify the death. Phone calls or faxes are used when the information about the cause of death is incomplete or poses an interpretation problem. The training of the students in medicine for certifying the causes of death is unsatisfactory. They receive only short information and vocational training on certification does not exist.

In 1993-1997, only two causes were registered for each death, the underlying cause of death and the immediate cause of death. The 9th revision of the International Classification of Diseases (ICD) was used. From 1st January 1998, new death certificates have been used. In accordance with the wishes of the World Health Organization, they ask the underlying cause of death and three antecedent causes of death and other significant conditions contributing to the death, but not related to the disease or condition causing it. The 10th revision of the ICD has been applied since 1998.

The comparability of the coding of causes of death between the north and the south of

the country may be affected because different administrations are responsible for coding.

The proportion of ill-defined conditions (3.5%) is comparable with other countries, but the proportion of malignant neoplasms of other and unspecified sites (195-199) among the total of cancers is fairly high (9%: 7.9% for males and 10.5% for females).

Statistical publications

Tables of general mortality data (giving information on age, sex, civil status, residence, etc.) are published (in French and Dutch) by the Belgian National Institute of Statistics in a series of brochures entitled Demographic Statistics. The brochure on causes of death mainly contains information at the national level. Tables of causes of death classified according to abridged lists of mortality causes (the basic tabulation list of the 9th revision) are available down to the arrondissement level.

The results of the Health Interview Surveys 1997, 2001 and 2004 can be obtained on the web site of the Scientific Institute of Public Health: <http://www.iph.fgov.be> – choose Department of Epidemiology-Toxicology, Section of Epidemiology.

On the same main site causes of death for Belgium (registration years 1987 to 1997) are in an interactive way available on “Standardised Procedures for Mortality Analysis – Belgium (SPMA)”:

<http://www.iph.fgov.be/epidemio/spma/index.htm>

The Flemish Region is publishing annually its own health indicators and causes of death since registration year 1993: “Gezondheidsindicatoren” en “Statistiek van de doodsoorzaken” (only in Dutch).

A Doneux

A Kongs

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4.3: CYPRUS

Introduction

Cyprus is a small island of 9,250 km² (3,570 sq miles), extending 240 kms (150 miles) from east to west and 100 kms (60 miles) from north to south. It is strategically situated in the far eastern end of the Mediterranean (35° N 33° E), on the busy trade routes linking Europe with the Middle East, Russia, Central Asia and the Far East.

The country is divided into six districts: Nicosia (Lefkosa) which is the capital, Limassol (Lemesos), Larnaca (Larnaka), Paphos (Pafos), Famagusta (Ammochostos) and Kyrenia (Keryneia). The former two of these districts are occupied by Turkish forces, partially and totally, respectively.

The official languages of the Republic of Cyprus are Greek and Turkish.

Cyprus gained its independence from Britain in 1960. In 1974 Turkey invaded Cyprus and occupied over a third of the island. The ceasefire line runs right across the island and cuts through the capital, Nicosia, dividing the city and the country.

Although the northern part of the island is still occupied by Turkish forces, the Republic of Cyprus is internationally recognised as the sole legitimate State on the island with sovereignty over its entire territory. In May 2004 the Republic of Cyprus became a full member of the European Union.

Mortality data collection in Cyprus

Law 141(I) of 2002 regarding the Population Register regulates the whole procedure of death certification and registration. Under this Law, medical certification of deaths is carried out when the deceased had been hospitalised, institutionalised or died elsewhere. The Law underlines the obligatory registration of all deaths, and specifies the relevant person for the death registration and the provision of any necessary additional information about the deceased. After

the registration of the death, the death certificate is issued to the relatives of the deceased, since it is necessary for burial. Data from the District Registrar's Office is sent to the Statistical Service of Cyprus for processing.

The certification of deaths is conducted by a physician who completes three copies of the medical certificate of death. A medical certificate is necessary under any circumstances: if the deceased had been hospitalised because of the illness that finally caused the death, the doctor who was responsible for the patient during the hospitalisation would be responsible for certifying the death; if the deceased had not been hospitalised, a physician must examine the corpse in order to certify the death; if there are any doubts concerning the circumstances under which the person died, the case should be further investigated by the coroner. Specifically, autopsies are performed when the cause of death is not clearly identified or in cases when the death is sudden or violent or when an investigation is asked for by relatives.

One copy of the medical certificate is given to the relatives of the deceased who are obliged to notify the death, soon after the date of death, to the District Registrar's Office where the death certificate is issued. The second copy remains at the hospital or in the doctor's records. And the third copy is given to the authorised person who will conduct the burial. The medical certificate provides information on the name of the deceased, the date of death, age as stated, the place of death, last time the deceased was seen alive and the cause of death.

The Medical Death Certificate is available in both Greek and English. The diagnosis is described in text format and not in ICD codes. The physicians who fill the certificates have not undergone special training.

Since 2004, statistics on cause of death are compiled by the Statistical Service in collaboration with the Health Monitoring Unit (HMU) of the Ministry of Health. The HMU

is mainly responsible for collecting copies of the medical death certificates from the District Registration offices and coding the causes of death. The coding is performed according to ICD-10 rules and includes multiple cause coding and underlying cause coding.

Death statistics are published in the annual “Demographic Report” and “Health and Hospital Statistics”, which are available on the website of the Statistical Service of Cyprus:

http://www.pio.gov.cy/mof/cystat/statistics.nsf/index_en/index_en?OpenDocument.

Population statistics

The population census is the main source of population statistics for Cyprus. Decennial censuses were undertaken from 1881 until 1931. In 1941 the census was not compiled due to the

Second World War, but one was carried out in 1946. The next census was conducted in 1960, the year of the Independence of the Republic of Cyprus. In 1973 a census was conducted, but only amongst the Greek Cypriots, since the Turkish Cypriots were unwilling to provide data.

Censuses after 1974 refer to the Government Controlled Area. Four population censuses have been conducted since then: in 1976, in 1982, in 1992 and in 2001. The next population census is planned to be conducted in 2011.

For years between censuses, annual population estimates are published in the Demographic Report. These estimates are available by district of residence, age and sex.

E Kyriacou

4.4: CZECH REPUBLIC

Introduction and brief history

Until the end of 1918, the Czech Republic was a part of the Austro-Hungarian Empire. In 1918 the Czechs and Slovaks established a common state called Czechoslovakia. This state existed, with the exception of the period of the Second World War, until January 1993 (from 1968 under the name Czech and Slovak Federative Republic) when the country was peacefully divided into two independent states: the Czech Republic and Slovakia. The Czech Republic encompasses the territory of Bohemia, Moravia and Silesia. It acceded to the EU in May 2004.

The country and its people

The Czech Republic is situated in the middle of Europe between 48°33' and 51°03' N and between 12°05' and 18°51' E. The land boundaries total 2,290 km; the border countries are Germany with 810 km, Poland with 762 km, Austria with 466 km and Slovakia with 252 km. The Czech Republic covers an area of 78,900 km² including 1,590 km² of water. The country is surrounded by mountains, only the eastern border having several open valleys. Generally, the Czech Republic is a hilly country. The territory is formed by two different types of earth crust. The old earth crust forms the west part while the young crust and Carpathian mountains form the east part. The Czech highlands create a large hollow with border mountains on the west; the land gradually declines towards the Carpathian mountains in the east. Plains cover 15.5% of the territory and provide regions with the best condition for agriculture, the largest areas being hilly regions (39.6%), highlands (29.7%) and mountains (18.2%) which are used for less intense agriculture or are covered by forests, lakes, meadows and settlements. The lowest and highest points of the country are 115 m and 1,602 m above sea level. Natural resources of the country are hard and soft coal, kaolin, clay, graphite and timber. The country is highly industrialised and oriented mainly to metallurgy, machinery and equipment, motor vehicles, glass and armament production. There are areas with air and water pollution in northwest Bohemia and in northern Moravia, around Ostrava,

which present health risks and resulting acid rains damage forests. The climate is determined by the position of the country between western Europe, with a maritime climate, and eastern Europe, with a continental climate. Most of the country belongs to the temperate warm zone with good conditions for growing nearly all cultivated plants, while the cold zone, including all the highlands, is exploited for forestry, pasture or foraging. The Czech Republic is administratively divided into 14 counties and 91 districts.

The total population in 1995 (estimate based on the 1991 census) was just over 10.3 million, consisting of 5.0 million males and 5.3 million females, with a density of 130 inhabitants per km². About 70% of the population lives in cities. Overall median age was 36.4 years, 34.4 for males and 38.4 for females. About 18% of the population was younger than 15 years, 68% in the age group 15 to 64 years and 14% were 65 and over (2004 estimate). There is a very high proportion of females in the highest age group. Life expectancy at birth has increased slowly but gradually and was estimated to be 72.5 years in males and 79.0 years in females in 2004. According to the 1991 census, just over 80% of the population are Czechs; the other groups are Moravians 13.2%, Slovaks 3.1%, Poles 0.6%, German 0.5%, Silesians 0.4%, Gipsies 0.3%, Hungarians 0.2% and other 0.5%.

The total labour force was around 4.8 million people in 2004; of these, 30% were employed in industry, 4% in agriculture, 7% in construction and 59% in various services. The official unemployment rate in the Czech Republic was 4% in 1995, one of the lowest rates among the countries of central and eastern Europe and below the EU average.

Mortality data collection

As in other countries which were once part of the Austro-Hungarian Empire, mortality statistics in the former Czechoslovakia have a long tradition: data on the main diseases (numbers) are mostly available from 1890. Great progress in this field was made in 1949 with the obligatory use

of the International Classification of Diseases 6th revision (ICD-6) in the whole of Czechoslovakia, together with the introduction of death certificates of international format. In Czechoslovakia the shortened version of ICD-6, with a list of diseases confined to about 200 items, was used in the period 1949-1974, but from 1975 the whole list of diseases of ICD-6 and of the subsequent revisions of ICD (ICD-7 from 1958, ICD-8 from 1968 and ICD-9 from 1979) has been used. Since January 1994, coding according to ICD-10 has been mandatory. In the National Cancer Registry, the International Classification of Diseases for Oncology 2nd Edition has been used for coding of morphology from January 1994. The mortality statistics are based on information present in death certificates and are compiled and published by the Czech Statistical Office. Data on cancer

mortality are published also in the annual report "Malignant neoplasms" accompanying the data on incidence published for every year by the Institute of Health Information and Statistics, where the National Cancer Registry is situated. The legislation on the protection of personal data is strictly respected.

Population statistics

Annual estimates on the size and age-structure of the population (mid- and end-year), based on the results of the 1991 census, taking into account births, deaths and immigration of population, are provided and regularly published by the Czech Statistical Office.

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4.5: DENMARK

Introduction

Denmark has an area of 43,100 km². It consists of the major islands Sjælland and Fyn and the peninsula Jylland, which has a 68 km long border with north Germany at its base. Altogether there are 483 islands, of which about 100 are inhabited. The major islands are connected by bridges, the longest being the crossing over the Great Belt between Sjælland and Fyn (17km long). The pylons of the 6.8 km long suspension bridge are, at 254 m, the highest points in Denmark. The coastline along the North Sea, Skagerrak, Kattegat and the Baltic runs for 7,314 km. Denmark is a flat country, rising to only 173 m at its highest natural point. The longest river is the Gudenå (160 km) which rises in central Jylland and flows into Randers Fjord. About two thirds of the area is agricultural land, and some 11% is wooded. Of growing importance are the oil and natural gas deposits in the Danish waters of the North Sea.

The capital is Copenhagen (population around 1.2 million, including suburbs), the second largest city in the Nordic countries. It lies on the island of Sjælland and the nearby island of Amager.

Denmark has a population of 5.4 million, excluding Greenland and the Faeroes, and the average population density is 124 per km² (2001 figures). The population density on Sjælland is 302 per km².

Of the 206,000 migrants in Denmark, 30,000 come from the Nordic countries, 36,000 from EU countries, predominantly Britain and the Federal Republic of Germany, and the remainder mostly from Asia (56,000), Turkey (37,000) and the former Yugoslavia (35,000).

Denmark was divided into 14 counties plus the metropolitan region of Copenhagen with Frederiksberg, in 2008 counties were combined into 5 regions. The Faeroes have had home rule since 1948; they have their own assembly and are not in the EU. Greenland has belonged to Denmark since 1721; it obtained home rule

following a referendum in 1979 and withdrew from the EU in 1985.

Mortality data collection

Death certification has been mandatory by law since 1871 and from 1875 onwards the National Board of Health has published annual statistics on the causes of death.

The international form of death certificate was introduced in Denmark in 1951. Anonymous death certificates were introduced in January 1966 and the current form was introduced in 1996 when processing of was automated including optical computer reading (OCR) technology.

The completed and sealed death certificate is given to the next of kin, who passes it to the local vicar who will be responsible for the burial. The vicar checks the name and personal number of the deceased and notifies the local population register of the death. He then sends the death certificate itself to the Department of Health Statistics at the National Board of Health (a division within the Ministry of the Interior and Health), where it is again checked and coded manually and computerised.

From the 1870s until 1931, a Danish classification system for deaths were used, followed by a Nordic classification in 1931-1940 and then one based on the Bertillion nomenclature until 1951. Since 1951 the WHO International Classification of Diseases (ICD) has been in use as follows: 6th revision 1951-1957, 7th revision 1958-1968, 8th revision 1969-1993, and since 1994 the 10th revision has been in use. Due to the modifications in the classifications over time, the data are not fully comparable, but a computerised system of fairly compatible categories of data was set up by the Danish Institute of Clinical Epidemiology (DICE) from 1943. From 1970 the register of causes of death has existed in a full and computerised form at the National Board of Health. The key identifier is the unique personal registration number given to all Danes since 1968. This number

facilitates easy linkages to other files and follow-up of questionable cases, e.g. in hospital files.

For all natural deaths, the death certificate is filled out by the physician of the deceased or, if the person was under treatment at the time of death, by the attending physician. If examination of the body raises doubt about the mode of death, the physician must inform the police, who must also be informed if there is suspicion that death was due to suicide, accident or criminal acts. In such cases, a legal examination must be undertaken. In 1984, legal examination took place following 11% of all deaths. If, after a legal examination, there is still doubt about the cause of death, an autopsy must be carried out. In 1984 an autopsy was performed for 33% of all deaths occurring in Denmark; this figure includes both legal and hospital autopsies.

The quality of the death certificates has been studied for cancer, heart diseases and other causes. It is obvious there is room for improvement even for cancer deaths, but the Danish death certificates are no worse than seen elsewhere in the developed world. Of importance has been the steep decline in autopsies from 45% of all deaths in 1970 to 12.5% in 1996. Ill-defined cause of death virtually did not exist in 1971 (1%) but accounted for 9% of deaths in 1996. This development in fact reflects more accurate coding and less guessing from the medical doctors filling in the certificates.

Danish population statistics

Data on the size, composition and mobility of the Danish population are compiled from entries in local (council) population registers, which contain, for each individual, information on place of residence, civil status, sex, age and nationality.

Information from all the local registers is collected together in the Central Population Register. The local registers are updated as births, deaths, changes of address, marriages and divorces are notified; all such changes must be reported to the Central Population Register within 40 days. Information from the Central Population Register is transferred to the Central Bureau of Statistics, which is responsible for publishing population statistics. These are available at <http://www.dst.dk>.

Statistical publications

(i) Official publications

Causes of Death in Denmark, National Board of Health (published annually in Danish).
Changes of the Population, Central Bureau of Statistics (published annually in Danish).
Statistical Yearbook, Central Bureau of Statistics (published annually in Danish).
Denmark Statistics: <http://www.dst.dk>.
National Board of Health : <http://www.sst.dk>.
Association of Nordic Cancer Registries.
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(ii) Other publications

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Juel K & Helweg-Larsen K (1999). The Danish registers of causes of death. *Danish Medical Bulletin*, 46:354-357.

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Lynge E. *Mortality and Occupation 1970-75*. Copenhagen, Central Bureau of Statistics, 1979 (Statistical Investigations Number 37).

Østerlind A (1986). Diverging trends in incidence and mortality of testicular cancer in Denmark, 1943-1982. *British Journal of Cancer*, 53:501-505.

Storm HH. *Validity of Death Certificates for Cancer Patients in Denmark 1977*. Copenhagen, Danish Cancer Society, 1984.

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H Storm

4.6: ESTONIA

Introduction

Estonia was occupied for several centuries by Denmark, Germany, Sweden, Poland-Lithuania and Russia and attained independence only in 1918. At the beginning of the Second World War, Estonia was annexed by the USSR and regained its independence only in 1991, after the dissolution of the USSR. Subsequently, Estonia was able to undertake real political and economic transformation and to restore ties with Western Europe. The country acceded to the EU in May 2004.

The country and its people

Estonia is situated in Northern Europe between 57°3' and 59°5' N and between 21°5' E and 28°1' E. The area of the country is 45,200 km², including 43,200 km² of mainland and 2,000 km² of water; there are also over 1,500 islands in the Baltic Sea. Land boundaries with neighbouring countries total 633 km: the length of the border with Latvia in the south is 339 km, and in the east that with the Russian Federation is 294 km, while in the north and east of Estonia are the Baltic Sea and the Gulf of Finland. The mainland terrain is flat in the north with marsh and boggy lowland, and there are low hills in the south where the highest point is 318 m. Forests cover around half and arable land represents only just over a quarter of the country's area. Natural resources are oil shale, peat, phosphorite, clay, limestone, sand, dolomite and sea mud. Industry is oriented mainly to engineering, electronics, wood and wood products, textile, information technology and telecommunications. There is some air pollution with sulphur dioxide from oil-shale power plants but the amount of pollutants emitted to the air is falling gradually and emissions in the year 2000 were only 20% of the amount in 1980. Also, the amount of non-purified wastewater discharged to water bodies was only 5% of the level discharged in 1980 as a result of the building of new water purification plants; coastal waters are polluted in certain locations. The climate is temperate, with relatively warm summers and moderate but sometimes severe winters. The whole country is divided administratively into 15

counties. There are 254 local municipalities, of which 207 are rural and 47 urban.

The total population in 1995 (estimate based on the census in 1988) was 1,485,000 inhabitants (692,000 males and 793,000 females). In 1998 the majority, 64%, were Estonians; 29% were Russians, 3% Ukrainians, 2% Belarusians and 2% other ethnic minorities. The density of population was nearly 33 per km² in 1995. Over 70% of inhabitants live in urban areas. Overall median age was 38.8 years, 35.1 years for males and 42.1 for females. The age structure of the population (2004 estimate) was 16% in the age group 0-14 years, 67.5% 15-64 years, and 16.5% 65 years and over with a prevailing majority of females (about twice of the number of males, owing to the very short life expectancy of males in Estonia). The life expectancy at birth was 65.5 years for men (one of the lowest in Europe) and 74.3 years for women. The lowest rates of life expectancy in males, less than 63 years, were recorded around 1994, after a gradual decrease beginning in the mid-1980s. The sex difference in life expectancy has increased to 9.5 years and is above the EU average (6.4 years in 1997).

The labour force contains more than 600,000 people, of which 20% are employed in industry, 11% in agriculture and 69% in services (1999 estimate). The official unemployment rates in Estonia reached 12.3% in 1998, which is relatively high in comparison with neighbouring countries as well as with the other countries of eastern and central Europe.

Mortality data collection

Mortality statistics in Estonia are compiled from information provided by physicians on death certificates, which in recent decades have been based on the international model proposed by WHO. All deaths are confirmed by physicians, including the selection of the underlying cause of death. Main and immediate causes of death together with comorbidity (accompanying diseases) present on the

death certificate are coded using the codes of ICD-9. For cancer incidence and mortality, in addition to ICD-9 (and recently ICD-10) codes, the International Classification of Diseases for Oncology (ICD-O) has also been introduced in the National Cancer Registry; this has enabled the participation of Estonia in several international projects and studies. The data file for all death certificates issued in Estonia is produced annually by Statistics Estonia. The Population Registry was founded in 1992, when the national identification number was introduced. Legislation regulates access to mortality data as well as to the National Cancer Registry data, by decree No. 21 of the Minister of Social Affairs in February 2001 in accordance with the Personal Data Protection Act.

References

Estonian Statistics. Statistical yearbook of Estonia 2007. Tallinn, Estonian Statistics, 2007.

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Parkin DM, Whelan SL, Ferlay J, Teppo L & Thomas DB, eds. *Cancer Incidence in Five Continents, Volume VIII*. Lyon, IARC, 2002 (IARC Scientific Publications No.155).

Pukkala E, Söderman B, Okeanov A et al. *Cancer atlas of Northern Europe*. Helsinki, Cancer Society of Finland, 2001.

Population statistics

Demographic data are based on information from censuses. The last census was carried out in 2000. For years between censuses population, size, age structure and composition are estimated by counting the births, deaths and migrations reported to the Statistics Estonia (now the Estonian State Department of Statistics). The mid- and end- year population size and structure is published annually, together with mortality and other demographic statistics.

I Plesko

M Rahu

Staneczek W, Gadomska H, Rahu M, Chaklin A, Shtraus Z & Plesko I, eds. *Atlas of cancer incidence in the population of the CMEA*. Moscow, CMEA, 1983 (in Russian).

Turner B, ed. *The statesman's yearbook 2000*. London, Macmillan, 1999.

Zatonski W, Boyle P & Tyczynski J, eds. *Cancer prevention – vital statistics to intervention*. Warsaw, The Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology, 1990.

Zatonski W, Smans M, Tyczynski J & Boyle P, eds. *Atlas of Cancer Mortality in Central Europe*. Lyon, International Agency for Research on Cancer, 1996 (IARC Scientific Publications No.134).

4.7: FINLAND

Introduction

Finland has an area 338,000 km², of which inland waters form 33,600 km². From the southern coast to the border in the north is 1,157 km, and the country's greatest width is 542 km.

The length of the land boundary with Sweden is 586 km, with Norway 727 km and with Russia 1,269 km. In the south is the Gulf of Finland, opposite Russia and Estonia; in the west the Gulf of Bothnia; opposite Sweden; and in the southwest the Baltic Sea.

Forests and other wooded land cover 68%, and water 10%, of the country. About 8% of the land surface is used for agriculture. Gross national income per capita was US\$ 22,600 in 1999.

The capital is Helsinki, located on the south coast, with 0.5 million inhabitants. In 1999, Finland had a population of 5.2 million and average population density of 15 inhabitants per km² (1999). The official languages are Finnish and Swedish. The Swedish-speaking minority is 6% of the total population. The proportion of foreigners is 2.6%, a quarter of them from Russia.

Cause of death statistics

Finland has since 1987 had two separate death certificate forms: one for persons aged 28 days or more, and one for stillbirths and infants who died under the age of 28 days. The death certificate is approved by the Ministry of Social Affairs and Health and is in accordance with the recommendation of the World Health Organization in its International Classification of Diseases, 9th Revision.

The certifier declares the causes of death with a text describing the diseases, conditions or external causes and with the corresponding code of the Finnish Classification of Diseases. At maximum there are four causes leading to the death and four contributing causes on the death

certificate. In addition, the death statement is further supported by free text under the section "Circumstances of death".

If the determination of the causes of death necessitates forensic autopsy or medical autopsy, the death certificate, on which the statistics are based, is made out once the results of the autopsy have been released. The proportion of forensic autopsies is 20% of all deaths. The proportion of medical autopsies is lower, around 10% of all deaths. The rest of the death certificates are based on clinical examinations.

The doctor signing the death certificate sends the certificate to the legal medical officer at the county administration office to be checked. This officer then forwards the certificate to Statistics Finland.

In drawing up cause of death statistics, Statistics Finland uses both death certificates and the Population Information System available from the Population Register Centre where the death is registered by the notification of death (given in most cases by the same doctor who completes the death certificate). Statistics Finland links the death certificate data with the data from the Population Information System by means of the personal identification code of the deceased. This method ensures complete coverage of the statistics on deaths. It also reduces the volume of data handled by Statistics Finland because the vital events and the demographic personal data are included in the Population Information System.

The cause of death statistics covers the death in Finland or abroad of persons who were residents in Finland at the time of death. All causes of death are coded centrally by Statistics Finland. The International Statistical Classification of Diseases and Related Health Problems, 10th Revision, was introduced in 1996. Other variables coded from death certificates are manner of death (disease, occupational disease, accident, work accident, suicide, homicide, war, undetermined

intent), place of death, place of accident, activity during accident, medical operation before death, and code of the institute or hospital of the certifier. Additionally, the files of cause of death statistics include many demographic data from the Population Information System, for example name of the deceased, date of death, marital status, personal identification code of the spouse, and place of residence.

Because of the two sources of data – the death certificate and the Population Information System – the coverage of deaths is practically 100%. The non-response rate for death certificates was 0.1% of all deaths in 2000. These deaths occurred abroad, or when death certificates were still missing by the deadline for the production of the statistics.

In all, 6.1% of death certificates were specially processed. Inquiries were sent in respect of total of 1.2% of all death certificates, either to the issuing physician, or in case of multiple poisonings to the forensic medical register. The rest of the specially processed death certificates were coded with the assistance of the medical experts of Statistics Finland.

In the Finnish cause of death statistics the number of ill-defined causes is very low. The categories R96-R99 included only 92 cases, 0.2% of all deaths.

For epidemiological uses such as this atlas, the death certificates from Statistics Finland are sometimes linked with the data base of the Finnish Cancer Registry to get some additional variables related to cancer diagnosis, or to ascertain the place of residence at the time at cancer diagnosis. If the place of residence at death is used, migration close to the main hospitals because of cancer treatment may falsify the geographical pattern.

Population statistics and censuses

Statistics concerning the structure of population and families, housing conditions or vital events are produced by Statistics Finland based on data from

the Population Information System. All Finnish population files use the personal identification code, which makes possible versatile statistical production by combining individual data with the personal identification code.

Nation-wide population censuses were carried out in 1950, 1960 and 1970, and every fifth year from 1975 onwards. The 1990 census was the first which was entirely based on administrative registers. Data on occupation is included only in the censuses.

Since 1987, Statistics Finland has compiled annual Employment Statistics based on several administrative registers such as those of taxation, pensions, unemployment and welfare benefits. Other annual statistical data support the improvement of the databases based on censuses or Employment Statistics.

Publications

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Official Statistics of Finland, Health, 2002.

Official Statistics of Finland, Economic activity and housing conditions of the population, 1970-1990.

Official Statistics of Finland, Population, 2002. Keskimäki I, Salinto M, Aro S. Socioeconomic equity in Finnish hospital care in relation to need. *Soc Sci Med.* 1995 Aug;41(3):425-31.

Finnish Cancer Registry. Cancer in Finland 2004 and 2005. Cancer Society of Finland Publication No. 72, Helsinki, 2007.

Patama, T., Engholm, G., Klint, Å., Larønningen S, Ólafsdóttir, G.H., Pukkala, E: Small-area based map animations of cancer mortality in the Nordic countries, 1971-2003. *Nordic Cancer Union 2008*: <http://astra.cancer.fi/cancermaps/Nordic/mort>.

*Hilkka Ahonen (Statistics Finland),
Eero Pukkala (Finnish Cancer Registry)*

4.8: FRANCE

Introduction

France has a surface area of 550,000 km² and is a maritime and continental crossroads between North European and Mediterranean European countries. With 60 million inhabitants, France has the third largest population in the EU. The mean population density is 107 inhabitants per km². Three quarters of the people live in cities and towns.

About 70% of the active population, more than 18 million people, work in the tertiary sector (transport, trading, service) that represents 71% of the gross domestic product. In 1998, unemployment affected 12% of the population. Migrants represent 6% of the population. Just over half of the surface area is used for agriculture. The most important crop is wheat, followed by oats and maize. Fruits and vegetables are grown in all regions, but particularly in the south. Vines cover extensive areas, especially in Languedoc, Bourgogne and around Bordeaux. Woodland covers 30% of the country.

People under 20 years of age currently represent a quarter of the population, compared with one third 20 years ago. The proportion of the population aged 65 and over (16%) continues to increase. Following a decrease which began in the 1960s, the fertility rate is now stable at 1.8 child per woman. The number of births, 745,000 in 1999, ranks third in the EU after Ireland and the United Kingdom.

In 1999, 540,000 deaths occurred, a mortality rate of 9.1 per 1000 inhabitants. The life expectancy at birth of French women, 82 years, is the highest in the EU, but male life expectancy, 75 years, is the same as the EU average.

With one physician for 338 inhabitants, France follows Spain (237), Germany (293) and Great Britain (310), but is above The Netherlands (396).

The French capital is Paris (population: city 2.1 million and Ile de France 11 million). Metropolitan France is divided into 22 regions

and 96 departments. The regions are: Nord-Pas-de-Calais, Ile-de-France, Centre, Picardie, Basse Normandie, Haute Normandie, Bretagne, Pays de la Loire, Poitou-Charentes, Limousin, Aquitaine, Midi-Pyrénées, Champagne-Ardenne, Alsace, Lorraine, Bourgogne, Auvergne, Franche-Comte, Rhone-Alpes, Languedoc-Roussillon, Provence Alpes-Cte-d'Azur, and Corse. The overseas departments and territories are not represented in this Atlas.

Mortality data collection

The death certificate currently used in France was introduced in 1958. The physician can indicate one or more diseases leading directly or indirectly to death. Causes of death are coded according to the International Classification of Diseases (ICD). The ninth revision of the ICD (ICD-9) was used from 1979 to 1999. The present system for recording death information has been used since 1968.

When someone dies, a physician fills in a two-part death certificate: the date and time of death, identification information (name, surname, age, residence) are entered in the first part; and the place and date of death, and medical causes of death are entered in the second part – this part is sealed by the physician to preserve confidentiality.

The physician certifies the death and fills in the medical certificate. The medical certificate is sent to the town council of the place of death, where the nominal part is separated from the medical part. Another document, called bulletin 7, is completed by the town council. It contains information on socio-professional status, place of residence and places and dates of birth and death (but no information on identity). The sealed part of the death certificate and the corresponding Bulletin 7 are sent to the Direction Departementale de l'Action Sanitaire et Sociale (DDASS), which opens the anonymous death certificate in order to follow trends in important diseases.

The anonymous Bulletin 7 and the corresponding medical certificate are finally sent

by the DDASS to the department of the National Institute of Health and Medical Research (CépiDc-INSERM) responsible for the national statistics and the analysis of the medical causes of death. INSERM codes the causes of death according to ICD-9 (since 2000, ICD-10). The INSERM data base is then matched to the sociodemographic database of the National Institute of Statistics and Economic Studies (INSEE). INSEE performs the final checking of the data and sends back the final file to INSERM (socio-demographic information and medical causes of death for each death). This database does not contain the name of the decedent but is not completely anonymous, because dates and places of birth and death may be sufficient to identify an individual.

Since 1997, the French death certificate has been based strictly on the international form recommended by WHO. A first part with four lines describes the morbid process leading to death and a second part includes the contributing causes of death. Moreover, since 2000, the production process has been completely modified with the aim of improving the quality and the comparability of the data. This involved digitalisation of all the death certificates with the creation of a picture database, and implementation of an automatic coding system for medical causes of death (software STYX), implementing ICD rules for the selection and modification of the underlying cause. A bridge coding exercise has been performed on a sample of 50,000 certificates to document the changes in trends due to the new classification (ICD-9 versus ICD-10) and to the change in the coding mode (manual versus automated coding).

Deaths are recorded very accurately in France, but the quality of data on causes of death may vary according to age and region. The proportion of undefined causes of death decreased from 10.4% in 1970 to 6.3% in 1999 at the national level, but this proportion varies according to death place and age. In 1999, it ranged from 3.7% in Bas-Rhin to 12.6 % in Paris. In the same year,

the proportion of undefined causes was 9.3 % for persons less than 45 years, 4.9% between 45 and 65, 4.4% between 65 and 84 and 8.7% for persons 85 and over.

Population statistics

Information on the size and composition of the resident population of France is gathered by census, carried out under the supervision of INSEE. From 1815 to 1936, a national census was carried out every five years. However, because of wars, the 1916 and 1941 censuses were not carried out. Since 1946, censuses have been carried out at intervals of 6-8 years; the most recent was in 1999. Data are collected by investigators specially employed by INSEE and the quality of these data is high. National Population statistics (census results) are published by INSEE (mean population by 5 year age group). For the years between census, populations at regional or departmental levels are estimated by INSEE.

Publications on mortality and population statistics

General Census of the Population of 1975, 1990 and 1999. [in French]. Paris, INSEE.

La situation démographique en France –Mouvement de la population (1979-1999) [in French]. Paris, INSEE.

Statistics of Medical Causes of Death. Data for the Whole of France and data by * Region and departement (for years 1968 to 1999) [in French], Paris, INSERM

Atlas de la santé en France. John Libbey ed., 2000.

Website CépiDc INSERM (Causes of death data): <http://www.cepidc.vesinet.inserm.fr>

Website INSEE (Demographic data): <http://www.insee.fr>

Eric Jouglà

4.9: GERMANY (FEDERAL REPUBLIC)

Introduction

The description that follows refers to the Federal Republic of Germany as constituted at the period covered by the data in this atlas (1993-1997) after the unification with the German Democratic Republic in 1990.

Germany covers an area of 357,000 km², made up of mountain areas, uplands and plains. To the north the country is bounded by the North Sea and the Baltic Sea, and to the south by the Alps, Lake Constance and the Rhine – which also forms the border in the south-west. The main rivers are the Rhine, the Danube, the Elbe, the Weser and the Moselle. The highest mountain is the Zugspitze (2,962 m) in the Alps. Other upland areas rise to 1,500 m. About half the land is used for agriculture and 31% is wooded. Mineral resources include iron ore, potash, lignite, uranium, copper and natural gas.

The capital is Berlin (population 3,382,000) and the total population of Germany is 82.2 million, with an average density of 230 inhabitants per km² (2000).

The number of foreign residents stood at 7.3 million (8.9%) in 2000. Among these, the most common nations of origin were Turkey (1 998 000), Serbia and Montenegro (662 500), Italy (619 000), Greece (365 000), Poland (300 000) and Croatia (217 000).

The Federal Republic of Germany is a democratic, parliamentary State with a federal constitution. It is divided into 16 *laender*: Schleswig-Holstein, Hamburg, Niedersachsen (Lower Saxony), Bremen, Nordrhein-Westfalen, Hessen, Rheinland-Pfalz (Rhineland-Palatinate), Baden-Wuerttemberg, Bayern (Bavaria), Saarland (Saar), Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt and Thueringen. For all but two *laender* (Hamburg and Schleswig-Holstein) data in the atlas are published at level III (*Kreis*), so that in total 448 different regions are shown. The biggest region (by population) is Schleswig-Holstein

with an average of 2,717,000 inhabitants in the years 1993-1997. The smallest area is Zweibruecken with 36,000 inhabitants. The average for all regions is just over 182,000 inhabitants.

Mortality data collection

In the Federal Republic of Germany, mortality statistics are collected by each of the 16 *laender* independently. Statistics are compiled from information provided by physicians on death certificates which vary among the *laender*, but are mainly based on the international model proposed by the World Health Organization. From 1979, cause of death was coded according to the 9th revision of the International Classification of Diseases (ICD). In 1997 the 10th revision of the ICD was introduced. Mortality statistics are based solely on underlying cause of death.

The death certificate consists of two parts: an *open part* containing identification data (name, sex, date of birth, place of residence, place and time of death, and mode of death – natural, violent or unknown), and a *confidential part*, on which the physician indicates all causes contributing to the death. In the case of accidental death (for example, following a road accident) the physician must indicate the type of accident. In most *laender*, the physician may also make a request for an autopsy on the death certificate. Once filled in, the confidential part is sealed.

The physician who certifies the death sends the death certificate to the registrar's office of the town where the person died. A registration sheet, containing identification data and a registration number, is set up for every death; information on this sheet is used to compile population statistics. The death certificate is then sent to the Local Health Authority (*Gesundheitsamt*), where the information on the confidential part is checked by a physician (requests for clarification are rare). Violent deaths and deaths from unknown causes must be reported to the police or public prosecutor's office.

In most laender, the Local Health Authority sends the confidential death certificate to the State Board of Statistics (*Statistisches Landesamt*) where cause of death is coded; in Hamburg, deaths are coded by the Health Authority itself. The ICD code corresponding to the underlying cause of death is entered; contributing causes are not recorded but are considered for the choice of the underlying cause of death. The data are then exchanged between the regional statistical offices according to the place where the deceased person was last resident.

Once checked and corrected, data are pooled monthly, quarterly and annually in the state mortality statistics. On an annual basis, each of the laender transfers pooled data (on laender of residence, year of death, sex, nationality, cause of death (four digits), age (in standard age classes), type of accident and civil status) to the Federal Board of Statistics (*Statistisches Bundesamt*), which uses these data to compile and publish annual mortality statistics.

Validity

To guarantee the homogeneity of death coding in the different Federal States, and to ensure the correct application of WHO instructions for selecting the underlying cause of death, programs with plausibility checks are unified. The Federal Board of Statistics also runs annual training courses for coders.

Population statistics

Demographic data other than age, sex and civil status are only available through the census. The last two censuses, covering all residents in the Federal Republic of Germany, were held in 1970 and in 1987. For years between censuses, population size and composition are estimated by counting the births, deaths and migration reported to the State Boards of Statistics, and relating these figures to the last census data available. As for mortality statistics, population statistics are compiled by each federal state independently. The information from each of the State Boards of Statistics is reported to the Federal Board of Statistics, pooled and then published. As changes of residence are not always reported to the population registry, population data based on this information might be slightly overestimated.

Statistical publications

Each State Board of Statistics publishes its own mortality and population statistics annually in a series of Statistical Reports.

The Federal Board of Statistics publishes national statistics annually. Mortality statistics are published in Fachserie 12, Gesundheitswesen, Reihe 4, Todesursachen (Public Health – Causes of Death), and population statistics in Fachserie 1, Bevoelkerung und Erwerbstaetigkeit, Reihe 1.

The results of the 1987 census were published separately by the Federal Board of Statistics in Fachserie 1, Bevoelkerung und Erwerbstaetigkeit, Volumes 1 to 12.

In addition, articles on specific topics of mortality statistics are published, irregularly, by the Federal Board of Statistics and the State Boards of Statistics. The following are some important publications, in German, from the Federal Board of Statistics in its series *Wirtschaft und Statistik*: Causes of death 1990/91 in the unified Germany, Volume 4, 1993

Deceased 1993 by causes of death, Volume 12, 1994

Other important publications from the Federal Board of Statistics include the Statistical Yearbook of the Federal Republic of Germany.

To evaluate the quality of the cause of death statistics in Germany, several studies were carried out:

Mieller, W., Bocter, N.: Beitrag zur Abschaetzung der Aussagekraft der amtlichen Statistik. Schriftenreihe des Bundesministerium für Jugend, Familie, Frauen und Gesundheit, Band 253. Stuttgart, Berlin, Köln 1990.

Jahn, I., Jöckel, K.-H. et al: Studie zur Verbesserung der Validität und Reliabilität der amtlichen Todesursachenstatistik. Schriftenreihe des Bundesministerium für Gesundheit, Band 52. Baden-Baden, 1995.

Address: Statistisches Bundesamt, Gustav-Stresemann-Ring 11, 65189 Wiesbaden.

Stefan Dittrich

4.10: GREECE

Territory and population

Greece is bounded in the north by Albania, the Former Yugoslav Republic of Macedonia (FYROM) and Bulgaria, in the east by Turkey and the Aegean Sea, in the south by the Mediterranean and in the west by the Ionian Sea. The total area of Greece is 132,000 km², of which the islands account for 25,000 km².

The greatest length from north to south is 792 km and the greatest width from east to west is 992 km. The total length of the continental borders of Greece with neighbouring countries is 1,180 km, while the length of the coastline is 15,000 km.

The highest mountain in Greece is Olympos (2,904 m). The Aliakmon is the longest river in Greek territory (297 km). Among the lakes the largest is Trichonida (96 km²).

Greece produces a variety of ores and minerals and the Greek economy was traditionally based on agriculture with the highest proportion exported of any EU member country.

The country is divided into 10 geographic departments or 13 regions (NUTS 2) and 51 departments, excluding Mount Athos, which is self-governed. The largest city (2001 housing and population census) is Athens (the capital) with 790,000 inhabitants; it is in the department of Attiki with a population of 3,895,000 millions.

According to the population census of March 2001, the usual resident population of Greece was 10.9 million, of which 5,413,000 were males and 5,521,000 females. The population average density was 83 inhabitants per km². The total population is mainly urban – 8,212,000, some 75% of the total.

About two thirds of the usual resident population (7,447,000 inhabitants) were aged 15-64 years (68%). The population aged under 15 years totals 1,661,000 (15%), with the remainder of the population, 1,827,000 (17%), 65 years or over.

The only official and written language is Modern Greek with Demotic as its core.

Mortality data collection

The register offices are the sources of information on vital statistics. Each municipality or commune constitutes a separate register area. The Registrar is the mayor or the president of the commune. Registrars are attached to the Ministry of Justice and are supervised by the local Public Prosecutor.

Legislation requires all deaths to be recorded at the regional register offices; official registration is needed for burial. A relative of the deceased, or a person present at the death, delivers the medical certificate, signed by the attending doctor and indicating the cause of death, to the Registrar's Office. Death should be reported within 24 hours of the event.

The register offices are required to send a report of all deaths to the local Regional Statistical Offices of the National Statistical Service of Greece (NSSG) during the month following the death. All the statistical forms are sent to the Central Statistical Office for coding and analysis. Any queries arising due to unclear indication of cause of death on the certificate are referred back to the certifying doctor for clarification. About 55% of deaths in Greece take place in hospitals and other institutions.

The NSSG provides mortality statistics every year to Eurostat and WHO, by sex and age at the NUTS 2 level. Causes of death are coded to the 9th revision of the International Classification of Diseases.

Population statistics

In order to plan for, and implement, economic and social development, administrative action or scientific research, it is necessary to have reliable and detailed data on the size, distribution and

composition of the population. The population census is the primary source of these benchmark statistics on persons, married couples, families and households for a wide variety of geographical units ranging from the country as a whole to small localities or city blocks.

Since the establishment of the Greek State (1828) there have been 29 population censuses (up to 2001) although the information collected has varied over time. Since 1951 the censuses have been on a decennial basis with questions in line with UN recommendations so the collected information is internationally comparable. The traditional complete census has been used for collecting population data, using enumerators

and paper questionnaires. The data from the 2001 population census are available at LAU 1 and LAU 2 region levels.

Statistical publications (in Greek and English)

The Statistical Yearbook (annual)
News Release (annual)
The Concise Statistical Yearbook (annual)
Monthly Statistical Bulletin
Mouvement Naturel de la Population de la Grece
(annual)

L Andritsopoulou

4.11: HUNGARY

Introduction

Hungary, unified under King Stephen 1st in 1001, was for many centuries an important part of the Austro-Hungarian Empire which was divided into several independent states after the First World War. The country came under the influence of the USSR after the end of the Second World War and achieved independence only in 1990, after the collapse of the USSR. In the same year Hungary held its first multiparty election and in May 2004 it acceded to the EU.

The country and its people

Hungary is situated in the south of Central Europe, lying between 45°05' and 48°45' N and between 16°05' and 22°05' E. The country is situated in the central part of the Carpathian basin encircled by the Alps, the Carpathian mountains and the Binaric Alps along the central parts of the rivers Danube and Tisza. These two rivers divide the country from north to south into three large regions. The area of Hungary is 93,000 km², with 690 km² of water. Lake Balaton (598 km²) is the largest lake in Europe. The country's boundaries total 2,171 km; the length of the border with Austria in the west is 366 km, with Slovakia in the north 677 km, in the east with Ukraine 103 km and with Romania 443 km, and in the south with Croatia 329 km, Serbia 151 km and Slovenia 102 km. The largest part of the country is plain at about 200 m above sea level; only 2% is above 400 m. The mountains in the north, on the Slovakian border, are only of medium height with the highest point 1,015 m above sea level.

In the past, Hungary was mainly an agricultural country with a low level of industrialisation. Arable land forms about 52%, and forests about 15%, of the country. There has been a rapid decrease in the area of agricultural land, with corresponding increases in residential and industrial use. The main natural resources are bauxite, coal, natural gas, fertile soils and arable land. Industry is oriented to mining, metallurgy, construction materials, processed foods, textiles, chemicals, pharmaceuticals and

motor vehicles. About 13% of Hungary, containing nearly half its population, has high levels of air pollution; the main sources are road traffic, industry and heating. The emission of sulphur dioxide was more than twice the EU average. It has also been found that about 10% of children living in cities have relatively high concentrations of lead in blood.

The climate, due to the variable continental, oceanic and Mediterranean influences, is rather changeable with some very cold winters and extremely high temperatures in summer.

Hungary is divided administratively into 19 counties and the capital Budapest (which has county status). The counties are divided into towns and villages. There were 157 cities in 1990. The capital of the country, Budapest, is not only the seat of the government but also the site of many major factories.

The population of Hungary was 10,067,500 (mid-year population 1999) with an average density of 108 persons per km². Nearly 90% of the population are Hungarians; the main ethnic minorities in 1995 were Slovaks (0.8%), Romanians (0.7%), Germans (2.6%), Gypsies (4%), and Serbs (2%). On the other hand many Hungarians live in other countries. The median age of the population (2004 estimate) was 38.4 years, 35.9 for males and 41.1 for females. About 16% of the population were children under age 15 years, 69% were in the age group 15 to 64 years, and 15% were aged 65 or over. There were nearly twice as many females than males in the highest age groups. Life expectancy at birth was 66.2 years for men and 75.3 years for women in 1998, both lower than the averages for the countries of central and eastern Europe, including the Baltic states. The sex difference in life expectancy at birth increased from 8.1 years in 1985 to 9.2 years in 1998.

The labour force totalled 4.2 million in 1997, with 8% in agriculture, 27% in industry and 65% in various services. The official unemployment rate is declining and was 9.6% in 1998, lower than the EU average (11.1% in 1997).

Mortality data collection

Health statistics, including those of mortality from cancer, have a long tradition stretching back to the Austro-Hungarian Empire and are available from the end of the 19th century. In Hungary, the beginning of cancer control dates back to the beginning of the 20th century, with the collection of cancer statistics by Farkas in 1901. With the support of the Society of Physicians this work continued in 1904. Since the end of the Second World War, data on mortality have been collected from death certificates having the internationally accepted form and statistics are regularly published by the Hungarian Central Statistical Office. Data on cancer incidence, however, are collected only in smaller territories; the data for the longest period published in "Cancer Incidence in Five Continents" (Vol. I to Vol. VI) were provided

by the registry covering the most eastern region of Hungary, Szabolz- Szatmar county.

I Plesko

Population statistics

Estimates of the size and age structure of the population are derived from censuses – the most recent in 1991 was performed together with a National representative survey – taking into account birth and deaths. All demographic data including the mid- and end-year population size and age structure in the whole country and in individual administrative units and regions are computed and published annually by the Hungarian Central Statistical Office in Budapest.

References

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Staneczek W, Gadomska H, Rahu M, Chaklin A, Shtraus Z & Plesko I, eds. *Atlas of cancer incidence in the population of the CMEA*. Moscow, CMEA, 1983 (in Russian).

Turner B, ed. *The statesman's yearbook 2000*. London, Macmillan, 1999.

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Zaridze DG, Plesko I, Sidorenko JS & Sheliakina TV, eds. *Epidemiology of lung cancer*. Rostov on Don, Rostov University Press, 1990 (in Russian).

Zatonski W, Boyle P & Tyczynski J, eds. *Cancer prevention – vital statistics to intervention*. Warsaw, The Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology, 1990.

Zatonski W, Smans M, Tyczynski et al., eds. *Atlas of Cancer Mortality in Central Europe*. Lyon, International Agency for Research on Cancer, 1996 (IARC Scientific Publications No.134).

4.12: ICELAND

Introduction

Iceland is a volcanic island situated in the North Atlantic Ocean between Europe and America. The area of the island is 103,000 km², but the habitable part is only about 24,000 km², the rest being glaciers, lakes and wasteland.

The country is divided into eight constituencies. The capital area is located in two of those and consists of the capital city (Reykjavik) and Reykjanes.

Iceland is traditionally a European country, although recent geological studies have shown that the western part of the country is in fact situated on the North-American plate, moving westward, and the eastern part is situated on the Euro-Asian plate, moving eastwards.

Iceland is one of the smallest independent nations in the world. In 2001 the mean population was 285,050 individuals – 142,750 males and 142,300 females. Iceland was mainly settled from Norway 1,100 years ago, but to some extent also from the British Isles, where some Nordic-speaking people were residing. Celtic people were also among the first inhabitants, mostly slaves of the Vikings. Over 100,000 of the inhabitants live in Reykjavik. Reykjanes county includes six bigger districts (municipalities), with 5,000-25,000 inhabitants each, some smaller districts (fishing villages) and countryside. The rest of the inhabitants live in urban areas.

The nation is rather homogenous as there has been relatively little immigration since the settlement of the country. Icelanders have kept good family records since the country was settled.

Throughout the ages the main occupation was agriculture. Then in the 19th century fishing became more important, and migration from the rural areas to more densely populated areas started. This was on a small scale compared with

the great migration to fishing and the fishing industry towns in the 20th century. At that time the migration was mostly to the capital area, where more than half of the population now lives. The main occupations have become commerce, services and industry, in addition to the traditional fishing and fish processing.

Mortality data collection

General registration of the underlying cause of deaths in Iceland began in 1911; from 1996 other underlying causes were also registered.

The death certificate is written by a medical doctor, who passes it to the local vicar who then conducts the funeral. The vicar sends the certificate to Statistics Iceland as soon as possible after the funeral has taken place. According to legislation (from 1998) the medical doctor gives the death certificate to the nearest relative, who sends it to the District Commissioner and from there it is sent to Statistics Iceland. In Iceland all information is entered on one form, but the form is folded and sealed so that the medical information is concealed and not available until it is used for statistical purposes.

At Statistics Iceland the name of the person and the personal identification number is checked. The underlying cause of death is coded (International Classification of Diseases (ICD) manually and then checked by a medical doctor, who can refer back to the certifying medical doctor for clarification. When the coding of death certificates is completed, the information is stored in a computerised database.

About 82% of deaths in Iceland (1998) take place in hospitals, nursing homes and other institutions. An autopsy was performed for 19-20% of all deaths occurring in Iceland in the period 1995-1998, but for 31% in the period 1971-1995.

In 1951-1970, the cause of death was coded according to the 7th revision of the ICD. In 1971-

1980 the 8th revision was used and in 1981-1995 the 9th revision. Since 1996, the cause of death has been coded according to the 10th revision.

Population statistics

The *National Register of Persons* within Statistics Iceland was founded 1952. A special census was taken in October 1952 to furnish a base for the new National Register, together with the general census of December 1950. Today the register is a computerised database, updated by means of notices of residence changes and the reporting of births, baptisms, marriages, deaths, etc. All such events must be reported to Statistics Iceland.

Sources of population data in Iceland are unusually rich and reach back three centuries. The first census was taken in 1703 (the inhabitants' names, age, sex and status, plus detailed livestock statistics) followed by a second census in 1769. At the same time the two bishops in the country were required to collect annual records from all parsons on births and deaths in their parishes, and later on confirmations and marriages too. Censuses were taken every ten years in the 19th century until 1960, followed by a long interval until the census of 1981. Since then no census has been taken.

Statistical publications

Statistics Iceland is responsible for publishing mortality and population statistics.

Hagtíðindi (Monthly Statistic) from 1916, includes summaries of statistics under preparation.

Landshagir (Statistical Yearbook of Iceland) from 1991

Hagskinna (Icelandic Historical Statistics) 1997

Icelandic mortality data are also published in:

Publications by *Directorate of Health*

Publications by *Eurostat*

Publications by *Nomesco*

Publications by *WHO*

In addition, information on cause of death is used for special research. The following are examples of such publications:

Björnsson J, Jónasson JG, Nielsen GP. Áreiðanleiki dánarvottorða (Accuracy of death certificates). *Læknablaðið* 1992, 78:181-185.

Tryggvadóttir L, Birgisson H, Jónasson JG & Tulinius H. Upplýsingar um dánarmein á dánarvottorðum (Information on the underlying cause of death from death certificates). *Læknablaðið* 1993, 79:313-320.

E Olafsdóttir

4.13: IRELAND

Introduction

The total area of the Republic of Ireland is almost 70,000 km². The greatest length from north to south is 486 km and the greatest width from east to west is 275 km.

Ireland consists of a large central lowland of limestone with a relief of hills and a number of coastal mountains, the highest of which is Carantuoohill (1,040 m). The Shannon is the longest river, 370 km. There are many lakes. Roughly 81% of the total land is used for agriculture, mostly for grassland pasture. About 5% is wooded. Ireland is a major base-metal producer. Water, peat and natural gas are important indigenous sources of energy.

The country is divided into four provinces (Connacht, Leinster, Munster and Ulster). Dublin, the capital, is in Leinster and is situated on the east coast at the mouth of the river Liffey. The population of the greater Dublin area is approximately 1 million. The Irish population has been increasing since 1961, reaching approximately 3.7 million in 1997, with an average density of 53 inhabitants per km². Ireland continues to have a young population with 22% of the population in 1997 aged under 15.

The official languages are Irish and English. Irish (Gaelic) is a Celtic language – one of the oldest written languages in Europe, and it is the first official language. All official documents are published in both languages.

Mortality data collection

General registration of deaths in Ireland began in January 1864, following the Births and Deaths Registration (Ireland) Act 1863. The responsibility for the administration of the registration system, the compilation of death records and the issuing of certificates is vested in the Registrar General, who in turn is responsible to the Minister for Health.

The registration service comprises local registrars in approximately 300 districts

throughout the country, under the supervision of about 20 Superintendent Registrars responsible for all the registrations within larger areas, generally counties and county boroughs. Deaths are registered initially at local offices to where the death occurred and the Registrar's books are subsequently forwarded to the Registrar General.

Deaths must be registered within one year of occurrence. A relative of the deceased, or a person present at the death, delivers to the Registrar's Office the medical certificate, signed by the attending doctor and indicating the cause of death. The person registering the death also completes a special statistical form, which is sent, with any medical certificates, to the Central Statistics Office for coding and analysis. Any queries arising due to unclear indication of cause of death on the certificate are referred back to the certifying doctor for clarification.

In cases of sudden death a post-mortem may be required and the death may be registered on the basis of a coroner's certificate. About 10% of deaths in Ireland are registered following inquests or post-mortems.

About 70% of deaths in Ireland take place in hospitals, nursing homes and other institutions.

The coding and statistical analysis of deaths is carried out on behalf of the Minister for Health and Children by the Central Statistics Office. The causes of death in the data used in this atlas were coded in accordance with the 9th revision of the International Classification of Diseases.

Population statistics

The census of population is the main source of population statistics for Ireland. Decennial censuses were undertaken from 1821 until 1911 and, following a break in 1921, were resumed in 1926. Quinquennial censuses have been undertaken since 1946 with the exception of 1976, although a census with restricted content was

carried out in 1979. The usual range of questions on the census questionnaire cover such topics as age, marital status, sex, place of birth, principal economic status, occupation and industry.

For years between censuses, annual April population estimates are published by August of that year. These are available by sex, age, marital status and area of residence (NUTS 3) since 1986. The eight NUTS 3 regions are: Border, Midland, West, Dublin, Mid-East, Mid-West, South-East and South-West. There are two NUTS 2 regions in Ireland: Border, Midland and Western Region, and the Eastern and Southern Region. The latter is made up of the Dublin, Mid-East, Mid-West, South-East and South-West regions.

Statistical publications

Summaries of mortality data are compiled by the Central Statistics Office every quarter,

approximately 18 weeks after the quarter to which they refer. A detailed report on each year is also prepared and published approximately two years after the year concerned.

Annual Report on Vital Statistics (published annually for the years 1864-2000), Department of Health and Children/Central Statistics Office.

Quarterly Report on Vital Statistics (published quarterly for the years 1899-2002), Department of Health and Children/Central Statistics Office.

Population and Migration Estimates (published annually for the years 1950-2002, Central Statistics Office.

Health Statistics (published annually for the years 1976-1999), Department of Health and Children.

Address: Central Statistics Office, Skehard Road, Cork or Ardee Road, Rathmines, Dublin 6.

M Heanue

4.14: ITALY

Introduction

The land area of Italy is just over 300,000 km²; it is divided into 20 regions and 103 provinces, eight of which were established after 1995, and 8100 communes.

The Italian regions are grouped in four large functional areas: North-East, North-West, Centre and South–Islands, which have different demographic and socio-economic characteristics.

Population

The population resident in Italy at the end of 2000 was estimated to be 57.8 million, 28.1 million males (51.4%) and 29.7 million females.

During 2000, 543,000 live births and 560,200 deaths were recorded, and about 1,572,000 immigrants and 1,391,000 emigrants were reported to the population registers. The population increase of 2.85‰ was due to the net migration – a natural decrease (more deaths than births) has been recorded in recent years.

The age structure of the Italian population continues to shift towards the elderly: the elderly (aged 65 and over) to child (0-14) ratio rose from 58% in 1980 to 125% in 2000. In 1999 Italy had the highest elderly to child ratio in Europe, 122%; the European average ratio was 96%.

Many factors contribute to this: the reduced level of fertility (1.25 children per woman in 2000, making the country one of the least prolific in the world); and the increase in longevity which results in a higher proportion of elderly people. During the past 20 years, a constant decrease in the proportion of children, from 23% in 1980 to 14% in 2000, has been recorded, together with an increase in the proportion of those aged 65 and over from 13.1% in 1980 to 18.2% in 2000. The proportion of the very elderly (over 80 years of age) has doubled during the last 20 years to more than 4% of the total population.

The age structure has shifted towards the elderly in all the regions, but there are important differences between north and south: in the South the elderly do not outnumber children (ratio 91%), in the North-Centre the ratio has reached 150%, and it has reached 157% in the North-East – more than three elderly people for every two children.

Survival patterns

Mortality trends have been showing decreases all over the country since the beginning of the 20th century. Life expectancy at birth for men was 69.4 years in 1975, increasing to 75.5 years in 1998; for women it was 75.7 and 81.8 years, respectively. The Italian population is consequently one of the oldest in Europe; it also had one of the highest life expectancies at 65 years of age (in 1998).

Male mortality is higher in the Northern regions while the highest female mortality is in the South. The Centre has the highest life expectancy for both sexes.

Mortality patterns

The main causes of death in 1998 were cardiovascular diseases (ICD-9 390-459), which accounted for 39% of male and 49% of female deaths. Cancer (ICD-9 140-239) was the second largest cause of death, being responsible for 32% and 23% of deaths for males and females, respectively. Respiratory diseases (ICD-9 460-519) and violent causes of death (ICD-9 800-999) each accounted for less than 8% of the total.

Mortality data collection

Demographic registries were first established in Italy in 1865, during the unification of the country. All deaths, from whatever cause, have been recorded for the whole country since 1887. All the Italian communes have their own registry office, where births, marriages and deaths are recorded. The death certificate currently used in Italy is based on the International model proposed by WHO.

Deaths must be reported to the communal registry office within 24 hours. When a death is notified, a two-part data form must be filled in. The first part is filled in by the medical practitioner who certifies the death; this part contains comprehensive medical data and specifies whether the death was due to a natural or a violent cause. In the former case, the initial (underlying), the intermediate and the final causes are recorded as well as any other relevant health conditions along with the time interval before death (in years, months and days).

For violent deaths, the violent cause and the description of the lesion are recorded, as well as the diseases or complications that occurred after the lesion, any other diseases before the accident together with the means and the modality of lesion; the date and place of accident and the time between action and accident, and between accident and death, are recorded as well.

Once this first part of the death form is filled in, the medical practitioner sends the form to the registry office of the commune in which the death took place. The registrar fills in the second part, with information on civil status and personal data of the deceased person and sends the form to the Italian National Census Bureau (ISTAT).

ISTAT produces the official mortality data; it codes the underlying cause of death reported on the form, as this one of the most important and demanding phases of the process. Until 1994, the coding was done directly by coders, who also

selected the underlying cause of death. ISTAT subsequently introduced a new coding system using dedicated software.

Every year, 75% of the deaths forms are coded by use of the Micar-Acme software (Mortality Medical Indexing Classification and Retrieval – Automated Classification of Medical Entities), developed in the United States. This software is used in various countries (USA, Canada, Scotland, England and Wales, Sweden, Holland and Catalonia). The other 25% of deaths, including violent or AIDS deaths, for which the automated coding is not efficient, are coded manually.

The new system has optimised the production of official mortality data but there are inevitably differences between data coded up to and after 1995. For this reason, ISTAT carried out a bridge-coding exercise for a sample of about 300,000 deaths that occurred in seven months during 1995 (January, February, March, May, July, September, November) that provides both manual and automated classification.

The table below shows the distribution of the deaths in the sample by large groups of causes and by coding system, together with the coefficient of accordance (K) between the two coding systems.

The automated coding reduces the number of deaths attributed to ill-defined causes.

Only anonymous data are processed and published by ISTAT and the Istituto Superiore di

Cause of death	Code		K (A/M)
	Manual (M)	Automated (A)	
Infectious diseases	1230	1644	1.337
Cancer	90554	88850	0.981
Mental disorders, and nervous system and sense organs	10142	11138	1.098
Cardiovascular diseases	143481	143640	1.001
Respiratory diseases	19794	20722	1.047
Digestive system diseases	16676	15698	0.941
Other diseases	21010	21750	1.035
Ill-defined illnesses	4924	4369	0.887
Violent causes	16216	16216	..
Total	324027	324027	..

Sanità – aggregated by cause of death, age, sex, and region and province of residence. Scientists and researchers may have direct access to the anonymous and coded individual records.

Publications

(i) Population

Popolazione legale al 13° censimento della popolazione e delle abitazioni. 13° censimento generale della popolazione e delle abitazioni del 20 ottobre 1991. ISTAT, 1993.

Annuario Statistico Italiano 2001, ISTAT, 2001.

(ii) Mortality

La mortalità in Italia nel periodo 1970-1992: evoluzione e geografia. A cura di L. Frova, S. Prati, G. Boccuzzo, R. Capocaccia, S. Conti, M. Masocco, V. Toccaceli, A. Verdecchia. ISTAT (ed) Roma, 1999, pp 435.

Cause di morte. Anno 1995. ISTAT, annuario 11, 1999.

Cause di morte . Anno 1998. ISTAT, annuario 14, 2001.

La mortalità in Italia nell'anno 1993. A cura di R. Capocaccia, G. Farchi, S. Barcherini, A. Verdecchia, S. Mariotti, R. Scipione, G. Feola, G. Cariani. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (97/33), 1997.

La mortalità in Italia nell'anno 1994. A cura di R. Capocaccia, G. Farchi, S. Barcherini, A. Verdecchia, S. Mariotti, R. Scipione, G. Feola, V. Buratta. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (97/12), 1998.

La mortalità in Italia nell'anno 1995. A cura di S. Conti, G. Farchi, R. Capocaccia, M. Masocco, G. Minelli, R. Scipione, V. Toccaceli, M. Vichi, R. Crialesi, L. Frova. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (01/18), 2001.

La mortalità in Italia nell'anno 1996. A cura di S. Conti, G. Farchi, R. Capocaccia, M. Masocco, G. Minelli, R. Scipione, V. Toccaceli, M. Vichi, R. Crialesi, L. Frova. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (01/19), 2001.

La mortalità in Italia nell'anno 1997. A cura di S. Conti, G. Farchi, R. Capocaccia, M. Masocco, G. Minelli, R. Scipione, V. Toccaceli, M. Vichi, R. Crialesi, L. Frova. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (01/20), 2001.

La mortalità in Italia nell'anno 1998. A cura di S. Conti, G. Farchi, R. Capocaccia, M. Masocco, G. Minelli, R. Scipione, V. Toccaceli, M. Vichi, R. Crialesi, L. Frova. Roma: Istituto Superiore di Sanità, Rapporti ISTISAN (in press).

Sources of data

Population data are from the ISTAT data bases.

Mortality data are from the Italian Mortality Data Base; they are collected by ISTAT and processed by the Laboratory of Epidemiology and Biostatistics at the Istituto Superiore di Sanità (Italian National Institute of Health).

Susanna Conti

4.15: LATVIA

Introduction

Like Estonia, Latvia obtained its independence only after the end of the First World War. At the beginning of the Second World War, Latvia was annexed by the USSR. Its independence was re-established only in 1991, following the break-up of the USSR. Latvia joined the EU in May 2004.

The country and its people

Latvia is situated in Northern Europe and is similar in many ways to the other Scandinavian countries. The country is located between 55°40' and 58°05' N and between 20°58' and 28°14' E. The land boundaries total 1,159 km: with Belarus 141 km, Estonia 339 km, Lithuania 453 km and the Russian Federation 212 km. The coastline (Baltic Sea) is 531 km long. The total area of Latvia is 64,600 km², of which surface water is about 1,000 km². Arable land forms about 29% of the territory. Most of the country consists of fertile, low lying plains with some hills in the east. The land in Latvia is often wet and in need of drainage. Approximately 16,000 km² or 85% of agricultural land has been improved by drainage during recent decades. Land resources are mainly peat, limestone, dolomite, amber, hydropower, wood and arable land. Industry, despite depending on imports of energy and raw material, includes production of buses, vans, street and railroad cars, synthetic fibres, agricultural machinery, fertilizers, washing machines, radios, electronics, pharmaceuticals, processed foods and textiles. On environmental pollution, the country benefited from the shift towards services industries after regaining its independence. The main priority in this field is improvement of drinking water quality and sewage systems, household and hazardous waste management and reduction of air pollution. The climate is maritime, temperate and continental. Winters are moderate and summers warm and wet, while warm and moist air coming from the Atlantic Ocean causes storms mainly in spring and autumn. Latvia is divided into 26 districts

and seven cities. These are further divided into 481 municipalities (civil parishes).

The population of Latvia has decreased in recent decades. In 1990 it was 2,625,000 but decreased to 2,606,000 in 1994 due to Soviet military personnel leaving the country, and fell further to 2,458,000 at the end of 1997. Only just over half of the population is Latvian (55.5%), while Russians make up almost one third (32.4%). Smaller groups include Belarusians (3.9%), Ukrainians (2.9%), Poles (2.2%) and Lithuanians (1.3%). Around 70% of the population live in urban areas and 30% in rural areas; this distribution has not changed substantially during recent years. The average density of the population was 37 per km². The overall median age was 38.8 years – 35.6 for males and 41.9 for females. The age distribution was: children under the age of 15 15%; in the age group 15-65 years 69.2%; and in the age group 65 and over 15.8% (2004 estimate). The total labour force (2001 estimate) was about 1.1 million, with 25% employed in industry, 15% in agriculture and 60% in services. The official unemployment rate in Latvia increased from 2.3% in 1992 to 9.1% in 1999, still below the EU average (10.3% in 1999). Health status, including the cancer incidence rates, is closely related to the very short life expectancy in males which decreased in the 1970s but started to increase slowly from 1980. In 1987, male life expectancy started to decline once more and in 1994 fell to 59.5 years – the lowest in Europe with the exception of the Russian Federation. Since 1994 the mortality from main causes of death declined and 75% of the decline in life expectancy during previous seven years has been regained. The downward trend in life expectancy in females to 72.6 years in 1994 has also reversed to 75.4 years in 1999. The sex difference in life expectancy was 13.4 years in 1994 but declined to 10.7 years in 1999.

Mortality data collection

During the period 1993-97, death certificates of international format were used. For the period 1993-94 the codes of ICD-9 were used;

subsequently, ICD-10 was used for all health statistics in Latvia.

Deaths are confirmed, and the death certificates produced by, physicians; the death certificates are sent to the local district or city civil registry office, and then from there (in bulk) to the Central Statistical Bureau. After processing, the mortality data are published in a yearbook "The medical aspects of mortality in Latvia" by the Agency for Health Statistics and in the "Demographic Yearbook of Latvia" published by the Central Statistical Bureau of Latvia. According to the text about the contribution of the National Cancer Registry of Latvia to Volume VIII of Cancer Incidence in Five Continents, there were some difficulties in changing the morphology coding of numerous death cases

coded up to 1996 using a system adapted from that used in the USSR. The confidentiality of personal data in Latvia is protected by law.

Population statistics

Annual population estimates based on the 1989 census were made for subsequent years, taking into account births, deaths and migration. The annual estimates of the size and structure of population are available and published every year by the Central Statistical Bureau of Latvia. In the above mentioned "Demographic Yearbook of Latvia". The last census was performed in 2000.

I Plesko

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4.16: LITHUANIA

Introduction

The Lithuanian nation came into being in the 13th to 15th centuries with the formation of the Grand Duchy of Lithuania. In the 16th century it was united with Poland to form a commonwealth. During the partition of this commonwealth by Russia, Prussia and the Austro-Hungarian Empire in the 18th century, Lithuania was absorbed into the Russian Empire. The country obtained its independence in 1918 after the end of the First World War, but was annexed by the USSR in 1940 at the beginning of the Second World War. On March 1990 Lithuania became the first of the former Soviet republics to declare its independence; it acceded to the EU in May 2004.

The country and its people

Lithuania is situated in north-eastern Europe bordering the Baltic Sea. The country lies between 49°15' and 57°30' N and between 49°15' and 57°34' E. Its land boundaries measure 1,747 km; border countries are Belarus (with a 724 km long border), Latvia (610 km), Poland (110 km), and the Kaliningrad region of the Russian Federation (303 km). The coastline is 99 km long. The country has an area of 65,300 km². The terrain of the country is mainly lowland, flat with many scattered small lakes; the highest point of the country is only 292 m above sea level. Areas with fertile soil in the central plains are separated by hilly uplands which are the remainders of ancient glacial deposits. Arable land covers about 45% of the country. Natural resources are peat and arable land. The industrial production of the country is rather diverse (in relation to the needs of the market of the former USSR) and oriented to metal-cutting machine tools, television sets, furniture, refrigerators and freezers, electric motors, petroleum refining, building of small ships, textiles, food processing, fertilizers, agricultural machines, optical equipment, electronic components, computers and products made from amber. The agricultural sector produces grain, potatoes, sugar beet, flax, vegetables, beef, milk and eggs. Lithuania is divided administratively

into 10 counties, 44 regions, 111 towns and 449 wards (local administrative units).

The climate of the country is transitional, between maritime in the western parts adjacent to the Baltic Sea, and continental in the eastern part. There has been contamination of soil and ground waters with petroleum products and chemicals in the vicinity of the former military bases of Russian troops.

At the beginning of 1997, the estimated population of Lithuania was 3,588,000 persons, of which 1,685,800 were males and 1,902,200 were females, with a population density was 55 persons per km². Almost 68% of Lithuania's population lived in urban areas. The mean age of the population of Lithuania was 35.9 years. The mean age of males (33.5) was 4.5 years lower than that of females (38.0). The estimated age structure is 21.4% of the population younger than 15 years, 65.8% in the age group 15-64, and 12.8% in the age group 65 years and over, with the high proportion of females in the highest age groups. Nearly 80% of the population are Lithuanians, 9.4% Russians, 7.0% Poles, 1.7% Belarusians, 1.2% Ukrainians and 1.1% are members of smaller ethnic groups (1989 Population census data). Life expectancy at birth for men was 65.5 years and for women 76.6 years (in 1993 it was 63.2 and 75.0 years respectively). A quite significant difference between the life expectancy at birth for men and women remained: in 1997, life expectancy at birth for men was 11.2 years lower than that for women while in 1993 the difference was 11.8 years. Life expectancy of the rural population, especially of males, tends to be lower than that of the urban population. The largest differences between urban and rural areas were 4.2 years for males in 1997, and 2.2 years for females in 1993.

The total labour force is about 1.5 million; the main areas of occupation in 1997 were industry (about 30%), agriculture (20%), construction and building (15%) and the remainder in transport, communication and various services. Official

unemployment in Lithuania has increased continuously and according to the National Labour Exchange Information the rate in 1998 was 6.4%; by the end of 1999 this had risen to 8.4%.

Mortality data collection

The format of the death certificate is the common international model proposed by WHO and was introduced in 1975. All deaths are confirmed by physicians who also select the underlying and immediate cause of death as well as associated diseases (co-morbidity). The data in death certificates were coded using the International Classification of Diseases; the 9th revision (ICD-9) was introduced in Lithuania in 1978, and ICD-10 has been used since 1998. Death certificates are issued at primary health centres, hospitals or medico/legal departments. Mortality data are computed and published by the Lithuanian Department of Statistics in the annual "Causes of death of the Lithuanian population". The National Cancer Registry of Lithuania has responsibility at Lithuania's Department of Statistics to check the

death certificates of cancer patients and examine them for validity of coding and completeness. Approximately 2% of cancer registrations are made from autopsy records and 6% from death certificates only. All institutions dealing with personal data are obliged to follow the recommendations of the Data Protection Agency and appropriate laws.

Population statistics

Demographic statistics are based on results obtained from censuses; the data used in this Atlas and in Volume VIII of Cancer Incidence in Five Continents were based on the 1989 census. The last census was performed in 2001. Population estimates are prepared every year taking into account births, deaths and migration. The size and age-structure of the population (mid- and end-year) in the whole country and in individual administrative regions are computed and published annually by the Department of Statistics.

I Plesko

L Kasparaviciene

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4.17: LUXEMBOURG

Introduction

The Grand Duchy of Luxembourg is a small country, tucked between Belgium, France and Germany. The country is 84 km long and 52 km wide, encompassing an area of 2,586 km². It shares borders with a total length of 356 km to the north and west with Belgium (148 km), to the south with France (73 km) and to the east with Germany (135 km).

The country is divided into two clearly defined regions:

1 the Eisléck or Öesling in the north, which is part of the Belgian and French Ardennes, on the western rim of the Eifel, and covers one-third of the territory; and

2 the Gutland or Good country in the centre and the south, covering the remainder of the territory, which is mainly rolling farmland and woods.

The highest point of the country (560 m) is Kneif in the northern village of Wilwerdange. Luxembourg is landlocked, but part of the eastern border (37 km) with Germany is a navigable river, the Moselle. Other important rivers are the Sûre, Our and Alzette. The capital is the city of Luxembourg with a population of 81,800 (2001 census).

According to STATEC (Service Central de la Statistique et des Etudes Economiques) the population of Luxembourg (2001 census) was 441,300. There were 164,700 foreign residents (37%), mainly Portuguese (13.2%), Italian (4.6%), French (4.6%), Belgian (3.4%) and German (2.4%).

Description of the mortality surveillance system

In Luxembourg, the mortality surveillance system – the collection, coding, transmission, analysis, interpretation and utilisation of mortality data – is centrally organised by the Directorate of Health/Ministry of Health. The death registration process has two stages:

- 1 certification of death (based on the international model proposed by WHO); and
- 2 coding of the cause of death.

As in all European countries, the medical certification of death is mandatory in Luxembourg. A physician is called to confirm the death; he fills out certain administrative information about the deceased person and certifies the cause of death. For confidentiality reasons, the physician seals the medical part of the death certificate involving the description of the cause of death before giving it to the family of the deceased, who take it to the town hall. Here, the civil registrar documents the death, and completes certain information related to the place of residence and the citizenship of the deceased. He sends a special form of declaration to the National Institute of Statistics and a notification to the municipality of residence. He forwards the death certificate to the Directorate of Health/Division of Sanitary Inspection.

The document used to certify a death has two separate parts: an administrative and a medical part. The administrative part, which is held at the civil registration office of the town hall, consists of identifying information including sex, age, residence, place (district) of residence, occupation, marital status, place of death (hospital, home, public street, etc), nature of death (known, unknown, suspected, etc). Usually, these official death records are directly collected via the death certificate. This part represents the socio-demographic variables and the mortality database. In the medical part of the death certificate, the certifying physician enters as clearly and completely as possible the causes of death, describing the sequences of diseases leading to death, mentioning other contributing conditions and specifying each cause of death involved. In case of a (suspected) non-natural death, the certifying physician will refer the death to the police, who contact the general prosecutor, and the latter decides whether further forensic investigation is needed. If so, the forensic physician can issue the death certificate after the autopsy.

The original death certificate is processed as follows:

-In the Division of Sanitary Inspection, the Inspector-Doctor, who has the exclusive right to open the sealed medical part of the death certificate, decides on the cause of death. He notifies the causes due to certain contagious diseases. He also fixes the conditions of burial (authorisation, transport to another country, prolongation of delay, etc).

-The certificate is then forwarded to the Service of Statistics of the Directorate of Health for the central coding of the mortality data.

-Finally, it is stored in the archive of the Directorate of Health (as an original document after being digitalised).

(See the diagram of the flow of death certificates, below.)

Practices of coding of cause of death and policy regarding corrections

The purpose of the coding process is to select the underlying cause of death and to translate the literal text of the listed conditions into ICD codes. From 1968 to 1970, cause of death was coded according to the 7th revision of ICD; the 8th revision of ICD was used until 1978; the 9th revision of ICD was used until 1997; and since 1998, the 10th revision has been used. These data are centrally processed and codified by the Service of Statistics in the Directorate of Health.

The last major change to the medical part of the general death certificate was made in 1980 when a specific form of infant death certificate was introduced. It covers the peri-natal period (up to 10 days of age) as recommended by WHO. The objectives were to facilitate the collection of mortality data and to improve the quality of infant mortality statistics. Generally, the administrative part of the infant death certificate is similar to the usual death certificate. The medical part requires additional details about the type of infant death (stillbirth, premature, or death at term), the period of gestation, the nature of labour (normal, forceps, caesarean, etc), and infant weight, as well as the cause of death (natural or violent).

About 1-3% of death certificates are queried by the Service of Statistics in order to improve the quality of the causes of death coded (in case of

incoherent sequences, imprecise cause of death, etc). In the case of lack of clarity in the description of a specific cause of death, the physician responsible for the mortality statistics at national level asks the certifying physician for clarification.

Potential sources of biases

The completeness and coverage of the mortality register in Luxembourg is good – it is a small country, there are small numbers of deaths, and only one coder. Nevertheless, biases may occur in the process of coding or certification:

- The mortality data cover all those persons who died within Luxembourg's territory, whether listed in the resident population or holding foreign domestic residence. However, the data do not include those who died abroad – this can create a bias, particularly for certain rare causes of death or for deaths in certain groups of age (e.g. children aged 5 to 9).

-Under-declaration of suicide: for cultural, religious, moral or insurance reasons, suicide is sometimes denied by the family or the certifying physician.

-Autopsies are not very common in Luxembourg: the frequency of unknown causes of death has not improved in the past.

-Since there is no Faculty of Medicine in Luxembourg, our physicians have to be trained in different countries (Belgium, France, Germany, UK, etc). Therefore, their medical experience and their skill in filling out death certificates varies.

-An under-estimation of mortality due to alcohol abuse may exist, with such deaths recorded as complications such as liver cirrhosis, accidental falls, aspiration and asphyxia. Conversely, an over-estimation related to ischaemic heart diseases may exist, since these deaths are occasionally coded as an alternative to sudden death, unknown causes or cardiac arrest, mainly when the certifying physician of the emergency medical service did not know the patient.

Population statistics

Demographic data are provided by STATEC. The 35th and most recent census was carried

out in February 2001. Between two decennial censuses, the total population and the structure of this population are calculated by counting the births, deaths and migration reported to STATEC and combining these figures with those from the last available census data.

Statistical publications

Every year, STATEC publishes population statistics and many other statistical data in the “Annuaire Statistique du Luxembourg”. Statec’s address is

6, boulevard Royal, B.P. 304,
L – 2013 Luxembourg.
Tél: + 352 478 42 21
Fax: + 352 46 42 89
Email: statec.post@statec.etat.lu
Website: www.statec.lu (data available on this website)

National mortality data are published annually by the Directorate of Health:

Direction de la Santé, Service des Statistiques,
Allée Marconi – Villa Louvigny, L – 2120
Luxembourg.
Tél: + 352 478 55 58 ;
Fax: + 352 478 50 599
Email: statinfo@ms.etat.lu
Website: www.etat.lu/ms

In addition, STATEC has also published various documents on specific topics:

- Trausch G., 1997, *La mortalité au Luxembourg : 1901-1995*, Cahiers Economiques n° 88, STATEC Editions, presenting mortality data in Luxembourg between 1901 and 1995.
- Statistiques du mouvement de la population – Volume III: 1954 – 1995, Statec Editions, 1996.

The « Registre Morphologique des Tumeurs » Association and the “Laboratoire National de la Santé” publishes morbidity data due to cancer every year.

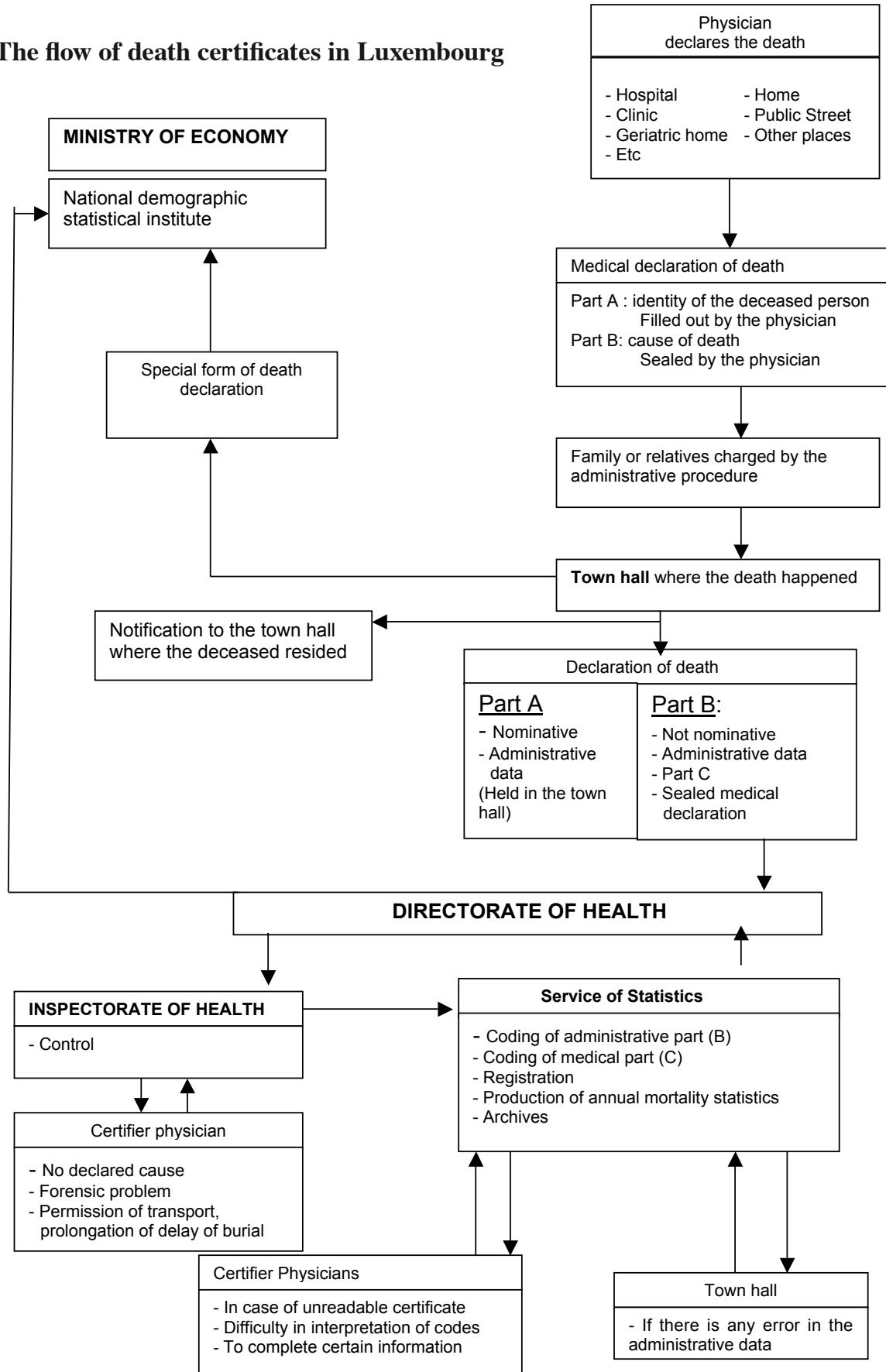
The “Comité de Surveillance du SIDA” has, since 1984, published annually an activity report presenting morbidity and mortality data.

Quality of cause of death statistics

The quality of the national mortality data, particularly the reliability of the coding process, is due to:

- Centralisation of the surveillance system in terms of coding, registration, and processing of mortality statistics
- Coding and registration of the medical data of the death certificates is done by one health professional
- Double checking is always done to overcome possible human error in manual coding and registration
- Constant external contact and intense internal communication with all mortality data customers, for example certifying physicians, civil registrars, inspector-doctor, etc.
- Browsing the newspaper, looking for further information about certain causes of death caused by accidents, suicide, homicide, etc
- Tabulation of deaths for non-residents, in order to implement exchange of information between countries, for deaths occurring abroad
- Initiation of, and familiarisation with, the automated coding system, to improve the quality as well as to reduce the tedious work of manual coding
- International collaboration with WHO, the European Commission, INSERM, etc
- Finally, it is planned to develop the training of physicians in order to improve the certification process.

Guy Weber

The flow of death certificates in Luxembourg

4.18: MALTA

The Maltese Islands

Located in the Mediterranean Sea, just south of Sicily, the Maltese archipelago consists of three main islands: Malta, Gozo and Comino. The total population of the Maltese Islands in 1997 was estimated at 376,500. The distance between Malta and the nearest point of Sicily is 93 km, and from the nearest point on the North African mainland (Tunisia) is 288 km. Malta is the largest island measuring 27 kms by 14.5 km. The area of the Maltese Islands is 316 km². Malta is characterised by a series of low, flat-topped hills with terraced fields on their slopes. Malta's coastline is well indented with natural and man-made harbours, bays, creeks, several sandy beaches and rocky coves.

Malta's climate is strongly influenced by the sea and is typical of the Mediterranean. The islands have a very sunny climate with a daily average of five to six hours sunshine in mid-winter and more than 12 hours in summer. Annual rainfall is low, averaging 580 mm a year.

The strengths of the Maltese economy are its limestone, a favourable geographical location, its rich history and a productive labour force. The economy is dependent on foreign trade, manufacturing, tourism and financial services. The official languages are Maltese and English.

Mortality data collection

The National Mortality Registry, together with the National Cancer Registry, is housed within the Department of Health Information and Research (DHIR). The DHIR is one of the eight departments of the Health Division of the Ministry for Health. It is responsible for the management of national health data sets as well as for a number of other databases on health service activity. The department is also responsible for the National Health Interview Survey.

All death certificates of people who die in the Maltese Islands (around 3,200 each year) are received at the department where the National Mortality Registry is responsible for the coding, inputting, and verification of the information and analysing the data in order to produce mortality statistics which are as accurate and timely as possible. A copy of any death certificate in which cancer is mentioned is given to the National Cancer Registry.

Published mortality data by cause of death are available since 1872 in Malta. These were produced in the form of a fortnightly report published by the Chief Police Physician. Annual reports after 1896 were published by the Chief Government Medical Officer.

Main sources of information and reports received at the National Cancer Registry

Sources	Reported by	Notes
Clinical notification	Hospital doctors, GPs and others	Notification of Cancer Act, 1957
Copy of histology and cytology report	Pathology laboratories	State-owned (1) and private (8)
Copy of autopsy report	Pathology laboratories	Autopsies are only done in state-owned general hospitals
Death certificates	National Mortality Registry	Another registry at DHI
New referrals to Oncology Department	Oncologists	There is only one Oncology centre on the Islands

The Department of Health Information and Research and its forerunners have been responsible for keeping mortality data since 1983. Mortality data is available in electronic form from 1991. Mortality data have been coded using ICD-10 since 1995.

The National Cancer Registry is population-based and aims at covering all cancer diagnoses in residents of the Maltese Islands. These amount to about 1,200 new diagnoses each year excluding non-melanoma skin cancers. The main sources of information for the cancer registry are shown in the table below.

The first attempts at cancer registration in Malta were made in the mid-1960s. The present registry was started in 1985.

Statistical publications

The National Statistics Office came into being in March 1947, although official statistics had been compiled and published for a long time

previously. In 1872, an official publication called The Malta Blue Book featured a statistical view of Malta and its Dependencies for the previous ten years – 1863 to 1872 – including time series for population, education, finance, sale of public sites, imports, exports and shipping. The National Statistics Office (NSO) is responsible for carrying out a census of the population every ten years. Mortality statistics are compiled by the DHIR and sent to the National Statistics Office on a yearly basis. Statistics regarding cancers are compiled by the National Cancer Registry.

Sources of Information:

Department of Health Information and Research, Malta: www.sahha.gov.mt/entities/healthinformation.html

National Statistics Office, Malta: www.nso.gov.mt

K England

4.19: THE NETHERLANDS

Introduction

The Kingdom of the Netherlands was formed in 1815. In 1830 Belgium seceded and formed a separate kingdom. A modern, industrialised nation, the Netherlands is also a large exporter of agricultural products. The country was a founding member of NATO and the EU, and participated in the introduction of the euro in 1999.

The Netherlands has an area of about 41,500 km², and extends roughly 300 km north to south and about 200 km east to west. Behind the North Sea coast lie the ‘polders’ – land partly reclaimed from the sea. The islands in Zeeland and South Holland provinces are linked by secure dikes to prevent the recurrence of disasters caused by storm tides. About 27% of the country’s total area is below sea level, and the land is criss-crossed by a network of lakes, rivers and canals. Land over 100 m above sea level is to be found only in the south-east corner of the country.

About 70% of the land area (excluding water) is used for agriculture or horticulture and 9.5% is wooded. Mineral resources include coal, oil and natural gas.

The capital is Amsterdam (population 736,000), but the seat of government and the location of most central government departments is The Hague (population 458,000).

The Netherlands has a population of 16.1 million, with an average density of 475 inhabitants per km² (2002), making it one of the most densely populated countries in the world.

Dutch is the national language. There is a Frisian minority, speaking its own language, in the north of the country.

The Netherlands is divided into 12 provinces: Groningen, Friesland, Drenthe, Overijssel, Flevoland (established in 1986), Gelderland, Utrecht, North Holland, South Holland, Zeeland, North Brabant

and Limburg. Each province has a Provincial Council and a Provincial Executive (responsible for day-to-day business), both chaired by a Queen’s Commissioner appointed by the Government. The provinces are divided into 40 corop regions. These regions were set up in the early seventies for statistical and planning purposes. These regions consist of one or more centres and their surrounding areas. Corop regions are the NUTS level 3 subdivision of the Netherlands. Corop boundaries do not cross provincial and municipal boundaries, so that corops comprise several municipalities all contained within a single province.

Mortality data collection

The principles of the present system for notification of death and compilation of cause-of-death statistics date from 1927, modelled after the system of Switzerland. When a natural death occurs, the attending physician prepares two documents: a death certificate and a cause-of-death certificate (CoD-certificate). In the case of non-natural death, notification of death is given by the “legal physician”. The CoD-certificate is a strictly confidential document on which the name of the deceased does not appear. It is inserted in an envelope which is then sealed. A perforated slip of paper attached to this envelope bears the name of the deceased. Civil registration of death takes place when both the death certificate form and the CoD-certificate are presented at the office of the Local Registrar of the municipality where the death occurred.

In the Local Registrar’s Office, the data stream is split: demographic and medical data about the deceased go to Statistics Netherlands (CBS) separately, keeping the medical data confidential. At CBS these two data streams are merged again, using the entry number in the municipal death register. This number has been written on the envelope of the CoD-certificate.

At CBS the envelopes with the CoD-certificates are forwarded to the Medical Officer. After opening

of the envelopes the information on the cause of death in the CoD-certificates is coded – according to the 9th revision of the ICD in the period 1979-1995 and the 10th revision from 1996 onward.

Demographic data from the automated municipal population registers (date of death, date of birth, marital status, etc) concerning the deceased are meanwhile being processed by CBS.

After coding of the cause of death and processing of the demographic information have been completed, the two data sets are linked by means of the certificate number (and the number of the municipality where the death occurred). The final and complete data set on cause of death is used to produce statistics on cause of death differentiated by various characteristics.

Information on cause of death is available for the following characteristics: primary and secondary cause of death, municipality where the death occurred; date of death; date of birth; sex; nationality; country of birth; marital status; date of marriage or divorce; municipality of residence; municipality of birth (for infants only); place of death (hospital or at home); and whether a post-mortem examination was performed.

In some cases, the CoD-certificate contains incomplete or inconsistent information or is missing. Whenever possible, the Medical Officer of the CBS requests the attending physician to provide the missing information or to resolve inconsistencies. As a result of such efforts, more than 80% of these cases can be coded satisfactorily. The percentage of cases where the cause of death is described as ‘unknown or badly described’ (ICD-10 R95-R99) was 3% in 2002. The percentage of known autopsies in the Netherlands is around 5%; in 86% of the deaths, no post-mortem was held, while for 9% of deaths, no information was available (in 2002). About one third of the deaths (33%) occurred in hospitals in 2002; 60% occurred elsewhere and for the remaining 6% no information was available.

Population statistics

Information on the size and composition of the population of the Netherlands is based on

the automated municipal population registers. In these registers information is stored on every inhabitant of the municipality. When an inhabitant undergoes a demographic event that results in the register being updated, Statistics Netherlands is informed directly by means of an electronic message. These messages are the building blocks for the population statistics.

This registration system is known as the GBA system, which stands for Gemeentelijke Basis Administratie persoonsgegevens, the municipal basic registration of population data. ‘Basic’ refers to the fact that the GBA serves as the basic register of population data within a system of local registers. Among these registers are the local registers on social security, the local registers of water and electricity supply, the local registers of police departments that are concerned with the foreign population in the Netherlands and the (national) registers of the old age pension fund system.

The GBA system was introduced on 1 October 1994. It is a fully decentralised, comprehensive and cohesive population registration system. Due to local provisions there is no central counterpart of these municipal registers. In this respect the system is unique in the world. Every municipality in the Netherlands has its own population register containing information on all inhabitants of that municipality. This information on each individual inhabitant is contained in a personal file (PL). In the registration system each inhabitant has been given a unique personal identification number (pin), which enables the municipal authorities to link his or her data to those on a spouse, parents and children. For this reason on each PL not only the inhabitant’s pin is stored, but also those of the parents, the spouse and the offspring. This is done if these persons were in the population register of that municipality at any moment since 1 October 1994.

The personal file includes personal data, for example about the mother, father, citizenship, marriage, partnership, widowhood, divorce, death, registration, address, offspring, legal permit to stay in the Netherlands, legal restraints, passport and the right to vote.

Up to and including September 1994, the population registers were a paper card system.

These registers were maintained by the Local Registrars in the different municipalities and comprise all the personal cards of the de jure resident population of these municipalities. New personal cards were made out for births and migrants into The Netherlands. All changes in personal situation, such as marriage, divorce, change of residence or death, were entered on this card. When a person moved to another municipality his or her personal card was forwarded to the municipality of the new residence. In the case of emigration or death, the personal card was removed from the register. The population figures from the 1971 census (the last census in the Netherlands) were used as the base.

Over the years, a number of changes have occurred in municipal boundaries. The few small changes in boundaries do not affect the comparability of the data presented in this atlas.

Statistical publications

Data and articles on mortality by age, sex, region and cause of death are available in StatLine, the

electronic databank of Statistics Netherlands at www.cbs.nl. It contains statistical information on many social and economic subjects in the form of tables and graphs. All the information in StatLine may be consulted, printed and downloaded free of charge.

The Atlas of Cancer Mortality in the Netherlands, 1979-1990 (in both English and Dutch) consists of maps, supplemented by graphs and tables, showing average standardised mortality ratios for the period 1979-1990 of cancers from a large number of sites by the 40 corop areas. The graphs and tables also show standardised mortality ratios of cancers of various sites for six two-yearly periods from 1979 to 1990 in corop areas, provinces and large municipalities.

Address: Division of Social and Spatial Statistics, Statistics Netherlands, Henri Vaasdreef 312, P.O. Box 24500, 2490 HA Den Haag.

J Hoogenboezem

4.20: NORWAY**Introduction**

Norway is in the north of Europe between 57°58' and 71°11' N. The seaboard on the North Sea and North Atlantic Ocean is some 3,419 km long (excluding numerous islands and fjords). The mainland borders with Sweden, Finland and Russia are 2,542 km long and the land area is about 323,800 km². Approximately one-third of the mainland lies north of the Arctic Circle and some 40 percent of its area is more than 600 m above sea level. Due to the prevailing westerly winds coming from the Atlantic and also the Gulf Stream, the country has a higher average temperature than one would expect given its latitude. These winds also make the annual precipitation higher in the western part of South Norway than in the rest of the country. Only 3% of the area is arable land and 27% is forests and woodland. The discovery of oil and gas in adjacent waters has been a main determinant of the Norwegian economy. Other natural resources are hydropower, timber and fish.

The majority of the Norwegian population are caucasians. The country has 4.5 million inhabitants. At present there are about 260,000 immigrants from all over the world (of whom 40,000 are second generation). Some 20% of the immigrants are from the northern parts of Europe and 50% from third world countries. Some 20,000 to 40,000 samis comprise a racial minority; their traditional homeland was in the northern part of Norway. There is a great variation in population density from 1,190 km² in the capital of Oslo to 1.6 km² in Finnmark, the northernmost county. Most cities and towns are situated on the coast. Norway is divided into 435 municipalities and 19 counties. The counties are: Østfold, Akershus, Oslo, Hedmark, Oppland, Buskerud, Vestfold, Telemark, Aust-Agder, Vest-Agder, Rogaland, Hordaland, Sogn og Fjordane, Møre og Romsdal, Sør-Trøndelag, Nord-Trøndelag, Nordland, Troms and Finnmark.

Health services are a part of the Norwegian welfare system and much is spent in maintaining

equal opportunities for health services all over the country. Most hospitals are run by the government and the public health system covers all municipalities. For all inhabitants medical treatment is either free or only a modest payment is required. The country is divided into five health regions with responsibility for diagnosis and treatment of cancer, but patients with rare diseases or special needs might be transferred to other regions.

Mortality data collection

Since 1951, Norwegian cause of death statistics have been collected, classified and edited according to the International Classification of Diseases (ICD). The international form of medical certificate of cause of death recommended by the World Health Assembly is used. The present forms for certifying cause of death were introduced by Ministry of Social Affairs in 1983. Centralised coding of cause of death is performed at Central Bureau of Statistics (Statistics Norway). The coding was in accordance with ICD-9 in the period 1986-95 and with ICD-10 thereafter.

The law requires that when someone dies, a physician issues a medical death certificate. This includes demographic and medical information on the deceased. The certificate is taken to civilian authorities in the municipality who send it to the public health officer. The demographic information forms the basis for civil registration of deaths. In the case of deaths without medical information, the civilian authorities fill in a form with the demographic information and send it to the public health officer who has responsibility for the determination of cause of death. The public health officer regularly sends all death certificates issued in his/her municipality to Statistics Norway.

In the coding of cause of death, Statistics Norway has access to information from the Cancer Registry of Norway which includes incident cancer cases since 1953, the Medical Birth Registry which includes medical information on births since 1967, autopsy

reports from hospitals and forensic institutes, and information from statistics on road traffic accidents (from Statistics Norway).

The medical certificates are matched against the deaths in the civil registration of deaths in the Central Population Registry. If medical information on a death is lacking, a reminder is sent to the health authorities. Statistics Norway contacts the certifier in cases where the information is insufficient for coding the underlying cause of death. The coverage of the cause of death statistics is close to 100%. In 1997, 2.4% of all deaths, and 2.1% among people aged over 74 years, were classified as "Unknown and unspecified causes".

Population statistics

Information on the size of, and changes in, the resident population of Norway can be found in the Central Population Registry. Major demographic events such as birth, death, marriage/divorce and migration are recorded. Since 1964 all inhabitants of Norway have had a unique identification number. This is used in several areas of social life and enhances the linkage of different data sources. The Central Population Registry is run by the Directorate of Taxes and there are local population registries in each municipality.

The first national census was held in 1769, when there were 724,000 inhabitants in

Norway. Since the Second World War there have been censuses in 1946, 1950, 1960, 1970, 1980, 1990 and 2000. From 1980 the Central Population Registry has provided the basis for the censuses.

Statistical publications

Statistics Norway is responsible for the publication of statistics on cause of death, population and censuses. From 1964 onwards, annual publications on cause of death have been issued. Earlier cause of death figures can be found in the series Health Statistics (1962-63) and Sundhedstilstanden og medicinalforholdene i Norge/ Rapport sur l'état sanitaire et médical (1854-1961). Annual figures for the population from 1986 can be found in three series: Changes in Municipalities, Population 1 January and Survey. Earlier important series are those on Vital Statistics and Migration Statistics which date back to 1866. For each census there are several publications on population by sex, age, marital status, education, occupation and industry for geographical subdivisions of the country. There are also publications on family/household and housing statistics.

Statistics Norway publishes official statistics on their website (<http://www.ssb.no>).

Tor Haldorsen

4.21: POLAND

Introduction

The Polish nation was formed in Central Europe around the middle of the 10th century. After a long period of economic and political evolution, particularly in the 16th century, internal disorders weakened the country. In a series of agreements in the late 1770s, Russia, Germany and Austria divided Poland among themselves. Poland regained its independence in 1918, but was occupied by Germany and the USSR at the beginning of the Second World War. After the post-war years under the influence of the USSR, Poland regained its independence in 1990 and acceded to the EU in May 2004.

The country and its people

Poland is situated in the northern part of Central Europe between the Baltic Sea in the north and Carpathian mountains in the south. In the west its territory is limited by the river Odra and in the east by the river Bug. The territory is situated between 49°00' and 54°50' N and 14°07' and 24°08' E. The country covers an area of about 314,000 km². Poland's western neighbour is Germany with which it has a border of 470 km; in the south are the Czech Republic (border 558 km) and Slovakia (444 km); to the east are Lithuania (91 km), Belarus (407 km) and Ukraine (526 km); and to the north are the Kaliningrad region of Russia (206 km) and the Baltic Sea with a coastline of 524 km.

Poland is a lowland country, mostly flat and with 75% of its area less than 200 m above sea level; only 3% is above 500 m. The highest point in the Tatras Mountains reaches 2,499 m. Poland has many thousands of lakes with a total area of nearly 3,200 km².

In 1990, agricultural land covered about 60% of the country. The extent of agricultural land is diminishing gradually every year: about 9% has been converted to other purposes since 1946. Forested areas have increased from 21% in 1946 to 28% in 1990.

Poland is rich in resources including coal, sulphur, copper and iron ores, common salt, natural gas and arable land as well as lead, silver and amber. Polish industry is oriented to machine building, iron and steel, coal mining, chemicals, ship building, food processing, glass, beverages and textiles. About 40% of Polish industry is located in south-western Silesia, but Warsaw, the capital of Poland, is also a major industrial centre. Rapid industrialisation in the post-war years resulted also in growing environmental pollution, although this subsequently declined with reductions in heavy industry production and increased environmental concern of both the government and the population after 1989. Nevertheless, Poland is one of the leading emitters in Europe of sulphur dioxide (10% of total sulphur dioxide in Europe), and nitrous oxides (8%). Power engineering, chemical industry and metallurgy are responsible for about 65% of the total emissions. In 1990, 48% of industrial enterprises and 363 towns had no water treatment plants. Only 67% of the total sewage was treated while the remaining 33% was dumped into surface waters (rivers or lakes).

In 1975, the country was divided into 49 administrative provinces (voivodship). Voivodships are divided into communes (gminas) and towns. At the end of 1990 Poland had 830 towns, of which 20 were populated by more than 200,000 inhabitants, and 2,121 other gminas. In 1997, a new administrative division of the country was introduced with the number of provinces reduced to 16. The maps in this atlas are based on the administrative division in use from 1975 to 1996.

Poland has a mild climate characterised by the influences of the continental climate of eastern Europe and the maritime climate of western Europe and the Baltic Sea, so its weather is quite variable. The winters are often cold with frequent precipitation, while summers are mild with frequent showers and thunderstorms. The plains of central Poland have the lowest precipitation.

The total population of Poland in 1990 exceeded 38.2 million, 18.6 million males and 19.6 million females. By 2004 it had risen slightly

to 38.6 million. The density of population was 124 per km² with wide differences among the regions. Poland has an ethnically homogenous population – Poles make up 96.7%, with small ethnic groups of Germans, Belarusians, Ukrainians, Czechs and Lithuanians.

The median age of the population in 2004 was 36.2 years, 34.3 years for males and 38.2 for females. About 17% of the population was less than 15 years old, 70% in the age group 15 to 64 years, and 13% 65 and over. Life expectancy at birth was 68.9 years for males and 77.6 years for females in 1999. Life expectancy for women began to increase in the mid-1980s and is now some 2.5 years higher than in 1974. For men an earlier decline in life expectancy was reversed only in the 1990s. The sex difference in life expectancy in Poland was 8.7 years, more than two years greater than the average for the EU.

At the end of 1996 there were 20.1 million working people, of which 46% were women. About 30% were working in agricultural production (of these, about two thirds in small private farms), nearly 17% in industry and building, 18% in transport, communication, trade, education, or in financial, social or health services. The official unemployment rate in Poland increased from 6.3% in 1990 to 16.4% in 1993, then decreased to 10.5 in 1998, but rose again to 13.1% in 1999. Unemployment in most countries of eastern and central Europe may, however, be higher than the official rates.

Mortality data collection

Poland has had very good mortality statistics, including on cancer mortality, from the late 1950s. These data were regularly used in the first comparisons of cancer mortality in European countries in the post-war period after the end of the Second World War. Mortality statistics

are based on the evaluation of data present in death certificates. All deaths in Poland are confirmed and the immediate and underlying causes of death are selected by physicians. The internationally accepted structure of the death certificate was introduced in Poland, as in the majority of the countries of central and eastern Europe, in the late 1950s, together with use of the latest revisions of the International Classification of Diseases (ICD). The data present in death certificates are completed in the local Registrar's Office and then compiled and regularly published by the Central Statistical Office. Several cancer mortality atlases covering different periods have been published. Introduction of the International Classification of Diseases for Oncology (ICD-O), together with data on cancer incidence derived from the national and regional cancer registries covering relatively long periods of time, enabled the presentation of incidence data from some regions in "Cancer Incidence in Five Continents" as well as the participation in, and use of the data for, several international projects in cancer epidemiology. Relatively high cancer incidence, and consequently cancer mortality rates, are a major influence on the low life expectancy figures, particularly in males.

Population statistics

Censuses were held in Poland in 1978 and 1988. Intercensal estimates were prepared for the years 1984 to 1995 based on census data and taking into account births, deaths, migration and administrative changes. Data on the size and age structure of the population for the whole of Poland and for smaller administrative regions are published annually in the Statistical Journal by the Central Statistical Office.

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4.22: PORTUGAL

Introduction

Located in southwest Europe, Portuguese territory is made up of a continental region, with an area of 89,000 km² and the archipelagos of the Azores (nine islands) and Madeira (two main islands and the small islets Desertas and Selvagens) situated in the Atlantic Ocean with areas of 2,320 and 800 km², respectively. Bounded by the Atlantic Ocean to the west and south, the continental territory has a coastline of 1,411 km, and a land border of 1,320 km with Spain to the north and east.

About 70% of the territory situated below 400 m, and only 12% above 700 m. The River Tagus crosses the Central Region, flowing from east to west into the Atlantic Ocean near Lisbon. North of the Tagus, 95% of the territory has an altitude above 400 m; 62% of the area to the south has an altitude below 200 m. The highest point is in the Azores (Pico Island, 2,351 m); within the continental territory the highest altitude is 1,993 m (Estrela Mountain) in the Central Region.

The climate is temperate and influenced by Atlantic characteristics which are more noticeable to the north of the Tagus River. In the South Region, summers are hot and dry, whilst winters are normally rainy. Over the last 15 years the average annual precipitation value has been about 850 mm, varying between 542 and 1,092 mm. Recorded average annual temperatures have varied between 14.9 and 16.6°C. The highest mean monthly values of 30°C have been registered during the months of July and August, and the lowest mean values around 4°C during the winter months. The highest temperature variations are registered in the interior Central and Northern Regions.

The estimated Portuguese population at the end of 2005 was 10,570,000, with 5,116,000 males and 5,454,000 females. The population density in coastal areas, where the main urban centres are located, is higher than in the interior of the country. The two main cities are Lisbon with 520,000 inhabitants and Oporto with 233,000. However,

their wider metropolitan areas contain 2.8 and 1.3 million inhabitants, respectively, almost 40% of the Portuguese population. According to the 2001 census, there were six cities with a population above 100,000 inhabitants, totalling around 1,326,000 people. There were 120 urban centres with a population of between 10,000 and 100,000 inhabitants with a total of 2,580,000 individuals; and 114 urban centres with a population between 5,000 and 10,000 inhabitants, in which 800,000 people lived. The remaining population lived in places with less than 5,000 inhabitants.

The average population density is 115 inhabitants per km². The highest values are in some districts of the metropolitan areas of Lisbon, Oporto and Braga (above 750 inhabitants per km²); in most of the districts of the interior, the density is less than 60 inhabitants per km².

During the 20th century, in spite of several demographic upheavals the Portuguese population almost doubled, although with low growth rates: the 1900 census registered 5,447,000 inhabitants, while the 2001 Census registered 10,356,000.

The official language of the country is Portuguese. Most of the Portuguese (around 84% of the total population, according to the 2001 Census) consider themselves Catholic, with a minority that follow other Christian religions and other creeds.

According to the Constitution, the Portuguese Republic is based on the principles of sovereignty, freedom of speech and democracy. Administratively, the country is divided into 18 districts within the continental territory and two Autonomous Regions (Azores and Madeira). Districts are divided into municipalities, and these into parishes. In total, the country is made up of 308 municipalities and 4,257 parishes.

Mortality data collection

General registration of deaths in Portugal began in 1910 with the establishment of the Republic.

The responsibility for the administration of the registration system, the compilation of death records and the issuing of certificates is vested in the Registrar General, who reports to the Minister for Justice.

The registration service is based on local registrars in 308 municipalities throughout the country. They are also responsible for all the registrations in surrounding areas, generally counties and county boroughs. Deaths are registered initially in the local offices where the death occurred. The local officials make a hand-written copy of the Registrar's form, which is subsequently forwarded to the National Statistics Institute.

Deaths must be registered within two days of occurrence. A relative of the deceased or a person present at the death delivers the medical certificate, signed by the attending doctor and indicating the cause of death, to the Registrar's Office. The person registering the death also completes a special statistical form, which is sent to the National Statistics Institute for coding and analysis. The National Statistics Institute then sends those forms to the Directorate-General of Health for coding and analysis. Since 2002, any queries arising due to unclear indication of cause of death on the certificate have been referred back to the certifying doctor for clarification.

In cases of sudden death, a post-mortem may be required and the death may be registered on the basis of a certificate completed by a doctor after the post-mortem inquest. About 7% of deaths in

Portugal are registered following post-mortem inquests. About 50% of deaths in Portugal take place in hospitals. Since 2002, cause of death has been coded in accordance with the 10th revision of the International Classification of Diseases.

Statistical publications

Summaries of mortality data are compiled by the National Statistics Institute every month. A detailed report for each year is also prepared and published approximately two years after the year concerned.

The Directorate-General of Health also publishes its own publications on these subjects, based on the same data, but with the distribution of deaths by district.

Health in Portugal 2007. Lisboa, Direcção-Geral da Saúde, 2007 (<http://www.dgs.pt>)

Anuário Estatístico de Portugal 2005. Lisboa, Instituto Nacional de Estatística, 2006 (<http://www.ine.pt>)

Censos 2001: Resultados definitivos; XIV Recenseamento Geral da População; IV Recenseamento Geral da Habitação. Lisboa, Instituto Nacional de Estatística, 2001 (<http://www.ine.pt>)

J Catarino

4.23: SLOVAKIA

Introduction

Until the end of the First World War, Slovakia was part of the Austro-Hungarian Empire. In 1918 Slovakia joined the closely related Czechs to form Czechoslovakia. In 1968 the political structure was changed and the state was transformed into a federation with the name Czech and Slovak Federative Republic. Following the collapse of the socialist system in 1989 the country regained independence through its peaceful “Velvet Revolution”. In January 1993 the Czechs and Slovaks agreed to separate the country into the Czech Republic covering the territory of Bohemia and Moravia, and the Slovak Republic covering the territory of Slovakia. Slovakia joined the EU in May 2004.

The country and its people

The Slovak Republic (conventional short form Slovakia) is situated in central Europe in the Pannonian Basin. The territory of Slovakia has a broadly rectangular shape with gradual narrowing from the west to the east. The area of Slovakia is about 49,000 km²; it lies between 47°43' and 49°36' N and between 16°54' and 22°34' E. The whole country is relatively small: the distances between the northern and southern borders vary from 76 to 195 km and the distance between extreme east and west is only 428 km. The neighbouring countries are: in the north Poland (with a border of 597 km), in the east the former USSR now Ukraine (98 km) and in the south Hungary (679 km) and Austria (76 km). The new western neighbour is now the Czech Republic with a border of 265 km.

About 40% of Slovakia is lowlands up to 300 m above sea level, 45% is between 300 and 800 m, 14% is between 800 and 1500 m, and only 1% is mountains above 1500 m; the highest point is 2,695 m above sea level. The fertile lowlands are situated in the south-western part of Slovakia in the northern extension of the great Western Pannonian Basin. This lowland is divided by the Carpathian Mountains into two parts, the smaller

part lying in the extreme south-west of the country along the basin of the river Moravia and the larger in the northern part of the Danube basin. The lowlands situated in southeastern Slovakia are the northern extension of the Eastern Pannonian Basin. The central part of this lowland (100 to 120 m above sea level) is surrounded by hilly land (110 to 160 m). Arable land makes up about 30% of the country. The climate is continental with hot summers and cold and frosty winters, particularly in the mountainous regions.

Until 1996, the territory of Slovakia was divided into four counties, one of which was the capital Bratislava, and 38 districts. In 1996, new administrative boundaries were introduced, dividing the country into eight counties and 78 districts.

Natural resources are brown coal and lignite, small amounts of iron, copper and manganese ores, salt and arable land. Industry is oriented to the production of metal and its products, electricity, gas, coke, oil, nuclear fuel, chemicals and manmade fibres, machinery, paper, ceramics, transport vehicles, textiles, electrical and optical apparatus, rubber products, food and beverages. In some areas there is air pollution from metallurgical plants and the resulting acid rain damages forests. One small region in northwestern Slovakia is also polluted with arsenic from power plants which used coal with a high content of this element.

The total population of Slovakia in 1995 (estimate based on the census of 1991) was 5,359,000 – 2,610,000 males and 2,749,000 females.

During the period after the Second World War the population increased by more than 1.8 million – the population in 1945 had been only 3,459,000. The largest growth in the population (about 10%) occurred in 1970-1980; in the following decade, the increase slowed down 5.6% and was lower still in the 1990s. The density of the population increased from 70.5 per km² in 1945 to 107.5 per km² in 1991 and to 109.3 per km² in 1995. Overall median age is 35.1 years, 33.5 years for males and 38.9 for females.

The age structure is similar to that in other countries of central and eastern Europe: 17.5% are children aged under 15, 70.8% are in the age group 15-64 years, and 11.7% are 65 and over (2004 estimate). The proportion of females is nearly double that in males in the highest age groups – this is related to the difference in life expectancy at birth – 70.2 years in males and 78.4 years in females (2004 estimate).

The total labour force included about 3 million people in 1993. In 1994, 29% were employed in industry, 9% in agriculture, 8% in construction, 8% in transport and communication, and 46% in various services. The unemployment rate reached about 15% in 2003, but was very low in the western part of the country and high, about 20%, in some regions of northern and eastern Slovakia.

Mortality data collection

Mortality rates in Slovakia, as well as in the whole of the former Czechoslovakia, are available from the beginning of the 20th century owing to the highly efficient mortality statistics system in the former Austro-Hungarian Empire. Mortality rates from most important diseases, including cancer, in the former Czechoslovakia were published in 1926 with data beginning in 1890 for the Czech Republic and in 1900 for Slovakia. The importance of the availability of good mortality data was accepted in Czechoslovakia from its establishment. In the former Czechoslovakia (including Slovakia) ICD-6 was introduced in 1948, and during the period 1948 to 1974 the shortened form of ICD-6 was used. From January 1st 1975 use of the complete list of diseases of ICD-6 (and subsequent revisions) has been obligatory in all fields of health statistics. At the same time, death certificates of internationally accepted structure were introduced. The mortality data from Czechoslovakia were considered to be highly complete and reliable and were used in several international comparisons published by WHO and the UICC, mainly in the

period after the end of the Second World War. All deaths in the post-war period were confirmed and the underlying and immediate cause of death was selected by doctors. In 1994, ICD-10 was introduced. Death certificates are used also in the National Cancer Registry of Slovakia (established in 1976) where the International Classification of Diseases for Oncology 2nd Edition (ICD-O-2) is also used.

Up to 1999, the collection of mortality data began with the “Letter of dead person examination” which is prepared immediately after death by a physician, while the completed death certificate was prepared in the local Registrar’s office. There was the possibility of changing the cause of death within one month from death (e.g. after autopsy) using a special form for such correction. The death certificates are coded, and the mortality statistics are compiled and published annually, by the Statistical Office of the Slovak Republic. In 1999, the two documents were combined in one form “Letter of dead person examination and statistical notification of death”, which is used as the only source of mortality statistics by the Statistical Office of the Slovak Republic. The protection of personal data is based on legislation and is strictly respected.

Population statistics

Information on the size and age structure of the population for the whole country and for counties and districts, together with other information and demographic data characterising the Slovak population, are compiled and published regularly by the Statistical Office of the Slovak Republic. The annual mid- and end-year estimates of the size and age structure of the population are based on the 1991 census taking into account the births, deaths and migration of the population.

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4.24: SLOVENIA

Introduction

Slovenia was part of the Holy Roman Empire in the distant past and of the Austro-Hungarian Monarchy until 1918 when the Slovenians joined the Serbs and Croats in forming a new state which was renamed the Kingdom of Yugoslavia in 1929. After the Second World War, Slovenia became the Socialist Federal Republic of Yugoslavia. Despite the socialist system, Yugoslavia was able to remain independent from the USSR. Slovenia established its independence in 1991, and renewed its ties with western European countries. In May 2004 Slovenia joined the EU.

The country and its people

Slovenia is situated in the southern part of central Europe, in the eastern Alps, bordering the Adriatic Sea in the west. The country lies between 45°15' and 48°30' N and between 13°10' and 16°05' E. The land boundaries are 1,370 km long; the bordering countries are Austria (with a 318 km long border) and Hungary (102 km) in the north, Croatia (670 km) in the south and Italy (280 km) in the west. The coastline is very short, only 47 km long. Slovenia covers an area of 20,273 km², including 63.3 % of wooded areas, 30.5 % agricultural areas, 1.6 % bar soils, 0.7 % water, 2.8 % built-up areas, and 1 % roads. With the exception of the short coastal strip on the Adriatic Sea, the prevailing terrain of the country is mountainous, lying in the alpine mountain region adjacent to Italy and Austria, with high mountains, deep valleys and numerous rivers. The highest point is Triglav (2,864 m). Arable land represents only 12% of the area, and the majority of the country's surface consists of forests and mountains. Natural resources are lignite coal, lead, zinc, mercury, uranium, silver, hydropower and forests. The industry of the country is oriented to ferrous metallurgy, aluminium products, lead and zinc smelting, electronics, trucks, electric power equipment, wood products, textiles, chemicals and machine tools. Agricultural products are potatoes, hops, wheat, sugar beets, corn, grapes, cattle, sheep and poultry.

Air pollution from metallurgical and chemical plants and the resulting acid rain causes damage to forests in some regions. The river Sava is polluted with domestic and industrial waste, and some parts of the coastal waters are polluted with heavy metals and toxic chemicals. The country has a mild, maritime climate on the coast and a hard, continental climate with mild to very hot summers and cold, frosty winters in the eastern mountainous regions. The whole country is divided into 210 administrative districts (municipalities) including 11 urban municipalities.

The mid-year total population in 1995 was 1,987,505, of which 965,650 were males and 1,021,855 females. The density of population was 98 per km². About 50% of the country's population lives in urban areas, but only 19% in cities with more than 100,000 inhabitants. According to the census in 1991 the bulk of the population (88%) was formed of Slovenians, 2.8% were Croats, 2.5% were Serbs, and there were small numbers of Hungarians, Montenegrins, Macedonians, Albanians and Italians.

According to the census in 2002 there were 83% Slovenians, 1.8 % Croats, 2% Serbs, 1.1% Bosnians, and small numbers of Muslims, Hungarians, Montenegrins, Macedonians, Albanians and Italians. In 1995 the median age of the total population was 36.1 years, 34.6 for males and 37.6 for females; the age structure of the population was: 17.9% were younger than 15 years, 69.6% in age group 15 to 64 years and 12.5% aged 65 years and over. In 2004 the median age of the population was 39.9 years, 38.4 for males and 41.4 for females; 14.3% were younger than 15 years, 70.6% in age group 15 to 64 years and 15.1% aged 65 years and over. The great majority of the population in the highest age groups were females. The life expectancy of Slovenians at birth in 1999 was the highest of the countries of central Europe and the Baltic states – 71.8 years for males and 79.5 years for females. The sex difference in life expectancy was 7.7 years (the smallest in the above mentioned countries).

The total labour force in 1995 was 952,000 of which 882,000 persons were in employment: 10% were working in agriculture, 43% in industry, and 46% in services. The service sector appears to be increasing as a proportion of the economic activity. The official unemployment rate in Slovenia rose from 1.5% in 1987 to 11.5% in 1992, but it fell to 7.4% in 1999, still among the lowest rates in the countries of central Eastern Europe and Baltic states.

Mortality data collection

Mortality statistics in Slovenia are based on the information present on death certificates. Medical death certificates are filled in by hospital physicians, GPs or specialists in forensic medicine. Civil death certificates are written in the Community registrar office. Medical and Civil death certificates are sent to Central Population Register of the Republic of Slovenia (RS), and forwarded to the Public Health Institute of the RS for coding of the underlying causes of death. Underlying causes of death (4-digits code) are coded according the rules described in the ICD. Data in this atlas were coded according to ICD-9 (1993-1996) and ICD-10 (1997). Obvious mistakes and incomplete information are traced

back in hospitals, health centres, and also at the Cancer Registry of Slovenia founded in 1950 and producing traditionally highly reliable data on incidence. At the Public Health Institute of the RS a central mortality data-base has been created. Data since 1985 incl. are stored and analysed regularly. Data protection regulations are strictly respected during the coding and computation of mortality data as well as in the cancer registry.

Population statistics

Demographic data on the size and age structure on the population as well as on the other demographic information on the whole of Slovenia and on individual administrative regions are prepared and published regularly by the Statistical Office of the Republic of Slovenia in close collaboration with the Central Population Register of the Republic of Slovenia. The Central Population Register has been the source for the number of population and the number of the citizens of Slovenia since 1985. All inhabitants of Slovenia have a unique identification number.

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4.25: SPAIN

Introduction

Spain has a land surface area of 506,000 km² (just under 195,000 sq. miles), including mainland Spain, the Balearic Isles, the Canary Islands and the twin city enclaves of Ceuta and Melilla on the north African coast. Spain occupies 85% of the Iberian peninsula, with a shoreline extending 2,073 km along the Mediterranean, 1,682 km along the Atlantic and 1,075 km along the Bay of Biscay (Cantabria). The Spanish mainland has a perimeter 6,843 km long, made up of 4,830 km of coast and 2,013 km of land borders (France, Andorra, Portugal and Gibraltar). Five major mountain ranges traverse the country and almost 50% of its territory lies on high plateaux (*mesetas*).

Spain is divided administratively into 17 Autonomous Regions (*Comunidades Autónomas*): Andalusia, Aragon, Balearic Isles, Basque Country, Canary Islands, Castile-Leon, Castile-La Mancha, Catalonia, Galicia, the Principality of Asturias, Cantabria, La Rioja, Madrid, Murcia, Navarre, Valencian Region, Extremadura) that have their own organs of government and representative institutions. In addition, there are the two autonomous cities of Ceuta and Melilla.

Spain has a population of 40,500,000 (January 2000). At 80 inhabitants per km², Spain's population density is one of the lowest in Europe. The country's capital is Madrid. It is the largest city in Spain in terms of population, with 2,883,000 inhabitants in the metropolitan area and 5,205,000 in the Madrid Autonomous Region as a whole. Spanish is the official State language, along with *gallego*, *catalán* and *euskera* in their respective autonomous regions (Galicia, Catalonia and the Basque Country, respectively).

In 2000, the proportion of foreign residents in Spain was 2.3% (924,000 people). Of these, over 40% came from European countries, 20% from Latin America and 22% from African countries, principally Morocco. In 2001 the number of foreign residents was 1,370,000 people.

Spain has vast expanses of fertile areas, 54% of which are devoted to farming. Leading crops include citrus fruit, grapes and olives, the latter two being used for the production of wine and olive oil. The Spanish fishing fleet is one of the biggest in the world. The most important industries are the food and agriculture, automotive, chemicals, shipbuilding, steel, textiles, and footwear sectors. There is an economically active population of 16,844,000, with 14% being unemployed (2000).

Mortality data collection

In Spain, as in many other countries, death certificates are the only homogeneous and complete source of information that can be used for epidemiological studies of the whole country. The document used in Spain for certification of death is based on the WHO-recommended format introduced in 1951 (International Classification of Diseases (ICD) 6th Revision). Cause of death was coded in accordance with the International Classification of Diseases, the 7th, 8th, 9th and 10th revisions of which were introduced in 1961, 1968, 1980 and 1999, respectively. Certification of death is made in two documents, the death certificate and the death statistics report card (*Boletín Estadístico de Defunción – BED*). Both documents are compulsory. They must be completed by the medical practitioner who certifies the death and sent to the Civil Registry, which in turn forwards the BEDs to the statistics offices on a monthly basis.

When a violent death occurs, an Instruction Judge fills out a brief additional questionnaire about the external circumstances (accident, suicide, etc) that probably produced the injuries that caused death. This information is supplemented by the forensic information registered in the autopsy provisional report. This questionnaire is sent to the Civil Registries in order to be attached to the BED.

The information shown on the BED is: name and surname, ID number, date and place of birth, civil status, profession, nationality, municipality and province of residence, home address, date

and causes of death (immediate, intermediate and underlying history, other processes).

All regional authorities collaborate with the National Statistics Institute (*Instituto Nacional de Estadística* – INE) in producing population vital statistics and deaths by cause of death. When the data have been screened to detect errors and ensure quality control, the underlying cause of death is coded at the Regional Mortality Registries by trained teams applying common criteria in accordance with ICD-based international guidelines; national coding protocols were established to guarantee homogeneity of data (INE 1996). The decentralisation of the responsibility for the processing and management of deaths data has not only served to streamline the system, but has also enhanced overall quality. The Regional Authorities have implemented specific methods to validate the data in a systematic way (telephone interviews with doctors signing any certificate with ill defined or improbable causes of death; visits to Civil Registries or Courts to examine conflicting data) (García-Benavides 1991, Carballeira 1989, Regidor 1993, Saenz 1993, Cáffaro 1995), and have established courses for doctors to improve certification (Cirera 1998).

The files are sent to the central INE office, which releases them once they have been rendered 'anonymous', i.e. the death data are stripped of all information which might enable individuals to be identified (day of birth, day of death, months and days at death for older than 1 year, days at death for deaths between 1 month and 1 year old, municipality of residence in cases where there are fewer than 10,000 inhabitants). Access to the full uncensored register is, however, allowed for specific approved research purposes.

Quality of death statistics

The accuracy of cause of death reported in mortality statistics is very high in Spain and similar to that for other European countries, making this information suitable for geographical studies such as disease atlases (although there might be some inter-regional variability). Globally, the proportion of unspecified or ill-defined causes of death (ICD-9 780-799) fell from 4.6% of all deaths in 1975 to 2.0% in 1996; however, in 1996 the percentage

varied across the Autonomous Communities from 1.0% to 4.3% for men and from 1.5% to 5.0% for women, with Navarre having the lowest values and Melilla the highest rates.

Neoplasms are among the best certified cause of death (García-Benavides 1989, Regidor 1993, Giménez 1998, Carballeira 1989). Overall, it has been estimated that medical death certificates in Spain might underestimate cancer deaths by 5%, with inaccuracies more frequently found in people of advanced age, women and home deaths (Cáffaro 1995, Cirera 2002). The proportion of ill-defined tumours (ICD-9 195-199) in 1996 was 7.4%, ranging from 4.4% in Navarre to 10.3% in Catalonia and 15% in Melilla (which has less than 0.2% of the Spanish population).

For all tumours as a whole, detection and confirmation rates have been found to be around 90 and 95 percent respectively. On mortality from specific cancers, concordance with clinical information has also improved over time.

In a study published by a Spanish Regional Authority, the proportion of agreement at the third digit of the ICD was close to 80% in 1992, and aggregation of data into 31 categories increased it to 83% (Cirera 2002); similar figures have been published for other parts of the country (Bosch 1981, García-Benavides 1989, Cáffaro 1995, Martínez 2000). Table 1 summarises available information about concordance by site in Spain. The highest concordance indices have been found for lung, breast, brain and haematological cancers, but some sites have low rates of agreement. Validation studies have shown some over reporting of larynx cancer due to misclassification of head and neck tumours, as well as underestimation of urinary bladder cancer, erroneously certified as prostate neoplasm (Cáffaro 1995, Cirera 2002, Martínez 2000). Also, unspecified uterus tumours are still over represented, including tumours of cervix, endometrium and ovary, while some declared cases of death due to ovarian cancer were really abdominal or uterus neoplasms (Cáffaro 1995, Sánchez Garrido 1996, Cirera 2002, Martínez 2000). However, "all uterus" as a category achieves good standards of certification. There is also some over reporting for oesophagus, which is due to inclusion of stomach cases and for

Table 1. Pooled analysis of published studies on accuracy of death certification for specific cancers in Spain according to Percy's criteria (Percy 1981).

Location	Well-certified (DR>80 and CR>80)			Over-certified (DR>80 and CR<80)			Under-certified (DR<80 and CR>80)			Ill-certified (DR<80 and CR<80)					
	ICD-9	DR	CR	Location	ICD-9	DR	CR	Location	ICD-9	DR	CR	Location	ICD-9	DR	CR
Stomach	151	83	89	Oesophagus	150	87	78	Mouth & pharynx	140-149	59	85	Colon	153	72	70
Colon-rectum	153-154	83	90	Liver	155	85	45	Rectum	154	54	82	Gallbladder	156	58	79
Pancreas	157	84	80	Larynx	161	83	67	Skin	172-173	54	87	Corpus uteri	182	42	76
Lung	162	92	91					Melanoma	172	78	91	Ill-defined tumours	195-199	53	39
Breast- ♀	174	90	98					Skin (non- melanoma)	173	42	80	L. Hodgkin	201	69	69
Uterus	179,180,182	82	83					Cervix uteri	180	51	91				
Prostate	185	89	82					Ovary	183	74	81				
Brain	191	96	85					Other genital-♂	186-187	69	82				
Lymphomas	200-202	86	80					Testicular	186	78	88				
Multiple Myeloma	203	96	94					Bladder	188	76	91				
Leukaemia	204-208	93	93					Kidney	189	76	83				
								Endocrine Glands	193-194	79	83				
								Thyroid gland	193	76	89				
								Lymphomas, Others	200,202	76	83				

Source: Pérez-Gómez B, Aragonés N, Pollán M, Suárez B, Lope V, Llácer A, López-Abente G. Accuracy of cancer death certificates in Spain: a summary of available information. *Gac Sanit.* 2006 Dec;20 Suppl 3:42-51.

liver due to misclassification of hepatic metastasis. Finally, the occurrence of childhood tumours is not well described in mortality data, due to the high survival rates than are found in Spain as in most other European countries (Gatta 2002).

Population statistics

Information on the composition of the population is drawn up on the basis of censuses. In Spain, Population & Dwelling Censuses must be conducted every ten years by law. The principal goal is: to ascertain the number of inhabitants, dwellings and buildings countrywide, both at a State level and in the various geographical and administrative areas; and to obtain a description of the structure of the country from different points of view to enable demographic, social and health, educational and environmental policies to be drawn up and assessed.

The task of conducting Population & Dwelling Censuses falls to the INE. In the last census, conducted in 2001, over 40,000 persons took part and for a period of some three months travelled to 21 million postal addresses, to gather

information on buildings, occupied dwellings and the persons inhabiting same. A total of 13 million households were visited in this way and information was collected from approximately 40 million persons.

The taking of Spanish population censuses dates back to 1768. Since 1900, population censuses have been conducted every 10 years (1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1981, 1991, 2001). The quality of such census data is high.

Another source of demographic data is provided by the Municipal Rolls (*Padrón Municipal de Habitantes*), which currently take the form of an administrative register that is constantly being updated and lists all the inhabitants in the village, town or city in question.

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4.26: SWEDEN

Introduction

Sweden, which occupies the eastern part of the Scandinavian Peninsula, is the fourth-largest country in Europe with an area of over 410,000 km² – slightly larger than California. The country slopes eastward and southward from the Kjölen Mountains along the Norwegian border, where the peak elevation is Kebnekaise (2,123 m) in Lapland. In the north are mountains and many lakes. To the south and east are central lowlands and fertile areas of forest, valley, and plain where most of the population lives. About 65% of Sweden's land area is forested, and less than 10% is arable. Along Sweden's rocky coast, indented by bays and inlets, are many islands, the largest of which are Gotland and Öland. The country is divided into 24 provinces (*län*).

Sweden played a leading role in the second phase of the Thirty Years' War (1618–1648). By the Treaty of Westphalia (1648), Sweden obtained western Pomerania and some neighbouring territory on the Baltic. In 1700, a coalition of Russia, Poland, and Denmark united against Sweden and by the Peace of Nystad (1721) forced it to relinquish Livonia, Ingria, Estonia, and parts of Finland. The union between Sweden and Norway was an uneasy relationship, and it was finally dissolved in 1905. Sweden maintained a position of neutrality in both world wars.

In a 1994 referendum, voters approved joining the European Union. Although supportive of a European monetary union, Sweden decided not to adopt the euro when it was introduced in 1999 and rejected it again overwhelmingly in a referendum in September 2003.

Stockholm is the capital of Sweden and is one of Europe's leading economic regions with its high concentration of information technology, health care industry and research. Sweden is a monarchy and there are ten royal castles in the country. *Stockholm Palace* is the official residence of His Majesty King Carl XVI Gustaf. The Palace is situated in the Old

Town, Stockholm's original city nucleus, and is built on the remains of its predecessor, Tre Kronor, which was destroyed by fire in 1697.

The population (July 2006 estimate) was 9,017,000 and the age structure was: 0-14 years 16.7% (male 775,400/female 732,800); 15-64 years 65.7% (male 3,002,000/female 2,918,000); and 65 years and over 17.6% (male 689,800/female 898,500). The great majority of the nation's population speaks Swedish. There is a sizable Finnish-speaking minority and a small Lapp-speaking minority. About 12% of the population is foreign born.

Mortality data collection

Swedish statistics on cause of death go back to 1749 when a nationwide reporting system was introduced. The responsibility was vested with the clergy until July 1860 when doctors were entrusted with the task of making out death certificates, especially in cities with medical officers of their own.

The most exhaustive way to establish the cause of death is autopsy. In Sweden, there are two different types, clinical and forensic. The clinical type is performed on the initiative of a doctor, the forensic type by the order of the police authorities. There has been a decrease in the number autopsies performed; this might lead to inaccurate statistics. Reasons for the decrease are new regulations that give relatives the right to refuse autopsies, amended rules for financial compensation for clinical autopsies and amended instructions for forensic autopsies.

American software (ACME – Automated Coding of Medical Entities) was incorporated fully into the Swedish coding system after the transition to ICD-10. Before that, Sweden used a version of ACME that was adapted to the Swedish system of coding.

Statistics on cause of death cover Swedish residents, whether the person in question was a

Swedish citizen or not and irrespective of whether the deaths occurred in Sweden or not. The quality of the statistics varies, due to the examinations made to define the underlying cause of death or the changes in the classification system or the processing methods.

The main variables included in the death register are: social security number, home district, sex, date of death, underlying cause of death, nature of the injury, multiple causes of death, marker if autopsied or not and if so what kind, marker if operated on within four weeks before death, marker if injury/poisoning, marker if alcohol related, marker if narcotic related, and code for diabetes.

There were 93,000 deaths in Sweden in 2003, of which 47,600 were females and 45,400 males. To facilitate comparisons of mortality rates over time and between regions, age standardisation is used. In this publication the population in 2000 was used for both women and men as the standard population. The most common cause of death both for women and men was diseases of circulatory organs – almost half the deaths had these as the underlying cause of death (45% in women, 44% in men). The second most common cause of death was cancer (22% and 26%, respectively). Breast cancer was the most common cause of cancer death among women, and prostate cancer among men.

The trends for most causes of death fell in Sweden during the period 1987-2003. The trend was the same for males and females, although the absolute level was higher for males. The trends for diseases of the circulatory organs in those aged 15-74 have decreased continuously during this period, from 121 deaths per 100,000 females

in 1987 to 69 in 2003, and from 337 to 166 for males. The overall cancer mortality trends are also falling. The figures show similar trends for most of the cancer sites, except for lung cancer for women which has increased.

Statistical publications

Statistics on cause of death have annually been published from 1911 to 1993 by Statistics Sweden (SCB). The National Swedish Board of Health and Welfare has been responsible for publication since 1994. Statistics Sweden had until recently been entrusted by the National Swedish Board of Health and Welfare with the compilation of the statistics. However, from 2003 onwards, all work on the cause of death registry and the related yearly publication was transferred to the Centre for Epidemiology at the National Swedish Board of Health and Welfare.

More information on publications and the Swedish cause of death registry is on the website: <http://www.sos.se/epc/english/dorseng.htm>

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4.27: SWITZERLAND

Introduction

Switzerland, which is landlocked, has an area of 41,300 km². In the west and southwest the Jura Mountains and the Lake of Geneva form the border with France (having a length of 572 km). In the north, it is separated from Germany by the River Rhine and Lake Constance (346 km). Its eastern neighbours are Austria (165 km) and Liechtenstein (41 km). In the southeast and south it is divided from Italy by the Alps and Lakes Lugano and Maggiore (734 km).

About 30% of the country is covered by forests and woods; 24% is cultivated land, 13% mountain farming, 7% settlements, 4% rivers and lakes, and 21% is unproductive. Switzerland's natural resources are hydropower potential, timber and salt.

The federal capital is Bern (population: 128,600 in 2000); the largest cities are Zurich (363,300), Geneva (178,000) and Basel (166,600).

Switzerland has a population of 7.2 million and an average population density of 175 inhabitants per km² (2000). The age structure is: 0-14 years 23.2% (male 641,500, female 605,800), 15-64 years 61.5% (male 2,427,000, female 2,420,000); and 65 years and over 15.3% (male 450,900, female 658,300). The proportion of foreign residents is around 20% and the net migration is rate 5.6 migrants/1,000 population (2001). The broad categories of employment are: agriculture and forestry 5%; industry 26%; services 69%. The official languages are German (64%), French (20%) and Italian (7%); Romanch is spoken by 0.5% and other languages by 9%.

Switzerland is divided into 26 cantons: Aargau, Appenzell AR, Appenzell IR, Basel-Land, Basel-Stadt, Bern, Fribourg, Genève, Glarus, Graubünden, Jura, Luzern, Neuchâtel, Nidwalden, Obwalden, St-Gallen, Schaffhausen, Schwyz, Solothurn, Thurgau, Ticino, Uri, Valais, Vaud, Zug and Zürich.

Mortality data collection

In Switzerland information on cause of deaths has been collected since 1876. Until 1969, a Swiss coding system was used. From 1969 to 1994, the 8th revision of the International Classification of Diseases was used, modified by country specific coding rules; from 1995 the 10th revision has been used.

Every case of death is certified by a licensed physician in a two step process. The fact of a death is communicated to the registry office of the local government within three days of its occurrence. The registrar registers the case of death with all the demographic information of the deceased person (date and time of death, sex, nationality, date of birth, marital state, number of dependent children, religion, job title of last performed occupation and job position) into a central database. On a daily basis, a list of cases with demographic information, but without the name of the deceased person, is sent to the Federal Statistical Office (FSO). From the electronic system the local registrar prints out a questionnaire for the collection of the causes of death and sends it to the certifying physician. The questionnaire comprises two pages: page 1 contains the name of the deceased person, place of residence, date of birth and a registration number. On page 2, the name of the physician who ascertained the death, the registration number, and date of birth are repeated. This form is then sent to the physician to complete page 2 of the form with the underlying illness or event having caused death, the direct cause of death and concurrent diseases. The physician will keep page 1 of the form containing the name of the deceased person in his files. He sends page 2 (without the name of the deceased person) to the FSO. There, both pieces of data are joined on the base of the unique registration number.

The information on cause of death is coded at the FSO according to the rules of the International Classification of Diseases and stored in a permanent data base. The FSO produces and publishes some standard reports and provides researchers and the public with specific summary information according to their needs.

Data quality is primarily dependent on the information provided by physicians. In more than 10 percent of cases the FSO asks the certifying physician to provide more information or to explain an incomprehensible expression or abbreviation. In the end, some 2 to 2.5% of cases are registered with unknown cause of death.

Data quality is checked routinely using plausibility checks. There is also internal supervision of the coding process. A major set of external validity studies was published in 1989 when ICD-8 was used. One study compared the reliability of the coding process through re-coding of 662 cases. An error rate of 3.8% of cases was found; an additional 2% of cases were coded differently because of the special coding rules mentioned above. A second study compared 12,478 death cases in 1979 from hospitals where data on the cause of death could be linked to diagnostic data from the Swiss hospital statistic (VESKA). The occurrence of the same code was strongly dependent on the diagnostic category: the best results, with rates over 90%, were obtained for malignant diseases, violent deaths, and perinatal causes.

Population statistics

Information on the size and composition of the resident population of Switzerland is provided by the FSO. The two main sources of data are the census and the yearly population estimates. From 1850 onwards a census was conducted in Switzerland every 10 years, the most recent in the year 2000. Data from the residents' registration offices and from the central Aliens Register are used to estimate monthly and annual population figures. The FSO establishes the size of the permanent resident population in Switzerland by using the census data, the figures on population movements (births, deaths, immigration, emigration) and the central Aliens Register data. The publication "Statistics of the yearly state of the population" (ESPOP) contains information on age, sex, marital state, community of residence, and nationality.

Statistical publications

The main population statistics are published regularly on the internet site of the Internet site of the BFS/OFS.

All paper publications can also be downloaded in pdf files, free of charge, from this site.

Statistisches Jahrbuch der Schweiz (Statistical Yearbook of Switzerland) [published yearly in German and French (in one volume)] Neuchâtel, FSO and Zürich, Verlag NZZ

"Le portrait démographique de la Suisse", published every 2 years in German and French, presents and comments the main population figures for Switzerland. Neuchâtel, FSO

Todesursachenstatistik [Tables, published yearly, in German, French and Italian (in one volume)] Neuchâtel, FSO

Minder Ch.E. Zingg W.: Datenqualität der Todesursachen und der Berufsbezeichnungen / Qualité des données relatives aux causes de Décès et aux professions. Bern, FSO, 1989

Web site: www.statistik.admin.ch

The collaboration of the following members of the Swiss Statistical Office should be acknowledged

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4.28: UNITED KINGDOM

Introduction

The United Kingdom of Great Britain and Northern Ireland (UK), which played a leading role in developing parliamentary democracy and in advancing literature and science, was the dominant industrial and maritime power of the 19th century. At its zenith, the British Empire stretched over a quarter of the earth's surface. The second half of the 20th century saw the dismantling of the empire and the rebuilding of the UK into a modern and prosperous European nation. Although a member of the EU, the UK is outside the European Monetary Union and its official currency is still the pound sterling, not the euro. Regional assemblies with varying responsibilities and degrees of delegated authority were established in Wales, Scotland and Northern Ireland in the late 1990s.

The UK has an area of around 245,000 km². Nowhere is further than 120 km from the sea. In general, a line from Bristol on the west coast to the Wash on the east divides mainland Britain into a hilly north-western zone and the lowlands of the south-east. The 240 km long Pennine Chain runs down from the Cheviot Hills on the Scottish border to the Midlands; north-western England is dominated by the Cumbrian Mountains of the Lake District where the highest point is Scafell Pike (977 m). Wales is dominated by the north-south range of the Cambrian mountains (Snowdon

1085 m). Scotland is also mountainous (Ben Nevis 1342 m), principally to the north of the central Forth-Clyde lowlands. The north-west highlands, deeply indented by sea lochs, are one of the most scenically impressive areas of Europe.

About 75% of the land surface is used for agriculture. There is relatively little heavily wooded country in Britain (10%), but there are large areas of heaths, moors and common land around. Coal and iron were mined for centuries, but over the past thirty years natural gas and offshore oil deposits have been increasingly exploited.

London is the capital of England (mid-1990s population 7 million), Cardiff (300,000) of Wales, Edinburgh (450,000) of Scotland, and Belfast (300,000) of Northern Ireland.

The population of the United Kingdom in 1995 was almost 59 million, with an average density of nearly 240 inhabitants per km². About 83% of the total population lived in England, 5% in Wales, 9% in Scotland, and 3% in Northern Ireland. The age structure of the population, and its broad categories of employment are given in Table 4.28.1 below. At the end of the 1990s, the ethnic origin of about 90% of the population was White, 1% were Mixed, 4% Asian and 2% Black, with the remainder being Chinese, "Other", or "not stated" (3%).

Table 4.28.1: Age structure and employment status of the UK population, 1995

Age group	Population (000)		Employment status	Numbers (000)	
	Males	Females		Males	Females
Under 1	376	358			
1-4	1,589	1,513			
5-9	1,980	1,880			
10-14	1,882	1,785			
15-19	1,781	1,682			
20-29	4,406	4,211			
30-44	6,415	6,294			
45-59	5,201	5,244			
60-64	1,358	1,427			
65-74	2,330	2,797			
75-84	1,147	1,907			
85 & over	263	781			
Total	28,728	29,879			
			Employees in employment	11,083	10,869
			Self-employed persons (with or without employees)	2,540	803
			Work related Government training programmes	148	78
			HM Forces	214	16
			Workforce in employment	13,985	11,766
			Unemployed	1,764	549
			Total workforce	15,749	12,315

The official language is English, but Welsh is spoken in Wales. Gaelic speakers are found in western Scotland, particularly the Hebrides.

England had eight Standard Statistical Regions in the mid-1990s; there were 45 counties, consisting of 331 local authorities, plus 33 London Boroughs and the Isle of Wight which became a Unitary Authority in 1995. Wales had 22 unitary authorities. From 1974 to 1996, Scotland had 9 regions which were split into 53 local government districts and 3 island authorities. There were 26 districts in Northern Ireland.

Mortality data collection

The present system of registration of deaths in the United Kingdom dates from the Births and Deaths Registration Act 1836 for England and Wales, the Registration of Births, Deaths and Marriages (Scotland) Act 1854, and the Registration of Births and Deaths (Ireland) Act 1863. The responsibility for the processing and publication of information on deaths lies with the Office for National Statistics (ONS) for England and Wales, and the General Register Offices (GROs) for Scotland and Northern Ireland.

Most deaths in England and Wales – around 75% in the mid-1990s – were certified by a medical practitioner using the medical certificate of cause of death. The death certificate is then usually taken to a registrar of births and deaths by a person known as an informant, who is usually a near relative of the deceased. The informant is expected to provide information about the deceased, including date and place of birth, occupation and usual address.

In England, Wales and Northern Ireland, certain deaths are referred to, and sometimes then investigated by, a coroner who sends information to the registrar of deaths which is used instead of that from the medical practitioner. ONS encourages the prevailing practice of voluntary referral to the coroner by the certifying doctor who should consider whether the death was an accident, a suicide, or related to the deceased's employment; whether the death occurred during or shortly after detention in police custody; and whether the doctor himself, or another doctor, is legally qualified to certify the death. A registrar is legally obliged to refer a death to the coroner (unless

it has already been so reported) if: (i) the deceased person was not attended during his or her last illness by a medical practitioner; (ii) the registrar has been unable to obtain a certificate of cause of death; (iii) information on the certificate of cause of death indicates that the deceased was not seen either after death or within 14 days before death by the certifying practitioner; (iv) the cause of death appears to be unknown; (v) the registrar has reason to believe that death resulted from an unnatural cause, violence, neglect, abortion or suspicious circumstances; (vi) death appears to have occurred from an operation or before recovery from an anaesthetic; or (vii) from the contents of the certificate, it appears that death was due to industrial disease or poisoning. Depending on the results of preliminary enquiries into whether death was from natural causes, the coroner may issue a notification of the cause of death without holding an inquest, having in some circumstances had an autopsy carried out. In fact, autopsies are performed for the majority of deaths referred to the coroner (about 80% in the mid-1990s). However, not all deaths referred to the coroner are certified by him; in 1995, just over 10% of the deaths initially referred to the coroner were finally certified by a doctor.

In some cases, additional information from the coroner's certificate is forwarded to ONS and the GRO for Northern Ireland by the registrar. Scotland does not have a system of coroners. However, cases such as those listed above are generally investigated by a procurator fiscal who may amend the cause(s) of death. The GRO for Scotland (GROS) records any such amendments. Coroners certify nearly a quarter of all deaths in England and Wales. The coroner does not hold an inquest if the pathologist's post mortem examination establishes a clear natural cause of death. About 40% of deaths from ischaemic heart disease, which may occur suddenly in people without previous symptoms, are certified by coroners in this way, but only about 5% of cancer deaths, where the course of the disease is often long and diagnosis is usually confirmed by biopsy or other tests before death.

Thus the information used in UK mortality statistics may have come from one of four sources: the doctor, the informant, a coroner or procurator fiscal, or derived from one or other of the above (for example, the age of the dead person is derived from date of birth and date of death).

Routine mortality statistics are usually based on a single cause for each death, the “underlying cause of death” as defined by the WHO [WHO 1977]. The medical certificate of death used in England and Wales has been in the format recommended by the WHO since 1927. Part I has three lines and Part II one line. Similar certificates are used in Scotland and Northern Ireland. If the death certificate has been properly completed, the underlying cause should be the condition entered in the lowest line of Part I. Various rules apply for determination of the underlying cause if the death certificate has not been completed correctly, or the conditions entered are not an acceptable sequence. In addition, there are modification rules which apply to particular conditions, combinations or circumstances. These rules are explained in the ICD9 manual Volume 1 [WHO 1977] with examples, but their interpretation and application is not always straightforward. It is clear from many studies [Percy & Muir 1989, Coleman & Aylin 2000] that the rules are not always applied uniformly in different countries, or even by different coders in the same country, or by one coder at different times. Using computer algorithms to apply the WHO selection and modification rules can increase uniformity and consistency – and so improve the spatial and temporal comparability of mortality statistics.

In the early 1990s, the Office of Population Censuses and Surveys (OPCS) – which merged with the Central Statistical Office in 1996 to form the Office for National Statistics – redeveloped its deaths registrations computer processing system. The main changes affecting the data included the progressive computerisation of local offices of registrars of births and deaths, and the automation of cause of death coding.

Since 1993, for a large and increasing proportion – over 90% by 1997 – of deaths in England and Wales the information from death certificates has been collected directly onto a personal computer by the registrar and forwarded to ONS on floppy disks at the end of each week. The remaining cases still sent as paper copies were keyed in at ONS using a clone of the software used by the registrars. This automation of the registration process, coupled with the change to the use of a relational database on the mainframe

computer at ONS enabled the automation of the coding of causes of death in England and Wales from January 1993.

The automatic cause coding system (ACCS) consists of five main software components which take in the text for cause(s) of death from the death certificate and produce ICD9 codes for both underlying and multiple causes. The first module of ACCS (called TRACER) automatically splits the text into separate medical conditions and matches each recognisable word or phrase into an “entity reference number” (ERN) while retaining its position on the certificate. TRACER rejects non-standard text including spelling errors, or phrases which do not match its dictionary entries exactly. Rejected records are passed to clerical coders who can make corrections or select synonymous ERNs. The ERNs from TRACER are submitted automatically to a module (MICAR 200) which maps them to ICD9 codes. The output from MICAR passes directly to the next module (ACME) which applies the ICD9 general, selection and modification rules to select the underlying cause of death from all the conditions mentioned on the certificate. The final module (TRANSAX) sorts out linkages and repeat occurrences of codes to produce a set of multiple cause codes for each death.

The software was developed in the USA by the National Centre for Health Statistics. For technical reasons, the modules MICAR, ACME and TRANSAX were embedded in the ACCS as one automated unit with no intermediate input, output or clerical intervention possible. ICD9 codes for records rejected by MICAR or ACME therefore have to be coded clerically directly onto the deaths database. The database is “dynamic” in the sense that subsequent information, received for example after post mortem, can be used to produce final corrected multiple and underlying cause codes. Amended information is, however, not in the public domain, unlike the original death certificate, and is not stored as electronic text. The automated system does not deal adequately with external causes of death, which are certified after a coroner’s inquest, and ONS has reverted to coding these clerically. Further details of the automated coding system have been published by ONS [Birch 1993; Rooney & Devis 1996; ONS 2001].

A full set of notes and definitions for mortality data has been published by ONS [ONS 2001]. This includes: base populations; occurrences and registrations; areal coverage; death rates and standardisation; certification of cause of death; coding the underlying cause of death; analysis of conditions mentioned on the death certificate; amended cause of death; accelerated registrations; legislation on registration of deaths; and the processing, reporting and analysis of mortality data. A paper describing the various processes by which deaths are certified and registered by doctors and coroners, and the many changes affecting registration and certification in recent years, has also been published by ONS [Devis & Rooney 1999].

A similar suite of automatic cause coding software has been used in Scotland since 1996; as in England and Wales, some manual coding is still required, particularly for external causes. Northern Ireland did not move to automatic coding for deaths until 2001.

UK Population statistics

(i) National population censuses

A national census has been held every 10 years since 1801, with the exception of 1941; there was an additional “mid-term” census in 1966 involving a 10% sample of the population.

The vast majority of the population are counted at the census in their (or someone else’s) home, usually on a Sunday in April, by specially appointed enumerators. There are also arrangements for enumerating people present in institutions. The number of questions asked of respondents reached a peak of 30 in 1971, and was reduced to 21 in 1981. A major improvement in the 1966 census was the substitution of date of birth for the previous census question on age; this improved the accuracy of much of the age data. From the point of providing a denominator for calculating rates, the main demographic items are sex, age and marital status. More extended epidemiological analyses can be performed using the other material.

The initial coverage of the census is checked by attempting to repeat the enumeration for a sample of households, shortly after census day, using a skilled team of field staff. In 1981, it was

estimated that 0.62% of people had been missed, but about 0.17% had been counted twice. This indicates that net under-enumeration was less than 0.5%. Under-enumeration in the 1991 census was thought to be just over 1%, but this varied by age and geographic area.

(ii) Annual population estimates

In years between censuses, annual population estimates are produced, which take account of the occurrence of births and deaths and migration into and out of the country or locality since the last census. These estimates have been prepared for the country and large towns since the 19th century, and for local authority areas since 1911; they have been produced for both levels in Scotland since 1901, and in Northern Ireland since 1926.

Occasional Paper 37 describes the methods used by ONS to produce annual mid-year estimates of the population of local and health authority areas in England and Wales has been published [the paper is available, price £4.00, from the address below; it and other papers on this subject are available on the National Statistics website – see below]. It includes historical background and methods used in the 1980s. Details are given of the components of change (births, deaths and migration), and of methods used to estimate some special groups in the population, such as students and armed forces.

At the time that this atlas was prepared, revised population estimates for the 1990s for small areas (such as NUTS 2 and NUTS 3 levels) based on the 2001 census were not available. The main differences at the national level between the population figures from the 2001 census and the population estimates “rolled forward” from the earlier censuses was in the younger age groups, particularly for men. Cancer is, however, generally a disease of the elderly, and checks have shown that the effects of (lower) population figures from the 2001 census on cancer mortality rates are very small.

Statistical publications

(i) England and Wales

From 1840 to 1974, the Registrar General published an Annual Report containing

statistics for England and Wales. After 1954, The Registrar General's Statistical Review of England and Wales was published in three parts – medical tables, population tables, and a commentary. Detailed tables were provided, giving particulars of deaths and death rates by cause, sex, age, locality, etc.

In 1974 this publication was replaced by an annual series of volumes containing subsets of the mortality statistics. The intention was that individual components of this series would be published with the least delay; individuals could acquire the subset of material that was of particular interest to them. This series, known as series DH, is now produced in four parts:

- DH1 – Mortality statistics: general
- DH2 – Mortality statistics: cause
- DH3 – Mortality statistics: childhood, infant and perinatal
- DH4 – Mortality statistics: injury and poisoning

A further volume, DH5 – Mortality statistics: area, was produced up to 1992, then replaced by sets of tables giving various aggregated mortality data for different geographical areas, on floppy discs or CD-ROM.

The main tables in the DH2 volume present the numbers of deaths by age and sex at ICD three and four digit levels, and rates for selected three digit codes or groups of codes; other analyses appear in the general DH1 volume.

Area and occupational mortality statistics have been published approximately every 10 years since 1851, initially as supplements to the Registrar General's Annual Reports, and later as specific decennial supplements produced by the Registrar General, OPCS or ONS. Those relating to the period of the data included in this atlas are: DS 10 Occupational Health. Frances Drever (Ed). HMSO, 1995

DS 11 The health of our children. Beverly Botting (Ed). HMSO, 1995

DS 12 The Health of Adult Britain 1841-1994, Volume 1. John Charlton & Mike Murphy (Eds). HMSO, 1997

DS 13 The Health of Adult Britain 1841-1994, Volume 2. John Charlton & Mike Murphy (Eds). HMSO, 1997

DS 14 English Life Tables No.15, 1990-1992, England and Wales. TSO, 1997

DS 15 Health Inequalities. Frances Drever & Margaret Whitehead (Eds). TSO, 1997.

DS 16 Geographic Variations in Health. Justine Fitzpatrick & Clare Griffiths (Eds). TSO, 2001.

Until 1974, the Registrar General also published a Weekly Return and a Quarterly Return. In 1974 the Weekly Return was replaced by a monitor, particularly devoted to statistics on infectious diseases, and the Quarterly Return by a quarterly journal, *Population Trends*, which includes articles on specific topics and regular tables, with limited analyses on mortality. Since the beginning of 1999, ONS has also published the journal *Health Statistics Quarterly* which covers mortality and other health topics; the emphasis of *Population Trends* is now on population and demography, but it also includes some mortality data.

The National Statistics website www.statistics.gov.uk provides a comprehensive source of freely available vital statistics and ONS publications on other topics.

Address: Office for National Statistics, 1 Drummond Gate, London, SW1V 2QQ.

(ii) Scotland

The Registrar General for Scotland published an Annual Report every year between 1855 and 2000. The Report for 2001 (published in 2002) adopted a new style and approach to reporting vital events. Many of the tables previously published on a quarterly and annual basis are now available on the GROS website: www.gro-scotland.gov.uk.

Address: General Register Office for Scotland, Ladywell House, Ladywell Road, Edinburgh EH12 7TF.

(iii) Northern Ireland

From 1863 to 1921, Northern Ireland Statistics were included in the Annual Reports of the Registrar General for Ireland. After 1922, the Registrar General published

annual statistics for Northern Ireland, with detailed tables giving particulars of deaths and death rates by cause, sex, age, locality, etc. From 1924 to 1969, the Registrar General published weekly and quarterly returns, but from 1970 only quarterly returns have been published.

Address: General Register Office, Department of Health and Social Security, Oxford House, 49-55 Chichester Street, Belfast BT1 4HL.

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