2. WORLDWIDE PRODUCTION AND USE OF ALCOHOLIC BEVERAGES

2.1 Worldwide production

(a) Kinds of alcoholic beverages

The Standard International Trade Classification (SITC; United Nations, 1961) defines the following classes of alcoholic beverages, which corresponds to the Brussels Tariff Nomenclature (BTN) of the Customs Cooperation Council:

SITC			BTN
112	Alcoholic beverages		
	112.1	Wine of fresh grapes (including grape must)	
		112.1(1) Grape must, in fermentation or with fermentation arrested, otherwise than by the addition of alcohol	22.04
		112.1(2) Wine of fresh grapes; grape must with fermentation arrested by the addition of alcohol	22.05
		112.1(3) Vermouths and other wines of fresh grapes flavoured with aromatic extracts	22.06
	112.2	Cider and fermented beverages (not elsewhere specified)	22.07
	112.3	Beer (including ale, stout, porter)	22.03
	112.4	Distilled alcoholic beverages	22.09

Most of the available data refer to three groups of alcoholic beverages: beer, wine and distilled spirits. These classes are based on raw materials and production methods, not on ethanol content, but the classes are not clear-cut. Fortified wines, for example, are classified as wines, even though spirits are added during their production; while wine blended with distilled beverages to make a cocktail belongs to the category 'distilled spirits', as do aperitifs, unless they are made of wine from fresh grapes. In the tables in this section, other kinds of fermented beverages, such as cider, fruit wines, rice wine, saké, palm wine, cactus wine and pulque, are sometimes included in statistics for other groups; for instance, fruit wines are counted as wines. The quantities of these other beverages are small in a global perspective, although they are important at a national level.

In addition to commercial production, various types of home-produced alcoholic beverages are common in many countries, particularly in developing countries. It is hard to estimate the quantities of such beverages that are consumed, and very little documentation exists on their chemical composition and possible toxicity.

Table 1 summarizes the average ethanol content and content per glass of some alcoholic beverages. It is worth noting that the amount of ethanol consumed in a standard measure of most drinks is approximately the same for beer, wine and spirits. The ethanol content of beverages can be measured either by weight or by volume. In this section of the monograph, ethanol content is given by volume; the conversion factor is 1 ml = 789 mg.

Table 1. Approximate ethanol content of various alcoholic beverages per drink[a]

Beverage	Ethanol content (%)		Average standard glass		Ethanol per drink	
	Vol.	Weight	USA (fl oz (ml))	Europe (ml)	ml	g
Beer	5	4	12 (350)	250	12–17.5	10–14
Wine	12	10	4 (120)	100	12–14.5	10–12
Spirits	40	32	1.5 (45)	35	14–18	11–14.2

[a]Adapted from Hoofdproduktschap voor Akkerbouwprodukten (1984); Anon. (1985a)

(*b*) *Production methods*

The production of beer, wine and spirits can be outlined as follows:

beer is brewed by fermenting malted barley, and occasionally other cereals, to which hops are added;

wine is made by fermenting grape juice (white wine) or crushed grapes (red wine and rosé). In fortified wines, such as sherry and port, distilled spirits are added;

distilled spirits are made from different sources of starch or sugar: cereals, molasses (from sugar beets), grapes, potatoes, cherries, plums or other fruits; when the sugar has fermented, the liquid is distilled.

(i) *Beer* (from Jackson, 1982)

In the basic recipe for brewing beer, barley is turned into malt, the malt is cooked in hot water, hops are added as a flavouring and preserving agent, and yeast is introduced to induce fermentation. Modern industrial processes have, in some cases, replaced traditional brewing practices, resulting in substantial variations in composition.

Without malting, the barley grain cannot be fermented; its starches have to be broken down into their component sugars, maltose and dextrin, and it is principally maltose that is later converted to ethanol and carbon dioxide through fermentation. Controlled germination is induced by steeping the barley in water. Traditionally, the grain is spread on a floor during the malting period, which may last for a week or ten days. Germination is then arrested by drying, or by roasting if a dark beer is to be produced. When other grains such as rice and corn are used, the carbohydrates are made soluble by precooking.

The malt and other grains are mixed with hot water to form a mash, which is heated for up to 6 h. A clarified liquid, known as the wort, is extracted and fed into a brewing kettle, where it is heated to boiling point and boiled for 1-2.5 h. Hops are then added. After brewing, the spent hops are removed, and the wort is cooled before being transferred to the fermentation vessel, where the yeast is added.

Fermentation is basically of two types — bottom fermentation (producing lager-type beers) and top fermentation (producing ales and stouts or dark beers) — distinguished by the location of the yeast in the fermentation vessel. Bottom fermentation takes place at low temperatures. Primary fermentation (one or two weeks) is carried out at approximately 5-10°C; secondary fermentation ('maturing', 'ageing', 'ripening', 'conditioning', 'lagering') takes place at an even lower temperature ($\leqslant$2°C) for four weeks or more. When the beer reaches condition it is usually filtered. Top fermentation takes place at higher temperatures; primary fermentation, at 15-20°C, lasts for about a week, and maturation at the brewery lasts for only a few days. Traditional English ale, one of the most typical top-fermented beers, is not filtered, so that secondary fermentation continues while the beer is in the barrel.

Beer may or may not be pasteurized; pasteurization stabilizes the beer, but also affects the taste. Bottled beer is more likely to be pasteurized to enable longer storage, and is also more likely to contain preservatives. Draught beer is more commonly sold unpasteurized, but this varies in different parts of the world.

The ethanol content of beer is often measured by weight. Beer may vary in ethanol content from 2.25% by volume to over 10%. German beers usually contain about 5% alcohol, as do US beers; English ales usually contain 2.5-5.5% by volume (mild ale, 2.5-3.5%; bitter ale, 3-5.5%). Recent developments in different countries include stronger beers, also called 'malt liquors', containing up to 10% ethanol, and weaker beers, so-called 'low-alcohol' beers. In western Australia, for instance, a beer with only 0.9% ethanol has taken 15% of the beer market (Smith, 1987). In many countries, taxation and sales regulations are related to ethanol content — stronger beers are more heavily taxed and sold only in special outlets.

(ii) *Wine* (from Johnson, 1985)

Wine is made basically by fermentation of grapes, during which their sugar content, or part of it, is converted into ethanol and carbon dioxide by yeast. Traditionally, the natural yeasts on the grape skins are used, but in modern industrial wine-making yeast may be added.

White wine is made by fermenting only the grape juice obtained by pressing grapes. To make red wine, the grapes are crushed, and fermentation takes place before the juice is

separated from the residue. Rosé wine is made by fermentation beginning when the grapes are crushed; however, the juice is run into a separate vat after a short time. Red wine gets its colour from the skin of the grapes, and its chemical composition is altered due to the presence of tannins in the skin. The sweetness of the wine depends on the sweetness of the grapes and on the length of fermentation; in the production of sweet wines, fermentation must be stopped before all of the sugar is converted into ethanol. Fermentation can be stopped by adding sulphites or by filtering off the yeast; it can also be stopped by adding alcohol (generally brandy) to raise the level up to or exceeding 15%, as for fortified wines, such as sherry and port (Lord, 1979).

Fermentation usually takes about two weeks at 24°C for red wine and four to six weeks at 15.5°C for white wines. This is followed by a second fermentation, the malolactic fermentation, during which bacteria work on the malic acid to convert it to lactic acid, which is less sharp to the taste. The second fermentation may take place in barrels, during which the wine extracts different substances from the wood. In the case of sparkling wines, the second fermentation takes place in bottles and may continue for several months; the carbon dioxide content determines the extent to which the wine will be sparkling. Maturation continues during storage, which may last for several years. Red wines of high quality are often stored for a long time; white wines are generally consumed within a few years, with the exception of wines such as sweet French Sauternes and Italian Tokay wines.

The ethanol content of wine usually varies from 8 to 15% by volume. Recently, light wines with an ethanol content of 4.5% were introduced onto markets such as the USA, primarily as 'low-calorie' wines. In so-called nonalcoholic wines, the ethanol content has been reduced to 0.5% (Hiaring, 1986).

Although grapes are by far the most common raw material for wine, it can also be made from other fruits and from berries, particularly in countries where grapes are not grown. Cider, which is fermented from apples or pears, is a common alcoholic beverage in many countries, although its consumption has declined in industrialized areas.

(iii) *Spirits* (from Lord, 1979)

Spirits are made by distilling a liquid, or wash, that contains ethanol produced by fermentation of a base ingredient that contains sugar or starch. The purpose of distillation is to increase the ethanol content and to eliminate fractions of the base liquid that are not wanted in the final product. The process of distilling involves heating the liquid so that ethanol and other volatile substances evaporate, passing the vapours through a cooling system, and collecting the liquid which then contains less water and other unwanted substances. The liquid may be redistilled, or rectified, several times to increase its purity: this process leads ultimately to a colourless neutral spirit, which can then be flavoured. In many cases, some of the original flavouring components of the base liquid are retained. The traditional distilling process is carried out in a 'pot-still', and is still used in the production of cognac, malt whisky, most Irish whiskeys and some of the flavouring used in liqueurs. For many other spirits, distillation is performed in a 'continuous still', consisting of two or three columns; the heat of the product at the end of the process is used to warm the cold liquid that enters the system. The pot-still allows greater retention of the original flavouring elements in

the base liquid, while continuous distillation is more efficient. After distillation, water is often added to achieve the desired strength of the beverage.

Spirits are made from many raw materials; these may contain sugar, such as sugar cane, molasses, grapes and other fruits, or starch which is converted into sugar by malting, such as grains and potatoes. Wood is also used as a raw material. Brandies are made from a fruit mash or from wine; cognac and other varieties are made from grapes, but numerous other types are made from other fruits, such as apples, pears, pineapples, plums and strawberries. Malted grains are the base of all types of whisky. Scotch malt whisky is made almost entirely from barley, but in other whiskies grains such as maize, oats, rye and wheat are used. Gins and vodkas are produced from grain or potatoes; both are distilled to a fairly high ethanol content, sometimes filtered through charcoal to attain purity, and then, in the case of gin, flavoured. Sugar cane and molasses are used to produce rum; and the Mexican spirit, tequila, is distilled from a mash made from cactus.

Flavouring is an important part of spirits. The large variety of substances used in flavouring can be grouped into three main categories: herbs and spices, seeds and plants, and fruits. The flavours can be obtained from the raw ingredients by pressure, by extraction or by distillation from an alcoholic solution. One or more ingredients may be soaked in alcohol, which is sometimes warmed to hasten the process. Another method is to mix the ingredient with alcohol and then distil the mixture; the condensed vapour then contains a high proportion of both ethanol and the flavouring components of the added ingredient, provided these components are volatile. Many flavouring ingredients may be used in a single beverage. The recipes are often closely guarded secrets, but it is well known that ingredients such as angelica, aniseed, blackcurrant, camomile, caraway, cinnamon, cloves, coffee, juniper, lavender, lemon, orange and rose petals are used, as are many other fruits and berries. Aperitifs and appetizers are among the richly flavoured spirits, as are liqueurs. A list of flavour compounds is given in Appendix 1.

The ethanol content of spirits varies. Generally speaking, whisky, vodka, schnapps, rum, liqueurs and brandies contain around 40% ethanol by volume, but may be stronger. Aperitifs usually have an ethanol content of around 20%. There are three different ways of indicating the ethanol content. In this monograph, the simple percentage by volume is used, which is also called the French or Gay-Lussac system. American proof is equal to twice the percentage of ethanol by volume; thus, spirits that contain 50% ethanol are 100 proof. The British proof system is slightly more complicated, 100 proof containing 57% ethanol by volume and pure (100% ethanol) alcohol being 175 proof.

(iv) *Mixed drinks*

Beer, wine and spirits may be consumed without adding any other liquid. In some countries, however, beer and wine are consumed as mixtures with other beverages, and, in the case of wine, mixed with water. Mixtures of spirits and soft drinks are sold; spirits may be drunk with ice or water, or mixed with other beverages in various dilutions.

(c) *Production volumes*

The available figures on production of and trade in alcoholic beverages have been

reviewed by Walsh and Grant (1985), and the following discussion relies mainly upon that report.

The production of alcoholic beverages has increased substantially in most parts of the world since the Second World War, and world production of alcohol showed an 83% increase between the early 1960s and 1983 (Kortteinen, 1986). Overall commercial production of alcoholic beverages between 1965 and 1980 increased by 50%, measured in terms of 100% ethanol content. On a per head basis, the increase during the same period was 15% (Table 2).

(i) *Beer*

World commercial production of beer more than doubled between 1960 and 1980; and, in terms of weight, over half of the world's alcohol is now produced in the form of beer (Kortteinen, 1986). As shown in Table 3, Europe, the USA and Canada accounted for almost 80% of the total production in 1960; although these areas increased their production very rapidly, their share of world production had fallen to 70% by 1980, because of the even more rapid increase in production in other regions. It should be noted that information on the production of beer by traditional, small-scale methods is not included in these figures, although it may be considerable in certain parts of the world, notably in West and Central Africa. World production per head rose by 50% during the period 1960-80, with Europe, North America, Australia and New Zealand remaining the areas with the highest production per head. As shown in Table 4, seven of the ten largest producers in 1960 were still among the ten largest producers in 1981; Japan, Mexico, Brazil and Nigeria were among the 25 largest producers in that year.

(ii) *Wine*

Wine production has increased since the Second World War, except in North Africa, where there was a reduction following the emigration of a large part of the French population. In terms of weight, about one-fifth of all alcoholic beverages now produced are as wine (Kortteinen, 1986). Since 1950, wine production has increased by about 80%, and, since 1965, by a little over 20%. Since, in general, this growth has parallelled the population growth since the War, current world production per head is about the same as in the 1950s. Wine-growing has always been concentrated in Europe and in areas of European settlement (Table 5). Table 6 shows the production in the largest producing countries: ten countries accounted for 84.4% of world production in 1965 and for 80.5% in 1980.During the 1980s, production in the 'new' wine countries has continued to increase, while the surplus in traditional European wine-producing countries has led to attempts to limit the volume of production and emphasize prestigious varieties.

(iii) *Spirits*

Table 7 presents available data on the production of spirits in 1965 and 1980. These figures are less complete than those for production of beer and wine, especially in Latin America. Three-quarters of the amount recorded in 1965, and slightly more in 1980, was produced in Europe, the USSR, the USA and Canada; a fall in production over the period was seen in Latin America, but increases were notable in the USA, Canada, Japan, Europe

Table 2. Total commercial production of alcoholic beverages (beer, wine and spirits)[a]

Region or country	1965								1980							
	Beer		Wine		Spirits		Total		Beer		Wine		Spirits		Total	
	Volume[b]	Per head[c]	Volume	Per head	Volume	Per head	Volume	Per head	Volume	Per head	Volume	Per head	Volume	Per head	Volume	Per head
Africa	0.35	0.1	2.5	0.8	0.2	0.1	3.1	1.0	1.9	0.4	1.2	0.3	0.2	0.1	3.3	0.7
Asia, excluding Japan	0.3	0.0	0.1	0.0	0.7	0.0	1.1	0.1	1.1	0.0	0.2	0.0	3.0	0.1	4.3	0.2
Japan	0.9	0.9	0.0	0.0	1.2	1.2	2.1	2.1	2.0	1.7	0.0	0.0	2.6	2.2	4.6	4.0
Australia and New Zealand	0.7	5.0	0.1	0.7	0.1	0.7	0.9	6.4	1.0	5.6	0.5	2.8	0.4	2.2	1.9	10.6
Oceania, excluding Australia and New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.0	0.0	0.0	0.0	0.0	0.1	2.0
North America	5.4	2.7	1.0	0.5	3.2	1.5	9.6	4.7	11.0	4.5	2.2	0.9	6.5	2.7	19.7	8.1
Latin America and Caribbean	1.1	0.4	2.75	1.1	2.3	0.9	6.1	2.4	3.3	0.9	3.5	1.0	2.0	0.5	6.8	2.4
Europe, excluding the USSR	10.9	2.4	22.8	5.1	5.1	1.1	38.8	8.7	16.2	3.3	26.3	5.4	10.2	2.1	52.7	10.9
USSR	1.4	0.6	1.5	0.6	7.4	3.2	10.3	4.4	2.7	1.0	3.5	1.3	8.8	3.3	15.0	5.6
World	22.4	0.7	30.9	0.9	20.5	0.6	73.8	2.2	39.3	0.9	37.5	0.8	33.3	0.8	110.1	2.5

[a] From Walsh & Grant (1985); based on an assumed ethanol content of: beer, 4.4%; wine, 11.0%; spirits, 40%. Totals may not equal the sum of the individual entries since these have been rounded off.

[b] Million hectolitres of ethanol

[c] Litres of ethanol

Table 3. Commercial beer production[a]

Region or country	1960		1970		1980	
	Total[b]	Per head[c]	Total	Per head	Total	Per head
Africa	5.0	1.8	16.6	4.7	43.6	9.3
Asia, excluding Japan	3.2	0.2	10.0	0.5	25.1	1.0
Japan	9.3	9.9	30.0	28.8	45.5	38.7
Australia and New Zealand	13.0	102.4	18.9	122.7	23.2	130.3
Oceania, excluding Australia and New Zealand	0.0	0.0	0.1	2.5	1.6	32.0
North America	122.2	61.4	173.8	77.2	249.4	101.4
Latin America and Caribbean	25.3	11.8	50.2	17.7	73.9	20.1
Europe, excluding the USSR	197.5	46.4	304.7	71.7	368.8	76.2
USSR	25.0	11.7	41.9	19.6	61.3	23.0
World	400.5	13.4	646.2	17.6	892.4	20.2

[a]From Walsh & Grant (1985)
[b]Million hectolitres
[c]Litres

Table 4. Commercial beer production by major producing countries (total production in million hectolitres)[a]

Country	1960
USA	110.8
Germany, Federal Republic of	53.7
United Kingdom	43.4
USSR	25.0
France	16.7
Czechoslovakia	14.1
German Democratic Republic	13.4
Canada	11.4
Australia	10.5
Belgium	10.1
Japan	9.3
Mexico	8.5
Poland	6.7
Colombia	6.1
Brazil	5.7
Austria	5.1
Ireland	4.1
Denmark	4.0
Netherlands	3.6
Hungary	3.6
Spain	3.4
Switzerland	3.3
Italy	2.5
Venezuela	2.4
Sweden	2.4

Country	1981
USA	227.3
Germany, Federal Republic of	93.7
USSR	62.9
United Kingdom	61.7
Japan	46.4
Mexico	29.3
Brazil	24.3
German Democratic Republic	24.1
Czechoslovakia	23.9
Canada	22.7
France	21.7
Spain	20.9
Australia	19.8
Netherlands	16.6
Belgium	13.8
Yugoslavia	12.2
Venezuela	12.0
Colombia	12.0
Romania	11.5
Poland	10.5
South Africa	10.4
Italy	9.0
Denmark	8.1
Nigeria	8.0
Austria	8.0

[a]From Walsh & Grant (1985)

Table 5. Commercial wine production[a]

Region or country	1948–52		1965		1980	
	Total[b]	Per head[c]	Total	Per head	Total	Per head
Africa	17.1	7.8	23.0	7.4	10.9	2.3
Asia	0.5	0.0	1.3	0.1	2.6	0.1
Australia and New Zealand	1.5	15.0	1.8	12.9	4.6	25.8
Oceania, excluding Australia and New Zealand	0.0	0.0	0.0	0.0	0.0	0.0
North America	9.2	5.5	9.2	4.3	19.7	8.0
Latin America	16.5	10.0	25.0	10.0	32.7	8.9
Europe, excluding the USSR	141.3	36.0	207.4	46.6	238.7	49.3
USSR	0.3	0.2	13.4	5.8	32.2	12.1
World	186.4	7.5	281.1	8.4	341.6	7.7

[a] From Walsh & Grant (1985)
[b] Million hectolitres
[c] Litres

Table 6. Commercial wine production by major producing countries (in million hectolitres)[a]

Country	1965	Country	1980
France	68.4	Italy	75.0
Italy	68.2	France	69.1
Spain	26.5	Spain	42.6
Argentina	18.3	USSR	32.2
Portugal	14.7	Argentina	23.3
Algeria	14.0	USA	18.0
USSR	13.4	Portugal	9.4
USA	8.5	Romania	7.6
Romania	5.2	Germany, Federal Republic of	7.1
Yugoslavia	5.2	Yugoslavia	6.9
Germany, Federal Republic of	4.6	South Africa	6.3
Greece	4.1	Chile	5.7
Chile	3.6	Australia	4.7
South Africa	3.6	Greece	4.4
Morocco	3.5	Bulgaria	4.0
Bulgaria	3.4	Austria	3.1
Hungary	2.2	Poland	3.0
Brazil	1.9	Brazil	2.7
Tunisia	1.8	Algeria	2.6
Australia	1.8	Hungary	2.4
Poland	1.6	Czechoslovakia	1.4
Austria	1.4	Morocco	1.0
Switzerland	1.0	Canada	1.0
Uruguay	0.9	Switzerland	0.8
Canada	0.8	Turkey	0.7
Czechoslovakia	0.7	Tunisia	0.7
Turkey	0.5	Mexico	0.7
Cyprus	0.3	Cyprus	0.6
Peru	0.1	Uruguay	0.5
		New Zealand	0.5

[a] From Walsh & Grant (1985)

Table 7. Commercial production of spirits[a]

Region or country	1965		1980	
	Total[b]	Per head[c]	Total	Per head
Africa	0.4	0.1	0.4	0.1
Asia, excluding Japan	1.8	0.1	7.4	0.3
Japan	2.9	2.9	6.4	5.5
Australia and New Zealand	0.2	1.3	0.1	0.4
Oceania, excluding Australia and New Zealand	0.0	0.0	0.0	0.0
North America	8.1	3.8	16.6	6.7
Latin America and Caribbean	5.7	2.3	4.9	1.3
Europe, excluding the USSR	12.7	2.9	25.5	5.3
USSR	18.5	7.9	22.0	8.2
World	50.3	1.5	83.3	1.9

[a] From Walsh & Grant (1985)
[b] Million hectolitres
[c] Litres

and the USSR. World production of spirits increased by 65% between 1965 and 1980 and production per head by slightly over 25%. The principal producing countries are listed in Table 8. The five largest producers (the USSR, the USA, the UK, France and the Federal Republic of Germany) accounted for over 71% of total production in 1965, but by 1980 this figure had fallen to 54%. Production of spirits rose rapidly between 1965 and 1980 in many countries, notably in the Republic of Korea, Cuba, Mexico and the Philippines. Production by home distilling is not included in the figures, but, in some countries where beverage taxes, and thus retail prices, are high, illegal distilling can be widespread.

Table 8. Commercial production of spirits by major producing countries (in million hectolitres)[a]

Country	1965	1980[b]	Country	1965	1980[b]
USSR	18.5	22.0	Mexico	0.6	1.5
USA	7.7	14.9	Philippines	0.5	1.1
United Kingdom	3.6	4.9	Canada	0.4	1.7
France	3.4	2.8	Bulgaria	0.4	0.5
Germany, Federal Republic of	3.3	3.9	Czechoslovakia	0.4	1.3
			Sweden	0.4	0.5
Japan	2.9	6.4	Colombia	0.3	NA
Spain	2.0	3.1	Hungary	0.2	1.1
Poland	2.0	5.3	Finland	0.2	0.6
Brazil	2.0	NA	Austria	0.2	0.4
Argentina	1.6	NA	Algeria	0.2	NA
Republic of Korea	0.9	5.1	Cuba	0.2	0.4
German Democratic Republic	0.8	2.1	Jamaica	0.2	0.2
			Estimated world total	51.2	89.5

[a] From Walsh & Grant (1985)
[b] 1980 or nearest year with available data; NA, not available

2.2 International trade

International trade in alcoholic beverages has increased in volume and in value over the years, although only a small part of production is traded, accounting for about one-half of 1% of total world trade in the market economy countries during the period 1976-80 (Walsh & Grant, 1985). In general, it is the higher priced products that are traded internationally, mostly between a few industrialized countries. Exports to developing countries consist predominantly of beer.

(a) Beer

Beer is a relatively low-value, bulky commodity and would not therefore be expected to figure prominently in long-distance international trade; technical problems of storage and conservation also render transport of beer over long distances difficult. This situation is changing with improvements in technology (pasteurization and shipping in containers), although it is estimated that only about 2.4% of world production of beer entered into international trade in 1981, compared to 1.6% in 1960 (Walsh & Grant, 1985). Table 9 shows the relative distribution of international trade in beer between market economy countries. Imports to developing market economy countries fell during the 1970s, as production of beer under licence from a parent European or North American company in these countries increased (Walsh & Grant, 1985). The effect of this development on the economy of developing countries is still unclear, but reductions in imports of beer may be offset, at least partly, by increases in imports of raw materials (Kortteinen, 1986). The gross flow of trade in beer exaggerates its net impact on consumption, since several importing countries are also significant exporters.

Table 9. Percentage distribution of international trade in beer by value[a]

Imports			Exports		
Country	1971	1980	Country	1971	1980
USA	14.9	40.8	Netherlands	17.0	30.8
France	10.5	12.0	Germany, Federal Republic of	19.4	17.8
United Kingdom	21.6	7.9	Belgium and Luxembourg	7.0	8.9
Italy	3.4	6.1	Denmark	19.0	8.8
Developing market economy countries	24.8	19.7[b]	United Kingdom	6.6	4.7
			Ireland	10.5	4.0
Other countries	24.8	13.5	Other countries	20.5	25.0

[a] From Walsh & Grant (1985)
[b] 1978

(*b*) *Wine*

The trade in wine is dominated by a few industrialized countries. Table 10 shows the percentage distibution of trade in wine between market economy countries; France alone accounted for almost half the total exports of wine, and its share increased slightly between 1973 and 1980. The proportion of the total production of wine that entered into international trade increased from 5.2% in 1965 to 12.4% in 1980, and this, in combination with the increase in travelling, has contributed to the spread of wine drinking to countries outside viticultural regions. Table 11 illustrates the importance of wine exports to four main trading countries. As with beer, however, some of the leading exporters also import wine, in particular France and the Federal Republic of Germany.

Table 10. Percentage distribution of international trade in wine by value in the market economy countries[a]

Imports			Exports		
Country	1973	1980	Country	1973	1980
USA	16.1	18.6	France	43.0	44.7
Germany, Federal Republic of	19.3	18.2	Italy	16.6	21.1
United Kingdom	13.7	14.7	Spain	10.1	9.8
Belgium and Luxembourg	6.5	8.6	Germany, Federal Republic of	5.1	8.9
France	10.8	7.8	Portugal	7.0	6.2
Switzerland	7.0	6.7	Algeria	8.5	–
Netherlands	4.1	6.4	All other market economy countries	3.5	3.1
Canada	9.7	9.3			
Denmark	1.6	2.2			
Italy	3.4	2.1			
All other market economy countries	14.0	11.6			

[a] From Walsh & Grant (1985)

(*c*) *Spirits*

As with beer and wine, only the more expensive spirits tend to enter into international trade. Most spirits are exported from the UK, France and Canada (Table 12), where the volumes in 1980 were 5.6, 3.1 and 1.6 million hl, respectively. Imports to the USA in 1979 amounted to 7.7 million hl. The rapid growth in exports ceased during the late 1970s and early 1980s, possibly as a result of economic recession, shortage of foreign exchange and increased consumption of cheaper domestic substitutes. The drop in exports of Scotch whisky to Latin America (especially to Venezuela) and to Nigeria is particularly notable. The importance of the USA as an importer of spirits is clear but has declined, and a wider range of countries now import significant quantities of spirits (Walsh & Grant, 1985).

Table 11. Exports of wine by four main trading countries[a]

Country	1965		1973		1980	
	Volume (million hl)	% of domestic production	Volume (million hl)	% of domestic production	Volume (million hl)	% of domestic production
France	4.1	6.0	9.0	10.8	11.8	17.0
Italy	2.4	3.5	9.5	12.3	14.7	19.6
Spain	2.2	8.3	3.8	9.5	6.1	14.3
Portugal	2.5	17.0	2.0	18.0	1.4	21.2

[a]From Walsh & Grant (1985)

Table 12. Percentage distribution of international trade in spirits by value in the market economy countries[a]

Imports[b]			Exports[c]		
Country	1970	1979	Country	1970	1980
USA	54.8	31.6	United Kingdom	50.0	49.6
Germany, Federal Republic of	5.8	8.3	France	19.2	25.7
United Kingdom	4.9	7.3	Canada	17.5	6.8
Japan	1.4	7.0	Ireland	0.2	2.3
France	3.9	4.1	USA	2.4	1.8
Italy	2.5	3.7	Netherlands	1.4	1.7
Belgium and Luxembourg	1.8	3.3	Spain	0.7	1.3
Canada	3.1	2.7	Mexico	0.2	1.0
Other market economy countries	21.8	32.0	Other market economy countries	8.4	9.8

[a]From Walsh & Grant (1985)
[b]Total value (in US $): 1970, 900 million; 1979, 3500 million
[c]Total value (in US $): 1970, 900 million; 1980, 3900 million

2.3 Trends in consumption

By the middle of the nineteenth century, intake of alcoholic beverages was high in most countries in Europe and North America, but, at the turn of the century, there was a decline in consumption which continued until the period between the two world wars. This downward trend was particularly strong with respect to distilled beverages, and especially pronounced in the spirit-drinking countries of northern and eastern Europe compared to countries with a high daily intake of wine. Such patterns ('long waves') of consumption of alcoholic beverages are notable in two respects: firstly, they are surprisingly common across countries, despite differences in general economic development and in drinking habits. Secondly, none of the factors commonly proposed to explain these consumption habits — such as buying power, amount of leisure time, social misery or industrialization and urbanization — presents patterns of variation over time similar to the variations in consumption of alcoholic beverages (Mäkelä *et al.*, 1981). A partial explanation of lower consumption in the first decades of the twentieth century in many industrialized countries may be the influence of the reform movements, including the international temperance movement, in preceding decades.

In contrast, the last few decades have been a period of increasing consumption in developed countries, with some countries approaching the peak levels of the nineteenth century. The largest growth rates have been recorded in countries with originally relatively low levels of average consumption; a few viticultural countries with very high initial levels of consumption showed no increase. In different countries, patterns of drinking tended to be aligned with type of beverage, but changes in economic structure and living conditions, large-scale migration, increased economic independence and relative isolation from wider social networks of individuals and families during the postwar period in industrialized countries led to weakening of local and subcultural traditions and to a more international pattern of consumption. The increase in consumption of alcoholic beverages slowed down or levelled off in many countries in the 1970s, and some decreases were recorded. This phenomenon has been explained partially by economic difficulties experienced in most industrialized countries and by changes in living conditions and life styles (Mäkelä *et al.*, 1981).

In the developing countries, the variation in trends over the last 30 years has undoubtedly been greater. Most of the available information points toward increases in consumption, except in areas such as Muslim countries (Moser, 1985). In many developing countries local alcohol industries, which provide a base for other industries (glass, packaging, etc.), have been encouraged, as they serve as a source of state revenue and obviate the use of foreign exchange for imported beverages. Once developed, these industries tend to create their own demand, so that the overall rates of consumption rise. In most cases, new factories produce European-style beverages — beer or spirits; and in parts of the developing world, European-style beverages are gradually replacing traditional beverages, although at present

both types are consumed. Improvements in transportation and distribution also tend to have a direct, dramatic effect on the trade and consumption of alcoholic beverages (Marshall, 1982; Rootman & Moser, 1984).

(*a*) *Total consumption per head*

There are wide variations in the rates of consumption of alcoholic beverages between countries and regions. Total consumption of alcohol per head is often calculated as the difference between the quantities produced and imported and the quantities exported and in stock, or on the basis of sales statistics collected for taxation purposes. Neither calculation includes noncommercial production of alcoholic beverages or tax-free importation by individual travellers between countries. A report from the Addiction Research Foundation (1985) in Toronto, Canada, covering 164 countries, gives estimated consumption of 100% alcohol per head for the period 1970-77 (Table 13); two-thirds of the countries experienced an increase in consumption per head, and 10% a doubling of consumption per head, but only 2% showed a decrease of 50% or more. For the period before 1970 and after 1977, data are available for a smaller number of industrialized countries only (Table 13). Table 14 summarizes the changes over the period 1970-77 in different regions of the world; increases can be seen for most regions and for each type of beverage. Sales of spirits, wine and beer per head in some countries in 1985 are shown in Table 15.

In alcohol-producing areas, consumption is dominated by the type of beverage that is produced, which usually accounts for most of the increase in consumption, although other beverages also contribute significantly. In countries where wine is drunk, for instance, there has been a marked increase in consumption of beer and spirits; whereas, in countries where beer was the preferred drink, consumption of wine and spirits has become more general (Walsh & Grant, 1985; Horgan *et al.*, 1986). Overall, there has been no very marked shift in the relative standing of the categories of alcoholic beverages. In both 1960 and 1981, commercially produced beer, wine and spirits contributed approximately equal amounts to world ethanol consumption. The share of beer in the total has risen slightly, however, while that of wine has declined (Walsh & Grant, 1985).

Table 16 shows the growth in consumption of alcoholic beverages for selected countries in which total consumption increased very rapidly over the period 1960-81. With the sole exception of spirits in Austria, consumption of *all* beverages increased in these countries over that period. The rate of increase in the Republic of Korea, the Netherlands and Japan was exceptionally high, and other countries in Africa, Latin America and Asia are already in the initial stages of what may become a similar trend, although the increase may at present be confined to a single beverage (typically beer).

(*b*) *Beer consumption*

Table 17 shows the consumption of beer per head in 1960 and 1981 in the 25 largest consumer countries. The figures are not directly comparable because of differences in population structure: in countries in which a large proportion of the population is under 15 years of age, the average consumption of the drinking population is greater than that shown

Table 13. International statistics: consumption of commercial alcohol (as ethanol) per head for 1960, 1970, 1977 and 1985

Country or area	Ethanol (litres per head)[a]			
	1960[b]	1970[c]	1977[c]	1985[d]
Africa				
Algeria	2.0	0.3	–	–
Angola	–	2.7	2.2	–
Benin	–	0.6	1.2	–
Botswana	–	3.7	2.5	–
Burkina Faso	–	2.3	2.4	–
Burundi	–	13.7	13.8	–
Cameroon	–	6.7	7.0	–
Cape Verde	–	1.0	1.7	–
Central African Republic[e]	–	2.0	–	–
Chad	–	0.5	0.4	–
Comoros	–	0.1	0.1	–
Congo	–	1.4	2.6	–
Côte d'Ivoire	–	1.3	2.0	–
Egypt	–	0.1	0.1	–
Ethiopia	–	0.8	–	–
Gabon	–	3.9	9.6	–
Gambia	0.2	2.0	1.3	–
Ghana	–	1.0	–	–
Guinea	–	0.1	0.1	–
Guinea-Bissau	–	2.9	2.2	–
Kenya	–	1.7	–	–
Liberia	–	0.6	–	–
Libyan Arab Jamahiriya	–	0.01	–	–
Losotho	–	1.7	1.5	–
Madagascar	–	0.7	0.9	–
Malawi	–	2.3	3.0	–
Mali	–	1.0	1.0	–
Mauritania	–	0.1	0.1	–
Mauritius	–	1.4	–	–
Morocco	0.6	0.4	–	–
Mozambique	–	0.8	0.5	–
Niger	–	0.1	0.1	–
Nigeria	–	3.8	3.7	–
Réunion	–	4.0	5.4	–
Rwanda	–	5.4	5.1	–
Sao Tome and Principe	–	5.8	3.6	–
Senegal	–	0.3	0.4	–
Sierra Leone	–	0.2	0.2	–
Somalia	–	0.02	0.01	–
South Africa	1.8	4.3	5.2	4.3
Sudan	–	1.2	–	–
Swaziland	–	3.5	4.0	–
Togo	–	1.4	2.2	–
Tunisia	–	0.8	0.5	–
Uganda	–	12.6	11.7	–
United Republic of Tanzania	–	4.6	4.0	–
Zaire	–	2.7	2.9	–
Zambia	–	3.5	3.1	–
Zimbabwe	–	0.8	0.8	–

Table 13. (contd)

Country or area	Ethanol (litres per head)[a]			
	1960[b]	1970[c]	1977[c]	1985[d]
America, North				
Antigua and Barbuda	–	5.1	3.3	–
Bahamas	–	11.0	9.7	–
Barbados	–	8.0	16.2	–
Belize	–	4.6	2.8	–
Bermuda	–	6.4	6.3	–
Canada	4.8	6.5	8.5	8.0
Costa Rica	–	1.4	2.4	–
Cuba	–	1.5	–	–
Dominica	–	3.7	2.9	–
Dominican Republic	–	2.0	2.1	–
El Salvador	–	0.7	1.8	–
Grenada	–	2.3	2.4	–
Guadeloupe	–	6.5	9.0	–
Guatemala	–	1.4	1.9	–
Haiti	–	4.0	3.9	–
Honduras	–	1.3	1.4	–
Jamaica	–	2.1	2.6	–
Martinique	–	9.5	10.1	–
Mexico	–	2.1	2.4	–
Netherlands Antilles	–	4.4	7.0	–
Nicaragua	–	3.0	2.7	–
Panama	–	2.9	2.8	–
Puerto Rico	–	–	–	–
Saint Christopher and Nevis	–	3.3	2.1	–
Saint Lucia	–	4.7	3.8	–
Saint Vincent and the Grenadines	–	1.4	1.3	–
Trinidad and Tobago	–	2.9	5.2	–
USA	5.2	6.8	8.1	8.0
America, South				
Argentina	9.7	13.1	14.0	8.7
Bolivia	1.6	1.8	2.0	–
Brazil	0.7	2.2	2.4	–
Chile	7.0	6.5	7.1	–
Colombia	2.2	2.2	2.5	–
Ecuador	–	0.9	–	–
French Guinea	–	12.1	10.3	–
Guyana	–	3.5	4.9	–
Paraguay	–	2.1	2.8	–
Peru	–	2.4	2.5	–
Suriname	–	4.3	3.7	–
Uruguay	–	5.6	–	–
Venezuela	–	3.7	4.1	–

Table 13. (contd)

Country or area	Ethanol (litres per head)[a]			
	1960[b]	1970[c]	1977[c]	1985[d]
Asia				
Afghanistan	–	–	–	–
Bangladesh	–	–	–	–
Bhutan	–	2.7	2.7	–
Brunei Darussalam	0.4	0.9	–	–
Burma	–	0.1	–	–
China	–	0.1	–	–
Cyprus	3.3[f]	3.3	3.8	5.6
Democratic Kampuchea	–	0.6	–	–
Democratic People's Republic of Korea	–	2.9	3.4	–
Democratic Yemen	–	0.6	0.3	–
Hong Kong	–	1.8	2.2	–
India	–	–	0.01	–
Indonesia	–	0.02	–	–
Iran (Islamic Republic of)	–	0.2	–	–
Iraq	–	0.2	0.4	–
Israel	2.3[f]	2.8	2.9	–
Japan	–	4.9	–	5.7
Jordan	–	0.1	–	–
Lao People's Democratic Republic	–	0.4	0.3	–
Lebanon	–	1.9	–	–
Macao	–	2.1	2.8	–
Malaysia	–	6.6	6.3	–
Mongolia	–	1.1	2.0	–
Nepal	–	–	–	
Pakistan	–	–	–	–
Philippines	–	3.0	–	–
Republic of Korea	–	3.6	7.0	–
Saudi Arabia	–	–	0.02	–
Singapore	–	1.4	1.7	–
Sri Lanka	–	0.3	–	–
Syrian Arab Republic	–	0.2	–	–
Thailand	–	0.4	0.6	–
Turkey	0.3[f]	0.5	–	1.0
Viet Nam	–	0.3	–	–
Yemen	–	–	–	–
Europe				
Albania	–	0.6	0.6	–
Austria	8.7	11.9	11.5	9.9
Belgium	6.4	8.9	10.1	10.5
Bulgaria	3.8	7.2	–	8.7
Czechoslovakia	5.5	9.1	9.9	9.1
Denmark	4.2	6.3	8.8	9.9
Faröe Islands	–	2.5	3.8	–
Finland	1.8	4.5	6.9	6.5
France	17.3	19.6	17.3	13.3
German Democratic Republic	4.6	6.3	9.1	10.3
Germany, Federal Republic of	6.9	11.2	12.2	10.8

Table 13. (contd)

Country or area	Ethanol (litres per head)[a]			
	1960[b]	1970[c]	1977[c]	1985[d]
Greece	–	5.9	6.3	–
Hungary	6.2	10.1	13.6	11.5
Iceland	1.7	2.7	3.2	4.0
Ireland[g]	3.4	4.2	5.8	6.2
Italy	12.2	14.5	12.4	11.6
Luxembourg	8.3	10.2	14.4	13.0
Malta	–	2.3	3.3	–
Netherlands	2.5	5.7	8.9	8.5
Norway	2.6	3.6	4.5	4.1
Poland	3.8	5.1	8.2	7.0
Portugal	10.4	9.9	14.0	13.1
Romania	4.1[f]	6.3	–	–
Spain	10.3	11.3	12.8	11.8
Sweden	3.7	5.6	6.0	5.0
Switzerland	9.8	10.5	10.6	11.2
United Kingdom	5.1	5.2	6.8	7.1
Yugoslavia	4.7	7.6	6.9	7.7
Oceania				
Australia	6.5	8.2	9.8	9.4
Fiji	–	1.3	2.0	–
French Polynesia	–	9.1	9.0	–
New Caledonia	–	8.6	5.9	–
New Hebrides	–	1.9	1.6	–
New Zealand	6.5	6.7	8.4	9.2
Papua New Guinea	–	0.5	0.7	–
Samoa	–	0.5	1.0	–
Solomon Islands	–	0.3	0.3	–
Tonga	–	0.3	0.7	–
USSR	3.7	5.1	5.2	8.4

[a] Figures were converted into ethanol on the basis of the following average values for ethanol by volume: beer, 5%; fermented beverages, 12%; wine, 12%; vermouths and similar beverages, 18%; distilled beverages, 40%; –, no country- or beverage-specific data available.

[b] From Finnish Foundation for Alcohol Studies (1977)

[c] From Addiction Research Foundation (1985)

[d] From Systembolaget (1986)

[e] Population figures for 1970 are estimates based on the 1968 'recensement instantané' of 1968.

[f] 1963

[g] Figures for 1970 are for the 12 months ending 31 March of that year; figures for 1977 correspond to the 12-month period ending 31 December of that year.

Table 14. Percentage change in consumption of commercial alcoholic beverages (as ethanol) per head by type of beverage in six WHO regions, 1970–77[a]

Beverage	Africa	Americas	Eastern Mediter-ranean	Europe	South-east Asia	Western Pacific
Wine	-16.7	6.9	0.0	-4.2	0.0	200.0
Beer	9.1	17.1	8.3	15.6	100.0	20.7
Spirits	11.1	8.8	71.4	4.3	20.0	-24.3
All alcoholic beverages	7.3	11.3	12.5	3.0	25.0	-4.4

[a]From Moser (1985)

Table 15. Sales of alcoholic beverages in litres per head, 1985[a]

Country	Spirits[b]	Wine	Beer
France	5.8	80	40
Portugal	2.0	87	38
Luxembourg	6.3	57	120
Spain	7.5	48	61
Italy	3.0	85	22
Hungary	13.5	25	92
Switzerland	5.5	50	69
Germany, Federal Republic of	5.9	26	146
Belgium	5.3	23	121
German Democratic Republic	12.0	10	142
Austria	3.8	34	112
Denmark	4.0	21	119
Australia	3.3	21	116
New Zealand	4.3	14	115
Czechoslovakia	8.4	16	131
Argentina	2.5	60	10
Bulgaria	7.5	22	60
Netherlands	5.6	15	84
USSR	14.0	13	24
USA	6.8	9	90
Canada[c]	6.6	10	83
Yugoslavia	5.0	26	50
United Kingdom	4.3	10	109
Poland	11.5	8	30
Finland	7.5	4	59
Ireland	4.4	4	100
Japan	6.0	1	38
Cyprus	5.3	12	42
Sweden	5.1	12	35
South Africa	2.8	10	40
Norway	3.5	5	45
Iceland	5.6	7	17
Turkey	1.6	1	4

[a]From Systembolaget (1986)
[b]Values converted from 50% ethanol to litres of beverage with an ethanol content of 40% (a common strength of distilled beverages) by the Working Group
[c]1984

Table 16. Growth in commercial alcoholic beverage consumption (in litres of ethanol per head) in countries in which it has increased rapidly[a]

Country	1960				1981				Increase 1960–81 (%)
	Beer	Wine	Spirits	Total	Beer	Wine	Spirits	Total	
Republic of Korea	0.1	–	0.7	0.8	1.5	–	5.4	6.9	762
Netherlands	1.0	0.2	1.1	2.3	3.9	1.4	2.6	7.9	243
Japan	1.1	1.3[b]	1.2	3.6	4.3	2.2[b]	3.2	9.7	169
Finland	1.1	0.1	1.3	2.5	2.5	0.5	2.8	5.8	132
German Democratic Republic	3.1	0.3	0.6	4.0	5.7	1.8	1.5	9.0	125
Canada	3.4	0.4	1.4	6.2	6.2	1.1	4.8	12.1	95
Germany, Federal Republic of	2.5	0.2	1.5	4.2	3.8	1.0	3.3	8.1	93
Mexico	1.0	–	0.5	1.5	1.8	–	0.9	2.7	80
Hungary	1.6	3.2	1.4	7.2	3.9	3.5	4.8	12.2	69
Poland	1.0	0.4	2.4	3.8	1.3	0.8	4.3	6.4	68
Denmark	4.2	1.1	1.9	7.2	6.5	2.2	2.9	11.9	61
Austria	3.2	2.3	2.4	7.9	4.6	3.8	1.5	9.9	25

[a] From Walsh & Grant (1985)
[b] Including saké

Table 17. Consumption of commercially produced beer per head (in litres)[a]

Country	1960	Country	1981
Luxembourg	116.4	Germany, Federal Republic of	147.0
Belgium	112.0	German Democratic Republic	141.4
Australia	101.9	Czechoslovakia	140.1
Czechoslovakia	100.1	Gabon	135.0
New Zealand	100.0	Australia	134.4
Germany, Federal Republic of	95.7	Denmark	131.0
United Kingdom	85.1	Belgium	124.0
German Democratic Republic	79.5	Luxembourg	118.6
Austria	71.9	New Zealand	117.7
Denmark	71.4	Ireland	116.4
Ireland	67.3	United Kingdom	111.5
Switzerland	62.9	Austria	104.8
Canada	60.0	USA	93.3
USA	57.9	Netherlands	89.6
Colombia	43.4	Hungary	88.0
Hungary	36.8	Canada	86.4
Venezuela	36.0	Venezuela	79.9
France	35.3	Switzerland	71.0
Sweden	31.1	Bulgaria	60.9
Chile	30.0	Finland	57.1
Cuba	25.1	Spain	55.2
Finland	25.0	Romania	45.0
Norway	24.5	Colombia	45.0
Netherlands	23.8	Norway	44.8
Mexico	22.9	France	44.0

[a] From Walsh & Grant (1985)

by the figures per head. Table 18 gives the average consumption of beer per person 15 years or older, from which it can be seen that some countries with a young population, such as Venezuela, Colombia, Mexico and Panama, are ranked higher. In 1960, high levels of beer consumption were recorded mainly in Europe, North America, Australia and New Zealand, and in a few Latin American countries; in 1981, while consumption had increased in all those countries where it was already high in 1960, a wider range of Latin American countries were among high-consumer countries, as were Gabon and South Africa (Walsh & Grant, 1985).

Consumption of commercially produced beer increased in many countries over the period 1960-81 (Table 19). Although in many instances consumption per head in 1981 was

Table 18. Consumption of commercially produced beer per person aged 15 and over (in litres)[a]

Country	1960	Country	1981
New Zealand	149.2	Australia	184.1
Belgium	147.4	Germany, Federal Republic of	183.7
Australia	145.6	Czechoslovakia	181.9
Luxembourg	145.5	Gabon	180.0
Czechoslovakia	137.1	German Democratic Republic	179.0
Germany, Federal Republic of	122.7	Ireland	168.7
United Kingdom	109.1	Denmark	167.9
German Democratic Republic	101.9	New Zealand	165.8
Ireland	96.1	Belgium	159.0
Denmark	95.2	Luxembourg	148.2
Switzerland	93.9	United Kingdom	142.9
Austria	92.1	Venezuela	140.2
Canada	89.6	Austria	136.1
USA	83.9	USA	122.8
Colombia	72.3	Netherlands	117.9
Venezuela	65.5	Canada	115.2
Chile	50.0	Hungary	111.4
France	47.1	Switzerland	89.9
Cuba	41.8	Colombia	81.8
Mexico	41.6	Bulgaria	78.1
Sweden	39.9	Spain	76.7
Finland	35.7	Mexico	74.1
Poland	35.1	Finland	73.2
Netherlands	34.0	Panama	64.0
Norway	33.1	Romania	60.0
		South Africa	59.7
		Norway	58.2
		Sweden	57.2
		France	57.1
		Japan	51.8
		Peru	51.2
		Portugal	50.8

[a]From Walsh & Grant (1985)

Table 19. Consumption[a] of commercially produced beer (in litres per head) in countries or areas in which there has been a marked increase over the period 1960–81[b]

Country or area	1960	1973	1981
Africa			
Cameroon	5.0	22.0	33.1
Congo	4.3[d]	18.5	42.7
Côte d'Ivoire[c]	3.3[d]	12.4	20.0
Gabon	12.0[d]	35.6	135.0
Kenya	4.8	10.0	16.7
Namibia	12.6	22.9	47.1
South Africa[c]	4.2	14.3	34.6
America, Central and Caribbean			
Costa Rica[c]	6.8	10.8	21.7
Dominican Republic	3.1	12.7	17.0
Jamaica	9.2	29.1	27.0
Mexico[c]	22.9	32.0	40.0
Nicaragua	2.8	13.3	16.4
Panama	14.3	22.5	47.4
Trinidad and Tobago	11.0	23.5	28.3
America, South			
Bolivia	4.6[d]	8.3	24.6
Brazil	9.3[d]	14.0	19.8
Ecuador	9.2	12.5	35.7
Paraguay	2.8	8.3	23.9
Peru	14.6	23.3	29.2
Suriname	7.3	22.3	32.8
Venezuela	36.0	40.8	86.0
Asia			
Cyprus[c]	8.2	20.5	34.7
Hong Kong[c]	3.8	16.1	23.0
Japan[c]	9.8	34.9	39.4
Republic of Korea	0.7	2.6	14.5
Philippines[c]	3.3	8.5	14.9
Europe[c]			
Bulgaria	13.0	43.6	60.9
Finland	25.0	54.5	57.1
Greece	5.5	13.3	34.6
Hungary	36.8	61.6	88.0
Italy	5.1	15.7	17.9
Netherlands	23.8	73.5	89.6
Portugal	3.0	26.0	36.6
Romania	8.8	27.0	45.0
Spain	11.0	42.6	55.2
USSR	11.9	20.4	23.4
Yugoslavia	6.7	37.2	79.9[e]

[a] Based on production data, unless otherwise specified
[b] From Walsh & Grant (1985)
[c] Based on consumption data
[d] 1965
[e] 1980

still relatively modest, the rate of increase in these countries was such that, if it were sustained for another decade, the level of beer consumption per head would be higher than that recorded in Norway and the Netherlands in 1960. There is currently no evidence of a levelling off in this rate. The appearance of so many developing countries in Africa, Latin America, the Caribbean and Asia on this table is an indication of recent trends in beer consumption (Walsh & Grant, 1985).

(*c*) *Wine consumption*

Wine-producing areas, such as France and Italy, tend also to be areas of highest wine consumption (Table 20). Countries in which rapid changes (growth or decline) in wine consumption have been seen are listed in Table 21: important increases occurred during the 1960s in several northern European countries, in North America and in Australia. In general, this reflects a diversification of drinking patterns, as the new beverage (wine) is added to the already fairly large amounts of beer and spirits consumed. The decline in wine consumption in France, Italy and Portugal, where consumption was previously very high, is an important trend. In Italy, the decline has been offset by increased beer consumption, while in France and Portugal total alcohol consumption has declined (Walsh & Grant, 1985).

Increased wine production in the USA, Spain and Australia in recent years, in conjunction with the marked fall in consumption in the heaviest wine-drinking countries, has given rise to a growing surplus of production over consumption. The potential for increased consumption outside the areas of Mediterranean culture is illustrated by the rapid growth of wine drinking in Scandinavia during the last three decades. People in this region formerly consumed almost exclusively beer and spirits, but during the 1960s their levels of wine consumption rose rapidly without a corresponding fall in drinking of other alcoholic beverages. The growing popularity of wine was thus an important factor in the increase in total consumption of alcoholic beverages (Walsh & Grant, 1985).

(*d*) *Consumption of spirits*

In many of the countries that are the world's largest producers of spirits, there is a high consumption per person. In Table 22, countries are ranked according to consumption of spirits per head in 1960 and 1981; countries in which there was a substantial increase in consumption of spirits during that period are listed in Table 23.

There is a tendency to an 'internationalization' of drinking habits following the increased ease of communication. An example is the increase in wine consumption in many countries where traditionally beer and spirits have dominated; the new drinking habits are added to the old ones, resulting in an increase in total consumption of alcohol. In other countries, the increase in wine drinking during the period 1975-85 has been at least partly offset by a decrease in consumption of spirits. Examples of the latter are Norway, Sweden (Systembolaget, 1986) and the USA (National Institute on Alcohol Abuse and Alcoholism, 1987).

Table 20. Consumption of commercially produced wine (in litres per head)[a]

Country	1960		Country	1981	
	Total population	Population over 14 years		Total population	Population over 14 years
France	126.9	171.5	France	90.0	116.9
Italy	108.3	144.4	Portugal	77.0	106.9
Portugal	85.0	119.7	Italy	74.0	97.4
Argentina	75.9	108.4	Argentina	73.0	101.4
Spain	50.7	70.4	Spain	60.0	83.3
Chile	46.0	76.6	Switzerland	48.5	61.3
Greece	40.8	55.9	Chile	43.7	66.2
Switzerland	36.0	48.6	Greece	42.0	55.3
Luxembourg	31.3	39.1	Luxembourg	40.2	50.2
Hungary	29.9	39.9	Austria	34.2	44.4
Romania	21.7	29.7	Hungary	33.0	41.8
Yugoslavia	21.4	31.5	Romania	28.9	38.6
Uruguay	21.0	28.8	Yugoslavia	28.2	38.1
Austria	20.7	26.9	Uruguay	25.0	34.2
Bulgaria	20.2	27.3	Bulgaria	22.0	28.2
Czechoslovakia	13.2	18.3	Belgium	21.0	26.9
Cyprus	11.5	18.3	Germany, Federal Republic of	20.2	25.3
Germany, Federal Republic of	10.8	13.8	Australia	18.3	25.1
South Africa	8.8	13.1	Denmark	16.1	20.6
Belgium	7.8	10.3	Netherlands	13.0	16.9
Australia	5.2	7.4	USSR	14.5	19.6
Poland	4.5	6.9	New Zealand	14.4	20.3
USA	3.4	5.0	Czechoslovakia	13.5	17.5
German Democratic Republic	3.3	4.2	Cyprus	10.8	14.4
Sweden	3.3	4.2	German Democratic Republic	10.2	12.6
Denmark	3.1	4.1	Sweden	9.7	12.3
Canada	2.0	3.1	South Africa	9.0	15.5
Netherlands	1.9	2.7	Canada	8.9	11.9
United Kingdom	1.6	2.1	United Kingdom	8.4	10.8
Finland	1.3	1.9	USA	8.2	10.8
Norway	1.2	1.6	Poland	7.5	9.9
Iceland	0.8	1.2	Iceland	6.3	8.9
			Finland	5.4	6.9
			Norway	4.2	5.5

[a]From Walsh & Grant (1985)

Table 21. Consumption of commercially produced wine (in litres per head) in countries where it has increased or decreased rapidly[a]

Increased consumption			Decreased consumption		
Country	1960	1981	Country	1960	1981
Germany, Federal Republic of	10.8	20.2	France	129.9	90.0
Belgium	7.8	21.0	Italy	108.3	74.0
Australia	5.2	18.3	Portugal	85.0	77.0
USA	3.4	8.2			
German Democratic Republic	3.3	10.2			
Sweden	3.3	9.7			
Denmark	3.1	16.1			
Canada	2.0	8.9			
Netherlands	1.9	13.0			
United Kingdom	1.6	8.4			
Finland	1.3	5.4			
Norway	1.2	4.2			
Iceland	0.8	6.3			

[a]From Walsh & Grant (1985)

2.4 Drinking patterns

Drinking patterns vary between regions and countries, between groups within a country, between individuals belonging to the same social and ethnic group and between different times in the life of an individual. As travel, trade, standards of living and media communication increase, drinking habits may be introduced from one country or group into another.

Societies differ substantially in the proportion of the adult population who drinks at all. Surveys in India, for instance, typically report abstention rates of 50-70% (Mohan *et al.*, 1980; Sundaram *et al.*, 1984). The variation between European and North American countries is narrower: from about one-third abstainers among adults in the USA and Ireland to fewer in many western European countries (see Table 24). Rates of abstention have fallen considerably over the last 40 years in some countries that had had strong temperance traditions; for instance, in Finland, there were 25% nondrinkers in 1968 and 13% in 1976 (Mäkelä *et al.*, 1981).

Table 22. Consumption of commercially produced spirits (in litres of ethanol per head)[a]

Country	1960		Country	1981	
	Total population	Population over 15 years		Total population	Population over 15 years
USSR	2.6	3.3	Republic of Korea	5.4	9.2
Austria	2.4	3.2	German Democratic Republic	4.8	5.9
Poland	2.4	3.6	Hungary	4.8	6.2
Sweden	2.3	2.9	Luxembourg[b]	4.5	5.5
USA	2.1	3.0	Poland	4.3	5.7
France	2.0	2.7	Czechoslovakia	4.0	5.3
Spain	2.0	2.8	USSR	3.3	4.4
Germany, Federal Republic of	1.9	2.4	Canada	3.3	4.3
Yugoslavia	1.8	2.6	Japan	3.2	4.2
Iceland	1.6	2.5	Spain	3.0	4.1
Switzerland	1.5	2.0	USA	3.0	4.1
Canada	1.5	2.3	Germany, Federal Republic of	2.9	3.5
Hungary	1.4	1.9	Finland	2.8	4.1
German Democratic Republic	1.4	1.8	Sweden	2.8	3.5
Norway	1.3	1.8	Netherlands	2.6	3.4
Finland	1.3	1.9	France	2.5	3.2
Bulgaria	1.3	1.8	Iceland	2.2	3.5
Japan[c]	1.2	1.6	Switzerland	2.1	2.6
Romania	1.1	1.5	Belgium	2.1	2.6
Netherlands	1.1	1.6	Yugoslavia	2.0	2.7
Italy	1.0	1.3	Romania	2.0	2.7
Luxembourg	1.0	1.3	Bulgaria	2.0	2.6
New Zealand	1.0	1.5	Ireland	1.9	2.8
Czechoslovakia	1.0	1.4	Italy	1.9	2.4
Australia	0.8	1.1	New Zealand	1.8	2.4
Belgium	0.8	1.1	United Kingdom	1.7	2.2
Ireland	0.8	1.2	Norway	1.6	2.0
South Africa	0.7	1.0	Denmark	1.5	1.9
United Kingdom	0.7	0.9	Austria	1.5	1.9
Republic of Korea	0.7	1.2	Peru	1.4	2.6
			South Africa	1.4	2.5
			Australia	1.1	1.5

[a] From Walsh & Grant (1985)
[b] Based on production figures
[c] 1965

Table 23. Consumption of commercially produced spirits (in litres of ethanol per head for populations aged 15 years and over) in countries where it has increased substantially[a]

Country	1960	1981
Republic of Korea	2.2[b]	9.2[c]
German Democratic Republic	1.8	5.9
Luxembourg	1.3	5.5
Czechoslovakia	1.4	5.3
Hungary	1.4	4.8
Japan	1.6[b]	4.2
Finland	1.9	4.1
Netherlands	1.6	3.4
Ireland	1.2	2.8
Belgium	1.1	2.6
South Africa	1.0	2.5
United Kingdom	0.9	2.2

[a]From Walsh & Grant (1985)
[b]1965
[c]1980

Table 24. Percentages of adults reporting current abstention from drinking alcoholic beverages in an international public opinion survey, 1985[a]

Country	%	Country	%
Israel	56	Australia	24
Philippines	44	Canada	23
Brazil	40	Colombia	23
Uruguay	33	Mexico	22
USA	33	Switzerland	20
Ireland	32	Iceland	18
Japan	31	Norway	18
Belgium	31	United Kingdom	17
Germany, Federal Republic of	29	Netherlands	16
Argentina	28	Sweden	14
Finland	26	Greece	11
Republic of Korea	24		

[a]From Gallup et al. (1985). The data were collected in a coordinated fashion by the Gallup Poll and its affiliates, but should be taken only as indicative, since methods were not specified, and reported proportions of abstainers are in some cases higher than reported in other surveys, particularly for several western European countries.

Surveys of drinking habits, undertaken mostly in Europe and North America, indicate that consumption of alcoholic beverages is skewed, so that the relatively small group of heavier drinkers accounts for a large proportion of alcohol consumption. Under conditions of relatively free market availability, alcohol consumption is distributed roughly log

normally among drinkers, with the distribution skewed towards lighter drinkers (Skog, 1980). The proportion of heavy consumers appears to be approximately proportional to the square of the mean consumption. This empirical regularity is seen to reflect what has been termed the 'collectivity of drinking cultures': that people's drinking practices affect each other's and, indeed, that drinking is often a collective act (Skog, 1985).

Women generally more often abstain from drinking than men, and they tend to drink less than men in all age groups and socioeconomic groups. These differences are tending to become smaller for moderate consumption but not for heavier drinking (Room, 1978; National Institute on Alcohol Abuse and Alcoholism, 1987).

Age-related variations in drinking patterns are exemplified by current US and Canadian data, which show a general concentration of abstainers in the older age groups and children, while the 20-29-year age group has the lowest rate of abstainers (Room, 1978; Addiction Research Foundation, 1985; Rydberg, 1985; National Institute on Alcohol Abuse and Alcoholism, 1987). Abstention seems to be declining among teenagers in many countries, although in the 1980s there has been a decline in alcohol use by teenagers in countries such as the USA and Sweden (Rydberg, 1985; National Institute on Alcohol Abuse and Alcoholism, 1987). Among regular drinkers, the most common pattern after the age of 30 appears to be frequent, light drinking, whereas among younger consumers, it appears to be less frequent, heavier drinking (Room, 1978).

The relationship between drinking behaviour and social class is more complicated and varied. In some countries, heavy drinkers belong to lower socioeconomic classes, while in others they are of higher social status. In countries where alcoholic beverages are relatively expensive, such as the Nordic countries, there seems to be a positive correlation between income and total alcohol consumption, although different socioeconomic groups may vary in their style of drinking. 'Binge drinking' — periodic heavy drinking — tends to be more common in lower income groups and, in many instances, might be affected by traditions in specific occupational groups. Data on the relationship between specific occupations and particular drinking patterns in the general population are very sparse (Edwards *et al.*, 1972; Room, 1978; Mäkelä *et al.*, 1981; Fillmore & Caetano, 1982).

In wine-producing countries, where wine is cheap, it is drunk widely in rural areas; in nonproducing countries, where alcoholic beverages tend to be more expensive, drinking may be less common in rural areas (Péquignot *et al.*, 1988). Within a country, there may be regional variations in choice of beverage and levels of consumption (Room, 1983). Cultural and religious differences are reflected in international comparisons but can also occur within countries where there are various ethnoreligious groups. In many countries, for example, Islamists have a very low consumption of alcohol. American Indians and Alaskan natives, taking another example, appear to have very high rates of alcohol abuse and alcoholism overall, although most members of many tribes are abstainers.