

SPECIAL COMMUNICATIONS

Changes in adult cigarette consumption per head in 128 countries, 1986-90

Simon Chapman

Each year in the final issue of *Tobacco Control* we will publish tables showing international data on adult - that is aged 15 and above - cigarette consumption per head. We have opted to provide *adult* cigarette consumption per head, rather than total cigarette consumption or total consumption per head, because adult consumption more accurately reflects a measure of true smoking in populations than do the other two options. Total consumption data are useful when considering the size and value of tobacco markets to the industry and governments, but when not adjusted for population differences cannot be used to meaningfully assess relative smoking rates between nations. Similarly, large demographic differences between countries in the age distribution of their populations, together with the insignificant contribution to total smoking by infants and young children, makes total consumption per head also a misleading index of actual consumption. For example, the mean proportion of African nations' populations aged under 15 years is 44.2%, compared with 20.1% in Europe.

None the less, the data on adult consumption per head shown here remain problematic for a number of reasons. Firstly, in many cultures - especially among less developed economies - smoking by women remains largely proscribed, with smoking prevalence often being confined to the small proportion of women who are culturally or economically elite.¹ In such countries adult consumption per head will grossly overestimate smoking by women, while correspondingly underestimating it among men. Ideally, we would like to provide two tables showing adult consumption per head for each of the sexes, but both space and the lack of the necessary data on smoking prevalence for many (especially less developed) countries preclude us from doing this.

Secondly, the data shown have been calculated from data published in the United States Department of Agriculture's *World Tobacco Situation*. "Domestic consumption" data published in this periodical are a product of total production plus imports, minus exports. However, domestic consumption calculated this way does not take into account stockpiling movements or smuggling. Stockpiling results in unknown quantities of cigarettes being both withheld and released on to domestic markets in any given year. Across several years, movements from stockpiling are evened out; however, for any one year stockpiling may distort apparent domestic consumption for particular countries.

Smuggling of cigarettes is known to be endemic in many poorer countries^{2,3} and smuggled cigarettes do not enter government records. The 1989 Euromonitor report describes smuggling as being at significant levels in Algeria, Nigeria, Pakistan, the Philippines, Romania, Uruguay, Tanzania ("substantial"), Zimbabwe ("flourishing"), and China ("massive").⁴ The data in our tables for these and probably many other less developed countries are thus likely to be underestimates of actual consumption.

Expressing cigarette consumption as *cigarettes* rather than as *grams of tobacco in cigarettes* can present a misleading picture of the actual level of tobacco being consumed in a country. Australia (table 3), for example, shows a 5% increase in adult cigarette consumption per head between 1986 and 1990. However, Australian cigarettes have been becoming progressively lighter for over a decade, corresponding to a marked trend to increase the number of cigarettes per pack. In 1991-2, only 4% of cigarettes were sold in packs of 20 in Australia (25s: 37%; 30s: 16.2%; 35s: 11.3%; 40s: 14.4%; 50s: 17.1%). The average weight of 1000 Australian cigarettes in 1982 was 823 g, while in 1991 they weighed 13% less (715 g). In contrast to *cigarette* consumption, adult cigarette consumption per head in *grams* in Australia fell by 4.9% between 1986 and 1990 (2087 g to 1985 g). Standardisation to grams can thus show quite different trends than when expressed as *cigarettes*.

Finally, the tables here show only cigarette consumption data. Overall, cigarette consumption accounts for 80% of world tobacco consumption.⁵ However, in some cases, the contribution of these forms of tobacco to total consumption is significant. Norway, for example, consumed 3500 tonnes of roll-your-own tobacco in 1990 out of a total of 5400 tonnes of total unmanufactured tobacco processed for domestic consumption into all forms of tobacco. *World Tobacco Situation* publishes international consumption data on cigars and cheroots (for 29 countries only), chewing tobacco (for six countries), snuff (four countries), and roll-your-own tobacco (22 countries). Those interested in trends in consumption of these forms of tobacco would do well to subscribe to the publication.

Summary: 1986-90

When 1986 and 1990 are taken as index years and population changes are adjusted for, mean

Department of
Community Medicine,
University of Sydney,
Westmead Hospital,
Westmead, New South
Wales 2145, Australia
S Chapman

Table 1 Changes in adult* cigarette consumption per head in Africa, 1986-90†

Country	Adult population 1986 (million)	Adult consumption of cigarettes 1986	Adult population 1990 (million)	Adult consumption of cigarettes 1990	Change 1986-90 (No (%))
Algeria	12.540	1555	14.391	1251	-304 (-20)
Angola	4.551	560	4.892	521	-39 (-7)
Benin	2.179	734	2.541	118	-616 (-84)
Cameroon	5.634	770	5.895	814	44 (6)
Chad	2.998	13	2.939	17	4 (31)
Congo	1.063	862	1.266	750	-112 (-13)
Côte D'Ivoire	5.456	729	6.160	686	-43 (-6)
Egypt	29.653	1563	34.178	1192	-371 (-24)
Ethiopia	23.191	82	27.375	91	9 (11)
Ghana	7.037	369	8.107	358	-11 (-3)
Guinea	3.612	26	4.140	24	-2 (-8)
Kenya	10.521	509	12.598	464	-45 (-9)
Liberia	1.651	256	1.948	217	-39 (-15)
Libya	2.146	2563	2.270	2423	-140 (-5)
Madagascar	5.678	449	6.341	402	-47 (-10)
Malawi	4.090	324	4.379	249	-75 (-23)
Mauritius	0.689	1807	0.801	1773	-34 (-2)
Morocco	13.405	1101	15.479	988	-113 (-10)
Mozambique	7.945	136	8.851	124	-12 (-9)
Niger	3.482	187	4.064	172	-15 (-8)
Nigeria	54.183	343	62.209	297	-46 (-13)
Senegal	3.603	641	4.106	572	-69 (-11)
Sierra Leone	2.104	654	2.365	634	-20 (-3)
South Africa	20.006	1475	22.653	1463	-12 (-1)
Sudan	12.491	123	13.802	112	-11 (-9)
Tanzania	12.311	309	13.834	282	-27 (-9)
Togo	1.612	868	1.855	809	-59 (-7)
Tunisia	4.575	1777	4.987	1558	-219 (-12)
Uganda	7.799	269	9.029	244	-25 (-9)
Zaire	17.058	229	19.099	269	40 (17)
Zambia	3.526	411	4.114	365	-46 (-11)
Zimbabwe	4.695	508	5.675	441	-67 (-13)
Overall mean	291.48	693.81	332.25	615	-78.81 (-9.03)

* Aged 15 and over; data on population obtained from United Nations, various years, from *Demographic Yearbook* (published in New York).

† Data on total domestic cigarette consumption obtained from US Department of Agriculture, Foreign Agriculture Service *World Tobacco Situation Supplement* 2-91, April 1991.

Table 2 Changes in adult* cigarette consumption per head in the Americas, 1986-90†

Country	Adult population 1986 (million)	Adult consumption of cigarettes 1986	Adult population 1990 (million)	Adult consumption of cigarettes 1990	Change 1986-90 (No (%))
Argentina	21.540	1861	22.638	1452	-409 (-22)
Barbados	0.162	1377	0.207	1063	-314 (-23)
Belize	0.123	1423	0.129	1357	-66 (-5)
Bolivia	3.678	326	3.774	318	-8 (-2)
Brazil	89.042	1897	101.853	1571	-326 (-17)
Canada	20.262	2728	20.935	2193	-535 (-20)
Chile	8.534	984	9.021	1120	136 (14)
Colombia	18.522	1870	20.890	1551	-319 (-17)
Costa Rica	1.616	1321	1.940	1046	-275 (-21)
Cuba	8.263	3510	8.575	3382	-128 (-4)
Dominican Republic	4.044	933	4.641	1009	76 (8)
Ecuador	5.771	780	6.463	696	-84 (-11)
El Salvador	2.643	798	3.127	627	-171 (-21)
Guatemala	4.454	252	5.022	346	94 (37)
Guyana	0.583	1029	0.559	1073	44 (4)
Haiti	3.592	251	3.900	231	-20 (-8)
Honduras	2.505	904	2.908	851	-53 (-6)
Jamaica	1.572	696	1.663	743	47 (7)
Mexico	49.687	942	53.782	938	-4 (0)
Netherland Antilles	0.147	1701	0.146	1712	11 (1)
Nicaragua	1.834	1309	1.940	1237	-72 (-6)
Panama	1.454	812	1.565	754	-58 (-7)
Paraguay	2.227	1141	2.744	1004	-137 (-12)
Peru	12.132	347	13.765	306	-41 (-12)
Suriname	0.303	1287	0.299	1304	17 (1)
Trinidad and Tobago	0.779	1630	0.888	1430	-200 (-12)
Uruguay	2.130	1849	2.876	1369	-480 (-12)
United States	189.438	3128	196.347	2605	-523 (-17)
Venezuela	10.967	1580	12.146	1096	-484 (-31)
Overall mean	468.00	1333	504.74	1186	-148 (-7)

* Aged 15 and over; data on population obtained from United Nations, various years, from *Demographic Yearbook* (published in New York).

† Data on total domestic cigarette consumption obtained from US Department of Agriculture, Foreign Agriculture Service *World Tobacco Situation Supplement* 2-91, April 1991.

Table 3 Changes in adult* cigarette consumption per head in Asia and Oceania, 1986-90†

Country	Adult population 1986 (million)	Adult consumption of cigarettes 1986	Adult population 1990 (million)	Adult consumption of cigarettes 1990	Change 1986-90 (No (%))
Afghanistan	9-988	140	10-968	155	15 (11)
Australia	12-424	2568	12-915	2703	135 (5)
Bangladesh	57-251	259	64-129	219	-40 (-15)
Brunei	0-164	4579	0-285	3158	-1421 (-31)
Cambodia	4-165	840	4-557	922	82 (10)
China	768-233	1684	811-955	2038	354 (21)
Fiji	0-540	1209	0-591	1105	-104 (-9)
Hong Kong	4-344	1409	4-524	1614	205 (15)
India	491-545	165	534-646	159	-6 (-4)
Indonesia	106-202	1089	120-902	1183	94 (9)
Iran	25-470	648	30-986	968	320 (49)
Iraq	8-809	1419	10-064	2593	1174 (83)
Israel	2-950	2381	3-031	2392	11 (0)
Japan	98-446	3136	100-243	3081	-55 (-2)
Jordan	2-358	1590	1-971	1725	135 (8)
North Korea	12-832	1169	14-136	1082	-87 (-7)
South Korea	30-573	2560	32-324	2895	335 (13)
Kuwait	1-169	2917	1-332	2541	-376 (-13)
Laos	2-081	553	2-252	533	-20 (-4)
Lebanon	1-534	3651	1-573	3560	-91 (-2)
Macau	0-351	5912	0-369	4734	-1178 (-20)
Malaysia	10-060	1839	10-608	1840	1 (0)
Myanmar	24-059	145	25-796	155	10 (7)
Nepal	9-789	143	10-913	128	-15 (-10)
New Zealand	2-306	2741	2-606	2406	-335 (-12)
Papua New Guinea	2-124	26	2-249	24	-2 (-8)
Pakistan	54-553	697	62-002	610	-87 (-12)
Philippines	34-048	1765	39-905	1738	-27 (-2)
Saudi Arabia	6-630	1961	9-203	1353	-608 (-31)
Singapore	1-962	2069	2-062	1649	-420 (-20)
Sri Lanka	10-918	471	11-542	446	-25 (-5)
Syria	5-574	1896	6-438	1078	-818 (-43)
Taiwan	13-881	2327	14-529	2302	-25 (-1)
Thailand	35-091	840	37-603	1045	205 (24)
Turkey	33-397	2116	36-697	2071	-45 (-2)
United Arab Emirates	0-968	5682	1-554	3218	-2464 (-43)
Vietnam	37-938	646	41-006	600	-46 (-7)
Western Samoa	0-089	1708	0-102	1500	-208 (-12)
Yemen	4-266	979	3-705	1215	236 (24)
Overall mean	1929-070	1742	2082-270	1609	-133 (-1)

* Aged 15 and over; data on population obtained from United Nations, various years, from *Demographic Yearbook* (published in New York).

† Data on total domestic cigarette consumption obtained from US Department of Agriculture, Foreign Agriculture Service *World Tobacco Situation* Supplement 2-91, April 1991.

Table 4 Changes in adult* cigarette consumption per head in Europe, 1986-90†

Country	Adult population 1986 (million)	Adult consumption of cigarettes 1986	Adult population 1990 (million)	Adult consumption of cigarettes 1990	Change 1986-90 (No (%))
Albania	1-956	1176	2-111	1279	103 (9)
Austria	6-178	2508	6-242	2262	-246 (-10)
Belgium-Luxemburg	8-402	1688	8-390	1692	4 (0)
Bulgaria	7-141	2586	7-236	1810	-776 (-30)
Cyprus	0-555	4505	0-590	4831	326 (7)
Czechoslovakia	11-909	2326	12-023	2196	-130 (-6)
Denmark	4-189	2039	4-296	1792	-247 (-12)
Finland	3-939	1832	4-012	1915	83 (5)
France	44-158	2142	44-783	2099	-43 (-2)
Former East Germany	14-328	2277	14-405	1923	-354 (-16)
Former West Germany	51-855	2348	52-283	2324	-24 (-1)
Greece	8-029	3599	8-104	3554	-45 (-1)
Hungary	8-495	3194	8-468	3177	-17 (-1)
Iceland	0-201	2736	0-206	2670	-66 (-2)
Ireland	2-333	2688	2-565	2417	-271 (-10)
Italy	47-557	2212	47-859	2081	-131 (-6)
Malta and Gozo	0-290	3448	0-315	3968	520 (15)
The Netherlands	11-479	1387	12-218	1220	-167 (-12)
Norway	3-384	773	3-406	830	57 (7)
Poland	28-079	3527	28-750	3061	-466 (-13)
Portugal	7-973	1713	8-287	1814	101 (6)
Romania	17-433	2051	17-799	1781	-270 (-13)
Spain	30-528	2517	31-343	2572	55 (2)
Sweden	6-923	1714	6-938	1702	-12 (-1)
Switzerland	5-387	2946	5-510	2886	-60 (-2)
United Kingdom	46-015	2086	46-266	1945	-141 (-7)
Former Soviet Union	208-587	2164	215-367	1685	-479 (-22)
Yugoslavia	16-897	3379	18-355	3062	-317 (-9)
Overall mean	604-20	2413	618-13	2305	-108 (-4)

* Aged 15 and over; data on population obtained from United Nations, various years, from *Demographic Yearbook* (published in New York).

† Data on total domestic cigarette consumption obtained from US Department of Agriculture, Foreign Agriculture Service *World Tobacco Situation* Supplement 2-91, April 1991.

Table 5 Adult cigarette consumption per head in 128 countries, 1990*

Cyprus	4831	Jordan	1725	Togo	809
Macau	4734	Netherland Antilles	1712	Panama	754
Malta and Gozo	3968	Sweden	1702	Congo	750
Lebanon	3560	Belgium-Luxemburg	1692	Jamaica	743
Greece	3554	Former Soviet Union	1685	Ecuador	696
Cuba	3382	Singapore	1649	Côte D'Ivoire	686
United Arab Emirates	3218	Hong Kong	1614	Sierra Leone	634
Hungary	3177	Brazil	1571	El Salvador	627
Brunei	3158	Tunisia	1558	Pakistan	610
Japan	3081	Colombia	1551	Vietnam	600
Yugoslavia	3062	Western Samoa	1500	Senegal	572
Poland	3061	South Africa	1463	Laos	533
South Korea	2895	Argentina	1452	Angola	521
Switzerland	2886	Trinidad and Tobago	1430	Kenya	464
Australia	2703	Uruguay	1369	Sri Lanka	446
Iceland	2670	Belize	1357	Zimbabwe	441
United States	2605	Saudi Arabia	1353	Madagascar	402
Iraq	2593	Suriname	1304	Zambia	365
Spain	2572	Albania	1279	Ghana	358
Kuwait	2541	Algeria	1251	Guatemala	346
Libya	2423	Nicaragua	1237	Bolivia	318
Ireland	2417	The Netherlands	1220	Peru	306
New Zealand	2406	Yemen	1215	Nigeria	297
Israel	2392	Egypt	1192	Tanzania	282
Former West Germany	2324	Indonesia	1183	Zaire	269
Taiwan	2302	Chile	1120	Malawi	249
Austria	2262	Fiji	1105	Uganda	244
Czechoslovakia	2196	Venezuela	1096	Haiti	231
Canada	2193	North Korea	1082	Bangladesh	219
France	2099	Syria	1078	Liberia	217
Italy	2081	Guyana	1073	Niger	172
Turkey	2071	Barbados	1063	India	159
China	2038	Costa Rica	1046	Myanmar	155
United Kingdom	1945	Thailand	1045	Afghanistan	155
Former East Germany	1923	Dominican Republic	1009	Nepal	128
Finland	1915	Paraguay	1004	Mozambique	124
Malaysia	1840	Morocco	988	Benin	118
Portugal	1814	Iran	968	Sudan	112
Bulgaria	1810	Mexico	938	Ethiopia	91
Denmark	1792	Cambodia	922	Papua New Guinea	24
Romania	1781	Honduras	851	Guinea	24
Mauritius	1773	Norway	830	Chad	17
Philippines	1738	Cameroon	814		

* See footnotes to tables 1-4.

adult consumption of cigarettes per head fell in 93 out of 128 countries (73%) for which data were available. It rose in 31 (24%) and remained unchanged in four. Countries with the largest proportional falls include those which have implemented robust and com-

prehensive tobacco control programmes such as Singapore and Canada (both a 20% reduction) and New Zealand and Sweden (both a 12% reduction). However, many countries have experienced plummeting domestic consumption against a background of little to no government control efforts. Many of these are some of the poorest nations on Earth, and the falls are probably a reflection of general economic factors in their economies,⁶ ironically a feature that while auguring well for continuing low rates of tobacco-caused disease will probably predict a continuation of the health epidemics of underdevelopment for many of these nations.

Among those which experienced substantial rises in consumption over the five years were China (21%), Thailand (24%), and South Korea (13%). Each of these countries have been host to aggressive marketing campaigns by transnational tobacco companies, although the same may be said for Taiwan, which recorded a small fall in population-adjusted consumption.

- 1 Waldron I, Bratelli G, Carriker L, Sung WC, Vogeli C, Waldman E. Gender differences in tobacco use in Africa, Asia, the Pacific, and Latin America. *Soc Sci Med* 1988; 27: 1269-75.
- 2 Sweeney J. On selling cigarettes to the Africans. *The Independent Magazine* 1988 Oct 29: 16. (United Kingdom.)
- 3 Nares P. Despite smuggled brands, sales of Colombian cigarettes rise. *Tobacco International* 1985; 187 (13): 47-8.
- 4 Euromonitor Consultancy. *The world market for tobacco: strategy 2000*. London: Euromonitor Consultancy, 1989.
- 5 Food and Agriculture Organisation of the United Nations. Tobacco: supply, demand and trade projections 1995 and 2000. FAO Economic and Social Development Paper 86, 1990: 14.
- 6 Chapman S, Lazarus R. Macro-economic and social indicators of adult per capita cigarette consumption in 124 countries: implications for tobacco control. Paper presented at 8th world conference on tobacco or health, Buenos Aires, Argentina, 30 March-3 April 1992.