Variations and increase in use of statins across Europe: data from administrative databases

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Coronary heart disease remains a major cause of death in most European countries.[1] Statins lower blood cholesterol concentration and reduce the relative risk of coronary events by about 30% in both primary and secondary prevention.[2] Statins are widely and increasingly used in most European countries, although data on the extent of this are not generally available.

Methods and results

As part of a wider study on drug use,[3] we collected data on statin use by total defined daily doses and then calculated doses per 1000 of the population covered (by the relevant data source) in 13 of the 15 European Union countries and in Norway for the year 2000. The data sources were the major publicly supported sources, mostly governmental or major insurance or sickness funds (see appendix 2 on bmj.com for details). These systems cover all or only part of a population, and only the publicly funded use (except Sweden, which includes both public and the small privately reimbursed use) in the community (except Norway, which includes use in small hospitals). For instance, the Irish data refer only to the population covered by the General Medical Services Scheme (the poorest third of the population, who are probably also at highest cardiovascular risk); for Germany, the Netherlands, France, and Portugal, the data refer to the population covered by Social Insurances (75-90% of the whole population, according to the country); "UK" data refer to England only (83% of UK population). For Austria and Belgium, only aggregated data on total use and expenditure were available.

Use of statins across Europe was extensive but variable (table). The widest use was in Norway, with over five times the per capita use than in Italy, which had the lowest use. The market leading drug varied between countries, but the most common were simvastatin and atorvastatin. Statin use rose rapidly in all the countries studied: the European average, weighted by population of each country reporting in that year, rose from 11.12 defined daily doses/1000 in 1997 to 41.80/1000 in 2002, an average 31% increase a year.

Comment

Our analysis shows enormous variation in statin use across Europe and a rapid increase in use. Variations in morbidity may explain some of the differences in use (such as between Italy and Britain) but not all (as between Norway and Denmark). We must consider other explanations, and these may lie in factors unique to each country: for example, differences between Norway and Denmark may reflect the involvement of Norwegian doctors in seminal trials, while in Denmark these drugs were only reimbursed from 1998 onwards and their use has lagged behind other countries. Low use in Italy may reflect low coronary morbidity or poor adherence of Italian patients to statins, worse than elsewhere in Europe.[4] Other differences may lie in national guidance and policies. These national figures also hide wide variations within countries.[5]

The rapid increase in use may be due to a growing awareness of the effectiveness of these drugs as their evidence base has expanded[2] or to government policies that have stressed more aggressive management of risk factors for ischaemic heart disease (such as in Britain). Some of the effect may be due to success-

P+ *Potential influences on results and supplementary data are on bmj.com*

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Use of different statins in European countries in 2000

Country	Simvastatin		Lovastatin		Pravastatin		Fluvastatin		Atorvastatin		Cerivastatin		All statins		Average annual increase in statin use 1997-2002 (%)‡
	Total use*	Rate use†	Total use*	Rate use†	Total use*	Rate use†	Total use*	Rate use†	Total use*	Rate use†	Total use*	Rate use†	Total use*	Rate use†	
Austria	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	64.96	21.94	37
Belgium	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	146.9	39.32	NK
Denmark	14.83	7.60	1.37	0.70	3.32	1.70	0.98	0.50	8.97	4.60	0.78	0.40	30.25	15.50	38
Finland	23.05	12.12	6.45	3.39	3.97	2.09	6.55	3.44	18.12	9.53	0.52	0.27	58.65	30.85	37
France	206.81	13.57	0.00	0.00	145.17	9.58	29.79	1.97	357.52	23.56	107.60	7.09	846.88	55.82	NK
Germany	144.10	5.54	31.20	1.20	55.90	2.15	41.30	1.59	299.70	11.52	116.20	4.47	688.40	26.47	26
Ireland	1.27	3.02	0.00	0.00	4.63	11.05	0.50	1.19	4.24	10.12	4.16	1.00	14.80	26.38	NK
Italy	132.51	6.29	0.00	0.00	41.18	1.96	5.15	0.24	93.84	4.46	37.04	1.79	309.72	14.74	52
Netherlands	115.30	22.13	0.00	0.00	32.58	6.25	7.94	1.53	96.87	16.72	3.60	0.69	256.29	47.28	27
Norway	48.70	29.79	1.80	1.10	9.40	5.75	0.70	0.43	34.41	21.05	1.91	1.17	96.91	59.28	28
Portugal	14.13	5.29	7.38	2.76	8.69	3.25	8.68	3.25	9.21	3.44	2.85	1.07	50.93	19.06	NK
Spain	101.83	6.89	37.88	2.56	57.36	3.88	9.00	0.61	111.81	7.56	42.59	2.88	360.30	24.13	31
Sweden	59.46	18.60	0.00	0.00	11.49	3.59	2.13	0.66	34.46	10.78	2.11	0.66	109.65	34.29	34
UK	178.03	9.72	0.00	0.00	48.52	2.65	12.02	0.66	172.01	9.39	26.47	1.44	437.03	23.86	48

NK=Not known. *Total use in million defined daily doses. †Rate use in defined daily doses/1000 of population covered/day.
‡Data available only for the following periods: Austria, Norway, Spain 1997-2001; Finland, Sweden 1998-2002; Italy 2002; Germany, Netherlands, UK 1997-2002.

ful marketing, particularly since the market leaders in many countries were drugs with no evidence of benefits in mortality at the time. This may also explain in part why the heaviest use was in France, which had relatively low cardiovascular mortality even before statins were available. Political, cultural, and social issues determine such use as well as medical indications. In view of the public health implications, these merit more specific study in each country.

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Prevalence of asthma and allergy in schoolchildren in Belmont, Australia: three cross sectional surveys over 20 years

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We have previously shown that the prevalence of asthma in Australian primary schoolchildren increased substantially between 1982 and 1992.[1] Similar increases have been reported in studies of children of different ages and from various geographical regions, spanning periods up to the mid-1990s.[2] It is not known whether this trend has continued during the late 1990s and early 2000s. We therefore conducted a third cross sectional study in the same population that was surveyed previously.[1] We report here on prevalence trends over the latter 10 year period.

Participants, methods, and results

We conducted all studies during June and July in primary schools in and around Belmont, a coastal suburb some 150 km north of Sydney, Australia. We invited all children in years 3, 4, and 5 (ages 8-11 years)

Changes in prevalence of atopy and asthma in primary school children, Belmont, New South Wales, Australia, 1982 to 2002. Values are numbers (percentages) unless otherwise indicated

	1982* (n=816)	1992† (n=1052)	2002† (n=1222)	1992 to 2002 Absolute % increase (95% CI‡)
Participants (response rate)	718 (88.0)	914 (86.9)	810 (66.3)	
Asthma diagnosed	65/718 (9.1)	348/909 (38.3)	249/804 (31.0)	–7.3% (–11.8% to –2.8%)
Recent use of asthma medicine	69/718 (9.6)	256/910 (28.1)	185/798 (23.2)	–4.9% (–9.0% to –0.8%)
Recent use of inhaled steroids	NA	112/910 (12.3)	59/591 (10.0)	–2.3% (–5.5% to 0.9%)
Wheeze in the past 12 months§	75/718 (10.4)	259/907 (28.6)	189/795 (23.7)	–4.9% (–9.1% to –0.7%)
No of attacks of wheeze in the past 12 months:				
< 4	57/718 (7.9)	106/905 (11.7)	80/783 (10.2)	–1.5% (–4.5% to 1.5%)
≥ 4	18/718 (2.5)	144/905 (15.9)	92/783 (11.8)	–4.1% (–7.4% to –0.8%)
Hay fever	147/718 (20.5)	310/908 (34.1)	309/804 (38.4)	4.3% (–0.3% to 8.9%)
Eczema	146/718 (20.3)	222/908 (24.4)	198/800 (24.8)	0.4% (–3.7% to 4.5%)
Parental asthma ever	129/718 (18.0)	248/891 (27.8)	218/571 (38.2)	10.4% (5.5% to 15.4%)
Skin prick test positive¶		356/906 (39.3)	216/597 (36.2)	–3.1% (–8.1% to 1.9%)
Airway hyperresponsiveness**				
All participants	65/718 (9.1)	180/891 (20.2)	108/550 (19.6)	–0.6% (–4.8% to 3.6%)
In non-atopic participants		40/540 (7.4)	35/353 (9.9)	2.5% (–1.3% to 6.3%)
In atopic participants		139/347 (40.1)	71/192 (37.0)	–3.1% (–11.7% to 5.7%)
Current asthma††	32/718 (4.5)	110/889 (12.4)	62/549 (11.3)	–1.1% (–4.5% to 2.3%)

NA=Not available.
*Data from[3] and relating to children aged 8-10 years only.
†Data for children aged 8-11 years in the 1992 and the current (2002) study.
‡Ranges that exclude zero are significant at the 5% level.
§Includes a positive response to either wheeze or exercise wheeze in the past 12 months.
¶Any allergen skin prick test mean wheal diameter ≥3 mm. 1982 data not presented because of methodological differences with 1992 and 2002 data.
**Provoking dose of histamine to cause a 20% fall in forced expiratory volume at 1 second <3.91 μmol.
††Recent wheeze and airway hyperresponsiveness.