

# Alcohol-Caused Deaths and Hospitalisations in Australia, 1990-1997.

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## Summary Points

During 1997, 3,290 Australians died from injury and disease caused by high-risk drinking<sup>1</sup>:

- ◆ 70% of these people were male and most of them died from either stroke, alcoholic liver cirrhosis, road injuries, suicide or alcohol dependence.
- ◆ On average, 19 years of life were lost for each person who died prematurely from an alcohol-caused condition.
- ◆ Younger people were more likely to die from bouts of intoxication, while older people were more likely to die from conditions related to long term alcohol misuse.
- ◆ Female alcohol-caused death rates decreased slowly but consistently between 1990 and 1997.
- ◆ Male rates declined rapidly between 1990 and 1993 but showed little evidence of decline in the following years.
- ◆ In South Australia, Western Australia and the Northern Territory, there were higher rates of alcohol-caused death in non-metropolitan regions than in the capital cities.
- ◆ Aboriginal populations had higher rates of alcohol-caused death than non-Aboriginal populations.

During 1996/97, high-risk drinking was responsible for 72,302 hospitalisations and 403,795 hospital bed-days in Australia:

- ◆ 70% of people attending hospital for an alcohol-caused condition were male and most hospitalisations were due to falls, alcohol dependence, assaults or road injuries.

**Introduction.** Alcohol is a major cause of death, injury and illness in Australian society. The annual cost of alcohol-caused problems in Australia has been estimated to be \$4,494 million – about 2.6 times the cost for illicit drugs<sup>2</sup>.

This is the first report of the National Alcohol Indicators Project (NAIP). The aim of NAIP is to monitor and report on trends in alcohol-related harm in Australia, at national, state and local levels. This report addresses national and state-wide trends in alcohol-caused deaths occurring between 1990-1997<sup>3</sup> and hospitalisations from 1993/94-1996/97<sup>4</sup> and updates previous estimates of alcohol-caused morbidity and mortality<sup>5</sup>. Future bulletins will report on; alcohol-related road injury, violence, *per capita* alcohol consumption and levels of high-risk alcohol consumption in the community. Each bulletin will be accompanied by a technical report (available on request) providing methods and results in greater detail.

## Method

**Calculation of death and hospitalisation rates attributable to high-risk (hazardous/harmful) drinking.** Some deaths and hospitalisations are entirely due to high-risk drinking (e.g. alcoholic liver cirrhosis). Other conditions are only partially caused by high-risk drinking (e.g. road accidents). The numbers of deaths/hospitalisations for each of the latter conditions were adjusted by specific "aetiologic fractions", which corresponded to the proportions of deaths/hospitalisations in the population caused by high-risk drinking. These aetiologic fractions were dependent on the prevalence of high-risk drinking in the population, which in turn was related to *per capita* consumption. The death and hospitalisation rates reported in this Bulletin apply to adults (15+ yrs) and were age-standardised for males and females separately (using the 1997 Australian population as the reference population).

**Chronic and Acute Conditions.** See Table 5 for a list of chronic and acute conditions. Those alcohol-related conditions listed as chronic are generally those which result from long term misuse of alcohol (e.g. alcoholic liver cirrhosis), while those listed as acute tend to result from a bout of intoxication (e.g. road injury). Suicide and stroke are listed separately as "mixed" conditions.

**Person-years of life lost.** (PYLL) is a measure of shortened life-span due to premature death. In keeping with English *et al.* (1995), PYLL were calculated for deaths occurring between the ages of 0 and 69 years.

**Metropolitan and non-metropolitan areas.** Capital cities within each state or territory were defined as "metro" with remaining areas defined as "non-metro".

**Aboriginality.** Death rates for 1991 to 1997 by Aboriginality, sex and metro/non-metro regions were calculated for South Australia, Western Australia and the Northern Territory. Necessary information on Aboriginality was not available for other jurisdictions.

**Australian trends.** Table 1 shows numbers (and rates) of alcohol-caused deaths in Australia between 1990 and 1997. Death rates were consistently higher for males than females. Declines in death rates were evident for both males and females, rates decreasing by 20% and 24% respectively over the whole period. For men, most of this decline occurred between 1990 and 1993. Non-alcohol-related deaths declined at a slower rate (15%) between 1990 and 1997.

**Table 1:** Per capita consumption (PCC) of pure alcohol (litres) and numbers and rates (per 10,000) of alcohol-caused deaths for males and females in Australia, 1990-1997.

Year	PCC <sup>6</sup>	Males (15+yrs)		Females (15+yrs)	
		N	Rate	N	Rate
1990	8.4	2560	4.01	1093	1.75
1991	8.0	2377	3.66	1059	1.64
1992	7.7	2351	3.57	985	1.49
1993	7.6	2134	3.19	971	1.44
1994	7.7	2247	3.30	1020	1.47
1995	7.6	2243	3.24	1012	1.43
1996	7.6	2294	3.25	985	1.36
1997	7.6	2269	3.15	986	1.33

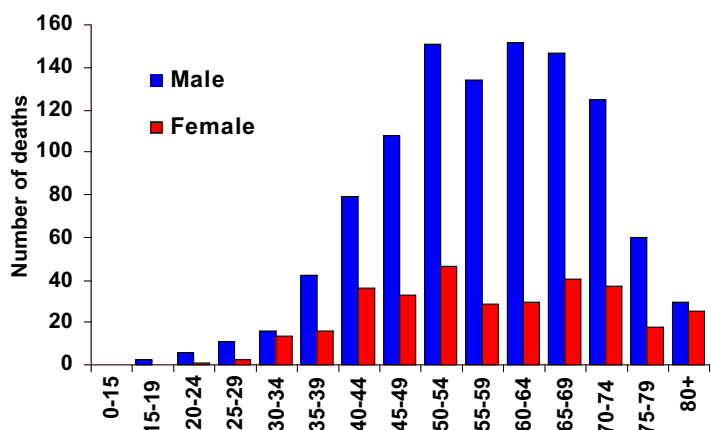
Data on Australian alcohol-caused hospitalisations are presented in Table 2 for the period 1993/94 to 1996/97. Among both sexes, the rate of admissions remained relatively stable, with a small increase evident for females (5.8%).

**Table 2:** Numbers and rates (per 10,000) of alcohol-caused hospitalisations for males and females in Australia, 1993/94-1996/97.

Year	Males (15+yrs)		Females (15+yrs)	
	N	Rate	N	Rate
93/94	46521	67.18	20263	28.61
94/95	46396	66.13	20688	28.81
95/96	48192	67.79	22003	30.17
96/97	48533	67.34	22399	30.26

**Age trends.** Deaths and hospitalisations from alcohol-caused conditions occurred among all age groups, but few people under 15 years of age died or were hospitalised as a result of high-risk alcohol consumption (1% of deaths; 2% of hospitalisations).

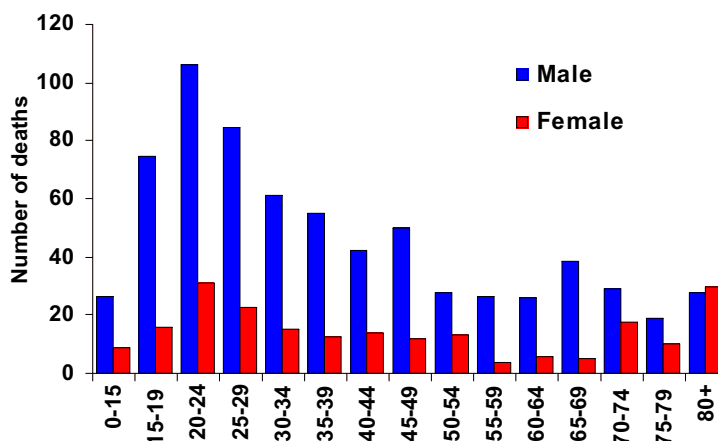
Figures 1 and 2 show the different age distributions of people dying from conditions generally associated with long-term alcohol misuse (chronic conditions) or intoxication (acute conditions), in 1997. Older people (40-74 years) were more likely to die from chronic conditions, and younger people (15-29 years) from acute conditions.



**Figure 1:** Age and sex distribution among deaths resulting from alcohol-caused chronic conditions, 1997.

Alcohol-caused suicide deaths were highest for males aged 20-29 years, and about 6.4 times higher for men than women.

Alcohol-caused stroke deaths were generally highest in older people (65 years and older), with 1.3 times more women dying than men.



**Figure 2:** Age and sex distribution among deaths resulting from alcohol-caused acute conditions, 1997.

**Geographic trends in alcohol-caused deaths.** The data presented in this section focuses on deaths wholly caused by alcohol<sup>7</sup>. Comparison of Tables 3 and 4 shows that in all states and territories men had a higher rate of death than women. All jurisdictions had similar patterns of alcohol-caused death with the exception of the NT, which had the highest death rate in the country - for both sexes and in every year. Hospitalisation rates among the states varied widely and were likely to have been strongly influenced by regional differences in bed availability, and management practices (see Technical report).

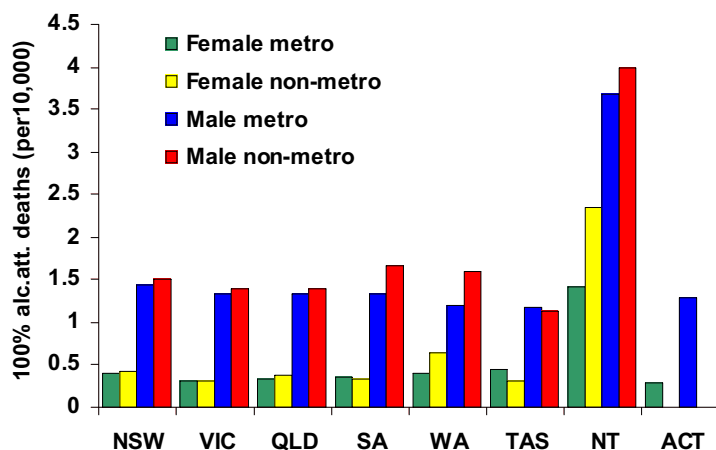
**Table 3:** State-wide death rates (per 10,000) due to wholly alcohol-caused conditions, males, 1990-1997.

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1990	1.85	1.65	1.49	1.26	1.30	1.01	3.56	1.28
1991	1.50	1.51	1.48	1.22	1.30	1.31	3.52	2.08
1992	1.44	1.81	1.48	1.66	1.37	0.98	4.47	1.43
1993	1.42	0.98	1.20	1.41	1.21	1.29	3.84	0.89
1994	1.42	1.34	1.27	1.50	1.23	0.89	2.23	1.32
1995	1.46	1.14	1.30	1.50	1.39	1.34	4.60	1.52
1996	1.38	1.19	1.40	1.42	1.27	1.09	3.84	1.12
1997	1.30	1.26	1.39	1.35	1.31	1.28	4.49	0.90

**Table 4:** State-wide death rates (per 10,000) due to wholly alcohol-caused conditions, females, 1990-1997.

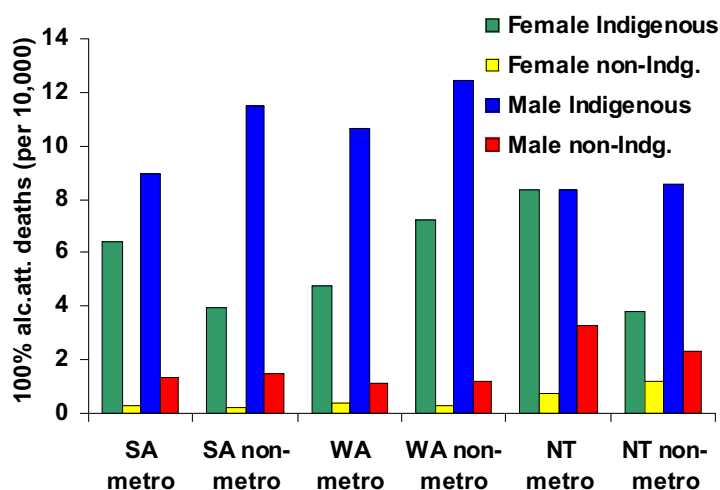
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
1990	0.48	0.36	0.38	0.39	0.50	0.26	3.00	0.39
1991	0.36	0.41	0.37	0.40	0.50	0.65	1.26	0.20
1992	0.42	0.26	0.35	0.22	0.41	0.38	1.44	0.00
1993	0.40	0.28	0.31	0.35	0.48	0.21	1.81	0.27
1994	0.39	0.30	0.33	0.46	0.57	0.37	1.26	0.50
1995	0.44	0.24	0.35	0.36	0.37	0.42	2.61	0.40
1996	0.32	0.28	0.39	0.36	0.52	0.36	1.21	0.12
1997	0.38	0.28	0.31	0.29	0.38	0.25	2.62	0.27

**Metropolitan and non-metropolitan regions.** Figure 3 shows the total death rate between 1990 and 1997, wholly caused by alcohol, for metro and non-metro areas of each state/territory. The death rates for men were generally higher in non-metro areas, especially in SA, WA and NT. For women, NT and WA non-metro death rates were notably higher than in the capital cities.



**Figure 3:** Overall death rates (per 10,000) due to wholly alcohol attributable conditions, by sex, state/territory, metro/non-metro, 1990-1997.

**Indigenous Australians.** Regardless of sex or region, there were markedly higher rates of wholly alcohol attributable deaths among Indigenous persons compared to the remainder of the Australian population. However, it should be noted that in some areas, especially the NT, overall alcohol-caused death rates were also high compared to the rest of the country (see Tables 3 & 4).



**Figure 4:** Overall death rates (per 10,000) due to wholly alcohol caused conditions for SA, WA and the NT, by sex, Aboriginality, metro/non-metro, 1991-1997.

**Summary statistics for alcohol-caused deaths and hospitalisations.** Table 5 provides a summary of the number of deaths, PYLL, hospitalisations and bed-days for all conditions attributable to high-risk drinking, using the most recent data available. The most common conditions resulting in alcohol-caused death included: alcoholic liver cirrhosis, alcohol dependence, road injuries, stroke and suicide. Alcohol-caused hospitalisations were most commonly the result of falls, alcohol-dependence, assaults and road injuries.

Comparing numbers of alcohol-caused deaths in 1992<sup>5</sup> with those in 1997, there appears to have been an overall decline. This has been particularly marked for male road injury victims. However, despite the large saving in road deaths, the overall average numbers of life-years lost to premature death (through high-risk drinking) have risen. Increases in premature loss of life-years were evident among most conditions, with road injury and aspiration being the major exceptions. Between previous and current estimates, there has been little overall change in the proportions of all deaths and prematurely lost years of life which were caused by alcohol.

**Note**

Methodological differences exist between the current report and previous studies<sup>5</sup>. In particular, current numbers of deaths/hospitalisations do not include elderly people (65+yrs) who suffered fall injuries<sup>8</sup>. Other studies have assumed that 34% of all falls, regardless of age, were caused by alcohol<sup>5</sup>. This difference is likely to have had a significant impact on morbidity/mortality summary estimates for falls and any inclusive totals.

Additionally, English *et al.* (1995) used 1989/90 levels of high-risk alcohol consumption to estimate aetiologic fractions for 1992<sup>5</sup>. Since then however, it has become evident that between 1989 and 1992 there was a substantial decline in alcohol consumption. It is therefore likely that earlier estimates of numbers of deaths and hospitalisations for 1992 were somewhat overestimated.

**Acknowledgments.** The authors note that this report relied heavily on the use of aetiologic fraction estimates in English *et al.* (1995)<sup>5</sup>. We also gratefully acknowledge the assistance of Dr Jim Codde, Director of Epidemiology and Analytical Services at the Health Department of Western Australia, for his assistance in calculating PYLL and the use of the Rates Calculator<sup>9</sup>.

<sup>1</sup> An average of > 4 standard drinks per day for men and > 2 per day for women, National Health and Medical Research Council. (1992) Is there a safe level of daily consumption of alcohol for men and women? *Recommendations Regarding Responsible Drinking Behaviour*, Canberra, AGPS.

<sup>2</sup> Collins, D.J. & Lapsley, H.M. (1996) *The social cost of drug abuse in Australia in 1988 and 1992*, Commonwealth Department of Human Services and Health, Australian Government Publishing Service.

<sup>3</sup> Sourced from the Australian Bureau of Statistics.

<sup>4</sup> Sourced from the Australian Institute of Health and Welfare.

<sup>5</sup> English, D.R., Holman, C.D.J, Milne, E., Winter, M.G., Hulse, G.K., Codde, J.P., Bower, C.I., Corti, B., De Klerk, N., Knuiman, M.W., Kurinczuk, J.J., Lewin, G.F. & Ryan, G.A. (1995) *The Quantification of drug caused morbidity and mortality in Australia, 1995 edition*. Commonwealth Department of Human Services and Health, Canberra.

<sup>6</sup> Sourced from: World Drink Trends. (1998) *International Beverage Consumption and Production Trends*. Henly-on-Thames: NTC Publications LTD.

<sup>7</sup> Suitable *per capita* consumption data were not available for all jurisdictions (SA, Tas, and ACT), it was therefore not possible to calculate year and state specific aetiologic fractions for conditions partially caused by alcohol.

<sup>8</sup> Jonas, H., Dietze, P., Rumbold, G., Hanlin, K., Cvetkovski, S., & Laslett, A. (1999). Associations between alcohol-related hospital admissions and alcohol consumption in Victoria, Australia: Influence of sociodemographic factors. *Australian and New Zealand Journal of Public Health*, 23(3), 272-280.

<sup>9</sup> Codde, J. (1999) *Rates Calculator software*. Epidemiology and analytical services, Western Australian Health Department.

**Table 5:** Estimated number of Australian deaths<sup>a</sup> (all ages), person-years of life lost<sup>a</sup>, hospitalisations<sup>b</sup> and bed-days<sup>b</sup> caused by hazardous and harmful alcohol consumption in 1997, 1996/97 by condition, acute/chronic/mixed and sex (*English et al. (1995) estimates for 1992 deaths and PYLL in parentheses<sup>c</sup>*).

Condition <sup>c</sup>	Males				Females			
	Deaths	PYLL <sup>d</sup>	Hosp.	Bed-days	Deaths	PYLL <sup>d</sup>	Hosp.	Bed-days
<b>Acute</b>								
Falls <sup>e</sup>	35 (153)	992 (1053)	8378	32699	6 (172)	145 (239)	5147	24149
Assault	84 (88)	2919 (2502)	6505	19921	40 (50)	1462 (1678)	2049	5961
Road injuries	343 (429)	13751 (15884)	6108	36651	75 (89)	3423 (3799)	1681	8346
Occup. and mach.Inj.	4 (5)	127 (110)	1301	2866	0 (0)	3 (6)	303	817
Fire injuries	24 (32)	446 (474)	568	4005	11 (18)	203 (138)	178	1823
Drowning	61 (58)	1909 (1630)	64	199	12 (17)	325 (417)	29	65
Child abuse	0 (0)	10 (11)	35	161	0 (1)	31 (43)	37	185
<b>Alcohol abuse</b>	10 (12)	309 (367)	2596	6388	3 (3)	96 (28)	1576	4184
<b>Alcoholic psychosis</b>	40 (36)	358 (135)	2457	40951	11 (5)	35 (28)	669	7387
<b>Alcoholic gastritis</b>	2 (2)	44 (2)	856	2070	2 (1)	40 (2)	250	536
<b>Aspiration</b>	34 (56)	498 (722)	285	1189	23 (26)	116 (214)	234	1030
<b>Ethanol toxicity</b>	30 (0)	1118 (0)	10	20	7 (0)	301 (0)	27	73
<b>Alc. beverage. pois.</b>	0 (7)	0 (169)	274	581	0 (0)	0 (0)	194	343
<b>Othe. eth./meth.ps.</b>	2 (0)	87 (0)	44	116	0 (0)	0 (0)	22	63
Acute pancreatitis	20 (18)	126 (125)	886	5939	18 (18)	57 (70)	525	3877
Gastro-oesoph. haem.	1 (1)	0 (0)	366	994	0 (0)	0 (0)	197	572
Supr. card. dysrhyth.	5 (4)	22 (12)	629	1672	9 (7)	5 (3)	388	1389
Spontaneous abortion	0 (0)	0 (0)	0	0	0 (0)	0 (0)	6	8
Low birthweight	0 (0)	1 (0)	3	55	0 (0)	1 (0)	5	57
<b>Methanol toxicity</b>	0 (0)	0 (0)	0	0	0 (0)	0 (0)	0	0
<i>Sub-total</i>	<i>695</i> <i>(901)</i>	<i>22743</i> <i>(23196)</i>	<i>31366</i>	<i>156476</i>	<i>218</i> <i>(407)</i>	<i>6246</i> <i>(6665)</i>	<i>13517</i>	<i>60865</i>
<b>Chronic</b>								
<b>Alc. liver cirrhosis</b>	539 (572)	8313 (6719)	2468	18887	144 (148)	2795 (1823)	754	6767
<b>Alcohol dependence</b>	204 (159)	3300 (2086)	9054	59279	53 (26)	1035 (339)	3989	26015
<b>Alc. poly neuropathy</b>	0 (0)	0 (0)	23	171	0 (0)	0 (0)	9	69
<b>Alc. cardiomyopathy</b>	98 (136)	1343 (1309)	132	822	11 (12)	138 (118)	14	51
Female breast cancer	0 (0)	0 (0)	0	0	51 (54)	715 (579)	371	1810
Epilepsy	19 (17)	509 (399)	995	3488	12 (10)	285 (172)	735	2965
Hypertension	19 (19)	167 (83)	211	836	19 (19)	49 (38)	206	1000
Oesophageal varices	2 (1)	28 (5)	339	843	0 (0)	0 (0)	134	362
Chronic pancreatitis	8 (10)	107 (87)	1054	5470	5 (2)	44 (0)	462	2907
Cholelithiasis	-1 (-1)	-4 (-7)	-465	-1714	0 (-1)	-2 (-4)	-653	-2070
Oropharyn.cancer	48 (59)	576 (480)	348	3295	7 (8)	61 (49)	47	413
Oesophageal cancer	46 (47)	485 (343)	185	1364	8 (10)	47 (37)	40	306
Laryngeal cancer	28 (35)	280 (228)	167	1338	3 (3)	20 (14)	15	147
Liver cancer	50 (44)	540 (339)	128	875	15 (13)	119 (76)	33	283
Psoriasis	0 (0)	0 (0)	31	94	0 (0)	0 (0)	9	28
<i>Sub-total</i>	<i>1061</i> <i>(1098)</i>	<i>15675</i> <i>(12071)</i>	<i>14670</i>	<i>95049</i>	<i>328</i> <i>(304)</i>	<i>5309</i> <i>(3241)</i>	<i>6165</i>	<i>41052</i>
<b>Mixed</b>								
Stroke	312 (313)	2236 (1473)	2440	21122	414 (397)	1783 (1425)	2276	22125
Suicide	228 (208)	7836 (6249)	1023	3993	36 (33)	1149 (916)	845	3112
<i>Sub-total</i>	<i>540</i> <i>(521)</i>	<i>10076</i> <i>(7722)</i>	<i>3463</i>	<i>25115</i>	<i>449</i> <i>(430)</i>	<i>2933</i> <i>(2341)</i>	<i>3122</i>	<i>25238</i>
<b>TOTAL</b>	<b>2296</b> <b>(2521)</b>	<b>48661</b> <b>(43183)</b>	<b>49499</b> <b>(45600)</b>	<b>276640</b> <b>(443834)</b>	<b>994</b> <b>(1139)</b>	<b>14503</b> <b>(12267)</b>	<b>22803</b> <b>(25993)</b>	<b>127155</b> <b>(287335)</b>
<i>Total conditions</i>	<i>67752</i> <i>(66108)</i>	<i>587348</i> <i>(494234)</i>	<i>2534594</i> <i>(1280801)</i>	<i>10521934</i> <i>(7268371)</i>	<i>61598</i> <i>(57543)</i>	<i>321548</i> <i>(264683)</i>	<i>2984975</i> <i>(1632737)</i>	<i>12533289</i> <i>(9271764)</i>
<i>% caused by alcohol</i>	<i>3.4 (3.8)</i>	<i>8.3 (8.7)</i>	<i>2.0 (3.5)</i>	<i>2.6 (6.1)</i>	<i>1.6 (2.0)</i>	<i>4.5(4.6)</i>	<i>0.76 (1.6)</i>	<i>1.01 (3.1)</i>
<i>Average number of years lost per death</i>		<i>21 (17)</i>				<i>15 (11)</i>		

<sup>a</sup>mortality data, 1997, <sup>b</sup>morbidity data, 1996/97. <sup>c</sup>Wholly alcohol-caused conditions in bold green font. <sup>d</sup>PYLL including deaths occurring between age 0 and age 69 years. <sup>e</sup>See note inset on pp.3. Note: small numerical inconsistencies due to rounding errors.

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