

Trends in suicide by method in England and Wales, 1979 to 2001

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INTRODUCTION

A recently published article in *Health Statistics Quarterly 19*¹ found that mortality had increased in young adults during the 1990s, contrary to the trend seen in other age groups. In 1998 suicide deaths in young adult males reached a peak (accounted for approximately a fifth of all young adult male deaths). The Government has put several health strategies in place to reduce deaths in young adults, which includes a Suicide Prevention Strategy² target of reducing suicide deaths in all ages by a fifth by 2010. This article takes a more in-depth look at trends in suicide among young adults and also examines suicide trends by method for older age groups.

This article updates and extends previous work³ that investigated the trends in suicide in England and Wales. We have used population estimates (published in March 2003) that were revised on the basis of the 2001 Census results and have extended previous analyses to 2001. In addition, we have examined trends in suicide by the method of injury taken from textual information on death certificates in some cases.

As the Tenth Revision of the International Classification of Diseases (ICD-10) was introduced in 2001 for mortality data in England and Wales, we have also examined the impact of this on data available to examine trends in suicide. This is the most radical change in the ICD within the last 50 years. ONS has developed webpages documenting the effect that ICD-10 has had on mortality statistics for England and Wales and has produced several articles and reports⁴⁻⁶ including a recently published article documenting changes in injury and poisoning deaths.⁷ The main change between these two revisions for suicide is that the fourth digit of ICD-10 now classifies place of occurrence of the event. This is useful but means that some detail on specific methods of injury

This article examines trends in suicide by method in England and Wales for 1979 to 2001. It updates previous analyses with population estimates revised following the 2001 Census and extends analyses to 2001. The article also examines the impact of the introduction of ICD-10 on analysis of trends in suicide by method and, for the first time, uses textual information from death certificates to look in more detail at particular methods of suicide.

have been lost. In this article we have examined whether it is possible to categorise these methods by investigating the cause of death and coroner's text on the death records.

DATA AND METHODS

In this analysis 'suicide' has been defined as deaths where the coroner has given a verdict of suicide or where an open verdict was reached in a death from injury and poisoning. Open verdicts accounted for an average of a quarter of male and a third of female suicide deaths from 1979 to 2001, although this figure had risen slightly over this period and in 2001 stood at 28 per cent for men and 38 per cent for women. Except in children, it is thought that most open verdicts are cases where the harm was self-inflicted but there was insufficient evidence to prove that the deceased deliberately intended to kill themselves.⁸ In this analysis we have excluded all deaths assigned to code ICD-9 E988.8 and ICD-10 Y33.9 where the verdict was still pending investigation, as these codes are used in England and Wales in cases where a coroner adjourns an inquest awaiting prosecution of a third party in a higher court. The coroner is able to register these deaths before legal proceedings have been completed (accelerated registration).⁹ As a large proportion of these cases are subsequently found to be homicides, these deaths were not included in this analysis as their inclusion would present a misleading picture of suicide trends. There were an average of 230 male and 110 female deaths each year from 1979 to 2001 coded to these codes that were excluded from this analysis.

Suicide data for children are not comparable to those for adults due to the high number of open verdicts compared to suicide verdicts that are recorded in these cases. These open verdicts cannot be considered suicides in the way that they are for adults. Therefore, although a section has been included on child suicide, the data are not comparable to the rest of the article which concentrates on suicide mortality in persons aged 15 and over.

As suicide deaths are coded using the coroner's verdict, the total numbers of deaths per year are comparable between ICD-9 and ICD-10. However, there are several changes within the classification by method of injury between ICD-9 and ICD-10. These mainly concern 4th digit definitions. In ICD-9 the 4th digit was used as a more detailed classification for method of injury. In ICD-10, however, the 4th digit has been used to code place of occurrence of event.

This means that a more detailed classification cannot be attained by using ICD codes alone for certain methods of suicide in ICD-10. An example of this is ICD-9 E952.0 – Self-inflicted injury by poisoning by other gases and vapours, motor vehicle exhaust gas. In ICD-10 the comparable code is X67 – Intentional self-harm by other gases and vapours. This code contains carbon monoxide, tear gas, nitrogen oxide, sulphur dioxide, and utility gas as well as motor vehicle exhaust gas. In this case the poison can be identified using nature of injury code ICD-10 T58 – Toxic effect of carbon monoxide, but the source of the poison can not, eg domestic supply, motor vehicle exhaust gas, etc. This is also the case for hanging (ICD-9 E953.0) and suffocation by plastic bag (ICD-9 E953.1) where the comparable ICD-10 code is X70 – 'Hanging, strangulation and suffocation'. The nature of injury code ICD-10 T71 – Asphyxiation, is of no use here as there is no differentiation between the source of the mechanical threat to breathing or suffocation. Since 1993, the text from death certificates, including information from the coroner, has been stored electronically. In this analysis we have therefore used this information to examine whether consistency across ICD Revisions for these two methods of suicide can be achieved.

There has also been considerable interest in suicide deaths from 'tracked vehicles', including railway and underground trains. In both ICD-9 and ICD-10 a definition for self-inflicted or undetermined injury incurred by or from trains did not exist – they were included in the wider definition of 'Jumping or lying before moving object' (ICD-9 E958.0; ICD-10 X81) and 'Electrocution' (ICD-9 E958.4; ICD-10 X83). Using the electronic text information held by ONS, these data have been analysed to look for mentions of these forms of transport. Text was also checked for mention of tracked vehicles in ICD-9 E958.8 and ICD-10 X82 – crashing of motor vehicle.

The relevant ICD codes for open verdicts were also examined in this way. Annex 1 shows the ICD codes, for both the Ninth and Tenth Revisions, used in this analysis.

The mortality rates examined in this article were calculated using the latest revised population estimates for England and Wales. These revised population estimates have affected the mortality rates of young men and elderly women. The impact of this on suicide mortality rates is shown in Box 1.

Most of the rates that appear in this article have been directly age-standardised. Directly age-standardised rates make allowances for differences in the age structure of the population, over time and between sexes. The age-standardised rate (ASR) for a particular disease is that which would have occurred if the observed age-specific rates (ie (deaths in age-group/mid-year population in age group)* 100,000) for the disease had applied in a given standard population, in this case the European Standard Population. This is a hypothetical population standard, which is the same for both males and females, allowing standardised rates to be compared for each sex over time, or between places, and between males and females.

DATA QUALITY

ONS uses the ICD to code suicide deaths based on a coroner's verdict. For the coroner to reach a suicide verdict he/she requires proof beyond reasonable doubt of the intention to end life, not just that the death occurred as a result of the actions taken by the person who died. This proof is often hard to establish, since there may often be a possibility that the individual took the action leading to the death as a sign of acute distress and a signal for help. This, taken with the wish of many coroners to avoid adding to the family's distress, means that the outcomes of coroner's inquests understate the scale of suicide. For this reason, ONS routinely includes open verdicts in deaths from injury and poisoning within its definition of suicide, although some of these cases may be the result of accidents or abuse. Others have suggested that some accidental death verdicts should also be counted as suicide.¹¹ In this analysis, however, we have classified suicide as deaths from injury and poisoning with a suicide or an open verdict.

Suicide data used in this article are for deaths registered during the calendar year from 1979 to 1992, and for deaths occurring in the calendar year from 1993 onwards. From 1993, ONS annual mortality statistics changed to an occurrence basis to make it easier to analyse changes over time. By law a death should be registered 'before the expiration of five days from the date of the death'¹² unless it has been reported to the coroner. All deaths for which a verdict of suicide (or an open verdict) was reached would have been subject to a coroner's inquest. In the case of violent deaths, however, where a coroner needs to hold an inquest before reaching a verdict, this is almost impossible. Previous analysis has shown that a large proportion (71 per cent) of suicide deaths are

Box one

The effect of the revised population estimates on mortality rates for adults in England and Wales

The 2001 Census results showed that previous mid-year population estimates (MYEs) for England and Wales were overestimates of the population. MYEs based on the 2001 Census were published in September 2002 and figures for the years 1982 to 2000 were rebased using the 2001 Census data and released in March 2003. The main groups affected by these revisions were young men and elderly women.¹⁰ The analysis in this article is based entirely on the 2001 Census rebased MYEs. The MYEs for 2001 have since been revised (in September 2003). The revision mainly affects young men aged 25 to 34. Revised MYEs for 1992 to 2000 are to be released after this article goes to publication.

Figure A shows age-standardised suicide[†] mortality rates for young adult men aged 15–44 in England and Wales from 1979 to 2001. The rate has been calculated using the original MYEs based on the 1991 Census, the revised MYEs based on the 2001 Census, and an age-standardised rate has been calculated using the September 2003 revision to the 2001 MYEs. When a similar figure was calculated for women and elderly adults the effect on the age-standardised mortality rate was minimal.

Table A below shows age-standardised rates for young adult men aged 15–44 for the year 2001 using both the original and revised MYEs for 2001 for all causes of death and for suicide.

† See Annex 1 for definition of suicide.

Figure A Age-standardised rate for suicide, men aged 15–44, using original and revised population estimates, 1979–2001

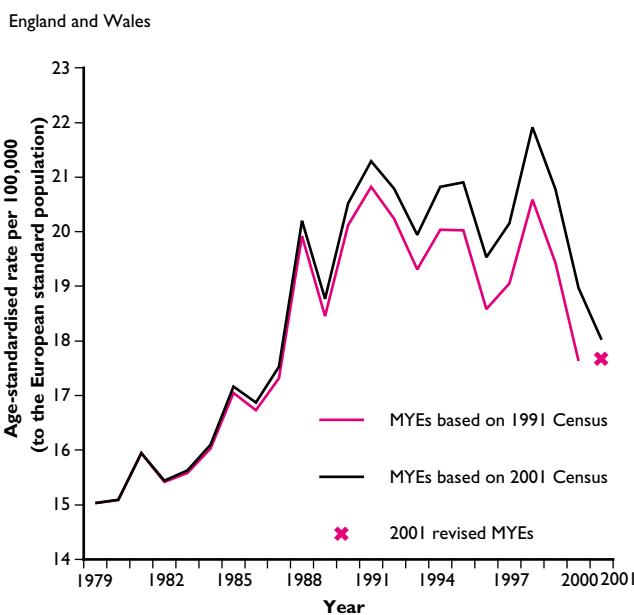


Table A Age-standardised mortality rate in young adult men aged 15–44 using the original and revised population estimates, 2001

	Rate per 100,000 population*	
	All causes	Suicide
Original 2001 population estimates	108.57	18.02
Revised 2001 population estimates	106.92	17.68
Percentage difference	-1.52	-1.89

* Age-standardised to the European standard population.

registered within 3 months of the death occurring,¹³ ONS therefore extracts a dataset based on date of occurrence of death roughly 9 months after the end of the year, by which time 98 per cent of suicides occurring in the year have been registered.

In 1993 a revised coroner’s reporting form was introduced (Form 99(REV)). The form, for deaths certified after inquest, contains a section (Part V) which asks the coroner to list the details of how an ‘accident’ happened.¹⁴ It is not compulsory for the coroner to complete this part of the form and they are only asked to do so for accidents. However, some coroner’s provide additional information for suicides. These details, along with any text entered into the cause of death section of the form, have been stored electronically by ONS since this time and have been used in this analysis to examine whether more detailed methods of injury could be obtained. As it is not compulsory for the coroner to complete Part V of the form any results obtained in this way will be incomplete.

RESULTS

Trends by sex and age

As previous research has shown that suicide and attempted suicide among children is primarily a problem in older teenagers³ our analysis does not cover the age group 0–9. We have classified persons aged 15 and over as adults so that comparisons can be made with previous analysis of young adult mortality trends.¹ Although suicide accounted for less than 1 per cent of deaths at all ages in 2001 it accounted for 14 per cent of all deaths in young adults aged 15–44.

Children aged 10–14

There were no suicide verdicts recorded during the period covered for children under the age of 11 but in Table 1 we have included children aged 10 to be consistent with previous analysis.³ There are more undetermined deaths than suicide deaths at all ages in children and

there are on average two and a half times the number of male deaths to female deaths although this decreases with age. It is not possible to ascertain from ONS records how many of these undetermined deaths are really suicides that could not be confirmed and how many were caused by unverifiable abuse, neglect, or accidents. These verdicts combined accounted for just over 2 per cent of all deaths in children aged 10–14 during this period. Over two thirds of male deaths with a suicide or open verdict were from ‘hanging, strangulation or suffocation’ whereas this method accounted for a third of suicide and a fifth of open verdicts in females. Poisoning accounted for almost half of all suicide and over half of all open verdicts in females but less than 12 per cent of suicides and 4 per cent of open verdicts in males. Other research has found no indication of a major change in suicide rates in children aged 10-14.¹⁵

Adults aged 15 and over

In adults, when suicide is examined by sex it can be seen that more men commit suicide than women and that this gap had widened. In 1979 there were roughly 1.6 suicide deaths in men for every suicide death in women. By 2001 this had increased to 3.5 male deaths to one female death. This

is also seen in open verdicts where there were 1.2 male deaths to every female death in 1979 but this had increased to 2.2 male deaths to each female death in 2001. Figure 1 shows the age-standardised rate for both suicide and open verdicts by sex from 1979 to 2001. Suicide deaths in women had fallen by half from 1979 to the mid-1990s but then levelled off whereas open verdicts started to slowly decline from the mid-1980s. Suicide deaths in men, however, rose throughout the 1980s by almost 20 per cent. From this time they declined steadily and in 2001 stood at just under what they were in 1979. This increase during the 1980s was also seen in deaths with an open verdict but a decline was not seen during the 1990s.

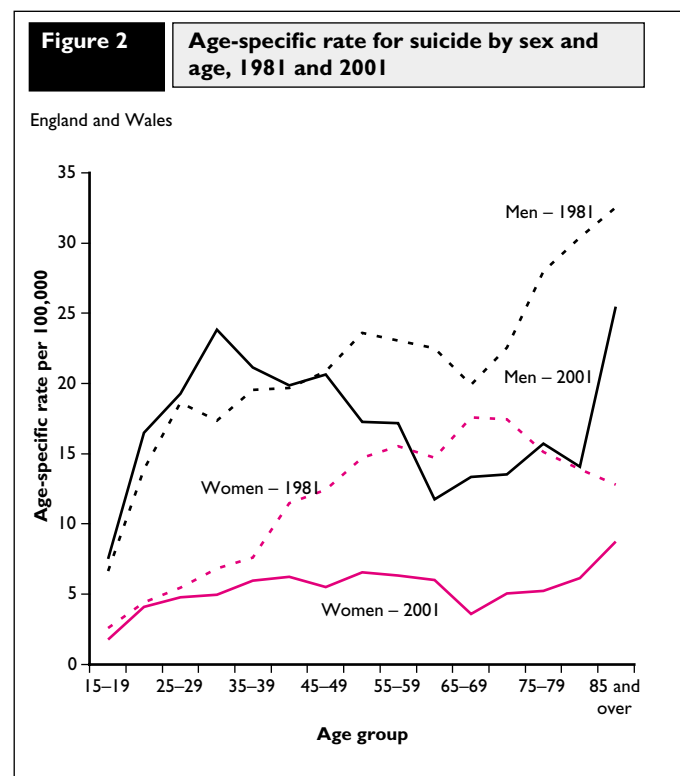
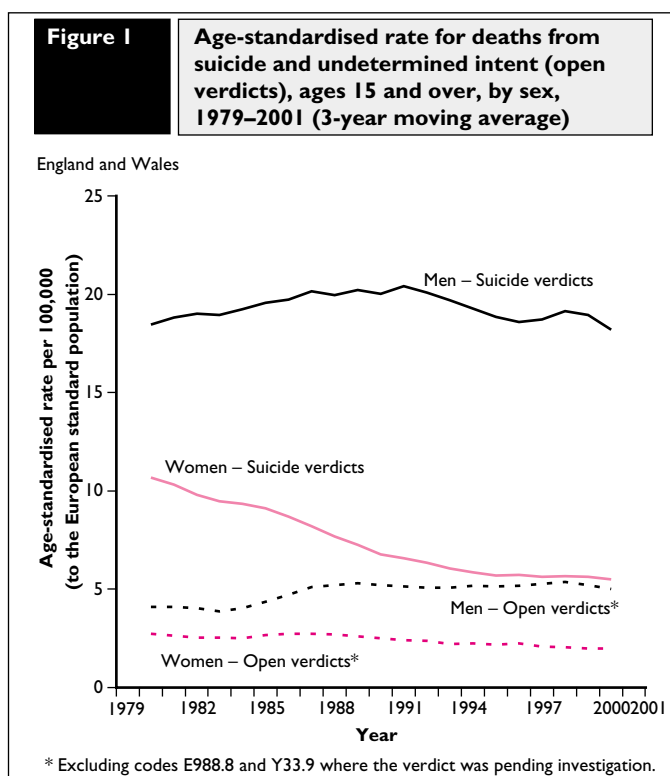
The term ‘suicide’ is used in the remainder of this article to refer to suicide and open verdicts combined. Open verdicts accounted for 28 and 38 per cent of all suicide deaths in 2001 for men and women respectively, compared with 23 and 28 per cent respectively in 1979.

Figure 2 shows age-specific mortality rates by sex and age group from suicide for 1981 and 2001. It can be seen that in 1981 men had a higher

Table 1 Number of suicides and undetermined intent deaths (open verdicts) by sex, ages 10–14, 1979–2001

		Age						Percentage by method		
		10	11	12	13	14	10–14	Hanging*	Poisoning†	Other methods
Males	Suicide verdict	0	3	5	14	38	60	70.0	11.7	18.3
	Open verdict	14	16	26	44	68	168	68.5	4.2	27.3
Females	Suicide verdict	0	0	1	15	21	37	35.1	40.5	24.4
	Open verdict	3	5	12	12	33	65	21.5	58.5	20.0

* Hanging, strangulation and suffocation.
 † Poisoning by solid or liquid substance.



mortality rate from age 50 onwards than they did in 2001, whereas for men aged 15–44 the mortality rate was higher in 2001 than in 1981. Women, however, had a higher suicide rate in 1981 than in 2001 at all ages. Among older men, suicide rates generally increased with age in 1981 (although there was a slight decrease between ages 50 to 69). In 2001, male suicide rates by age rose to a peak at ages 30–34, then decreased with age until age 64 after which they again rose with age. Although the rates in older adult women decreased with age from age 65 in 1981 this pattern was reversed in 2001 when the suicide rate increased with age above age 65.

Figure 3 shows age standardised suicide rates by sex and age group from 1979 to 2001. The age groups 15–44, 45–74 and 75 and over have been used to facilitate comparisons with previous analysis into mortality trends in young adults.¹ In this article those aged 15 to 44 will be referred to as young adults, those aged 45–74 as older adults and those aged 75 and over as the elderly. It can be seen that suicide rates in young adult men aged 15–44 increased throughout the 1980s whereas rates were stabilising or falling for older adults during this period. Since the late 1990s, young adult men have had the highest suicide rate of all age groups and this age group accounted for 56 per cent of all suicide deaths in men in 2001 (60 per cent at a peak in 1998). In women suicide rates have been falling in all age groups but have stopped declining since the late 1990s. However, suicide in young adult women accounted for nearly a half of all women's suicide deaths from the late 1990s.

Trends by method of suicide

The likelihood of committing suicide will depend to some extent on the ease of access to, and knowledge of, effective means.³ Figure 4 shows the age-standardised suicide rate by sex for the 4 most common methods of injury from 1979 to 2001 in adults.

The three main methods of suicide in men during this period in order of magnitude were 'hanging, strangulation and suffocation'; drug poisoning; and 'other poisoning' (which was mainly comprised of motor vehicle exhaust gas). 'Hanging, strangulation and suffocation' had been the most common method of suicide since the 1980s although 'other poisoning' briefly became the most common method during the early 1990s. 'Hanging, strangulation and suffocation' as a method of suicide

in men increased dramatically during the 1990s and accounted for almost half of all suicide deaths in men from 1998 onwards. Suicide from drug poisoning fell by almost a third between 1979 and the mid-1980s, but then stopped declining and averaged around 3.7 deaths per 100,000 from 1990 onwards. Drug poisoning accounted for a fifth of all suicide deaths in men in 2001. 'Other poisoning' deaths increased dramatically during the 1980s and then just as dramatically declined during the 1990s. This coincides with legislation from January 1993 onwards which required all new petrol vehicles to be fitted with catalytic converters, which reduce carbon monoxide emissions, and the reduction in the carbon monoxide content of the domestic gas supply.³ At its peak in the early 1990s 'other poisoning' accounted for almost a third of suicide deaths in men, but by 2001 this method accounted for only 10 per cent.

In contrast, drug poisoning was the most common method of suicide in women, followed by 'hanging, strangulation and suffocation', and drowning, although from 1990 to 1997 suicide rates from 'other poisoning' replaced drowning to become the third most common method. Drug poisoning accounted for approximately half of all suicide deaths throughout the period covered. Although the drug poisoning suicide rate fell by almost half during the 1980s this decline slowed and the rate only fell by 12 per cent during the 1990s. Suicide from 'hanging, strangulation and suffocation' fell from the mid-1980s to the mid-1990s but then saw an increase of over 50 per cent into the new century and accounted for a quarter of all suicide deaths in women in 2001. Suicide deaths due to drowning saw a steady decline throughout the 1980s and 1990s with the rate falling by 75 per cent over this period. Although drowning accounted for 15 per cent of all suicide deaths in women in 1979 this had dropped to 7 per cent by 2001. Suicides from 'other' poisoning saw the same increase and decline that occurred in men but also saw an earlier rise in 1985. At a peak in 1990 this method accounted for 10 per cent of suicide deaths in women.

Table 2 shows suicide data by sex, age group and method for the years 1981, 1991 and 2001. It can be seen that there has been an increase in the proportion of suicide deaths in young adults of both sexes although that seen in women is greater than in men. In 2001, over half of all suicides in men and almost half of all suicides in women occurred in young adults.

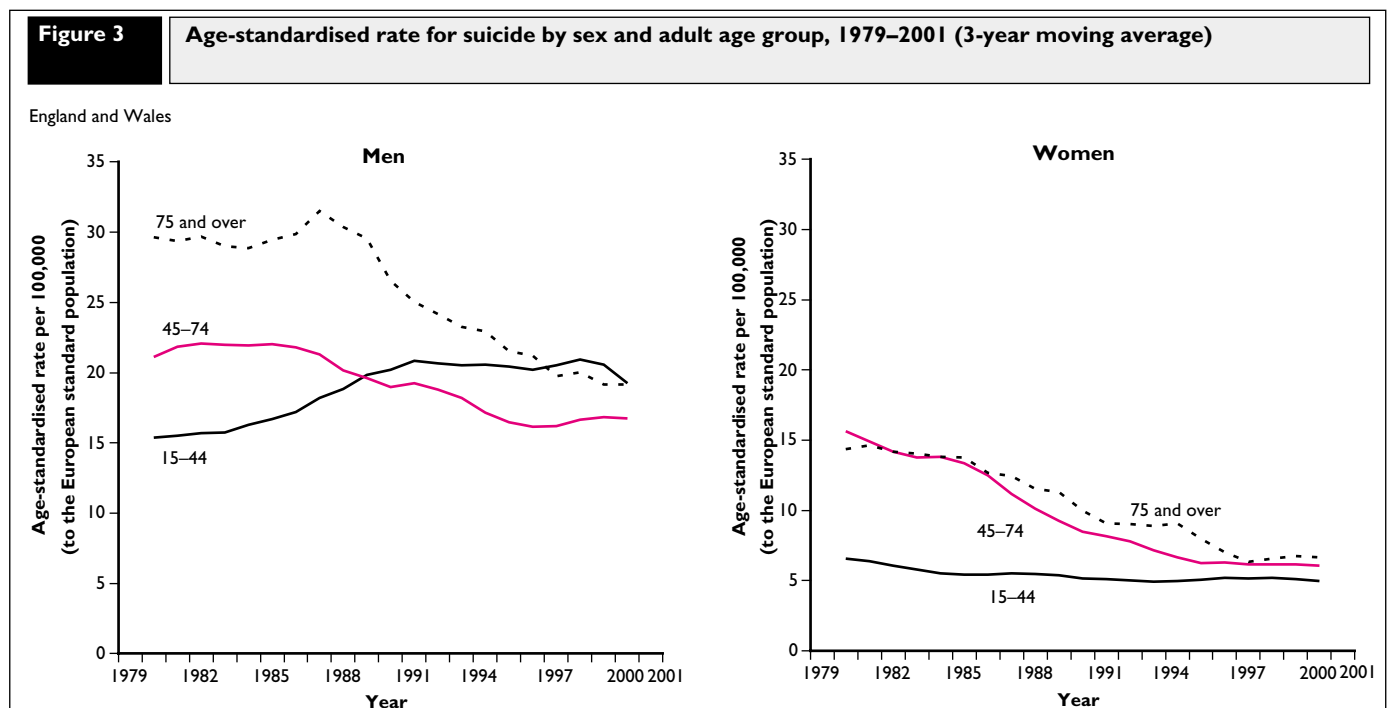
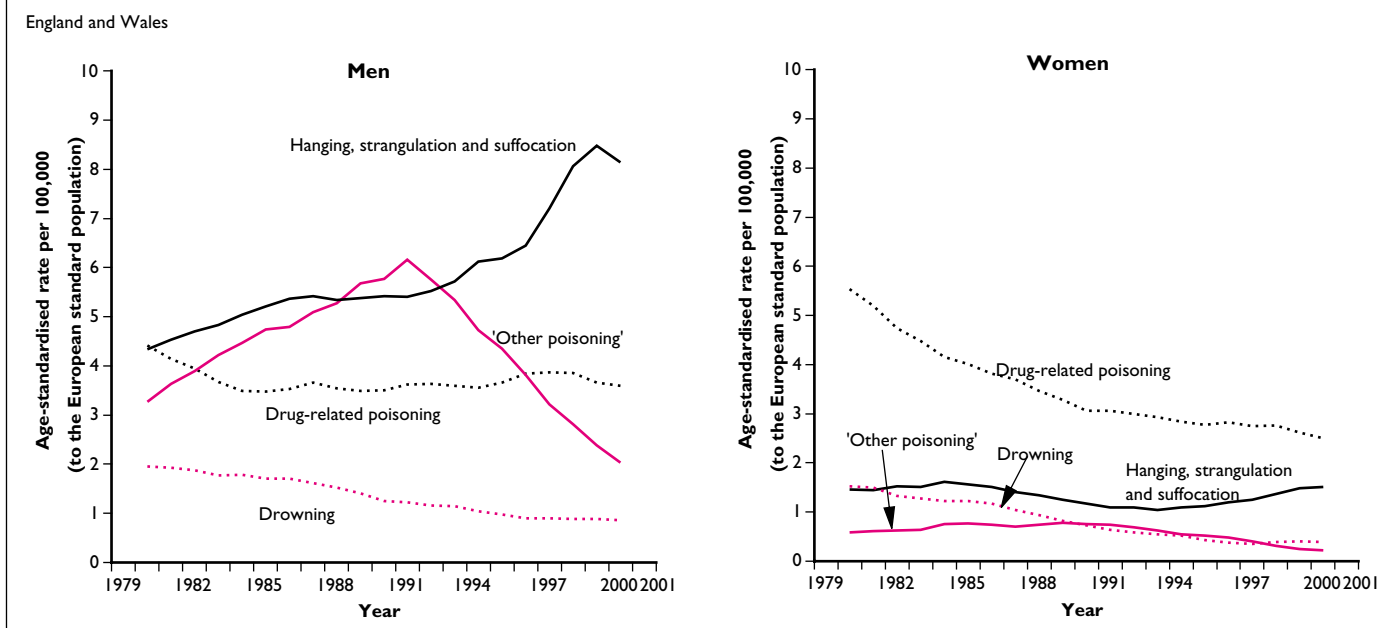


Figure 4

Age-standardised rate for suicide by method of injury and sex, ages 15 and over, 1979–2001 (3-year moving average)



In young adult men aged 15–44 in 1981 and 1991, ‘other poisoning’ (which was mostly comprised of motor vehicle exhaust gas) was the main method used accounting for a quarter of suicide deaths. In 2001, however, ‘hanging, strangulation and suffocation’ was responsible for almost a half of all suicides in young adult men and ‘other poisoning’ accounted for only 10 per cent. In older adult men aged 45–74, ‘hanging, strangulation and suffocation’ was the most common method of suicide in 1981 accounting for a quarter of all suicide deaths in this age group. In 1991, however, although this method still accounted for a quarter of all suicide deaths in older adult men, more were caused by ‘other poisoning’. But by 2001, as in young adult men, suicide from ‘other poisoning’ had decreased and suicide by ‘hanging, strangulation and suffocation’ was the most common method. In elderly men ‘hanging, strangulation and suffocation’ was the most common method of suicide accounting for a third of all suicide deaths in this age group in 1981 and 1991 and over 40 per cent in 2001.

Drug poisoning was the most common method of suicide in women in all age groups across the period covered. Drug poisoning accounted for almost half of all suicide deaths in all age groups in women. The second most common method across all age groups was ‘hanging, strangulation and suffocation’. In women of all ages the proportion using this method of injury had increased but this had especially been the case in young adult women where ‘hanging, strangulation and suffocation’ was responsible for almost a third of suicide deaths in 2001 compared to 13 per cent in 1981.

‘Hanging, strangulation and suffocation’

This is the most common method of suicide in men and the second most common in women. In ICD-10 there is no more detailed definition than the broad group ‘Hanging, strangulation and suffocation’, whereas in ICD-9 the 4th digit was used to classify deaths from hanging and from suffocation by plastic bag separately, and the nature of injury code does not aid in classifying these deaths any further. We therefore inspected any text on death certificates and any coroner’s text to classify these cases. A death was classified as hanging if the words ‘hanging’, ‘hung’, or ‘suspended’ were found in the death or coroner’s text. If ‘plastic bag’ or ‘bag’ without mention of any other method was found these cases were classified as plastic bag. If ‘ligature’ was mentioned without any

other text referring to either hanging or plastic bag then this was noted as ‘not stated’. Table 3 below shows that most of these deaths in both sexes, except in elderly adults, were due to hanging which concurs with data where ICD classifications were available (the second part of the table). The high proportion of ‘not stated’ classifications in elderly adult women may show that the details in Part V of the coroners certificate for these cases were not completed as fully as they were for persons of younger ages or men of the same age.

Figure 5 shows the age-standardised suicide rates for hanging only by age group, using these data for 2001. For men, the suicide rate in young adults aged 15–44 increased by over 150 per cent from the beginning of the 1980s to the mid-1990s. The suicide rate increased even more steeply during the late 1990s and reached a peak in 1998 with a rate of 9.8 deaths per 100,000, since when it has declined. For older adults aged 45–74 a rise was also seen in this method of suicide during the 1990s. This increase during the 1990s in suicide from hanging was not seen, however, in elderly men. During the 1980s and early-1990s elderly men had the highest suicide rate from hanging but by the mid-1990s the suicide rate from hanging in young adult men had overtaken them. The suicide rate in older adult men aged 45–74 also increased during the 1990s and from 1998 was higher than the rate in elderly men aged 75 and over.

For women, the suicide rate from hanging was much lower than that for men with older adult women aged 45–74 having the highest mortality rate from this method up until the early-1990s. The suicide rate from hanging in young adult women almost doubled during the 1990s and although the rate in older adult women also increased during this time, young adult women still had the highest suicide rate in 2001.

Drug-related poisoning suicides

This was the most common method of suicide in women and the second most common in men from the late-1990s. This definition includes over-the-counter medications and prescription medicines as well as illegal drugs. Data by specific drug mention were taken from the drug-related poisoning database held by ONS, data from which are published annually.¹⁶

Table 2

Percentage of all suicides in adults (aged 15 and over) by sex, age group and method, 1981, 1991 and 2001

England and Wales

	Men				Women				
	15-44	45-74	75 plus	All adults	15-44	45-74	75 plus	All adults	
1981					1981				
Hanging*	20.2	25.3	32.0	23.5	Drug-related poisoning	45.4	51.1	47.5	49.0
Drug-related poisoning	20.7	23.5	19.8	21.9	Hanging*	12.7	16.4	20.9	15.9
'Other' poisoning†	24.6	16.1	9.4	19.5	Drowning	10.0	15.4	17.0	14.1
Drowning	7.4	12.1	16.9	10.3	Other and unspecified	10.5	4.9	7.8	6.9
Other and unspecified	10.3	8.4	7.9	9.2	'Other' poisoning†	7.9	5.5	3.5	5.9
Firearms and explosives	6.0	4.9	4.3	5.4	Moving object**	4.9	1.9	0.4	2.6
Moving object**	4.2	3.5	2.9	3.8	Jumping/falling from high place	6.8	3.1	1.4	4.0
Sharp objects	1.3	3.2	2.5	2.2	Sharp objects	1.0	1.3	1.1	1.2
Jumping/falling from high place	5.4	3.0	4.3	4.2	Firearms and explosives	0.8	0.3	0.4	0.5
All suicides	1,637	1,643	278	3,558	All suicides	630	1,265	282	2,177
% of all adult suicides	46.0	46.2	7.8		% of all adult suicides	28.9	58.1	13.0	
1991					1991				
'Other' poisoning†	31.7	28.1	16.1	29.3	Drug-related poisoning	43.1	46.1	47.2	45.1
Hanging*	27.8	25.8	32.1	27.4	Hanging*	18.6	15.7	22.0	17.7
Drug-related poisoning	17.8	18.1	20.1	18.1	'Other' poisoning†	14.4	9.8	3.3	10.6
Drowning	3.7	7.1	15.1	5.7	Drowning	3.8	14.4	14.0	10.2
Other and unspecified	4.2	4.7	4.0	4.3	Other and unspecified	5.1	3.2	6.1	4.4
Firearms and explosives	3.6	5.2	2.7	4.1	Moving object**	5.4	3.7	0.9	3.9
Moving object**	4.3	3.8	1.7	4.0	Jumping/falling from high place	7.2	4.8	5.6	5.8
Jumping/falling from high place	5.4	4.7	4.3	5.1	Sharp object	1.1	2.0	0.9	1.5
Sharp objects	1.5	2.5	4.0	2.0	Firearms and explosives	1.4	0.3	0.0	0.7
All suicides	2,374	1,374	299	4,047	All suicides	555	651	214	1,420
% of all adult suicides	58.7	34.0	7.4		% of all adult suicides	39.1	45.8	15.0	
2001					2001				
Hanging*	47.2	40.3	41.8	44.2	Drug-related poisoning	44.7	47.5	45.4	46.0
Drug-related poisoning	20.0	20.7	18.9	20.1	Hanging*	31.5	22.7	23.3	26.7
'Other' poisoning†	9.6	9.6	10.0	9.7	Other and unspecified	6.0	9.5	18.4	9.2
Other and unspecified	8.4	9.5	9.6	8.9	Drowning	3.3	9.7	9.8	6.9
Drowning	3.2	7.7	6.8	5.2	Moving object**	5.8	1.9	0.0	3.4
Moving object**	4.1	3.3	1.6	3.6	'Other' poisoning†	3.3	3.3	0.6	2.9
Firearms and explosives	2.2	3.9	4.0	2.9	Jumping/falling from high place	3.5	3.7	1.8	3.4
Sharp objects	1.8	2.3	4.4	2.2	Sharp objects	1.2	0.8	0.6	0.9
Jumping/falling from high place	3.5	2.6	2.8	3.1	Firearms and explosives	0.6	0.8	0.0	0.6
All suicides	1,959	1,321	249	3,529	All suicides	514	484	163	1,161
% of all adult suicides	55.5	37.4	7.1		% of all adult suicides	44.3	41.7	14.0	

* Hanging, strangulation and suffocation.

† Includes MVEG.

** Jumping/lying/falling before moving object.

Table 3

Percentage of deaths by method coded to 'hanging, strangulation and suffocation' (ICD-10 X70 and Y20) by method stated on statistical death record, 2001

England and Wales

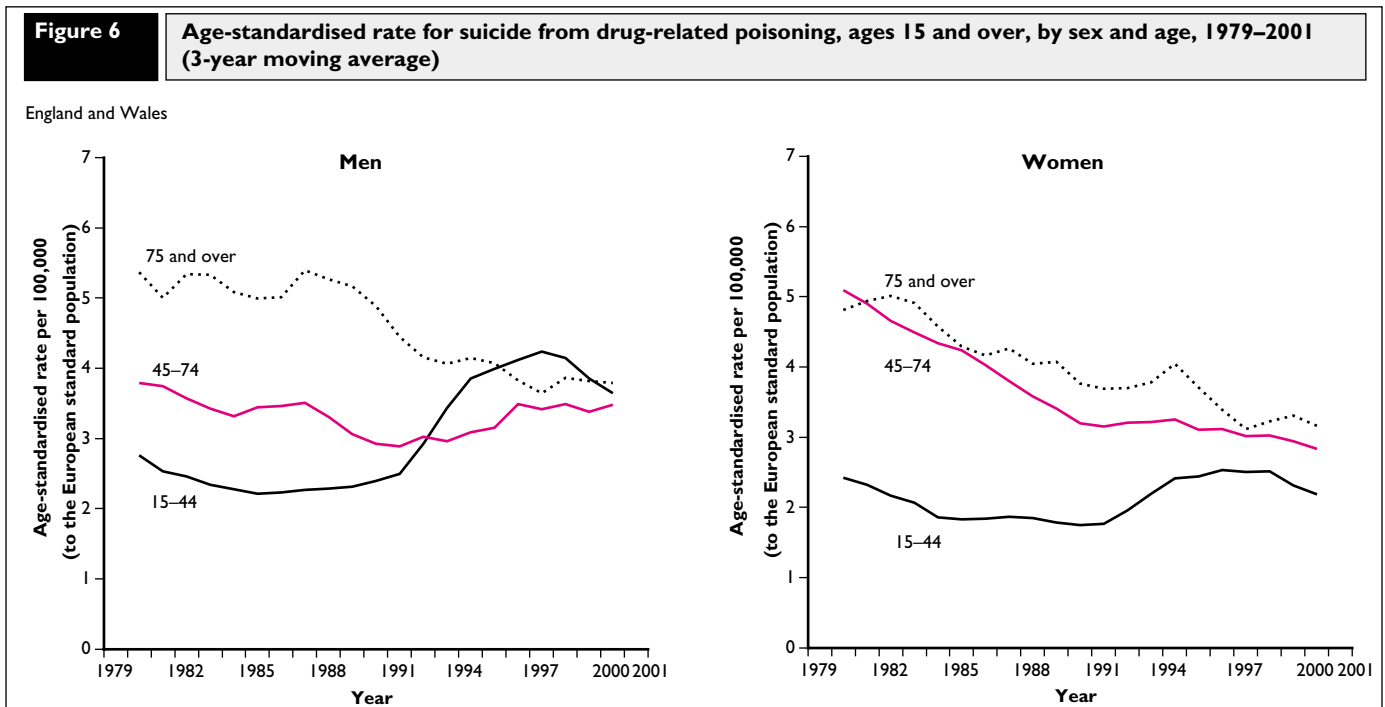
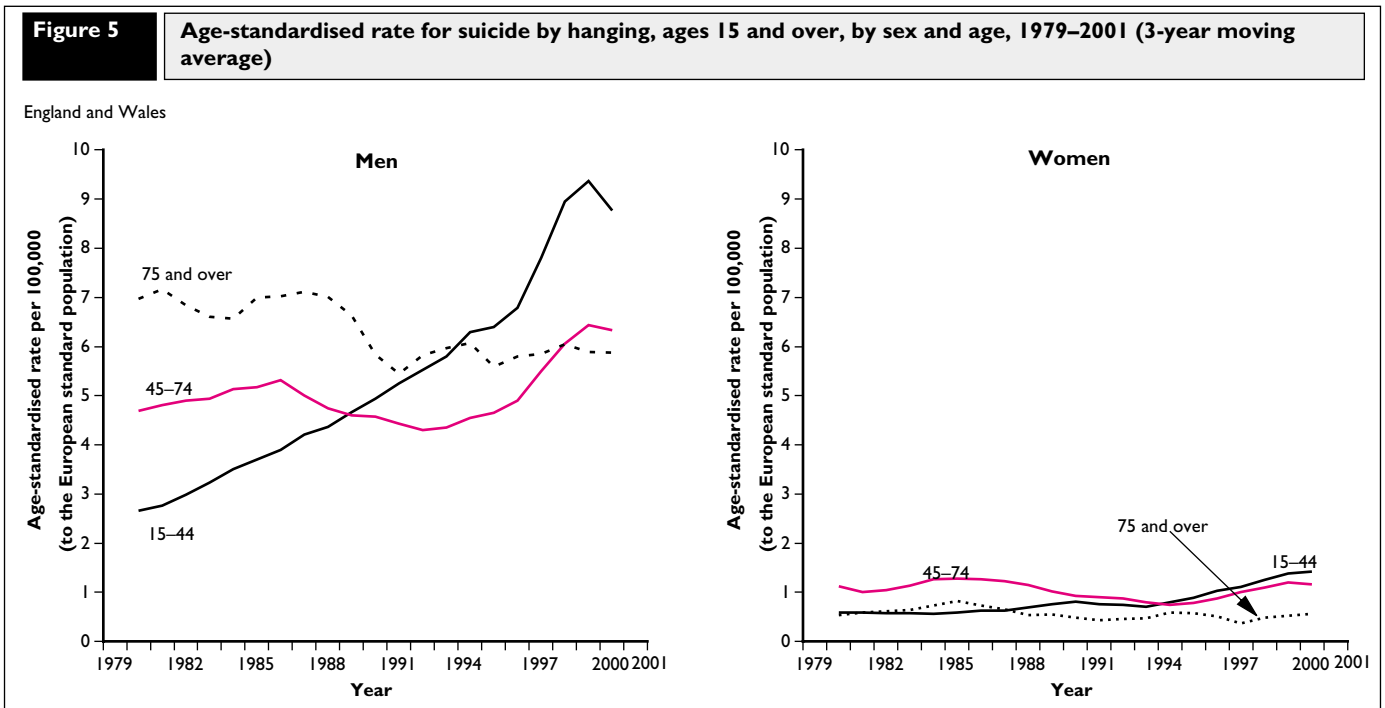
Age group	Men				Women			
	15-44	45-74	75 and over	All adults	15-44	45-74	75 and over	All adults
Hanging	94.4	93.6	78.8	93.1	92.6	78.2	28.9	79.7
Plastic bag	1.0	2.6	8.7	2.1	2.5	14.5	36.8	11.0
Not stated	4.7	3.8	12.5	4.9	4.9	7.3	34.2	9.4
Total number	924	533	104	1,561	162	110	38	310
Data for 2000 using ICD-9 4th digit definitions								
Hanging (E953.0,E983.0)	95.3	92.3	78.8	93.3	93.0	76.8	30.6	80.0
Plastic bag (E953.1,E983.1)	1.0	3.2	15.4	2.7	1.8	13.0	44.4	10.7
Other and unspecified	3.7	4.5	5.8	4.1	5.3	10.1	25.0	9.3
Total number	984	558	104	1,646	171	138	36	345

As Figure 6 shows, the young adult male suicide rate from drug poisoning increased by 90 per cent between 1990 to peak in 1997 but has since fallen. Older adults also saw a peak around this time but unlike young adults this rate has stayed roughly the same since then. In elderly men the suicide rate from drug poisoning fluctuated during the 1980s but has since fallen.

In women, the overall trend was downward at ages 45 and over, but during the 1990s there was an increase in drug-poisoning suicide rates in young adult women. This increase in young adult women mirrored the one seen in young adult men but was not as dramatic, although the rates increased by 50 per cent between 1991 and a peak in 1997.

Table 4 shows the three main substances mentioned on the death certificate in adult drug poisoning suicides by sex for 1993 and 2001. In men, paracetamol and its compounds was the most common substance mentioned on drug-poisoning suicide death certificates in both 1993 and 2001, with antidepressants a close second. The numbers of deaths where these substances were mentioned has decreased however. Although benzodiazepines were the third most commonly mentioned substance in drug-poisoning suicide death certificates in 1993, heroin/morphine was the third most common in 2001.

In women, antidepressants and paracetamol and its compounds were also the most common substances mentioned on drug-poisoning suicide death certificates in both 1993 and 2001. Although the number of



deaths certificates where these substances were mentioned decreased within this time, antidepressants fell more than paracetamol. In 1993, benzodiazepines were the third most common substance mentioned on death certificates for suicides by drug poisoning, for both men and women. However, by 2001 numbers had declined sharply. This is probably related to trends in prescribing.

In 1998 legislation was introduced concerning the maximum number of paracetamol allowed in a pack¹⁷ and the decrease in the numbers of suicide deaths where paracetamol are mentioned may show the effect of this. As paracetamol and antidepressants were the most commonly mentioned drugs over this period any changes in the use of these substances will affect the overall rate of drug-related poisoning suicide.

Motor vehicle exhaust fumes

Motor vehicle exhaust gas (MVEG) comprises part of 'other poisoning'

in Figure 4 and accounted for almost all of these deaths in both sexes. Figure 7 shows the age-standardised rates for 'other poisoning' and MVEG by sex for all adults from 1979 to 2001. The large decrease in MVEG deaths in 1993 was due to a revised coroner's reporting form, introduced in May 1993.¹⁸ As there is not a separate code for this method of injury in ICD-10, the cause of death and coroner's inquest text were examined for mentions of type of poison or exposure factor to determine whether a comparable number of deaths were recorded in 2001 for MVEG. If a record had 'motor vehicle', 'car', 'van', 'lorry', 'camper van', 'motor bike' or 'motor cycle' in the death text then these were classified as MVEG. Table 5 shows these findings for the year 2001. From these results it does not seem possible to use the cause of death or coroner's text on these death records to obtain comparable data to earlier years when ICD-9 was used due to the large proportion of death records where relevant textual information was not present.

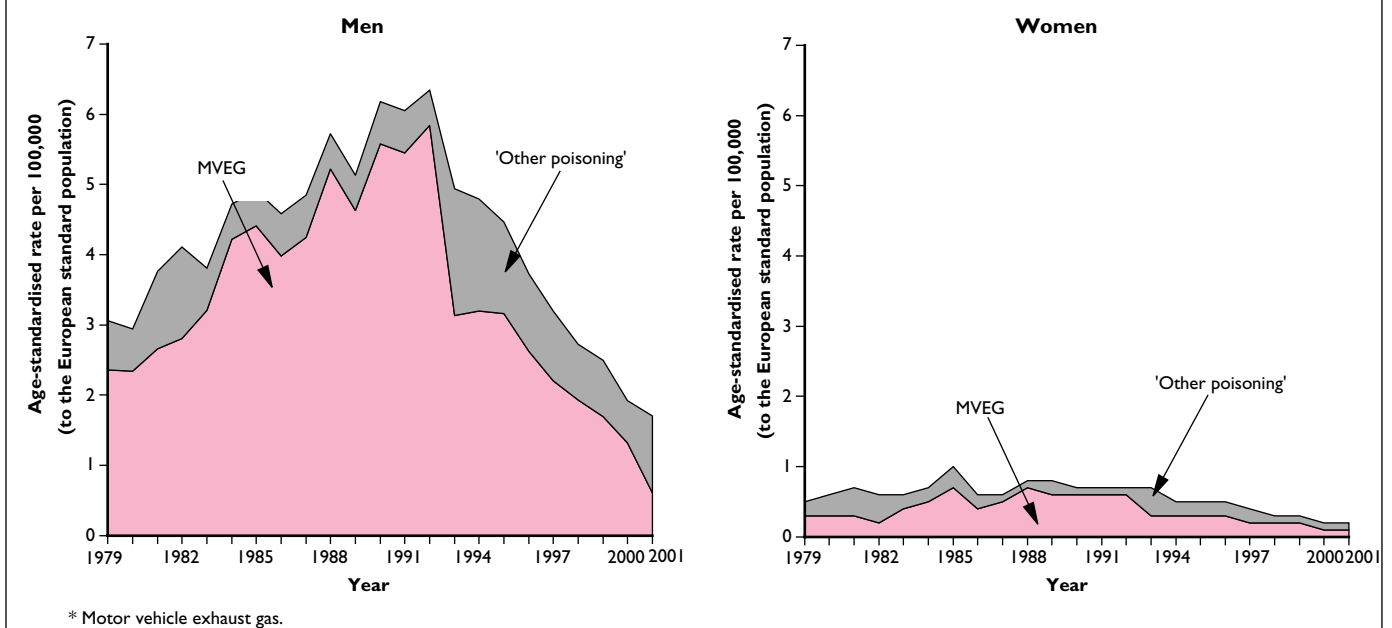
Table 4 Suicides by drug poisoning in adults aged 15 and over, main substances taken by sex, 1993 and 2001

England and Wales

3 main substances	1993				3 main substances	2001			
	Number of deaths	Percentage of suicides by poisoning	Percentage of all suicides	Percentage of all drug poisonings		Number of deaths	Percentage of suicides by poisoning	Percentage of all suicides	Percentage of all drug poisonings
Men					Men				
Paracetamol including compounds	193	28	5	14	Paracetamol including compounds	184	26	5	9
All antidepressants	163	24	4	12	All antidepressants	157	22	4	8
Benzodiazepines	69	10	2	5	Heroin/morphine	78	11	2	4
Women					Women				
All antidepressants	188	30	14	21	Paracetamol including compounds	171	32	15	19
Paracetamol including compounds	177	28	13	20	All antidepressants	148	28	13	17
Benzodiazepines	81	13	6	9	No specific drug mentioned	59	11	5	7

Figure 7 Age-standardised rate for 'other' poisoning and MVEG* for adults aged 15 and over by sex, 1979-2001

England and Wales



* Motor vehicle exhaust gas.

Table 5 Percentage of deaths coded to ICD-10 X67 and Y17 (poisoning by other gases and vapours) by method stated on statistical death record, by sex and age, 2001

England and Wales

Age groups	Men				Women			
	15-44	45-74	75 and over	All adults	15-44	45-74	75 and over	All adults
Motor vehicle exhaust gas	43.1	31.7	40.9	38.7	50.0	53.8	-	50.0
Other	1.7	2.4	-	1.8	-	-	-	-
Not stated	55.2	65.9	59.1	59.5	50.0	46.2	100.0	50.0
Total number	181	123	22	326	14	13	1	28
% of total suicide deaths	0.9	1.0	0.9	1.0	0.3	0.3	0.1	0.2

Figure 8 shows these data by age and sex. In each age-group shown there was a sharp peak in male death rates during the early 1990s. The decline coincides with legislation which required all new cars to have catalytic converters and cleaner fuel for motor cars becoming widely available. Young adult men had the highest suicide rates from this cause during the period covered. In women, however older adults aged 45-74 and young adult women had roughly the same rate of suicide from MVEG throughout this period.

Railway suicides

There has been substantial interest in the number of suicides occurring on railways and a report has recently been published examining the consequences of railway suicide.¹⁹ ICD codes in either ICD-9 or ICD-10 do not exist to identify these suicides. Therefore, we examined the cause of death and coroner’s text on death records coded to ‘jumping or lying before moving object’, ‘electrocution’, and ‘crashing of motor vehicle’ to attempt to identify the number of these suicides which occurred on railways. Within the classification of ‘tracked vehicles’ we also included deaths occurring on underground tracks and by trams.

If a record had ‘railway’, ‘train’, ‘tube’, ‘metro’, ‘tram’ or ‘track line’ mentioned in the text, then we classified the death as railway. We also classified deaths where the deceased was killed by motor vehicles without mention of any railway-specific text as road vehicle. An ‘other’ category was chosen where textual information on the death certificate indicated that neither a tracked nor motor vehicle was involved in the death – most of these deaths were from electrocution from domestic appliances.

Table 6 shows these findings for the combined years 1993-2001. It can be seen that although a large proportion had no mention of any vehicle or text that would distinguish the involvement of a vehicle, approximately half mentioned tracked vehicles. These deaths combined accounted for only a small proportion (3 per cent) of all suicide deaths and no discernible trend could be seen in age-specific rates. However, it is clear that men aged 75 and over had a higher proportion of deaths (43 per cent) where no detail was given on the death certificate to allow the identification of tracked vehicles. In elderly women, however, almost half of the records referred to other mentioned methods.

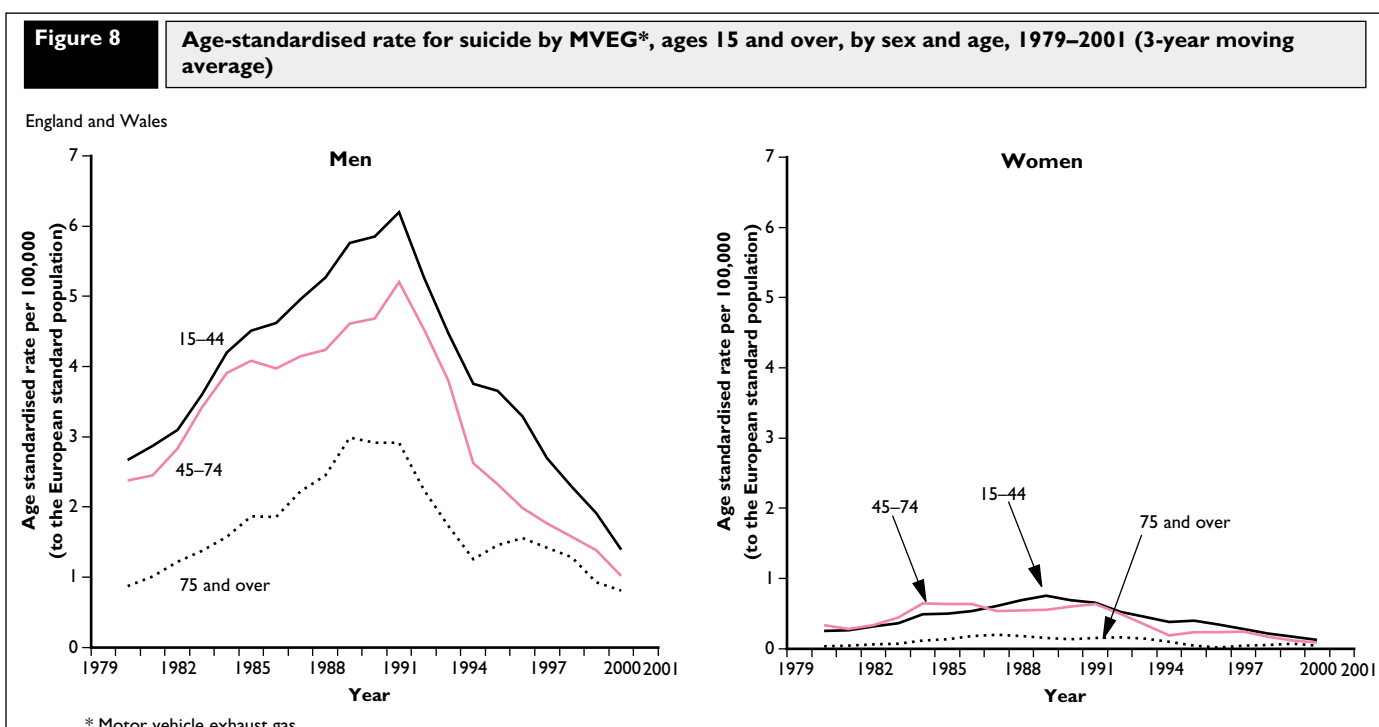


Table 6

Percentage of deaths coded to ICD-9 E958.0, E958.4, E958.5, E988.0, E988.4, E988.5 and ICD-10 X81-X83, Y31-Y33 by whether tracked vehicle stated on statistical death record, by sex and age, 1993–2001

England and Wales

Age groups	Men				Women			
	15–44	45–74	75 and over	All adults	15–44	45–74	75 and over	All adults
Railway*	50.0	48.9	37.3	48.9	64.8	52.9	29.4	57.2
Road vehicle	5.6	2.5	1.5	4.4	4.9	3.6	0.0	4.0
Not stated	37.2	35.4	43.3	37.0	27.5	37.9	23.5	32.1
Other	7.2	13.2	17.9	9.7	2.8	5.7	47.1	6.7
Total number	774	393	67	1,234	142	140	17	299
% of total suicide deaths	3.9	3.3	2.8	3.6	2.9	2.9	1.1	2.6

* Railway includes underground trains and trams.

DISCUSSION

There are many issues surrounding suicide statistics and the way in which coroners reach verdicts in these cases that need to be taken into consideration when examining ONS mortality data. This article has described some of them, particularly relating to the introduction of ICD-10 and its impact on analysis of trends by method of suicide.

Although the introduction of ICD-10 for the coding of mortality statistics from 2001 has not affected overall suicide figures, it has affected some classifications of method of suicide. The main differences between ICD-10 and ICD-9 for suicide are that the fourth digit now classifies place of occurrence of the event, and that some detail on specific methods of injury has been lost e.g. hanging and suffocation by plastic bag, and motor vehicle exhaust gas. The data collected by ONS from coroners may help overcome some of these problems, such as defining self-inflicted injury from hanging and by plastic bag, but may not be of use in other cases such as sorting deaths from motor vehicle exhaust gas from other forms of poisoning involving carbon monoxide.

The Fundamental Review of Coroners²⁰ and the Shipman Inquiry²¹ published recommendations in 2003 concerning the investigation and certification of deaths. Some of these impact directly on suicides, for example proposed abolition of the short-form verdict of “suicide” and the removal of the need to meet the criminal standard of proof “beyond reasonable doubt”.

The increase in suicide rates in young adults throughout the 1990s appears to have stopped, but in 2001 young adult men still had the highest suicide rate in England and Wales of all sex and age groups. The Government has introduced a Suicide Prevention Strategy² which includes targets to reduce suicide rates in all ages by a fifth by 2010 and a drug misuse-related deaths²² strategy has also been introduced which may have some bearing on drug-poisoning suicide rates, where controlled drugs are involved.

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Key findings

- Open verdicts accounted for 28 and 38 per cent of all suicide deaths in 2001 for men and women aged 15 and over respectively, compared with 23 and 28 per cent in 1979.
- Suicide and open verdicts accounted for 2 per cent of deaths in children aged 10–14. Over two thirds of these deaths in males were from ‘hanging, strangulation or suffocation’, and half in females were from poisoning.
- Of all sex and age groups, young adult men have had the highest suicide rate since the late 1990s and this age group accounted for 60 per cent of all suicide deaths in men at a peak in 1998.
- Among adults, young adult women had the lowest suicide rate across the period covered but this age group accounted for almost half of the number of women’s suicide deaths during the late 1990s.
- The three most common methods of suicide in men in 2001 were ‘hanging, strangulation and suffocation’ (44 per cent), drug-related poisoning (20 per cent), and ‘other poisoning’ (10 per cent) which included motor vehicle exhaust gas. The three most common methods in women in 2001 were drug-related poisoning (46 per cent), ‘hanging, strangulation and suffocation’ (27 per cent), and drowning (7 per cent).
- Suicide from ‘hanging, strangulation and suffocation’ almost doubled in young adult men from 1979 to a peak in 1998 and increased by 50 per cent in young adult women during the 1990s.
- Antidepressants and paracetamol and its compounds were the two most commonly mentioned substances on drug-related poisoning suicide death certificates in both 1993 and 2001.

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Annex I | ICD-9 and ICD-10 codes used in this analysis

	ICD-9		ICD-10	
	Suicide verdict	Open verdict	Suicide verdict	Open verdict
Suicide	E950–E959	E980–E989 excluding E988.8	X60–X84	Y10–Y34 excluding Y33.9 where verdict pending
Poisoning	E950–E952	E980–E982	X60–X69	Y10–Y19
Drug-related poisoning	E950.0–E950.5	E980.0–E980.5	X60–X64	Y10–Y14
‘Other’ poisoning	E950.6–E950.9, E951–E952	E980.6–E980.9, E981–E982	X65–X69	Y15–Y19
Motor vehicle exhaust gas (MVEG)	E952.0	E982.0	X67 (part)	Y17 (part)
Hanging, strangulation and suffocation	E953	E983	X70	Y20
Hanging	E953.0	E983.0	n/a	n/a
Suffocation by plastic bag	E953.1	E983.1	n/a	n/a
Drowning	E954	E984	X71	Y21
Firearms and explosives	E955	E985	X72–X75	Y22–Y25
Sharp objects	E956	E986	X78	Y28
Jumping/falling from a high place	E957	E987	X80	Y30
Jumping/lying/falling before moving object	E958.0	E988.0	X81	Y31
Electrocution	E958.4	E988.4	X83 (part)	Y33 (part)
Crashing of motor vehicle	E958.5	E988.5	X82	Y32