

## BRIEF REPORT

## US data show sharply rising drug-induced death rates

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Substantial numbers of deaths are related to disease and injury resulting from the use of drugs, alcohol and firearms worldwide. Death rates associated with these exposures were compared with those from motor vehicle crashes in the US from 1979 to 2003 by race. Among Caucasians, drug-induced death rates rose sharply after 1990 and surpassed deaths involving alcohol and firearms in 2001 and 2002, respectively. Among African-Americans, drug-induced deaths surpassed alcohol-induced deaths for the first time in 1999.

Because exposure to a single agent can result in various diseases and injuries, the National Center for Health Statistics (NCHS) has created three special categories of deaths that have common causes.<sup>1</sup> The drug-induced death category includes all manner of death (unintentional, suicide, homicide and undetermined intent) from drug poisoning, mental disorders due to drug-taking and drug-induced diseases. It does not include traumatic deaths indirectly related to drug use, newborn deaths owing to a mother's drug use, adverse drug events that result from the therapeutic use of drugs at the prescribed dosage (eg, allergic reactions) or deaths from infection related to intravenous use—for example, HIV infection. It includes both legal and illegal drugs. The alcohol-induced death category includes all manner of death from alcohol poisoning, mental disorders due to alcohol and alcohol-induced diseases such as cirrhosis. The firearm death category comprises suicides, homicides, unintentional and undetermined gunshot injuries involving firearms.

We compared the relative importance of these three categories with motor vehicle-related deaths from 1979 to 2003. We chose this comparison because motor vehicles have been the leading cause of fatal injury in the US since the 1920s.<sup>2</sup> All manner of death resulting from motor vehicle crashes both on and off public roadways was included.

## METHODS

Data were drawn from reports based on vital statistics published by the NCHS.<sup>1–3</sup> From 1979 to 1998, the underlying causes of death were coded according to the Ninth Revision of the International Classification of Diseases (ICD-9). During these years, the drug-induced death category was limited to acute drug poisoning of all intents and mental and behavioural disorders related to drugs.<sup>1</sup> For deaths from 1999 to 2003, coded by the Tenth Revision of the International Classification of Diseases in the US (ICD-10), the category was expanded to include some medical disorders caused by drugs, such as drug-induced interstitial lung disease and drug-induced Cushing's syndrome, which added fewer than 30 deaths per year.<sup>3</sup> In addition to this change, the change in the ICD coding scheme and the rules associated with those codes was determined by NCHS to be responsible for about a 20% increase in drug-induced mortality from 1998 to 1999. The ICD transition affected the alcohol and firearm categories by <3%.<sup>3</sup>

The ranking of these causes differed for Caucasians and African-Americans; hence we graphed them separately. We also examined the ranking of these four causes of death within each state in 2003.

## RESULTS

Among Caucasians, the ranking of the four underlying causes of death (motor vehicles, firearms, alcohol and drugs) was unchanged during the 1980s and 1990s (fig 1). The ranking changed in 2001, when the drug-induced death rate exceeded the alcohol-induced death rate. By 2002, the drug-induced death rate had also surpassed the firearm-related death rate. Overall, drug-induced death rates among Caucasians increased roughly by 189% from 1990 to 2003. Among African-Americans, the drug-induced death rate caught up with the declining alcohol-induced death rate in 1999, but was still below both the firearm and motor vehicle death rates in 2003. Despite the 64% increase in the drug-induced death rate among African-Americans since 1990, the rate among whites surpassed that among African-Americans in 2002. By 2003, the drug-induced death rate for all races combined had passed the motor vehicle rate in eight states (Connecticut, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island, Utah and Washington) and Washington DC.

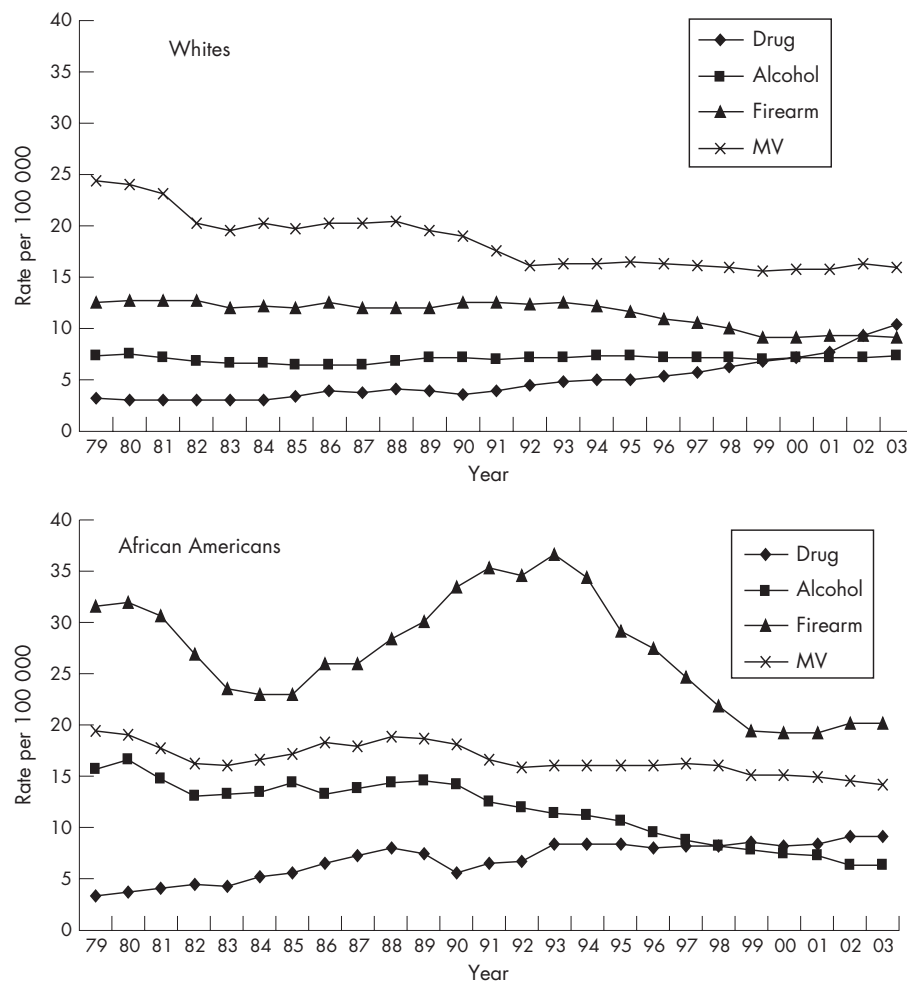
Acute drug poisoning, unintentional and intentional (ICD-10: X40–X44, X60–X64, X85, Y10–Y14), made up 89.8% of the 28 723 drug-induced deaths in 2003. Unintentional poisoning, suicide, homicide and poisoning of undetermined intent made up 63.7%, 13.5%, 0.2% and 12.4% of deaths, respectively. Mental and behavioural disorders made up 10.1%, and drug-induced diseases made up 0.1%. In 1979, acute drug poisoning (ICD-9: E850–E858, E950.0–E950.5, E962.0, E980.0–E980.5) made up 91% of the 7101 drug-induced deaths. Unintentional poisoning, suicide, homicide and poisoning of undetermined intent made up 35.8%, 42.7%, 0.2% and 12.2%, respectively. All remaining deaths (9%) were attributed to mental and behavioural disorders due to drugs.

## DISCUSSION

Rates of drug-induced deaths have been increasing in the US for the past 25 years despite efforts to control drug misuse. This combined with static rates of alcohol-induced deaths among Caucasians, declining alcohol-induced deaths among African-Americans, and declining firearm deaths since 1993 have led to changes in the ranks of what have been referred to as the actual causes of death.<sup>4</sup> The increase in drug-induced mortality resulted largely from the rising numbers of poisoning deaths that were unintentional or of undetermined intent, rather than from an increase in suicides.

The upward trend in drug-induced mortality since 1990 is largely due to the increasing numbers of deaths associated with prescription drugs rather than illegal drugs. Prescription drugs now contribute to more unintentional drug-induced deaths in

**Abbreviations:** ICD, International Classification of Diseases; NCHS, National Center for Health Statistics



**Figure 1** Crude death rates from motor vehicles (MV), firearm injury and alcohol- and drug-induced causes for Caucasians and African-Americans in the US, 1979–2003.

the US than illegal drugs.<sup>5</sup> This upturn in unintentional drug deaths owes a great deal to the dramatic increases in the prescribing of, and overdoses from, opioid analgesics since 1990.<sup>6,7</sup>

**Key points**

- Rapidly rising drug-induced death rates in the US surpassed death rates from alcohol in 2001 and death rates from firearms in 2002 among Caucasians.
- Among African-Americans, drug-induced death rates surpassed death rates from alcohol in 1999 for the first time since at least 1979.
- Unintentional and undetermined poisoning deaths are driving the increase in drug-induced deaths.
- The literature suggests that deaths involving prescription drugs are contributing to the increase in unintentional poisoning deaths.

If current rates of increase continue, then drug-induced deaths will surpass deaths related to motor vehicles in more states, and, among Caucasians, may surpass deaths from

motor vehicles nationwide by the end of the decade. The health effects of drug use are a major problem in the US, but are by no means restricted to one country.<sup>8</sup> We believe the American as well as the international public health communities urgently need better information about the potential for misuse of opioid analgesics and other prescription drugs, and the characteristics of people who misuse them. The relative contributions of drugs obtained legally and illegally also need to be quantified. Once we understand better the notable change in rankings of leading underlying causes of death in the US resulting from an increase in drug-induced deaths, the clinical, public health and regulatory communities can collaborate to identify solutions.

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