

Live and let die

Is methadone more likely to kill you than heroin?

DRUG-RELATED MORTALITY is a neglected issue in British drugs research. This article is concerned with deaths related to one important group of drugs – the opiates – and seeks to assess the relative mortality risks of methadone and heroin. It is believed that this will highlight the fallacies of commonly held assumptions and demonstrate how the analysis of information on drug-related deaths can provide clues for designing more effective policies and practices to reduce deaths among people who use illicit drugs.

As shown by the article on the history of methadone in this issue of *Druglink*, the drug was rediscovered in the early 1960s as a treatment for heroin addiction, and the concept of methadone maintenance was introduced by the Americans, Dole and Nyswander.¹

In the UK, medical support for methadone maintenance gave way to a preference for detoxification in the mid-1970s. However, methadone maintenance resurfaced in the late 1980s, when drug injectors were seen as 'the weak link' in the spread of HIV to heterosexual society. Since then, methadone maintenance has been officially supported not just as a treatment but as an intervention for reducing drug-related harm. Record numbers of opiate users are now prescribed the drug. Of 33,952 drug addicts notified to the Home Office in 1994, 23,270 were being prescribed methadone on their first notification – compared with 155 who were prescribed heroin.

Methadone maintenance is entrenched as the standard treatment option for dependent heroin users. But a new look at official statistics casts doubt on methadone's safety

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S U M M A R Y

This article focuses upon evidence about opiate-related deaths. More specifically, it examines the statistics for methadone-related deaths and compares them with those for heroin. The question posed is, what are the relative mortality risks of using methadone compared to using heroin? The evidence consistently suggests that methadone kills more drug users than heroin, and raises the issue of whether switching from heroin use to methadone use increases the drug user's risk of death.

What does methadone maintenance mean?

The aim of methadone maintenance is to stabilise and then 'cure' the opiate user – an aim which breaks down into such objectives as:

- improving the health of drug users by providing 'clean' drugs in measured doses, under professional supervision
- reducing drug-related crime by providing users with free legal opiates, thus reducing their need to steal to fund purchases of illicit heroin
- improving the social situation of drug users (family relationships, finances, employment, housing and so on)
- persuading users to reduce their daily dosage and to take gradual steps towards abstinence.

Methadone is implicitly or explicitly perceived by professionals in the drug field as a *legal medicine* for treating addiction to the *illegal drug* heroin (a clear case of history repeating itself – shortly after its synthesis in 1874, heroin was widely held to be the cure for morphine addiction). Yet, in British law, methadone (like morphine, diamorphine, dipipanone and other opiates) is a Class A drug. Similarly, like other strong opiates, methadone is a Schedule 2 medicine – that is, it can be prescribed and dispensed to addicts under certain conditions. But unlike heroin and dipipanone (and cocaine), doctors can prescribe methadone without a special licence from the Home Office.

The key questions about methadone maintenance are *what does it do?* and *does it*

work? That is, does methadone maintenance achieve its objectives, such as improving the health and welfare of opiate users, preventing HIV infection, reducing crime, or reducing heroin use? Several reviews of the literature have asked these questions, though their conclusions are often conflicting. Assessments of the effectiveness of methadone maintenance programmes must also be weighed against unanticipated negative consequences. In a paper entitled *Methadone: one person's maintenance dose is another's poison*, Harding-Pink found that:

a single day's maintenance dose of methadone (50-100 mg) can cause life-threatening poisoning in non-tolerant adults; 10 mg in a young child can be fatal . . . Methadone is highly toxic to anyone who is not tolerant to opioids.²

Obviously, methadone is only as safe as the person taking it. And, at worst, it can cause death – in early 1994, King's College Hospital in London reported that three young people had died there from illicit recreational use of methadone. The Clinical Director of Intensive Care said that these deaths were “just the tip of the iceberg”. Clearly, if methadone was found to kill far more of its users than heroin does, the question of whether maintenance is an acceptable public health policy would have to be addressed. This article provides an initial framework to answer that question.

Research findings

There has been relatively little real-world research into methadone's mortality risks when compared to its effects on HIV-related behaviour and crime. Evaluations of maintenance programmes more often than not neglect what is undeniably the most ‘ineffective’ of outcomes – death. A recent review of the international literature on drug treatment evaluation found only four out of seventeen UK studies had used mortality as an outcome measure.³

However, there is a limited amount of British research, and it lends reasonable support to the view that methadone users are more at risk of death than those who use heroin. But this is by no means conclusively proven. A recent Scottish study, for example, highlights the benefits of a methadone maintenance programme.

Drug-related deaths in Glasgow and Edinburgh were studied over a two-year period in the early 1990s.⁴ Overall, 92 drug-related deaths were identified, 66 in Glasgow and 26 in Edinburgh. In Glasgow, there were 13 deaths in 1991 rising to 53 in 1992.

By contrast, drug-related deaths in Edinburgh remained reasonably static in the two years – 12 in 1991 and 14 in 1992. This difference may be partly explained by the drugs on which people overdosed. Deaths in Glasgow tended to be associated with heroin (51), temazepam (39) and diazepam (24), while in Edinburgh, methadone was found to be the main drug, involved in half of the 26 deaths.

The background to these differences is that during the period of research, Edinburgh had a well-established methadone prescribing service, and Glasgow did not (only one of the 53 dead drug users in Glasgow in 1992 had been receiving a prescription of methadone). The authors concluded:

although some people may overdose on methadone, as in Edinburgh, in the absence of methadone more will overdose on mixtures of street drugs, as in Glasgow.

In 1992, the methadone death rate was four times that of heroin

On the other hand, there is also plenty of research which questions the safety of methadone. A 1980 London-based study found that 175 addicts had died between 1971 and 1979.⁵ Of the overdose deaths, strong analgesics – including opiates – accounted for over four in ten, and methadone was the chief culprit:

up to 1977 methadone accounted for the majority of deaths attributed to strong analgesics.

Five years later, a team of researchers examined the records of notified addicts who had died between 1967 and 1981.⁶ They found that among heroin-using patients, three-quarters of deaths were directly drug-related, and concluded:

most deaths of addicts in which a drug was implicated were due to medically prescribed drugs [invariably, methadone].

In 1986, it was found that, of 184 heroin users seen by an Edinburgh general practice in the four years ending June 1985, only seven had died.⁷ The researchers concluded:

the low mortality rate may perhaps reflect the practice's policy of *non-prescription of opiates* to drug users, since there was a low number of deaths in which medically prescribed drugs were implicated, compared with the number found by Ghodse and colleagues [author's own italics].

Revisiting drug users over a long period of time can also tell us a lot about mortality patterns. A recent study reported on 128 heroin addicts first visited in 1969, and followed up for 22 years.⁸ There were 28 drug-related deaths, of which

the great majority were among people being prescribed opiates at the time [again, invariably methadone].

A similar study analysed 352 consecutive cases of fatal substance overdose in Scotland between 1983 and 1992.⁹ Analgesics accounted for 43 per cent of all overdose deaths, with narcotic analgesics representing 32 per cent. The researchers found that while heroin deaths fell away throughout the 1980s, methadone deaths increased. They concluded:

the increase in deaths due to methadone is traceable to the use of this drug as a heroin substitute, to curb the spread of HIV transmission, in treatment programmes.

It hardly needs saying that all the above findings must be treated with caution. Many heroin users will also take methadone and vice versa. Nevertheless, the research does not exonerate methadone and justifies a closer examination of the drug's relationship to mortality.

Official statistics

It should be noted at the outset that assessing and interpreting official statistics on drug-related deaths is a very tricky business, requiring careful appraisal of patchy information from various sources, and the adoption of several assumptions – some of which rest on a kind of conceptual quicksand. However, some theoretical and methodological groundwork has been laid, and detailed information in the form of mortality statistics is readily available from the Office of Population Censuses and Surveys (OPCS) and the Home Office.¹⁰

In 1988, there were 971 deaths involving poisoning by controlled drugs in the UK. By 1992, this number had risen steadily to 1001. Statistics on specific drugs involved in *Class A* deaths by poisoning clearly show that the three main chemical culprits are methadone,

morphine and heroin. Between 1982 and 1992:

- deaths by methadone poisoning rose from 16 to 131 (an increase of over 710 per cent)
- deaths by morphine poisoning rose from 27 to 95 (an increase of about 250 per cent)
- deaths by heroin poisoning rose from 11 to 51 (an increase of over 360 per cent)

In other words, compared with heroin, there were over one and a half times as many methadone deaths by poisoning in 1991 and over two and a half times as many in 1992.

Slicing the cake We now need to break down the poisoning deaths. Poisonings statistics are made up of three types of death – accidental, suicide or undetermined. Accidental deaths are the real one to watch – they are largely based on mistaken overdose (what we're really looking for). And the main trend by type of death is the increase in *Class A accidental deaths*, from 77 in 1982 to 204 by 1992.

If methadone kills more people than heroin, is this an acceptable social policy?

Looking at the accidental deaths in more detail, it again becomes clear that methadone is the prime suspect. Between 1982 and 1992:

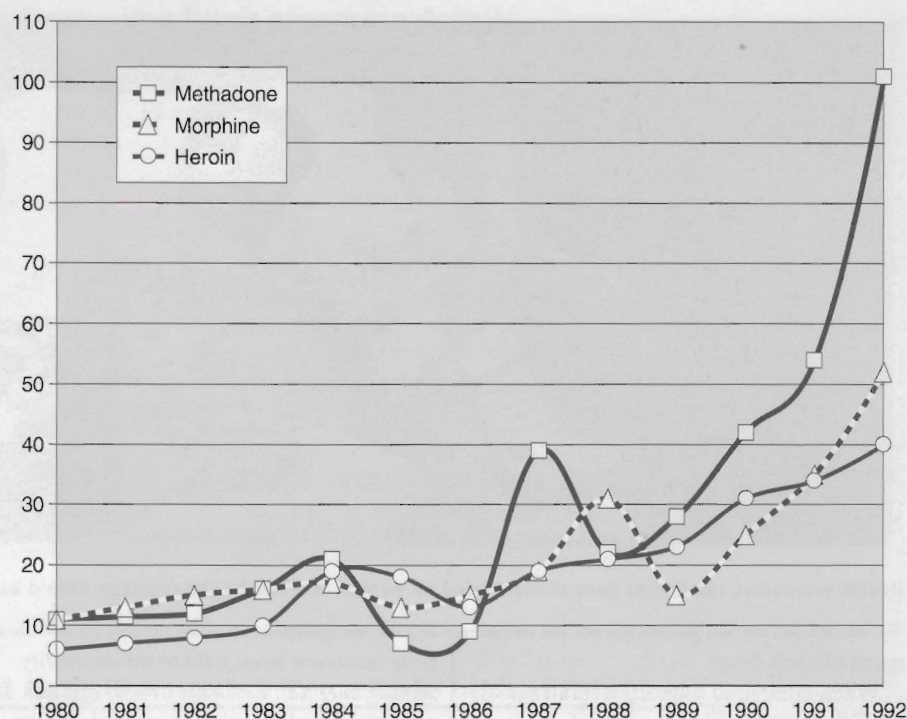
- accidental methadone-related deaths rose from 12 to 101 (an increase of over 740 per cent)
- accidental morphine-related deaths rose from 15 to 52 (again, an increase of about 250 per cent)
- accidental heroin-related deaths rose from eight to 40 (an increase of 400 per cent)

In other words, compared to heroin, there were over one and a half times as many accidental poisonings by methadone in 1991 and over two and a half times as many in 1992. This is proportionally similar to Class A poisoning deaths overall.

Estimating death rates

In 1994, 34,000 opiate addicts were notified to the Home Office's Addict Index – just under half were notified for methadone while two-thirds were notified for heroin (an addict can be notified for more than one drug).¹¹ However, there are

Annual trends in accidental fatal poisoning by three opiate drugs, 1980-1992



Annual trends in accidental poisoning by three main drugs: methadone, morphine and heroin, 1982-1992

	82	83	84	85	86	87	88	89	90	91	92
Methadone	12	16	21	7	9	39	22	28	42	54	101
Morphine	15	16	17	13	15	19	31	15	25	35	52
Heroin	8	10	19	18	13	19	21	23	31	34	40

Rate of poisoning deaths from methadone and heroin per 10,000 users of each drug (based on estimates of true prevalence)

	All deaths		Accidental deaths only	
	Methadone	Heroin	Methadone	Heroin
1990	27.6	4.7	16.8	4.3
1991	18.5	5.9	13.5	4.5
1992	26.2	6.0	20.2	4.7

obviously more than 34000 opiate addicts in Britain, as in all probability most will not seek help from GPs. One popular 'quick and dirty' way for estimating the true figure is to use a 'multiplier' – take the Addict Index number and multiply it by a factor derived from research.

There are a number of suggested multipliers, all of which depend on the 'sample' being studied (criminal drug users, registered addicts, the general population and so on).¹² As this is a general population study, we will adopt the commonly accepted multiplier of five, which allows for an estimate of around

110,000 heroin users and around 80,000 methadone users in 1994.

These estimates can now be used to compare *death rates* for heroin and methadone, based on the poisoning statistics.¹³ Interpretation is complicated, however, by the fact that there is substantial overlap between these two groups of users – many people are known to use or be dependent on both drugs simultaneously, or to switch from one to the other several times in a year.

The table shows the recent estimated annual rate of deaths by poisoning for methadone and heroin per 10,000 regular



**The effects can
last forever.**

Health promotion campaigns have concentrated on heroin, but maybe the message should be – methadone really screws you up ...

users of each drug.

When compared with the overall rate of heroin-related deaths, the rate of methadone-related deaths was six times greater in 1990, three times greater in 1991, and over four times greater in 1992. Similarly, when compared with the rate of accidental heroin-related deaths, the rate of accidental methadone-related deaths was four times greater in 1990, three times greater in 1991, and over four times greater in 1992.

In short, though these figures rest on several assumptions which require further elaboration and validation, they clearly indicate a far greater mortality risk for methadone compared with heroin.

Conclusions

One of the most important questions raised by this brief analysis is *why has so*

little attention been paid to the mortality risks of methadone? This article can do no more than leave this question hanging in the air, but a more pressing practical issue is what should be done now – that is, what changes in policy and practice toward opiate users should be introduced to reduce mortality risks to the lowest degree possible?

A recent encouraging sign that policy-makers may be taking the issue of drug-related deaths more seriously was given in *Tackling Drugs Together*, the government's recent White Paper. One of the aims identified was the reduction of drug-related health risks; and one of the key performance indicators to be used to evaluate progress towards this aim is the number of deaths attributable to drug use.

Perhaps another way to deal with methadone-related deaths specifically is

to develop alternative treatment regimes based on prescribing drugs other than methadone, for instance morphine and diamorphine.¹⁴ This option has been openly considered by the Clinical Director of Intensive Care at King's College Hospital in London, following a spate of deaths from recreational use of diverted methadone amongst young people. In a statement to the press, he said:

addicts are not taking a lot of the methadone that they are prescribed, so perhaps they should be given clean injectable heroin instead. We have to find a way of stopping the glut of methadone as well as safely treating addicts.

Though this is clearly no laughing matter, one is reminded of the old joke amongst doctors – *the operation was a great success but unfortunately the patient died*. If methadone treatment achieves most of its objectives to an acceptable degree, but also kills far more of its users than heroin does, can this be regarded as an acceptable social policy? If people who switch from heroin to methadone are found to be statistically more likely to die from their drug use, by what criteria do we decide what number of deaths is acceptable? In the final analysis, the number of methadone-related deaths which can be tolerated as a 'price worth paying' will be partly determined by political and economic factors. ○

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3D Research Bureau is an independent social research agency specialising in studies of illicit drug use. This article is based on a paper presented at the conference *Drug Policy in the 90s: the Changing Climate*, Liverpool, June 1995