



## PERSPECTIVES ON DRUGS

# Preventing overdose deaths in Europe

More than 9 000 lives were reported to be lost to drug overdoses in Europe (28 EU Member States, Turkey and Norway) in 2016, the latest reporting year, and this is an underestimate. Reducing drug-related deaths therefore remains a major challenge for public health policy. This analysis describes some of the factors that increase the risk of fatal and non-fatal overdoses and a number of interventions developed to prevent these events.

The heroin epidemics that spread across Europe in the 1980s resulted in increasing numbers of overdose deaths <sup>(1)</sup> among opioid users, which peaked for the first time around the turn of the millennium. A new record number for the countries reporting to the EMCDDA (28 EU Member States, Turkey and Norway) was registered in 2016, with 9 138 overdose deaths. At country level, the most recent data from a number of the countries with relatively robust reporting systems, including Ireland, Lithuania, Sweden and the United Kingdom, show an increase. The 2016 data show an increasing trend for the fourth consecutive year.

Drug overdose continues to be a major cause of death, especially among young people in Europe, with data showing that males are disproportionately affected. Overdose mortality rates are highest at age 35-39 for males, with 57.4 deaths per million, and at age 40-44 for females, with 12.4 deaths per million. Mean age at death, however, is 39 years old for both men and women. European countries have implemented a variety of approaches in their attempt to reduce overdose deaths at the national level, using evidence-based interventions drawing on an understanding of individual and environmental risk factors.

### Which factors increase the risk of fatal and non-fatal overdose?

The type of substance used, the route of administration and the health of the user all have an impact on the risk of

<sup>(1)</sup> In this analysis, the term 'overdose deaths' refers to deaths that are caused directly by the consumption of one or more illicit drug (<http://www.emcdda.europa.eu/activities/drd>). Generally, overdose deaths occur shortly after the consumption of the substance(s). These deaths are also known as 'poisonings' or 'drug-induced deaths'.

Full edition of this article with interactive features available online at

[emcdda.europa.eu/topics/pods/preventing-overdose-deaths](http://emcdda.europa.eu/topics/pods/preventing-overdose-deaths)



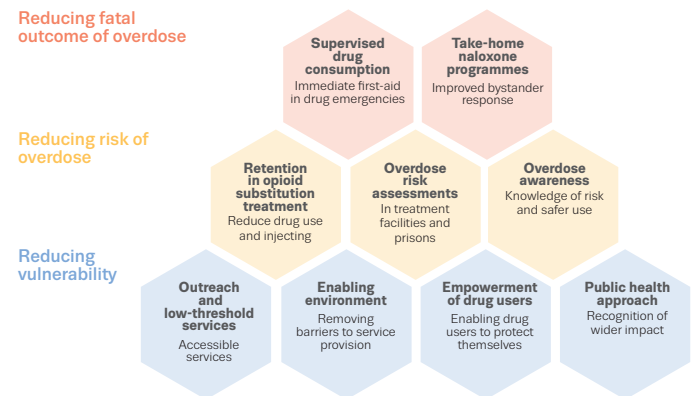
overdose. Most overdose deaths are linked to the use of opioids, primarily the injection of heroin. Heightened levels of risk are also associated with the misuse of certain prescription drugs (e.g. benzodiazepines), and the non-medical use of prescribed substitution medications and opioid analgesics (EMCDDA, 2017, 2018a; Giraudon et al., 2013). In addition, a substantial number of deaths involve polydrug use, particularly heroin in combination with other central nervous system depressants, such as alcohol or benzodiazepines.

Highly potent new synthetic opioids seem to play an increasing role in drug overdose in Europe. Of particular concern are the fentanyl derivatives, which make up the majority of the new opioids monitored by the EMCDDA. Because of the high potency of these substances, minute quantities can cause life-threatening conditions, due to rapid and severe respiratory depression. This makes them especially dangerous, particularly for unsuspecting users who believe they are using heroin, other illicit drugs or pain medicines. The dangers to public health posed by these substances are being witnessed in the United States, where synthetic opioids other than methadone, mostly illicitly manufactured fentanyls (Centers for Disease Control and Prevention, 2018) are now one of the main drivers behind a continuing surge in overdose deaths. A rapid increase in deaths attributed to this group of substances has been noted over recent years, with 19 413 deaths in 2016, corresponding to 6.2 deaths per 100 000 population, a six-fold increase from 1.0 deaths per 100 000 population in 2013.

A number of environmental factors increase the risk of drug overdose death including, in the case of opioid users, disruption of treatment provision or discontinuity of treatment and care. In certain situations, for example following detoxification or discharge from drug-free treatment, the tolerance of drug users to opioids is greatly reduced and, as a result, they are at particularly high risk of overdosing if they resume use. For these same reasons, inadequate throughcare between prison and community has also been identified as an important environmental risk factor (WHO, 2014; Zlodre and Fazel, 2012). In a cohort study in England, differences in the risk of fatal opioid poisoning were identified, dependent on the type of treatment received: opioid users who received only psychological support appeared to be at greater risk than those who received opioid agonist pharmacotherapy (Pierce et al., 2016).

Finally, the lack of response or inadequate interventions by those witnessing overdoses, whether due to poor first aid knowledge, lack of access to effective medication or fear of legal repercussions, increases the risk of an overdose event having a fatal outcome (Fisher et al., 2012). A study in Bergen, Norway analysed differences in the time emergency services needed to arrive after overdose call-outs to private or public addresses. Ambulance response times were more likely

FIGURE 1  
Interventions to reduce opioid-related deaths



Source: EMCDDA, 2017.

to be longer for private locations; victims at private homes were more likely to be left at the scene after being treated and less likely to be transported to hospitals (Madah-Amiri et al., 2016).

### A range of responses: reducing the number of overdoses and preventing deaths

Drawing on the insights gained from risk and protective factors, the prevention of overdose deaths is generally addressed at three levels (see Figure 1). As a basis for a successful response, broader public health approaches such as provision of outreach and low-threshold services and enabling environments can reduce access barriers and thus reduce vulnerability to overdose, while empowering drug users to protect themselves may provide an environment in which overdoses are less likely. The second level involves a set of interventions geared towards preventing the occurrence of overdoses, while the third level focuses on reducing morbidity and fatal outcomes when an overdose has happened (EMCDDA, 2017).

Below, we introduce some of the most important strategies used by countries to address overdose prevention.

#### Increasing awareness of and information about overdose risks

A history of opioid use is a risk factor for overdose, and those who report prior overdoses are at a higher risk of overdosing again. As many drug users either are unaware of or seriously underestimate overdose risks, effective communication with users can act as a catalyst for reducing harm. Ideally, overdose prevention, education and counselling interventions would be provided by trained professionals as a matter of routine in the relevant health and primary care settings. Screening for overdose risk by those treating heroin users may contribute

to reductions in overall mortality (Darke et al., 2011), while the use of overdose risk assessment interventions can assist the early identification of high-risk individuals. All EU Member States and Norway report the distribution of overdose risk information, which is sometimes also available in different languages in order to be accessible to migrant drug users. An [e-health overdose risk assessment tool](#) and overdose awareness videos, which may be projected in the waiting rooms of drugs facilities (e.g. <http://vimeo.com/album/1655129>), have also been produced.

Acknowledging the risk of mortality related to prescription opioids witnessed in the United States, EU countries now have an opportunity to adapt and scale up their prevention measures, reinforce surveillance and introduce improved regulatory measures to prevent deaths reaching epidemic proportions (Giraudon et al., 2013).

#### **Provision of effective drug treatment and retention in treatment**

There is convincing evidence that opioid substitution treatment (OST) substantially reduces the risk of mortality, as long as doses are sufficient and continuity of treatment is maintained ([EMCDDA Best practice portal](#); Pierce, 2016). A prospective observational cohort study conducted in Edinburgh confirmed that survival is increased by cumulative exposure to treatment (Kimber et al., 2010). As retention in drug treatment is a protective factor against overdose deaths, many European countries have given priority to increasing access to and coverage of treatment services.

With OST provision high, medical staff and service planners face the challenge of minimising the diversion of substitution medications to those without prescriptions while continuing to ensure that access to treatment is not impeded, for example by supervising consumption. Another widely used approach to reducing the risk of overdose is the implementation of good treatment practice, which involves the use of clinical guidelines and training doctors in prescribing practices (including benzodiazepine prescribing).

#### **Improving throughcare between prison and community**

Several interventions are recommended to help reduce the high number of overdose deaths among former prisoners in the period shortly after leaving prison (Binswanger et al., 2013; Merrall et al., 2010). These include pre-release education on overdose risks and prevention, continuation and initiation of substitution treatment (Degenhardt et al., 2014), naloxone distribution (Meade et al., 2018) and improved referral to aftercare and community treatment services (WHO



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Regional Office for Europe, 2014). A current EU-funded multi-country project 'My first 48 hours out' (Belgium, Germany, France, Portugal) explores approaches to pre- and post-prison release interventions to reduce harms, through investigating risk behaviour of people upon release from prison and documenting best practices.

#### **Prevention of deaths in overdose situations**

A second set of responses focuses on the prevention of fatalities when overdoses occur. These include a range of targeted interventions, the purpose of which is to enhance safety and ensure a rapid and effective response in emergency situations.

##### **Supervised drug consumption rooms**

A total of 78 facilities for supervised drug consumption operate across six EU Member States (Denmark, Spain, Germany, France, Luxembourg, Netherlands) and Norway, serving specific subgroups of highly marginalised and homeless drug users. Supervised drug consumption facilities aim to reach marginalised high-risk drug users and connect them to the wider network of care, to reduce the acute risks of diseases and overdose death associated with injecting or inhalative drug use, and to reduce public drug use (Belackova and Salmon, 2017). Consumption rooms are highly targeted services, usually integrated within facilities that offer a broad range of other health and social services. They provide a safer drug use environment, advice on safer injecting and medical supervision, and are equipped to manage drug overdoses and reduce related morbidity and mortality. Millions of injections have been supervised and no overdose fatalities have occurred in the facilities. Evidence from robust studies documents increased access to health and social services among clients of supervised drug consumption facilities, and decreased public drug use and associated nuisance.

## Facts and figures

**1.3 million** high-risk opioid users in Europe, including Norway

**9 138** overdose deaths in 2016 (EU28 plus Turkey and Norway) — highest number of overdose deaths ever reported

**57** deaths per million male population aged 35-39 due to overdose

**636 000** clients in opioid substitution treatment in the EU and Norway in 2016

**10** countries with take-home naloxone programmes

**8** European countries, including Switzerland, with drug consumption rooms

A reduction in overdose mortality at the population level was documented in the city of Vancouver, in the local area where a supervised injecting facility operates (Marshall et al., 2011). See also, [Drug consumption rooms](#) (EMCDDA, 2018b).

### Improved bystander response

Most overdoses occur when others are present, and most injecting drug users have witnessed or experienced overdoses. Therefore, drug users themselves, or their friends and family, are likely to be both bystanders and potential first responders in emergency overdose situations (Strang et al., 2008). These human networks, with appropriate training and awareness raising, can be utilised to prevent overdose deaths. Interventions that aim to improve bystander responses consist of training peers and family members of drug users in overdose prevention, recognition and response. A contextual analysis of ambulance call-outs to emergencies at private addresses (Madah-Amiri et al., 2016; see section on risk factors above) also indicates potential opportunities for peer overdose prevention interventions. In its guidelines on community management of opioid overdose, the World Health Organization (WHO) recommends that people likely to witness an opioid overdose should have access to naloxone — an effective antidote that can reverse opioid intoxication — and should be instructed in its administration (WHO, 2014). Evidence shows that educational and training interventions for peers and family members, complemented by take-home naloxone, help decrease overdose-related mortality. With evidence on its effectiveness growing, take-home naloxone provision has gained more attention in Europe in recent years. A recent EMCDDA publication brings together evidence as well as experiences from take-home naloxone projects in Europe and elsewhere (EMCDDA, 2016).

## Interactive element: videos



Video: example of an overdose awareness video projected in waiting rooms of drugs facilities available on the EMCDDA website: [emcdda.europa.eu/topics/pods/preventing-overdose-deaths](http://emcdda.europa.eu/topics/pods/preventing-overdose-deaths)



Video: Take-home naloxone programmes in Europe — overdose prevention available on the EMCDDA website: [emcdda.europa.eu/topics/pods/preventing-overdose-deaths](http://emcdda.europa.eu/topics/pods/preventing-overdose-deaths)

## Conclusions

Drug overdose deaths are preventable, and there is good evidence to show that specific interventions can both reduce the occurrence of overdose events and prevent fatal outcomes in overdose situations. The accumulated knowledge about risk and protective factors associated with overdoses, and about the successful management of overdose situations, has grown. Access to OST, which constitutes an important protective factor, has been substantially scaled up across Europe. In addition, some countries have introduced new and targeted approaches, searching for innovative ways to identify those at risk of overdose, to raise risk awareness and to enable those who witness overdoses to intervene and prevent fatal outcomes.

## Peer naloxone distribution

Naloxone is an opioid antagonist medication used worldwide in emergency medicine to reverse respiratory depression caused by opioid overdose. It is listed by the World Health Organization as an essential medicine and is available in injectable form (intramuscular and intravenous) and, more recently, as intranasal spray. WHO guidelines on community management of opioid overdose recommend improving the availability of naloxone among those who are likely to witness an opioid overdose (WHO, 2014).

In order to make naloxone available where overdoses occur, opioid overdose prevention programmes train potential bystanders, such as opioid users, their peers and family, on how to recognise and respond to opioid overdose and provide them with the medication. These so-called 'take-home' naloxone programmes exist in Australia, Canada, Europe and the United States (Wheeler et al., 2015; Clark et al., 2014; McDonald et al., 2017; Horton et al., 2017).

In its 2015 systematic review of 21 studies on take-home naloxone, the EMCDDA found evidence that educational and training interventions complemented by take-home naloxone decrease overdose-related mortality, and that opioid-dependent patients and their peers involved in such programmes improved their knowledge on the correct use of naloxone and the management of witnessed overdoses (EMCDDA, 2015).

Currently, nine European countries (Denmark, Germany, Estonia, Ireland, Spain, France, Lithuania, Norway, United Kingdom) report the existence of take-home naloxone programmes. In Italy, where the medication is available as an 'over-the-counter' drug, service providers can give it out to potential bystanders (Ronconi et al., 2017). Take-home naloxone programmes in Denmark, France, Norway and the United Kingdom (England, Scotland and Wales) operate nationwide, while programmes in Germany, Estonia, Ireland, Spain and Lithuania are regional or local. The feasibility of take-home naloxone in the context of release from prison has been established in several studies (Horton et al., 2017), and in five European countries (Denmark, Estonia,

France, Norway, United Kingdom), take-home programmes target inmates on release from prison.

The adoption of take-home naloxone programmes, which implies a widespread distribution of the medication, has been hampered by practical and regulatory hurdles, mostly due to the fact that available products are destined for parenteral (injecting) use and that, except in Italy and more recently other countries, the medication has to be prescribed by a doctor to the person it is used on. In response to a strong increase in the number of opioid overdose deaths in the United States and Canada, special efforts to simplify and improve naloxone availability are made. While take-home naloxone programmes are implemented under medical supervision, solutions have been found to facilitate access to naloxone through its legal recognition as an emergency medication and re-scheduling (United Kingdom, Italy), repeal of prescription restrictions (Australia, Canada, France and several US states), and local and temporary exceptions for take-home programmes (Denmark, Norway).

Naloxone preparations for intranasal use, which are considered relevant for use by laypersons and non-medical responders in community-based programmes, have been available in the United States since 2015. In July 2017, following a 12-month trial, France became the first European country to authorise the marketing of a nasal naloxone spray. In November 2017, the European Commission granted authorisation for the marketing of an intranasal product across the European Economic Area, which in addition to the European Union includes Iceland, Lichtenstein and Norway.

With increasing implementation of take-home naloxone programmes, the evidence base as to their effectiveness is growing (Espelt et al., 2017). A modelling study assessing the distribution of naloxone to 30 % of heroin users, in a UK cost context, estimated a decrease of overdose deaths by around 6.6 % and confirmed a high level of cost-effectiveness (Langham et al., 2018).

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