

# Problem Opioid Use in the Czech Republic from a Historical Perspective: Times are Changing but Opioid Pharmaceuticals Remain

MALINOVSKÁ, J<sup>1</sup>, MRAVČÍK, V.<sup>1,2,3</sup>

**1** | Charles University, First Faculty of Medicine and General University Hospital in Prague, Department of Addictology, Prague, Czech Republic

**2** | National Monitoring Centre for Drugs and Addiction, Office of the Government, Czech Republic

**3** | National Institute of Mental Health, Czech Republic

**Citation** | Malinová, J., Mravčík, V. (2018). Problem Opioid Use in the Czech Republic from a Historical Perspective: Times are Changing but Opioid Pharmaceuticals Remain. *Adiktologie*, 18(3–4), 215–222.

**SUMMARY:** The prevalence of problem opioid use (POU) in the Czech Republic was estimated at 26.7% of 46,800 problem drug users in 2016, with buprenorphine being the most frequently used opioid. Although POU is not dominant in the Czech Republic because of the prevalent methamphetamine use, it still represents a public health issue, also because of the high level of intravenous use. This article reviews the literature on the development of POU on the territory of the Czech Republic and describes several phases of this development: the use of opioid analgesics and domestic production before 1989, a heroin epidemic in

the 1990s, and the decline in the use of heroin, which was replaced by diverted substitution medications (buprenorphine), and the recent return of the misuse of opioid analgesics as a consequence of users looking for a substance with an optimal cost/benefit ratio. Opioid analgesics are a desirable alternative to illicit opioids in various historical and socio-political contexts as they represent a cheap and effective opioid drug. In conclusion, appropriate regulatory, preventive, and treatment measures, such as opioid maintenance treatment, are needed to alleviate the health and social harms associated with POU.

**Keywords** | Opioids – Czech Republic – Opioid Analgesics – Buprenorphine – History

**Submitted** | 15 January 2019

**Accepted** | 12 April 2019

**Grant affiliation** | This paper was supported by the Ministry of Health of the Czech Republic, Grant No. 16-28157A, the Charles University institutional support Progress No. Q06/LF1, and Project No. LO1611 with financial support from the Ministry of Education, Youth, and Sports of the Czech Republic under the NPU I programme.

**Corresponding author** | Jana Malinová, Kroftova 5, 150 00 Prague 5, Czech Republic

[jana.malinovska@seznam.cz](mailto:jana.malinovska@seznam.cz)

## ● 1 INTRODUCTION

Problem opioid use is a substantial public health issue. At present, the average prevalence of problem opioid users (POU) in the EU is estimated to be 0.4% of the EU population, meaning there are around 1.3 million POU in the EU (European Monitoring Centre for Drugs and Drug Addiction, 2017). Opioid users in Europe are five to ten times more likely to die than their peers of the same age and gender as the illicit use of opioids is linked to high somatic comorbidity, as well as psychiatric comorbidity and a high overdose mortality rate (Fischer et al., 2006; Nutt et al., 2010; Taylor et al., 2012; Van Amsterdam et al., 2010). It is estimated that there were at least 7585 drug-induced deaths in the EU in 2017 and opioids were present in the majority of the fatal overdoses (79%) (European Monitoring Centre for Drugs and Drug Addiction, 2017). Illicit opioid use is also related to high levels of criminal activity and other social issues such as social isolation, low quality of life, and considerable financial expenses (Fischer et al., 2006; Nutt et al., 2010; Taylor et al., 2012; Van Amsterdam et al., 2010).

The onset of heroin use in Europe commenced in the 1960s in big cities in Northern and Western Europe, especially among young people, and by the 1980s the use of heroin had spread throughout the non-communist European countries (Hartnoll, 1986; Ruggiero & South, 1995). There was also an increase in heroin injecting and subsequent HIV transmission during this time (Hartnoll, 1986; Ruggiero & South, 1995). This article reviews the literature on the development of problem opioid use on the territory of the Czech Republic and describes the periods of problem opioid use from the socialist era until the present.

## ● 2 METHODS

A non-systematic literature review focusing on problem opioid use, the substances used by POU, and the illicit opioid market on the territory of the Czech Republic was conducted. The abstract and citation databases Web of Science, PubMed (NCBI), and Scopus were used for the primary identification of sources. The combinations of key words “opioids”, “history of use”, “opiates”, “drug scene”, “Czech Republic”, and Czech equivalents were used for the primary identification of sources, and afterwards the key words “heroin”, “buprenorphine”, “opioid analgesics”, “fentanyl”, “methadone”, and “opioid substitution” were added to yield more specific results. As a result, 13 relevant articles were selected. Other sources included the online library of the Czech National Monitoring Centre for Drugs and Addiction (NMS), Czech publications and scholarly journals (such as *Adiktologie*, *Zaostreno*, and annual reports on the drug situation in the Czech Republic), and publications by the European Monitoring Centre for Drugs and Drug Addictions. Key monographs in the addiction field and related university thesis works were also utilised. A narrative summary was produced.

## ● 3 RESULTS

### Situation before 1989: the communist era

The Communist Party of Czechoslovakia gained power in 1948 and held on to it till 1989. The communist regime presented an ideology of a harmonious classless society and any antisocial behaviour was considered capitalist “decay”. Drug users were therefore persecuted and isolated from the rest of society. Since the drug issue was taboo, there is only limited information on the drug scene in this period. The relative isolation of the country, strict control of its borders, and high level of police control restricted the importing of drugs into the country and shaped the drug market in the direction of domestic production, which was dominant in this period (Bém et al., 2003).

The drug market consisted of small, isolated groups in which everyone knew each other inside their group (Bém et al., 2003). There was a division of roles within the group (suppliers of precursors and chemicals, suppliers of the equipment that was needed, and “cooks”, e.g. of “braun”) and the product was shared within the group members – a commercial market did not exist at that time (Hampl, 1994; Kalina & Bém, 1994; Miovský, 2007; Zábanský, 2007)

The drugs that were used were mainly pharmaceutical (analgesics, sedatives, tranquillisers, and anxiolytics) and volatile substances, and to a lesser extent marijuana, methamphetamine, and hydrocodone (Hampl, 1994; Kalina & Bém, 1994). Addiction to pharmaceutical substances (especially by medical professionals, who had the easiest access to drugs) has been known since the first half of the 20<sup>th</sup> century. Codeine misuse has been reported since the 1940s (Nechanská et al., 2012; Vondráček, 1941). The 1950s brought an enormous increase in the misuse of analgesics; a typical example was Algena<sup>®</sup>, which consisted of phenobarbital, acetylsalicylate, caffeine, phenacetin, and aminophenazone. Because of the rapid increase in its misuse, the production of Algena<sup>®</sup> was stopped and it was replaced by Alnagon<sup>®</sup>, with phenacetin and aminophenazone being replaced in the composition with codeine. Alnagon<sup>®</sup> was sold as an OTC drug and became the most widely misused opioid analgesic from the 1960s till the 1980s and the main source for the home-made production of “braun” at the time (Brenza & Gabrhelik, 2014; Nechanská et al., 2012).

“Braun” was produced from codeine in clandestine “kitchen” laboratories. The final brown liquid, administered intravenously, consisted of a mixture of opioids such as hydrocodone, dicodid, and dihydrocodeinone (Nožina, 1997; Urban, 1973). Domestic production of “braun” has been known since the 1970s (Brenza & Gabrhelik, 2014) and it remained the most frequently used opioid among PDU until the heroin epidemic in the 1990s (Bém et al., 2003; Hampl, 1994).

The use of pharmaceutical products was widespread in the population, with 10% of the adult population using analgesics on a daily basis, and 3% of the population were estimated to be addicted in the 1970s (Brenza & Gabrhelik, 2014).

The number of non-alcohol drug users was estimated to be 25–30 thousand at the end of the 1980s (Nožina, 1997). Addiction treatment services were limited to wards in psychiatric hospitals and outpatient treatment centres for both alcoholics and drug addicts. There were no appropriate specialised services for non-alcohol drug users because of the nature of the political and healthcare system (Kalina & Bém, 1994).

### Early 1990s: the onset of heroin use

Whilst the use of heroin had become widespread throughout non-communist countries in Europe by the 1980s, the onset of heroin use in the Czech Republic was delayed until the fall of communism in 1989, which brought about a change on the drug market with the return of a democratic system in the country. The borders opened and the strict control by the police and state authorities receded. Drug consumption was identified with freedom, especially among the young (Kalina & Bém, 1994). The country was not prepared for the rapid increase in the availability of drugs and drug use as the drug issue had been taboo for several decades and no drug policy had been formulated or realised. Hence drug use spread quickly around the country (Bém et al., 2003).

The opened borders facilitated the introduction of heroin and other imported illicit drugs onto the Czech drug market and the Czech Republic became a transit country for the transportation of drugs from Asia to Northern and Western Europe (Kalina & Bém, 1994). Heroin and other imported drugs appeared on the Czech drug scene “to test the market” or in exchange for other services. Drug use spread quickly in the population and the number of drug users, including recreational and experimental users, increased rapidly. Drugs started to be paid for with money (or services, including sex) but the cost of drugs was not yet so high as to cause drug-related crime to become apparent. The drug market started to resemble a commercial market based on supply and demand. The character of the market can be described as semi-open, but not yet fully open or public (Bém et al., 2003).

Codeine (as part of the intravenously applied “braun”) remained the most abused opioid at this time (Hampl, 1994). The first heroin addicts were reported by medical services in 1991. Despite the importing of heroin, an increase in heroin use was delayed in comparison with neighbouring Slovakia or Hungary. This can be explained by the widespread domestic production of opioids, as well as “pervitin” (metamphetamine). According to a study in 1992, there were around 10,000 non-alcohol drug users, but it was estimated that the real number was several times higher (Kalina & Bém, 1994).

### 1994–2000: the dominance of heroin

A drug policy started to be shaped after 1993 (with the formation of the independent Czech state), new legislation was introduced, and the first preventive and harm reduc-

tion programmes were implemented (such as the Drop-In low-threshold centres, needle exchange programmes, and HIV counselling and testing) (Bém et al., 2003). An experimental ethylmorphine maintenance programme was introduced at the Drop-In centres (Kalina & Bém, 1994) as methadone was not officially approved for opioid maintenance treatment (OMT) until 1997, when a pilot study on OMT started at “Apolinář”, the addiction treatment unit in Prague (Zábranský et al., 2002).

Imported drugs had become dominant on the Czech drug market by 1994, with domestic production retreating as a consequence of the supply of cheap imported heroin of high quality. Drugs became widely available and the number of new drug users increased. The drug market could be characterised as open and hierarchised, with typical market competition. However, the cost of drugs increased with greater organisation of the market, with a consequent increase in drug-related crime (Bém et al., 2003).

According to a survey among PDU in Prague from 1995, 23% of the respondents indicated heroin as their primary drug (66% indicated pervitin). The proportion of heroin users increased further in the late 1990s (Csémy et al., 2002). The number of heroin users was estimated at 15 thousand out of 37.5 thousand PDU in the Czech Republic in 1998 (Mravčík & Zábranský, 2002).

### 2000–2001: the new millennium

OMT with methadone continued as a standard regime from 2000 and it was available for 318 clients (3% of POU) at seven substitution centres in six cities. An alternative, the buprenorphine substitution medication Subutex®, was registered on the Czech market in March 2000 (Zábranský et al., 2002).

Drug distribution throughout the whole Czech Republic, as well as the dominance of imported heroin over domestic opioid production, continued at the beginning of the new millennium. Heroin spread outside the capital city, Prague, and North Bohemia to other regions. The relatively isolated pervitin drug market started to shrink because of law enforcement activity and policing, which led to the development of organised crime and the merging of the heroin and pervitin drug markets (Radimecký, 2003).

Most of the opioid users were people who inject drugs (PWID), although new users would choose other routes of administration. Intravenous use brought an increase in the number of new cases of hepatitis B and C (Radimecký, 2003). In comparison to other countries, HIV/AIDS did not spread that widely among intravenous drug users in the Czech Republic (709 HIV positive cases were diagnosed up to 2001, of which only 29 were PWID) (Csémy et al., 2002).

The dominance of heroin among POU continued in this period. The number of heroin users increased slightly, in contrast to the decreasing number of pervitin users. There

was a peak in opioid-induced deaths in 2001, with 53 opioid-induced deaths, out of which 30 were caused by heroin overdoses (Zábranský et al., 2002).

The number of PDU stabilised in this period at 37.5 thousand (30 thousand PWID), with 15 thousand heroin users, suggesting an end of the heroin epidemic despite the continuous availability of imported heroin on the drug market (Mravčík et al., 2005; Mravčík & Zábranský, 2002). This was a surprising evolvment, as the heroin epidemic did not spread to such an extent and did not involve as many drug users in comparison to the adjacent countries and the post-Soviet countries. The difference might have been caused by the relatively resistant domestic market, with strong domestic production and the use of pervitin (Zábranský, 2003).

### **2002–2010: leakage of buprenorphine onto the black market**

The drug epidemic began to retreat in 2002, which was documented by a relatively stable number of PDU (35–37 thousand users, out of whom 13–15 thousand were heroin users) and a decline in opioid-induced deaths (new users would be more prone to overdoses). On the other hand, the number of recreational and experimental users increased. The proportion of heroin users in treatment decreased from 28.7% in 2001 to 16.9% in 2002. This can be explained by the high price of heroin, despite its very low purity (dropping down to as little as 0.4%). OMT coverage increased slowly – there were 463 patients on methadone treatment at nine substitution centres and 500–700 patients who were being prescribed Subutex® in 2002, which represented 7% coverage of OMT (Mravčík et al., 2003).

The most frequently used opioid among PDU remained heroin, imported through the southern Balkan route. Opiates made from poppies were used only seasonally and the use of domestically prepared “braun” disappeared almost completely. Alnagon® and other pharmaceutical opioids were sporadically used by some PDU. The first reports by the SANANIM outreach programme on the leakage of Subutex® from OMT onto the illicit drug market in Prague appeared in summer 2002 (Řezníčková & Nedvěd, 2004). Subutex® had appeared on the illicit drug market in other regions (North Bohemia) by the end of the year (Nechanská et al., 2012). Subutex® (mainly applied intravenously) was used on single occasions or in transitional periods of a shortage of heroin on the illicit market. The primary drug of opioid users in the early 2000s still continued to be heroin (Mravčík et al., 2003).

Act No. 223/2003 Sb., on controlled substances, came into effect in the second half of 2003. The legislation scheduled buprenorphine medications in a stricter regime of opioid prescription. This unprepared and isolated legislative change led to a sudden drop in the availability of Subutex® as there were few medical doctors ready and willing to prescribe the drug. In consequence, it led to prolonged waiting periods for entering OMT and users were looking for a source of the

drug on the illicit market (Nechanská et al., 2012). The shortage of Subutex® became reflected in the cost of a dose on the illicit market, which increased five times, up to 1500 CZK (\$67.5 according to the exchange rate on 10<sup>th</sup> January 2019; this exchange rate is used throughout the paper) for an 8-mg tablet. Some users switched back to heroin use, which led to an increased demand for heroin and thus an increase in the price of heroin. There was also an increase in drug-related crime in the form of stealing prescriptions and mugging clients in OMT (Mravčík et al., 2004). This was the moment when the illicit market in buprenorphine preparations was finally established (Nechanská et al., 2012). A combined substitution product Suboxone®, with buprenorphine and naloxone (reducing the risk of misuse by injecting), entered the Czech market in February 2008. Initially, there was no demand for this product on the illicit drug market or in OMT (Mravčík et al., 2009).

The leakage of Subutex® from OMT onto the illicit drug market continued, especially in those regions with a traditionally high proportion of heroin users among PDU. Subutex® gradually became a primary drug of people who had originally been heroin users, and this was accompanied by a shrinking heroin market and a drop in the number of fatal opioid overdose cases. The number of buprenorphine users gradually rose from 4300 buprenorphine users out of 10,500 opioid users in 2006 up to 2012, when the number of buprenorphine users exceeded the number of heroin users for the first time (Mravčík et al., 2013).

Because of the high cost of buprenorphine, buprenorphine users tend to pulverise the tablet into smaller doses, which increases the frequency of injecting compared to heroin users (Švůgerová, 2015). The high cost leads to the use of a low dose (much lower than the optimal therapeutic dose) among problem buprenorphine users (Gluzová, 2014). This leads to *doctor shopping* (Sansone & Sansone, 2012) in an effort to get a prescription for a greater amount of substitution medication at substitution centres so that a client can afterwards resell part of the prescribed medication on the illicit drug market for a higher price to pay for his own dose (Nechanská & Mravčík, 2013). Poly-drug and intravenous use is common among buprenorphine users. According to a survey in 2006, one quarter of users combined buprenorphine with pervitin and 95% were PWID (Mravčík & Orlíková, 2007).

### **2011–present times: the comeback of opioid analgesics**

The consumption of prescribed opioid analgesics in the Czech Republic has increased significantly, with a more than fourfold increase between the years 2001 and 2013 (Berterame et al., 2016), and the trend continues (Bosetti et al., 2018). The prescription of opioid analgesics is regulated by Decree No. 54/2008 Sb., which supplements Act No. 378/2007 Sb. and defines special prescription forms with a blue stripe and sets rules for keeping records regarding the prescription. According to the data of the Internation-

al Narcotics Control Board, by far the most frequently consumed opioid analgesic in the Czech Republic was fentanyl, while other frequently used opioids were oxycodone, hydro-morphone, and morphine (Bosetti et al., 2018). The most frequent diagnosis for the prescription of opioid analgesics for chronic pain, according to a pilot study in chronic pain centres in the Czech Republic, is musculoskeletal disorders (Lávičková et al., 2012).

The low purity of heroin and its high cost on the illicit drug market forced users to look for cheaper alternatives. Clients of low-threshold drop-in centres in Pilsen indicated the use of a morphine-based opioid analgesic, Vendal® retard 200 mg, for the first time at the end of 2010 and the intravenous misuse of fentanyl from transdermal plasters started to appear among the clients from 2012. Both opioid analgesics became the primary drugs of some of the users in Pilsen (Frýbert & Ackrmannová, 2015).

The first reports on fentanyl came from police units in the Moravian-Silesian region at the end of 2010. Fentanyl was distributed in a mixture called “vlacho”, cut with caffeine and paracetamol. The first two cases of fatal overdoses on fentanyl also occurred in the same year (Nechanská et al., 2012). Vendal® retard was also used among users in South Bohemia. Another illicitly used opioid analgesic was Palladone®, used among drug users in the Pilsen and Hradec Kralove regions (Mravčík et al., 2015).

There were also cases of domestic heroin production by the acetylation of raw opium or morphine products (Mravčík et al., 2015). A “braun” manufactory was uncovered for the first time in the new millennium in 2010 (Mravčík et al., 2012). The seasonal use of raw opium obtained from poppies cultivated in the Czech Republic is present. However, the poppy strains *Papaver somniferum* L. grown in the Czech Republic are cultivated mainly for culinary purposes and contain only a limited amount of opiates (according to Act No. 167/1998 Sb., the proportion of morphine in a poppy head must not exceed 0.8%).

Since 2012, the most prevalent opioid among POU in the Czech Republic has been buprenorphine; the second most commonly used opioid is heroin. However, opioid analgesics have reappeared, especially morphine and fentanyl (Mravčík et al., 2012). The estimated number of heroin users decreased in 2016, whilst the number of users of opioid analgesics increased (Mravčík et al., 2017). Heroin has gradually become a supplementary drug for most POU, rather than a primary drug, and there are just a few POU taking heroin regularly on a daily basis (Malinovská & Mravčík, 2017). There are some regional differences in the use of heroin. The use of heroin increased in the South Bohemia region in 2016. On the other hand, the availability of heroin in the Central Bohemia region decreased after a temporary come-back onto the illicit drug market in 2014-2016 and POU in Central Bohemia switched again to buprenorphine and opioid analgesics in reaction to the decrease in the availability of heroin (Mravčík et al., 2017).

The opioid analgesics used by POU in the Czech Republic are especially fentanyl, morphine (Vendal® retard), hydro-morphone (Palladone®), oxycodone (OxyContin®) and tramadol (Tramal®). Opioid analgesics can be the predominant opioids in some regions, for example Pilsen, where Vendal® retard is the second most prevalent drug among PDU (the most prevalent is pervitin). Fentanyl plasters are most often found in medical waste or obtained from oncological patients. The use of buprenorphine from boiled-out plasters has also been detected (Mravčík et al., 2017).

Intravenous application among POU is an ongoing public health issue; injecting is the route of application for up to 90% of PDU. However, according to reports from low-threshold centres, the proportion of PWID seems to have been decreasing recently (Mravčík et al., 2017). Suboxone® has the lowest proportion of injecting use among the clients of low-threshold centres, which may be caused by the addition of naloxone, which can prevent some users from injecting the drug (Malinovská & Mravčík, 2017).

The number of PDU in the Czech Republic in 2016 was estimated at 46.8 thousand (95% CI: 45.1–48.4 thousand), out of whom 34.3 thousand (33.7–34.9 thousand) were pervitin users and 12.5 thousand (12.0–12.9 thousand) were opioid users. There were 7.3 thousand (7.0–7.6 thousand) buprenorphine users, 3.4 thousand (3.2–3.6 thousand) heroin users, and 1.7 thousand (1.6–1.8 thousand) users of other opioids estimated using a multiplier method extrapolating the data from low-threshold programmes as a benchmark. Intravenous drug users were estimated at 42.8 thousand (41.8–43.7 thousand). The prevalence of problem drug use in the Czech Republic decreased slightly to 0.67% of the adult population aged 15–64. The majority of PDU are in Prague and the Ústí nad Labem region (Northern Bohemia), regions with a typically higher prevalence of POU (Mravčík et al., 2017).

## Opioid maintenance treatment today

Drug use patterns are influenced by the availability of drug treatment and accordingly discussion of opioid maintenance treatment in the Czech Republic is important. 2266 patients in OMT from 63 healthcare providers were reported to the national registry of addiction treatment in 2016 (2300 patients annually were reported in the last five years). That means 18.1% of POU are registered in OMT. 1578 patients (69.6%) were prescribed buprenorphine, while 688 (30.4%) were on methadone. Subutex® and other mono-buprenorphine products were prescribed to 881 patients (55.8% of those on buprenorphine), and 697 patients (44.2%) were prescribed the combined product Suboxone®. However, there are doctors who do not register their patients in the national registry; therefore, the number of patients in OMT is underreported. On the evidence of the results of a survey among medical doctors, the estimated number of patients in OMT not reported to the registry is 1500–3500, which altogether yields 30–46% OMT coverage (Mravčík et al., 2017). The Czech Republic continues to have a below-aver-

age proportion of POU in OMT in comparison to the average OMT coverage in the EU, which is around 50% (European Monitoring Centre for Drugs and Drug Addiction, 2017). As some studies have shown, the reasons for the low coverage by OMT are the strict conditions set by health insurance companies and administrative and regulatory restrictions for OMT providers (Knudsen & Roman, 2012; Mravčík et al., 2018; Nosyk et al., 2013; Vranken et al., 2014).

There are considerable regional differences in the availability of OMT in the Czech Republic. The lowest availability is in the Zlín region (1% POU), Karlovy Vary region (7%), South Bohemia region (11.4%), Moravian-Silesian region (12%), and Pilsen region (13%). These regions are also typified by the significant use of opioid analgesics among POU. Prague also has a below-average availability of OMT: 67.7% of the POU in the Czech Republic are estimated to be in Prague, and just 16.5% of them (1418) are registered in OMT (Mravčík et al., 2017).

Apart from the limited geographical availability of OMT, the affordability of substitution medication is also critical. Methadone is available in the form of a *magistra liter* preparation; the import of the generic substance is financed directly by the Ministry of Health. Patients thus obtain methadone for free; however, methadone is only available at 12 substitution centres with a capacity of up to 700 slots in the long run. Mono-buprenorphine preparations, available on prescription in pharmacies, are not covered by health insurance and so are fully paid for by patients (Subutex® is around 1450 CZK (\$65.3) for seven 8-mg tablets). Suboxone® 8 mg (the combined product) can be fully paid for by health insurance. However, the medication that is covered is available for a small number of clients only, because the majority of OMT providers do not apply for this option because of the specific nature of the insurance scheme (special contract needed, available just at specialised centres, prescribed by psychiatrists or addiction specialists only, the costs are reimbursed to health facilities retrospectively, strict control by insurance companies). As a result, the estimated number of clients with Suboxone® treatment paid for by health insurance was around 75 in four centres in 2015. Therefore, the majority of clients on buprenorphine (over 3000) pay the full price for the substitution medication (Mravčík et al., 2015). A proper and sufficient dosage is an important factor for effective treatment, as a higher dosage prolongs retention in treatment and prevents illicit drug use (Fareed et al., 2009; Gossop, 2006; Schulte et al., 2008).

Low affordability and availability are likely to be the main factor of limited OMT coverage in the Czech Republic. They act as a motor for *doctor shopping* and the reselling of the surplus prescribed medication at a higher price among users, which shapes the Czech illicit opioid market today and at the same time co-finances the medication of clients in official OMT programmes. Improving the financial affordability of OMT is crucial in order to increase OMT coverage and to help reduce the illicit market in OMT medication (Mravčík, et al., 2018).

The development of problem opioid use in the Czech Republic is summarized in *Table 1*.

Period	Description
<b>Before 1989</b>	Home-made drugs made from opioid medicinal products Closed user groups, no commercial market
<b>Early 1990s</b>	Introduction of imported heroin onto the drug market Rapid spread of drug use, beginnings of a commercial market
<b>1994–2000</b>	Dominance of heroin among POU Further spread of drug use, an open, hierarchised commercial market
<b>2000–2001</b>	Continuation of dominance of heroin among POU Stabilisation of the number of PDU, merging of plevitin and heroin markets
<b>2002–2010</b>	Leakage of buprenorphine from OMT onto the illicit market Decline in the number of heroin users
<b>2011–now</b>	Dominance of buprenorphine over heroin among POU Comeback of opioid medicinal products

**Table 1 |** Summary of the development of problem opioid use in the Czech Republic

## ● 4 SUMMARY AND CONCLUSIONS

The present review summarises the historical development of problem opioid use in the Czech Republic. Because of the language barrier and the low availability of relevant sources in bibliographical databases, a substantial part of the review is based on grey and unpublished sources in Czech. Some evidence, especially that referring to the 1980s or 1990s, may be anecdotal and the validity of some findings may thus be limited.

Although POU in the Czech Republic has never been as dominant as in other EU countries because of the prevalent plevitin use, it still represents a substantial public health problem, additionally because of the high level of intravenous use. It has gone through several developmental phases: from the use of opioid analgesics and domestic production based on them before 1989, the heroin epidemic in the 1990s, until the decline in heroin use saw it replaced by diverted substitution medications, and the recent return of opioid analgesics. The current situation on the Czech opioid scene can be characterised as a predominant misuse of opioid pharmaceutical products. The illicit opioid market is again disintegrating and decommercialising, as before 1989, as *doctor shopping* and the reselling of surplus prescribed medication among users are shaping the form of the market.

The development of opioid use on the territory of the Czech Republic illustrates how social changes, the nature of illicit drug supply, the quality/purity and price of a drug, legislative and regulatory changes, the availability of OMT, and the availability of opioid pharmaceutical substances, all in

combination, affect the shape of the phenomenon. Probably the major lesson to be learnt from this story is that users are looking for a substance with an optimal cost/benefit ratio (combination of effect and price) that would replace expensive and less effective/low-quality illicit opioids such as heroin. That is a reason why opioid analgesics are a desirable alternative to illicit opioids in various diverse historical and socio-political contexts.

Low affordability and availability are likely to be the main factor in the limited OMT coverage in the Czech Republic, driving the illicit market in OMT. Improving the financial affordability of OMT is crucial in order to increase OMT coverage and to help reduce the illicit market in OMT medications.

Therefore, it is necessary to apply appropriate regulatory and policy measures to reduce the prevalence and severity

of problem opioid use and to improve the availability and accessibility of effective preventive and treatment alternatives such as OMT.

## LIST OF ABBREVIATIONS

**OMT:** opioid maintenance treatment

**PDU:** problem drug use(rs), defined by the EMCDDA as 'injecting drug use or long duration or regular use of opioids, cocaine, and/or amphetamines'

**POU:** problem opioid use, defined as injecting opioid use or long duration or regular use of opioids

**PWID:** people who inject drugs

**Authors' contribution:** JM conducted the literature search and drafted the manuscript. VM revised and added to the text. Both authors contributed to the article and approved the final version of the manuscript.

**Declaration of interest:** The authors declare that they have no conflict of interest.

## REFERENCES

- Bém, P., Kalina, K., & Radimecký, J. (2003). Vývoj drogové scény a protidrogové politiky v České republice. In *Drogy a drogové závislosti: mezioborový přístup* (pp. 33–40). Praha: Úřad vlády České republiky.
- Berterame, S., Erthal, J., Thomas, J., Fellner, S., Vosse, B., Clare, P., Hao, W., Johnson, D. T., Mohar, A., Pavadia, J., Samak, A. K. E., Sipp, W., Sumyai, V., Suryawati, S., Toufiq, J., Yans, R., & Mattick, R. P. (2016). Use of and barriers to access to opioid analgesics: A worldwide, regional, and national study. *The Lancet*, *387*(10028), 1644–1656. [https://doi.org/10.1016/S0140-6736\(16\)00161-6](https://doi.org/10.1016/S0140-6736(16)00161-6)
- Bosetti, C., Santucci, C., Radrezza, S., Erthal, J., Berterame, S., & Corli, O. (2018). Trends in the consumption of opioids for the treatment of severe pain in Europe, 1990–2016. *European Journal of Pain*. <https://doi.org/10.1002/ejp.1337>
- Brenza, J., & Gabrhelík, R. (2014). Vývoj užívání léčiv v České socialistické republice v období před „objevem“ postupu pokoutní výroby pervitinu a braunu. *Adiktologie*, *14*(3), 284–293.
- Csémy, L., Kubička, L., & Nociar, A. (2002). Drug Scene in the Czech Republic and Slovakia during the Period of Transformation. *European Addiction Research*, *8*(4), 159–165. <https://doi.org/10.1159/000066134>
- European Monitoring Centre for Drugs and Drug Addiction. (2017). *European Drug Report 2017: Trends and developments*. Luxembourg.
- Fareed, A., Casarella, J., Roberts, M., Sloboda, M., Amar, R., Vayalappalli, S., & Drexler, K. (2009). High dose versus moderate dose methadone maintenance: is there a better outcome? *J Addict Dis*, *28*(4), 399–405.
- Fischer, B., Cruz, M. F., & Rehm, J. (2006). Illicit opioid use and its key characteristics: a select overview and evidence from a Canadian multisite cohort of illicit opioid users (OPICAN). *Can J Psychiatry*, *51*(10), 624–634.
- Frýbert, J., & Ackermannová, M. (2015). Preference jednotlivých opioidů mezi klienty spolku Ulice - Agentura sociální práce. *Adiktologie*, *15*(3), 242–251.
- Gluzová, J. (2014). *Vzorce užívání buprenorfinu u klientů Terénního programu SANANIM*. Univerzita Karlova v Praze.
- Gossop, M. (2006). *Treating drug misuse problems: evidence of effectiveness*. London: National Treatment Agency for Substance Misuse.
- Hampl, K. (1994). Substance Abuse in the Czech Republic. In *Substance Abuse in the Czech Republic: Selected Papers on Alcohol and Drug Abuse; Country Report on Drug Abuse* (pp. 28–36). Praha: International Institutes on the Prevention and Treatment of Alcoholism and Drug Dependence. Retrieved from [http://www.drogy-info.cz/data/download/91280/393202/file/3\\_Substance Abuse in the Czech Republic\\_ePub.pdf](http://www.drogy-info.cz/data/download/91280/393202/file/3_Substance%20Abuse%20in%20the%20Czech%20Republic_ePub.pdf)
- Hartnoll, R. (1986). Current situation relating to drug abuse assessment in European countries. *UN Bulletin on Narcotics*, *38*(1–2), 65–80.
- Kalina, K., & Bém, P. (1994). Drug Problems and Drug Policy in the Czech Republic. In *Substance Abuse in the Czech Republic: Selected Papers on Alcohol and Drug Abuse; Country Report on Drug Abuse* (pp. 37–44). Praha: International Institutes on the Prevention and Treatment of Alcoholism and Drug Dependence. Retrieved from [http://www.drogy-info.cz/data/download/91280/393202/file/3\\_Substance Abuse in the Czech Republic\\_ePub.pdf](http://www.drogy-info.cz/data/download/91280/393202/file/3_Substance%20Abuse%20in%20the%20Czech%20Republic_ePub.pdf)
- Knudsen, H. K., & Roman, P. M. (2012). Financial factors and the implementation of medications for treating opioid use disorders. *J Addict Med*, *8*(4), 280–286.
- Lávičková, J., Gabrhelík, R., & Voňková, H. (2012). Kombinace opioidních analgetik na lékařský předpis s alkoholem nebo jinou návykovou látkou. *Adiktologie*, *2*(12), 80–88.
- Malinová, J., & Mravčík, V. (2017). Problémové užívání opioidů mezi klienty nízkoprahových kontaktních center v Praze : dotazníkové šetření [Problem Opioid Use among Clients of Low-threshold Drop-in Centres in Prague: Questionnaire Survey]. *Adiktologie*, *17*(4), 262–271.
- Miovský, M. (2007). Changing Patterns of Drug Use in the Czech Republic During the Post-Communist Era: A Qualitative Study. *Journal of Drug Issues*, *37*(1), 73–102.
- Mravčík, V., Chomynová, P., Grohmannová, K., Janíková, B., Grolmusová, L., Tion Leštinová, Z., Rous, Z., Kiššová, L., Nechanská, B., Sopko, B., Vlach, T., Fidesová, H., Jurystová, L., Vopravil, J., & Malinová, H. (2015). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2014 [Annual Report on the Drug Situation 2014 – Czech Republic]*. Praha.
- Mravčík, V., Chomynová, P., Grohmannová, K., Janíková, B., Tion Leštinová, Z., Rous, Z., Kiššová, L., Nechanská, B., Vlach, T., Černíková, T., Fidesová, H., & Vopravil, J. (2017). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2016 [Annual Report on the Drug Situation 2016 – Czech Republic]*. Praha.

- Mravčík, V., Chomynová, P., Grohmannová, K., Nečas, V., Grolmusová, L., Kiššová, L., Nechanská, B., Sopko, B., Fidesová, H., Vopravil, J., & Jurystová, L. (2013). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2012 [Annual Report on the Drug Situation 2012 – Czech Republic]*. Praha.
- Mravčík, V., Grohmannová, K., Chomynová, P., Nečas, V., Grolmusová, L., Kiššová, L., Nechanská, B., Fidesová, H., Kalina, K., Vopravil, J., Kostecká, L., & Jurystová, L. (2012). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2011 [Annual Report on the Drug Situation 2011 – Czech Republic]*. Praha.
- Mravčík, V., Janíková, B., Drbohlavová, B., Popov, P., & Pirona, A. (2018). The complex relation between access to opioid agonist therapy and diversion of opioid medications: a case example of large-scale misuse of buprenorphine in the Czech Republic. *Harm Reduction Journal*, 15(1), 60. <https://doi.org/10.1186/s12954-018-0268-0>
- Mravčík, V., Korčíšová, B., Lejčková, P., Miovska, L., Škrdlantová, E., Petroš, O., Radimecký, J., Sklenář, V., Gajdošíková, H., & Vopravil, J. (2004). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2003 [Annual Report on the Drug Situation 2003 – Czech Republic]*. Praha.
- Mravčík, V., Lejčková, P., & Korčíšová, B. (2005). Prevalenční odhady problémových uživatelů drog v ČR - souhrnný článek. *Adiktologie*, 5(1), 13–20.
- Mravčík, V., & Orlíková, B. (2007). Překryv klientů mezi jednotlivými nízkoprahovými programy a zneužívání buprenorfinu v Praze. *Adiktologie*, 7(1), 13–20.
- Mravčík, V., Pešek, R., Škařupová, K., Orlíková, B., Škrdlantová, E., Šťastná, L., Kiššová, L., Běláčková, V., Gajdošíková, H., & Vopravil, J. (2009). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2008 [Annual Report on the Drug Situation 2008 – Czech Republic]*. Praha.
- Mravčík, V., & Záborský, T. (2002). Prevalenční odhad problémových uživatelů drog v ČR - syntéza dostupných dat. *Adiktologie*, 1 (Suppl. 1), 23–42.
- Mravčík, V., Záborský, T., Korčíšová, B., Lejčková, P., Škrdlantová, E., Šťastná, L., Macek, V., Petroš, O., Gajdošíková, H., Miovský, M., Kalina, K., & Vopravil, J. (2003). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2002 [Annual Report on the Drug Situation 2002 – Czech Republic]*. Praha.
- Nechanská, B., & Mravčík, V. (2013). Zneužívání psychoaktivních léků v České republice: identifikace a analýza zdrojů dat. *Zaostřeno Na Drogy*, 11(1), 1–16.
- Nechanská, B., Mravčík, V., & Popov, P. (2012). *Zneužívání psychoaktivních léků v České republice: identifikace a analýza zdrojů dat*. Praha: Úřad vlády České republiky.
- Nosyk, B., Anglin, M. D., Brissette, S., Kerr, T., Marsch, D. C., Schackman, B. R., Wood, E., & Montaner, J. S. (2013). A call for evidence-based medical treatment of opioid dependence in the United States and Canada. *Health Aff (Millwood)*, 32(8), 1462–1469.
- Nožina, M. (1997). *Svět drog v Čechách*. Praha: KLP - Koniasch Latin Press.
- Nutt, D. J., King, L. A., & Phillips, L. D. (2010). Drug harms in the UK: a multicriteria decision analysis. *Lancet*, 376(9752), 1558–1565.
- Radimecký, J. (2003). Přehled drogové problematiky v České republice v r. 2001. In *Drogy a drogové závislosti: mezioborový přístup* (pp. 25–32). Praha: Úřad vlády České republiky.
- Řezníčková, M., & Nedvěd, T. (2004). Zkušenosti terénních pracovníků s uživateli Subutexu na otevřené drogové scéně. *Adiktologie*, 4(Suppl.), 406–407.
- Ruggiero, V., & South, N. (1995). *Eurodrugs: drug use, markets, and trafficking in Europe*. Bristol: UCL Press.
- Sansone, R. A., & Sansone, L. A. (2012). Doctor shopping: a phenomenon of many themes. *Innov Clin Neurosci*, 9(11–12), 42–46.
- Schulte, B., Thane, K., Rehm, J., Uchtenhagen, A., Stöver, H., Degkwitz, P., Reimer, J., & Haasen, C. (2008). *Review of the efficacy of drug treatment interventions in Europe*.
- Švůgerová, H. (2015). *Spotřeba injekčního materiálu klienty pražských harm reduction služeb v závislosti na vzorcích užívání*. Univerzita Karlova v Praze.
- Taylor, M., Mackay, K., Murphy, J., Mcintosh, A., Mcintosh, C., Anderson, S., & Welch, K. (2012). Quantifying the RR of harm to self and others from substance misuse: results from a survey of clinical experts across Scotland. *BMJ Open*, 2(4).
- Urban, E. (1973). *Toxikomanie*. Praha: Avicenum.
- Van Amsterdam, J., Opperhuizen, A., Koeter, M., & van der Brink, W. (2010). Ranking the harm of alcohol, tobacco and illicit drugs for the individual and the population. *Eur Addict Res*, 16(4), 202–207.
- Vondráček, V. (1941). Kodeinismus. *Časopis Lékařů Českých*, 80, 733–736.
- Vranken, M. J. M., Mantel-Teeuwisse, A. K., Jünger, S., Radbruch, L., Lisman, J., Scholten, W., Payne, S., Lynch, T., & Schutjens, M. H. D. B. (2014). Legal barriers in accessing opioid medicines: Results of the ATOME quick scan of national legislation of eastern European Countries. *Journal of Pain and Symptom Management*, 48(6), 1135–1144.
- Záborský, T. (2003). *Drogová epidemiologie*. Olomouc: Univerzita Palackého.
- Záborský, T. (2007). Methamphetamine in the Czech Republic. *Journal of Drug Issues*, 37(1), 155–180.
- Záborský, T., Radimecký, J., Mravčík, V., Gajdošíková, H., Petroš, O., Korčíšová, B., Miovský, M., Vopravil, J., Csémy, L., & Kuda, A. (2002). *Výroční zpráva o stavu ve věcech v České republice v r. 2001 [Annual Report on the Drug Situation 2001 – Czech Republic]*. Praha, Lisbon.