Die Opioidepidemie in Nordamerika und die Auswirkungen auf Europa

Mythen und Fakten

Dr. Thomas Pietschmann,
Drug Research Section,
Mai 2018
The complex evaluation of the global (illicit) opioid markets

Opiates
- (Illicit) opiates
- Opium
- Heroin

Fentanyl
- Furanyl-fentanyl
- Oc-fentanyl
- Butyr-fentanyl
- Car-fentanyl

Non-medical use of licitly produced prescription opioids
- Synthetic prescription opioids (hydrocodone, oxycodone, buprenorphine, methadone)

Kratom (partly legally produced)

Some piperazines with opioid-like effects: e.g. MT-45

Prescription opiates: morphine, codeine

Illicitly produced opioids
Extent, trends and patterns of the abuse of opioids at the global level and in North America
Annual prevalence of illicit drug use at the global level, among the population aged 15-64, 2009 - 2015

All drug use: 5.3%
Range: 3.3%-7.3%

Problem drug use: 0.6%
Range: 0.3%-0.9%

Source: UNODC, response to annual report questionnaire.
Use of opioids in 2015

Germany: 0.3%; Austria: 0.5%

High levels of opioid misuse in USA:
• prescription practices/incentives from pharmaceutical companies/access to health system
• smuggling of (illicit) opioids into the USA

Source: UNODC, World Drug Report 2017
Workforce testing results (urine drug test) of opioids use in the USA, 2016

Annual prevalence of opioid misuse in the USA (population aged 12+), 2015-2016

Heroin

<table>
<thead>
<tr>
<th>State</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total U.S.</td>
<td>0.33%</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.46%</td>
</tr>
<tr>
<td>Midwest</td>
<td>0.33%</td>
</tr>
<tr>
<td>South</td>
<td>0.28%</td>
</tr>
<tr>
<td>West</td>
<td>0.32%</td>
</tr>
</tbody>
</table>

Pain relievers (mostly opioids)

<table>
<thead>
<tr>
<th>State</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total U.S.</td>
<td>4.46%</td>
</tr>
<tr>
<td>Northeast</td>
<td>4.05%</td>
</tr>
<tr>
<td>Midwest</td>
<td>4.45%</td>
</tr>
<tr>
<td>South</td>
<td>4.43%</td>
</tr>
<tr>
<td>West</td>
<td>4.85%</td>
</tr>
</tbody>
</table>

Development of opioid abuse in North America

1861-1865: American Civil War - widespread use of morphine and subsequent addictions
1898: Bayer started marketing heroin; as of 1914 opioids started being banned;
1924: Anti Heroin Act; international trafficking in the 1930s (Turkey, France, USA)
1950s: limited use (e.g. jazz musicians, artists)

Late 1960s/early 1970s: re-emergence of heroin; some 3,000 drug deaths a year in USA (Janis Joplin, Jimmy Hendrix etc.), increasing use among soldiers in Vietnam (10-15%), “war on drugs” – Richard Nixon, 1971; “French Connection” dismantled 1971/72; end of opium production in Turkey, heroin increasingly from South-East Asia; in 1990s from South America; over last decade increasingly from Mexico

Increase in heroin use in 1960s and 1970s, but fairly stable from 1970s to mid 1990s

1980: Jane Porter and Hershel Jick “Addiction Rare in Patients Treated with Narcotics” Letter to the Editors, New England Journal of Medicine, January 1980. (“Out of 11,882 hospitalized medical patients receiving narcotics only 4 developed an addiction” = 0.03%, severe in only 1 case (= 0.01%); subsequent changes in prescription practices in 1990s

1996-2001: active marketing of oxycodone (known since 1939 and a schedule II drug) sold as OxyContin (oxycodone with a controlled release formulation). Purdue Pharma fined $600 million in 2007 for false claims about risks (but revenue: $35 bn). (OxyContin was removed from the Canadian drug formulae in 2012). Other pharmaceutical companies also lobbied among (or even infiltrated) health care regulators, medical societies, state medical boards, patient advocacy groups, elected officials etc. spending some $880 million in campaigns from 2006-2015 (Center for Public Integrity); Tom Marino – bill to curtail DEA’s ability in case of pharmaceutical companies in 2016; DEA officials hired;

2014-2017: fentanyl and its analogues emerging as a serious health threat

2017: opioid crisis declared by US president (Oct.) a “public health emergency” and “worst drug crisis in American history”; life-expectancy fell 2015 & 2016 (last 1993); more Americans died in 2016 (64,000) than in Vietnam War (2010-16 > WWI & WWII), annual cost $500 bn, 2.8% of GDP (White House Council of Economic Advisers)
Annual prevalence of opioid misuse in the USA in per cent of the general population aged 12 and older, 2015 and 2016

Source: Substance Abuse and Mental Health Administration
Age distribution of the use and the misuse of pharmaceutical opioids in the USA, 2016

Overall proportion of the misuse of pain relievers:
12.6% of all persons having access to pain medication

Source: Substance Abuse and Mental Health Administration (SAMHSA)
Misuse of selected opioids in the past year, by age group, United States, 2016

Annual prevalence in the population age 12 and older, in %

Source: Substance Abuse and Mental Health Administration (SAMHSA)
Trends in the use of heroin and prescription opioids in the USA, 2002-2016

Source: Substance Abuse and Mental Health Administration (SAMHSA)
Number of opioid samples submitted to and analysed by laboratories, by type of drug identified, United States, 2009-2016

Source: US Drug Enforcement Administration (DEA), National Forensic Laboratory Information System reports.
Links of the use of synthetic opioids and heroin (estimates for USA):

- 2 million people in USA estimated to suffer from substance use disorders related to prescription opioid pain relievers; 591,000 related to heroin use disorder in 2015;
- 21–29% of patients prescribed opioids for chronic pain misused them in the USA;
- Between 8-12% of opioid users develop an opioid use disorder;
- 6% of annual misusers or 21% of past month misusers of pain relievers (mostly opioids) were in treatment for abuse of such substances according to national household survey data in 2016 (versus 9% of all past month drug users);
- 718,000 in treatment for pain relievers > 636,000 for heroin abuse; but: 6% of annual misusers of pain relievers in treatment versus 67% of heroin users in 2016;
- 4-6% of people misusing prescription opioids in the USA turn to heroin;
- 80% of heroin addicts in the USA began by abusing prescription opioids;
- Ongoing increases of opioid overdoses in 2015 and 2016; increase from July 2016-September 2017: 30%; in large cities by 54%; in mid-western region by 70%.

Sources: National Institute on Drug Abuse, NIDA, Opioid Overdose Crisis, March 2018 and SAMHSA, National Household Survey on Drug Use and Health 2016.
Development of international drug control - primarily a consequence of the abuse of opioids
International Drug Control

1909
Shanghai Conference
13 nations; forum known as Opium Commission, led to

1912
International Opium Convention (The Hague); officially entered into force 1915. Governorship of narcotic drugs, i.e. control of transport of drugs which were used for medical purposes

1920
League of Nations Drug Control
Products subject to control were related to opium poppy, coca bush and cannabis

1920
Establishment of “Advisory Committee on Traffic in Opium and Other Dangerous Drugs” to assist the League’s Council

Under the League’s auspices, 3 new Conventions were passed:

1925
Convention, which went into force in 1928:
- Introduction of a statistical control system,
- Introduction of a system of import certificates and export authorizations for the licit international trade in narcotic drugs
- “Permanent Central Narcotics Board” of independent experts (compared INCB) formed to supervise statistical control system

1931
Convention, which entered into force in 1933
“Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic drugs”
- Aimed at limiting manufacture of drugs to amounts needed for medical and scientific purposes
- Establishment of a Drug Supervisory Body, to monitor operation of the system (compare CND)

1936
Convention, which went into force in 1939
“Convention for the Suppression of the Illicit Traffic in Dangerous Drugs”
- Severe punishment for illicit drug traffickers

In addition, there were also international agreements, signed in 1925 and 1931 to suppress opium smoking.

1946
United Nations Drug Control

1946
Protocol, entered into force in 1947
Legally transferred the drug control functions exercised by the League of Nations to the United Nations

1961
Single Convention on Narcotic Drugs, entered into force in 1964
- Consolidation of earlier drug control treaties (for opium, coca bush and cannabis)
- Streamlining the control mechanism
- The Permanent Central Board and the Drug Supervisory Body became The International Narcotics Control Board (INCB)
- It also prohibits opium smoking, coca leaf chewing - transition period

Parties: 184

1948
Protocol, entered into force in 1949
Brought a large number of synthetic drugs (“man-made substances”) under international control

1953
Opium Protocol, entered into force in 1963
Protocol for Limiting the Cultivation of the Poppy Plant, the Production of, International and Wholesale Trade in and Use of Opium, signed in New York aimed at limiting opium use and trade to medical and scientific needs, eliminated legal over-production through stock control
- Only 7 countries (Bulgaria, Greece, India, Iran, Turkey, USSR and Yugoslavia) were authorized to produce opium for export
- The Permanent Central Board (now the INCB) was empowered with supervisory and enforcement responsibilities; Board has right to impose embargo on importation and exportation of opium

Parties: 183

1972
Protocol amending the Single Convention, entered into force in 1972
- Stronger emphasis on treatment and rehabilitation, social integration as alternatives to imprisonment for abusers
- INCB is given key role in ensuring a balance between supply and demand of narcotic drugs for medical and scientific purposes

Parties: 188

1971
Convention on Psychotropic Substances, entered into force in 1976
- Amphetamine-type substances, sedative hypnotic agents, hallucinogens
- Particularly LSD (lysergic acid diethylamide), mescaline, amphetamines, and sedative hypnotics, such as barbiturates
- 4 separate “schedules”
- Schedule 1, which are completely prohibited
- Convention also regulates inspection of stocks, records, laboratory premises
- Responsibility: CND, INCB

1988
Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, entered into force in 1990
- Money Laundering (confiscation of proceeds)
- Extradition of major drug traffickers
- Cooperation in demand reduction

1998
Special Session of the General Assembly devoted to Countering the Drug Problem
Political Declaration, Guiding Principles of Drug Demand Reduction
- Plan of Action (target date: 2019)

2000
Special Session of General Assembly

2016
Demand reduction policies shall (i) aim at preventing the use of drugs and at reducing the adverse consequences of drug abuse
Global opium production in metric tons, 1906/1907 – 2016

Memo:
World population:
1906: 1.75 billion
2016: 7.47 billion

Note: The transformation of poppy straw into opium equivalents is tentative. A transformation ratio of around 7 kg of opium for 100 kg of poppy straw was applied, derived from average morphine output from poppy straw of 0.7% at the global level and an average opium morphine content of close to 10% at the global level (10 years average). Annual specific results were applied for data over the 2006-2015 period. Poppy straw figures for 2016 are still preliminary. Average 2006-2015 ratios (7.2 kg of opium for 100 kg poppy straw and 9.8 kg of morphine for 100 kg of opium) were used as proxies for 2016.

Number of psychoactive substances under international control, 1912-2018

- **Narcotics**
- **Psychotropics**

### Key Dates and Conventions
- **1912** International Opium Convention, The Hague (opium, morphine, heroin, cocaine)
- **1925** (cannabis)
- **1931** (codeine)
- **1936** (trafficking)
- **1925** Conventions under the League of Nations: 1925 (cannabis), 1931 (codeine), 1936 (trafficking)
- **1961 Single Convention on Narcotic Drugs**
- **1971 Convention on Psychotropic Substances** (amphetamines, barbiturates, LSD)
- **2014-2018** Number of psychoactive substances under international control:

**Source:** UNODC, 2013 World Drug Report (updated).
Opioids recently scheduled at the international level

2015: AH-7921

2016: acetylfentanyl; MT-45;

2017: U-47700; butyrfentanyl;
Fentanyl precursors: 4-anilino-N-phenethylpiperidine (ANPP) and N-phenethyl-4-piperidone (NPP)

2018: carfentanyl, ocfentanil, furanylfentanyl, acrylyfentanyl, 4-fluoroisobutyrfentanyl, tetrahydrofuranylfentanyl
Number of internationally controlled drugs in 2017 and identified New Psychoactive Substances (NPS) at the global level, 2009 to 2017 (cumulative)

Sources: Commission on Narcotic Drugs and UNODC Early Warning Advisory on NPS (based on information submitted by Member States through surveys and submissions from laboratories participating in the International Collaborative Exercises (ICE) programme.)
Emergence of NPS by year, 2009-2016

Emergence of NPS with opioid effects

“Licit” consumption of opioids at the global level and in North America
Global (licit) consumption of opioids* presented in million defined daily doses for statistical purposes (S-DDD), 1997-2016

Source: INCB, Narcotic Drugs 2017, p. 251.
Share of USA in global oxycodone consumption in 2016: 73%

Share of USA in global methadone consumption in 2016: 56%

Share of USA in global hydrocodone consumption in 2016: 99%

Memo: Population of USA: 4% of global total

Source: INCB, Narcotic Drugs 2017.
Selected opioids, 1997-2016

Figure 27. Fentanyl: global manufacture, consumption and stocks, 1997-2016

Figure 28. Fentanyl: distribution of consumption, 2016

Memo: Population of USA: 4% of global total

Source: INCB, Narcotic Drugs 2017.
(Licit) Consumption of opioids in S-DDDs per million inhabitants, average 2014-2016

* in alphabetical order: buprenorphine, codeine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxycodone, pethidine and others.
Countries with the highest levels of (licit) opioids consumption in S-DDDs per million inhabitants, average 2014-2016


Consumption in DDs per inhabitant

<table>
<thead>
<tr>
<th>Country</th>
<th>Consumption (S-DDDs per million inhabitants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>46,090</td>
</tr>
<tr>
<td>Canada</td>
<td>30,970</td>
</tr>
<tr>
<td>Germany</td>
<td>21,279</td>
</tr>
<tr>
<td>Austria</td>
<td>21,055</td>
</tr>
<tr>
<td>Denmark</td>
<td>19,641</td>
</tr>
<tr>
<td>Switzerland</td>
<td>19,199</td>
</tr>
<tr>
<td>Belgium</td>
<td>19,039</td>
</tr>
<tr>
<td>Australia</td>
<td>15,173</td>
</tr>
<tr>
<td>Netherlands</td>
<td>14,648</td>
</tr>
<tr>
<td>UK</td>
<td>14,063</td>
</tr>
<tr>
<td>Israel</td>
<td>13,626</td>
</tr>
<tr>
<td>Spain</td>
<td>12,771</td>
</tr>
<tr>
<td>Norway</td>
<td>12,665</td>
</tr>
<tr>
<td>Ireland</td>
<td>11,592</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>11,502</td>
</tr>
<tr>
<td>New Zealand</td>
<td>11,594</td>
</tr>
<tr>
<td>Sweden</td>
<td>10,369</td>
</tr>
<tr>
<td>Iceland</td>
<td>10,284</td>
</tr>
<tr>
<td>France</td>
<td>8,527</td>
</tr>
<tr>
<td>Greece</td>
<td>8,250</td>
</tr>
<tr>
<td>Slovenia</td>
<td>8,182</td>
</tr>
<tr>
<td>Italy</td>
<td>7,107</td>
</tr>
<tr>
<td>Finland</td>
<td>6,460</td>
</tr>
<tr>
<td>Portugal</td>
<td>6,480</td>
</tr>
<tr>
<td>Slovakia</td>
<td>5,467</td>
</tr>
</tbody>
</table>
Trends in (licit) opioids consumption in USA, Germany, Australia and France in mg/capita, 2000-2016

Source: INCB, Narcotic Drugs data; prepared by Pain & Policy Studies Group, University of Wisconsin, WHO Collaboration Center, 2018.
(Licit) consumption or pharmaceutical opioids* per inhabitant in defined daily doses (DDDs) for statistical purposes, average 2014-2016

<table>
<thead>
<tr>
<th>Drug</th>
<th>Oceania</th>
<th>Europe</th>
<th>North America</th>
<th>South America</th>
<th>Asia</th>
<th>Africa</th>
<th>Central America &amp; Caribbean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocodone</td>
<td>14.661</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>7.524</td>
<td>5.025</td>
<td></td>
<td>2.451</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxycodone</td>
<td>1.688</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methadone</td>
<td>1.512</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buprenorphine</td>
<td>1.052</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphine</td>
<td>1.071</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>1.176</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codeine</td>
<td>0.656</td>
<td>0.105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pethidine</td>
<td>0.212</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.913</td>
<td>0.097</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: INCB, Narcotic Drugs 2017, p. 251.
(Licit) consumption or pharmaceutical opioids* in USA, Germany and Austria per inhabitant in defined daily doses (DDDs) for statistical purposes, average 2014-2016

Consequences of abuse of opioids
Source: UNODC, Annual Report questionnaire and other Government reports.
USA: Substance abuse and treatment, 2014

Risk:
Treatment admissions per 1000 annual users

<table>
<thead>
<tr>
<th>Substance</th>
<th>Treatment admissions in 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL SUBSTANCES</td>
<td>1,286,664</td>
</tr>
<tr>
<td>ALCOHOL</td>
<td>585,024</td>
</tr>
<tr>
<td>ALL DRUGS</td>
<td>1,286,664</td>
</tr>
<tr>
<td>HEROIN</td>
<td>357,293</td>
</tr>
<tr>
<td>CANNABIS</td>
<td>247,461</td>
</tr>
<tr>
<td>STIMULANTS</td>
<td>143,659</td>
</tr>
<tr>
<td>- Methamphetamine</td>
<td>135,039</td>
</tr>
<tr>
<td>COCAINE</td>
<td>87,510</td>
</tr>
<tr>
<td>- Crack cocaine</td>
<td>57,493</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance</th>
<th>Number of users, in thousand (2014), annual prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALCOHOL</td>
<td>162,251</td>
</tr>
<tr>
<td>ALL DRUGS</td>
<td>44,157</td>
</tr>
<tr>
<td>CANNABIS</td>
<td>35,124</td>
</tr>
<tr>
<td>COCAINE</td>
<td>4,553</td>
</tr>
<tr>
<td>- Crack cocaine</td>
<td>773</td>
</tr>
<tr>
<td>STIMULANTS</td>
<td>3,715</td>
</tr>
<tr>
<td>- Methamphetamine</td>
<td>1,301</td>
</tr>
<tr>
<td>HEROIN</td>
<td>914</td>
</tr>
</tbody>
</table>

Sources: SAMHSA, Treatment Episode Data Sets (TEDS) and SAMHSA, National Survey on Drug Use and Health
Lethal consequences of abuse of opioids
### Health related harm

**Number of deaths and “healthy” years of life lost (DALYs) at the global level attributable to drug use, 2015**

<table>
<thead>
<tr>
<th>Health Related Harm</th>
<th>Number of deaths (thousands) attributable to drug use, 2015</th>
<th>“Healthy” years of life lost (DALYs) (millions) attributable to drug use, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS—tuberculosis</td>
<td>-</td>
<td>-25.7</td>
</tr>
<tr>
<td>HIV/AIDS resulting in other diseases</td>
<td>-</td>
<td>-3.6</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>-</td>
<td>-12.0</td>
</tr>
<tr>
<td>Liver cancer resulting from hepatitis C</td>
<td>-</td>
<td>39.0</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>-</td>
<td>19.0</td>
</tr>
<tr>
<td>Opioid use disorders</td>
<td>122</td>
<td>29.6</td>
</tr>
<tr>
<td>Cocaine use disorders</td>
<td>11</td>
<td>49.7</td>
</tr>
<tr>
<td>Amphetamine use disorders</td>
<td>12</td>
<td>67.5</td>
</tr>
<tr>
<td>Cannabis use disorders</td>
<td>-</td>
<td>0.6</td>
</tr>
<tr>
<td>Other drug use disorders</td>
<td>25</td>
<td>23.0</td>
</tr>
<tr>
<td>Self-harm</td>
<td>-</td>
<td>2.6</td>
</tr>
</tbody>
</table>

**Percentage change from 2005**

<table>
<thead>
<tr>
<th>Health Related Harm</th>
<th>Percentage change from 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS—tuberculosis</td>
<td>-12.3</td>
</tr>
<tr>
<td>HIV/AIDS resulting in other diseases</td>
<td>-5.6</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>-12.3</td>
</tr>
<tr>
<td>Liver cancer resulting from hepatitis C</td>
<td>27.5</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>12.1</td>
</tr>
<tr>
<td>Opioid use disorders</td>
<td>23.3</td>
</tr>
<tr>
<td>Cocaine use disorders</td>
<td>37.0</td>
</tr>
<tr>
<td>Amphetamine use disorders</td>
<td>40.1</td>
</tr>
<tr>
<td>Cannabis use disorders</td>
<td>5.3</td>
</tr>
<tr>
<td>Other drug use disorders</td>
<td>21.8</td>
</tr>
<tr>
<td>Self-harm</td>
<td>0.1</td>
</tr>
</tbody>
</table>


Notes: Error bars represent uncertainty intervals. Numbers given in charts are percentage changes from 2005.
USA: overdose deaths in 2015

among 1000 past year drug users

- Heroin: 15.7
- All opioids: 1.8
- Prescription drugs: 1.6
- Benzodiazepines: 1.5
- Cocaine: 1.4
- Illicit drugs: 0.5

among 1000 past month drug users

- Heroin: 39.5
- All opioids: 6.0
- Prescription drugs: 4.7
- Benzodiazepines: 3.8
- Cocaine: 3.6
- Illicit drugs: 0.8

Drugs overdose deaths: United States and European Union, 1985-2016

- **USA:** 20 per 100,000 inhabitants (2016)
- **EU-28:** 1.5 per 100,000 inhabitants (2015)
- **Austria:** 1.7 per 100,000 inhabitants (2016)

Sources: EMCDDA, UNODC, Annual Report Questionnaire data and ONDCP.
Drug overdose deaths in USA per 100,000 people: 20 in 2016, (N: 64,000; >70% opioids related)

Austria: 1.7

U.S. rate is 19.8 per 100,000 standard population.

Source: National Centre for Health Statistics (NCHS), Centers for Disease Control and Prevention, National Vital Statistics System, Mortality.
Overdose deaths in the USA, 1999-2016

2016: some 64,000 drug overdose deaths (63,600-64,100) including 42,249 related to opioids (66%; adjusted up to 75%) incl. 19,419 synthetic opioids (fentanyl(s) and tramadol) incl. 15,469 heroin incl. 14,487 natural & semi-synthetic opioids (morphine, oxycodone, hydrocodone) incl. 3,373 methadone

Source: US Centers for Diseases Control (CDC); National Vital Statistics System, Mortality
Overdose deaths in the USA involving opioids, 2000-2016

Number of synthetic opioids deaths and fentanyl exhibits analysed and identified forensic laboratories in the United States, 2004-2015

Origin of fentanyl exhibits provided to forensic laboratories in the United States, 2016

Source: Center for Disease Control and DEA National Forensic Laboratory Information System
Identified illicit Fentanyl and precursor flows to the USA

China's Increased Controls

Beijing announced that effective March 2017, carfentanil, furanyl fentanyl, acryl fentanyl, and valeryl fentanyl will be controlled substances in China, in an effort to stem availability of the drugs in the United States. China’s October 2015 scheduling of 116 synthetic substances resulted in a decrease of their availability in the United States, and additional scheduling is expected to yield similar results.

Fentanyl in powder form and pill presses are shipped via mail services.

The powder fentanyls are processed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the Canadian drug market.

Some fentanyl products are smuggled from Canada into the United States for sale, on a smaller scale.

The powder fentanyl is pressed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the United States drug market.

The powder fentanyl is cut and diluted for further smuggling, or pressed into counterfeit prescription pills.

Diluted powder fentanyls and counterfeit prescription pills containing fentanyl are smuggled from Mexico into the United States.

Precursors for manufacturing fentanyl are shipped via mail services.

Precursors are used to manufacture fentanyls in clandestine laboratories.

Precursors are smuggled across the Southwest border into Mexico to manufacture fentanyls.

Precursors are used to manufacture fentanyls in clandestine laboratories.
Fentanyl combination exhibits identified in the National Forensic Laboratory Information System

Source: National Forsensic Laboratory Information System August 2017
Fentanyl analogues reported to the UNODC Early Warning Advisory

1964
fentanyl

1980
sufentanil

1984
alfentanil

1988

1990
remifentanil

1999
acetyl-alpha-methylfentanyl, alpha-methylfentanyl, 3-methylfentanyl,
alpha-methyl-thiofentanyl, beta-hydroxyfentanyl,
beta-hydroxy-3-methylfentanyl, 3-methylthiofentanyl,
para-fluorofentanyl, thiofentanyl

2013
acetylfentanyl, ocfentanil

2015
butyrfentanyl, furanylfentanyl

2016
acetylfentanyl, para-fluoroisobutyrfentanyl

No. of possible analogues: $5 \times 3 \times 16 \times 8 = 1,920$

NPS fentanyl analogues reported to the UNODC EWA, 2012-2016

<table>
<thead>
<tr>
<th>COMMON NAME</th>
<th>REPORTED IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-fluorofentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>4-fluorobutyrfentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>4-methoxybutyrfentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>acetylfentanyl</td>
<td>Asia, Europe, North America</td>
</tr>
<tr>
<td>acrylfentanyl</td>
<td>Asia, Europe</td>
</tr>
<tr>
<td>beta-hydroxy-thiofentanyl</td>
<td>North America</td>
</tr>
<tr>
<td>butyrfentanyl</td>
<td>Asia, Europe, North America</td>
</tr>
<tr>
<td>despropionyfentanyl</td>
<td>Latin America, North America</td>
</tr>
<tr>
<td>despropionyl-2-fluorofentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>furanylfentanyl</td>
<td>Asia, Europe, North America</td>
</tr>
<tr>
<td>isobutyrfentanyl</td>
<td>Africa, Europe</td>
</tr>
<tr>
<td>(iso)buty-F-fentanyl N-benzyl analogue</td>
<td>Europe</td>
</tr>
<tr>
<td>methoxyacetylfentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>ocfentanil</td>
<td>Europe</td>
</tr>
<tr>
<td>para-fluoroisobutyrfentanyl</td>
<td>North America</td>
</tr>
<tr>
<td>tetrahydrofuranylfentanyl</td>
<td>Europe</td>
</tr>
<tr>
<td>valerylfentanyl</td>
<td>Asia, Europe, North America</td>
</tr>
</tbody>
</table>

Fentanyl and analogues controlled under the 1961 Single Convention on Narcotic Drugs

Source: UNODC, Global Smart Update Fentanyl and its analogues – 50 year on, Volume 17, March 2017
Evolution of the Number of Illicit Drug-Related Deaths in British Columbia, Canada

Population: 4.6 million
Drug-related overdose deaths:
20 per 100,000 people in 2016
30 per 100,000 people in 2017

Population 36.3 million
Opioid related deaths:
8 per 100,000 people in 2016
11 per 100,000 people in 2017
+43% in 2017 (81% fentanyl)
Evolution of the Number of Illicit Drug-Related Deaths in British Columbia, Canada

2010

2015

Drug related overdose deaths
2016:
20 per 100,000 in BC
54 per 100,000 in Vancouver

2017:
30 per 100,000 in BC

Source: BC Centre for Disease Control
The sharp rise in opioid-related deaths has made it a leading cause of mortality among working-age Canadians

Rates by Leading Cause of Deaths for Canadians Aged between 30 and 39 (2014)

<table>
<thead>
<tr>
<th>Cause</th>
<th>Death Rates per 100,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid-Related Deaths (2017)</td>
<td>22.2</td>
</tr>
<tr>
<td>Accidents (All Types)*</td>
<td>17.8</td>
</tr>
<tr>
<td>Opioid-Related Deaths (2016)</td>
<td>15.2</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>13.4</td>
</tr>
<tr>
<td>Suicide*</td>
<td>13.1</td>
</tr>
<tr>
<td>Heart Diseases</td>
<td>5.6</td>
</tr>
<tr>
<td>Homicide</td>
<td>1.9</td>
</tr>
<tr>
<td>Chronic liver disease</td>
<td>1.9</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.4</td>
</tr>
</tbody>
</table>

f = forecasted (based on an estimated 4,000 opioid-related deaths in 2017)

*Data on accidents and suicide may include opioid-related death

Source: Statistics Canada AND National Report on Apparent Opioid-Related Deaths
Will the synthetic opioids epidemic also reach Europe in the near future?
Heroin related treatment in West, Central- and South-East Europe – entrants into treatment, 2005-2015

Overdose deaths linked to the abuse of opioids in the United States and in the United Kingdom, 2000-2016

Source: UNODC, World Drug Report
Number of drug related deaths

Patterns in 2016
* Mean age: 38 years, up from 32 years in 2002
* Proportion male: 80%
* Mostly related to **overdoses with heroin/morphine** in combination with other substances

Source: Bundeskriminalamt, *Bundeslagebild Rauschgift* 2016 (and previous years)
Drug related deaths in Austria, 1968-2016

Data for 2016:
Average age of death: 36 in 2016
up from <30 in 2006
Sex: male: 77%; female 23%
Substances found:
Opioids: 91%; including heroin and morphine: 69%
Cocaine: 23%; amphetamines: 14%
By province, per 100,000 people age 15-64:
Vienna: 5.3; Tyrol: 4.8; Vorarlberg: 4.3;
Carinthia: 3.0
AUSTRIA – average: 2.8
Upper Austria: 1.6; Styria: 1.6; Burgenland: 1.6;
Lower Austria: 1.4, Salzburg: 1.4.

Sources: UNODC, Annual Reports Questionnaire Data, Ministry of Interior, ÖBIG, Gesundheit Österreich.
Austria: Selected Illicit Drugs
Reported violations against the Narcotics Control Act, 1985-2016

Source: Austria, Ministry of Interior.
Afghan opium production in tons, 1994-2017

<table>
<thead>
<tr>
<th>Region</th>
<th>Production 2016 (tons)</th>
<th>Production 2017 (tons)</th>
<th>Change 2016-2017 (%)</th>
<th>2017 production as % of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>18</td>
<td>64</td>
<td>+256%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Eastern</td>
<td>571</td>
<td>837</td>
<td>+47%</td>
<td>9%</td>
</tr>
<tr>
<td>North-eastern</td>
<td>196</td>
<td>294</td>
<td>+50%</td>
<td>3%</td>
</tr>
<tr>
<td>Northern*</td>
<td>278</td>
<td>1,408</td>
<td>+406%</td>
<td>16%</td>
</tr>
<tr>
<td>Southern</td>
<td>2,591</td>
<td>5,158</td>
<td>+999%</td>
<td>57%</td>
</tr>
<tr>
<td>Western*</td>
<td>1,139</td>
<td>1,210</td>
<td>+6%</td>
<td>13%</td>
</tr>
<tr>
<td>Total (rounded)</td>
<td>4,800</td>
<td>9,000</td>
<td>+87%</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Estimates of 2016 and 2017 are not directly comparable since Ghornach district, a major opium cultivating district formerly part of Badghis province (Western region) came in 2017 under the administration of the Governor of Faryab province.

Sources: MCN/UNODC opium surveys, 1994-2017. The vertical lines represent the upper and lower bounds of the confidence interval of the estimates. Figures refer to oven-dry opium. Production figures for 2006 to 2009 have been revised in 2012; see MCN/UNODC Afghanistan opium survey 2012.
Global opioid seizures, 2000-2016

Note: a ratio of 10:1 was used to convert opium into heroin equivalents. Source: UNODC, annual report questionnaire.
Main opiate trafficking flows, 2012-2016

Source: UNODC elaboration based on responses to the annual reports questionnaire and individual drug seizures
Significant individual heroin seizures in Europe, January 2016-December 2017*

Balkan route: 80% of all mentions of heroin trafficking in West, Central and South-East Europe over 2012-2016 period

*Latest 500 seizure cases.
Source: UNODC (AOTP) and Paris Pact, Drugs Monitoring Platform (DMP).
Opium production in Afghanistan and related heroin seizures, 1996-2016/2017

Over the 1996-2016 period the standard deviation of annual changes of Afghan opium production amounted to 3.9 while the standard deviation of annual changes of heroin seizures related to Afghan opiate production was just 0.2, indicating far lower year on year changes of heroin seizures.
Dry Afghan farm-gate opium prices, October 2004 - February 2018

Seizures of opioids in Europe, 2006-2016

Source: UNODC, annual report questionnaire
Seizures of synthetic opioids in Europe, 2006-2016

Seizures of pharmaceutical opioids, 2014-2016

<table>
<thead>
<tr>
<th></th>
<th>Seizures in kilograms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tramadol</strong></td>
<td>91%</td>
</tr>
<tr>
<td><strong>Methadone</strong></td>
<td>7%</td>
</tr>
<tr>
<td><strong>Codeine</strong></td>
<td>1%</td>
</tr>
<tr>
<td><strong>Fentanyl</strong></td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Buprenorphine</strong></td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>α-Methylacetylfentanyl</strong></td>
<td>0.01%</td>
</tr>
<tr>
<td><strong>Ocfentanil</strong></td>
<td>0.01%</td>
</tr>
<tr>
<td><strong>Carfentany</strong></td>
<td>0.01%</td>
</tr>
</tbody>
</table>

Seizures of other opioids, 2014-2016

3-Methylfentanyl
Heroin/racemethorphane;/carfentany
Desomorphine

Main opioids reported by treatment services in Europe:
Heroin
Methadone
Buprenorphine
Fentanyl
Codeine
Morphine
Tramadol
Oxycodone


Note: a ratio of 10:1 was used to convert opium into heroin equivalents. Source: UNODC, annual report questionnaire.
Annual prevalence of the misuse of synthetic opioids in the USA and European countries, 2016 or latest year available

Prevalence of synthetic opioid misuse in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>Prevalence in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>4.4</td>
</tr>
<tr>
<td>Czechia</td>
<td>2.6</td>
</tr>
<tr>
<td>Italy</td>
<td>0.7</td>
</tr>
<tr>
<td>Finland</td>
<td>0.7</td>
</tr>
<tr>
<td>Germany</td>
<td>0.3</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.13</td>
</tr>
<tr>
<td>UK</td>
<td>0.1</td>
</tr>
<tr>
<td>Estonia</td>
<td>0.1</td>
</tr>
<tr>
<td>Poland</td>
<td>0.1</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Prevalence of synthetic opioid misuse in USA

Source: UNODC, Annual Report Questionnaire.
Average annual seizures of pharmaceutical opioids at the global level, 2014-2016

Source: UNODC, annual report questionnaire
Regional distribution of seizures of pharmaceutical opioids in 2016 and average annual seizures over the 2014-2016 period

Largest quantities seized: 2014-2016

Africa: tramadol (94%), codeine (6%)

Asia: codeine (87%), tramadol (12%)

Europe: tramadol (91%), methadone (7%).

Americas: codeine (62%), oxycodone (19%), fentanyl (9%), hydrocodone (9%)

Oceania: codeine (31%), fentanyl (31%)

Source: UNODC, annual report questionnaire
CONCLUSION

• The “North American opioid epidemic” is linked to prescribing practises, a rise in heroin trafficking and – increasingly – by the smuggling of synthetic opioids (notably fentanyl analogues).

• Increases in the seizures of synthetic opioids in Europe: early signs that use of such opioids is also increasing here? (Darknet purchases; shipment by mail; fentanyl and analogues are also found in Europe)

• But, no full-scale “European opioid epidemic” - so-far - is in sight:
  – Better controls within the health system prevent large-scale over-prescriptions; easier access to the health system to treat underlying diseases instead of just treating pain.
  – Expected strong increases in heroin smuggling from Afghanistan to Europe will to set the focus – once again - on preventing and dealing with the consequences of heroin abuse.

Nonetheless, it is time to think of all possibilities to prevent – well in time - any future opioid crisis
THANK YOU
FOR YOUR ATTENTION

For more information:
http://www.unodc.org/