E. M. C. D. D. A.

EMCDDA SCIENTIFIC REPORT

Final version, 11-07-2002

Co-ordination of the implementation of the EMCDDA standard guidelines on the drug-related deaths indicator in the EU Member States, and the collection and analysis of information on drug-related deaths

EMCDDA project CT.00.RTX.22

EMCDDA/P1/2002

This report was prepared by:

Margriet van Laar, Trimbos Institute, the Netherlands
Guus Cruts, Trimbos Institute, the Netherlands
Julian Vicente, EMCDDA, Lisbon
Richard Hartnoll, EMCDDA, Lisbon

Together with the National experts:

Austria: Martin Busch, Rainer Eigner, Jeannette Klimont.
Belgium: Emmanuelle Robert, Francis Sartor.
Denmark: Lene Haastrup, Eva Hammerby, Henrik Sælan.
Finland: Hilkka Ahonen*), Ari Virtanen, Erkki Vuori
France: Eric Jougla*), Hélène Martineau.
Germany: Axel Heinemann.
Greece: Chara Spiliopoulou.
Ireland: Mary O'Brien, Mary Heanue*) , Hamish Sinclair.
Italy: Salvatore D'Amato, Roberta Crialesi, Teodora Macchia.
Luxembourg: Alain Origer, Jean-Marie Schanck.
Portugal: Maria Moreira, Joao Pinheiro, Estela Pinho Marques, Filomena Ramos.
Spain: Teresa Brugal.
Sweden: Anna Fugelstad, Lars Age Johansson.*)
United Kingdom: John Corkery.

Together with Eurostat:

Marleen De Smedt
*)Members of the Eurostat Task Force "Causes of Death Statistics".

Together with the WHO:

Lars Age Johansson, member of the WHO Mortality Reference Group.

European Monitoring Centre for Drugs and Drug Addiction
Rua da Cruz de Santa Apolónia 23-25
PT-1149-045 Lisboa
Portugal
Tel: +351 21 811 30 00
Fax: +351 21 813 17 11
e-mail: info@emcdda.org
http://www.emcdda.org

List of contents

Abbreviations

The Member States of the European Union

At	Austria
Be	Belgium
Dk	Denmark
Fi	Finland
Fr	France
Ge (D)	Germany
Gr	Greece
Ie	Ireland
It	Italy
Lu	Luxembourg
NL	the Netherlands
Pt	Portugal
Sp (Es)	Spain
Se	Sweden
UK (GB)	United Kingdom
UK/EW	United Kingdom/England and Wales
UK/NI	United Kingdom/Northern Ireland
UK/Sc	United Kingdom/Scotland

Other abbreviations

DRD	Drug-Related Death
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
GMR	General Mortality Register
ICD	International Classification of Diseases
NFP	National Focal Point
SR	Special Register
WHO	World Health Organisation

Executive summary

Key-indicator drug-related deaths

Data on drug-related deaths count as one of the five epidemiological key-indicators of the EMCDDA to be implemented in the Member States of the European Union. Therefore the EMCDDA's ultimate goal is to establish objective and reliable figures on drug-related death that are comparable between Member States. Comparability will be reached if in all Member States a similar procedure will be followed to estimate the number of drug-related deaths.

In order to set realistic goals for the coming years, priorities have been set at the endpoint of procedures by harmonising data extraction and classification from different registers. Estimations further focus on deaths directly related to drugs. To estimate the total burden of direct and indirect deaths, four methodological options have been established.

Version 2.0 of the DRD-Standard

For the 2001 field trial on drug-related deaths version 2.0 of the DRD-Standard was developed. In addition to version 1.0 that applied to Special Registers (SRs) and ICD-9 coded General Mortality Registers (GMRs), version 2.0 also applies to ICD-10 coded GMRs. A main purpose of the 2001 field trial was to test the DRD-Standard for ICD-10 data.

To avoid laborious spreadsheets it was recommended to send the data directly in the format of the general EMCDDA databases. Therefore guidelines were established for direct data-delivery. During the 2001 field trial, four Member States have proven indeed that this more efficient procedure of direct data-delivery is feasible.

Analysis of ICD-10 data from GMRs

It appeared feasible to analyse ICD-10 data from the GMRs of Denmark, Finland, Germany, Luxembourg, the Netherlands, and Sweden. Three possible selections of ICD-10 codes were investigated:

- Selection A, the Restrictive estimate, which included deaths due to mental and behavioural disorders (harmful use, dependence) and accidental poisoning by drugs typical of abuse.
- Selection B, the Broad estimate, which included selection A as well as deaths due to intentional poisoning and poisoning by undetermined intent by drugs typical of abuse.
- Selection C, the All-Inclusive estimate, which included selection B (and thus A) as well as deaths due to medicines.

Ten versions of selection A, ten versions of selection B, and ten versions of selection C were investigated, resulting in a total of 30 possible selections.

Recommendations

Selection of ICD-10 codes

1) For ICD-10 coded General Mortality Registers (GMRs), it is recommended to select the following codes to estimate the number of drug-related deaths:

- Harmful use, dependence, and other mental and behavioural disorders due to:
  - opioids (F11)
  - cannabinoids (F12)
  - cocaine (F14)
  - other stimulants (F15)
  - hallucinogens (F16)
  - multiple drug use (F19).
- Accidental poisoning (X41, X42), intentional poisoning (X61, X62), or poisoning by undetermined intent (Y11, Y12) by:
  - opium (T40.0)
  - heroin (T40.1)
  - other opioids (T40.2)
  - methadone (T40.3)
  - *other synthetic narcotics (T40.4)*
  - cocaine (T40.5)
  - *other and unspecified narcotics (T40.6)*
  - cannabis (T40.7)
  - lysergide (T40.8)
  - *other and unspecified psychodysleptics (T40.9)*
  - psychostimulants (T43.6)

The T-codes are to be selected in combination with the respective X-codes and Y-codes.

2) It is recommended that the proposed selection be discussed among national experts, Eurostat, and the WHO.

Continuation of research

3) It is recommended that, by continuation of research, it be investigated in the countries already coding to ICD-10 which cases are coded to T40.4 (other synthetic narcotics), T40.6 (other and unspecified narcotics), T40.9 (other and unspecified psychodysleptics), and the remaining T-codes.

4) It is recommended that in further research it be investigated which factors may have caused a breach of trend when changing from ICD-8/9 coding to ICD-10 coding in Finland (1996-1997).

Selection on age group

5) It is recommended that for the estimation of the number of drug-related deaths, the selection of ICD-10 codes proposed above will be further selected on an appropriate age group. It is recommended to investigate in continued research, for example, the age group 15 through 64 years.

Guidelines for ICD-10 coding

6) It is recommended that the WHO Mortality Reference Group will establish a new priority list for substances and will recommend to the WHO Update Reference Committee the following guideline: "As far as current guidelines for multiple substances lead to other ICD-10 groups than T50.9, apply these guidelines. When existing guidelines would lead to T50.9, apply the new priority list."

7) It is recommended that it be recommended to Eurostat that for the ICD-10 code T50.9 (other and unspecified drugs, medicaments and chemicals) special queries will be conducted.

8) It is further recommended that the WHO Mortality Reference Group will recommend to the WHO Update Reference Committee the following new guideline for ICD-10 coding: "Code lethal poisonings to Txx.x and not to "acute intoxication" (Fxx.0)."

9) It is recommended that the WHO Mortality Reference Group will recommend to the WHO Update Reference Committee the following new guideline for ICD-10 coding: "Instead of giving dependence (Fxx.2) priority over poisoning (Txx.x), give poisoning (Txx.x) priority over dependence (Fxx.2)."

Direct data-delivery

10) It is recommended that for future data collection all Member States deliver data on drug-related deaths more efficiently in the direct format of the EMCDDA databases.

Total burden of drug-related deaths

11) It is recommended that the national experts apply those methodological options that are feasible for their country to estimate the total burden of drug-related deaths.

Forensic issues

12) With regard to forensic issues, it is recommended that the EMCDDA continues collaboration with Eurostat and initiates collaboration with the European Council of Legal Medicine (ECLM).

1. Introduction

1.1 Key indicator drug-related deaths

Data on drug-related deaths count as one of the five epidemiological key-indicators of the EMCDDA to be implemented in the Member States of the European Union. Figures on drug-related deaths can be useful to monitor trends in the most severe consequence of drug use. Such data are also of potential value in estimating the prevalence of problematic drug use (see: EMCDDA project CT.99.RTX.05).

However, it is acknowledged that figures on drug-related deaths are not directly comparable between countries due to conceptual differences and due to procedural differences occurring at various steps in the chain from the death scene to the final statistics on drug-related deaths. Variations can be observed in particular with regard to the:
- cause of death investigation, including post-mortem examinations
- completion of death certificates
- codification or classification
- data entry (bound by the characteristics of a register)
- data extraction to calculate the number of drug-related deaths ('definition').

The EMCDDA's ultimate goal is to establish objective and reliable figures on drug-related death that are comparable between Member States. Comparability will be reached if in all Member States similar procedures are followed for each of the above mentioned steps. In order to set realistic goals for the coming years, priorities have been set at the endpoint of this chain by harmonising data extraction and classification from different registers.

1.2 Objectives and methods

The objectives of the current project were as follows:

1) To collect new data, especially ICD-10 data, by a field trial.
2) To obtain a selection of ICD-10 codes to estimate the number of drug-related deaths.
3) To establish methods to estimate the total burden of drug-related deaths.

1.2.1 The 2001 field trial

For the previous project (CT.99.RTX.04), version 1.0 of the DRD-Standard was developed. This standard applied to ICD-9 coded GMRs and SRs. In addition, version 2.0 of the DRD-Standard that was now developed also applies to ICD-10 coded GMRs. The DRD-Standard in its version 2.0 is given in Annex 2. A main purpose of the 2001 field trial was to test the DRD-Standard for ICD-10 data.

For the 2001 field trial data were requested and received as reviewed in Table 1 below.

Table 1: Requested and received data for the 2001 field trial on drug-related deaths

	General Mortality Register (GMR)		Special Register (SR)	
Country	Requested	Received (ICD version)	Requested	Received
Austria	from 1999 onwards	1999, 2000 (ICD-9)	from 1999 onwards	1999, 2000
Belgium	from 1995 onwards	1998, 1999 (ICD-10)	not applicable	not applicable
Denmark	from 1994 onwards	1994-1998 (ICD-10)	from 1995 onwards	2000
Finland	from 1996 onwards	1996-1999 (ICD-10)	from 1998 onwards	1998-1999
France	from 1998 onwards	1998-1999 (ICD-9)	from 1999 onwards	1996-2000
Germany	from 1998 onwards	1998, 1999 (ICD-10)	from 1999 onwards	1999, 2000
Greece	from 1998 onwards		from 1985 onwards	(received in other format)
Ireland	from 1999 onwards	1980-2000 (ICD-9)	not applicable	not applicable
Italy	from 1997 onwards	1997-1998 (ICD-9)	from 1999 onwards	1999-2001
Luxembourg	from 1998 onwards	1998-2000 (ICD-10)	from 1999 onwards	1999, 2000
the Netherlands	from 1996 onwards	1996-1999 (ICD-10)	not applicable	not applicable
Portugal	from 1999 onwards	1999-2000 (ICD-9)	from 1998 onwards	1998-2000
Spain	from 1997 onwards	1997-1998 (ICD-9)	from 1999 onwards	1996-1999
Sweden	from 1997 onwards	1997-1998 (ICD-10)	not applicable	not applicable
United Kingdom			from 1999 onwards	1997-2000
England and Wales	*from 1999 onwards*	*1998-2000 (ICD-9)*		
Northern Ireland	*from 1998 onwards*	*1998-2000 (ICD-9)*		
Scotland	*from 1985 onwards*			

A first option was to deliver data by means of the spreadsheets as shown in the DRD-Standard, version 2.0 in Annex 2. This procedure implied filling in the spreadsheets and then transferring the data from the spreadsheets to the two general EMCDDA databases, one for GMR-data and one for SR-data. Filling in spreadsheets and next transferring the spreadsheets to the general databases resulted in two laborious steps. To avoid these two laborious steps, a second option was recommended to send the data directly in the format of the general EMCDDA databases. This much more efficient procedure is described in the

guidelines for direct data-delivery given in Annex 3. Data were delivered directly in the database format by Denmark, Finland, Ireland, and the Netherlands.

Specific explanations to the databases are given in Annex 4.

1.2.2 Selection of ICD-10 codes

In the previous report (EMCDDA, 2001a, p. 25 ff.) three selections of ICD-9 codes were investigated:

Selection A, the Restrictive estimate, that included deaths due to mental and behavioural disorders (harmful use, dependence) and accidental poisoning by drugs typical of abuse.

Selection B, the Broad estimate, that included selection A as well as deaths due to intentional poisoning and poisoning by undetermined intent by drugs typical of abuse.

Selection C, the All-Inclusive estimate, that included selection B (and thus A) as well as deaths due to medicines.

The method that was applied to the three selections of ICD-9 codes was now applied to three selections of ICD-10 codes. Ten versions of selection A, ten versions of selection B, and ten versions of selection C were investigated, resulting in a total of 30 possible selections.

1.2.3 Total burden of direct and indirect deaths

Drugs of abuse can be involved in death in a direct way, but also in an indirect way. If drugs of abuse result in a fatal overdose, that is fatal poisoning, they cause death in a direct way. In such cases the drugs of abuse count as the underlying cause of death. If, on the other hand, drugs of abuse reinforce fatal accidents or deadly diseases, they are involved in death in an indirect way. In such cases, the drugs count as a contributing cause of death. This report focuses on deaths directly related to drugs. To estimate in future research the total burden of direct and indirect deaths, four methodological options were established. By means of a concrete example for calculating estimations for an imaginary country, these four methodological options are introduced in Annex 1.

2. Analysis of ICD-10 data from GMRs

2.1 Selections A, B, and C

In the previous report (EMCDDA, 2001a, p. 25 ff.) three selections of ICD-9 codes were investigated. Building on the previous report, three possible selections of ICD-10 codes are now to be investigated.

Selection A, the Restrictive estimate, includes deaths due to mental and behavioural disorders (harmful use, dependence) and accidental poisoning by drugs typical of abuse.

Selection B, the Broad estimate, includes selection A as well as deaths due to intentional poisoning and poisoning by undetermined intent by drugs typical of abuse.

Selection C, the All-Inclusive estimate, includes selection B (and thus A) as well as deaths due to medicines.

For the previous ICD-9 codes consensus has been reached among national experts that Selection B is most suited for estimating the number of drug-related deaths. For ICD-10 codes selections A, B, and C are now under investigation.

Different codes can be included in selection A, B, or C. Ten versions of selection A, ten versions of selection B, and ten versions of selection C will be investigated, resulting in a total of 30 possible selections. Consensus will have to be found among national experts about which of the 30 possible selections will become the standard selection.

The ten possible versions of selection A, B, and C are given in Table 2 below. The F-codes, X-codes, Y-codes, and T-codes in Table 1 are the respective ICD-10 codes. T-codes are selected in combination with the X-codes and Y-codes.

Table 2: Ten possible versions of selection A, B, and C

No.	Selection A: Restrictive	Selection B: Broad	Selection C: All-Inclusive
1	Harmful use, dependence, and other mental and behavioural disorders due to: • opioids (F11) • cannabinoids (F12) • cocaine (F14) • other stimulants (F15) • hallucinogens (F16). Accidental poisoning (X42) by: • opium (T40.0) • heroin (T40.1) • other opioids (T40.2) • methadone (T40.3) • cocaine (T40.5) • cannabis (T40.7) • lysergide (T40.8) • psychostimulants (T43.6).	A1 + Intentional poisoning (X62, X61) or poisoning by undetermined intent (Y12, Y11) by: • opium (T40.0) • heroin (T40.1) • other opioids (T40.2) • methadone (T40.3) • cocaine (T40.5) • cannabis (T40.7) • lysergide (T40.8) • psychostimulants (T43.6).	B1 + Harmful use, dependence, and other mental and behavioural disorders due to: • sedatives (F13). Accidental poisoning (X41), intentional poisoning (X61), or poisoning by undetermined intent (Y11) by: • barbiturates (T42.3) • benzodiazepines (T42.4) • other antiepileptic and sedative-hypnotic drugs (T42.6) • antiepileptic and sedative-hypnotic drugs, unspecified (T42.7).
2	A1 + • multiple drug use (F19).	B1 + • multiple drug use (F19).	C1 + • multiple drug use (F19).
3	A2 + • other synthetic narcotics (T40.4).	B2 + • other synthetic narcotics (T40.4).	C2 + • other synthetic narcotics (T40.4).
4	A3 + • other and unspecified narcotics (T40.6).	B3 + • other and unspecified narcotics (T40.6).	C3 + • other and unspecified narcotics (T40.6).
5	A4 + • other and unspecified psychodysleptics (T40.9).	B4 + • other and unspecified psychodysleptics (T40.9).	C4 + • other and unspecified psychodysleptics (T40.9).
6	A5 + • narcotics and psychodysleptics (remaining T-codes).	B5 + • narcotics and psychodysleptics (remaining T-codes).	C5 + • narcotics and psychodysleptics (remaining T-codes).
7	A6 + • other psychotropic drugs (T43.8).	B6 + • other psychotropic drugs (T43.8).	C6 + • other psychotropic drugs (T43.8).
8	A7 + • psychotropic drug, unspecified (T43.9).	B7 + • psychotropic drug, unspecified (T43.9).	C7 + • psychotropic drug, unspecified (T43.9).
9	A8 + • other and unspecified drugs, medicaments, etc. (T50.9).	B8 + • other and unspecified drugs, medicaments, etc. (T50.9).	C8 + • other and unspecified drugs, medicaments, etc. (T50.9).
10	A9 + • other and unspecified chemicals, etc. (T50.9).	B9 + • other and unspecified chemicals, etc. (T50.9).	C9 + • other and unspecified chemicals, etc. (T50.9).

2.2 Denmark

For Denmark for 1994 through 1998, the results for selections A are given in Table 3 through 7, for selections B in Table 8 through 12, and for selections C in Table 13 through 17.

Skipping ICD-9 codes, the Danish GMR in 1994 developed directly from an ICD-8 coded register into an ICD-10 coded register. According to data from its SR the number of drug-related deaths in Denmark was estimated at 271 in 1994, 274 in 1995, 266 in 1996, 275 in 1997, 250 in 1998, and 239 in 1999. These cases also include deaths indirectly related to drugs.

Version 8 of selection B comes close to the SR-estimate. According to version 8 of selection B, the number of drug-related deaths is estimated at 287 in 1994, 218 in 1995, 248 in 1996, 259 in 1997 and at 244 in 1998.

Table 3: Versions of selection A for Denmark 1994

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	112	112
Multiple drug use and other psychoactive substances (F19)	14	126
Other synthetic narcotics (T40.4)	19	145
Other and unspecified narcotics (T40.6)	0	145
Other and unspecified psychodysleptics (T40.9)	1	146
Narcotics and psychodysleptics (remaining T-codes)	1	147
Other psychotropic drugs (T43.8)	0	147
Psychotropic drug, unspecified (T43.9)	1	148
Other and unspecified drugs, medicaments, etc. (T50.9)	18	166
Other and unspecified chemicals, etc. (T50.9)	0	166

Table 4: Versions of selection A for Denmark 1995

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	87	87
Multiple drug use and other psychoactive substances (F19)	21	108
Other synthetic narcotics (T40.4)	15	123
Other and unspecified narcotics (T40.6)	0	123
Other and unspecified psychodysleptics (T40.9)	5	128
Narcotics and psychodysleptics (remaining T-codes)	2	130
Other psychotropic drugs (T43.8)	0	130
Psychotropic drug, unspecified (T43.9)	0	130
Other and unspecified drugs, medicaments, etc. (T50.9)	36	166
Other and unspecified chemicals, etc. (T50.9)	0	166

Table 5: Versions of selection A for Denmark 1996

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	91	91
Multiple drug use and other psychoactive substances (F19)	14	105
Other synthetic narcotics (T40.4)	10	115
Other and unspecified narcotics (T40.6)	2	117
Other and unspecified psychodysleptics (T40.9)	2	119
Narcotics and psychodysleptics (remaining T-codes)	1	120
Other psychotropic drugs (T43.8)	0	120
Psychotropic drug, unspecified (T43.9)	0	120
Other and unspecified drugs, medicaments, etc. (T50.9)	8	128
Other and unspecified chemicals, etc. (T50.9)	0	128

Table 6: Versions of selection A for Denmark 1997

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	85	85
Multiple drug use and other psychoactive substances (F19)	33	118
Other synthetic narcotics (T40.4)	9	127
Other and unspecified narcotics (T40.6)	0	127
Other and unspecified psychodysleptics (T40.9)	6	133
Narcotics and psychodysleptics (remaining T-codes)	0	133
Other psychotropic drugs (T43.8)	0	133
Psychotropic drug, unspecified (T43.9)	0	133
Other and unspecified drugs, medicaments, etc. (T50.9)	11	144
Other and unspecified chemicals, etc. (T50.9)	0	144

Table 7: Versions of selection A for Denmark 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	73	73
Multiple drug use and other psychoactive substances (F19)	35	108
Other synthetic narcotics (T40.4)	7	115
Other and unspecified narcotics (T40.6)	0	115
Other and unspecified psychodysleptics (T40.9)	4	119
Narcotics and psychodysleptics (remaining T-codes)	0	119
Other psychotropic drugs (T43.8)	0	119
Psychotropic drug, unspecified (T43.9)	0	119
Other and unspecified drugs, medicaments, etc. (T50.9)	6	125
Other and unspecified chemicals, etc. (T50.9)	0	125

Table 8: Versions of selection B for Denmark 1994

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	191	191
Multiple drug use and other psychoactive substances (F19)	14	205
Other synthetic narcotics (T40.4)	77	282
Other and unspecified narcotics (T40.6)	0	282
Other and unspecified psychodysleptics (T40.9)	2	284
Narcotics and psychodysleptics (remaining T-codes)	2	286
Other psychotropic drugs (T43.8)	0	286
Psychotropic drug, unspecified (T43.9)	1	287
Other and unspecified drugs, medicaments, etc. (T50.9)	102	389
Other and unspecified chemicals, etc. (T50.9)	0	389

Table 9: Versions of selection B for Denmark 1995

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	141	141
Multiple drug use and other psychoactive substances (F19)	21	162
Other synthetic narcotics (T40.4)	45	207
Other and unspecified narcotics (T40.6)	0	207
Other and unspecified psychodysleptics (T40.9)	7	214
Narcotics and psychodysleptics (remaining T-codes)	4	218
Other psychotropic drugs (T43.8)	0	218
Psychotropic drug, unspecified (T43.9)	0	218
Other and unspecified drugs, medicaments, etc. (T50.9)	116	334
Other and unspecified chemicals, etc. (T50.9)	0	334

Table 10: Versions of selection B for Denmark 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	182	182
Multiple drug use and other psychoactive substances (F19)	14	196
Other synthetic narcotics (T40.4)	42	238
Other and unspecified narcotics (T40.6)	2	240
Other and unspecified psychodysleptics (T40.9)	2	242
Narcotics and psychodysleptics (remaining T-codes)	1	243
Other psychotropic drugs (T43.8)	0	243
Psychotropic drug, unspecified (T43.9)	5	248
Other and unspecified drugs, medicaments, etc. (T50.9)	52	300
Other and unspecified chemicals, etc. (T50.9)	0	300

Table 11: Versions of selection B for Denmark 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	181	181
Multiple drug use and other psychoactive substances (F19)	33	214
Other synthetic narcotics (T40.4)	36	250
Other and unspecified narcotics (T40.6)	0	250
Other and unspecified psychodysleptics (T40.9)	7	257
Narcotics and psychodysleptics (remaining T-codes)	2	259
Other psychotropic drugs (T43.8)	0	259
Psychotropic drug, unspecified (T43.9)	0	259
Other and unspecified drugs, medicaments, etc. (T50.9)	46	305
Other and unspecified chemicals, etc. (T50.9)	0	305

Table 12: Versions of selection B for Denmark 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	172	172
Multiple drug use and other psychoactive substances (F19)	35	207
Other synthetic narcotics (T40.4)	28	235
Other and unspecified narcotics (T40.6)	0	235
Other and unspecified psychodysleptics (T40.9)	6	241
Narcotics and psychodysleptics (remaining T-codes)	2	243
Other psychotropic drugs (T43.8)	0	243
Psychotropic drug, unspecified (T43.9)	1	244
Other and unspecified drugs, medicaments, etc. (T50.9)	48	292
Other and unspecified chemicals, etc. (T50.9)	0	292

Table 13: Versions of selection C for Denmark 1994

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	234	234
Multiple drug use and other psychoactive substances (F19)	14	248
Other synthetic narcotics (T40.4)	77	325
Other and unspecified narcotics (T40.6)	0	325
Other and unspecified psychodysleptics (T40.9)	2	327
Narcotics and psychodysleptics (remaining T-codes)	2	329
Other psychotropic drugs (T43.8)	0	329
Psychotropic drug, unspecified (T43.9)	1	330
Other and unspecified drugs, medicaments, etc. (T50.9)	102	432
Other and unspecified chemicals, etc. (T50.9)	0	432

Table 14: Versions of selection C for Denmark 1995

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	184	184
Multiple drug use and other psychoactive substances (F19)	21	205
Other synthetic narcotics (T40.4)	45	250
Other and unspecified narcotics (T40.6)	0	250
Other and unspecified psychodysleptics (T40.9)	7	257
Narcotics and psychodysleptics (remaining T-codes)	4	261
Other psychotropic drugs (T43.8)	0	261
Psychotropic drug, unspecified (T43.9)	0	261
Other and unspecified drugs, medicaments, etc. (T50.9)	116	377
Other and unspecified chemicals, etc. (T50.9)	0	377

Table 15: Versions of selection C for Denmark 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	214	214
Multiple drug use and other psychoactive substances (F19)	14	228
Other synthetic narcotics (T40.4)	42	270
Other and unspecified narcotics (T40.6)	2	272
Other and unspecified psychodysleptics (T40.9)	2	274
Narcotics and psychodysleptics (remaining T-codes)	1	275
Other psychotropic drugs (T43.8)	0	275
Psychotropic drug, unspecified (T43.9)	5	280
Other and unspecified drugs, medicaments, etc. (T50.9)	52	332
Other and unspecified chemicals, etc. (T50.9)	0	332

Table 16: Versions of selection C for Denmark 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	187	187
Multiple drug use and other psychoactive substances (F19)	33	220
Other synthetic narcotics (T40.4)	36	256
Other and unspecified narcotics (T40.6)	0	256
Other and unspecified psychodysleptics (T40.9)	7	263
Narcotics and psychodysleptics (remaining T-codes)	2	265
Other psychotropic drugs (T43.8)	0	265
Psychotropic drug, unspecified (T43.9)	0	265
Other and unspecified drugs, medicaments, etc. (T50.9)	46	311
Other and unspecified chemicals, etc. (T50.9)	0	311

Table 17: Versions of selection C for Denmark 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	173	173
Multiple drug use and other psychoactive substances (F19)	35	208
Other synthetic narcotics (T40.4)	28	236
Other and unspecified narcotics (T40.6)	0	236
Other and unspecified psychodysleptics (T40.9)	6	242
Narcotics and psychodysleptics (remaining T-codes)	2	244
Other psychotropic drugs (T43.8)	0	244
Psychotropic drug, unspecified (T43.9)	1	245
Other and unspecified drugs, medicaments, etc. (T50.9)	48	293
Other and unspecified chemicals, etc. (T50.9)	0	293

2.3 Finland

For Finland for 1996 through 1999, the results for selections A are given in Table 18 through 21, for selections B in Table 22 through 25, and for selections C in Table 26 through 29.

In 1995 the number of drug-related deaths according to the ICD-9 coded GMR (selection B) was estimated at 36. In ICD-10 many cases are coded to T40.4, meaning "other synthetic narcotics". For selection B, 73 cases were coded to T40.4 in 1996, 52 in 1997, 19 in 1998, and 25 in 1999.

For Finland version 2 of selection B seems the best option for estimating the number of drug-related deaths, indicating 34 cases in 1996, 44 in 1997, 67 in 1998, and 94 cases in 1999.

Another possibility is that coding to T40.4 in ICD-10 has made visible cases of drug-related death that remained hidden under ICD-9.

Table 18: Versions of selection A for Finland 1996

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	20	20
Multiple drug use and other psychoactive substances (F19)	9	29
Other synthetic narcotics (T40.4)	21	50
Other and unspecified narcotics (T40.6)	0	50
Other and unspecified psychodysleptics (T40.9)	0	50
Narcotics and psychodysleptics (remaining T-codes)	0	50
Other psychotropic drugs (T43.8)	0	50
Psychotropic drug, unspecified (T43.9)	0	50
Other and unspecified drugs, medicaments, etc. (T50.9)	0	50
Other and unspecified chemicals, etc. (T50.9)	0	50

Table 19: Versions of selection A for Finland 1997

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	23	23
Multiple drug use and other psychoactive substances (F19)	12	35
Other synthetic narcotics (T40.4)	19	54
Other and unspecified narcotics (T40.6)	1	55
Other and unspecified psychodysleptics (T40.9)	0	55
Narcotics and psychodysleptics (remaining T-codes)	0	55
Other psychotropic drugs (T43.8)	0	55
Psychotropic drug, unspecified (T43.9)	0	55
Other and unspecified drugs, medicaments, etc. (T50.9)	0	55
Other and unspecified chemicals, etc. (T50.9)	0	55

Table 20: Versions of selection A for Finland 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	45	45
Multiple drug use and other psychoactive substances (F19)	9	54
Other synthetic narcotics (T40.4)	7	61
Other and unspecified narcotics (T40.6)	0	61
Other and unspecified psychodysleptics (T40.9)	1	62
Narcotics and psychodysleptics (remaining T-codes)	0	62
Other psychotropic drugs (T43.8)	0	62
Psychotropic drug, unspecified (T43.9)	0	62
Other and unspecified drugs, medicaments, etc. (T50.9)	0	62
Other and unspecified chemicals, etc. (T50.9)	0	62

Table 21: Versions of selection A for Finland 1999

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	55	55
Multiple drug use and other psychoactive substances (F19)	30	85
Other synthetic narcotics (T40.4)	9	94
Other and unspecified narcotics (T40.6)	0	94
Other and unspecified psychodysleptics (T40.9)	0	94
Narcotics and psychodysleptics (remaining T-codes)	0	94
Other psychotropic drugs (T43.8)	0	94
Psychotropic drug, unspecified (T43.9)	1	95
Other and unspecified drugs, medicaments, etc. (T50.9)	0	95
Other and unspecified chemicals, etc. (T50.9)	0	95

Table 22: Versions of selection B for Finland 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	25	25
Multiple drug use and other psychoactive substances (F19)	9	34
Other synthetic narcotics (T40.4)	73	107
Other and unspecified narcotics (T40.6)	0	107
Other and unspecified psychodysleptics (T40.9)	0	107
Narcotics and psychodysleptics (remaining T-codes)	0	107
Other psychotropic drugs (T43.8)	0	107
Psychotropic drug, unspecified (T43.9)	1	108
Other and unspecified drugs, medicaments, etc. (T50.9)	0	108
Other and unspecified chemicals, etc. (T50.9)	0	108

Table 23: Versions of selection B for Finland 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	32	32
Multiple drug use and other psychoactive substances (F19)	12	44
Other synthetic narcotics (T40.4)	52	96
Other and unspecified narcotics (T40.6)	2	98
Other and unspecified psychodysleptics (T40.9)	0	98
Narcotics and psychodysleptics (remaining T-codes)	0	98
Other psychotropic drugs (T43.8)	0	98
Psychotropic drug, unspecified (T43.9)	0	98
Other and unspecified drugs, medicaments, etc. (T50.9)	1	99
Other and unspecified chemicals, etc. (T50.9)	0	99

Table 24: Versions of selection B for Finland 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	58	58
Multiple drug use and other psychoactive substances (F19)	9	67
Other synthetic narcotics (T40.4)	19	86
Other and unspecified narcotics (T40.6)	0	86
Other and unspecified psychodysleptics (T40.9)	1	87
Narcotics and psychodysleptics (remaining T-codes)	0	87
Other psychotropic drugs (T43.8)	0	87
Psychotropic drug, unspecified (T43.9)	0	87
Other and unspecified drugs, medicaments, etc. (T50.9)	0	87
Other and unspecified chemicals, etc. (T50.9)	0	87

Table 25: Versions of selection B for Finland 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	64	64
Multiple drug use and other psychoactive substances (F19)	30	94
Other synthetic narcotics (T40.4)	25	119
Other and unspecified narcotics (T40.6)	0	119
Other and unspecified psychodysleptics (T40.9)	0	119
Narcotics and psychodysleptics (remaining T-codes)	0	119
Other psychotropic drugs (T43.8)	0	119
Psychotropic drug, unspecified (T43.9)	1	120
Other and unspecified drugs, medicaments, etc. (T50.9)	0	120
Other and unspecified chemicals, etc. (T50.9)	0	120

Table 26: Versions of selection C for Finland 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	129	129
Multiple drug use and other psychoactive substances (F19)	9	138
Other synthetic narcotics (T40.4)	73	211
Other and unspecified narcotics (T40.6)	0	211
Other and unspecified psychodysleptics (T40.9)	0	211
Narcotics and psychodysleptics (remaining T-codes)	0	211
Other psychotropic drugs (T43.8)	0	211
Psychotropic drug, unspecified (T43.9)	1	212
Other and unspecified drugs, medicaments, etc. (T50.9)	0	212
Other and unspecified chemicals, etc. (T50.9)	0	212

Table 27: Versions of selection C for Finland 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	124	124
Multiple drug use and other psychoactive substances (F19)	12	136
Other synthetic narcotics (T40.4)	52	188
Other and unspecified narcotics (T40.6)	2	190
Other and unspecified psychodysleptics (T40.9)	0	190
Narcotics and psychodysleptics (remaining T-codes)	0	190
Other psychotropic drugs (T43.8)	0	190
Psychotropic drug, unspecified (T43.9)	0	190
Other and unspecified drugs, medicaments, etc. (T50.9)	1	191
Other and unspecified chemicals, etc. (T50.9)	0	191

Table 28: Versions of selection C for Finland 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	116	116
Multiple drug use and other psychoactive substances (F19)	9	125
Other synthetic narcotics (T40.4)	19	144
Other and unspecified narcotics (T40.6)	0	144
Other and unspecified psychodysleptics (T40.9)	1	145
Narcotics and psychodysleptics (remaining T-codes)	0	145
Other psychotropic drugs (T43.8)	0	145
Psychotropic drug, unspecified (T43.9)	0	145
Other and unspecified drugs, medicaments, etc. (T50.9)	0	145
Other and unspecified chemicals, etc. (T50.9)	0	145

Table 29: Versions of selection C for Finland 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	119	119
Multiple drug use and other psychoactive substances (F19)	30	149
Other synthetic narcotics (T40.4)	25	174
Other and unspecified narcotics (T40.6)	0	174
Other and unspecified psychodysleptics (T40.9)	0	174
Narcotics and psychodysleptics (remaining T-codes)	0	174
Other psychotropic drugs (T43.8)	0	174
Psychotropic drug, unspecified (T43.9)	1	175
Other and unspecified drugs, medicaments, etc. (T50.9)	0	175
Other and unspecified chemicals, etc. (T50.9)	0	175

2.4 Germany

For Germany for 1998 through 1999, the results for selections A are given in Table 30 through 31, for selections B in Table 32 through 33, and for selections C in Table 34 through 35.

According to the ICD-9 coded GMR the number of drug-related deaths in Germany (according to selection B) was estimated at 1305 in 1996 and 1088 in 1997.

For ICD-10, version 8 of selection B seems the best option for Germany, indicating 1321 cases in 1998, and 1376 cases in 1999.

Table 30: Versions of selection A for Germany 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	652	652
Multiple drug use and other psychoactive substances (F19)	421	1073
Other synthetic narcotics (T40.4)	1	1074
Other and unspecified narcotics (T40.6)	4	1078
Other and unspecified psychodysleptics (T40.9)	5	1083
Narcotics and psychodysleptics (remaining T-codes)	3	1086
Other psychotropic drugs (T43.8)	0	1086
Psychotropic drug, unspecified (T43.9)	0	1086
Other and unspecified drugs, medicaments, etc. (T50.9)	14	1100
Other and unspecified chemicals, etc. (T50.9)	0	1100

Table 31: Versions of selection A for Germany 1999

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	614	614
Multiple drug use and other psychoactive substances (F19)	502	1116
Other synthetic narcotics (T40.4)	1	1117
Other and unspecified narcotics (T40.6)	2	1119
Other and unspecified psychodysleptics (T40.9)	5	1124
Narcotics and psychodysleptics (remaining T-codes)	4	1128
Other psychotropic drugs (T43.8)	0	1128
Psychotropic drug, unspecified (T43.9)	1	1129
Other and unspecified drugs, medicaments, etc. (T50.9)	18	1147
Other and unspecified chemicals, etc. (T50.9)	0	1147

Table 32: Versions of selection B for Germany 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	730	730
Multiple drug use and other psychoactive substances (F19)	421	1151
Other synthetic narcotics (T40.4)	3	1154
Other and unspecified narcotics (T40.6)	15	1169
Other and unspecified psychodysleptics (T40.9)	111	1280
Narcotics and psychodysleptics (remaining T-codes)	8	1288
Other psychotropic drugs (T43.8)	2	1290
Psychotropic drug, unspecified (T43.9)	31	1321
Other and unspecified drugs, medicaments, etc. (T50.9)	766	2087
Other and unspecified chemicals, etc. (T50.9)	5	2092

Table 33: Versions of selection B for Germany 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	675	675
Multiple drug use and other psychoactive substances (F19)	502	1177
Other synthetic narcotics (T40.4)	5	1182
Other and unspecified narcotics (T40.6)	13	1195
Other and unspecified psychodysleptics (T40.9)	142	1337
Narcotics and psychodysleptics (remaining T-codes)	7	1344
Other psychotropic drugs (T43.8)	8	1352
Psychotropic drug, unspecified (T43.9)	24	1376
Other and unspecified drugs, medicaments, etc. (T50.9)	768	2144
Other and unspecified chemicals, etc. (T50.9)	2	2146

Table 34: Versions of selection C for Germany 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	926	926
Multiple drug use and other psychoactive substances (F19)	421	1347
Other synthetic narcotics (T40.4)	3	1350
Other and unspecified narcotics (T40.6)	15	1365
Other and unspecified psychodysleptics (T40.9)	111	1476
Narcotics and psychodysleptics (remaining T-codes)	8	1484
Other psychotropic drugs (T43.8)	2	1486
Psychotropic drug, unspecified (T43.9)	31	1517
Other and unspecified drugs, medicaments, etc. (T50.9)	766	2283
Other and unspecified chemicals, etc. (T50.9)	5	2288

Table 35: Versions of selection C for Germany 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	873	873
Multiple drug use and other psychoactive substances (F19)	502	1375
Other synthetic narcotics (T40.4)	5	1380
Other and unspecified narcotics (T40.6)	13	1393
Other and unspecified psychodysleptics (T40.9)	142	1535
Narcotics and psychodysleptics (remaining T-codes)	7	1542
Other psychotropic drugs (T43.8)	8	1550
Psychotropic drug, unspecified (T43.9)	24	1574
Other and unspecified drugs, medicaments, etc. (T50.9)	768	2342
Other and unspecified chemicals, etc. (T50.9)	2	2344

2.5 Luxembourg

For Luxembourg for 1998 through 2000, the results for selections A are given in Table 36 through 38, for selections B in Table 39 through 41, and for selections C in Table 42 through 44.

According to its SR the number of drug-related deaths in Luxembourg was estimated at 17 in 1998. For Luxembourg version 5 of selection B seems the best option, indicating 22 cases in 1998, 13 cases in 1999, and 22 cases in 2000.

Table 36: Versions of selection A for Luxembourg 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	7	7
Multiple drug use and other psychoactive substances (F19)	1	8
Other synthetic narcotics (T40.4)	0	8
Other and unspecified narcotics (T40.6)	0	8
Other and unspecified psychodysleptics (T40.9)	12	20
Narcotics and psychodysleptics (remaining T-codes)	16	36
Other psychotropic drugs (T43.8)	0	36
Psychotropic drug, unspecified (T43.9)	0	36
Other and unspecified drugs, medicaments, etc. (T50.9)	0	36
Other and unspecified chemicals, etc. (T50.9)	0	36

Table 37: Versions of selection A for Luxembourg 1999

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	0	0
Multiple drug use and other psychoactive substances (F19)	0	0
Other synthetic narcotics (T40.4)	0	0
Other and unspecified narcotics (T40.6)	0	0
Other and unspecified psychodysleptics (T40.9)	13	13
Narcotics and psychodysleptics (remaining T-codes)	0	13
Other psychotropic drugs (T43.8)	0	13
Psychotropic drug, unspecified (T43.9)	0	13
Other and unspecified drugs, medicaments, etc. (T50.9)	1	14
Other and unspecified chemicals, etc. (T50.9)	0	14

Table 38: Versions of selection A for Luxembourg 2000

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	3	3
Multiple drug use and other psychoactive substances (F19)	0	3
Other synthetic narcotics (T40.4)	0	3
Other and unspecified narcotics (T40.6)	1	4
Other and unspecified psychodysleptics (T40.9)	18	22
Narcotics and psychodysleptics (remaining T-codes)	21	43
Other psychotropic drugs (T43.8)	0	43
Psychotropic drug, unspecified (T43.9)	0	43
Other and unspecified drugs, medicaments, etc. (T50.9)	2	45
Other and unspecified chemicals, etc. (T50.9)	7	52

Table 39: Versions of selection B for Luxembourg 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	8	8
Multiple drug use and other psychoactive substances (F19)	1	9
Other synthetic narcotics (T40.4)	0	9
Other and unspecified narcotics (T40.6)	0	9
Other and unspecified psychodysleptics (T40.9)	13	22
Narcotics and psychodysleptics (remaining T-codes)	18	40
Other psychotropic drugs (T43.8)	0	40
Psychotropic drug, unspecified (T43.9)	0	40
Other and unspecified drugs, medicaments, etc. (T50.9)	4	44
Other and unspecified chemicals, etc. (T50.9)	0	44

Table 40: Versions of selection B for Luxembourg 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	0	0
Multiple drug use and other psychoactive substances (F19)	0	0
Other synthetic narcotics (T40.4)	0	0
Other and unspecified narcotics (T40.6)	0	0
Other and unspecified psychodysleptics (T40.9)	13	13
Narcotics and psychodysleptics (remaining T-codes)	0	13
Other psychotropic drugs (T43.8)	0	13
Psychotropic drug, unspecified (T43.9)	0	13
Other and unspecified drugs, medicaments, etc. (T50.9)	2	15
Other and unspecified chemicals, etc. (T50.9)	0	15

Table 41: Versions of selection B for Luxembourg 2000

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	3	3
Multiple drug use and other psychoactive substances (F19)	0	3
Other synthetic narcotics (T40.4)	0	3
Other and unspecified narcotics (T40.6)	1	4
Other and unspecified psychodysleptics (T40.9)	18	22
Narcotics and psychodysleptics (remaining T-codes)	21	43
Other psychotropic drugs (T43.8)	0	43
Psychotropic drug, unspecified (T43.9)	0	43
Other and unspecified drugs, medicaments, etc. (T50.9)	6	49
Other and unspecified chemicals, etc. (T50.9)	7	56

Table 42: Versions of selection C for Luxembourg 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	12	12
Multiple drug use and other psychoactive substances (F19)	1	13
Other synthetic narcotics (T40.4)	0	13
Other and unspecified narcotics (T40.6)	0	13
Other and unspecified psychodysleptics (T40.9)	13	26
Narcotics and psychodysleptics (remaining T-codes)	18	44
Other psychotropic drugs (T43.8)	0	44
Psychotropic drug, unspecified (T43.9)	0	44
Other and unspecified drugs, medicaments, etc. (T50.9)	4	48
Other and unspecified chemicals, etc. (T50.9)	0	48

Table 43: Versions of selection C for Luxembourg 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	2	2
Multiple drug use and other psychoactive substances (F19)	0	2
Other synthetic narcotics (T40.4)	0	2
Other and unspecified narcotics (T40.6)	0	2
Other and unspecified psychodysleptics (T40.9)	13	15
Narcotics and psychodysleptics (remaining T-codes)	0	15
Other psychotropic drugs (T43.8)	0	15
Psychotropic drug, unspecified (T43.9)	0	15
Other and unspecified drugs, medicaments, etc. (T50.9)	2	17
Other and unspecified chemicals, etc. (T50.9)	0	17

Table 44: Versions of selection C for Luxembourg 2000

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	6	6
Multiple drug use and other psychoactive substances (F19)	0	6
Other synthetic narcotics (T40.4)	0	6
Other and unspecified narcotics (T40.6)	1	7
Other and unspecified psychodysleptics (T40.9)	18	25
Narcotics and psychodysleptics (remaining T-codes)	21	46
Other psychotropic drugs (T43.8)	0	46
Psychotropic drug, unspecified (T43.9)	0	46
Other and unspecified drugs, medicaments, etc. (T50.9)	6	52
Other and unspecified chemicals, etc. (T50.9)	7	59

2.6 The Netherlands

For the Netherlands for 1996 through 1999, the results for selections A are given in Table 45 through 48, for selections B in Table 49 through 52, and for selections C in Table 53 through 56.

According to its ICD-9 coded GMR the number of drug-related deaths in the Netherlands (according to selection B) was estimated at 70 in 1995. For ICD-10, version 3 of selection B seems the best option for the Netherlands, indicating 83 cases in 1997, 86 in 1998, and 77 cases in 1999.

Table 45: Versions of selection A for the Netherlands 1996

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	52	52
Multiple drug use and other psychoactive substances (F19)	2	54
Other synthetic narcotics (T40.4)	0	54
Other and unspecified narcotics (T40.6)	3	57
Other and unspecified psychodysleptics (T40.9)	2	59
Narcotics and psychodysleptics (remaining T-codes)	1	60
Other psychotropic drugs (T43.8)	0	60
Psychotropic drug, unspecified (T43.9)	0	60
Other and unspecified drugs, medicaments, etc. (T50.9)	2	62
Other and unspecified chemicals, etc. (T50.9)	0	62

Table 46: Versions of selection A for the Netherlands 1997

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	51	51
Multiple drug use and other psychoactive substances (F19)	0	51
Other synthetic narcotics (T40.4)	1	52
Other and unspecified narcotics (T40.6)	10	62
Other and unspecified psychodysleptics (T40.9)	7	69
Narcotics and psychodysleptics (remaining T-codes)	1	70
Other psychotropic drugs (T43.8)	0	70
Psychotropic drug, unspecified (T43.9)	1	71
Other and unspecified drugs, medicaments, etc. (T50.9)	12	83
Other and unspecified chemicals, etc. (T50.9)	0	83

Table 47: Versions of selection A for the Netherlands 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	50	50
Multiple drug use and other psychoactive substances (F19)	0	50
Other synthetic narcotics (T40.4)	0	50
Other and unspecified narcotics (T40.6)	9	59
Other and unspecified psychodysleptics (T40.9)	2	61
Narcotics and psychodysleptics (remaining T-codes)	0	61
Other psychotropic drugs (T43.8)	0	61
Psychotropic drug, unspecified (T43.9)	0	61
Other and unspecified drugs, medicaments, etc. (T50.9)	4	65
Other and unspecified chemicals, etc. (T50.9)	0	65

Table 48: Versions of selection A for the Netherlands 1999

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	54	54
Multiple drug use and other psychoactive substances (F19)	0	54
Other synthetic narcotics (T40.4)	0	54
Other and unspecified narcotics (T40.6)	14	68
Other and unspecified psychodysleptics (T40.9)	7	75
Narcotics and psychodysleptics (remaining T-codes)	1	76
Other psychotropic drugs (T43.8)	0	76
Psychotropic drug, unspecified (T43.9)	1	77
Other and unspecified drugs, medicaments, etc. (T50.9)	4	81
Other and unspecified chemicals, etc. (T50.9)	0	81

Table 49: Versions of selection B for the Netherlands 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	90	90
Multiple drug use and other psychoactive substances (F19)	2	92
Other synthetic narcotics (T40.4)	4	96
Other and unspecified narcotics (T40.6)	9	105
Other and unspecified psychodysleptics (T40.9)	3	108
Narcotics and psychodysleptics (remaining T-codes)	2	110
Other psychotropic drugs (T43.8)	0	110
Psychotropic drug, unspecified (T43.9)	1	111
Other and unspecified drugs, medicaments, etc. (T50.9)	98	209
Other and unspecified chemicals, etc. (T50.9)	1	210

Table 50: Versions of selection B for the Netherlands 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	79	79
Multiple drug use and other psychoactive substances (F19)	0	79
Other synthetic narcotics (T40.4)	4	83
Other and unspecified narcotics (T40.6)	15	98
Other and unspecified psychodysleptics (T40.9)	10	108
Narcotics and psychodysleptics (remaining T-codes)	1	109
Other psychotropic drugs (T43.8)	0	109
Psychotropic drug, unspecified (T43.9)	3	112
Other and unspecified drugs, medicaments, etc. (T50.9)	107	219
Other and unspecified chemicals, etc. (T50.9)	3	222

Table 51: Versions of selection B for the Netherlands 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	82	82
Multiple drug use and other psychoactive substances (F19)	0	82
Other synthetic narcotics (T40.4)	4	86
Other and unspecified narcotics (T40.6)	21	107
Other and unspecified psychodysleptics (T40.9)	3	110
Narcotics and psychodysleptics (remaining T-codes)	3	113
Other psychotropic drugs (T43.8)	2	115
Psychotropic drug, unspecified (T43.9)	4	119
Other and unspecified drugs, medicaments, etc. (T50.9)	100	219
Other and unspecified chemicals, etc. (T50.9)	0	219

Table 52: Versions of selection B for the Netherlands 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	75	75
Multiple drug use and other psychoactive substances (F19)	0	75
Other synthetic narcotics (T40.4)	2	77
Other and unspecified narcotics (T40.6)	25	102
Other and unspecified psychodysleptics (T40.9)	13	115
Narcotics and psychodysleptics (remaining T-codes)	2	117
Other psychotropic drugs (T43.8)	1	118
Psychotropic drug, unspecified (T43.9)	5	123
Other and unspecified drugs, medicaments, etc. (T50.9)	109	232
Other and unspecified chemicals, etc. (T50.9)	2	234

Table 53: Versions of selection C for the Netherlands 1996

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	142	142
Multiple drug use and other psychoactive substances (F19)	2	144
Other synthetic narcotics (T40.4)	4	148
Other and unspecified narcotics (T40.6)	9	157
Other and unspecified psychodysleptics (T40.9)	3	160
Narcotics and psychodysleptics (remaining T-codes)	2	162
Other psychotropic drugs (T43.8)	0	162
Psychotropic drug, unspecified (T43.9)	1	163
Other and unspecified drugs, medicaments, etc. (T50.9)	98	261
Other and unspecified chemicals, etc. (T50.9)	1	262

Table 54: Versions of selection C for the Netherlands 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	128	128
Multiple drug use and other psychoactive substances (F19)	0	128
Other synthetic narcotics (T40.4)	4	132
Other and unspecified narcotics (T40.6)	15	147
Other and unspecified psychodysleptics (T40.9)	10	157
Narcotics and psychodysleptics (remaining T-codes)	1	158
Other psychotropic drugs (T43.8)	0	158
Psychotropic drug, unspecified (T43.9)	3	161
Other and unspecified drugs, medicaments, etc. (T50.9)	107	268
Other and unspecified chemicals, etc. (T50.9)	3	271

Table 55: Versions of selection C for the Netherlands 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	123	123
Multiple drug use and other psychoactive substances (F19)	0	123
Other synthetic narcotics (T40.4)	4	127
Other and unspecified narcotics (T40.6)	21	148
Other and unspecified psychodysleptics (T40.9)	3	151
Narcotics and psychodysleptics (remaining T-codes)	3	154
Other psychotropic drugs (T43.8)	2	156
Psychotropic drug, unspecified (T43.9)	4	160
Other and unspecified drugs, medicaments, etc. (T50.9)	100	260
Other and unspecified chemicals, etc. (T50.9)	0	260

Table 56: Versions of selection C for the Netherlands 1999

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	134	134
Multiple drug use and other psychoactive substances (F19)	0	134
Other synthetic narcotics (T40.4)	2	136
Other and unspecified narcotics (T40.6)	25	161
Other and unspecified psychodysleptics (T40.9)	13	174
Narcotics and psychodysleptics (remaining T-codes)	2	176
Other psychotropic drugs (T43.8)	1	177
Psychotropic drug, unspecified (T43.9)	5	182
Other and unspecified drugs, medicaments, etc. (T50.9)	109	291
Other and unspecified chemicals, etc. (T50.9)	2	293

2.7 Sweden

For Sweden for 1997 through 1998, the results for selections A are given in Table 57 through 58, for selections B in Table 59 through 60, and for selections C in Table 61 through 62.

According to its ICD-9 coded GMR (according to selection B) the number of drug-related deaths in 1996 in Sweden was estimated at 169. For ICD-10, version 3 of selection B seems the best option for Sweden, resulting in 199 cases in 1997 and 193 cases in 1998.

Table 57: Versions of selection A for Sweden 1997

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	91	91
Multiple drug use and other psychoactive substances (F19)	25	116
Other synthetic narcotics (T40.4)	6	122
Other and unspecified narcotics (T40.6)	1	123
Other and unspecified psychodysleptics (T40.9)	0	123
Narcotics and psychodysleptics (remaining T-codes)	0	123
Other psychotropic drugs (T43.8)	0	123
Psychotropic drug, unspecified (T43.9)	0	123
Other and unspecified drugs, medicaments, etc. (T50.9)	18	141
Other and unspecified chemicals, etc. (T50.9)	0	141

Table 58: Versions of selection A for Sweden 1998

Causes of death: disorders and accidental poisoning	Separate	Cumulative
Drugs of abuse	71	71
Multiple drug use and other psychoactive substances (F19)	34	105
Other synthetic narcotics (T40.4)	2	107
Other and unspecified narcotics (T40.6)	3	110
Other and unspecified psychodysleptics (T40.9)	0	110
Narcotics and psychodysleptics (remaining T-codes)	1	111
Other psychotropic drugs (T43.8)	0	111
Psychotropic drug, unspecified (T43.9)	0	111
Other and unspecified drugs, medicaments, etc. (T50.9)	22	133
Other and unspecified chemicals, etc. (T50.9)	0	133

Table 59: Versions of selection B for Sweden 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	107	107
Multiple drug use and other psychoactive substances (F19)	25	132
Other synthetic narcotics (T40.4)	67	199
Other and unspecified narcotics (T40.6)	5	204
Other and unspecified psychodysleptics (T40.9)	0	204
Narcotics and psychodysleptics (remaining T-codes)	43	247
Other psychotropic drugs (T43.8)	0	247
Psychotropic drug, unspecified (T43.9)	0	247
Other and unspecified drugs, medicaments, etc. (T50.9)	233	480
Other and unspecified chemicals, etc. (T50.9)	0	480

Table 60: Versions of selection B for Sweden 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent	Separate	Cumulative
Drugs of abuse	101	101
Multiple drug use and other psychoactive substances (F19)	34	135
Other synthetic narcotics (T40.4)	58	193
Other and unspecified narcotics (T40.6)	9	202
Other and unspecified psychodysleptics (T40.9)	1	203
Narcotics and psychodysleptics (remaining T-codes)	52	255
Other psychotropic drugs (T43.8)	0	255
Psychotropic drug, unspecified (T43.9)	0	255
Other and unspecified drugs, medicaments, etc. (T50.9)	234	489
Other and unspecified chemicals, etc. (T50.9)	0	489

Table 61: Versions of selection C for Sweden 1997

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	175	175
Multiple drug use and other psychoactive substances (F19)	25	200
Other synthetic narcotics (T40.4)	67	267
Other and unspecified narcotics (T40.6)	5	272
Other and unspecified psychodysleptics (T40.9)	0	272
Narcotics and psychodysleptics (remaining T-codes)	43	315
Other psychotropic drugs (T43.8)	0	315
Psychotropic drug, unspecified (T43.9)	0	315
Other and unspecified drugs, medicaments, etc. (T50.9)	233	548
Other and unspecified chemicals, etc. (T50.9)	0	548

Table 62: Versions of selection C for Sweden 1998

Causes of death: disorders and accidental and intentional poisoning and poisoning undetermined intent, including medicines	Separate	Cumulative
Drugs of abuse and medicines	160	160
Multiple drug use and other psychoactive substances (F19)	34	194
Other synthetic narcotics (T40.4)	58	252
Other and unspecified narcotics (T40.6)	9	261
Other and unspecified psychodysleptics (T40.9)	1	262
Narcotics and psychodysleptics (remaining T-codes)	52	314
Other psychotropic drugs (T43.8)	0	314
Psychotropic drug, unspecified (T43.9)	0	314
Other and unspecified drugs, medicaments, etc. (T50.9)	234	548
Other and unspecified chemicals, etc. (T50.9)	0	548

2.8 Conclusions and recommendations

Selection of ICD-10 codes

For any country underinclusion must be avoided. Therefore, for ICD-10 coded General Mortality Registers (GMRs), it is recommended to select the following codes to estimate the number of drug-related deaths:

- Harmful use, dependence, and other mental and behavioural disorders due to:
  - opioids (F11)
  - cannabinoids (F12)
  - cocaine (F14)
  - other stimulants (F15)
  - hallucinogens (F16)
  - multiple drug use (F19).
- Accidental poisoning (X41, X42), intentional poisoning (X61, X62), or poisoning by undetermined intent (Y11, Y12) by:
  - opium (T40.0)
  - heroin (T40.1)
  - other opioids (T40.2)
  - methadone (T40.3)
  - other synthetic narcotics (T40.4)
  - cocaine (T40.5)
  - other and unspecified narcotics (T40.6)
  - cannabis (T40.7)
  - lysergide (T40.8)
  - other and unspecified psychodysleptics (T40.9)
  - psychostimulants (T43.6)

The T-codes are to be selected in combination with the respective X-codes and Y-codes.

The results of the proposed selection in comparison to ICD-9 codes are given in paragraph 2.9 below.

It is recommended that the proposed selection be further discussed among national experts, Eurostat, and the WHO.

Continuation of research

Including T40.4 (other synthetic narcotics), T40.6 (other and unspecified narcotics), and T40.9 (other and unspecified psychodysleptics) may lead to overinclusion for some countries. Selecting on an appropriate age group might partially solve this overinclusion.

It is recommended that, by continuation of research, it be investigated in the countries already coding to ICD-10 which cases are coded to T40.4 (other synthetic narcotics), T40.6

(other and unspecified narcotics), T40.9 (other and unspecified psychodysleptics), and the remaining T-codes.

It is recommended that in further research it be investigated which factors may have caused a breach of trend when changing from ICD-8/9 coding to ICD-10 coding in Finland (1996-1997).

Selection on age group

It is recommended that for the estimation of the number of drug-related deaths, the selection of ICD-10 codes proposed above will be further selected on an appropriate age group. It is recommended to investigate in continued research, for example, the age group 15 through 64 years.

Guidelines for ICD-10 coding

Including T50.9 (other and unspecified drugs, medicaments and chemicals) would imply overinclusion for all countries. However, some cases of drug-related death are coded to T50.9. Therefore it is recommended that the WHO Mortality Reference Group will establish a new priority list for substances and will recommend to the WHO Update Reference Committee the following guideline: "As far as current guidelines for multiple substances lead to other ICD-10 groups than T50.9, apply these guidelines. When existing guidelines would lead to T50.9, apply the new priority list."

It is recommended that it be recommended to Eurostat that for the ICD-10 code T50.9 (other and unspecified drugs, medicaments and chemicals) special queries will be conducted. By queries the coders at the GMRs ask the doctors that filled in the death certificate for more information about the lethal substances.

It is further recommended that the WHO Mortality Reference Group will recommend to the WHO Update Reference Committee the following new guideline for ICD-10 coding: "Code lethal poisonings to Txx.x and not to "acute intoxication" (Fxx.0)."

It is also recommended that the WHO Mortality Reference Group will recommend to the WHO Update Reference Committee the following new guideline for ICD-10 coding: "Instead of giving dependence (Fxx.2) priority over poisoning (Txx.x), give poisoning (Txx.x) priority over dependence (Fxx.2)."

Direct data-delivery

It is recommended that for future data collection all Member States deliver data on drug-related deaths more efficiently in the direct format of the EMCDDA databases.

Total burden of drug-related deaths

To estimate the total burden of drug-related deaths, it is recommended that the national experts apply those methodological options that are feasible for their country. Four methodological options are given in Annex 1. The number of drug-related deaths may then

be compared between countries. This way, the amount of under- or overestimation that confounds other estimations may also become visible.

Forensic issues

With regard to forensic issues, it is recommended that the EMCDDA continues collaboration with Eurostat and initiates collaboration with the European Council of Legal Medicine (ECLM).

2.9 Recommended ICD-10 selection compared to ICD-9

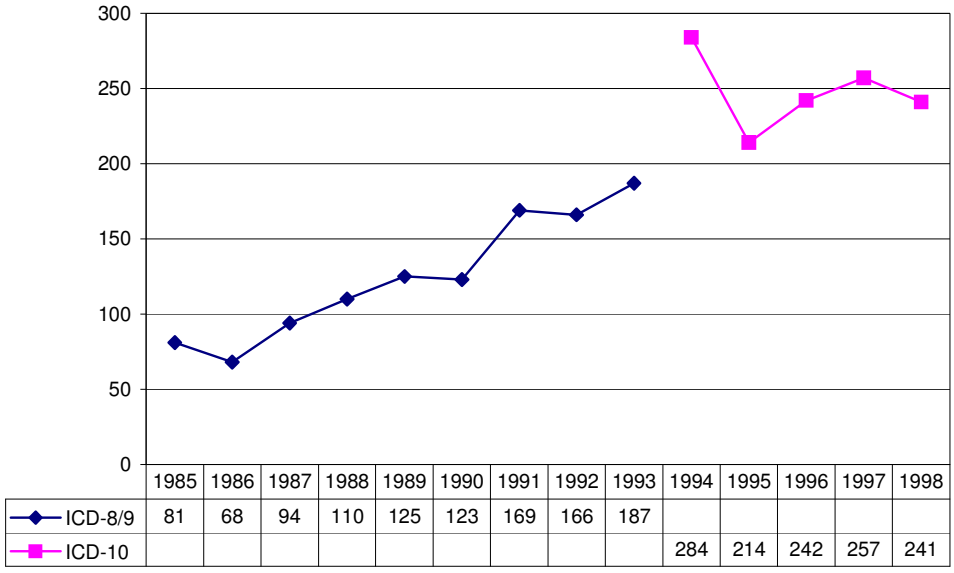
Table 63 below gives the number of drug-related deaths resulting from the recommended selection of ICD-10 codes.

Table 63: Drug-related deaths according to the recommended ICD-10 selection

	C o u n t r y					
Year	Denmark	Finland	Germany	Luxembourg	The Netherlands	Sweden
1994	284					
1995	214					
1996	242	107			108	
1997	257	98			108	204
1998	241	87	1280	22	110	203
1999		119	1337	13	115	
2000				22		

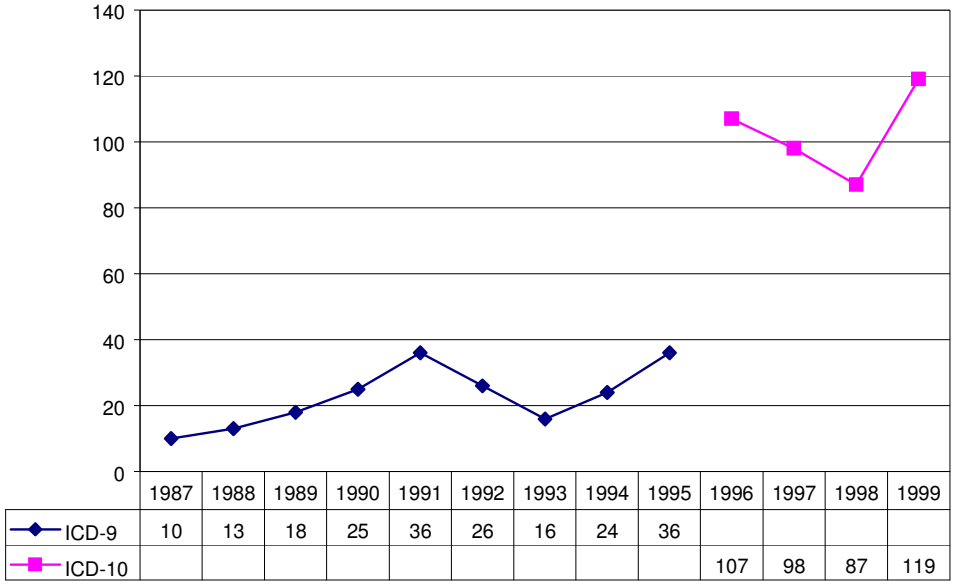
The overall trends in the number of drug-related deaths that include the change from ICD-9 to ICD-10, are given in the figures below. Figure 1 gives the trend for Denmark, Figure 2 for Finland, Figure 3 for Germany, Figure 4 for Luxembourg, Figure 5 for the Netherlands, and Figure 6 for Sweden. The figures for ICD-9 represent selection B and the figures for ICD-10 represent the recommended selection B.

In Denmark, the trend signalled from 1985 through 1993 continues from 1995 through 1998. The year 1994 shows a breach of trend that may be due to a temporary adjustment in coding practices.



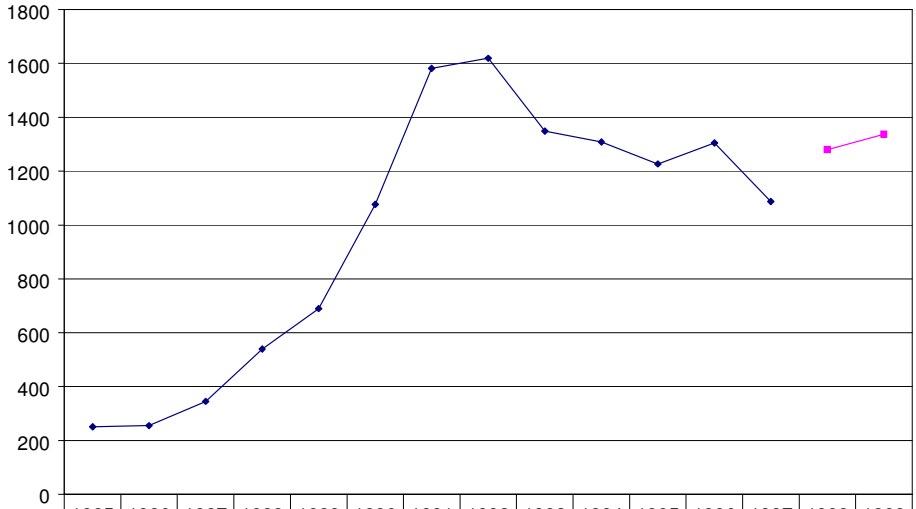
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ICD-8/9	81	68	94	110	125	123	169	166	187					
ICD-10										284	214	242	257	241

Figure 1: *Number of drug-related deaths according to the Danish GMR for ICD-8/9 (selection B, based on ICD-8) and ICD-10 (recommended selection B).*



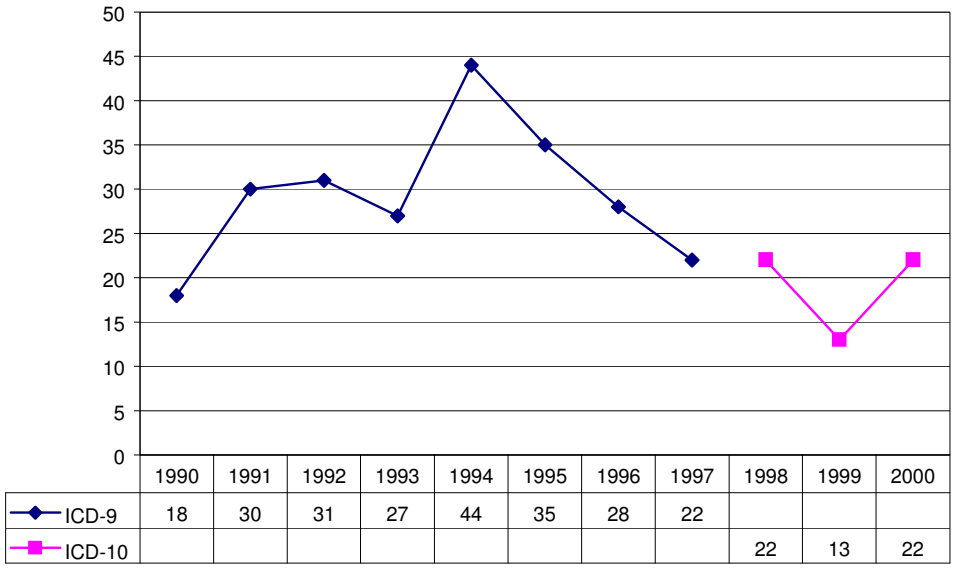
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
ICD-9	10	13	18	25	36	26	16	24	36				
ICD-10										107	98	87	119

Figure 2: *Number of drug-related deaths according to the Finnish GMR for ICD-9 (selection B) and ICD-10 (recommended selection B).*



	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
ICD-9	251	255	345	540	690	1077	1582	1619	1349	1308	1227	1305	1088		
ICD-10														1280	1337

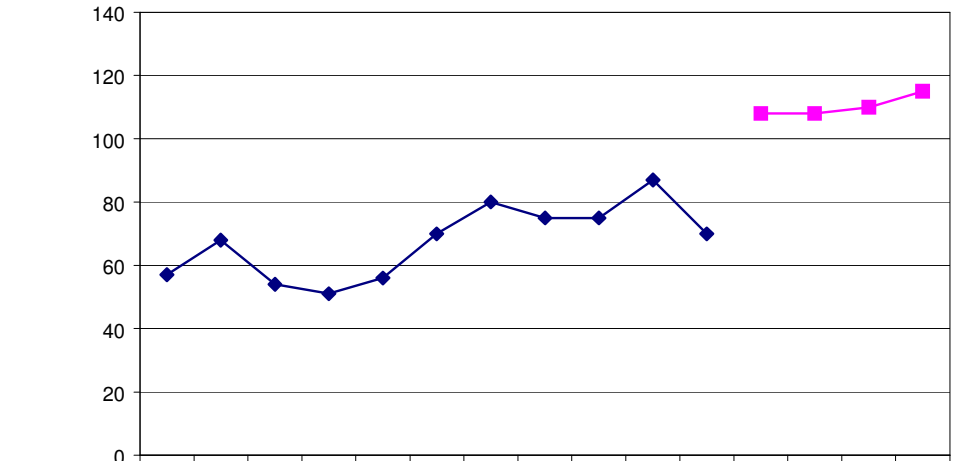
Figure 3: *Number of drug-related deaths according to the German GMR for ICD-9 (selection B) and ICD-10 (recommended selection B).*



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
ICD-9	18	30	31	27	44	35	28	22			
ICD-10									22	13	22

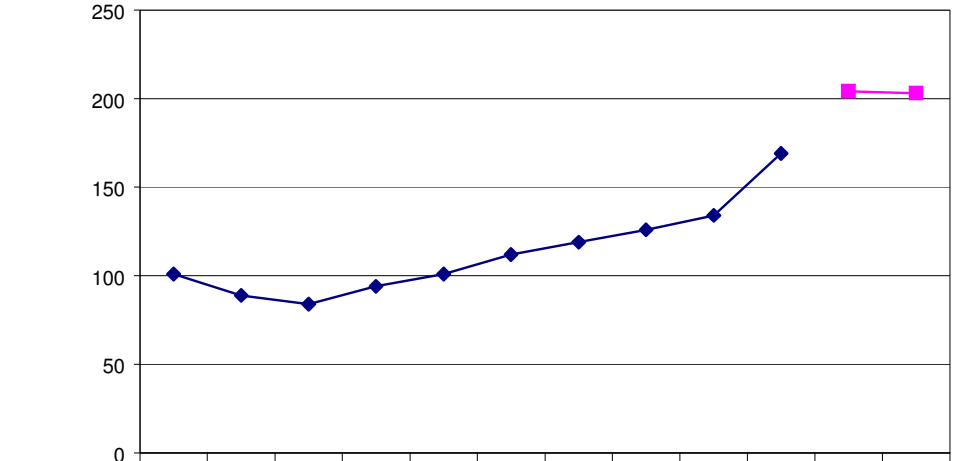
Figure 4: *Number of drug-related deaths according to the Luxembourg GMR for ICD-9 and ICD-10 (recommended selection B)*

.



	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
ICD-9	57	68	54	51	56	70	80	75	75	87	70				
ICD-10												108	108	110	115

Figure 5: *Number of drug-related deaths according to the Dutch GMR for ICD-9 (selection B) and ICD-10 (recommended selection B).*



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ICD-9	101	89	84	94	101	112	119	126	134	169		
ICD-10											204	203

Figure 6: *Number of drug-related deaths according to the Swedish GMR for ICD-9 (selection B) and ICD-10 (recommended selection B).*

Annex 1: Options to estimate the total burden of mortality related to psychoactive drug use

Introduction

Drugs of abuse can be involved in death in a direct way, but also in an indirect way. If drugs of abuse result in a fatal overdose, that is fatal poisoning, they cause death in a direct way. In such cases the drugs of abuse count as the underlying cause of death. If on the other hand drugs of abuse reinforce fatal accidents or deadly diseases, they are involved in death in an indirect way. In such cases, the drugs count as a contributing cause of death.

The total burden of mortality related to psychoactive drug use is given by the sum of direct and indirect drug-deaths. A long-term goal of the EMCDDA is to assess this total burden of drug mortality in the Member States of the European Union. The EMCDDA (2001) project on standard guidelines focuses on direct drug-deaths. Further information on direct as well as indirect drug-deaths has resulted from the EMCDDA (2000) project on cohort studies.

This paper introduces five theoretical options to assess the total burden of mortality related to psychoactive drug use. First, the mathematical model behind the options is described. Next, five options are sketched to estimate the parameters of this mathematical model.

The National Experts on Drug-Related Deaths are requested to discuss this paper in their National Work Group on Drug-Related Deaths.

For each of the five options please discuss the following questions:
- To what extent is this option already feasible in your country?
- Which further steps would have to be taken in your country to make this option feasible?
- As far as feasible, which estimations of the parameters have already resulted from this option?

Please report the results of the discussion in your National Work Group to the EMCDDA, on behalf of Julian Vicente.

Mathematical model

A telling way to introduce the mathematical model for direct and indirect drug-deaths is to give the example of an imaginary country. The example of an imaginary country is summarised in Table 1 below.

Table 1: Mathematical model for an imaginary country

Registration year	2001
Inhabitants	32,000,000
Population at risk for drug abuse, 20-40 years (or another appropriate age group)	10,050,000
problem drug users	50,000
non-users	10,000,000
prevalence of problem drug users (p_e)	0.5% (0.4975%)
Deaths among non-users	10,000
external causes	2,000
natural causes	8,000
mortality rate of non-users	0.1%
Deaths among problem drug users	1,500
mortality rate of problem drug users	3%
relative risk problem drug users (RR), or the standardised mortality ratio (SMR)	30
deaths not attributable to drugs	
external causes	10
natural causes	40
total burden of drug-related mortality	1,450
direct by poisoning by overdose	450
indirect	1,000
indirect by external causes	600
indirect by natural causes	400
Drug Attributable Fraction (DAF)	
for all deaths	12.6%
for external causes	23.0%
for natural causes	4.7%

As if looking through the eyes of an omniscient god, imagine a country in the registration year 2001 with a total of 32 million inhabitants. People at risk for drug abuse in this country age between 20 and 40 years, implying 10,050,000 people being at risk. (The age group is just an example to be replaced by a more appropriate age group, for example an age group that is compatible with other key indicators.) In fact 50,000 people have become a problem drug user, leaving 10,000,000 people as non-users. This means that the prevalence of problem drug users (p_e) is about 0.5%.

From the 10,000,000 non-users 10,000 people die in 2001. This implies a mortality rate among the non-users of 0.1%. It appears that 2,000 non-users die from external causes like traffic accidents. The remaining 8,000 non-users have died from natural causes, that is diseases. (In actual practice making a distinction between users and non-users may not be feasible. In that case the mortality rate among the non-users will have to be calculated on the whole group of users and non-users taken together. This is acceptable since the group of users is usually far too small to influence the mortality rate of the whole group.)

From the 50,000 problem drug users 1,500 people die in 2001. This implies a mortality rate among the problem drug users of 3%. The mortality rate among the non-users is only 0.1%, which means that the death risk is 30 times higher among the problem users. This ratio is coined the parameter "RR" or "SMR" (standardised mortality ratio).

The assumption is made that if the 50,000 problem drug users would not have abused drugs, their mortality rate would have been 0.1%, just like the mortality rate among the non-users. In that case, only 50 of them would have died, of which 10 due to external causes, and 40 due to natural causes. In fact 1,500 of them have died, which means that 1,450 deaths can be attributed to problem drug use. That is, the total burden of drug-related mortality in this example amounts to 1,450.

A total of 11,500 people have died, namely 10,000 non-users and 1,500 problem drug users. Given the 1,450 drug-related deaths, this means that 12.6% of all deaths in the population at risk can be attributed to drugs. In other words, the Drug Attributable Fraction (DAF) for all deaths is 12.6%.

The formula usually applied to estimate the DAF is:

$$DAF = p_e(RR-1)/(p_e(RR-1)+1)$$

Applying this formula to our example indeed results in:

$$DAF = 0.004975(30-1)/(0.004975(30-1)+1) = 12.6\%$$

The further breakdown of the 1,450 drug-related deaths is as follows: 450 problem users have died directly by poisoning (overdose). The remaining 1,000 problem users have died indirectly from drugs of which 600 by external causes like traffic accidents, and 400 from diseases like aids and hepatitis.

From the 10,050,000 people aged 20-40 years 2,610 people die from external causes, among which 600 related to problem drug use. This implies that from deaths due to external causes 600/2,610 equalling 23% can be attributed to drugs. In other words, the Drug Attributable Fraction (DAF) for external causes is 23%.

From the 10,050,000 people aged 20-40 years 8,440 people die from natural causes (diseases), from which 400 people have died from problem drug use. This implies that from the deaths due to natural causes 400/8,440 equalling 4.7% can be attributed to drugs. In other words, the Drug Attributable Fraction (DAF) for natural causes is 4.7%.

Another way to show the distribution of the 10,050,000 people at risk from the imaginary country is given in Table 2 below. The percentages resulting from this example are given in Table 3.

Table 2: Distribution of people at risk in an imaginary country

Vital status				Non-users	Problem drug users	Total
Survivors				9,990,000	48,500	10,038,500
Deceased	not drug-related		external	2,000	10	2,010
			natural	8,000	40	8,040
	drug-related	direct		0	450	450
		indirect	external	0	600	600
			natural	0	400	400
			Total	10,000,000	50,000	10,050,000

Table 3: Distribution of people at risk in an imaginary country in percentages

Vital status				Non-users	Problem drug users
Survivors				99.90%	97.00%
Deceased	not drug-related		external	0.02%	0.02%
			natural	0.08%	0.08%
	drug-related	direct		0.00%	0.90%
		indirect	external	0.00%	1.20%
			natural	0.00%	0.80%
			Total	100.00%	100.00%

Not being able to look through the eyes of an omniscient god, there are four theoretical options for us human scientific researchers to put this mathematical model into actual practice.

Option 1: Estimation from a General Mortality Register (GMR)

Option 1 requires that a country's General Mortality Register (GMR) has complete coverage and registers with high validity direct as well as indirect drug-deaths. The direct drug-deaths are given by selection B for GMRs as described by the EMCDDA (2001). The indirect drug-deaths are given by those cases in which drugs are registered as a contributing cause of death. Double counting with direct drug-deaths must be avoided.

For a combination of this option 1 with option 3 below, see option 5 below.

Option 2: Estimation from a Special Register (SR)

Option 2 requires that a country's Special Register (SR) has complete coverage and registers with high validity direct as well as indirect drug-deaths. The direct drug-deaths are given by selection D for SRs as described by the EMCDDA (2001). The indirect drug-deaths are given by those cases in which drugs are registered as a contributing cause of death. Double counting with direct drug-deaths must be avoided.

In some countries the SR will only cover a geographical part of the population at risk. In that case results from the respective geographical part of the country will have to be generalised to the whole country.

Option 3: Estimation from a cohort study

A telling way to demonstrate option 3 is to ponder further on the example given above of the imaginary country.

In the imaginary country a cohort study is conducted on a sample of 500 problem drug users, drawn at the beginning of 2001. From research projects on the key-indicator "problem drug use" it is estimated that there is a total of 50,000 problem drug users. This implies that the sample consists of 1% of the total population under study.

At the end of 2001, the cohort study shows that from the 500 abusers, 15 have died, resulting in a mortality rate of 3%. Generalising this 3% mortality rate from the sample to the whole population, results in an estimated number of 1,500 deaths among the 50,000 drug abusers. From a control group it is known that the mortality rate among non-users in the same age group is only 0.1%. This implies 50 deaths among the problem drug users that are not to be attributed to drugs. From the initial 1,500 deaths, this leaves 1,450 deaths as the total burden of drug-related mortality.

In addition, cause-specific estimations can be derived from the cohort study. More specifically, the total burden of drug-related mortality will be due to overdose (poisoning), diseases (aids, hepatitis, other diseases), and accidents (traffic accidents and other accidents). Percentages of death due to a specific cause may be generalised from the cohort study to the whole population of problem drug users.

For a combination of this option 3 with option 1 above, see option 5 below.

Option 4: Estimation from Drug Attributable Fractions (DAFs)

Finally, the example of the imaginary country is also a telling way to demonstrate option 4. The imaginary country's government orders by law that in 2001 each tenth fatal traffic or fatal domestic accident (and other external causes) be toxicologically examined. From a total of 2,610 accidents, this results in a sample of 261 accidents. Toxicological examinations show that in 60 of these fatal accidents drugs of abuse have played a contributing role. This implies a DAF for accidents of 23%. This means that 600 accidents are estimated to be related to drugs.

A total of 8,440 people die in 2001 from diseases like aids and hepatitis. The national institute of public health further investigates a sample of these cases showing that in 4.7% problem drug use has played a contributing role. This implies that about 400 fatal diseases are related to drugs.

From the GMR and the SR it is further known that 450 people have died from a fatal overdose by drugs of abuse. In this case the DAF is 100%.

Summing up the fatal 600 drug-related accidents, the fatal 400 drug-related diseases, and the 450 fatal overdoses, results in an estimated total burden of drug-related mortality of 1,450 deaths.

Applying this option requires a reliable GMR and requires reliable estimations of the DAFs. In some countries the DAFs have been estimated through extensive bibliographic reviews of epidemiological studies. In some cases the relationship between drug use and illness and the proportion of cases attributable to drugs is well established. In some cases the DAF will change from country to country. The proportion of aids cases related to drug use, for example, will change from country to country.

Option 5: Estimation from a General Mortality Register (GMR) in combination with a cohort study

This option is a combination of option 1 (estimation from a GMR) with option 3 (estimation from a cohort study).

This option is only feasible as far as privacy regulations prevailing in the European Union and the respective Member State allow linking data from a cohort study with data from the GMR. In some Member States, only anonymous data linkage will be allowed.

Suppose there is a cohort of known drug abusers, but no data are available about mortality in this cohort. If linkage with the GMR is allowed by privacy regulations and is technically

feasible, the required information about mortality figures can then be obtained from the GMR. Next, it can be proceeded as in option 3 above: the estimation from a cohort study.

Annex 2: The DRD-Standard, Version 2.0

1. Replacement of previous versions

This version 2.0 of the DRD-Standard replaces the previous version 1.0. Version 1.0 was tested during a field trial in the summer of 1999 in the Member States of the European Union. The modifications of version 2.0 compared to its predecessor version 1.0 are reviewed in paragraph 6 below.

This version 2.0 of the DRD-Standard also replaces the third draft version of the spreadsheet GMR_02 for ICD-10 coded General Mortality Registers from 17-05-2000.

2. The origin of the DRD-Standard

The DRD-Standard is the Drug-Related Deaths Standard. It is the standard protocol for extracting data on drug-related deaths from registers in the Member States of the European Union.

The DRD-Standard has the following parts:

Part I standardises extracting data from the General Mortality Registers (GMRs).
Part IA applies to ICD-9 coded GMRs.
Part IB applies to ICD-10 coded GMRs.
Part II standardises extracting data from the Special Registers (SRs).

3. The rationale behind the DRD-Standard

There are two main sources of information on drug-related deaths: I. General Mortality Registers (GMRs), which are present in all countries of the European Union, and II. Special Registers held by the police or forensic institutions, which are present in a subset of countries. Both registers have advantages and disadvantages. For comparative purposes, data are collected from both types of registers.

4. General Mortality Registers

The standard comprises a series of *underlying causes of deaths* as coded under the International Classification of Diseases, 9th and 10th edition. These codes are specified at three- or four-digit level. Broad categories include: drugs psychosis, drug dependence, nondependent drug abuse, accidental poisoning, suicide and self-inflicted poisoning, and poisoning with intent undetermined.

The substances causing death need to be specified. For ICD-9 coded GMRs this requires that a number of defined E-codes (poisoning deaths) must be extracted in combination with *nature of injury* codes (N-codes). For ICD-10 coded GMRs this respectively requires that X-codes and Y-codes be extracted in combination with T-codes.

As one E-code may have multiple N-codes, a specific procedure must be followed to exclude double counting of persons.

Contributing causes of death are not included because a significant number of countries are not able to provide the corresponding data. There are also difficulties related to the interpretation of the data.

The defined standard for *data extraction and collection* does not automatically imply that all causes of death will be used for calculating the overall number of drug-related deaths in the EU Member States. A consensus has been reached among EU experts to include in the overall number the following categories: deaths by drugs psychoses, drug dependence, nondependent drug abuse, accidental poisoning, suicide and self-inflicted poisoning, and poisoning with undetermined intent. Only deaths due to drugs typical of abuse like opiates, cocaine, amphetamines, cannabis, and hallucinogens will be included. Psychoactive medicines will be excluded from the calculation of the overall number of drug-related deaths. Causes of death related to unspecified drugs are only collected to obtain insight into the accuracy of coding.

The standard also specifies the breakdown by *gender* and *age groups.*

5. Special Registers

Information on fatal drug poisoning is common to most Special Registers. Therefore, part II of the DRD-Standard focuses on poisoning cases. In accordance with prevailing international classifications, 'poisoning' means an unnatural, violent, external cause of death. It includes homicide by poisoning, suicide by poisoning, accidental poisoning, and poisoning with undetermined intent. In everyday language 'poisoning' is usually called 'overdose'.

It has appeared feasible to distinguish between poisoning cases in which different substances have played a role: opiates only (excluding methadone), methadone only, poly-substances including opiates, poly-substances excluding opiates, psychoactive medicines, and unspecified/unknown substances. Therefore, this distinction between substances has been chosen as the breakdown for the poisoning cases together with the standard breakdown by gender and age group.

The Special Registers in some countries are also able to distinguish other causes of death than poisoning. These other causes differ widely between the countries. Therefore, within the DRD-Standard, the other causes than poisoning are grouped together into natural/internal causes like diseases, accidents other than by poisoning, suicide other than by poisoning, homicide other than by poisoning, and undetermined external causes other than poisoning. The Special Registers are asked to specify which cases are grouped together into these other causes. These other causes are also broken down by gender and the standard age breakdown.

6. Modifications compared to the previous version 1.0

Compared to the previous version 1.0 of the DRD-Standard, this version 2.0 is modified as follows:

- For ICD-9 coded GMRs (see Table 1 below), for the DRD-numbers 23, 24, 35, 36, 44, 45, 53, and 54, the code "N969.9" has been replaced by "N969.6".
- For those ICD-9 coded GMRs that can only combine E-codes with one N-code (instead of two), it has been standardised how to make these combinations (see Table 2).
- For ICD-10 coded GMRs the DRD-numbers 56 through 151 have been added (see Table 3 below). Herewith version 2.0 of the DRD-Standard replaces the third draft version of the spreadsheet GMR_02 for ICD-10 coded General Mortality Registers from 17-05-2000. Please notice that compared to this previous draft version the numbering of DRD56 through DRD151 has been changed.
- For the SRs (see Table 4 below), the breakdown into overdoses has been changed into poisoning by opiates only (excluding methadone), methadone only, poly-substances including opiates, poly-substances excluding opiates, psychoactive medicines, and unspecified/unknown substances. The breakdown into other causes than poisoning has been changed into natural/internal, accidents other than by poisoning, suicide other than by poisoning, homicide other than by poisoning, and undetermined other than poisoning.
- For the GMRs as well as the SRs the previous 5 age groups have been replaced by 13 age groups. The 13 new age groups are (1) 0-14 years, (2) 15-19 years, (3) 20-24 years, (4) 25-29 years, (5) 30-34 years, (6) 35-39 years, (7) 40-44 years, (8) 45-49 years, (9) 50-54 years, (10) 55-59 years, (11) 60-64 years, (12) 65 years or older, and (13) age group unknown.

7. Limitations of the DRD-standard

The current standard for General Mortality Registers focuses on underlying causes of death and does not take into account deaths where drug use is a contributory cause of death. The last category of deaths comprises natural causes of death (such as cardiac diseases) as well as external causes of death other than poisoning (such as accidents) where drugs are indirectly involved. Depending on the width of the definition adopted for drug-related deaths this standard may give rise to underreporting. In a similar vein, underreporting may occur under the standard for Special Registers because of its focus on harmonising direct deaths (poisoning) in contrast to deaths indirectly related to drug use.

8. General guidelines to apply the DRD-Standard

The DRD-Standard is the European Union's greatest common divisor to extract data on drug-related deaths. This implies that some Member States will not be able to confirm exactly to the DRD-Standard. In all cases in which the DRD-Standard cannot be applied exactly, please act as follows:
Please deviate from the DRD-Standard in such a way that the resulting data will approach the standard as much as possible. (In case ICD-9 E-codes can only be combined with one N-code, instead of two, see Table 2).
While sending in the aggregated data by means of the spreadsheets, please report all deviations from the DRD-Standard in a separate technical report.

9. The form of the DRD-Standard

The DRD-Standard is given by the Excel-spreadsheets in which the aggregated data on drug-related deaths are to be reported.

For the ICD-9 coded General Mortality Registers, the format of the spreadsheet is shown in Table 1. For the ICD-10 coded General Mortality Registers, the format of the spreadsheet is shown in Table 3.

For the Special Registers, the format of the spreadsheet is shown in Table 4.

Retrieving the aggregated numbers that must be reported in the cells of the spreadsheet, may require the development of special computer programs that will select and count the appropriate cases. These new computer programs will differ between the countries, because they must fit to the specific data structure of a General Mortality Register in a given country. Therefore, the DRD-Standard for all Member States is stated in general terms.

10. Logical terminology

Beware of the fact that the DRD-Standard applies formal logical terminology, because logical terminology can be translated directly into computer languages. This counts especially for selections of cases that are defined by the terms 'AND' and 'OR'. Beware of the fact that in common language the words 'and' and 'or' have a different meaning compared to the logical meaning of 'AND' and 'OR'. Especially for the General Mortality Registers, it is recommended that professionals, who are trained to apply formal logic, extract the data on drug-related deaths.

The logical definition of 'AND'

In logical terminology, the prescription ’A AND B’ means that a case is only selected if the case satisfies condition A *as well as* condition B. If the case does not satisfy condition A, the case is not selected. If the case does not satisfy condition B, it is selected neither. Of course, the case is also not selected if it does not satisfy condition A and does not satisfy condition B as well.

The logical definition of 'OR'

In logical terminology, the prescription ’A OR B’ means that a case is selected if condition A is satisfied, if condition B is satisfied, or if both conditions A and B are satisfied. The case is not selected if both conditions A and B are not satisfied.

The mutual definitions of 'AND' and 'OR'

From the logical definitions of 'AND' and 'OR' given above, it follows that (A AND B) equals NOT (NOT A OR NOT B). Conversely, (A OR B) equals NOT (NOT A AND NOT B). This way, 'AND' and 'OR' are mutually defined by one another.

The definition of 'through'

For the DRD-Standard the term 'through' means 'up to and including'. For example '1 through 10' means: '1, 2, 3, 4, 5, 6, 7, 8, 9, and 10'. Furthermore, ‘1-10’ means ‘1 through 10’, which equals ‘1 up to and including 10’ as defined above.

Part IA: The protocol for ICD-9 coded General Mortality Registers

For ICD-9, the DRD-Standard focuses on the following categories of underlying causes of death:

Underlying cause of death	Selected ICD-9 code(s)
Drug psychoses	292
Drug dependence	304.0, 304.2-9
Nondependent drug abuse	305.2-3, 305.5-7, 305.9
Accidental drug poisoning	E850.0, E850.8[1)], E854.1-2, E855.2, and E858.8[1)]
Suicide and self-inflicted drug poisoning	E950.0[1)] , E950.4[1)]
Drug poisoning undetermined intent	E980.0[1)], E980.4[1)]

[1)]In combination with N-codes (N965.0, and/or N968.5, and/or N969.6, and/or N969.7), as explained below.

The protocol for extracting data on drug-related deaths from ICD-9 coded General Mortality Registers consists in taking three consecutive steps:

Step 1: Apply the spreadsheets for ICD-9 coded General Mortality Registers

For ICD-9 coded GMRs, the format of the spreadsheet to report the aggregated data is given in Table 1 below. For each combination of registration year and gender, a spreadsheet can be filled in.

For each spreadsheet, 55 different selections of causes of drug-related deaths are to be made from the General Mortality Register. These 55 selections are labelled DRD1 through DRD55. DRD1 through DRD55 are described in the explanations following Table 1.

The cases that are selected are counted within 13 age groups. The 13 age groups are (1) 0-14 years, (2) 15-19 years, (3) 20-24 years, (4) 25-29 years, (5) 30-34 years, (6) 35-39 years, (7) 40-44 years, (8) 45-49 years, (9) 50-54 years, (10) 55-59 years, (11) 60-64 years, (12) 65 years or older, and (13) age group unknown. For each combination of DRD1 through DRD55 and age group, the respective numbers of selected cases are to be reported in the respective cells of the spreadsheet.

Step 2: Select the single ICD-9 codes

Some DRD-codes are defined by just one ICD-9 code. Other DRD-codes are defined by combinations of ICD-9 codes. If a DRD-code is defined by only one ICD-9 code, only select a

case if the *underlying* cause of death is coded to the respective ICD-9 code. This means that in case of one ICD-9 code, *contributing* causes of death are *not* taken into account and are *not* selected. The DRD-codes that are defined by only one ICD-9 code are: DRD1 through DRD20, DRD25 through DRD32, DRD37, DRD39, DRD40, DRD46, DRD48, DRD49, and DRD55. Step 3 below prescribes how to select DRD-codes that are defined by combinations of E- and N-codes.

Step 3: Select the combinations of ICD-9 codes

It is preferred that E-codes can be combined with at least two N-codes. In case only one N-code is available, see below at alternative 2 for step 3.

The DRD-codes that are defined by combinations of E- and N-codes are: DRD21 through DRD24, DRD33 through DRD36, DRD38, DRD41 through DRD45, DRD47, and DRD50 through DRD54. The selection criterion for these DRD-codes always starts with an E-code. These are E850.8, E858.8, E950.0, E950.3, E950.4, E980.0, E980.3, and E980.4. These E-codes refer to the underlying cause of death. Of these, codes E950.0 and E980.0 must be extracted in combination with N-code 965.0 to obtain cases related to opiates. Similarly, codes E950.3 and E980.3 must be extracted in combination with N-code 969.4 to extract cases related to benzodiazepines.

The remaining four codes (E850.8, E858.8, E950.4, E980.4) are known to be associated with multiple N-codes, at least in some countries. In order to avoid double counting, cases should be assigned into one of four mutually exclusive categories. At a descriptive level these categories are:

opiates AND cocaine (regardless of other substances);
opiates AND NO cocaine (regardless of other substances);
mixed, including one or more of the following: cocaine OR stimulants OR hallucinogens AND NO opiates (regardless of other substances);
other, NO opiates, NO cocaine, NO stimulants, NO hallucinogens.

The corresponding definitions can be found in Table 1 under DRD21-DRD24, DRD33-DRD36, DRD42-DRD45 and DRD51-DRD54.

Option to avoid laborious spreadsheet work

Filling in a sequence of spreadsheets, of which the format is shown in Table 1, may result in laborious work. Ultimately, the data from these spreadsheets will be transferred to a general SPSS database. Some programmers will be able to shortcut this roundabout route of the spreadsheets. Programming the output in the format of the ultimate general database has proven to be even less difficult than programming the output for filling in the spreadsheets.

Programmers who prefer a shortcut that will save much work for both parties, are requested to contact Guus Cruts directly at the e-mail address gcruts@trimbos.nl to obtain the codebook of the ultimate database. If output can be programmed directly according to this codebook, the spreadsheets can be skipped entirely.

Alternative 1 for step 3: N-codes by exception from contributing causes

In some countries, codes E850.8, E858.8, E950.4 or E980.4 may have one additional N-code that is non-specific, for example, code N977.8 (other drugs and medicaments) or N977.9 (unspecified drug or medicament). Information on the specific substances involved (e.g. opiates) may be contained in a series of N-codes recorded as contributing causes. In this specific situation, the N-codes recorded as *contributing* causes of death, and all other information pertaining to a case, must also be taken into account. For example, if the underlying cause of death is coded to E850.8 in combination with N965.0 and in combination with N968.5, the case counts as a DRD21. The case counts as a DRD21 if in *all* information about the case, including the contributing causes, E850.8 is found in combination somewhere with N965.0 AND somewhere with N968.5. The same logic applies to the other DRD-codes that are defined by combinations of E-codes and N-codes.

Table 1: Spreadsheet format for ICD-9 coded GMRs

		Age group[1]													
DRD	**ICD9-Code(s)**	1	2	3	4	5	6	7	8	9	10	11	12	13	**T**
1	292														**0**
2	304.0														**0**
3	304.1														**0**
4	304.2														**0**
5	304.3														**0**
6	304.4														**0**
7	304.5														**0**
8	304.6														**0**
9	304.7														**0**
10	304.8														**0**
11	304.9														**0**
12	305.2														**0**
13	305.3														**0**
14	305.4														**0**
15	305.5														**0**
16	305.6														**0**
17	305.7														**0**
18	305.8														**0**
19	305.9														**0**
20	E850.0														**0**
21	E850.8 AND N965.0 AND N968.5														**0**
22	E850.8 AND N965.0 AND NOT N968.5														**0**
23	E850.8 AND (N968.5 OR N969.7 OR N969.6) AND NOT N965.0														**0**
24	E850.8 AND NOT N965.0 AND NOT (N968.5 OR N969.7 OR N969.6)														**0**
25	E850.9														**0**
26	E851														**0**
27	E852														**0**
28	E853.2														**0**
29	E854.1														**0**
30	E854.2														**0**
31	E855.2														**0**
32	E855.9														**0**
33	E858.8 AND N965.0 AND N968.5														**0**
34	E858.8 AND N965.0 AND NOT N968.5														**0**
35	E858.8 AND (N968.5 OR N969.7 OR N969.6) AND NOT N965.0														**0**
36	E858.8 AND NOT N965.0 AND NOT (N968.5 OR N969.7 OR N969.6)														**0**
37	E858.9														**0**
38	E950.0 AND N965.0														**0**
39	E950.1														**0**
40	E950.2														**0**
41	E950.3 AND N969.4														**0**
42	E950.4 AND N965.0 AND N968.5														**0**
43	E950.4 AND N965.0 AND NOT N968.5														**0**
44	E950.4 AND (N968.5 OR N969.7 OR N969.6) AND NOT N965.0														**0**
45	E950.4 AND NOT N965.0 AND NOT (N968.5 OR N969.7 OR N969.6)														**0**
46	E950.5														**0**
47	E980.0 AND N965.0														**0**
48	E980.1														**0**
49	E980.2														**0**
50	E980.3 AND N969.4														**0**
51	E980.4 AND N965.0 AND N968.5														**0**
52	E980.4 AND N965.0 AND NOT N968.5														**0**
53	E980.4 AND (N968.5 OR N969.7 OR N969.6) AND NOT N965.0														**0**
54	E980.4 AND NOT N965.0 AND NOT (N968.5 OR N969.7 OR N969.6)														**0**
55	E980.5														**0**
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[1]Age groups: 1 = <15, 2 = 15-19, 3 = 20-24, 4 = 25-29, 5 = 30-34, 6 = 35-39, 7 = 40-44, 8= 45-49, 9 = 50-54, 10 = 55-59, 11 = 60-64, 12 = >=65, 13 = age unknown.

Explanation to Table 1: DRD1 through DRD37

DRD	Explanation
1	Drug psychoses
2	Drug dependence, morphine type
3	Drug dependence, barbiturate type
4	Drug dependence, cocaine
5	Drug dependence, cannabis
6	Drug dependence, amphetamine type and other psychostimulants
7	Drug dependence, hallucinogens
8	Drug dependence, other
9	Drug dependence, combination of morphine-type drug with any other
10	Drug dependence, combination excluding morphine-type drug
11	Drug dependence, unspecified
12	Nondependent abuse of drugs, cannabis
13	Nondependent abuse of drugs, hallucinogens
14	Nondependent abuse of drugs, barbiturates and tranquillisers
15	Nondependent abuse of drugs, morphine type
16	Nondependent abuse of drugs, cocaine type
17	Nondependent abuse of drugs, amphetamine type
18	Nondependent abuse of drugs, antidepressants
19	Nondependent abuse of drugs, other, mixed, or unspecified
20	Accidental poisoning, opiates and related narcotics
21	Accidental poisoning, mixed including opiates AND cocaine
22	Accidental poisoning, mixed including opiates AND NO cocaine
23	Accidental poisoning, including cocaine OR stimulants OR hallucinogens and NO opiates
24	Accidental poisoning, other, NO opiates, NO cocaine, NO stimulants, NO hallucinogens
25	Accidental poisoning, unspecified analgesics, antipyretics, antirheumatics
26	Accidental poisoning, barbiturates
27	Accidental poisoning, other sedatives and hypnotics
28	Accidental poisoning, benzodiazepines
29	Accidental poisoning, psychodysleptics (including cannabis and hallucinogens)
30	Accidental poisoning, psychostimulants (including amphetamines)
31	Accidental poisoning, local anaesthetics (including cocaine)
32	Accidental poisoning, unspecified other drugs acting on the nervous system
33	Accidental poisoning, mixed including opiates AND cocaine
34	Accidental poisoning, mixed including opiates AND NO cocaine
35	Accidental poisoning, including cocaine OR stimulants OR hallucinogens and NO opiates
36	Accidental poisoning, other, NO opiates, NO cocaine, NO stimulants, NO hallucinogens
37	Accidental poisoning, unspecified other drugs

(continued)

Explanation to Table 1 *(continued)* : DRD38 through DRD55

38	Suicide and self-inflicted poisoning, opiates
39	Suicide and self-inflicted poisoning, barbiturates
40	Suicide and self-inflicted poisoning, other sedatives and hypnotics
41	Suicide and self-inflicted poisoning, benzodiazepines
42	Suicide and self-inflicted poisoning, mixed including opiates AND cocaine
43	Suicide and self-inflicted poisoning, mixed including opiates AND NO cocaine
44	Suicide and self-inflicted poisoning, including cocaine OR stimulants OR hallucinogens and NO opiates
45	Suicide and self-inflicted poisoning, other, NO opiates, NO cocaine, NO stimulants, NO hallucinogens
46	Suicide and self-inflicted poisoning, other unspecified drugs or medicaments
47	Poisoning undetermined intent, opiates
48	Poisoning undetermined intent, barbiturates
49	Poisoning undetermined intent, other sedatives and hypnotics
50	Poisoning undetermined intent, benzodiazepines
51	Poisoning undetermined intent, mixed including opiates AND cocaine
52	Poisoning undetermined intent, mixed including opiates AND NO cocaine
53	Poisoning undetermined intent, including cocaine OR stimulants OR hallucinogens and NO opiates
54	Poisoning undetermined intent, other, NO opiates, NO cocaine, NO stimulants, NO hallucinogens
55	Poisoning undetermined intent, other unspecified drugs or medicaments

Alternative 2 for step 3: Combinations with only one N-code

To apply the DRD-Standard, version 2.0 completely, it is required that ICD-9 E-codes can be combined with at least two ICD-9 N-codes. However, for the General Mortality Registers of some countries, E-codes can only be combined with one N-code. The following guidelines describe how to act if E-codes can only be combined with one N-code.

Please report during data delivery if this alternative for step 3 has been applied.

Table 2 below shows how to compute DRD1 through DRD55 in case E-codes can only be combined with one N-code.

Table 2: Combinations of E-codes with one N-code

DRD-number(s)	Computation prescription
DRD1 through DRD20	Compute as already prescribed in Table 1.
DRD21	E850.8 AND N965.0
DRD22	Do not compute but leave empty.
DRD23	E850.8 AND N968.5 E850.8 AND N969.7 E850.8 AND N969.6
DRD24 through DRD32	Compute as already prescribed in Table 1.
DRD33	E858.8 AND N965.0
DRD34	Do not compute but leave empty.
DRD35	E858.8 AND N968.5 E858.8 AND N969.7 E858.8 AND N969.6
DRD36 through DRD41	Compute as already prescribed in Table 1.
DRD42	E950.4 AND N965.0
DRD43	Do not compute but leave empty.
DRD44	E950.4 AND N968.5 E950.4 AND N969.7 E950.4 AND N969.6
DRD45 through DRD50	Compute as already prescribed in Table 1.
DRD51	E980.4 AND N965.0
DRD52	Do not compute but leave empty.
DRD53	E980.4 AND N968.5 E980.4 AND N969.7 E980.4 AND N969.6
DRD54 through DRD55	Compute as already prescribed in Table 1.

Explanation to Table 2

Table 2 above prescribes the following:

Compute DRD1 through DRD20 as prescribed by the DRD-Standard.

Compute DRD21 as “E850.8 AND N965.0”, meaning “accidental poisoning, mixed including opiates”.

Do not compute DRD22, because these cases are merged with DRD21.

Compute DRD23 as “E850.8 AND (N968.5 OR N969.7 OR N969.6)”, meaning “accidental poisoning, including cocaine OR stimulants OR hallucinogens”.

Compute DRD24 through DRD32 as prescribed by the DRD-Standard.

Compute DRD33 as “E858.8 AND N965.0”, meaning “accidental poisoning, mixed including opiates”.

Do not compute DRD34, because these cases are merged with DRD33.

Compute DRD35 as “E858.8 AND (N968.5 OR N969.7 OR N969.6)”, meaning “accidental poisoning, including cocaine OR stimulants OR hallucinogens”.

Compute DRD36 through DRD41 as prescribed by the DRD-Standard.

Compute DRD42 as “E950.4 AND N965.0”, meaning “suicide and self-inflicted poisoning, mixed including opiates”.

Do not compute DRD43, because these cases are merged with DRD42.

Compute DRD44 as “E950.4 AND (N968.5 OR N969.7 OR N969.6)”, meaning “suicide and self-inflicted poisoning, including cocaine OR stimulants OR hallucinogens”.

Compute DRD45 through DRD50 as prescribed by the DRD-Standard.

Compute DRD51 as “E980.4 AND N965.0”, meaning “poisoning undetermined intent, mixed including opiates”.

Do not compute DRD52, because these cases are merged with DRD51.

Compute DRD53 as “E980.4 AND (N968.5 OR N969.7 OR N969.6)”, meaning “poisoning undetermined intent, including cocaine OR stimulants OR hallucinogens”.

Compute DRD54 through DRD55 as prescribed by the DRD-Standard.

Consequences

Following the 17 guidelines above will have the following consequences for data delivery:

DRD21 merges with DRD22 into DRD21.

DRD33 merges with DRD34 into DRD33.

DRD42 merges with DRD43 into DRD42.

DRD51 merges with DRD52 into DRD51.

Part IB: The protocol for ICD-10 coded General Mortality Registers

For ICD-10, the DRD-Standard focuses on the following categories of underlying causes of death:

Underlying cause of death	Selected ICD-10 code(s)
Disorders	F11-F16, F18-F19
Accidental poisoning	X42[1)], X41[1)]
Intentional poisoning	X62[1)], X61[1)]
Poisoning undetermined intent	Y12[1)], Y11[1)]

[1)]In combination with T-codes, as explained below.

The protocol for extracting data on drug-related deaths from ICD-10 coded General Mortality Registers consists in taking three consecutive steps:

Step 1: Apply the spreadsheets for ICD-10 coded General Mortality Registers

For ICD-10 coded GMRs, the format of the spreadsheet to report the aggregated data is given in Table 3 below. For each combination of registration year and gender, a spreadsheet can be filled in.

For each spreadsheet, 96 different selections of causes of drug-related deaths are to be made from the General Mortality Register. These 96 selections are labelled DRD56 through DRD151. DRD56 through DRD151 are described in Table 3 itself.

The cases that are selected are counted within 13 age groups. The 13 age groups are (1) 0-14 years, (2) 15-19 years, (3) 20-24 years, (4) 25-29 years, (5) 30-34 years, (6) 35-39 years, (7) 40-44 years, (8) 45-49 years, (9) 50-54 years, (10) 55-59 years, (11) 60-64 years, (12) 65 years or older, and (13) age group unknown. For each combination of DRD56 through DRD151 and age group, the respective numbers of selected cases are to be reported in the respective cells of the spreadsheet.

Step 2: Select the single ICD-10 codes

Some DRD-codes are defined by just one ICD-10 code. Other DRD-codes are defined by combinations of ICD-10 codes. If a DRD-code is defined by only one ICD-10 code, only select a case if the *underlying* cause of death is coded to the respective ICD-10 code. This means that in case of one ICD-10 code, *contributing* causes of death are *not* taken into account and are *not* selected. The DRD-codes that are defined by only one ICD-10 code are: DRD56 through DRD87, DRD98 (for some countries), DRD118 (for some countries), DRD138 (for some countries), and DRD148 through DRD151. Step 3 below prescribes how to select DRD-codes that are defined by combinations of X- and Y-codes with T-codes.

Step 3: Select the combinations of ICD-10 codes

It is preferred that X- and Y-codes can be combined with at least one T-code that specifies the underlying cause of death. In case no T-code is available as a specification of the underlying cause of death, see below at alternative 2 for step 3.

The DRD-codes that are defined by combinations of X- and Y-codes with T-codes are: DRD88 through DRD97, DRD99 through DRD117, DRD119 through DRD137, and DRD139 through DRD147. The selection criterion for these DRD-codes always starts with an X- or Y-code. These are primarily X42, X41, X62, X61, Y12, and Y11. These X- and Y-codes refer to the underlying cause of death. At DRD88, for example, “X42 AND T40.0” represents accidental poisoning by opium.

Option to avoid laborious spreadsheet work

Filling in a sequence of spreadsheets, of which the format is shown in Table 3, may result in laborious work. Ultimately, the data from these spreadsheets will be transferred to a general SPSS database. Some programmers will be able to shortcut this roundabout route of the spreadsheets. Programming the output in the format of the ultimate general database has proven to be even less difficult than programming the output for filling in the spreadsheets.

Programmers who prefer a shortcut that will save much work for both parties, are requested to contact Guus Cruts directly at the e-mail address gcruts@trimbos.nl to obtain the codebook of the ultimate database. If output can be programmed directly according to this codebook, the spreadsheets can be skipped entirely.

Alternative 1 for step 3: T-codes by exception from contributing causes

In some countries, information on the specific substances involved (e.g. opiates) may be contained in a series of T-codes recorded as contributing causes. In this specific situation, the T-codes recorded as *contributing* causes of death, and all other information pertaining to a case, must also be taken into account. For example, if the underlying cause of death is coded to X42 in combination with T40.0, the case counts as a DRD88. The case counts as a DRD88 if in *all* information about the case, including the contributing causes, X42 is found in combination somewhere with T40.0. The same logic applies to the other DRD-codes that are defined by combinations of X- and Y-codes with T-codes.

Alternative 2 for step 3: X- and Y-codes without T-codes

To apply the DRD-Standard, version 2.0 completely, it is required that ICD-10 X- and Y-codes can be combined with at least one ICD-10 T-code. However, for the General Mortality Registers of some countries, X- and Y-codes cannot be combined with any T-code. The following guidelines describe how to act if X- and Y-codes cannot be combined with any T-code. Please report during data delivery if this alternative for step 3 has been applied.

In case X-codes and Y-codes cannot be combined with any specifying T-code, please deviate from the prescriptions above as follows:

Do not compute DRD88 through DRD97, but only compute DRD98, that is X42.

Do not compute DRD99 through DRD105.

For DRD106, instead of "X44 AND T50.9", only compute X44.

For DRD107, instead of "X49 AND T50.9", only compute X49.

Do not compute DRD108 through DRD117, but only compute DRD118, that is X62.

Do not compute DRD119 through DRD125.

For DRD126, instead of "X64 AND T50.9", only compute X64.

For DRD127, instead of "X69 AND T50.9", only compute X69.

Do not compute DRD128 through DRD137, but only compute DRD138, that is Y12.

Do not compute DRD139 through DRD145.

For DRD146, instead of "Y14 AND T50.9", only compute Y14.

For DRD147, instead of "Y19 AND T50.9", only compute Y19.

Step 4: Make specific estimations

The GMRs of some countries code drug-related deaths to unspecified codes like X44, X49, X64, X69, Y14, and Y19, sometimes in combination with T50.9. These codes are represented by DRD106, DRD107, DRD126, DRD127, DRD146, and DRD147. The question is which percentage of cases in these categories can be attributed to drugs. Please answer this question by filling in the following table on the accompanying spreadsheet:

DRD	ICD10-Code(s)	(I) % of cases with opiates	(II) % of cases with drugs of abuse* but no opiates	If (I) and (II) cannot be differentiated: % of cases with drugs of abuse*
106	X44 AND T50.9**			
107	X49 AND T50.9**			
126	X64 AND T50.9**			
127	X69 AND T50.9**			
146	Y14 AND T50.9**			
147	Y19 AND T50.9**			

*drugs of abuse are: opiates, cocaine, amphetamines, hallucinogens, cannabis, and synthetic drugs

**If no T-codes are available, only apply the single X-code or the single Y-code.

The accompanying spreadsheet also asks on which source(s) the estimations for the table above are based.

Step 5: Answer specific questions

Question 1

A first question is how multiple substances are coded. How would your General Mortality Register code cases to ICD-10 where the underlying cause of death involves multiple substances? Please answer this question by filling in the following table on the accompanying spreadsheet:

Multiple substances	ICD-10 code(s)
opiates and alcohol	
opiates and no alcohol	
drug(s) of abuse*, no opiates, no alcohol	
drug(s) of abuse*, no opiates, alcohol	

*drugs of abuse are: opiates, cocaine, amphetamines, hallucinogens, cannabis, and synthetic drugs

Question 2

A second question is to what extent cases of "other synthetic narcotics", that is DRD92, DRD112, and DRD132, contain deaths due to the synthetic opiate *dextropropoxyphene*. Please answer this question by filling in the following table on the accompanying spreadsheet:

DRD	ICD-10 code(s)	Percentage of dextropropoxyphene cases
DRD92	X42 AND T40.4*	
DRD112	X62 AND T40.4*	
DRD132	Y12 AND T40.4*	

*If no T-codes are available, only apply the single X-code or the single Y-code.

Question 3

A third question is how unspecified overdoses are coded. If "overdose" is stated on the death certificate without further specifications, to what ICD-10 code(s) is such a case coded?

Table 3: Spreadsheet format for ICD-10 coded GMRs

	Underlying cause of death		**Age group**[*)]													
	Substances		1	2	3	4	5	6	7	8	9	10	11	12	13	
DRD	**Disorders: Acute intoxication**	**ICD10-Code(s)**														**T**
56	Opioids	F11.0														**0**
57	Cannabinoids	F12.0														**0**
58	Sedatives	F13.0														**0**
59	Cocaine	F14.0														**0**
60	Other stimulants	F15.0														**0**
61	Hallucinogens	F16.0														**0**
62	Volatile solvents	F18.0														**0**
63	Multiple/other	F19.0														**0**
DRD	**Disorders: Harmful use**	**ICD10-Code(s)**														**T**
64	Opioids	F11.1														**0**
65	Cannabinoids	F12.1														**0**
66	Sedatives	F13.1														**0**
67	Cocaine	F14.1														**0**
68	Other stimulants	F15.1														**0**
69	Hallucinogens	F16.1														**0**
70	Volatile solvents	F18.1														**0**
71	Multiple/other	F19.1														**0**
DRD	**Disorders: Dependence**	**ICD10-Code(s)**														**T**
72	Opioids	F11.2														**0**
73	Cannabinoids	F12.2														**0**
74	Sedatives	F13.2														**0**
75	Cocaine	F14.2														**0**
76	Other stimulants	F15.2														**0**
77	Hallucinogens	F16.2														**0**
78	Volatile solvents	F18.2														**0**
79	Multiple/other	F19.2														**0**
DRD	**Disorders: Other**	**ICD10-Code(s)**														**T**
80	Opioids	F11.3-9														**0**
81	Cannabinoids	F12.3-9														**0**
82	Sedatives	F13.3-9														**0**
83	Cocaine	F14.3-9														**0**
84	Other stimulants	F15.3-9														**0**
85	Hallucinogens	F16.3-9														**0**
86	Volatile solvents	F18.3-9														**0**
87	Multiple/other	F19.3-9														**0**
DRD	**Accidental poisoning**	**ICD10-Code(s)**														**T**
88	Opium	X42 AND T40.0														**0**
89	Heroin	X42 AND T40.1														**0**
90	Other opioids	X42 AND T40.2														**0**
91	Methadone	X42 AND T40.3														**0**
92	Other synthetic narcotics	X42 AND T40.4														**0**
93	Cocaine	X42 AND T40.5														**0**
94	Other and unspecified narcotics	X42 AND T40.6														**0**
95	Cannabis	X42 AND T40.7														**0**
96	Lysergide [LSD]	X42 AND T40.8														**0**
97	Other/unspec. psychodysleptics	X42 AND T40.9														**0**
98	Narcotics and psychodysleptics	X42*														**0**
99	Barbiturates	X41 AND T42.3														**0**
100	Benzodiazepines	X41 AND T42.4														**0**
101	Other antiepileptic and sedative	X41 AND T42.6														**0**
102	Antiepileptic and sedative unspec.	X41 AND T42.7														**0**
103	Psychostimulants	X41 AND T43.6														**0**
104	Other psychotropic	X4* AND T43.8														**0**
105	Psychotropic unspecified	X4* AND T43.9														**0**
106	Other and unspecified drugs	X44 AND T50.9														**0**
107	Other and unspecified chemicals	X49 AND T50.9														**0**

(continued)

Table 3 *(continued):* Spreadsheet format for ICD-10 coded GMRs

	Underlying cause of death		**A g e g r o u p**[*)]													
	Substances		1	2	3	4	5	6	7	8	9	10	11	12	13	
DRD	**Intentional poisoning**	**ICD10-Code(s)**														**T**
108	Opium	X62 AND T40.0														**0**
109	Heroin	X62 AND T40.1														**0**
110	Other opioids	X62 AND T40.2														**0**
111	Methadone	X62 AND T40.3														**0**
112	Other synthetic narcotics	X62 AND T40.4														**0**
113	Cocaine	X62 AND T40.5														**0**
114	Other and unspecified narcotics	X62 AND T40.6														**0**
115	Cannabis	X62 AND T40.7														**0**
116	Lysergide [LSD]	X62 AND T40.8														**0**
117	Other/unspec. psychodysleptics	X62 AND T40.9														**0**
118	Narcotics and psychodysleptics	X62*														**0**
119	Barbiturates	X61 AND T42.3														**0**
120	Benzodiazepines	X61 AND T42.4														**0**
121	Other antiepileptic and sedative	X61 AND T42.6														**0**
122	Antiepileptic and sedative unspec.	X61 AND T42.7														**0**
123	Psychostimulants	X61 AND T43.6														**0**
124	Other psychotropic	X6* AND T43.8														**0**
125	Psychotropic unspecified	X6* AND T43.9														**0**
126	Other and unspecified drugs	X64 AND T50.9														**0**
127	Other and unspecified chemicals	X69 AND T50.9														**0**
DRD	**Poisoning undetermined intent**	**ICD10-Code(s)**														**T**
128	Opium	Y12 AND T40.0														**0**
129	Heroin	Y12 AND T40.1														**0**
130	Other opioids	Y12 AND T40.2														**0**
131	Methadone	Y12 AND T40.3														**0**
132	Other synthetic narcotics	Y12 AND T40.4														**0**
133	Cocaine	Y12 AND T40.5														**0**
134	Other and unspecified narcotics	Y12 AND T40.6														**0**
135	Cannabis	Y12 AND T40.7														**0**
136	Lysergide [LSD]	Y12 AND T40.8														**0**
137	Other/unspec. psychodysleptics	Y12 AND T40.9														**0**
138	Narcotics and psychodysleptics	Y12*														**0**
139	Barbiturates	Y11 AND T42.3														**0**
140	Benzodiazepines	Y11 AND T42.4														**0**
141	Other antiepileptic and sedative	Y11 AND T42.6														**0**
142	Antiepileptic and sedative unspec.	Y11 AND T42.7														**0**
143	Psychostimulants	Y11 AND T43.6														**0**
144	Other psychotropic	Y1* AND T43.8														**0**
145	Psychotropic unspecified	Y1* AND T43.9														**0**
146	Other and unspecified drugs	Y14 AND T50.9														**0**
147	Other and unspecified chemicals	Y19 AND T50.9														**0**
DRD	**ILL defined**	**ICD10-Code(s)**														**T**
148	Instantaneous death	R96.0														**0**
149	Death not otherwise explained	R96.1														**0**
150	Unattended death	R98														**0**
151	Other ill-defined and unspecified	R99														**0**
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

*)Age groups: 1 = <15, 2 = 15-19, 3 = 20-24, 4 = 25-29, 5 = 30-34, 6 = 35-39, 7 = 40-44, 8= 45-49, 9 = 50-54, 10 = 55-59, 11 = 60-64, 12 = >=65, 13 = age unknown.

X42* = Include in DRD98, if there is an X42-code and the case is not yet included in DRD88 through DRD97.

X4* = (X40-X49)

X62* = Include in DRD116, if there is an X62-code and the case is not yet included in DRD106 through DRD115.

X6* = (X60-X69)

Y12* = Include in DRD134, if there is an Y12-code and the case is not yet included in DRD124 through DRD133.

Y1* = (Y10-Y19)

Part II: The protocol for the Special Registers

For the Special Registers, the DRD-Standard focuses on the following categories of underlying causes of death:

Underlying cause of death	Further breakdowns
Poisoning (by accident, suicide, homicide, or undetermined intent)	Opiates, methadone, poly-substances, medicines, and unspecified.
Other than poisoning	Natural/internal, accidents, suicide, homicide, and undetermined.

The protocol for extracting data on drug-related deaths from the Special Registers consists in taking four consecutive steps:

Step 1: Apply the spreadsheet

The format of the spreadsheet to report the aggregated data from the Special Registers is given in Table 4 below. For each registration year, a spreadsheet can be filled in.

Step 2: Apply gender and age breakdowns

For each year the spreadsheet is broken down by gender, cause of death, and age group. Gender is divided into male, female, and gender unknown. The age groups are (1) 0-14 years, (2) 15-19 years, (3) 20-24 years, (4) 25-29 years, (5) 30-34 years, (6) 35-39 years, (7) 40-44 years, (8) 45-49 years, (9) 50-54 years, (10) 55-59 years, (11) 60-64 years, (12) 65 years or older, and (13) age group unknown.

Step 3: Apply substance breakdown to poisoning cases

The causes of death are divided into poisoning and other than poisoning. The protocol for the other than poisoning causes is given in step 4 below. The poisoning cases are further divided by the substances implicated in death.

Beware of the fact that not all substances detected or mentioned in a case are taken into account. Only those substances are taken into account that are considered an underlying or a contributing cause of death. Substances that are *not* considered an underlying or contributing cause of death are thus *not* taken into account to assign a case to a category of substances.

Each poisoning case is coded to only one of the six mutually exclusive categories A1 through A6:

A1. Opiates only (excluding methadone)

A case is coded to A1 if only opiates, but not methadone, are registered as a cause of death, and no other substances are registered as a cause of death. If, for example, alcohol is also registered as a cause of death besides opiates, the case is assigned to category A3 below.

A2. Methadone only

A case is coded to A2 if only methadone is registered as a cause of death, and no other substances are registered as a cause of death. If, for example, alcohol is also registered as a cause of death besides methadone, the case is assigned to category A3 below.

A3. Poly-substances including opiates

A case is coded to A3, if opiates are registered as a cause of death and one or more of the following substances are also registered as a cause of death:

amphetamines
cocaine/crack
cannabis
hallucinogens (e.g. LSD, mescaline, PCP, psilocybine)
solvents
'synthetic designer drugs' (e.g. MDMA, 2-CB, GHB and derivates)
barbiturates
tranquillisers and other nonbarbiturate sedatives (e.g. benzodiazepines)
alcohol
other substances

A4. (Poly)substances excluding opiates

A case is coded to A4 if one or more of the following substances are registered as a cause of death, but no opiates are registered as a cause of death:
amphetamines
cocaine/crack
cannabis
hallucinogens (e.g. LSD, mescaline, PCP, psilocybine)
solvents
'synthetic designer drugs' (e.g. MDMA, 2-CB, GHB and derivates)

If in addition to the aforementioned substances, alcohol, barbiturates, tranquillisers or nonbarbiturate sedatives are also registered as a cause of death, the case is still coded to A4.

If on the other hand psychoactive medicines are registered as a cause of death, and none of the above substances, and no opiates are registered as a cause of death, the case is coded to A5 below.

A5. Psychoactive medicines

To be coded to A5, no opiates, no amphetamines, no cocaine/crack, no cannabis, no hallucinogens, no solvents, and no 'synthetic designer drugs' may be registered as a cause of death. A case is coded to A5 if one or more of the following psychoactive medicines are registered as a cause of death:

barbiturates
benzodiazepines
other sedatives and minor tranquillizers

Antidepressants, neuroleptics and other psychoactive medicines are not taken into account. A case is also coded to A5 if death is due to the combined use of alcohol and one or more of the psychoactive medicines listed above.

A6. Unspecified/unknown

A case is coded to A6 if it is unspecified or unknown which substances have caused death.

Step 4: Apply and specify other causes than poisoning

The five other causes of death B1 through B5, which are other causes than poisoning, are as follows:

B1. natural/internal (e.g. disease)
B2. accidents other than by poisoning
B3. suicide other than by poisoning
B4. homicide other than by poisoning
B5. undetermined other than poisoning

These other causes are mutually exclusive. One case may only be coded to one cause. Please specify which cases are coded to B1, B2, B3, B4, or B5.

Option to avoid laborious spreadsheet work

Filling in a sequence of spreadsheets, of which the format is shown in Table 4, may result in laborious work. Ultimately, the data from these spreadsheets will be transferred to a general SPSS database. Some programmers will be able to shortcut this roundabout route of the spreadsheets. Programming the output in the format of the ultimate general database has proven to be even less difficult than programming the output for filling in the spreadsheets.

Programmers who prefer a shortcut that will save much work for both parties, are requested to contact Guus Cruts directly at the e-mail address gcruts@trimbos.nl to obtain the codebook of the ultimate database. If output can be programmed directly according to this codebook, the spreadsheets can be skipped entirely.

Table 4: Spreadsheet format for SRs

M	Cause of death	Age group													
A	A. Poisoning by accident, suicide,	<15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	>=65	?y	Total
L	homicide, or undetermined intent														
E	A1. Opiates only (excluding methadone)														0
	A2. Methadone only														0
	A3. Poly-substances including opiates														0
	A4. (Poly)substances excluding opiates														0
	A5. Psychoactive medicines														0
	A6. Unspecified/unknown														0
	Subtotal A: poisoning	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B. Other than poisoning	<15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	>=65	?y	Total
	B1. Natural/internal														0
	B2. Accidents other than by poisoning														0
	B3. Suicide other than by poisoning														0
	B4. Homicide other than by poisoning														0
	B5. Undetermined other than poisoning														0
	Subtotal B: other than poisoning	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total males	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	Cause of death	Age group													
E	A. Poisoning by accident, suicide,	<15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	>=65	?y	Total
M	homicide, or undetermined intent														
A	A1. Opiates only (excluding methadone)														0
L	A2. Methadone only														0
E	A3. Poly-substances including opiates														0
	A4. (Poly)substances excluding opiates														0
	A5. Psychoactive medicines														0
	A6. Unspecified/unknown														0
	Subtotal A: poisoning	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B. Other than poisoning	<15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	>=65	?y	Total
	B1. Natural/internal														0
	B2. Accidents other than by poisoning														0
	B3. Suicide other than by poisoning														0
	B4. Homicide other than by poisoning														0
	B5. Undetermined other than poisoning														0
	Subtotal B: other than poisoning	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total females	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total males and females	0	0	0	0	0	0	0	0	0	0	0	0	0	0

?y = age group unknown

Annex 3: Guidelines for direct data-delivery

Introduction

These guidelines belong to "The DRD-Standard, Version 2.0; EMCDDA standard guidelines to report statistics on Drug-Related Deaths from the EU Member States (Draft version from 18-04-2001, EMCDDA project CT.00.RTX.22)". On the pages 9, 17, and 25 the DRD-Standard offers an "option to avoid laborious spreadsheet work". These guidelines describe how to take advantage of this option.

Direct data-delivery means that the data are delivered in the format of the EMCDDA databases on drug-related deaths. These guidelines describe the format of the databases, that is the "codebooks". Programmers on GMRs and SRs are requested to programme output files in these formats according to the codebooks. This way, the output from GMRs and SRs can be directly implemented in the EMCDDA databases on drug-related deaths.

Part IA of these guidelines applies to ICD-9 coded General Mortality Registers (GMRs). Part IB applies to ICD-10 coded GMRs. Part II applies to Special Registers (SRs).

Questions about these guidelines can be addressed to the Trimbos Institute to either Guus Cruts <gcruts@trimbos.nl> or Margriet van Laar <mlaar@trimbos.nl>.

Part IA: ICD-9 coded General Mortality Registers (GMRs)

Data on drug-related deaths from ICD-9 coded GMRs are transferred to the general EMCDDA database. The format of this database is given in the following table.

Country	Year	Gender	Age	DRD	Number
40-826	1985 ff.	1-3	6-18	1-55	1 ff.

Country

The variable "Country" complies with the ISO 3166 standard for country codes (RIPE Network Coordination Centre, 1994).

The country codes are as follows:

- 040 for Austria
- 056 for Belgium
- 208 for Denmark
- 246 for Finland
- 250 for France
- 276 for Germany
- 300 for Greece
- 372 for Ireland
- 380 for Italy
- 442 for Luxembourg
- 528 for The Netherlands
- 620 for Portugal
- 724 for Spain
- 752 for Sweden
- 826 United Kingdom

Year

For the variable "Year" the respective year is filled in.

Gender

The variable "Gender" runs from 1 through 3.

The following codes are used:

- 1 for male
- 2 for female
- 3 for gender unknown.

Age

The variable "Age" runs from 6 through 18.

The following codes are used:

- 6 for <15 years
- 7 for 15-19 years
- 8 for 20-24 years
- 9 for 25-29 years
- 10 for 30-34 years
- 11 for 35-39 years
- 12 for 40-44 years
- 13 for 45-49 years
- 14 for 50-54 years
- 15 for 55-59 years
- 16 for 60-64 years
- 17 for >=65 years
- 18 for age unknown.

DRD

The variable "DRD" runs from 1 through 55. The codes 1, 2, 3, etc. are used for the ICD9-Codes as described on page 11 in Table 1 in the DRD-Standard, Version 2.0.

If, for example, the categories 21 through 24 are taken together, the cases are coded to 21.

Number

The variable "Number" stands for the number of drug-related deaths. Zero cases need not be delivered. Therefore "Number" runs from 1 through the maximum number found in a category.

Part IB: ICD-10 coded General Mortality Registers (GMRs)

Data on drug-related deaths from ICD-10 coded GMRs are transferred to the general EMCDDA database. The format of this database is given in the following table.

Country	Year	Gender	Age	DRD	Number
40-826	1994 ff.	1-3	6-18	56-151	1 ff.

Country

The variable "Country" complies with the ISO 3166 standard for country codes (RIPE Network Coordination Centre, 1994).

The country codes are as follows:

- 040 for Austria
- 056 for Belgium
- 208 for Denmark
- 246 for Finland
- 250 for France
- 276 for Germany
- 300 for Greece
- 372 for Ireland
- 380 for Italy
- 442 for Luxembourg
- 528 for The Netherlands
- 620 for Portugal
- 724 for Spain
- 752 for Sweden
- 826 United Kingdom

Year

For the variable "Year" the respective year is filled in.

Gender

The variable "Gender" runs from 1 through 3.

The following codes are used:

- 1 for male
- 2 for female
- 3 for gender unknown.

Age

The variable "Age" runs from 6 through 18.

The following codes are used:

- 6 for <15 years
- 7 for 15-19 years
- 8 for 20-24 years
- 9 for 25-29 years
- 10 for 30-34 years
- 11 for 35-39 years
- 12 for 40-44 years
- 13 for 45-49 years
- 14 for 50-54 years
- 15 for 55-59 years
- 16 for 60-64 years
- 17 for >=65 years
- 18 for age unknown.

DRD

The variable "DRD" runs from 56 through 151. The codes 56, 57, 58, etc. are used for the ICD10-Codes as described on page 21 and 22 in Table 3 of the DRD-Standard, Version 2.0.

Number

The variable "Number" stands for the number of drug-related deaths. Zero cases need not be delivered. Therefore "Number" runs from 1 through the maximum number found in a category.

Part II: Special Registers (SRs)

Data on drug-related deaths from SRs are transferred to the general EMCDDA database. The format of this database is given in the following table.

Country	Year	Gender	Age	Cause	Number
40-826	1985 ff.	1-3	6-18	18-28	1 ff.

Country

The variable "Country" complies with the ISO 3166 standard for country codes (RIPE Network Coordination Centre, 1994).

The country codes are as follows:

- 040 for Austria
- 056 for Belgium
- 208 for Denmark
- 246 for Finland
- 250 for France
- 276 for Germany
- 300 for Greece
- 372 for Ireland
- 380 for Italy
- 442 for Luxembourg
- 528 for The Netherlands
- 620 for Portugal
- 724 for Spain
- 752 for Sweden
- 826 United Kingdom

Year

For the variable "Year" the respective year is filled in.

Gender

The variable "Gender" runs from 1 through 3.

The following codes are used:

- 1 for male
- 2 for female
- 3 for gender unknown.

Age

The variable "Age" runs from 6 through 18.

The following codes are used:

- 6 for <15 years
- 7 for 15-19 years
- 8 for 20-24 years
- 9 for 25-29 years
- 10 for 30-34 years
- 11 for 35-39 years
- 12 for 40-44 years
- 13 for 45-49 years
- 14 for 50-54 years
- 15 for 55-59 years
- 16 for 60-64 years
- 17 for >=65 years
- 18 for age unknown.

Cause

The variable "Cause" runs from 18 through 28. The codes are used for the causes of death as described on page 26 in Table 4 of the DRD-Standard, Version 2.0.

The following codes are used:

- 18 for poisoning by opiates only (excluding methadone)
- 19 for poisoning by methadone only
- 20 for poisoning by poly-substances including opiates
- 21 for poisoning by (poly)substances excluding opiates
- 22 for poisoning by psychoactive medicines
- 23 for poisoning by unspecified/unknown substances
- 24 for natural/internal causes
- 25 for accidents other than by poisoning
- 26 for suicide other than by poisoning
- 27 for homicide other than by poisoning
- 28 for undetermined causes other than by poisoning.

Number

The variable "Number" stands for the number of drug-related deaths. Zero cases need not be delivered. Therefore "Number" runs from 1 through the maximum number found in a category.

Annex 4: Explanations to the databases on drug-related deaths

Explanations to the database GMR_01.sav

Belgium

The data for 1998 and 1999 are provisional and are not to be published. The data refer to Brussels (code for "Coun_old" = 21) and the Flemish Community (code for "Coun_old" = 22).

Denmark

For 1994 through 1998 the data are included for ICD-9 as well as for ICD-10.

Portugal

ICD-9 E-codes can only be combined with one N-code.

United Kingdom

For Northern Ireland ("Coun_old" = 152), the data for 2000 are provisional.

Explanations to the database SR_01.sav

Austria

Medicines only are excluded.

Poly-substances include alcohol.

France

Only poisoning cases are included.

Contrary to the year 2000, the opiates cases from 1996 through 1999 include opiate-based medicines like Subutex, Skenan, and Moscontin (excluding methadone). Generally, these substances are included into the psychoactive medicines.

Germany

For 1999 and 2000 the data refer to 4 Bundesländer: Bavaria, Bremen, Hamburg, and Lower Saxonia. The data represent about 30% of all drug-related deaths from the German SR for which the required age breakdown could be delivered.

Italy

For 2001 the data refer to the period from January through September.

For the age groups 15-19 means 15-20 years, 20-24 means 21-25 years, 25-29 means 26-30 years, 30-34 means 31-35 years, 35-39 means 36-40 years, 40-44 means 41-45 years, 45-49 means 46-50 years, 50-54 means 51-55 years, 55-59 means 56-60 years, and 60-64 means 61-65 years.

Portugal

Direct causes cannot be distinguished from indirect causes.

Medicines are included in poly-substances.

For 1998 and 1999: 0-14 years means 15-19 years, 15-34 years means 20-24 years, 35-64 years means 25-29 years, >=65 years means >=30 years.

For 2000: 15-19 years means <=19 years, 45-49 years means >=45 years.

Spain

For 1996 through 1998 the data are included twice: once according to version 1.0, and once according to version 2.0 of the DRD-Standard.

United Kingdom

For 1997 and 1998 the data are included twice: once according to version 1.0, and once according to version 2.0 of the DRD-Standard.

For 1997 through 2000 (according to version 2.0 of the DRD-Standard) the data refer to England and Wales and include all acute drug-related deaths that are reported voluntarily by the coroners (currently about 80% of jurisdictions). The coverage of coroners' jurisdictions was as follows: 1997: 66/135; 1998: 102/135; 1999: 104/135; 2000: 97/135.

The causes of death refer to the causes of death as recorded on the death certificate and the coroner's verdict. It was decided not to extract drugs found at post-mortem, as these might be different to the drugs taken into account by the doctor/coroner. In deciding whether a death was caused by drug poisoning, the presence in the underlying cause of death field of the words 'poisoning', 'overdose', 'toxicity', etc. were taken to mean poisoning. All other deaths were then assigned to 'other than poisoning' depending on the coroner's verdict.

References

Caces, M.F. (1999). *Method for Counting Drug-Induced and Drug-Related Deaths.* (Unpublished report. Draft version send by fax to the EMCDDA on 09-17-99.) Washington: Executive Office of the President, Office of National Drug Control Policy.

De la Fuente, L., Barrio, G., Vicente, J., Bravo, M.J., and Santacreu, J. (1995). The Impact of Drug-Related Deaths on Mortality among Young Adults in Madrid. *American Journal of Public Health, 85:* 102-105.

Degenhardt, L., Hall, W., Warner-Smith, M., and Lynskey, M. (in press). *Comparative risk assessment; Illicit Drug Use.* National Drug and Alcohol Research Centre, University of New South Wales/WHO Collaborating Centre for Research into the Treatment and Prevention of Drug and Alcohol Problems.

EMCDDA (July 1997). *Drug-related death in Europe: Quality and comparability of data on drug-related deaths. Final report of the Working Group for Subtask 3.3 of the EMCDDA programme 1996/97.* Lisbon: EMCDDA.

EMCDDA (July 1998). *Feasibility study of the implementation of the proposals given in the final report of REITOX subtask 3.3 to improve the quality and comparability of data on drug-related deaths. Final report.* Lisbon: EMCDDA.

EMCDDA (May 1999). *Feasibility of implementing standards for collecting data on drug-related deaths in the EU Member States: Results of the Questionnaire Drug-Related Deaths^{R}. Intermediary progress report.* Lisbon: EMCDDA.

EMCDDA (2000). *Co-ordination of implementation, follow-up and analysis of cohort studies on mortality among drug users in European Union Member States; EMCDDA project CT.98.EP.12.* Lisbon: European Monitoring Centre for Drugs and Drug Addiction.

EMCDDA (2001a). *Co-ordination of the implementation of the EMCDDA standard guidelines on the drug-related deaths in the EU Member States, and the collection and analysis of information on drug-related deaths; EMCDDA project CT.99.RTX.04.* Lisbon: European Monitoring Centre for Drugs and Drug Addiction.

EMCDDA (2001b). *Health impact of problematic drug use (opiate use) in the European Union: mortality among cohorts of drug users; Summarised overview of work being done in project "Mortality of drug users in the European Union: co-ordination of implementation of cohort studies, follow-up and analysis of existing cohorts and development of new methods and outputs (CT.99.EP.07 and CT.00.EP.13).* Lisbon: European Monitoring Centre for Drugs and Drug Addiction.

English, D.R., D'Arcy, C., Holman, J., Milne, E., Hulse, G., and Winter, M.G. (1995). *The quantification of morbidity and mortality caused by substance abuse; Paper presented at the Second International Symposium on the Social and Economic Costs of Substance Abuse, 2-5 October 1995.*

English, D.R., Holman, C.D.J., Milne, E., Winter, M.G., Hulse, G.K., Godde, J.P., Bower, C.I., Corti, B., De Klerk, N., Knuiman, M.W., Kurinczuk, J.J., Lewin, G.F., and Ryan, G.A. (1995). *The quantification of drug caused morbidity and mortality in Australia; 1995 Edition.* Canberra: Commonwealth Department of Human Services and Health.

Hall, W.D., Degenhardt, L.J., and Lynskey, M.T. (1999). Opioid overdose mortality in Australia, 1964-1997: birth-cohort trends. *Medical Journal of Australia, 171:* 34-37.

Hulse, G.K., English, D.R., Milne, E., and Holman, D.J. (1999). The quantification of mortality resulting from the regular use of illicit opiates. *Addiction, 94:* 221-229.

ONDCP (2000). *Fact Sheet; Derivation of ONDCP Estimate of Drug-Related Deaths.* Washington: Executive Office of the President, Office of National Drug Control Policy.

Perucci, C.A., Forastiere, F., Rapiti, E., Davoli, M., and Abeni, D.D. (1992). The impact of intravenous drug use on mortality of young adults in Rome, Italy. *British Journal of Addiction, 87:* 1637-1641.

Ridolfo, B., and Stevenson, C. (2001). *The quantification of drug-caused mortality and morbidity in Australia, 1998; AIHW cat. no. PHE 29; Drug Statistics Series no. 7.* Canberra: Australian Institute of Health and Welfare (AIHW).

RIPE Network Coordination Centre, ISO 3166 Maintenance Agency (1994). *ISO 3166 Country Codes* [Online]. Available: http://stiwww.epfl.ch/utile/iso_3166.html [2002, February 19].

SAMHSA, Office of Applied Studies. (2002). *Mortality Data from the Drug Abuse Warning Network, 2000; DAWN Series D-19, DHHS Publication No. (SMA) 02-3633.* Rockville, MD: Substance Abuse and Mental Health Services Administration.

Shai, D. (1994). Problems of accuracy in official statistics on drug-related deaths. *International Journal of the Addictions, 29* (14): 1801-1811.

Single, E., Rehm, J., Robson, L., and Van Truong, M. (2000). The relative risks and etiologic fractions of different causes of death and disease attributable to alcohol, tobacco and illicit drug use in Canada. *Canadian Medical Association Journal, 162:* 1669-1675.

Single, E., Robson, L., Rehm, J., and Xie, X. (1999). Morbidity and Mortality Attributable to Alcohol, Tobacco, and Illicit Drug Use in Canada. *American Journal of Public Health, 89:* 385-390.

Single, E., Robson, L., Xie, X., and Rehm, J. (1998). The economic costs of alcohol, tobacco and illicit drugs in Canada, 1992. *Addiction, 93:* 991-1006.