Croatian cohort study:
Mortality of persons treated for opioid use between 2010 and 2019

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- To compare the mortality of persons treated for opioid use disorder (OUD) with that of the general population;
- Assess cause-specific mortality among people treated for OUD;
- Analyse time trends of overall and cause-specific mortalities;
- Compare the mortality of persons treated for OUD in HR and the EU countries where similar research has been conducted;
- Estimate overall mortality of cohort participants;
- Estimate age and gender-specific mortalities of cohort participants;
- Analyse the possibility of using data from the Central Health Information System of the Republic of Croatia (CEZIH) in assessing the use of primary health care by the IDU;
- Estimate the life expectancy of the cohort participants;
- Analyse regional differences in addiction mortality;
- Assess the risk factors for addiction mortality;
- Analyse the predictive values of risk factors;
- Examine the possibilities of applying the value of assessed risks to the estimated number of deaths;
- Analyse the predictive values of socio-demografic and other risk factors for survival;
- Describe the usage of hospital care by cohort participants.

Inclusion criteria

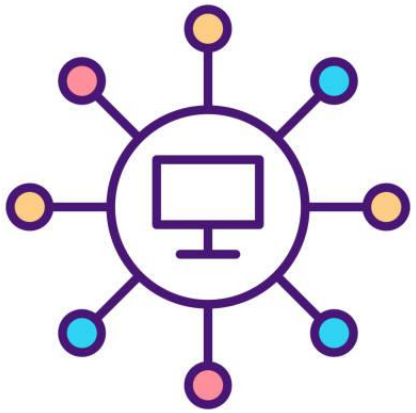
- Participant was alive on January 1st 2010;
- Participant was registered in the Registry of Persons Treated for Psychoactive Drug Abuse;
- Registration of the participant's first treatment or a new episode of treatment for substance abuse was recorded between January 1st 2010 and December 31st 2019;
- Participant has a registered PIN through which they can be associated with relevant existing data sources;
- Participant was aged between 15 and 49 on the day of inclusion into the study;
- Participant has a permanent residence in HR.

Exclusion criteria

- Death;
- End of observation period;
- Last registered treatment for psychoactive drug abuse.

Database creation

Registry of Persons Treated for Psychoactive Drug Abuse:



- New identifier;
- Gender;
- Date of birth;
- Age of inclusion into the Cohort study;
- Year of inclusion into the Cohort Study;
- Years of treatment;
- Year of first treatment;
- Source of referral;
- Current living conditions –living with;
- Current living situation – living where;
- Children;
- Cohabitation with other people who use drugs;
- Employment status;
- Highest level of education;
- Marital status;
- Primary drug;
- Secondary drugs;
- Route of administration of primary and secondary drugs;
- Frequency of use of primary and secondary drugs;
- Age of first use of any substance;
- Age of primary drug use;
- Types of treatment facility;
- Period before parents learned about the addiction;
- Pharmacotherapy;
- Medication;
- Dose;
- Other treatments/programmes;
- Treatment outcome;
- HIV status;
- Hepatitis B status;
- Hepatitis C status;
- Other chronic diseases according to ICD-10;
- Overdose;
- Intravenous substance use ever;
- Age of first IV use;
- Use of common paraphernalia;
- Current legal problems;
- Earlier legal problems;
- Types of current and earlier legal problems;
- Juvenile court measures;
- Compulsory treatment measures.

Database creation

Causes of Death Registry

- New identifier;
- Date of death;
- Place of death;
- Death called by;
- Cause of death (ICD-10);
- External cause of death (ICD-10).

Psychoses Registry

- New identifier;
- Diagnosis (ICD-10);
- Date of incidence.

Committed Suicides Registry

- New identifier;
- Date of committed suicide;
- Cause of death (ICD-10)
- External cause of death (ICD-10);
- Registered psychiatric diagnosis.

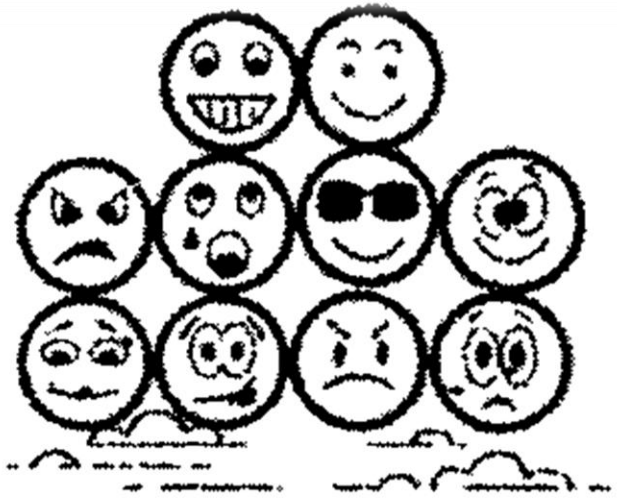
Hospitalisations Database

- New identifier;
- Date of admission into hospital;
- Date of release;
- Primary diagnosis for treatment;
- Method of release.

Cohort characteristics

Included: 8,615

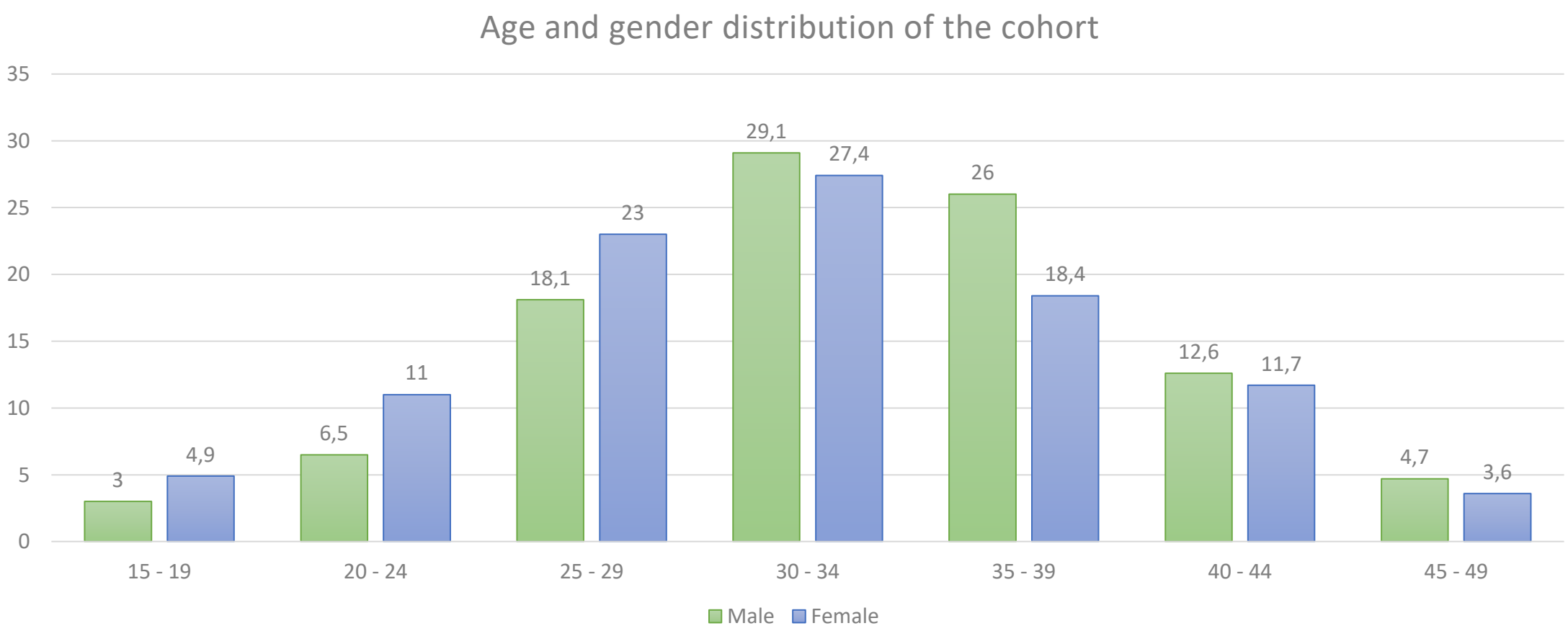
- Males: 7,026 (81,6%)
- Females: 1,589 (18,4%)

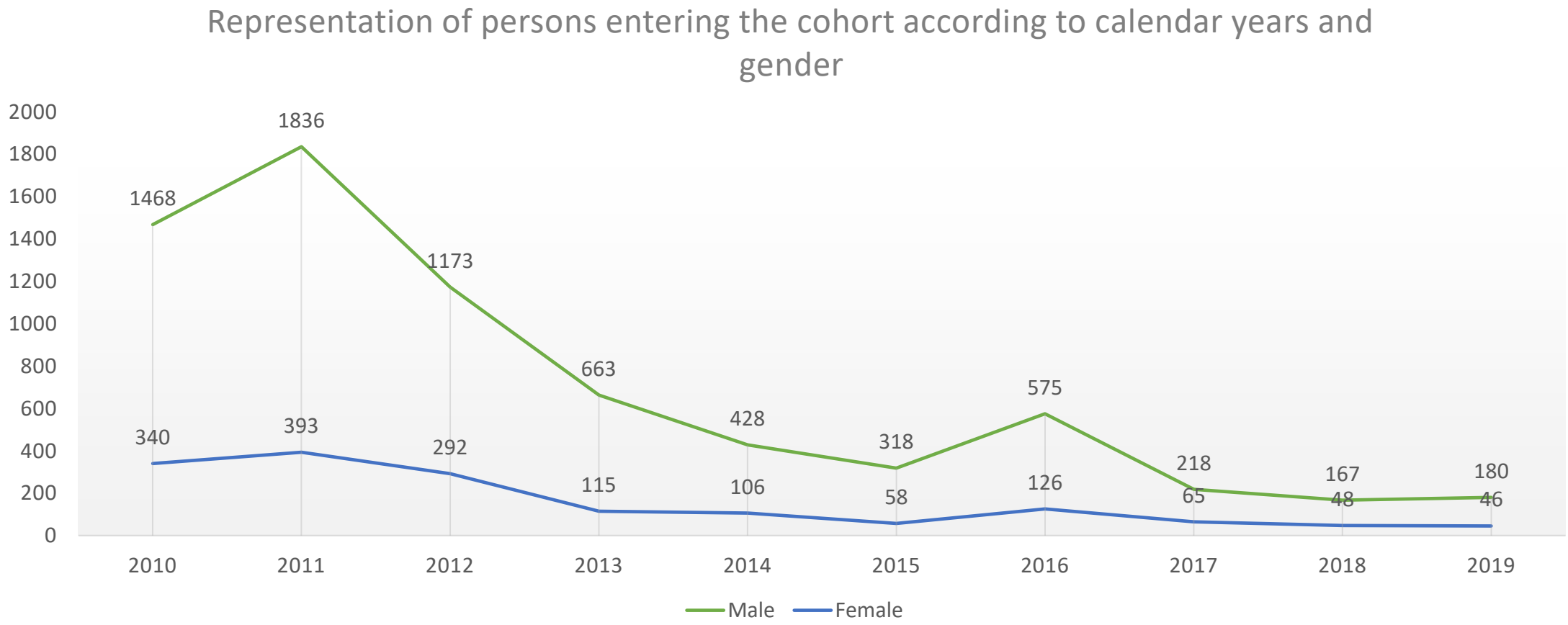


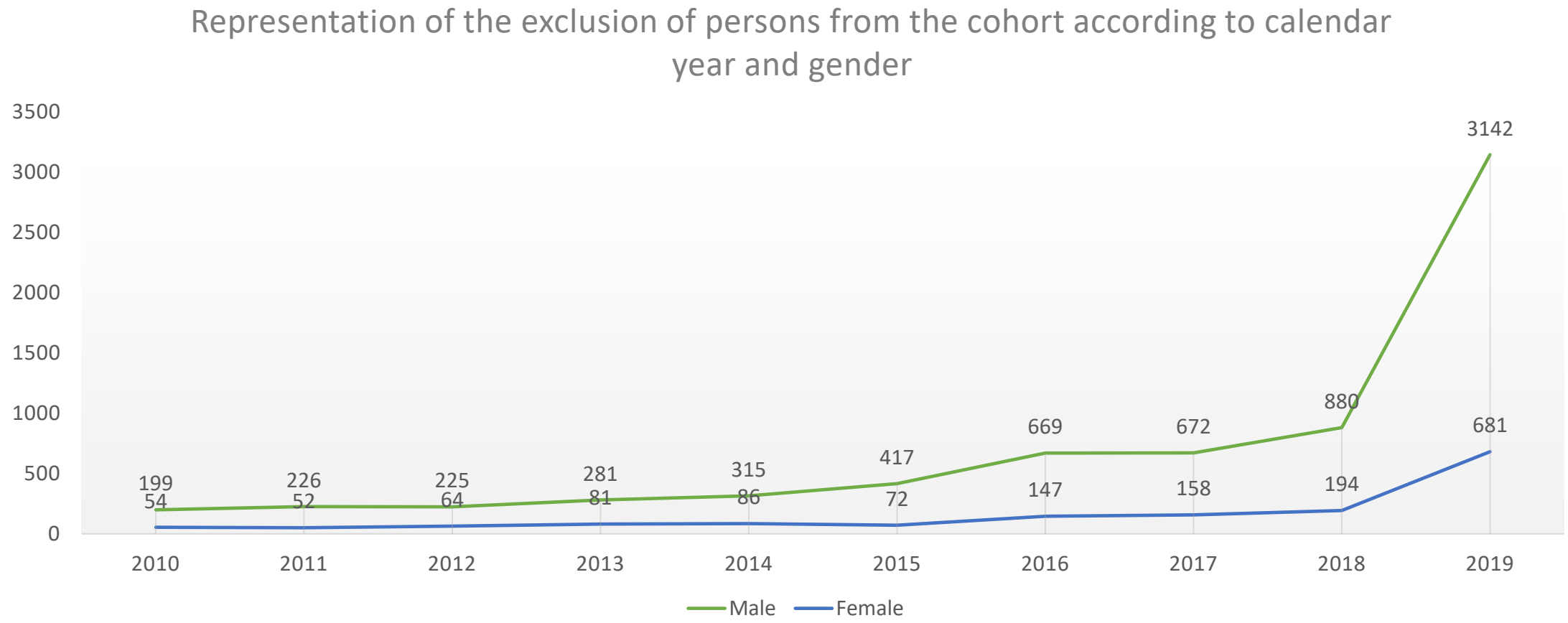
Mean age at entry: 33,0 (min=15; max=49)

Males: 33,28 (min=15; max=49)

Females: 31,65 (min=15; max=49)


Age and gender distribution of the cohort
35
30
25
20
15
10
5
0
3
4,9
6,5
11
18,1
23
29,1
27,4
26
18,4
12,6
11,7
4,7
3,6
15 - 19
20 - 24
25 - 29
30 - 34
35 - 39
40 - 44
45 - 49
Male
Female


Representation of persons entering the cohort according to calendar years and gender
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1468
1836
1173
663
428
318
575
218
167
180
340
393
292
115
106
58
126
65
48
46
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Male
Female


Representation of the exclusion of persons from the cohort according to calendar year and gender
3500
3000
2500
2000
1500
1000
500
0
199
54
226
52
225
64
281
81
315
86
417
72
669
147
672
158
880
194
3142
681
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Male
Female

First means of addiction

Main means of addiction	Male No. (%)	Female No. (%)	Total No. (%)
Heroin	6438 (91,6)	1382 (87)	7820 (90,8)
Buprenorphine	313 (4,5)	84 (5,3)	397 (4,6)
Methadone	187 (2,7)	80 (5)	267 (3,1)
Tramadol	41 (0,6)	27 (1,7)	68 (0,8)
Other opiates	46 (0,7)	16 (1)	62 (0,7)
Fentanyl	1 (<0,1)	-	1 (<0,1)
Total	7026 (100)	1589 (100)	8615 (100)

X^2= 51,48 df= 5 P<0,001

Means of addiction at the last entry into the Registry of Persons Treated for Psychoactive Drug Abuse

Main means of addiction	Male No. (%)	Female No. (%)	Total No. (%)
Heroin	6070 (89,6)	1318 (86,0)	7388 (88,9)
Buprenorphine	396 (5,8)	86 (5,6)	482 (5,8)
Methadone	233 (3,4)	90 (5,9)	323 (3,9)
Tramadol	36 (0,5)	23 (1,5)	59 (0,7)
Other opiates	41 (0,6)	15 (1,0)	56 (0,7)
Fentanyl	2 (<0,1)	0	2 (<0,1)
Total	6778 (100)	1532 (100)	8310 (100)

X^2= 40,56 df= 5 P<0,001

Route of administration at the last entry in the Registry of Persons Treated for Psychoactive Drug Abuse

Route of administration	Male No. (%)	Female No. (%)	Total No. (%)
Injecting	4240 (61,8)	889 (58)	5129 (61,1)
Snorting	1433 (20,9)	348 (22,7)	1781 (21,2)
Eating/drinking	612 (8,9)	195 (12,7)	807 (9,6)
Smoking	577 (8,4)	101 (6,6)	678 (8,1)
Total	6862 (100)	1533 (100)	8395 (100)

X^2= 28,88 df= 3 P<0,001

Joint use of paraphernalia

Joint use of paraphernalia in the last month	Male No. (%)	Female No. (%)	Total No. (%)
Not applicable	2590 (38,6)	616 (41,1)	3206 (39,1)
No	3760 (56,1)	827 (55,2)	4587 (55,9)
Yes	353 (5,3)	55 (3,7)	408 (5)
Total	6703 (100)	1498 (100)	8201 (100)

X^2= 8,36 df= 2 P=0,015

Overdose experience by gender

Ever overdosed	Male No. (%)	Female No. (%)	Total No. (%)
No	4574 (67,8)	1062 (71,6)	5636 (68,5)
Yes	2169 (32,2)	422 (28,4)	2591 (31,5)
Total	6743 (100)	1484 (100)	8227 (100)

X^2= 8,36 df= 2 P=0,015

HIV status by gender

HIV status	Male No. (%)	Females No. (%)	Total No. (%)
Not tested	963 (14,4)	187 (12,5)	1150 (14)
Positive	28 (0,4)	7 (0,5)	35 (0,4)
Negative	5702 (85,2)	1303 (87,0)	7005 (85,5)
Total	6693 (100)	1497 (100)	8190 (100)

X^2= 3,69 df= 2 P=0,158

HBV status by gender

HBV status	Male No. (%)	Female No. (%)	Total No. (%)
Not tested	1262 (19)	256 (17,3)	1518 (18,7)
Positive	265 (4)	48 (3,2)	313 (3,9)
Negative	5118 (77)	1178 (79,5)	6296 (77,5)
Total	6645 (100)	1482 (100)	8127 (100)

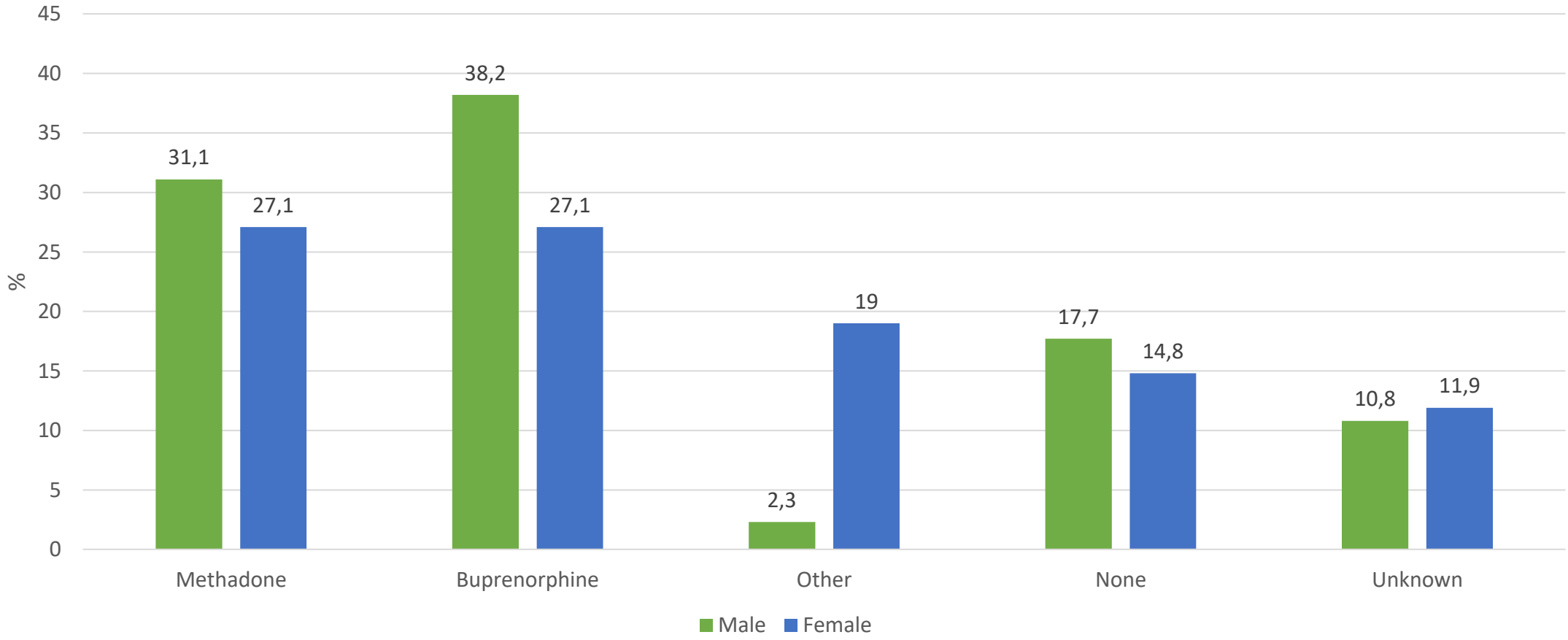
X^2= 4,63 df=23 P=0,099

HCV status by gender

HCV status	Male No. (%)	Female No. (%)	Total No. (%)
Not tested	1291 (19,4)	272 (18,2)	1563 (19,1)
Positive	1918 (28,8)	450 (30)	2368 (29)
Negative	3460 (51,9)	776 (51,8)	4236 (51,9)
Total	6669 (100)	1498 (100)	8167 (100)

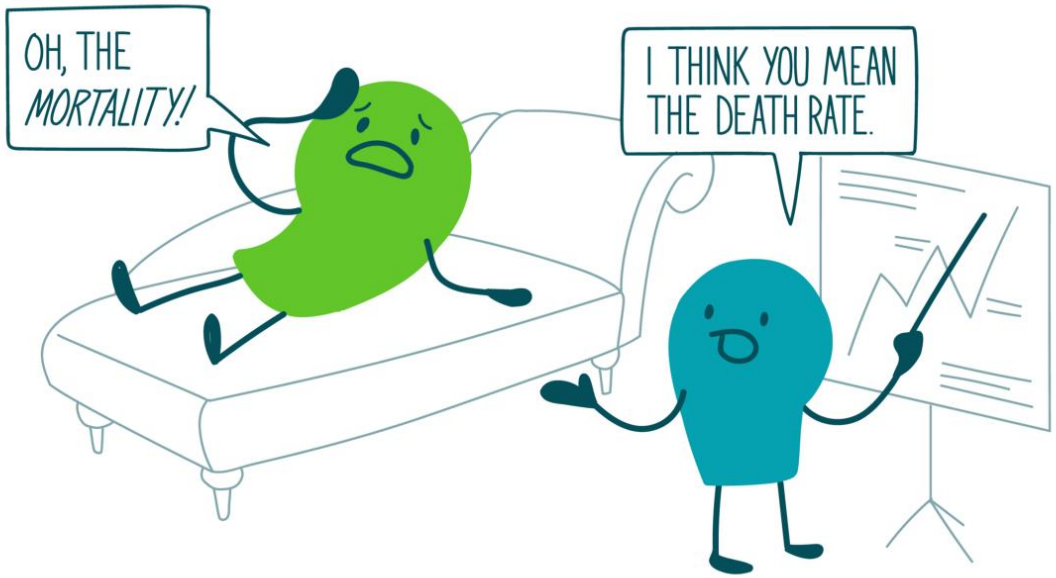
X^2= 1,61 df= 2 P=0,446

Last recorded means of pharmacotherapy by gender

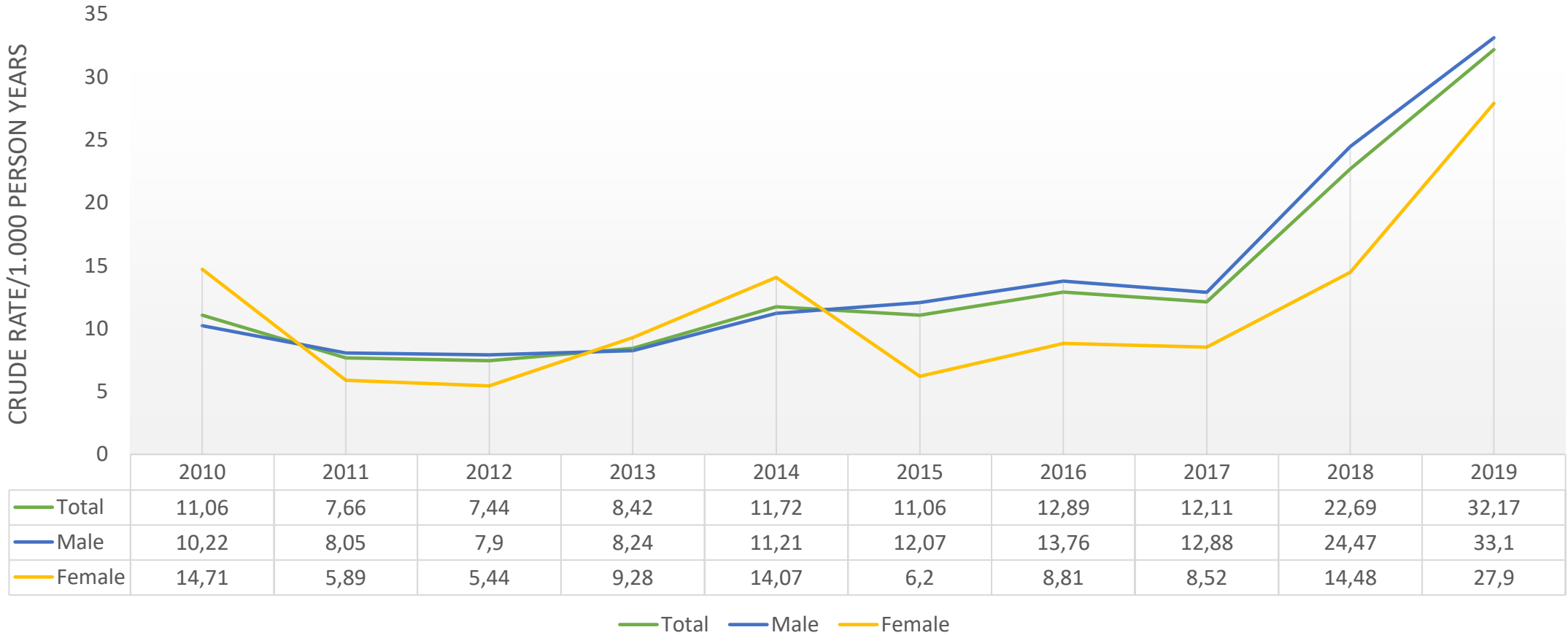


Mortality

- Mortality in the observed period:
  - Total 628 (7,3%),
  - Male 537 (7,6%),
  - Female 91 (5,7%).

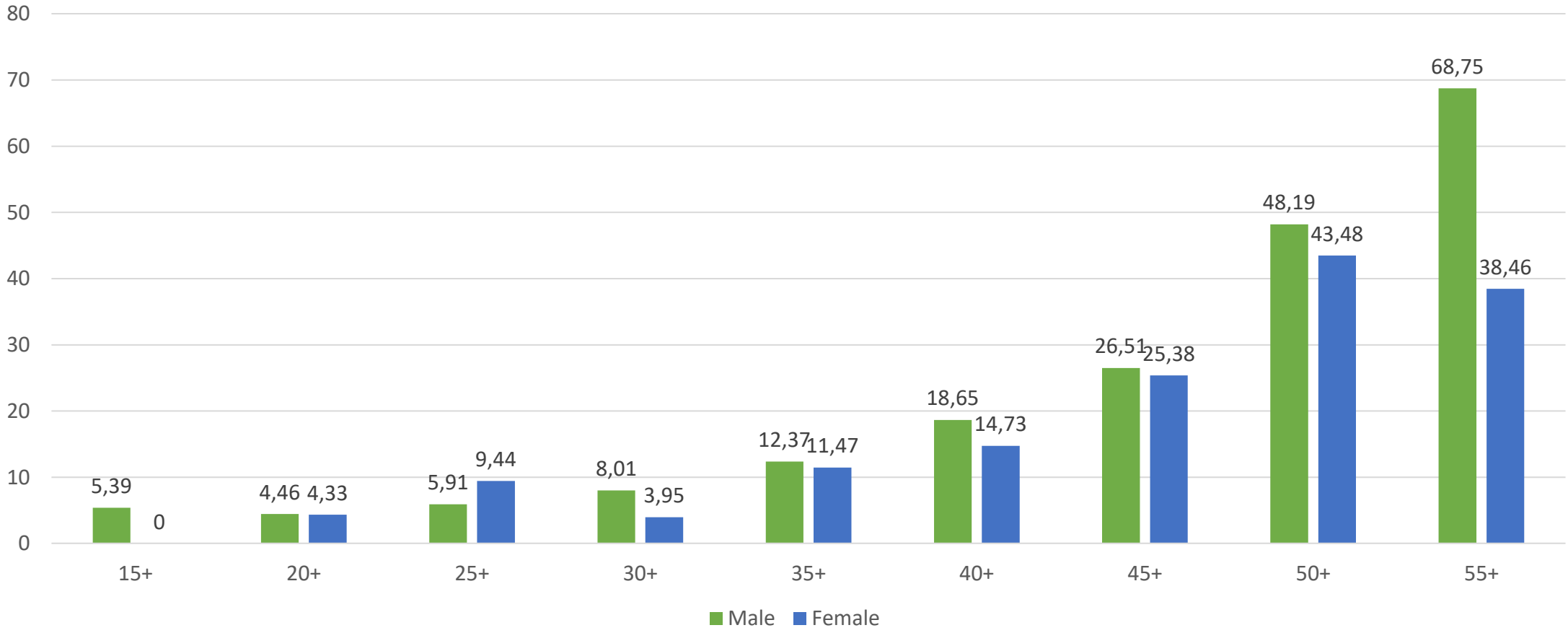


Crude death rate of persons treated for opioid addiction by gender for the observed period

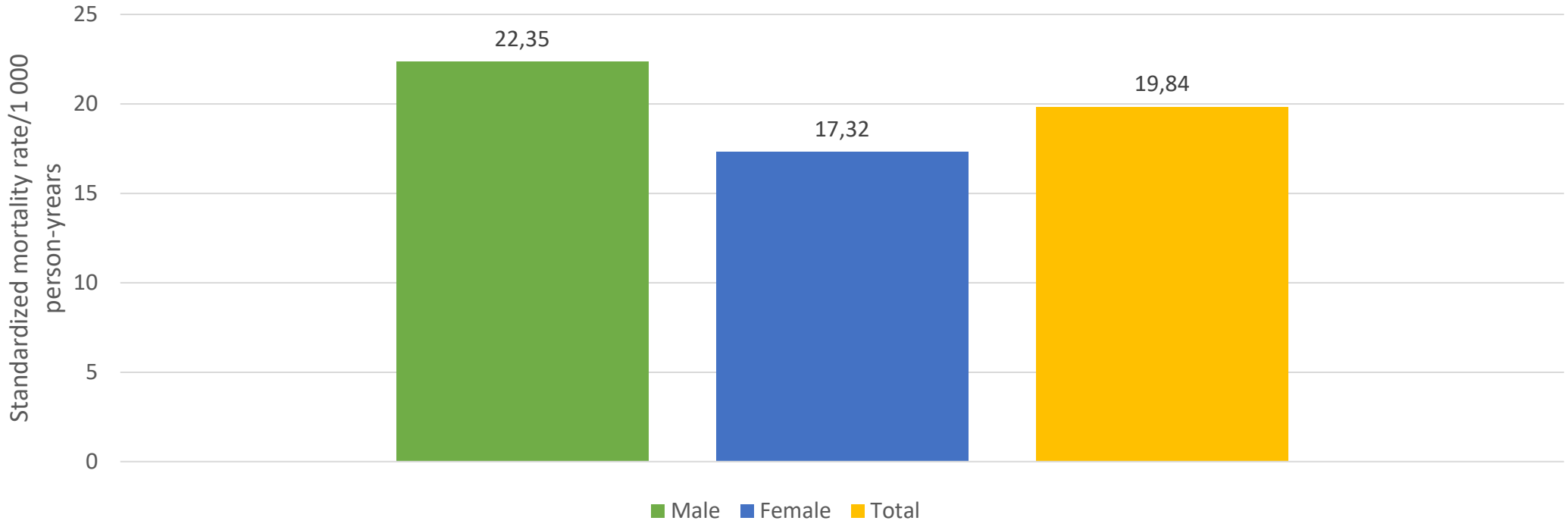


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total	11,06	7,66	7,44	8,42	11,72	11,06	12,89	12,11	22,69	32,17
Male	10,22	8,05	7,9	8,24	11,21	12,07	13,76	12,88	24,47	33,1
Female	14,71	5,89	5,44	9,28	14,07	6,2	8,81	8,52	14,48	27,9

Age-specific mortality rates per 1 000 person-years by gender

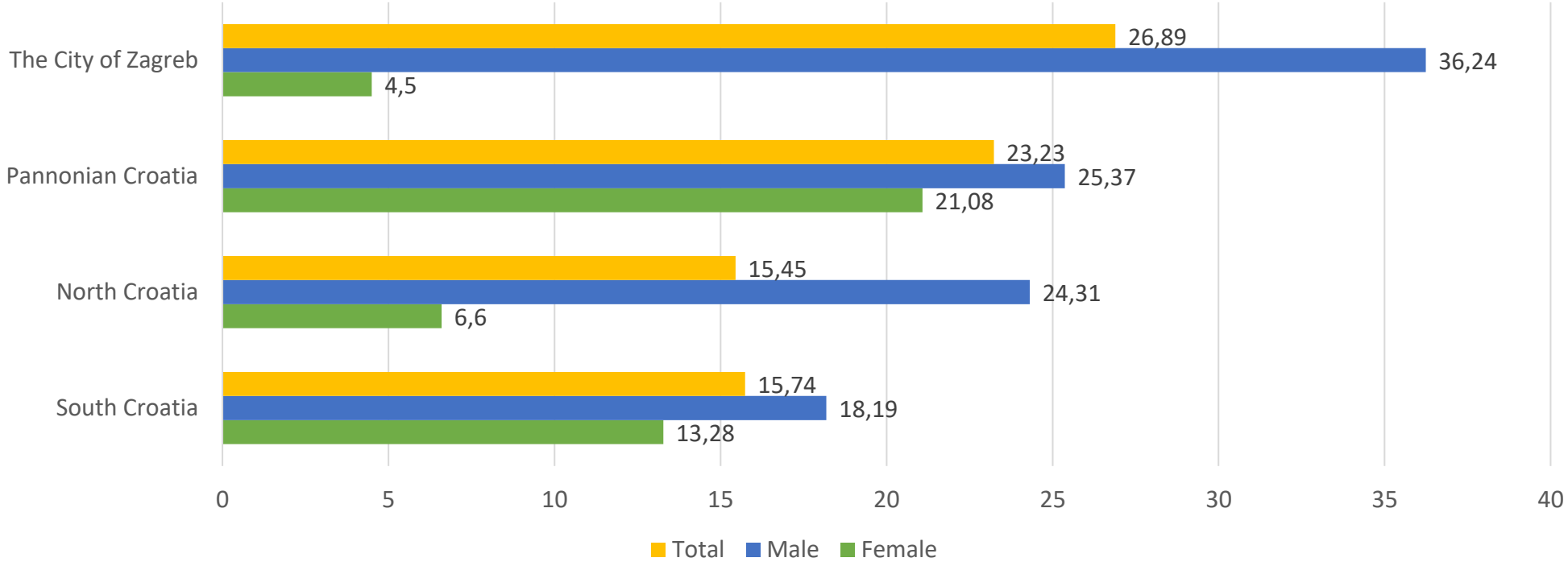


Standardised mortality rates in persons treated for psychoactive drug abuse



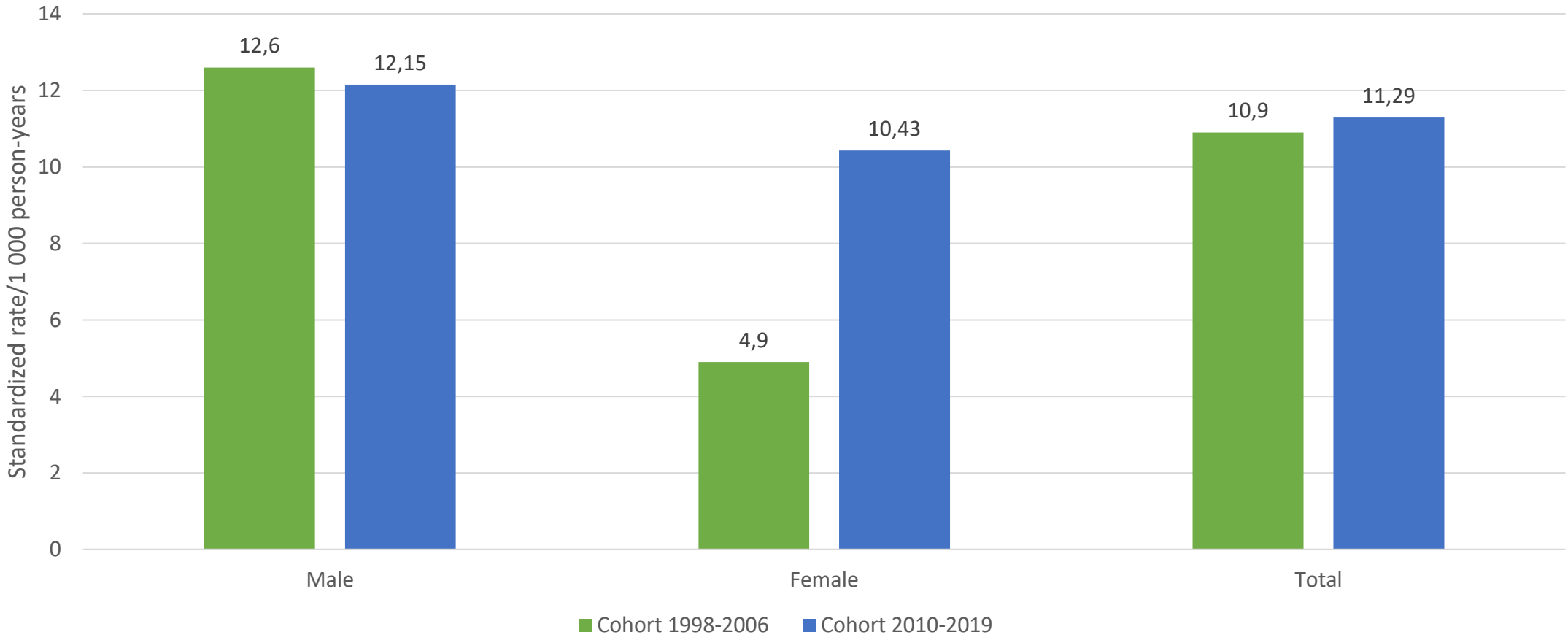
For direct standardization the ESP 2013 was used

The comparison of standardised mortality rates by gender and regions in Croatia

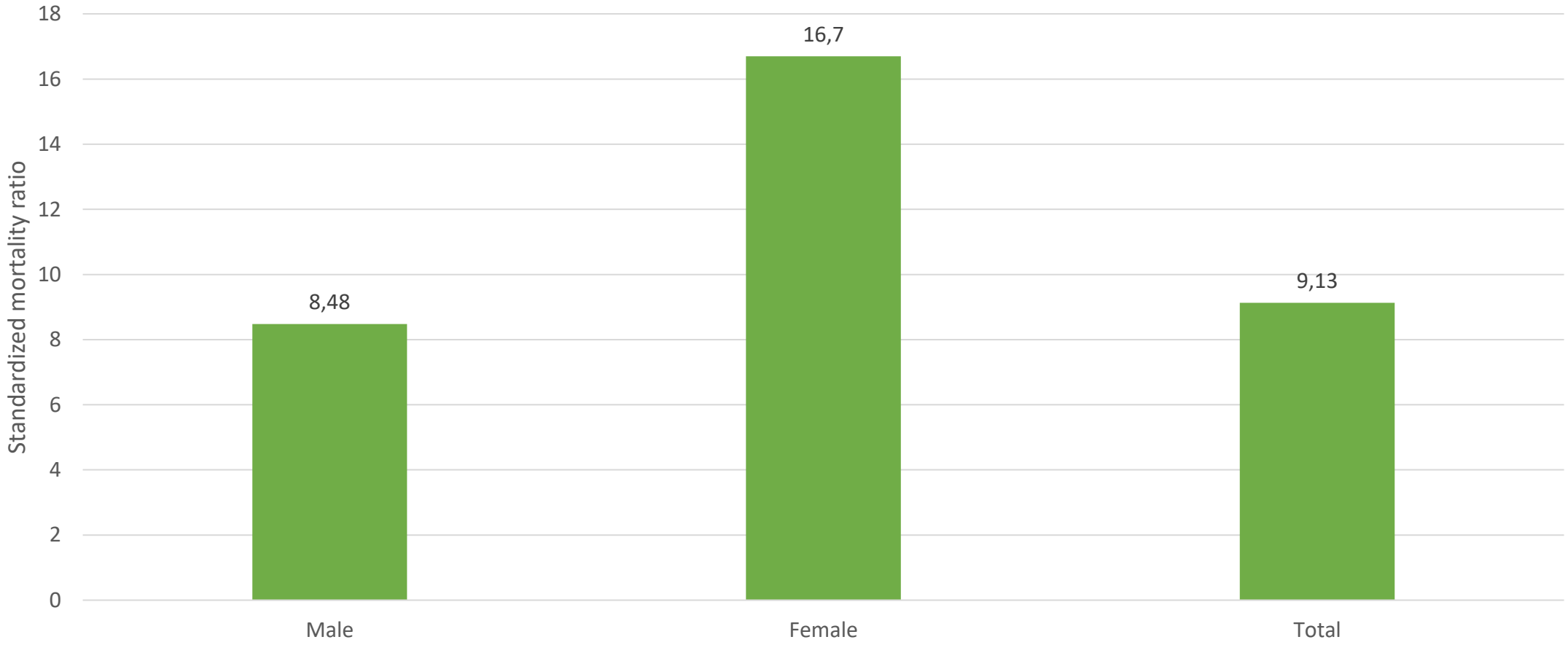


For direct standardization the ESP 2013 was used

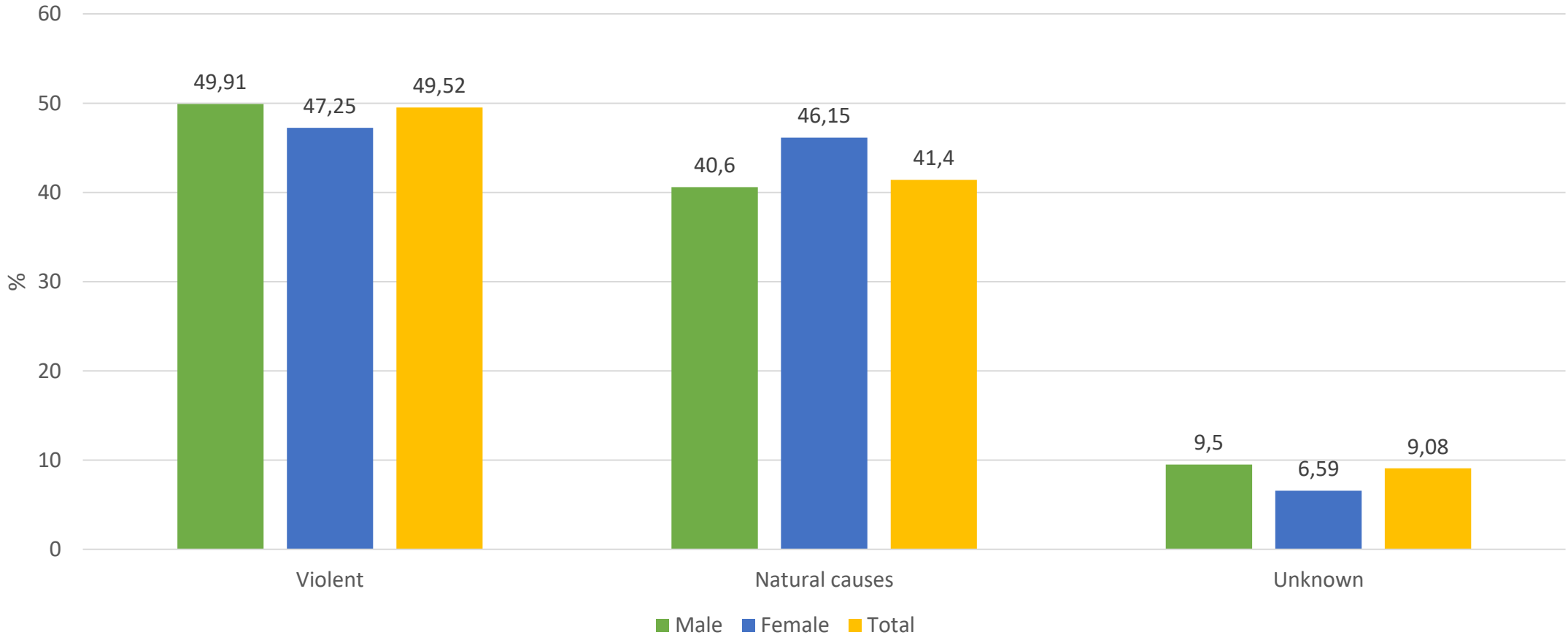
The comparison of standardised mortality rates between two cohort studies conducted in Croatia



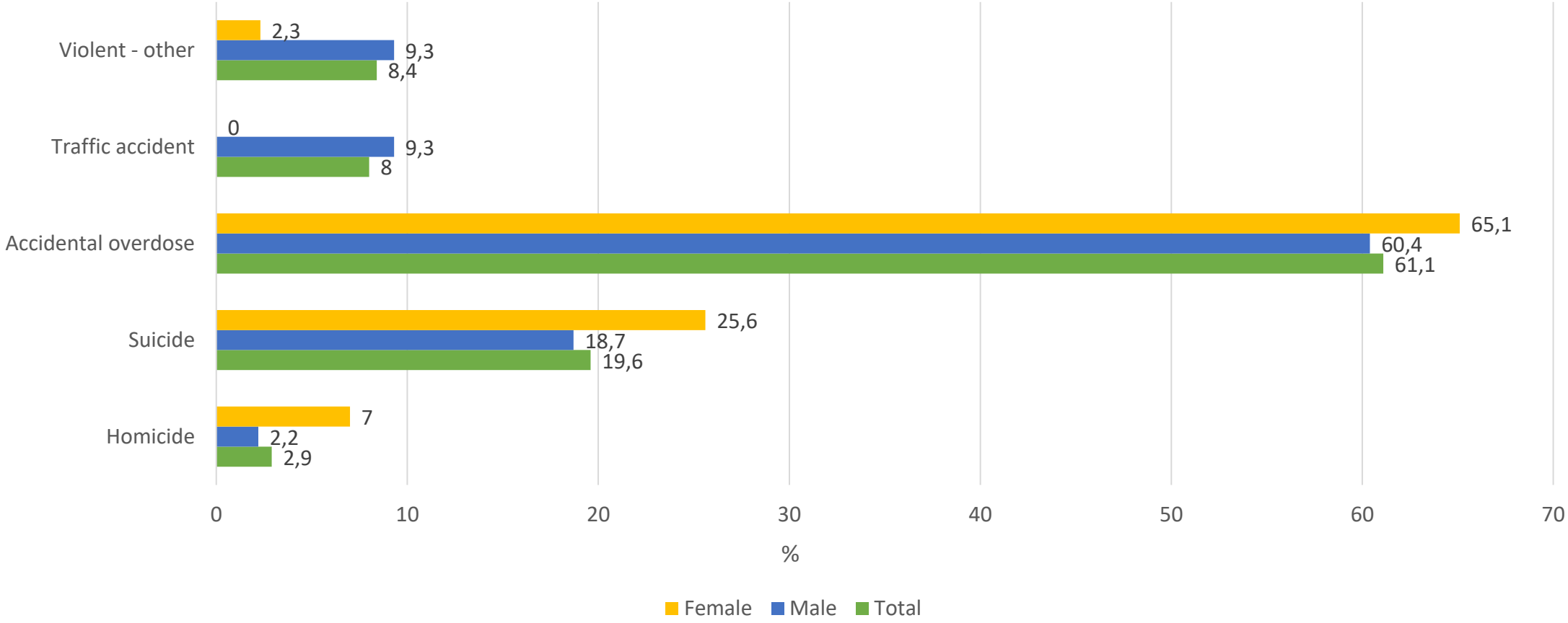
Standardized mortality ratios by gender



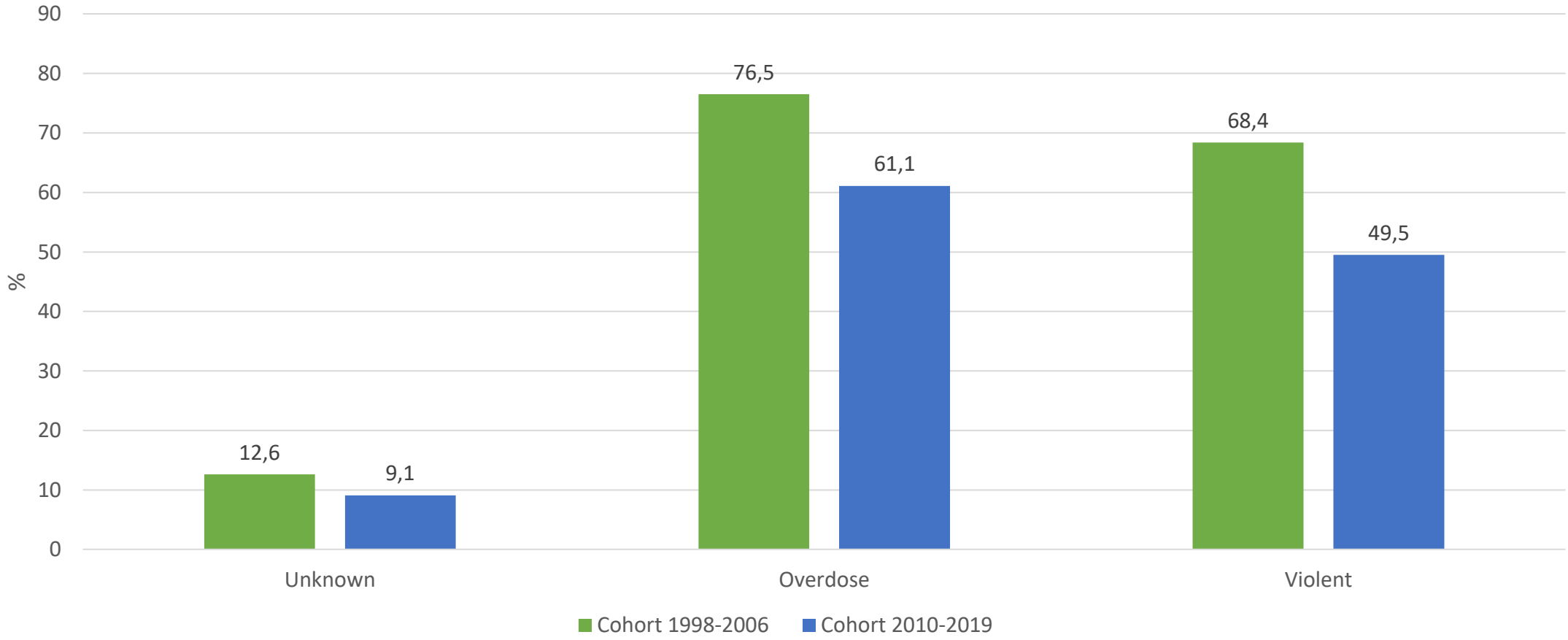
Proportional mortality by types of death by gender



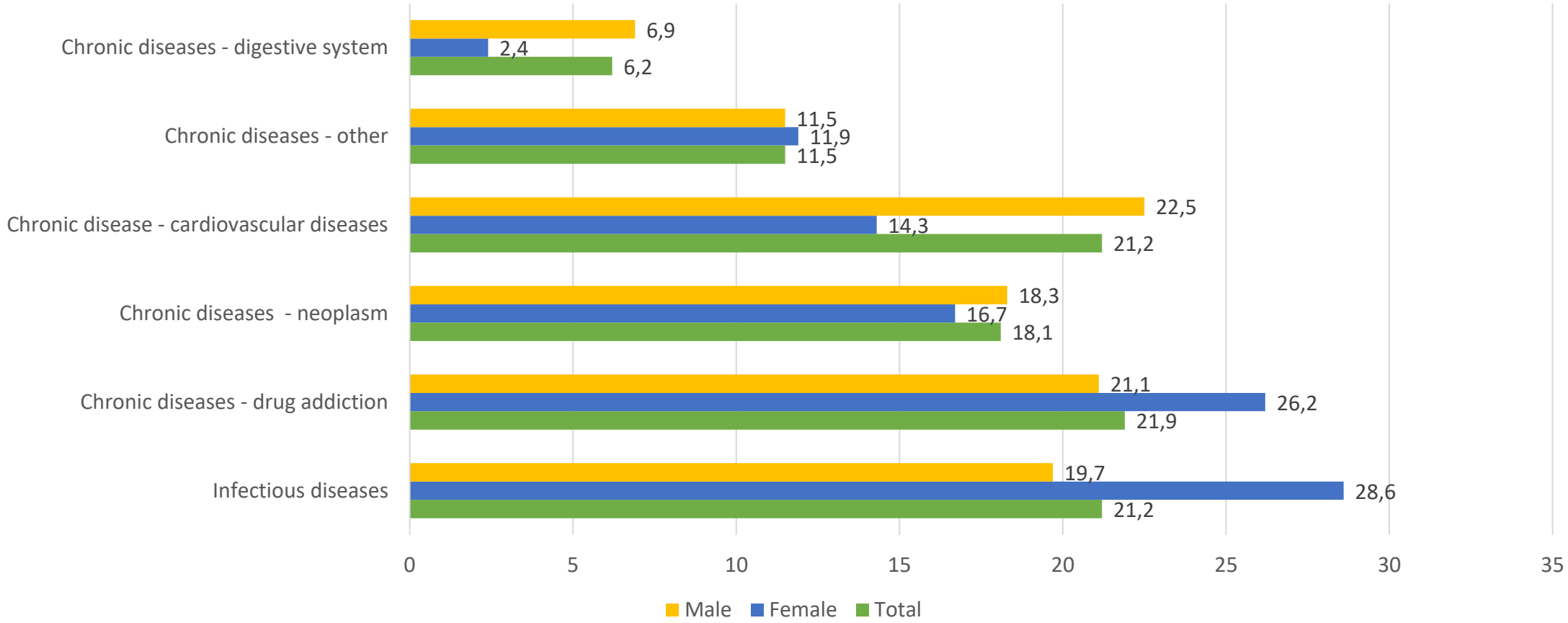
Proportional mortality of certain violent death causes by gender



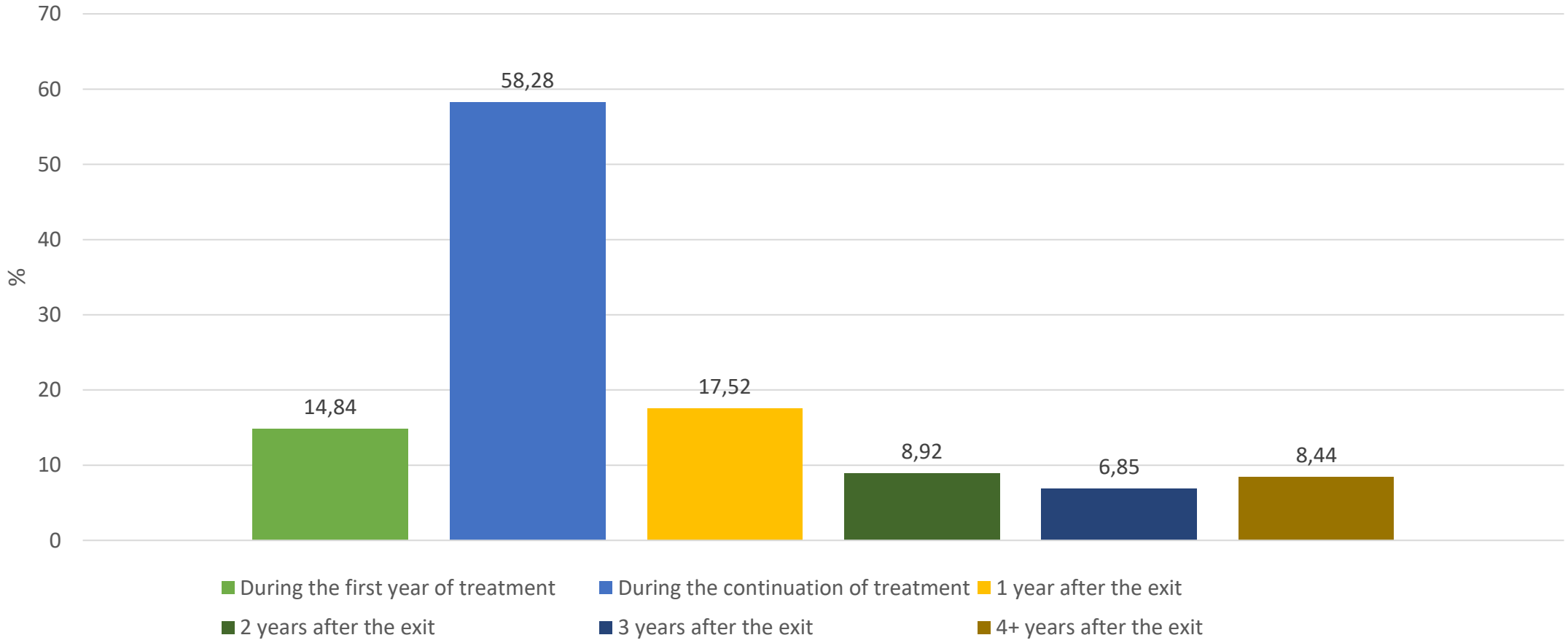
Comparison of proportional mortality between cohort studies



Proportional mortality of certain natural causes of death



Overdose deaths in relation to treatment episodes



Risk factors in univariate logistic models

Male vs. female,
Lives alone vs. lives with a partner,
Unemployed and retired vs. employed,
Elementary school vs. high school education.
Divorced or single vs. married,
Enrolled into treatment alone vs. rest of referral options,
Heroin vs. buprenorphine and methadone,
IV route of administration, snorting and oral consumption vs. smoking,
Overdose history,
HIV,
HBV,
HCV,
Not in treatment in Public Health Institute.

THANK YOU
FOR YOUR
ATTENTION