ANALYSIS OF DRUG-RELATED INFECTIOUS DISEASES IN PEOPLE WHO INJECT DRUGS – PILSEN REGION, 2003–2018

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SUMMARY

Objectives: The aim of the study is to analyse drug-related infectious diseases (DRID) rates for people who inject drugs (PWID) in the Pilsen Region in order to identify the main determiners of infection risk and also to provide a foundation for comparison between this region and the others in the Czech Republic.

Methods: In a descriptive cross-sectional study, we analysed the Pilsen Region's data on PWID. The data was transcribed from the 2003 to 2018 internal database of the Ulice Outreach Programme. In addition to the data regarding the testing of DRID, we analysed commercial sex work (CSW) and the PWID's duration of drug use, age and current address. The statistical analysis was performed using SPSS, primarily employing logistic regression (i.e., backward elimination method) to explore predictors of seropositivity. Moreover, we calculated its prevalence from an epidemiological perspective.

Results: In total, 384 PWID were tested, from which 54.7% were males, and 84.1% were from Pilsen. The average age for initiation of using drug was 19.37 years. The most used drug was methamphetamine (64.8%), 77 women (20.1%) were reported to be CSW. The prevalence of DRID was as follows: hepatitis C virus (HCV) 37.24%, syphilis 1.82%, hepatitis B virus (HBV) 0.78%, and HIV infection 0.26%. The analysis showed that men had a lower risk of syphilis than women. Individuals who started their drug use via injection had a 1.365-times higher risk of DRID in comparison to those who initiated intravenous drug use later in their drug-using lives. We identified a significant association between the drug type and the risk of HCV infection: the main predictor of seropositivity was the use of fentanyl, which posed a 1.930-times higher risk than in the case of methamphetamine.

Conclusions: This study is the first descriptive cross-sectional study implemented in the Pilsen Region in the Czech Republic with a focus on the subpopulation of PWID with individual data. A high prevalence of HCV infection still persists but the prevalence of HBV and HIV infections in this study (and generally in the Czech Republic) is relatively low compared to foreign studies. Syphilis is not closely associated with injecting-drug use, but rather with the sexual behaviour of the people who use drugs intravenously. The most important predictor of seropositivity for syphilis was CSW. We also found the duration of being a CSW to be significant influence. The women who had been CSWs for less than 5 years had a significantly lower risk of syphilis than those who had prostituted for more than 5 years.

Key words: drug-related infectious diseases, people who inject drugs, Czech Republic, Pilsen Region, commercial sex workers

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INTRODUCTION

Drug-related infectious diseases (DRID) are diseases transmitted during sexual activity. The availability of DRID data varies from country to country in terms of scope, completeness and representativeness. The spread of DRID is closely linked to sexual habits and behaviour. In terms of risky behaviour, people who inject drugs (PWID) are between the most vulnerable groups among the general population.

Substance users are at a higher risk for a number of infectious diseases, especially those who inject drugs intravenously. This method of drug use (needle) is considered the most dangerous method of drug administration, and in the Czech Republic, it is estimated that 90% of methamphetamine and opioid users administer the drug this way (1). The Czech Republic is among the countries with the highest percentage of injecting-drug users in Europe (2).

The increased risk of contracting DRID among the PWID subpopulation is due to the specific route of drug administration, which is associated with the potential introduction of an infectious agent directly into the bloodstream. The main infectious agents in this transmission are human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).

Among the most common infectious diseases for this group of people over the long-term is mainly HCV, which, according to the European Centre for Disease Prevention and Control (ECDC) (3), has a recorded incidence of 7.3 cases per 100,000 inhabitants in Europe. However, transmission was managed to

be detected only in 26% of cases and 44% of these cases were from injecting-drugs (3). In the Czech Republic, the rate of HCV incidence varies greatly (8.4 per 100,000 inhabitants in 2014 vs. 10.1 per 100,000 inhabitants in 2016) (3), and the long-term ratio of PWID among the total number of positive HCV cases has been more than a half (1). Some cross-sectional studies implemented in low-threshold facilities demonstrate the prevalence of HCV in the range of 34.9% in 2003 (4) to 37.1% in 2018 (1). The 2019 study showed the treatment of HCV-positive people, out of which only 35.3% sought a medical specialist, 12% started treatment and 5.3% completed treatment (5).

Another infection associated with injecting-drug use is HBV. In contrast to the progressive character of HCV, this infection shows lower incidence not only within the entire population, but also in the PWID subpopulation, which is probably related to the implementation of widespread mandatory vaccination. In 2017, an incidence rate of 6.7 cases per 100,000 inhabitants was reported in 29 countries in Europe (6). However, in the European and Czech context, transmission through injection is not responsible for the majority of the cases (only 1–9% of PWID in seven EU countries were positive for HBV) (7). In the Czech Republic, the incidence of HBV in 2015 was 0.84 cases per 100,000 inhabitants, of which 23.6% were PWID (8, 9).

The rate of territorial spread of HIV infection in Europe is significantly different, as there are highly significant regional differences dependent on the method of transmission. While injecting-drug use is dominant in Eastern Europe, the most dominant mode of transmission in Western and Central Europe is sex between men – men having sex with men (MSM). In the Czech Republic, the representation of this transmission is one of the highest in the world (since 2005, more than 50% of new cases always result from MSM) (10). The proportion of HIV-positive individuals in the PWID subpopulation has long been constant at around 1% (1). Since 1985, which is when the first case of this infection has been reported in the Czech Republic, a total of 122 HIV-positive PWID have been reported (3.6% of all cases) (11).

An analysis of the situation of DRID in the context of risky behaviour of PWID in individual regions of the Czech Republic has not yet been elaborated in detail. For this reason, our cross-sectional study focussing on the rates of DRID in PWID in one of the 14 regions in the Czech Republic can be considered unique. By analysing this situation through the data on DRID rates in PWID in the Pilsen Region as well as through the clients of one of the organisations operating there, the aim of the study is to identify the main determinants of infection risk and to provide a basis for comparison among the entire Czech Republic and other regions. In the Pilsen Region, there are estimated 2,700 high-risk users of methamphetamine and opioids (of which 2,200 are methamphetamine users), out of which 2,500 are PWID (1).

MATERIALS AND METHODS

The basic dataset was accumulated from the data provided by the Ulice Outreach Programme, which since 2001 has focused on social work with people who use drugs and in the area of sex work (on the street, in clubs and private apartments). "Ulice" focuses on harm reduction in people who use illegal addictive substances in the Pilsen Region*. "Ulice" activities also include screening for selected infections (HIV, HBV, HCV, and syphilis). The specific subpopulation of "Ulice" clients prefers to be tested in their natural environment and avoids visits to usual testing sites. In addition to this opportunity, "Ulice" offers anonymous, voluntary and free of charge testing. Rapid blood cassette tests are used, which detects significant antibodies. The test is performed with the blood taken from the fingertip; results are usually available within 15 minutes. Over the years, the organization has taken tests from 7 different companies from several European countries. The tests mostly have over 99% sensitivity and specificity. The tests were in most cases CE marked, which means that the product meets the requirements of the European Union. Inherent parts of the test are the pre-test and post-test counselling. If the result is reactive, the client is connected to a cooperating medical facility.

Prior to the statistical analysis, the data was transcribed from "Ulice" internal database between 2003 and 2018. Daily reports for individual calendar years kept in paper form and, since 2004, in Excel. Furthermore, field notes recorded in Word were used. For some clients, the necessary data found in their files was kept in paper form. All clients' files were kept in electronic form and with description of all contacts since 2007. There were more PWID tested and tests performed during the study period. But due to insufficient record keeping in the early years, it was not possible to trace back all the data. Therefore, we included only clearly verifiable cases in the study. For some years, saliva tests were also used, but we did not include them in the study. After excluding some cases that did not meet the inclusive conditions (i.e., absence of inherent information), a total of 384 individual PWID records was included. The main inclusion criterion was admittance to using drugs via injection. The other inclusion criteria were the following data: year of birth, gender, the drug used (main drug used over the period of time in which the individual was tested), whether they were a commercial sex worker (CSW), city in which the testing took place, their nationality, number of tests for individual investigated infections (HIV, HBV, HCV, syphilis), and any pertinent information about testing (date of testing, result). Cases in which the test was performed on the basis of salivation were excluded from the analysis.

Statistical analysis employed SPSS, version 23. For the purposes of the initial statistical evaluation, descriptive methods were first used, and the following average values were used: average age (derived from the date of birth and year of the test), average length of being a CSW, average age at initiation of drug abuse, and average age at initiation of intravenous drug use. A two-sample t-test at $\alpha = 0.05$ was used to compare these mean values. A multivariate statistical ANOVA was used for the analysis of variance. For statistical evaluation of the influence of individual variables (independent variables – predictors of seropositivity: gender, analysed drug, CSW, intravenous initiations) on the prevalence of DRID (dependent variables: DRID, HCV, HBV, syphilis) or an individual DRID separately, the logistic regression was used. Backward elimination (likelihood ratio) methods were used for logistic regression to reduce the number of predictors and reduce multicollinearity problems. To ensure statistical significance, a confidence interval (CI) of 95% and an α value of 0.05 were

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determined. For the possible presence of confounding, testing was also performed in individual groups in order to identify the influence of the third variable.

RESULTS

Selected characteristics of the research sample (N = 384 PWID) are described in Table 1, 54.7% were men. The majority of PWID were Czech (93.7%) with a higher proportion of foreigners among men. The study included a total of 24 persons (6%) of nationality other than Czech, namely 19 PWID from Slovakia, 3 from Ukraine, 1 from Russia, and 1 from Bulgaria. The average age at the initiation of drug abuse was 19.4 years (min. 12 years, max. 47 years). The mean age of their first test (for any of the screened DRID) was 28.8 years, and at the initiation of CSW the average age was 22.8 years (min. 15 years, max. 39 years). Most people were tested in Pilsen (84.1%), and then in Klatovy and Rokycany (about 7% at each location). The fewest number of people were tested in Nepomuk (5%) and Přeštice (1%), which are listed as 'others' in Table 1.

Commercial sex work concerned only women. A total of 44% women declared it, the most common type was as a CSW on the street. The average number of years spent working as a CSW was 4.8 years (max. 24 years).

At the time of testing, the main drug used was methamphetamine (64.8%), followed by opioids (35.2%). In the group of PWID, DRID were detected in more than 40% of cases, more often in men (prevalence 41.4%) than in women (prevalence 38.5%). Of the individual DRID, the highest prevalence was HCV (37.24%),

Table 1. *Selected characteristics of studied people who inject drugs in Pilsen Region, 2003–2018 (N = 384)*

Characteristics	Total n (%) 384 (100.0)	Men n (%) 210 (54.7)	Women n (%) 174 (45.3)
Nationality			
Czech	360 (93.7)	191 (53.1)	169 (46.9)
Other	24 (6.3)	19 (79.2)	5 (20.8)
Town (where the testing took place)			
Pilsen	323 (84.1)	169 (52.3)	1547.7)
Klatovy	28 (7.3)	21 (75.0)	7 (25.0)
Rokycany	27 (7.0)	16 (59.3)	11 (40.7)
Other	6 (1.6)	4 (66.6)	2 (33.3)
Commercial sex work			
Yes, thereof	77 (20.1)	0 (0.0)	77 (44.3)
Club	11 (14.3)	0 (0.0)	11 (100.0)
Apartment	2 (2.6)	0 (0.0)	2 (100.0)
Street	64 (83.1)	0 (0.0)	64 (100.0)
Average length	–	–	4.8 years
Main drug used			
Methamphetamine	249 (64.8)	132 (53.0)	117 (47.0)
Heroin	81 (21.1)	48 (59.3)	33 (40.7)
Vendal retard	30 (7.8)	16 (53.3)	14 (46.7)
Fentanyl	13 (3.4)	5 (38.5)	8 (61.5)
Buprenorphine	9 (2.3)	7 (77.8)	2 (22.2)
Methadone	2 (0.5)	2 (100.0)	0 (0.0)
Reactive persons			
DRID	154 (40.10)	87 (41.43)	6738.51)
HIV	1 (0.26)	1 (0.48)	0 (0.00)
HCV	143 (37.24)	83 (39.52)	60 (34.48)
HBV	3 (0.78)	2 (0.95)	1 (0.57)
Syphilis	7 (1.82)	1 (0.48)	6 (3.45)
Average age			
First testing	28.8 years	29.4 years	26.3 years
Initiation of CSW	–	–	22.8 years
Initiation of drug abuse	19.4 years	19.3 years	19.5 years

which corresponded to the level of HCV among PWID in the Czech Republic. The largest difference in prevalence between men and women was recorded for syphilis, which was the only DRID where the prevalence was higher in women than in men (Table 1). Due to the fact that some DRID appeared repeatedly in some of the PWID, a total of 200 reactive tests were reported.

An overview of the performed tests for the four monitored DRID is described in Table 2. A total of 2,586 tests were performed on PWID over the monitored period. Most tests were performed for the presence of HIV and the least for HBV; the average number of tests per individual was 7.4. From Table 2, it is evident that in all cases, the number of first tests accounted for more than 50% of the total number of tests performed. The table also shows that the youngest average age at first testing was reported in HCV (26.6 years). All people who had a reactive result for syphilis also had a reactive HCV test result (7 people in total). The only statistically significant ($\alpha = 0.034$) difference between the genders was found in syphilis, where only one man was reactive; all other syphilis-reactive individuals were female CSWs.

The main results of the logistic regression (with four models) are presented in Table 3. There are regressions for all observed infections and their predictor of seropositivity. The probability of the observed infections (binary dependent variable, the presence of infection = 1, absence of infection = 0) was evaluated for each

Table 2. *Overview of tests for drug-related infectious diseases in PWID selected population in Pilsen region, 2003–2018 (N = 384)*

	HIV	HCV	HBV	Syphilis
Number of tests	657 (100%)	651 (100%)	635 (100%)	643 (100%)
First test	351 (53.4%)	364 (55.9%)	335 (52.8%)	342 (53.2%)
Reactive test	1 (0.15%)	188 (28.88%)	3 (0.47%)	8 (1.24%)
Number of reactive people	1	143	3	7
Average age at first test (years)	28.8	26.6	28.8	29.0

PWID – people who inject drugs; HIV – human immunodeficiency virus; HCV – viral hepatitis C; HBV – viral hepatitis B

Table 3. *Binary logistic regression*

Variable	DRID		HCV		HBV		Syphilis	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Gender								
Male	1.03	0.87–1.11	1.15	0.67–2.46	1.00	0.88–1.39	**0.87**	0.80–0.97
Female+	1.00		1.00		1.00		1.00	
Analysed drug								
Methamphetamine+	1.00		1.00		1.00		1.00	
Heroin	1.58	0.98–3.45	1.40	0.93–1.68	0.98	0.00–1.72	0.76	0.40–1.07
Vendal retard	1.30	0.76–1.60	**1.42**	1.30–1.54	1.07	0.76–1.30	0.59	0.38–1.09
Fentanyl	1.29	0.78–2.02	**1.93**	1.87–1.96	1.29	0.93–1.50	1.43	0.72–1.51
Buprenorphine	0.71	0.03–1.46	0.90	0.67–1.31	**0.22**	0.10–0.50	1.00	0.92–1.46
Methadone	0.93	0.40–1.56	0.86	0.30–1.24	**0.46**	0.21–0.88	0.95	0.73–1.50
CSW								
No+	1.00		1.00		1.00		1.00	
Yes	**1.19**	1.18–1.33	1.02	0.08–1.12	1.00	0.38–1.64	**2.43**	2.24–2.71
In a club[1]+	1.00		1.00		1.00		1.00	
Private[1]	0.73	0.52–1.01	**0.59**	0.59–0.59	1.03	0.87–1.31	0.99	0.27–1.20
On the street[1]	**1.31**	1.21–1.66	**1.20**	1.08–1.71	0.99	0.81–1.05	1.98	0.56–3.71
< 5 years[1]	0.87	0.51–1.00	0.99	0.83–1.20	1.43	0.73–1.90	**0.28**	0.21–0.31
> 5 years[1]+	1.00		1.00		1.00		1.00	
Intravenous initiations								
No+	1.00		1.00		1.00		1.00	
Yes	**1.37**	1.08–1.49	**1.88**	1.71–1.93	**1.10**	1.00–1.22	**1.29**	1.10–1.32

DRID – drug-related infectious diseases; HCV – viral hepatitis C; HBV – viral hepatitis B; CSW – commercial sex worker
[1]Analysed for women only as none of the men reported being a CSW
+Reference categories
Dependent variables: DRID, HCV, HBV, syphilis; independent variables (predictors of seropositivity): gender, analysed drug, CSW, intravenous initiations. Numbers in bold indicate statistically significant values.

of the four independent variables (gender, a drug used, CSW, and initiation of intravenous drug use).

In this sample, there was only one statistically significant influence of having DRID, which was injecting drugs as the initial method of drug use in their lives. Persons who started their drug use via injection had a 1.37-times higher risk of DRID (95% CI: 1.08–1.49) compared to those who initiate intravenous drug use later in their drug-using lives. There were other independent variables that represented a higher risk of DRID overall but without statistical significance. However, being a CSW was a statistically significant risk factor (OR = 1.19, 95% CI: 1.18–1.33) for contracting DRID in women. In the analysis of the influence of being a CSW, we found street-working CSWs (OR = 1.31, 95% CI: 1.21–1.66) to be at a higher risk than club-working CSWs. The last kind of CSW (private CSW) was not at statistically significant greater risk.

In the case of HCV, we identified the influence of more variables. The main risk factor was the use of fentanyl, it posed a 1.93-times higher risk (95% CI: 1.87–1.96) than in case of the most frequent drug, methamphetamine. The risk of contracting DRID when injecting Vendal retard was also higher (OR = 1.42, 95% CI: 1.30–1.54); injection of both of these drugs posed a statistically significant difference over the risk posed by heroin (OR = 1.40, 95% CI: 0.93–1.68). Another statistically significant influence was attributed to being a CSW (only in women). The women working as a street CSW had a higher risk (OR = 1.20, 95% CI: 1.08–1.71) of contracting DRID than the women practising as a CSW in a club. However, the women who worked as a private CSW were at a lower risk (OR = 0.59, 95% CI: 0.59–0.59) than a club CSW. The intravenous initiations were in general a statistically significant risk factor, as was the risk of specifically contracting HCV (OR = 1.88, 95% CI: 1.71–1.93).

The third factor influencing the risk of contracting HBV with statistical dependence was when drug use via injection began; however, this dependence was very weak (OR = 1.10, 95% CI: 1.00–1.22). The use of buprenorphine and methadone meant less risk (OR = 0.22, 95% CI: 0.10–0.50 and 0.46; 95% CI: 0.21–0.88, respectively) than methamphetamine in this model.

Several risk factors were presented in the model where the dependent variable was syphilis. The most important risk factor was shown to be CSW (OR = 2.43, 95% CI: 2.24–2.71). Furthermore, in regard to CSWs, we found a significant influence of the duration of being a CSW. The women who had been CSWs for less than 5 years had a significantly lower risk of syphilis than those who had prostituted for more than 5 years (OR = 0.29, 95% CI: 0.21–0.31). In case of this infection, we also found the influence of taking drugs via injection: the risk was 1.30-times higher for persons who started using this way (95% CI: 1.10–1.32) compared to those who started injecting consequently (i.e., first took drugs via another method). Finally, the analysis showed that men had a lower risk of syphilis than women (OR = 0.87, 95% CI: 0.80–0.97).

DISCUSSION

This cross-sectional study focused on the analysis data of the Ulice Outreach Programme between the years 2003 and 2018. In this study, the data of 384 clients was analysed. The clients were tested for four selected DRID (HIV, HCV, HBV, and syphilis), and all were PWID. The study analysed 2,586 tests, out of which 200 were reactive (7.7%) from 154 PWID.

In our study, more than half of the tested group were men (54.7%), and we found an association between syphilis and gender: the men were at a lower risk than women (OR = 0.87). We did not find a statistically significant association between the level of risk of contracting DRID and gender (each included DRID together). This data is in contrast to the research of Hill et al. (12) and Hotton and Boodram (13), who describe a higher level of risk of getting DRID due to a higher number of sexual partners and the frequency of having sex. Another study placed women at a higher risk than men for contracting DRID (14). This fact was explained by a higher percentage of women sharing injection needles and syringes compared to men (26% vs. 13%).

On the contrary, the research of Wang et al. (15) found men to be at a higher risk of contracting DRID than women. Wang et al. (15) identified the association to be resulting from a lower frequency of protected sex (i.e., using a condom) in men than women. Furthermore, our study shows that women use more testing services (51.1%); however, conversely, only 45.3% of our study participants were women. We compared this with the report of the European Monitoring Centre for Drugs and Drug Addiction (16), which states a higher use of services among men than women. This is confirmed in a study by Arpa (17), who rationalised stigmatisation and discrimination against women in the PWID population.

According to many studies, the age at initiation of abuse is much more important, especially the age of the first intravenous administration. The prevalence of HIV infection is higher among persons who initiated intravenous drug use prior to the age of 21 (47% vs. 15%) (18). In this study, we did not identify an association between age and risk of contracting DRID. The logistic regression of our study identified that persons who begin their drug using lives by taking intravenously have a 1.37-times higher risk of contracting DRID than persons who initiate intravenous drug use later in their drug-using lives.

In the study, the most commonly used drug was methamphetamine (64.8%), followed by heroin (21.1%). In our study, we focused on the drug currently used, without examining experimentation with other drugs.

The other differing result in this study was identified in the risk of contracting DRID. For example, a study of PWID in San Diego (19) demonstrated a 3.23-times higher risk of HIV infection for heroin users over other drug users. However, we did not identify any statistically significant relationship between any drug use and contracting DRID. In this context, we found a higher risk of HCV infection among fentanyl users (OR = 1.93, 95% CI: 1.87–1.96) and a higher risk of HCV infection was associated with Vendal retard use (OR = 1.42, 95% CI: 1.30–1.54). These prescription drugs (opioid analgesics) began to be widely misused in about 2010 when heroin disappeared from the black market. In association with this, we accepted the hypothesis that opioid users have generally a higher frequency of using than stimulant users (20, 21). There was the issue that we had to stratify our sample for the next analysis because we tried to detect how many drug users tested reactive while they were using heroin. Thus, we divided the sample into two parts: those who used heroin before 2010 and were negative, and those who then switched to opioid analgesics

and tested reactive. Most of these users switched from heroin to opioid analgesics and had a reactive test. At the same time, they had been tested from their time when using heroin (23.3% of the PWID, in other users the test was not available before 2010 or they reported having been using opioid analgesics already by this time); thus, they initially tested negative, and the reactive result came after using opioid analgesics.

Coffin et al. (22) described sexual polypartnerism in more than half (59.2%) of respondents in their study, which is defined as having engaged in sexual activity with more than one partner at a time. In our study, we worked with 37 couples (19.3% of people in the sample), in which both partners were tested (36 couples were heterosexual and 1 was lesbian). A negative result by both partners was found in 11 couples (30.6% of all couples), in 6 couples (16.7%), only one of the two tested reactive. In the next 14 couples, both tested reactive for DRID (37.8%), and in 6 couples first the male tested reactive and then the female. Hankins (23) reported a similar situation. She explained the higher risk of transmission from man to woman (not vice versa) by order of application of the drug: a man often initiates the drug use, then passes the needle to the woman to use. Brookmeyer et al. (24) offered a different opinion, ascribing higher importance to the fact that women who use a drug by injection have more experience with forced sex and with commercial sexual activity. Commercial sexual activity carried a higher risk of contracting DRID for the women of our study (OR = 1.19), especially street CSWs (OR = 1.31). A higher risk of contracting a specific DRID was identified for HCV (OR = 1.20) for women with experience working as a street CSW. On the contrary, a lower risk (OR = 0.59) was associated with being a private CSW. The same situation (OR = 9.30) applied to HCV in women who had engaged in commercial sexual activity (25). Tyndall et al. (26) also found a higher (OR = 2.42) risk of contracting HCV in a woman with commercial sex experience. Nonetheless, syphilis was identified in our study as the highest-risk DRID in relation to commercial sex activities (OR = 2.43).

We reported a low prevalence of HIV infection (0.26%), which is a big difference compared to many other studies. However, in case of the prevalence of HCV infection, we reported 37.24%, which is similar to Todd et al. (27) and Rezaei et al. (28). In both studies, the prevalence of HCV infection was reported to be about 37%. The prevalence of HCV infection was the highest among DRID analysed in our study. HCV infection is commonly analysed but measuring the prevalence of HBV infection is not so popular among this subpopulation of PWID. Todd et al. (27) and Murrill et al. (29) calculated the prevalence of HBV infection but they got very different results (6.5% and 64%, respectively). However, our study data is more similar to Todd's et al. (27) study because we reported the prevalence of HBV infection at 0.78%, we explain this low prevalence by area vaccination against HBV available in some countries. Finally, the last analysed DRID, syphilis, had a lower prevalence than in other studies (15, 22, 30). In general, the prevalence of HCV infection reported in our study aligns with other studies, but in cases of other analysed DRID (HBV, HIV and syphilis), we report a lower prevalence than other studies. The biggest difference was between the prevalence of HIV infection in our study and other studies implemented in Eastern Europe, where the major transmission pathway for HIV was determined to be from injecting-drug use.

In our study, we focussed on data analysis of drug-related infectious diseases between PWID in the Pilsen Region. While it is the first cross-sectional study focusing on this topic in this region, we are aware of some limitations to the study, despite reliable data from testing. We see the main limitations of our study as a deficiency of additional data that could outline determinants of DRID risk, specifically in sexual behaviour. With this data, we could better identify risk factors resulting from sexual behaviour and from injecting-drug use, which are unfortunately absent in this study. We find another limitation to be the sample, which was chosen from one organisation in Pilsen. Therefore, it is not possible to generalise the results to the whole Pilsen Region, even though the clients can be shared by multiple organisations.

CONCLUSIONS

The prevalence of DRID among subpopulations of PWID, who are clients of the Ulice Outreach Programme, corresponds to the situation throughout the Czech Republic. Thus, a high prevalence of HCV infection (37.24%) still persists but the prevalence of HBV (0.78%) and HIV (0.26%) infections in this study (and generally in the Czech Republic) is relatively low compared to foreign studies. Importantly, syphilis (1.82%) is not closely associated with injecting-drug use, but rather with the sexual behaviour of the people who use drugs intravenously. The most important risk factor for syphilis was CSW. We found a significant influence to be the duration of being a CSW. The women who had been CSWs for less than 5 years had a significantly lower risk of syphilis than the women who had prostituted for more than 5 years (OR = 0.287).

DRID were detected in more than 40% of cases, more often in men (prevalence 41.4%) than in women (prevalence 38.5%). Women use the services of "Ulice" more than men, despite the fact that there were more men in the study. There was a total of 2,586 tests and 1,322 of them were used by women (51.1%). The largest difference in prevalence between men and women was recorded for syphilis, which was the only DRID where the prevalence was higher in women than in men. The analysis showed that men had a lower risk of syphilis than women (OR = 0.872).

Among the higher risk groups are users of opioid analgesics, especially among the users who started their drug use via intravenous administration. The main risk factor was the use of fentanyl, which posed a 1.930-times higher risk than in case of the most frequent drug, methamphetamine. People who started their drug use via injection had a 1.365-times higher risk of DRID compared to those who initiate intravenous drug use later in their drug-using lives.

Transmission of DRID in PWID requires further study. The reduction of DRID between PWID has in general far-reaching consequences for controlling the spread of DRID, and it remains to be a major issue in global public health policies.

Conflict of Interests
None declared

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