Substance use and addictive behaviours during COVID-19 confinement measures increased in intensive users: Results of an online general population survey in the Czech Republic

Mravčík V.[1, 2, 3], Chomynová P.[1, 2, 3]

[1]National Monitoring Centre for Drugs and Addiction, Office of the Government, Prague, Czech Republic
[2]Centre for Epidemiological and Clinical Research on Addictions, National Institute of Mental Health, Klecany, Czech Republic
[3]Department of Addictology, First Faculty of Medicine, Charles University and General University Hospital, Prague, Czech Republic

ABSTRACT

Background: The COVID-19 pandemic has affected substance use and other addictive behaviour, however detailed insight is lacking.

Material and Methods: Online questionnaire survey on the sample of 3,000 respondents aged 15+ randomly selected from the Czech internet panel using socio-demographic quotas was performed shortly after the end of confinement measures in May 2020 (response rate 35.4%). Questions covered current prevalence and patterns of substance use (i.e. in the last 12 months) and other forms of addictive behaviours as well as changes in their behaviour during the confinement measures. Responses were provided on categorical scale; a factor of 0 to 2 was assigned to the categories to quantify the changes where 1 means no change.

Results: Respondents reporting the highest frequency of current use, especially the use of alcohol, cannabis and sedatives, further increased their intensity of use during the confinement measures by 5–10% on average, while less frequent users reduced it. The reduction of use during confinement measures increased with decreasing frequency of current use. Although the same correlation exists in tobacco smokers, decrease in intensity of use was observed also in daily smokers. On the population level, our results suggest a slight increase in total alcohol and sedatives consumption and a significant increase in the total consumption of gaming and social media. On the contrary, there was a significant reduction in the consumption of tobacco and online gambling (likely due to the ban on sports matches), and a slight reduction in the consumption of cannabis and other illicit drugs.

Conclusion: People with intensive patterns of substance use increased their use during confinement measures. The same concerns gaming and social media. Without this insight the overall picture suggests rather overall reduction of consumption. Addiction treatment system should prepare for the increase of treatment demand following COVID-19 epidemic.

KEYWORDS

COVID-19 – substance use – addictive behaviour – impact assessment – population survey

SOUHRN

Mravčík V., Chomynová P.: Užívání návykových látek a návykové chování se během opatření proti covid-19 zvýšilo u intenzivních uživatelů: výsledky online studie v obecné populaci České republiky

Východiska: V průběhu pandemie covid-19 se mění míra a vzorce užívání návykových látek a další návykové chování, podrobné informace však chybí.

Materiál a metody: Krátce po ukončení nouzového stavu v květnu 2020 byla provedena online dotazníková studie na souboru 3 000 respondentů ve věku 15 a více let náhodně vybraných z českého internetového panelu pomocí sociálně-demografických kvót (respondence 35,4 %). Analyzované otázky se týkaly současné míry a vzorců užívání návykových látek (tj. užívání v posledních 12 měsících) a dalších forem návykového chování a také změn během protiepidemických opatření. Odpovědi týkající se změny byly získány na kategorické škále, při analýze jim byl přidělen koeficient 0–2 (kde 1 znamená žádná změna).

Výsledky: Respondenti uvádějící nejvyšší frekvenci současného užívání, zejména užívání alkoholu, konopí a sedativ, dále zvýšili svou intenzitu užívání během nouzového stavu průměrně o 5–10 %, zatímco méně intenzivní uživatelé ji snížili. Redukce užívání za nouzového stavu byla o to vyšší, oč nižší byla frekvence současného užívání. Ačkoli stejný vztah byl nalezen také u kuřáků tabáku, pokles intenzity užívání byl pozorován také v nejintenzivnější kategorii, tj. u denních kuřáků. Pokud jde o vliv nouzového stavu na populační úrovni, výsledky naznačují mírný nárůst celkové konzumace alkoholu a sedativ a výrazné zvýšení hraní digitálních her a užívání sociálních médií. Naopak došlo k výraznému celkovému snížení spotřeby tabáku a online hazardních her (zřejmě kvůli zákazu sportovních soutěží) a mírnému snížení spotřeby konopí a jiných nelegálních drog.

Závěr: Lidé s intenzivními vzorci užívání návykových látek zvýšili míru užívání během nouzového stavu. Totéž se týká digitálních her a sociálních médií. Bez analýzy podle intenzity současného užívání by výsledky mohly svádět k závěru o celkovém (průměrném) snížení spotřeby. Lze očekávat, že poptávka po léčbě závislosti po epidemii covid-19 vzroste.

proLékaře.cz | 4.11.2026

KLÍČOVÁ SLOVA
covid-19 – užívání návykových látek – návykové chování – hodnocení dopadů, populační studie

Epidemiol Mikrobiol Imunol, 2021;70(2):98–103

INTRODUCTION

The COVID-19 epidemic (infection caused by the new coronavirus SARS-CoV-2) originated in China at the end of December 2019 and gradually spread throughout the world, including Europe. On 11 March 2020, the WHO declared the COVID-19 outbreak a pandemic [1].

The first 3 cases appeared in the Czech Republic on 1 March 2020. At the beginning of April 2020, over 3,000 cases were reported in the Czech Republic. In the second half of April, the situation in the Czech Republic stabilized. While at the end of March and the beginning of April 2020, up to around 300 new infections per day were reported daily in the Czech Republic, a month later it was around 50 cases per day. The situation worsened in the summer and especially in September 2020 again when the second wave of epidemic started [2]; however this paper focuses on the impact of the first outbreak in spring 2020.

The first anti-epidemic measures were adopted by the Czech government on 3 March 2020. On 12 March 2020, the State of Emergency was declared and a number of radical containment measures were gradually introduced including closure of the state border, closure of schools, shops and restaurants, as well as other social distancing measures. The confinement measures were gradually relaxed from 20 April 2020 and the state of emergency ended on 17 May 2020.

In general, substance users are among the groups most affected by COVID-19 infection. This is a population with reduced immunity, frequent respiratory diseases, and experiencing respiratory depression (e.g. opioid users). Drug users are often in a difficult social situation with unstable housing, difficult access to essential hygiene-related services and have difficulties to comply with quarantine measures [3]. Impacts on the mental health may be one of the most significant manifestations of the SARS--CoV-2 epidemic [4]. Psychiatric comorbidity in drug users is accentuated by the state of emergency and its impact on the functioning of society, psychological distress and anxiety in connection with fears of coronavirus infection and decreased availability of some substances [5].

Information on changes of pattern and level of substance use, gambling and so called digital addictions during the confinement measures related to COVID-19 are still very limited. In this paper, we present the first results from an online questionnaire survey performed by the National Monitoring Centre for Drugs and Addiction among general adult population of the Czech Republic focusing on the assessment of COVID-19 on substance use and addictive behaviour.

MATERIAL AND METHODS

National Survey on Substance Use, a large-scale general population survey focused on adult population aged 15+ years, is performed in the Czech Republic every 4 years. Since 2016, it consists of 2 parts – face-to-face interviews (F2F) and online survey with self-administered questionnaire. Due to COVID-19 situation, the online survey was carried out earlier in 2020 and data collection was launched shortly after the end of the confinement measures. Data collection took place between 29 May 2020 and 10 June 2020.

The sample consisted of 3,000 people selected from an Internet panel of approx. 60,000 people of the Mind--Bridge Consulting agency. Quota sampling by gender, age and region was performed based on the structure of the Czech general adult population. In total, 8,486 panelists were contacted, 5,025 did not respond (59.2%), and 461 questionnaires were discarded (5.4%) due to incompleteness or quota oversampling. Final response rate was 35.4%.

The questionnaire covered questions on patterns and prevalence of use of tobacco and related products, alcohol, illicit drugs, volatile substances, sedatives and hypnotics, as well as gambling, digital gaming and social media use. In addition, the questionnaire contained a set of 13 questions focusing on the changes of intensity of substance use and other addictive behaviour during the lockdown period, including:

1. tobacco smoking,
2. electronic cigarettes use,
3. heat-not-burn tobacco use,
4. frequency of alcohol use,
5. usual dose of alcohol,
6. use of cannabis,
7. other illicit drugs,
8. use of sedatives and hypnotics
9. online gambling,
10. gaming on mobile phones, tablets or computers (digital gaming),
11. use of social media (e.g. Facebook, Instagram, YouTube, Twitter, Skype, WhatsApp, Snapchat, Messenger, TikTok; excluding business communication),
12. other online activities excluding business-related,
13. news monitoring.

Some of these are not present in this analysis.

proLékaře.cz | 4.11.2026

Each question offered the same 7-point response scale:
1. I started using,
2. my consumption increased significantly,
3. my consumption somehow increased,
4. my consumption did not change,
5. my consumption somehow decreased,
6. my consumption decreased significantly,
7. I stopped using.

In order to quantify the changes in user's behaviour, a factor from 0 to 2 was assigned to each of the 7 response options during data processing, i.e. a coefficient of 1.33 means an increase by one third and 0.66 a decrease by one third (Table 1).

Table 1. Factors assigned to changes in use during the lockdown period caused by COVID-19

Answer	Factor
1. I started using	2.00
2. my consumption increased significantly	1.66
3. my consumption somehow increased	1.33
4. my consumption did not change	1.00
5. my consumption somehow decreased	0.66
6. my consumption decreased significantly	0.33
7. I stopped using	0.00

In order to assess the overall impact of the lockdown period and related confinement measures on the total consumption of the Czech population, individual respondents were assigned weights corresponding to the number of consumption occasions based on the question on the frequency of use/behaviour in the last 12 months. This means, for example, that the daily user had 60.9 times higher weight in the analysis than the respondent using less frequently than once a month. To avoid an artificial increase of the sample size, weights were relativized on the basis of the presence of individual frequency categories in the data set (Table 2).

Since the frequency in the last 12 months was asked only in questions on substance use and gambling, weights related to gaming and social media use were based on the usual time spent daily on screen with these activities.

Presented confidence intervals are 95% confidence intervals (CI) for means. IBM SPSS Statistics 24 was used for data processing and analysis.

Ethical Considerations

The implementation of the National Survey on Substance Use 2020 was approved by the Ethics Committee of the National Monitoring Centre for Drugs and Addiction, No. EK-NMS-2020-05-01.

Table 2. Weights* based on the frequency of use in the last 12 months

Frequency of use	Weight
Daily	365.25
Almost daily (5–6 times a week)	286.99
Few times a week (3–4 times a week)	182.63
Once or twice a week	78.27
Few times a month (2–3 times a month)	30.00
Once a month	12.00
Less frequently than once a month	6.00

**i.e. number of occasions in the last 12 months*

RESULTS

The most frequent users (daily or almost daily users) increased their intensity of use during the lockdown period, while less frequent users tended to reduce it. The reduction increased with decreasing frequency of use in the last 12 months, especially as regards the use of alcohol, cannabis and sedatives (Figure 1). The only exception in substance use represents tobacco – though the same pattern exists, a decrease in intensity of use was observed in all smoking categories including daily smokers.

In case of digital gaming and social media use, the general trend of increase in consumption with higher intensity of use is present as well, although an increase was observed in all frequency categories (Figure 2).

The estimated impact of the lockdown period and related confinement measures on the total consumption in the Czech Republic is presented in Figure 3. After weighting the sample by the frequency of use in the last 12 months (or the usual time spent daily on screen), it seems that there may have been a slight increase in total alcohol and sedatives consumption. The intensity of gaming and social media use has significantly increased. On the other hand, there was an overall slight reduction in the consumption of cannabis and other illicit drugs, and a significant reduction in the consumption of tobacco and online gambling (Figure 3).

DISCUSSION

Our results indicate that the intensity of substance use may have increased during the lockdown period in the most frequent consumers. This corresponds to the first results from the European Web Survey on Drug focusing on impact of COVID-19 among people who use drugs in spring 2020. The results of the European survey similarly showed that occasional cannabis users have reduced their consumption while frequent users have increased their consumption during the period

proLékaře.cz | 4.11.2026

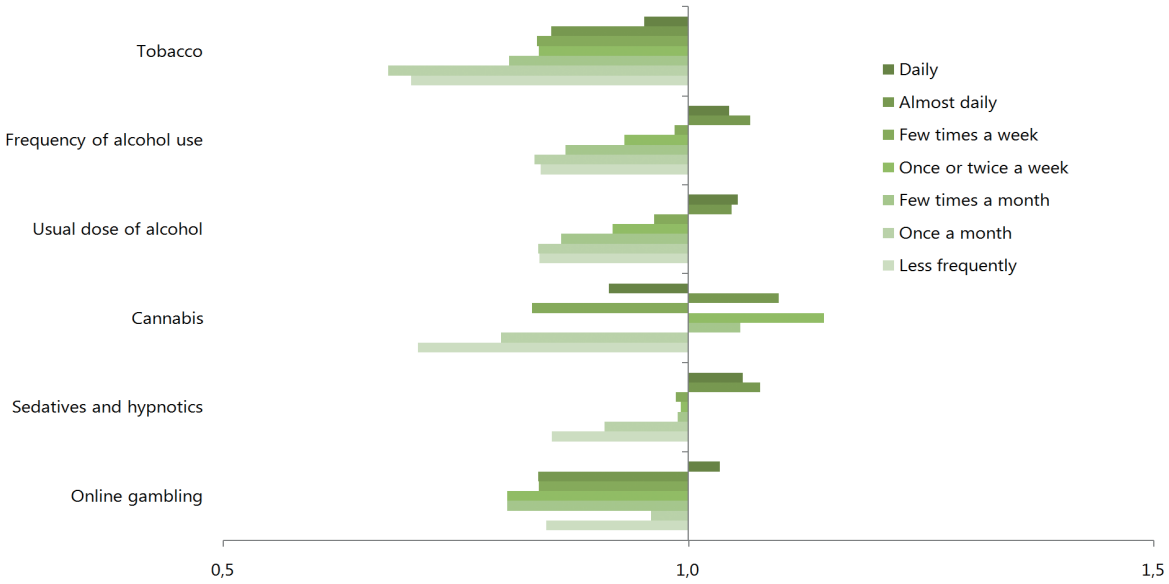


Figure 1. Average change in the intensity of use related to COVID-19 lockdown period by frequency of use
Note: Value 1.0 on *x* axis indicates no change, value > 1.0 indicates an increase and value < 1.0 indicates a decrease

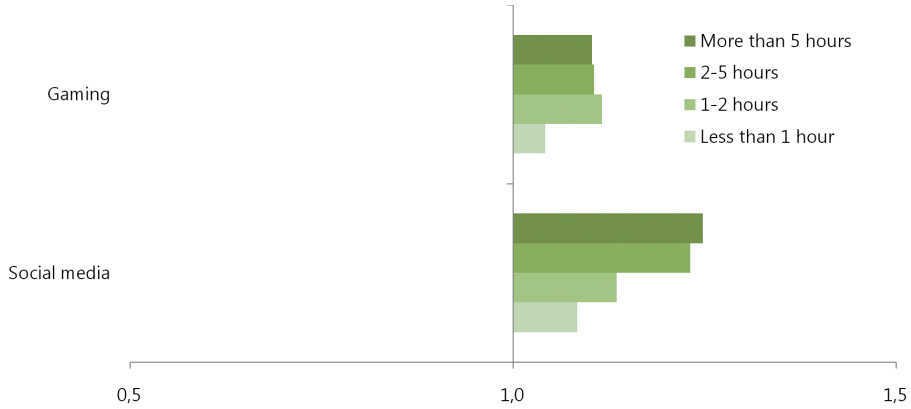


Figure 2. Average change in the intensity of digital gaming and use of social media related to COVID-19 lockdown period by usual time spent daily with these activities on working days
Note: Value 1.0 on *x* axis indicates no change, value >1.0 indicates an increase and value <1.0 indicates a decrease

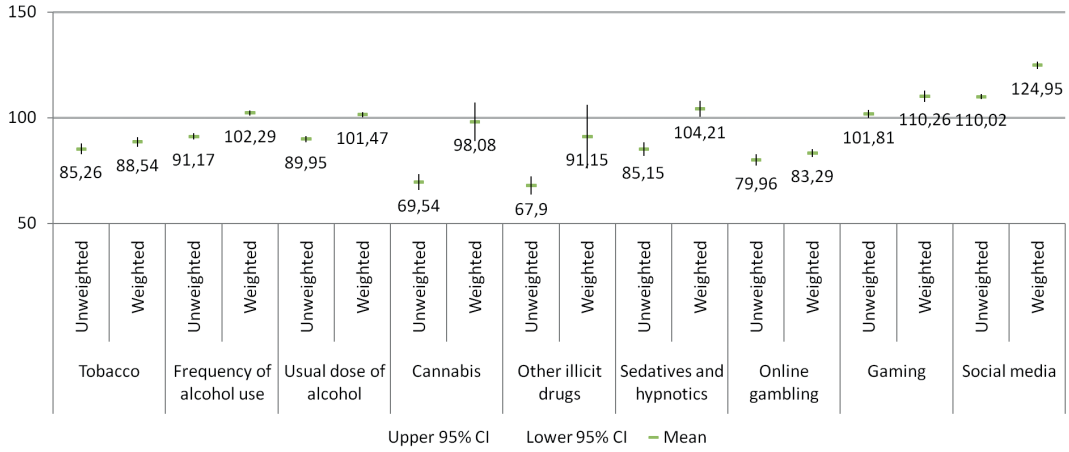


Figure 3. Estimated change in the total consumption of addictive substances, online gambling, digital gaming and social media use related to COVID-19 lockdown period – unweighted and weighted results

proLékaře.cz | 4.11.2026

of confinement measures. Regular (weekly) cannabis users were twice as likely to report an increased frequency of use compared to non-regular users. Similarly, regular cannabis users were three times more likely to report greater doses compared to non-regular users. Qualitative responses from survey participants, however, suggest that changes in the intensity of use may have varied over the period of confinement measures and may have been related to ongoing changes on the drug markets [6]. Similarly an online survey focusing on alcohol use in Germany during the pandemic found increases in alcohol use among people with risky consumption patterns [7].

In our survey, we have not asked about reasons related to the changes in substance use. However, other research shows that multiple factors can play a role in changing patterns of substance use, such as coping strategy to counteract boredom and anxiety, reduced opportunity to use drugs during confinement period and night-life economy closure, shifts from illicit to licit substances (alcohol a sedatives), or a disruptions in access to certain drugs [6, 8].

It is obvious that the most frequent users contribute to the total consumption in a population more than occasional users do. Although they represent a relatively small part of all consumers, they substantially influence the total consumption and total burden of disease. Intensive alcohol use is responsible for the majority of the alcohol-attributable burden of disease and mortality [9, 10]. It has been estimated that in the EU, heavy alcohol drinking accounts for 77% of the total alcohol mortality [11].

In this context, it appears important to weight the changes in consumption behaviour in a population by the intensity of use to estimate the total impact. Our results indicate that there could be a slight increase in total alcohol and sedatives/hypnotics consumption on the population level, and a substantial increase in digital gaming and social media use (which was an expected result due to intensive online communication during the period of confinement measures). On the other hand, the total consumption of cannabis and other illicit drugs does not seem to have been impacted much by COVID-19. At the same time, we observed a substantial decrease of online gambling (perhaps due to lack of betting opportunities since all professional sport events were stopped), as well as of tobacco smoking. Tobacco was the only substance where also a decrease in daily or almost daily users occurred – we can only speculate about the reasons, but social distancing measures and staying at home probably contributed to this the most, though fear of higher COVID-19 severity and progression among current smokers and ex-smokers [12], which was broadly medialized, could also contribute to it.

It is apparent that COVID-19 lockdown period mostly affected the heaviest users. In the most intensive alcohol users, both the frequency and the dose of alcohol consumed increased. It is known that heavy users over time are more likely to develop substance-related problems and substance-use disorders [9], and COVID-19 further increased this risk. The socio-economic impact of COVID-19 will probably lead to deterioration of the socio-economic conditions, which will consequently lead to a further increase of risk of development of substance-use disorder in the most affected and vulnerable individuals [13, 14, 15].

Limitations

The sample cannot be considered fully representative for the Czech population since non-probability quota sampling was used. However, respondents were selected randomly from the online panel of approx. 60,000 adults. The response rate was 35.4 %, thus presence of non-response bias is likely. The respondents were contacted randomly from the online panel, so that self-nomination (opt-in sampling strategy), which represents one of the main drawbacks of online surveys [16, 17], was avoided. Data were self-administered online, so an information bias can be also expected. Also, it is likely that people with intensive patterns of use and with substance use disorders were underrepresented in the survey due to different reasons such as coverage bias or non-response bias [18]. However taking into account external factors of the lockdown period, the methodological design and sampling were the best we could achieve in the given situation.

On the contrary to the sampling limitations, a number of positives of online surveys were reported compared to other modes of survey administration, like higher sense of anonymity and privacy of the respondents, their readiness to report their substance use and thus lower evasive answer bias. In this respect, the online surveys are increasingly considered a valuable tool for monitoring of drug use also under normal conditions [17, 19].

The quantification of changes in consumption behaviour that we have performed in our analysis should be perceived as indicative since it was based on the approximation of categorical data. It has to be noted that some subgroups (e.g. people frequently using cannabis or other illicit drugs) were very small, so random effect may have manifested.

CONCLUSION

The results of the presented online survey among general adult population of the Czech Republic suggest that people with intensive patterns of use may have increased their intensity of use during COVID-19 lockdown period. The same concerns "digital addictions" such as gaming or excessive social media use. This is an important finding because the overall picture can be biased suggesting reduction of substance use

proLékaře.cz | 4.11.2026

on average. There is an important message for policy and practice following our research: the COVID-19 lockdown period has aggravated the situation of people with intensive patterns of substance use, and this is likely to lead to an increase in the demand for addiction treatment in near future. Negative socio-economic consequences of COVID-19 may accelerate this development.

REFERENCES

1. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta bio-medica: Atenei Parmensis*, 2020;91(1):157–160.
2. Ministerstvo zdravotnictví ČR. *COVID-19: Přehled aktuální situace v ČR Praha*: Ministerstvo zdravotnictví; 2020 [cited 2020 16 August]. Available from: https://onemocneni-aktualne.mzcr.cz/covid-19.
3. European Monitoring Centre for Drugs and Drug Addiction. EMCDDA update on the implications of COVID-19 for people who use drugs and drug service providers. Lisbon: European Monitoring Centre for Drugs and Drug Addiction; 2020.
4. Mukhtar S. Psychological health during the coronavirus disease 2019 pandemic outbreak. *The International journal of social psychiatry*, 2020;66(5):512–516.
5. European Monitoring Centre for Drugs and Drug Addiction. Impact of COVID-19 on drug services and help-seeking in Europe, EMCDDA Trendspotter briefing. Lisbon: European Monitoring Centre for Drugs and Drug Addiction; 2020.
6. European Monitoring Centre for Drugs and Drug Addiction. Impact of COVID-19 on patterns of drug use and drug-related harms in Europe, EMCDDA Trendspotter briefing. Lisbon: European Monitoring Centre for Drugs and Drug Addiction; 2020.
7. Manthey J, Kilian C, Schomerus G, Kraus L, Rehm J, Schulte B. Alkoholkonsum in Deutschland und Europa während der SARS-CoV-2 Pandemie. *SUCHT*, 2020;66(5):247–258.
8. Winstock AR, Davies EL, Gilchrist G, Zhuparris A, Ferris JA, Maier LJ, et al. GDS Special Edition on COVID-19, Global Interim Report. 2020.
9. Rehm J, Marmet S, Anderson P, Gual A, Kraus L, Nutt DJ, et al. Defining substance use disorders: do we really need more than heavy use? *Alcohol Alcohol*, 2013;48(6):633–640.
10. Jayasekara H, English DR, Room R, MacInnis RJ. Alcohol consumption over time and risk of death: a systematic review and meta-analysis. *Am J Epidemiol*., 2014;179(9):1049–1059.
11. Rehm J, Shield KD, Gmel G, Rehm MX, Frick U. Modeling the impact of alcohol dependence on mortality burden and the effect of available treatment interventions in the European Union. *European Neuropsychopharmacology*, 2013;23(2):89–97.
12. Reddy RK, Charles WN, Sklavounos A, Dutt A, Seed PT, Khajuria A. The effect of smoking on COVID-19 severity: A systematic review and meta-analysis. *Journal of medical virology*, 2021;93(2):1045–1056.
13. Afuseh E, Pike CA, Oruche UM. Individualized approach to primary prevention of substance use disorder: age-related risks. *Substance Abuse Treatment, Prevention, and Policy*, 2020;15(1):58.
14. Mravčík V, Chomynová P, Grohmannová K. Koncept problémového užívání návykových látek. *Psychiatrie*, 2019;23(3):121–128.
15. Mravčík V, Chomynová P, Grohmannová K. Veřejnozdravotní význam užívání návykových látek. *Hygiena*, 2019;64(1):21–26.
16. Skarupova K, Singleton N, Matias J, Mravcik V. Surveying drug consumption: Assessing reliability and validity of the European Web Survey on Drugs questionnaire. *Int J Drug Policy*, 2019.
17. Matias J, Kalamara E, Mathis F, Skarupova K, Noor A, Singleton N. The use of multi-national web surveys for comparative analysis: Lessons from the European Web Survey on Drugs. *International Journal of Drug Policy*, 2019;73:235–244.
18. Johnson TP. Sources of Error in Substance Use Prevalence Surveys. *Int Sch Res Notices*, 2014;2014:923290.
19. Barratt MJ, Ferris JA, Zahnow R, Palamar JJ, Maier LJ, Winstock AR. Moving on From Representativeness: Testing the Utility of the Global Drug Survey. *Substance abuse: research and treatment*, 2017;11:1178221817716391.

Funding sources
This study was funded from the state budget of the Czech Republic, the drug policy budget of the Office of the Government of the Czech Republic. This work was partly supported by the project Effectiveness of the system of addictology services in the Czech Republic in context of the COVID-19 pandemic (No. TL04000382) supported by the Technology Agency of the Czech Republic within programme ÉTA, by the project Sustainability for the National Institute of Mental Health (No. LO1611) with financial support from the Ministry of Education, Youth and Sports of the Czech Republic under the NPU I program, and by the Charles University institutional support Progres No. Q06/LF1. These sources had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Conflict of Interest
The authors declare no conflict of interest.

Do redakce došlo dne 2. 11. 2020.

Adresa pro korespondenci:
doc. MUDr. Viktor Mravčík, Ph.D.
Národní monitorovací středisko pro drogy a závislosti
Úřad Vlády České republiky
Nábřeží E. Beneše 4
118 01 Praha
e-mail: mravcik.viktor@vlada.cz