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Proposed indicators for Sustainable Development Goals (SDGs) in drug abuse fields based on national data from Japan

SHIMANE Takuya, INOURA Satoshi, MATSUMOTO Toshihiko

Department of Drug Dependence Research, National Institute of Mental Health,
National Center of Neurology and Psychiatry

Abstract

Objectives: This study aimed to develop proposed indicators for Sustainable Development Goals section 3.5 (SDGs 3.5) based on existing databases published in Japan.

Methods: The following data sources were selected to identify potential indicators because they contained information consistent with the research objectives, the surveys were conducted sustainably, and the information was available on the Internet: Nationwide General Population Survey on Drug Use in Japan (2007–2019), reports on the status of the implementation of a substance abuse preventive class (SAPC) (2015–2018), Nationwide Mental Hospital Survey on Drug-related Psychiatric Disorders (2012–2020), and mental health and welfare-related reports from the National Database (2014–2017).

Results: The lifetime prevalence of illicit drug use among the general population in 2019 was as follows: marijuana, 1.81%; methamphetamine, 0.39%; inhalants, 1.09%; MDMA, 0.30%; cocaine, 0.34%; heroin, 0.13%; new psychoactive substances (NPSs), 0.31%; and LSD, 0.30%. Regarding changes in the lifetime prevalence of substance use from 2007 to 2019, marijuana showed a significant increase, while inhalants showed a significant decrease. The SAPC implementation rate was 78.6%, 90.6%, and 85.8% in elementary, junior high, and high schools respectively. The proportion of principal drugs among patients with substance use disorders (SUDs) visiting psychiatric facilities was as follows: methamphetamine, 36.0%; hypnotics/anxiolytics, 29.5%; over-the-counter drugs (OTCs), 15.7%; polysubstance, 7.3%; marijuana, 5.3%; inhalants, 2.7%; non-steroidal anti-inflammatory drugs, 0.7%; opioids, 0.5%; and NPSs, 0.3%. While the proportion of methamphetamine cases has remained the highest, the proportions of hypnotic/anxiolytic and OTC cases are increasing. The number of inpatients with SUDs in psychiatric wards was 1,689 in 2014, 1,437 in 2015, 1,431 in 2016, and 2,416 in 2017. The number of outpatients who received treatment for substance use at least once was 6,636 in 2014, 6,321 in 2015, 6,458 in 2016, and 10,746 in 2017.

Conclusions: Considering the accumulation and sustainability of databases in the area of substance abuse and dependence, we concluded that it is appropriate to use the following as SDGs 3.5 indicators for Japan: 1) the lifetime prevalence of illicit drug use in the general population; 2) the SAPC implementation rate in schools; 3) the composition ratios of the principal drugs among patients with SUDs in psychiatric facilities, and 4) the number of patients with SUDs and the medical facilities available to them.

keywords: Sustainable Development Goals, substance use disorders, drug abuse, national data, indicators

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Corresponding author: SHIMANE Takuya

4-1-1 Ogawa-Higashi, Kodaira, Tokyo 187-8553, Japan.

Tel: +81-42-346-1869 /Fax: +81-42-346-1954

E-mail: shimane@ncnp.go.jp

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I. Introduction

Sustainable Development Goals (SDGs) comprise international goals for the achievement of a better and more sustainable world by 2030, as stated in the 2030 Agenda for Sustainable Development, which was unanimously adopted by member countries at the United Nations (UN) Summit in September 2015 as the successors of the Millennium Development Goals formulated in 2001. Health-sector targets were included in Goal 3: ensure healthy lives and promote well-being for all ages [1]. Furthermore, the target for substance abuse was set in "Goal 3.5: strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol." Global indicators have been set for each of the SDGs. In particular, "Indicator 3.5.1: coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders (SUDs)" has been set for Target 3.5 [2].

Currently, the drug policy in Japan is based on the Fifth Five-Year Strategy for Substance Abuse Prevention (FF strategy) led by the Ministry of Health, Labor and Welfare (MHLW) [3]. The prevention of substance abuse among youth was emphasized in "Goal 1: prevention of drug abuse by raising the awareness of the whole nation about the norms through publicity and awareness-raising, especially among youth." Specific measures included the enhancement of substance abuse preventive classes (SAPC) in schools and strengthening public relations and awareness based on scientific findings. Regarding treatment, "Goal 2: prevent reuse of drugs by providing appropriate treatment and effective support for rehabilitation" emphasizes the importance of dealing with substance abusers. Specific measures include strengthening the medical provision system (e.g., treatments for SUDs) and guidance and support for rehabilitation by criminal justice agencies.

Treatment interventions for patients using illegal drugs, such as methamphetamine, have focused on addressing chronic addictive psychoses such as hallucinations and delusions; however, the focus of treatment and support is now on SUDs. For instance, the Serigaya Methamphetamine Relapse Prevention Program (SMARPP), a relapse prevention program for SUDs, was developed in 2006 [4][5]. SMARPP, a cognitive-behavioral therapy program based on the Matrix model [6], is highly rated as an intensive outpatient program for cocaine users in the United States (US) and has been modified for methamphetamine users, who comprise the core patient population of addiction clinical practice in Japan. Currently, the program is being disseminated to psychiatric facilities and mental health and welfare centers nationwide. Since 2016, SMARPP has been covered by health insurance as group therapy for relapse prevention.

The number of patients eligible for treatment interventions in the community was calculated to determine the coverage of treatment interventions for patients with SUDs as defined in Goal 3.5. However, the number of illegal drug users (e.g., methamphetamine users) in Japan is small, rendering it difficult to estimate the number of potential patients with SUDs in the community. Furthermore, SDGs Indicator 3.5.1, which covers the area of substance abuse, states that it is an "indicator for which internationally agreed definition nor computation method has not been released by United Nations so far." Therefore, indicator definitions and calculation methods remain to be determined. In light of these limitations, we aimed to propose a set of SDG indicators for Japan in the area of substance abuse, using data from nationwide surveys conducted over several years, as well as publicly available administrative information, such as the status of illicit drug use in the general population, the status of SAPC implementation in schools, and the status of treatment for SUDs in psychiatric facilities.

II. Methods

The following criteria for database selection were established: contained information consistent with the research objectives, ongoing surveys (i.e., sustainably conducted), and the information was available on the Internet. We also determined the outcomes that could be used as proposed SDG indicators from each database. When necessary, inquiries were made to the research entities of the database via e-mails and phone calls. The following data sources were included in this study: Nationwide General Population Survey on Drug Use in Japan (NGP survey) [7], reports on the status of SAPC implementation [8], Nationwide Mental Hospital Survey on Drug-related Psychiatric Disorders (NMH survey) [9], and mental health and welfare-related reports from the National Database (NDB) [10]. Each of these data sources is described in detail in the following sections.

1. NGP survey

NGP surveys have been conducted by the National Center of Neurology and Psychiatry (NCNP) every other year since 1995 to estimate the number of substance users in the general population and to examine changes over time. The subjects comprised 7,000 randomly selected residents aged 15–64 years. Information was collected using a self-administered questionnaire.

The main outcome, and proposed SDG indicator, was the estimate (point estimate and 95% confidence interval [CI]) of the lifetime prevalence of illicit drug use for eight sub-

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stances: marijuana, methamphetamine, inhalants, MDMA, cocaine, heroin, new psychoactive substances (NPSs), and LSD. Additionally, the estimated past-year prevalence of illicit drug use was a sub-outcome. In this study, we referred to data from 2007 to 2019 for which estimates of the lifetime prevalence of illicit drug use were publicly available. The change in drug prevalence over time by survey year was determined based on an overlap in 95% CIs. In other words, the upper limit of the interval estimates of drug A in year X was compared to the lower limit of the interval estimate of drug A in year Y. If the lower limit in year Y was higher than the upper limit in year X, the lifetime prevalence of drug A was considered to have increased significantly from year X to year Y.

2. Status of the implementation of SAPC

Preventive education on substance abuse for young people in Japan is provided consistently from elementary to high school through health and physical education. In addition to this standard curriculum, the FF strategy requires all junior high schools (a three-year program for ages 12 to 15 years) and high schools (a three-year program for ages 15 to 18 years) to provide an SAPC at least once per year with an external expert, such as a police officer or pharmacist. Elementary schools (a six-year program for ages 6 to 12 years) are also expected to host the event according to local circumstances.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) is responsible for surveying the status of SAPC implementation at each school, which is reported and published annually through the Board of Education at each prefecture and government-designated city.

The main outcome, and proposed SDG indicator, was the SAPC implementation rate, overall and by school type (elementary, junior high, or high school). In this study, we referred to data from 2015 to 2018, which were published online.

3. NMH survey

NMH surveys, conducted by the NCNP every other year since 1987, cover "patients with drug-related psychiatric disorders due to the use of psychoactive substances other than alcohol" who were either hospitalized or treated as outpatients at psychiatric facilities with psychiatric wards in Japan. Each physician at the surveyed facilities collected clinical information (without personal information) by completing a questionnaire through the transcription of medical records and interviews.

The main outcome, and proposed SDG indicator, was the proportion of principal drugs in target patients who had a history of substance use within the past year. The principal drug was defined as "the drug of abuse that was considered to have the greatest impact on the clinical problem (e.g., psychosis or dependence) by the attending psychiatrist," and the physicians who completed the questionnaire were asked to select one of the following drug categories: methamphetamine, inhalants, marijuana, cocaine, heroin, MDMA, hallucinogens other than MDMA, NPSs, hypnotics/anxiolytics, non-steroidal anti-inflammatory drugs (NSAIDs), opioids, over-the-counter drugs (OTCs; cough and cold medicines, analgesics, etc.), medications for attention-deficit hyperactivity disorder, others, and polysubstance. In this study, we referred to data from 2012 to 2020, for which data on patients with a history of substance use within the past year were publicly available.

4. NDB reports

The NDB, established by the MHLW, contains information on medical receipts and specified medical examinations and covers all medical receipts within the universal health insurance system in Japan. Using the NDB, the NCNP publishes mental health and welfare-related reports on the results of medical treatment for each disease in the region throughout the year, and the demographics of patients admitted and discharged from hospitals, as well as information on medical centers for dementia diseases and ambulance transport times.

The main outcomes and proposed SDG indicators were the number of inpatients with SUDs in psychiatric wards nationwide, the number of outpatients who received treatment for substance use at least once, and the number of outpatients who received group therapy for relapse prevention. The sub-outcomes and proposed SDG indicators were the number of hospitals with psychiatric wards that provided inpatient treatment for SUDs, medical facilities that provided outpatient treatment for SUDs, and medical facilities that provided group therapy outpatient services for relapse prevention, covered by health insurance. In this study, we referred to data from 2014 to 2017 that were published on the Internet.

This study used existing databases published on the Internet and did not obtain new information from subjects. Therefore, this study was not subject to ethical guidelines for medical research involving human subjects.

III. Results

1. NGP survey

Table 1 shows the estimated lifetime prevalence of illicit drug use in the general Japanese population aged 15–64 years. The lifetime prevalence in 2019 was 1.81% for marijuana, 0.39% for methamphetamine, 1.09% for inhalants,

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Table 1 Estimated lifetime prevalence of illicit drug use in the general population aged 15 to 64 years (2007-2019) (%)

Year	2007	2009	2011	2013	2015	2017	2019
Marijuana	0.84 (0.55-1.28)	1.43 (1.02-1.99)	1.21 (0.82-1.79)	1.10 (0.75-1.60)	1.01 (0.68-1.48)	1.45 (0.85-2.43)	1.81 (1.40-2.35)
Methamphetamine	0.44 (0.24-0.81)	0.34 (0.18-0.63)	0.41 (0.22-0.75)	0.53 (0.31-0.92)	0.53 (0.31-0.91)	0.54 (0.30-0.99)	0.39 (0.21-0.73)
Inhalant	2.03 (1.58-2.62)	1.88 (1.43-2.47)	1.57 (1.15-2.13)	1.87 (1.39-2.51)	1.47 (1.07-2.02)	1.13 (0.78-1.63)	1.09 (0.80-1.48)
MDMA	0.19 (0.08-0.47)	0.22 (0.10-0.50)	0.15 (0.06-0.35)	0.27 (0.12-0.61)	0.13 (0.05-0.29)	0.16 (0.06-0.41)	0.30 (0.15-0.59)
Cocaine	0.13 (0.00-0.38)	0.22 (0.09-0.57)	0.08 (0.00-0.26)	0.08 (0.00-0.34)	0.05 (0.05-0.31)	0.28 (0.11-0.72)	0.34 (0.17-0.67)
Heroin	0.07 (0.00-0.27)	N/A	N/A	0.07 (0.00-0.27)	0.07 (0.00-0.24)	N/A	0.13 (0.04-0.41)
NPS	-	-	-	0.41 (0.23-0.73)	0.33 (0.17-0.63)	0.24 (0.09-0.64)	0.31 (0.15-0.61)
LSD	-	-	-	-	-	-	0.30 (0.20-0.60)

Source：National Center of Neurology and Psychiatry, Nationwide General Population Survey on Drug Use in Japan, https://www.ncnp.go.jp/nimh/yakubutsu/index.html
(-): Data not available; N/A: Not applicable; NPS: New psychoactive substances
Point estimates and interval estimates (95% confidence intervals) are shown.
SPSS complex samples were used for estimation and weighted in consideration of the sampling plan.
NPSs have been included since 2013, and LSD since 2019.

Table 2 Estimated past-year prevalence of illicit drug use in the general population aged 15 to 64 years (2007-2019) (%)

Year	2007	2009	2011	2013	2015	2017	2019
Marijuana	0.06 (0.00-0.24)	0.01 (0.00-0.09)	0.05 (0.00-0.19)	N/A	0.04 (0.00-0.15)	0.10 (0.00-0.74)	0.10 (0.05-0.24)
Methamphetamine	0.03 (0.00-0.25)	N/A	N/A	N/A	N/A	N/A	0.04 (0.00-0.17)
Inhalant	N/A	N/A	N/A	N/A	0.04 (0.00-0.18)	0.10 (0.00-0.30)	0.11 (0.00-0.38)
MDMA	0.04 (0.00-0.26)	N/A	N/A	0.04 (0.00-0.31)	N/A	N/A	0.04 (0.01-0.09)
Cocaine	0.05 (0.00-0.35)	N/A	N/A	N/A	N/A	N/A	0.04 (0.01-0.09)
Heroin	N/A	N/A	N/A	N/A	N/A	N/A	0.04 (0.00-0.16)
NPS	-	-	-	0.15 (0.06-0.39)	N/A	N/A	0.04 (0.01-0.09)
LSD	-	-	-	-	-	-	0.04 (0.01-0.09)

Source：National Center of Neurology and Psychiatry, Nationwide General Population Survey on Drug Use in Japan, https://www.ncnp.go.jp/nimh/yakubutsu/index.html
(-): Data not available; N/A: Not applicable; NPS: New psychoactive substances
Point estimates and interval estimates (95% confidence intervals) are shown.
SPSS complex samples were used for estimation and weighted in consideration of the sampling plan.
NPSs have been included since 2013, and LSD since 2019.

Table 3 International comparisons in the lifetime prevalence of illegal drug use in the general population (%)

	Japan	US	EU	Canada	Thailand
Year	2019	2019	2020	2017	2019
Age	15-64	18 or older	15-64	15 or older	12-65
Marijuana	1.81 (1.40-2.35)	46.2	27.2	46.6 (44.3-48.8)	2.55 (2.34-2.79)
Methamphetamine	0.39 (0.21-0.73)	5.8	3.7 [b]	3.7 (2.8-4.6)	2.34 (2.14-2.57)
Inhalant	1.09 (0.80-1.48)	9.1	-	-	0.35 (0.27-0.46)
MDMA	0.30 (0.15-0.59)	7.3	4.1	7.6 (6.2-9.0)	0.23 (0.16-0.32)
Cocaine	0.34 (0.17-0.67)	15.1	5.4	10.4 (9.0-11.9)	0.12 (0.07-0.20)
Heroin	0.13 (0.04-0.41)	2.1	-	0.7 (0.3-1.1)	0.25 (0.18-0.37)
NPS	0.31 (0.15-0.61)	-	-	-	-
LSD	0.30 (0.20-0.60)	10	-	14.3 (12.6-15.9) [#]	-

All data represent estimates prevalence (data in Japan, Canada, and Thailand indicate 95% confidence interval).
(-): Data not available   ♯: Data for hallucinogens   ♭: Data for amphetamine NPS: New psychoactive substance
Japan: Nationwide General Population Survey on Drug Use in Japan
US: National Survey on Drug Use and Health (NSDUH)
EU: European Monitoring Center for Drug and Drug Addiction (EMCDDA)
Canada: Canadian Tobacco, Alcohol and Drugs Survey (CTADS)
Thailand: Survey on the quality of living and size estimation on substance use

0.30% for MDMA, 0.34% for cocaine, 0.13% for heroin, 0.31% for NPS, and 0.30% for LSD. Among the eight illegal drugs, marijuana had the highest lifetime prevalence and increased significantly from 2007 to 2019. In contrast, the lifetime prevalence of inhalants decreased significantly from 2007 to 2019. Other drugs remained unchanged, with overlapping 95% CIs. Regarding the past-year prevalence, the actual number of drug users was very small, and there were no responses for some questions, making it difficult to esti-

mate the number of potential drug users in the community (Table 2).

Table 3 shows an international comparison of the lifetime prevalence of illegal drug use in the general population. The lifetime prevalence of illicit drug use in Japan was significantly lower than that in the US, the European Union, and Canada. Additionally, the lifetime prevalence of marijuana, methamphetamine, and heroin was lower in Japan than in Thailand, which is in the same Asian region as Japan, while

the lifetime prevalence of inhalants, MDMA, and cocaine was higher in Japan than in Thailand.

2. Status of SAPC implementation

Table 4 shows the status of SAPC implementation according to school type. In 2018, the SAPC implementation rates by school type were as follows: elementary schools, 78.6%; junior high schools, 90.6%; and high schools, 85.8%. The SAPC implementation rate across all school types remained unchanged over 2015 (81.0%), 2016 (82.5%), 2017 (83.5%), and 2018 (83.2%).

3. NMH survey

Table 5 presents the ratios of the principal drugs in patients with drug-related psychiatric disorders due to the use of psychoactive substances other than alcohol in psychiatric facilities nationwide in the 2020 NMH survey: metham-

phetamine, 36.0%; hypnotics/anxiolytics, 29.5%; OTCs, 15.7%; polysubstance, 7.3%; marijuana, 5.3%; inhalants, 2.7%; NSAIDs, 0.7%; opioids, 0.5%; and NPSs, 0.3%. Between 2012 and 2020, methamphetamine cases comprised the highest proportion, and the proportion of hypnotics/anxiolytic and OTC cases increased. NPSs have been declining rapidly since 2016.

4. Mental health and welfare-related reports from the NDB

Table 6 shows the number of patients with SUDs referred to the NDB. The number of inpatients with SUDs in psychiatric wards was 1,689, 1,437, 1,431, and 2,416 in 2014, 2015, 2016, and 2017 respectively. The number of outpatients who received treatment for substance use at least once was 6,636, 6,321, 6,458, and 10,746 in 2014, 2015, 2016, and 2017 respectively. The number of outpatients who received

Table 4　Status of the implementation of a substance abuse preventive class by school type (2015-2018) (%)

Year	2015	2016	2017	2018
All type of schools	81.0	82.5	83.5	83.2
Elementary schools	76.5	77.3	79.1	78.6
Junior high schools	88.9	91.0	91.0	90.6
High schools	84.6	86.3	86.4	85.8

Source: Ministry of Education, Culture, Sports, Science and Technology, Bureau of Elementary and Secondary Education, Health Education and Shokuiku Division, Yakubutu-ranyou-boushi-kyoushitsu ni tsuite, https://www.mext.go.jp/a_menu/kenko/hoken/1297198.htm
The Fifth Five-Year Strategy for Substance Abuse Prevention states that substance abuse preventive class (SAPC) should be included in school health plans and held at least once a year in all junior high and high schools, and also in elementary schools according to local circumstances.
Elementary school in Japan is a six-year program (for ages 6 to 12 years), junior high school is a three-year program (for ages 12 to 15 years), and high school is a three-year program (for ages 15 to 18 years).

Table 5　Ratios of principal drugs among patients with drug-related psychiatric disorders due to the use of psychoactive substances other than alcohol in psychiatric facilities nationwide (2012-2020) (%)

Year	2012 (n=546)	2014 (n=1,010)	2016 (n=1,098)	2018 (n=1,149)	2020 (n=1,129)
Methamphetamine	28.9	27.5	38.1	39.3	36.0
Inhalant	5.3	4.4	7.7	4.3	2.7
Marijuana	1.8	2.7	4.9	5.6	5.3
Cocaine	0.2	0.0	0.1	0.3	0.4
Heroin	0.4	0.1	0.3	0.3	0.1
MDMA	0.0	0.2	0.1	0.0	0.1
Hallucinogen other than MDMA	0.4	0.0	0.3	0.1	0.4
NPS	25.1	34.7	2.5	1.2	0.3
Hypnotic, anxiolytic	20.9	16.9	27.9	29.9	29.5
NSAIDs	2.0	1.8	1.0	0.7	0.7
Opioid	0.0	0.0	0.5	0.6	0.5
OTC	2.7	3.8	8.2	9.1	15.7
ADHD Medications	0.2	0.2	0.1	0.4	0.2
Others	4.8	3.0	1.2	2.3	0.7
Polysubstance	7.3	4.9	7.3	5.9	7.3

Source : National Center of Neurology and Psychiatry, Nationwide Mental Hospital Survey on Drug-related Psychiatric Disorders, https://www.ncnp.go.jp/nimh/yakubutsu/index.html
The principal drug was defined as "the drug that seems to be most clinically relevant to the current psychiatric symptoms" and the physicians who completed the questionnaire were asked to select one of the following drug categories: methamphetamine, inhalant, marijuana, cocaine, heroin, MDMA, hallucinogens other than MDMA, new psychoactive substance (NPS), hypnotic/anxiolytic, non-steroidal anti-inflammatory drugs (NSAIDs), opioid, over-the-counter drug (OTC), medication for attention-deficit hyperactivity disorder (ADHD), others, and polysubstance.
Only cases with a history of drug use within the past year were selected.

Table 6 Number of patients with SUDs referred to the NDB (2014-2017)

Year	2014	2015	2016	2017
No. of inpatients with SUDs in psychiatric wards	1,689	1,437	1,431	2,416
No. of outpatients who received treatment for substance use (at least once)	6,636	6,321	6,458	10,746
No. of outpatients who received treatment for substance use (two or more times)	5,197	5,166	5,373	9,112
No. of outpatients who received group therapy for relapse prevention	-	-	57	142

No.=Number; (-): Data not available; SUD: substance use disorder; NDB, National Database
Group therapy for relapse prevention has been covered by health insurance since 2016.

Table 7 The number of medical facilities treating patients with SUDs referred to the NDB (2014-2017)

Year	2014	2015	2016	2017
No. of hospitals with psychiatric wards that provided inpatient treatment for SUDs	494	503	487	709-711
No. of medical facilities that provided outpatient treatment for SUDs	1,719	1,721	1,745	2,486
No. of medical facilities that provided group therapy outpatient services for relapse prevention, covered by health insurance	-	-	5	11

No.=Number; (-): Data not available; SUD: substance use disorder; NDB, National Database
※Group therapy for relapse prevention has been covered by health insurance since 2016.

group therapy for relapse prevention was 57 in 2016 and 142 in 2017.

Table 7 shows the number of medical facilities that treated patients with SUDs referred to the NDB. The number of hospitals with psychiatric wards providing inpatient treatment for SUDs was 494, 503, 487, and 709–711 in 2014, 2015, 2016, and 2017. The number of medical facilities that provided group therapy outpatient services for relapse prevention, covered by health insurance, was 5 in 2016 and 11 in 2017.

IV. Discussion

1. Lifetime prevalence of illicit drug use in the general population

We propose the lifetime prevalence of illicit drug use in the general population nationwide as one SDG 3.5.1 indicator. The source database for GPS surveys is based on public research-funded projects rather than government statistics. GPS surveys have been conducted biennially for more than twenty years (since the 1990s). Therefore, the sustainability of the data is expected to be high in the future. However, the lifetime prevalence of illegal drug use as a proposed indicator suffers from a limitation: the data do not necessarily reflect the current prevalence of illicit drug use because it includes past experiences. The data would be more reflective of the current state of illicit drug use if the most recent use, such as the past-year prevalence of illicit drug use, was used as an indicator. In Japan, where the number of illicit drug users is lower than that in other countries, the past-year experience rate is significantly lower, or there are no applicable persons. Given these circumstances, we are compelled to recommend the lifetime prevalence of illicit drug use as an indicator. It should also be noted that, in Japan, as the use of illegal drugs (e.g., methamphetamine or cocaine) is strictly punishable by law, and questions about one's experience with using illegal drugs, even if it is a past experience, may cause a certain amount of reporting bias.

Changes from 2007 to 2019 reflect a significant decrease in inhalants and a significant increase in marijuana. This result is similar to drug crime trends. For example, according to a White Paper on Crime published by the Ministry of Justice [11], the number of people arrested for violating the Poisonous and Deleterious Substances Control Act, which regulates the abuse of inhalants, continued to exceed 20,000 per year in the 1980s but began to decline in the 1990s, and there were only 177 arrests in 2019. Contrastingly, over 3,000 people were arrested for marijuana use in 2009, but the number has been subsequently declining. However, since 2014, the number has been rising again, and the number of arrests in 2019 was 4,570 (the highest number yet). Most of the arrests for the violation of the Cannabis Control Act involved young people in their 20s and 30s. The movement to legalize marijuana in other countries may have had a considerable influence on the increase in marijuana use in Japan. For example, according to a National Police Agency survey of arrests for violations of the Cannabis Control Act (the offense was simple possession), the most common response was "because there are countries in which marijuana is undergoing legalization" as a reason for ignoring the risk of marijuana [12]. It has been reported that there is a widespread affirmation of marijuana use among young people; especially those in their 20s and 30s, who state that "using marijuana is a personal choice" and "a little bit is okay" [7].

2. Implementation rate of SAPC in schools

According to the MEXT database, all school types had a high SAPC implementation rate (80%). Furthermore, our findings show that the SAPC implementation rate was

higher in junior high and high schools than in elementary schools. The higher percentage in junior high and high schools is probably because Japan's drug policy, the FF strategy, clearly states that "SAPC should be included in school health plans and held at least once a year in all junior high and high schools."

This proposed indicator would fall under "strengthen the prevention of substance abuse" in the section on Indicator 3.5. The database that served as the source of information is published on the Internet by MEXT, and the indicators are considered to be highly sustainable. However, there is a limitation in that only quantitative data, that is, the SAPC implementation rate can be ascertained. Therefore, it is not possible to ascertain the qualitative aspects of the topics covered in the SAPC and the types of addictive drugs handled. Furthermore, the style of education and message to the youth may differ depending on the job title of the outside instructor in charge of the SAPC. For example, if a police officer is leading the class, they are more likely to emphasize the criminality of illegal drugs. If a pharmacist is leading the class, they are more likely to emphasize the pharmacological and health effects of addictive drugs. The MEXT database also provides information on the job titles of the instructors who prepared the SAPC [8].

3. Composition ratios of principal drugs among persons with SUDs in psychiatric facilities

We propose the composition ratios of principal drugs related to SUDs other than alcohol in psychiatric facilities nationwide as one of the indicators. Limiting the indicator to cases with a history of substance use within the past year would be more reflective of the current status of the SUD epidemic. In Australia [13], the composition ratios of principal drugs have been used as an indicator for SDGs 3.5, and it is considered to be an indicator that can be compared internationally.

The highest proportion of cases in Japanese psychiatric facilities comprised methamphetamine users, which had a higher age range than that of other drug users. For example, patients in their 40s, 30s, and 20s accounted for the highest percentage of methamphetamine, hypnotics/anxiolytics, and OTC cases respectively [9]. Although methamphetamine cases remain the core patient population in Japanese psychiatry, this ratio may gradually decline in the future. Incidentally, the number of arrests for violations of the Stimulant Control Act has already declined; it rose to nearly 20,000 in 1997 but has since been on a downward trend, falling to below 10,000 in 2019 for the first time in nearly 40 years [11].

After methamphetamine, the second-most common type of abused substance is prescribed medicines such as hypnotics/anxiolytics. Most hypnotics/anxiolytics cases are cases of benzodiazepine abuse; additionally, etizolam, flunitrazepam, and zolpidem are frequently abused [9]. Among OTC cases, cough medicines containing dihydrocodeine and methyl ephedrine, cold medicines, and analgesics containing bromvalerylurea are frequently abused [9]. The use of these substances is not regulated, unlike methamphetamine, which is prohibited by law. Users with dependence on these substances have been reported to be younger, less likely to commit crimes, and more educated than methamphetamine users. While many methamphetamine users report the reason for initiation of methamphetamine as "seeking stimulation," "out of curiosity," "peer pressure," or "unable to refuse," many pharmaceutical drug users start abusing substances for self-medication, such as "alleviation of insomnia" or "alleviation of anxiety" [14].

Japan consumes more benzodiazepines than other countries, and the issue of polypharmacy, in which many drugs of the same type are prescribed, has been indicated as a reason for this [15]. New systems have been created to combat polypharmacy, such as medical fees that render it difficult for doctors to prescribe multiple drugs and long-term prescriptions, and dispensing fees that evaluate drug reductions based on pharmacists' prescription suggestions; however, the number of dependency cases is still on the rise. Regarding OTCs, pharmacies and drugstores have taken measures such as limiting the number of units sold and confirming the purpose of use for those who purchase large or frequent quantities; however, these measures have not led to a fundamental solution.

4. Number of patients with SUDs and medical facilities treating SUDs

We propose the number of patients receiving treatment for SUDs and the number of medical facilities treating SUDs referred to the NDB as proposed indicators that can provide a comprehensive image of the status of medical interventions in medical facilities across Japan. Because the NDB is used as the information source, the database is highly sustainable. However, published data are only available for the four years from 2014 to 2017, and data after 2018 have yet to be published; these data are expected to be published on the Internet in the future. Although SDG indicators should specify specific types of treatment interventions, such as pharmacological, psychosocial, rehabilitation, and aftercare services, the indicators we have proposed do not capture details regarding the types of treatment interventions except for psychosocial group therapy for relapse prevention, such as SMARPP, which has been covered by health insurance since 2016.

The number of inpatients with SUDs in psychiatric wards

and the number of outpatients who received treatment for substance use remained fairly constant from 2014 to 2016 but increased markedly from 2016 to 2017. The number of medical facilities treating patients with SUDs also increased significantly between 2016 and 2017. These increases should be evaluated as an increase in the coverage of treatment interventions rather than as an expansion of the problem of SUDs. This is because there has traditionally been a shortage of places to receive treatment interventions for SUDs; accordingly, the MHLW has been promoting the establishment of medical facilities across the country that will serve as bases for the treatment of addiction, including SUDs. Essentially, to calculate the coverage for treatment interventions, it is necessary to estimate the number of potential persons with SUDs in the community, but no such data are available publicly at this time. In the future, it will be necessary to estimate the potential number of patients with SUDs in the community and then calculate the coverage of treatment interventions.

V. Conclusion

The UN has not published specific definitions of the SDGs 3.5 indicators that concern the prevention and treatment of substance abuse or methods of calculation for these indicators. Additionally, in Japan, the number of potential persons with SUDs in the community has not been estimated, and it is not possible to directly calculate the coverage of treatment interventions. Therefore, we aimed to propose SDG 3.5 indicators for Japan based on the status of illicit drug use in the general population, SAPC implementation in schools, and treatment for SUDs in psychiatric facilities, using existing databases published in Japan. Based on the accumulation and sustainability of data from research projects and government statistics over time, we concluded that 1) the lifetime prevalence of illicit drug use in the general population, 2) SAPC implementation rate in schools, 3) composition ratios of principal drugs among persons with SUDs in psychiatric facilities, and 4) number of patients and medical facilities for SUDs are appropriate indicators for SDGs 3.5 in Japan.

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Disclosure statement

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＜総説＞

全国データに基づく薬物乱用分野における持続可能な開発目標（Sustainable Development Goals :SDGs）に対する指標の提案

嶋根卓也，猪浦智史，松本俊彦

国立精神・神経医療研究センター精神保健研究所薬物依存研究部

抄録

目的：本研究では，日本国内で公表されている既存データベースをもとに薬物乱用領域(SGDs3.5)の指標案を検討することを目的とした．

方法：指標案を作成するために，研究目的に合致した情報が含まれている，調査が継続的に行われている，インターネットで情報が公開されていることを選択基準とし，次のデータベースを選択した．薬物使用に関する全国住民調査（2007〜2019年），薬物乱用防止教室開催状況（2015〜2018年），全国の精神科医療施設における薬物関連精神疾患の実態調査（2012〜2020年）精神保健福祉資料（2014〜2017年）．

結果：2019年に実施された全国調査によれば，一般住民における違法薬物の生涯経験率は，大麻（1.81％），覚醒剤（0.39％），有機溶剤（1.09％），MDMA（0.30％），コカイン（0.34％），ヘロイン（0.13％），危険ドラッグ（0.31％），LSD（0.30％）であった．大麻の生涯経験率は，2007年から2019年にかけて有意に増加した一方で，有機溶剤の生涯経験率は，2007年から2019年にかけて有意に減少した．薬物乱用防止教室の開催率は，小学校（78.6％），中学校（90.6％），高等学校（85.8％）であった．精神科医療施設を受診する薬物使用障害患者の主たる薬物の比率は，覚醒剤（36.0％），睡眠薬・抗不安薬（29.5％），一般用医薬品（15.7％），多剤（7.3％），大麻（5.3％），有機溶剤（2.7％），非オピオイド鎮痛薬（0.7％），オピオイド鎮痛薬（0.5％），危険ドラッグ（0.3％）であった．覚醒剤症例の比率が最も高い傾向が続く一方で，睡眠薬・抗不安薬および一般用医薬品の症例が増加した．薬物使用障害の精神病床での入院患者数は，2014年（1,689名），2015年（1,437名），2016年（1,431名），2017年（2,416名）であった．薬物依存症外来患者数(1回以上)は，2014年（6,636名），2015年（6,321名），2016年（6,458名），2017年（10,746名）であった．

結論：薬物乱用・依存領域におけるデータベースの蓄積性や継続性を踏まえ，1)地域住民における違法薬物の生涯経験率，2)学校における薬物乱用防止教室の実施率，3)精神科医療施設における物質使用障害者の主たる薬物の構成比率，4)薬物依存症の患者数および診療機関数を日本のSGDs3.5指標とすることが妥当と結論付けた．

キーワード：持続可能な開発目標（Sustainable Development Goals, SDGs），物質使用障害，薬物乱用，全国データ，指標