Validation of Self-reported Opioid Agonist Treatment Among People Who Inject Drugs Using Prescription Dispensation Records

Zachary Bouck,[a,b] *Andrea C. Tricco,*[c,d] *Laura C. Rosella,*[a,e] *Vicki Ling,*[e] *Tara Gomes,*[e,f] *Mina Tadrous,*[f,g] *Matthew P. Fox,*[h,i] *Ayden I. Scheim,*[b,j] *and Dan Werb*[b,c,k]

Background: Studies of people who inject drugs (PWID) commonly use questionnaires to determine whether participants are currently, or have recently been, on opioid agonist treatment for opioid use disorder. However, these previously unvalidated self-reported treatment measures may be susceptible to inaccurate reporting.

Methods: We linked baseline questionnaire data from 521 PWID in the Ontario integrated Supervised Injection Services cohort in Toronto (November 2018–March 2020) with record-level health administrative data. We assessed the validity (sensitivity, specificity, positive and negative predictive value [PPV and NPV]) of self-reported recent (in the past 6 months) and current (as of interview) opioid agonist treatment with methadone or buprenorphine–naloxone relative to prescription dispensation records from a provincial narcotics monitoring system, considered the reference standard.

Results: For self-reported recent opioid agonist treatment, sensitivity was 78% (95% CI = 72, 83), specificity was 90% (95% CI = 86, 94), PPV was 90% (95% CI = 85, 93), and NPV was 79% (95% CI = 74, 84). For self-reported current opioid agonist treatment, sensitivity was 84% (95% CI = 78, 90), specificity was 87% (95% CI = 83, 91), PPV was 74% (95% CI = 67, 81), and NPV was 93% (95% CI = 89, 95).

Conclusions: Self-reported opioid agonist treatment measures were fairly accurate among PWID, with some exceptions. Inaccurate recall due to a lengthy lookback window may explain underreporting of recent treatment, whereas social desirability bias may have led to overreporting of current treatment. These validation data could be used in future studies of PWID to adjust for misclassification in similar self-reported treatment measures.

Keywords: Opioid agonist therapy, Opioid substitution treatment, Medication for opioid use disorder, Methadone, Buprenorphine–naloxone, Validation study

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Observational studies of people who inject drugs (PWID) often use questionnaires to capture participants' behaviors including their use of opioid agonist treatment (i.e., methadone or buprenorphine–naloxone) for opioid use disorder.[1–10] While pragmatic, self-reported opioid agonist treatment measures may be susceptible to inaccurate reporting that could bias estimates of treatment prevalence or associations involving treatment as an exposure, outcome, or covariate. A primary concern is that some PWID may feel pressured to misreport current (or recent) use of opioid agonist treatment; such overreporting might be especially prominent when treatment is a real or perceived requirement for participation

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From the [a]Epidemiology Division, Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada; [b]Centre on Drug Policy Evaluation, St. Michael's Hospital, Unity Health Toronto, Toronto, ON, Canada; [c]Institute for Health Policy, Management and Evaluation, University of Toronto, Toronto, ON, Canada; [d]Knowledge Translation Program, St. Michael's Hospital, Unity Health Toronto, Toronto, ON, Canada; [e]ICES, Toronto, ON, Canada; [f]Ontario Drug Policy Research Network, Toronto, ON, Canada; [g]Women's College Research Institute, Women's College Hospital, Toronto, ON, Canada; [h]Department of Epidemiology, Boston University School of Public Health, Boston, MA; [i]Department of Global Health, Boston University School of Public Health, Boston, MA; [j]Dornsife School of Public Health, Drexel University, Philadelphia, PA; and [k]Division of Infectious Diseases and Global Public Health, University of California San Diego, La Jolla, CA.

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Although data sharing agreements prohibit ICES from making the data set publicly available, access may be granted to those who meet prespecified criteria for confidential access, available at https://www.ices.on.ca/DAS. The full data set creation plan and underlying analytic code are available from the authors on request, understanding that the computer programs may rely on coding templates or macros that are unique to ICES and therefore either are inaccessible or may require modification.

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Correspondence: Zachary Bouck, MPH, Centre on Drug Policy Evaluation, St. Michael's Hospital, Unity Health Toronto, 209 Victoria St, Toronto, ON M5B 1T8, Canada. E-mail: zachary.bouck@mail.utoronto.ca.

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in paid research or study interviews occur in treatment settings.[11–14] For self-reported opioid agonist treatment measures with lengthy recall periods (e.g., "recent" treatment typically defined as any enrollment in the past 6 months),[1–4] an additional concern is misclassification due to imperfect memory, as some participants cannot accurately recount their treatment history over the inquired duration.[11] Despite these and other potential sources of inaccurate reporting (e.g., imprecise survey items or participants misunderstanding questions),[12] without validation data, the extent of misclassification in common self-reported opioid agonist treatment measures among PWID remains unknown.

Validating self-reported opioid agonist treatment measures necessitates linkage and comparison of participants' responses with presumably more accurate treatment data (e.g., prescription dispensation records),[11,12] which can be challenging due to logistical reasons (e.g., cannot recontact participants for consent to required linkages) or resource-based constraints (e.g., cannot access a comprehensive database for treatment dispensations). To overcome these issues, we leveraged a contemporary cohort of PWID in Toronto, Ontario, Canada, which uniquely has linked questionnaire and health administrative data for most participants.[15] Among these participants, we assessed the concurrent validity of self-reported recent and current opioid agonist treatment enrollment relative to provincial prescription dispensation records. We aimed to quantify the degree of misclassification in both self-reported treatment measures and thereby provide validation data that could be used in future studies of PWID to adjust for observed misclassification in similar measures.

METHODS

Validation Sample

We used data from the ongoing, prospective Ontario integrated Supervised Injection Services cohort study in Toronto (OiSIS-Toronto), which aims to evaluate the impact of supervised consumption services integrated within local community health agencies on health service utilization and clinical outcomes among PWID.[15] Between November 5, 2018, and March 19, 2020, OiSIS-Toronto recruited 701 participants through self-referral, snowball sampling, and community or street outreach.[15] At baseline, all participants were ≥18 years old, English-speaking, living in Toronto, reported injecting drugs in the past 6 months, provided informed consent, and completed an interviewer-administered questionnaire, which collected self-reported information on participants' socio-demographics, drug use behaviors, use of harm reduction services, and treatment for substance use disorders.[15] Interviews occurred at three community health agencies (one with on-site opioid agonist treatment) or the research team's offices, with participants receiving $30 CDN upon completion.[15]

OiSIS-Toronto participants were asked for additional consent to having their questionnaire data individually linked with record-level health administrative data at ICES, a nonprofit research institute authorized under Ontario's health information privacy law to collect and analyze health care and demographic data for health system evaluation and improvement.[15] Overall, 632 participants (90%) consented to administrative data linkage and provided ≥2 of the following identifiers: their Ontario Health Insurance Plan (OHIP; Ontario's universal publicly-funded health insurance plan) number, birthdate, sex, first name, surname, and postal code. After transferring their baseline questionnaire data to ICES, 521 or 82% of consenting participants were linked at ICES using their provided identifiers and analyzed as the validation sample (eFigure 1; http://links.lww.com/EDE/B877).[16–18] Specifically, we used the Registered Persons Database, which contains demographic information and vital statistics on anyone ever issued an OHIP card (nearly all 14.6 million Ontario residents); the Narcotics Monitoring System, which captures all prescriptions for monitored medications (including opioid agonist treatment) dispensed at community pharmacies in Ontario, irrespective of payer; and the Canadian Institute for Health Information Discharge Abstract Database, which captures administrative and clinical information on inpatient hospitalizations in Ontario.[18,19] We obtained ethics approval from Research Ethics Boards at Unity Health Toronto, the University of Toronto, and Toronto Public Health.

Self-reported Opioid Agonist Treatment Measures

Using select OiSIS-Toronto baseline questionnaire items (eAppendix 1; http://links.lww.com/EDE/B877), we derived two self-reported treatment measures using definitions consistent with previous PWID studies.[1–10] We defined recent opioid agonist treatment as a "yes" response to the question "In the last six months, have you been in a drug/alcohol treatment or detox program?" with subsequent selection of the "Methadone maintenance program" or "Suboxone [buprenorphine–naloxone] treatment" option(s) when prompted by the interviewer to specify their recent treatment(s).[1–4] Current opioid agonist treatment was defined similarly with an additional requirement: participants had to report being on methadone or Suboxone as of their baseline interview.[5–10]

Dispensation-based Opioid Agonist Treatment Measures

The Narcotics Monitoring System was used to derive reference standard measures, as the database provides a complete and accurate history of monitored prescription medications (including opioid agonists) dispensed in community pharmacies across Ontario.[19,20] First, dispensing community pharmacists are required under the *Narcotics Safety and Awareness Act, 2010,* to report dispensation data for monitored prescriptions to the Narcotics Monitoring System (e.g., patient, prescriber, pharmacist, and drug identifiers) and patients cannot opt out.[19,20] Second, the database conducts real-time reviews of submitted dispensations. If incomplete or

invalid information is detected, the submission is rejected and a corrected dispensation record must be resubmitted to process the transaction.[19,20] Although the validity of the Narcotics Monitoring System has not been quantified previously, the database receives dispensation data from pharmacies via the same province-wide network and involves similar adjudication processes as the Ontario Drug Benefit database, which has an estimated accuracy of >99% compared with manual chart abstraction.[21]

We defined recent opioid agonist treatment as ≥1 dispensation(s) in the Narcotics Monitoring System for methadone (liquid) or buprenorphine–naloxone (sublingual tablet) in the past 180 days including baseline (eTable 1; http://links.lww.com/EDE/B877).[22] In Ontario, methadone for opioid use disorder is dispensed almost exclusively in liquid formulation.[23,24] Although buprenorphine alone (i.e., not in combination with naloxone) can be prescribed for opioid use disorder, no participants were dispensed buprenorphine without naloxone during the 180-day lookback window (eTable 2; http://links.lww.com/EDE/B877). We defined current opioid agonist treatment similarly, albeit with a 30-day (versus 180-day) lookback window for eligible dispensations and an additional stipulation: the duration (i.e., days supplied) for opioid agonists filled on the participant's most recent dispensation date in the lookback window must extend up to and cover their baseline interview date (assuming doses were taken as prescribed).[25] In Ontario, opioid agonist treatment is mostly dispensed daily in community pharmacies for witnessed ingestion; however, stabilized patients who have been on treatment for a sufficient length of time (often several months) and clear routine urine screening may receive days' to weeks' worth of take-home doses.[26–28]

Statistical Analysis

Within the validation sample, we calculated the prevalence of recent and current opioid agonist treatment with 95% confidence intervals (CI) based on dispensations and self-report. To assess validity, we calculated sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) with 95% CI for each self-reported treatment measure relative to its dispensation-based reference standard. We evaluated the level of agreement beyond chance between self-report and dispensations using Cohen's kappa.[29]

To promote transportability of our results to other PWID studies with differing sample composition, we additionally estimated sensitivity and specificity stratified by the following baseline characteristics (self-reported, unless indicated otherwise): age group (18–34/35–44/45–54/≥55 years); sex (male or female); racial/ethnic minority (yes ["Indigenous" or "Racialized, non-Indigenous"] or no ["White, non-Indigenous"]); education (less than secondary, secondary graduate, or any postsecondary); on-site opioid agonist treatment at interview location (yes or no); recent frequency of injection drug use (daily, weekly, less than weekly, or none); recent frequency of nonmedical opioid use (daily, weekly, less than weekly, or none); recent incarceration (jailed, imprisoned, or detained minimally overnight; yes or no); recent homelessness or unstable housing (yes or no); and recent hospitalization (≥1 day as inpatient according to Discharge Abstract Database; yes or no).[12,30] Characteristics denoted as "recent" reflect behaviors or experiences over the past 6 months. Information on participant race and ethnicity were aggregated to an indicator of racial/ethnic minority status due to data transfer, governance, and privacy agreements with ICES. We performed analyses in SAS V9.4 (SAS Institute Inc.; Cary, NC).

RESULTS

Resembling the broader OiSIS-Toronto cohort (n = 701) and subset consenting to administrative data linkage (n = 632), the validation sample (n = 521) was primarily composed of participants who were male (68%), age 18–44 years (61%), and White, non-Indigenous (55%); most reported daily injection drug use (57%) and daily nonmedical opioid use (58%) over the past 6 months (Table 1).

Overall, 45% (233/521; 95% CI = 40, 49) of participants self-reported recent opioid agonist treatment and 35% (180/521; 95% CI = 30, 39) self-reported current opioid agonist treatment (Table 1). Conversely, according to dispensations, 52% (269/521; 95% CI = 47, 56) of participants recently received opioid agonist treatment and 31% (159/521; 95% CI = 27, 35) were currently on treatment. We observed moderate agreement between self-report and dispensations for recent (kappa = 0.68) and current (kappa = 0.69) opioid agonist treatment.

Over 75% of participants with a recent opioid agonist treatment dispensation received 1 days' supply (median [interquartile range; IQR], 1 [1–1]; maximum = 14) for their last dispensation, which occurred at baseline for >50% of recently treated participants (eTable 3; http://links.lww.com/EDE/B877). Among those on current opioid agonist treatment, 86% were on methadone and 100% had ≥2 dispensations in the past 30 days.

For self-reported recent opioid agonist treatment, sensitivity was 78% (209/269; 95% CI = 72, 83), specificity was 90% (228/252; 95% CI = 86, 94), PPV was 90% (209/233; 95% CI = 85, 93), and NPV was 79% (228/288; 95% CI = 74, 84) (Table 2). Although sensitivity and specificity of self-reported recent opioid agonist treatment did not vary substantially by most measured baseline characteristics, both values were highest in the oldest subgroup (Table 2). Participants who incorrectly self-reported no recent opioid agonist treatment had, on median, more time since their last dispensation (median [IQR], 18 [0–69] days) versus those who correctly self-reported recent opioid agonist treatment (median [IQR], 0 [0–4] days) (eTable 3; http://links.lww.com/EDE/B877).

For self-reported current opioid agonist treatment, sensitivity was 84% (134/159; 95% CI = 78, 90), specificity was 87% (316/362; 95% CI = 83, 91), PPV was 74% (134/180;

TABLE 1. Distribution of Self-reported Baseline Characteristics Among 701 People Who Inject Drugs From the Ontario Integrated Supervised Injection Services Study in Toronto (OiSIS-Toronto), Overall and Stratified by Consent to Administrative Data Linkage at ICES and Inclusion in Validation Sample—November 5, 2018, to March 19, 2020

		Consented to Administrative Data Linkage		In Validation Sample (i.e., Linked and Analyzed)	
	Overall	Yes	No	Yes	No
Baseline Characteristics	**(N = 701)**	**(n = 632)**	**(n = 69)**	**(n = 521)**	**(n = 111)**
Recent OAT, n (%)					
Yes	295 (42)	273 (43)	22 (32)	233 (45)	40 (36)
No	404 (58)	359 (57)	45 (65)	288 (55)	71 (64)
Missing	2 (<1)	0 (0)	2 (3)	0 (0)	0 (0)
Current OAT, n (%)					
Yes	222 (32)	202 (32)	20 (29)	180 (35)	22 (20)
No	477 (68)	430 (68)	47 (68)	341 (65)	89 (80)
Missing	2 (<1)	0 (0)	2 (3)	0 (0)	0 (0)
Age (y), mean ± SD	40.9 ± 10.8	41.2 ± 10.7	38.9 ± 11.4	41.1 ± 10.7[a]	NR
Age group (y), n (%)					
18–34	220 (31)	192 (30)	28 (41)	165 (32)[a]	NR
35–44	218 (31)	195 (31)	23 (33)	153 (29)[a]	NR
45–54	177 (25)	168 (27)	9 (13)	144 (28)[a]	NR
≥55	86 (12)	77 (12)	9 (13)	58 (11)[a]	NR
Missing	0 (0)	0 (0)	0 (0)	1 (<1)[a]	NR
Sex, n (%)					
Male	472 (67)	429 (68)	43 (62)	355 (68)	74 (67)
Female	226 (32)	201 (32)	25 (36)	165 (32)	36 (32)
Missing	3 (<1)	2 (<1)	1 (1)	1 (<1)	1 (<1)
Racial/ethnic minority[b], n (%)					
Yes	325 (46)	293 (46)	32 (46)	232 (45)	61 (55)
No	375 (54)	338 (54)	37 (54)	288 (55)	50 (45)
Missing	1 (<1)	1 (<1)	0 (0)	1 (<1)	0 (0)
Education, n (%)					
Less than secondary	280 (40)	259 (41)	21 (30)	206 (40)	53 (48)
Secondary graduate	190 (27)	165 (26)	25 (36)	136 (26)	29 (26)
Any postsecondary	230 (33)	207 (33)	23 (33)	178 (34)	29 (26)
Missing	1 (<1)	1 (<1)	0 (0)	1 (<1)	0 (0)
On-site OAT[c], n (%)					
Yes	340 (49)	311 (49)	29 (42)	262 (50)	49 (44)
No	361 (51)	321 (51)	40 (58)	259 (50)	62 (56)
Recent frequency of injection drug use, n (%)					
Daily	398 (57)	359 (57)	39 (57)	295 (57)	64 (58)
Weekly	199 (28)	179 (28)	20 (29)	146 (28)	33 (30)
Less than weekly	104 (15)	94 (15)	10 (14)	80 (15)	14 (13)
Recent frequency of nonmedical opioid use, n (%)					
Daily	407 (58)	371 (59)	36 (52)	302 (58)	69 (62)
Weekly	128 (18)	116 (18)	12 (17)	100 (19)	16 (14)
Less than weekly	83 (12)	76 (12)	7 (10)	64 (12)	12 (11)
None	82 (12)	69 (11)	13 (19)	55 (11)	14 (13)
Missing	1 (<1)	0 (0)	1 (1)	0 (0)	0 (0)
Recent incarceration, n (%)					
Yes	247 (35)	228 (36)	19 (28)	193 (37)	35 (32)
No	403 (58)	355 (56)	48 (70)	283 (54)	72 (65)
Missing	51 (7)	49 (8)	2 (3)	45 (9)	4 (4)
Recent homelessness or unstable housing, n (%)					
Yes	588 (84)	532 (84)	56 (81)	430 (83)	102 (92)
No	62 (9)	51 (8)	11 (16)	46 - 50 (9 - 10)[e]	≤5 (≤5)[d]
Missing	51 (7)	49 (8)	2 (3)	44 - 48 (8 - 9)[e]	≤5 (≤5)[d]

The sum of column percentages may not equal exactly 100% due to rounding. All variables qualified as "recent" measure behaviors and experiences over the last 6 months.

[a]Age based on birthdate recorded in the ICES Registered Persons Database, as self-reported birthdate was not provided by all 632 participants in dataset transferred to ICES for linkage; thus, age not available (or reported) among subset of consenting participants who were not linked (n = 111).

[b]"Yes" if participant indicated they were "Indigenous" or "Racialized, non-Indigenous"; "No" if participant indicated they were "White, non-Indigenous."

[c]At interview location.

[d]Exact counts (and corresponding column percentages) suppressed due to small cells (1 ≤ n ≤ 5) and possible risk of reidentification as per ICES requirements.

[e]Values presented as ranges to prevent back-calculation of small cell(s) as per ICES requirements.

NR indicates not reported; OAT, opioid agonist treatment.

TABLE 2. Sensitivity and Specificity of Self-reported Recent Opioid Agonist Treatment Relative to Prescription Dispensation Records,[a] Overall and Stratified by Select Baseline Characteristics, Among 521 People Who Inject Drugs From the Ontario Integrated Supervised Injection Services study in Toronto (OiSIS-Toronto)—November 5, 2018, to March 19, 2020

Baseline Characteristics	n[a] (%)	Sensitivity[b] of Recent Self-reported OAT, % (95% CI)	n[a] (%)	Specificity[c] of Recent Self-reported OAT, % (95% CI)
Overall	269 (–)	78 (72, 83)	252 (–)	90 (86, 94)
Age[d] (y)				
18–34	91 (34)	70 (60, 79)	74 (29)	85 (75, 92)
35–44	83 (31)	84 (75, 91)	70 (28)	86 (75, 93)
45–54	76 (28)	76 (65, 85)	68 (27)	96 (88, 99)
≥55	19 (7)	89 (67, 99)	39 (15)	100 (91, 100)
Missing	0 (0)	–	1 (<1)	NR
Sex				
Male	174 (65)	78 (71, 84)	181 (72)	91 (86, 95)
Female	95 (35)	77 (67, 85)	70 (28)	89 (79, 95)
Missing	0 (0)	–	1 (<1)	NR
Racial/ethnic minority[e]				
Yes	98 (36)	77 (67, 85)	134 (53)	90 (84, 95)
No	170 (63)	79 (72, 85)	118 (47)	91 (84, 95)
Missing	1 (<1)	NR	0 (0)	–
Education				
Less than secondary	105 (39)	79 (70, 86)	101 (40)	90 (83, 95)
Secondary graduate	73 (27)	74 (62, 84)	63 (50)	89 (78, 95)
Any postsecondary	91 (34)	79 (69, 87)	87 (35)	92 (84, 97)
Missing	0 (0)	–	1 (<1)	NR
On-site OAT[f]				
Yes	146 (54)	77 (69, 83)	116 (46)	89 (82, 94)
No	123 (46)	79 (71, 86)	136 (54)	92 (86, 96)
Recent frequency of injection drug use				
Daily	172 (64)	76 (68, 82)	123 (49)	85 (77, 90)
Weekly	66 (25)	85 (74, 92)	80 (32)	94 (86, 98)
Less than weekly	31 (12)	74 (55, 88)	49 (19)	100 (93, 100)
Recent frequency of nonmedical opioid use				
Daily	190 (71)	76 (70, 82)	112 (44)	82 (74, 89)
Weekly	51 (19)	80 (67, 90)	49 (19)	94 (83, 99)
Less than weekly	19 (7)	84 (60, 97)	45 (18)	98 (88, 100)
None	9 (3)	78 (40, 97)	46 (18)	100 (92,100)
Recent incarceration				
Yes	110 (41)	85 (76, 91)	83 (33)	89 (80, 95)
No	131 (49)	72 (63, 79)	152 (60)	93 (88, 97)
Missing	28 (10)	79 (59, 92)	17 (7)	71 (44, 90)
Recent homelessness or unstable housing				
Yes	220 (82)	78 (72, 83)	210 (83)	91 (86, 94)
No	21 (8)	71 (48, 89)	25 (10)	100 (86, 100)
Missing	28 (10)	79 (59, 92)	17 (7)	71 (44, 90)
Recent hospitalization				
Yes	49 (18)	80 (66, 90)	39 (15)	97 (87, 100)
No	220 (82)	77 (71, 83)	213 (85)	89 (84, 93)

[a]Based on prescription dispensation records from the Narcotics Monitoring System.

[b]Sensitivity calculated as the proportion of participants with a recent (i.e., past 6 month) opioid agonist dispensation record that self-reported being on opioid agonist treatment in the past 6 months.

[c]Specificity calculated as the proportion of participants without a recent (i.e., past 6 month) opioid agonist dispensation record that self-reported not being on opioid agonist treatment in the past 6 months.

[d]Age based on birthdate recorded in the ICES Registered Persons Database.

[e]"Yes" if participant indicated they were "Indigenous" or "Racialized, non-Indigenous"; "No" if participant indicated they were "White, non-Indigenous."

[f]At interview location.

CI indicates confidence interval (constructed using Clopper-Pearson exact method; upper limit truncated to 100% where necessary); NR, not reported (due to sparse data; i.e., both joint cells np and $n(1-p) < 5$); OAT, opioid agonist treatment.

95% CI = 67, 81), and NPV was 93% (316/341; 95% CI = 89, 95) (Table 3). Sensitivity and specificity of self-reported current opioid agonist treatment were largely consistent across measured subgroups, although specificity was highest among participants reporting less than weekly or no nonmedical opioid use in the past 6 months (Table 3).

DISCUSSION

In linking participant questionnaires to comprehensive dispensation records from a prescription monitoring program, we found that self-reporting of recent and current opioid agonist treatment is generally of high validity among PWID. Despite moderate agreement with dispensations, self-report underestimated recent opioid agonist treatment prevalence by 7% and overestimated current opioid agonist treatment prevalence by 4%.

Although to our knowledge, no previous studies have evaluated the validity of self-reported recent or current opioid agonist treatment among PWID, Langendam et al. found self-reported current methadone dosage (ordinal variable; range = 0 to >80 mg/day) had almost perfect agreement (kappa = 0.94) with a centralized methadone treatment register in Amsterdam. Unlike our study, the authors analyzed participants' responses at multiple visits over time (on average, 4 visits/participant; not exclusively PWID) with most visits (84%) involving a participant currently prescribed methadone, which likely contributed to higher agreement.[12]

Several possible explanations exist for the inflated number of false negatives leading to overall underreporting of recent opioid agonist treatment. First, the lengthy 6-month recall period may have disproportionately impacted reporting accuracy among participants whose last opioid agonist treatment dispensation was weeks to months before baseline. Supporting this claim, false negatives had substantially more time elapsed since their last methadone or buprenorphine–naloxone dispensation (18 days longer on median) versus true positives. Furthermore, prior evidence suggests that when PWID are asked to recall treatment-related behaviors over an extended period (e.g., past 4–6 months), they may instead report over a shorter-than-queried duration (e.g., past month).[12] Second, since treatment questions begin toward the end of the OiSIS-Toronto questionnaire, some participants may have intentionally misreported no recent opioid agonist treatment to avoid anticipated follow-up questions and accelerate interview completion. Moving treatment-related questions earlier in surveys might therefore increase sensitivity of self-reported recent and current treatment measures. Recent opioid agonist treatment false positives, while less frequent than false negatives, are unlikely to be due to gaps in the reference standard—the Narcotics Monitoring System does not capture treatment dispensations for inpatients or incarcerated individuals—as specificity was not appreciably lower among recently hospitalized or incarcerated participants.[19]

In contrast, accuracy of self-reported current opioid agonist treatment was primarily compromised by false positives, which may be owed to social desirability bias or perceived negative consequences of reporting nontreatment (e.g., unable to participate further in paid research).[11–14] However, we did not find increased overreporting (lower specificity) among participants whose interview location offered on-site opioid agonist treatment. Further, all OiSIS-Toronto participants were paid for their time, treatment was not an explicit (or implied) requirement for participation, and interviews were not conducted in formal treatment settings or by clinical staff.[15] Qualitative interviews could assist in uncovering participants' reasons for overreporting current opioid agonist treatment.

LIMITATIONS

Our dispensation-based reference standards are imperfect measures of use of opioid agonist treatment.[31] Although, as opioid agonist treatment medications are primarily dispensed daily for witnessed ingestion in Ontario, dispensations often correspond with use.[26,27] Despite observed similarities between the validation sample and full OiSIS-Toronto cohort across measured characteristics, the sample likely differs from the broader cohort in unmeasured characteristics that may influence the accuracy of reporting opioid agonist treatment; furthermore, our findings likely do not generalize to the target population (adult PWID living in Toronto) given the OiSIS-Toronto cohort was recruited using convenience sampling, which prioritized enrollment of supervised consumption site clients.[15] While we did observe some variability in sensitivity and specificity estimates across measured subgroups, which might suggest differential self-reported opioid agonist treatment misclassification, the more extreme estimates may be owed to small subgroup denominators.[32,33] Finally, as the "yes" racial/ethnic minority group combines several heterogenous racial and ethnic groups, we recognize that the validation data provided for this group is likely of limited value for future applications.

CONCLUSIONS

Our findings suggest that PWID validly report opioid agonist treatment enrollment, with some exceptions. Observed inaccuracies are unlikely to dissuade continued use of self-reported treatment data (nor should they) but may introduce bias into estimates of prevalence, effects, or uptake of opioid agonist treatment. Therefore, we recommend that future studies of PWID using comparable self-reported treatment measures apply these data to adjust for misclassification.

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TABLE 3. Sensitivity and Specificity of Self-reported Current Opioid Agonist Treatment Relative to Prescription Dispensation Records[a], Overall and Stratified by Select Baseline Characteristics, Among 521 People Who Inject Drugs From the Ontario Integrated Supervised Injection Services Study in Toronto (OiSIS-Toronto)—November 5, 2018, to March 19, 2020

Baseline Characteristics	n[a] (%)	Sensitivity[b] of Current Self-Reported OAT, % (95% CI)	n[a] (%)	Specificity[c] of Current Self-Reported OAT, % (95% CI)
Overall	159 (–)	84 (78, 90)	362 (–)	87 (83, 91)
Age[d] (y)				
18–34	37 (23)	92 (78, 98)	128 (35)	82 (74, 88)
35–44	51 (32)	84 (71, 93)	102 (28)	87 (79, 93)
45–54	56 (35)	79 (66, 88)	88 (24)	93 (86, 97)
≥55	15 (9)	87 (60, 98)	43 (12)	91 (78, 97)
Missing	0 (0)	–	1 (<1)	NR
Sex				
Male	112 (70)	81 (73, 88)	243 (67)	88 (83, 92)
Female	47 (30)	91 (80, 98)	118 (33)	86 (79, 92)
Missing	0 (0)	–	1 (<1)	NR
Racial/ethnic minority[e]				
Yes	54 (34)	80 (66, 89)	178 (49)	88 (83, 93)
No	104 (65)	88 (80, 93)	184 (51)	86 (81, 91)
Missing	1 (1)	NR	0 (0)	–
Education				
Less than secondary	61 (38)	82 (70, 91)	145 (40)	86 (80, 91)
Secondary graduate	40 (25)	85 (70, 94)	96 (26)	85 (77, 92)
Any postsecondary	58 (37)	86 (75, 94)	120 (33)	90 (83, 95)
Missing	0 (0)	–	1 (<1)	NR
On-site OAT[f]				
Yes	82 (52)	83 (73, 90)	180 (50)	86 (80, 91)
No	77 (48)	86 (76, 93)	182 (50)	88 (83, 93)
Recent frequency of injection drug use				
Daily	86 (54)	85 (76, 92)	209 (58)	82 (76, 87)
Weekly	47 (30)	89 (77, 96)	99 (27)	93 (86, 97)
Less than weekly	26 (16)	73 (52, 88)	54 (15)	96 (87, 100)
Recent frequency of nonmedical opioid use				
Daily	91 (58)	85 (76, 91)	211 (58)	82 (76, 87)
Weekly	43 (27)	86 (72, 95)	57 (16)	91 (81, 97)
Less than weekly	19 (12)	84 (60, 97)	45 (12)	100 (92, 100)
None	6 (4)	NR	49 (14)	96 (86, 100)
Recent incarceration				
Yes	63 (40)	94 (85, 98)	130 (36)	83 (76, 89)
No	82 (52)	74 (64, 83)	201 (56)	91 (86, 95)
Missing	14 (9)	100 (100, 100)	31 (9)	81 (63, 93)
Recent homelessness or unstable housing				
Yes	129 (81)	85 (77, 90)	301 (83)	87 (83, 91)
No	16 (10)	69 (41, 89)	30 (8)	93 (78, 99)
Missing	14 (9)	100 (100, 100)	31 (9)	81 (63, 93)
Recent hospitalization				
Yes	23 (14)	83 (61, 95)	65 (18)	82 (70, 90)
No	136 (86)	85 (77, 90)	297 (82)	89 (84, 92)

[a]Based on prescription dispensation records from the Narcotics Monitoring System.

[b]Sensitivity calculated as the proportion of participants with an opioid agonist dispensation in the past 30 days with days supplied from last dispensation covering up to their baseline interview date that self-reported being on current opioid agonist treatment.

[c]Specificity calculated as the proportion of participants without an opioid agonist dispensation in the past 30 days with days supplied from last dispensation covering up to their baseline interview date that self-reported not being on current opioid agonist treatment.

[d]Age based on birthdate recorded in the ICES Registered Persons Database.

[e]"Yes" if participant indicated they were "Indigenous" or "Racialized, non-Indigenous"; "No" if participant indicated they were "White, non-Indigenous".

[f]At interview location.

CI indicates confidence interval (constructed using Clopper-Pearson exact method; upper limit truncated to 100% where necessary); NR, not reported (due to sparse data; i.e., both joint cells np and $n(1\text{-}p) < 5$); OAT, opioid agonist treatment.

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