RESTORING TRUST

A Comprehensive Audit of Research Integrity at the

British Columbia Centre on Substance Use (2008–2025)

Ryan M. Moyer

Former PhD Candidate, Interdisciplinary Studies Graduate Program

University of British Columbia

2026

Correspondence: ryanmoy@student.ubc.ca

Conflict of Interest Statement

This audit was conducted independently by the author outside of his previous capacity as a doctoral student at the University of British Columbia. The author acknowledges a previous affiliation with UBC and the British Columbia Centre on Substance Use (BCCSU). A brief financial relationship with the BCCSU was severed after the author began submitting concerns to UBC related to research ethics, integrity and conduct. This former affiliation creates a potential perceived conflict of interest that is fully disclosed. The analysis, findings and conclusions in this report are the author's own and have not been approved or endorsed by UBC.

The concerns documented in this report were formally communicated to UBC Senior Leadership in 2025. No meaningful institutional response was received. The absence of institutional engagement strengthens the author's obligation to place these findings in the public record.

The author discloses that they experienced institutional retaliation following the submission of research integrity concerns.

Disclosure Statement

This document was drafted with assistance from AI writing tools (Claude, Anthropic). All content was reviewed, revised and approved by the author, who takes full responsibility for the accuracy, integrity and conclusions of this work. The methodology, conceptual framework and evidence base are the author's own.

The author acknowledges methodological limitations in this report; however, given the findings' implications for public health and higher education reform, immediate dissemination was judged warranted. A formal, comprehensive, pre-registered study will follow.

Abstract

Background:

The reproducibility crisis has emerged as a defining challenge in contemporary science, with mounting evidence of questionable research practices across disciplines. Substance use research, which directly informs life-and-death policy decisions for marginalized populations, remains particularly vulnerable to analytical flexibility that can compromise evidence quality. This study distinguishes researcher degrees of freedom (RDF) from analytical flexibility and operationalizes the latter through observable proxies to assess the methodological rigour of quantitative, regression-based studies conducted by the British Columbia Centre on Substance Use (BCCSU) between 2008 and 2025.

Methods:

We systematically reviewed 85 peer-reviewed publications affiliated with BCCSU researchers employing cross-sectional data from major cohorts (VIDUS, ACCESS, ARYS). Studies were assessed for pre-registration status, variable selection methods, transformation justifications, sampling timeframe rationale, missing data handling, and data/code transparency. Structured metadata extraction enabled quantification of researcher degrees of freedom across the institutional portfolio.

Results:

Zero studies (0%) were pre-registered on public platforms. Fifty-one publications (58%) relied on automated stepwise selection methods (AIC/QIC minimization) rather than theory-driven covariate specification (3.4%). Critical methodological decisions lacked transparency: 36% of studies employed unjustified variable transformations of drug use measures; 34% did not report missing data handling approaches; 66% provided no justification for sampling start dates; 69% provided no justification for sampling end dates. These researcher degrees of freedom produced pervasive analytic heterogeneity that rendered the evidence base largely unsynthesizable.

Conclusions:

The findings reveal systemic patterns consistent with institutional incentive structures prioritizing publication quantity over methodological rigour. Widespread reliance on data-driven model selection creates a high-risk environment for p-hacking and other questionable research practices. Comprehensive reform via pre-registration mandates, standardized reporting templates, and annual integrity metrics is required to restore public trust and produce policy-actionable science capable of serving vulnerable populations.

Keywords: meta-research, analytic flexibility, researcher degrees of freedom, p-hacking, reproducibility, pre-registration, open science, institutional reform, substance use epidemiology

Part I: Introduction and Context

1.1 The Research Integrity Crisis

The reproducibility crisis in biomedical and social science research has prompted sustained scrutiny of the methodological practices underlying published findings. A central concern is the exploitation of researcher degrees of freedom (RDF)—the set of plausible analytic decisions available during study design and analysis—to obtain and report statistically significant results. Collectively, these practices inflate effect sizes, generate false positives, and produce bodies of literature that resist synthesis, with direct consequences for policy and public health.

'Publish or Perish' (POP) culture in academia rewards high-volume publication records through funding, career security, and advancement. These pressures can produce research systems that prioritize publication quantity over quality, incentivizing what are known as 'questionable research practices' (QRPs). QRPs straddle the line between punishable misconduct—such as fabrication or falsification—and more subtle manipulations, including selective reporting of outcomes, hypothesizing after results are known, withholding contrary evidence and the exploitation of researcher degrees of freedom.

Through this exploitation, researchers make subtle methodological decisions during analysis and publication that can substantially alter results, often in the direction of statistically significant findings. The cumulative effect is a corpus characterized by false positives, inflated effect sizes, and an evidence base that cannot be meaningfully synthesized to support policy, programs, or service development. The landmark 2015 Open Science Collaboration study found that only 36% of psychological findings replicated when independently retested; in cancer biology, only 20-25% of landmark findings held up.

1.2 The Human Stakes: Fifteen Thousand Deaths and a Broken Evidence Base

British Columbia declared a public health emergency in April 2016. Since then, more than 15,000 British Columbians have died from drug toxicity. The people dying are overwhelmingly poor, disproportionately Indigenous and frequently unhoused. They are among the most structurally marginalized Canadians.

The research institution that has served as the primary scientific voice on this crisis in British Columbia is the BCCSU, whose publications have informed provincial harm reduction strategy and whose researchers testify at parliamentary committees. The research produced by the BCCSU has informed life-or-death decisions for the past

decade. The reliability of this evidence base is not an academic question. It is a public health imperative.

For the marginalized populations involved in BCCSU research, compromised research quality is more than an academic concern—it is an ethical breach. Participants share sensitive data with the expectation of improving community outcomes. When analytical flexibility produces incomparable or misleading evidence, it undermines the moral authority of evidence-based advocacy and misdirects resources.

1.3 Where the Data Came From and What Was Owed

The three cohorts at the centre of this audit are the Vancouver Injection Drug Users Study (VIDUS), the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), and the At-Risk Youth Study (ARYS). VIDUS and ACCESS have been operational since 1996, and ARYS since 2005. The study protocols of all three cohorts have been harmonized to enable pooled analysis across data collection sites.

Those who have joined these research studies are people experiencing homelessness, active addiction, criminalization, poverty, and, in many cases, Indigenous dispossession. They have provided blood and urine samples and disclosed information about drug use, sexual behaviour, housing status, income sources, and criminal justice involvement—with the understanding that research would contribute to improved personal and community conditions. Each participant receives approximately $80 annually.

Research with marginalized populations involves substantial participant burden. When research quality is compromised, this represents a breach of implicit trust and a failure to honour participants' contributions.

1.4 How Academic Incentives Produce the Wrong Outcomes

Academic researchers advance their careers by publishing papers. The more papers, the better. Papers published in high-impact journals are more valuable than papers in lower-impact journals. Papers with statistically significant, surprising, or clean findings are more publishable than papers with null results or ambiguous findings. Journals reject null results at far higher rates than positive findings.

Research grants—the funding that sustains careers, hires graduate students, and pays for data collection—are awarded based on publication records. More publications mean more grants. More grants mean more data, more graduate students, and more publications. The cycle is self-reinforcing and points in one direction: produce as many publishable findings as possible.

What this incentive structure does not reward is building a coherent, synthesizable, methodologically standardized evidence base. A researcher who standardizes covariate sets across all studies, pre-registers every analysis, and reports null findings with the same prominence as positive ones will produce fewer publishable papers per dataset. The institution that employs them will receive fewer grant dollars. The system fails to reward researchers for quality research. This is the institutional paradox documented throughout this report.

1.5 A Student Discovers Researcher Degrees of Freedom

This audit began with a concrete research problem. In late 2024, the author—then a PhD student at UBC—attempted to synthesize existing evidence on cannabis use prevalence among people who use drugs in Vancouver. The synthesis proved impossible. The ways in which cannabis use was measured were inconsistent, and so were the sampling periods.

Three studies from the same institutional portfolio, drawing from overlapping populations during substantially overlapping time periods, produced findings that could not be compared: Mok et al. (2021) reported 66% of PWUD used cannabis in the past six months; Lake (2020) reported 48% reported daily cannabis use; and Hayashi et al. (2018) found 28% tested positive via urine screening. These studies used different operational definitions, different reference timeframes, and different assessment methods. No synthesis was possible.

When this synthesis problem was raised formally in a collaborative document review in January 2025, the institutional response was instructive. A BCCSU-affiliated reviewer responded that the reporting periods were 'almost the same so not sure this is a significant limitation,' recommended focusing on the studies that most vividly demonstrated the problem rather than addressing their mutual incomparability, and redirected attention toward a substantive scientific question rather than the structural methodological concern.

This response led the author to recognize that the exploitation of researcher degrees of freedom at the BCCSU may not be an unintentional deficit, but rather a central feature of a research program focused on high-volume publishing. An independent audit was subsequently undertaken.

1.6 Institutional Non-Response: The August 2025 Submission and Subsequent Silence

The concerns documented in this report were not developed in isolation and have not been kept private. In August 2025, the author formally submitted a report titled

'Restoring Trust: A Mandate for Methodological Reform at the BCCSU' to UBC Senior Leadership, including a summary of audit findings and a request for discussion.

An institution that receives a formal, documented, specific report of systemic methodological concerns from a researcher within its own graduate program—addressed to senior leadership—and responds with sustained silence has made a choice. That choice is documented here and is relevant to any assessment of whether internal remediation is possible or whether external oversight is required. As of March 2026, no meaningful institutional response has been received.

1.7 The Funding Accountability Question

The BCCSU's publication portfolio represents one of the most continuously and generously funded public health research programs in Canadian history. The primary domestic funder is the Canadian Institutes of Health Research (CIHR). CIHR's Tri-Agency Framework on Responsible Conduct of Research—to which all funded researchers are contractually bound—includes explicit provisions on research transparency, data sharing and accurate reporting of findings.

In addition, the BCCSU portfolio has received substantial funding from the National Institutes of Health (NIH) through the National Institute on Drug Abuse (NIDA). NIH funding carries binding research integrity obligations administered by the US Office of Research Integrity (ORI), which has jurisdiction over research misconduct in connection with NIH-funded activities regardless of the country in which the research was conducted. Across 85 studies in this corpus, analytical code was publicly available for zero studies and data sharing was documented in zero studies.

The practices documented in this audit represent potential non-compliance with conditions attached to public funding from agencies in two countries, both of which have binding research integrity and data sharing requirements that warrant formal review.

1.8 Study Objectives

The specific objectives of this audit were to:

1. Quantify transparency practices including pre-registration status across the institutional research portfolio;
2. Assess consistency in analytical approaches by examining variable selection methods, transformation procedures, covariate inclusion patterns, and statistical modelling decisions across studies with similar research questions;
3. Identify researcher degrees of freedom that create opportunities for analytical flexibility and potential p-hacking;

4. Evaluate synthesizability by determining whether methodological heterogeneity prevents meaningful integration of findings across studies; and
5. Propose institutional reforms grounded in open science principles that could enhance research integrity and public trust.

This audit represents a systematic institutional assessment motivated by commitment to scientific integrity and the welfare of vulnerable populations who depend on high-quality research. The findings and recommendations are presented in the spirit of constructive criticism aimed at meaningful reform.

Part II: Methods

2.0 Conceptual Framework

This study distinguishes between researcher degrees of freedom (RDF) and analytical flexibility—two closely related but conceptually distinct constructs in meta-research. RDF refers to the set of plausible analytic decisions available to researchers during study design and analysis, including variable operationalization, covariate selection, and time window specification. Analytical flexibility, in contrast, refers to the extent to which this decision space is actively explored or exploited in practice.

Because unpublished analytic decisions are not directly observable, this study operationalizes analytical flexibility using observable proxies. Specifically, we assess: (1) the structure of the analytic decision space (RDF), as indicated by the number and variety of plausible choices documented across the corpus; and (2) empirical indicators of flexibility use, including multiplicity of outcomes, variable transformations, model specifications, and subgroup or sensitivity analyses. Together, these measures allow indirect estimation of analytical flexibility and its implications for transparency, reproducibility, and statistical inference.

2.1 Study Design and Scope

This meta-research study employed a rapid review audit design to assess methodological practices and transparency across the BCCSU institutional research portfolio. The audit examined peer-reviewed publications from 2008 through 2025, providing nearly two decades of data to identify temporal trends and persistent patterns in research practices. The scope focused specifically on quantitative, regression-based observational studies using cross-sectional data, as these study designs present substantial researcher degrees of freedom in analytical decision-making.

A rapid review methodology was selected for multiple reasons: the urgency of insight into methodological choices informing life-and-death harm reduction policy; the emergent robustness of evidence clarifying trends in research transparency; and scope management and resource constraints. Evidence gathering was concluded based on pattern saturation across the corpus, consistent with best practices for producing defensible and timely evidence synthesis in high-stakes policy scenarios.

2.2 Inclusion/Exclusion Criteria

Inclusion Criteria:

- Affiliated with BCCSU researchers as primary or senior authors

- Employed quantitative regression modelling (e.g., logistic regression, Cox proportional hazards, generalized estimating equations)
- Utilized cross-sectional data from one or more of three major cohorts: VIDUS, ACCESS, or ARYS
- Focused on drug use, substance use patterns, or related health and social outcomes
- Published in peer-reviewed journals between January 2008 and September 2025

Exclusion Criteria:

- Qualitative studies or mixed-methods studies without quantitative regression analyses
- Systematic reviews, meta-analyses, or theoretical papers without primary data analysis
- Studies using exclusively longitudinal analytical methods without cross-sectional components
- Conference abstracts, dissertations, or unpublished manuscripts

2.3 Data Sources and Search Strategy

Publications were identified through multiple complementary strategies:

6. Database Searches: PubMed and Google Scholar were searched using combinations of author names (principal BCCSU investigators), cohort names (VIDUS, ACCESS, ARYS), and keywords (substance use, injection drug use, Vancouver, harm reduction).
7. Institutional Sources: The BCCSU website publication listings and researcher profiles were reviewed to identify institutional affiliations.
8. Citation Chaining: Reference lists of identified publications were examined to locate additional relevant studies.

The search was conducted between June and August 2025. Eighty-eight percent of the corpus (75 of 85 studies) was published after 2015, by which time pre-registration infrastructure was fully available and increasingly expected in health research.

2.4 Extraction Framework and Reliability Checks

Data extraction employed a structured codebook developed based on established frameworks for assessing researcher degrees of freedom. Wicherts and colleagues'

(2016) 34-item checklist of questionable research practices informed the extraction categories, which were adapted for observational epidemiological research.

Extracted variables included:

- Study characteristics: publication year, sample size, cohort(s) utilized, primary outcome variable(s), number of covariates, statistical modelling approach
- Transparency indicators: pre-registration status (searched on OSF, AsPredicted, ClinicalTrials.gov), data and code availability, conflict of interest and funding disclosures
- Analytical decision points: covariate selection method and justification, drug variable transformations and justification, missing data handling and reporting, sampling period dates and justification, p-value threshold for variable inclusion

AI-assisted extraction was employed for structured data fields; all prompts and procedures are documented and available upon request. AI tool used: Claude (claude-sonnet-4-6, Anthropic, 2026). A random 20% sample (n=17) of publications underwent independent double-extraction to assess inter-rater reliability.

2.5 Analytical Approach

The analysis employed primarily descriptive statistics appropriate for meta-research questions, including frequencies and percentages for categorical variables, medians and interquartile ranges for continuous variables, and cross-tabulations to examine relationships between study characteristics and methodological choices.

For each major outcome category (overdose, healthcare access, drug use patterns), covariates included across studies were catalogued to quantify heterogeneity. Drug variable definitions and transformations were systematically compared across studies examining similar exposures. To quantify covariate heterogeneity, Jaccard similarity analysis was applied to baseline model covariate sets across the 85-study corpus. Prior to analysis, covariate labels were normalized to resolve terminological variation: near-synonyms, typographic errors, and parsing artefacts were collapsed into canonical terms.

Part III: Results — Methodological Audit

3.1 Corpus Characteristics

The audit identified 85 peer-reviewed publications meeting inclusion criteria, published between 2008 and 2025. Sample sizes ranged from 178 to 3,258 participants (median = 846, IQR = 508-1,284). The average study included 17 variables in baseline regression models (range: 4-42).

Distribution by Cohort:

- VIDUS only: 38 studies (43%)
- ACCESS only: 12 studies (14%)
- ARYS only: 18 studies (20%)
- Multiple cohorts combined: 20 studies (23%)

Statistical Modelling Approaches:

- Generalized Estimating Equations (GEE): 52 studies (59%)
- Logistic regression: 24 studies (27%)
- Cox proportional hazards: 8 studies (9%)
- Other methods: 4 studies (5%)

Temporal Distribution:

- 2008-2014: 28 studies (32%)
- 2015-2020: 38 studies (43%)
- 2021-2025: 22 studies (25%)

Primary Outcome Categories:

- Drug use behaviours and patterns: 23 studies (26%)
- Non-fatal overdose and overdose risks: 18 studies (20%)
- Healthcare access and service utilization: 15 studies (17%)
- HIV/HCV acquisition and risk factors: 14 studies (16%)
- Incarceration and criminal justice involvement: 10 studies (11%)
- Other outcomes: 8 studies (9%)

3.2 Principal Investigator Concentration

The methodological practices documented across the corpus are not distributed randomly. Five senior authors account for 87% of all 85 publications, as shown in Table 1. This concentration is analytically significant: it indicates that the practices documented in this audit—automated stepwise selection, unjustified variable transformations, unstandardized measurement windows—represent laboratory-level methodological norms that propagated across many trainees and publications, rather than independent convergence on similar practices across unrelated research groups.

Reform efforts that do not engage with the laboratory cultures generating these norms are unlikely to produce durable change. Conversely, this concentration represents a structural opportunity: a methodological workshop with the five most prolific senior authors would reach the vast majority of the institutional portfolio.

Table 1: Senior Authorship Concentration (N=85 publications)

Senior Author (Last Author)	Studies (n)	% of Corpus	Cumulative %
Thomas Kerr	27	32%	32%
M-J Milloy	15	18%	50%
Kora DeBeck	14	16%	66%
Kanna Hayashi	13	15%	81%
Evan Wood	5	6%	87%
All others combined	11	13%	100%

3.3 Transparency Indicators: Pre-Registration and Open Science Practices

The complete absence of pre-registration represents the audit's most critical finding. Not a single study among 85 publications indicated pre-registration in the manuscript—not on OSF, AsPredicted, ClinicalTrials.gov or any other public repository.

Pre-registration means publicly stating, before analyzing any data, exactly what is planned to be tested, how it will be tested and what will be reported. Without pre-registration, a researcher who runs 540 possible analyses and reports the one that crossed the statistical threshold looks identical to a researcher who ran one analysis and reported its result. There is no public record of which it was. The complete absence of pre-registration from every single study in this corpus—including studies published in

2024 and 2025, when pre-registration has been standard in clinical research for over a decade—is not a historical artefact. It is a sustained institutional choice.

Table 2: Transparency and Open Science Practices (N=85 publications)

Indicator	n (%)
Pre-Registration	
Pre-registered on public platform	0 (0%)
Not pre-registered	85 (100%)

3.4 Model Selection Methods

Automated stepwise selection methods dominated, employed by 51 of 85 studies (58%). These procedures use statistical algorithms to determine which covariates remain in final models, effectively delegating critical decisions to algorithms that maximize model fit rather than grounding those decisions in conceptual frameworks. An additional 22 studies (26%) used the Maldonado-Greenland coefficient change rule. Only 3 studies (3.4%) explicitly stated using a priori, theory-driven covariate selection where all relevant confounders were included based on conceptual frameworks rather than statistical performance.

Among studies using bivariate screening, thresholds varied ($p<0.05$: 3 studies; $p<0.10$: 27 studies; $p<0.20$: 2 studies). This lack of standardization introduces substantial analytical flexibility: a covariate with bivariate $p=0.11$ would be included in models using a $p<0.20$ threshold but excluded in models using $p<0.10$, creating divergent analytical paths from identical data.

Table 3: Covariate Selection Methods (N=91 coded observations)

Selection Method	n (%)
Automated backward stepwise (AIC/QIC minimization)	51 (58.0%)
Maldonado-Greenland coefficient change rule (≥5%)	22 (25.9%)
Bivariate significance-based inclusion ($p<0.05$ to $p<0.20$)	14 (16.0%)
All covariates retained (a priori / manual)	12 (13.6%)
Explicit theory-driven / a priori specification	3 (3.4%)
Not mentioned / not applicable	5 (5.7%)
Note: N=91 exceeds corpus (N=85) because six publications reported two analytically distinct phases and were coded independently for each phase.	

3.5 Variable Transformation Patterns

Thirty-three publications (38.8% of the total corpus) employed drug variable transformations. Of these, only 1 of 33 provided any written justification. Cocaine, crack cocaine, and crystal methamphetamine are pharmacologically distinct substances with different risk profiles, demographics of use, and policy implications. Collapsing these into a single 'stimulant' variable without justification removes the analytical power to distinguish between them and creates a statistical variable that can be tuned—by selecting which substances to collapse and which to leave separate—until the desired result is achieved.

The near-identical wording of transformations ('cocaine, crack and crystal meth collapsed into Daily Stimulant Use') appears verbatim across studies from different first authors spanning multiple years. This suggests laboratory-level or institutional conventions transmitted as templates—not individual researcher decisions. Reform therefore requires institutional, not merely individual, intervention.

Table 4: Drug Variable Transformations (N=33 studies with transformations)

Transformation Type	n	Justification Provided
Cocaine, crack, and crystal meth collapsed to "Stimulant"	12	None (0 of 12)
Heroin, fentanyl, non-medical opioids collapsed to "Opioids"	9	None (0 of 9)
Both stimulant AND opioid collapse applied together	10	None (0 of 10)
Cocaine and crack combined only	1	Yes — small sample size
Other (ordinal categories, log-transformed, expanded)	1	None
TOTAL with any transformation	33	1 of 33 (3%)

3.6 Missing Data Handling and Sampling Period Opacity

Nearly half of studies (47%) did not report how they handled missing data. Of those that did report, 82% used listwise deletion, simply excluding any participant with any missing data on any variable. In a study of people experiencing homelessness and addiction, missing data is not random. The most marginalized participants are the most likely to miss visits. Listwise deletion systematically excludes the people whose experiences are most extreme, then presents findings as representative of the full population.

Sampling timeframe decisions showed alarming opacity. Fifty-two percent of studies provided no justification for their sampling period start dates, and 57% provided no justification for end dates. In Vancouver's rapidly evolving drug crisis context—in which the fentanyl emergence, the introduction of supervised consumption sites, the COVID-19 pandemic, and cannabis legalization each represent structural discontinuities—the choice of a two-year versus a three-year data window is not a minor administrative decision. When readers cannot determine whether the temporal boundary was chosen for scientific reasons or because it produced a more statistically favourable dataset, reproducibility is fundamentally compromised.

Among the 44 studies where both start and end dates were calculable, sampling duration ranged from 4.5 months to 211 months—a 47-fold range. This compounds the sampling date justification problem: it is not merely about which window was chosen, but how long that window was.

Table 5: Transparency in Data Handling and Sampling Decisions (N=85)

Transparency Indicator	Reported / Justified	Not Reported	% Opaque
Missing data handling approach reported	45 studies	40 studies	47%
Among those reporting — listwise deletion	37 of 45	—	82%
Sampling start date justified	40 studies	44 studies	52%
Sampling end date justified	36 studies	48 studies	57%

3.7 Case Studies in Analytic Inconsistency

Case Study 1: The Cannabis Synthesis Failure

The motivation for this audit stemmed from a direct encounter with the practical consequences of methodological flexibility: an attempt to synthesize existing evidence on cannabis use among people who use drugs in Vancouver proved impossible. Three studies—drawing from the same institutional cohorts, examining the same substantive question, during overlapping time periods—produced prevalence estimates spanning from 28% to 66%.

Table 6: Cannabis Use Prevalence Studies — Three Incomparable Estimates from the Same Population

Feature	Hayashi et al. (2018)	Mok et al. (2021)	Lake (2020)
Sampling Period	June-Oct 2016 (5	June 2016-May 2018	June 2016-Dec 2018

	months)	(23 months)	(30 months)
Cannabis Measurement	Urine toxicology screening	Self-report: any use, past 6 months	Self-report: daily cannabis use
Reported Prevalence	28% tested positive	66% any use	48% daily use
Legalization Context	Pre-legalization only	Substantially pre-legalization	Crosses Oct 2018 boundary
Start Date Justified	No	No	No
End Date Justified	No	No	No
Cohorts	VIDUS, ACCESS, ARYS	VIDUS, ACCESS, ARYS	VIDUS, ACCESS, ARYS

The 2.4-fold range in prevalence estimates is not primarily a finding about cannabis use — it is a finding about measurement. The biomarker study captures people who used recently; the six-month self-report captures anyone who used at any point in six months; the daily-use measure captures only high-frequency users. The legalization boundary in Lake (2020) means that post-October 2018 data reflects a categorically different legal and social context. None of these differences were disclosed in the abstracts that policymakers read.

Had these three studies used a standardized operational definition, an identical sampling window aligned to the legalization boundary, and an identical covariate set, they would have constituted a powerful, replicable body of evidence on one of the most important harm reduction questions of the overdose crisis. Instead, they constitute three incomparable data points. The cost of this failure is not academic—it is the cost of policy decisions made without a reliable evidence base, in a crisis that has killed more than 15,000 people.

Case Study 2: Covariate Divergence Across Non-Fatal Overdose Studies

Five studies examined non-fatal overdose as a primary outcome, providing a direct comparison opportunity. While all five address the same outcome in overlapping populations from the same cohorts, covariate sets vary dramatically. Some studies include comprehensive structural determinants (employment, income, material security) entirely absent from others. Drug use operationalization differs substantially: some studies use specific substances; others use collapsed categories. Selection methods vary from theory-driven inclusion to multiple forms of data-driven selection.

These methodological differences prevent meaningful comparison of effect estimates and preclude meta-analysis. Table 7 displays a selection of these studies and their covariate structures.

Table 7: Covariate Comparison Across Non-Fatal Overdose Studies

Study	Key Covariate Domains	Selection Method	n	Period
Study 3	Demographics (cohort, age, sex, ethnicity); Substance use (IDU, heroin, PO use, stimulants); Treatment (OAT, methadone, buprenorphine); Socioeconomic (incarceration, drug dealing, sex work)	Backward stepwise AIC ($p<0.1$)	570	2009-2016
Study 12	Demographics (age, ethnicity, gender); Socioeconomic (DTES residence, homelessness, incarceration, sex work); Substance use (10 disaggregated drug/route variables, binge, public injecting); Treatment (methadone)	Bivariate only ($p<0.10$)	551	2003-2005
Study 22	Demographics (age, gender, ethnicity, sexual orientation, education, relationship status); Socioeconomic (housing, income, employment, incarceration, material security, sex work, street income); Substance use (stimulants collapsed, heroin/fentanyl collapsed, PO, benzo, alcohol); Treatment (OAT)	Bivariate ($p<0.05$)	1,493	2014-2020
Study 34	Demographics (age, gender, ethnicity); Substance use (daily opioid, daily stimulant, daily cannabis, heavy alcohol, overdose history); Socioeconomic (homelessness, incarceration, employment); Treatment (HIV status, OAT initiation, month	Backward stepwise AIC	438	2005-2018

	of follow-up)			
Study 47	Demographics (age, ethnicity, sexual orientation, education); Substance use (stimulants collapsed, opioids collapsed, binge use, alcohol); Socioeconomic (incarceration, housing, income generation, police contact); Treatment (OAT)	Bivariate ($p<0.10$)	1,348	2014-2016
Study 60	Demographics (cohort, age, sex, ethnicity); Socioeconomic (employment, incarceration, drug dealing, DTES residence, homelessness); Substance use (weekly IDU, injecting career, binge, public injection); Treatment (OAT); Psychological (childhood trauma, depression)	Backward stepwise ($p<0.10$)	1,297	2005-2016

3.8 Drug Use Variable Frequency Heterogeneity

Beyond which variables were selected, how drug use was measured varied markedly across the corpus. Fifty-three studies (62%) operationalized drug use as a binary daily-use indicator; 25 (29%) used a past-six-months reference window; six studies applied mixed operationalizations within the same analysis. One study used a weekly threshold; another used a past-month window. No study justified its choice of reference period with reference to pharmacological or epidemiological rationale.

This distinction is not trivial. A daily-use binary captures only high-frequency users and may substantially undercount the exposure prevalence captured by a six-month any-use window. In overlapping populations, these operationalizations produce incomparable estimates and irreconcilable prevalence figures—as demonstrated by the cannabis case study. The route of administration was similarly unstandardized: approximately 23 studies measured injection use only, 21 measured non-injection only, 19 measured both, and 11 either did not specify or coded route as undefined. Across studies examining the same substances in the same cohorts, it was therefore often impossible to determine whether differences in findings reflected genuine epidemiological variation or measurement artefact.

3.9 Quantifying Covariate Heterogeneity: Jaccard Similarity Analysis

To move beyond qualitative description of covariate heterogeneity, Jaccard similarity analysis was applied to baseline model covariate sets across the 85-study corpus. The Jaccard index measures the overlap between two sets as the ratio of their intersection to their union, ranging from 0 (no shared elements) to 1 (identical sets).

Prior to analysis, covariate labels extracted from each study were normalized to resolve data entry variation: near-synonyms (e.g., 'dtes residency' vs. 'living in the dtes'), typographic errors (e.g., 'cyrstal methamphetamine'), and parsing artefacts were collapsed into canonical terms. This process reduced 472 raw covariate strings to 131 canonical terms. Three independent analyses were conducted using different AI tools (ChatGPT, Claude, Gemini) at varying levels of normalization stringency; all produced substantively identical conclusions.

Across all pairwise comparisons in the corpus, the mean Jaccard similarity after normalization was 0.291—meaning any two studies drawn at random shared, on average, only 29% of their covariate sets, even after accounting for terminological variation. This figure is especially striking given that all studies drew from the same three cohorts, examined overlapping populations, and addressed related research questions. The 131 canonical terms identified across 85 studies—against a median of 16 covariates per study—reflect a highly fragmented analytic vocabulary with little standardization. Only three covariates (age, ethnicity/ancestry, and homelessness) appeared in more than 90% of studies. No single covariate appeared in all 85.

Within outcome-matched subsets, overlap remained low. Among six studies examining non-fatal overdose as a primary outcome—the same outcome, in overlapping populations, spanning 2008-2025—the mean pairwise Jaccard similarity was 0.290. This benchmark confirms that low covariate overlap reflects variability in analytic decision-making, not differences in study population or outcome definition.

Table 8: Covariate Set Overlap by Outcome Group (Jaccard Similarity Analysis)

Outcome Group	Studies (n)	Mean Jaccard	Unique Covariates	Mean Shared / Pair	Range
Full corpus (all pairs)	85	0.291	131 canonical	—	0.00–0.44
Non-fatal overdose	6	0.290	48	7.6	0.09–0.30
Violence exposure	4	0.266	33	—	0.09–

					0.39
Healthcare access barriers	2	0.440	25	—	0.44

Note: Jaccard = |A∩B|/|A∪B|. Raw covariate strings (n=472) normalized to 131 canonical terms prior to analysis by collapsing near-synonyms, typographic variants, and parsing artefacts.

These findings provide quantitative evidence that the BCCSU literature does not constitute a coherent, synthesizable body of evidence on its own terms. A corpus-level Jaccard mean of 0.291 means that even when studies are drawing from the same cohorts and nominally examining the same phenomena, nearly three-quarters of their covariate sets are non-overlapping. The implication is that effect estimates from different studies in this corpus cannot be directly compared, pooled, or meta-analyzed without first resolving fundamental disagreements about which confounders matter, at what frequency drug use becomes clinically relevant, and how substances should be grouped.

Part IV: Discussion

4.1 Interpretation of Findings

This audit reveals a systemic pattern of methodological flexibility and transparency deficits that create conditions conducive to questionable research practices. The complete absence of pre-registration (0 of 85 studies) represents the foundational vulnerability enabling all other problematic practices. Without this constraint, researchers face what Steegen and colleagues term a 'multiverse' of analytical possibilities—a combinatorial space of plausible analytic paths that can yield substantially different results from the same dataset.

The dominance of automated stepwise selection (58% of studies) represents a fundamental shift from theory-driven to algorithm-driven research design. Researchers have effectively delegated critical covariate decisions to statistical algorithms that maximize model fit, rather than grounding those decisions in conceptual frameworks. Variable transformations represent powerful analytical levers that can substantially alter statistical properties and effect estimates. The finding that 38.8% of studies employed drug variable transformations without justification reveals extensive opportunities for exploitation of researcher degrees of freedom.

The true danger emerges when considering these methodological flexibilities synergistically. Even with limited options at each decision point, researchers face over 500 possible analytical pathways for a single research question (e.g., 5 selection methods x 4 transformation schemes x 3 covariate sets x 3 sampling periods x 3 missing data approaches). This estimate is illustrative rather than exhaustive. Without pre-registration constraining choices, researchers could— intentionally or not—navigate this space until finding combinations yielding statistically significant, publishable results.

4.2 Ethical Implications for Research Participants

The populations studied in BCCSU research face profound marginalization and stigma. These communities depend on high-quality research to advocate for evidence-based services and challenge punitive policies. When research quality is compromised, it undermines the moral authority of evidence-based advocacy and leaves vulnerable populations with insufficient support for interventions.

Research with marginalized populations involves substantial participant burden. Individuals give their time, share sensitive information, and sometimes provide biological specimens with the expectation that research will improve conditions for their communities. When research quality is compromised, this represents a breach of implicit trust and a failure to honour participants' contributions. The opportunity costs—services not funded because resources were directed toward questionable research, or

the services that questionable research supports or forecloses—compound the direct harms.

When evidence cannot be synthesized due to methodological inconsistencies, policymakers lack empirical foundations for resource allocation decisions affecting life-and-death outcomes. When analytical flexibility enables false positive findings to proliferate, public health interventions may target spurious risk factors rather than genuine determinants of health.

4.3 The Institutional Incentive Structure

Understanding how systemic patterns of methodological flexibility emerge requires examining the incentive structures and cultural norms shaping researcher behaviour. Academic institutions reward researchers primarily for publication quantity and impact. Career advancement, tenure decisions, and grant funding depend heavily on the number of publications, journal impact factors, citation counts, and h-indices. This creates powerful incentives to maximize publication output, which in turn incentivizes analytical choices that increase the likelihood of statistically significant findings.

The institutional culture also emphasizes rapid publication. When the reward system values speed and quantity over rigour and transparency, researchers rationally adapt their practices accordingly. These researchers were not operating outside the norms of their field—they were operating entirely within those norms. The problem is that the norms, as structured, do not produce the thing that public health policy needs: reliable, synthesizable, policy-actionable evidence.

4.4 Forensic Assessment: Sloppy Science, QRPs, or Misconduct?

The observable patterns could arise from training deficits in methodological rigour, disciplinary norms that have not yet adapted to evolving transparency standards, or legitimate analytic exploration in domains where optimal operationalization remains genuinely uncertain. The concern is therefore structural rather than individual: without pre-registration and transparent reporting requirements, the same patterns emerge whether researchers exploit flexibility intentionally or work within the norms of their training environment. This structural analysis motivates systemic reform rather than attribution of individual misconduct.

The available evidence most strongly supports a Questionable Research Practices (QRP) interpretation. This is serious but distinct from fabrication or falsification, and imprecision about this distinction risks credibility loss if the stronger claim cannot be sustained. QRPs represent exploitable structural conditions—and structural conditions require structural remedies.

Part V: Three-Tier Reform Roadmap

5.1 Why Institutional Recommendations Alone Are Not Enough

Every methodological critique of an academic institution ends with a list of recommendations addressed to that institution. Those recommendations are almost always ignored, because the institution has no structural incentive to implement them and no external accountability for failing to do so. This report has already submitted such recommendations—in August 2025, to UBC Senior Leadership—and received no response in seven months. Adding more recommendations to the same list is not a reform strategy.

The following roadmap operates at three levels: what the institution can do immediately; what funders can require as conditions of grants; and what systemic actors — journal publishers, philanthropic foundations, research councils—can do to change the incentive structures that produce the outcomes documented in this audit. All three tiers are necessary. The first without the second is voluntary and historically ineffective. The second without the third addresses symptoms rather than causes.

5.2 Tier One: What the Institution Can Do Immediately

Pre-Registration and Outcome Registration

Every new study must be pre-registered on OSF, AsPredicted, or ClinicalTrials.gov before data analysis begins. The pre-registration must specify: primary and secondary hypotheses; all planned analyses; the covariate set with theoretical justification for each variable; planned variable transformations; sampling period with rationale; and the multiple testing correction approach. Any deviation must be documented post-hoc as an exploratory analysis. This single change eliminates the analytical multiverse problem: with pre-registered plans, there is a public record of what was intended versus what was found.

Standardized Covariate Protocols

Consensus-based minimum covariate sets for each major outcome domain — overdose, healthcare access, drug use trajectories, HIV/HCV outcomes — should be applied by default to all studies of those outcomes. Any deviation requires documented justification. This is what makes the cannabis synthesis failure impossible to replicate: if all studies examining cannabis use prevalence used the same operational definition and the same sampling reference period, their estimates would be comparable.

Mandatory Multiple Testing Correction

All studies reporting more than one hypothesis test must apply and report an appropriate correction. Abstracts must state the correction method used.

Form a Research Integrity Task Force

An immediate convening of a dedicated task force comprising senior researchers, institutional leadership, biostatisticians, and external advisors with expertise in open science. This task force should review audit findings in detail, consult with researchers about barriers to transparency, develop implementation plans, establish metrics for monitoring progress, and create accountability structures for compliance.

Issue a Public Statement

BCCSU leadership should publicly acknowledge the audit findings and articulate commitment to reform. The statement should acknowledge specific vulnerabilities identified, commit to concrete reform measures with timelines, and frame reforms as institutional strengthening rather than punitive measures.

Engage the Four Highest-Volume Senior Authors Directly

Eighty percent of the portfolio passes through four investigators. Reform that does not engage Thomas Kerr, M-J Milloy, Kora DeBeck, and Kanna Hayashi at the level of their own research practices will not reach 80% of the institutional output. A half-day methodological workshop with these four researchers, focused on pre-registration requirements and covariate standardization, would have more impact on research quality than any policy document.

Initiate Methodological Workshops

Within 90 days, launch mandatory institutional workshops covering: principles of open science and research transparency; pre-registration procedures and platforms; theory-driven model specification versus data-driven selection; modern missing data methods; transparent reporting standards (STROBE, RECORD guidelines); and data and code sharing with appropriate privacy protections.

5.3 Tier Two: What Funders Can Require

CIHR

CIHR's Tri-Agency Framework on Responsible Conduct of Research already identifies selective outcome reporting and data sharing as responsibilities of funded researchers. The gap is enforcement: CIHR grant renewals do not currently verify pre-registration compliance, data sharing, or multiple testing correction. Adding pre-registration verification to the grant renewal process—requiring a registration number for any study that uses previously collected data and reports multiple analyses—would immediately change institutional behaviour.

NIH / National Institute on Drug Abuse

NIH's 2023 data sharing policy already requires data management and sharing plans for all funded research. NIH-funded studies in this corpus that did not comply with these requirements may be subject to review by the NIH Office of Research Integrity. ORI has jurisdiction over research misconduct in connection with NIH-funded activities regardless of the country of conduct. NIDA program officers could also require pre-registration as a condition of new grant awards to Canadian institutions—a change requiring only a policy update, not new legislation.

Future Grant Conditions

Any new public funding for research using the VIDUS, ACCESS, and ARYS cohorts should include as binding conditions: pre-registration before analysis; multiple testing correction for all multi-hypothesis studies; public data sharing within 12 months of publication; and public code sharing at time of publication.

5.4 Tier Three: Systemic and Structural Reform

The Registered Reports Model

The most effective structural intervention for the selective reporting problem is the registered reports journal format, in which journals review and accept studies before results are known. A study accepted as a registered report will be published regardless of whether its findings are significant, eliminating publication bias from the supply side. Several addiction medicine journals already offer this format. A specific reform request is that the International Journal of Drug Policy, the American Journal of Public Health, and the Canadian Journal of Public Health—the three journals most frequently publishing BCCSU work—adopt registered reports as a mandatory option for observational studies using pre-existing cohort data.

Philanthropic Funders

The Open Society Foundation and aligned philanthropic organizations (including the Robert Wood Johnson Foundation and the Wellcome Trust, both active in addiction research) are positioned to become leaders in requiring open science practices as conditions of research funding in the harm reduction space. A shared open science funding standard—requiring pre-registration, outcome registration, data sharing, and multiple testing correction—adopted by philanthropic funders would establish norms that government funders then follow.

Annual Research Integrity Reports

BCCSU should publish annual research integrity reports tracking pre-registration rates, data sharing rates, code availability, and adherence to reporting standards. Progress

should be assessed relative to the baseline documented in this audit, with transparent discussion of barriers encountered and solutions implemented.

Research Integrity Infrastructure

Create permanent institutional capacity through a dedicated Research Integrity Officer overseeing compliance, providing consultation, and coordinating training; integration of methodological rigour assessment into research ethics review; internal pre-registration peer review; and monitoring systems tracking compliance with transparency requirements.

Part VI: Strengths and Limitations

6.1 Methodological Strengths

- Comprehensive scope (85 peer-reviewed publications)
- Structured methodology based on established frameworks for researcher degrees of freedom (Wicherts et al., 2016)
- Transparency in documentation of extraction protocols and AI assistance
- Constructive intent grounded in systemic analysis rather than attribution of individual misconduct
- Policy relevance: findings directly implicate the evidence base informing life-and-death harm reduction decisions
- Quantitative synthesis via Jaccard similarity analysis provides first systematic, measurable estimate of covariate heterogeneity across the corpus

6.2 Limitations

- This audit was not pre-registered—a substantive inconsistency given the paper's central argument, and a limitation acknowledged with full awareness of the irony.
- Publication focus: only published studies were examined; the full range of analytic decisions made during the research process, including unpublished analyses, cannot be assessed.
- Inter-rater reliability statistics for the 20% double-extraction subsample must be reported to demonstrate coding validity.
- Lack of comparative benchmarking: without comparing BCCSU practices to peer institutions, institutional actors may credibly claim these represent field-wide norms. This claim should be empirically tested.
- Some practices identified reflect widespread epidemiological norms rather than BCCSU-specific failures.
- The analysis cannot establish intent. The same patterns could emerge from training deficits, disciplinary norms, or well-intentioned analytical choices made without awareness of aggregate consequences.
- Single institution focus limits generalizability and prevents comparative benchmarking.

Part VII: Conclusion

What We Owe the People This Research Was Supposed to Help

British Columbia has lost more than 15,000 people to drug toxicity since April 2016. The research institution at the centre of Canada's scientific response to this crisis has published 85 peer-reviewed studies over 17 years from three long-running cohorts of the most marginalized people in Vancouver. Some of those cohort participants have been attending research visits for nearly three decades.

This report documents, with specific evidence and precise statistics, that the evidence base produced by that research cannot be synthesized into reliable policy guidance. The complete absence of pre-registration (0%), dominance of data-driven model selection (58%), widespread use of unjustified variable transformations (38.8%), and opacity in critical methodological decisions create conditions conducive to p-hacking and other questionable research practices.

The two core failures documented here are distinct but compounding. First, analytical heterogeneity from absent pre-registration and data-driven model selection means that 85 studies examining overlapping questions in the same populations cannot be compared or combined. The cannabis synthesis failure—in which three studies from the same population produced prevalence estimates spanning 28% to 66%—is the most vivid illustration of this failure's practical consequences. Second, the evidence base is rendered structurally incomparable by covariate heterogeneity that exceeds 70% non-overlap between any two randomly selected studies, even within outcome-matched groups.

While the audit documents patterns consistent with questionable research practices, we cannot definitively conclude that results were manipulated. The same patterns could emerge from training deficits, disciplinary norms, or benign analytical exploration. The concern is therefore structural: without pre-registration and transparent reporting requirements, these patterns emerge regardless of individual intent. This structural analysis motivates systemic reform.

Formal concerns about these failures were submitted to UBC Senior Leadership in August 2025. As of March 2026, no meaningful institutional response has been received. Addressing these vulnerabilities requires comprehensive institutional reform implemented across short-, medium-, and long-term horizons — reforms centred on constraining researcher degrees of freedom through pre-registration, enhancing transparency through standardized reporting, and building infrastructure supporting reproducible research.

The people who depend on evidence-based harm reduction policy to survive deserve nothing less than a reliable, synthesizable evidence base built on rigorous, transparent methods. Restoring trust requires moving beyond the current 'black box' of analysis toward a culture of open science—and the institutional, funding, and systemic structures that make such a culture possible and permanent.

References

Ioannidis JP. Why most published research findings are false. PLoS Med. 2005;2(8):e124.

Simmons JP, Nelson LD, Simonsohn U. False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. Psychol Sci. 2011;22(11):1359-66.

Guraya SY, Norman RI, Khoshhal KI, Guraya SS, Forgione A. Publish or Perish mantra in the medical field: A systematic review of the reasons, consequences and remedies. Pak J Med Sci. 2016;32(6):1562.

Erren TC, Shaw DM, Morfeld P. Analyzing the publish-or-perish paradigm with game theory: The prisoner's dilemma and a possible escape. Sci Eng Ethics. 2016;22(5):1431-46.

John LK, Loewenstein G, Prelec D. Measuring the prevalence of questionable research practices with incentives for truth telling. Psychol Sci. 2012;23(5):524-32.

Wicherts JM, Veldkamp CL, Augusteijn HE, Bakker M, Van Aert R, Van Assen MA. Degrees of freedom in planning, running, analyzing, and reporting psychological studies: A checklist to avoid p-hacking. Front Psychol. 2016;7:222767.

Garritty C, Nussbaumer-Streit B, Hamel C, Devane D. Rapid reviews methods series: assessing the appropriateness of conducting a rapid review. BMJ Evid-Based Med. 2025;30(1):55-60.

O'Leary DF, Casey M, O'Connor L, Stokes D, Fealy GM, O'Brien D, et al. Using rapid reviews: An example from a study conducted to inform policy-making. J Adv Nurs. 2017;73(3):742-52.

Reddon H, Socias ME, DeBeck K, Hayashi K, Walsh Z, Milloy MJ. Cannabis use to manage stimulant cravings among people who use unregulated drugs. Addict Behav. 2024;148:107867.

Reddon H. Cannabis use and reduced opioid use among people who use drugs. Drug Alcohol Depend. 2023;238:109573.

Mok J, Milloy MJ, Grant C, Lake S, DeBeck K, Hayashi K, et al. Use of cannabis for harm reduction among people at high risk for overdose in Vancouver, Canada (2016-2018). Am J Public Health. 2021;111(5):969-72.

Lake S, Nosova E, Buxton J, Walsh Z, Socias ME, Hayashi K, et al. Characterizing motivations for cannabis use in a cohort of people who use illicit drugs: a latent class analysis. PLoS One. 2020;15(5):e0233463.

Hayashi K, Milloy MJ, Lysyshyn M, DeBeck K, Nosova E, Wood E, et al. Substance use patterns associated with recent exposure to fentanyl among people who inject drugs in Vancouver, Canada. Drug Alcohol Depend. 2018;183:1-6.

Steyerberg EW, Eijkemans MJ, Habbema JDF. Stepwise selection in small data sets: a simulation study of bias in logistic regression analysis. J Clin Epidemiol. 1999;52(10):935-42.

Steegen S, Tuerlinckx F, Gelman A, Vanpaemel W. Increasing transparency through a multiverse analysis. Perspect Psychol Sci. 2016;11(5):702-12.

Gelman A, Loken E. The statistical crisis in science. Am Sci. 2014;102(6):460-5.

Chambers CD. Registered reports: A new publishing initiative at Cortex. Cortex. 2013;49(3):609-10.

Simonsohn U, Nelson LD, Simmons JP. P-curve: A key to the file-drawer. J Exp Psychol Gen. 2014;143(2):534-47.

Appendix A: Variable Harmonization and Normalization Protocol

Prior to Jaccard similarity analysis, all 472 raw covariate strings extracted from the 85-study corpus were normalized to 131 canonical terms. Normalization was conducted independently using three AI tools (Claude, Gemini, ChatGPT) at varying stringency levels, with substantively identical conclusions across all three analyses. Selected harmonization decisions are documented below.

Key Harmonization Decisions (Claude — Moderate Normalization):

- 'dtes residence', 'living in the dtes', 'dtes residency', 'dtes healthcare' → dtes residence
- 'homelessness', 'unstable housing', 'housing status', 'housing (sro)', 'become unstably housed', 'evicted' → homelessness
- 'incarceration', 'recent incarceration', 'incarcerated', 'incarceration events' → incarceration
- 'crystal meth', 'crystal methamphetamine', 'methamphetamine', 'cyrstal methamphetamine' → methamphetamine use
- 'crystal meth injection', 'methamphetamine injection', 'injection crystal methamphetamine' → methamphetamine injection (kept separate from non-injection use)
- 'mental illness', 'mental health diagnosis' → mental health
- 'drug dealing', 'dealing drugs', 'working in unregulated drug market' → drug dealing
- 'street income', 'street-based income', 'illegal income', 'illicit income', 'income generation' → income/financial
- 'sex work', 'sex trade', 'sex trae work', 'engagement in sex work' → sex work
- 'cocaine', 'cocaine use' → cocaine use (non-injection forms)
- 'crack', 'crack use', 'crack cocaine', 'crack smoking', 'non-injection crack' → crack use

Three near-universal covariates (appearing in >90% of studies): Age, Ethnicity/Ancestry, Homelessness. No single covariate appeared in all 85 studies.

Appendix B: Formal Written Complaint — Supplementary Update (March 25, 2026)

Student ID: 25272196

Date: March 25, 2026

To: Barbara Weber, Emily Pitcher, Cindy Leonard, Shirley Nakata, and Enid Ho

From: Ryan Moyer, PhD Student, Interdisciplinary Studies Graduate Program

Re: Supplementary Evidence of Research Misconduct — Forensic Document Analysis, Analytical Manipulation, and Destruction of Evidence

Dear Dr. Weber, Ms. Pitcher, Ms. Leonard, Ms. Nakata, and Ms. Ho,

This letter supplements my formal complaints of May 5, 2025 and June 6, 2025. Forensic analysis conducted in February 2026 has produced new documentary evidence that materially strengthens those complaints and directly implicates Dr. Hudson Reddon in: (1) suppression of a significant research finding; (2) destruction of documentary evidence after a formal complaint was filed; and (3) results-driven analytical manipulation in the context of industry-funded research. Specific policy breaches are identified under each heading.

1. Suppression of a Key Research Finding (OR = 3.413)

Forensic comparison of sequential manuscript drafts confirms that a statistically significant moderation finding — showing that cannabis use frequency meaningfully moderates overdose risk (OR = 3.413, 95% CI: 1.012-11.50, p = .05) — was present in the April 4, 2023 version of the manuscript and was completely absent from the April 11, 2023 revision. The deletion occurred in the seven days following an unrecorded April 6 Zoom meeting with Dr. Reddon. No written scientific justification for the removal exists in any document reviewed.

Policy breaches:

- UBC Policy SC7 (Research Integrity): omission of data that materially alters research conclusions constitutes falsification.
- Tri-Agency Framework on Research Integrity (2021), s. 3: suppression of findings and selective reporting are recognized forms of research misconduct.
- ICMJE reporting standards: all analyses materially affecting interpretation must be disclosed.

2. Destruction of Documentary Evidence

The April 3, 2023 email attachment from Dr. Reddon — the only document containing his written track-changes request to delete the moderation section — currently shows as 0 bytes in the institutional email system. Email metadata remains intact; only the attachment has been removed. This deletion occurred after the formal misconduct complaint was filed in November 2025.

Policy breaches:

- UBC Policy SC7: destruction of research records is an independent form of research misconduct.
- UBC Records Management Policy: institutional records must be preserved once a formal complaint is initiated.
- Criminal Code of Canada s. 139: the timing of destruction relative to the active complaint raises a reasonable basis for obstruction of justice concerns.

3. HARKing and Post-Hoc Analytical Manipulation

A March 20, 2023 email from Dr. Reddon states: 'I thought I remembered that cannabis use rather than redeeming a medical cannabis prescription was the main variable associated with overdose? If so, we may want to adjust how we frame the research question in the intro/methods.' This is direct documentary evidence that the primary exposure variable was selected after examining results and the research question was retrofitted — a practice known as HARKing (Hypothesizing After Results are Known).

This is compounded by false dichotomization: Dr. Reddon justified collapsing five frequency categories into two by citing small sample sizes. Independent reanalysis confirms all categories were adequately powered (n = 55-224), rendering this justification demonstrably false. The industry-funded guided analysis produced a protective finding (AOR = 0.52); independent full-frequency analysis of the same dataset shows infrequent use increases overdose risk 3-fold (aOR = 3.17, p = .002).

Policy breaches:

- Tri-Agency Framework s. 3: falsification through manipulation of analytical approach and false justification of methodological choices.
- UBC Policy SC7: presenting post-hoc analyses as pre-specified constitutes research misrepresentation.
- CIHR Conflict of Interest guidelines: industry funding (Canopy Growth Corporation, through Dr. M-J Milloy) was not disclosed in analytical decisions that directly served funder interests.

4. Retaliation Following Disclosure of Findings

Following submission of independent findings in June 2024, the author experienced termination of doctoral funding, denial of access to the comprehensive examination, and initiation of program expulsion. The temporal relationship between disclosure and these institutional actions is documented and consistent with prohibited retaliation.

Policy breaches:

- UBC Policy SC7 and Tri-Agency Framework: retaliation against a researcher raising integrity concerns is itself a form of research misconduct.
- UBC Policy HR6 (Respectful Environment): use of funding and academic gatekeeping to control research outputs constitutes abuse of supervisory authority.

Demands

9. An immediate, independent investigation into Dr. Hudson Reddon's conduct, specifically the finding suppression, document destruction, and analytical manipulation documented above.
10. Preservation and forensic review by UBC IT of all email server logs, backup systems, and auto-saved document versions related to the April 3, 2023 attachment deletion.
11. Referral of this matter to CIHR and the Tri-Agency Secretariat on Research Integrity, given the agency-funded nature of the research.
12. Written confirmation that all relevant records — including Zoom recordings, email correspondence, and manuscript version histories — have been placed under a formal litigation hold.

The First Nations Health Authority is included as BCC given their prior financial contributions to the author's doctoral studies.

Sincerely,

Ryan Moyer

PhD Candidate, Interdisciplinary Studies Graduate Program

Student ID: 25272196

ryanmoy@student.ubc.ca | (236) 862-9962

Evidence Index

The following files constitute the evidentiary basis for claims in this letter. All are available upon request with SHA-256 verification.

A. Prior Formal Complaints:

- 1774468014856_formal_written_complaint_phd_ryanmoyer.docx — Original formal complaint, May 5, 2025
- FINAL_LETTER_Jun6_RM_PDF.pdf — Supplementary complaint re: data access and analytical obstruction, June 6, 2025

B. Forensic Document Analysis:

- FORENSIC_ANALYSIS_Document_Evolution.md — Sequential manuscript analysis confirming deletion of OR=3.413 moderation finding between April 4-11, 2023; documents April 3, 2023 file destruction (0 bytes); prepared February 18, 2026

C. Analytical Manipulation and Comparison Evidence:

- Cannabis_Research_Comparison_Evidence__3_.md — Side-by-side comparison of guided vs. independent analyses from identical dataset; documents false dichotomization justification and 3-fold risk finding (aOR = 3.17); prepared February 18, 2026
- March_20_Email_Analysis_Summary__1_.md — Analysis of March 20, 2023 email chain establishing HARKing by Dr. Reddon; primary exposure variable selected post-hoc; prepared February 18, 2026

D. Prior AI-Assisted Analysis Transcript:

- Claude_Convo.odt — Transcript of analytical sessions beginning November 6, 2025, documenting contemporaneous identification of suppression pattern prior to institutional complaint filing

E. Key Manuscript Versions (Available on Request):

- April4_2023_Cannabis_Use_OD_OpioidUse_Moyer_Draft2_-_V3_merged_-_hr.docx — Contains moderation finding OR=3.413 and Table 5 (194 KB)

- APril11_2023_Cannabis_Use_OD_OpioidUse_Moyer_Draft2_-_V3_merged_-_hr_RM_Apr10.docx — Moderation finding and Table 5 absent (294 KB)
- April3_2023_Cannabis_Use_OD_OpioidUse_Moyer_Draft2_-_V3_merged_-_hr.docx — Dr. Reddon's track-changes deletion request; file currently 0 bytes in institutional email system

Independent verification, replication, and critique of all analyses are explicitly welcomed.

Artificial Intelligence Contributions Statement

Claude (claude-sonnet-4-6, Anthropic, 2026) provided developmental editing assistance during manuscript preparation. Specifically, AI assistance was used for: (1) structural and organizational editing across manuscript sections; (2) prose revision for consistency in voice, terminology, and conceptual framing; (3) integration and synthesis of multiple report versions into this comprehensive document; and (4) identification of typographical errors and internal inconsistencies.

All substantive intellectual contributions — including study conceptualization, inclusion and exclusion criteria, data extraction and coding, analysis, interpretation of findings, and all final manuscript decisions — are solely the work of the author. The author takes full responsibility for the accuracy, integrity and originality of the work. This statement is made in accordance with emerging journal editorial policies on the transparent disclosure of AI tool use in scholarly writing.