

Supplemental Digital Content Table 1. Criteria and Data Sources for the BC Hepatitis Testers Cohort (BC-HTC), web: <https://bchtc.med.ubc.ca/>

Criteria for Inclusion in BC-HTC

All individuals:

- tested at the BCCDC Public Health Laboratory (BC-PHL) for HCV or HIV OR
- reported to BC public health as a confirmed case of HCV, HIV or AIDS, HBV, or active TB OR
- included in BC Enhanced Strain Surveillance System (EHSSS) as an acute HBV or HCV case

All individuals meeting at least one the above criteria were linked internally across all their tests and case reports. Those with a valid personal health number (PHN) were then sent for deterministic linkage with the province-wide Cancer and Ministry of Health (MoH) datasets.

Provincial Communicable Disease Data Sources:

**Data Date
Ranges:**

BCCDC-PHL HIV laboratory testing datasets (tests: ELISA, Western blot, NAAT, p24, culture)	1988–2015
BCCDC-PHL HCV laboratory tests datasets (tests: antibody, HCV RNA, genotyping)	1992–2019, Apr
HIV/AIDS Information System (HAISYS) (public health HIV/AIDS case reports)	1980–2015
Integrated Public Health Information System (iPHIS) (public health case reports of HCV, HBV, and TB)	1990–2015
Enhanced Strain Surveillance System (EHSSS) (risk factor data on a subset of acute HCV and acute HBV cases)	2000–2013

Cancer and MoH Administrative Data Sources:

**Data Date
Ranges:**

BC Cancer Registry (primary tumour registry, excludes metastatic cancers)	1923–2016
Client Roster (CR) (Registry of enrollment in the universal public health insurance plan including residential history) ^{S1}	1990–2016
Discharge Abstracts Dataset (DAD) (hospitalization records) ^{S2}	1985–2015
Medical Services Plan (MSP) (physician diagnostic and billing data) ^{S3}	1990–2015
PharmaCare/PharmaNet (Pharma) (prescription drug dispensations) ^{S4, S5}	1985–2018, Dec
BC Vital Statistics (VS) (deaths registry) ^{S6}	1985–2018, Dec
National Ambulatory Care Reporting System (NACRS) (Emergency Departments) ^{S7}	2012–2015
Chronic Disease Registry ^{S8}	1992–2015

The final BC-HTC comprises all individuals successfully linked on PHN to the MoH Client Roster^{S1} (a registry of all BC residents enrolled in the publicly-funded universal healthcare system)

HCV: Hepatitis C Virus; HBV: Hepatitis B Virus; HIV/AIDS: Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome; BCCDC-PHL: BCCDC Public Health Laboratory; RNA: Ribonucleic Acid; PCR: Polymerase Chain Reaction.

Supplementary References:

- S1. British Columbia Ministry of Health [creator]. Client Roster (Client Registry System/Enterprise Master Patient Index). British Columbia Ministry of Health [publisher]. Data Extract. MOH (2013). 2016. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S2. British Columbia Ministry of Health [creator]. Discharge Abstract Database (Hospital Separations). British Columbia Ministry of Health [publisher]. Data Extract. MOH (2013). 2016. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S3. British Columbia Ministry of Health [creator]. Medical Services Plan (MSP) Payment Information File. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2013). 2016. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S4. British Columbia Ministry of Health [creator]. PharmaCare. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2013). 2018. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S5. British Columbia Ministry of Health [creator]. PharmaNet. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2013). 2018. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S6. BC Vital Statistics Agency [creator]. Vital Statistics Deaths. BC Vital Statistics Agency [publisher]. Data Extract. BC Vital Statistics Agency (2014). 2018. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S7. British Columbia Ministry of Health [creator]. National Ambulatory Care Reporting System. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2017). 2017. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>
- S8. British Columbia Ministry of Health [creator]. Chronic Disease Registry. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2017). 2017. <https://www2.gov.bc.ca/gov/content/health/conducting-health-research-evaluation/data-access-health-data-central>

Supplemental Digital Content Table 2. Definitions of variables used in the analysis

<p>Problems related to <u>opioid</u> use</p> <p>Defined at first occurrence of 2 MSP or 1 DAD for opioid disorder/dependence/poisoning-related diagnoses/hospitalizations, or 1 MSP fee item or 1 PharmaNet DIN/PIN code for methadone, buprenorphine, or morphine opioid substitution treatment. Age at diagnosis between 11 and 65 (inclusive).</p> <p>Physician Billing Data: ICD-9 diagnostic codes starting with 3040, 3047, 3055, 9650, 9701, E8500, or MSP fee item = 39</p> <p>Hospitalization Data: DAD1/DAD3/ICD-9-CM diagnostic codes starting with 3040, 3047, 3055, 9650, 9701, E8500. DAD2/ICD-10-CA diagnostic codes starting with F11; exact codes R781, T400, T401, T402, T403, T404, T406, T507.</p> <p>PharmaNet Data: exact codes for 999776 999792 999793 2241377 2242963 2242964 2295695 2295709 2408090 2408104 2424851 2424878 2453908 2453916 2468085 2468093 2474921 2481979 2483092 2495872 2495880 22123346 22123347 22123348 22123349 22123357 66999990 66999991 66999992 66999993 66999997 66999998 66999999 67000000 67000001 67000002 67000003 67000004 67000005 67000006 67000007 67000008 67000009 67000010 67000011 67000012 67000013 67000014 67000015 67000016 67000017 67000018 67000019</p>
<p>Problems related to <u>stimulant</u> use</p> <p>Defined at first occurrence of 2 MSP or 1 DAD for stimulant disorder/dependence/poisoning-related diagnoses/hospitalizations. Age at diagnosis between 11 and 65 (inclusive).</p> <p>Physician Billing Data: ICD-9 diagnostic codes starting with 3042, 3044, 3056, 3057, 9697, 9700, 9708, 9709.</p> <p>Hospitalization Data: DAD1/DAD3/ICD-9-CM diagnostic codes starting with 3042, 3044, 3056, 3057, 9697, 9700, 9708, 9709. DAD2/ICD-10-CA diagnostic codes starting with starting with F14 , F15 ; exact codes R782, T405.</p>
<p>Problems related to <u>benzodiazepine</u> use</p> <p>Defined at first occurrence of 2 MSP or 1 DAD for benzodiazepine poisoning-related diagnoses/hospitalizations. Age at diagnosis between 11 and 65 (inclusive).</p> <p>Physician Billing Data: ICD-9 diagnostic codes starting with 9694.</p> <p>Hospitalization Data: DAD1/DAD3/ICD-9-CM diagnostic codes starting with 9694. DAD2/ICD-10-CA diagnostic codes starting with starting with T424.</p>
<p>Problems related to <u>alcohol</u> use</p> <p>Alcohol dependence was defined at the first occurrence of 2 MSP or 1 DAD code for major alcohol-related diagnoses including alcoholic mental disorders and dependence/abuse syndromes; alcoholic polyneuropathy, myopathy, cardiomyopathy; pseudo Cushing's syndrome; or discharge to alcohol rehabilitation, counselling, or surveillance.</p> <p>Physician Billing Data: MSP/ICD-9 diagnostic codes starting with 291, 303, 3050, 3575, 4255</p> <p>Hospitalization Data: DAD1/ICD-9-CM diagnostic codes starting with 291, 303, 3050, 3575, 4255; DAD2/ICD-10-CA diagnostic codes starting with F10, E244, G312, G621, G721, I426, Z502, Z714</p>
<p>Major mental health illness</p>

Major mental illness was defined at the first occurrence of either 2 MSP or 1 DAD code from a psychiatrist visit for schizophrenic, bipolar, delusional, nonorganic psychotic, adjustment, anxiety, dissociative, personality and major depressive disorders.

Physician Billing Data: MSP claim specialty = 3 AND ICD-9 diagnostic codes starting with 295-298, 300-301, 308-309, 311 or exact code for 50B.

Hospitalization/Emergency Department Data: DAD1/ICD-9-CM diagnostic codes starting with 295-298, 300-301, 308-309, 311; DAD2/ICD-10-CA diagnostic codes starting with F20-F25, F28-F34, F38-F45, F48, F60-F61

Chronic pain

Chronic pain was defined at the first occurrence of either 1 MSP or 1 DAD for a ‘highly likely’ pain diagnostic code OR first occurrence of 2 MSP or 2 DAD (at least 30 days apart) for a ‘likely’ pain diagnostic code for a range of primarily joint and musculoskeletal disorders (spondylitis, arthritis, spinal stenosis, fibromyalgia).

i) ‘Highly likely’ codes

Physician Billing Data: MSP/ICD-9 diagnostic codes starting with 3382, 3384; MSP fee-item = 1016, 1116 and 1107.

Hospitalization Data: DAD1/ICD-9-CM diagnostic codes starting with 3382, 3384. DAD2/ICD-10-CA starting with R521, R522.

ii) ‘Likely’ codes

Physician Billing Data: MSP/ICD-9 diagnostic codes starting with 30780, 30789, 3380, 71941, 71945, 71946, 71947, 71949, 720, 721, 722, 723, 724, 7290, 7291, 7292, 7294, 7295 (but excluded if starting with 7201, 7208, 7215, 7217, 7232, 72403, 72471)

Hospitalization Data: DAD1/ICD-9-CM diagnostic codes starting with 30780, 30789, 3380, 71941, 71945, 71946, 71947, 71949, 720, 721, 722, 723, 724, 7290, 7291, 7292, 7294, 7295 (but excluded if starting with 7201, 7208, 7215, 7217, 7232, 72403, 72471). DAD2/ICD-10-CA starting with F454, M081, M2550, M2551, M2555, M2556, M2557, M432, M433, M434, M435, M436, M45, M461, M463, M464, M469, M47, M480, M481, M488, M489, M500, M502, M503, M508, M509, M51, M531, M532, M533, M538, M539, M54, M608, M609, M633, M725, M790, M791, M792, M796, M797, M961.

References (adapted from):

- 1) Tian TY, Zlateva I, Anderson DR. Using electronic health records data to identify patients with chronic pain in a primary care setting. *J Am Med Inform Assoc.* 2013 Dec 1;20(e2):e275–e280.
- 2) Tonelli M, Wiebe N, Fortin M, Guthrie B, Hemmelgarn BR, et al. Methods for identifying 30 chronic conditions: application to administrative data. *BMC Med Inform Decis Mak.*

HCV infection

A positive PCR, HCV antibody ,or genotype test in the BCCDC-PHL OR Identified as a case through the public health reporting system (iPHIS or Panorama) OR PharmaNet DINPIN = 2452294, 2370816, 2444747, 2444755, 2451131, 2467550, 2432226, 2436027, 2447711, 2416441, 2418355, 2467542, 2456370, 2371553, 2371448, 2371456, 2371464, 2371472,

2239729, 2239730, 2239731, 2241159, 2253410, 2253429, 2246026, 2246027, 2246028, 2246029, 2246030, 2254581, 2254603, 2254638, 2254646.

Human immunodeficiency virus (HIV) infection

HIV coinfection was defined at the first occurrence of 3 MSP or 1 DAD code for HIV, or a positive HIV serologic test in BCCDC-PHL, reported to as an HIV case in HAISYS, or BC Vital Statistics indication.

Physician Billing Data: MSP/ICD-9 diagnostic codes starting with 042, 043, or 044 or exact for 7953, 7958, 79571 or V08.

Hospitalization Data: DAD1/ICD-9-CM diagnostic codes starting with 042, 043 or 044 or exact code for 7953, 7958, 79571 or V08; DAD2/ICD-10-CA diagnostic codes starting with B20-B24, B9735, F024, O987, R75, Z21.

Elixhauser Comorbidity Score

Using DAD ICD-9 and ICD-10 code data, we calculated a score in which any hospitalization for one of the 31 Elixhauser diagnostic groups was scored as 1:

Congestive Heart Failure, Cardiac Arrhythmia, Valvular Disease, Pulmonary Circulation Disorders, Peripheral Vascular Disorders, Hypertension Uncomplicated, Hypertension Complicated, Paralysis, Neurological Disorders, Chronic Pulmonary Disease, Diabetes Uncomplicated, Diabetes Complicated, Hypothyroidism, Renal Failure, Liver Disease, Peptic Ulcer Disease excluding bleeding, AIDS/HIV, Lymphoma, Metastatic Cancer, Solid Tumor without Metastasis, Rheumatoid Arthritis/collagen, Coagulopathy, Obesity, Weight Loss, Fluid and Electrolyte Disorders, Blood Loss Anemia, Deficiency Anemia, Alcohol Abuse, Drug Abuse, Psychoses, Depression.

Reference: Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity Measures for Use with Administrative Data: Med Care. 1998 Jan;36(1):8–27.

Palliative care

Palliative care was defined at first occurrence of either 1 MSP or 1 DAD for palliative care codes.

Physician Billing Data: MSP/ICD-9 diagnostic code starting with V667; MSP fee-item codes = 14063, 96163, 96169, 96963 or 96969.

Hospitalization Data: DAD1/ICD-9-CM diagnostic code starting with V667; DAD2/ICD-10-CA diagnostic code starting with Z515.

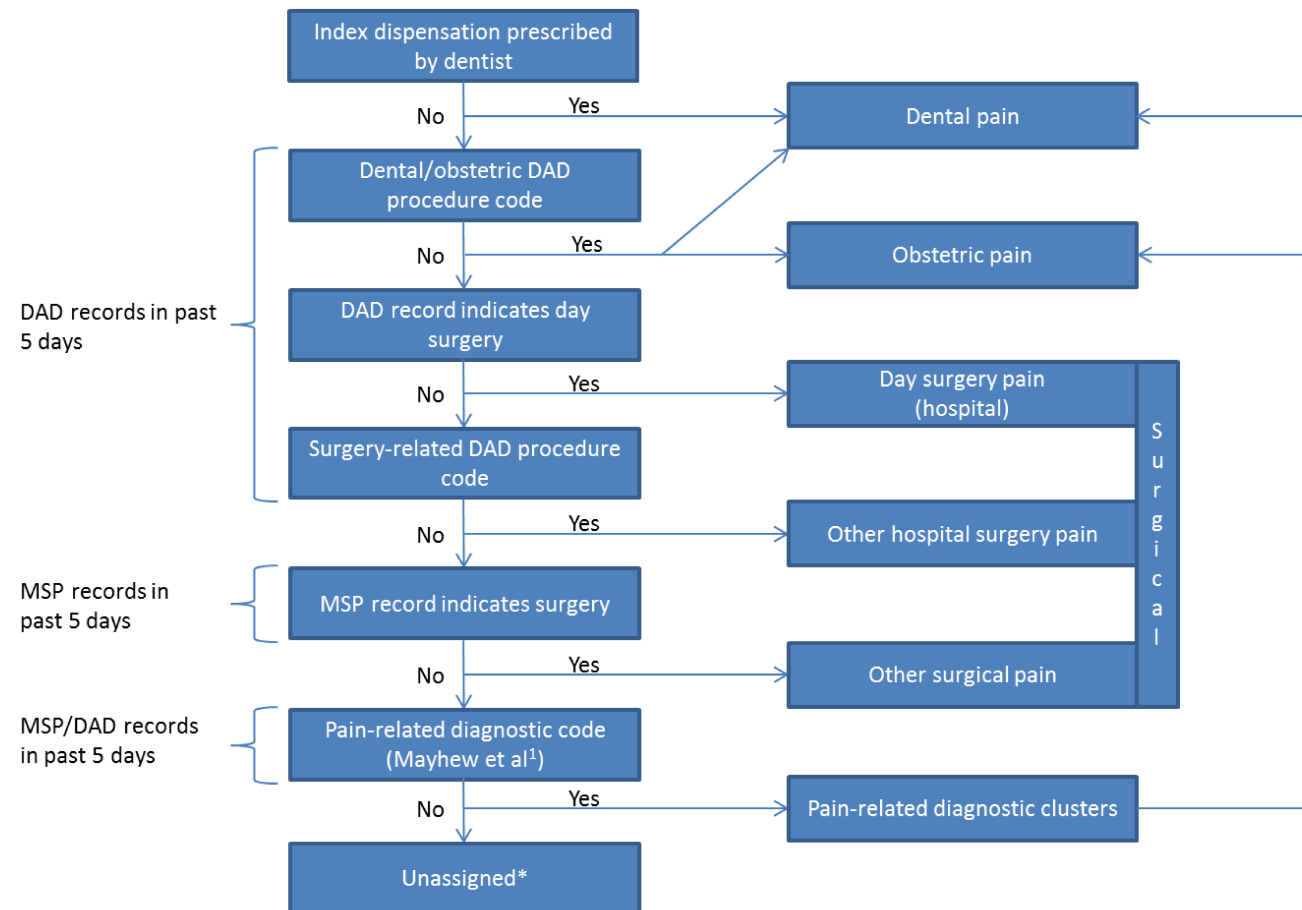
Cancer

Defined at first occurrence of a primary cancer diagnosis in the British Columbia Cancer Registry. This registry includes all primary cancer diagnoses among BC residents which are reported to the BC Cancer Registry and is estimated to cover at least 95% of all cancer cases. Sources include haematology and pathology reports, death certificates, hospital reports, and cancer treatment centres. Benign cancer cases are excluded (only invasive cases of cancer and in-situ bladder cancer cases are included).

References:

<p>http://www.bccancer.bc.ca/health-professionals/professional-resources/bc-cancer-registry/reporting-cancers-to-the-registry</p> <p>https://www.popdata.bc.ca/data/health/bccancer</p>
<p>Urbanicity</p> <p>'Urban area' defined as having a population of at least 1,000 and a density of 400 or more people per square kilometer.</p> <p>Reference: https://www.statcan.gc.ca/eng/subjects/standard/sgc/notice/sgc-06</p>
<p>Material and Social Deprivation Quintiles</p> <p>The Québec Index of Material and Social Deprivation was calculated based on individuals' 6-digit postal code. The deprivation index combines six indicators related to health and welfare that represent material or social deprivation and are available by enumeration area in Canadian census data: 1) proportion of persons without high-school diploma 2) ratio of employment to population 3) average income 4) proportion of persons separated, divorced, widowed 5) the proportion of single-parent families 6) proportion of people living alone.</p> <p>Reference: Pampalon R, Gamache P, Hamel D. A deprivation index for health planning in Canada. <i>Chronic Diseases in Canada</i> 2009; 29.</p>

BCCDC-PHL, British Columbia Centre for Disease Control Public Health Laboratory; HAISYS, HIV/AIDS Information System (public health HIV/AIDS case reports); DIN, Drug Identification Number; PIN, Product Identification Number; ICD, International Classification of Diseases; MSP, Medical Services Plan (physician billing data); DAD, Discharge Abstract Database (hospitalization data).



Supplemental Digital Content Figure 1. Hierarchical algorithm used to assign indication to prescription opioid episodes. DAD, Discharge Abstract Database (hospital records); MSP, Medical Services Plan (physician billing). Physician billing and hospital diagnostic codes include ICD9/ICD10 codes and MSP fee items. DAD procedure codes include CCI/CCP. See Table S3 for additional information on categories and list of pain-related diagnostic clusters. * After assigning episodes to the pain diagnostic clusters based on Mayhew et al¹, we reviewed the most common diagnostic, procedure and billing codes from unassigned episodes and categorized them into existing or newly created clusters. ¹ Mayhew M et al. Development and Assessment of a Crosswalk Between ICD-9-CM and ICD-10-CM to Identify Patients with Common Pain Conditions. *J Pain.* 2019 Dec;20(12):1429–45.

Supplemental Digital Content Table 3. Indication categories for prescription opioid episodes.

Indication (hierarchical order)	Conditions/definition
Dental pain	<ul style="list-style-type: none"> • Prescribed by a dentist OR • Physician billing or hospital diagnostic/procedure codes related to teeth or gingiva
Obstetric pain	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic/procedure codes related to pregnancy, including surgical and non-surgical deliveries
Surgical pain	<ul style="list-style-type: none"> • Hospital record indicates day surgery OR • Hospital procedure codes related to surgery OR • Physician billing record indicates surgery
i) Pain related diagnostic clusters (adapted from Mayhew et al¹)	
Fractures, contusions, sprains, strains	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for joint effusion or derangement, fractures, loose bodies, dislocation, sprains and strains (other than back/neck), contusions and injuries
Back and neck pain	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic code related to back or neck pain, including spondylopathies, sciatica, spinal stenosis and enthesopathy, disc degeneration and displacement, and back and neck sprains
Limb/extremity pain, joint pain, nonsystemic/noninflammatory arthritic disorders, neuropathy, and fibromyalgia	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for carpal tunnel, gout and other crystal arthropathies, neuropathic arthropathy, osteoarthritis, diabetic and non-diabetic neuropathy, optic neuropathy and fibromyalgia
Headache and orofacial, ear and temporomandibular disorder pain	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for headaches, migraines, eye pain, temporomandibular joint disorders and jaw dislocation
Urogenital, pelvic and menstrual pain	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for cystitis and bladder disorders, endometriosis, menstrual pain, other disorders of female/male reproductive system, prostatitis, urinary calculus and vulvodynia
Abdominal and bowel pain	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for general abdominal pain, hernia, irritable bowel syndrome and kidney/gall stones
Other painful conditions	<ul style="list-style-type: none"> • Physician billing or hospital diagnostic codes for musculoskeletal chest pain, acquired deformities, cancer-related pain, general pain, post-trauma pain, restless legs syndrome, spinal cord injury, bone infections and infectious arthritic diseases

ii) Newly created clusters based on most common unassigned codes	
Skin	<ul style="list-style-type: none"> Physician billing or hospital diagnostic codes for burns, skin infection, eczema and herpes simplex
Respiratory	<ul style="list-style-type: none"> Physician billing or hospital diagnostic codes for asthma, mononucleosis, acute pharyngitis and laryngitis, influenza, allergies, and non-specific chest pain
Cardiovascular	<ul style="list-style-type: none"> Physician billing or hospital diagnostic codes for hypertension and non-specific cardiovascular issues
Non-specific	<ul style="list-style-type: none"> <i>Broad/non-specific</i> physician billing or hospital diagnostic codes for general symptoms (e.g., generalized pain), nervous/musculoskeletal disorders, head/neck symptoms and soft tissue disorders
Unknown	<ul style="list-style-type: none"> No physician billing/hospital record in preceding 5 days OR a record is present but does not fit into above categories
History of chronic pain	<ul style="list-style-type: none"> Any lifetime history of chronic pain^{2,3} prior to episode start
No history of chronic pain	<ul style="list-style-type: none"> No lifetime history of chronic pain

Notes: All indications are based on records in the 5 days preceding episode start, except for ‘History of chronic pain’ which is based on full history. Pain-related diagnostic clusters and newly created categorizations are listed in hierarchical order (ie., the order used to determine indication if more than one indication identified). Lists of conditions are not exhaustive. Physician billing and hospital diagnostic codes include ICD9/ICD10 codes and MSP fee items. DAD procedure codes include CCI/CCP. For the pain-related diagnostic clusters, we used Mayhew et al’s¹ publicly available ICD9/ICD10 crosswalk file (see manuscript for GitHub link).

References

- ¹ Mayhew M, DeBar LL, Deyo RA, Kerns RD, Goulet JL, Brandt CA, et al. Development and Assessment of a Crosswalk Between ICD-9-CM and ICD-10-CM to Identify Patients with Common Pain Conditions. *J Pain*. 2019 Dec;20(12):1429–45.
- ² Tian TY, Zlateva I, Anderson DR. Using electronic health records data to identify patients with chronic pain in a primary care setting. *J Am Med Inform Assoc*. 2013 Dec 1;20(e2):e275–e280.
- ³ Tonelli M, Wiebe N, Fortin M, Guthrie B, Hemmelgarn BR, et al. Methods for identifying 30 chronic conditions: application to administrative data. *BMC Med Inform Decis Mak*.

Supplemental Digital Content Table 4. Summary of prescription opioid use by individual-level use categories, OPERA Cohort, 1996-2015

	Acute-only (N=830,152)	Long-term		
		Episodic (N=261,116)	Chronic (N=87,756)	Any long-term (N=348,872)
First episode - %				
Acute	NA	62.4	51.9	59.8
Episodic	NA	37.6	20.1	33.2
Chronic	NA	NA	28.0	7.0
First long-term episode - %				
Episodic	NA	NA	42.8	85.6
Chronic	NA	NA	57.3	14.4
Any episode during follow up - %				
Acute	100	88.8	74.5	85.2
Episodic	NA	100	54.0	88.4
Chronic	NA	NA	100	25.2
Number of episodes during follow-up – median (IQR)				
Acute	2 (1-3)	3 (1-5)	2 (0-3)	3 (1-4)
Episodic	NA	1 (1-2)	1 (0-2)	1 (1-2)
Chronic	NA	NA	1 (1-1)	0 (0-1)
Cumulative PO use during follow-up – Median (IQR)				
Dispensations	2 (1-3)	10 (6-19)	80 (32-182)	13 (7-39)
Episode days	10 (5-22)	302 (178-696)	2,080 (866-3,922)	433 (199-1,406)
Days' supply	10 (5-19)	73 (34-172)	1,408 (533-3,007)	122 (45-528)
MEQ	180 (90-390)	1,476 (684-3,630)	34,701 (11,067-110,196)	2,445 (885-11,040)

Notes: PO, prescription opioids; MEQ, morphine equivalents; NA, not applicable; IQR, interquartile range. See Table 1 for definitions of individual-level use categories.

Supplemental Digital Content Table 5. Most frequently prescribed opioid formulation by episode type, OPERA Cohort, 1996-2015

	Acute (N=2,768,770)		Long-term		
	Episodic (N=536,144)	Chronic (N=105,409)	Chronic – not codeine-only (N=79,602)	All long-term (N=641,553)	
Most frequently prescribed opioid during episode - %					
Codeine – IR	84.2	80.3	46.2	29.4	74.7
Codeine – ER	0.0	0.1	1.1	0.9	0.3
Tramadol – IR	5.6	5.6	4.3	5.8	5.4
Tramadol – ER	0.3	0.8	3.4	4.5	1.2
Oxycodone – IR	5.4	6.9	14.6	19.3	8.2
Oxycodone – ER	0.2	0.4	3.8	5.1	0.9
Hydromorphone – IR	2.6	2.7	6.3	8.3	3.3
Hydromorphone – ER	0.1	0.3	3.1	4.1	0.8
Morphine – IR	0.8	1.0	1.6	2.2	1.1
Morphine – ER	0.3	0.8	9.2	12.2	2.2
Fentanyl – ER	0.1	0.1	2.3	3.0	0.5
Methadone - ER	0.1	0.1	1.2	1.6	0.3
Buprenorphine - ER	0.0	0.1	0.4	0.5	0.1

Notes: See Table 1 for definitions of episode types. IR, immediate-release; ER, extended-release; NA, not applicable.

Supplemental Digital Content Table 6. Characteristics of chronic episodes by codeine use, OPERA cohort, 1996-2015

	Chronic episodes			
	Codeine-only (n=25,807)	Not codeine- only (n=79,602)	Codeine most frequently prescribed opioid (n=49,885)	Codeine not most frequently prescribed opioid (n=55,524)
Age at episode start – median (IQR)	50 (40-60)	48 (38-59)	48 (39-59)	48 (38-60)
Number of dispensations – median (IQR)	19 (6-56)	61 (20-159)	41 (12-117)	52 (17-146)
Episode length (days) – median (IQR)	517 (209-517)	1263 (429-2852)	1015 (314-2596)	1037 (357-2446)
Days' of drug supply – median (IQR)	343 (140-966)	914 (300-2158)	679 (207-1816)	764 (225-1913)
Intensity of use (%) – median (IQR)	69 (58-84)	76 (63-88)	69.3 (58.8-82.5)	78.7 (65.3-89.6)
Average daily dose across days with drug supply (MEQ)				
Median (IQR)	11.5 (7.3-15.8)	41.6 (22.6-85.9)	15.2 (10.1-23.8)	57.3 (32.1-115.5)
<20 - %	87.7	20.2	66.2	10.2
20-49 - %	12.1	36.9	27.3	34.0
50-89 - %	0.2	19.1	4.3	23.6
90-199 - %	0.0	14.8	1.8	19.6
200+ - %	0.0	9.1	0.4	12.6
Prescription opioid - %				
Any higher potency opioid (oxycodone, hydromorphone, morphine, fentanyl)	NA	86.8	41.0	87.6
Any ER formulation	3.7	63.1	25.2	69.7
Most frequently prescribed opioid during episode - %				
ER formulation	1.9	32.0	2.4	44.5
Oxycodone, hydromorphone, morphine or fentanyl	NA	52.2	0.1	77.6
Codeine – IR	98.1	29.4	97.6	NA
Codeine – ER	1.9	0.9	2.4	NA
Tramadol – IR	NA	5.8	NA	8.2
Tramadol – ER	NA	4.5	NA	6.5

Oxycodone – IR	NA	19.3	NA	27.7
Oxycodone – ER	NA	5.1	NA	7.3
Hydromorphone – IR	NA	8.3	NA	12.0
Hydromorphone – ER	NA	4.1	NA	5.9
Morphine – IR	NA	2.2	NA	3.1
Morphine – ER	NA	12.2	NA	17.5
Fentanyl – ER	NA	3.0	NA	4.3
Concomitant drug use - %				
Benzodiazepines/z-drugs	55.3	71.6	66.4	68.7
Gabapentinoids	15.5	47.3	30.4	47.7
Select indications - %				
Dental	2.7	2.9	3.2	2.5
Surgical	4.3	7.4	5.6	7.5
Back and neck pain	10.8	13.9	11.0	15.0
Limb, extremity and joint pain; arthritic disorders; neuropathy; fibromyalgia	12.0	11.5	11.4	11.8

Notes: See Table 1 for definitions of episode types. IQR, interquartile range; MEQ, morphine equivalents; IR, immediate-release; ER, extended-release, NA, not applicable. Intensity of use = percent of episode days covered by drug supply.

Supplementary digital content table 7. Inferred clinical indication (where indication known) by episode type

	Acute (2,242,730)	Episodic (N=380,267)	Chronic (N=63,182)
Dental	27.7%	16.3%	4.4%
Surgical	24.1%	15.1%	10.5%
Back, neck pain	7.7%	12.2%	20.3%
Limb, extremity and joint pain; arthritic disorders; neuropathy; fibromyalgia	4.9%	10.1%	17.8%

Notes: Only select indications shown. Episodes with an unknown indication removed from denominator when calculating percentages. Table 3 in manuscript presents percentages where episodes with unknown indication are included in denominator. Supplementary Figure 1 and Supplementary Table 3 contain more information on indication assignment.