

## CONTEXT

A large number of case selection algorithms for identifying diseases or health conditions from health-administrative databases have been published in the literature. These algorithms are based on different populations and data sources and are validated using various types of reference samples. In addition, each of these algorithms have specific characteristics that should be taken into account according to the research question [sensitivity (Se), specificity (Sp), positive predictive value (PPV) and negative predictive value (NPV)].

## OBJECTIVE

To build an **inventory of validated case selection algorithms** including their metric characteristics for **7 ambulatory care sensitive conditions** (asthma, chronic obstructive pulmonary disease [COPD], diabetes, obesity, chronic pain, arthritis/osteoarthritis and mental health) which have been published in the literature.

## HOW THE INVENTORY WAS BUILT?

### Step 1. Systematic reviews for studies identification

Seven systematic reviews of the literature on algorithms validation for each of the issues were carried out using the PRISMA methodology as well as the standards of systematic reviews of Quebec National Institute of Excellence in Health and Social Services (INESSS).

**Research strategies.** Six databases were searched (Medline, EMBASE, CINAHL, PsycINFO, Ageline and Abstract in Social Gerontology) using a combination of the following concepts: 1) the health condition of interest (e.g. Asthma and synonyms); 2) health-administrative data and; 3) algorithms validation.

**Studies selection.** To be included in the systematic reviews, the studies had to report  $\geq 1$  case selection algorithm developed using health-administrative data and validated against a reference standard. The metric characteristics of all case selection algorithms also had to be reported (Se, Sp, PPV or NPV).

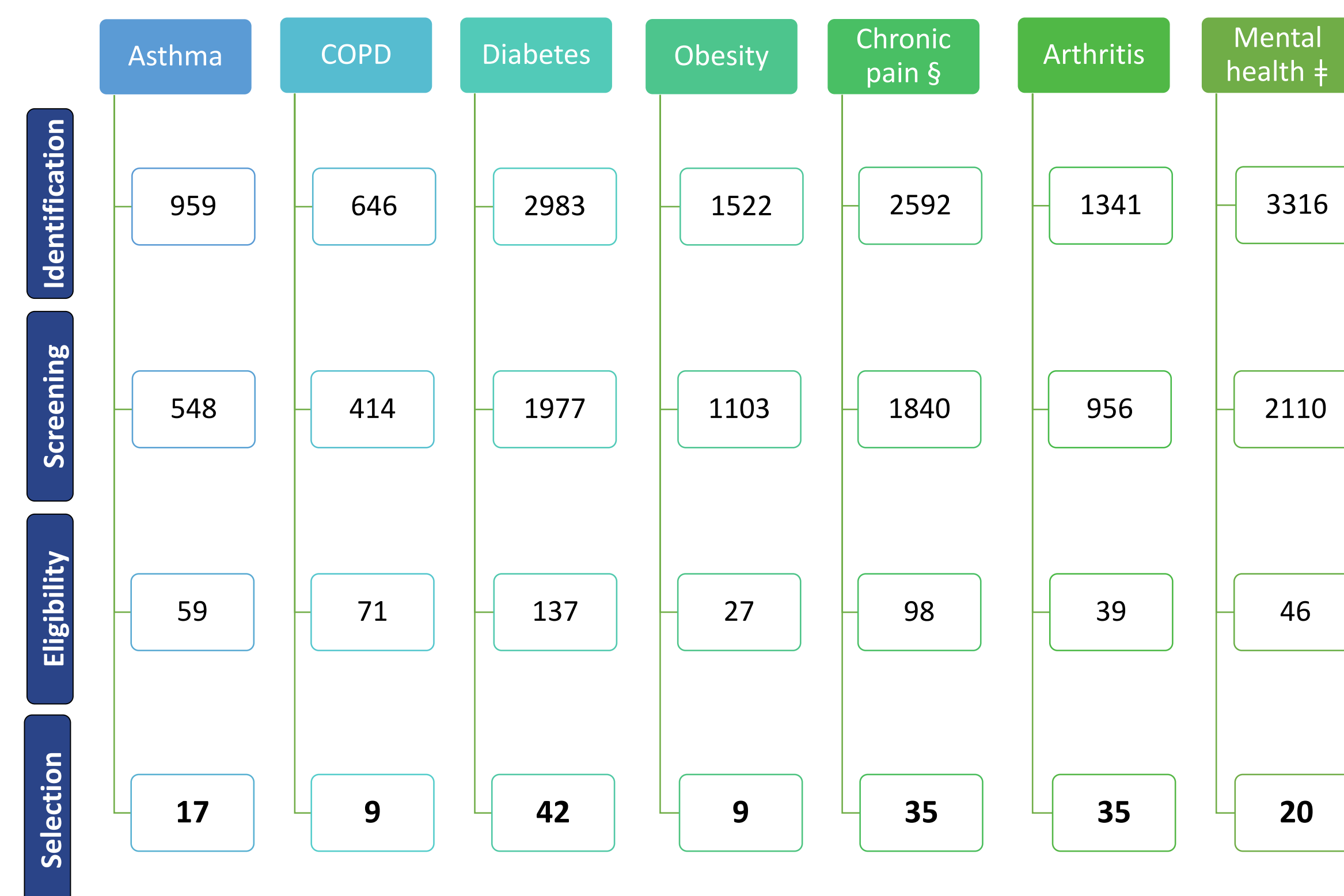
### Step 2. Inventory of validated case selection algorithms

From the results of these systematic reviews, an inventory was built to organize the information collected from the selected studies. This inventory includes publication information, algorithm definition, databases used, population under study, reference standard, etc.

The searchable inventory allows to select a specific algorithm according to its metric characteristics.

## STUDIES SELECTION FLOW DIAGRAM

Between 9 and 42 studies were selected for the 7 conditions.



The systematic reviews were performed between June 2017 and March 2018.

§ Conditions included as chronic pain in the systematic review are: Commonly studied chronic non-cancer pain conditions (i.e., back pain, neck pain, neuropathic pain, complex regional pain syndrome, fibromyalgia, headaches, migraine) and some specific diseases associated with chronic non-cancer pain conditions (e.g., neurodegenerative diseases such as amyotrophic lateral sclerosis and multiple sclerosis).

‡ Conditions included as mental health in the systematic review are: Depressive disorders, Anxiety disorders, Obsessive-compulsive disorder and related conditions.

## CONCLUSION

The creation of an inventory of case selection algorithms for 7 ambulatory care sensitive conditions, which documents very precisely the construction and the characteristics of these algorithms, is particularly useful for researchers working with health-administrative databases to create cohorts of patients. Researchers will be able to accurately select the algorithms that best meet their research question.

## SUSTAINABILITY OF THE INVENTORY

In order to ensure the sustainability of the inventory of case selection algorithms for the 7 ambulatory care sensitive conditions, a publication monitoring has been put into place using the eSRAP platform<sup>1</sup>. Thus, this tool allows us to easily update the inventory.

## GENERAL CHARACTERISTICS OF THE STUDIES INCLUDED IN THE 7 SYSTEMATIC REVIEWS

	Asthma (n=17)	COPD (n=9)	Diabetes (n=42)	Obesity (n=9)	Chronic pain (n=35)	Arthritis (n=35)	Mental health (n=20)
<b>Country</b>							
Canada	10 (58.8%)	3 (33.3%)	22 (52.4%)	2 (22.2%)	12 (34.3%)	8 (22.9%)	7 (35.0%)
USA	4 (23.5%)	4 (44.4%)	15 (35.7%)	7 (77.8%)	13 (37.1%)	20 (57.1%)	13 (65.0%)
Europe	2 (11.8%)	2 (22.2%)	1 (2.4%)	0	10 (28.6%)	5 (14.3%)	0
Other	1 (5.9%)	0	4 (9.5%)	0	0	2 (5.7%)	0
<b>Population</b>							
Children	6 (35.3%)	0	5 (11.9%)	1 (11.1%)	0	2 (5.7%)	0
Adults	6 (35.3%)	6 (66.7%)	25 (59.5%)	6 (66.7%)	12 (34.3%)	28 (80.0%)	5 (25.0%)
Elderly	1 (5.9%)	2 (22.2%)	2 (4.8%)	1 (11.1%)	0	1 (2.9%)	3 (15.0%)
Children and adults	4 (23.5%)	0	10 (23.8%)	1 (11.1%)	23 (65.7%)	4 (11.4%)	4 (20.0%)
<b>Reference standard</b>							
Clinical measures	1 (5.9%)	0	4 (9.5%)	2 (22.2%)	0	14 (40.0%)	1 (5.0%)
Charts review	11(64.7%)	8 (88.9%)	14 (33.3%)	6 (66.7%)	20 (57.1%)	11 (31.4%)	10 (50.0%)
Self-report	5 (29.4%)	1 (11.1%)	15 (35.7%)	0	4 (11.4%)	5 (14.3%)	8 (40.0%)
Clinical database	0	0	4 (9.5%)	1 (11.1%)	7 (20.0%)	2 (5.7%)	1 (5.0%)
Registry/Cohort	0	0	5 (11.9%)	0	4 (11.4%)	3 (8.6%)	0

## SEARCHABLE INVENTORY

Filters selection:  
(e.g.: Condition, Country and validation)

condition	Asthma	▼
Sensitivity filter	(Tous)	▼
Specificity filter	(Tous)	▼
Publication year filter	(Tous)	▼
Age min filter	(Tous)	▼
Age max filter	(Tous)	▼
Country	Canada	▼
validation	Chart review	▼

Search result:

Author	Title	Data type	Population characteristics	Algorithm definition	Sex	Age	Sensitivity	Specificity	PPV	NPV
Blais, L., Lemiere, C., Menzies, D., Berbi	Validity of asthma diagnoses recorded in the Medical Services database of Quebec	Physician claims	Patients seen by a family physician	equals or more than 1 diagnosis of asthma recorded in the RAMQ database over a 1-year period	Men and women	16-44	-	-	67 (58-75)	99 (97-100)
				equals or more than 2 diagnoses of asthma recorded in the RAMQ database over a 1-year period	Men and women	45-80	-	-	60 (50-70)	100 (96-100)
				equals or more than 1 diagnosis of asthma recorded in the RAMQ database over a 1-year period	Men and women	16-44	-	-	78 (65-90)	-
				equals or more than 2 diagnoses of asthma recorded in the RAMQ database over a 1-year period	Men and women	45-80	-	-	68 (56-80)	-
				equals or more than 1 asthma diagnosis on the index medical visit in RAMQ	Men and women	16-44	-	-	75 (66-85)	96 (92-100)
				equals or more than 2 diagnoses of asthma recorded in the RAMQ database over a 1-year period	Men and women	45-80	-	-	78 (69-87)	93 (87-98)
				equals or more than 1 diagnosis of asthma in RAMQ for the year prior to the index date	Men and women	16-44	-	-	77 (64-90)	-
				equals or more than 2 diagnoses of asthma in RAMQ for the year prior to the index date	Men and women	45-80	-	-	87 (78-96)	-
				equals or more than 1 asthma diagnosis on the index medical visit in RAMQ	Men and women	16-44	85 (78-92)	95 (90-99)	-	-
				equals or more than 2 diagnoses of asthma in RAMQ for the year prior to the index date	Men and women	45-80	73 (64-82)	95 (91-99)	-	-
Witchisky, M., Tamblyn, R.M., Huang, A	Validation of diagnostic codes within medical services claims	Physician claims NA		equals or more than 1 physician billing claims for asthma in the year prior to the start of the MOXXI study.	Men and women	66-100	84 (77-91)	83 (75-90)	29.94 (27.3-32.7)	98.88 (98.7-99.0)
							43.22 (40.3-46.2)	96.76 (96.5-97.0)	-	-

## REFERENCE

<sup>1</sup>Unité de Soutien SRAP – Québec, Développement méthodologiques, Outil de veille collaborative des tendances en recherche axée sur le patient (eSRAP); Available from: <https://soutiensrapmetho.ca/outils-techniques/#eSRAP>

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