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Appendix eTable 1. Ontario health administrative data sources

Source	Description
Ontario Asthma Surveillance Information System (OASIS)	Surveillance system longitudinally monitoring over 2 million individuals with asthma in Ontario that have been captured according to a validated health administrative definition of asthma. This definition has shown 84% sensitivity and 76% specificity in adults compared to a clinical reference standard [1].
Mother and Baby Database (MOMBABY)	Record of all hospital deliveries in Ontario that captures maternal and newborn characteristics.
Ontario Health Insurance Plan Database (OHIP)	Contains information on all fee-for-service billings for physician services as well as emergency department visits in Ontario, including diagnosis.
Canadian Institute for Health Information's Discharge Abstract Database (CIHI-DAD)	Records administrative, clinical and demographic information on hospital discharges, including diagnosis codes.
The National Ambulatory Care Reporting System (NACRS)	Contains data for all visits to hospital-based emergency departments.
The Ontario Registered Persons Database (RPDB)	Captures information on sex, date of birth and residence postal code.

*These databases are housed at the Institute for Clinical Evaluative Sciences (<https://datadictionary.ices.on.ca/Applications/DataDictionary/Default.aspx>). They were linked on an individual level using an encrypted unique health card number given to all Ontario residents.

1. Gershon AS, Wang C, Guan J, Vasilevska-Ristovska J, Cicutto L, To T. Identifying patients with physician-diagnosed asthma in health administrative databases. *Canadian Respiratory Journal* 2009; 16(6): 183-188.

Appendix eTable 2. International classification of disease (ICD-9 and ICD-10) codes of asthma, asthma-related conditions and non-pregnancy-related conditions

Conditions	OHIP	ICD-9	ICD-10
Asthma	Asthma, Allergic Bronchitis 493	Asthma 493	Asthma J45 Status asthmaticus J46
Asthma-related conditions	Acute respiratory infections 460–462, 464–466 COPD and allied conditions 491, 492, 496 Other diseases of the upper respiratory tract 473, 477 Pneumonia and influenza 486,487 Atopic dermatitis and related conditions 691 Symptoms involving respiratory system and other chest symptoms 786 Gastro-esophageal reflux disorder 530 Heartburn 787	Acute respiratory infections 460, 461, 466 COPD and allied conditions 490–492, 496 Other diseases of the upper respiratory tract 471–473, 476, 477, 478.8 Pneumonia and influenza 480–487 Atopic dermatitis and related conditions 691.8 Symptoms involving respiratory system and other chest symptoms 786 Other diseases of lung or respiratory system 519.8, 519.9, 487.9, 518.81, 518.83, 518.84, 518.89 Gastro-esophageal reflux disorder 530.81 Heartburn 787	Acute respiratory infections J00–J02, J04–J06, J30, J20 COPD and allied conditions J40, J22, J40–J44 Other diseases of the upper respiratory tract J33, J31, J37, J30, J39.3 Pneumonia and influenza J10–J18 Atopic dermatitis and related conditions L20 Symptoms involving respiratory system and other chest symptoms R05, R06, R09.2, R09.3, R09.8 Other diseases of lung or respiratory system J39.8, J39.9, J96.0, J96.1, J96.9, J98.4, J98.8, J98.9 Gastro-esophageal reflux disorder K21 Heartburn R12 Allergic contact dermatitis L23
Non-pregnancy-related conditions <i>Conditions excluded include: normal labour,</i>	<u>All except:</u> Complications of pregnancy, childbirth, and the puerperium 632–677	<u>All except:</u> Complications of pregnancy, childbirth, and the puerperium 630–679	<u>All except:</u> Complications of pregnancy, childbirth, and the puerperium O00–O99

<i>obstructed pregnancy, pregnancy with abortive outcomes and caesarian delivery.</i> <i>All other conditions are included, such as asthma, diabetes, cardiovascular disease and well visits to primary care.</i>	Certain conditions originating in the perinatal period 762–779	Certain conditions originating in the perinatal period 760–779 Persons encountering health services in circumstances related to reproduction V20–V29	Certain conditions originating in the perinatal period P00–P96 Persons encountering health services in circumstances related to reproduction Z30–Z39
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Note: Asthma and asthma-related conditions are mutually exclusive. Non-pregnancy-related conditions include asthma and asthma-related conditions.

OHIP=Ontario Health Insurance Plan

ICD=International Classification of Disease

COPD=Chronic Obstructive Pulmonary Disease

Appendix eTable 3. International classification of disease (ICD-9 and ICD-10) codes of chronic diseases comorbidities

Conditions	ICD-9	ICD-10	Algorithm
Diabetes	250	E10, E11, E13, E14	≥ 2 OHIP claims with diagnostic code 250 or ≥ 1 OHIP claim with fee code Q040, K029 or K030 or ≥ 1 CIHI admission within 2 years.
Cardiovascular disease:			
<i>Acute myocardial infarction</i>	410	I21	Patients with a most responsible diagnosis of listed ICD codes in the CIHI-DAD, CIHI-SDS database
<i>Angina</i>	413	I20	Patients with a most responsible diagnosis of listed ICD codes in the CIHI-DAD, CIHI-SDS database, NACRS and OHIP claims.
<i>Hypertension</i>	401, 402, 403, 404, 405	I10, I11, I12, I13, I15	Patients with ≥ 1 hospital admission with a hypertension diagnosis, or ≥ 1 OHIP claim with a hypertension diagnosis followed within two years by either ≥ 1 OHIP claim or ≥ 1 hospital admission with a hypertension diagnosis.
<i>Ischemic heart disease</i>	411, 414	I24, I251, I258, I259	Patients with a most responsible diagnosis of any of listed ICD codes in the CIHI-DAD, CIHI-SDS database, NACRS and OHIP claims.
<i>Stroke</i>	433, 434, 435, 436	G45, G46, I63, I64	Patients with a most responsible diagnosis of any of listed stroke ICD codes in the CIHI-DAD, CIHI-SDS database, NACRS and OHIP claims.
Cancer	140-239	C00-D29	Patients in the Ontario Cancer Registry (OCR) who had any of listed ICD codes indicated as primary cancer. Note: The OCR is a computerized database of information on all adult Ontario residents who have been newly diagnosed with cancer ("incidence") or who have died of cancer ("mortality"). All new cases of cancer are registered, except non-melanoma skin cancer.
Chronic obstructive pulmonary disease (COPD)	491, 492, 496	J41, J42, J43, J44	<i>Ages 35 and above:</i> Individuals with ≥ 1 COPD diagnosis in OHIP or CIHI-SDS or CIHI-DAD databases.

CIHI-DAD=Discharge abstract data collected by the Canadian Institute for Health Information

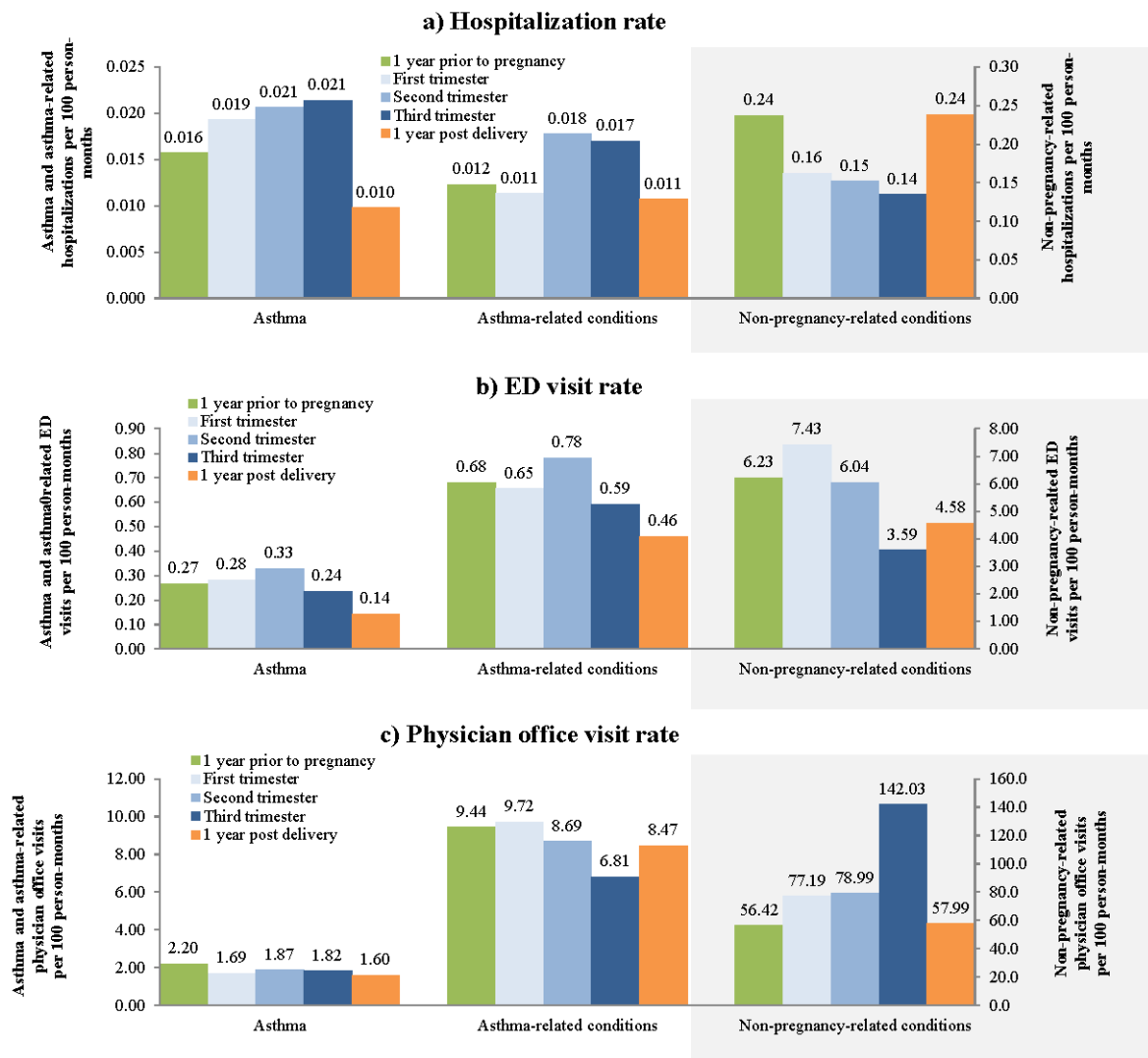
CIHI-SDS=Same day surgery data collected by the Canadian Institute for Health Information

NACRS=National Ambulatory Care Reporting System

OHIP=Ontario Health Insurance Plan

ICD=International Classification of Disease

Appendix eFigure 1. Rates per 100 person-months of follow-up for a) hospitalizations, b) ED visits and c) physician office visits for asthma, asthma-related conditions and all non-pregnancy-related causes during the year prior to pregnancy, each of the three trimesters of pregnancy, and the first year post delivery.



Trimesters of pregnancy are defined as follows: weeks one through 13 for the first trimester, weeks 14 through 26 for the second trimester and week 27 and above for the third trimester.