

Impact of the COVID-19 Pandemic on Drug Utilization in Ontario

Technical Appendix

Background

The COVID-19 pandemic has placed pressure on Canada's healthcare system and resources, including prescription drugs. Media reports of drug stockpiling, together with anecdotal reports of an uptick in commonly used medications and off-label use of medications to treat COVID-19, have highlighted additional pressures on a drug supply already under strain. As the risks of COVID-19 evolve, so too will the impact of drug shortages on patients, healthcare professionals, and the healthcare system. To confirm or refute these reports and characterize the impact of COVID-19 on drug prescribing, the Ontario Drug Policy Research Network (ODPRN) has developed an interactive COVID-19 Ontario Prescription Drug Utilization Tool to provide public access to data on drug utilization in Ontario during the COVID-19 pandemic. This tool reports weekly trends on the number and rate of individuals who were dispensed a prescription drug or received a pharmacy service from 2016 onwards. Information was captured using the [Ontario Drug Benefit \(ODB\)](#) database, which contains records of dispensed drugs and pharmacy services that are reimbursed through Ontario's publicly-funded drug program, and the Ontario [Narcotics Monitoring System \(NMS\)](#), which contains all prescriptions for narcotic, controlled, and monitored substances dispensed from community pharmacies in Ontario. This tool will be updated as new data becomes available.

Drug Utilization Indicator

Number and rate of individuals who received a claim

All indicators are reported as a crude total and rate per 1000 population. Rate is defined as:

$$\frac{\text{\# of individuals receiving at least one claim}}{\text{Population}} \times 1000$$

- **Numerator:** Total number of individuals who received at least one claim.
- **Denominator 1:** Population of Ontario for the time period of interest for measures specific to the NMS data and ODB-related pharmacy services and influenza vaccinations.
- **Denominator 2:** Number of ODB program beneficiaries in the time period of interest for all ODB-derived measures, excluding pharmacy services and influenza vaccinations.

Data Sources

The below datasets were linked using unique encoded identifiers and analyzed at ICES (www.ices.on.ca). The use of data in this project was authorized under section 45 of Ontario's Personal Health Information Protection Act, which does not require review by a Research Ethics Board.

Narcotic Monitoring System, 2012-2022

The NMS captures data on all prescriptions for opioids and other controlled substances dispensed from community pharmacies in Ontario, regardless of payment type.

Ontario Drug Benefit Database, 2015-2023

The ODB database contains records of dispensed drugs and pharmacy services that are reimbursed through Ontario’s publicly-funded ODB program. This includes drugs listed on the ODB formulary, drugs covered under the Exceptional Access Program, and products and services such as the influenza vaccination. Individuals are eligible for the ODB program if they are eligible for [OHIP+](#), are 65 years of age or older, living in a long-term care home, receiving publicly-funded professional home and community care services, or enrolled in programs such as the [Trillium Drug Program](#), [Ontario Works](#), or the [Ontario Disability Support Program](#).

Methodological Notes

- Weekly (Sunday to Saturday) data is reported from January 3, 2016 onwards. Data reported using the NMS database might be slightly behind ODB-derived data due to the scheduling of updates to these databases at ICES.
- In accordance with ICES commitments in data sharing agreements and in order to minimize risk of re-identification, ICES prohibits the presence of small cells (counts less than 6) in any output or report. To prevent small cell disclosure in the Ontario Drug Utilization Tool, the number and rate of individuals receiving at least one claim have been suppressed for any drug or pharmacy service meeting these criteria.

Drug and Services

The inclusion of prescription drugs and services in the tool were determined through discussion with key stakeholders and representatives from the ODPRN Citizens’ Panel. The tool includes:

Drug/Service	Data Source	Description
Total ODB Drugs	ODB	All claims for dispensed prescription drugs that are reimbursed/funded through the ODB program. Pharmacy services and pharmacy-administered flu vaccines are excluded from this category.
Commonly Used Drugs		
ACE/ARB	ODB	Angiotensin converting enzyme (ACE) inhibitors and angiotensin-receptor blockers (ARBs) are drugs often used to treat hypertension (high blood pressure). Some reports have suggested that the use of these drugs may be associated with an increased likelihood of COVID-19 illness.
Antidepressants	ODB	Antidepressants are most commonly used to treat depressive and anxiety disorders, but can also be used to treat other mental health related conditions including obsessive

		compulsive disorder, serious phobias, post-traumatic stress disorder, and long-term pain. The COVID-19 pandemic has led to considerable changes in peoples' lives, including fear and anxiety about a new disease, economic uncertainty, and feelings of isolation and loneliness, potentially impacting the prevalence of antidepressant use during this time.
Benzodiazepines	NMS	Benzodiazepines are a group of psychoactive drugs that are used for a broad range of indications including anxiety, sleep disorders, and epilepsy.
Insulin	ODB	Insulin is a drug that is used in the management of diabetes. There is concern that stockpiling or related changes in uptake behavior may lead to shortages of the drug.
MOH Chronic Drugs	ODB	Drugs that are used to treat long-term medical conditions. Drugs included in this measure are those defined as chronic drugs by the Ontario Ministry of Health (MOH).
Opioids	NMS	Opioids are a class of drugs that are commonly used to treat pain. This analysis was limited to opioid formulations used to treat pain.
Stimulants	NMS	Stimulants are a class of drugs that are commonly used to treat ADHD.
Drugs of Interest		
BUD Inhalers	ODB	Budesonide Inhalers is a corticosteroid inhaler that was tested for use in high-risk patients with COVID-19 and demonstrated some benefits.
Dexamethasone	ODB	Dexamethasone is a corticosteroid that was tested in hospitalized patients with COVID-19 and demonstrated benefit for critically ill patients.
Evusheld	ODB	Evusheld is a monoclonal antibody that was tested in high-risk patients with COVID-19 and demonstrated benefit for reducing hospitalizations. We only reported use in the outpatient setting – there is large use in the inpatient setting.
Fluvoxamine	ODB	Fluvoxamine is an antidepressant that was tested in high-risk patients with COVID-19 and demonstrated benefit for reducing hospitalizations.
HCQ	ODB	Hydroxychloroquine (HCQ) is a medication used to prevent and treat malaria. HCQ was suggested for the potential treatment of COVID-19, but evidence has since shown that the drug is most likely ineffective in treating COVID-19.
HCQ+AZI	ODB	Hydroxychloroquine/Azithromycin (HCQ+AZI) is a drug combination that was suggested for the potential treatment of COVID-19, but evidence has since shown that the combination is most likely ineffective in treating COVID-19.
Oral corticosteroids	ODB	Corticosteroids, specifically dexamethasone, have exhibited efficacy as a treatment of severe COVID-19, but evidence has since shown that these drugs have no benefit in patients with non-severe COVID-19.

Paxlovid	ODB	Paxlovid is a combination of two antiviral drugs that was tested in high-risk patients with COVID-19 and demonstrated benefit for reducing hospitalizations.
Respiratory Inhalers	ODB	Respiratory inhalers are hand-held devices that deliver medication straight to an individuals' lungs. They are most commonly used by patients living with asthma, Chronic Obstructive Pulmonary Disease (COPD), or other lung diseases. As COVID-19 is known to cause respiratory illness, there is concern that stockpiling or related changes in uptake behavior may lead to shortages of these devices.
SABA Inhalers	ODB	Short-acting beta-agonist (SABA) inhalers are a type of respiratory inhaler that provide quick relief for shortness of breath and wheezing. They are sometimes referred to as "rescue inhalers." Due to an increased demand of these devices, there have been a number of shortages reported, as well as special exemptions created for importing foreign formulations to help improve the current supply.
Pharmacy Services and Vaccinations		
Pharmacy-administered COVID-19 Tests	ODB	COVID-19 testing is currently available at many pharmacies across Ontario. To be tested, individuals must make an appointment and must not be showing any COVID-19 symptoms.
Pharmacy-administered COVID-19 Vaccinations	ODB	COVID-19 vaccinations and boosters were administered in many pharmacies across Ontario.
Pharmacy-administered Flu Vaccinations	ODB	Flu vaccinations administered by a pharmacist. This does not include administration of flu shots that occur in flu clinics or doctors' offices.
Minor Ailments Services	ODB	Ontario pharmacies are able to prescribe for 13 different minor ailments. These codes are for the service of assessing for the minor ailment and potentially writing a prescription. This measure is the actual delivery of the service, not the associated prescriptions.
Pharmacy Services	ODB	Pharmacy services included in this category are medication reviews part of Ontario's MedsCheck program . Due to the physical distancing measures introduced to help curb the impacts of COVID-19, virtual MedsChecks were allowed to occur.
Trillium Drug Program	ODB	The Trillium Drug Program helps Ontarians pay for their prescription drugs if associated costs are high compared to their household income. The COVID-19 pandemic has increased unemployment rates and affected the household income of many Ontarians, which may in turn influence the number of people applying to the Program.

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For more information about this tool and related research, please contact us at info@odprn.ca.