Changes in local access to mifepristone dispensed by community pharmacies for medication abortion in Ontario: a population-based repeated cross-sectional study

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Abstract

Background: Although mifepristone for medication abortion has been available in Canada since a regulatory change in 2017, leading to its rapid uptake, the effects of this availability on regional access to abortion are unknown. We sought to examine how community pharmacy dispensation of mifepristone affected distribution of abortion services over time in Ontario, Canada.

Methods: We used linked health administrative data to identify a cohort of all medication and procedural abortions provided in Ontario from 2017 to 2022, defined by outpatient mifepristone dispensations and abortion billing, diagnostic, and procedure codes. We evaluated changes over time in the annual proportion of community pharmacies that dispensed mifepristone and the availability and distribution of medication and procedural abortion services across geographic regions, defined by postal code forward sortation areas.

Results: In 2017, 2% of Ontario pharmacies filled 1 or more prescriptions for mifepristone, which increased to 20% in 2022. In 2017, few regions contained a mifepristone-dispensing pharmacy (19%) or procedural abortion service (18%). By 2022, most regions had local access to a mifepristone-dispensing pharmacy (77%), with geographically distributed abortion services across Ontario. Although only 37% of abortion service users lived in a region with either a mifepristone-dispensing pharmacy or procedural provider in 2017, this increased to 91% by 2022.

Interpretation: Access to medication abortion across Ontario increased substantially within 5 years of mifepristone's availability as a normally prescribed and dispensed medication. This regulatory approach appears successful for achieving widespread access to local abortion services.

Equitable and timely access to health care services remains a pressing concern in Canada.[1] Abortion is a common reproductive health service, with nearly 100 000 performed each year in Canada.[2] One-third of people capable of pregnancy will experience at least 1 abortion during their lifetime.[3] Timely access to abortion services is essential for safety, as risks of complications and adverse events, although rare, increase exponentially with each successive week of gestation.[4] Historically, abortion services in Canada have been inequitably distributed.[5] In 2016, 96% of abortions in Canada were procedural, performed in fewer than 100 hospitals and clinics located primarily in urban centres.[6] Medication abortion, primarily via the off-label use of methotrexate, was infrequent.[7] Abortion services were difficult to access, resulting in delayed care, particularly for people in rural and remote settings.[5,8]

In January 2017, mifepristone became available in Canada, marketed as part of the combined medication abortion regimen of mifepristone and misoprostol.[9,10] This regimen is safe and effective for medication abortion and approved in Canada for use through 9 completed gestational weeks.[11–13] Although mifepristone has been available internationally since the 1980s,[14–16] many countries have specific regulatory requirements that limit its use (e.g., prescriber training or certification, direct prescriber dispensing, observed dosing).[17–19] Similar regulatory requirements were initially implemented in Canada, including required pharmacist training and physician-only dispensing.[10] In 2017,

Health Canada incrementally removed these regulatory requirements,[20–22] creating an unprecedented policy framework in which the mifepristone–misoprostol medication abortion regimen became available as a normally prescribed medication.[22] A 2022 study using Ontario data found that the proportion of abortions provided by medication rapidly increased from 2% in 2016 to 31% in 2020.[23] By 2022, 40% of all abortions in Canada were conducted using medication.[24]

The impact of this rapid change in abortion practice on the availability of abortion services, especially for rural and remote communities, is not well understood. Mifepristone availability led to a rapid increase in the number of abortion providers, including providers in rural areas.[25,26] Many clinicians shifted to providing medication abortion services via telemedicine during the COVID-19 pandemic.[27] These developments may have improved access to medication abortion, but this remains uncertain. In addition to prescribers, access to medication abortion usually requires that pharmacies stock (or rapidly acquire) mifepristone. Two small surveys found low and variable rates of mifepristone stocking and dispensing by community pharmacies,[28,29] further limiting access. However, no systematic investigation into community pharmacy dispensing of mifepristone has been undertaken. As a result, the accessibility of this method in Canada, and its impact on the distribution of abortion services broadly, are unknown.

We sought to evaluate the proportion of pharmacies in Ontario that dispensed mifepristone each year since its availability, overall and by geographic region. In addition, we aimed to determine changes in the geographic distribution of abortion services based on the location of mifepristone-dispensing pharmacies and procedural abortion services.

Methods

Study design

We used linked, population-based, health administrative data from ICES[30] to identify all medication and procedural abortions from Jan. 1, 2017, through Dec. 31, 2022. We identified a population-based patient cohort and all abortion services they received using practitioner billing records (Ontario Health Insurance Plan payments database), inpatient hospitalization records (Discharge Abstract Database), surgery records (Same Day Surgery Database), emergency department and ambulatory care visits (National Ambulatory Care Reporting System), and outpatient prescription dispensations (Ontario Drug Benefits Claims, which captures all outpatient mifepristone dispensations from community pharmacies, given the universal no-cost subsidy for this medication[23,31]), and population demographics (Registered Persons Database). Our approach to identifying an abortion cohort within administrative data (Appendix 1, Supplemental Table 1, available at www.cmaj.ca/lookup/doi/10.1503/cmaj.241505/tab-related-content[32]) was based on a study reporting validity of practitioner billing and hospital records from British Columbia[33] and underwent extensive consideration by our multidisciplinary team of clinicians and health services researchers.[31] With this approach, we expected that our cohort represented all abortions provided to provincially insured individuals in Ontario over the study period. These data sets were linked using unique encoded identifiers and analyzed at ICES.

Statistical analysis

We identified the number and proportion of community pharmacies with at least 1 dispensed mifepristone dose each year and cumulatively over the study period. We examined mifepristone dispensing patterns by pharmacy, including median (interquartile range [IQR] and 99th percentile) and range of doses dispensed per year, and identified high-volume pharmacies, defined as those that dispensed more than 100 doses per year. We stratified our analysis of mifepristone-dispensing pharmacies by year and by urban versus rural location, with rural location defined by a zero as the second postal code digit.[34]

To assess regional patterns of pharmacy mifepristone dispensing, we divided the province into local geographic regions using forward sortation areas (FSAs), which are administrative geographic subunits represented by the first 3 characters of the postal code. Forward sortation areas are similar in population size (525–530 FSAs per year in Ontario with around 30 000 residents per FSA) but can differ greatly in geographical size. For instance, rural and remote FSAs, which have lower population density, are geographically much larger than urban FSAs. We determined dispensing within these regions, including the annual number of regions with no pharmacy, with at least 1 pharmacy that had dispensed mifepristone, with a procedural abortion provider, with either a dispensing pharmacy or a procedural abortion provider, and with both a dispensing pharmacy or a procedural abortion provider. We then limited this same categorization to regions in which at least 1 abortion service user lived in each year, determined using the cohort of abortion service users. To understand the population impact of service level by region, we identified the number of reproductive-aged females living in regions with each service category. To understand whether regional mifepristone availability related to the number of local pharmacies, we categorized regions according to the number of pharmacies they contained (1–2, 3–5, ≥ 6). Within each category, we calculated the percent of regions without a mifepristone-dispensing pharmacy and the percent of pharmacies in each category that dispensed mifepristone.

We mapped the geographic distribution of the primary practice location for procedural abortion providers and mifepristone-dispensing pharmacies according to region at the start (2017) and end (2022) of our study period. This enabled assessment of geographic service distribution, considering region size and services in adjacent regions. In accordance with ICES policy to preserve privacy and confidentiality, we combined regions containing fewer than 6 pharmacies with adjacent regions in region-level maps. Where possible, we combined small-cell regions with neighbouring regions that had concordant abortion services (i.e., the same combination of procedural abortion services and mifepristone-dispensing services). In 2017, 96.2% of 141 small-cell regions were collapsed with neighbouring regions that had concordant service levels, while 2.5% were collapsed with a discordant neighbouring region to create

Table 1: Mifepristone dispensing by pharmacy in Ontario, Canada, 2017–2022

Year	No. of abortions	No. (%) of medication abortions	No. of mifepristone dispensations*	No. of pharmacies	No. (%) of pharmacies that dispensed ≥ 1 mifepristone dose			Cumulative no. (%) of pharmacies that ever dispensed mifepristone†	Mifepristone dispensations per pharmacy			No. (%) of pharmacies that dispensed > 100 mifepristone doses
					All	Urban	Rural		Median (IQR)	Range	95th‡	
2017	36 383	2949 (8.1)	1688	4912	122 (2.5)	116 (2.6)	6 (1.3)	122 (2.5)	1 (1–3)	1–312	89	6 (0.1)
2018	37 690	9907 (26.3)	10 452	4804	414 (8.6)	379 (8.7)	35 (7.8)	458 (8.5)	1 (1–4)	1–1501	94	19 (0.4)
2019	38 926	13 229 (34.0)	14 476	4846	512 (10.6)	458 (10.4)	54 (11.7)	737 (12.8)	1 (1–4)	1–2017	78	23 (0.5)
2020	36 809	16 456 (44.7)	18 584	4932	712 (14.4)	632 (14.2)	80 (17.1)	1073 (17.6)	2 (1–5)	1–3001	49	26 (0.5)
2021	35 633	18 357 (51.5)	21 476	5109	821 (16.1)	741 (16.0)	80 (16.5)	1398 (21.4)	2 (1–5)	1–3407	49	27 (0.5)
2022	41 557	23 120 (55.6)	26 984	5160	1040 (20.2)	934 (20.0)	106 (21.4)	1791 (25.8)	2 (1–5)	1–3571	46	32 (0.6)

Note: IQR = interquartile range.
*Before mifepristone was available, some medication abortions were provided using other off-label medications (mainly methotrexate or misoprostol). As noted in the study limitations, mifepristone was sometimes dispensed directly by providers or by hospitals and, thus, not captured in the Ontario Drug Benefit Claims database. This occurred mainly in early 2017 (before coverage for mifepristone was available through the Ontario Drug Benefit program for all provincially insured residents and before physician-only dispensing for mifepristone was eliminated). For these reasons, the number of recorded mifepristone dispensations is smaller than the number of medication abortions in 2017. Conversely, mifepristone was increasingly used for miscarriage management during our study period, which likely accounts for the larger number of mifepristone dispensations that were not linked with a medication abortion event throughout our study period.
†Cumulative number of pharmacies defined as every pharmacy that dispensed at least 1 mifepristone dose in each year or any previous study year, divided by every pharmacy that had at least 1 dispensation of any medication in each year or any previous year during the study. Pharmacies that subsequently closed were included in both the numerator and denominator.
‡Percentile.

a combined "mixed service level" area. In 2022, 84.4% of 157 small-cell regions were collapsed with concordant neighbouring regions, while 14.8% were collapsed to create mixed service level areas. We created a map showing changes in abortion service availability between 2017 and 2022, with regions categorized according to whether both services became available, 1 service became available and 1 remained unchanged, both services remained unchanged, 1 service became available and the other became unavailable, or 1 service remained unchanged and 1 became unavailable. As no region had both services become unavailable over our study period, we excluded this category. Since FSA-defined regions are small and tightly packed in urban centres (because of population density), we created a supplemental map showing urban regions with 1 or both abortion services available and those with no local services that were adjacent to a region with services available.

Finally, to understand the magnitude of not having local access to abortion services from a patient perspective, we examined the annual number of urban and rural abortion service users that lived in a region with a procedural abortion provider (based on primary practice location), at least 1 mifepristone-dispensing pharmacy, either, or both.

Ethics approval

The use of the data in this project was authorized under section 45 of Ontario's *Personal Health Information Protection Act* (PHIPA) and did not require review by a research ethics board.

Results

From 2017 to 2022, we identified 226 998 abortions provided to 175 091 people, including 142 941 procedural abortions and 84 018 medication abortions. The percent of abortions provided by medication increased from 8.1% in 2017 to 55.6% in 2022. As shown in Table 1, there were 93 660 mifepristone dispensations from 2017 to 2022. Of these, 13 502 (14.4%) were not linked with a physician or hospital abortion record, which would include prescriptions for an off-label indication such as miscarriage management;[35] these dispensations were retained in the analysis for this study, as availability of mifepristone in community pharmacies provides a measure of abortion access regardless of the indication for the specific doses dispensed. Among pharmacies in Ontario over the study period (4912 in 2017; 5160 in 2022), the proportion that filled at least 1 prescription for mifepristone increased steadily from 2.5% in 2017 to 20.2% in 2022. A similar proportion of rural and urban pharmacies dispensed mifepristone each year. Most pharmacies dispensed a small number of mifepristone doses, with a median of 1–2 (IQR 1–4, 90th percentile 10–19) dispensations. Dispensing volume per pharmacy was quite variable. Alhough the absolute number of high-volume pharmacies that dispensed more than 100 doses remained low (0.1%–0.6% of dispensing pharmacies), they dispensed an increasing number of mifepristone doses over time, with a maximum of 1501 in 2018 and 3572 in 2022.

The proportion of regions with a pharmacy that dispensed mifepristone increased from 19% in 2017 to 77% in 2022 (Table 2). A small and steady proportion of regions (6%–7%) did not have a pharmacy within their boundaries during the study period. Nearly all regions (≥ 97%) had need for abortion services each year, defined as at least 1 resident using abortion services during the year. A small proportion of regions (around 5%) had abortion service need, but no pharmacy. Although only one-fifth of regions with a pharmacy and with abortion service need had at least 1 mifepristone-dispensing pharmacy at the start of the study period (20%), this increased steadily to 82% by 2022. A modest and fairly stable proportion of regions (15%–19%) had a procedural abortion provider's primary location within their boundaries. Among regions with procedural abortion services available, 40% also had a mifepristone-dispensing pharmacy in 2017, which increased to 89% in 2022 (data not shown). In 2017, less than one-third (30%) of regions with abortion service need had either a mifepristone-dispensing pharmacy or procedural abortion services present; this increased over the study period to 80% in 2022. In 2017, 22% of reproductive-aged females lived in a region with procedural abortion services, which declined to 18% by 2022. In contrast, the proportion of reproductive-aged (15–49 yr) females living in a region with either procedural services or a mifepristone-dispensing pharmacy increased from 37% in 2017 to 91% in 2022 (Appendix 1, Supplemental Table 2).

We found a strong relationship between the number of pharmacies per region and availability of mifepristone dispensing (Table 3). The percent of pharmacies that dispensed mifepristone increased fairly consistently over our study period across regions, regardless of the number of pharmacies within the region. In all categories (1–2, 3–5, ≥ 6 pharmacies per region), the percent of pharmacies that dispensed mifepristone increased from 3% or less in 2017 to 17%–30% in 2022. The number of urban and rural regions without a mifepristone-dispensing pharmacy decreased over the study period in each category; however, most regions with 1–2 pharmacies lacked a mifepristone-dispensing pharmacy in 2022 (73% of urban regions, 75% of rural regions).

In 2017, most regions of Ontario had neither a resident procedural abortion provider nor a mifepristone-dispensing pharmacy (Figure 1A). Most geographically large regions (representing rural and remote areas) lacked services entirely, while nearly all primary locations for procedural providers were concentrated in geographically small regions located in urban centres. By 2022 (Figure 1B), access expanded substantially such that most of Ontario did have local access to either a mifepristone-dispensing pharmacy, a procedural abortion provider, or both. In 2022, only a handful of (still mostly urban) regions contained both a mifepristone-dispensing pharmacy and a procedural abortion provider's primary practice location. Between 2017 and 2022, at least 1 abortion service type became available in much of Ontario, while service availability remained unchanged in some regions; few regions experienced a change toward less service availability (Figure 2). Similarly, for nearly all urban regions, at least 1 abortion service type became available, either within the region itself or in an adjacent region (Appendix 1, Supplemental Figure 1).

Figure 3 shows the frequency of abortion service users residing in regions with mifepristone-dispensing or procedural abortion services available, with values shown in Appendix 1, Supplemental Table 3. Throughout the study period, the proportion of abortion service users who lived in a region with a procedural abortion provider's primary practice location declined from 25% in 2017 to 18% in 2022 for urban service users and remained at 12% for rural service users in 2017 and 2022. In contrast, the proportion of abortion service users living in a region that contained a mifepristone-dispensing pharmacy increased from 27% of urban services users in 2017 to 90% in 2022 and from 17% of rural services users in 2017 to 88% in 2022. Together, the frequency of

Table 2: Number of geographic regions* with local abortion service availability defined by mifepristone-dispensing community pharmacy or procedural abortion provider from 2017 to 2022 in Ontario, Canada

	No. (%) of regions								
Year	Total	With no pharmacy	With ≥ 1 mifepristone-dispensing pharmacy	With a pharmacy and no mifepristone-dispensing pharmacy	With abortion service need†	With abortion service need and no pharmacy	With abortion service need and at least 1 mifepristone-dispensing pharmacy‡	With procedural abortion services	With abortion service need and a mifepristone-dispensing pharmacy or procedural abortion services§
2017	526	39 (7.4)	98 (18.6)	389 (79.9)	511 (97.2)	29 (5.7)	98 (20.3)	95 (18.1)	155 (30.3)
2018	526	36 (6.8)	247 (47.0)	243 (49.6)	512 (97.3)	28 (5.5)	246 (50.8)	89 (16.9)	279 (54.5)
2019	526	37 (7.0)	270 (51.3)	219 (44.8)	511 (97.2)	30 (5.9)	269 (55.9)	100 (19.0)	287 (56.2)
2020	527	35 (6.6)	317 (60.2)	175 (35.6)	515 (97.7)	28 (5.4)	315 (64.7)	81 (15.4)	332 (64.5)
2021	528	34 (6.4)	360 (68.2)	134 (27.1)	513 (97.2)	27 (5.3)	358 (73.7)	87 (16.5)	368 (71.7)
2022	526	33 (6.3)	404 (76.8)	89 (18.1)	516 (98.1)	28 (5.4)	402 (82.4)	82 (15.6)	411 (79.7)

*Geographic regions are defined using forward sortation areas, administrative geographic subunits represented by the first 3 characters of the postal code.
†Regions with abortion service need defined as those in which at least 1 abortion service user resided.
‡Denominator is the number of regions with abortion service need minus regions with abortion need and no pharmacy.
§Denominator is the number of regions with abortion service need.

Table 3: Pharmacies that dispensed mifepristone and regions with no mifepristone-dispensing pharmacy, by number of pharmacies within the region from 2017 to 2022 in Ontario, Canada*

Year	Regions with 1–2 pharmacies		Regions with 3–5 pharmacies		Regions with ≥ 6 pharmacies	
	No. (%) with no mifepristone-dispensing pharmacy	Pharmacies that dispensed mifepristone, %	No. (%) with no mifepristone-dispensing pharmacy	Pharmacies that dispensed mifepristone, %	No. (%) with no mifepristone-dispensing pharmacy	Pharmacies that dispensed mifepristone, %
Urban regions						
2017	56 (100.0)	0.0	77 (89.5)	2.8	222 (72.8)	2.6
2018	54 (90.0)	7.3	64 (68.1)	9.8	108 (36.6)	8.6
2019	42 (87.5)	9.4	56 (57.7)	14.5	102 (34.1)	10.1
2020	41 (82.0)	15.2	42 (48.3)	21.1	77 (24.9)	13.5
2021	35 (77.8)	16.4	31 (38.3)	24.9	46 (14.5)	15.3
2022	33 (73.3)	20.3	22 (27.2)	29.7	23 (7.3)	19.3
Rural regions						
2017	12 (100.0)	0.0	8 (100.0)	0.0	26 (81.3)	1.4
2018	10 (83.3)	12.5	6 (60.0)	10.0	13 (41.9)	7.3
2019	7 (70.0)	23.1	7 (63.6)	13.6	12 (38.7)	11.2
2020	7 (70.0)	33.3	7 (87.5)	6.3	7 (20.6)	17.4
2021	8 (88.9)	9.1	7 (70.0)	7.3	7 (21.9)	17.6
2022	6 (75.0)	16.7	1–5†	20.9	1–5†	21.5

*Geographic regions are defined using forward sortation areas, administrative geographic subunits represented by the first 3 characters of the postal code.
†Cell counts < 6 are suppressed in accordance with ICES policy to prevent reidentification.

abortion service users residing in a region with either a local procedural abortion service provider or a pharmacy that dispensed mifepristone increased to 92% in urban regions and 90% in rural regions. However, access to both mifepristone-dispensing pharmacies and local procedural abortion providers remained uncommon (17% in urban regions and 10% in rural regions in 2022).

Interpretation

We found that, from 2017 to 2022, access to local abortion services increased markedly after the introduction of mifepristone as a normally prescribed medication in Ontario. This increase was almost entirely attributable to access to mifepristone-dispensing community pharmacies. More than two-thirds of geographic regions with need for abortion services lacked access to either local procedural abortion providers or a pharmacy that dispensed mifepristone in 2017; this proportion decreased to one-fifth of regions in 2022. Likewise, the number of abortion services users living in a region without these types of local abortion services declined substantially, from more than half to less than 10% over this study period, with similar declines in urban and rural areas. These findings suggest that mifepristone dispensing in Ontario pharmacies is now generally well distributed across the population. Although the proportion of pharmacies that dispensed mifepristone increased rapidly after 2017, only one-fifth of all pharmacies dispensed mifepristone by 2022. With roughly 20 000 medication abortions in 2022 and around 5000 pharmacies in Ontario, there is wide variability in the number of mifepristone doses dispensed per pharmacy each year, consistent with results of pharmacist surveys.[29]

Despite these rapid gains in access to procedural or medication abortion services, in 2022, 6% of regions had no pharmacy at all, nearly 20% of regions with a pharmacy still lacked a pharmacy that dispensed mifepristone, and roughly 9% of abortion service users lived in a region without a local procedural provider or a pharmacy that dispensed mifepristone. Abortion service needs are time-sensitive, as risks of abortion complications increase exponentially with increasing gestational age.[4] It is likely that the proportion of abortions provided by medication in Ontario will continue to increase beyond our study period, mirroring trends elsewhere.[36,37] Although not all pharmacies need to dispense mifepristone to achieve adequate local access for the full population, communication between neighbouring pharmacies to ensure availability within each region may support improved access. Since most regions without a dispensing pharmacy also lack a local procedural abortion provider, further geographic expansion of pharmacies that dispense mifepristone may be an important component of continuing to improve access to abortion services in Canada, with initial efforts focused on regions with at least 1 existing pharmacy. Beyond this, understanding the geographic distribution of medication abortion providers (i.e., those prescribing mifepristone) will provide complementary information on abortion service access in Ontario.

Other studies have reported several barriers pharmacists may experience with mifepristone dispensing, including high cost, unknown demand, liability, and need for training.[29,38] System-level work to address these barriers, including alternative funding schemes for expired medications, continued professional development for pharmacists (including expanded uptake of the Canadian Pharmacists Association's medication abortion toolkit[39]) or other

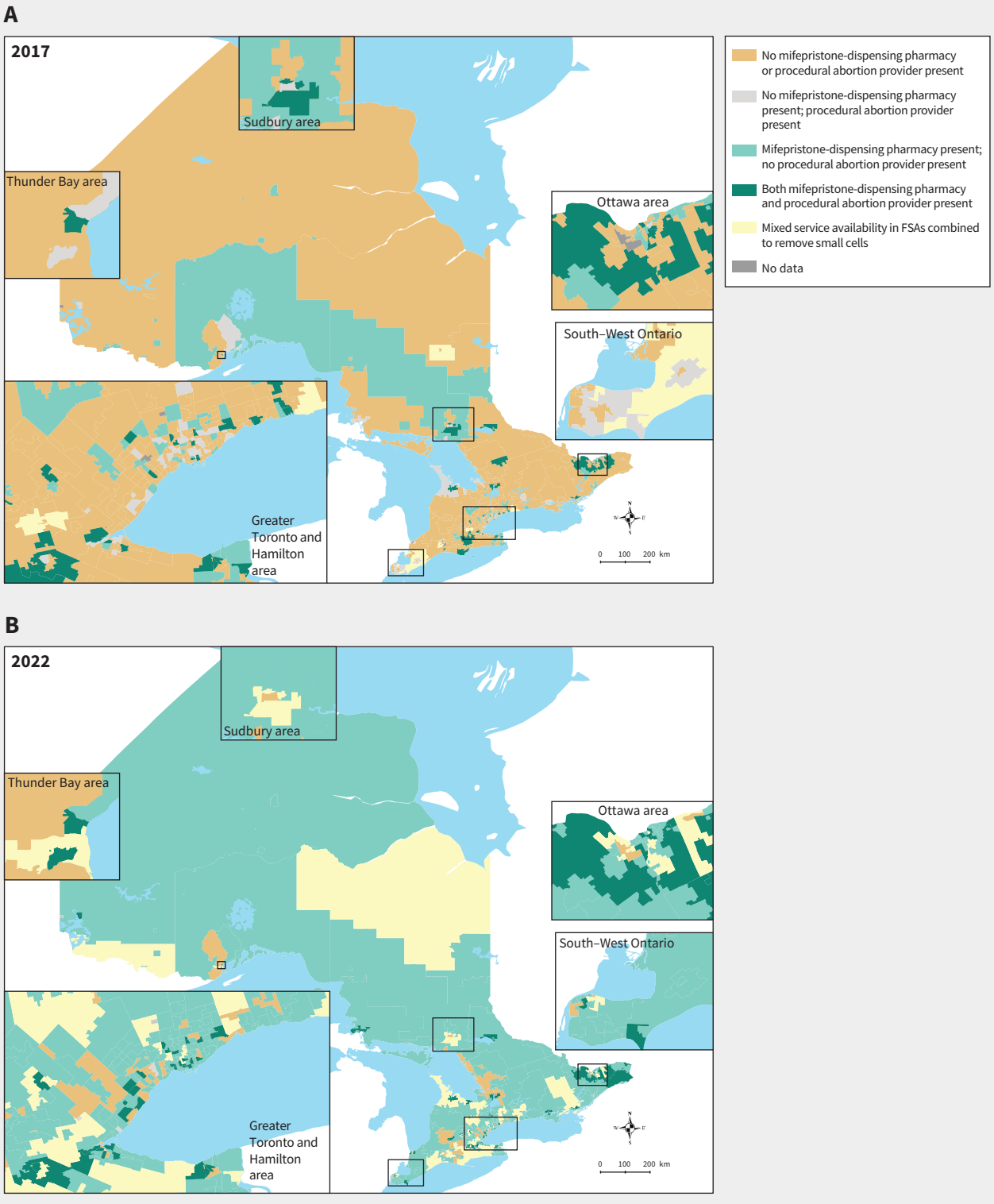

Figure 1: Distribution of primary location for procedural abortion providers and mifepristone-dispensing pharmacies according to geographic region in Ontario, Canada, in (A) 2017 and (B) 2022. Regions with no mifepristone-dispensing pharmacy or procedural abortion provider are shown in beige; regions with at least 1 procedural abortion provider but no mifepristone-dispensing pharmacy are shown in light grey; regions with at least 1 mifepristone-dispensing pharmacy but no procedural abortion provider are shown in light green; regions with at least 1 mifepristone-dispensing pharmacy and at least 1 procedural abortion provider are shown in dark green. Regions with mixed service availability combined to remove small cells are shown in light yellow. In 2017, most regions of Ontario had neither a resident procedural abortion provider nor a mifepristone-dispensing pharmacy and most geographically large (rural and remote) regions lacked services entirely; nearly all primary locations for procedural providers were concentrated in geographically small (urban) regions. By 2022, access expanded such that most regions had local access to either a mifepristone-dispensing pharmacy, a procedural abortion provider, or both. Created in ArcGIS Pro 3.4.0. Note: FSA = forward sortation area.

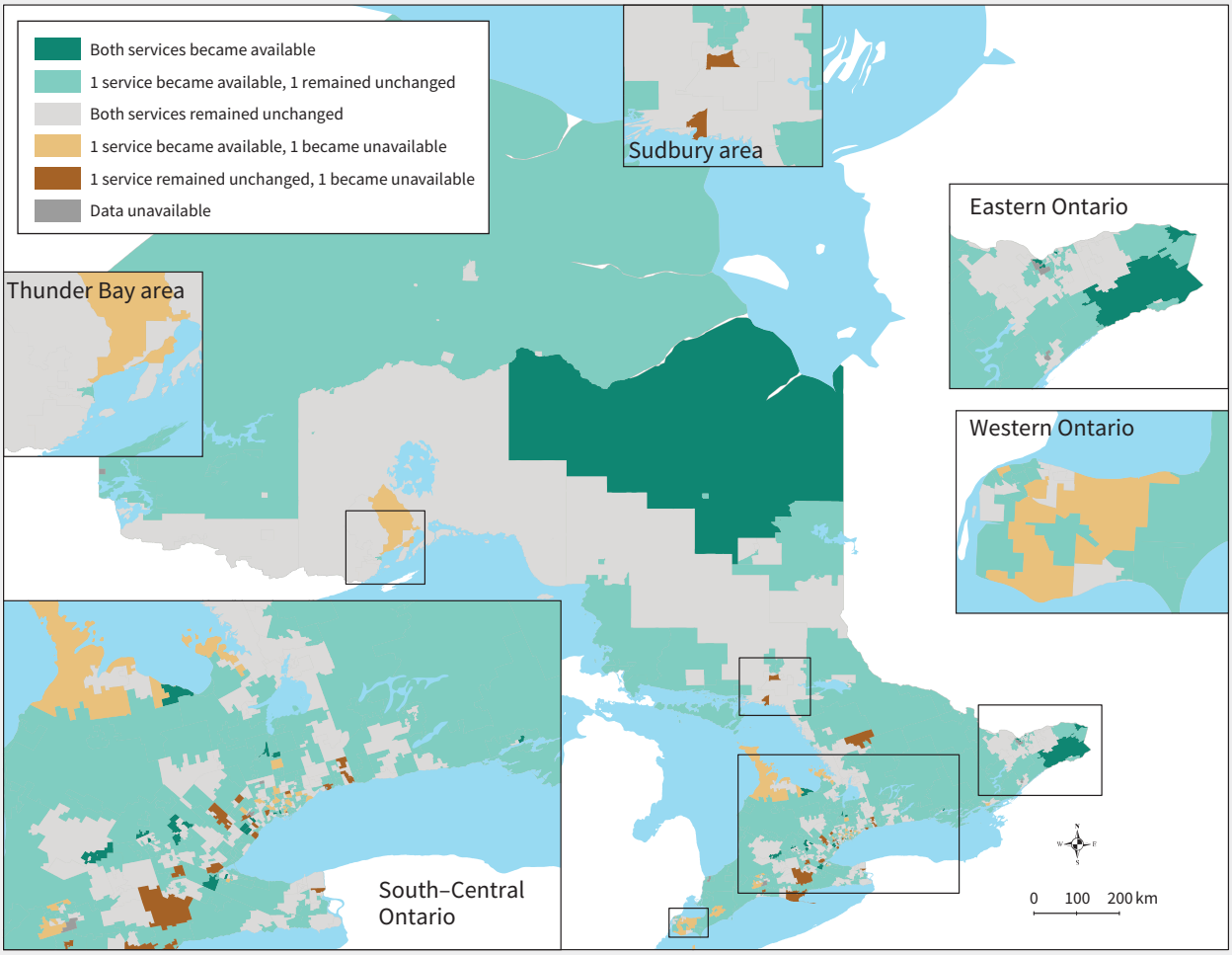

Figure 2: Change in regional availability of procedural abortion services and mifepristone-dispensing pharmacies from 2017 to 2022 in Ontario, Canada. At least 1 abortion service type became available between 2017 and 2022 in much of Ontario (dark green), while service availability remained unchanged in some regions (light grey). Regions in which 1 service became available and the other became unavailable are shown in beige; few regions experienced a change toward less service availability (brown). Created in ArcGIS Pro 3.4.0.

training supports may lead to further expansion of mifepristone access across Canada. Professional development to support pharmacists to create networks that can share information on local service demand and stocking practices may enable efficient service planning among community pharmacies.

The overall number of abortions increased modestly in the first 3 years of mifepristone availability, declined during the COVID-19 pandemic years, and returned to the expected pre-pandemic trends in 2022.[32] Meanwhile, the percent of abortions provided by mifepristone expanded rapidly from 2017 to 2022. This indicates that expanded availability of medication abortion providers[26] and mifepristone dispensing in community pharmacies primarily shifted the abortion service delivery model (replacing procedural abortions), with only small increases in abortion service use overall.[23,32]

Abortion service need, use, and access patterns changed during the COVID-19 pandemic, including a decrease in the abortion rate[32] and a shift to virtual medication abortion provision.[27] In contrast to settings where prepandemic mifepristone restrictions required in-person provider dispensing and observed ingestion, which required rapid regulatory changes in response to the pandemic,[19,40,41] Canada's regulatory approach to mifepristone positioned health systems to seamlessly transition to provision of virtual medication abortions as appropriate.[42,43] We were unable to quantify the shift to virtual provision of medication abortion because of limitations in billing records. Availability of either procedural abortion care or mifepristone dispensing by community pharmacies remained essential elements of abortion care, which were not likely disrupted substantially during the pandemic in Canada.[44] Our findings demonstrate that availability of mifepristone-dispensing pharmacies continued to expand during the pandemic years.

Limitations

The geographic distribution of procedural abortion providers' primary addresses and mifepristone-dispensing pharmacies is a

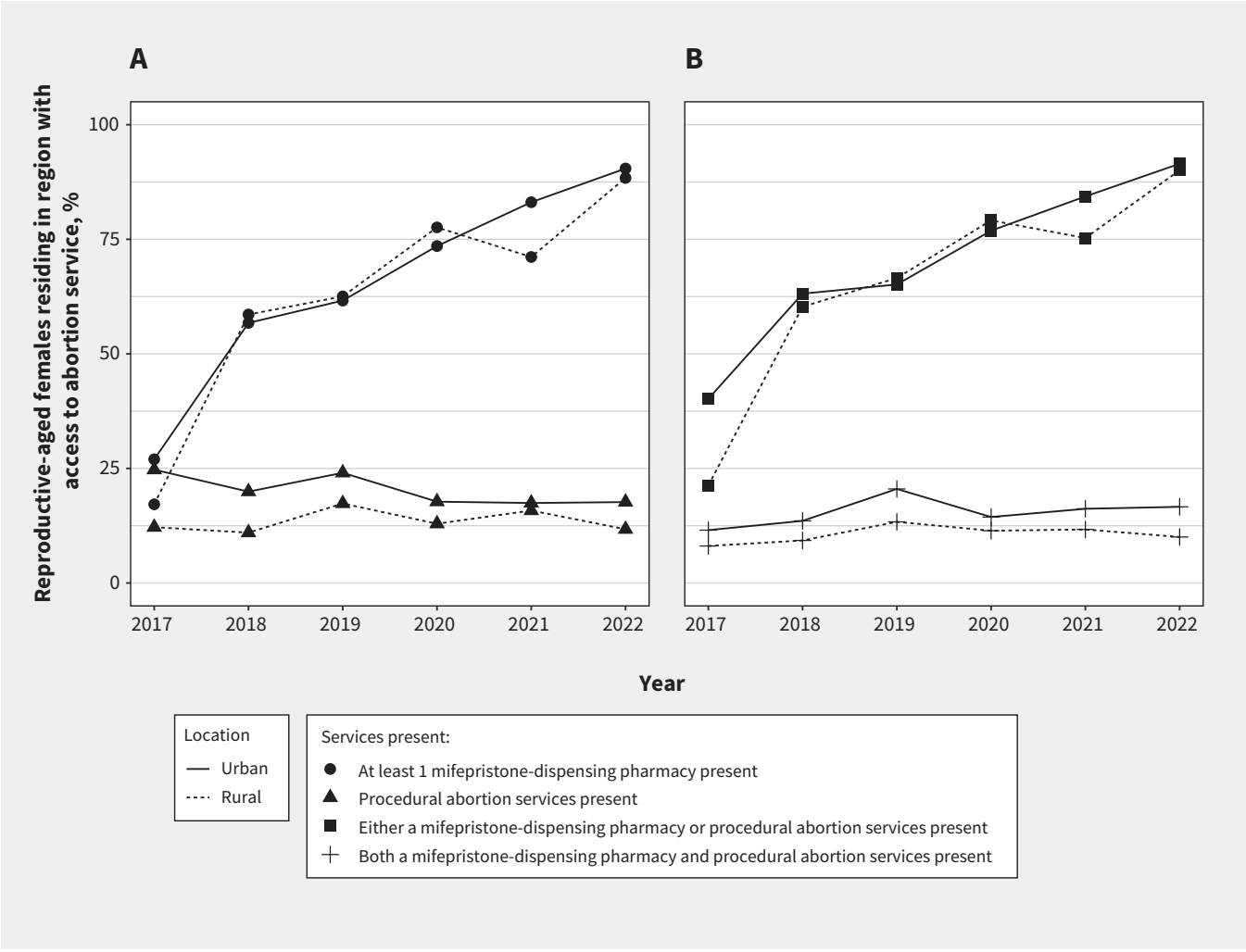

Figure 3: (A) Percent of reproductive-aged (15–49 yr) females residing in urban and rural geographic regions of Ontario, Canada, with at least 1 mifepristone-dispensing pharmacy present and the percent of reproductive-aged females living in urban and rural geographic regions with at least 1 procedural abortion provider present. (B) Percent of reproductive-aged females residing in urban and rural geographic regions of Ontario, Canada, with either a mifepristone-dispensing pharmacy or a procedural abortion provider present and the percent of those living in regions with both a mifepristone-dispensing pharmacy or a procedural abortion provider present. Supporting data are presented in Appendix 1, Supplementary Table 3. Created in ArcGIS Pro 3.4.0.

reasonable proxy for abortion service access, but cannot comprehensively measure this complex domain. Measures based on FSA likely misclassify access to some unknown extent, which vary based on where an individual lives within a given region (e.g., in the centre v. near the border with another FSA). Geographic information for pharmacies in the Ontario Drug Benefit database is limited to FSA (i.e., no further geographic granularity is available in the linkable outpatient prescription dispensation database required to identify mifepristone dispensing). The geographic size of FSAs varies substantially by population density, such that rural and remote FSAs are often very large, while urban FSAs can represent easily walkable areas. Thus, service availability by region may still imply long driving distances for access, especially for rural and remote populations. This database limitation prevented any analysis of estimated driving time or distance for patients to reach a dispensing pharmacy. We were unable to detect prescription delivery services, including brick-and-mortar pharmacies that offer prescription delivery or Internet-only pharmacies,[45] which may have led us to underestimate the availability of mifepristone in settings with access to delivery services. Unlike in some jurisdictions (such as in the United States), obtaining mifepristone and misoprostol via mail delivery services outside the health care system (e.g., Women on Web) was very uncommon in Canada during our study period;[46,47] thus, we expect that our capture of mifepristone dispensations in administrative data are near complete. Some hospitals or clinics may have directly dispensed mifepristone (particularly in 2017, before physician-only dispensing for mifepristone was eliminated[10]); since only outpatient community pharmacies report dispensations in the Ontario Drug Benefit system, these dispensations would not appear in ICES data holdings. Similarly, some rural and remote areas may have procedural abortion services provided by physicians with primary practice locations in different regions. With a repeated cross-sectional design, our study cannot directly differentiate between expanded local availability of mifepristone versus pandemic-accelerated or pandemic-specific changes. However, our year-by-year changes

did not reveal a sharp increase during the pandemic relative to other year-by-year changes in nonpandemic years. As we cannot measure pregnancy intentions in population-based administrative data, our analysis may underestimate discordance between patient need for abortion services and service availability. In this analysis, we defined regions with abortion need as those in which a resident successfully obtained an abortion; however, inadequate abortion access may have led some individuals to continue a pregnancy even if they would have preferred to terminate.[48] Although the introduction of mifepristone and removal of restrictions limiting its use were enacted nationwide,[10,22] implementation of this new abortion practice, uptake by providers, and changes in geographic distribution of service availability may differ across Canadian jurisdictions. Thus, while we found encouraging improvements in availability of abortion services in Ontario, these findings may not be generalizable to other settings.

Conclusion

Access to medication abortion across Ontario increased substantially within 5 years of mifepristone availability as a normally prescribed and dispensed medication. Further expansion to address remaining service gaps may need to focus on professional development or supports to develop pharmacy referral or delivery networks to ensure access within each geographic area, as well as expanded access to procedural abortion services.

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Data sharing: The data set from this study is held securely in coded form at ICES. Although legal data sharing agreements between ICES and data providers (e.g., health care organizations and government) prohibit ICES from making the data set publicly available, access may be granted to those who meet prespecified criteria for confidential access, available at www.ices.on.ca/DAS (email: das@ices.on.ca). The full data set creation plan and underlying analytic code are available from the authors upon request, understanding that the computer programs may rely upon coding templates or macros that are unique to ICES and are therefore either inaccessible or may require modification.

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