

## PATIENT MARGINALIZATION AND COVID-19 EMERGENCY DEPARTMENT (ED) VISITS DURING THE INITIAL WAVE OF THE PANDEMIC

Prepared by: HHS Integrated Decision Support BI (IDS), September, 2020

### Data Sources:

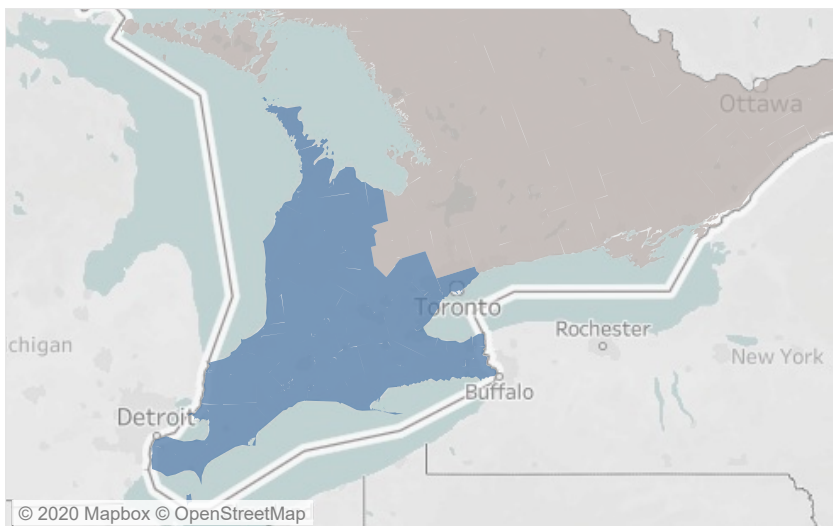
1. ED Visit & Marginalization Information: IDS: National Ambulatory Care Reporting System (NACRS), 2016 Ontario Marginalization Index
2. Population Counts: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016003. Accessed July, 2020.

**Purpose:** To explore how the marginalization of a patient's community relates to the rate of adult COVID-19 ED visits (both suspected and confirmed cases) in the initial wave of the pandemic.

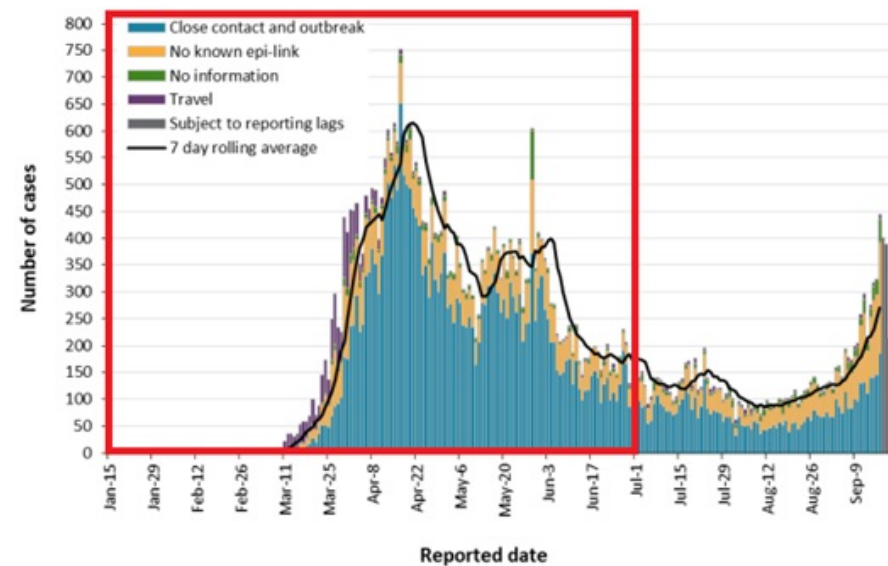
**Data Time Period:** January to June, 2020

> For context, this is the time period outlined in **red** as displayed in the Public Health Ontario chart to the right, which shows confirmed daily cases in Ontario.

**IDS Patient Regions:** Patients residing in the regions displayed below in **blue** are included in this report, accounting for about half the province of Ontario. For more details see Appendix A.



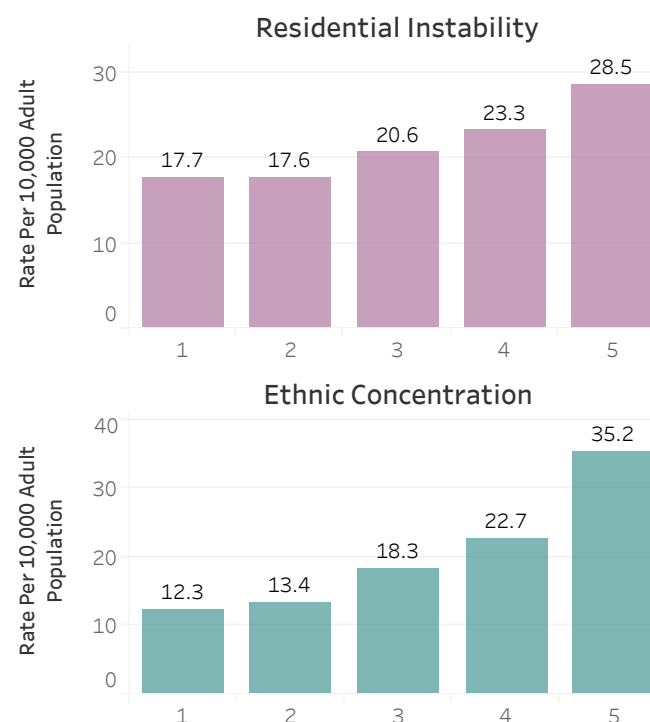
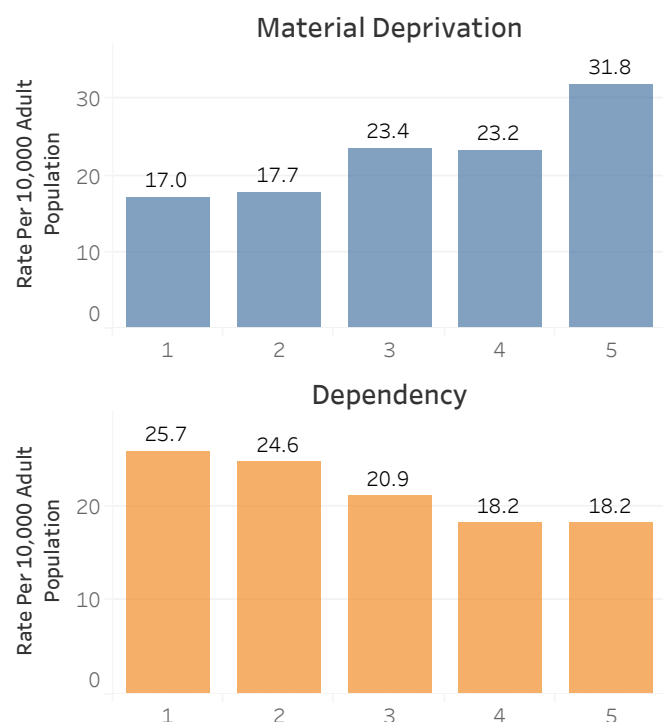
**Figure 1. Confirmed cases of COVID-19 by likely acquisition and public health unit reported date: Ontario, January 15, 2020 to September 20, 2020**



Data Source: CCM plus

**Chart Source:** Ontario Agency for Health Protection and Promotion (Public Health Ontario). Epidemiologic summary: COVID-19 in Ontario – January 15, 2020 to September 20, 2020. Toronto, ON: Queen's Printer for Ontario; 2020. <https://files.ontario.ca/moh-covid-19-report-en-2020-09-21.pdf>. Accessed on Sept 21, 2020.

## Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Ontario Marginalization Dimensions All IDS Patient Regions, Adults Only, Jan to Jun 2020



**Observations:** Looking across all IDS patient regions, the rate of COVID-19 ED visits per population increases considerably as the material deprivation, residential instability or ethnic concentration of the patient's neighbourhood increases. In addition, the rate appears to decrease as dependency increases.

However, this aggregate level can be misleading. Results by public health unit on the next several pages, show that within each area the trend is less pronounced, especially for dependency and ethnic concentration.

Part of the reason for this, is that not all cities have an equal distribution of marginalization across the dimensions. For example, Peel & Toronto contribute 77% of the population within the 'Ethnic Concentration 5' bar on this page, but only 3% of the population within the 'Ethnic Concentration 1' bar. Peel & Toronto regions have some of the highest rates of COVID-19 ED visits per population overall (regardless of Ethnic Concentration), and this higher overall rate has a large impact on the 'Ethnic Concentration 5' column and a low impact on the 'Ethnic Concentration 1' column.

Similarly, Peel & Toronto contribute 58% of the 'Dependency 1' bar, but only 20% of the 'Dependency 5' bar.

## Summary Table IDS Patient Regions

COVID-19 ED Visits 11,972

Adult Population 5,392,245

Rate Per 10,000 Adult Population 22.2

### 2016 ON MARG INDEX:

1 - Least Marginalized to 5 - Most Marginalized

### Material Deprivation

Closely connected to poverty and refers to the inability for individuals and communities to access and attain basic material needs

### Residential Instability

People who experience high rates of family or housing instability

### Dependency

People who do not have income from employment (including seniors, children, and adults whose work is not compensated)

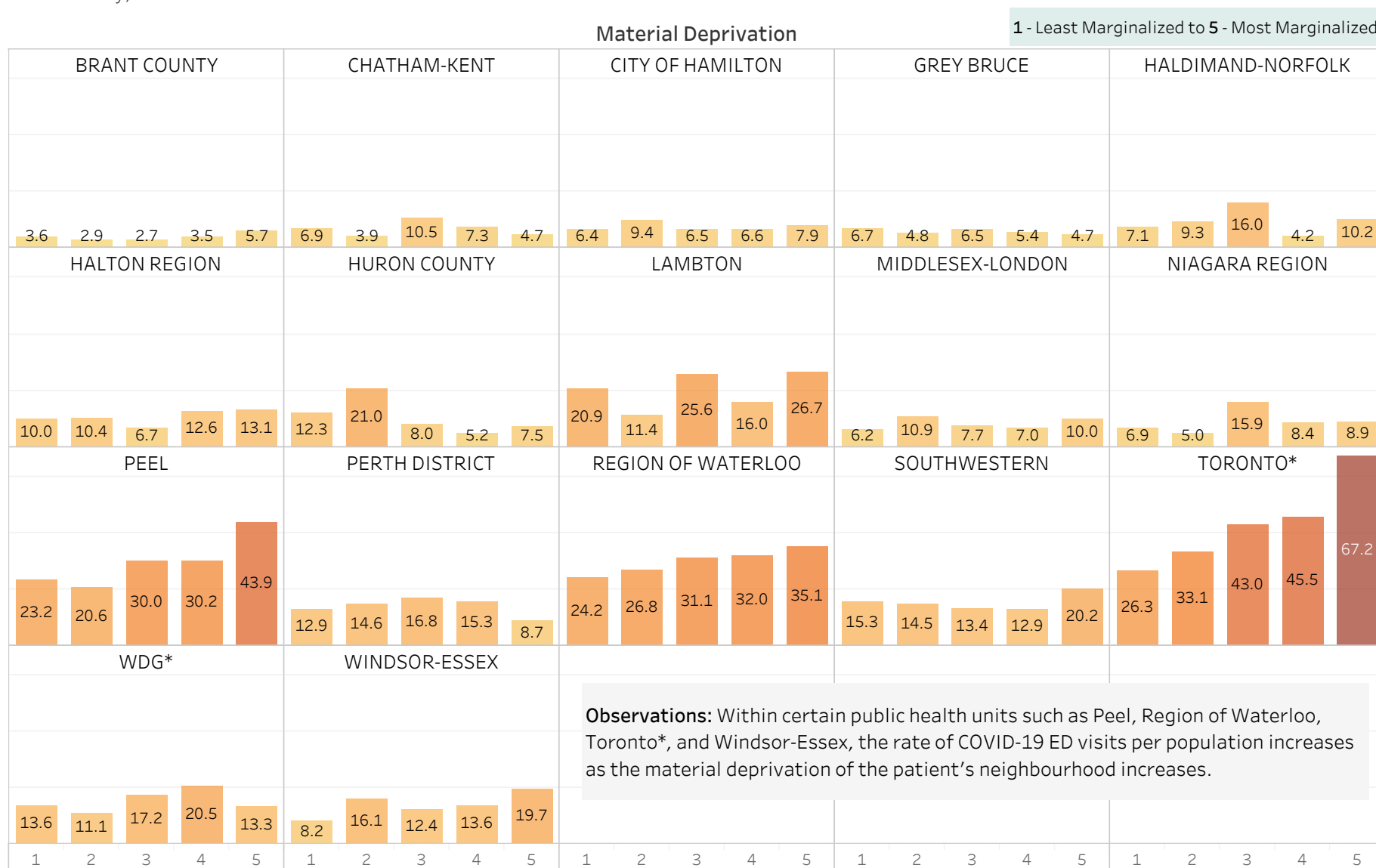
### Ethnic Concentration

High area-level concentrations of people who are recent immigrants and/or people belonging to a 'visible minority' group (defined by Statistics Canada as "persons, other than aboriginal peoples, who are non-Caucasian in race or non-white in colour").

**ON-MARG Definition Source:** Matheson, FI; Ontario Agency for Health Protection and Promotion (Public Health Ontario). 2016 Ontario marginalization index: user guide. Toronto, ON: Providence St. Joseph's and St. Michael's Healthcare; 2018. Joint publication with Public Health Ontario.

## Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Material Deprivation & Public Health Unit

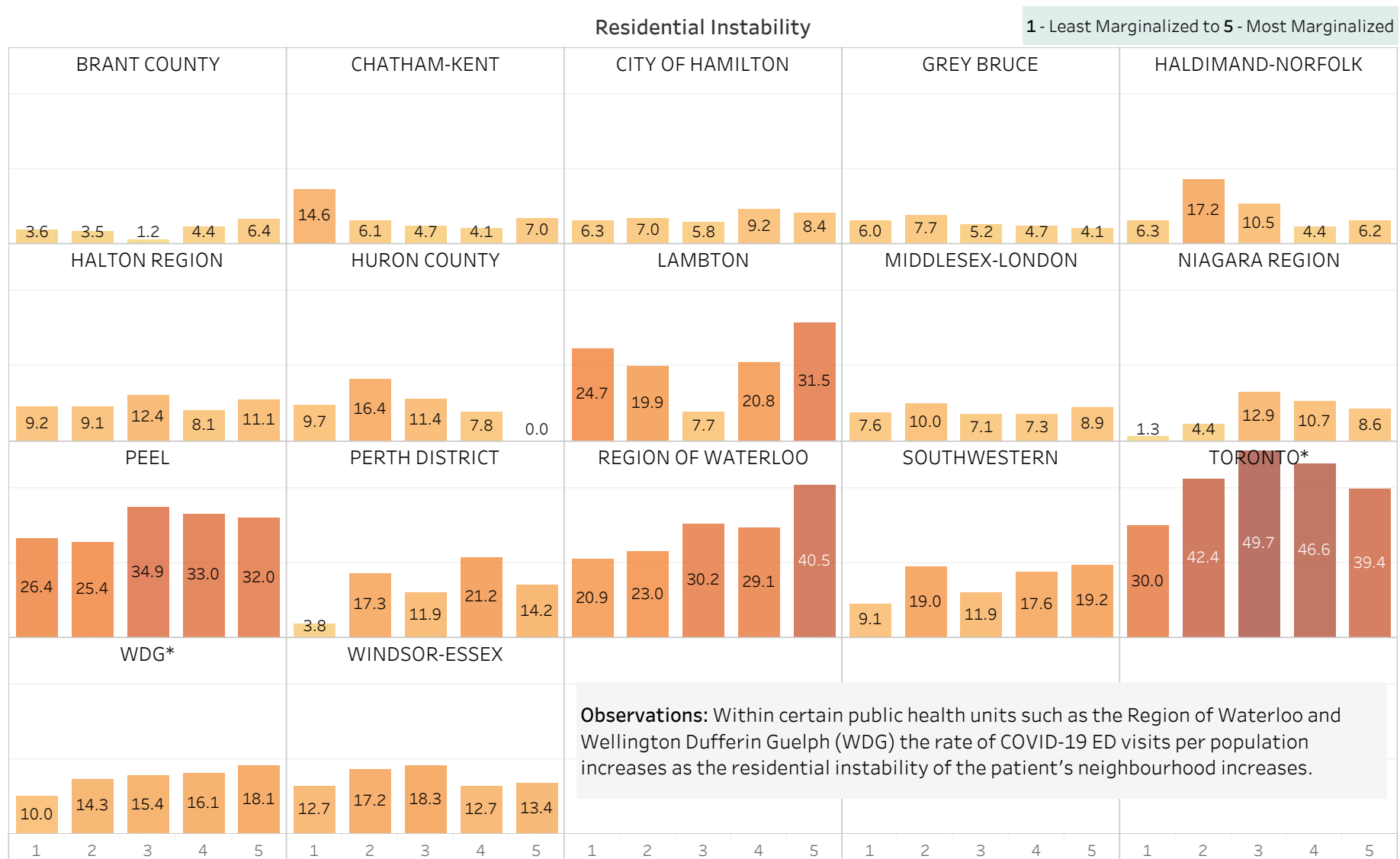
Adults Only, Jan to Jun 2020



**TORONTO\*:** This figure displays results for only the portion of Toronto Public Health (about half) that is contained in the TC LHIN, CW LHIN and MH LHIN regions. See Appendix A for more information.

**Wellington-Dufferin-Guelph (WDG)\*:** This figure only displays results for the Wellington & Guelph portions of this Public Health Region, not the Dufferin Region. See Appendix A for more information.

**Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Residential Instability & Public Health Unit**  
Adults Only, Jan to Jun 2020

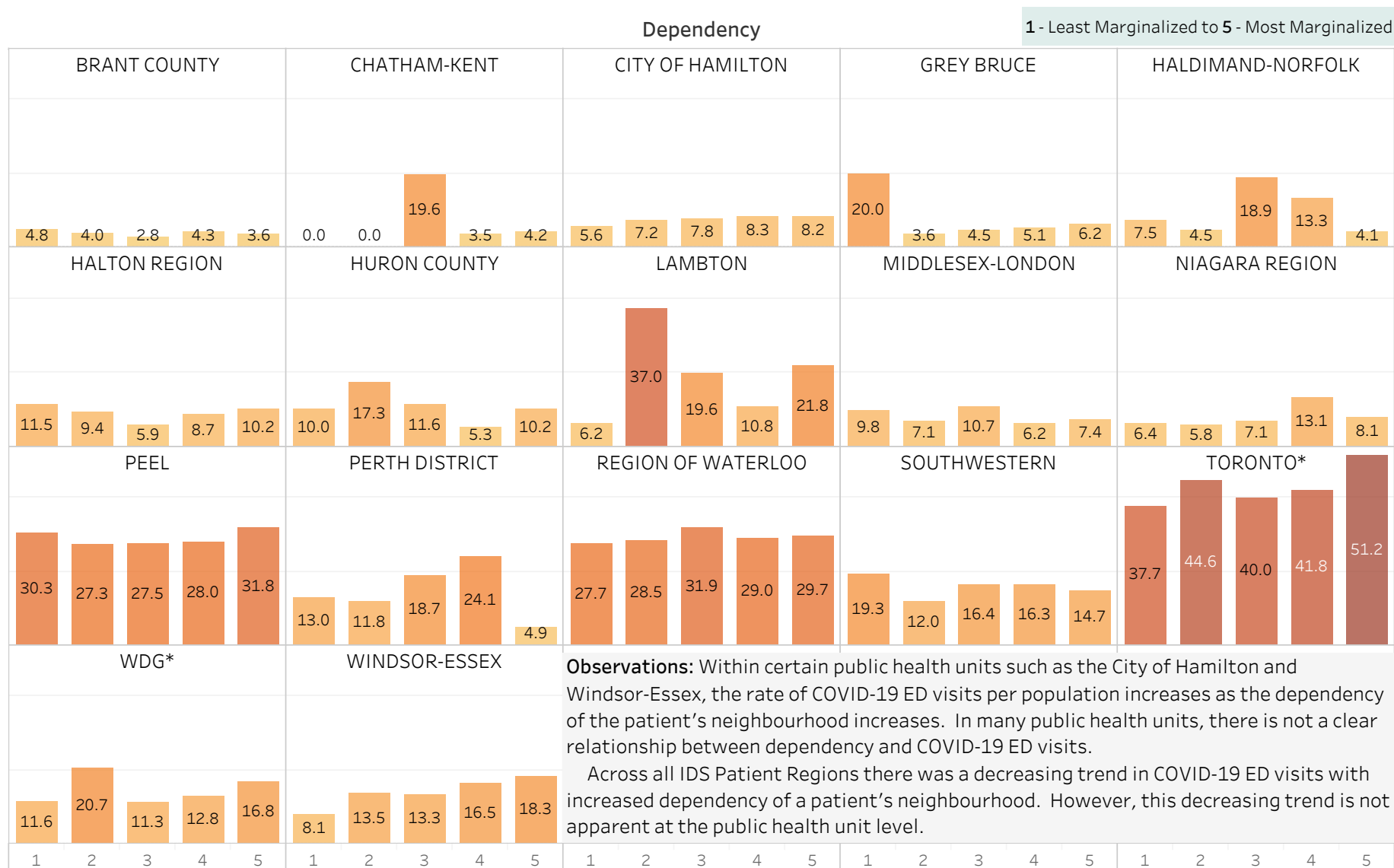


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## Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Dependency & Public Health Unit

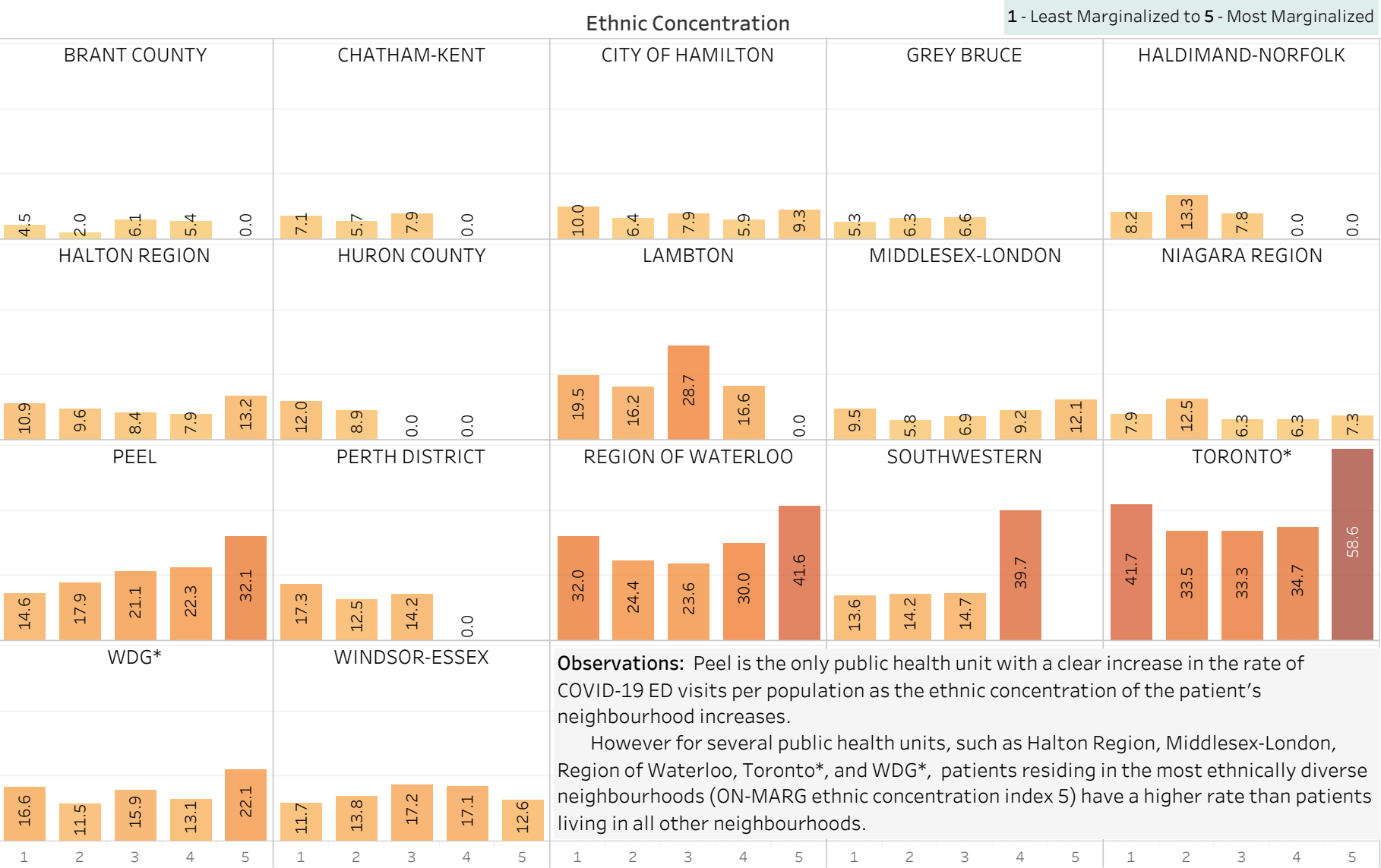
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# Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Ethnic Concentration & Public Health Unit Adults Only, Jan to Jun 2020

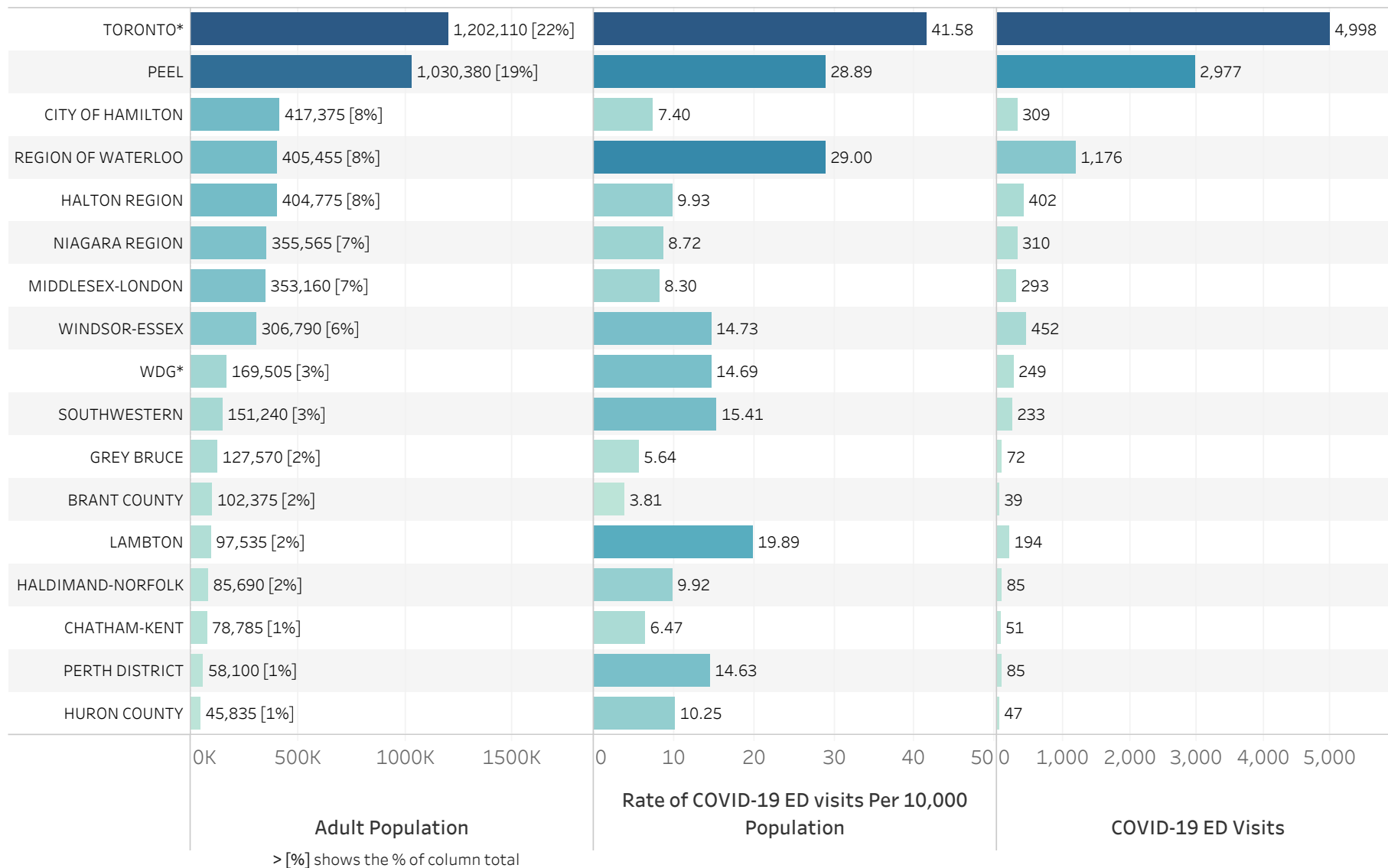


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# Overall Rate of COVID-19 ED Visits Per 10,000 Adult Population

## Results by Public Health Unit, Adults Only, Jan to Jun 2020



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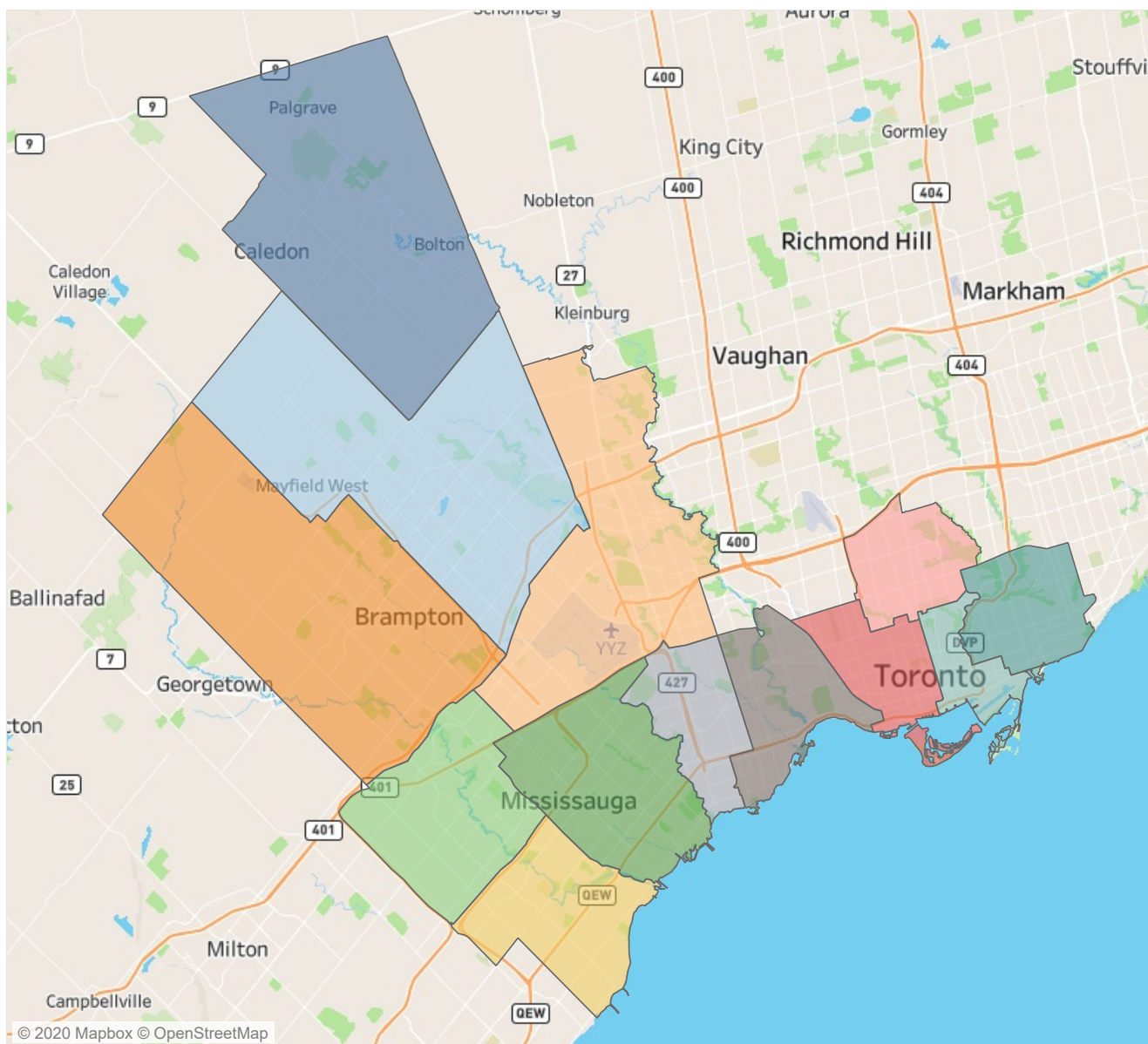
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## TORONTO\* & PEEL SPOTLIGHT

**Background:** Since Toronto and Peel Public Health Units (PHUs) cover such a large population, the following four pages break the two PHUs into smaller LHIN Subregions. The LHIN Subregion map below is provided for reference.

### Toronto\* & Peel LHIN Subregion Reference Map



#### LHIN Subregion

- 05 Bolton-Caledon
- 05 Bramalea
- 05 Brampton
- 05 North Etobicoke Malton\*
- 06 East Mississauga
- 06 North West Mississauga
- 06 South Etobicoke
- 06 South West Mississauga
- 07 East Toronto
- 07 Mid-East Toronto
- 07 Mid-West Toronto
- 07 North Toronto
- 07 West Toronto

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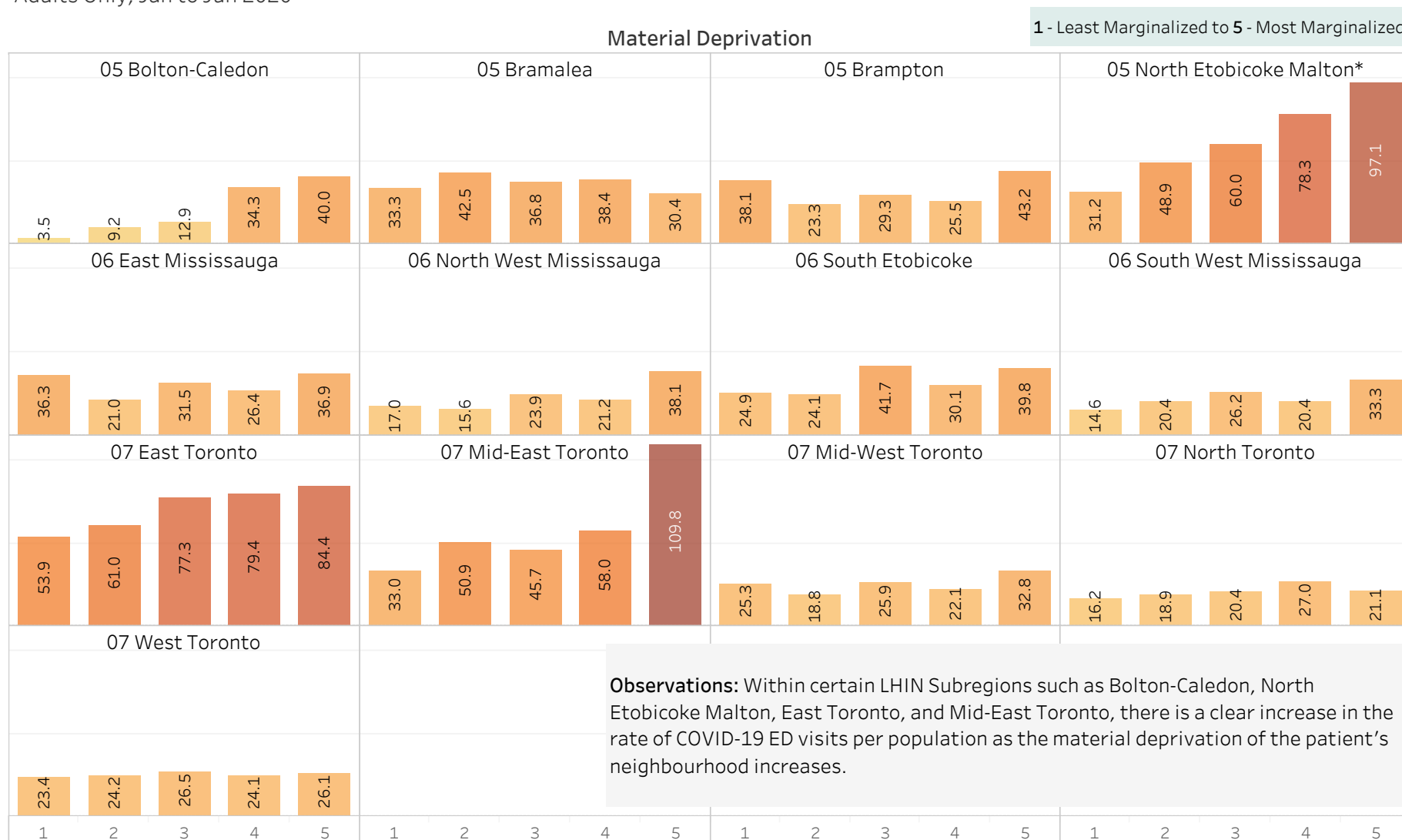
**05 North Etobicoke Malton\*:** This LHIN subregion is typically named 05 North Etobicoke Malton West Woodbridge. However, the West Woodbridge portion of the LHIN subregion falls within the York Region PHU, which is not within the IDS Patient Region geography. Therefore West Woodbridge is not included in this analysis, and the LHIN subregion name has been revised accordingly.



## TORONTO\* & PEEL SPOTLIGHT

Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Material Deprivation & LHIN Subregion

Adults Only, Jan to Jun 2020



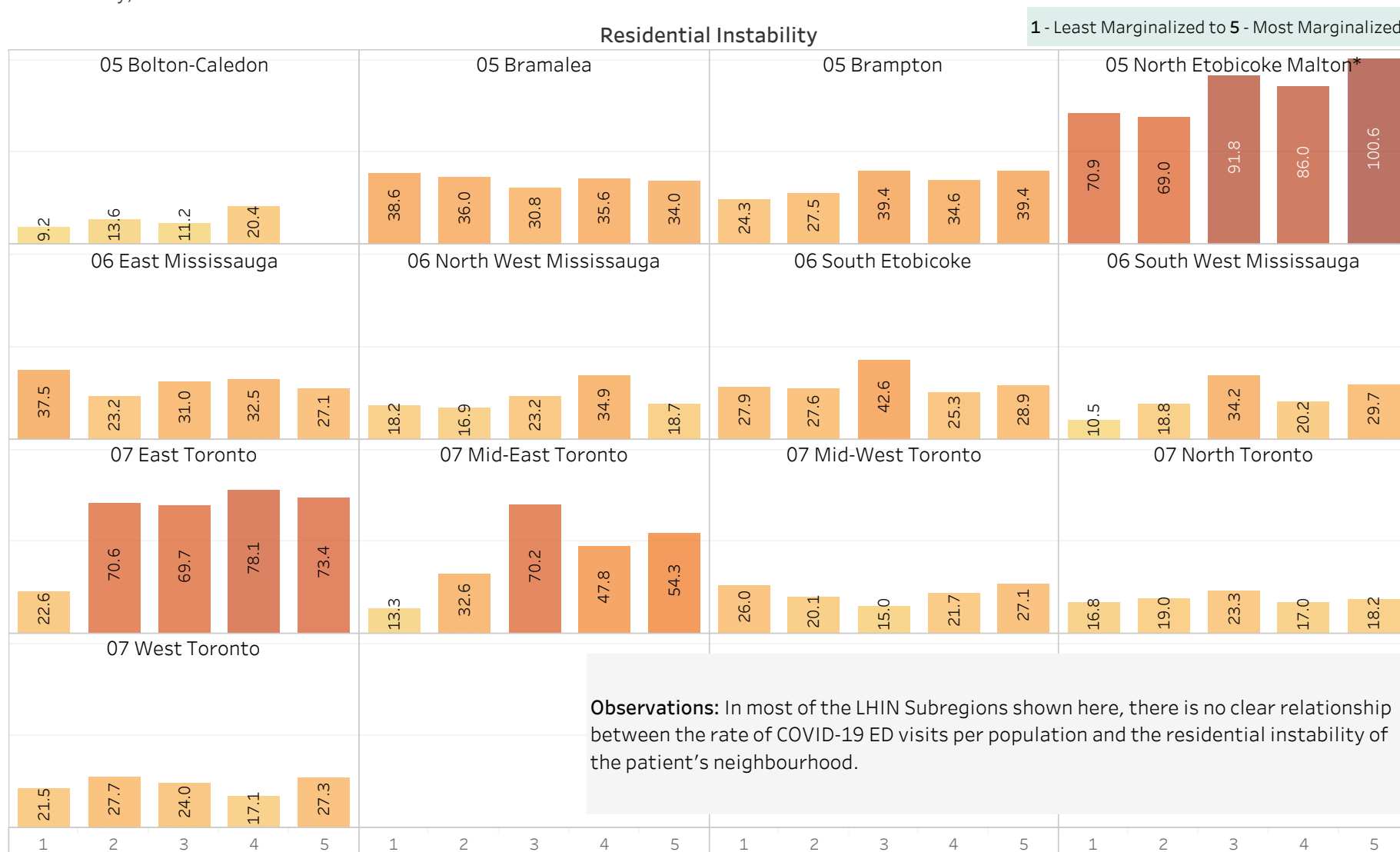
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## TORONTO\* & PEEL SPOTLIGHT

Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Residential Instability & LHIN Subregion

Adults Only, Jan to Jun 2020



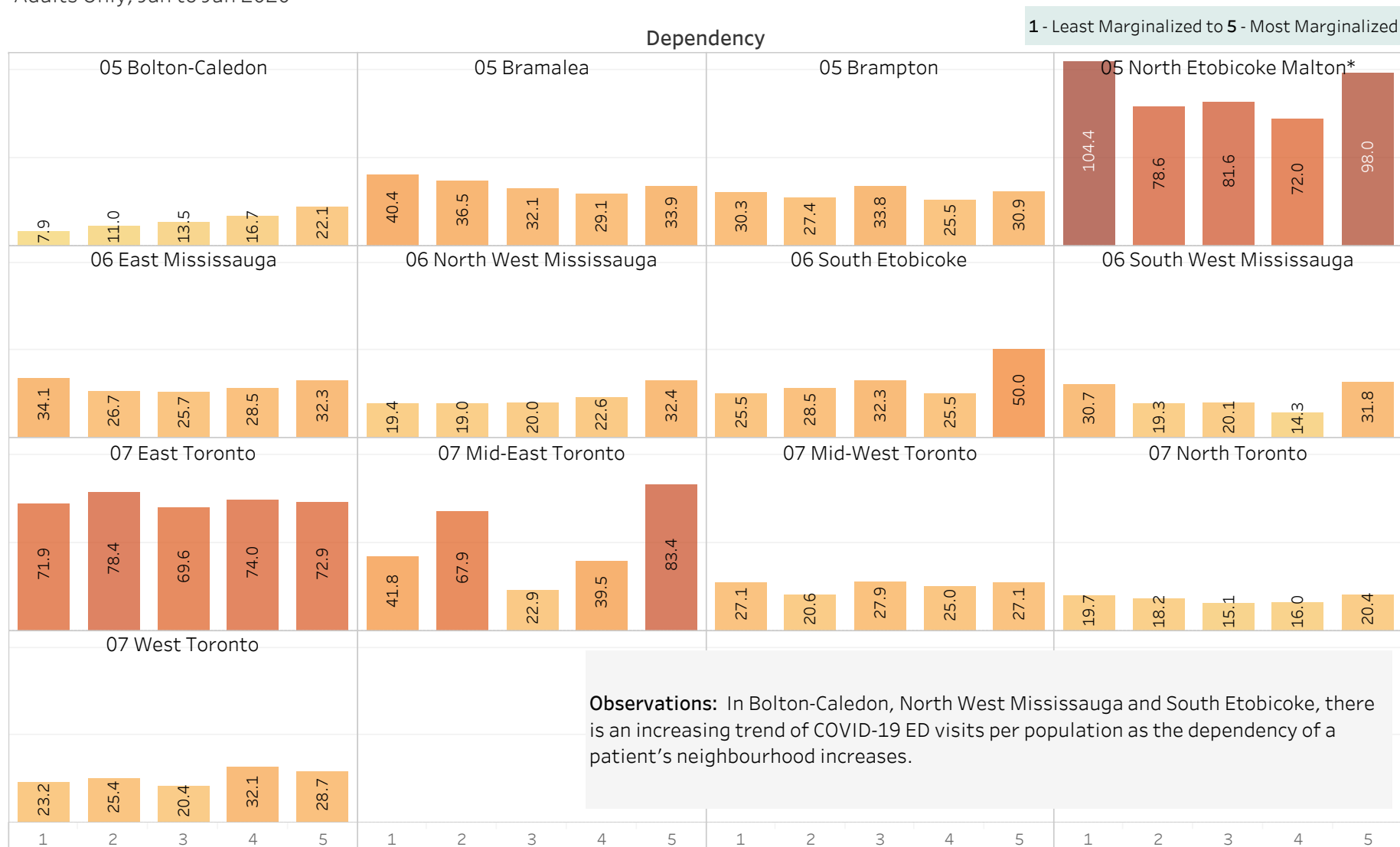
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## TORONTO\* & PEEL SPOTLIGHT

Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Dependency & LHIN Subregion

Adults Only, Jan to Jun 2020



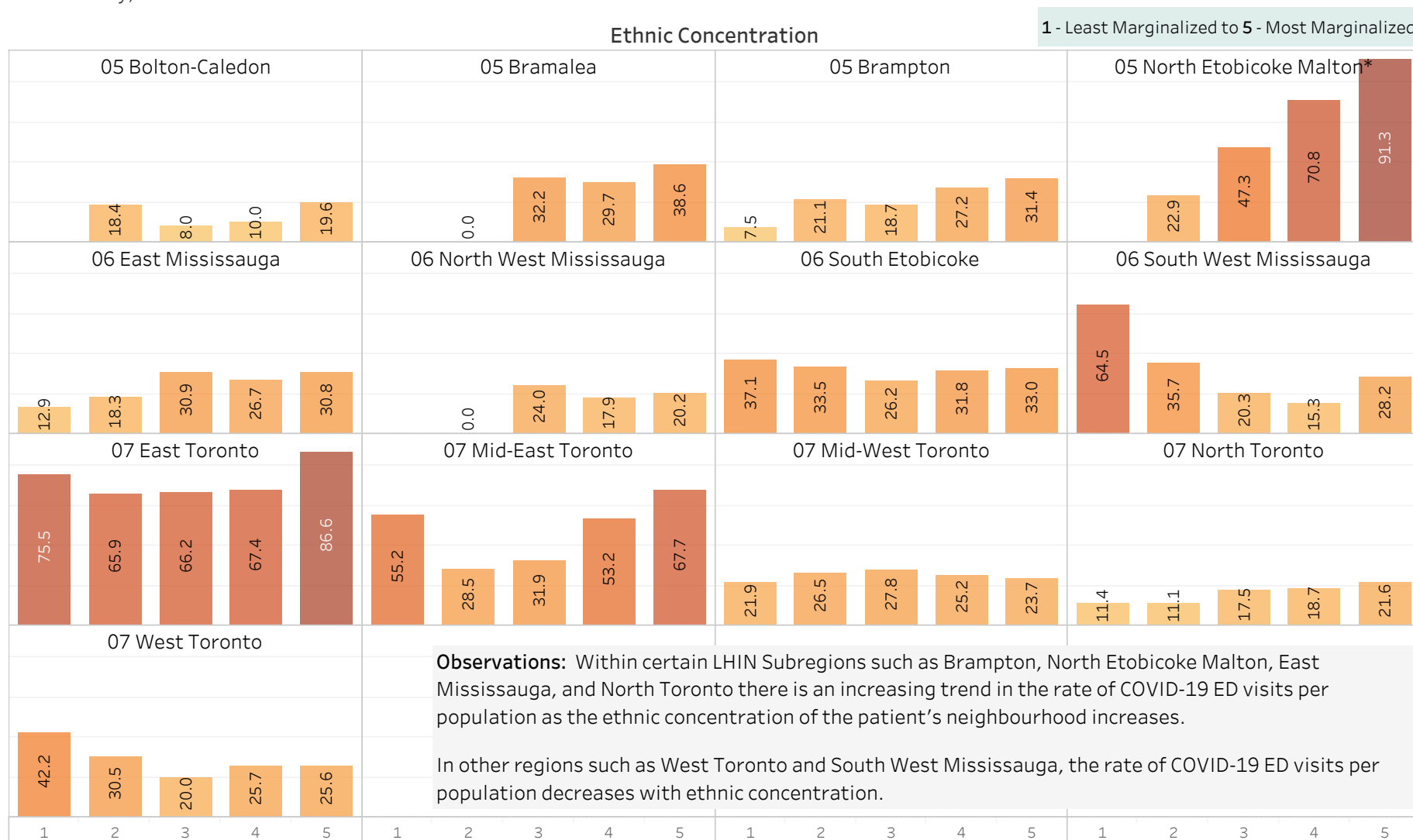
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## TORONTO\* & PEEL SPOTLIGHT

Rate of COVID-19 ED Visits Per 10,000 Adult Population, by Ethnic Concentration & LHIN SubRegion

Adults Only, Jan to Jun 2020



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## Appendix A: IDS Patient Regions

> IDS data includes all acute care hospitals within the ESC, SW, WW, HNHB, MH & TC LHINs, as well as single health service providers in other regions: William Osler Health System, Children's Hospital of Eastern Ontario & Health Sciences North.

> In order to calculate a rate per population, only regions where the majority of patient hospital activity from that region is captured within the hospitals listed above can be used.

> Therefore, only residents that live within the census divisions within the 6 LHIN regions above, as well as Peel (since William Osler accounts for the majority of ED visits for residents of Peel) have been included in the analysis, and are referred to as 'IDS Patient Regions'.

> Toronto Census Division however, is only partially contained within these regions. Therefore, only the Dissemination Areas included within the TC, MH & CW LHINs are included in the analysis, displayed in dark green in the 'Toronto Census Division' map below.

> As noted throughout this report, the Dufferin portion of the Wellington-Dufferin-Guelph (WDG) Public Health Unit is not included. The majority of acute visits for residents of Dufferin take place at Headwaters Healthcare, which is not an IDS Participating Hospital.

### How much of Ontario is included?

The adult (18+) population residing in the 'IDS Patient Regions' is 5.4 million, which is 50% of the total Ontario adult population of 10.8 million as of the 2016 census.

## IDS Patient Regions

Census Divisions marked in **blue** below, as well as the **dark green** portion of the Toronto Census Division is included in this report.



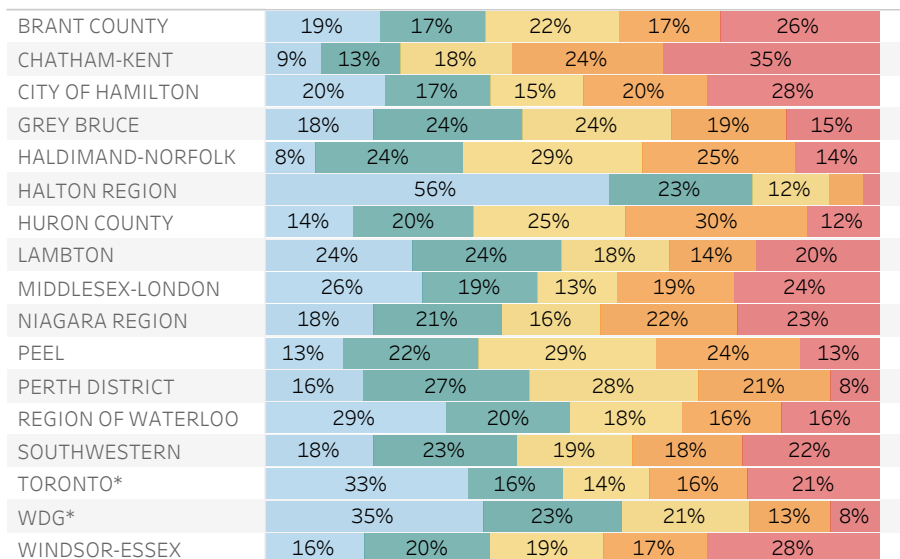
## Appendix B: Distribution of Public Health Unit Adult Population by Ontario Marginalization Dimension

Ontario Marginalization Quintiles [1 - Least Marginalized to 5 - Most Marginalized]:

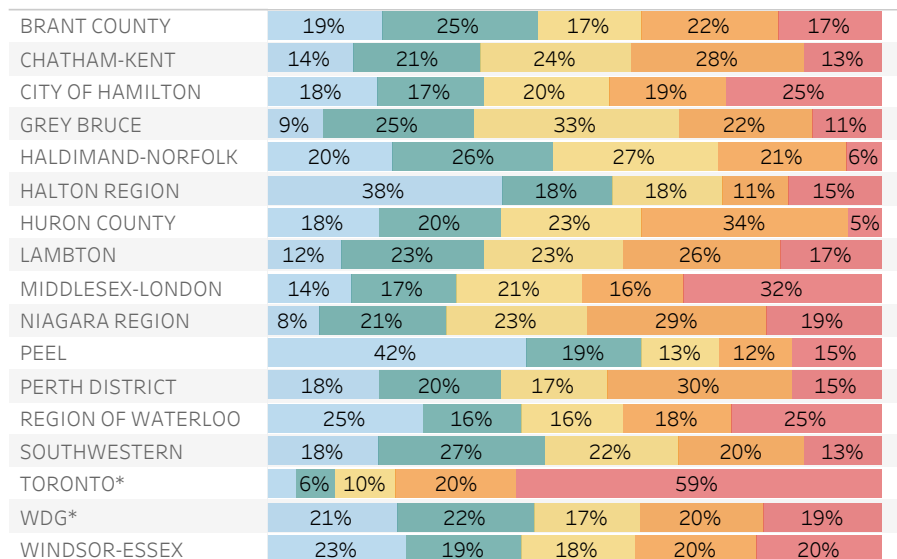


**Sample Interpretation:** 35% of the population of Chatham-Kent live in the most materially deprived areas in the province (quintile 5), while 9% live in the most affluent (quintile 1) areas of the province.

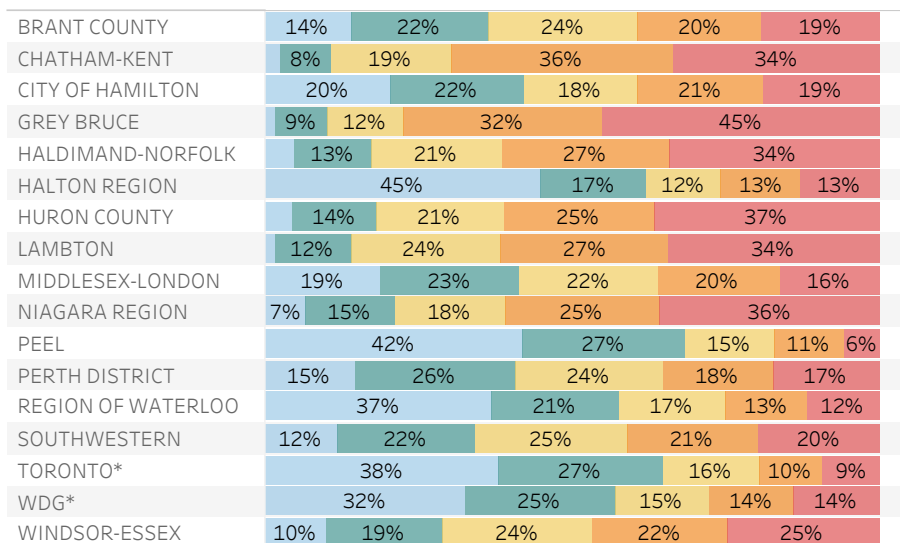
### Material Deprivation



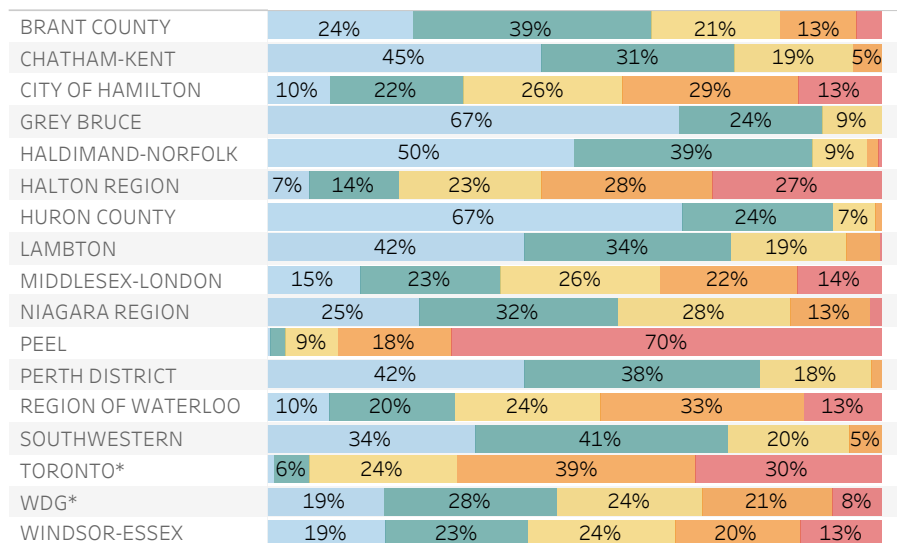
### Residential Instability



### Dependency



### Ethnic Concentration



## Appendix C: Methodology & Considerations

### METHODOLOGY

1. The following Census Divisions of patient residence are included in the analysis: Brant, Bruce, Chatham-Kent, Elgin, Essex, Grey, Haldimand-Norfolk, Halton, Hamilton, Huron, Lambton, Middlesex, Niagara, Oxford, Peel, Perth, Toronto, Waterloo, Wellington. In addition, any dissemination areas (DAs) of the Toronto Census Division outside of MH, CW & TC LHIN region boundaries were excluded.
2. The adult population (18+) of each DA were downloaded from Statistics Canada (source citation on page 1 of this report).
3. Adult COVID-19 ED visits were identified from NACRS data as follows: ED Visits (ED Visit Indicator = 1) with a registration date in January to June, 2020, patient age of 18 or older, and any diagnosis (not just main diagnosis) of "U071 - Confirmed COVID-19 Case" or "U072 - Suspected COVID-19 Case".
4. Each patient was assigned an Ontario Marginalization (ON-MARG) Index Score using the dissemination area (DA) of patient residence (based on the patient's postal code of the ED visit). A DA is the smallest geography that the ON-MARG information is made available. Patients records that were not associated with an ON-MARG index score (either due to invalid patient geography, or because the region has not been attributed an ON-MARG score due to small cell counts) were excluded from the analysis. In addition, patients residing in a DA where the adult population count is deemed 'too unreliable to be published' by Statistics Canada are excluded from the analysis.
5. The rate of adult COVID-19 ED visits per 10,000 population is calculated as the number of ED visits within each ON-MARG quintile, divided by the total adult population within each ON-MARG quintile.

### CONSIDERATIONS

1. The 2016 Ontario Marginalization Index (ON-MARG) is used here as a proxy for patient marginalization based on the dissemination area (DA) of patient residence, since this marginalization information is not available at an individual patient level. Therefore patients are assigned the marginalization score of their overall neighbourhood (a DA typically has a population of 400-700 people), and may not reflect that marginalization level as an individual. In addition, the 2016 Ontario Marginalization Index is based on the 2016 Statistics Canada census, while the ED visits in this report are from 2020. Therefore, population demographics within in each area that have changed since 2016 are not represented here.
2. As stated in Appendix A, not all hospitals in Ontario are participants of IDS. Therefore, patient activity for those who reside in the 'IDS patient regions' but attend a hospital outside of IDS will not be captured in this report.
3. Adult population counts from Statistics Canada are aggregated from counts by individual age at a DA level into an 18+ category. At the DA level, some of these individual age volumes are labelled as "too unreliable to be published" and are not available. In addition, populations of DAs that are not assigned an ON-MARG score are excluded from the analysis. Therefore aggregate population counts at the public health unit level posted by Statistic Canada may differ slightly from the population counts displayed in this report.
4. Results here are not adjusted for differences in age across regions or dimensions of marginalization. Age-adjustment could provide a more equitable look at the difference in rates. Public Health Ontario has released a document looking at ON-MARG ethnic concentration and COVID-19 infections across the province using age adjusted rates. This report is available here:  
> Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 in Ontario - A Focus on Diversity: January 15, 2020 to May 14, 2020 Toronto, ON: Queen's Printer for Ontario; 2020.