TEAM TRIPLE ANALYTICS

BRIDGING DIVIDES MIGRATION DATA CHALLENGE 2025

FINAL REPORT

MEMBERS:

MAITREYEE DAS URMI

ALIZEH ZAFAR

NIDHI BISWAS

Barriers or Gateways? The Role of Public Service Accessibility in Immigrant Settlement Across Canada

Imagine newcomers arriving in Canada hoping for a better life, only encountering unexpected barriers to essential services. With little prior knowledge of their surroundings, many immigrants settle in neighbourhoods where schools are overcrowded, medical clinics are distant, and limited public transportation makes access even more difficult.

In this analysis, my team and I explore "*the divide recent immigrants (immigrated between 2016-2021) and long-term immigrants (immigrated before 2016) face when accessing healthcare and education in Canada."* As immigrants ourselves, we wanted to shed light on the challenges faced by people like us and examine whether these experiences differ depending on the period of immigration.

Method Used for Analysis

To better understand the trends in the dataset, we merged the Census Profile data with the Spatial Access Measures datasets to capture more context around two immigrant groups: one representing the immigrant ratio in regions with high walkable access to amenities, and the other in regions with high public transit access. To identify regions with high accessibility, we used the median values of variables such as *public_ef* and *walk_hf* as thresholds. Regions with values above the median for these indicators were classified as having high public transit or walkable accessibility, respectively.

For our analysis, we also incorporated external datasets from Statistics Canada's Open Databases; specifically, the Open Database of Healthcare Facilities and the Open Database of Educational Facilities. These datasets allowed us to examine the number of healthcare and educational institutions in each region, aggregated at the provincial level.

Long-term Immigrants

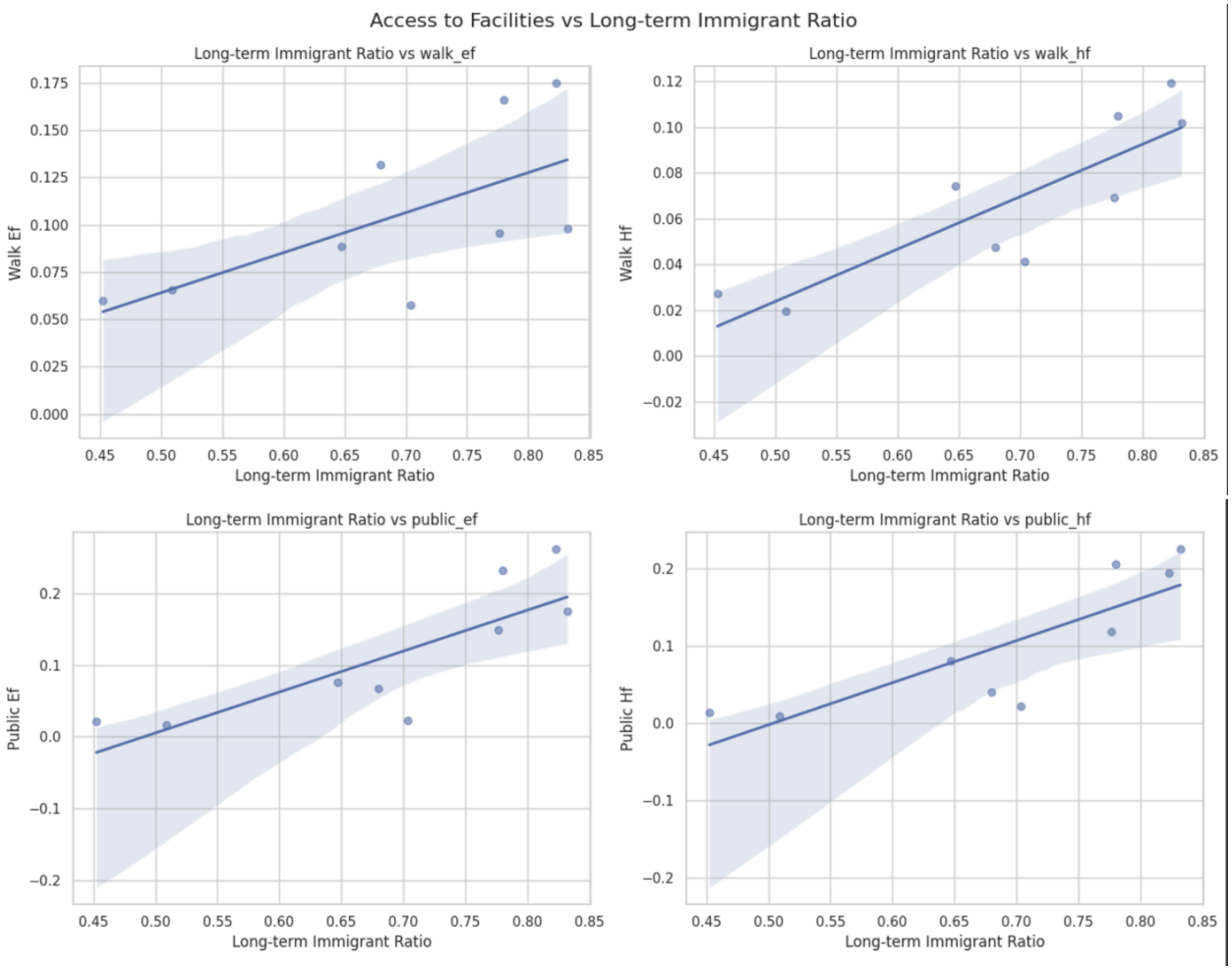


Fig 1.

The regression plots above (Figure 1) show a consistent positive correlation between the proportion of long-term immigrants and access to healthcare and educational facilities, both walkable and transit-based. This indicates that regions with higher concentrations of immigrants who arrived before 2016 tend to have better access to these essential services. While the plots do not explain causality, they suggest that long-settled immigrant communities are more likely to be located in areas where services are more accessible, whether by walking or public transit. These results can be seen by the positive correlation between long-term immigrant ratio and *walk_hf* (walkable access to healthcare facilities), *walk_ef* (walkable access to educational facilities), *public_ef* (public transit access to educational facilities), and *public_hf* (public transit access to healthcare facilities).

Walkable and Transit Access to educational facilities

In the top-left and bottom-left plots, the positive slopes for *walk_ef* and *public_ef* show that as the long-term immigrant ratio increases, so does access to educational facilities. This suggests that regions with more long-term immigrants are associated with better walkable and transit access to schools. Although the direction of the relationship is not confirmed, these results highlight a spatial alignment between established immigrant populations and educational infrastructure.

Walkable and Transit Access to Healthcare Facilities

The top-right and bottom-right plots show similar positive trends for healthcare facility access. In particular, the relationship between the long-term immigrant ratio and walkable access to healthcare (*walk_hf*) appears stronger than that of transit access (*public_hf*). This may indicate that in regions where long-term immigrants reside, healthcare facilities are more often located within walking distance. However, these associations are correlational and do not imply direct causation or improvement over time.

Recent Immigrants (2016-2021)

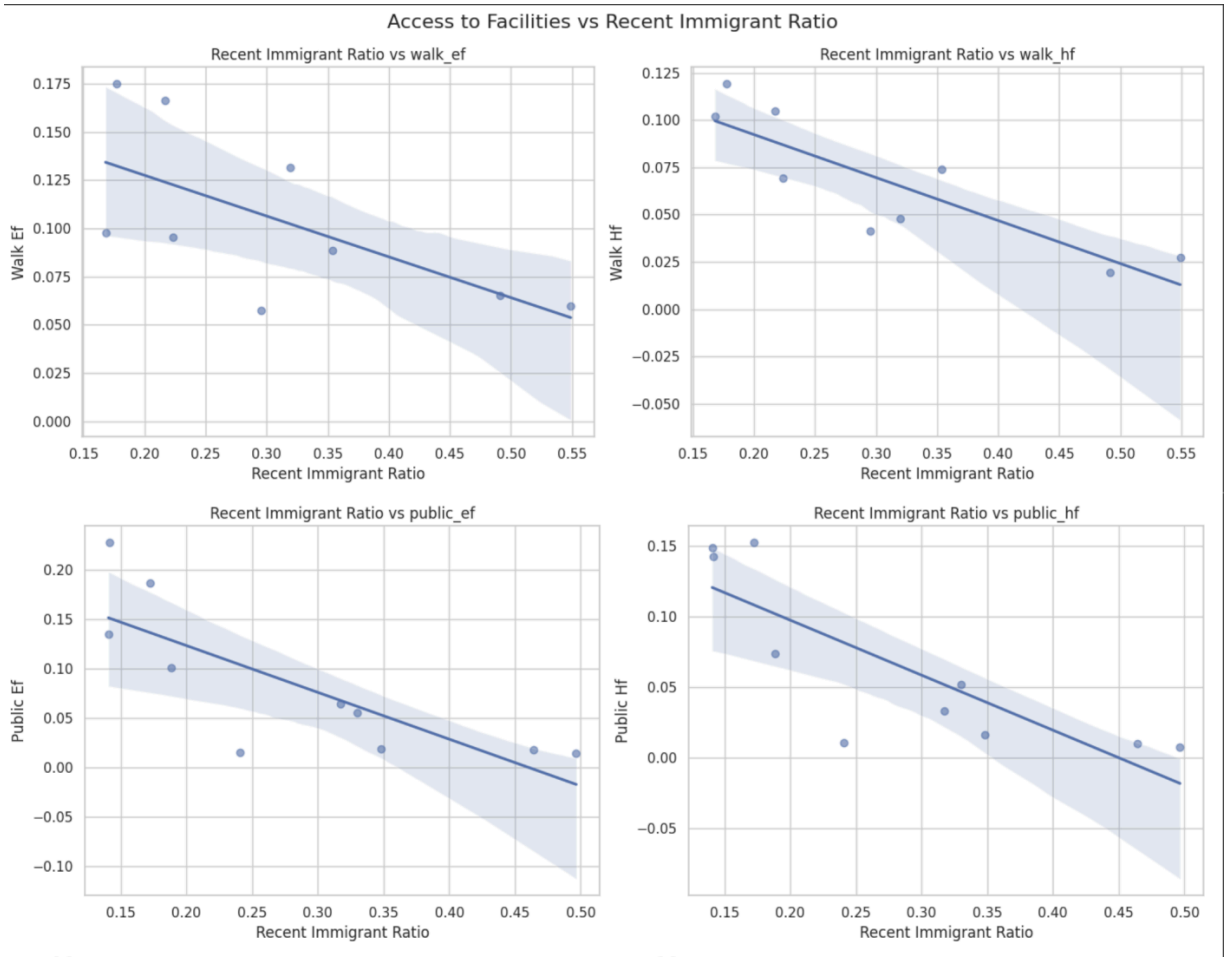


Fig 2.

The regression plots above (Figure 2) show a consistent negative correlation between the recent immigrant ratio and access to healthcare and educational facilities, both walkable and transit-based. This suggests that regions with higher proportions of immigrants who arrived after 2016 tend to have lower access to essential public services. These relationships point to an uneven distribution of service accessibility across areas where newcomers have settled.

Walkable and Transit Access to Educational Facilities

In the top-left and bottom-left plots, we see that both walkable access (walk_ef) and transit-based access (public_ef) to educational facilities decline as the recent immigrant ratio increases. In regions where more recent immigrants live, access to schools appears lower, both in terms of proximity and connectivity. While the plots do not explain why this relationship exists, they indicate that newer immigrant communities are more commonly associated with areas where school infrastructure and transit connections may be less established or less accessible. This means that a newcomer family's children may have to endure long walks or long transits just to get to a classroom.

Walkable and Transit Access to Healthcare Facilities

The negative slope for *walk_hf* is more pronounced than for education. Higher recent-immigrant ratios translate into much poorer walk access to clinics and hospitals. For elderly newcomers, this can mean that trips to the doctor are a much more difficult ordeal than they expected.

Just like *walk_hf*, public transit-based healthcare access (*public_hf*) is significantly worse where recent immigrants concentrate. The transit slope is roughly on par with the walking slope, meaning that neither mode reliably serves newcomer neighbourhoods. This can mean missed appointments and delayed check-ups when public transit cannot connect you to your local clinic easily.

While it's easy to show the numbers, what does this mean in terms of the disparities between individuals, families, and communities? Since new immigrants are not able to easily access the facilities that they need, is Canada failing to provide them with the resources they need to succeed? The observed patterns may reflect broader challenges that recent immigrants face in navigating their new environments, particularly when services are not easily accessible by foot or transit. These findings highlight the importance of considering accessibility in planning decisions that impact newcomers' integration and well-being.

Immigration Trends in High Public Transit Accessibility Regions

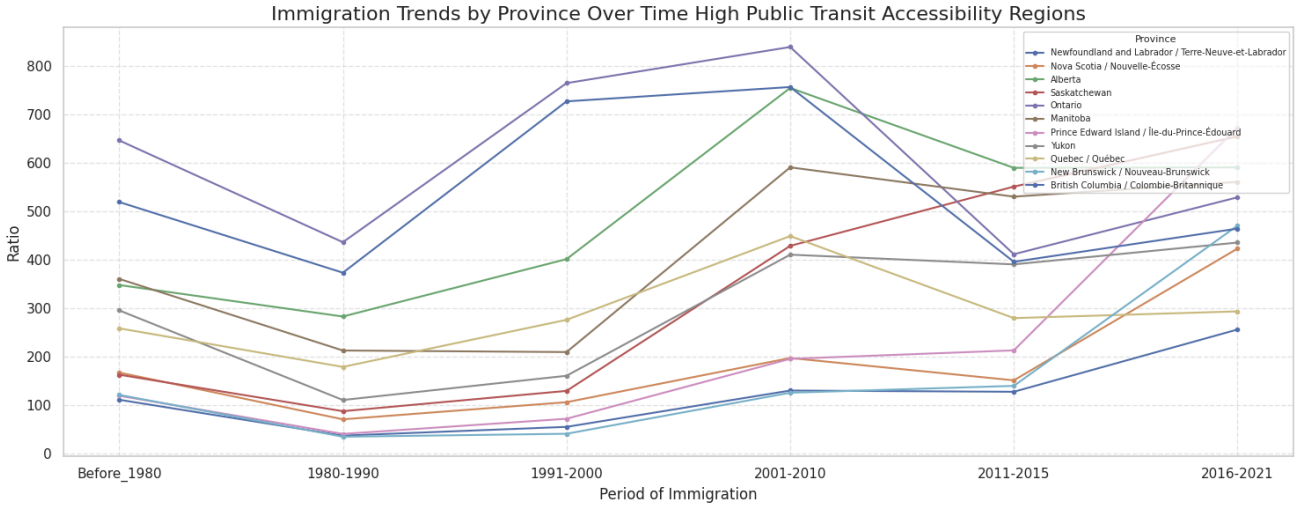


Fig 3. *View Interactive plot: Click here*

Figure 3 above shows how immigrants to transit-accessible areas have shifted over the years. Some provinces, like Prince Edward Island, Manitoba, and British Columbia, have stable or increasing trends — a sign that not only are their transit systems running, but they are also actively serving newcomers. After analyzing the Open Databases of Healthcare and Educational Facilities from Statistics Canada, we observed that with a high number of healthcare and educational facilities,[1] these provinces are more actively making transit-connected housing open and affordable for new immigrants.

But this upward pattern isn't seen everywhere. Ontario, Alberta, and Newfoundland and Labrador show a clear decline in immigrant shares in high transit-access areas (areas with more of these facilities) over the decades. For provinces that historically have received high numbers of arrivals, this trend signals deeper challenges, such as rising housing unaffordability, insufficient transit-connected growth, or policy failures that limit where immigrants can afford to live.

Observing these shifts leads us to the question of whether our transportation networks are constructed for the people arriving, or for the demographic trends of the past.

Because immigration continues to drive population growth, transit infrastructure must be followed by policies that keep it affordable and expand access so that immigrants can continue to rely on it, not just to get around, but to make a living.

[1] (Statistics Canada, 2020, The Open Database of Healthcare Facilities) (Statistics Canada, 2024, The Open Database of Educational Facilities)

Immigration Trends in High Walk Accessibility Regions

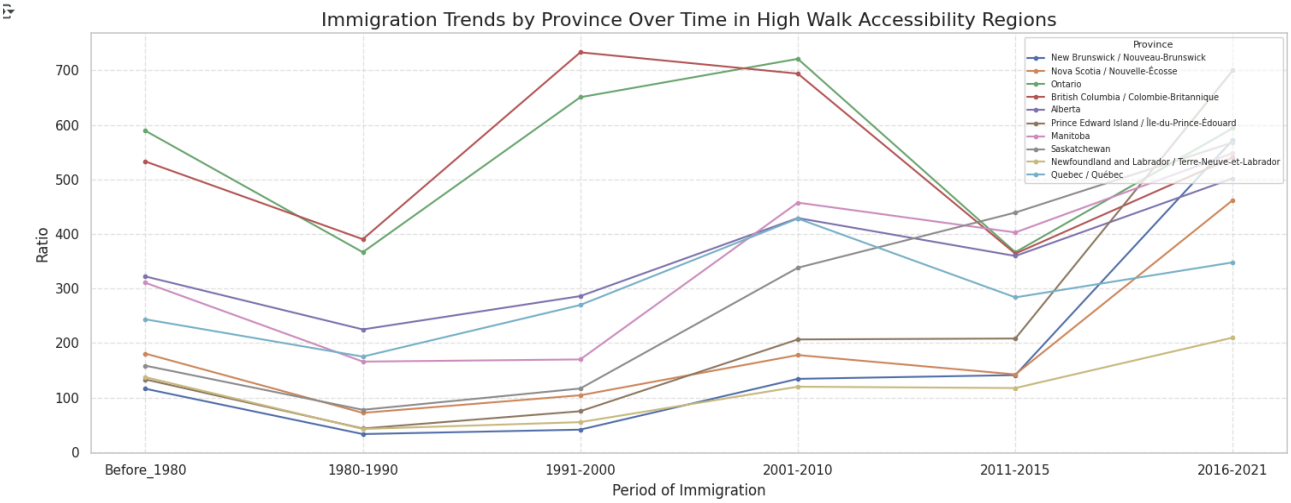


Fig 4. View interactive plot: Click here

Figure 4 above explores the composition of immigrant settlement in high walkable access areas from the period between 1980 through 2021.

A few provinces — like Ontario and British Columbia — show strong, early patterns of walkable access, with high immigrant proportions before 2000. However, their patterns fall in subsequent years, especially between 2011 and 2015, suggesting that newer immigrants are settling in areas where there are not a lot of these health and educational facilities.[2]

In contrast, Manitoba, Nova Scotia, and Newfoundland and Labrador illustrate a different trajectory. Their lines rise steadily towards 2016–2021, thus walkable accessibility for the immigrant group in those provinces is getting improved, possibly due to more recent planning strategies, less pressure of population pressure, or housing closer to services.

In walkable neighborhoods, generally in downtown or older neighborhoods, affordable housing might not be as available, making them inaccessible to newcomers. Meanwhile, new construction in the city outskirts leads to people having to reach facilities via car, given that it's not accessible on foot. Without intentional pre-planning to include affordable housing close to schools, clinics, and workplaces, walkability becomes a feature reserved for those who can afford it, rather than those who need it most.

Conclusion

Our analysis shows a striking divide: long-term immigrants inhabit neighbourhoods with steadily improving walkable and transit access to both schools and clinics, while recent arrivals find themselves in areas where neither sidewalks nor bus routes reliably link them to essential

[2] (Statistics Canada, 2020, The Open Database of Healthcare Facilities) (Statistics Canada, 2024, The Open Database for Educational Facilties)

services. Provincial trends reveal that only a handful of provinces (e.g., PEI, Manitoba, BC) are bucking this pattern, suggesting that targeted policy and planning can, and do, make a difference.

Some helpful policy recommendations would be:

- ➔ Expand walkable infrastructure in high-growth newcomer areas
- ➔ Route transit lines so newcomers can access education and health facilities easily
- ➔ Affordable housing incentives should focus on proximity to schools and clinics

By focusing on the lived immigrant experience in Canada, we can conclude that equitable access isn't just a metric—it's the foundation upon which successful settlement and integration rest. Only through intentional, data-driven planning can Canada bridge this gap for all immigrants.

References

Statistics Canada. (2020). The Open Database of Healthcare Facilities. *Statistics Canada Open Databases*, *Version 1.1*. https://www.statcan.gc.ca/en/lode/databases/odhf

Statistics Canada. (2024). The Open Database of Educational Facilities. *Statistics Canada Open Databases*, *Version 3.0*. https://www150.statcan.gc.ca/n1/pub/37-26-0001/372600012022001-eng.htm

Barriers or Gateways? Public Service Accessibility in Immigrant Settlement

Bridging Divides Migration Data Challenge 2025

Team Name: Triple Analytics

Members:
Nidhi Biswas
Alizeh Zafar
Maitreyee Das Urmi

How does access to healthcare and education differ for immigrants arriving 2016–2021 vs. before 2016?

This analysis compares immigrants who arrived between 2016–2021 with those who came before 2016, focusing on differences in access to education and healthcare via walkable and transit access.

It highlights hidden barriers and suggests targeted solutions

Methodology and Datasets Used

- Merged Census Profile with Spatial Access Measures (eg., using variables like walk_hf, public_hf, walk_ef, public_ef)
- Median split to define high-access regions
- Incorporated healthcare & education facility counts from Statistics Canada Open Databases
- Line Graphs and Regression plots analysis

Findings - Long Term Immigrants

- Positive correlations:
- Higher pre-2016 ratios → better walk_ef & public_ef
- Stronger walk_hf access, clinics within walking distance
- Transit health access also improves with settlement

Findings - Recent Immigrants

- Negative correlations:
- Higher 2016–21 ratios → lower walk_ef & public_ef
- Steeper decline in walk_hf, highlighting clinic distance
- Transit health access equally poor, impacts care

How can we improve walkable access for immigrants?

- To increase walkable access to educational and healthcare facilities, more sidewalks, street lights, and safe crossings are needed

- Protect walkable neighborhoods by keeping rent affordable and building housings

How can we improve transit access for immigrants?

- To increase access to these facilities via public transit, transit lines should connect places where recent-immigrants have settled with major health and education areas

- Offer transit fare discounts or newcomer-specific passes to ease the financial burden

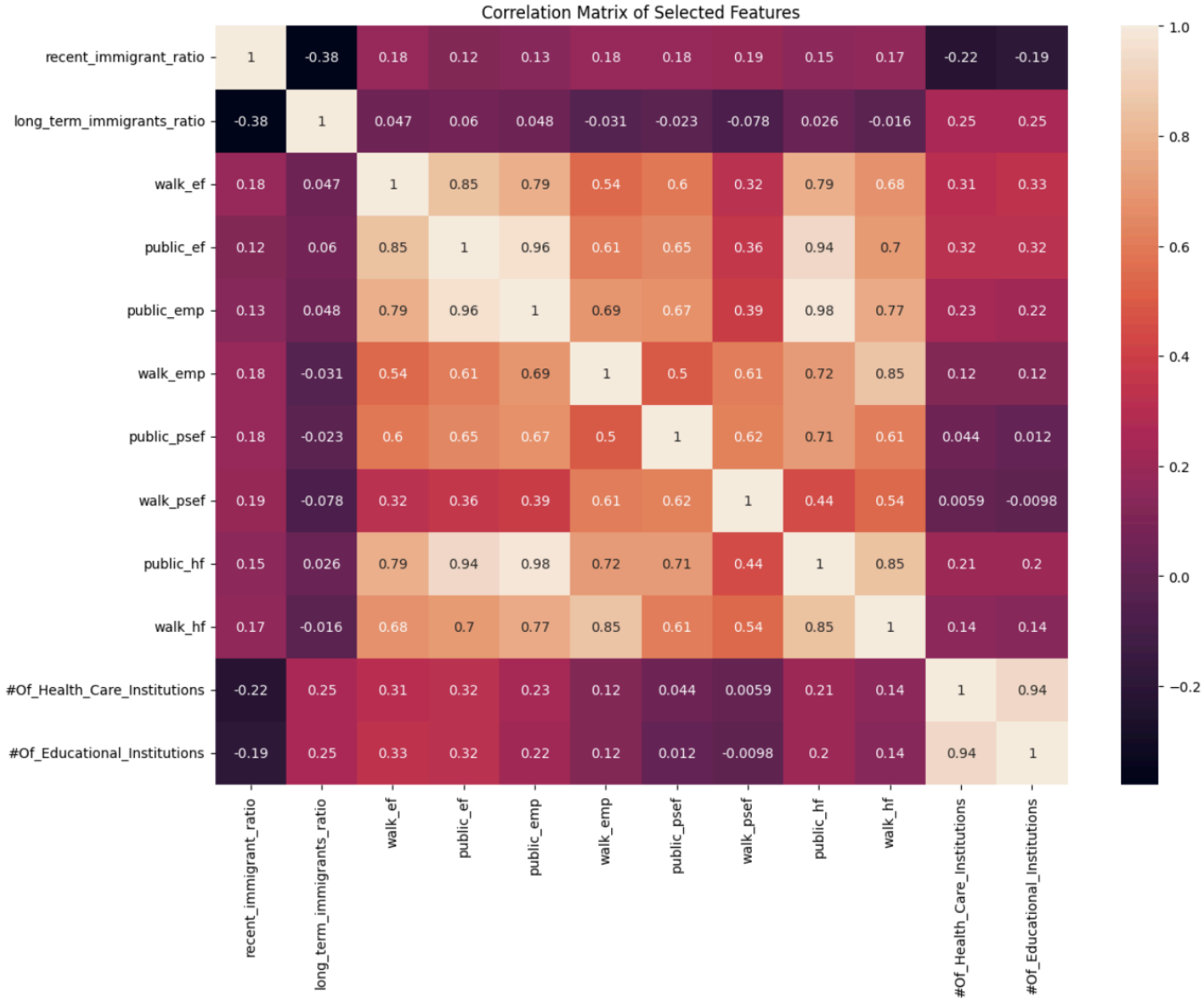
Closing the Access Gap for Immigrants

Recent immigrants often live farther from schools, clinics, and services, and
Long-term immigrants have better access to walkable, service-rich areas

- To fix this, we need:
  More pedestrian-friendly streets
  Better transit planning
  Affordable housing near key services

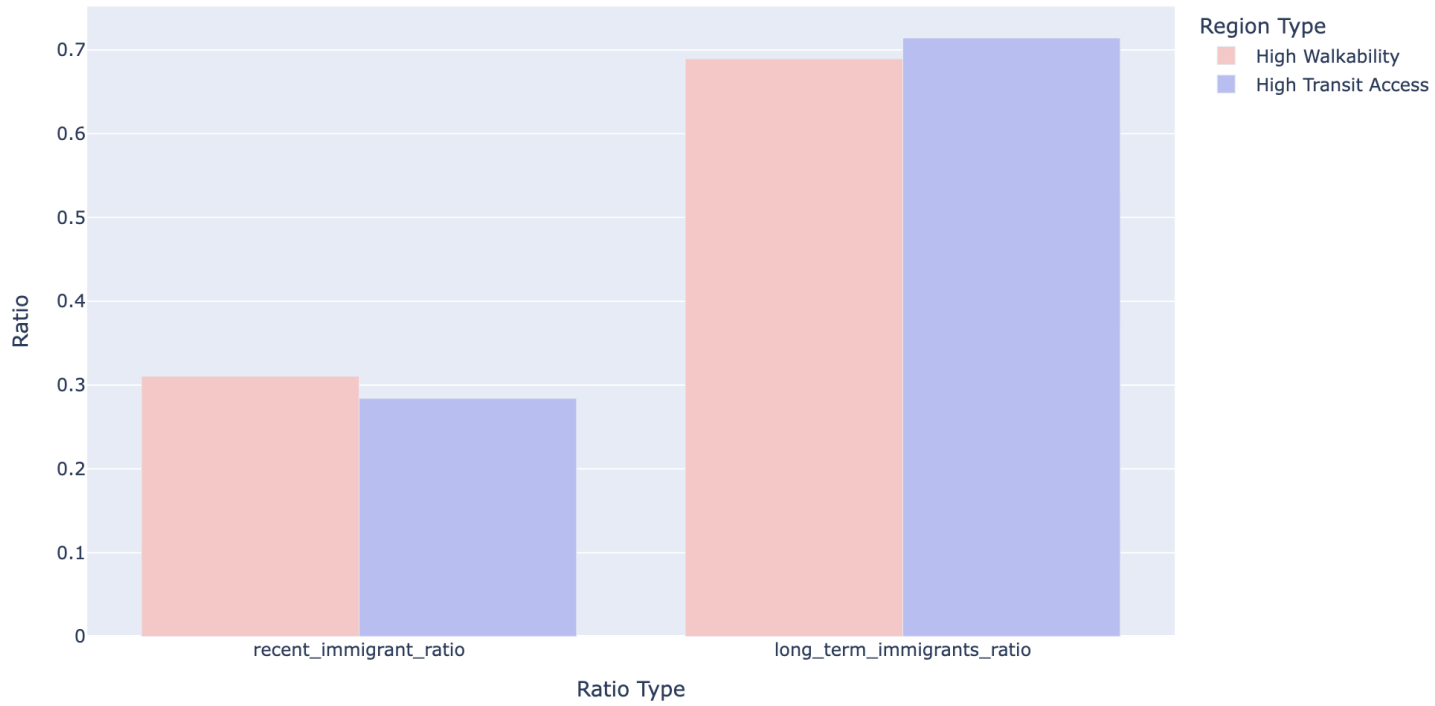
These changes can turn barriers into opportunities for newcomers
A step toward a more inclusive, immigrant-friendly country.

Visualizations for BRIDGING DIVIDES MIGRATION DATA CHALLENGE 2025

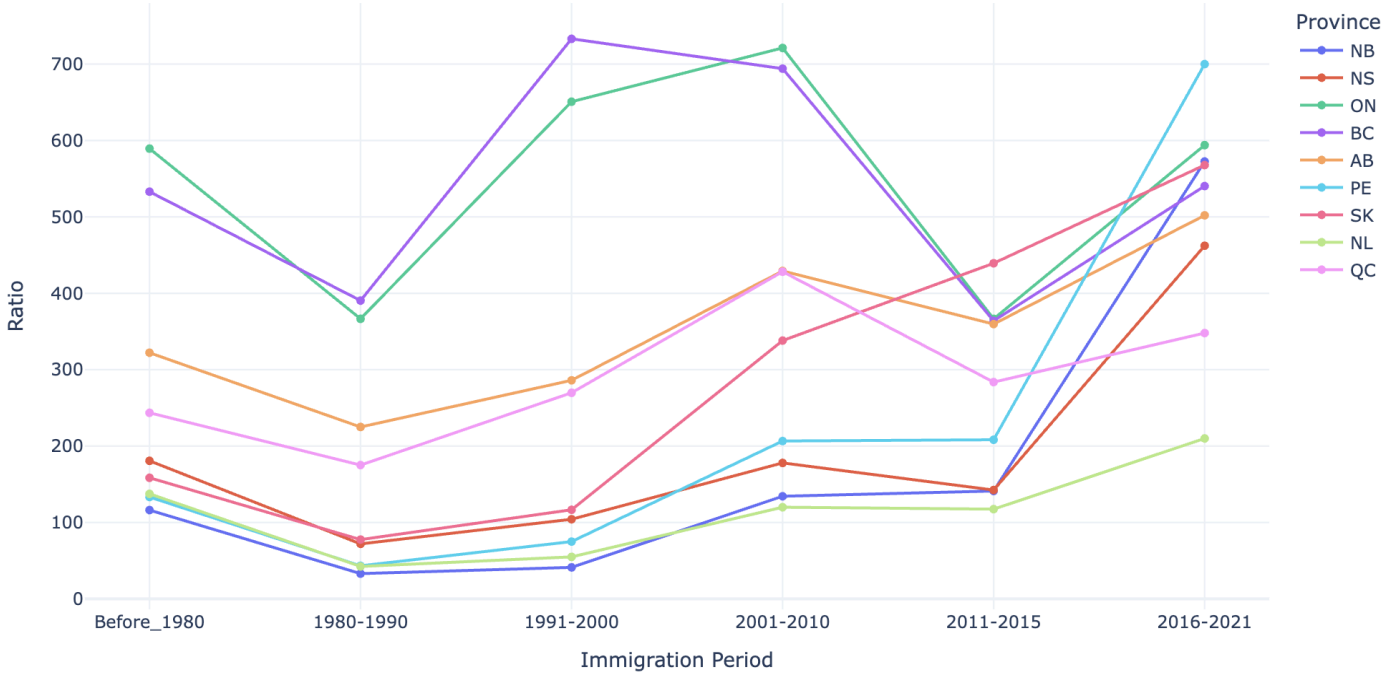


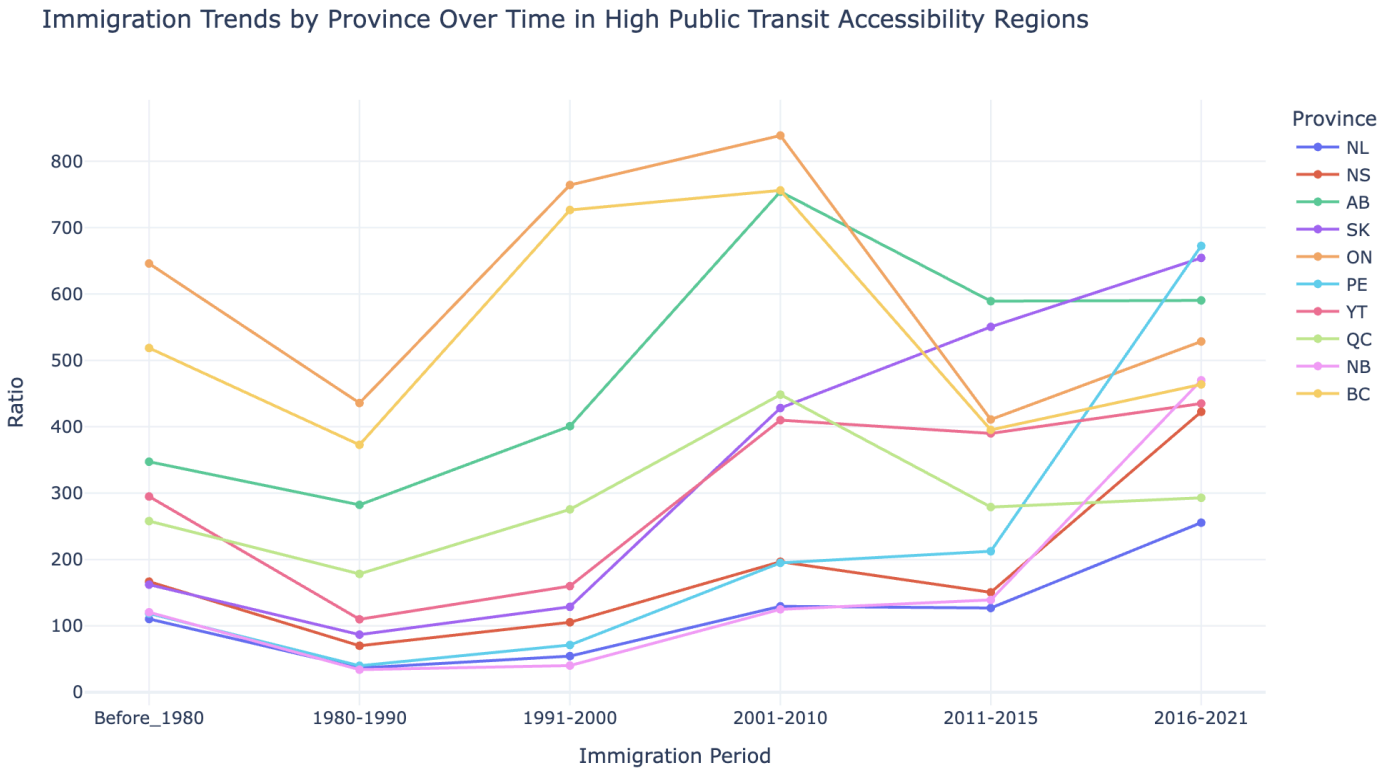
Correlation Matrix of important variables from the merged dataset

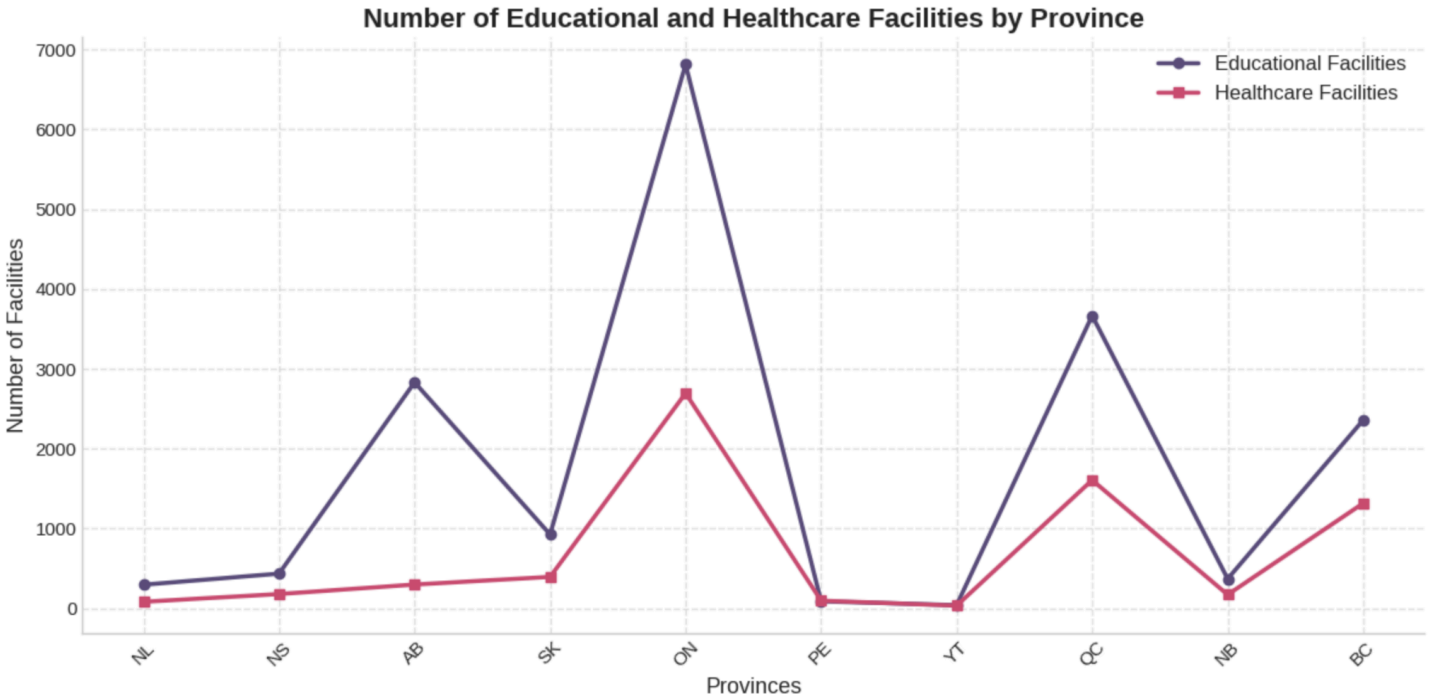
Comparison of Immigrant Ratios: Walkability vs Transit Access



Immigration Trends by Province Over Time in High Walk Accessibility Regions




Immigration Trends by Province Over Time in High Public Transit Accessibility Regions
Province
NL
NS
AB
SK
ON
PE
YT
QC
NB
BC
Ratio
0
100
200
300
400
500
600
700
800
Before_1980
1980-1990
1991-2000
2001-2010
2011-2015
2016-2021
Immigration Period


Number of Educational and Healthcare Facilities by Province
Educational Facilities
Healthcare Facilities
Number of Facilities
0
1000
2000
3000
4000
5000
6000
7000
NL
NS
AB
SK
ON
PE
YT
QC
NB
BC
Provinces