**Unequal Realities: A Quality-of-Life Dashboard for Evidence-Based Decisions in Canada**

**GROUP 7**

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| **Names** | **N Number** |
| Abhi Thaker | N01606781 |
| Alan Koonamparayil Mathew | N01604305 |
| Bishwajit Dutta | N01604226 |
| Mohit Rathod | N01579983 |
| Ruchi Tiwari | N01607974 |
| Sonia Thomas | N01604000 |

**Dashboard Link –** <https://app.powerbi.com/groups/me/reports/fbd985d9-0f41-4387-9cea-494ad31c8bfe/1d848be189b648bc0c3d?experience=power-bi>

**Group Presentation Link –**

<https://humberital-my.sharepoint.com/:v:/r/personal/n01604226_humber_ca/Documents/Recordings/Course_Project_BIA-5400-0LAw-20250405_225842-Meeting%20Recording.mp4?csf=1&web=1&e=eTDFzJ&nav=eyJyZWZlcnJhbEluZm8iOnsicmVmZXJyYWxBcHAiOiJTdHJlYW1XZWJBcHAiLCJyZWZlcnJhbFZpZXciOiJTaGFyZURpYWxvZy1MaW5rIiwicmVmZXJyYWxBcHBQbGF0Zm9ybSI6IldlYiIsInJlZmVycmFsTW9kZSI6InZpZXcifX0%3D>

**Gantt Chart**

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| --- | --- | --- | --- | --- | --- |
| |  | | --- | | **Task** | | **Start Date** | **End Date** | **Duration** | **Notes** |
| Dimension Topic Selection | 29/03/2025 | 29/03/2025 | 40 mins | Finalized 5 dimensions: Prosperity, Health, Society, Environment, Good Governance |
| Dimension Dataset Selection | 29/03/2025 | 30/03/2025 | 1hr 15 mins | Selected datasets from Statistics Canada for each dimension |
| Data Modeling | 31/03/2025 | 31/03/2025 | 2.5 hrs | Created fact and dimension tables |
| DAX & Measures | 01/04/2025 | 01/04/2025 | 1 hr | Will involve metric creation and data aggregation |
| Dashboard Design | 02/04/2025 | 05/04/2025 | 4 days | Creating visuals and layout in Power BI |
| Insights and Storytelling | 06/04/2025 | 07/04/2025 | 2 days | Creating narrative visuals per indicator |
| Final Review & Polishing | 08/04/2025 | 09/04/2025 | 2 days | Reviewing for consistency and usability |
| Submission | 10/04/2025 | 10/04/2025 | 1 day | Final presentation or upload |

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**DAX Codes**

1. **Percentage change in index**

This measure calculates the **percentage change** in the crime severity index between **2021 and 2022**.

**How it works:**

* It first stores the total value for **2022** and **2021** using VAR.
* Then it checks if both values are **not blank** (data is available).
* If data exists, it calculates the percentage change using this formula:

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**Why it’s useful:**

This measure is used in the **Governance dashboard** KPI card to **quickly show the change** in crime severity year-over-year. It helps decision-makers see if crime rates are increasing or decreasing.

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1. **Crime index value 2021**

This measure simply **sums the crime severity values** for the year **2022**.

**How it works:**

It filters the data where the Date is 2022 and adds up the Value column from the fact\_Governance table.

**Why it’s useful:**

This is shown on the **Governance dashboard** to highlight the **total crime index** for 2022.

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1. **Crime index value 2022**

This measure sums up the **crime severity values** for the year **2021**.

**Why it’s useful:**

This lets us **compare 2021 and 2022** directly and is also used inside the % Change in Index measure.

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**Dashboard Screenshots**

**Summary Page – “Unequal Realities”**

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**Key Insights:**

* **Poverty** is highest in **Ontario** (approx. 2.1M), followed by **Quebec** and **Prairies**.
* **Health values** also peak in **Ontario**, indicating a potential population-driven demand for health services.
* **Crime Index** data for Alberta shows slight fluctuations, and the **Youth Crime Severity Index** is notable.
* People reported **highest satisfaction** in life, access to health providers, and sense of belonging.
* In terms of **environment**, “satisfaction with local environment” shows wide variation among regions.

**Health Dashboard - "Mind Over Matter"**

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**Key Insights:**

* **Elderly population (65+)** represents the **highest count** of health-related indicators (both male and female).
* **Ontario** leads with the **highest average health indicator values** (~2.07M), likely due to population.
* **Top health indicators** include:
  + Regular healthcare access
  + Mental and physical health perception
  + Life satisfaction
  + Influenza vaccination
  + BMI and arthritis data
* **Women** generally report **higher values** in health-related categories.

**Prosperity Dashboard – “Economic Roots: Canada’s Poverty Rate"**

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**Key Insights:**

* **Ontario** again leads with the highest poverty numbers (~0.42M avg), followed by the **Prairies** and **BC**.
* **Gender split** shows that **males (52.13%)** slightly exceed females (47.87%) in poverty numbers.
* The highest poverty numbers are concentrated in urban and populous provinces.

**Governance - "Security in Numbers: Crime Severity Index"**

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**Key Insights:**

* British Columbia shows an increase in the **Crime Severity Index**:
  + From **96.44 (2021)** to **100.37 (2022)** → a **4% rise**.
* You have included a KPI visual clearly showing this % change.
* Filter options for **different types of crime indicators** (violent, non-violent, clearance rates) allow for detailed governance analysis.

**Society - "We’re in This Together: Sense of Belonging"**

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**Key Insights:**

* **Strong sense of belonging** reported by **18 to 34 year-olds** most frequently (~0.30M).
* **Top 5 Indicators** for society satisfaction include:
  + Life satisfaction
  + Having a healthcare provider
  + Sense of belonging
  + Good health & mental health
* Gender distribution: **Females (49.22%)**, **Males (50.78%)** — relatively balanced.
* Maps show **regional distribution**, highlighting provinces where belonging is stronger.

**Environment - "We’re in This Together: Sense of Belonging"**

**A map of the united states

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**Key Insights:**

* Gender distribution again nearly balanced: **Women: 49.21%**, **Men: 50.79%**.
* Environmental satisfaction is highest in the most populous and urbanized regions.

**Filter Page**

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**Challenges Faced**

**1.⁠ ⁠Finding and Understanding the Right Data from Statistics Canada**

One of the first major hurdles was locating the correct datasets aligned with the five dimensions of Canada’s Quality of Life (QoL) framework — Health, Prosperity, Society, Environment, and Good Governance. The Statistics Canada website uses terms like “cubes,” “vectors,” and “PIDs,” which were initially confusing. We had to spend time understanding:

* What a vector represents (a specific time series of an indicator),
* How to identify useful datasets using product IDs (PIDs),
* How to ensure data accuracy and relevance to the QoL framework.

We also had to manually explore multiple files and verify that indicators such as Self-rated mental health, Crime Severity Index, or Satisfaction with local environment actually matched the official QoL categories. This slowed our initial progress.

**2.⁠ ⁠Data Cleaning and Structuring for Analysis**

The raw data files had inconsistencies in structure across dimensions. Some had additional columns like UOM, SCALAR\_FACTOR, or VECTOR, which weren’t relevant for our Power BI visuals. Others had data stored by:

* Age groups, gender, region, and year, but not consistently.
* Both percentages and absolute values, which caused confusion when summarizing or averaging data.

We had to:

* Filter rows to only include Number of persons in many places (instead of Percent) so visuals would be more meaningful.
* Convert large numbers (in thousands) to actual readable values using the scalar factor.
* Standardize columns like Region, Gender, and Indicator across files to merge or append data easily.
* Create consistent date formats and verify they matched for slicers and KPIs (like 2021 vs. 2022).

This took time and several data transformation steps in Power Query and Excel before importing to Power BI.

**3.⁠ ⁠Creating DAX Measures and Calculations**

Working with DAX was both a learning curve and a challenge. Writing expressions that involved year comparisons, conditional logic, and filter context took us multiple attempts to get right. Some examples include:

* Calculating the % Change in Crime Severity Index using VAR, CALCULATE, DIVIDE, and IF functions.
* Filtering values based on Date, Indicator, and Region in the same formula.
* Aggregating totals only for certain UOM types (like “Number”) while excluding others.

Some measures gave incorrect results initially because the filter context wasn’t clear, so we had to debug by visualizing intermediate steps.

**4.⁠ ⁠Designing Clear and Engaging Visuals**

Designing a multi-page dashboard that is both aesthetically pleasing and easy to interpret was a creative challenge. Some issues we faced:

* Tree maps looked crowded when indicators had too many categories, especially in the health page.
* Labels would disappear or overlap in donut charts and bar graphs unless properly formatted.
* Choosing the right type of chart for each insight took trial and error (e.g., stacked bar vs clustered column, tree map vs bar chart).
* Ensuring all pages followed a consistent layout with filters at the top, maps (if any) on the left, and charts grouped logically.

We iterated multiple times, aligning font sizes, axis formats, and tooltip customization to keep the visuals both informative and clean.

**5.⁠ ⁠Balancing Team Collaboration and Task Division**

Since this was a group project, we initially struggled with coordinating everyone's contributions. Not all members were equally comfortable with Power BI or DAX, so we divided responsibilities like this:

* One person handled data cleaning and transformation.
* One focused on DAX measures and calculations.
* One designed the visuals and layout of the report pages.
* One worked on the solution document and Gantt chart.

Even after division, we faced delays when someone needed clarification or got stuck, especially when tasks were dependent (e.g., DAX not working meant visuals couldn’t be completed). We held weekly meetings to stay on track and shared notes on Teams/Google Docs.

**6.⁠ ⁠Power BI Performance and Optimization**

As the dashboard grew (with multiple pages and visuals per page), the performance started to slow down. Some slicers took time to refresh, and visuals were lagging. To resolve this, we:

* Removed redundant visuals and limited the number per page.
* Ensured we weren’t calculating heavy measures repeatedly.
* Optimized DAX by using variables and restricting unnecessary filters.
* Used ALLEXCEPT to keep filter context efficient in visuals grouped by region or gender.

Even though we didn’t hit any hard technical limits, this taught us how Power BI performance can degrade if not optimized well.

**Conclusion**

This project helped us deeply understand how data visualization can play a powerful role in decision making, especially when the goal is to analyze complex, real-world issues like quality of life in Canada. By working with Statistics Canada’s QoL framework, we explored key dimensions — Health, Prosperity, Society, Environment, and Good Governance — and learned how to bring these abstract concepts to life through clean and meaningful dashboards in Power BI.

We didn't just focus on creating charts — we focused on building a story using data. From identifying regional differences in poverty rates to tracking changes in crime severity, each page of our dashboard was designed to support data analysts and policymakers in spotting patterns, asking questions, and prioritizing resources.

Throughout the project, we developed hands-on experience with:

* Data cleaning and modeling
* DAX calculations and KPI design
* Dashboard aesthetics and usability
* Team collaboration and task coordination

One of the biggest takeaways was realizing how even clean-looking data still needs thoughtful preparation and transformation before it’s ready to drive insights. We also learned how to think critically when choosing visual formats and when writing formulas that change based on filters or years.

In the end, we were able to build a 6-page interactive Power BI dashboard that not only meets the project requirements but also reflects our combined effort, creativity, and learning throughout the semester. This experience has made us more confident in using Power BI for real-world analysis and showed us how to turn data into decisions.

**References**

1. **11-10-0135-01 – Low income statistics by age, sex and economic family type**

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1. **13-10-0096-03 – Perceived mental health, by age group and province**

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009603>

1. **45-10-0052-01 – Sense of belonging to local community by gender and province**

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310009615>

1. **45-10-0070-01 – Satisfaction with local environment, by gender and province**

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=4510007001>

1. **35-10-0026-01 – Crime severity index and weighted clearance rates, Canada, provinces, territories and Census Metropolitan Areas**

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3510002601>