

# Analyzing Trends in EI Beneficiaries by Occupation and Province

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Lowercase all column values to make them easier to work with

```
EIdataset %<>%
  rename_with(tolower)

EIdataset <- EIdataset %>%
  mutate(ref_date = ymd(paste0(ref_date, "-01")))

print(head(EIdataset))

## # A tibble: 6 x 15
##   ref_date   geo  dguid occupations uom  uom_id scalar_factor scalar_id vector
##   <date>     <chr> <chr> <chr>         <chr> <dbl> <chr>          <dbl> <chr>
## 1 2008-01-01 Cana~ 2021~ All occupa~ Pers~    249 units          0 v1593~
## 2 2008-01-01 Cana~ 2021~ Legislativ~ Pers~    249 units          0 v1593~
## 3 2008-01-01 Cana~ 2021~ Legislativ~ Pers~    249 units          0 v1593~
## 4 2008-01-01 Cana~ 2021~ Business, ~ Pers~    249 units          0 v1593~
## 5 2008-01-01 Cana~ 2021~ Specialize~ Pers~    249 units          0 v1593~
## 6 2008-01-01 Cana~ 2021~ Profession~ Pers~    249 units          0 v1593~
## # i 6 more variables: coordinate <dbl>, value <dbl>, status <chr>,
## #   symbol <lgl>, terminated <lgl>, decimals <dbl>
```

Summarize EI beneficiaries by geography and occupation

```
summary_data_EI <- EIdataset %>%
  group_by(ref_date, geo, occupations) %>%
  summarize(total_beneficiaries = sum(value, na.rm = TRUE), .groups = 'drop')

print(head(summary_data_EI))

## # A tibble: 6 x 4
##   ref_date   geo  occupations          total_beneficiaries
##   <date>     <chr> <chr>                  <dbl>
## 1 2008-01-01 Alberta Administrative and financial superviso~    270
## 2 2008-01-01 Alberta Administrative and financial support a~   1160
## 3 2008-01-01 Alberta Administrative occupations and transpo~    880
## 4 2008-01-01 Alberta All occupations                        20850
## 5 2008-01-01 Alberta Assisting occupations in education and~    490
## 6 2008-01-01 Alberta Assisting occupations in support of he~    160
```

## Create a relevant dataset for the visualisations

```
selected_geo <- c("Ontario", "Alberta", "British Columbia", "Quebec")

selected_occupations <- c(
  "Sales and service occupations",
  "Business, finance and administration occupations",
  "General trades",
  "Administrative and financial supervisors and specialized administrative occupations"
)

summary_data_EI <- summary_data_EI %>%
  mutate(occupations = trimws(gsub("\\s*\\[.*?\\]\\s*", "", occupations)))

matching_geo <- intersect(unique(summary_data_EI$geo), selected_geo)
matching_occupations <- intersect(unique(summary_data_EI$occupations), selected_occupations)

summary_data_EI_filtered <- summary_data_EI %>%
  filter(geo %in% matching_geo, occupations %in% matching_occupations)

print(summary(summary_data_EI_filtered))
```

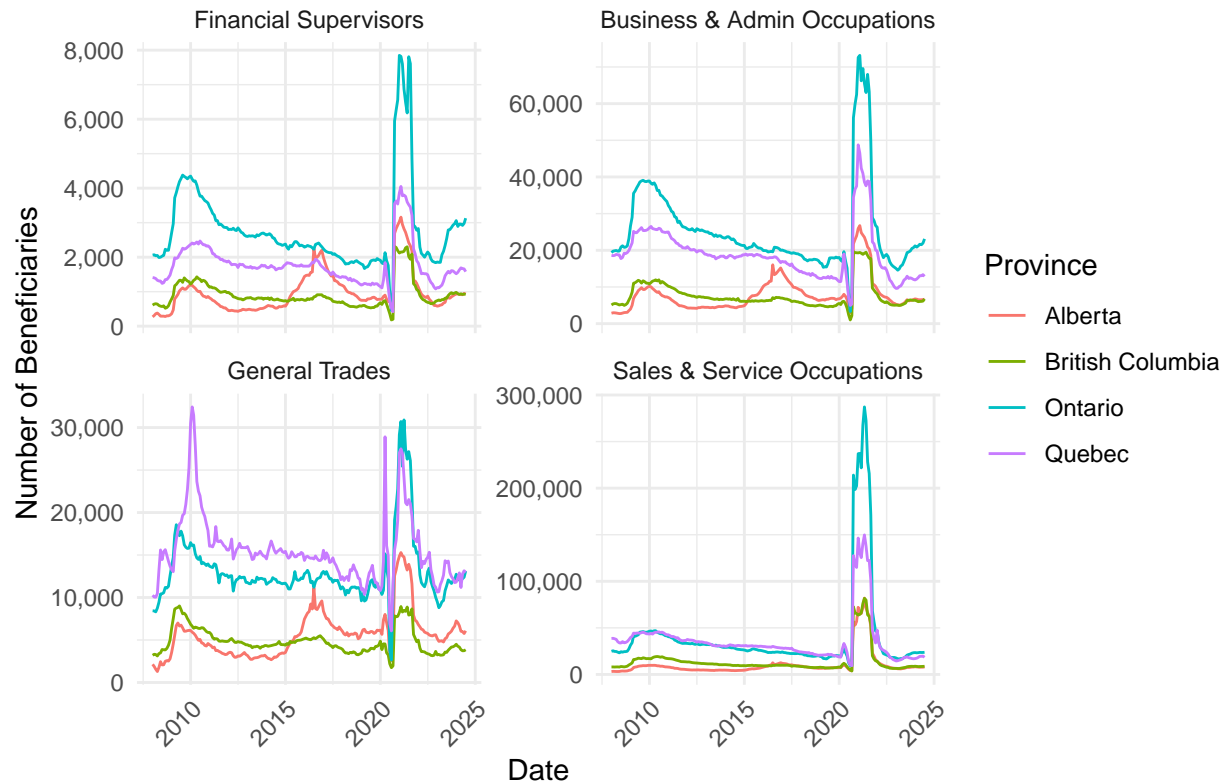
##	ref_date	geo	occupations	total_beneficiaries
##	Min. :2008-01-01	Length:3184	Length:3184	Min. : 180
##	1st Qu.:2012-02-01	Class :character	Class :character	1st Qu.: 3120
##	Median :2016-04-01	Mode :character	Mode :character	Median : 7830
##	Mean :2016-03-31			Mean : 12881
##	3rd Qu.:2020-06-01			3rd Qu.: 17050
##	Max. :2024-07-01			Max. :287210

## Visualise

```
occupation_labels <- c(
  "Administrative and financial supervisors and specialized administrative occupations" = "Financial Sup",
  "Business, finance and administration occupations" = "Business & Admin Occupations",
  "General trades" = "General Trades",
  "Sales and service occupations" = "Sales & Service Occupations"
)

ggplot(summary_data_EI_filtered, aes(x = ref_date, y = total_beneficiaries, color = geo)) +
  geom_line() +
  facet_wrap(~ occupations, scales = "free_y", labeller = labeller(occupations = occupation_labels)) +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1),
        plot.title = element_text(size = 12)) +
  scale_y_continuous(labels = scales::comma) +
  labs(title = "Trends in EI Beneficiaries by Occupation and Province",
       x = "Date", y = "Number of Beneficiaries",
       color = "Province")
```

## Trends in EI Beneficiaries by Occupation and Province



## Analysis of Trends in EI Beneficiaries by Occupation and Geography

The graph presents the trends in Employment Insurance (EI) beneficiaries across four occupational categories and four Canadian provinces (Alberta, British Columbia, Ontario, and Quebec) from approximately 2009 to 2025. Here's a breakdown of the key observations:

### 1. Financial Supervisors and Specialized Administrators:

There's a notable spike in EI beneficiaries around 2020, particularly pronounced in Quebec and Ontario. This sharp rise corresponds to the economic impact of the COVID-19 pandemic, which caused widespread job losses and increased EI support. Following the spike, there's a significant drop with a slight increase in beneficiaries post-2021.

### 2. Business, Finance, and Administration Occupations:

This category exhibits the second largest volume of EI beneficiaries, with over 60,000 at the 2020 peak in Ontario. All provinces show a steep increase in beneficiaries in 2020, again correlating with the pandemic. Post-pandemic recovery is visible as numbers decline sharply by 2022, though there is a slight upward trend in 2023, indicating lingering economic impacts or structural changes in this occupation.

### 3. General Trades:

The data show a significant rise in EI beneficiaries in Quebec around 2009, which gradually declines, except for a sharp 2020 spike in all provinces. Quebec and Ontario lead the number of beneficiaries, with Quebec

experiencing over 30,000. General trades is also the most variable occupation sector. The sharp increase in EI in 2010 is likely due to the aftereffects of the global financial crisis. The construction and manufacturing sectors, which are part of general trades, were hit particularly hard during the recession. Quebec, having a significant presence in industries like construction and manufacturing, likely experienced a surge in unemployment as these sectors struggled to recover.

#### **4. Sales and Service Occupations:**

Sales and service occupations were heavily impacted during the pandemic, with a dramatic surge in EI beneficiaries, particularly in Ontario (approaching 300,000). This is the most significant spike across all categories, reflecting how vulnerable service jobs were to pandemic-related shutdowns. There's a steep decline after 2020, although the numbers in all provinces remain somewhat elevated compared to pre-pandemic levels.

#### **General Insights:**

- **Pandemic Impact:** The most prominent trend across all occupations and provinces is the sharp rise in EI beneficiaries in 2020, coinciding with the economic disruption caused by the COVID-19 pandemic. This spike highlights how various sectors and regions were affected by job losses.
- **Geographic Differences:** Quebec and Ontario show the highest number of beneficiaries across multiple categories, particularly in business, finance, administration, and general trades, indicating these provinces were disproportionately affected, or had a larger workforce in these occupations.
- **Post-COVID Recovery:** While all provinces see a reduction in beneficiaries post-2020, none return to their pre-pandemic levels. This may indicate a structural change in the job market, such as longer-term unemployment or shifts in industry dynamics.
- **Sales and Service Occupations:** The particularly high spike in this category reflects the vulnerability of service sector jobs to economic shutdowns, but the recovery here is also the most dramatic. This analysis suggests that while there has been some recovery since the pandemic, EI beneficiary levels are still somewhat elevated in 2023 and beyond, possibly indicating ongoing economic challenges in certain sectors.