

## Data 624 – Datathon 1

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### Introduction

The importance of mental health is relevant in every stage of life – from childhood through to adulthood. It includes emotional and psychological wellbeing; it can also affect how stress is managed and choices are made. For Datathon #1, the following questions and accompanying figures were investigated below:

| Figure | Title                                       | Guiding Question                                                                                         |
|--------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1      | Ability to handle stress by Province (2019) | How does the ability to handle stress vary by province?                                                  |
| 2      | Gender Differences in Main Source of Stress | What is the main cause of stress for both males and females?                                             |
| 3      | Age Differences in Main Source of Stress    | Does the main cause of stress from both males and females increase with age?                             |
| 4      | Mental Health Indicators Breakdown          | From 2016 to 2019, is there a significant change between gender for main sources of stress in Canadians? |

### Data Engineering Process

The following datasets (csv files) were imported into Tableau with following actions taken per figure:

| No. | Dataset                                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Mental health characteristics - Ability to handle stress & sources of stress by age group & sex, Canada (excluding territories) & provinces - 2016 & 2019 |
| 2   | Mental health characteristics & suicidal thoughts by age group & sex, Canada (excluding territories) & provinces - 2015 & 2019                            |

For Figure 1:

- Indicators filtered to include the 'ability to handle' values and exclude 'main source of stress' values
- The only characteristic analyzed was 'percent'
- Age group filtered to include only 'Total, 12 years and over'
- REF\_DATE filtered to include only data from 2019
- GEO filtered to exclude the 'Canada (excluding territories)' value

For Figure 2:

- Gender, sources of stress, and characteristics were filtered
- Percentage of the males and females was calculated based on the number of participants and displayed with color – the greater the percentage, the darker and larger the box

For Figure 3:

- Age group, sources of stress, and characteristics were filtered
- Values were colour encoded – the larger values have a darker shade than the lighter values

For Figure 4:

- Percentages of the males and females for Canada was averaged
- Gender between males and females was filtered
- Indicators related to sources of stress was filtered
- GEO location areas was filtered

## Analysis

To represent the average (or expected values), the reported percentage values were analyzed. The appropriate filters for each variable were then applied to generate each figure. The filters are described in the above section.

## Findings

### Figure 1 - Ability to Handle Stress – Findings by Province

Based on the 2019 survey results of Canadians reporting their ability to handle day-to-day demands as well as unexpected and difficult problems, there are some differences between provinces as well differences between sexes, however most of the differences are small. When aggregating across all age groups, it appears that Canadians' overall ability to handle stress is quite good, however further analysis by age group may show more differences.

Across all provinces, more males and females were better able to handle day-to-day demands (87% to 95% reported good or excellent ability) compared to the ability to handle unexpected and difficult problems (79% to 89%). It was observed that males in Quebec reported the highest percentage of the population with good or excellent ability to handle stress (95%) as well as unexpected or difficult problems (89%).

In all the Western and Central provinces, a higher percentage of males reported better ability to handle both types of stress compared to females. In the Eastern provinces, the same trend is only observed in Nova Scotia. In Newfoundland and Labrador and New Brunswick, a higher percentage of females reported ability to handle both types of stress. In Prince Edward Island, males were better able to handle unexpected and difficult problems, while females were better able to handle day-to-day demands.

There is no observable correlation between percentage of residents who report positive mental health (flourishing) and ability to handle stress. In almost all provinces, fewer residents reported that they are flourishing than those who can handle stress. Less than 80% of residents reported positive mental health in only Alberta (77%), British Columbia (78%), and Quebec (78%) for females, and Nova Scotia (74%) and Alberta (77%) for males. Newfoundland and Labrador had the highest percentage of flourishing males (88%). Newfoundland and Labrador and Manitoba had the highest percentage of flourishing females (both 86%).

### Figure 2 – Gender and Stress – Differences in Main Source of Stress

There was a difference in main sources of stress between sexes. For males, the most common source of stress was work (13.35 %) and the next most stressful factor was financial concerns (10.13 %) then followed by issues within family (6.21 %).

There were more female participants than men, however the differences were not significant. For females, the most common source of stress was family (10.69 %) and the next most stressful factor was work (10.10 %) then followed by financial concerns (8.73 %).

It was interesting to see that the percentage of the two main source of stress, which were family and work, in females was not significant, whereas there was a significant percentage gap between work and family in males. According to a survey conducted by Pew Research Center (2015), “mothers were much more likely than fathers to report experiencing significant career interruptions in order to attend to their families’ needs”. The data clearly indicated the primary causes of stress in both males and females.

### **Figure 3 – Age and Stress – Differences in Main Source of Stress**

At age 12 to 17 years, unsurprisingly, school work was a leading cause of stress. At age 18 to 34 years, we observed that ‘Work’ was a primary stressor then followed by ‘Financial concerns’. There was a drastic change in sources of stress when compared to the age group 12 to 17.

At age 35 to 49 years, ‘Work’ was again the biggest source of stress then followed by ‘Financial concerns’; however, there was a decreasing trend from both primary stressors. Interestingly, stress from ‘Family’ was becoming significant.

At age 50 to 64 years, ‘Work’ was still the most stressful factor then followed by ‘Family’. Stress from financial concerns was not the next most stressful factor after ‘Work’ anymore. Moreover, the data showed that people in this age group were starting to feel stress about health.

At age 65 years and over, stress from work was not the main source of stress in day-to-day life, but ‘Family’ was (excluding ‘none’). According to Harvard Health (2016), this could be due to loss of a loved one and a change in relationships with their children. Furthermore, this is when people retire.

The biggest cause of stress reported in males and females was work and family, respectively. We investigated these primary stressors by age groups to see if there was any trend. We observed an increasing trend for ‘Main source of stress in day-to-day life, family’ from age group 12 to 17 years to 65 years and over, whereas a decreasing trend was seen for ‘Main source of stress in day-to-day life, work’ from age group 18 to 34 years to 65 years and over.

### **Figure 4 - Mental Health Indicators Breakdown Across Canada**

The largest source of stress reported in females and males was schoolwork in (12 – 34 year olds), with 35.47% and 30.97% respectively in 2016 and 36.61% and 34.55% respectively in 2019. For females, the second source of stress was day-to-day life (family concerns), with 21.09% in 2016 and 21.85% in 2019. The third largest source of stress was reported to be work concerns, with 19.08% in 2016 and 19.32% in 2019. For males, the second largest source of stress in males to be in day-to-day life (work) at 24.96% in 2016 and 24.68% in 2019. The third largest source of stress was reported to be financial concerns, with 21.53% in 2016 and 22.16% in 2019.

The data reported seems to diverge between genders with top 5 sources of stress in descending (highest to lowest) order in females as: School, Family, Work, Financial, None, and in males as: School, Work, Financial, None, Family.

Between the years 2016 and 2019, it can be observed that there is not much significant change across Canada in sources of stress broken down between males and females. The descending order of main sources of stress relative to each gender has not changed as well, indicating that more females relate their top stress sources to school, work, and family; whereas more males relate their top stress sources to school, work, and finances.

## Conclusion

The percentage of residents who handle stress well and/or have positive mental health do not vary greatly between provinces, which may mean that Canadian mental health programs have a fairly consistent impact across the country. Overall, fewer people report a good ability to handle unexpected and difficult problems, as compared to ability to handle day-to-day demands. Therefore, it would be more beneficial to support Canadians with programs or information on dealing with unexpected and difficult problems. There does not appear to be a correlation between self-reported positive mental health with the ability to handle stress.

Stress can come not only from major events but also from minor daily events as well. The results clearly indicated that there was a difference in the primary cause of stress between men and women and between different age groups. A decision-maker at Health Canada can use this information to connect with community groups to identify the main stressors that Canadians face daily and to help Canadians maintain and improve their mental health by designing stress-reducing Intervention or programs.

While the main source of stress for females and males was from school work, there are more females reporting family as the second highest source of stress, and more males reporting financial concerns as a second highest source of stress. This can indicate that there is some inequality in the sources of stress across Canada between genders. A Health Canada worker could use this information to inform government agencies and help justify providing childcare options so that more women may be able to enter or stay longer in the workforce and potentially help alleviate financial concerns within a family unit. Another policy this could help inform is for workplaces to provide more flexible options for both women and men.

School work as a source of stress grew slightly from 35.47% to 36.61% in females and 30.97% to 34.55% in males. A decision-maker could conclude that schoolwork in 12 – 34-year-olds has been a consistent source of stress that grew slightly in 2019. This could lead them to work with and urge school agencies across the country to lighten the burden and modify programs to reduce stress. Between years 2016 and 2019, there does not seem to be a significant change in stress across all the other indicators.

## References

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