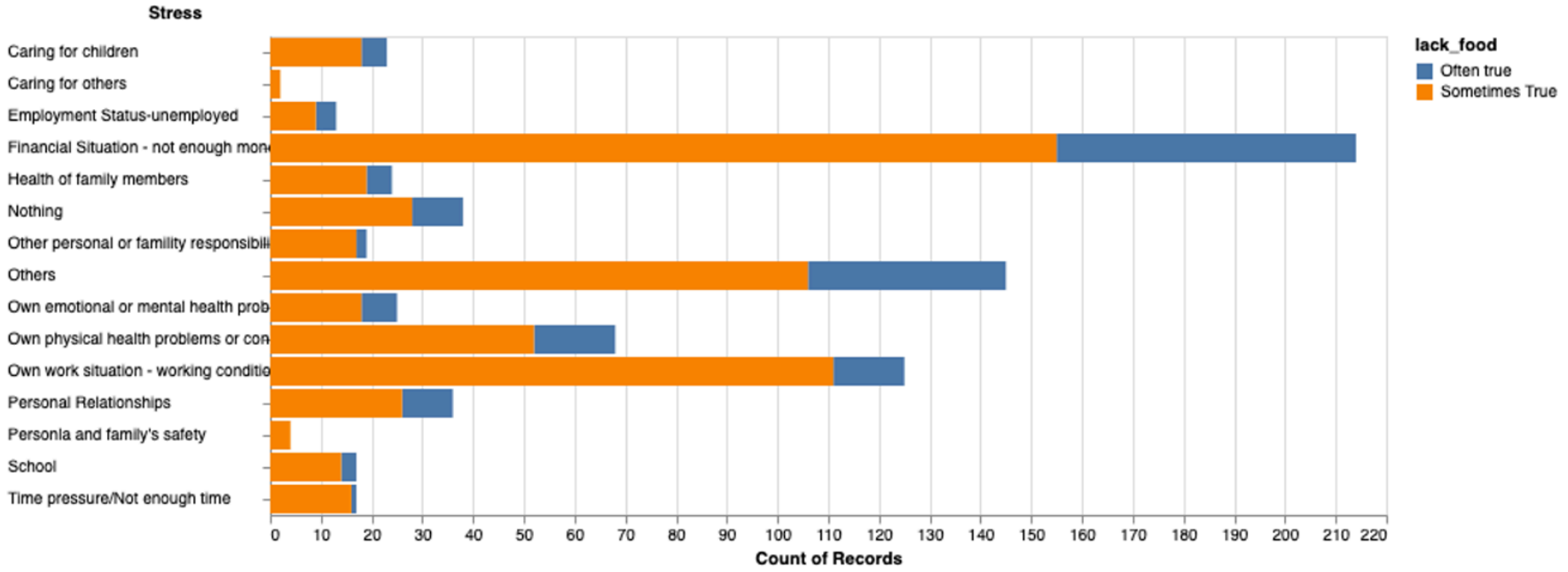
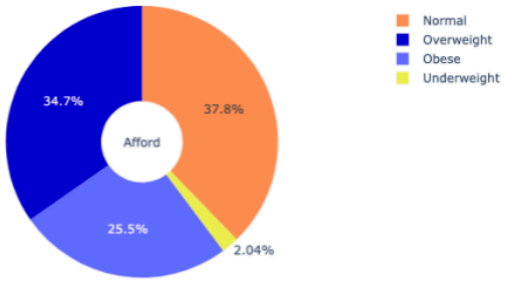
Food Security (poverty) and Obesity

Biggest stressor for individuals that responded to "often true" and "sometimes true" to question that household members worried that food would run out before money to buy more was obtained



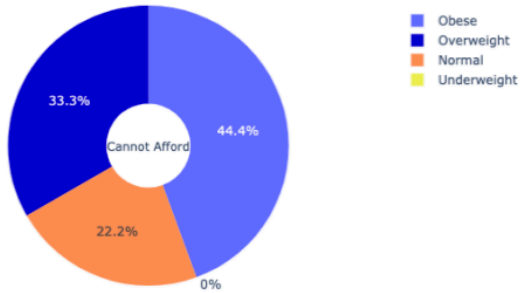
60.2% (Obese + Overweight)

Can afford fruits and vegetables atleast once a day



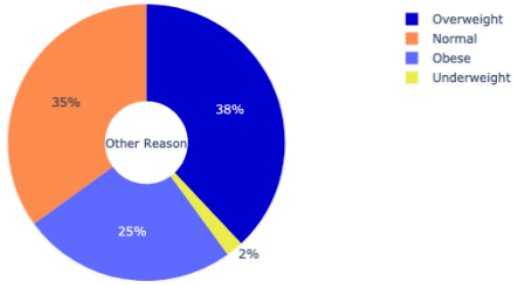
77.7% (Obese + Overweight)

Cannot afford fruits and vegetables once a day



63% (Obese + Overweight)

Other reason for NO fruits and vegetables atleast once a day



Alberta Community Health Survey (ACHS)

Introduction/Rationale

Obesity rates in Canada have tripled between 1985 and 2011 and it has been projected by the Canadian Medical Association Journal that by the year 2019, about 21% of all Canadians will be obese. One of the main drivers of the health disparity has been identified as socioeconomic status (low levels of income and education). Detrimental eating habits and access to low-nutritional foods along with lower levels of physical activity are strongly intertwined and overlap with low socioeconomic status. Increasing obesity rates have not only fuelled soaring healthcare costs and exacerbated recent fiscal and economic challenges but they also come at a great personal cost to afflicted individuals. Obese children are more likely to have asthma, diabetes, joint problems and early signs of heart disease. These children are teased and bullied and, as a result, experience anxiety, depression and many other mental health problems. Obesity puts adults at a greater risk for an even longer list of debilitating diseases and conditions, including cancer, liver disease, and stroke. Obese adults are less likely to be hired and promoted and make less money than their healthy weight peers. Treatment of obesity and related diseases costs the healthcare system an estimated $147 billion annually, which translates to approximately $1400 in additional spending per obese person compared to people with healthy weights.

We worked on the Alberta Community Health Survey (ACHS). The ACHS is an Alberta Survey program that conducts telephone surveys of Albertans with the aim of collecting data on specific determinants of health to support the creation of material and social deprivation indices, and assess their effects on health. Therefore, this dataset contains individual level survey response details predominantly containing ordinal data.

For our exploration, we were interested in understanding the intertwined relationship between obesity, sedentary behaviour, nutrition, socio-economic status, and life satisfaction at a population-level. The question answered with this particular visualization:

1. Can we quantify the biggest stressor for individuals that reported being worried about running out of food before more money was obtained to buy more food? And subsequently can we identify patterns in children obesity and overweight rates between respondents that could afford to eat fresh fruits and vegetables at least once a day versus those that could not?

Data Engineering and Analysis

1.We used the FSC_Q020 (Question: You and other household members worried that food would run out before you got money to buy more?) and STS_Q3 (Question: Thinking about

stress in your day-to-day life, what would you say is the most important thing contributing to feelings of stress you may have?) questionnaires in order to quantify the biggest stressors for individuals that responded to “Often true” and “Sometimes true” to being worried about food running out before money to buy more was obtained. We removed all null entries and subsequently plotted our results on a stacked bar graph from Altair visualization library. The stacked bar graph was ideal for this question not only because it allowed us to accurately quantify the results of the survey but also because it allowed us to compare the stressors for both groups of respondents (often worried about running out of food and sometimes worried about running out of food) all in one chart. We intentionally left out individuals that were never worried about running out of food as we wanted to specifically tease out the results from only the individuals that were worried about food running out and primarily what their stressors were.

In order to identify patterns in children's obesity, we used the CPV_3 (Question: Do ALL the children in your household eat fresh fruit or vegetables at least once a day?). We used all the respondents in the survey (individuals that could afford, those that could not and those that did not eat fruits or vegetables at least once a day for some other reason) so that cross-sectional comparisons could be made between the 3 groups. We removed all the null-values and calculated the percentage of individuals in each group that were underweight (BMI < 18.5), normal (BMI 18.5-25, overweight (BMI 25-40) or obese (BMI>=40) (from the BMI question). We then proceeded to plot these results on three separate donut charts (each chart for 1 group of respondents in the survey). The donut chart was used as it allows easy visual comparisons between multiple groups.

Results

From the stacked bar graph we see that the 3 biggest stressors for individuals that reported being sometimes and often worried about running out of food (in order of highest magnitude) was their financial situation, other reasons and their own work situation (working conditions). Financial situation was by far the highest stressor (220 total counts) as compared to others stressors (145 counts) and working conditions (125 counts). This makes sense as these are the same individuals worried about running out of food before they get money to purchase more.
From the donut charts, we see that majority of the individuals fall into the obese or overweight category for all three groups and only a very small sliver of the respondents are underweight. The respondents that reported not being able to afford fruits and vegetables once a day had the highest combined percentage of obese and overweight individuals (77.7%) whereas individuals that could afford fruits and vegetables had a combined 60.2% of obese and overweight individuals (lowest of all three groups). It was also interesting to note that the group that could afford fruits and vegetables versus the group that did not eat fruits and vegetables at least once a day for some other reasons, almost mirrored each other in terms of having identical percentages for individuals that were either underweight, normal, overweight or obese. These results indicate that individuals that cannot afford fruits and vegetables may not necessarily be getting adequate

nutritional food as a lot of times nutritional food is more expensive and less readily available for them as opposed to cheaper but lower nutritional value options such as fast-foods.

Conclusion

Obesity is a chronic disease that requires long-term management. However, obesity management isn't just about reducing numbers on a scale but rather it's about identifying and addressing root causes and improving overall health and well-being over the long term. From our results, we see certain recommendations can be made so that policies can be implemented by the government in order to improve overall health. For example, from our results we see that financial aid can be used to help individuals with low socio-economic status to have access to healthier foods, advertisements could be used to educate people on the harms of high sugar and fructose drinks, and bans can be put in place in order to limit the availability of high fructose drinks in certain areas in order to deter large-scale consumption. Additionally, as people's subjective health satisfaction is linked to their behaviour, interventions such as apps, or cognitive behavioural therapy techniques, could be used to help people reduce certain unwanted behaviours like eating fast food. In terms of fiscal policy, higher taxes could be implemented for high fructose and unhealthy foods and that money could be divested to build sports-related infrastructure such as recreational facilities in different neighborhoods that are accessible by people of all socio-economic status. For future studies, we hope to map zip codes in order explore and tailor recommendations as per different areas of the city.