

Change in Food Security and Health Outcomes Since the COVID-19 Pandemic in Northern New England

Jennifer Laurent¹, Farryl Bertmann¹, Mattie Alpaugh¹, Emily Belarmino^{1,2}, Sam Bliss^{1,2}, Jonathan Malacarne³, Ashley C. McCarthy¹, Scott Merrill^{1,2}, Rachel E. Schattman³, Kathryn Yerxa³, Meredith T. Niles^{1,2}

1- University of Vermont

2- Gund Institute for Environment, University of Vermont

3- University of Maine

Introduction

We conducted a Northern New England survey in March-June of 2021 to understand the initial and continued impacts of the COVID-19 pandemic on food security, health behaviors, and health outcomes. A total of 988 adults (562 in Maine and 426 in Vermont) responded regarding food access and availability, health behaviors such as diet composition and exercise, and use of habit-forming substances (e.g. alcohol, tobacco, etc.)

before and in the year following the onset of the COVID-19 pandemic. Additional information was obtained to examine how the pandemic affected individuals' mental health and wellbeing and other chronic health conditions such as hypertension and diabetes type 2. The data presented in this research brief were weighted to be representative of income in both States. When data are referred to as "significant" it indicates a statistical significance at $p < 0.05$.

Key Findings

- 39.1% of Maine and 43.2% of Vermont respondents indicated weight gain since the start of the COVID-19 pandemic.
- Individuals with food insecurity were significantly less likely to consume fruits and vegetables and engage in physical activity than those who report being food secure.
- Nearly half of respondents indicated anxiety or depression during the COVID-19 pandemic.
- Those with persistent food insecurity (i.e. food insecure before and during the COVID-19 pandemic) were 8.8 times more likely to experience higher levels of stress, 2.6 times more likely to experience anxiety and be diagnosed with diabetes type 2 and hypertension during the COVID-19 pandemic.
- Individuals who identify as LGBTQ+ were more likely to be food insecure, 4 times more likely to report anxiety or depression, and also experienced higher levels of stress than individuals who did not identify as LGBTQ+ during the COVID-19 pandemic.
- Individuals with food insecurity were up to 7 times more likely to skip or stop their medication for anxiety, depression, and/or hypertension, as compared to food secure respondents.
- Individuals reporting the use of substances prior to the onset of the pandemic (e.g., tobacco, alcohol, and drugs) were more likely to have increased their use of additional habit-forming substances during the COVID-19 pandemic. Substance use was also associated with a higher prevalence of stress.

Food Security

Food security, meaning the ability for respondents and their households to access enough food at all times for a healthy, active lifestyle was measured using a 6-item food security module from the U.S. Department of Agriculture.¹ Survey respondents answered questions about their food insecurity status prior to and during the first year of the COVID-19 pandemic, as well as the most recent four months before survey completion. Early in the pandemic food insecurity peaked at 31.5%, but has since decreased to 28.6% at the time of the survey.

Weight, Diet, and Physical Activity

In Maine, 39.1% of respondents and 43.2% of Vermont respondents indicated weight gain since the start of the COVID-19 pandemic. Body mass index (BMI) was calculated using self-reported heights and weights. The average BMI was 29 kg/m² (classified as overweight) for the sample, and did not vary by state. The overall prevalence of overweight (BMI greater or equal to 25 kg/m²) and obese (BMI greater or equal to 30 kg/m²) respondents was 69% (Figure 1). Obesity prevalence for Vermont respondents was 43.2% and Maine respondents was 37.2%, which is significantly higher than America’s Health Rankings, an analysis of national health according to state.² We found no significant differences in BMI by food security status, however those with higher levels of physical activity reported a lower BMI during the COVID-19 pandemic. Respondents who indicated an increase in their weight were also significantly more likely to report anxiety and depression.

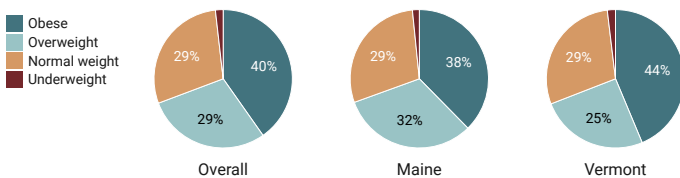


Figure 1. Percentage of respondents in each body mass index (BMI) category.

We also examined physical activity behaviors pre- and during the first year of the COVID-19 pandemic according to food security status (Figure 2). Maine respondents with food insecurity were more likely

to report less physical activity the year following the onset of the COVID-19 pandemic, while the intensity (i.e., the level of exertion associated with any activity) of physical activity did not vary according to food security status in Vermont.

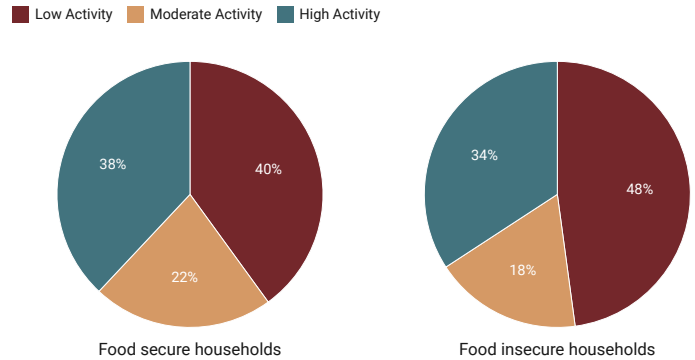


Figure 2. Percent of respondents engaging in low, moderate, and high intensity physical activity based on food security status at the time of the survey.

One-third of food insecure respondents reported a decrease in fruit, vegetable, and red meat consumption during the COVID-19 pandemic, compared to those with food security in both states (Figure 3). Regardless of food security status, respondents from both states did not report increased consumption of sweet foods (e.g., candy, baked sweets) during the COVID-19 pandemic.

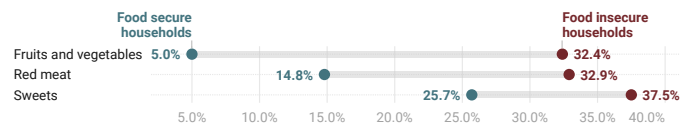


Figure 3. Percent of respondents reporting eating less of each food type since the onset of the COVID-19 pandemic based on food security status.

Chronic Disease Since the COVID-19 Pandemic

Our results suggest a decrease in health and wellbeing since the beginning of the pandemic. The prevalence of hypertension (HTN) in our sample is similar to national pre-COVID-19 data for both Vermont (29%) and Maine (35.2%) according to America’s Health Rankings² (Figure 4). However, our data shows that the prevalence of diabetes type 2 (DMT2) is approximately 3 times higher than 2020 Vermont data and a fifth greater for Maine. Respondents diagnosed with HTN during the

1 Six-Item Short Form of the Food Security Survey Module. (2021) USDA. www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools/#six
 2 United Health Foundation. (2020) America’s Health Rankings. Retrieved from www.americashealthrankings.org

COVID-19 pandemic were significantly more likely to be over 62 years old, male, diagnosed with DMT2 and indicated anxiety and depression. Respondents with DMT2 and HTN also reported having a higher BMI.

Nearly half of Maine respondents and more than half of Vermont respondents indicated anxiety or depression during the COVID-19 pandemic. The rate of depression was significantly higher than reported in America’s Health Rankings, with 51% of Vermont and 45.2% of Maine respondents indicating a diagnosis of depression. Individuals who reported experiencing anxiety or depression reported increased consumption of sweet foods in the year following the onset of the pandemic. Respondents who were food insecure during the COVID-19 pandemic reported significantly higher levels of anxiety and depression compared to food secure respondents. Those with persistent food insecurity (i.e., food insecure before and during the COVID-19 pandemic) were 8.8 times more likely to experience higher levels of stress and 2.6 times more likely to experience anxiety than those with more recent food insecurity (i.e., those reporting food insecurity in the four months prior to data collection) or food security.

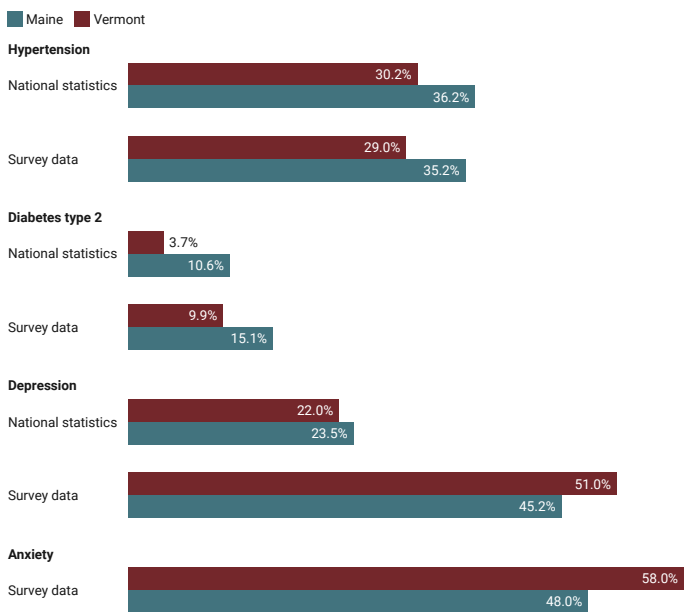


Figure 4. Respondents reporting a diagnosis of hypertension, Diabetes type 2, depression and anxiety compared with state-wide data from America’s Health Rankings.

3 Hafeez H, Zeshan M, Tahir M A, et al. (April 20, 2017) Health Care Disparities Among Lesbian, Gay, Bisexual, and Transgender Youth: A Literature Review. *Cureus* 9(4): e1184. doi:10.7759/cureus.1184

Health Outcomes Among LGBTQ+ Respondents

LGBTQ+ individuals experience higher rates of health disparities including denial of rights, social stigma, and discrimination.³ We found that LGBTQ+ respondents across both states (n=175; 17.7%) were significantly more likely to be food insecure before and during the COVID-19 pandemic (Figure 5). LGBTQ+ respondents were 4 times more likely to experience depression, anxiety, and more likely to be diagnosed with hypertension.

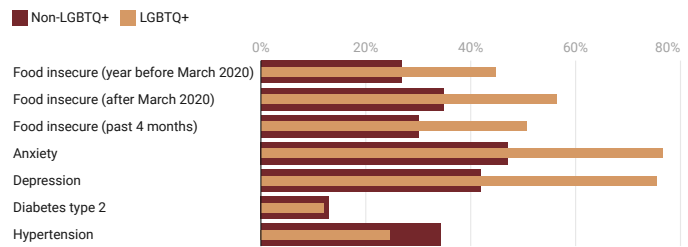


Figure 5. Reported rates of food insecurity before and since the onset of the COVID-19 pandemic and reported rates of health outcomes by LGBTQ+ or non-LGBTQ+ respondents.

Medication Use and Food Security

We explored if respondents with food insecurity were more likely to add, skip, or stop medications related to COVID-19 financial hardship (Figure 6). Individuals with food insecurity were 4-7 times more likely to skip or stop depression and/or anxiety medications and 10 times more likely to stop their diabetes medications than respondents that identified as food secure during the COVID-19 pandemic. Further, individuals with food insecurity prior to the onset of the pandemic were 5 times more likely to add medications for anxiety and/or depression post-pandemic, likely attributable to higher levels of anxiety and depression. Vermont respondents with DMT2 were less likely to skip medication and more likely to add medication than respondents from Maine post-pandemic. Respondents who identified as female and older than 62 years were less likely to report adding, skipping, or stopping medication for anxiety and/or depression.

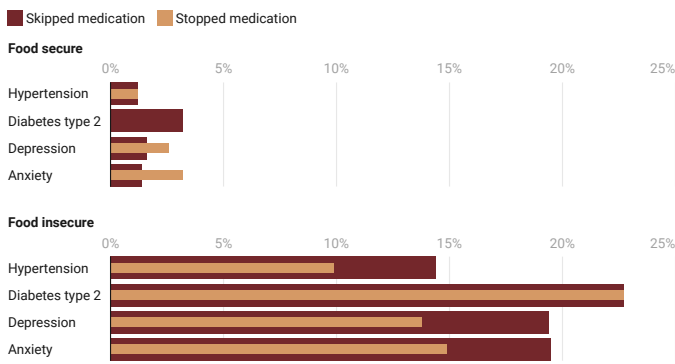


Figure 6. Percent of respondents with a given condition who skipped or stopped medication for hypertension, diabetes type 2, depression, or anxiety by food security status.

Substance Use Since the COVID-19 Pandemic

We examined the change in use of substances including alcohol, tobacco, cannabis, and “street drugs” such as heroin, oxycodone, cocaine, crack, crystal meth, and/or sedatives since the COVID-19 pandemic (Figure 7). Since June of 2020, the Centers for Disease Control and Prevention found that 13% of Americans reported an increase in substance use as a way of coping with stress related to COVID-19. Our findings echo these national trends. We found a positive relationship between the co-use of different substances, meaning respondents using one type of substance were more likely to report using additional substances during the pandemic.

CANNABIS USE. Thirty-four percent of respondents, most often males between the age of 18-55 years, used cannabis during the COVID-19 pandemic. Among these individuals, 10% reported increasing their use during the COVID-19 pandemic. Individuals who reported increased use of cannabis were 50% more likely to also report increased use of tobacco, indicate higher COVID-19 related stress levels, and be persistently food insecure (i.e. before and during the COVID-19 pandemic) (Figure 8).

ALCOHOL USE. Sixty percent of respondents reported consuming alcohol during the COVID-19 pandemic. Among these individuals, 10% reported increased consumption since the onset of the pandemic. Respondents who were newly food insecure were twice as likely than those who were persistently food insecure to increase alcohol consumption. We found

that Vermont respondents who consumed more alcohol during the COVID-19 pandemic were more likely to have a job loss, be educated below the college level, and nearly three times more likely to report greater use of cannabis. Respondents from Maine who reported higher alcohol consumption during the COVID-19 pandemic were three times more likely to report increased cannabis use than individuals who reported drinking the same or less alcohol.

“STREET DRUGS”. Eight percent of respondents reported using one or more non-prescribed drugs during the COVID-19 pandemic, including heroin, “oxy” or oxycodone, cocaine, crack, crystal meth, and/or sedatives. Among these respondents, 2.5% reported increased use of street drugs during the COVID-19 pandemic. Of those reporting increased use of street drugs, respondents were twice as likely to use greater amounts and twice as likely to be food insecure prior to the onset of the pandemic. Vermont respondents who reported increased use of street drugs were also 7 times more likely to suffer from depression.

TOBACCO. Thirty percent of respondents reported using tobacco during the COVID-19 pandemic with 8.3% reporting increased use of tobacco. Respondents who were persistently food secure were more likely to increase their use of tobacco than those who were food secure. Maine respondents that increased their tobacco use also reported increasing cannabis use and were three times more likely to have used street drugs. Meanwhile, there was no association between increased tobacco use and increased use of other habit-forming substances among Vermont respondents.

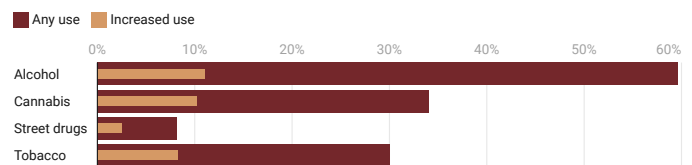


Figure 7. Percent of respondents reporting any substance use and an increase in substance use since the COVID-19 pandemic.

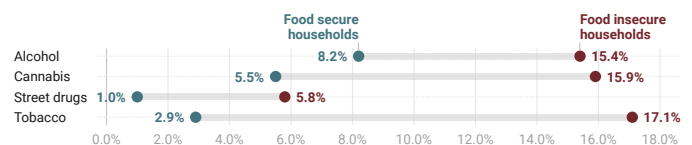


Figure 8. Percent of respondents reporting an increase in substance use since the start of the COVID-19 pandemic by food security status.

Implications

Our findings suggest significant health behavior changes and worsening health outcomes since the onset of the COVID-19 pandemic. A reduction in fruit and vegetable consumption, poor medication adherence, greater use of one or more habit-forming substances, and increasing levels of stress, depression, and anxiety may exacerbate chronic disease prevalence and severity. Individuals who are food insecure and LGBTQ+ were more likely to experience these changes and impacts. Ongoing public health efforts will be critical to offset COVID-19 related disease and associated chronic disease burden.

Acknowledgments

This work was supported by the Joint Catalyst Award from the Gund Institute for Environment at the University of Vermont and the Northern New England Clinical and Translational Research Network. Additional funding was made possible from the USDA National Institute of Food and Agriculture, Hatch project number ME022103 through the Maine Agricultural & Forest Experiment Station and from the UVM ARS Food Systems Research Center.