

“Behavioral Health Care Service Trends During the COVID-19 Pandemic in a Health First Colorado Population”

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Executive Summary of Findings

- Both depression and anxiety claims follow a seasonal pattern where peaks were detected during winter months and weekly claim volumes were lowest during summer months.
- Steep declines in the frequency of in-office and community mental health center (i.e., non-telehealth) visit types for both depression and anxiety were evident beginning with the implementation of COVID-19 stay-at-home orders in the Denver metropolitan area. At the same time, telehealth visits began to increase markedly as in-office visits decreased.
- Depression claim counts did not increase over time prior to COVID-19 stay-at-home orders, but increased 0.65% for each additional week following the implementation of stay-at-home orders. Despite an increasing weekly trend post-COVID-19 stay-at-home orders, depression claims on average decreased 9.5% following stay at home orders in the time period analyzed.
- Anxiety claim counts increased weekly over time during the period prior to COVID-19 stay-at-home orders, and then increased 0.47% per week over and above their previous trend post-COVID-19 stay-at-home orders.
- Detected increases in weekly trends of claims coinciding with dramatic changes to the number of services billable through telehealth suggest that virtual care delivery is able to meet a large portion of depression and anxiety health care needs for those



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who sought care during the COVID-19 pandemic.

- The overall decrease detected in depression claims following COVID-19 stay-at-home orders (despite an increasing trend) may suggest that individuals with depression preferred in-person treatment or that telehealth may have opportunities for improvement in depression treatment.

Background

During the COVID-19 pandemic that began in the United States in 2020, speculation regarding changes in the way that people utilize health care services and the amount at which they do so has been rampant. With many states and localities experiencing stay-at-home orders, businesses shuttering temporarily and some permanently, and schools moving to remote lessons, much of the collective movements of the country came to a halt. In many places, this included a temporary suspension of elective procedures.^{1,2} Additionally, the Centers for Medicare and Medicaid Services (CMS) loosened restrictions around administering telehealth services.^{3,4}

The impacts from the disruptions to daily life are far-reaching. As a result of these disruptions, the ways in which people have utilized health care services has changed. Telehealth services have increased.⁵ The number of services administered through telehealth and reimbursed through CMS continued to increase through the pandemic.³ As of October 2020, CMS is proposing to make some of these changes in telehealth permanent.⁶ Upon the conclusion of the pandemic, some of these utilization patterns may have permanently shifted, especially if CMS does permanently change telehealth guidelines.

In addition to changes in the way that health care is utilized and delivered, people may be using the health care system for different reasons than their typical use patterns. Several recent studies suggest that COVID-19 has had an effect on mental health, specifically with regard to depression and anxiety.^{7,8,9,10,11}

This paper investigates changes in telehealth use patterns in a Health First Colorado (Colorado's Medicaid Program) population, specifically around diagnoses for depression and anxiety. Telehealth visits as well as in-office visits for depression and anxiety are investigated over a two-year timeframe in order to establish health care use patterns pre- and post-COVID-19 pandemic onset.

Methods

Data

Claims data were analyzed from Colorado Access (COA), a nonprofit health plan that is focused on public insurance. COA is the Regional Accountable Entity (RAE) for two regions within the program of Health First Colorado. These two regions, Region 3 and Region 5, encompass a portion of the Denver metropolitan area, specifically the counties of Adams, Arapahoe, Denver, Douglas, and Elbert.

Behavioral health visits for anxiety (ICD codes F41.X) and depression (ICD codes F32.X and F33.X) were plotted over time beginning 7/1/2018 and ending 8/31/2020, inclusive of both demarcation dates. Visits were determined to be related to depression or anxiety if the relevant ICD codes appeared in the first four lines of the claim. Place of service codes were grouped to represent telehealth (i.e., POS 2), community mental health centers (CMHCs) (i.e., POS 53), or other location type. Plots of weekly claim volumes are presented with dates of relevant public health orders for the state of Colorado identified (i.e., stay-at-home orders began March 26, 2020 and ended April 26, 2020 (Figures 1 and 2)).

Claims were deduplicated by Medicaid ID, claim first service date, and POS code type (i.e., telehealth, CMHC, or office/other). In total, 643,100 claims representing 71,546 unique members were included for depression and 492,873 claims representing 79,032 unique members were included for anxiety.

Table 1. Claim counts by place of service (POS) code groupings.

	Depression	Anxiety
Total # of claims	643,100	492,873
# telehealth claims (% of total)	69,154 (10.8%)	56,074 (11.4%)
# CMHC claims (% of total)	120,911 (18.8%)	58,939 (12.0%)
# office/other location claims (% of total)	453,035 (70.4%)	377,860 (76.7%)

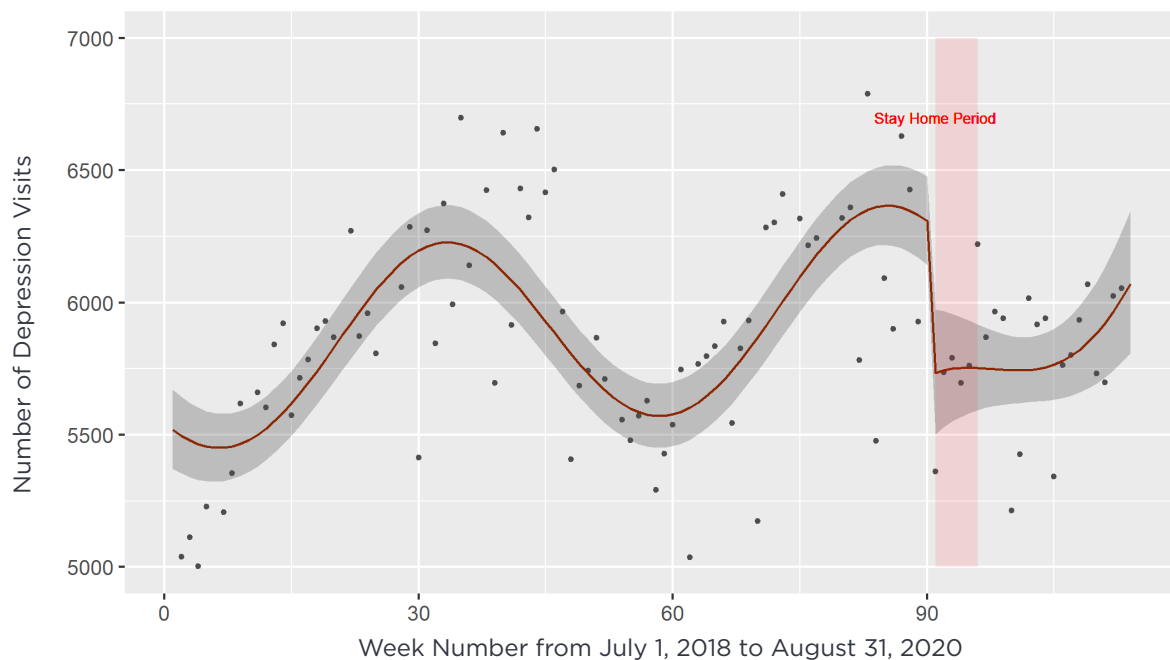
Analysis

An interrupted time series was used to test differences in patterns of claim volumes before and after COVID-19 stay-at-home orders were issued in the Denver metropolitan area on March 26, 2020. Due to the seasonal count nature of the data, a negative binomial regression with sinusoidal harmonic terms was fit. Harmonic terms included one period per year of sine and cosine functions. Week was used to capture an overall trend independent of harmonics. Interaction terms of period (i.e., pre-/post-COVID stay-at-home orders) by week were used to test the differences in slopes after the COVID-19 stay-at-home orders. Variables were retained if $p < 0.05$. Thirteen influential outliers were removed from the seasonal analysis of depression and twelve from anxiety (Figures 1 and 2) but can be viewed in Figures 3 and 4. These outliers included weeks containing holidays that led to artificially low values due to office closures or other circumstances. The negative binomial approach in similar data has been shown to be robust to serial correlations,¹² likely due to the additional parameter used to adjust errors for overdispersion which can be caused by correlated data.

Results

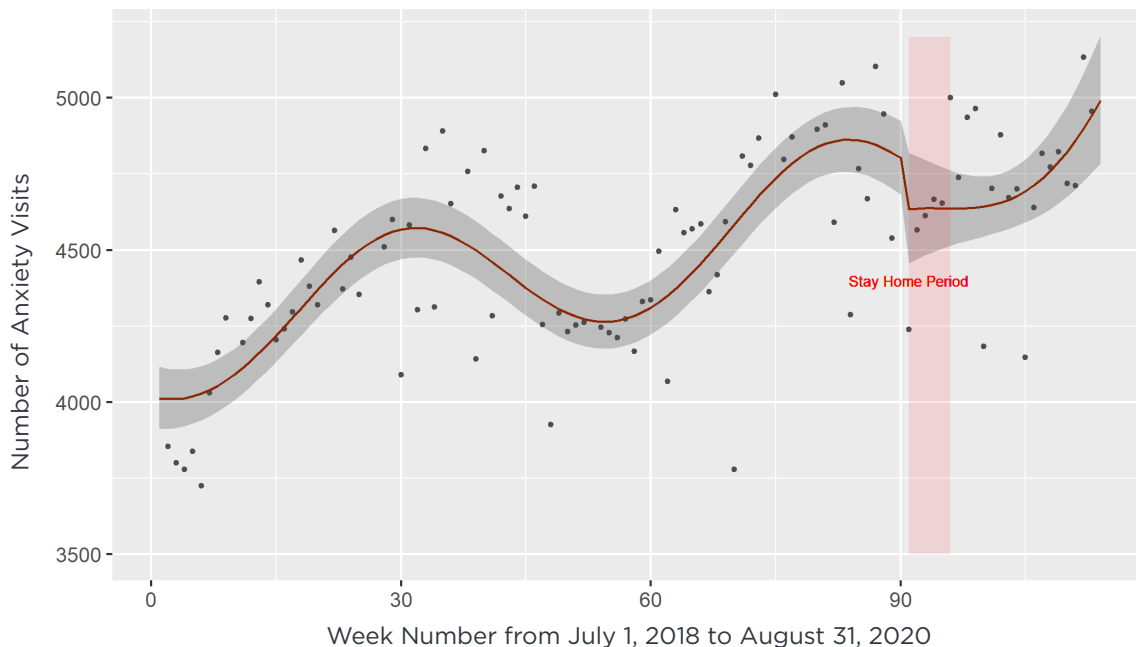
Depression claim volume by week is presented in Figure 1. Claim counts over time followed a sinusoidal, seasonal pattern where both harmonic terms were significant (sine harmonic $p < 0.001$, cosine harmonic $p < 0.001$). The interaction between week and pre-/post-COVID-19 stay-at-home orders was significant ($p < 0.001$); claims counts were not increasing prior to COVID-19 stay-at-home orders but increased 0.65% for each additional week following the implementation of stay-at-home orders. However, despite the post-COVID-19 stay-at-home orders increase in claim counts per week, the overall mean claim volume in the post-COVID-19 stay-at-home orders period was 9.5% lower than the pre-COVID-19 stay-at-home period (95% CI -14.8 - -4.2, $p < 0.001$).

Figure 1. Depression visits by week



Claims for visits related to anxiety similarly followed a seasonal pattern (sine harmonic $p = 0.003$, cosine harmonic $p < 0.001$). Over time and independent of seasonal effects, anxiety claim volumes increased 0.12% per week (95% CI 0.08 – 0.16, $p < 0.001$); however, on average there was not a significant difference in geometric mean claim volume between the pre- and post-COVID-19 stay-at-home periods ($p = 0.20$). Additionally, the interaction between week and COVID-19 period (i.e., pre- or post-COVID-19 stay-at-home orders) was significant for anxiety visits ($p = 0.008$), suggesting that the slope in the post-COVID-19 period increased 0.47% more than it was before the implementation of stay-at-home orders.

Figure 2. Anxiety visits by week



Weekly claim volumes for depression and anxiety by place of service (POS) code grouping are presented in Figures 3 and 4, respectively. Steep declines in the frequency of in-office and CMHC (i.e., non-telehealth) visit types for both depression and anxiety are evident beginning around the time of COVID-19 stay-at-home orders in Colorado. Similarly, telehealth visits began to increase as in-office visits decreased, coinciding with the timing of stay-at-home orders in the Denver metropolitan area.

Figure 3. Weekly depression visits by POS code type

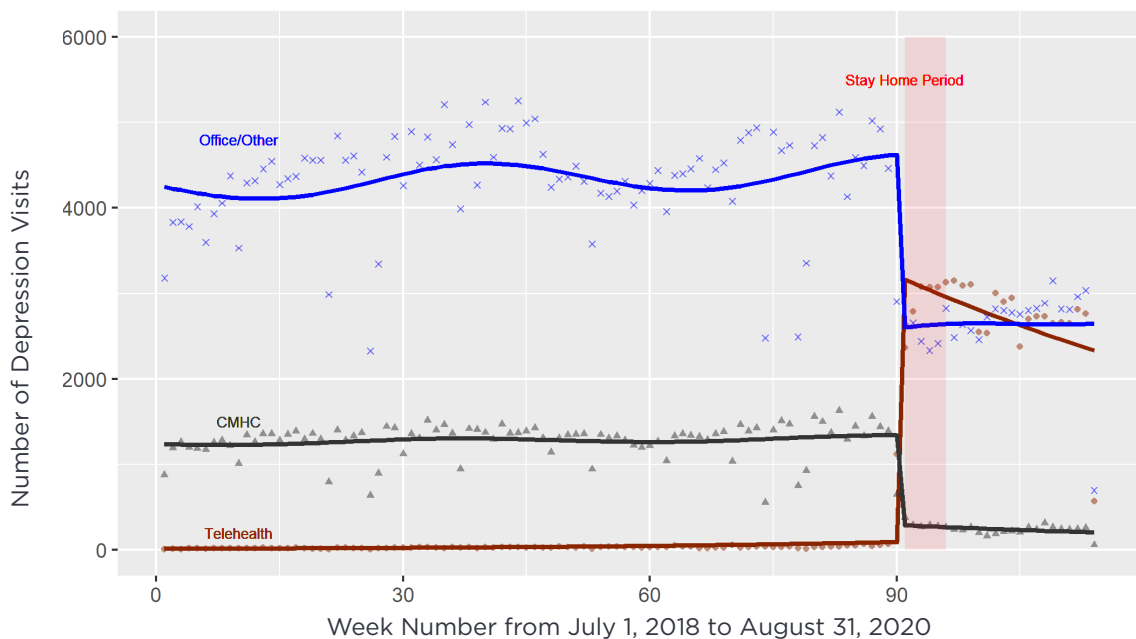
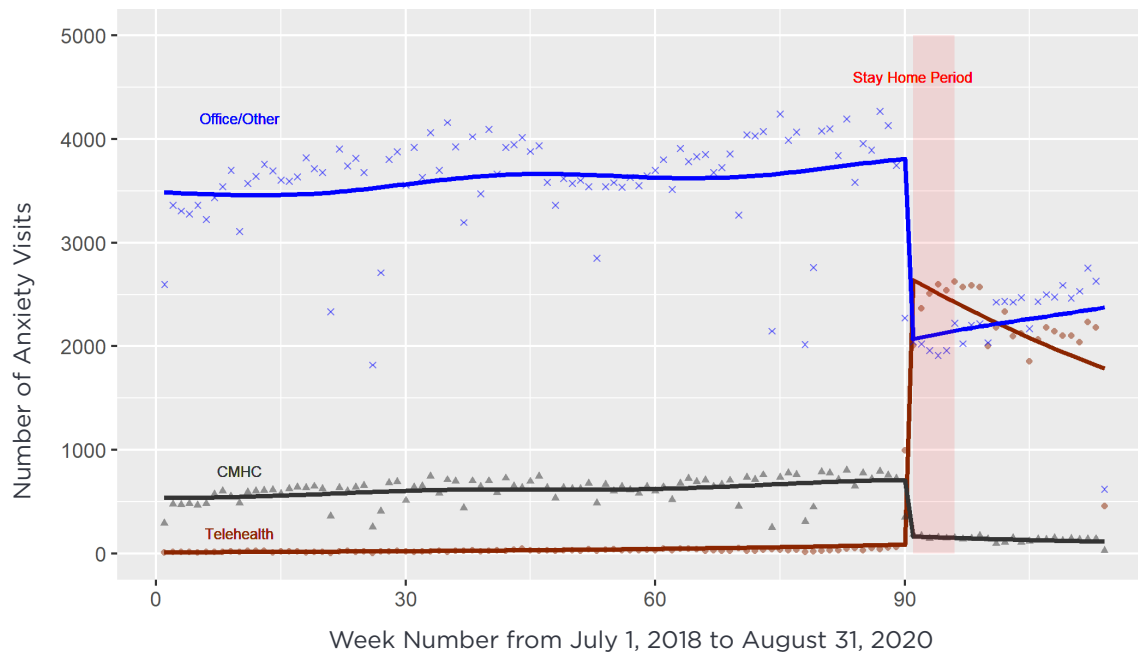


Figure 4. Weekly anxiety visits by POS code type



Discussion

Visits for both depression and anxiety followed sinusoidal, seasonal patterns that peaked in the winter months, and visits for both diagnoses have been increasing following a period of COVID-19 related stay-at-home orders in the Denver area. While visits for depression were not increasing prior to COVID-19 stay-at-home orders, visits for anxiety have been consistently increasing since July 2018. However, the significant interaction between week and COVID-19 period indicates that the increase per week in anxiety-related visits in the post-COVID-19 stay-at-home order period is outpacing the increase seen prior to the implementation of COVID-19 stay-at-home orders, independent of any seasonal effects.

Additionally, examining the volume of depression- and anxiety-related claims by POS code type (i.e., telehealth, CMHC, or other office visit) suggests that the shift to telehealth has allowed providers to continue meeting the needs of a large portion of COA members even as the COVID-19 pandemic complicates the health care delivery system. In the weeks following the expiration of COVID-19 stay-at-home orders, non-CMHC office visits have begun to increase while CMHC visits have continued to decrease, suggesting that CMHCs are continuing to provide telehealth services for depression and anxiety as other offices transition back to in-person care. Mean decreased amounts of depression claims in the post-COVID-19 stay-at-home period, however, might suggest that depression treatment through telehealth may have opportunities for improvement or that individuals with depression preferred more in-person care. Given that recent COVID-19-related changes to the CMS telehealth guidelines may become permanent, it is important to understand how telehealth services can be leveraged to best support Health First Colorado members in managing their behavioral health.

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