Numerator Stockpiling Behavior Index

"Our data scientists distill millions of data points into new, coherent findings that help identify insights that drive action."

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Executive Summary:

Brands and retailers need to understand stockpiling behaviors during COVID-19 to properly anticipate trailing COVID-19 behaviors and future direction.

The Numerator Stockpiling Index methodology:

- Segments stockpiling behavior into three levels: pantry-fill, stock-up and hoarding defined as 1.5x, 2.5x and 4x versus average behaviors. These segments "nest," meaning stock-up is a subset of pantry-fill.
- Leverages large-scale, granular and longitudinal data to identify actual / observed behavior.
- Uses February 2018 - March 2019 as a control period, assessing lifts in behaviors from February 2019 - March 2020 which includes the COVID period of interest.

Key considerations for brands and retailers moving forward include:

- Understanding the extent to which stockpiling behaviors already occur naturally so as not to distort the COVID-19 dynamics when developing second-half actions.
- Exploring the implications of stockpiling behaviors at the category level as these behaviors solidify, mature and then transition as we exit COVID-19.

NOTE: Numerator is undertaking further study of the use cases (the whys) associated with elevated spending levels during this era of COVID-19.

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INTRODUCTION

Numerator's Stockpiling Behavior Index provides an essential understanding of consumer behavior in the COVID-19 era by examining stockpiling behaviors of actual shoppers based on total spending.

It is important to note that stockpiling (defined as a household purchasing significantly more in a given week compared to what that household actually spends on "average") naturally occurs in the marketplace on an ongoing basis. What is of interest now is how that stockpiling behavior has changed or increased during a period of disruption in the marketplace (in this case, the COVID-19 event).

> **Independent of COVID-19, 1 in 5 Americans do stockpiling behaviors in an average week.**

APPROACH

Building the right framework for this type of investigation requires large-scale, granular and longitudinal data from shoppers to identify patterns of actual (observed) behavior. Using this longitudinal data, a baseline of "expected" (or average) purchasing behavior can be established on a household-by-household basis. Actual purchase behavior can then be compared to the norm for each household on a week-by-week basis to determine the extent to which a household may be buying at higher than average levels (stockpiling).

> **Stockpiling behavior has increased significantly since the COVID-19 event began.**

During a period with a disruptive event (like COVID-19), a previous period can be used as a "Control" to establish the typical pattern of stockpiling that would be expected to occur.

As shown in Figure 1, the February 2018 through March 2019 was used to set the "Control" or typical pattern. Shopping behavior for the current year (February 2019 through March 2020) was then compared to the "Control" period that revealed and quantified significantly more stockpiling since the COVID-19 event. (More details on the Data Science methodology is provided in the subsequent section.)

FIGURE 1: Comparison Periods

PERIOD	DATE RANGE	USAGE
Control	February 2018 - March 2019	Used to establish typical behavior
Investigation	February 2019 - March 2020	Focus on COVID-19 event behavior change

Using this framework, a Pantry-Fill "stockpiler" in any given week was a household that purchased significantly higher in that week than what they would normally spend. Specifically, households that purchased 1.5 times more (or higher) were considered to be Pantry-Fillers.

Segmenting further, a heavier stockpiling group has been broken out (the Stock-Up group, representing 2.5 times the average spend during the week). And the heaviest stockpiling group (the Hoarding group) was identified -- these households spent 4 or more times their average spend in that week.

- Pantry-Fill (1.5x)
    - Stock-Up (2.5x)
        - Hoarding (4x)

Pantry-Fill (1.5x)	Stock-Up (2.5x)	Hoarding (4x)

(To be clear, the Hoarding group is a subset of the Stock-Up group and the Stock-Up group is a subset of the Pantry-Fill group, so these are nested groups.)

Stockpiling behavior is identified based on weekly purchasing, and any given household can purchase in multiple weeks (therefore can fall in and out of a stockpiling definition depending upon the week being examined).

Key Observation: Comparing current year behavior to the Control group showed the first lift in Pantry-Fill stockpiling began at the end of January which coincided with the first travel restrictions. Another and much steeper lift occurred starting in early March.

FIGURE 2:

Example: Pantry Filling (1.5x)
How to read: % of households who spent **1.5x** their average weekly spend
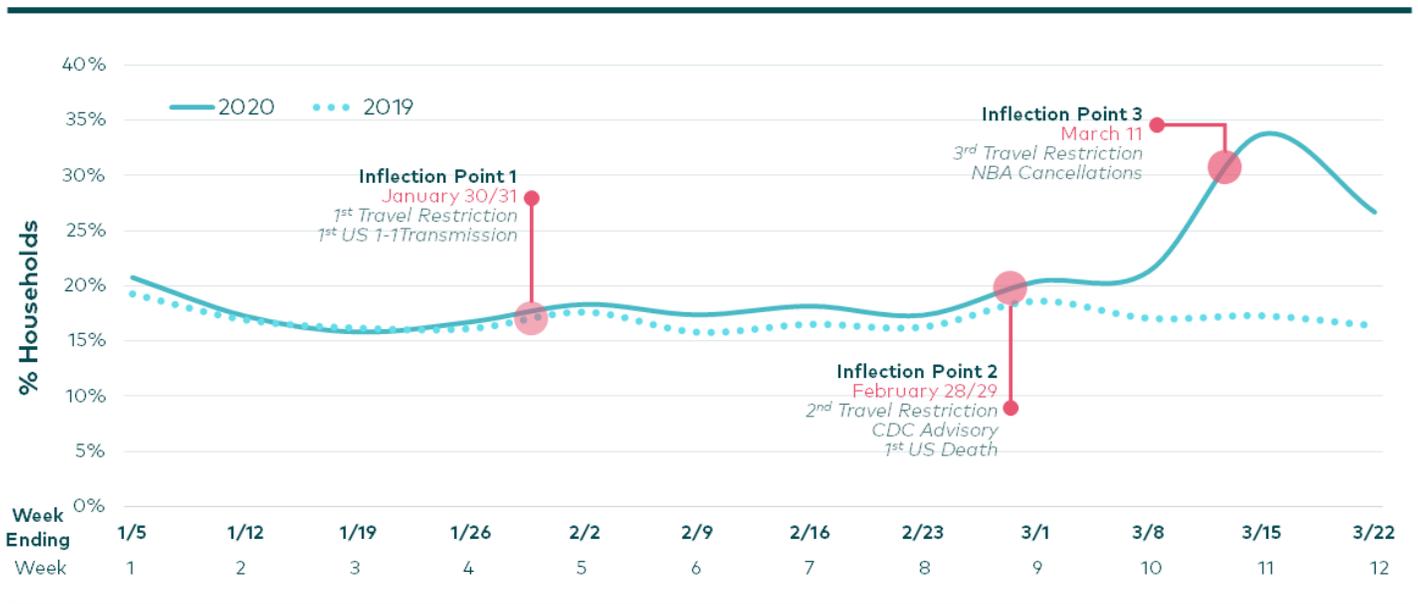
The purpose of this information is to provide a much needed understanding of how stockpiling behaviors are currently driving retail sales. From that base understanding, we can then build out insights that help us anticipate the trailing impact this stockpiling will have in the second half of 2020.

DETAILS ON METHODOLOGY

To set the benchmark for average ("normal") shopping behavior for each household, Numerator first selected a sample of ~100,000 static panelists (consistently reporting over an annual period from February through March). Individual weeks for the five-month period from May through September were then used to calculate the average amount each household spent on a weekly basis within Brick & Mortar outlets. This weekly average ("norm") was then used as the denominator to calculate an index for each week over the annual period to determine the extent to which any given week was above or below the average (expected) level.

For example, if a panelist normally spends 100 dollars each week, and in two consecutive weeks spent 150 and 90 dollars, the ratio for those weeks are 1.5 and .9, respectively.

As previously mentioned, stockpiling behavior occurs naturally in the marketplace on an ongoing basis. Looking at observed patterns of behavior, a threshold of 1.5 times the average weekly spend was identified as representing Pantry-Fill (stockpiling behavior). (Within the Pantry-Fill group, a spend of 2.5 fold was classified as Stock-Up behavior and a spend of 4 fold the normal level was considered Hoarding behavior -- these groups represent "nested" groups within the Pantry-Fill group.)

FIGURE 3:
Three "nested" groups of households were identified based on significantly higher level of purchasing than expected (stockpiling behavior).

Stockpiling Behavior Groups: How to Read

Base behavior: Average weekly behavior– either average spend or average trips– normalized to each individual consumer.

Stockpiling Behaviors: Households whose weekly behaviors are **1.5x/2.5x/4x** higher than they are in an average week
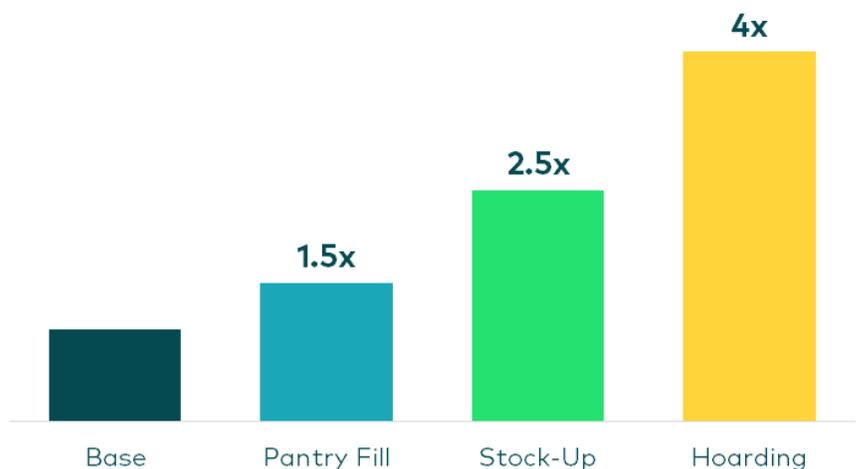
The same methodology was used to identify stockpiling behavior for a Control Group of households vs the Investigation Period.

TIME PERIOD	CONTROL GROUP	INVESTIGATION
Static Time Period	February 2018 - March 2019	February 2019 - March 2020
"Norm" Period	May 2018 - September 2018	May 2019 - September 2019

*Note: ~100,000 static panelists were used for each group*

As previously depicted in Figure 2, the percent of households making a Pantry-Fill trip for the Investigation period vs the Control period is very similar in the first part of the year. As the COVID event comes into play (in early January), more households start to stockpile, with an even greater deviation from the "norm" occurring in early March.

The chart below (Figure 4) shows how the spend for each of the three key groups of stockpiling shoppers indexed vs what would have been expected given the typical stockpiling behavior (as set by the Control period). Note that all three stockpiling behaviors ramp up sharply in the first two weeks of the COVID-19 event. In fact, the spending for the two heaviest stockpiling groups (Stock-Up and Hoarding) more than doubled by 3/9/2020.

FIGURE 4:

Stockpiling Behavior Index – Spending Based
How to read: Increase in households exhibiting stockpiling spend behavior versus year ago
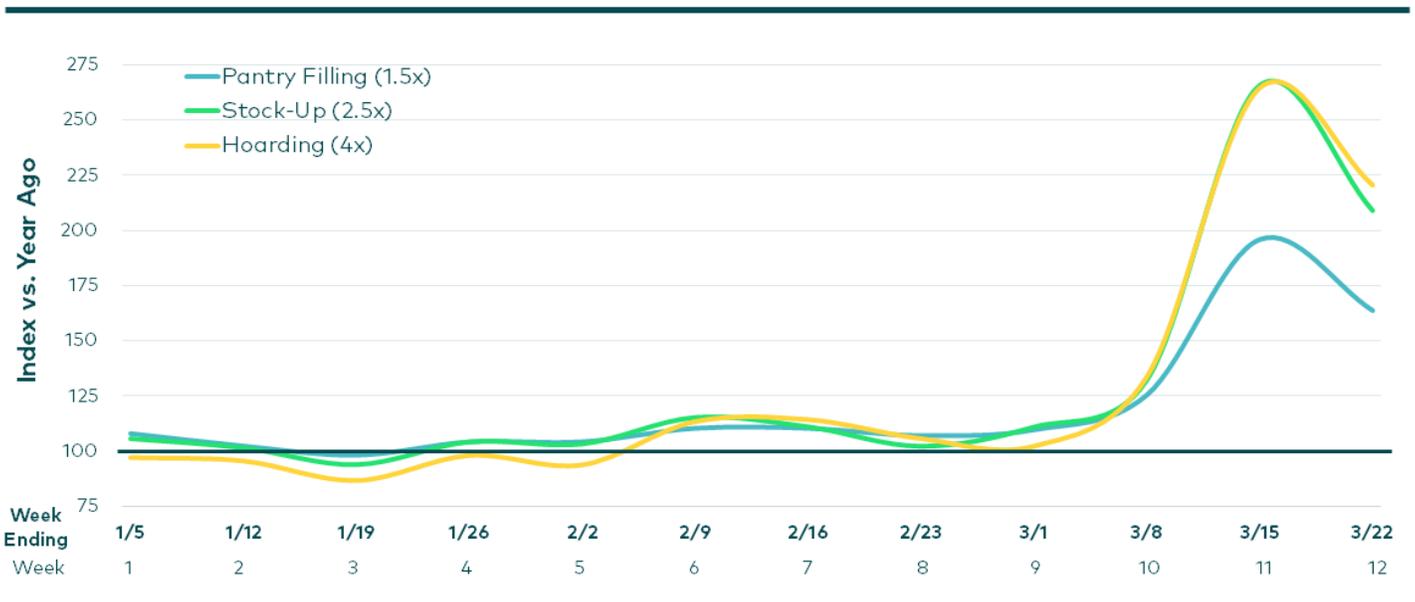
Source: Numerator Insights

As shelter-in-place restrictions emerged, a down-tick in spending behavior was observed across the groups, however, spend rate was still much higher than what these households would have typically spent in an average week.

IMPLICATIONS OF STOCKPILING NORMS

It is not surprising, given the impact of the COVID-19 events, that shopping behavior has been changing. However, using longitudinal, large-scale and granular data to segment and dissect this behavior enables researchers and marketers to prepare for the future impact. Numerator's Omnipanel has been designed to provide the right insights into modern consumer behavior, and that type of insight has never been more relevant.

> **Longitudinal, large-scale and granular data enables researchers and marketers the needed depth to segment and dissect behavior to prepare for the future.**

Establishing "norms" provides the ability to benchmark against "expected" behavior to segment the consumers and shoppers who are changing the most -- in this case, the key stockpilers. These benchmarks are critical to start to plan for and anticipate how this stockpiling behavior will impact future spending.

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