Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company’s public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
How COVID-19 changed Italian consumers’ behavior

Enrico Maria Cervellati a,*, Gian Paolo Stella b, Umberto Filotto c, Andrea Maino d

a Research Department, University of Rome, Link Campus, Via del Casale di San Pio V, 44, 00165 Rome, Italy
b Department of Law, LUMSA University, Via Filippo Parlatore, 65, 90105 Palermo, Italy
c Department of Management and Law, University of Rome, Tor Vergata Via Columbia, 2, 00133 Rome, Italy
d Swiss Finance Institute, University of Geneva, Bd du Pont d’Arve, 42, 1211 Geneva 4, Switzerland

ARTICLE INFO

JEL classifications:
D1
D7
D9
E7
I1
I3

Keywords:
Consumer behavior
Consumer spending
COVID-19
Health-related decisions
Socioeconomic variables

ABSTRACT

We investigate how the COVID-19 pandemic affected people’s health-related choices and spending habits in Italy, the first European country to be heavily affected by the pandemic. We collected about 3000 questionnaires in May and June 2020 (that is, during the stabilization phase that followed the country’s lockdown), asking questions taken from the “Survey tool and guidance: rapid, simple, flexible behavioural insights on COVID-19” issued by the World Health Organization (WHO), and correlated the responses with respondents’ demographic and socioeconomic profiles. A principal component analysis (PCA) shows three main components that we label “Unusual behavior,” “Precautionary spending,” and “Augmented social distancing,” which vary with demographic and socioeconomic characteristics.

1. Introduction

Countries around the world are facing one of the most difficult challenges in recent history. The COVID-19 pandemic is changing individuals’ habits and behaviors (Bavel, Baicker, Boggio, et al., 2020), including drinking and eating habits (Clay & Parker, 2020; Rundle, Park, Herbstman, Kinsey, & Wang, 2020), physical activities (Chen et al., 2020), and social media use (Allington, Duffy, Wessely, Dhavan, & Rubin, 2020). From an economic perspective, the uncertainty linked to the spread of the coronavirus resulted in increased stock market volatility (Altig et al., 2020) due to worsening conditions in the labor market (Coibion, Gorodnichenko, & Weber, 2020) and various economic activities (Atkeson, 2020; Barro, Ursúa, & Weng, 2020). Chronopoulos, Lukas, and Wilson (2020) analysis of more than 100,000 consumers in the United Kingdom shows that individuals’ spending was significantly affected by COVID-19. In particular, younger individuals increased food purchases during the lockdown imposed by British authorities. In an international comparison, Keane and Neal (2021) highlight how in 54 countries announcements of possible restrictions linked to the containment of the pandemic led individuals to increase their spending. Higher risk perception triggers self-protection activities including panic buying (Yuen, Wang, Ma, & Li, 2020). The resulting shortages of basic necessities or medical supplies inevitably harm the most vulnerable part of the population, like older or low-income individuals, who may not find the goods they need and thus do not have equal opportunities to fight the disease (Besson, 2020).

* Corresponding author.
E-mail addresses: e.cervellati@unilink.it (E.M. Cervellati), g.stella1@lumsa.it (G.P. Stella), filotto@sefemeq.uniroma2.it (U. Filotto), andrea.maino@etu.unige.ch (A. Maino).

https://doi.org/10.1016/j.gfj.2021.100680
Received 22 November 2020; Received in revised form 14 October 2021; Accepted 31 October 2021
Available online 6 November 2021
1044-0283/© 2021 Elsevier Inc. All rights reserved.
Our aim is to analyze how Italians’ consumer spending and health-related behaviors changed during the pandemic and how they are linked to individuals’ socioeconomic conditions. Italy was the first country in Europe to be heavily affected by COVID-19 and one of the first to take very stringent actions (e.g., imposing a nationwide lockdown) to reduce virus transmission (Remuzzi & Remuzzi, 2020). Its quick and rigorous approach to curbing the spread of the virus makes Italy an ideal benchmark for analyzing the effects of the pandemic on people’s behavior (Pisano, Sadun, & Zanini, 2020).

Our paper makes several contributions. First, we add new research insights to the recent literature on the effects of the COVID-19 shock on consumer spending. To the best of our knowledge, this paper is one of the first studies to provide empirical evidence on how, and in what directions, COVID-19 changed consumer spending and health-related behaviors in Italy. Second, using questions designed by the World Health Organization, we allow for an international comparison of such changes. Third, the method we use, based on principal components analysis, allows us to distinguish different factors related to individuals’ spending, contributing to the literature on what triggers purchase behaviors that are not fully rational.

The paper is organized as follows: in Section 2, we describe the research design; in Section 3, we present the results and discuss them; in Section 4, we conclude.

2. Research design

We collected data by distributing questionnaires in Italy between May and June 2020, during the stabilization phase that followed the lockdown. Using the Computer-Assisted Web Interview (CAWI) survey method, we invited 3000 randomly selected individuals to participate. According to the indications provided by Dattalo (2008), the sample we analyzed appears to be representative of the Italian population. Eventually, we collected 2950 answers, and after cleaning the sample for missing values, we ended up with 2872 respondents, aged 18–92.

To measure consumer spending and health-related behavior changes, we used eleven questions taken from the first release of the “Survey tool and guidance: Rapid, simple, flexible behavioural insights on COVID-19” issued by the World Health Organization (WHO, 2020). See Table 1.

For each question, the respondents could choose from three possible answers: “I already did that,” “I plan to do that,” or “I don’t plan to do that.” To analyze how our survey respondents’ consumer and health-related behaviors changed because of COVID-19, we also asked participants to provide demographic and socioeconomic information: age, gender, marital status, education level, work status, personal income, and area of residence (small town vs. big city). While most empirical studies treat demographic and socioeconomic characteristics as mere control variables, we claim that since the coronavirus affected people in distinct ways depending on their individual characteristics, it is important to treat these characteristics as true explanatory variables. In Table 2, we present the numbers of observations and the relative and cumulative frequencies of the variables analyzed.

We grouped the above questions on consumer spending and health-related behaviors using a principal component analysis (PCA). Starting from respondents’ answers to the eleven questions, the PCA (with the Promax rotation method) unveils the latent factor model for the data generating process. The principal components, also called extracted factors, have loadings on the questions—the basic components—that allow us to directly interpret the nature of the extracted latent factors.

As Table 3 shows, the PCA returns three principal components related to the respondents’ behavior changes during the COVID-19 outbreak, which we label “Unusual behavior changes,” “Precautionary buying,” and “Augmented social distancing.”

The pattern matrix shows that the three-component decomposition has no cross-loading, which leads to a cleaner interpretation of each principal component. For example, the first principal component has loadings on basic components identified by items 5, 6, 10, and 4 in Table 1. These direct links to the underlying questions allow us to interpret the factors as follows.

We chose the label “Unusual behavior changes” for the first principal component, since it includes drinking more alcohol, eating more unhealthy food, and exercising less than usual—that is, behaviors that are less healthy than one’s normal habits.1 In principle, the basic component “Exercised less than I usually do” (item 4) may be explained by the fact that during the pandemic gyms and other spaces devoted to exercising were closed. Nevertheless, people could still exercise outdoors; thus, exercising less than usual can be considered an unusual behavior change. Regarding the basic component “Bought drugs that I heard are good for treating COVID-19” (item 10), while it was quite clear that vaccines were being sought to combat COVID-19, at the time of the survey there still was great uncertainty on how to react to the pandemic at an individual level, so buying drugs perceived as good for treating COVID-19, even if not fully rational, could be considered at least understandable. Accordingly, we consider this behavior not as unhealthy, but as out of the ordinary, like the other three basic components forming the first principal component, “Unusual behavior changes.”

We named the second principal component “Precautionary buying” because it includes buying personal protection equipment such as masks and gloves, as well as buying food supplies or other everyday things on a large scale. Given the reassurance of the Italian government that there were not going to be shortages in food or other everyday supplies, buying large quantities of these things (items 1 and 2) might be labelled panic buying. It is also true that buying in quantity enables one to shop less frequently and shorten time in stores, thus minimizing exposure. Thus, we eventually decided to consider these behaviors as precautionary buying, rather than panic buying,2 because the PCA suggests that they are associated with buying personal protection equipment, which can definitely be

---

1 In a former version of the paper, we defined these behaviors as unhealthy. We thank an anonymous referee for suggesting that these habits are not necessarily unhealthy, just less healthy than usual.

2 We would like to thank the same anonymous referee for having suggested that these behaviors do not necessarily imply panic buying, but simply precautionary buying.
We labelled the third principal component “Augmented social distancing,” as it includes behaviors that minimize contact with others, including family and friends (items 3, 7, 8, and 9).

Table 1
Questions used to detect consumer spending and health-related behavior changes caused by COVID-19.

| Item | Behaviors |
|------|------------|
| 1    | Bought food supplies on a large scale |
| 2    | Bought other everyday things on a large scale |
| 3    | Avoided people who came from countries where coronavirus cases have occurred, such as China |
| 4    | Exercised less than I usually do |
| 5    | Drank more alcohol than I usually do |
| 6    | Ate more unhealthy food than I usually do |
| 7    | Avoided going to the doctor with issues that could be postponed, e.g., vaccination or a checkup |
| 8    | Asked family members or friends not to visit me |
| 9    | Decided that my child could not meet with a friend |
| 10   | Bought drugs that I heard that are good for treating COVID-19 |
| 11   | Bought personal protection equipment (masks, gloves) |

Note: WHO (2020).

Table 2
Number of observations, and relative and cumulative frequencies of demographic and socioeconomic variables.

|       | No. Obs. | Relative % | Cumulative % |
|-------|----------|------------|--------------|
| Age   |          |            |              |
| 18-25 | 200      | 7.0        | 7.0          |
| 26-35 | 1127     | 39.2       | 46.2         |
| 36-45 | 402      | 14.0       | 60.2         |
| 46-55 | 599      | 20.9       | 81.1         |
| 56-65 | 398      | 13.9       | 94.9         |
| 66-75 | 92       | 3.2        | 98.1         |
| >75   | 54       | 1.9        | 100          |
| Gender |          |            |              |
| Female| 1377     | 47.9       | 47.9         |
| Male  | 1495     | 52.1       | 100          |
| Marital Status |        |            |              |
| Married | 1310  | 45.6       | 45.6         |
| Single/Unmarried | 1215 | 42.3       | 87.9         |
| Divorced | 252   | 8.8        | 96.7         |
| Widowed | 95    | 3.3        | 100          |
| Education (in years) | |            |              |
| 0-8   | 409      | 14.2       | 14.2         |
| 9-12  | 669      | 23.3       | 37.5         |
| >12   | 1794     | 62.5       | 100          |
| Work Status |        |            |              |
| Full-time work | 1426 | 49.7       | 49.7         |
| Part-time work | 465   | 16.2       | 65.8         |
| Stay at home | 141   | 4.9        | 70.8         |
| Student | 470   | 16.4       | 87.1         |
| Retired | 181    | 6.3        | 93.4         |
| Disabled or unable to work | 16    | 0.6        | 94.0         |
| Unemployed | 173   | 6.0        | 100          |
| Income (in €) |      |            |              |
| <10,000 | 246  | 8.6        | 8.6          |
| 10,000-20,000 | 668 | 23.3       | 31.8         |
| 20,000-40,000 | 909 | 31.7       | 63.5         |
| 40,000-80,000 | 397 | 13.8       | 77.3         |
| >80,000 | 100  | 3.5        | 80.8         |
| Prefer not to say | 552 | 19.2       | 100          |
| Area of Residence (no. of inhabitants in parentheses) | |            |              |
| Rural Area (<20,000) | 814 | 28.3       | 28.3         |
| City (>20,000) | 2058 | 71.7       | 100          |

Note: No. Obs. stands for number of observations (total 2872). Relative % is the relative percentage of each class for each variable. Cumulative % is the cumulative percentage obtained for each class by summing the relative percentages of all classes up to the focal class. The cumulative percentage of the last class in each variable is thus 100%. Regarding the income variable, the option “Prefer not to say” was omitted from the regression analyses presented in Table 4 to avoid abnormal fluctuations in the values of the average and, consequently, of the standard deviation. Asterisks represent the level of confidence based on p-values: *p < 0.05, **p < 0.01, ***p < 0.001.

We labelled the third principal component “Augmented social distancing,” as it includes behaviors that minimize contact with others, including family and friends (items 3, 7, 8, and 9).
Table 3
Principal component analysis of consumer and health-related behavior changes.

| Basic components                          | Principal components |
|-------------------------------------------|----------------------|
|                                           | Item | Unusual behavior changes | Precautionary buying | Augmented social distancing |
| Drank more alcohol than I usually do      | 5    | 0.845                     |                      |                           |
| Ate more unhealthy food than I usually do | 6    | 0.796                     |                      |                           |
| Bought drugs that I heard are good for treating COVID-19 | 10   | 0.515                     |                      |                           |
| Exercised less than I usually do          | 2    | 0.428                     | 0.859                | 0.528                     |
| Bought food supplies on a large scale      | 1    | 0.859                     |                      |                           |
| Bought other everyday things on a large scale | 2    | 0.85                      |                      |                           |
| Bought personal protection equipment (masks, gloves) | 11   | 0.528                     |                      |                           |
| Asked family members or friends not to visit me | 8    | 0.813                     |                      |                           |
| Decided that my child could not meet with a friend | 9    | 0.762                     |                      |                           |
| Avoided going to the doctor with issues that could be postponed, e.g., vaccination or a check-up | 7    | 0.576                     |                      |                           |
| Avoided people who come from countries where coronavirus cases have occurred, such as China | 3    | 0.471                     |                      |                           |

Note: Basic components refer to the eleven questions adapted from WHO (2020). Item is the number associated with each question in Table 1. Principal components are the extracted factors of the Principal Components Analysis (PCA, with the Promax rotation method), which are based on the loadings of the eleven basic components.

3. Results and discussion

To analyze the effects of individuals’ demographic and socioeconomic characteristics on the three principal components of behavioral changes due to COVID-19, we ran three regression models; Table 4 shows the results.

Demographic and socioeconomic variables are mostly statistically significant in models 1 and 2, and partly in model 3, supporting our intuition that they can indeed be considered explanatory variables. We discuss their economic meaning, not only their statistical significance, in what follows.

In regression model 1, the dependent variable is “Unusual Behavior Changes,” and we find a negative coefficient associated with age, suggesting that younger respondents were likelier than older ones to adopt less healthy behaviors during the pandemic. A possible explanation is that social isolation may increase stress, which is an important risk factor for both the onset and the maintenance of alcohol misuse. While so far little is known about the global effect of isolation due to the pandemic on health and wellbeing, it seems that alcohol misuse (Clay and Parker, 2020) and unhealthy eating (Rundle et al., 2020) have been more common among at-risk individuals and young people. Social contact—e.g., sports, parties, dating, and just hanging out with friends—is especially important to young people, so the sudden deprivation may have been more stressful to them than to older people. On the other hand, people aged over 60 were more vulnerable to the virus, so one could have expected their stress levels to be higher. Given that young people possess, on average, lower level of income and poorer working status compared to older people, younger respondents could have been more stressed than older ones.

Policy makers might wish to consider how age affects citizens’ reactions to extreme events such as the pandemic. The positive coefficient associated with the dummy variable gender suggests that men exhibited less healthy behaviors than women. Clay and Parker (2020) claim that trait impulsivity—that is, the tendency to act without adequate forethought—is a risk factor for alcohol misuse. Since men on average seem to display more trait impulsivity than women, this may explain the evidence. The positive coefficient associated with marital status suggests that unmarried individuals (single, divorced, or widowed people) behaved in a less healthy way than married ones. Married individuals were probably able to eat more healthily than unmarried ones; also, loneliness might have eventually driven single, divorced, and widowed respondents to drink more alcohol. This evidence suggests that policy makers should devote greater attention to supporting more fragile citizens in difficult situations that increase their loneliness. The negative coefficient associated with education level suggests that the higher the number of years of education, the less disruption there was to behavior. More educated respondents may be more resilient in their habits. Previous studies have shown positive effects of higher education with respect to numerous domains. Our evidence is in line with the broader finding in previous studies (e.g., Cowell, 2006 and the literature therein mentioned) that more educated people are generally healthier than less educated ones and tend to engage in healthier behaviors, perhaps because they are better able to consider the future consequences of less healthy choices.

Somewhat surprisingly, the coefficient of the variable income does not appear to be statistically significant once we control for education, marital status, and work status. Instead, as we explain below, income plays a significant role in precautionary buying. Finally, the positive coefficient associated with the area of residence suggests that people living in smaller towns displayed healthier behaviors than those living in bigger cities.

In regression model 2 we use as dependent variable the second principal component (“Precautionary Buying”) and find that demographic and socioeconomic variables are statistically significant, except for gender. There seems to be no statistically significant difference between men and women with regard to precautionary buying. Instead, the other explanatory variables are significant not only statistically but also economically. Our finding that unmarried respondents tend to exhibit more precautionary buying than married ones can be explained by the former’s greater exposure to loneliness and stress. An alternative explanation is that unmarried people cannot count on a spouse to share the burden of buying food supplies and other everyday things, so when they do go out
being able to purchase what they need, even if shortages drive up prices. An alternative explanation is connected to our finding on supplies more than usual.

Our findings imply that policy makers should analyze individual demographic and socioeconomic characteristics closely, to better understand how different people may react differently to extreme situations such as pandemics. This attention to individual differences allows us to clearly identify the main behavioral changes due to the pandemic’s toll among elders. Indeed, the number of casualties due to the pandemic were especially horrific among older Italians in spring 2020.

The much stronger positive coefficient associated with marital status suggests that unmarried people adhered more closely to social distancing practices than did married ones. Again, a possible explanation is that single, divorced, and widowed people may have felt more deeply the loneliness, stress, and fear caused by the pandemic. On one hand, of course, they may have been especially tempted to meet family members and friends, but on the other hand they may have preferred to keep their distance to protect themselves and others. Another possible explanation is that each additional person in a household adds to the size of the household’s social network, and therefore to the need and desire for contact. Also, not all couples agreed with respect to how many visitors to allow. People who live alone have more control over this decision than those who must compromise with a spouse.

4. Conclusions

While it is important in general to link individual characteristics to health-related and spending behaviors, clustering them together in principal components that form “macro-behaviors” allows us to clearly identify the main behavioral changes due to the pandemic and how individual demographic and socioeconomic variables differently affect these macro-behaviors.

Our findings imply that policy makers should analyze individual demographic and socioeconomic characteristics closely, to better understand how different people may react differently to extreme situations such as pandemics. This attention to individual differences may help policy makers design action to support people effectively, avoiding a one-size-fits-all approach.

### Table 4
Regression models explaining how changes in consumer spending and health-related behavior depend on individuals’ demographic and socioeconomic characteristics.

| Variable     | Unusual Behavior Changes | Precautionary Buying | Augmented Social Distancing |
|--------------|--------------------------|-----------------------|-----------------------------|
| Age          | −0.230***                | −0.134***             | −0.048*                     |
| Gender       | 0.135***                 | −0.015                | −0.029                      |
| Civil Status | 0.166***                 | 0.163***              | 0.068***                    |
| Education    | −0.76***                 | −0.46**               | −0.009                      |
| Work Status  | 0.055**                  | 0.035*                | 0.020                       |
| Income       | 0.000                    | −0.044**              | −0.001                      |
| Area of Residence | 0.055**          | −0.061***             | −0.027                      |
| Σ             | 0.96                     | 0.98                  | 0.99                        |
| Adjusted $R^2$ | 0.067                 | 0.033                 | 0.003                       |
| No. of Observations | 2872             | 2872                  | 2872                        |

Note: The dependent variables in regression models 1 to 3 are the three principal components found using the Principal Component Analysis (PCA) shown in Table 3. Explanatory variables are the individual demographic and socioeconomic characteristics presented in Table 2. Standard errors are given in parentheses. Asterisks represent the level of confidence based on $p$-values: $* p < 0.05$, $** p < 0.01$, $*** p < 0.001$. Shopping they buy on a large scale; and for the same reason, they also need more protective devices. A closely linked finding regards age. Younger respondents seem to be more inclined to precautionary buying than older ones. Several explanations are possible. Older people may be wiser than younger ones and thus feel less pressure to buy things or may already have accumulated a greater variety of grocery staples and therefore may not have needed to purchase some items during the early-pandemic timeframe. Furthermore, before the pandemic young people didn’t seem to cook much, while later on have been somehow forced to do so, thus needing to buy food supplies more than usual.

Also, older people typically have higher incomes and better work status than younger ones, so they may be less worried about not being able to purchase what they need, even if shortages drive up prices. An alternative explanation is connected to our finding on marital status; young people are likelier to be unmarried, and unmarried people are more prone to precautionary buying.

Respondents living in small towns displayed more precautionary buying than people in bigger cities, likely because larger cities usually have larger food supplies.

In regression model 3, the dependent variable is the third principal component, “Augmented Social Distancing.” For this component most explanatory variables are not statistically significant, with the exceptions of age and marital status. Age is only slightly significant. While younger people may have decided to postpone (less urgent) medical treatment, older ones may have been reluctant to delay such treatments or may have had more urgent needs. Another possible explanation is that younger people are likely to have better general health and to feel (subjectively) more vigorous, so that any single health issue may seem less threatening. Older people are likelier to have multiple health problems and to have learned that those problems may interact. Moreover, their general awareness of vulnerability was intensified by the pandemic’s toll among elders. Indeed, the number of casualties due to the pandemic were especially horrific among older Italians in spring 2020.
Declaration of Competing Interest

None.

Acknowledgements

We would like to thank Professor Ali M. Fatemi, Editor-in-Chief of the Global Finance Journal, and the anonymous referee for useful comments and suggestions on a previous version of the paper.

References

Allington, D., Duffy, B., Wessely, S., Dhavan, N., & Rubin, J. (2020). Health-protective behaviour, social media usage and conspiracy belief during the COVID-19 public health emergency. *Psychological Medicine*, 51(10), 1763–1769. https://doi.org/10.1017/s003329172000224x

Altig, D., Baker, S. R., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., & Mizen, P. (2020). Economic uncertainty before and during the COVID-19 pandemic (No. w27418). National Bureau of Economic Research. https://doi.org/10.2139/ssrn.3638333

Atkeson, A. (2020). What will be the economic impact of COVID-19 in the US? Rough estimates of disease scenarios (No. w26867). National Bureau of Economic Research. https://doi.org/10.3386/w26867

Barro, R. J., Ursúa, J. F., & Weng, J. (2020). The coronavirus and the great influenza pandemic: Lessons from the “Spanish flu” for the coronavirus’s potential effects on mortality and economic activity (no. w26866). National Bureau of Economic Research. https://doi.org/10.3386/w26866

Bavel, J. J. V., Baicker, K., Boggio, P. S., et al. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4, 460–471. https://doi.org/10.1038/s41562-020-0884-z

Besson, E. K. (2020). COVID-19 (coronavirus): Panic buying and its impact on global health supply chains. Retrieved June 14, 2020, from https://blogs.worldbank.org/health/covid-19-coronavirus-panic-buying-and-its-impact-global-health-supply-chains.

Chen, P., Mao, L., Nassis, G. P., Harmer, P., Ainsworth, B. E., & Li, F. (2020). Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*, 9(2), 103–104. https://doi.org/10.1016/j.jshs.2020.02.001

Chronopoulos, D. K., Lukas, M., & Wilson, J. O. S. (2020). Consumer spending responses to the COVID-19 pandemic: An assessment of Great Britain (working papers in responsible banking and finance, no. 20-012). Centre for Responsible Banking and Finance. https://www.st-andrews.ac.uk/business/rbf/workingpapers/RBF20_012.pdf.

Clay, J. M., & Parker, M. O. (2020). Alcohol use and misuse during the COVID-19 pandemic: A potential public health crisis? *The Lancet Public Health*, 5(5), Article e259. https://doi.org/10.1016/s2468-2667(20)30088-8

Colbion, O., Gorodnichenko, Y., & Weber, M. (2020). Labor markets during the covid-19 crisis: A preliminary view (No. w27017). National Bureau of Economic Research. https://doi.org/10.3386/w27017

Cowell, A. J. (2006). The relationship between education and health behavior: Some empirical evidence. *Health Economics*, 15, 125–146.

Dattalo, P. (2008). *Determining sample size: Balancing power, precision, and practicability*. New York: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195315493.001.0001

Keane, M., & Neal, T. (2021). Consumer panic in the COVID-19 pandemic. *Journal of Econometrics*, 220(1), 86–105.

Pisano, G. P., Sadun, R., & Zanini, M. (2020). Lessons from Italy’s response to coronavirus. *Harvard Business Review*. Retrieved March 31, 2021, from https://hbr.org/2020/03/lessons-from-italys-response-to-coronavirus,

Remuzzi, A., & Remuzzi, G. (2020). COVID-19 and Italy: What next? *The Lancet*, 395(10231), 1225–1228. https://doi.org/10.1016/s0140-6736(20)30627-9

Rundle, A. G., Park, Y., Herbstman, J. B., Kinsey, E. W., & Wang, Y. C. (2020). COVID-19-related school closings and risk of weight gain among children. *Food and Nutrition*, 16, 226–233. https://doi.org/10.1002/oby.22813

WHO. (2020, July 29). Survey tool and guidance: Rapid, simple, flexible behavioural insights on COVID-19. WHO Regional Office for Europe. https://apps.who.int/iris/bitstream/handle/10665/333549/WHO-EURO-2020-696-40431-54222-eng.pdf?sequence=1&isAllowed=y.

Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The psychological causes of panic buying following a health crisis. *International Journal of Environmental Research and Public Health*, 17(10), 3513. https://doi.org/10.3390/ijerph17103513