

Proceeding Paper

# COVID-19 Societal Effects and Perceptions: A Case Study of Italy <sup>†</sup>

Gabriela Fernandez <sup>1,2,\*</sup> , Carol Maione <sup>1,2,3</sup> , Harrison Yang <sup>1,2</sup>, Karenina Zaballa <sup>1,2</sup>, Norbert Bonnici <sup>4</sup> , Jarai Carter <sup>5</sup>  and Ming-Hsiang Tsou <sup>1,2</sup>

<sup>1</sup> Department of Geography, San Diego State University, San Diego, CA 92182, USA; carol.maione@polimi.it (C.M.); hyang5959@sdsu.edu (H.Y.); kzaballa@sdsu.edu (K.Z.); mtsou@sdsu.edu (M.-H.T.)

<sup>2</sup> Metabolism of Cities Living Lab, Center for Human Dynamics in the Mobile Age, San Diego State University, San Diego, CA 92182, USA

<sup>3</sup> Department of Management, Economics, and Industrial Engineering, Politecnico di Milano, 20156 Milan, Italy

<sup>4</sup> Malta Critical Infrastructure Protection Directorate, 1532 Valletta, Malta; norbert@bonnici.mt

<sup>5</sup> Smart Lab, Procter & Gamble, Champaign, IL 61820, USA; jarai.carter@gmail.com

\* Correspondence: gfernandez2@sdsu.edu

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**Abstract:** This study employs a survey to investigate the societal response to COVID-19 in Italy. Data were collected via snowball sampling during the period April 2020 to April 2021 using the ArcGIS Survey 123 survey instrument. The study collected and analyzed 64 responses to investigate various aspects related to COVID-19. The areas covered in the analysis include socioeconomics, changing symptoms, relocation, physical distancing, health, social behaviors (past and future), personal attitudes, perceptions of government/public response and efficacy, beliefs, travel habits, well-being, current event worries, pandemic challenges, depression, vaccine, public opinion, personality, public health measures, social media preference, and contact with others. The study's results provide a snapshot of how people across Italy experienced the crisis caused by the COVID-19 pandemic, and can help public health organizations, decision-makers, and the general public address policies related to symptoms, social distance, policy measures/regulations, and social behaviors during the different policy phases and wave measures related to COVID-19 effects.

**Keywords:** COVID-19; Italy; perceptions; attitudes; beliefs; survey



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## 1. Introduction

Stay-at-home orders and recommended personal protective practices were enforced from early 2020 to mitigate the spread of COVID-19 around the world.

Routine assessment of public priorities, well-being, and health effects can guide public health decisions requiring collective action. The COVID-19 outbreak rapidly caused widespread social and economic devastation. Efforts to contain it resulted in measures such as closing of borders and restrictions around travel, social activities, and religious events [1]. While lockdown strategies may be effective in reducing the spread of COVID-19 and maintaining general health system responsiveness, this single-disease response compromises care for a range of other health conditions. The effects of health service disruption have already been reported for human immunodeficiency virus (HIV), tuberculosis, and malaria care in high-burden settings [2]. Reinvestment in public health and outreach services is warranted to better prepare for and manage future crises [3], as a wide range of services have been impacted by recent budget cuts in several countries [4].

While sentiment effects, government trust, well-being, mental health, and socioeconomic behavior disruptions regarding the pandemic have widely been explored, in this

study we explore the relationship between pandemic-related societal behavior and psychological outcomes across different geographies in Italy. This study aims to understand the behaviors, attitudes, beliefs, health conditions, hardships, and political interests of Italians during the COVID-19 pandemic. The dataset contains demographic variables, measures of stress, availability of social provisions, trust in various authorities, trust in governmental measures to contain the virus, personality traits, information behaviors, agreement with the level of government intervention, and compliance with preventive measures. Understanding public perceptions of government responses, well-being/mental health, and social behaviors in relation to COVID-19 may foster public cooperation. Furthermore, trust in government and population risk of exposure may influence the public perception of the response.

## 2. Methodology

### 2.1. Survey

The Track IT: COVID-19 Screening International Survey was built by researchers at the Metabolism of Cities Living Lab (MOC-LLAB) under the Center for Human Dynamics in the Mobile Age (HDMA) at San Diego State University, Politecnico di Milano, and Crowdfight COVID-19. To understand the different geographies of the COVID-19 outbreak, we correlated information related to socio-demographics and COVID-19 trends across Italy. The survey questionnaire included questions such as: What effects of the COVID-19 pandemic focused on public attitudes, behaviors, and beliefs regarding stay-at-home orders, mental well-being, symptoms, relocation, trust their government, and public health guidance? The following questions are considered in this study. The project is the first data-driven research series that addresses the challenges of societal behaviors during the COVID-19 pandemic.

The survey information can be used to educate public health organizations, decision-makers, and the general public to address policies related to symptoms, social distancing, policy measures/regulations, and social behaviors related to COVID-19 effects. The survey included questions based on social behaviors, symptoms, travel, well-being, public health measures, and contact with others, among other behaviors.

### 2.2. Data Collection

Survey data were collected over a one-year period between the months of April 2020 and April 2021. For this study, Italian major metropolitan cities were explored to understand the interconnections between geographical locations. A total of 64 responses were collected across Italy (Figure 1). The survey included 77 questions and was conducted in English and Italian languages via the ESRI Survey 123 software tool. Responses were then analyzed thematically based on geography.

### 2.3. Design Analysis: Pearson's Coefficient Correlation

The study employed correlations to measure the statistical relationship and association between the survey questions from respondents based in Italy. The analysis aims to provide further information about the magnitude of the association and correlation, as well as the direction of the relationship. The value of  $r$  was measured between +1 and -1 (strong, moderate, weak). The correlation coefficient was used to better understand the relationship between the quality of life, perception, government trust, belief, health conditions, mobility, and consumption behaviors and influences during the COVID-19 pandemic. The study used correlation as a statistic that measures the linear relationship between variables (for our purposes, survey items) and views all the statistically significant correlations across the survey categories. Furthermore, it is important to note that correlation cannot determine cause and effect. Correlation can only indicate the strength relationship between questions. As a result, it cannot indicate which of these items is influencing the other variables.



**Figure 1.** Geographic distribution of participants in Italy.

Formula 1 shows the Pearson's Coefficient Correlation. The correlation coefficient is determined by dividing the covariance by the product of two variables' (survey questions) standard deviations.

Pearson's Coefficient Correlation Formula:

$$r = (\Sigma((X_i - \bar{Y})(Y_i - \bar{Y}))) / (\sqrt{(\Sigma(X_i - \bar{Y})^2)} \sqrt{(\Sigma(Y_i - \bar{Y})^2)})$$

The sign of the correlation coefficient (+, -) defines the direction and relationship, either positive or negative. A positive correlation coefficient means that as the value of one variable increases, the value of the other variable increases; as one decreases, the other decreases. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice versa.

### 3. Results

#### 3.1. Age

As for the distribution of interviewees' age, most of the interviewees were between the ages of 20–29 (40.6%), followed by 30–39 (32.8%) and 60–69 (9.4%).

#### 3.2. Education

Regarding the distribution of interviewees' highest education level, most had professional degrees (29.7%), followed by a bachelor's degree (20.3%) and a Doctoral degree (18.8%).

#### 3.3. Gender

Regarding the distribution of interviewees' gender, the majority of participants (53.1%) were male.

#### 3.4. Persons per Household

We asked participants how many people, including themselves, occupied their household. The majority of interviewees reported that there were two people (29.7%) in their home, followed by three people (21.9%) and four people (21.9%).

### 3.5. Relocation

Regarding reports on the relocation of residence during the COVID-19 pandemic, findings showed that 18.8% of interviewees indicated that they relocated to a new residence because they felt the new residence had a lower risk of exposure to COVID-19.

### 3.6. Motivation to Leave the House

Findings showed that grocery shopping (78.1%) accounted for most of the interviewees, followed by pharmacy (35.9%) and exercise (29.7%). Overall, 39.1% interviewees indicated that they went shopping at the grocery store or drugstore once a week, followed by less than once a week (32.8%), while 39.1% of them used a delivery service for groceries or a drugstore once a week, followed by less than once a week (32.8%). In total, 42.2% of respondents indicated that they had never used a food delivery service for prepared meals. Moreover, 57.8% said that they never ate at a restaurant and 73% of them never attended public events. Furthermore, 60.9% of participants from Italy mentioned that they never needed to travel for work.

### 3.7. Physical and Social Distance Behavior

When reporting physical and social distancing behavior during the pandemic, 56.3% of the interviewees tended to stay at home; 67.2% of participants did not attend social gatherings; 46.9% of them kept a distance of at least two meters from other people; and 67.2% washed their hands more frequently than the month before.

### 3.8. Health

Regarding the health level of participants, 45.3% of the interviewees reported that their health level was "excellent", followed by "good" (39.1%).

### 3.9. Containment Measures

Findings reported that 89.1% of the interviewees indicated that they wore a mask to protect themselves from the COVID-19 virus, while 89.1% of participants indicated that they had never been stopped by the police or military for being outside their home.

### 3.10. COVID-19 within the Community

When participants were asked if they had been exposed to the COVID-19 virus in the community, 70.3% of the participants reported that they did not know anyone within their community who had contracted the COVID-19 virus.

### 3.11. COVID-19 Symptoms

When asked if they had experienced COVID-19 symptoms, 1.6% of participants reported having had a fever (a high temperature); 9.4% of them had a cough; 1.6% of them had shortness of breath (difficulty breathing); 6.3% of them had muscle ache; 4.7% of them had confusion; 21.9% of them had a headache; 3.1% of them had a sore throat; 7.8% of them had rhinorrhea (runny nose); 3.1% of them had chest pain; and 1.65% of them had diarrhea, while none of them had nausea and vomiting symptoms and 6.3% of them had fatigue. Moreover, no participants had conjunctivitis (red and watery eyes). Furthermore, 1.6% of them had loss of smell, and none of them had a loss of taste.

### 3.12. Pre-Existing Illnesses

When asked if they suffered from pre-existing illnesses during the pandemic, 64.1% of the participants said that they did not have pre-existing illnesses and approximately 20.3% of them did not disclose the information.

### 3.13. Government Attitudes, Trust, and Policy Measures

Participants were asked about how they felt concerning the government's behaviors, trust, and effective social distancing measures during the COVID-19 pandemic. In total,

53.1% of the participants believed that the reaction of their local government to the current COVID-19 outbreak was “appropriate”, while 21.9% of participants believed the reaction was “somewhat insufficient” or “not at all sufficient”. In addition, 64.1% of participants “strongly” or “somewhat trust” their local government to take care of its citizens. Moreover, 65.7% of the respondents “very” or “somewhat” trusted the government during the COVID-19 outbreak. Additionally, 76.6% of participants believed that the social distancing measures in their community (e.g., through a general curfew) were “very effective” or “effective” at slowing down the spread of the COVID-19 pandemic. Furthermore, 45.3% of respondents believed the government launched the emergency response measures “too late” while 42.2% believed the government launched the measures at “the right time”.

#### 3.14. Vaccine Attitudes

When asked about the COVID-19 vaccine, 31.3% of the participants said that they were willing to receive a vaccine, while 31.3% of them said they did not want to receive a vaccine.

#### 3.15. Public Transportation

Findings reported that 21.9% of participants avoided riding public transportation before the Covid-19 outbreak in their country, and only 1.6% of them were still riding public transportation.

#### 3.16. Most Important Current Events

Survey participants reported fake news (12.5%) as the most important issue that they were most worried about during the pandemic.

#### 3.17. Wellness, Anxiety, Depression, and Psychological Behaviors

Regarding wellness, anxiety, depression, and psychological behaviors, 51.6% of the interviewees reported as “strongly” or “somewhat” nervous when they thought about current circumstances related to the COVID-19 pandemic. Approximately 46.9% of participants reported being “strongly” or “somewhat” calm and relaxed, while 37.5% of the respondents reported being “strongly” or “somewhat” worried about their health. Additionally, 59.4% of participants reported being “strongly” or “somewhat” worried about the health of their family members. Moreover, 36% of participants reported feeling “strongly” or “somewhat” stressed when leaving their house, and 62.6% of the respondents showed little interest or pleasure in doing things. Overall, 50% of participants felt sad, depressed, or hopeless, while 53.2% of participants had trouble falling asleep, staying asleep, or were sleeping too much. Regarding health, 59.4% of participants felt tired or had little energy. Likewise, 35.9% of participants either had a poor appetite or overate while 36% felt bad about themselves (this means the feeling of letting themselves and/or family down). Additionally, 48.5% of participants had trouble concentrating on things, such as reading the newspaper or watching television, while 20.3% of participants reported moving or speaking slower than other people, or becoming ants reported that they were open to new experiences or complex situations, while 31.3% of participants agreed that they were reserved or quiet, and 53.1% of participants agreed that they were sympathetic and warm. Additionally, 7.8% of participants reported that they were disorganized or careless and 43.7% agreed that they were calm and emotionally stable. Further, 9.5% of participants agreed that they were conventional and uncreative during the COVID-19 pandemic.

#### 3.18. Difficulty Purchasing Household Items

During the pandemic, a number of items were difficult to obtain due to the closure of stores and the stopping of the production and movement of goods. As a result, we asked our participants if they encountered difficulty purchasing household items during the pandemic. Participants found health products to be the most difficult to obtain during the pandemic (such as masks, gloves, and hand sanitizer), which accounted for the majority

(26.6%), followed by personal care items (such as toilet paper and wet towelettes, 17.2%) and food or non-alcoholic beverages (14.1%).

### 3.19. Zip Codes

Based on zip codes, most of the interviewees from Italy were from the cities of Anghiari (32.8%), followed by Milan (26.6%) and Nocera Umbra (23.4%).

### 3.20. Most Popular Social Media Application used to Discuss COVID-19

Participants were asked what popular social media application was most often used to discuss COVID-19-related information. With respect to the most popular social media application, Facebook accounted for the majority (42.2%) of interviewees, followed by Instagram (26.6%) and Twitter (15.6%).

## 4. Discussion

Based on the correlation analysis, several statistics have been reported. Findings have been categorized into key areas: vaccine, essentials, social behaviors, health and symptoms, mental well-being, relocation and travel, government trust, measures, uncertainty, and technology. Our analysis showed a strong correlation between people that went shopping at the grocery store or drugstore and people that were willing to receive a COVID-19 vaccine. There was a strong correlation between people that used delivery services for groceries or for drugstores and people that ate at restaurants and traveled to work. There was a strong correlation between people's symptoms and social behaviors.

Participants reported that when sick they found little interest or pleasure in doing things. In addition, there was a strong correlation between people that started bad habits (smoking, alcohol, gambling, online shopping, etc.) and people that changed their diet. While some participants started a new hobby, others fell back into bad habits. It was reported that people that attended public events during COVID-19 were more prone to restarting bad habits. People that ate at restaurants were more likely to attend public events and were the majority of people that travel to work. There was a strong correlation between people with a cough and people that ate at restaurants during the pandemic.

There was a strong correlation between people with health symptoms (fever, shortness of breath and difficulty breathing, chest pain, headaches, and cough) experiencing muscle ache, confusion, fatigue, change of diet, and little interest or pleasure in doing things. There was a strong correlation between people who knew someone in their community who was sick (fever, along with cough, shortness of breath, headache, or difficulty breathing) and people with chest pain, fatigue, feeling bad about letting themselves and family down, and feeling nervous when they thought about current circumstances related to COVID-19. Additionally, participants reported that they were worried about their health, the health of their family members and felt stress about leaving their house. Moreover, participants with symptoms reported that they moved and spoke slowly, or were fidgety or restless, or moved and spoke faster than usual. This could be due to the constant worry, anxiety, and stress of contracting the COVID-19 virus. Findings reported that people that knew someone in their community who was sick, or contracted health symptoms (headache), were more prone to relocating to a new area with lower risk of exposure to COVID-19. According to the correlation result, there was a statistically significant correlation between how much interviewees worried about their health and how much they trusted their local government to take care of its citizens.

## 5. Conclusions

This paper investigates the geographies of the societal response to the first wave of COVID-19 in Italy, leveraging the Track IT: COVID-19 International Survey analysis to clarify and advance the understanding of societal behaviors in response to specific lockdown measures and social factors that occurred during the period from April 2020 to April 2021. Limitations of this study are associated with the number of samples, the platform

ESRI ArcGIS Survey 123 survey tool used, and the data collection period, which only represents a snapshot of the early stages of the pandemic. Future studies may analyze social, environmental, and economic behaviors during the post-pandemic period across Italy.

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**Conflicts of Interest:** The authors declare no conflict of interest.

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