

Attitudes towards the imposition of possible restrictions under COVID-19 among parents of schoolchildren: Evidence from Armenia

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Abstract

The purpose of this study is to determine the attitudes of parent's school-aged children towards the restrictions under COVID-19. The empirical analysis is grounded on a representative survey on knowledge, opinions, and beliefs conducted in Armenia in June 2020. The dataset was attained from Caucasus Research Resource Center Foundation. In the process of the estimation machine learning algorithms such as logistic and ordered logistic regression were utilized. Besides, the parental status, a number of other predictors were included in the model to control for biases and other significant factors possibly influencing the outlook. The choice of the latter was based on available literature and covariate analysis. The main findings of the paper imply that the relationship between attitudes on the lockdowns and parental status cannot be generalized. That is, the impact is distinct and even contrasting for certain subdivisions of parents. Specifically, *parents with higher education and an average level of earnings are more likely to oppose*, while those with lower education and different level of income are likely to support the imposition of restrictions.

Keywords: COVID-19, public attitudes, schoolchildren parents, lockdown, Armenia

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Introduction

Background

The appearance of the novel deadly coronavirus disease (COVID-19), resulted in an unprecedented outbreak all over the planet. As of May 2021, the number of the confirmed cases reached 166 million with an above 2 percent average mortality rate, *while some estimates claim higher numbers*. (ArcGIS Dashboards, JHU, 2021) (Rahman M., Islam M., Shimanto M H., 2021). To restrain the spread of the virus, most governments adopted drastic control measures to reduce human-to-human interactions. The latter collectively referred to as *lockdowns*, involved (but were not limited to) restrictions on travel, transportation, closure of schools, colleges, public places and enforced quarantine on people exposed to COVID-19 (WHO, 2020). Consequently, the lives of billions of people were disturbed, and a global economic recession was triggered (McKibbin W., Fernando R., 2020).

In the meantime, the mainstream media has been rampant with various articles about lockdowns. A number of articles aimed to identify the most vulnerable fractions of population to the ongoing crisis (Fiorenzato E., Zabberoni S., Costa A., & Cona G.2021). However, they frequently lacked in scientific evidence to support the propositions. Specifically, in several articles representing the decision of lockdown imposition in a negative light, authors claimed that the latter is opposed by parents of schoolchildren. For, the lockdowns are particularly challenging for the school-children (Sellgren, BBC, 2021). Although the claim might be reasonable, the proof used to corroborate it, was limited to few interviews with representatives of the aforementioned segment, thus can barely be considered a persuasive argument for the validity of its premises.

Purpose of the study

Given the scarcity of academic literature on the aforementioned topic and the importance of public support in achieving the end objective of a lockdown, as stated by several authors (Azlan A., Hamzah M., Sern T., Ayub S., & Mohamad E. 2020), it is imperative to identify the various segments of population with negative perceptions on the latter. This paper aims to study the attitudes among the parents of school children towards the imposition of a possible lockdown or partial restrictions in Armenia, through data analysis and machine learning

algorithms (i.e., logistic regression, ordered logistic regression). Thus, the results will help to test the validity of the claims mentioned in previous paragraph.

The main hypothesis of this paper is that the parents of school-aged children, contrary to widespread beliefs in the mainstream media, are on average are more likely to support the imposition of restrictions¹. Although the parents might indeed face greater challenges, they would also face greater risk of exposing their family to the virus if their children visit schools. Thus, the hypothesis is based on the expectation that the fear from adverse effects of the virus may outstrip the perceived difficulties caused by restrictions.

Hypothesis: parents of school-aged children are inclined to support imposition of a lockdown.

The main findings of the paper reveal ambiguous results on the studied attitudes for the parents of the school children. That is, different subdivisions of the mentioned group perceive the restrictions distinctively. In fact, the results confirm that the parents of school children in Armenia are on average more likely to support imposition of the lockdowns given the number of cases continue to grow. However, absolute generalization can be misleading. For instance, parents with average income or higher education the observed effect on attitudes is completely negated and the attitude is thus, determined by other factors such as government trust, risk perception, knowledge on the pandemic and beliefs. Moreover, if the respondent is a representative of both aforementioned subgroups, then he/she is prone to oppose the imposition of the lockdowns.

Structure Overview

The rest of the paper is organized into five sections. In the section following this paragraph the existing literature on health, social, financial and economic impacts of the pandemic is briefly discussed. Section three is devoted to the description and limitations of data attained for the study. It is followed by summary of methodology used to conduct the estimates. Second to

¹ In Armenia school-aged children are obliged to attend. Therefore, the terms parent of a school-aged child and parent of a schoolchild may be used interchangeably in the paper

last section contains the actual results and tables of the analysis. The thesis concludes with the findings and final remarks.

Literature Review

To the best of my knowledge no empirical evidence - neither qualitative nor quantitative analysis, has been presented to evaluate the attitudes of parents of school children on the ongoing pandemic, in the past. Still, many valuable contributions have been made to the study of the recent pandemic and its consequences, which serve as sufficient ground for the further analysis of this paper.

The economic and health crisis triggered by the outbreak of the virus is distinct from anything observed in recent history. There is substantial uncertainty about its long-term impact on people's livelihoods. (Gopinath G., 2020) Evidently, it is rather early to obtain accurate estimates of the economic and social costs of the pandemic. For, the long-term mental and health issues are unfathomable to modern medicine, the virus is still prevailing and the economy is yet to recover. Nevertheless, McKibbin and Fernando developed seven scenarios for the spread of the pandemic. They concluded that even in the best possible case the global deaths due to pandemic would reach 15 million people. Authors suggest that quarantine and preventative measures adopted by governments are useful, however investment in the development of healthcare globally is the only way to combat economic consequences institutionally in the long-term. (McKibbin W., Fernando R., 2020)

The research conducted on cross-country panel data, by V. Alfano and S. Ercolano aimed to evaluate the efficacy of the lockdowns. The results displayed that the number of cases significantly reduced in regions where the measurements were implemented. (Alfano V., Ercolano S., 2020) Bonaccorsi, et al evaluated the economic consequences of the mobility restrictions by treating the latter as an exogenous shock to the economy. The findings suggest an unprecedented decrease in government revenues and a sharp increase in inequality. (Bonaccorsi G., Pierri F., Cinelli M., Flori A., Galeazzi A., Porcelli F., ... & Pammolli F., 2020) Similar, results were attained by Olivier Coibion et al, based on cross-sectional survey conducted in USA. The average decline due to lockdowns in American household income was measured to vary between 5000-33000 US dollars.

The paper, “*The Benefits and Costs of Using Social Distancing to Flatten the Curve for COVID-19*” argues that the preventative measures, dramatically reduce economic activity, yet the net benefits of saving lives can potentially exceed 5.2 trillion dollars in the USA. (Thunström L., Newbold S., Finnoff D., Ashworth M., & Shogren J. 2020) F.Alvarez, D. Argente and F. Lippi, attempted to develop the most optimal policies to increase the effectiveness of lockdowns. The main findings imply that intense measures without sufficient testing can lead to increased costs of the lockdown.

Further, the study of public attitudes and knowledge was greatly enhanced in the initial period of the pandemic. An analysis conducted based on a cross-sectional survey in China concluded that the higher level of knowledge on COVID-19 is closely linked to comparably positive attitudes on preventative measures. (Dong L., & Bouey J.,2020)

A similar study conducted in Malaysia aimed to assess the knowledge and attitudes of citizens based on an online survey dataset. (Azlan A., Hamzah M. R., Sern T. J., Ayub S. H., & Mohamad E., 2020) The authors found a close relationship between pessimistic expectations and the knowledge level of respondents. In addition, the study identified link between adherence to regulations (i.e., wearing a mask, practice proper hygiene) and knowledge on the pandemic.

Another paper aimed to develop a policy recommendation to COVID-19 through analysis from the perspective of behavioral sciences. For instance, the study found that overly negative representation of the pandemic in media may exacerbate the emotional wellbeing of individuals exposed to the virus and thus increase the probability of severe symptoms leading to an increase in fatality. (Van Bavel J. J., Baicker K., Boggio P. S., Capraro V., Cichocka A., Cikara M., ... & Willer R. 2020)

Smith et. all attempted to identify the factors associated with adherence to regulations amid the pandemic. (Smith L. E., Amlôt R., Lambert H., Oliver I., Robin C., Yardley L., & Rubin G. J., 2020) The analysis was conducted through logistic regression based on a survey dataset from the UK. They defined shopping for non-essentials or leaving the house after interaction with a person or having visitors at home as characteristics of the non-adherent citizens. Attitudes on the pandemic were essential factors for non-adherence.

Further, a remarkable analysis was conducted to determine factors influencing the refusal of parents of the school to vaccination of their children. The results of the study revealed that the major justification was distrust towards the safety of vaccines. The latter was close to the trust level towards government and the education level of parents. (Salmon D. A., Moulton L. H., Omer S. B., DeHart M. P., Stokley S., & Halsey N. A. 2005)

Data

Data Description

The quantitative analysis is based on a dataset attained from Caucasus Research Resource Centre – Armenia foundation. The dataset contains a representative survey of Armenian citizens aimed to understand their opinions, perceptions and attitudes on the pandemic. It was conducted in the end of June 2020 and included 774 phone interviews, which had been chosen based on randomly-generated phone-number list. Besides demographic, social, employment characteristics, the survey addresses wide range of questions – such as trust towards local and international organizations, as well as the information level, future expectations and concerns on the pandemic.

The initial dataset included 199 variables and 774 observations. In the modification process half of the variables were dropped and number of variables were generated by combining two or more variables, leaving the final dataset with 26 variables that were included in the models along with their interactions.

Description & Selection of predictors

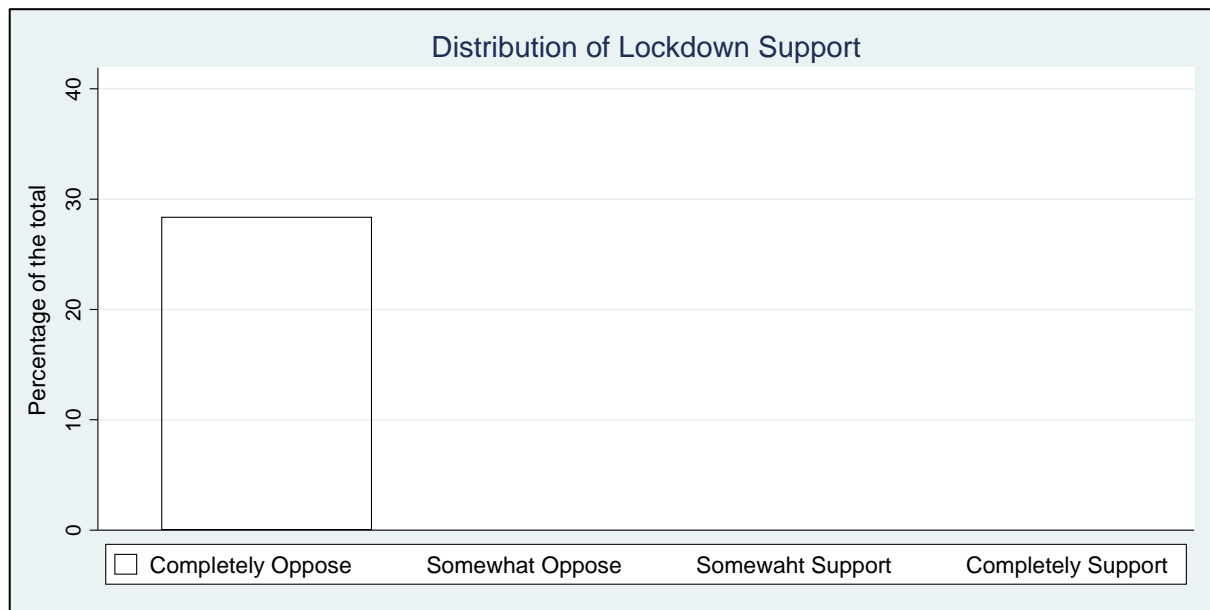
Descriptive information on final list of variables along with their derivation methods is provided below:

Note. The choice and categorization of variables was conducted on the basis of the following order available literature, comparison of means, correlation statistics and arbitrary choice. A general rule was followed to have at least 50 observations in each category.

Lockdown Support – is the proxy variable for the attitudes of the citizens towards restrictions. It contains 4 unique values based on the answers (*1 – completely oppose, 2 – rather oppose, 3 – rather support, 4 – completely support*) to the following question:

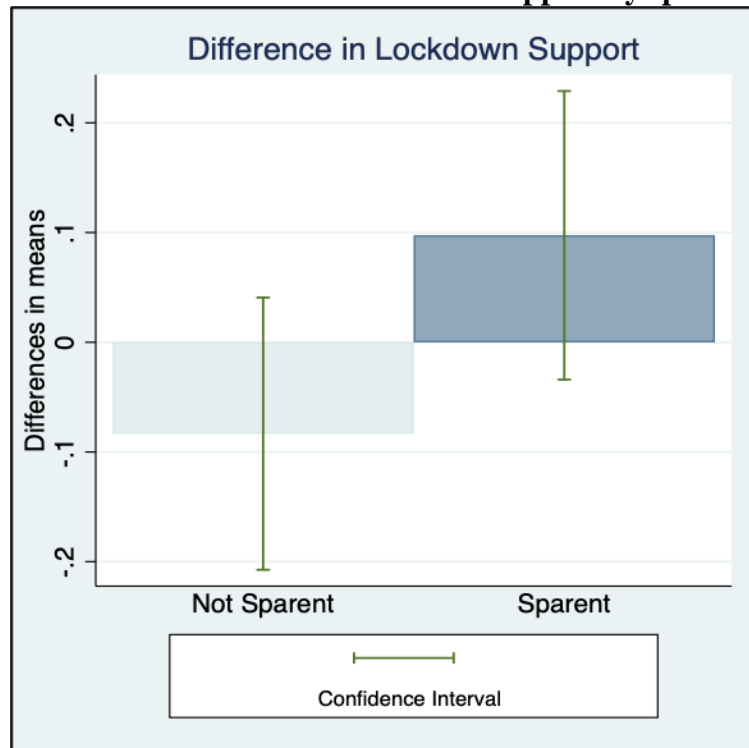
To what degree would you support the imposition of lockdown or partial restrictions given the number of cases continue to grow significantly?

55 observations where the respondents answered “don’t know” (16) or refused to answer completely (39) were dropped. The distribution of Lockdown Support is provided in chart.

Chart 1. Distribution of Lockdown Support

Comment. Almost half of the population spoke against imposition of restrictions even if the country experiences an increase in the number of cases.

Parent of School aged child (further on denoted as *sparent*) – The main explanatory variable takes value 1 if the response is “Yes” and 0 if otherwise. 46% of the respondents in sample are a parent of a school aged child.

Chart 2. Differences in Lockdown Support by sparent

Comment.

The chart 2 illustrates the differences in means of Lockdown support by parental status. Although, the mean Lockdown Support for the sparent=0 and sparent=1 is 2.56 and 2.75, respectively, for the high variance the confidence intervals slightly overlap.

Primary consequence of Covid-19 (view_econ) – The respondent was asked “Which one of the following statements best describes your view of Coronavirus in Armenia?”. 41.1 percent viewed Covid-19 as primary an economic issue. Whereas 51.2 and 7.66 percent viewed it as health issue or other, respectively. The variable is binary taking value 1 if respondent views it as an economic issue, and is expected to affect the dependent variable negatively.

Reason for the prevalence of Covid-19 (reason_citizen) – The respondent was asked to indicate the primary reason for the prevalence of the virus. The answers are summarized in table 1 below. Clearly 48% people who see the nonadherent citizens as the primary reason for spread of the pandemic, are more likely to support imposition of enforced restrictions, as opposed to more skeptical people who view pandemic to be a result of political competition by world powers. Although, the table 1 suggests almost similar hypothesis about the perception of foreigners spreading the virus, the variance and confidence interval for the given group was high (**Chart 7**, appendix section) (most likely because of low number of observations in the given group), hence a decision was made to assign value 1 to this variable only in cases if the answer was “Citizens not adhering to anti-pandemic rules”.

Table 1. Mean of Lockdown Support by opinions on the cause pandemic.

Reason for the prevalence of Covid-19	Percent	Mean
Citizens not adhering to anti-pandemic rules	47.63	2.95
Foreigners spreading the virus	5.71	2.80
Low levels of hygiene	11.98	2.55
The planet's environmental situation, global warming	4.46	2.41
The existence of Coronavirus is a natural phenomenon	8.08	2.17
Political/economic competition by world powers	8.91	2.14
Other	6.13	2.32
Don't know	7.1	2.35
Total	100	2.65

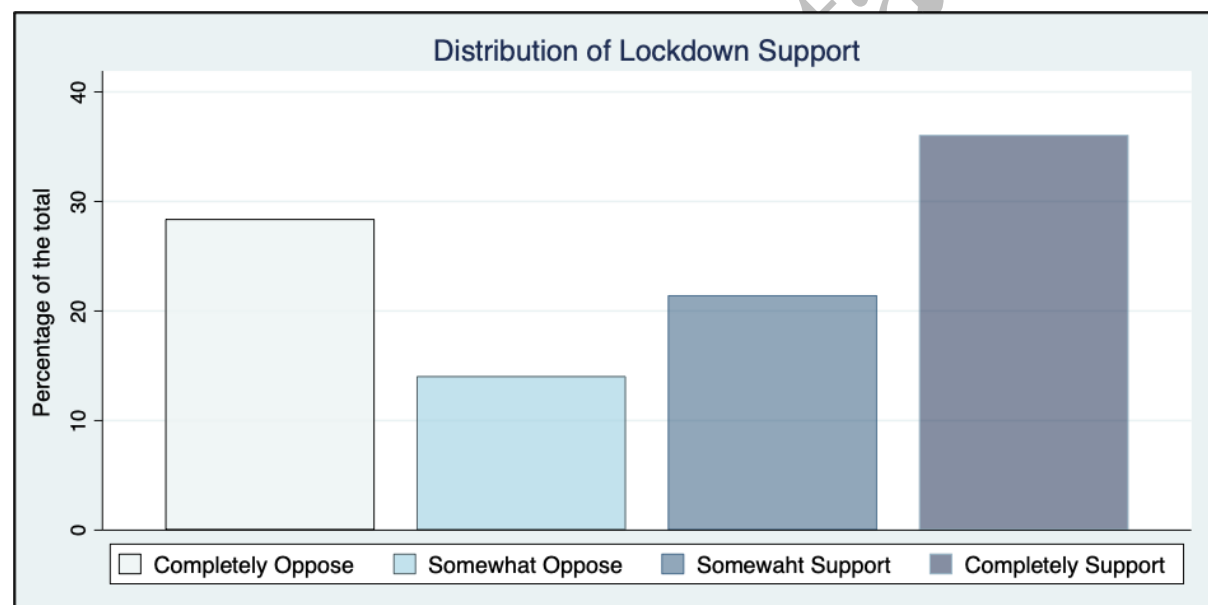
Level of information on the cause/how to protect of Covid-19 – The respondents evaluated their own knowledge on the cause and ways how to protect from the pandemic on a scale of one (very insufficient) to four (completely sufficient). Although the answers are likely to be somewhat biased towards higher evaluation, that is the average person tends to overestimate his/her knowledge (*find lit.) on given subject. Assuming, that on average it is true for all the sample, the differences in answers may still reveal patterns, e.g., the more informed citizen is the more likely he/she is to support imposition of restrictions. In table 2

the average score and standard deviation for *Lockdown_Support* is summarized based on level of information on *cause* and *protection* categories

Table 2. Mean & Standard Error of Lockdown Support by Information level

Level of Information	Mean		Std. Error	
	Cause	Protection	Cause	Protection
Very insufficient	2.54	2.42	0.18	0.27
Somewhat insufficient	2.50	2.03	0.13	0.22
Somewhat sufficient	2.64	2.68	0.06	0.06
Very sufficient	2.81	2.73	0.10	0.08

Chart 3. Mean of Lockdown Support by level of information on Covid-19 protection.



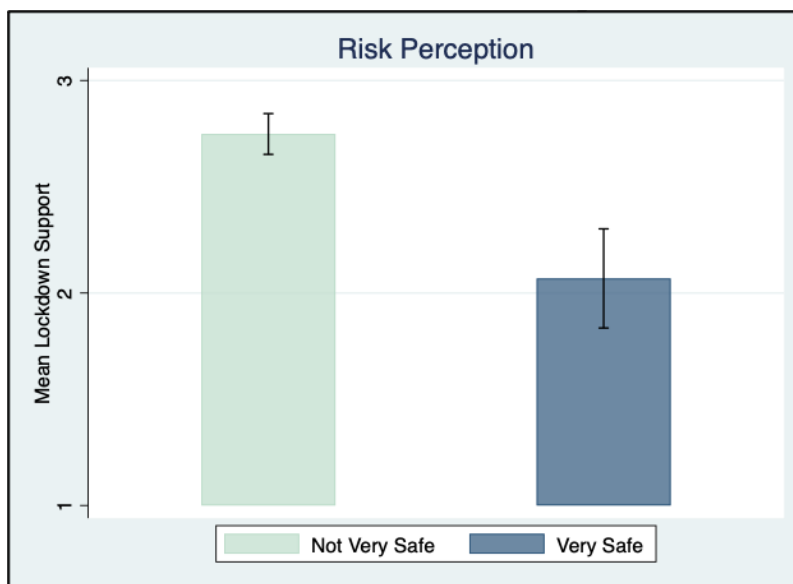
Comment. The chart shows that respondents who claimed to have sufficient or above knowledge on the protections are on average prone to support lockdowns.

Know-it-all – the variable represents the category of the people who claimed that no further information is needed when asked about what else they would like to know more about the pandemic. Variety of questions were provided among other choices, addressing up-to-date issues, including which treatments were effective, moreover the respondent was free to specify additional option, yet 34% of the people considered the level of information possessed to be sufficient. It is worth mentioning that at the time of conducting the interviews a number of questions remained esoteric and hidden.

Table 3. Information insufficiency perceptions on Covid-19 (cumulative)

What else would you like to know about the pandemic?	Percent	Mean Lockdown Support
How can I access support from the government	6	2.91
Where do I go if I get sick	16.3	2.9
Which treatments are effective	27.3	2.73
What is the government doing to help citizens	7.7	2.73
What is the status of a vaccine or a cure	20.3	2.71
What is the cost of treatment for citizens	9.3	2.7
Other	7.0	2.57
No further information is required	34.0	2.50

Low Risk Group – The variable was generated based on personal risk perception of Covid-19, rather than traditional medical classification of risk groups. Namely, in two separate questions the respondents were asked to evaluate the risk of catching the virus and the risk of having serious symptoms from Covid-19, on a scale from 1 (very high risk) to 4 (very low risk). Given, that the aim of this particular variable is to identify whether the person is basing his/her attitude towards lockdown on egoistical thinking (if the coefficient is negative) or is taking into account the collective wellbeing of the society (if the coefficient is positive or insignificant), the variable is assigned value 1 if the person evaluated himself at very low risk

Chart 4. Mean of Lockdown Support by risk perception.

of both catching the virus and getting very sick of Covid-19. Justification for this approach is that taking the two categories separately or assigning value of 1 if the answer to either of the questions was “very low risk” (in other words taking their union), would misrepresent the attitude of the person. Assuming the hypothesis

were true consider an example when and an egotistical person identified himself/herself at a very high risk of getting very sick of Covid-19, yet given that he/she maintains the advised preventative measures, in the same time believes to be in a very low risk of catching the virus. Based on our assumption he would oppose the imposition of restrictions, as it may create

unnecessary difficulties in his/her everyday activity. In this case, the empirical analysis would lead to inaccurate estimation of egoistical bias among the population based on sample analysis.

Responsible Citizen – the assessment of responsibility of the citizen is based on correspondence of the citizen's answer to government regulations and conventional guidelines of first action in case of having symptoms of illness during pandemic. Specifically, respondents were assigned a value of 1 (responsible) for the given variable if they claimed that in case of having adverse symptoms, they would immediately call the ambulance, visit medical establishment, contact the doctor or take a test, as opposed to responses, such as “self-medicate” (7%), “avoid leaving home” (9%) or “not do anything” (2%). Evidently, the methodology is hardly an impeccable representation of the conscientiousness of a person, however it reveals significant relationship between the first action and attitude towards possible restrictions.

Nonadherent Citizen – the variable is assigned value 1 if the respondent claimed not to wear medical mask (25.6%), despite the existing regulations at the time of interviews.

Status-Quo – the variable was generated with an intend to detect a possible positive bias toward future lockdowns among people who are less affected by the restrictions. The variable takes the value 1 if the respondent was working from home at the time of the interview or mostly stayed at home.

Table 4. Mean Lockdown Support be the degree of impact.

	Mean	Confidence Interval		N
Less affected by lockdown	2.83	2.50	2.71	144
More affected by lockdown	2.61	2.64	3.03	574

Experienced Decrease in Financial Situation – the variable takes the value 1 if the responded claimed that his/her financial situation was worsened or he/she lost the job, because of the pandemic. It is expected that the variable negatively affects the dependent variable.

Expects Decrease in Financial Situation – the variable was generated based on the respondents' expectations on the financial situation of his/her family in the next 12 months.

The variable takes value 1 if the answer was “*Much Worse off*”, 0 if otherwise. It is expected that the variable negatively affects the dependent variable.

Government/Police trust – the variables represent the trust level of the respondent towards the government. It is expected that an increase in the latter positively affects the level of support among citizens.

The following variables were utilized to control for demographic features.

- **Gender** – 1 = Male; 0 = Female
- **Age** – Categorized into 3 groups: 18-35, 36-55, 56+
- **Employment** – Employed, Retired, Student, Housewife or Unemployed
- **Education** – Completed Secondary or Less; Incomplete Higher; Completed Higher
- **Income** – Very Low (up to 48000); Low (48000-12000); Average (120000-192000); High (above 192000)

Several of the above-mentioned variables are not directly related to the primary purpose of this study, however based on the correlation heatmap (**Chart 8**, appendices section), their absence may cause bias in the estimates of the model.

Data Limitations

While interpreting the results attained and summarized in the subsequent section, one needs to meticulously consider the limitations of the dataset on which the former is based on.

- First of all, the survey was conducted in a single country, meaning the respondents shared similar background and culture. The perceptions and beliefs may thus be influenced by these factors, making the generalizability of the results for other countries irrelevant.
- The questions addressed in the survey are related to a phenomenon earlier unknown to majority. The perceptions on COVID-19 might change parallel to the new discoveries on the disease or rapid developments. Thus, the timing of the interviews might also have affected the answers.
- Lastly, the low number of observations makes the utilization of more complicated machine learning algorithms (i.e., random forest, cluster analysis) inapt, as they require bigger sample size.

For further analysis on the subject, researchers are recommended to attain a cross-country panel dataset. Surely increasing the magnitude of the research will further help to overcome

limitations mentioned limitations. In this context, this research can serve as a helpful basis for comparison between attitudes in different time periods.

Methodology

For gauging the covariate relationship between being a parent of a school aged-child and the level of support towards imposition of lockdowns regression analysis is conducted employing *logistic* (developed by Joseph Berkson) and *ordered logistic* (developed by Peter McCullagh) *models*. The description of the respective models is given in the subsections below; followed by compassion of their main advantages and drawbacks.

Logistic Regression

The Logit model is widely used to predict the probability of an event with two dichotomous outcomes (Bilder, 2014). Thus, the dependent variable is to be a binary variable. In essence, the aim of the quantitative analysis is to determine the probability whether the respondent supports lockdowns or not, given the values of other covariates (primarily parental status - *sparent*), which can be given by the following ratio:

$$\frac{Prob(lsupport=1)}{prob(lsupport=0)} \quad (1)$$

In this case dependent variable *lsupport* is assigned value 1 if the *Lockdown Support* = 3 or 4, and 0 if otherwise. The dependent variable is assumed to contain values 1 and 0 only, that are mutually exclusive. Thus,

$$prob(lsupport = 0) = 1 - prob(lsupport = 1) \quad (2)$$

The logged odds of the dependent variable can be estimated through the following formula (Peng, p.2, 2002):

$$\log \left(\frac{Prob(lsupport=1)}{1-prob(lsupport=1)} \right) = constant + \beta_1 * sparent + \beta_2 x_1 + \beta_3 x_2 \dots \beta_n x_{n-1} \quad (3)$$

Further, by taking the antilog of both sides in *equation*, the probability of the respondent being a supporter in *equation 4* (James et al, p 151,)

$$Probability(lsupport = 1) = \frac{e^z}{1+e^z} \quad (4)$$

In *equation 4*: z denotes the right-hand side of the equation 3. Thus, by predicting the values z we can estimate the probability of the occurrence. Consequently, the beta coefficient for *sparent* represents the change in the logged odds of the dependent variable, given the respondent is a parent of school aged child. Similarly for continuous variables the coefficient represents the change in logged odds for a unit change in respective predictor.

Ordered Logistic Regression

Ordered logistic model is a variation of the previous model. It is based on a similar mathematic concept as discussed in previous section, but can be expanded for predicting outcome of a variable with more than 2 categories. The critical requirement is that the dependent variable comprises ordered categories. For the dependent variable with J categories the mathematical formulation of logged odds ratio can be given as follows: (Ping, 2002)

$$\log \left(\frac{P_{\leq J-1}}{P_{\geq J-1}} \right) = constant + \beta_1 sparent_1 + \dots \beta_n X_n \quad (5)$$

Note that according to parallel lines assumption the slopes of explanatory variables (*betas*) are constant for all categories of J , while constant term (intercept) is unique.

Analogy between the candidate models

As shown both models translate information into probabilities, through learning a linear relationship from the given dataset. The information reveals the direction of association (positive or negative) between dependent and explanatory variables, and measures the scale and importance of the impact. To avoid the **information loss**, that might arise as a result of merging the groups of people completely supporting (opposing) and somewhat supporting (opposing), the ordinal regression model is mainly used in further analysis. However, for the **simplicity and interpretability** of the basic logistic model it is also discussed in the paper. Combination of these models for the data analysis serve as ground for valid statistical assumptions.

Empirical Analysis

This part of the paper presents the estimation process, output tables, hypothesis testing and discussion of the main findings. It is divided into two sub-sections *Estimation* - and *Discussion*.

Estimation

In this section the results of the quantitative analysis are provided. The summary statistics for four model predictions using ordered logistic regression are summarized in the **Table 5**. The coefficients represent the unit change in logged odds of the *Lockdown Support* for one unit change in independent variable (*ceteris paribus* assumed). The numbers in brackets below the coefficients are the p-values of corresponding explanatory variable. Even though, the usage of r-squared as a measure of explanatory power for regression models is prevalent in the common literature, the “pseudo” variation designed for logistic or ordered logistic models is not a sufficiently accurate measure for the performance of the model (Peng, p. 3, 2002). In fact, despite the fairly low pseudo-R-squared scores all models (nearly 8%, as shown in Table 5), almost all of the predictors have statistically significant impact on the dependent variable for all the models at 95% confidence level. In addition, the low variance between outputs of 4 models indicates the robustness of the results. Nevertheless, the Pseudo-R-Squared measure can still be useful for making comparison between similar models, thus is included in the table. The gradual increase in measure from model 1 to model 4 indicates a progress.

The main explanatory variable – *SParent* is significant at 90% confidence level in the initial **model 1** with a positive coefficient as predicted in the earlier sections of this paper. However, the presence of *Police-Trust* variable in the second model significantly alters the p-value of the latter, possibly insinuating to a likelihood of positive bias on *SParent* triggered by the absence of control towards any trust variable in the previous model.

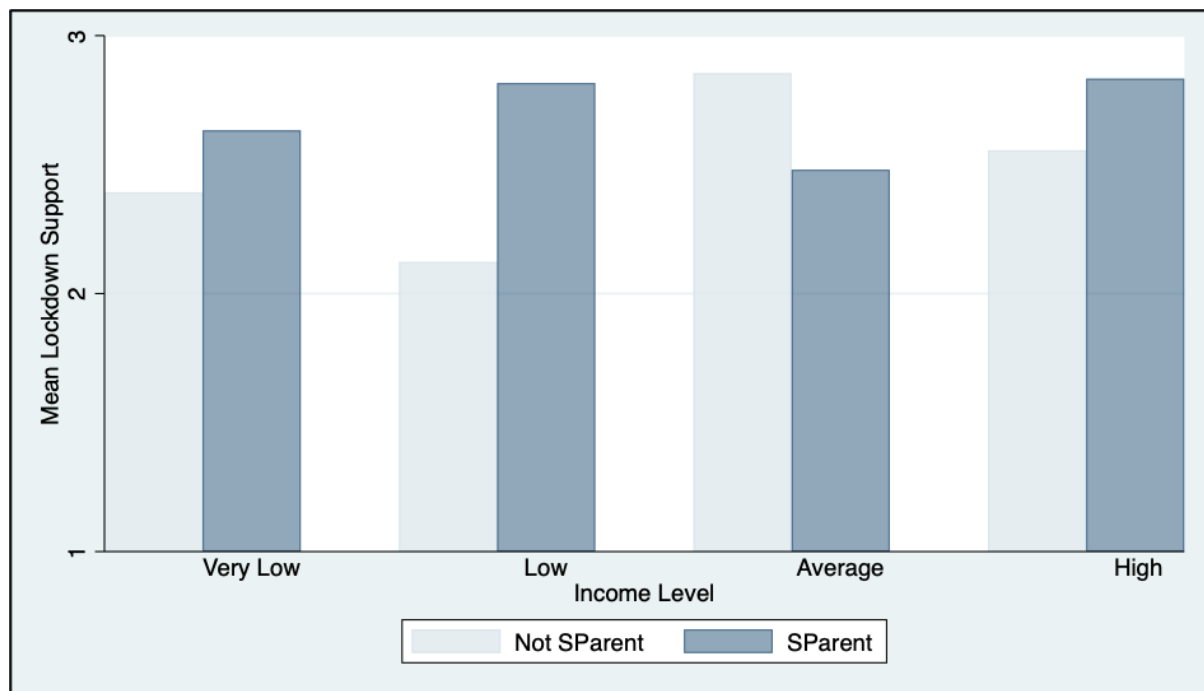
Consequently, in the 3rd and 4th models the estimation is targeted at identifying and separating the divergent effects from variable *SParent*. In other words, being a parent of a school aged child may have an atypical, or even contrasting influence on attitude on enforcement of a restriction depending on demographical features (e.g., gender, education, employment). As mentioned in the earlier sections of the paper one of the widespread arguments against lockdowns in general, is the additional difficulties created for the working parents, as they are forced to leave children at home alone. Hence, on average a negative

Table 5. Ordered logistic outputs (Coefficients and P-Values)

	Model 1	Model 2	Model 3	Model 4
<i>Lockdown Support</i>	N=718	N=718	N=623	N=718
<i>Pseudo R-squared</i>	7.22	8.05	8.27	8.43
<i>Parent of school-aged child (SPARENT)</i> [1=Yes (331); 0=No (387)]	0.258 (0.08)	0.189 (0.11)	0.407 (0.02)	0.498 (0.01)
<i>Primary consequence of Covid-19 (view_econ)</i> [1=Economic (295); 0=Health Other (423)]	-0.503 (0.00)	-0.454 (0.00)	-0.448 (0.01)	-0.427 (0.00)
<i>Reason for the prevalence of Covid-19 (reason_citizen)</i> [1=Nonadherent citizens (342); Other (376)]	0.643 (0.00)	0.605 (0.00)	0.597 (0.00)	0.615 (0.00)
<i>Level of information on the cause of Covid-19</i> [1=High Very high (557); 0=otherwise (161)]	0.409 (0.02)	0.351 (0.04)	0.466 (0.01)	0.354 (0.04)
<i>Level of information on how to protect from Covid-19</i> [1=High Very high (652); 0=otherwise (66)]	0.781 (0.00)	0.715 (0.01)	0.928 (0.00)	0.708 (0.01)
<i>Low Risk Group</i> [1=Very Low (102); 0=Otherwise (616)]	-0.880 (0.00)	-0.879 (0.00)	-0.922 (0.00)	-0.906 (0.00)
<i>Know-it-all</i> [1=True (244); 0=False (474)]	-0.327 (0.03)	-0.337 (0.03)	-0.324 (0.05)	-0.337 (0.03)
<i>Responsible Citizen</i> [1=True (565); 0=False (153)]	0.389 (0.03)	0.364 (0.04)	0.278 (0.16)	0.351 (0.05)
<i>Nonadherent Citizen</i> [1=True (184); 0=False (534)]	-0.262 (0.14)	-0.261 (0.14)	-0.225 (0.25)	-0.290 (0.10)
<i>Status-Quo (less affected by possible restrictions)</i> [1=True (144); 0=False (574)]	0.292 (0.13)	0.315 (0.10)	0.331 (0.11)	0.284 (0.14)
<i>Experienced Decrease in Financial Situation</i> [1=Yes (433); 0=No (285)]	-0.335 (0.03)	-0.312 (0.04)	-0.257 (0.13)	-0.288 (0.06)
<i>Expects Decrease in Financial Situation</i> [1=Yes (67); 0=No (651)]	-0.508 (0.06)	-0.457 (0.08)	-0.590 (0.04)	-0.476 (0.07)
<i>Housewife</i> [1=Yes (117); 0=No (601)]	0.541 (0.02)	0.524 (0.02)	0.560 (0.02)	0.531 (0.02)
<i>Male</i> [1=Yes (335); 0=No (383)]	0.925 (0.00)	0.897 (0.00)	0.902 (0.00)	0.896 (0.00)
<i>Police-Trust</i> [1=Very High; 0=Otherwise]		0.606 (0.00)	0.599 (0.00)	0.602 (0.00)
<i>Average income & SPARENT</i> [1=True (59); 0=False (659)]			-0.679 (0.03)	-0.633 (0.03)
<i>High level of education & SPARENT</i> [1=True (114); 0=False (604)]				-0.518 (0.09)
Other Demographic variables [age; settlement; employment; education; income]				
<i>Probability Cut off for [Rather Oppose]</i>	0.318	0.419	0.776	0.361
<i>Probability Cut off for [Rather Support]</i>	1.042	1.152	1.455	1.101
<i>Probability Cut off for [Completely Support]</i>	2.051	2.182	2.494	2.138

attitude may be extant for citizens with average income (between 120000-192000 DR.), as it is more likely that in this category both parents have a full-time job yet are still incapable to afford a caretaker. The chart 5 shows that on average parents of school-aged children are more likely to support restrictions, with exception those with average income.

Chart 5. Mean Lockdown Support by Parental status and income level



Comment. The mean lockdown scores hint that on average parents of school-aged children are more likely to support restrictions, with exception of those with average income.

Given that 13% of the respondents refused to reveal the level of their income, the regression results of **model 3** are based only on the rest of 87% sample (this was done to estimate the coefficient of the mentioned sub-group precisely, at the expense of random sampling). Based on model 3, one can confidently claim that on average there is 0.4 unit increase in logged odds of *Lockdown Support* for the parents of school-aged child, whereas if the latter earn between 120000 to 192000 there is a decrease of 0.3 points instead.

Segment of parents of school aged children who also have higher educational degree is added in the **Model 4**. The model shows that parent of school-aged children who are neither earning average income, nor have higher degree, on average have 0.5 units higher logged odds of dependent variable.

The model passed all conventional validity tests and outperformed the other ordinal models by pseudo-R-squared. Additionally, Model 4 excels based on Akaike Bayesian information criterion as shown in Table 6, therefore was chosen as the final ordinal model for the regression analysis.²

Table 6. Akaike-Bayesian Scores for Ordered logit models

Ordered Logit Models	AIC	BIC
Model 1	1827.9	1951.5
Model 2	1814.1	1942.2
Model 3	1563.3	1691.9
Model 4	1802.1	1940.2

Logistic model summarized in **Table 7** is fundamentally based on the same methodology, and encompasses same list of variables as **Model 4**. In essence, the conclusions attained in logistic model do not differ from that of **Model 4** significantly. Thus, for the sake of simplicity the logistic model is included and indented for and interpretation purposes only. The table is representing marginal effects of variables on likelihood of supporting versus opposing the possible restrictions *LSupport* (classified as two distinct categories only [1; 0 respectively]).

The logistic model that on average a parent of schoolchildren is by 13 percent more likely to support the imposition of measures to combat the pandemic. At the same time however, parents with average income or parents with higher education compared to other parents of school children are 13.3% and 13.2% more likely to oppose. Meaning that for the incremental effect of being a parent in case of the mentioned groups is nearly zero. Interestingly, the model demonstrates that parents with average income AND higher education are by 13.5% more likely to oppose the pandemic (assuming *ceteris paribus* to hold) as opposed to general public.

AUC and ROC curve for the logistic model is provided in the appendix section (**Chart 9**, appendices), and illustrates that the developed model is performing far better than random guess. The AUC ROC score is 0.67³.

² Although the model 3 has significantly lower AIC and BIC scores, it deals with lower number of observations, not considering people who refused to reveal their income level, and may fail to reveal robust estimates in general.

³ Running the same model on train and test samples revealed that AUC ROC scores of 0.72 and 0.65 respectively, did not indicate significant risk of overfitting.

Table 7. Marginal effects of logistic regression (Coefficients and P-Values)

Logistic Model <i>LSupport (binary)</i>	Marginal effect	Standard Error	P-Value	Confidence Interval {95%}	
<i>Parent of school-aged child (SPARENT)</i>	0.130	0.05	0.00	0.04	0.22
<i>Reason for the prevalence of Covid-19</i>	0.148	0.03	0.00	0.08	0.21
<i>Primary consequence of Covid-19</i>	-0.117	0.03	0.00	-0.18	-0.05
<i>Level of information on the cause of Covid-19</i>	0.060	0.04	0.14	-0.02	0.14
<i>Level of information on how to protect from Covid-19</i>	0.139	0.06	0.02	0.02	0.26
<i>Apathetic</i>	-0.041	0.04	0.27	-0.11	0.03
<i>Responsible Citizen</i>	0.071	0.04	0.09	-0.01	0.15
<i>Personal Risk Perception of Covid-19</i>	-0.157	0.05	0.00	-0.25	-0.06
<i>Nonadherent Citizen</i>	-0.038	0.04	0.36	-0.12	0.04
<i>Status-Quo (less affected by possible restrictions)</i>	0.077	0.05	0.10	-0.01	0.17
<i>Experienced Decrease in Financial Situation</i>	-0.080	0.04	0.03	-0.15	-0.01
<i>Expects Decrease in Financial Situation</i>	-0.033	0.06	0.58	-0.15	0.08
<i>Housewife</i>	0.090	0.05	0.09	-0.02	0.20
<i>Male</i>	0.189	0.07	0.01	0.06	0.32
<i>Police-Trust</i>	0.128	0.04	0.00	0.06	0.20
<i>Average income & SPARENT</i>	-0.133	0.07	0.07	-0.28	0.01
<i>High level of education & SPARENT</i>	-0.132	0.07	0.06	-0.27	0.01
Other Demographic variables [age; settlement; employment; education; income]					

Discussion

The study failed to confirm the main hypothesis of this paper for its assumed absolute generalization in the attitudes of school parents. Consequently, there is not enough evidence to say that the statement “the parents of school children are prone to support imposition of strict measures” is true for the whole population. Nevertheless, it managed to reveal number of interesting findings. Specifically, the attitudes of school parents are strongly linked to their income level and education level. Thus, after grouping these segments the unequivocal respective association on contrasting attitudes is apparent. As already mentioned, the parents

not in average income category and without higher education level (masters or further) are likely to support the imposition of lockdown. While for those in both of the subgroups the model predicts 13 percent lower likelihood of support (**Table 7**). At the same time, the latter characteristics (income & education) do not show any significant impact on attitudes when observed independently.

These results indicate that the discussed claims in the media might still be accurate, however for specific categories only. In fact, portion of parents that is predicted to oppose the restrictions in the models coincidingly match the group that might have similar lifestyle. That is, parents with higher education and average income are more likely to be full-time employed, therefore are forced to leave children at home alone, in case the restrictions include the closure of schools. This link, if true, aggravates the perceived difficulties faced by parents during the lockdowns. This suggestion can further be substantiated by the fact that housewives are more likely to support restrictions as shown in logistic model (**Table 7**). However, it is a mere explanation for the observed differences, and a thorough analysis is required to test the validity of the claim.

Further, the marginal effect table reveals number of other variables that are important in shaping of attitudes. The persons view on COVID-19, as primarily economic, rather than health issue makes him less likely to support restrictions by 11 percent. While high trust towards police and high level of information on ways to protect are indicators in shaping a positive attitude (13%, 14% respectively).

These findings might prove to be a useful basis for policy making and accurate targeting in the process of raising public support. Considering the modernity of the issue did not diminish parallel to the progress made in vaccine research, correct application of the attained insights may help mitigate the economic and social costs of the pandemic. The theoretical link between the attitudes and economics/social burden is illustrated in **chart 10** (appendices section), however is out of the scope of this particular research.

The scarcity of the vaccines and the circumspect attitude towards them and their effectiveness, make the lockdowns a practical and universal approach to combat the spread of the virus. Moreover, the recent pandemic exposed modern society's extreme unpreparedness for the hazard of a novel infection. Unfortunately, neither is the human race warranted from a

new healthcare crisis in the near future. Thus, the universality of the lockdowns as a means to tackle a plague is patent not solely in the case of COVID-19.

In addition, the announced snap elections in summer, and ongoing riots, may further serve as a catalyst for the spread of the pandemic in Armenia. As a result, the government might face a need to impose a new lockdown. Further issues might arise given that the period may coincide with the new academic year of 2021. The results of this paper can serve as basis for deeper research, to enhance the literature on the attitudes on protective measures enforced by the governments among the public.

Conclusion

The empirical analysis utilizing machine learning algorithms failed to provide enough evidence to confirm the hypothesis of the study. Yet, the results revealed valuable information that the oversimplification of relationship between parental status and views on imposition of possible restriction in Armenia is imminently flawed. The reason is that for different subgroups of parents of school-children the association was found to be contrasting. In fact, parents are more likely to support lockdowns, except for those with middle income or higher education.

Ironically, this means that the claim encountered in the media are flawed for their generalizability, just as the suggested hypothesis of this paper. However, the reasoning might still be correct in the sense that certain categories of this parents are indeed opposing the restrictions, which might be linked to their particular vulnerability to cope with the difficulties of the restrictions.

Moreover, the findings of the paper contain important insights on the perceptions and beliefs shaping the outlooks among the general public. They are as follows: people considering themselves not in danger of getting very sick of the and people who experienced decline in financial situation are 15 and 8 percent less likely to support the imposition of restrictions. On the other hand, people who are less affected by the restrictions, and people perceiving non-adherent citizens as the primary reason for the prevalence of the virus are predicted be less likely to oppose them.

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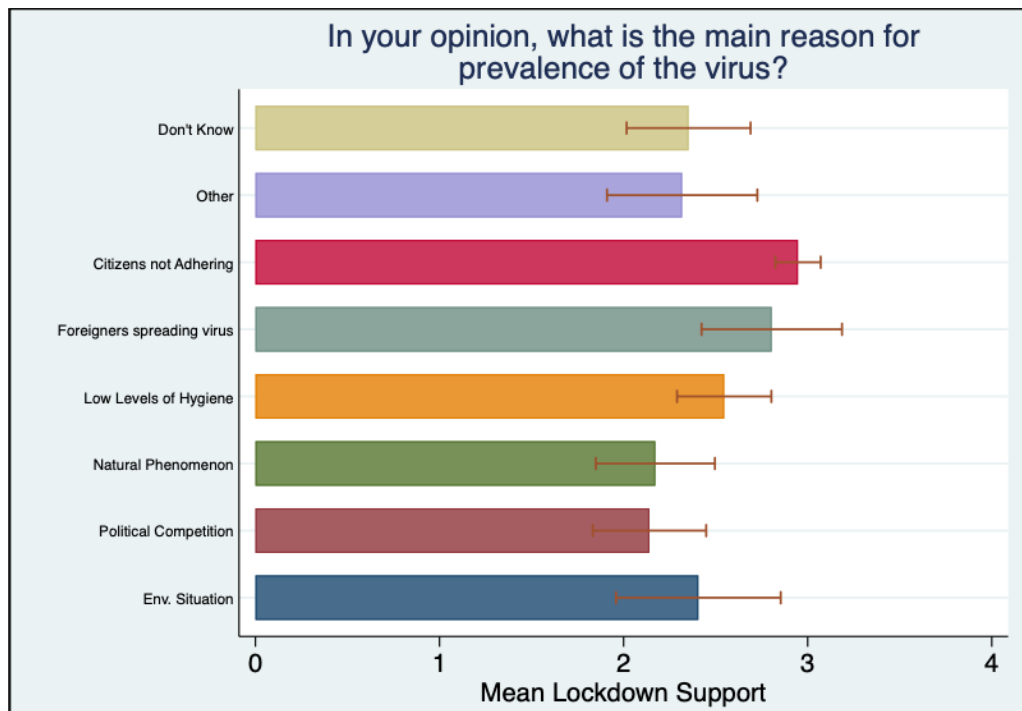
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Appendices

Chart 6. Mean Lockdown Support by beliefs on the cause of the pandemic



Comment. The chart shows the differences in attitudes based on perceptions on the prevalence of the COVID-19. Evidently, those who perceive the non-adherent citizens as the major reason for the latter are more likely to support the pandemic.

Chart 7. Mean Lockdown Support by expectations on well-being

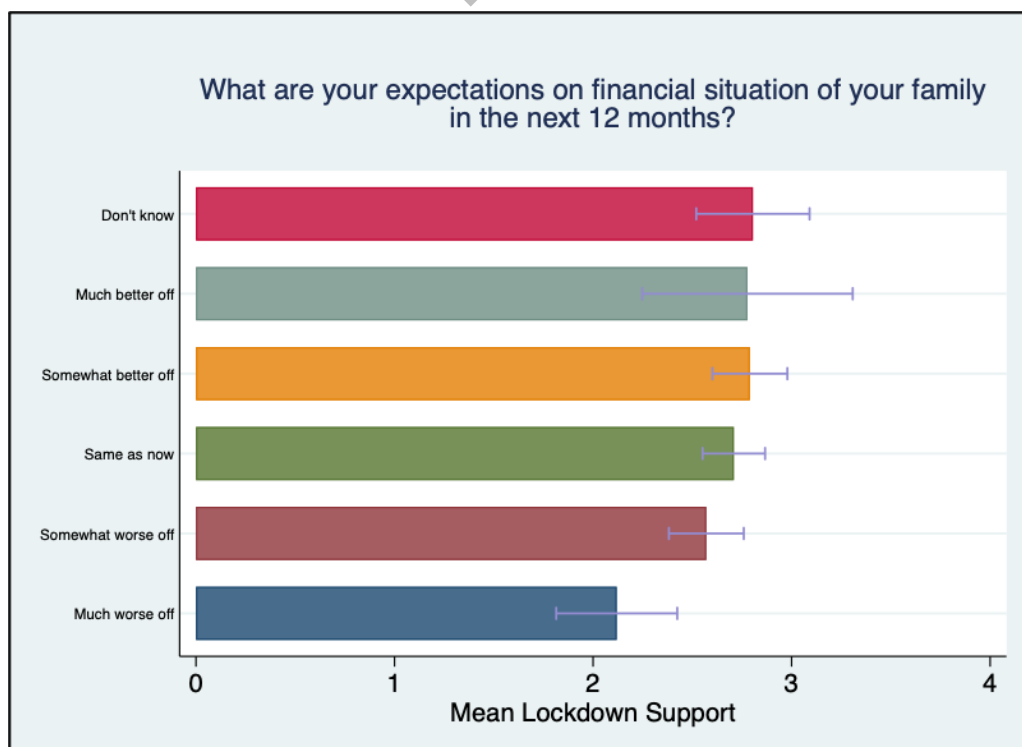
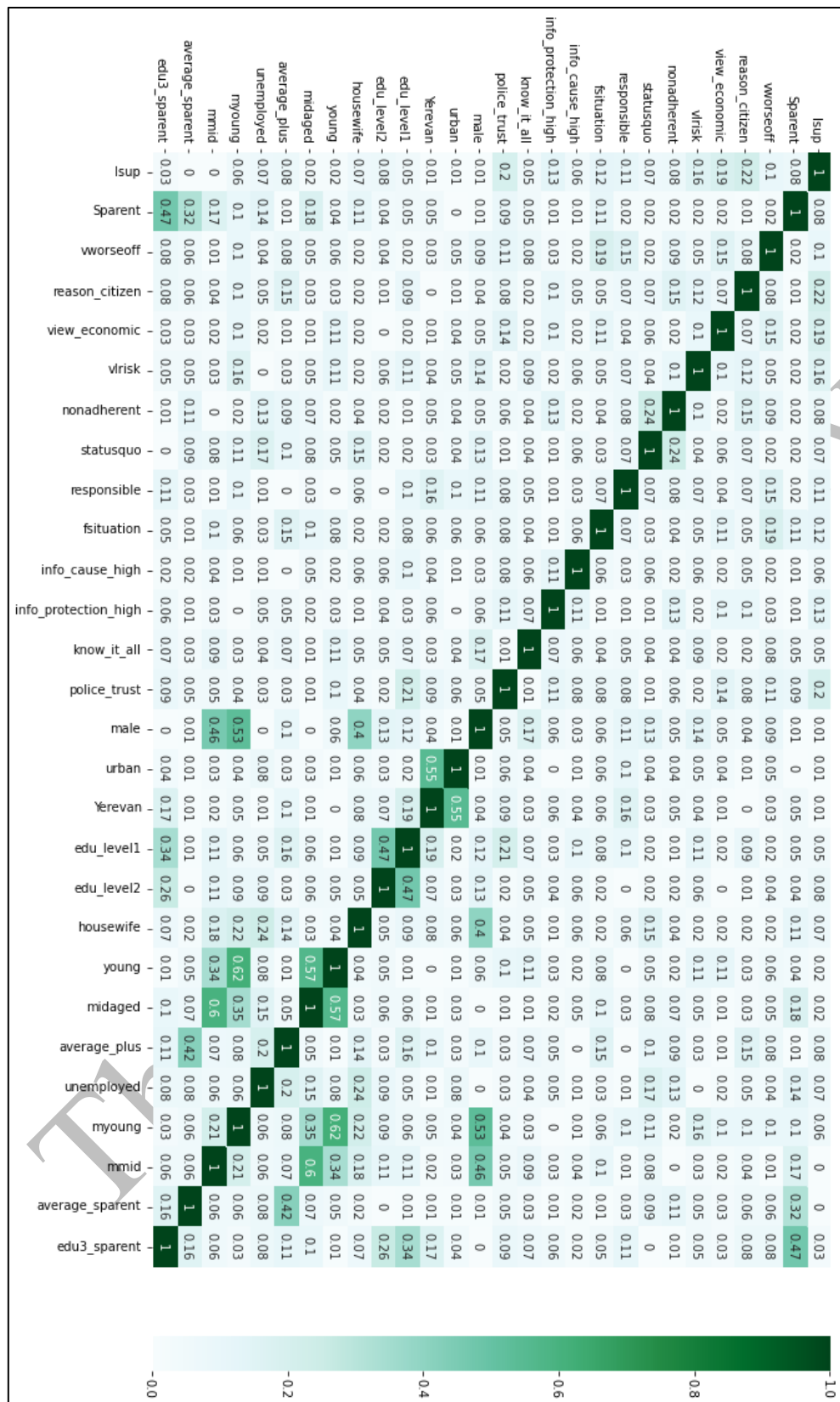
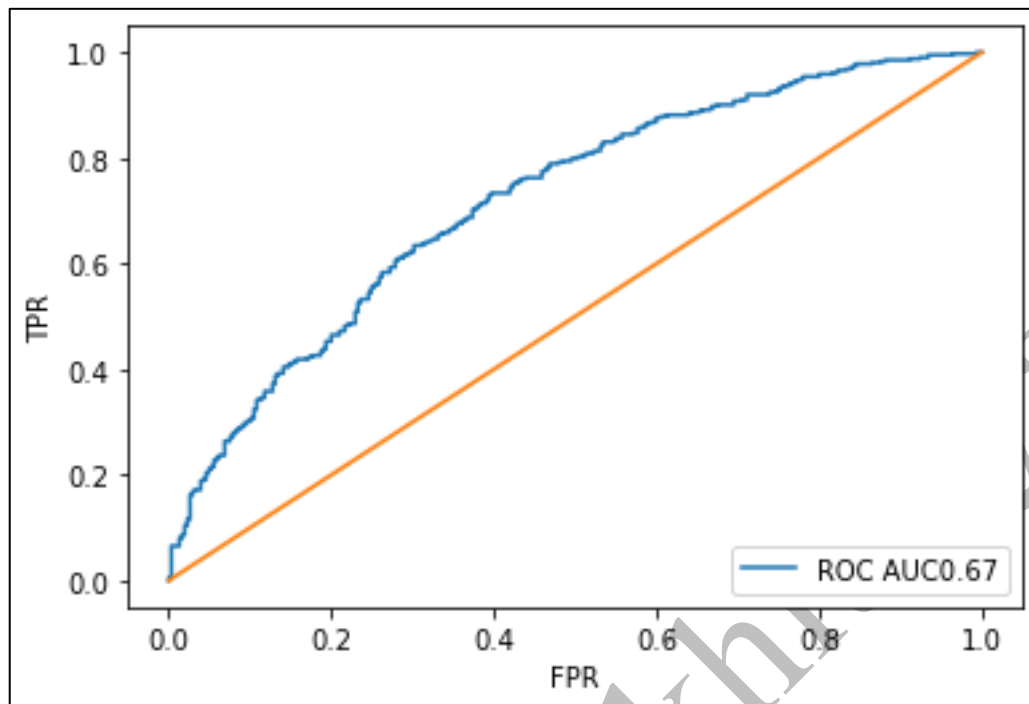


Chart 8. Correlation Heatmap (rotated).



Comment. The correlation heatmap indicates that none of the variables have more than 70% correlation between each other, and therefore can safely be included in the models.

Chart 9. AUC ROC curve for Logistic Regression

*Comment. Logistic Model performs far better than random selections
Given the importance of specificity in our case the optimal threshold is near 0.4*

Chart 10. Theoretical Link between Attitudes and economic and social costs