

**PERCEPTIONS OF THE MEDICAL AND ECONOMIC
RESTRICTIONS IMPOSED BY THE GOVERNMENT IN THE CASE OF THE COVID-19
PANDEMIC IN ROMANIA AT THE END OF 2020
PERCEPȚIA ÎN ROMÂNIA LA SFÂRȘITUL ANULUI 2020 A RESTRICȚIILOR MEDICALE
ȘI ECONOMICE IMPUSE DE GUVERN ÎN CAZUL FENOMENULUI PANDEMIC COVID-19**

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This paper is based on the Romanians' answers to question Q1 in a questionnaire. The sample was completed in October 2020 and includes 1038 people interviewed in Romania between September 25 and October 7, 2020 (Eurobarometer). Specifically, the question Q1 has the following wording: What is your opinion on the consequences generated by two aspects imposed in Romania by the Covid-19 pandemic? Use for the answer a scale with six answer possibilities where the value 1 means that the health benefits are greater than the economic damage, and by score 6 you appreciate the situation of some economic damage greater than the health benefits. Response scores 2-5 indicate opinions between these two extreme positions".

In the statistical analysis we will interpret the Romanians' answers to question Q1 as observations from a categorical random variable with six ordinal classes.

Applying the chi-square statistical test of homogeneity as well as the PSA indicator that measures the intensity of the "progress" phenomenon for an ordinal categorical variable, we will compare the opinions of several groups whose individuals differ by: gender, level of education, Romania's development region in which they live, the age category, belonging to a certain social class or the type of occupation.

We specify the fact that the initial database characterizing the sample used was subsequently weighted taking into account the real proportions in the Romanian population of the interviewed persons in relation to their age category, gender or place of residence.

Keywords: *questionnaire, Covid-19 pandemic, progress index, homogeneity statistical test, ordinal categorical variable, anti-Covid measures.*

Prezenta lucrare se bazează pe răspunsurile românilor la întrebarea Q1 dintr-un chestionar. Eșantionul a fost finalizat în octombrie 2020 și cuprinde 1038 persoane intervievate în România între 25 septembrie și 7 octombrie 2020 (Eurobarometru). Concret, întrebarea Q1 are următoarea formulare: "Care este opinia dvs. privind consecințele generate de două aspecte impuse în România de pandemia Covid-19? Utilizați pentru răspuns o scală cu șase posibilități de răspuns unde valoarea 1 semnifică faptul că beneficiile pe sănătate sunt mai mari decât pierderile economice, iar prin scorul 6 apreciați situația unor pierderi economice mai mari decât beneficiile de sănătate. Scorurile de răspuns 2-5 indică opinii între aceste două poziții extreme".

În cadrul analizei statistice vom interpreta răspunsurile românilor la întrebarea Q1 drept realizări ale unei variabile aleatoare categoricale cu șase clase ordinale.

Aplicând testul statistic chi-pătrat de omogenitate precum și indicatorul PSA ce măsoară intensitatea fenomenului de "progres" pentru o variabilă categorică ordinală vom compara opiniile mai multor grupuri ai căror indivizi se diferențiază prin: gen, nivel de educație, regiunea de dezvoltare a României în care ei domiciliază, categoria de vârstă, apartenența la o anumită clasă socială, tip de ocupație.

Precizăm faptul că baza de date inițială ce caracterizează eșantionul utilizat a fost ulterior ponderată ținându-se seama de proporțiile reale în populația României a persoanelor intervievate în raport cu categoria lor de vârstă, genul sau localitatea de reședință.

Cuvinte cheie: *chestionar, pandemie Covid-19, indice de progres, test statistic de omogeneitate, variabile categoricale ordinale, măsuri anti-Covid.*

JEL: C8, I28, H11, C5, C13.

1. The purpose of the paper

The Covid-19 pandemic has been brutal worldwide, affecting most human activities. Covid-19 is a wide spread pandemic that has caused immense damage globally in all major domains. We are talking especially about the medical system, the world economic structure and at the same time comprising the entire social system,

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interpersonal relations and relations between states, increasing the level of poverty and drastically decreasing the well-being of the planet's inhabitants. Starting with 2019, the states of the world have permanently taken measures against the Covid-19 pandemic, measures often correlated on various sectors, while also having a geographical orientation. Such measures have often affected the target populations, leading to multiple types of restrictions, the presence of borderline situations, frequent dissatisfaction.

The purpose of this paper is to see to what extent Romanians agree with the medical restrictions imposed by the government to save lives or rather prefer a relaxation of economic restrictions in order to achieve income necessary to lead a decent life.

2. Specialized literature

We further present some ideas on the topic addressed and reflected in the literature.

Given the highly destructive global feature of the Covid-19 pandemic, many mathematical models have been developed around the world to simulate evolution and also to estimate the multiple effects of an epidemic.

We note in this context the classic SIR model proposed by Kermack and McKendrick in 1933. The name SIR specifies the three types of actors with which this model operates, namely people susceptible, infected and removed. At the beginning of the Covid-19 pandemic, the SIR model was used intensively in the European space.

Taking into account the complexity of the manifestation of the SARS-CoV-2 virus, the researchers proposed after 2019 extensions of the SIR model that are adapted to the current Covid-19 pandemic. We mention the introduction of new parameters in the innovative applied models. Thus, different variations of the studied population volume are taken into account (for example, births and deaths normally taking place), the influence of the vaccination process, the production of reinfection, the hospitalization phase (Yamamoto, 2018; Meera, 2021).

Wu & Olson (2020) as well as Baldwin & Weder di Mauro (2020) present mathematical models for predicting both economic and population health effects (macroeconomic impact, effect on the banking sector, trade, tourism, monetary policy, evaluation public health services, specific measurement techniques).

At the moment, the Covid-19 pandemic is seen in the world as a wide distributed phenomenon, a wide spread pandemic that has caused immense damage globally in all major sectors of human activity. Measures taken at the national and global levels are largely influenced by such a vision (Bambra, Lynch and Smith, 2021; Basu, 2021).

In the dispute concerning social aspects versus economic priorities, we must remember the importance of the social domains deeply affected by the Covid-19 pandemic (Lupton and Willis, 2021).

The Covid 19 pandemic is sometimes seen as a perfect storm in which health inequalities and social factors interact with the new virus. (Bambra, Lynch and Smith, 2021).

In the literature is intensely discussed the possibility of an effective "closure" of an economy, a fact that is medically beneficial, but in the short term. Practically, the "closure" of the economy will have disastrous long-term consequences (Bourne, 2021). In the present paper, this aspect is partially analyzed, namely the opinions of Romanians in the dilemma of some medically favorable measures or the preference of the economic recovery variant.

However, it should be noted that when imposing measures to limit the adverse effects of the pandemic, it is mandatory to strictly comply with the laws in force. See in this regard the approach of Monti and Wacks (2021) in which the possible consequences of non-compliance with the law are suggested.

In addition, we must point out the immense work and human solidarity shown by all peoples to stop this pandemic. At the same time, we note the special contribution of the European Union in order to solve the multiple social and economic problems generated by the Covid-19 situation (Baldwin and Weder di Mauro, 2020).

3. Data collection and coding of answers

In this paper, the Romanians' answers to question Q1 from a questionnaire are analyzed. The sample was completed in October 2020 and includes 1038 people interviewed in Romania between September 25 and October 7, 2020 (Eurobarometer, 2021).

Specifically, question Q1 has the following wording: "What is your opinion on the consequences generated by two aspects imposed in Romania by the Covid-19 pandemic? Use for the answer a scale with six possibilities of answer where the value R1 means that the health benefits are greater than the economic losses, and by the score R6 you appreciate the situation of some economic losses greater than the health benefits. Response scores R2-R5 indicate opinions between these two extreme positions".

The interviewees prefer more or less one of the options, namely benefits of a medical nature or economic recovery.

4. Methodological aspects

The initial database characterizing the sample used was subsequently weighted taking into account the real proportions in the Romanian population of persons in relation to their age category, gender or place of residence.

In the statistical analysis we will interpret the Romanians' answers to question *Q1* as observations from a categorical random variable with six ordinal classes (Agresti, 2010).

The opinions of several groups whose individuals are differentiated by gender, age, level of education, development region of Romania, social status, families with children will be compared.

In order to differentiate the studied groups, we will apply the chi-square test to validate the hypothesis of homogeneity H_0 (Alkarkhi, 2021). More precisely, using an established criterion (gender, age, education, ...) the population is partitioned highlighting the sets $G_1, G_2, G_3, \dots$. For all the groups $G_1, G_2, G_3, \dots$ are estimated the distributions $F_1, F_2, F_3, \dots$ of the answers R_1-R_6 given by the people from the same group to question *Q1*.

The null hypothesis H_0 (homogeneity) has the following formulation: The distributions of the answers R_1-R_6 are not influenced by the respondent's belonging to a certain group $G_1, G_2, G_3, \dots$ (the experimental distributions $F_1, F_2, F_3, \dots$ are not "quite different" from a statistical point of view).

Effectively, will be calculated the χ^2 statistics specific for chi-square test, and also will be evaluated the threshold rej for rejecting the null hypothesis H_0 . If $\chi^2 < rej$ then the hypothesis H_0 will be accepted with the risk α of making a decision mistake. The classical value $\alpha = 0.05$ of the first type of risk was chosen (Alkarkhi, 2021).

In order to nuance the options of the respondents to the questionnaire, the PSA indicator was applied. The PSA coefficient characterizes the level of confidence given by the interviewee to question *Q1* knowing that the analyzed subject belongs to one of the groups $G_1, G_2, G_3, \dots$ (Stefănescu, 2015). The PSA indicator is normalized ($0 \leq PSA \leq 1$) which makes it possible to compare the groups.

In the specific case of question *Q1*, we bring new clarifications. Specifically, if $PSA < 0.5$ then respondents prefer more medical benefits. In the situation of $PSA > 0.5$, the individuals are mainly opted for economic recovery measures. The $PSA = 0.5$ variant means a balance between the two options, pro-health versus pro-economy.

The existence of $PSA_{G_1} < PSA_{G_2}$ inequality between two groups G_1 and G_2 practically means that people in group G_1 prefer medical restrictions more than subjects belonging to group G_2 .

5. Partial results

Answers R_1-R_6 to question *Q1* of all interviewees will be analyzed taking into account different characteristics such as: gender of respondent, age, level of education received, the development region of Romania, from where the respondent is coming, social level of the individual, if the family of the respondent has dependent minor children.

We remind you that the initial sample was weighted in relation to the main socio-demographic variables in Romania.

5.1. The whole sample

First, we will statistically analyze the responses of the interviewees belonging to the entire sample. Thus, the probabilities of the types of answer R_1-R_6 to question *Q1* are represented graphically in Figure 1.

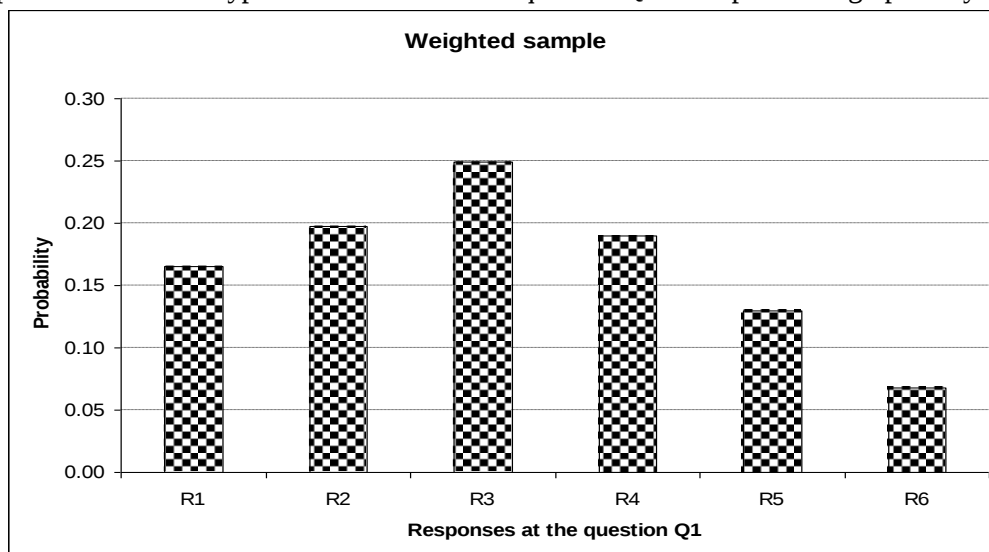


Figure 1. Distribution of population answers to question *Q1* (weighted sample)

An interpretation of the graph in *Figure 1* reveals that people interviewed in Q1 are more inclined to accept government-type medical measures (R1 = 16.5%, R2 = 19.8%, R3 = 25%) to the detriment of economic restrictions imposed by the authorities during Covid-19 pandemic (R6 = 6.8%, R5 = 13%, R4 = 19%).

The trend of the Romanian population, which preferred the medical benefits of the restrictive measures is also confirmed by the value of the PSA "progress" indicator, which is below the equilibrium threshold of 0.5 ($PSA = 0.425 < 0.5$).

In fact, the "medical" trend will be confirmed by statistical analyzes performed on subgroups of the population, results that will be briefly presented below.

5.2. Respondent gender (categorical variable gen).

Taking into account the gender of the respondent, we highlight groups M (men) and F (female). These two groups are to be compared in terms of opinions for Q1.

By applying the chi-square test regarding the hypothesis H_0 of "equality" of the distributions of the answers for men and women results the inequality $\chi^2_{gen} = 2.58 < 11.07 = rej_{gen}$.

Therefore, the hypothesis H_0 of homogeneity is accepted with the risk $\alpha = 0.05$ and for that reason the distribution of the answers R1-R6 to the question Q1 does not depend on the gender of the respondent.

In addition, we deduce $PSA_{gen-M} = 0.422 < 0.428 = PSA_{gen-F}$, values that are very close (the distributions of male and female responses are practically identical because the H_0 hypothesis was accepted).

Regardless of gender, Romanians focused more on the medical benefits of government-promoted measures in the Covid 19 pandemic ($PSA < 0.5$).

5.3. Age of the person (ordinal variable age).

We divide the sample population into four age groups. We thus highlight the V1-V4 age categories, namely: 16-24 years (V1), 25-34 years (V2), 35-44 years (V3) and 45-54 years (V4).

Following the application of the chi-square statistical test of homogeneity results the inequality $\chi^2_{age} = 10.14 < 25.0 = rej_{age}$. Concluding, the H_0 hypothesis of homogeneity is accepted, i.e., the distribution of R1-R6 responses does not depend on the age of the respondent.

However, there are nuances between R1-R6 opinions between the V1-V4 age categories. Specifically, $PSA_{age-V1} = 0.396$, $PSA_{age-V2} = 0.423$, $PSA_{age-V3} = 0.460$, $PSA_{age-V4} = 0.412$. In this situation, young people in particular prefer government health measures, finding them more useful than economic ones. This can be explained by the fact that the age category 35-44 years (V3) includes people generally active in the economy.

5.4. Education (ordinal variable edu).

The selected groups are defined according to the number of years of schooling. Thus, defining four levels of education: L (**l**ow, under 16 years of education), M (**m**iddle, between 17 and 19 years of school), H (**h**igh, school exceeding 20 years), C (subject is in the **c**ontinuation of studies).

The use of the chi-square statistical test leads to the inequality $\chi^2_{edu} = 20.84 < 25.0 = rej_{edu}$. As a result, with the risk $\alpha = 0.05$ of making an erroneous decision, we choose to validate the hypothesis H_0 of homogeneity. In conclusion, the distribution of R1-R6 answers to question Q1 is not influenced by the level of education of the interviewees.

But the value of χ^2_{edu} statistics is quite close to the rejection threshold rej_{edu} . So, it is possible to have a dependence of R1-R6 answers from the degree of individual education (see also *Figure 2*). This aspect will be extensively approached in a future analysis.

Depending on the degree of schooling, the following values of the PSA index characterize the level of "confidence" granted by the population to economic measures: $PSA_{edu-L} = 0.422$; $PSA_{edu-M} = 0.413$; $PSA_{edu-H} = 0.433$; $PSA_{edu-C} = 0.403$. All these values are close and are obviously below the equilibrium threshold of 0.5. For this reason, regardless of the number of school years completed, Romanians prefer the medical benefits of government restrictive measures to the detriment of anti-Covid economic actions promoted by the authorities.

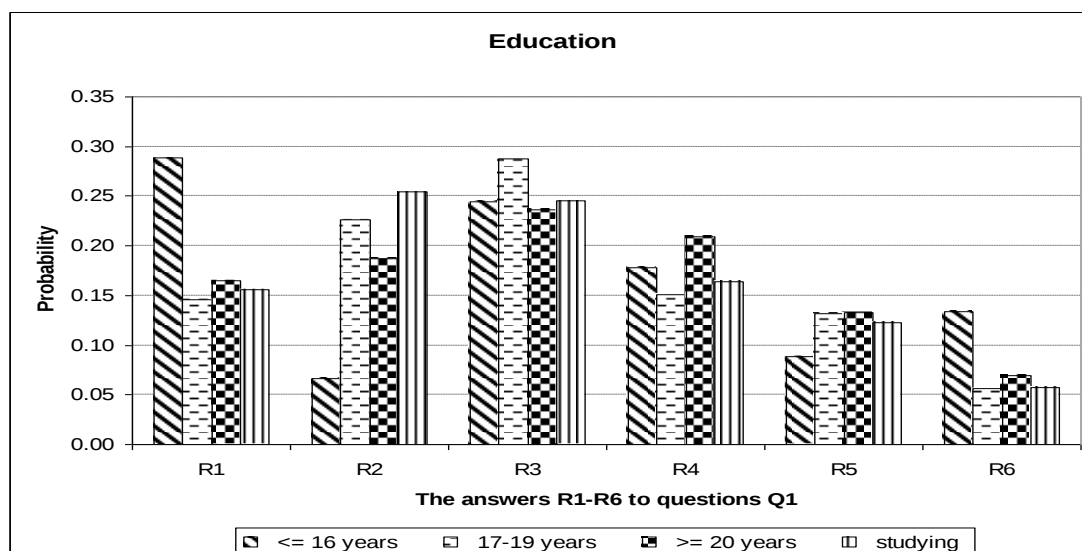


Figure 2. Distribution of population answers R1-R6 depending on individual education.

5.5. Development regions (categorical variable *reg*).

The territory of Romania is divided into four major regions of socio-economic development. More precisely, we have the following regions defined by their geographical positioning: North West / Center (NW/C); North East / South East (NE/SE); South / Bucharest (S/B); South West / West (SW/W).

The four regions mentioned have different economic and social characteristics. In such a situation, we expect the distributions of the R1-R6 answers to be differentiated according to the belonging to a certain region of the people who expressed their opinion on the *Q1* issue. The application of the chi-square statistical test will clarify this aspect. Specifically, following the calculations we deduce $\chi^2_{reg} = 20.12 < 25.0 = rej_{reg}$. Therefore, the hypothesis H_0 of homogeneity is statistically accepted and therefore the distribution of the answers R1-R6 to the question *Q1* is not influenced by the respondent's belonging to a certain development region of Romania.

However, the existing economic and social differences between the major development regions of Romania are highlighted by the values of the PSA indicator. In this case, the value of PSA means the “degree of trust” granted by the citizens to the economic variant from the *Q1* theme. Specifically, we have: $PSA_{reg-NW/C} = 0.397$; $PSA_{reg-NE/SE} = 0.448$; $PSA_{reg-S/B} = 0.427$; $PSA_{reg-SW/W} = 0.426$. It is observed that the values of the PSA index fluctuate significantly from one region to another, which highlights differences of opinion of an economic nature.

In conclusion, the entire population of Romania appreciates more the benefits of government measures promoted in the field of health ($PSA < 0.5$). However, we note nuanced opinions by region. Thus, in the North West / Center region the population's preferences target more the restrictive medical measures and in the North East / South East region we have an orientation of the respondents towards the usefulness of the economic measures (the need to keep their jobs).

5.6. Social status (ordinal variable *soc*).

Regarding the social status of the individual, three variants were considered: high (H), medium (M), low (L).

After applying the chi-square test resulted inequality $\chi^2_{soc} = 14.83 < 18.31 = rej_{soc}$ which validates the homogeneity hypothesis H_0 . So, from a statistical point of view, the distribution of answers R1-R6 is independent of the social status of the respondent.

However, there are nuances in the *Q1* issue in relation to the social status of the respondent. Specifically, the PSA “progress” index for groups with social status H, M, L has the following values: $PSA_{soc-H} = 0.428$; $PSA_{soc-M} = 0.432$; $PSA_{soc-L} = 0.409$.

In conclusion, regardless of social status, Romanians opt more for medical benefits to the detriment of economic ones ($PSA < 0.5$). However, we note small differences. Thus, people with a medium (M) or high (H) social status observe to a greater extent the need to reduce the huge damage caused to the economy by the Covid-19 pandemic.

5.7. Families with minor children (categorical variable *fam*).

Usually, families with children are characterized by an increased responsibility in making decisions that could affect family safety.

The statistical analysis will take into account the existence of two groups: families with minor children (C) and families without minor children (N).

The results of the chi-square test confirm the inequality $\chi^2_{fam} = 4.81 < 11.1 = rej_{fam}$, the hypothesis H_0 of homogeneity of the groups being thus accepted. So, the distribution of the answers to question Q1 is not decisively influenced by the fact that the family of the participant in the sociological survey has minor children.

However, the use of the PSA index highlights seemingly unexpected results in the Q1 issue, aspects that we will try to explain. Specifically, between the values of the PSA_{fam-C} , PSA_{fam-N} indices of "progress" for C families with minor children, respectively for N families without minors, we deduce the inequality of $PSA_{fam-C} = 0.434 > 0.419 = PSA_{fam-N}$.

Astonishingly, C families with dependent children, compared to other N families, are more concerned with the economic aspect of government restrictions than with the medical effect. The "economy-oriented" decision of C families could be explained by the priority of securing a job. Moreover, the medical benefits do not seem to be so important in families with children. Compared to the elderly, young families and also children are not so much affected by the serious health problems caused by the Covid-19 pandemic.

Conclusions

We summarize some results that have been reported and justified in the previous sections:

- Because $PSA \approx 0.4$, a value below the equilibrium threshold of 0.5, we can say that the Romanian population prefers more the medical benefits of the restrictive measures taken by the government in the Covid19 pandemic. The population is probably less aware of the country's economic disaster caused by the current epidemic.

- There are no significant differences between the distributions of R1-R6 responses given by people belonging to groups of the population that differ by gender, age, education, development regions of Romania, social status or families with minor children.

- Although the chi-square statistical tests did not confirm major differences in the Q1 issue between the various groups mentioned above, the introduction of the PSA indicator highlighted some nuances that are sociologically explainable. We note in this regard the case of families with minor children. This proves the practical usefulness of the PSA coefficient.

- In the future we will use more attributes of the participants in this sociological survey. We intend to select new groups from the population that could be differentiated by distinct opinions in the Q1 issue.

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