

Evolution of the risk perception of infection by COVID-19 - Evidence from the COVID-19 Barometer: Social Opinion

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INTRODUCTION

After the emergence of the SARS-CoV-2 virus and the establishment of COVID-19 as a global pandemic on March 2020, several non-pharmacological measures were adopted worldwide in order to contain the exponential transmission of the virus. These measures had a huge impact on the daily lives of the Portuguese population.

The effectiveness of the implemented containment measures depends on the public's adherence and willingness to cooperate, which, in turn, is heavily influenced by their risk perception. In other words, accurate public risk perception is essential for effective public health risk management.

Therefore, it is of utmost importance to study the public's risk perception during the COVID-19 pandemic, understand its evolution and identify related factors.

GOALS:

- evaluate the evolution of the perception of risk of infection by COVID-19 between March 2020 and March 2022
- identify associations with other factors, such as socio-demographic variables, epidemiological measures, mobility, etc.

DATA SOURCES

The "**Covid-19 Barometer: Social Opinion**" barometer was our main source of information. This study was launched in March 2020, shortly after the appearance of the first cases of COVID-19 in Portugal, by the NOVA National School of Public Health. This project was created to identify and monitor the evolution of the Portuguese population's perception of the pandemic and its impact on daily life. Several areas were analyzed over time: perception of risk of infection, use of healthcare services, mobility, level of satisfaction with the government's actions, etc. In addition to the Barometer data, data from external sources was also considered:

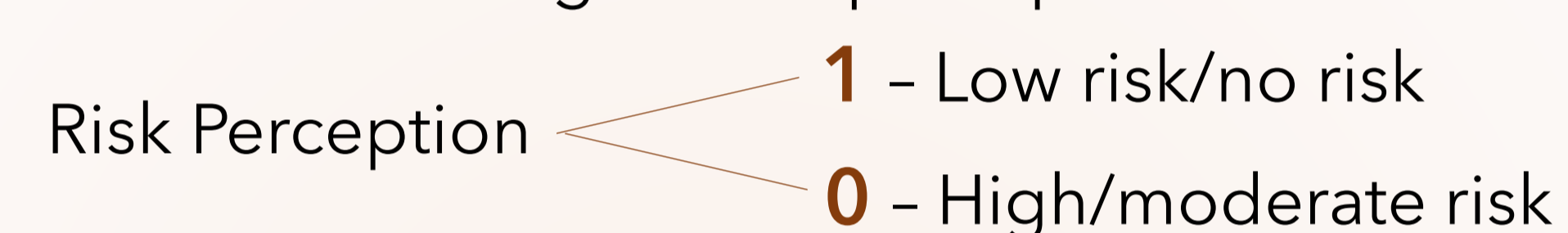
- **Epidemiological measures** (retrieved from DGS)
- **Prevalence of COVID-19 variants** (retrieved from CoVariants.org)
- **Stringency data** (retrieved from Our World in Data)
- **Google searches' popularity index for the COVID-19 disease** (retrieved from Google)



DATA MODEL

The data collected through the Barometer: Social Opinion study is structured weekly from March 2020 to March 2022, with each question of the barometer corresponding to a variable. The granularity of the data is each row corresponds to one response of the survey.

The outcome in this study was the perceived risk of infection by COVID-19, an ordinal variable that corresponds to one of the Barometer's questions. The variable has 5 levels, one of which "I don't know", which was excluded from the analysis for simplicity purposes. The variable was dichotomized, and the chosen reference level was the higher risk perception.



The explanatory variables were grouped into dimensions, to allow for a simpler and more efficient modelling:

- General factors**
 - age
 - sex
 - workplace
 - mental health status
 - anxiolytic intake
 - health status
 - previous covid diagnosis
- Protection measures**
- Vaccine hesitancy**
- Coping mechanisms**
- External factors**

METHODS

Considering the longitudinal nature of the data in question, longitudinal models were chosen to study the temporal evolution of the variables. Specifically, **mixed effects generalised linear models** were used, due to the presence of repeated observations from the same respondents throughout a two year period. One model was fit per group of variables/dimension.

Furthermore, confidence intervals and odds ratio were calculated for each model, to aid in model interpretation.

! The models here presented have not yet been validated and are subject to change pending validation.

RESULTS

The following results are preliminary and subject to change pending validation.

	Variable	Coefficient	Odds Ratio	p-Value
1	Mental Health (Infrequently)	0,351	1,420	4,29E-04
	Health (Poor)	-0,603	0,547	1,72E-11
	Number comorbidities (None)	0,347	1,415	1,71E-02
	Covid (Yes)	0,851	2,341	1,62E-08
2	Social distance (Infrequently)	-0,392	0,676	3,22E-07
3	Coping (food)	0,547	1,729	1,85E-04
	Coping (exercise)	0,660	1,936	2,59E-06
4	Vaccine Hesitancy (Positive tendency)	0,996	2,707	4,22E-13
5	Hospitalized ICU	-0,255	0,773	3,05E-03
	Stringency index	6,388	625,566	3,25E-14
	Dominant covariant (Delta)	1,489	4,432	6,22E-13
	Dominant covariant (Omicron)	1,650	5,209	5,29E-05
	Google popularity index	-3,540	0,029	6,12E-11

DISCUSSION

Taking into consideration that the presented results are preliminary, the following interpretations should be considered exploratory and hypothesis-like, rather than definitive conclusions.

The factors that indicate a more positive association with a lower perceived risk of infection by COVID-19 are: better mental health statuses, absence of comorbidities and changes in food and exercise habits as coping mechanisms. Additionally, a previous COVID-19 diagnosis, absence of vaccine hesitancy and the prevalence of the Delta and Omicron covariants show an even stronger increase in the likelihood of **lower perceived risks**.

On the contrary, worse individual health statuses, infrequent maintenance of social distancing, higher cases of hospitalized individuals and a higher google popularity index show some level of increase of the odds of perceiving a **higher risk of infection** by COVID-19.



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