Population preferences for inclusive COVID-19 policy responses

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THE LANCET
Public Health

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Blayac T, Dubois D, Duchêne S, Nguyen-Van P, Ventelou B, Willinger M. Population preferences for inclusive COVID-19 policy responses. *Lancet Public Health* 2020; published online Dec 7. https://doi.org/10.1016/S2468-2667(20)30285-1.

APPENDIX FOR LANCET-Public Health

Population preferences for inclusive COVID-19 policy responses

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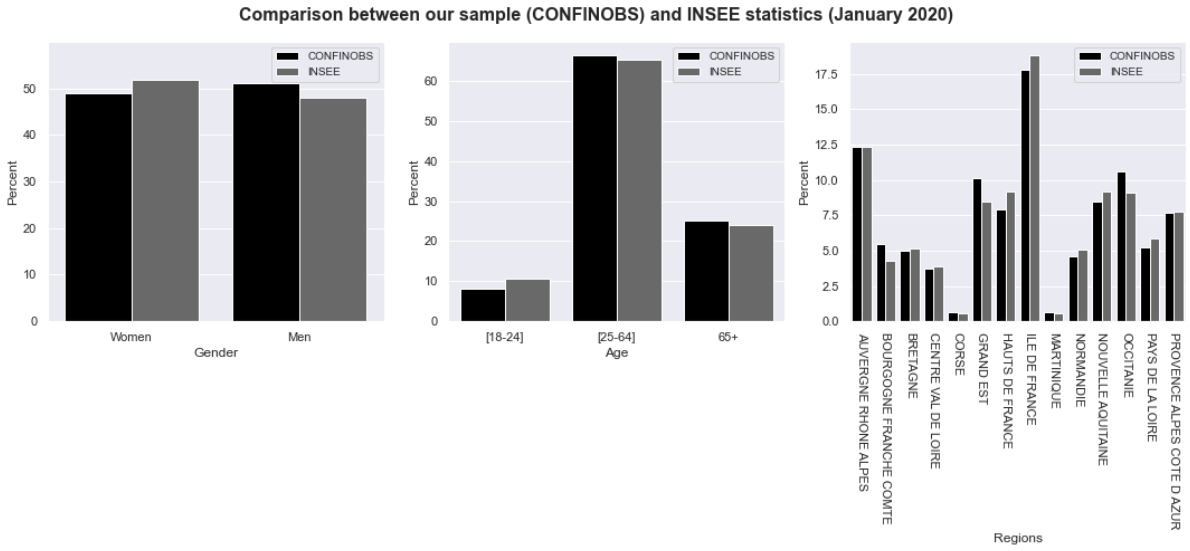
Materials and Methods

The web-based survey, developed with the oTree platform, was available for 2 weeks, from 4th May 2020 to 16th May 2020, on a dedicated server managed by the research-team. The survey-institute *Viavoice*[1] made the recruitment: over the 7500 persons that were contacted by telephone, 5331 accepted and received a web link, 1154 responded to the online survey, with a fully completed questionnaire and a signed online informed consent form (response rate 21.6 %). Graph 1 gives the data obtained from our sample, in comparison with data from the National Institute of Statistics and Economic Studies (INSEE).



Graph 1: Sample characteristics, compared with the national population

Statistical tests demonstrated that our sample is representative for regions (chi2-test of independence not rejected at .05), although weakly unbalanced in terms of *gender* and *age* composition (chi2-test of independence rejected at .05, but not at .01). **Discrete Choice Experiment** (DCE) is a method used for individuals' preferences elicitation[i]. It consists in putting individuals face to hypothetical, but realistic, situations of choice (scenarios) between two or more alternatives (options) which are differentiated

[1] http://www.institut-viavoice.com/

by the levels of their attributes. The choice by an individual of one of the options reflects his personal trade-offs between the attributes and makes explicit his preferences. The DCE has been applied in various fields, in particular for adoption of alternative medical treatments with side-effects as attributes[ii]. In our case, options were described as combinations of anti-COVID-19 national policies. Respondents were asked to choose one option among a couple presented in the choice set - see Figure 1 below. The choice task was repeated three times with different options, randomly assigned. Attributes of the choice options are the different prophylactic measures (see Figure 1), possibly applied at various levels (e.g.: No-Mask (level 0); Mask in public places (level 1); Mask in all circumstances (level 2)).

The list of attributes was determined in April 2020 after an attentive consideration of the debates (anti-covid strategies reported by the press, at the national and the international levels). The initial list of attributes was discussed with public-health experts from regional health agencies (Observatoire régional de santé PACA). Mask (3 levels: non-mandatory; mandatory in public place; mandatory everywhere); Restrictions in bars, restaurants and festive venues (2 levels: open; closed all the summer season); Adaptations in the public transportation system (2 levels: normal; adapted to working hours); Leisure travel (3 levels: no limitations; limited to France only; limited to 100 km around); Digital tracking (2 levels: no tracking; implementation with free access); and, of course, Additional weeks of confinement (3 levels: no extension; extension for one week; extension for 3 weeks). The introduction of a monetary bonus (4 levels: 0; 500€; 1500€; 2200€) was guided by:

i) a theoretical view, from economics, that monetary incentives could have an impact on the population's willingness to accept and follow binding sanitary programs (as founded by Charness and Gneezy[iii]). In a DCE study, introducing a financial compensation as a (continuous) attribute allows the researcher to properly estimate the level of monetary rewards that individuals are willing to accept in exchange for their effort.
ii) the fact that some governments (ex. Japan) actually decided to give an unconditional compensation, in order to reinject money in the country, so as to curb the effects of the economic crisis, and/or to make the policy more acceptable[iv] (Ando et al., 2020).

From all the possible combinations of the levels of these 7 attributes (i.e. a full factorial design consists of 864 possible combinations), 84 options were selected (with a D-efficiency of 83% for main effects and first order interactions) and divided randomly into 42 scenarios (each scenario includes 2 options, named as Option A and Option B). Each individual had to choose one option for each of the 3 scenarios that were randomly presented to him (her). Figure 1 shows a screenshot of the decision screen (translated from French to English).

Difficulty of the DCE task. Our strategy was to give all the information on the 7 attributes in a global choice set (see the screen choice proposed), although it can be cognitively demanding. At the time of the survey, France was at the end of the first lockdown: the media were constantly talking about end-of-lockdown measures; that makes the task simple for the respondents. A direct question about the difficulty of the task was asked: *did you have difficulty understanding the situations presented?* (In French: *avez-vous eu des difficultés de compréhension des situations qui vous ont été présentées* ?). We obtained the following answers: *No difficulty*: 50.43%; *occasional difficulties*: 40.38%; *frequent difficulties*: 7.10%; *always:* 2.08%.

[redacted]

Situation 1 over 3

Read again the explanations

Please choose the option that you prefer among the two given in the table below (Option A or Option B).

	Option A	Option B
Extension of lockdown	No extension	For three weeks
Wearing mask	 Mandatory every time	 Non mandatory
Bar and restaurant closed	 Until mid June	 All summer
Daily public transportation (urban and regional)	 Normal	 Reduced but adapted to working hours
Vacation and leisure travels	 Limited to metropolitan France	 Limited to 100km from home
Digital tracking	 No implementation	 Implementation with free participation
Financial compensation	 500€	 1500€
Your choice	○	○

Next

Figure 1: Screenshot of the decision screen

Statistical analysis: based on the random utility theory[v], the determinants of the 3462 binary choices (3 propositions x 1154 respondents) can be studied using a statistical model. After testing for various specifications, we estimated our model using the following functional form:

$$X'\beta = \beta_1(EXTD\_LOCKDOWN)^2 + \beta_2 MASK\_PUBLIC + \beta_3 MASK\_EVERYTIME + \beta_4 RESTO\_SUMMER + \beta_5 TRANSP\_ADAPTED + \beta_6 TRAVEL\_FR + \beta_7 TRAVEL\_100KM + \beta_8 TRACKING + \beta_9 BONUS.$$

The model described above[2] corresponds to a conditional logit and can be estimated by maximum likelihood. The first estimation of this model, made on the general population, has been controlled by some characteristics of the respondents: age, gender, and date of the survey. None of these variables changed the sign -or the magnitude- of the coefficients β.

By carrying out the econometric estimation, we noticed that the best statistical fit for variable $EXTD\_LOCKDOWN$ was a quadratic form. The effect increases more than proportionally with the number of additional weeks of lockdown. For example, when β_1 equals -0.024 for one week (general population strata), it gives a -0.216 for 3 weeks (=-0.024x3^2), and -1.54 for 8 weeks (=-0.024x8^2).

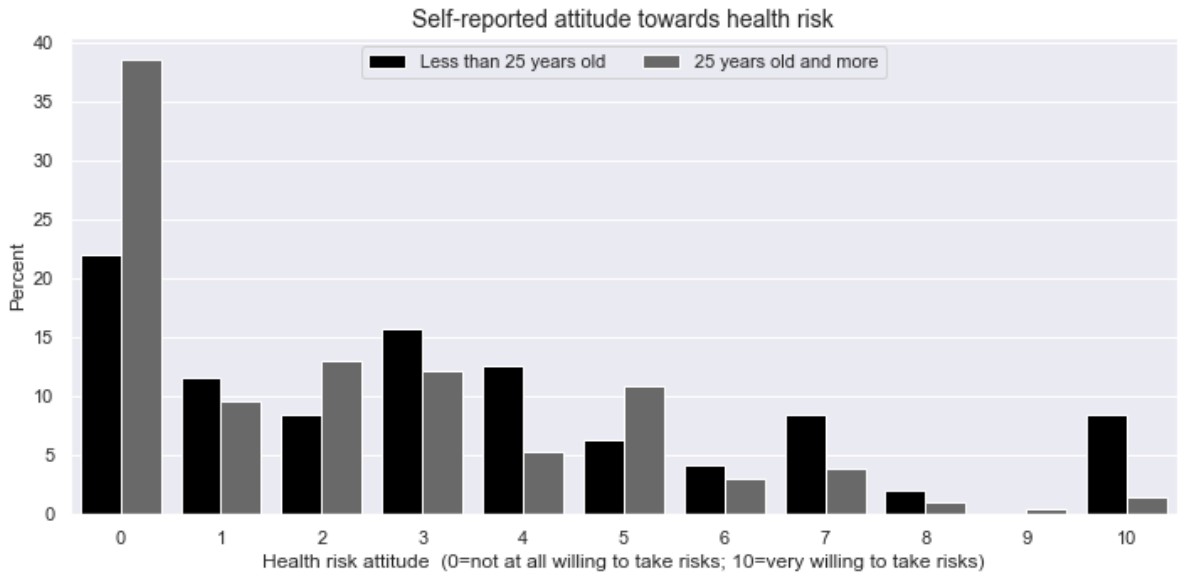
For building the figure, we selected an estimated point at: $EXTD^{-}LOCKDOWN = 8$ (8 additional weeks of lockdown) ; $BONUS = 1000$ (1000 euros of Bonus).

Additional information:

Vulnerability. 'clinically vulnerable' has been documented through the survey by the (self-reported) question: 'do you have an underlying medical condition increasing the risk of severe covid-19 illness' (yes/no, for you, for one member of your household).

Young people and the health risk. In the survey, we documented the willingness to take risk in the health domain**.** Young people have different risk perceptions (p-value < .001)**.**

[2] Variables and labels used in the model : (i) Extended lockdown (EXTD_LOCKDOWN: weeks of additional lockdown); (ii) Mask (MASK_PUBLIC and MASK_EVERYTIME, the reference category is NO MASK); (iii) Bar, restaurants and festive venues (dummy RESTO_SUMMER); (iv) Public transportation adapted to work-hours (dummy TRANSP_ADAPTED); (v) Leisure travels (TRAVEL_FR and TRAVEL_100KM, the reference category is NO restriction); (vi) Digital tracking with free participation (dummy TRACKING) ; and (vii) Monetary bonus (BONUS). After a series of alternative specifications, we retain the case where EXTD_LOCKDOWN (squared) and BONUS are considered as continuous variables.



Graph 2: Willingness to take risk by age-groups (health domain)

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