

## German measles vaccine mandate - reactions among affected individuals (#46111)

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### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

### 2) What's the main question being asked or hypothesis being tested in this study?

H1: Higher reactance to the measles mandate decreases uptake of other vaccines and the intention to vaccinate.

H2: Lower education (a), lower income (b) is a risk factor for less knowledge about measles mandate/ measles vaccine.

H3: Individuals with lower institutional trust have more reactance and therefore a more negative attitude towards the measles mandate.

H4: Individuals who are affected by the measles mandate (i.e. parents and respective professional groups) have a higher level of reactance and therefore a more negative attitude towards the mandate than individuals who are not affected (i.e. no children, not in respective professional group).

H5: The level of reactance decreases over time (t1-t3) among those affected while it remains constant and lower at all points in time among individuals who are not affected.

H6: Knowledge about the measles mandate and the measles vaccine increases among affected individuals over time and remains constant among those not affected (t1-t3).

### 3) Describe the key dependent variable(s) specifying how they will be measured.

Vaccination behavior: Participants (with the youngest child < 1 year of age) will be asked whether their youngest child was vaccinated against DTaP-IPV-Hib-HepB (yes, no, don't know). The same question will be asked for the pneumococcal vaccine.

Intention to vaccinate: Intention to vaccinate will be measured for the youngest child ((i) if the child is <1 year of age; (ii) if the child is 1-9 years of age). For (i) participants shall indicate their intention on a scale ranging from definitely not vaccinate (score = 1) to definitely vaccinate (score = 5) for meningococcal C vaccine. For (ii) participants shall indicate their intention for HPV vaccine and Tdap vaccine.

Knowledge on measles vaccine: We will measure knowledge about the measles vaccine with 7 true-false statements. Items were adapted from Zingg & Siegrist 2012. Knowledge scores will be built, ranging from 0 to 7 points.

Knowledge on measles vaccine mandate: We will measure knowledge about the measles protection act with 5 true-false statements. Items were self-developed. Knowledge score will be built, ranging from 0 to 5 points.

Institutional trust: We will measure institutional trust as the mean of 5 items (e.g. trust in government) (Bertelsmann Stiftung 2017) rated on a 5-point Likert-scale ranging from no confidence (score = 1) to very much confidence (score = 5).

Attitude towards measles vaccine mandate: The attitude towards the mandate will be measured with the mean of 5 items (e.g. vaccinating against measles should be mandatory for all schoolchildren and kindergartners) rated on a 5-point Likert-scale ranging from strongly disagree (score = 1) to strongly agree (score = 5). Items were self-developed.

Reactance: Reactance will be measured with the mean of 5 items (e.g. How much does the mandate make you angry?) on a 5-point Likert-scale ranging from not at all (score = 1) to very much (score = 5) (Sittenthaler et al. 2015).

Reliability of institutional trust, attitude towards measles vaccine mandate and reactance will be checked via Cronbach's alpha and for each the mean score will be calculated.

### 4) How many and which conditions will participants be assigned to?

No experimental conditions (survey).

### 5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

H1a: logistic regression

X: reactance to measles mandate

Y1: vaccination status child DTaP-IPV-Hib-HepB (vaccinated/ not vaccinated)

Y2: vaccination status child pneumococcal vaccine (vaccinated/ not vaccinated)

H1b: linear regression

X: reactance to measles mandate

Y1: intention to vaccinate child against HPV

Y2: intention to vaccinate child against tetanus, diphtheria, pertussis

Y3: intention to vaccinate child against meningococcal C disease

H2: ANOVA with post-hoc analysis of contrasts (reference group: low education (H2a) → C1: low vs. middle; C2: low vs. high; low income (H2b) → C1: low vs. middle; C2: low vs. high)

X (H2a): education (low, middle high) (highest level of education; ISCED/CASMIN)

X (H2b): income (low, middle, high) (equivalised disposable income, terciles)

Y1: knowledge on measles mandate

Y2: knowledge on measles vaccine

H3 + H4: PROCESS Macro (Hayes, 2013), Model 4 (mediation expected)

X (H3): institutional trust

X (H4): target group (affected vs. not affected individuals)

M: reactance to measles mandate

Y: attitude to measles mandate

H5: linear regression, interaction X\*Z

X: time (t1, t2, t3)

Z: target group (affected vs. not affected individuals)

Y: reactance to measles mandate

H6: linear regression, interaction X\*Z

X: time (t1, t2, t3)

Z: target groups (affected vs. not affected individuals)

Y1: knowledge on measles mandate

Y2: knowledge on measles vaccine

All analysis will be repeated controlling for: age, gender, region [and number of children where applicable]. Pattern of results will be compared to models without control variables. 95% Confidence Intervals will be used to assess significance of results (alpha 5%).

#### 6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

Exclusion of...

a) participants who do not match our target groups (e.g. age < 18, screened out by program)

b) participants who do not complete the full study (screened out by program)

We will use three (one question each measurement point) attention check questions (Berinsky et al., 2014). We will not exclude participants based on attention but stratify results by attention and discuss substantial differences.

#### 7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

The study will have 3 waves (T1 to T3) in 2020 and another 3 waves planned for 2021 (T4 to T6, depending on available funds). As small effects may matter as they are relevant on population level, we chose a large sample size to also detect small effects. Considering up to 35 % drop out (T1 to T2, T2 to T3), we estimated a sample size of N = 3.000 (n = 1.000 for each target group) at T3, resulting in N = 6.600 at T1.

#### 8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We are interested in certain psychological drivers of behavior and their changes over time, also considering the influence of the concurrent COVID-19 pandemic. These are:

- attitude towards mandatory vaccination policy (measles) and other possible mandatory vaccination laws

- risk perception (measles)

- institutional trust

- 5C (Betsch et al. 2018)

Further on we will include questions on a potential COVID-19 vaccine and vaccination myths around the measles mandate. Analysis will be explorative.

(1) COVID-19: vaccination intention, vaccination behavior, risk perception, 5C

(2) common myths (mandatory vaccination policy: qualitative evaluation)

Sample: The sample will be German speaking and aged 18 plus. All materials will be in German. Participants will be recruited via panel.

