Subjective Assessment of COVID-19 Risks in Japan: The Role of Media Sources

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Research purposes

- Understand how Japanese people perceive the risks of infection and fatality of COVID-19
- Explore the role of information sources in shaping their risk perceptions

What we do

- We conduct a large-scale survey in February 2023 to investigate the subjective assessments of COVID-19 risks in Japan.
- We compare perceived risks with actual ones and evaluate the extent of overestimation or underestimation.
- We apply multivariate logistic regressions to examine how information sources are linked to the perception (overestimation or underestimation) of COVID-19 risks.
  - Content and tone variations in COVID-19 reporting can lead to systematic variation in people's overall assessment of COVID-19.

Key results

- Notable differences in risk perception across media preferences
- Infection risk:
  - Readers of the Asahi newspaper are more likely to overestimate the risk of infection and less likely to underestimate it compared to others.
- Fatality risk:
  - Viewers of NHK-TV and TBS-TV, as well as readers of the Asahi newspaper are more inclined to overestimate fatality risk and less inclined to underestimate fatality risk than others.
  - Viewers of Fuji-TV and Asahi-TV and readers of the Yomiuri newspaper tend to overestimate fatality risk more than others.

Literature

- COVID-19 risk perceptions
  - Japan: Adachi et al. (2022), Sato et al. (2023)
  - Other countries: Cipolletta et al. (2022), Dryhurst et al. (2020), Dyer et al. (2022), Savadori & Lauriola (2022), Wise et al. (2020), etc.
- Few studies compare the perceived and actual risks
  - Abel et al. (2021), Akesson et al. (2022), Graso (2022)
- Media sources, usage behavior and COVID-19 risk perception
  - Adachi et al. (2022), Gollust et al. (2020), Huynh et al. (2020), Vai et al. (2020)

➢ Limited knowledge on risk perceptions in the post-pandemic stage, and/or the role of information sources

Design of the survey

- Country: Japan
- Period: February 22 to February 27, 2023.
- Target: Men and women aged 20 and older nationwide
- Number of valid responses: 40,000
- Nationally representative: Distributions in age, gender, and place of residence was matched to those in the 2020 Population Census
- Ethics approval number (University of Tokyo): 22-388

Survey questions - Perception of COVID-19 risks

- We inquired about:
  - Subjective probability of contracting COVID-19 within the next month
  - Subjective probability of fatality if infected within the next month
  - Response options: (1) less than 0.001%, (2) 0.001% – 0.01%, (3) 0.01% – 0.1%, (4) 0.1% – 1%, (5) 1% – 5%, (6) 5% – 10%, (7) 10% – 20%, (8) 20% – 50%, and (9) 50% or higher

Survey questions (cont.) – Individual characteristics

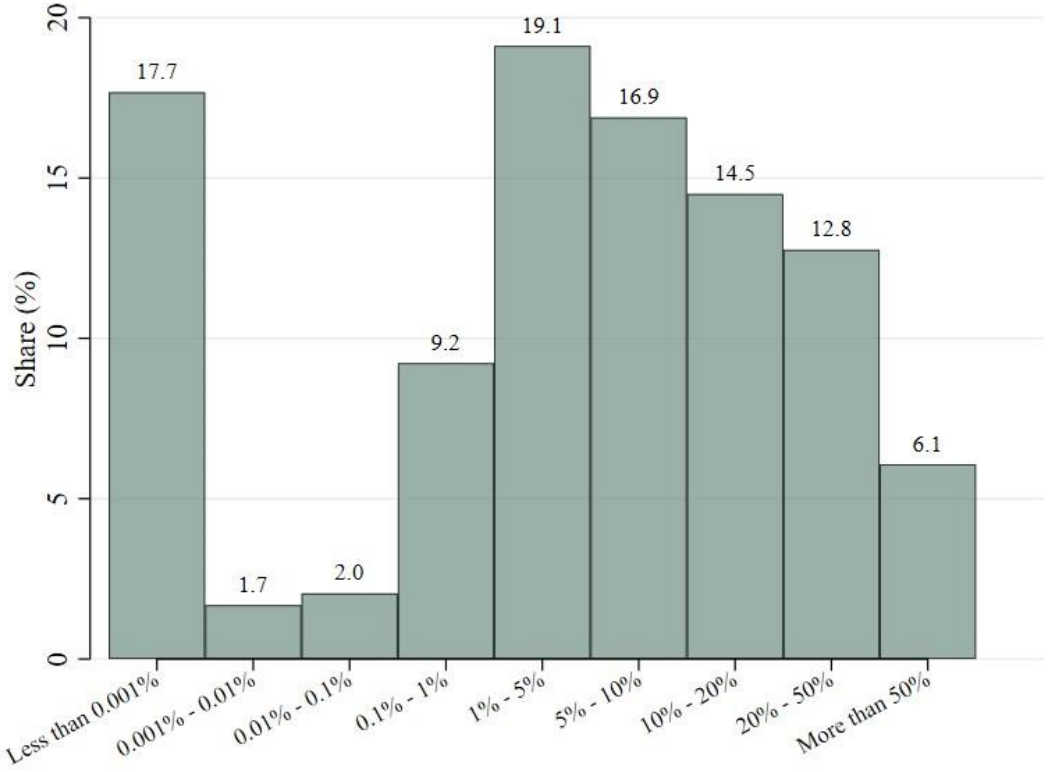
- Basic information: age, gender, place of residence, education level, income class
- Attributions:
  - Male: 48.0%, Female: 52.0%;
  - Age groups: 20s-30s: 24.4%, 40s-50s: 33.5%, Over 60s: 42.1%
- Household structure (living arrangement with spouse/partner, elderly members, children)
- Health situation: smoking habits, medical history of chronic diseases
- COVID-19-related experiences: vaccination status, number of past infections, acquaintances' COVID-19-related deaths
- Primary media source (e.g., television, newspaper, internet, SNS, or others)

Calculation of actual risks

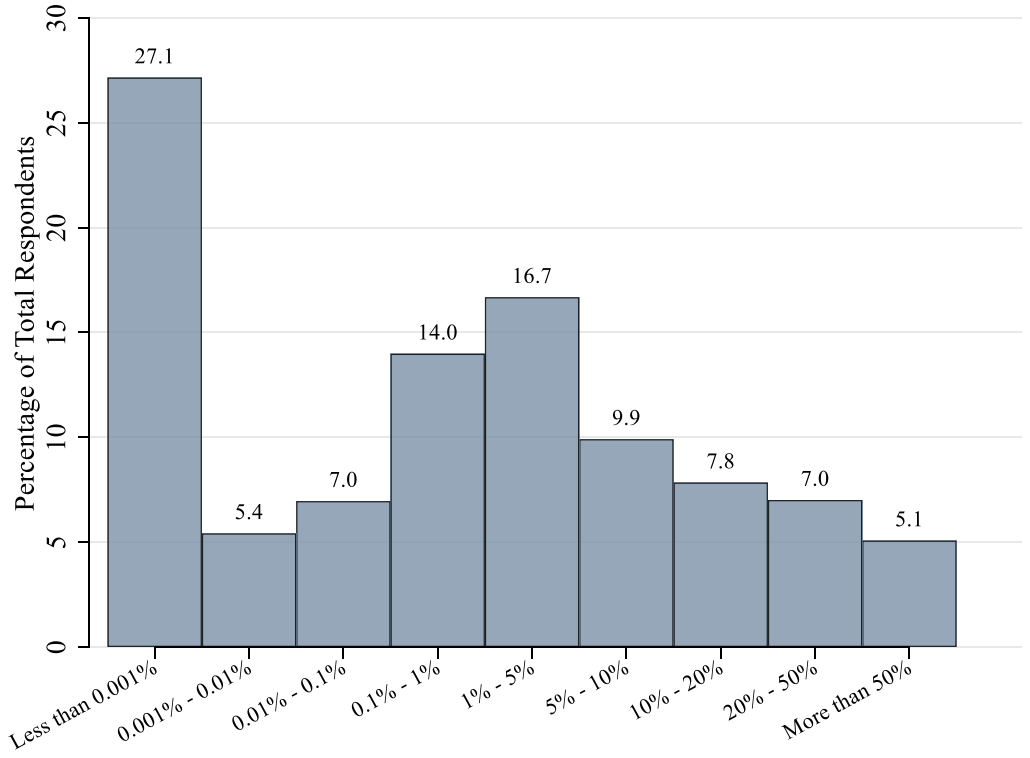
- Data sources:
  - Population of Japan – Statistics Bureau of Japan
  - Newly confirmed and death cases – Ministry of Health, Labour and Welfare
- Actual risks:
  - Infection risk: 0.20% (Period: February 24 – March 23, 2023)
  - Fatality risk: 0.24% (Period: November 1, 2022 – February 28, 2023 (eighth wave of COVID-19)

Risk perception toward COVID-19 in February 2023

Infection Risk



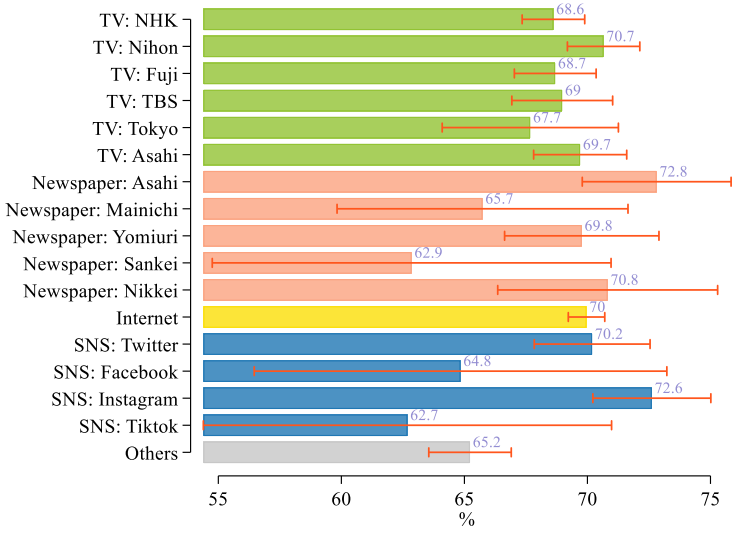
Fatality Risk



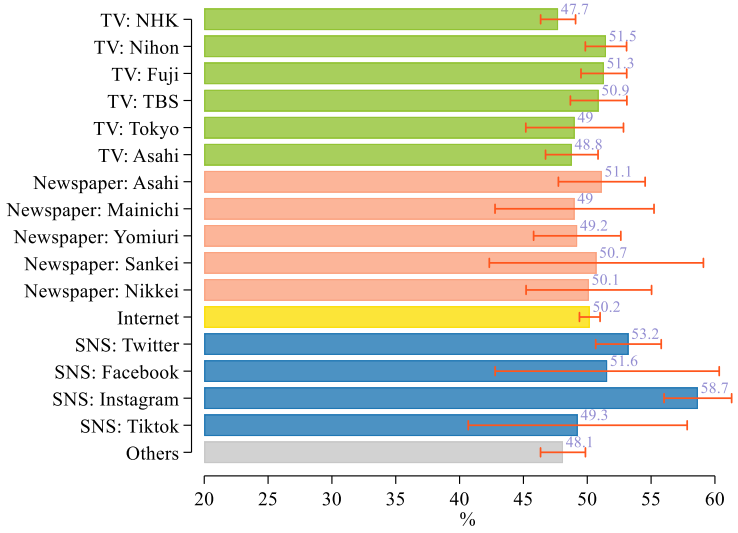
Note: N(Full Sample) = 40,000.

Information sources and infection risk perception: Overestimation

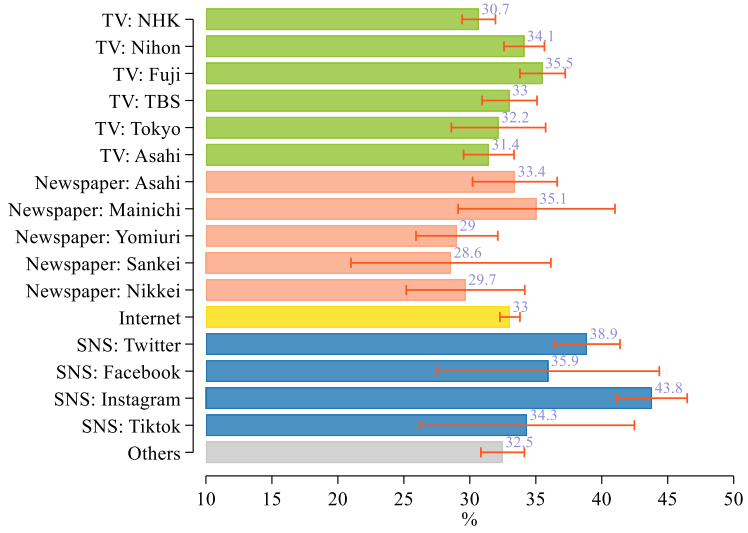
Infection Risk Over 1%



Infection Risk Over 5%

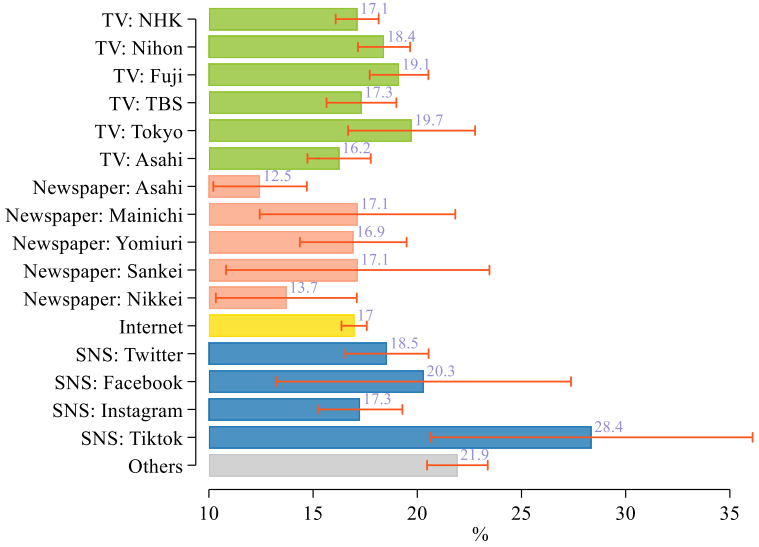


Infection Risk Over 10%

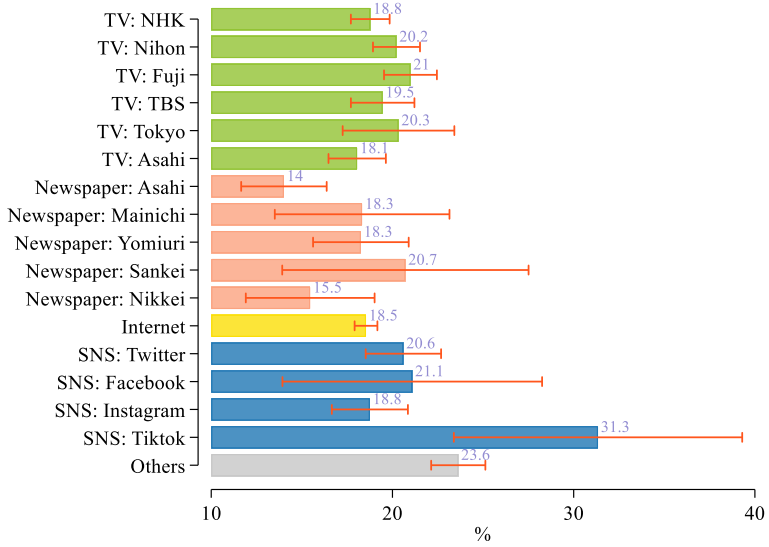


Information sources and infection risk perception: Underestimation

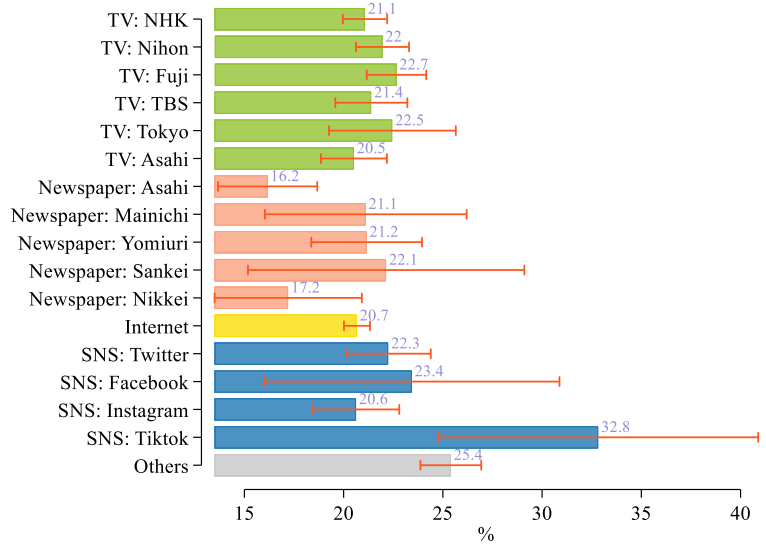
Infection Risk Under 0.001%



Infection Risk Under 0.01%

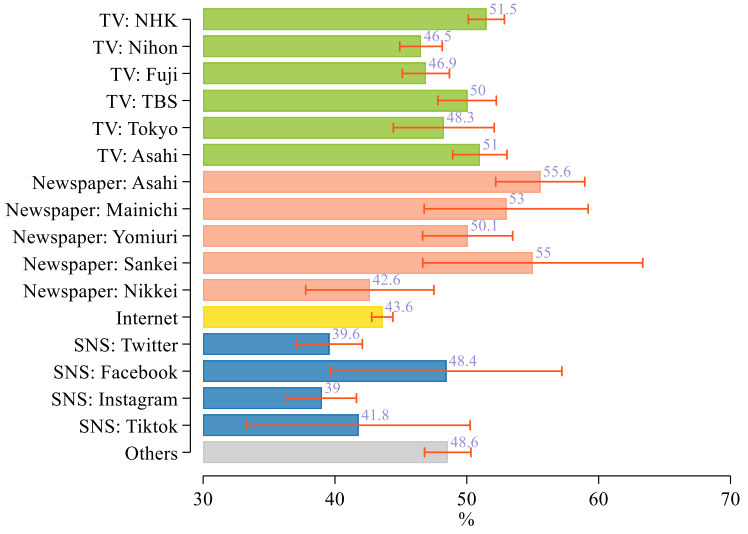


Infection Risk Under 0.1%

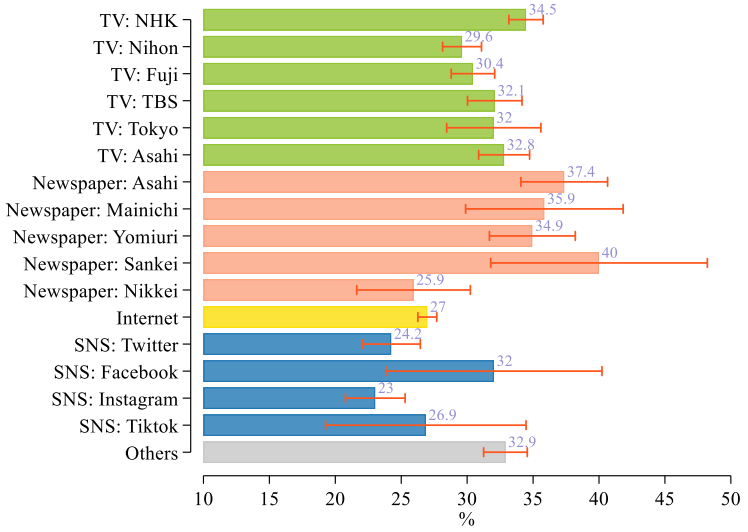


Information sources and fatality risk perception: Overestimation

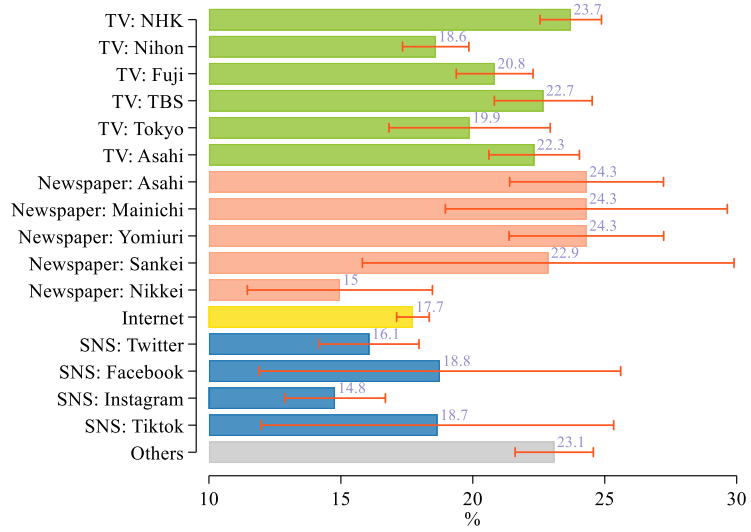
Fatality Risk Over 1%



Fatality Risk Over 5%

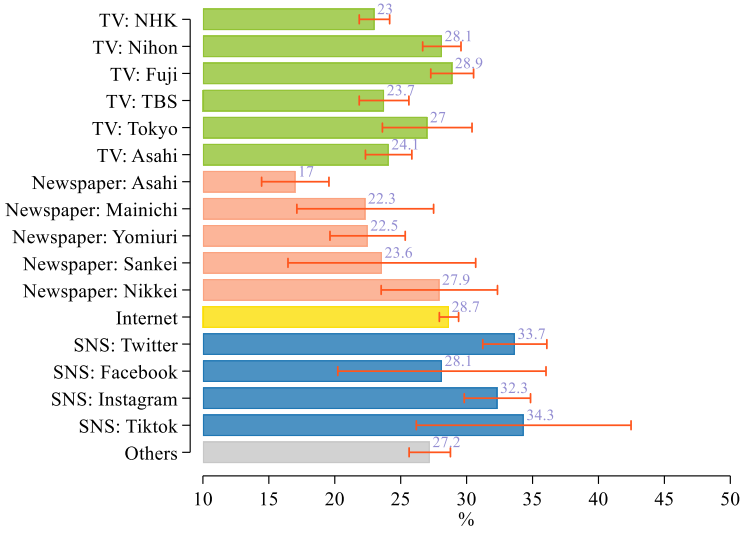


Fatality Risk Over 10%

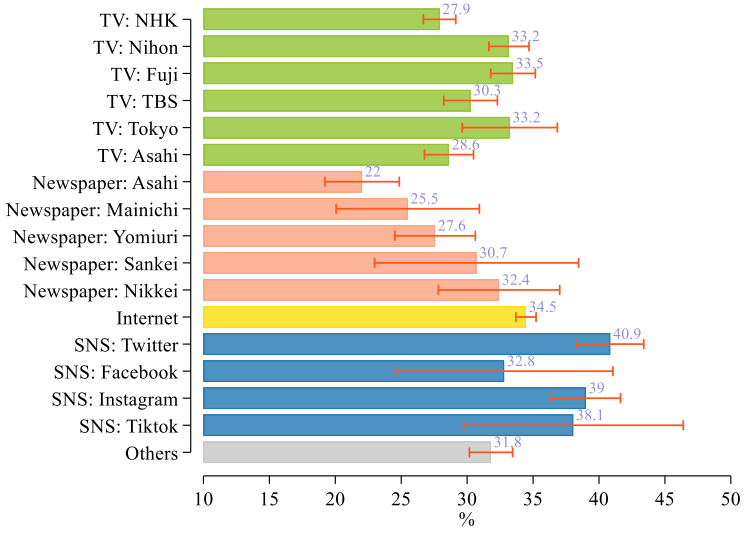


Information sources and fatality risk perception: Underestimation

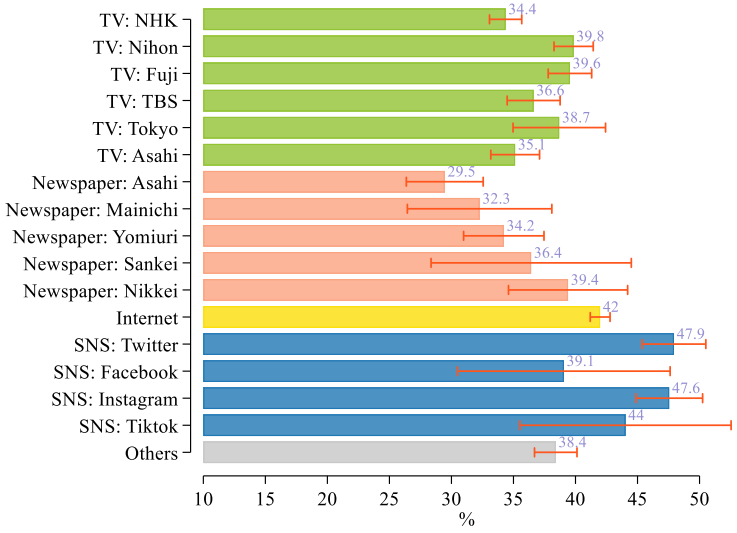
Fatality Risk Under 0.001%



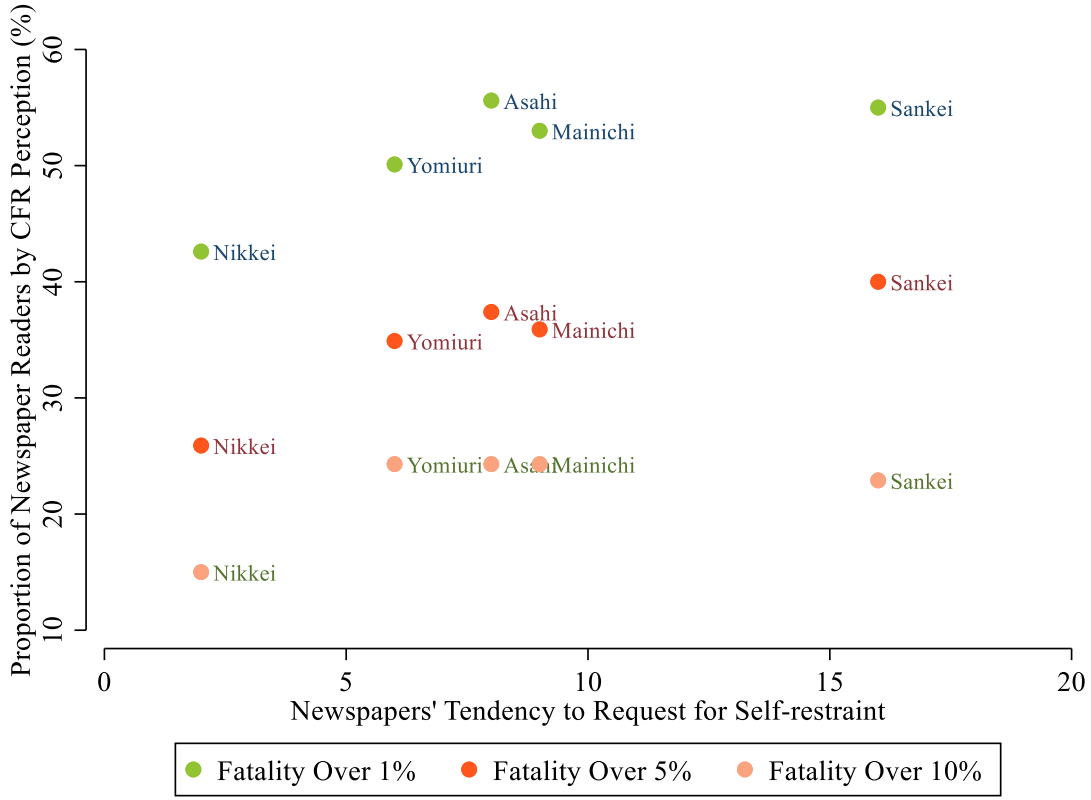
Fatality Risk Under 0.01%



Fatality Risk Under 0.1%



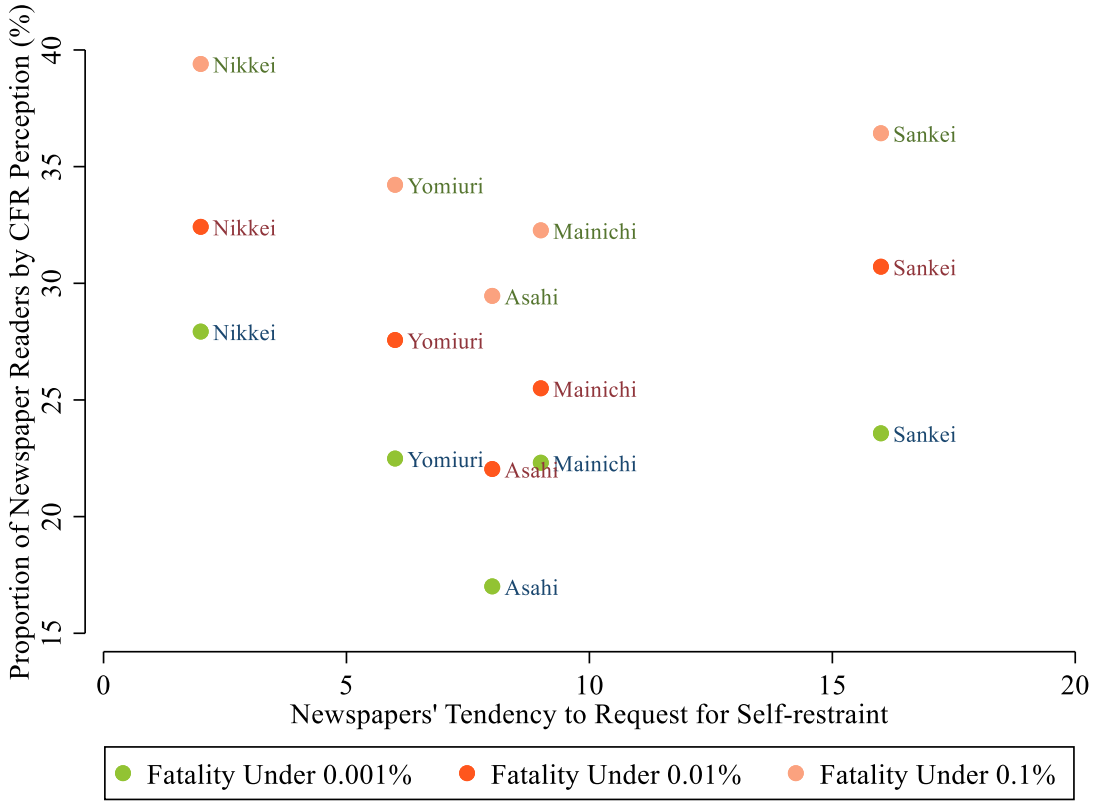
Fatality risk perception and newspapers' attitude toward COVID-19: Overestimation



Note:

- Vertical axis: Proportion of newspaper readers who perceived the CFR above 1%, 5%, or 10%.
- Horizontal axis: Newspaper's intensity to urge readers to practice self-restraint and preventive measures, computed using data on media-driven evocation published by Sugawara et al. (2021)

Fatality risk perception and newspapers' attitude toward COVID-19: Underestimation



Note:

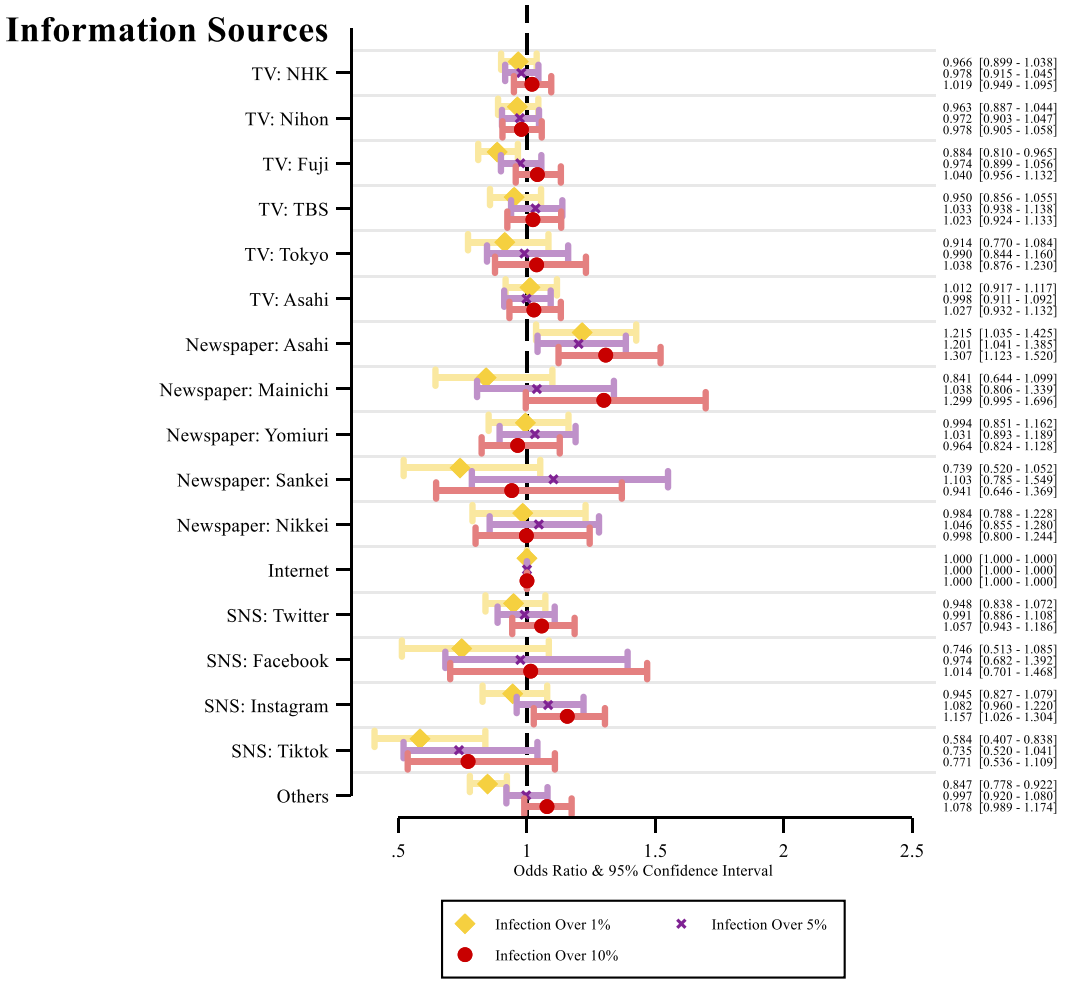
- Vertical axis: Proportion of newspaper readers who perceived the CFR below 0.001%, 0.01%, or 0.1%.
- Horizontal axis: Newspaper's intensity to urge readers to practice self-restraint and preventive measures, computed using data on media-driven evocation published by Sugawara et al. (2021)

Multivariate Analysis

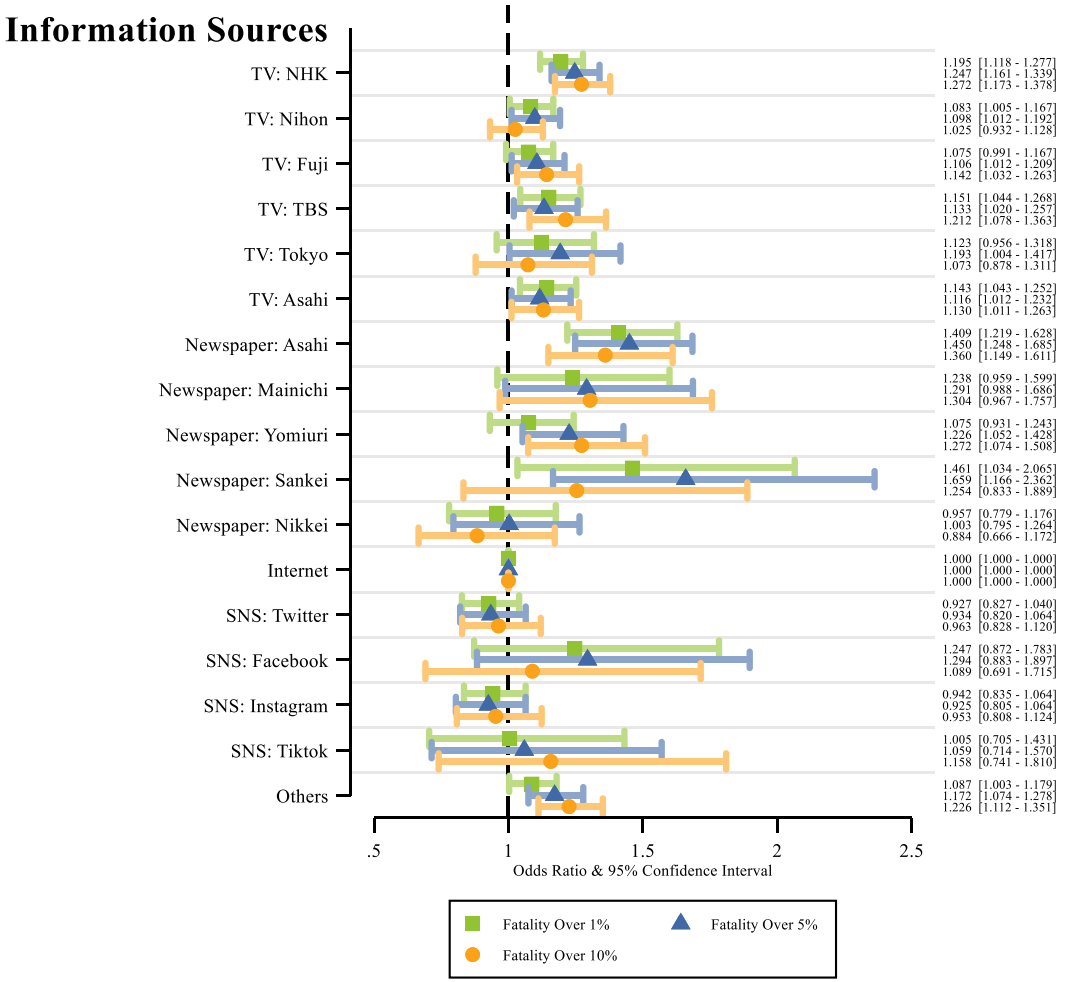
- Model: Logistic regression
- Outcome variables:
  - *Infection (Fatality) Over 1%, 5%, 10%*: equals 1 if the subjective risk of infection (fatality) is equal to or higher than 1%, 5% or 10%.
  - *Infection (Fatality) Under 0.001%, 0.01%, 0.1%*: equals 1 if the subjective risk of infection (fatality) is less than 0.001%, 0.01%, or 0.1%.
- Independent variables:
  - Primary media source: the source of media the respondent refers to the most
- Covariates:
  - Demographic factors (education, income, age group, gender, household structure)
  - Vaccination status, health situation
  - Proxies for COVID-19 related experiences (*Infected with COVID-19* and *Acquaintances Died of COVID-19*)
  - Prefecture fixed effects

Determinants of risk overestimation – Logistic regression

Infection Risk



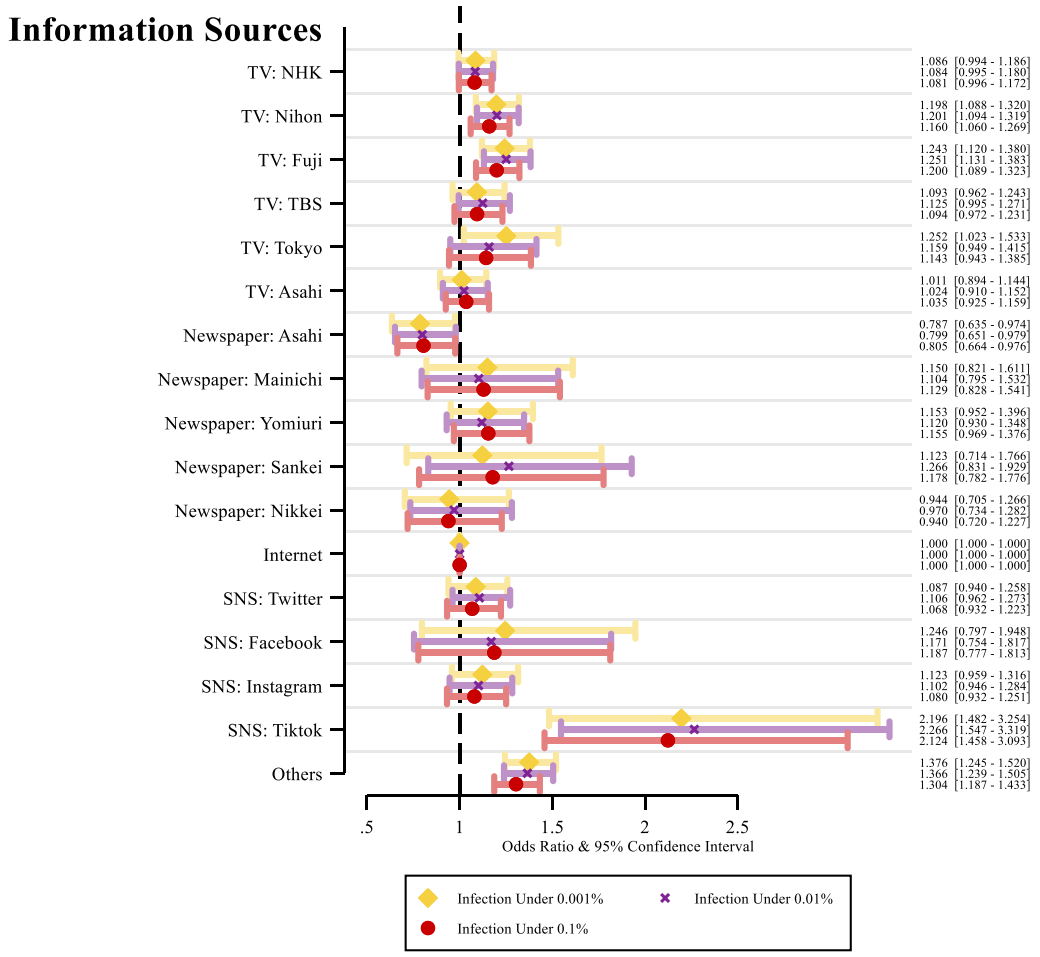
Fatality Risk



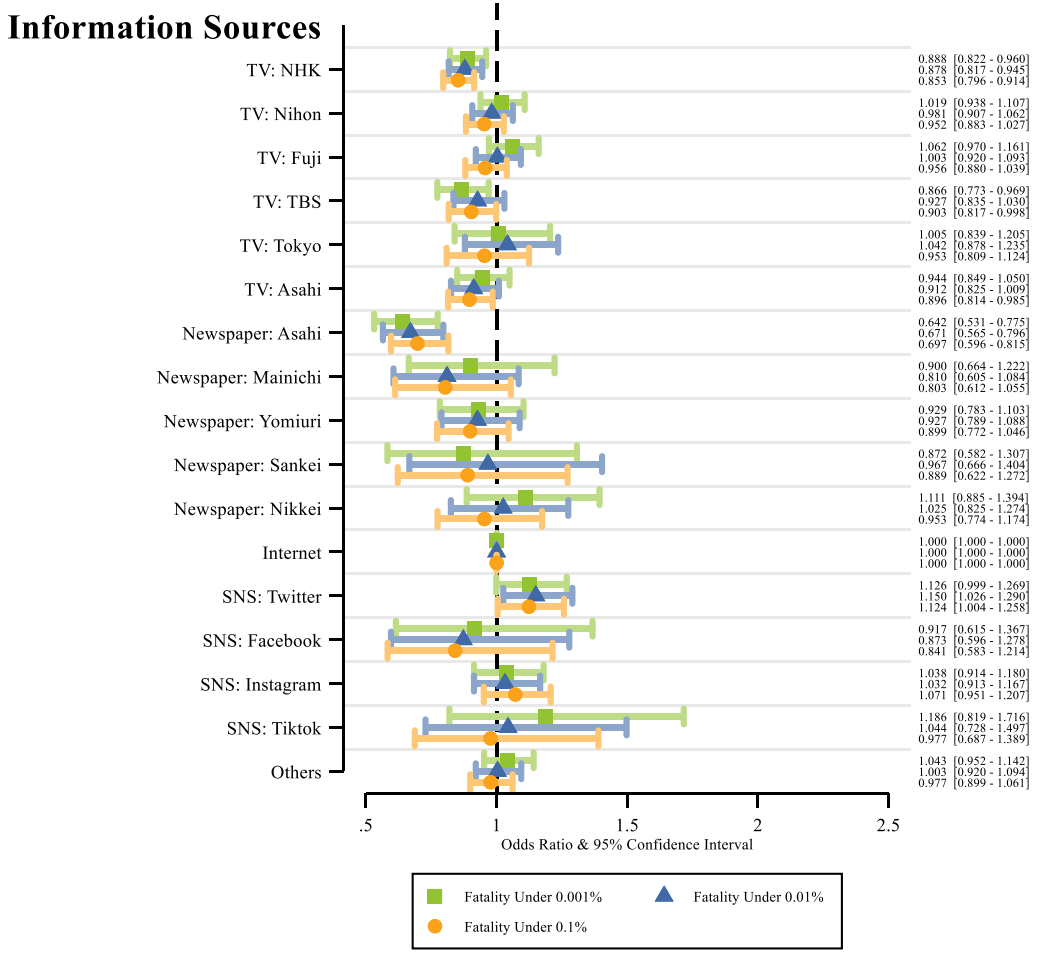
Note: N = 40,000. In the regressions, we also control for individual characteristics and prefecture fixed effects.

Determinants of risk underestimation – Logistic regression

Infection Risk



Fatality Risk



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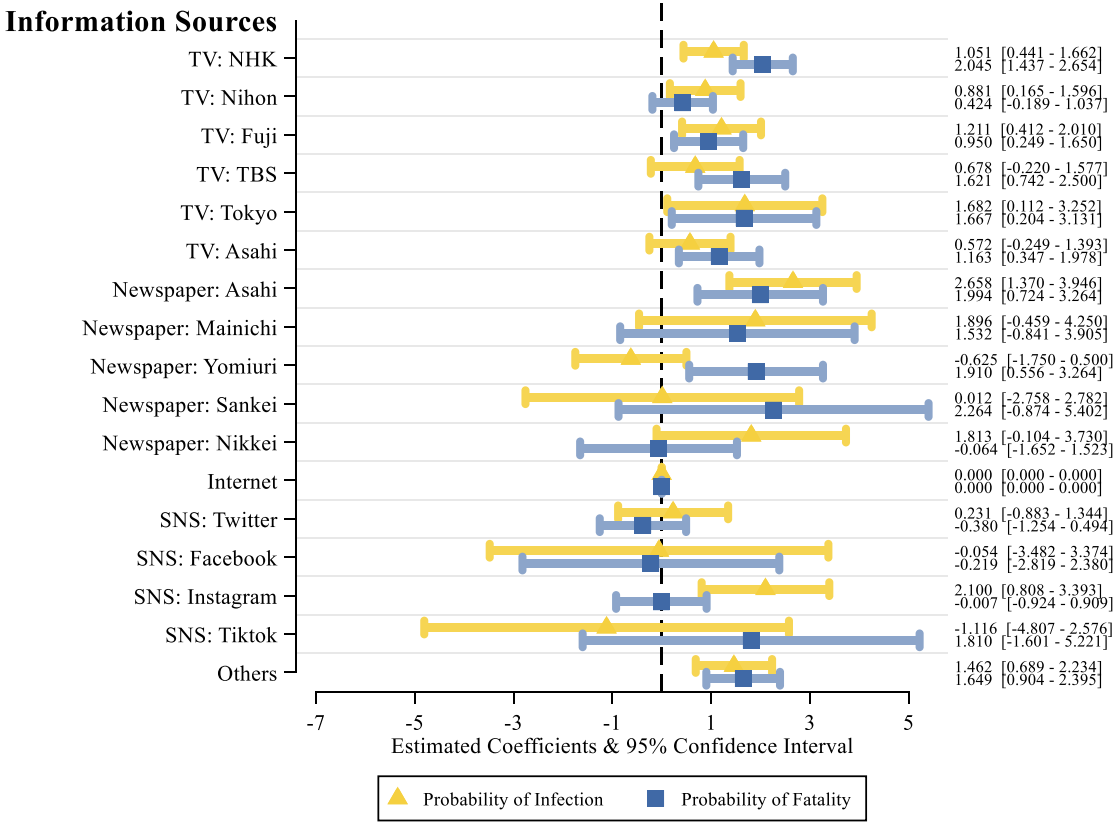
Robustness - Linear Regression



Note: The outcome variables are continuous.

- *Probability of Infection* (or *Fatality*): the midpoints in responses about subjective risks.
- Example: A participant rated the infection risk to be 50% or higher → the *Probability of Infection* would be 75%.
- In the regressions, we also control for individual characteristics and prefecture fixed effects.

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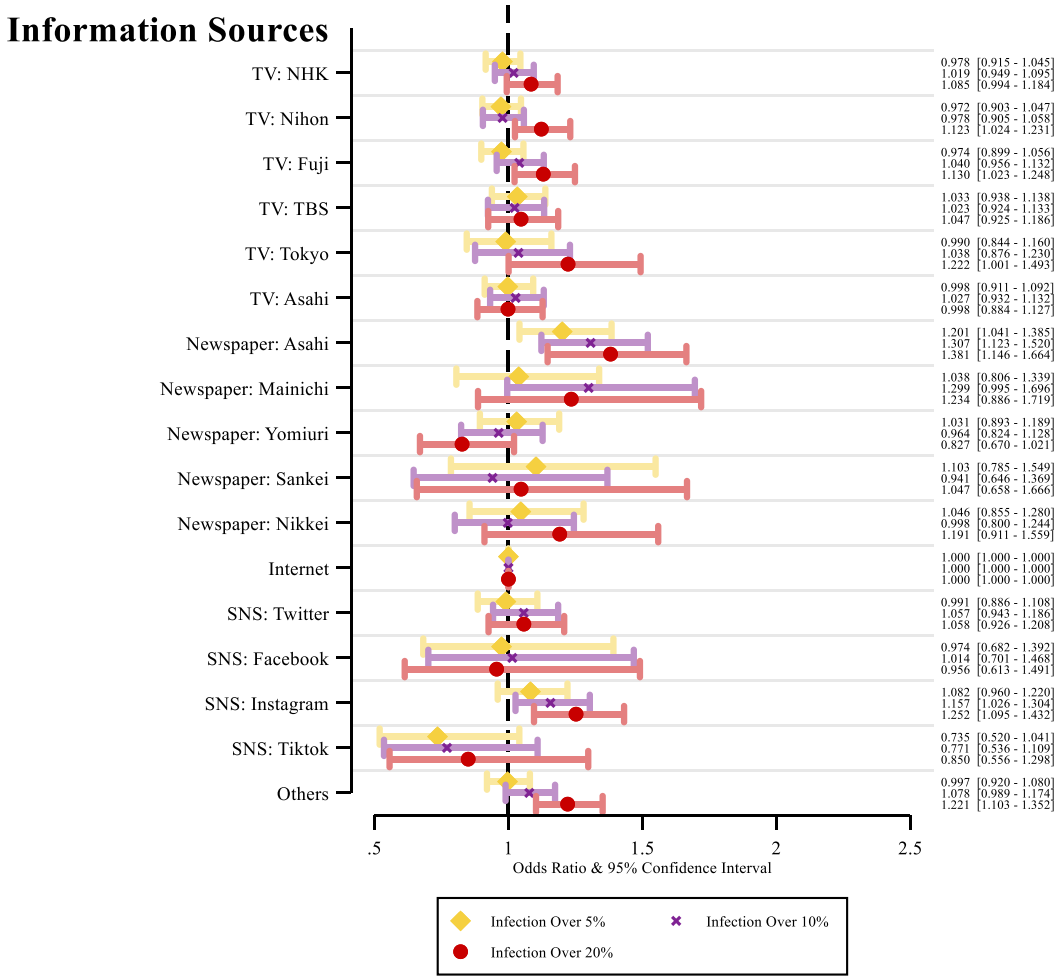
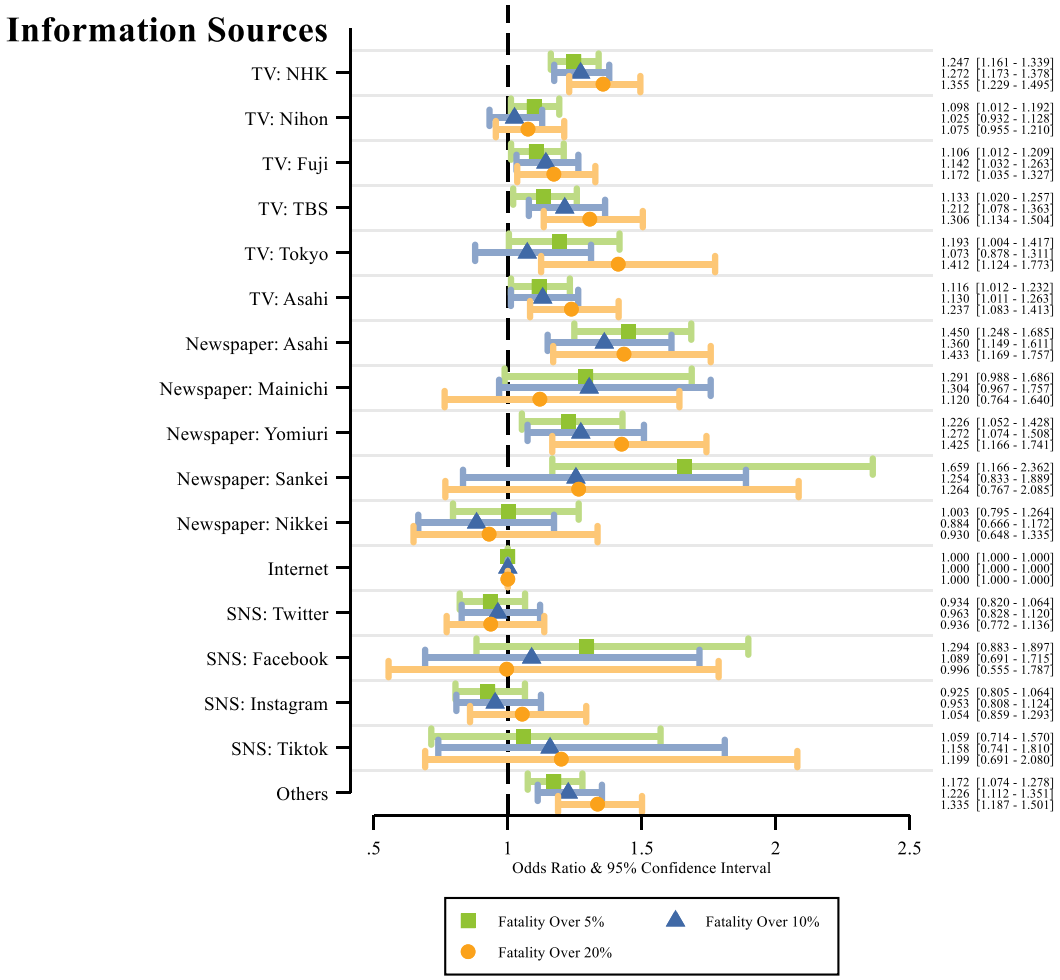
Appendix

Determinants of risk overestimation – Logistic regression

Infection Risk



Fatality Risk



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