# Association of COVID-19 Risk Misperceptions with Household Isolation in the United States

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# Association of COVID-19 Risk Misperceptions with Household Isolation in the United States

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## *Abstract*

**Background:** Adverse mental and emotional health outcomes are increasingly recognized as a public health challenge associated with the coronavirus disease 2019 (COVID-19) pandemic. As early as March 2020, a national survey reported that 36% of U.S. adults felt the pandemic would have a serious impact on their mental health. In April 2020, another survey found that 14% of U.S. adults reported serious psychological distress, compared to 4% during a similar time period in 2018. Rates of loneliness have also been high, with 36% of U.S. adults—including 61% of adults aged 18-25—reporting significant loneliness in an October 2020 survey. More recently, a March 2021 survey found that 48% of adults reported higher levels of stress in their lives compared to before the pandemic, and 61% reporting undesired weight changes.

This health sequelae of the COVID-19 pandemic are multifactorial, and social isolation is likely an important contributor. Because of physical distancing mandates, quarantines, and fear of illness, a substantial proportion of Americans have limited their physical contact with others outside of their household. This trend has likely contributed to social isolation and loneliness. Household isolation is analogous to quarantining, and research has shown that quarantining is a risk factor for a variety of adverse mental and emotional health outcomes. These include increased stress, anxiety, depression, fear, and detachment from other people.

The Centers for Disease Control and Prevention (CDC) recently recommended that researchers examine drivers of adverse mental health during COVID-19 pandemic. One driver that has received little attention is the role that COVID-19 risk misperceptions may play in the behavioral decision to limit physical contact with others. While COVID-19 risk perceptions have been associated with protective health behaviors, they may lead to suboptimal behavioral choices, if individuals substantially overestimate or underestimate risk. Overestimation, in particular, is of concern in the context of mental and emotional health and well-being because it tends to amplify social isolation and reduce contact with others. Using survey data from the Franklin Templeton-Gallup Economics of Recovery Study, we assessed the association of COVID-19 risk misperceptions with household isolation. Our findings are relevant to policy measures to reduce COVID-19-related social isolation and may inform the management of future epidemics and pandemics.

**Objective:** To examine the association of COVID-19 risk misperceptions with household isolation, a potential risk factor for social isolation and loneliness.

**Methods:** We analyzed data from the Franklin Templeton-Gallup Economics of Recovery Study (July 2020-December 2020) of 24,649 U.S. adults. We also analyzed data from the Gallup Panel (March 2020-February 2021) which included 123,516 observations about loneliness. Primary outcome was household isolation, which we defined as a respondent reporting having no contact or very little contact with people outside their household, analogous to quarantining.

**Results:** From July-December 2020, 53% to 57% of respondents reported living in household isolation. Most participants reported beliefs about COVID-19 health risks that were inaccurate, and overestimation of health risk was most common. For example, while deaths in persons younger than 55 years-old accounted for 7% of total U.S. deaths, respondents estimated that this population represented 43% of deaths. Overestimating COVID-19 health risks was associated with increased likelihood of household isolation, from 7.7 percentage points in July/August ($P<0.001$) to 11.8 percentage points in December ($P<0.001$). Characteristics associated with household isolation from the July/August 2020 survey and persisting in the December 2020 survey included younger age (18 to 39 years), having a serious medical condition, having a household member with a serious

medical condition, and identifying as a Democrat. In the Gallup Panel, living in household isolation was associated with a higher prevalence of loneliness.

**Conclusions:** Pandemic-related harms to emotional and mental well-being may be attenuated by reducing risk overestimation and household isolation preferences that exceed public health guidelines.

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# Original Manuscript

# Association of COVID-19 Risk Misperceptions with Household Isolation in the United States

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## ABSTRACT

**Objective**-To examine the association of COVID-19 risk misperceptions with household isolation, a potential risk factor for social isolation and loneliness.

**Methods**-We analyzed data from the Franklin Templeton-Gallup Economics of Recovery Study (July 2020-December 2020) of 24,649 U.S. adults. We also analyzed data from the Gallup Panel (March 2020-February 2021) which included 123,516 observations about loneliness. Primary outcome was household isolation, which we defined as a respondent reporting having no contact or very little contact with people outside their household, analogous to quarantining.

**Results**- From July-December 2020, 53% to 57% of respondents reported living in household isolation. Most participants reported beliefs about COVID-19 health risks that were inaccurate, and overestimation of health risk was most common. For example, while deaths in persons younger than 55 years-old accounted for 7% of total U.S. deaths, respondents estimated that this population represented 43% of deaths. Overestimating COVID-19 health risks was associated with increased likelihood of household isolation, from 7.7 percentage points in July/August (P<0.001) to 11.8 percentage points in December (P<0.001). Characteristics associated with household isolation from the July/August 2020 survey and persisting in the December 2020 survey included younger age (18 to 39 years), having a serious medical condition, having a household member with a serious medical condition, and identifying as a Democrat. In the Gallup Panel, living in household isolation was associated with a higher prevalence of loneliness.

**Conclusions**-Pandemic-related harms to emotional and mental well-being may be attenuated by reducing risk overestimation and household isolation preferences that exceed public health guidelines.

## INTRODUCTION

Adverse mental and emotional health outcomes are increasingly recognized as a public health challenge associated with the coronavirus disease 2019 (COVID-19) pandemic. As early as March 2020, a national survey reported that 36% of U.S. adults felt the pandemic would have a serious impact on their mental health.(1) In April 2020, another survey found that 14% of U.S. adults reported serious psychological distress, compared to 4% during a similar time period in 2018.(2) Rates of loneliness have also been high, with 36% of U.S. adults—including 61% of adults aged 18-25—reporting significant loneliness in an October 2020 survey.(3) More recently, a March 2021 survey found that 48% of adults reported higher levels of stress in their lives compared to before the pandemic, and 61% reporting undesired weight changes.(4)

These health sequalae of the COVID-19 pandemic are multifactorial, and social isolation is likely an important contributor.(5,6) Because of physical distancing mandates, quarantines, and fear of illness, a substantial proportion of Americans have limited their physical contact with others outside of their household. This trend has likely contributed to social isolation and loneliness. Household isolation is analogous to quarantining, and research has shown that quarantining is a risk factor for a variety of adverse mental and emotional health outcomes. These include increased stress, anxiety, depression, fear, and detachment from other people.(5,7)

The Centers for Disease Control and Prevention (CDC) recently recommended that researchers examine drivers of adverse mental health during COVID-19 pandemic.(8) One driver that has received little attention is the role that COVID-19 risk misperceptions may play in the behavioral decision to limit physical contact with others. While COVID-19 risk perceptions have been associated with protective health behaviors,(9) they may lead to suboptimal behavioral choices, if individuals substantially overestimate or underestimate risk.(10,11) Overestimation, in particular, is of concern in the context of mental and emotional health and well-being because it tends to amplify social isolation and reduce contact with others. Using survey data from the Franklin

Templeton-Gallup Economics of Recovery Study, we assessed the association of COVID-19 risk misperceptions with household isolation. Our findings are relevant to policy measures to reduce COVID-19-related social isolation and may inform the management of future epidemics and pandemics.

## METHODS

### Data

We used data from the Franklin Templeton-Gallup Economic of Recovery Study, a self-administered web survey from an opt-in sample provided by Dynata of 24,649 U.S. adults, aged 18 and older, of whom 10,419 participated during more than one survey time point. The survey was conducted July 2-14, August 3-11, September 4-13, October 1-9, November 2-6, and December 1-7, 2020. Gallup weighted the obtained sample to correct for nonresponse and construct a nationally representative population. Nonresponse adjustments were made by adjusting the sample to match the national demographics of gender, age, race/ethnicity, region, education level, marital status and employment status. Demographic weighting targets were based on the Census Bureau's 2018 data release of the American Community Survey and the Current Population Survey (February 2020).

We also supplemented this survey with data from the Gallup Panel, a research panel that is representative of the U.S. adult population and includes approximately 100,000 members. Gallup fielded the COVID Tracking Survey on March 13, 2020 and collected approximately 1,000 responses daily until April 26, 2020, when the sample declined to approximately 500 responses daily. The Gallup Panel's COVID Tracking Survey includes information about household isolation and self-reported loneliness, with 123,516 observations from March 24, 2020 to Feb 21, 2021. This study was exempt from institutional review board review according to policies of the UCLA Office of the Human Research Protection Program.

### Primary Measures

We assessed household isolation by asking participants about the degree of in-person contact

outside their household they had over the past 24 hours. We considered a participant to be isolated if they reported being “completely isolated” (no contact) or “mostly isolated” (very little contact) from people outside their household. We assessed loneliness in the Gallup Panel survey by asking participants, “Did you experience the following feelings during a lot of the day yesterday?” Loneliness and other emotional experiences were included as response options. The specific questions and respondent options are provided in the **Appendix**.

Perceptions of COVID-19 Health Risks

We evaluated perceptions of COVID-19 health risks using multiple questions. In July and August, respondents were asked about the percentage of all U.S. COVID-19 deaths that fell into the following age strata: age 24 and below, age 25-34, age 35-44, age 45-54, age 55-64, and age 65 and older. We assessed misperceptions using the reported proportion of deaths attributable to persons under the age of 55 because most deaths from COVID-19 have occurred in persons older than 55. Perceptions about age-related COVID-19 health risks were assessed in September and October 2020 with an analogous question about the age distribution of COVID-19 hospitalizations.

In the November 2020 survey, respondents were asked what percentage of patients hospitalized with COVID-19 died. In the December 2020 survey, respondents were asked what percentage of patients infected with COVID-19 required hospitalization.

Estimation of Actual COVID-19 Health Risks

CDC data was used to estimate the proportion of deaths from COVID-19 by age. Data from the COVID-19-Associated Hospitalization Surveillance Network (COVID-NET) was used to estimate hospitalizations by age.(12) Because COVID-NET data on hospitalizations were reported using different age strata than those provided to survey respondents, we adjusted these data using simple proportional methods. Specifically, we multiplied hospitalizations reported in COVID-NET by the proportion of years in a corresponding age stratum in order to recategorize hospitalizations into different age strata. The likelihood of hospitalization after infection was estimated to be

approximately 5% as reported by Reese and colleagues from the CDC estimate that there were 52.9 million infections from February to September 2020 and 2.4 million hospitalizations, implying a hospitalization rate of 4.5%.(13) Their method accounted for underreporting. We estimated the likelihood of death among patients hospitalized for COVID-19 to be 12% based on an analysis of 38,517 hospitalized patients from January 1, 2020 to June 30, 2020.(14)

Other Measures

In each wave, survey respondents were asked whether they or a household member had a comorbidity that increased the risk of severe COVID-19 illness. Respondents also reported sociodemographic characteristics, household income, and preferences for political parties. Per capita deaths from COVID-19 in each U.S. county from March 1 until December 1 were assessed using CDC data.

Analyses of Survey Data

Descriptive analyses of respondents' characteristics were performed using data from July/August and December 2020. The July and August surveys were combined for analyses because questions about risk perception were identical between those two time points. The September and October surveys were similarly combined. We used multivariable logistic regression analyses to examine the relationship between misperceptions about COVID-19 health risks and social isolation. Results from these models were presented as predictive margins, in which the regression models were used to estimate the marginal effect of risk overestimation (expressed as a proportion), while holding the distribution of all other covariates constant.(15) The adjusted association of respondent characteristics with social isolation was also presented using data from July/August and December in order to examine how behavioral patterns may have shifted over the course of the pandemic. In a secondary analysis, we used Gallup Panel data to assess the relationship between household isolation and loneliness.

Perceptions about risk were characterized as being overestimates, underestimates, or accurate

estimates. To provide respondents with a reasonable degree of latitude and account for any uncertainty in our reference estimates, we considered responses that were within 5 percentage points above or below the correct estimate as being accurate, e.g., a response of 15% for estimated hospital mortality would be considered accurate because it fell within 5 percentage points of the actual rate of 12%.(14) A range of 10 percentage points above or below was used for respondents' estimates of the proportion of hospitalizations occurring in persons younger than 55 years-old, due to the larger proportion.

We performed mean imputation from the overall sample for education (missing <1%), income (missing <1%), and whether the respondent or their family had a serious medical condition (missing <1%). We used this method instead of a more robust multiple imputation model because of the low rate of missingness. All analyses were performed using Stata (version 14; Stata Corp, College Station, Texas) and incorporated analytic weights to account for the effects of nonresponse.

Data availability

The data used in this study are available from the corresponding authors upon request and with the permission of Franklin Templeton and Gallup.

**RESULTS**

We present descriptive characteristics of the respondents in Table 1. The mean age of respondents was 47 years (interquartile range, 32 to 62) and 52% were female. The median household income range was $48,000 to $89,999. Half of respondents reported that they or a household member had a serious medical condition that increased their risk of serious illness from COVID-19.

Misperceptions about COVID-19 Health Risks

Most participants held beliefs about COVID-19 health risks that were inaccurate (Figure 1). Overestimation of health risk, rather than underestimation, was the most common type of inaccuracy at each survey time point. For example, while persons younger than 55 years-old accounted for 7%

of total U.S. deaths at the time of the July/August surveys, respondents estimated that they accounted for 43% of total deaths. In addition, while the proportion of COVID-19 hospitalizations that occurred in persons younger than 55 years-old (September/October survey) was 38%, respondents reported that this population accounted for 46%. The mortality rate of patients hospitalized with COVID-19 (November survey) was estimated by respondents to be 25% compared to an actual rate of 12%. The proportion of patients hospitalized after being infected with COVID-19 (December survey) was estimated by respondents to be 34% compared to an actual proportion of 12%.

Living in Household Isolation During COVID-19 Pandemic

The proportion of respondents living in household isolation did not vary substantially over time, ranging from 53% to 57% (Figure 2). Overestimating the proportion of death or hospitalizations from COVID-19 occurring in people under 55 years-old was associated with a significantly increased likelihood of household isolation (Table 2). Overestimating the likelihood of death or hospitalization was also associated with a significantly increased likelihood of household isolation. Excluding respondents who underestimated risk modestly attenuated the results but all associations between misperceptions and social isolation remained significant (Appendix Table 1). In the Gallup Panel, adults living in household isolation reported higher rates of loneliness (Appendix Figure 1).

Characteristics associated with household isolation from the July/August 2020 survey and persisting in the December 2020 survey included younger age (18 to 39 years), having a serious medical condition, having a household member with a serious medical condition, and identifying as a Democrat. Being Black or Hispanic was associated with a higher likelihood of social isolation in July/August but this relationship was not present in December. Reporting a higher income (>$48,000) was associated with a lower likelihood of social isolation in July/August but this relationship had largely waned by December.

## DISCUSSION

Adverse mental and emotional health effects of the COVID-19 pandemic are an increasingly recognized public health challenge. Risk misperceptions about COVID-19 may be exacerbating this challenge. Using Franklin Templeton-Gallup Economics of Recovery surveys from July to December 2020, we found that respondents consistently overestimated health risks associated with COVID-19, as measured by four different questions assessing COVID-19 morbidity and mortality. Overestimation of risk was consistently associated with greater household isolation, which may have adverse emotional and mental effects similar to quarantining.(5,7) These findings are relevant to policy interventions for social isolation and loneliness because they suggest that more accurate public understanding of risk would yield an optimal balance between health precautions and healthy social interactions.

While social isolation and loneliness are often been considered health risks for older adults, prior research has shown that COVID-19-related emotional and mental health harms are disproportionately borne by younger adults.(3,16) A June 2020 CDC survey reported that approximately twice as many respondents seriously considered suicide in the previous 30 days compared to U.S. adults in 2018 when asked about the previous 12 months (10.7% versus 4.3%). (8) The highest rates of suicidal ideation were reported by persons aged 18 to 24 years. We found that household isolation was most common among persons aged 18 to 39 years, a finding which likely contributes to the high rates of emotional distress reported in this population during the pandemic. The analysis of the Gallup Panel, which included detailed questions about emotional health, demonstrated that U.S. adults reporting household isolation also reported higher rates of loneliness. The disproportionate burden on young people also raises concern about long-term health and economic consequences.

Our study has limitations. We asked respondents about household isolation over the previous 24 hours rather than over a longer period of time, which may have led to inaccuracies. However, the

relatively stable distribution of reported household isolation from month to month suggests that a 24-hour recall period was informative. Although we measured household isolation, we could not quantify social isolation or loneliness for survey respondents in the Franklin Templeton-Gallup Economic of Recovery Study because we did not collect information about participation in group activities, social engagement with friends or relatives, or subjective experience of loneliness. (17,18) It is possible that some individuals who strictly avoided contact with people outside of their household experienced low levels of social isolation and loneliness, while others who did not isolate themselves experienced high levels of social isolation and loneliness. However, our analysis of Gallup Panel data showed that U.S. adults who avoided contact with people outside their household also reported higher rates of loneliness. Furthermore, household isolation is analogous to quarantining, and research has shown that quarantining is associated with increased stress, anxiety, depression, fear, and detachment from other people.(5,7) In addition, the questions we used to assess risk perceptions changed over time, which precluded direct comparisons of risk perception between time periods. However, survey questions related to COVID-19 risk perception consistently probed beliefs about hospitalization and mortality risk, and our finding of an association between risk overestimation and household isolation was consistent, despite the changing questions.

In conclusion, survey respondents overestimated several health risks associated with COVID-19, and this overestimation was associated with a respondent's decision to avoid contact with people outside the household. This relationship was consistent from July to December. Harms to emotional and mental well-being experienced by U.S. adults during the COVID-19 pandemic may be mitigated by addressing risk misconceptions and attenuating household isolation preferences that exceed public health guidelines.

## Data Availability

All data analyzed during the study are available from the corresponding author on reasonable

request.

Author Contributions

All authors were involved with data collection, data analysis, discussed results, and drafted the manuscript.

Competing Interest

The authors declare no competing interests.

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**Figure Legend**

Figure 1. Comparison of respondents' perceived risk versus actual risk associated with COVID-19 illness

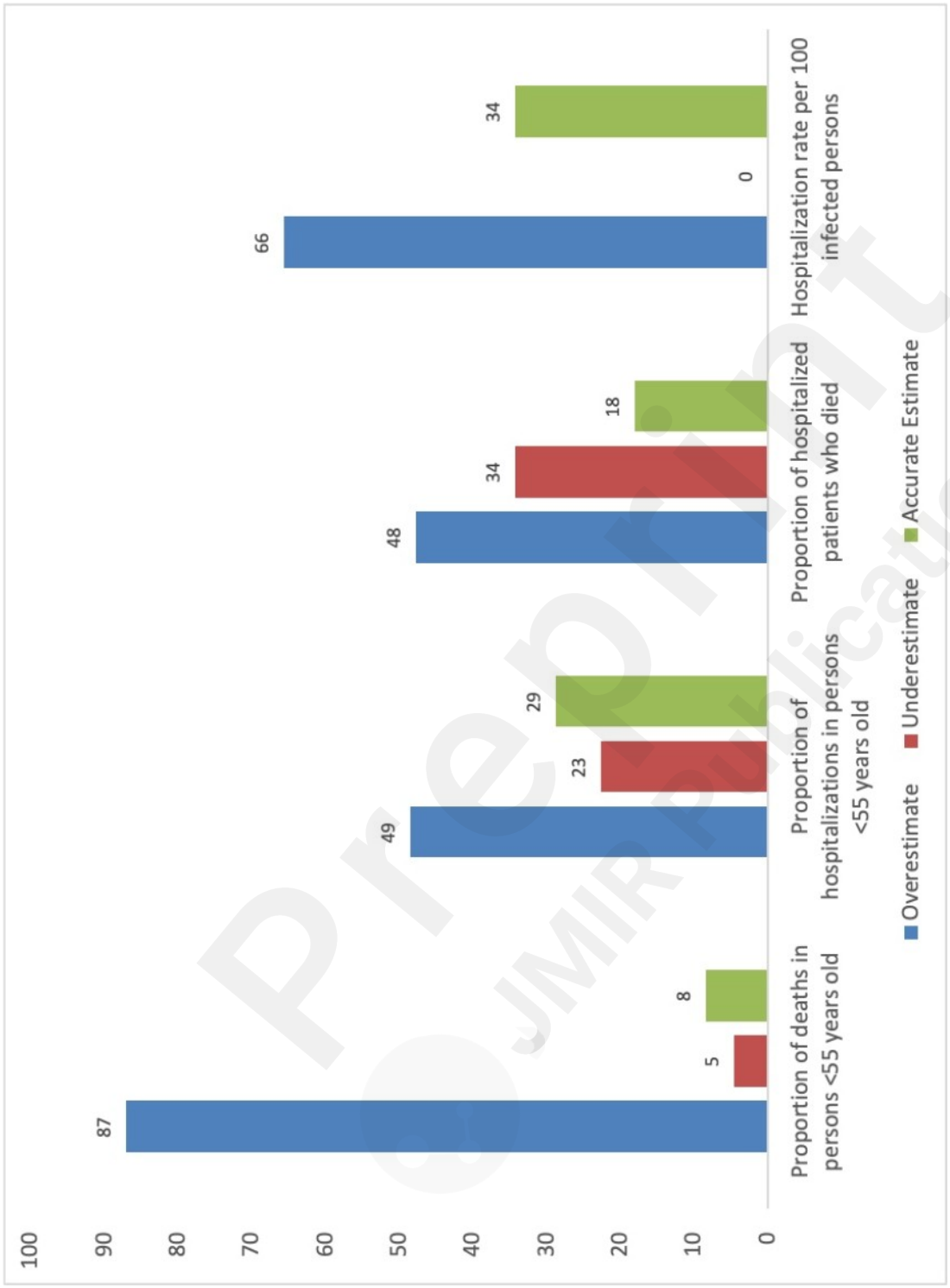


Figure 2. Rates of household isolation during COVID-19 pandemic

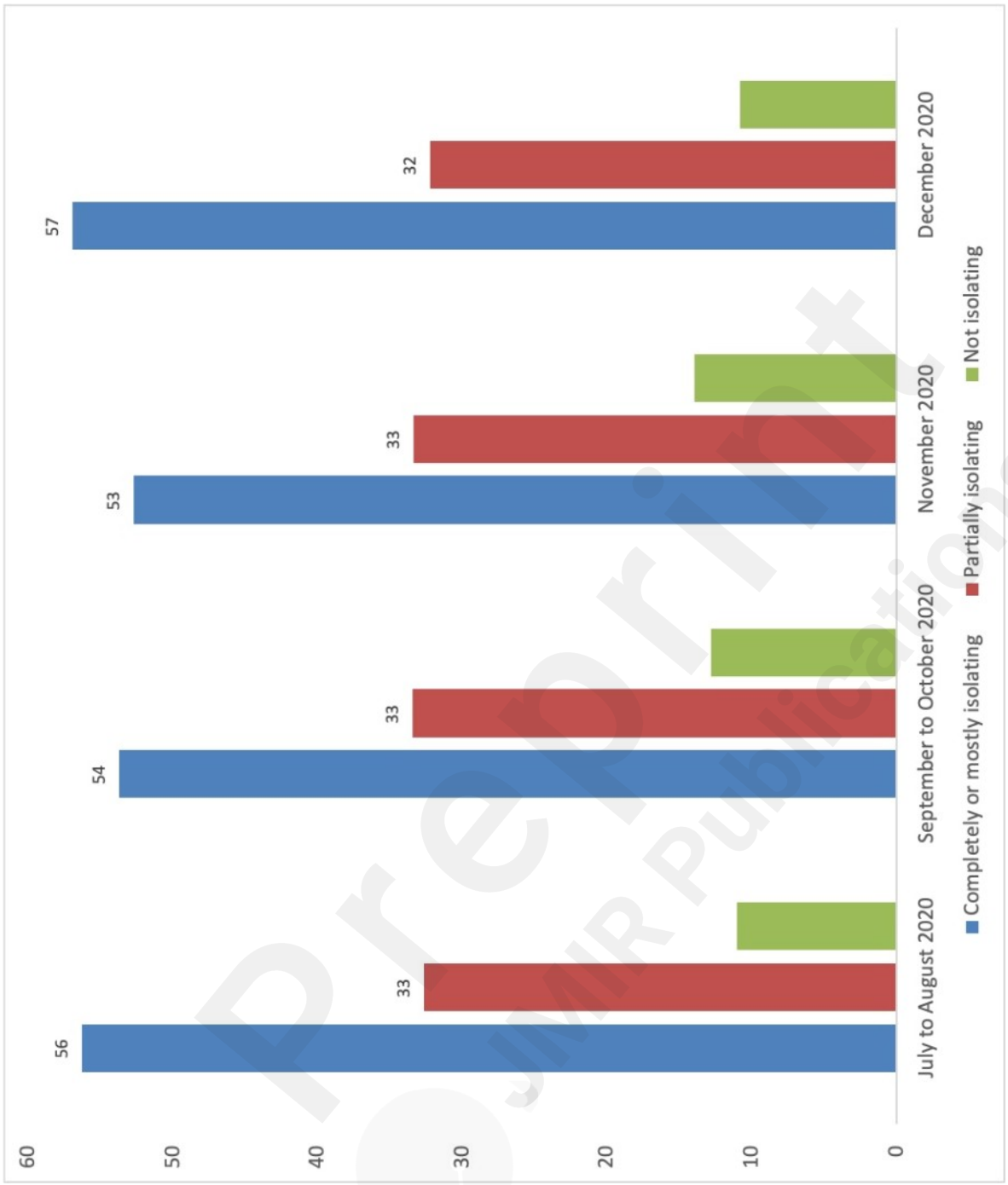


**Table 1**. Characteristics of the study sample

| | July/August 2020 | | December 2020 | |
|---|---|---|---|---|
| | No. of participants | Overall cohort (N=15,014), %* | No. of participants | Overall cohort (N=5,009), %* |
| Age group | | | | |
| 18 to 39 years | 5,333 | 38 | 1,749 | 38 |
| 40 to 64 years | 6,347 | 41 | 2,148 | 41 |
| 65 years or older | 3,334 | 21 | 1,112 | 21 |
| Female | | | | |
| Yes | 8,032 | 52 | 2,733 | 52 |
| No | 6,982 | 48 | 2,276 | 48 |
| Race or ethnic group† | | | | |
| White | 9,512 | 63 | 3,228 | 64 |
| Black | 1,909 | 12 | 680 | 12 |
| Hispanic | 2,491 | 16 | 720 | 16 |
| Other/unknown | 1,102 | 8 | 381 | 8 |
| Educational level | | | | |
| 8th grade or some high school | 328 | 4 | 106 | 3 |
| High school graduate | 2,889 | 37 | 1,173 | 38 |
| Some college or college graduate | 11,797 | 60 | 3,730 | 59 |
| Serious medical condition | | | | |
| No | 7,708 | 52 | 2,414 | 48 |
| Yes, in respondent | 3,843 | 26 | 1,211 | 25 |
| Yes, in household member | 2,324 | 15 | 890 | 18 |
| Yes, in respondent and household member | 1,139 | 7 | 494 | 9 |
| Political preference | | | | |
| Democrat | 5,483 | 36 | 1,990 | 38 |
| Republican | 4,539 | 31 | 1,545 | 31 |
| Independent | 4,155 | 27 | 1,232 | 25 |
| Other/unknown party | 837 | 6 | 242 | 6 |
| Household income | | | | |
| <$24,000 | 2,466 | 19 | 931 | 20 |
| $24,000-$47,999 | 2,825 | 22 | 1,152 | 26 |
| $48,000-$89,999 | 4,519 | 30 | 1,546 | 30 |
| ≥$90,000 | 5,204 | 28 | 1,380 | 23 |
| Married | | | | |
| Yes | 8018 | 48 | 2567 | 48 |
| No | 6996 | 52 | 2442 | 53 |
| Live in rural area | | | | |
| Yes | 1,262 | 9 | 474 | 10 |
| No | 13,752 | 91 | 4,535 | 90 |

**Table 2**. Effect of misperceptions (overestimating risk) on the likelihood of living in household isolation

| | July to August 2020 | | | September to October 2020 | | | November 2020 | | | December 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Difference in Percent (95% CI) | | P value | Difference in Percent (95% CI) | | P value | Difference in Percent (95% CI) | | P value | Difference in Percent (95% CI) | | P value |
| Living in social isolation | | | | | | | | | | | | |
| Misperception about deaths* | 7.7 | (5.3 - 10.1) | <0.001 | | | | | | | | | |
| Misperception about hospitalizations† | | | | 5.6 | (3.6 - 7.6) | <0.001 | | | | | | |
| Misperception about hospital mortalityΔ | | | | | | | 9.9 | (6.9 - 12.8) | <0.001 | | | |
| Misperception about hospitalization risk‡ | | | | | | | | | | 11.8 | (8.7 - 14.9) | <0.001 |

Note: Adjusted marginal effect of misperception (overestimation) of risk
Abbreviations: CI, confidence interval; OR, odds ratio
* Misperception about proportion of COVID-19 deaths attributable to persons younger than 55 years old
† Misperception about proportion of COVID-19 hospitalizations attributable to persons younger than 55 years old
Δ Misperception about proportion of patients hospitalized with COVID-19 who die
‡ Misperception about hospitalization risk if infected with COVID-19

**Table 3**. Association of misperceptions (overestimation) about COVID-19 health risks with preferences for living in household isolation

| Characteristics | July to August 2020 Adj. OR (95% CI) | | | P value | December 2020 Adj. OR (95% CI) | | | P value |
|---|---|---|---|---|---|---|---|---|
| Misperceptions about COVID-19 health risks | | | | | | | | |
| Misperception about deaths* | 1.38 | (1.25- | 1.53) | <0.001 | | | | |
| Misperception about hospitalization risk‡ | | | | | 1.65 | (1.45- | 1.88) | <0.001 |
| Age group | | | | | | | | |
| 18 to 39 years | 1.00 | | | | 1.00 | | | |
| 40 to 64 years | 0.73 | (0.67- | 0.79) | <0.001 | 0.84 | (0.73- | 0.96) | 0.013 |
| 65 years or older | 0.88 | (0.79- | 0.97) | 0.010 | 0.98 | (0.82- | 1.17) | 0.833 |
| Female | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 0.96 | (0.90- | 1.04) | 0.317 | 1.02 | (0.90- | 1.15) | 0.777 |
| Race or ethnic group† | | | | | | | | |
| White | 1.00 | | | | 1.00 | | | |
| Black | 1.13 | (1.00- | 1.26) | 0.043 | 0.97 | (0.79- | 1.18) | 0.736 |
| Hispanic | 1.35 | (1.22- | 1.49) | <0.001 | 0.97 | (0.82- | 1.16) | 0.758 |
| Other | 1.34 | (1.17- | 1.53) | <0.001 | 1.24 | (0.99- | 1.56) | 0.063 |
| Educational level | | | | | | | | |
| 8th grade or some high school | 1.00 | | | | 1.00 | | | |
| High school graduate | 0.95 | (0.79- | 1.15) | 0.586 | 0.70 | (0.50- | 0.99) | 0.042 |
| Some college or college graduate | 1.00 | (0.83- | 1.21) | 0.993 | 0.84 | (0.60- | 1.19) | 0.323 |
| Serious medical condition | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes, in respondent | 2.15 | (1.98- | 2.35) | <0.001 | 1.85 | (1.60- | 2.15) | <0.001 |
| Yes, in household member | 1.49 | (1.35- | 1.64) | <0.001 | 1.34 | (1.14- | 1.58) | <0.001 |
| Yes, in respondent and household member | 1.66 | (1.45- | 1.91) | <0.001 | 1.73 | (1.39- | 2.15) | <0.001 |
| Political preference | | | | | | | | |
| Democrat | 1.00 | | | | 1.00 | | | |
| Republican | 0.64 | (0.59- | 0.70) | <0.001 | 0.54 | (0.47- | 0.63) | <0.001 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Independent | 0.72 | (0.66- | 0.78) | <0.001 | 0.76 | (0.65- | 0.89) | <0.001 |
| Other party | 0.72 | (0.61- | 0.84) | <0.001 | 0.67 | (0.51- | 0.87) | 0.004 |
| Household income | | | | | | | | |
| <$24,000 | 1.00 | | | | 1.00 | | | |
| $24,000-$47,999 | 0.90 | (0.81- | 1.01) | 0.071 | 0.96 | (0.80- | 1.15) | 0.648 |
| $48,000-$89,999 | 0.80 | (0.72- | 0.89) | <0.001 | 0.98 | (0.82- | 1.18) | 0.847 |
| ≥$90,000 | 0.89 | (0.79- | 1.00) | 0.043 | 1.24 | (1.01- | 1.53) | 0.044 |
| Married | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 0.99 | (0.92- | 1.07) | 0.795 | 1.01 | (0.88- | 1.15) | 0.917 |
| Live in rural area | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 0.93 | (0.82- | 1.04) | 0.203 | 0.93 | (0.76- | 1.13) | 0.453 |
| Deaths per capita due to COVID-19 | 1.00 | (0.99- | 1.00) | 0.789 | 1.00 | (0.99- | 1.01) | 0.922 |

Abbreviations: CI, confidence interval; OR, odds ratio

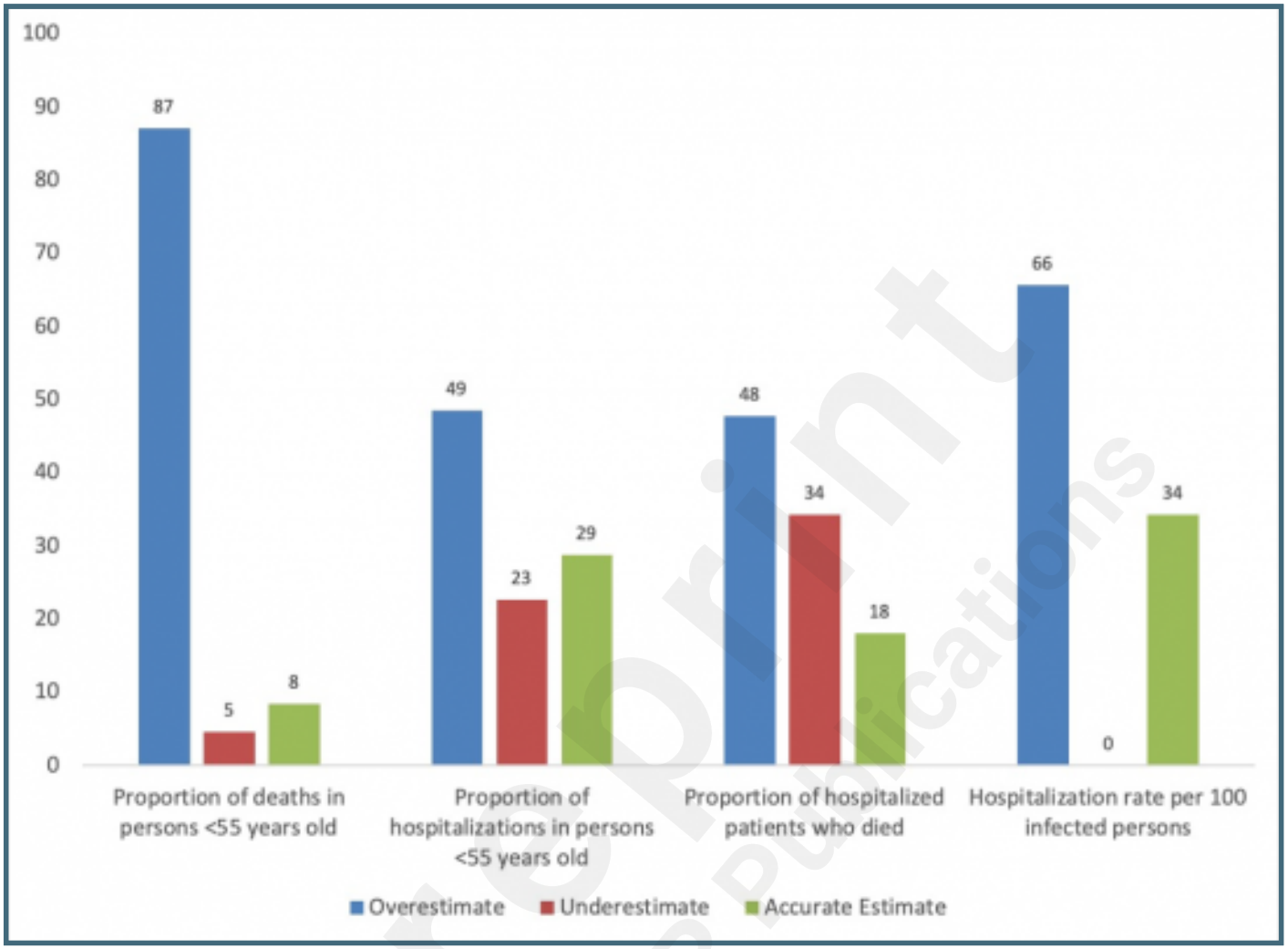
* Misperception about proportion of COVID-19 deaths attributable to persons younger than 55 years old

‡ Misperception about hospitalization risk if infected with COVID-19

# Supplementary Files

# Figures

Comparison of respondents' perceived risk versus actual risk associated with COVID-19 illness.



Rates of household isolation during COVID-19 pandemic.