RIETI Discussion Paper Series 21-E-041

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https://www.rieti.go.jp/en/

RIETI Discussion Paper Series 21-E-041
May 2021

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Abstract

In overcoming the COVID-19 crisis, contribution from social science is indispensable as well as medical research. With this consideration, we have initiated a socio-life scientific survey on COVID-19, which is associated with the antibody test for the virus, targeting 3,000 participants of the Nagahama Survey and 1,000 medical workers at the Kyoto University Hospital. The survey is designed to highlight respondents' changes in behavior, the effect of the COVID-19 outbreak on respondents' values, and the actual spread of COVID-19 among the respondents.

Keywords: COVID-19, Behavior change, Antibody test
JEL classification: I12

*This study is conducted as a part of the Project "Toward Building Socio-life Science" undertaken at the Research Institute of Economy, Trade and Industry (RIETI). The authors are grateful to Yoko Ibuka (Keio University), Daigo Nakata (RIETI), Masahiko Nakazawa (Ministry of Finance) and Akihiko Noda (Meiji University) for their useful discussion and Haruhiko Ando, Vice Chairman, RIETI, for his constant encouragement and support.

1. Introduction

Since it was first confirmed in December 2019 by Chinese health authorities,[1] COVID-19 has rapidly spread all over the world.[2] In March 2020, many European countries were locked down until May or June.[3] Similarly, in the U.S., President Trump declared a national emergency.[4] In this process, it has been revealed that elderlies and those with underlying illnesses (of what) tend to suffer from more severe illness.[5] Since then, the medical research on COVID-19 has rapidly progressed, and various treatments have been developed; the quick recovery of President Trump from COVID-19 infection has been attributed to a new medicine treatment based on dexamethasone, Regeneron's monoclonal antibody therapy, and remdesivir.[6] Despite all these efforts, however, 70.1 million of people have been infected with about 1.59 million dead as of December 12, 2020.[7]

While medical research is a key to containing the COVID-19 outbreak, social science provides another key. An early study of Yano (2020) shows evidence supporting that political leadership and social learning matter in controlling the spread of COVID-19 infection. Focusing on the early outbreaks in Florida, he shows that the virus spread more in counties in which more voters support President Trump, who downplayed the danger of the virus, and that the spread is less serious in middle to small cities than in countryside. At the same time, many observers relate the increase in the number of suicides in Japan and Korea during the summer of 2020 to the fact that the economic and social state of women was most severely hit by COVID-19.[8]

With these considerations, a group of social scientists at the Research Institute of Economy, Trade, and Industry (RIETI) and life scientists at the Graduate School of Medicine, Kyoto University, has initiated a socio-life scientific survey on COVID-19, targeting 3000 participants of the Nagahama Survey and 1000 medical workers at the Kyoto University Hospital. The survey is associated with the antibody test of COVID-19 administered to the respondents on the socio-life scientific survey. Although the survey can be adopted for various research theme, it is designed to highlight, in particular,

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[1] See Erin Shumaker (2020).

[2] See Johns Hopkins Site, https://coronavirus.jhu.edu/map.html

[3] Lockdown started in March 23 in UK, which lasted until the beginning of June (Steed and Cavanagh (2020)). In Italy, it first started in Feb. 21, 2020. France and Spain joined on March 14. See Reuters Staff (2020).

[4] See Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak, issued on March 13, 2020. See the White House Site.

[5] See Huang et al. (2020).

[6] See James Gallagherf (2020).

[7] See Johns Hopkins Site, https://coronavirus.jhu.edu/map.html

[8] See Denyer and Kashiwagi (2020) and Wang, Wright and Watsuki (2020).

behavior change in the face of a pandemic in general, the effect on a system of values of the COVID-19 outbreak, and the actual spread of COVID-19 among the respondents.

The primary purpose of our survey is to find what may determine people's propensity to behavior change in the face of a pandemic. More specific research questions could be: Is behavior change attributable to the state of health or to individual characteristics such as education, age, and the sensitivity to social pressures and to persuasion? Our experience shows that in order to prepare against the next pandemic, it is highly important to find what contributes to behavior change. The outbreak of COVID-19 has shown that behavior change is difficult not only for ordinary people but also political leaders. This fact was suggested as early as April 2020. Focusing on the 2016 U.S. presidential election and the 2018 Florida gubernatorial election, Yano (2020) shows that the number of COVID-19 cases in April is positively correlated to the county-by-county number of votes received by the Republican candidate, Governor DeSantis, whose policy is closely in line with President Trump heavily downplaying the potential danger of COVID-19. A similar relationship is not observed in Ohio, in which the Republican candidate, Governor Dewine, was elected in 2018; it has been known that Governor Dewine has kept a distance from President Trump. This finding is confirmed by the recent spread of COVID-19 in South Dakota and Vermont. A video posted by the Recount shows that since March, 2020, the COVID-19 outbreak have followed completely different paths between South Dakota, in which the state governor downplayed the danger of COVID-19, and Vermont, in which the governor has taken a very careful approach, even though the two states are similar in size and in that both governors are Republican.[9] As of December 2, 2020, 80,912 people have contracted the virus with 948 deaths in South Dakota whereas 4,239 have contracted it with 72 deaths in Vermont. By now, it is widely acknowledged that masks are important in dealing with the COVID-19 outbreak. Starting from the U.S., despite this, many countries are struggling to convince their people of the use of masks. This suggests how difficult a behavior change is for some people, including leading politicians. These considerations are reflected in the design of our survey.

The secondary purpose of our survey is to look into the effect of the COVID-19 outbreak on Japanese system of values. In order to compare different values across time and regions, Hirota, Yodo, Sekine and Yano (2020) adopt what they call a system of values, which is defined as a functional relationship between an individual's wellbeing and all the objective individual characteristics determining his wellbeing. Should, for example, the increase in the number of female suicides in Japan be in fact attributable to the COVID-19 outbreak, the change must somehow be reflected in the system of values. In order to capture such a change, panel data is necessary that makes it possible to

[9] The population and are of South Dakota are about 900,000 and respectively. See *The Recount* (2020).

compare people's wellbeing before and after the outbreak. Our COVID-19 data is designed in such a way that it may constitute panel data with the socio-life science surveys that we have compiled in Nagahama since 2016.

Our survey is also designed to study the determinants of the COVID-19 outbreak itself. For that purpose, we conduct antibody tests for some 3000 Nagahama survey participants and 1000 medical workers at the Kyoto University Hospital. In Nagahama city so far, 53 cases have been reported since March 2020, which is 0.045 percent of the Nagahama population; in contrast, in Kyoto city, 2018 cases have been reported, which is 0.14 percent of the Kyoto city population. At these ratios, we expect 1.4 cases either for the Nagahama respondents or for the Kyoto University medical worker respondents. Because our test is to detect the presence of COVID-19 antibodies, we may capture asymptomatic cases as well. Altogether, we hope to capture, for example, risk factors for each group of respondents.

In what follows, we explain the overall design of our survey in Section 2 and the survey questions and ideas behind them in Section 3. The actual survey questions and the options for answers are listed in the Appendix, although its design defers from that of the actual survey, which was conducted out through the Web.

2. Overview of the Survey

Our survey questions can roughly be classified into two types. The first type consists of questions concerning what we want to explain by using our data (dependent variables). They are: Those to capture behavior change, those designed to measure wellbeing in the standard literature, and the results of COVID-19 and other antibody tests. The second type consists of those capturing factors that may explain a dependent variable. They are: basic individual characteristics such as age, family structure, etc., risk attitudes.

The survey covers two different groups of people. The first group consists of participants of the Nagahama Survey. The second group consists of medical workers at the Kyoto-University Hospital.

2.1. Nagahama Group

As is discussed in Matsuda et al. (2021), the Nagahama survey was started in 2007 to compile cohort data covering genomic and medical treats of people living in the city of Nagahama.

In 2016, social scientific survey questions were added to capture the total aspect of human life. An individual's medical history may affect his lifestyle and way of thinking at the same time that an individual's economic status may influence his health. The current Nagahama Survey aims to capture this interaction between life scientific and social scientific aspects of life. As is discussed in Yano et al. (2021), Nagahama is a typical Japanese local city, in which the mobility of population is relatively low and in which traditional lifestyle is preserved.

As is discussed in Matsuda et al. (2020), the Nagahama Genome Cohort Survey was conducted by three waves. We conduct our survey through the Web. The survey selects participants from the 10,115 people who participated in the second wave (2012-2016). We solicit participants who can participate in the Web survey by announcing it through the local newspaper. Of these people, we randomly select 3000. In this selection, we exclude those who cannot use moved out of the Nagahama city, who refused the external management of medical examination information, those who withdrew their consent. After randomly dividing these 3,000 participants into three groups of 1000 individuals, we conduct the questionnaire survey and the antibody test for each group in sequence in two or three week intervals.

2.2. Medical Workers Group

In contrast, medical workers are expected to be from many different parts of Japan, representing many different value systems. By investigating the determinants of behavior change for this group of people, we may form a point of reference to make a comparison with the Nagahama group. Since the start of the outbreak, moreover, they have been exposed to the COVID-19 virus much more than those in the Nagahama group. By including the medical workers group, we may capture the relationship between behavior change and COVID-19 much more clearly than in the Nagahama group.

Of the medical professionals working at Kyoto University Hospital, about 1,000 people who agree with the purpose of this research and agree to participate are targeted. They are surveyed multiple times (about 4 times as a guide) to determine the presence or absence of COVID-19 antibodies, persistent infections, and reinfections. Multiple surveys will be conducted as follow-up surveys for the same subject.

2.3. Survey Method

Information on survey is delivered to potential participants, who are asked to express their

willingness to participate through our Web site. The selected participants are asked to answer our survey questionnaire. To those who complete the questionnaire, we send an equipment to correct saliva for Nagahama group and blood for medical workers group in order to conduct the antibody test. Survey participants will return the saliva sample in the enclosed return envelope according to the procedure manual. The test results are returned to participants in a secure manner by means of blockchain technology.

3. Survey Questions

Our survey questions can be divided into two types. The first type is primarily for dependent variables. The second type is primarily for explanatory variables. In addition, we ask a respondent's personal views on various issues, which could be used as either dependent or explanatory variables. An English translation of the survey is explained in the Appendix.

3.1. Primarily as Dependent Variables

3.1.1. Behavior Change

As is discussed in the Introduction, the primary purpose of the survey is to investigate what contribute to behavior change. In order to capture the way in which people change their behavior, we ask a number of questions.

In order to take into account the effect of the nation-wide state of emergence starting on April 16, 2020, and being lifted at different time points in May in different prefectures, we divide the time period into five subperiods and ask respondents to answer the behavior change related questions for each period. The five subperiods are (i) the period before the state of emergence (April 16), (ii) the period from April16 through the dates on which the state of emergency was lifted, which were May 14 in Shiga prefecture, in which Nagahama is, and May 21 in Kyoto prefecture, in which the Kyoto University Hospital is, (iii) after the state of emergency was lifted through June 30 by which the outbreak was once subsided, (iv) from July 1, at which the outbreak restarted through one month prior to the survey, and (v) for one month prior to the survey questions are answered. Note that, after July 1, the number of COVID cases hit a peak in August and stayed relatively low in September and October. It started to rise again after November. Most questions concerning behavior change are asked for each of these periods.

A. Changes in the frequency and ways in which daily activities are conducted

We ask if a respondent, facing the COVID-19 outbreak, has changed the frequency with which he/she engages in the following activities (increased / unchanged / decreased / stopped) and the precautions that a respondent took: General outing (Q8, Q9), outdoor exercise such as walking and jogging (Q10, Q11), indoor exercise such as gym (Q12, Q13), drinking out and eating out with friends (Q14, Q15), non-urgent hospital visits (Q16, Q17), visits to parents (Q18, Q19), visits to karaoke, live houses and game arcades (Q20, Q21), eating out with family members (Q22, Q23), and shopping (Q24, Q25). The selections for precautions we offer in our survey vary according to the nature of activity.

We ask why a respondence choose to, or not to, use a mask. As a reason why he/she uses a mask, a respondent is asked to rate how closely each of the following reasons holds true: "to prevent infection," "to prevent infection to others," and "because people around me wear them," "because someone told me to wear it," "because I would be criticized without a mask," and "because I usually wear it." As a reason why he/she does not use a mask, we present the following reasons. "Because I don't think it works," "because it was too expensive," "because masks are unavailable," "because it is uncomfortable," "because it does not look good," and "because it is unlikely that I will get infected."

We also ask if the frequency of walking, biking, driving, and using taxis, buses and trains has changed compared to before the spread of COVID-19 infection.

B. More careful daily conducts

We ask to what extent a respondent engages in activities to avoid infected. They are; washing hands, disinfect fingers, gargling, taking a temperature often, sunbathing, covering the mouth when coughing or sneezing, avoiding to touch the mouth or nose, not rubbing eyes, sleeping well, wearing a product that claims to disinfect the space, wearing a mask when going out, and taking enough space at the cash register. Although some of these are medically questionable, they are intentionally included to observe how much medical knowledge a respondent may have. For each of these items, we ask about the extent to which a respondent was concerned (not at all / not so much / to some extent / as much as possible).

C. Travelling between badly and not badly affected areas

Whether or not one abstains from visiting areas in which COVID-19 spread badly may be an important measure to capture people's willingness to change behavior. With this consideration, we ask whether a respondent travelled to areas in which COVID-19 spread. That is, we ask whether

a respondent has travelled or planned to travel to the eight prefectures in which COVID-19 badly spread (Tokyo, Hokkaido, Saitama, Chiba, Kanagawa, Osaka, Kyoto, and Hyogo); the options for an answer are: Yes and No.

In order to assist the tourism industry, on July 22, 2020, the government launched the "Go To Travel" campaign under which the government subsidizes half of the domestic travel cost. We ask whether a respondent has travelled or planned to travel after July 22 by using the "Go To" subsidy. To those who answers Yes, we ask if the respondent would travel or plan to travel even if the campaign did not start.

3.1.2. Wellbeing

As is noted above, a system of values is defined as a functional relationship between people's wellbeing and its determinants. In order to capture the way in which the COVID-19 outbreak affects the Japanese system of values, we ask questions focusing on people's wellbeing, the dependent variable in a system of values.

As an index characterizing wellbeing, we adopt happiness and life-satisfaction. The question to measure happiness is: "How happy are you now?" We also ask about future happiness five years from now and life satisfaction. The question for life satisfaction is: "Overall, how satisfied are you with life as a whole these days?" These questions are recommended by the *Organisation for Economic Co-operation and Development*; see OECD (2013, Annex B) In addition, we ask about subjective health by the following question: "How would you rate your general health status?" Self-rated or self-assessed health which is asked by this type of questions has been widely used to measure an individual's general health status and has been shown to be a powerful predictor of future morbidity and mortality.[10] A respondent is asked to rate the answers to the first two questions by 0 through 10 and the last question by five levels.

3.1.3. COVID-19 Antibody Test

As is noted above, in our research project, we offer respondents COVID-19 antibody tests to respondents. Its primary purpose is, obviously, to see how the virus is spread in a typical mid-size city (Nagahama) relative to a major city (Kyoto) and to medical workers in the major city. At the same time, we hope to attract more people to participate in our survey by offering an antibody test. Moreover,

[10] For example, see Mossey and Shapiro (1982) and Idler and Angel (1990).

we may be able to explain the COVID-19 spread by means of various social scientific factors, including people's readiness towards behavior change. One caveat is, as is noted above, that the number of respondents who have COVID-19 antibody may be rather small.

3.2. Primarily as Explanatory Variables

We ask many types of questions to obtain different explanatory variables. They are basic characteristics of respondents, work and economic status.

3.2.1. Basic Characteristics of Respondents

We ask about basic individual characteristics, including age, gender, and family structure. In addition to the basic family structure, we ask if a respondent has preschoolers and grandchildren living together. Moreover, in consideration of high COVID-19 risk groups, we ask if a respondent lives with people of age 65 and over and/or with underlying health problems (diabetes, heart failure, respiratory diseases, etc.). Moreover, we ask if a respondent live with someone who needs dialysis or takes immunosuppressive or anti-cancer drugs. We also ask about basic characteristics on health and lifestyle, including subjective health, the K6 index[11] measuring depression, drinking/smoking habits, and attitudes towards risks.

3.2.2. Work and Economic Status

We ask a respondent's job status: The options for answer are: No jobs (meaning full-time housewives, students, and retired), employees, self-employed (operating restaurants, wholesale retailers, agriculture, etc.), professionals (doctors, lawyers, accountants, tax accountants, writers, etc.), employees of a family business (restaurants, wholesale retailers, agriculture, etc.), home-based work/internal work that has no employment relationship with a company, consignment/contract worker (without long-term employment relationship). Moreover, we ask if a respondent has a job that requires to make a direct contact with customers (floor staff, cash register staff, etc.) and if he has a job to provide face-to-face customer services at eateries (waiters, waitresses, etc.). We also ask the average number of people with whom a respondent makes direct contacts for colleagues, clients and customers.

With respect to remote work and flexible time commuting, which has become popular due to the pandemic, we ask if a respondent is encouraged at workplace (not encouraged at all / not so

[11] See Kessler et al. (2002).

encouraged / neither encouraged nor discouraged / more or less encouraged / highly encouraged), how often the respondent takes up such an option (almost not / about 1-2 days a week / about 3 days a week / more than 4 days a week), and if he wants to have more or less opportunities for remote work/flexible time commuting.

We also ask about average weekly working hours, annual household income, and household wealth balance.

3.2.3. Risk Attitude

In the face of COVID-19, one's readiness towards behavior change may closely be related to his attitudes towards risk. With this consideration, we ask a couple of questions to quantify risk attitude.

The first question is as follows: "On the one hand, we have a saying that 'nothing ventured, nothing gained.' At the same time, we also have a saying that 'a wise man keeps away from danger.' Which do you think you are closer when you choose your own action?" A respondent is asked to identify which of these statements better describes your view. The other question is: "What is the probability of rain above which you take an umbrella when go out." A respondent is asked to choose from 0%, 10%, 20% to 100%.[12]

As related questions, we ask if a respondent agree with the following statements. "In general, I feel very positive about myself," "I'm always optimistic about my future," "I am free to decide for myself how to live my life," "I generally feel that what I do in my life is worthwhile," "Most days I get a sense of accomplishment from what I do," "When things go wrong in my life it generally takes me a long time to get back to normal," "I try to live free from social constraints."[13]

3.2.4. Basic Health

The state of health is also an important factor relating to behavior change. In order to estimate a stable system of values, it may be important to control one's physical health, which may affect one's view on wellbeing temporarily.

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[12] This type of question on individual's risk attitude is introduced in a survey named "Survey on Life and Society" (Kurashi to Shakai ni Kansuru Ankeito) by a University of Osaka study group. See http://www2.econ.osaka-u.ac.jp/~ohtake/survey/kogakusyotoku.pdf. For more information, see Ohtaka and Tomioka (2004, p. 343).

[13] These questions except for the last one are from Eudaimonic questions in OECD (2013, Annex B). The last one is an original question to investigate people's attitude toward peer pressure.

With these considerations, we ask if a respondent has various symptoms, such as sore throat, fever, fatigue, and stomach ache. We also ask if a respondent suffer from various illness in 2020, including flue, COVID-19, ordinary cold, allergy, and asthma and if he has more basic health problems such as diabetes, high cholesterol, high blood pressure, respiratory disorders, etc. These questions also serve as explanatory variables for COVID-19 infection.

3.3. Additional Questions

In addition, we ask a respondent's personal views on various aspects of life. Some of those questions are concerned with how people should live in the face of COVID-19. Others are concerned with one's social capital. These questions can be, in and of themselves, something to be explained. At the same time, they can serve as explanatory (control) variables in explaining behavior change and the system of values.

3.3.1. Personal Views on COVID-19

We ask a number of questions to capture a respondent's views on COVID-19. First, we ask a respondent to evaluate the national and local governments' dealings with COVID-19 outbreak. We also ask if a respondent thinks that the outbreak can be controlled if people simply follow governmental guidelines, which sources he relied on to obtain information on COVID-19 (friends / acquaintances, family, magazines / books, newspapers / TV, SNS, web information (news), web information (administrative agencies)), and the extent to which he rely on those sources.

We investigate how individuals view on social restrictions on individual activities. That is, a respondent is asked to what extent he is uncomfortable on, or unhappy about, those who do not heed to social distancing in such a case as waiting to check out at a supermarket, he believes that those who caught COVID-19 can be socially criticized, and he supports legalizing the use of a mask, prohibiting parties, and, more generally, restricting personal freedom.

We also ask if a respondent is usually vaccinated against the flu and if he wants to take a COVID-19 vaccine at first, if it becomes available.

3.3.2. General Temperament and Sociality

The survey includes some questions on general temperament and sociality. In relation to behavior change, we ask if a respondent has a metal block against starting new activities such as visiting a new store and adopting new technology (for example, smartphone, online meeting). In

addition, we ask if a respondent is reluctant to change his daily activities even if he knows he should change.

We measure social capital by means of standard questions recommended by the OECD (Scrivens and Smith, 2013, and Yodo and Yano, 2017). On the trust one would have toward others in general, we ask if a respondent thinks that most people can be trusted or that it is more prudent to be careful in interacting with others. To measure social capital related to networks, we ask how reliable a respondent finds neighbors, relatives, and colleagues at work to confide daily problems and concerns and the frequency with which he interacts with those group of people. We also ask the level of trust a respondent has in each of the national government, local governments, scientists such as infectious disease specialists, and news media such as broadcasters and newspapers. In addition, we ask about the donations that a respondent make in the last twelve months.

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Appendix: Socio-life Science Questionnaire on COVID-19 Outbreak

Q1. How long have you had continuously the following symptoms since January 2020?
・ Sore throat ・ Cough ・ Sneezing and runny nose ・ Low fever (below 37.5 degrees) ・ High fever (37.5 degrees or higher) ・ Feeling chill ・ Short breath ・ General fatigue ・ Stomach ache
1: Never. 2: One to three days. 3: Four to seven days. 4: More than a week.
Q2. When did you have the symptoms above? Please indicate all that are applicable.[14]
i.
Q3. What action did you take when you had a symptom in the previous question? If you have more than one option that describes your action, please mark all that are correct descriptions.

[14] In this survey, we divide the period of the outbreak into the following subperiods and ask respondents to answer the behavior change related questions for each subperiod.

i. Before the state of emergency was issued
ii. During the state of emergency (April 16 through May 14 in Shiga and May 21 in Kyoto)
iii. After the state of emergency through the end of June
iv. July through a month ago
v. Since a month ago.

1: I did not do anything particular. 2: I stayed at home to recover. 3: I visited a doctor. 4: I suspected a COVID-19 infection and consulted with a government and a governmental health service. 5: Following a governmental health service's advice, I took a PCR test.
Q4. What was the diagnosis?
1: Flu. 2: COVID-19. 3: Ordinary Cold. 4: Pollen Allergy. 5: Asthma.
Q5. Do you suffer from the following health problems?
• Diabetes. • Hyperlipidemia (High Cholesterol, High triglyceride). • Hypertension. • Stroke (Cerebral Infarction/Hemorrhage). • Respiratory disorders (Asthma, Chronic obstructive pulmonary disease (COPD)). • Angina/Myocardial Infarction/Heart Failure. • Dialysis. • Immunosuppressant/Anti-cancer Drugs.
Q6. Since January 2020, have you travelled to the area in which COVID-19 badly spread (Hokkaido, Saitama, Chiba, Tokyo, Kanagawa, Osaka, Kyoto and Hyogo) except for commuting?
0: Never. 1: One to four times. 2: Five to nine times. 3: More than nine times.
Q7. When did you travel? Please choose all applicable. (See footnote 14 for the periods.)
Q8. In each of the following periods (see footnote 14 for the periods), did you change the frequency of going out.

1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I have been housebound.
Q9. In each of the following periods (see footnote 14 for the periods), did you take precautions below. Please indicate all.
0: Took no precaution. 1: Used a mask. 2: Chose a non-crowded period. 3: Other precautions.
Q10. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).
• Going out using a mask. • Going out during a non-crowded period.
Q11. In each of the following periods (see footnote 14 for the periods), did you change the frequency of outdoor exercises such as walking and jogging.
1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not exercise.
Q12. When you exercise, did you take any precaution?
0: Took no precaution. 1: Used a mask. 2: Chose a non-crowded period. 3: Other precautions.
Q13. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).
• Exercising using a mask. • Exercising during a non-crowded period.
Q14. In each of the following periods (see footnote 14 for the periods), did you change the frequency of drinking and eating out with friends?

1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not eat out.
Q15. What sort of precautions did you take?
1: Used a mask. 2: Chose a non-crowded time. 3: Did it online. 4: Other precautions. 5: Took no precaution.
Q16. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).
• Drinking and eating out with friends using a mask. • Drinking and eating out with friends during a non-crowded period. • Drinking and eating out with friends online.
Q17. In each of the following periods (see footnote 14 for the periods), did you change the frequency of visiting a hospital and a clinic for a non-urgent purpose.
1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not make a doctor visit.
Q18. What sort of precautions did you take?
1: Used a mask. 2: Chose a non-crowded time. 3: Did it online. 4: Other precautions. 5: Took no precaution.
Q19. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).
• Visiting a hospital and a clinic with friends using a mask. • Visiting a hospital and a clinic during a non-crowded period. • Having a consultation online.

Q20. In each of the following periods (see footnote 14 for the periods), did you change the frequency of visiting your parents' home.
1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not visit parents.
Q21. What sort of precautions did you take?
1: Used a mask. 2: Chose a non-crowded time. 3: Did it online. 4: Other precautions. 5: Took no precaution.
Q22. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).
• Visiting your parents' home using a mask. • Visiting your parents' home during a non-crowded period. • See your parents online.
Q23. In each of the following periods (see footnote 14 for the periods), did you change the frequency of visiting such a pleasure facility as a Karaoke bar, a live music house, and a game center.
1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not use these facilities.
Q24. What sort of precautions did you take?
1: Used a mask. 2: Chose a non-crowded time. 3: Other precautions. 4: Took no precaution.
Q25. To what extent are you reluctant to do the following activities? Please indicate the level between 0 (not at all) and 10 (very much).

• Visiting a pleasure facility using a mask. • Visiting a pleasure facility during a non-crowded period.
Q26. In each of the following periods (see footnote 14 for the periods), did you change the frequency of shopping?
1: Increased. 2: Not changed. 3. Decreased. 4: Stopped. 5: I do not go out for shopping.
Q27. What sort of precautions did you take?
1: Used a mask. 2: Chose a non-crowded time. 3: Shopped online or by mail order. 4: Other precautions. 5: Took no precaution.
Q28. In each of the periods in 2020 (see footnote 14 for the periods), how often did contact with people (excluding passers by) with the following symptoms?
• Sore throat, coughs, sneezes, and/or short breath. • Fever of 37.5 degrees or higher. • COVID-19 infection. • Closely in touch with a COVID-19 patient.
0: Never. 1: Less than once a month. 2: Once to three times. 3: Less than four times a week. 4: Four times or more.
Q29. In your daily life, how did you deal with the following health precautions? Please answer for the following periods (see footnote 14 for the periods).

- Washing hands.
- Disinfecting hands by alcohol etc.
- Gargling.
- Taking temperature frequently.
- Sunbathing a lot.
- Covering your mouth by hands when coughing and sneezing.
- Trying not to touch mouth and nose.
- Trying not to rub eyes.
- Sleeping sufficiently.
- Waring products that are for disinfecting air.
- Using a mask when going out.
- Observing a social distance when lining up for a cashier at shops.

1: Did not attempt intentionally at all.

2: Did not attempt so ardently.

3: Did attempt somewhat seriously.

4: Did attempt very seriously.

Q30. What sort of precautions did you take when washing hands?

1: Washing hands with water.

2: Using soap to wash hands.

3: Washing hands for a longer time.

4: Washing more carefully.

5: Washing more often.

6: Washing every time after going out.

7: Washing the sides of fingers and lists intensively.

Q31. What sort of precautions did you take when disinfecting hands?

1: Using hand sanitizers offered by shops.

2: Carrying your own hand sanitizer.

3: Using ultraviolet sanitizers.

Q32. What sort of precautions did you take when gargling?

1: Taking a longer time.

2: Gargling more often.

3: Using a hot water.

4: Using a medicine for gargling.

5: Using salt water.

Q33. Why did you not use a mask when going out?

- A mask is ineffective against COVID-19.
- I did not feel to buy a mask for it was too expensive.
- I wanted to use a mask but could not get it.
- A mask makes me uncomfortable (hot, itchy).
- A mask makes me look bad, for it is not fashionable.
- I do not believe that I will catch it, for I am very healthy and strong.

1: This is absolutely not the reason.
2: This is not really a reason.
3: I do not know if this is a reason.
4: This is a relatively strong reason.
5: This is a strong reason.

Q34. Tell us why you use a mask.

- To avoid catching COVID-19.
- Because I am afraid to giving the virus to others.
- Because many people around me are using it.
- Because my family member or a friend advise me to use it.
- Because I am afraid of criticized if I do not use it.
- I am used to use a mask, for example, to protect against cedar pollen and other allergy.

1: This is absolutely not the reason.
2: This is not really a reason.
3: I do not know if this is a reason.
4: This is a relatively strong reason.
5: This is a strong reason.

Q35. To what extent did you rely on the information from the following sources?

- Friends and acquaintances.
- Family members.
- Magazines and books.
- Newspapers and TVs.
- Private Web sites and SNS.
- Web news.
- Governmental and organizational Web sites.

1: Not at all.
2: Rarely.
3: Somewhat.
4: Very much.

Q36. How do you rate a government's initiatives to cope with COVID-19.
1: Extremely satisfied. 2: Moderately satisfied. 3: Neither. 4: Moderately dissatisfied. 5: Extremely dissatisfied.
Q37. How do you rate a local government's initiatives to cope with COVID-19?
1: Extremely satisfied. 2: Moderately satisfied. 3: Neither. 4: Moderately dissatisfied. 5: Extremely dissatisfied.
Q38. To what extend do you agree with the statement that you can avoid catching COVID-19 if you follow what the government tells you to do?
1: I agree absolutely. 2: I agree basically. 3: I neither agree not disagree. 4: I disagree basically. 5: I disagree absolutely.
Q39. Per capita, the number of PCR tests conducted in Japan is lower than those in many other countries. What is you view on PCR test? Please choose the one close to your view.
1: The number of PCR tests should be increased to understand the spread of the virus. 2: The government should be careful in increasing the number of PCR tests because there can be many pseudo negatives and pseudo positives cases, which would cause an unnecessary confusion among the public. 3: I cannot either. / I do not know.
Q40. Do you take flu shots?
1: Every year. 2: Some years. 3: Rarely. 4: I do not want to take flu shot. 5: I cannot take flu shots because of medical reasons such as allergies.
Q41. Did you take flu shots this season (fall and winter)?

1: I did. 2: I will. 3: I will not.
Q42. "The Go To Travel campaign," during which the government pays half of a domestic travel expense, started on July 22. Since the start of the campaign, have you made a trip (including a day trip), or planned to make a trip, outside of the prefecture you live(d)?
1. I have either made a trip or planned a trip. 2. I have neither made a trip nor planned a trip.
Q43. If you choose 1 in the above question, would you have made, or planned, the trip even if the Go To Travel campaign were not adopted?
1. I would have not made the trip. 2. I would have made the trip. 3. I do not know.
Q44. Are there anyone close to you (family members, relatives, friends, colleagues, neighbors) who caught COVID-19?
1: Yes. 2: No.
Q45. When did the person(s) catch COVID-19? If more than one person caught the virus, please tell us the earliest case. (See footnote 14 for the periods.)
Q46. Are you upset when you see people who are not keeping a sufficient distance in a place where many people gather (such as a line for a cashier)?
1: Yes. 2: Somewhat yes. 3: It does not bother me.
Q47. Do you think it justifiable that people criticize those who caught COVID-19 in the current circumstances in which many people put various efforts to contain the virus?
1: It is justifiable. 2: It is somewhat justifiable. 3: It is not justifiable. 4: It is unforgivable to criticize people for that reason.
Q48. Please choose the option that best describes your view on each of the following statements.

• We should restrict travels of outside people to our area so as to control the spread of COVID-19 in our area. • It is better to restrict to one's freedom, such as requiring the use of a mask and prohibiting drinking parties, so as to contain the outbreak of COVID-19.
1: I do not agree at all. 2: I somewhat disagree. 3: I somewhat agree. 4: I absolutely agree.
Q49. On your current work, please tell us a type of job. [Only for Nagahama group]
1: No jobs (full-time housewives, students, retired). 2: Employees having a formal contract with the employer. 3: Self-employed (operating restaurants, wholesale retailers, agriculture, etc.) 4: Professionals (doctors, lawyers, accountants, tax accountants, writers, etc.) 5: Employees of a family business. 6: Home-based work/internal work, non-employee. 7: Contract workers, non-employee. 8: Do not want to answer.
Q50. On your current work, please tell us a type of job. [Only for medical workers group]
1: Doctor, Dentist. 2: Nurse, Midwife. 3: Pharmacist. 4: Clinical laboratory technician, Clinical engineer, Vision trainer. 5: Physiotherapist, Occupational therapist. 6: Radiological technologist. 7: Medical information manager, Medical information technologist. 8: Medical administrator, Medical secretary. 9: Other types of medical work. 10: Do not want to answer.
Q51. Do you have a job that requires to make a direct contact with customers?
1. Retail store staff (floor staff and cash register staff). 2. Customer service at restaurants and bars (waiter or waitress). 3. Customer service requiring personal contacts with customers. 4. My job does not require direct personal contacts.
Q52. In which area is your workplace located?

1: Nagahama city, Shiga prefecture. 2: Other cities than Nagahama, Shiga prefecture. 3: Kyoto prefecture. 4: Osaka prefecture. 5: Nara prefecture. 6: Hyogo prefecture. 7: Aichi prefecture. 8: Tokyo, Kanagawa, Chiba, Saitama prefecture or Hokkaido. 9: Other prefectures.
Q53. Can your work be conducted remote from home?
1: Impossible. 2: Partially possible. 3: It can easily be shifted.
Q54. Can your work permit off-peak-time commuting?
1: Impossible. 2: Partially possible. 3: It can easily be shifted.
Q55. In each of the following periods (see footnote 14 for the periods), were you encouraged by your workplace to go remote?
1: Not all encouraged. 2: Not so encouraged. 3: Neither encouraged nor discouraged. 4: Somewhat encouraged. 5: Strongly encouraged.
Q56. In each of the following periods (see footnote 14 for the periods), were you encouraged to go off-peak-time commuting?
1: Not all encouraged. 2: Not so encouraged. 3: Neither encouraged nor discouraged. 4: Somewhat encouraged. 5: Strongly encouraged.
Q57. How often did you work remote? (See footnote 14 for the periods.)

1: Almost never. 2: One or two days a week. 3: Three days a week. 4: More than for days a week.
Q58. How often did you commute off-peak time? (See footnote 14 for the periods.)
1: Almost never. 2: One or two days a week. 3: Three days a week. 4: More than for days a week.
Q59. Do you want to work remote more?
1: Want to reduce significantly. 2: Want to reduce somewhat. 3: I like the way it is now. 4: I want to increase a bit. 5: I want to increase a lot.
Q60. Do you want to increase off-peak time commuting?
1: Want to reduce significantly. 2: Want to reduce somewhat. 3: I like the way it is now. 4: I want to increase a bit. 5: I want to increase a lot.
Q61. Please choose one option that fits most to your view and idea with respect to the following:
• I do not have any hesitancy to start new things (eg. try a newly opened store) and to use new technology (eg. online meetings and smart phone). • I hesitate to change daily habits even if I should change them. • I tend to stick to what I have decided until something is accomplished. • I think one of the most important things in life is not to be troublesome for others. • I have a personality to do what is good for my health even if that would cause a pain either physically or mentally.
1: I do not agree at all. 2: I somewhat disagree. 3: I do not have any view. 4: I somewhat agree. 5: I absolutely agree.

Q62. On the one hand, we have a saying that "nothing ventured, nothing gained." At the same time, we also have a saying that "a wise man keeps away from danger." Which do you think you are closer when you choose your own action?
1: Nothing ventured, nothing gained. 2: A wise man keeps away from danger.
Q63. What is the probability of rain above which you take an umbrella when go out?
0: 0% 1: 10% 2: 20% 3: 30% 4: 40% 5: 50% 6: 60% 7: 70% 8: 80% 9: 90% 10: 100%
Q64. During the last 30 days, about how often did you feel ...
• ... nervous? • ... hopeless? • ... restless or fidgety? • ... so depressed that nothing could cheer you up? • ... that everything was an effort? • ... worthless?
1: Never. 2: Rarely. 3: Sometimes. 4: Usually. 5: Always.
Q65. Next, we ask you about yourself and what you feel in your life. Please indicate how strong you feel from 1 to 10. 1 implies that you absolutely feel so. 10 implies that you do not feel so at all.

• In general, I feel very positive about myself. • I'm always optimistic about my future. • I am free to decide for myself how to live my life. • I generally feel that what I do in my life is worthwhile. • Most days I get a sense of accomplishment from what I do. • When things go wrong in my life it generally takes me a long time to get back to normal. • I try to live free from social constraints.
Q66. How happy are you now? Please indicate the level between 1 (very unhappy) and 10 (very happy).
Q67. How happy do you think will you be five years later? Please indicate the level between 1 (very unhappy) and 10 (very happy).
Q68. Overall, how satisfied are you with life as a whole these days? Zero means you feel "not at all satisfied" and 10 means you feel "completely satisfied".
Q69. How would you rate your general health status?
1: Very good. 2: Quite good. 3: Neither good nor poor. 4: Quite poor. 5: Very poor.
Q70. Generally speaking, would you say that most people can be trusted? Or that you need to be careful in dealing with people? "Please indicate the number between 1 "Most people can be trusted" and 10 "You need to be very careful in dealing with people" that most closely describes your opinion by covering the number in black.
Q71. To what extent do you think you can count on the following people to seek for help to deal with daily problems and concerns?
• Neighbors. • Family members. • Relatives • Friends • Workmates

1. I can count on them a lot.
2. I can count on them to some extent
3. I either can or cannot count on them.
4. I cannot count on them so much.
5. I cannot count on them at all.
6. I have no such person.

Q72. During the past year, have you donated money to a non-profit organization or an organization conducting charitable activities?

1: None.
2: Less than 1000 yen.
3: 1,000 yen through 4,999 yen.
4: 5,000 yen through 9,999 yen.
5: 10,000 yen through 49,999 yen.
6: 50,000 yen and more.

Q73. How often do you usually associate with friends, relatives, or workmates?

- Friends and acquaintances (excluding classmates or work mates).
- Relatives.
- Workmates.

1: Very often (once a day - several times a week).
2: Occasionally (once a week - several times a year).
3: Rarely (once a year - several times in several years).
4: Never.
5: I do not have such a person.

Q74. To what degree do you trust the following organizations?

- Central government.
- Local governments.
- Scientists specializing in infectious diseases and other medical studies.
- TV and radio news media, newspapers.

1. I trust very much.
2. I trust to a certain degree.
3. I neither trust nor distrust.
4. I do not trust much.
5. I do not trust at all.
6. I do not know.

Q75. To what degree do you agree with the following statements?

• If I help somebody out, when I am in difficulty, somebody will help me out. • Most people are happy to help others.
1: I absolutely agree. 2: I somewhat agree. 3: I do not have any view. 4: I somewhat disagree. 5: I do not agree at all. 6: I do not know
Q76. Please let us understand your family structure. Do you live with the following family members?
• Spouse. • Children. • Grandchildren. • Parents. • Preschool children. • Elderly adult (65 years and older). • Those who have basic health problems, including diabetes, heart failure, and respiratory disorders, receives dialysis, immunosuppressants, and anticancer agents.
Q77. Please tell us a number of family members living with you (please do not include yourself).
Q78. Are you married?
1: Married. 2: Divorced. 3: Separated by death. 4: Never married. 5: I do not want to answer.
Q79. Do you smoke?
1: Yes. 2: Not now, although I used to smoke. 3. No.
Q80. Do you drink?

1: Not at all. 2: Less than once a week. 3: About once. 4: About twice. 5: About three times. 6: About four times. 7: About five times. 8: About six times. 9: Every day.
Q81. If you drink, please let us know what you drink and how much a day. If you take different types of alcohol from one day to another, please tell us by the most usual daily combination.
0. I do not drink. 1. Less than a glass of wine. 2. A glass of wine. 3. Two glasses of wine. 4. Half a bottle of wine. 5. A bottle of wine. 6. More than a bottle of wine.
Q82. Have you changed the amount of alcohol drink you take a day?
1. Decreased significantly. 2. Decreased a bit. 3. Unchanged. 4. Increased a bit. 5. Increased significantly.
Q83. How many hours do you work to earn income? Please include overtime hours. If you have more than one job, please let us know the total work hours.
Q84. How often do you have personal contacts at workplace? Please let us know the average number of people a day for your colleagues and others such as customers and clients.
Q85. Which of the following corresponds to your household's annual income? Please include all the side-job income and various benefits etc before you pay taxes and social insurance premiums.

1: No more than 2 million yen 2: Greater than 2 million and no more than 4 million yen. 3: Greater than 4 million and no more than 6 million yen. 4: Greater than 6 million and no more than 8 million yen. 5: Greater than 8 million and no more than 10 million yen. 6: Greater than 10 million and no more than 15 million yen. 7: Greater than 15 million yen. 8: I do not know. / I do not want to answer.
Q86. Which of the following corresponds to your household's total present bank deposits, shares, and investment trusts?
1: No more than 2 million yen 2: Greater than 2 million and no more than 4 million yen. 3: Greater than 4 million and no more than 6 million yen. 4: Greater than 6 million and no more than 8 million yen. 5: Greater than 8 million and no more than 10 million yen. 6: Greater than 10 million and no more than 15 million yen. 7: Greater than 15 million and no more than 20 million yen. 8: Greater than 20 million yen. 9: I do not know. / I do not want to answer.
Q87. Since when did your family live in the area where you currently live? Please answer about the father's side or mother's side who has lived in the area for a longer time.
1: From my generation. 2: From my parents' generation 3: From my grandparents' generation 4: From my great-grandparents' generation or ealier
Q88. Where did your family live before your family moved to your current area?
1: Nagahama city. 2: Shiga prefecture except for Nagahama city. 3: Outside of Shiga prefecture. 4: I do not know.