Survey of rural and urban happiness in Indonesia during the corona crisis

Yoko Mayuzumi

Received: 2 June 2022 / Accepted: 29 September 2022 / Published online: 14 October 2022
© The Japan Section of the Regional Science Association International 2022

Abstract
The COVID-19 pandemic has drastically changed urban life, and it can be said that the time is at hand when cities and rural areas should promote symbiotic projects. These projects are diverse and include medical conditions, socioeconomic activities, working conditions, information technology, food conditions, culture as well as education. According to previous studies, medical conditions are excellent, but well-being of the mental health of people in developed countries is higher in rural areas than in urban areas. Meanwhile, developing countries tend to have higher levels of well-being in urban life, while rural areas have lower levels of well-being and mental health, because of a focus on lagging economic activities and vulnerability in medical care. Preliminary interviews in Bali, Indonesia, the author’s study area, revealed no livelihood change in subsistence farming villages during the COVID-19 disaster indicating no effects by the pandemic. Meanwhile, urban residents faced difficulties obtaining food due to the government curfew and halt in economic activities. Most workers lost their jobs and suffered hardships in the tourism industry. With this situation, the conditions are slightly different from the previous studies in developing countries mentioned above. Previous studies did not reveal any mental health and well-being assessment for life in the rural areas of developing countries during the corona disaster. This study aimed to clarify the reality of urban and rural well-being during the Corona Disaster in a developing country, namely Bali. The hypothesis is that in Bali, Indonesia, a developing country, the level of well-being under the corona disaster is higher for rural residents than for urban residents. Six groups were surveyed with 71 questions from the survey items of previous studies including the World Happiness Report conducted worldwide, WHR2020, AHI and The Oxford Happiness Survey. Face Sheet, Mental Health, Anxiety, Happiness, Good things due to corona, and Corona infection control behaviors were included. The questionnaire was categorical to allow for a quantitative analysis and began in September 2021. I collected 280 samples from two villages, each in rural and urban areas of Bali, and analyzed the results with simple cross-tabulations and a difference of means, factor analysis, multiple regression analysis and structural analysis of covariance. The analyses revealed a tendency toward inward self-loneliness in the urban areas.
and outward anxiety about one’s surroundings in the rural areas. Under the corona disaster, subjects in rural areas stayed optimistic about external stress, in contrast to those in urban areas, who became inwardly oriented and negative. This point does not imply that well-being is higher among rural people, but it suggests that they are more mentally stress-tolerant because they are more likely to positively view the situation. Although the hypothesis was not proven, life in rural areas, where people have optimistic feelings and are not lonely, can be considered relatively humane and mentally healthy. This may indicate that the level of well-being of people living in rural areas is higher than people living in urban areas. The results of this study differ from previous studies in which people in rural areas of developing countries had lower levels of happiness and mental health. However, this study provides new knowledge about the situation of the corona disaster in developing countries by surveying the well-being of both rural and urban residents.

**Keywords**  Happiness · Well-being · COVID-19 · Anxiety · Mental health · Developing country · Indonesia · Bali · Structural equation modeling

**JEL Classification**  I31 · N35 · Q01 · Z10 · Z31

1 Introduction

1.1 Research background-urban–rural health disparities in the COVID-19 disaster

The pandemic of COVID-19 has drastically changed urban life, and it can be said that the time is at hand when cities and rural areas will promote symbiotic projects. They are diverse and include medical conditions, health and health care, spiritual life, socioeconomic activities, working conditions, information technology, migration, agricultural and food conditions, culture, education, and population structure. In particular, rural residents often comprise the majority of the population at high risk for serious illness, including the elderly and the poor. In addition, they face healthcare disparities in the prevention and treatment of infectious diseases in the healthcare setting, resulting in an environment with limited numbers of viral tests and recoveries. Charbel (2018) reports that deaths from infectious diseases in the urban group declined much more rapidly than in the rural group. Qian (2021) presented four explanatory variables, “location (urban/rural classification),” “existing social vulnerability (Social Vulnerability Index),” “community resilience (Baseline Resilience Indicators for Communities),” and “diversity among neighborhoods,” and found that urban groups had higher levels of resilience than rural groups. This result is consistent with the earlier findings of Charbel (2018), as well as Cutter et al. (2016) Qian (2021) report that this correlation has matched in all the U.S. counties.

On the other hand, when focusing on mental health regarding well-being, there are reports of different aspects of the existence of health disparities due to inadequate rural health care. It is about the paradox of rural well-being in developed countries (Denmark is the case here). According to reports on the subject
in developed countries, rural residents tend to exhibit higher levels of subjective well-being than urban residents. Higher connective social capital in rural areas and higher access to natural amenities contribute to the paradox of well-being in rural Denmark (Sørensen 2014).

As noted above, the COVID-19 pandemic highlights strengths and weaknesses in urban and rural areas. However, Sørensen (2014) cautions against generalizing these findings to other regions, especially considering differences in demographic structure, socioeconomic status, transportation, culture, physical environment, and scale of intervention.

This study aims to determine the reality of urban and rural subjective well-being in a corona disaster in a developing country, specifically the Indonesian island of Bali, as a case study. It will address the following issues in turn and finally verify the hypothesis: 1. to present an index of “subjective well-being” based on an objective global case study; 2. to select the survey subjects in Bali and conduct a questionnaire survey, and 3. to analyze the obtained data and verify the hypothesis through the results of the analysis.

Aristotle called happiness the final goal of life and defined “well-being” as not only temporary pleasure and happy feelings but also a life in which people use their unique human reason and make the best use of their abilities to the fullest (The previous studies in this field have used both well-being and happiness.). As the tool for examining a person’s well-being, there is a proposal for a quality of life assessment scale, the WHO Quality of Life 26 (1997), which can be of common use across countries, cultures, ages, and genders around the world. This tool is a 26-item QOL questionnaire routinely used in clinical settings in health care. The WHO defines QOL as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. And it consists of six domains (1. physical domain, 2. psychological domain, 3. level of independence, 4. social relationships, 5. environment, and 6. spirituality/religious/beliefs) (Tasaki et al. 1998). On the other hand, as an indicator of people’s happiness comprehensively from the viewpoint of consumers and with a qualitative evaluation perspective, there is a happiness indicator as a theory of people’s subjective well-being, apart from QOL (Quality of Life: ease of living and satisfaction), which is an indicator of well-being as a quality of life. Happiness is discussed primarily in the fields of psychology and economics. A typical example is Pugno’s (2004) “paradox of happiness.” Research on methods of measuring and quantifying happiness is still ongoing, and recently, self-reported “subjective well-being (individual evaluation of positive and negative emotions, happiness, life satisfaction, etc.)” in psychology is considered a better indicator. The mainstream view is that direct measurement of “subjective well-being” using questionnaires is effective (Ando 2014).

The following further summarizes previous studies about well-being on the content generated by the COVID-19 pandemic for urban and rural areas, divided into developed and developing countries, and on the strengths and weaknesses of their respective health care.
2 Literature review on health inequalities and happiness

2.1 Health inequalities and happiness in urban areas of developed countries with corona disasters, compared to rural areas.

Migration from rural to urban areas has been a megatrend ever since 1900 (UN 2006, 2019). The reality of urban life provides a favorable environment for health and health care. They are proximity to medical care and a conducive environment for the treatment of serious illnesses, the presence of ICUs and physicians with specialized skills, diversified economic activities and corresponding employment opportunities, high implementation of telework, and guarantees in case of inability to work due to illness (OECD 2020). Urban residents have an advantage in diverse living conditions compared to rural. According to the World Happiness Report (2020), most people choose to live in urban areas. This fact is because metropolitan areas offer a higher quality of life, both in terms of employment opportunities and access to amenities and public services (Faggian et al. 2011; Edward et al. 2016). However, these benefits from cities may be challenging to receive uniformly. Urbanization is generally associated with higher actual costs of living. The extent to which these costs are experienced and reflected in measures of well-being depends on the education and related socioeconomic status of residents (e.g., Morrison 2011; Edward et al. 2016). Although rural life is associated with more robust connections through social capital, the number of respondents who said they had relatives and friends they could rely on when in trouble was lower in rural areas than in urban areas (WHR 2020). Life in urban areas is more socially satisfied than in rural areas. The percentage of people who are satisfied with meeting people and making friends is the largest in high-income countries, with 79% satisfied in urban areas compared to 68% in rural areas. All different income groups score nearly the same as urban areas in semi-dense areas (WHR 2020). Tokyo’s population in Japan also continues to grow as young people leave the rural countryside hinterland searching for better educational and employment opportunities Julian (2020). Qian (2021) said that the urban–rural disparity relates to cultural perceptions of health and health care. Rural residents are more reluctant to seek medical care or engage in preventive health behaviors than urban residents. For example, rural residents are less likely to use sunscreen to prevent skin cancer (Zahnd et al. 2018). In addition, the Latino community, which works in rural industries, such as agriculture, poultry, and meat production, and has no separate household registration, often lacks health insurance coverage (Dorn et al. 2020). This example would mean that rural communities are less likely to be willing to seek and receive health care on their own.

2.2 Health inequalities and happiness in rural areas of developed countries with corona disasters, compared to urban areas.

The Gallup World Poll to examine urban–rural happiness differentials across the world in 2020 (Pugno 2004) shows that the desire to live in rural and small-town
surroundings has increased significantly over the past two years (OECD 2020). Almost half of U.S. adults said they would prefer to live there in 2020. This result is an increase of 9% from 2018. Remote work is crucial to be the driving force behind this change.

Several large U.S. cities reported that in 2020 when many people would be migrating to many rural areas of the country. And the expectation is that those who have not escaped urban sprawl will undoubtedly crave greener pastures and wide-open spaces. Deaton (2015) presents an 11-point Cantril Ladder index of numerical values for subjective well-being for the 150 countries surveyed. The results showed that the global average life rating for urban people was 5.48, while the global average life rating for rural people was 5.07, a difference of 0.41 points. In contrast, in 101 countries (67%), the average life rating of rural people was significantly higher than the average life rating of urban people. The following countries have lower-than-average urban life ratings, with average values closer to rural areas. They are Lebanon (−0.41), Iceland (−0.38), the Netherlands (−0.35), New Zealand (−0.34), the United Kingdom (−0.34), and Egypt (−0.34). However, there are no countries in this category in Oceania and North America, and in most Northern and Western Europe, there is no statistically significant difference in life evaluations between urban and rural populations (WHR 2020).

Social capital and nature have also often been key trump cards to prove the virtues of rural areas in developed countries. For example, in the introduction to the Organization for Economic Cooperation and Development’s (OECD 2006) rural policy document, The New Rural Policy Paradigm, in “Policy and Governance,” attention to “existing assets, such as location, natural and cultural amenities, and social capital” in rural areas, is encouraged. Here spatial location satisfaction, social capital, and access to natural amenities are expected to be positively correlated with subjective well-being. In rural areas, spatial location satisfaction, social capital, and access to natural amenities may be higher. Thus, these factors may contribute to understanding the origins of the paradox of well-being in rural areas, as Requena (2016) points out. Furthermore, an analysis of surveys in which respondents choose one of five options (1) large cities, (2) medium cities, (3) small cities, (4) villages, and (5) rural areas shows that satisfaction is higher in settlements where there is ample space. This point supports previous research that found that self-reported location satisfaction is positively related to self-reported life satisfaction (Adam and Rubia 2018). Rural residents in developed countries tend to report higher levels of subjective happiness than in their urban areas. This point has proven to be the case in studies of rural vs. urban happiness surveys in counties worldwide (Berry and Okulicz-Kozaryn 2009; Requena 2016; Easterlin et al. 2011), Survey in EU (Sørensen 2014; Camilla and Giovanni 2016), Survey in the USA (Campbell et al. 1976; Berry and Okulicz-Kozaryn 2013; John and Yu 2017), Survey in Australia (Ida et al. 2018). In addition, Berry and Okulicz-Kozaryn (2009) find that for a sample of high-income countries, dissatisfaction with life is highest in large cities with populations over 500,000 and lowest in rural areas with people under 2000. On the other hand, in their sample of low-income countries, they find that living in a rural area or a large city has no statistically significant association with life satisfaction. residents in other regions of the world. For example, Piper (2015) found that residents of the capital cities of 16 European countries have lower happiness levels than residents outside the
capital. In addition, studies from the United States (Adam and Rubia 2018), New Zealand (Morrison 2011), Sweden (Gerdtham and Johannesson 2001), Romania (Camilla and Giovanni 2016), several studies of single countries have reported low levels of subjective happiness in the capital and most significant cities. These studies rely on survey data that include self-reports of personal happiness, life satisfaction, or quality of life.

Furthermore, some studies have reported that for residents of capital cities in developed countries, subjective happiness in New Zealand was lowest in Auckland, the largest city in New Zealand. In response to this result, Morrison (2011) named it the “paradoxical localization of affluence.” Furthermore, Sørensen (2014), using data from the European Values Study 2008 for 28 EU member states, reveals that life satisfaction is higher in rural areas than in urban areas when controlling for socioeconomic factors, such as gender, age, education, employment, and income. In response to these results, Sørensen (2014) explores the reasons for higher life satisfaction in rural areas and considers rural–urban differences in levels of anxiety, frames of comparison (in assessing one’s life satisfaction), and social capital (social interaction). Furthermore, when the state ensures a relatively generous basic income, soft factors become more critical parameters of subjective happiness. In Denmark, the soft factors of conjunctive social capital and access to the natural environment are strong predictors of personal happiness (Rozaki 2020). According to classical sociologists’ theory (Louis 1938), social interaction, social cohesion, and solidarity are higher in rural communities than in urban communities. Louis (1938) explains the rural–urban conflict by the opposition of rural Gemeinschaft, characterized by high social cohesion and involvement, and urban Gesellschaft, characterized by weak family relations, friendship ties, division of labor, and high population heterogeneity.

Furthermore, a case study in Japan reports on agricultural experiences and mental health linked to rural life: JA and Juntendo University surveyed in November 2018 at a hands-on farm in Nerima-Ku, Tokyo (n = 40 men and women living in Tokyo). It asks participants to do fertilizing and harvesting work and compares saliva composition before and after. The results confirm that cortisol and chromogranin A, hormones that increase with stress, decreased, and oxytocin, a hormone that expresses happiness, increased on average, although there are gender and personal differences. Furthermore, questionnaires measuring mood revealed that negative factors, such as anger, confusion, depression, fatigue, and tension decreased. These results indicate that working on a hands-on farm contributes to a certain level of stress reduction and increased happiness. Professor Akiro Mizushima of the same university has suggested the possibility of “Agri-healing (healing through agriculture) effects” (Chiba 2021). This result could be one factor indicating a higher level of happiness in rural life.

2.3 Health inequalities and happiness in urban areas of developing countries with corona disasters, compared to rural areas.

The World Happiness Report (WHR 2020) shows the high valuation of life in urban areas regarding positive and negative feelings about the 115 countries in its sample. More people in urban areas experience fun than in rural areas, and more people in rural areas experience physical pain and sadness than in urban areas. This gap is
huge in low-income countries, where 46% of the rural areas say they experienced physical pain more often yesterday, compared to 43% in towns and semi-dense regions and 41% in urban areas, which decreases as one moves toward cities. Sadness is also more frequently found in rural areas of low-income countries, with 38% of respondents reporting experiencing more sadness in a day, compared to only 34% in urban areas. In low- and middle-income countries, more people in urban areas experience joy, and fewer experience pain and sadness than in rural areas. In addition, more people in urban areas than in rural areas feel they can rely on family and friends, meet people, and make friends. Urban dwellers value their lives more highly, and it is not surprising that they are more likely to move from rural to urban areas (WHR 2020).

As noted in 1.3 above, Deaton (2015) presented an 11-point Cantril Ladder index of numerical values for subjective happiness. The global average life rating for urban populations is 5.48, while the global average life rating for rural populations is 5.07, a difference of 0.41 points. The difference between urban and rural populations is most remarkable in East Asia (0.56) and Sub-Saharan Africa (0.56), followed by South Asia (0.47), Southern Europe (0.46), Latin America, and the Caribbean (0.38). These findings suggest that the average happiness of urban residents tends to be higher than that of rural residents, especially in less economically prosperous countries, such as those found primarily in developing countries in Africa and Southeast Asia. Furthermore, those who say they can count on family and friends in times of need are lower in rural areas, at 63%, compared to 68% in urban areas (WHR 2020). Requena (2016) reports that urban residents in developing countries have consistently higher levels of subjective happiness than rural residents. He then examines whether the geographic dispersion of happiness within a nation depends on the country’s stage of development. Using individual-level data from 29 European countries that participated in the 2012 European Social Survey, two groups consist of 24 developed countries with a GDP per capita of at least US$20,000 and five developing countries. The results show that developed countries have the highest levels of happiness in the countryside and the lowest in large cities, while the opposite is true for developing countries. Easterlin (2011) also reports higher levels of life satisfaction in urban areas in developing countries and the same or higher levels of life satisfaction in rural areas in developed countries. Rural life satisfaction exceeds urban life satisfaction in 14 countries, and rural life satisfaction exceeding urban life satisfaction is most pronounced in developed countries, such as the United Kingdom, the Netherlands, and Norway. In the remaining countries, life satisfaction is higher in urban areas, and urban life satisfaction exceeding rural life satisfaction is most pronounced in the least developed countries, such as Uganda, Tanzania, and Cambodia.

2.4 Health inequalities and happiness in rural areas of developing countries with corona disasters, compared to urban areas

In a study of rural–urban migrants in China by Knight and Gunatilaka (2010), rural-to-urban migrant households settled in urban China has lower average happiness
than rural households. They attribute this to the migrants’ high expectations of life in the city before migration. However, it is also possible to explain the rural-to-urban migrants as having been forced to move to the cities to survive economically but were willing to remain in their rural homelands if they were free to choose, regardless of their job status, according to the report. If China is an emerging developing country, this is a rare report of a case where rural well-being is considered high. Many studies have reported that happiness tends to be higher in rural areas in developed countries and lower in developing countries. On the other hand, only a few studies have examined the possible causes behind the rural happiness paradox (higher happiness in rural areas) in developing countries (Sørensen 2014; Piper 2015; Morrison and Weckroth 2018). There are few reports on differences in urban and rural happiness in developing countries, and it is unclear whether the differences in urban and rural happiness are by people-based factors, such as social capital, or place-based factors, such as access to health care. Complicating the issue is that people do not value environmental attributes in the same way, and some reports say that the relationship between place of residence and well-being is heterogeneous (Plaut et al. 2002).

2.5 COVID-19 occurrence and the strength of rural areas with no separation between developed and developing countries

Table 1 summarizes rural areas emerging from the COVID-19 crisis (OECD 2020). According to OECD (2020), the outbreak of COVID-19 led to new digital solutions that connect urban and rural areas in a more integrated way that could spur growth in firms and jobs. Since many jobs are in large metropolitan areas, remote and decentralized networks can strengthen rural–urban ties. This concept also reflects the ongoing shift in work practices from traditional office-based workers to more flexible methods, including telecommuting, working in multiple time zones, and nomadic (remote workers who move between different locations). These synergistic effects may be related to changing social and policy preferences for proximity services, increased local consumption, and the recovery of strategic industries. Sealing off certain areas to prevent the spread of viral infections could reduce pollution and CO2 emission levels. This measure could positively affect policies that support green and sustainable growth. In the recovery process, society’s high level of understanding of the path of sustainable development for rural communities will accelerate the

| Table 1 | Rural opportunities emerging from the crisis of COVID-19 (OECD 2020) |
|---------|---------------------------------------------------------------------|
| Higher relevance to enhance quality and use of digital tools/broadband in rural regions |
| Remote distributed work might increase linkages between rural and urban |
| Shift in consuming habits can favor local products and destinations |
| Greater awareness to ensure accessibility to quality services (e-health, e-education) |
| Re-shoring of strategic industries that were once delocalized (i.e., raw materials) |
| Momentum to accelerate a just transition toward a low-carbon economy for rural communities |
| Mobilize and strengthen local networks and co-operative structures to face future shocks |

Springer
transition to a zero-carbon economy. Rural communities occupy a significant portion of the land, water, and other natural resources essential for absorbing CO₂, providing ecosystem services, and protecting biodiversity. Supporting countries in building climate-smart rural economic development pathways is key to COVID-19 recovery. In addition, the Corona pandemic provides an opportunity for rural communities to strengthen local networks and collaborations to confront the economic shock. Local initiatives that temporarily emerge to address the pandemic’s impending economic and social impact (i.e., community groups transporting health care workers and the elderly) can become organic mechanisms to promote the well-being and cohesion of rural communities in the long run.

3 Subject and hypothesis, purpose in this study

3.1 Subject of this study

As mentioned above, previous studies have shown that although the medical situation is excellent in developed countries, the mental health of the people living in the countryside has a higher impact on subjective happiness in rural areas than in urban areas. On the other hand, developing countries tend to have higher levels of happiness in urban life, while rural areas have lower levels of happiness and mental health, focusing on lagging economic activity and vulnerability in medical care.

According to preliminary interviews in Bali, Indonesia, a developing country where the author researches, the author found that rural residents who could maintain self-sufficiency did not change their lives much during the Corona disaster and may not have been disturbed by the pandemic. On the other hand, urban residents had difficulty procuring food due to the government’s curfew and orders to suspend economic activities, and most of the workers lost their jobs and struggled to make ends meet because their principal workplace was in the tourism industry. This situation may be slightly different from the developing countries mentioned above. The medical condition in Bali is indeed vulnerable, as in the developing countries mentioned before. However, only a few studies have examined the possible reasons behind the rural happiness paradox (rural areas have higher levels of happiness) in developing countries, as indicated before (Sørensen 2014; Piper 2015; Morrison and Weckroth 2018). Research has not yet clarified the assessment of mental health and happiness for living in rural areas in developing countries with corona disasters. Therefore, I am aware of the problem that I should show new findings on the status of happiness in the corona disaster in developing countries by surveying residents’ consciousness about rural and urban life and happiness in developing countries.

3.2 Hypothesis and purpose

About many reports that medical conditions are better in urban areas and rural areas are more vulnerable and have lower levels of happiness, as summarized in previous studies on the corona disaster in developing countries, it is not possible to determine
whether this is necessarily a trend in developing countries. I question whether this is necessarily the case in developing countries, as there are many different situations there. Furthermore, as in the case of developed countries, the high level of happiness in rural life and the increase in life satisfaction due to connectivity with urban areas with the development of information technology may also apply to developing countries, but as far as the author can find, there are no such reports. With this background, this study aims to compare residents’ urban and rural happiness in developing countries and show that rural happiness is not the same as the trends found in previous studies. In this study, the author conducts a consciousness survey of rural and urban residents regarding their happiness in the COVID-19 disaster, quantitatively compares their consciousness, and shows their ways of thinking. Completing a questionnaire survey in the Corona disaster is extremely difficult due to the conditions of overseas travel and restrictions on the movement of local people. For this reason, the author conducts the survey as a case study in Bali, Indonesia, where the author is familiar with the local people and their communication.

Based on the background, subject, and objective of this study, as mentioned, the hypothesis of this study is as follows. “In Bali, Indonesia, a developing country, happiness in the COVID-19 disaster is higher for rural residents than for urban residents.”

4 Research methods

4.1 Detailed content of the questionnaire

To quantitatively indicate the level of happiness by surveying residents’ consciousness through questionnaires, we need a generalized index to measure these factors. Therefore, about happiness, “What should use as the indicator of happiness?” should refer to the idea that has become a global trend, and I should set the questions accordingly. As mentioned above, the World Happiness Report (WHR 2020) is the first reference. Then, the author refers to “happiness,” Peterson’s Authentic Happiness Inventory (AHI) (Peterson 2005), for “general happiness” and “subjective happiness,” Lyubomirsky and Lepper (1999), and for the “Depression Self-Rating Scale (CES-D),” Radloff (1977) of the National Institutes of Health, and The Oxford Happiness Survey by Peter and Micahel (2002), the Be Happy Index (BHI) by Robert (2009). The author has referred to three surveys as follows as the indicator for “Mental Health,” ‘Mental Health’ in the Household Pulse Survey by the National Center for Health Statistics (NCHS) (2021), COVID-19 Health and Well-being Survey by Ministry of Health, New Zealand (2020), and Survey of Mental Health in Connecticut, USA (2021).

As a result, it divides into six groups of the questionnaire: Face Sheet, Mental Health, Worry, Happiness, Good things by COVID-19, and Anti-corona Infection Behavior, with further questions prepared for each group, for a total of 69 questions (Table 2). For the questionnaire survey, the coordinator of the local environmental foundation in this study negotiates for acceptance of the questionnaire in Bali. The staff then visits the rural and urban areas and uses the survey method of reading
the questions directly to the subjects and asking for their responses. This action is because literacy rates may be low in rural areas, and we may not obtain accurate survey data.

4.2 Selection of survey subjects

In selecting the sample for the rural and urban areas, the local environmental foundation with which the author collaborated negotiated the survey implementation, as foreigners are not allowed to conduct surveys alone in Indonesia. In addition, the postal method, the Internet, and other communication-based methods are ineffective for collecting questionnaires from a wide age range in Bali. This situation is because of the poor postal conditions and the possibility of significantly lower collection rates due to lower literacy rates among older age groups and unfamiliarity with answering methods by correspondence. In addition, conducting a street survey requires permission from the municipality and the village self-help organization, as well as a briefing session for the residents. Unfortunately, we cannot do this under the Corona Disaster. With these backgrounds, the local environmental foundation, with which I’m collaborating, negotiated directly with key persons in the target villages and selected those areas that agreed to accept the survey as the subjects. As a result of the negotiations, the rural areas are two rice farmer villages located in the suburbs of Gianyar, an inland province in central Bali famous for its rice terrace scenery, and the urban areas are the villages in Denpasar, the provincial capital, and Kuta area, a nearby tourist downtown area. The survey method consists of staff from the local environmental foundation visiting each house, reading the survey items in an interview format, and obtaining responses. We explained to the subjects that we would use the survey results only for academic reporting and obtained their consent.

5 Results and discussion

The questionnaire survey begins in September 2021, although it is not easy to proceed with the field survey due to the curfew in Indonesia. We have the survey in two rural and two urban areas in Bali and collected 280 samples. The rural area targets rice farmers in an inland site in the middle of Bali, which is famous for its rice terrace landscape. This residential area is a rural village located next to terraced and flat rice fields. The urban areas are the villages of Denpasar, the provincial capital, and Kuta, the neighboring tourist downtown area. Statistical analysis of the survey results will focus first on the overall trends of the total sample of 280, then on the differences in consciousness between the rural and urban areas, and finally on the testing of the hypotheses based on these results. For the five-question groups other than Face Sheet, the response format for each question is a 9-point Likert scale. A reliability analysis response to these five groups of questions; Cronbach’s Alpha coefficient was 0.835 for urban areas and 0.934 for rural areas, which is reliable enough to conduct a statistical analysis.
Table 2  Detailed content of the questionnaire

| Face sheet                  | Mental health                                                                 | Happiness                                                                 |
|-----------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 1 Area of residence         | M_1 Nervous                                                                  | H_1 I feel I am a successful person                                      |
| 2 Name of Residence         | M_2 Fidgety, restless                                                        | H_2 I am usually in a good mood                                          |
| 3 Gender                    | M_3 Troubled                                                                 | H_3 I have a pretty good idea of the purpose of my life                   |
| 4 Age Group                 | M_4 Troubled by things that normally don’t bother me                         | H_4 I usually get what I want                                            |
| 5 Educational background    | M_5 Feeling depressed                                                        | H_5 I have more joy than sorrow in my life                                |
|                             | M_6 Feel that everything I did was for nothing                              | H_6 What I do is always of interest to me                                 |
|                             | M_7 Feel fearful                                                             | H_7 I feel proud of who I am                                             |
|                             | M_8 Talk less than usual                                                     | H_8 My existence has a small but positive impact on the world            |
|                             | M_9 Feel alone                                                               | H_9 I can do most things well                                            |
|                             | M_10 Feel that people around me do not like me                               | H_10 I am enthusiastic about things                                      |
|                             | M_11 Feel irritable                                                          | H_11 I am optimistic about the future of the world                       |
|                             | M_12 Cannot stop worrying                                                    | H_12 I feel happy to be myself                                           |
|                             | M_13 Feel physically tired                                                   | H_13 If I have to score my life, I am better than others                 |
|                             | M_14 Feel I am not attractive to others                                      | H_14 I experience more joy than suffering                                |
|                             | M_15 I can’t do the things I want to do                                      | H_15 I have a good life                                                 |
|                             | M_16 I spend time in my day doing things I don’t want to do                  | H_16 I know myself, and I like me                                         |
|                             | M_17 I want to get out of this routine                                       | H_17 I know how to have fun, and I enjoy it                               |
|                             | M_18 I feel unmotivated                                                      | H_18 I take care of my health                                           |
|                             | **Worry**                                                                    | Good things about being a COVID-19                                        |
|   |   |   |
|---|---|---|
| F_1 | I have concerns about infection of myself or family members | Y_1 | I spend more time with family than before |
| F_2 | I have concerns about changes in relationships with family and friends | Y_2 | I have more time to sleep than before |
| F_3 | I have anxiety about income for themselves and their family | Y_3 | I have less stress in interpersonal relationships than before |
| F_4 | I worry about shortages of food and daily necessities | Y_4 | I have less commuting to and from work and school than before |
| F_5 | I have anxiety about changes in my life due to self-restraint, etc. | Y_5 | I have more leisure time and other meaningful activities than before |
| F_6 | I have anxiety about discrimination in response to the region | Y_6 | My work hours have decreased, and work-life balance has improved |
| F_7 | At any rate, I have vague concerns |   | Cov-d-19 Infection Control Actions |
| F_8 | I eat less food than before COVID-19 | A_1 | Hand washing and hand sanitizing |
| F_9 | I have less sleep than before COVID-19 | A_2 | Coughing etiquette |
| F_10 | I have anxiety about the future of my job | A_3 | Leave as much space as possible between people when going out |
| F_11 | I have anxiety due to information obtained from sources I come into contact with | A_4 | Wear a mask |
| F_12 | I have anxiety that I may not be able to receive medical care | A_5 | Social distancing (Closed spaces, Crowded places, Close-contact settings) |
5.1 Results in face sheet

140 males and 137 females, three unknown. The age group between 20 and 64 is 257 persons, which is assumed to be the working-age, accounting for more than 90% of the total number of respondents. The most common educational background is high school graduation (113), junior or vocational school (49), university (36), and master’s degree (25). In terms of income, 153 persons (about 50%) earned more than 3juta before COVID-19, while under the Corona Disaster, 37 persons made more than 3juta, and 243 persons deserved less 2juta, indicating that the income of most people has dropped. In addition, 40 people (14%) are teleworking under the Corona Disaster (Table 3).

5.1.1 Results of chi-square test among Face sheet questions

Next, it shows the results of Pearson’s chi-square test between the Face Sheet questions. There is a significant probability of association between education and income at $p < 0.001$ for both pre and under Corona. The higher the education level, the higher the revenue. Regarding education and teleworking, there is an association with a significant probability of $p < 0.005$. Again, the higher the education level, the more telework is used.

5.2 Results of the analysis related to the Face sheet questions and the five groups of questions on happiness

We have the Mann–Whitney $U$ test between the gender and age groups and educational background of the Face sheet and the five groups of questions about happiness to compare means. In this analysis, I use nonparametric tests because the results obtained from the questionnaire utilize ordinal scales and do not assume any particular distribution, such as a normal distribution, for the data under consideration. All of the tests on the results adopt nonparametric tests for the same reason.

5.2.1 Results of tests of differences between men and women in the five-question groups on happiness

To examine differences in the consciousness of men and women in the five groups of questions (59 questions) on happiness, only two questions (M_2 “Fidgety and restless” (Average: Men 5.7 Women 5.4) and H_7 “Feel proud of me” (Average: Men 6.7 Women 6.4)) showed significant probabilities of $p > 0.05$ and differences in mean values (Table 3). Although there is not so numerical difference in these results, men are slightly more likely to feel proud of themselves, although less restless. In the statistical analysis, Gender comparisons analysis is a standard
| Table 3  | Result of face sheet ($n = 280$) |
|---|---|
| **Total** | **Rural area** | **Urban area** |
| **Gender** | Male 140, Female 137, Unknown 3 | Male 77, Female 62, Unknown 1 | Male 63, Female 75, Unknown 2 |
| Age Group | 15–19 yrs old 9, 20–24 yrs old 73, 25–34 yrs old 56, 35–44 yrs old 61, 45–54 yrs old 47, 55–64 yrs old 20, 65–74 yrs old 11, 75 yrs old or more 3 | 15–19 yrs old 4, 20–24 yrs old 16, 25–34 yrs old 26, 35–44 yrs old 36, 45–54 yrs old 30, 55–64 yrs old 17, 65–74 yrs old 9, 75 yrs old or more 2 | 15–19 yrs old 5, 20–24 yrs old 57, 25–34 yrs old 30, 35–44 yrs old 25, 45–54 yrs old 17, 55–64 yrs old 3, 65–74 yrs old 2, 75 yrs old or more 1 |
| **Educational background** | Elementary school 22, junior high school 34, high school 113, college/vocational school 49, university 36, master 25, doctor 1 | Elementary school 22, junior high school 31, high school 59, college/vocational school 10, university 16, master 2, doctor 0 | Elementary school 0, junior high school 3, high school 54, college/vocational school 39, university 20, master 23, doctor 1 |
| Media obtaining for COVID-19 information | TV news 124, news sites 120, social media 14, radio 19, print media 1 | TV news 76, news sites 50, social media 0, radio 14, print media 0 | TV news 48, news sites 70, social media 14, radio 5, print media 1 |
| Income before COVID-19 | Under 1juta 58, 2juta 79, 3juta 57, 4juta 23, 5juta 22, 6juta 15, 7juta and above 26 | Under 1juta 48, 2juta 37, 3juta 21, 4juta 11, 5juta 11, 6juta 5, 7juta and above 6 | Under 1juta 10, 2juta 41, 3juta 36, 4juta 12, 5juta 11, 6juta 10, 7juta and above 20 |
| Income during COVID-19 | under 1juta 142, 2juta 101, 3juta 27, 4juta 1, 5juta 7, 6juta 1, 7juta and above 1 | under 1juta 113, 2juta 25, 3juta 1, 4juta 0, 5juta 0, 6juta 0, 7juta and above 0 | under 1juta 29, 2juta 76, 3juta 26, 4juta 1, 5juta 7, 6juta 1, 7juta and above 1 |
| Teleworking k opportunities under the Corona Disaster | Did 40, did not do 239, unknown 1 | Did 1, did not do 138, unknown 1 | Did 39, did not do 101, unknown 0 |
| Frequency of smartphone use under the corona disaster | Increased 193, decreased 87 | Increased 69, decreased 70 | Increased 124, decreased 17 |
method. However, since these are the only two questions that got differences in mean values, we will not further analyze and discuss the results by gender for the 280 subjects.

5.2.2 The results of the test of difference in means values and factor analysis across age groups in the five-question groups

To determine the differences in mean values in the consciousness of the five groups of questions (59 questions) on happiness by age group (8 groups: 9 persons 15–19 years, 73 persons 20–24 years, 56 persons 25–34 years, 61 persons 35–44 years, 47 persons 45–54 years, 20 persons 55–64 years, 11 persons 65–74 years, 3 persons 75 years and older), I use the Kruskal–Wallis Test of non-parametric. Due to the variability in the number of subjects in these 8 age groups, I divide them into 3 groups: 15–19 (n = 9) and 20–24 (n = 73), 25–34 (n = 56) and 35–44 (n = 61), 45–54 (n = 47) and 55–64 (n = 20). As a result, 19 questions (M_3, M_6, M_11, M_13, M_14, M_15, M_17, F_4, F_8, F_9, H_2, H_5, H_8, H_13, H_14, Y_3, Y_4, A_2, A_4) obtained differences in means between each group at p < 0.05 level. Since many of the questions obtained differences, it is necessary to know the structural consciousness. For this reason, I tried a factor analysis (Maximum Likelihood, Rotation Method: Promax) on these 19 questions for the three groups (Table 4). In all age groups, the first factor shows that they have good and positive confidence in their life. This trend increases with age group. After the second factor, the negative aspects are more prominent, with a certain number of respondents in all age groups, just under 20%, suffering from mental instability. Only age groups 3 (45–54 (n = 47) and 55–164 (n = 20)) shows a strong commitment to infection control rather than psychological aspects in the third factor. We assume from these results that the middle-aged and elderly in age group 3 are not negative but positive psychologically, confident in their lives, and want to take infection control measures and get back to normal as soon as possible.

5.2.3 Results of tests of differences in means values between the five groups of questions on happiness and educational history

To examine the difference in means in consciousness between the five groups of questions on happiness (59 questions) and education (n = 280: 22 elementary schools, 34 middle schools, 33 national high schools, 80 private high schools, 49 vocational and junior colleges, 36 4-year universities, 25 master’s programs) (exclude doctoral programs because of one person), I use the Kruskal–Wallis Test. Table 5 shows the results. There are differences for 38 of the 59 questions, with p < 0.05 for 12 questions, p < 0.01 for four questions, and p < 0.001 for 22 questions. There are differences in many of the questions, but the most noticeable trend is in the mental health group and elementary and secondary school graduates.

About “M_8 I talk less than usual, M_12 I can’t stop worrying, M_13 I feel physically tired, M_14 I don’t see myself as attractive to others, M_15 I can’t do what I want to do, M_16 I spend my day doing things I don’t want to do, M_17 I want to get out of this routine, M_18 I don’t feel motivated,” the elementary and secondary
| Age group 1 | Age group 2 | Age group 3 |
|----------------|----------------|----------------|
| 15–19 yrs old: 9, 20–24 yrs old: 73 | 25–34 yrs old: 56, 35–44 yrs old: 61 | 45–54 yrs old: 47, 55–64 yrs old: 20 |
| **First factor** | **Second factor** | **Third factor** |
| Confidence in my life | Mental instability | Irritable |
| Factor contribution ratio % | | Factor contribution ratio % |
| 22% | 15% | 10% |
| | Confusion | |
| | Factor contribution ratio % | Factor contribution ratio % |
| 34% | 15% | 15% |
| | | 11% |
| | Strong desire to return to normal | Infection control behavior |
| | 45% | 16% |
Table 5 Difference in means by educational background Questions that elementary and secondary school graduates' rate low

| Q                       | SD  | SMP | SMA | SMK | Diploma | S1 | S2 | S3 | Total mean | Kruskal Wallis test |
|-------------------------|-----|-----|-----|-----|---------|----|----|----|------------|----------------------|
| H_1                     |     |     |     |     |         |    |    |    |            |                      |
| I feel I am a successful person | 2.3 | 2.6 | 3.4 | 4.4 | 4.0     | 5.2| 5.3| 8.0| 4.0        | 0.000                |
| H_2                     |     |     |     |     |         |    |    |    |            |                      |
| I am usually in a good mood | 2.5 | 2.8 | 3.6 | 4.7 | 5.0     | 5.7| 5.4| 6.0| 4.4        | 0.000                |
| H_5                     |     |     |     |     |         |    |    |    |            |                      |
| I have more joy than sorrow in my life | 2.7 | 2.9 | 3.5 | 4.7 | 4.8     | 5.5| 5.5| 8.0| 4.4        | 0.000                |
| H_6                     |     |     |     |     |         |    |    |    |            |                      |
| What I do is always of interest to me | 2.9 | 2.9 | 3.7 | 3.8 | 4.1     | 4.3| 5.0| 6.0| 3.8        | 0.000                |
| H_13                    |     |     |     |     |         |    |    |    |            |                      |
| If I have to score my life, I am better than others | 2.2 | 3.3 | 3.8 | 5.1 | 5.9     | 5.9| 6.1| 8.0| 4.8        | 0.000                |
| H_14                    |     |     |     |     |         |    |    |    |            |                      |
| I experience more joy than suffering | 2.7 | 3.2 | 3.6 | 4.8 | 4.8     | 5.8| 6.0| 2.0| 4.5        | 0.000                |
| Y_2                     |     |     |     |     |         |    |    |    |            |                      |
| I have more time to sleep than before | 3.2 | 3.9 | 3.8 | 4.7 | 5.7     | 6.2| 6.1| 4.0| 4.9        | 0.000                |
| A_2                     |     |     |     |     |         |    |    |    |            |                      |
| Coughing etiquette      | 5.1 | 6.4 | 6.7 | 7.0 | 7.2     | 7.1| 7.3| 8.0| 6.8        | 0.000                |

1: Does not apply at all – 9: Very much apply

*SD Junior School, SMP Junior High School, SMA National High School, SMK Private High School, Diploma Vocational school Junior college, S1 University, S2 Master's Course, S3 Doctoral Course

I exclude one doctoral graduate from the analysis
school graduates respondents are more likely than the other education groups to say that they are “not applicable”. In contrast, about “H_9 I can do most things well, H_13 If I had to score people’s lives, I am better than others, H_14 I experience more joy than suffering, H_15 My life is good, Y_3 I have less stress in interpersonal relationships”, it is more “not applicable” than other education groups. The results suggest that elementary and secondary school graduates are relatively optimistic about their mental health but tend to rate their happiness pessimistically low.

5.3 Differences in consciousness between rural and urban areas

See Table 3 for simple aggregate results for rural and urban areas for each question on the face sheet. This section shows the results of the statistical analysis.

5.3.1 Results of mean differences in consciousness by rural and urban areas in face sheet

The same questions on the Face sheet compare the means of the rural and urban responses by a Mann–Whitney U test. Differences with a $p < 0.001$ probability of significance are age group, education, income, and frequency of smartphone use. The age group is higher in rural areas and, concerning education, higher in urban areas. Revenue is higher in urban areas, both before and under the Corona disaster. Smartphone use is increasing in urban areas.

5.3.2 Results of tests of differences in means by rural and urban areas for the five groups of questions on happiness

I performed a Mann–Whiney U test concerning the five groups of questions (59 questions) on happiness for the rural ($n=140$) and urban ($n=140$) groups. The results show that 39 of the 59 questions differed between the two groups, with $p < 0.05$ for 7 questions (M_1, M_3, M_5, M_18, F_4, F_10, F_12), with $p < 0.01$ for 7 questions (M_4, M_15, M_16, H_3, H_8, H_12, A_4,) with $p < 0.001$ for 25 questions (M_6, M_11, M_13, F_1,F_3, F_11,H_1, H_2, H_4, H_5, H_6, H_9, H_11, H_13, H_14, H_15, H_17, H_18,Y_2, Y_3, Y_4, Y_5, Y_6,A_1, A_2). There are 20 questions where the mean differs by more than 1 point between rural and urban areas, shown in Table 6. Of these, seven questions have larger means (more likely to apply) in rural areas, with values ranging from 1: Does not apply at all to 9: Very much apply, and 13 questions have larger means in urban areas. These trends can be summarized as follows.

People in urban areas tend to have high happiness levels and are regaining their own time in the Corona Disaster, but are confusing because they cannot live the life they want. In other words, they tend to have a high sense of superiority and self-esteem in their view of life, despite their mental depression and negative psychology due to various anxieties.

People in rural areas tend to care about their health and are optimistic, but are exhausted by the uncertainty of income and infection of their families. In other
Table 6  Results of tests of differences in means by rural and urban areas for five groups of questions on happiness *20 questions with means differing by more than 1 point

| Q               | Rural Mean | Urban Mean | Rank | Asymp. Sig. (2-tailed) |
|-----------------|------------|------------|------|------------------------|
| M_6 Feel that everything I did was for nothing | 113.9 2.9 | 166.8 4.3 | 1    | 0.000                  |
| M_11 Feel irritable | 114.7 3.6 | 164.8 4.9 | 2    | 0.000                  |
| M_13 Feel physically tired | 172.0 6.8 | 109.4 5.3 | 1    | 0.000                  |
| F_3 I have anxiety about income for themselves and their family | 163.0 7.8 | 118.4 6.9 | 2    | 0.000                  |
| H_1 I feel I am a successful person | 111.2 3.2 | 169.4 4.9 | 1    | 0.000                  |
| H_2 I am usually in a good mood | 101.1 3.4 | 179.3 5.4 | 2    | 0.000                  |
| H_5 I have more joy than sorrow in my life | 98.5 3.3 | 181.9 5.5 | 1    | 0.000                  |
| H_6 What I do is always of interest to me | 115.9 3.3 | 163.9 4.4 | 2    | 0.000                  |
| H_9 I can do most things well | 110.7 3.4 | 169.8 4.7 | 1    | 0.000                  |
| H_11 I am optimistic about the future of the world | 168.5 7.1 | 111.7 5.9 | 2    | 0.000                  |
| H_13 If I had to score my life, I am better than others | 99.9 3.7 | 180.5 6.0 | 1    | 0.000                  |
| H_14 I experience more joy than suffering | 102.9 3.6 | 177.5 5.5 | 2    | 0.000                  |
| H_17 I know how to have fun, and I enjoy it | 161.9 6.8 | 118.2 5.9 | 1    | 0.000                  |
| H_18 I take care of my health | 167.5 7.4 | 113.9 6.2 | 2    | 0.000                  |
| Y_2 I have more time to sleep than before | 111.5 4.0 | 169.1 5.7 | 1    | 0.000                  |
| Y_3 I have less stress in interpersonal relationships than before | 102.9 2.5 | 177.6 4.2 | 2    | 0.000                  |
| Y_4 I have less commuting to and from work and school than before | 192.2 8.0 | 89.6 5.4 | 1    | 0.000                  |
| Y_5 I have more leisure time and other meaningful activities than before | 122.9 4.4 | 157.9 5.4 | 2    | 0.000                  |
| Y_6 I work hours have decreased, and work-life balance has improved | 111.4 3.1 | 169.2 4.4 | 1    | 0.000                  |
| A_1 Hand washing and hand sanitizing | 170.4 7.6 | 111.0 6.7 | 2    | 0.000                  |
words, they are not mentally down and optimistic about their daily lives, but they have lower happiness and confidence in their own lives than urban people, and they worry about lack of food and income and family illness in terms of their livelihoods.

5.3.3 Results of factor analysis by rural and urban areas in five groups of questions on happiness

In comparing responses by rural and urban areas in the five groups of questions on happiness in 5.3.2, it obtains differences in means for many questions. The group of questions on happiness is the most common (15 out of 18 questions), and it gets more than half of the questions in each question group. To learn more about the priorities of each group’s thinking and the overall trend in thought, it conducts a factor analysis (maximum likelihood method and Promax rotation) for each of the five groups of questions on happiness (59 questions: mental health group, happiness group, anxiety group, good things due to corona group, and corona infection control group). It shows the results of the analysis in Tables 7, 8 for results with a “Kaiser–Meyer–Olkin Measure of Sampling Adequacy” of 0.5 or greater, a probability of significance of $p < 0.001$, a numerical value of Extraction for factor extraction in the Communalities of 0.5 or greater, and an initial “sum of explained variance” in the “total variance explained results for which the eigenvalue is greater than or equal to 1 for the target factor.”

First, it compares the mental health and anxiety groups for which it could extract factors in both rural and urban areas. For the mental health group, rural areas have trouble and confusion, while urban areas are lonely and apathetic. As for the anxiety group, the rural group is more worried about not having access to proper medical care, while the urban group is more worried about life and infection.

Although it could not get the factors for both groups, the “Good things about being a COVID-19” group has more time with their families in the urban areas, as for the “infectious behavior” group, people are more in rural areas concerns about cough dispersal etiquette.

5.3.4 Results of multiple regression analysis by rural and urban areas in five groups of questions on happiness

In the factor analysis results in 5.3.3, some groups get no factors. For this reason, I use multiple regression analysis (Linear: stepwise method) to analyze them to learn more about trends in consciousness in another way. The advantage of performing multiple regression analysis is that it is possible to predict which and to what extent the dependent variable among several related factors (independent variables) influences the results when explaining the dependent variable. In the present study, it is difficult to predict and narrow down the explanatory (independent) variables in advance because of the limited previous literature on well-being surveys in developing countries. In other words, this is a not determined case of the independent variables used in the analysis. For this reason, I perform multiple regression analyses using the stepwise method. The stepwise method automatically selects variables related to the objective (dependent) variable among the input explanatory
### Table 7  Results of factor analysis by rural areas (n = 140)

| Mental health                                                                 | Worry                                                                 | Happiness                                                                 | Good things about being a COVID-19 | Covid-19 infection control actions |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------|------------------------------------|
| First factor                                                                 | Unstable and confusion                                                 | Concerns about medical care and the surrounding community                | Factor extraction impossible      | Cough dispersal etiquette          |
| Factor contribution ratio %                                                 | 56%                                                                   | 48%                                                                        |                                   | 37%                                |
| Second factor                                                               | troubled and nervous                                                  | Anxiety about income and food                                            | Factor extraction impossible      | Avoiding 3 close (Closed spaces, Crowded places, Close-contact settings) |
| Factor contribution ratio %                                                 | 17%                                                                   | 13%                                                                        |                                   | 21%                                |
| Third factor                                                                |                                                                       | Anxiety based on obtained information                                     |                                   |                                    |
| Factor contribution ratio %                                                 |                                                                       | 11%                                                                        |                                   |                                    |

*Two rural areas (n = 140)*
Table 8  Results of factor analysis by urban areas (n = 140)

| Mental health | Worry | Happiness | Good things about being a COVID-19 infection control actions |
|---------------|-------|-----------|--------------------------------------------------------------|
| First factor  | Feeling lonely and apathetic | Worry about income, food, and infection | Confidence in one’s own existence | Can relax with family |
| Factor contribution ratio % | 30% | 37% | 41% | 37% |
| Second factor | Powerlessness with no way out | Discrimination in policy responses by region | I get what I want | Work and interpersonal relationships become easier |
| Factor contribution ratio % | 17% | 16% | 12% | 21% |
| Third factor  | Troubling | | Positive | |
| Factor contribution ratio % | 14% | | 11% | |
| Fourth factor | | | Full attention to my health | |
| Factor contribution ratio % | | | 8% | |

*two urban areas (n = 140)
(independent) variables and can obtain analysis results with a narrowing of variables. On the other hand, the forced imputation method, which uses all the imputed explanatory variables, predicts that the accuracy of the analysis will be low because of the large number of variables in this survey. In addition, this study will not only test the hypothesis and conclude from the results of this stepwise multiple regression analysis alone. It will also conduct a covariance structure analysis while considering the results of this analysis as material for further consideration. In addition, for multicollinearity, I check the strength of the association between variables in advance by the correlation value and analyze by removing values that are not acceptable.

I excluded “Good things about being a COVID-19” group (6 questions) and the “COVID-19 Infection Control Actions” group (5 questions) because the number of questions is a few, and I got some results by examining the difference in the means in 5.3.2.

First, it does a multiple regression analysis about the “happiness” group, which got no factor in the rural areas. For the two areas, plus the same dependent variable, it gets no results with a coefficient of determination $R^2$ greater than 0.60, capable of capturing trends above a certain level. Therefore, for each independent variable, it shows that a coefficient of determination (coefficient of determination) $R^2$ is 0.60 or greater. It gets $H_{1}$, $H_{2}$, $H_{5}$, $H_{13}$, and $H_{14}$ for rural areas and $H_{8}$, $H_{12}$, and $H_{15}$ for urban areas. A characteristic trend shows among these.

It shows the results for the urban area in Table 9 in 5.3.3. The dependent variable of $H_{8}$ (My existence has a small but positive impact on the world) shows that “I feel confident about my existence, even though I feel I am not doing what I am interested in.”

It shows the results for rural areas in Tables 10, 11 in 5.3.3. Regarding the dependent variable $H_{2}$ (I am usually in a good mood), the respondents feel that “I’m successful

| Table 9 Happiness about urban area. The result of multiple regression analysis |
|---------------------------------|------------------|--------------|--------|--------|-----------------|
| Urban area                      | Unstandardized coefficients $\beta$ | Standardized coefficients $\beta$ | Sig    | $t$-value | VIF (Variance Inflation Factor) |
| (Constant)                      | $-0.581$         | $-1.018$     |        |         |                 |
| $H_{15}$ I have a good life     | $0.196$          | $0.175$      | $0.020$| $2.352$ | $1.826$         |
| $H_{7}$ I feel proud of who I am| $0.256$          | $0.240$      | $0.000$| $3.589$ | $1.477$         |
| $H_{9}$ I can do most things well | $0.366$          | $0.323$      | $0.000$| $4.864$ | $1.453$         |
| $H_{12}$ I feel happy to be myself | $0.364$          | $0.313$      | $0.000$| $4.350$ | $1.707$         |
| $H_{6}$ What I do is always of interest to me | $-0.272$         | $-0.233$     | $0.000$| $-3.965$| $1.137$         |
| $H_{17}$ I know how to have fun, and I enjoy it | $0.168$          | $0.153$      | $0.013$| $2.525$ | $1.206$         |

*Dependent Variable: $H_{8}$ My existence has a small but positive impact on the world

$R^2 = 0.60$ $F = 33.05$ ANOVA $p < 0.001$
and joyful in life, although I’m not confident about myself,” and regarding the dependent variable H_13 (If I had to score my life, I am better than others), they feel that “I’m a successful person who experience much joy.”

The difference in consciousness between urban and rural areas is that urban people are confident in themselves, and rural people are not convinced. In other words, urban people are confident and proud of themselves, while rural people do not think so but consider themselves successful, experiencing much joy.

Next, to learn more about the relationship between feelings of happiness and anxiety, it conducts a multiple regression analysis for the mental health group, the anxiety group, and the happiness group in urban and rural areas (Tables 12, 13, 14, 15). The results show that in both urban and rural areas, with the two mental health group questions (M_17, M_18) as dependent variables, the coefficient of determination $R^2$ is above 0.60. As for the dependent variable “M_17: I want to get out of this routine,” the results show that in urban areas, the respondents are unmotivated, lonely, and stagnant, while in rural areas, they are both unmotivated and in a good mood. As for the dependent variable “M_18: I feel unmotivated” the results show that in urban areas, the respondents are anxious but competent and want to get out of this routine, while in rural areas, the respondents are frustrated by the uncertainty of their lives but competent and want to get out of this routine. These results indicate that people in both urban and rural areas commonly consider themselves useful to the world. Furthermore, the urban respondents are lonely and anxious, while the rural respondents are optimistic but anxious about life.

5.3.5 The results of factor analysis and structural analysis of covariance (SEM/structural equation modeling) for each rural and urban area in the three question groups

Finally, it conducts a factor analysis (maximum likelihood method/Promax rotation) for each urban and rural area on all three groups of questions for the mental health, anxiety, and happiness groups, and then, using the results as a reference, creates a path diagram for structural analysis of covariance (SEM/Structural Equation Modeling: Maximum Likelihood Method). In the factor analysis, the Kaiser–Meyer–Olkin Measure of Sampling Adequacy is above 0.5, the probability of significance $p < 0.001$, the value of Extraction after factor extraction in Communalities is above 0.5, and in the “sum of explained variance,” the questions for which the initial value is above or equal to 1 in the target factor (Table 16). It uses the original data without missing values for the structural analysis of covariance. I adopt the best fit with the goodness of fit coefficients (CMIN/DF (2 or less), AGFI (Adjusted Goodness of Fit Index; adjusted goodness of fit index), RMR (Root Mean square Residual (Root Mean Square of Residual), Akaike’s Information Criterion (AIC), RMSEA (Root Mean Square Error of Approximation), degrees of freedom (d.f.), chi-square (chi-squared).

For urban areas, it gets the following trends (Fig. 1).
Table 10  Happiness about rural area. The result of multiple regression analysis

| Rural area                                      | Unstandardized coefficients $\beta$ | Standardized coefficients Beta | Sig   | $t$-value | VIF (Variance Inflation Factor) |
|------------------------------------------------|-------------------------------------|--------------------------------|-------|-----------|---------------------------------|
| (Constant)                                     | 2.139                               |                                 |       |           |                                 |
| H_1 I feel I am a successful person            | 0.449                               | 0.440                          | 0.000 | 7.293     | 2.471                           |
| H_5 I have more joy than sorrow in my life     | 0.283                               | 0.277                          | 0.000 | 5.068     | 2.019                           |
| H_7 I feel proud of who I am                   | -0.234                              | -0.111                         | 0.008 | -2.709    | 1.146                           |
| H_11 I am optimistic about the future of the world | 0.204                              | 0.122                          | 0.006 | 2.789     | 1.300                           |
| H_12 I feel happy to be myself                 | -0.262                              | -0.145                         | 0.001 | -3.568    | 1.122                           |
| H_13 If I have to score my life, I am better than others | 0.156                              | 0.171                          | 0.007 | 2.745     | 2.636                           |

*Dependent Variable: H_2 I am usually in a good mood

*R^2 = 0.80 F = 90.86 ANOVA p < 0.001
Table 11  Happiness about rural area. The result of multiple regression analysis

| Rural area                              | Unstandardized coefficients | Standardized coefficients | Sig  | t-value | VIF (Variance Inflation Factor) |
|-----------------------------------------|-----------------------------|---------------------------|------|---------|---------------------------------|
| (Constant)                              | −3.326                      |                           | −4.738 |         |                                 |
| H_14 I experience more joy than suffering | 0.601                       | 0.531                     | 0.000 | 9.384   | 1.957                           |
| H_1 I feel I am a successful person     | 0.329                       | 0.294                     | 0.000 | 5.305   | 1.882                           |
| H_18 I take care of my health           | 0.322                       | 0.175                     | 0.000 | 4.117   | 1.106                           |
| H_11 I am optimistic about the future of the world | 0.168                       | 0.092                     | 0.041 | 2.067   | 1.212                           |
| H_15 I have a good life                | 0.038                       | 0.083                     | 0.048 | 1.993   | 1.050                           |

*Dependent Variable: H_13 If I had to score my life, I am better than others

*R²=0.78 F=95.42 ANOVA p<0.001
**Table 12** Happiness and Worry and Mental Health about urban area. The result of multiple regression analysis

| Urban area | Unstandardized coefficients | Standardized coefficients | Sig  | t-value | VIF (Variance Inflation Factor) |
|------------|-----------------------------|----------------------------|------|---------|---------------------------------|
| (Constant) | 1.333                       | 1.911                      | 1.911|         |                                 |
| M_18       | I feel unmotivated          | 0.503                      | 0.427| 0.000   | 7.991                           |
| M_10       | Feel that people around me do not like me | 0.324 | 0.302 | 0.000   | 5.356                           |
| M_14       | Feel I am not attractive to others | 0.292 | 0.232 | 0.000   | 4.032                           |
| H_14       | I experience more joy than suffering | −0.325 | −0.228 | 0.000   | −4.389                          |
| F_9        | I have less sleep than before COVID-19 | 0.183 | 0.158 | 0.006   | 2.784                           |
| M_7        | Feel fearful                | −0.161                     | −0.116| 0.030   | −2.196                          |

*Dependent Variable: M_17 I want to get out of this routine

*R^2 = 0.67  F = 43.69  ANOVA p < 0.001*
Table 13 Happiness and Worry and Mental Health about rural area. The result of multiple regression analysis

| Rural area                              | Unstandardized coefficients | Standardized coefficients | Sig  | t-value | VIF (Variance Inflation Factor) |
|-----------------------------------------|-----------------------------|----------------------------|------|---------|---------------------------------|
| (Constant)                              | −0.597                      | −3.870                     |      | −3.870  | 4.471                           |
| M_18 I feel unmotivated                | 0.490                       | 0.485                      | 0.000| 9.640   | 4.471                           |
| H_2 I am usually in a good mood        | 0.383                       | 0.266                      | 0.000| 5.493   | 4.123                           |
| M_16 I spend time in my day doing things I don’t want to do | 0.246                       | 0.181                      | 0.000| 3.753   | 4.114                           |
| M_10 Feel that people around me do not like me | 0.135                       | 0.110                      | 0.001| 3.267   | 1.998                           |

*Dependent Variable: M_17 I want to get out of this routine

*R^2=0.92 F=407.89 ANOVA p < 0.001
Table 14  Happiness and Worry and Mental Health about urban area. The result of multiple regression analysis

| Urban area | Unstandardized coefficients β | Standardized coefficients β | Sig | t-value | VIF (Variance Inflation Factor) |
|------------|-------------------------------|----------------------------|-----|---------|-------------------------------|
| (Constant) | 1.109                         | 1.397                      |     |         |                               |
| M_17       | I want to get out of this routine | 0.434                  | 0.511 | 0.000 | 8.307                        | 1.301 |
| M_16       | I spend time in my day doing things I don’t want to do | 0.250                  | 0.269 | 0.000 | 4.638                        | 1.159 |
| F_2        | I have concerns about changes in relationships with family and friends | −0.295             | −0.273 | 0.000 | −4.711                       | 1.153 |
| F_7        | At any rate, I have vague concerns | 0.335                  | 0.338 | 0.000 | 5.333                        | 1.383 |
| F_6        | I have anxiety about discrimination in response to the region | −0.191             | −0.200 | 0.002 | −3.157                       | 1.384 |
| H_3        | I have a pretty good idea of the purpose of my life | −0.176             | −0.158 | 0.009 | −2.661                       | 1.209 |
| H_8        | My existence has a small but positive impact on the world | 0.291                  | 0.278 | 0.000 | 4.358                        | 1.399 |
| M_6        | Feel that everything I did was for nothing | 0.178                  | 0.187 | 0.003 | 3.072                        | 1.275 |

*Dependent Variable: M_18 I feel unmotivated
*R² = 0.63  F=27.19 ANOVA p < 0.001
**Table 15** Happiness and Worry and Mental Health about rural area. The result of multiple regression analysis

| Rural area | Unstandardized coefficients | Standardized coefficients | Sig | t-value | VIF (Variance Inflation Factor) |
|------------|-----------------------------|---------------------------|-----|---------|---------------------------------|
| (Constant) | −0.272                      | −0.337                    |     |         |                                 |
| M_17       | I want to get out of this routine | 0.717  | 0.724 | 0.000   | 13.489  | 3.889                           |
| M_11       | Feel irritable               | 0.187  | 0.129 | 0.009   | 2.659   | 3.183                           |
| F_6        | I have anxiety about discrimination in response to the region | −0.200 | −0.129 | 0.000   | −4.254  | 1.233                           |
| F_5        | I have anxiety about changes in my life due to self-restraint, etc. | 0.218  | 0.140 | 0.000   | 3.737   | 1.888                           |
| H_18       | I take care of my health     | −0.191 | −0.080 | 0.005   | −2.841  | 1.059                           |
| H_8        | My existence has a small but positive impact on the world | 0.245  | 0.072 | 0.011   | 2.575   | 1.053                           |

*Dependent Variable: M_18 I feel unmotivated

*R² = 0.90  F = 203.15  ANOVA p < 0.001
"I’m confident in my life due to the good life and my competent presence. I have confidence in my greatness, even though it torments me with endless lethargy that leaves me with no motivation to do anything."

Fig. 1 The result of structural analysis of covariance for urban area
For rural areas, it gets the following trends (Fig. 2).

“I’m not as confident in myself as others, but I can do anything I put my mind to and am always in a good mood and optimistic. And more, fearful of infection with corona and the future state of my life, I’m restless and very nervous and want to escape from this situation. But because of my naturally optimistic nature, I try to be optimistic about those fears.”

6 Discussion and hypothesis validation

It will discuss the analysis results separately for urban and rural areas and examine the hypotheses.

First, it considers urban areas. The Face Sheet shows that the average pre-COVID-19 income in urban areas is 3.6 juta and 2.2 juta under Corona Disaster, with higher education levels leading to higher revenue and teleworking. Both income and education are higher in urban areas. Smartphone use is also higher under Corona Disaster. Although many younger age groups have a good quality of life and positive confidence in themselves, just under 20% of all age groups suffer from mental...
instability. Regarding the difference between the means in the five groups of questions about happiness and mental health, the respondents have a high level of joy and are regaining their time under the Corona Disaster, but they are confused because they cannot live their lives as they want to. In other words, urban people tend to have a higher sense of superiority and self-esteem in their view of life, even though they are suffering from mental depression and a negative psychological state due to various anxieties. In the mental health group results in the factor analysis, subjects are lonely and apathetic. In the results of the anxiety group, subjects are more anxious about life and infection. The results of the multiple regression analysis for the mental health, anxiety, and happiness groups (48 questions) show that they are confident and proud of themselves, according to the analysis results, with the questions within the happiness group as the dependent variable. On the other hand, in the analysis results with the questions within the mental health group as the dependent variable, they are unmotivated, lonely, and stagnant, and they want to get out of this routine because they are anxious but competent. Considering these results, it creates a path diagram using structural analysis of covariance, and the results are as follows. 'It torments me by endless lethargy with no motivation to do anything, yet I am confident in my life because of the good life and my competent and great self.' The point that urban people are “confident in their greatness, superior to others” may be a factor in their mental stability. However, concerning the “persistent state of anxiety and lethargy,” recent studies have pointed out the following.

Therapeutic work with people who experience low levels of life function (This refers to one’s psychological, occupational, family-related, and social performances (Altshuler et al. 2002) and happiness should focus on coping, decreasing anxiety, and the tendency for stress responses. On the other hand, people who functioned better were happier and had better experiences despite the pandemic and the lockdown (Cohen-Louck and Levy 2022). And another report suggests a deterioration in mental health during the course of the COVID-19 pandemic, which emphasizes the importance to implement targeted health promotions to prevent a further symptom escalation especially in vulnerable groups (Christoph et al. 2022).

The government should take two possible measures based on this report. For anxiety, the government should provide opportunities for mental therapy and discuss future working plans in the workplace. For apathy, the government should provide opportunities for achieving a sense of well-being. Under the Corona pandemic, in the case of mental health, there should be opportunities to gain the joy of learning through online learning lessons to acquire qualifications, opportunities to create something that one can do on one’s own, and opportunities for family interaction to generate motivation. For physical health, it would need online dance, exercise, and yoga programs to improve health and wellness.

Next, it considers rural areas. The Face Sheet shows that pre-COVID-19 income in rural areas averaged 2.8 juta of payment, although most are 1 juta, and under the Corona Disaster averaged 1.2 juta. In addition, 53 (38%) rural primary and secondary school graduates compared to 3 (2%) in urban areas. This result shows that most have incomes at the 1 juta level. This point means that rural areas have less income and low education than urban areas. The factor analysis results show that all age groups have good and positive confidence in their lives.
in the first factor, but less than 20% of all age groups suffer from mental instability. There are 30 subjects (21%) in the urban area 45 years of age or older, compared to 58 (41%) in the rural area. It can suppose that this group does not have negative psychology but rather positive psychology, confidence in their lives, and wanting to get back to normal as soon as possible by taking measures to prevent infection. Regarding the differences in means across the five groups of questions on happiness and mental health, primary and secondary school graduates, who are more common in rural areas, are relatively optimistic about their mental health but tend to rate their happiness pessimistically low. On the other hand, all subjects are optimistic, although they are concerned about their health. However, they are tired of worrying about income and infecting their families. In other words, rural people are less mentally depressed and optimistic about their daily lives, but they are less happy and less confident about their human lives than their urban counterparts, and they worry about lack of food and income and family illness in terms of their livelihood. The factor analysis results show that subjects are distressed and confused about the mental health group. About the anxiety group, they are more concerned about not receiving appropriate medical care. The results of the multiple regression analysis for the three groups (48 questions), the mental health group, the anxiety group, and the happiness group, show that when selecting the happiness group question as a dependent variable, the subjects believe that they are not confident or proud of themselves. However, they experience a lot of joy and success in their lives. When selecting the mental health group question as a dependent variable, they believe that they are a person who is helpful in the world and that optimism and life anxiety coexist. The results of the covariance structure analysis show the following results. 'I am not as confident in myself as others, but I can do everything myself and am always in a good mood and optimistic. I am fearful of infection with corona and the future state of my life, I am restless and very nervous, and I want to escape from this current situation. However, because of my optimistic nature by nature, I try to take those fears easy.'

Rural people think “they are optimistic and have a sense of success in their own lives without comparison to others, although they are concerned about infecting their families and others around them.” This thinking may be because in rural areas, despite their low educational background, they are in an environment where they can live by their skills and belong to a community where the mentality is liberating. This result may seem consistent with the point shown below in Chapter 1. That is, rural residents in developed countries tend to report higher subjective well-being than urban residents. The paper tells that higher levels of connective social capital in rural areas and higher access to natural amenities contribute to the paradox of well-being in rural Denmark (Sørensen 2014).

Regarding “concern about infecting others around them,” there is no need for the same mental and physical healing and health promotion measures as those taken for people in urban areas. However, concerns about the risk of infection among family members and villagers living as a community may be influenced by a lack of knowledge about virus infection or by excessive fear spread by media reports about post-infection symptoms. Therefore, correct knowledge provision may be necessary. In
particular, local governments would need taking on the role of explaining in detail the risk of infection in sparsely populated rural areas and provide better protection measures to reduce their fears.

From discussing the results of the analysis of urban and rural areas, I verify the hypotheses. The hypothesis of this study is as follows:

“In Bali, Indonesia, a developing country, happiness degree under the corona disaster is higher for rural residents than for urban residents.”

Concerning happiness, the two regions have different views of how they perceive happiness. It assumes that in urban areas, people feel happy that they are confident that they are better than others, and in rural areas, people feel so glad that they are successful and optimistic about their own lives, not in comparison to others. Furthermore, when it examines these results together with those of the mental health and anxiety groups, the results are loneliness and apathy in urban areas and nervousness and anxiety in rural areas. In other words, urban subjects tend to be inwardly solitary themselves, while rural subjects tend to be outwardly anxious about their surroundings. The rural subjects may be optimistically spending the Corona Disaster with outward anxiety, unlike the urban subjects, who are inward-looking and negative. The findings of this study on happiness under the corona disaster in developing countries differ from those of previous studies. In other words, it does not necessarily mean that people living in a developing country are happier living in urban areas, and it is not possible to say whether people are happier in rural or urban areas. And as in the previous study, the findings that people in rural areas worry about the people around them are consistent with high levels of conjunctive social capital, which may contribute to the paradox of happiness in rural areas. In other words, it is possible that, as previous studies about the case of developed countries state, the mental health of people in the developing countries targeted by this study has a higher impact on happiness in rural areas than in urban areas. The results of this study differ from previous studies reporting that people in rural areas of developing countries have lower levels of happiness and mental health. Life in rural areas, where people are optimistic and not tormented by loneliness, is relatively humane and healthy mental health.

Finally, I hope that the results of this study for developing country will help rural life and that, together with the future enhancement of agricultural policies and infrastructure, rural areas will develop as active, sustainable, mentally healthy, and happy places to live.

Declarations

Conflict of interest The author declares no conflict of interest.

Informed consent The author and the local environmental foundation, Bali Biodiversitas, negotiated the survey implementation to obtain subjects for this survey, as it is prohibited in Indonesia for foreigners to conduct surveys on their own. The local environmental foundation, with which the author collaborated, negotiated the implementation of the study. As a result, in villages that fully understood the purpose of the survey and accepted its commission, the person in charge of the negotiations selected the subjects and provided explanations. The foundation visited the indicated subjects and obtained their responses to the
questionnaire. For those who could not read, they read the questionnaires to them, and the foundation staff filled in their oral responses.

References

Adam OK, Rubia V (2018) Livability and subjective well-being across European cities. Appl Res Qual Life. https://doi.org/10.1007/s11482-017-9587-7

Altshuler L, Mintz J, Leight K (2002) The life functioning questionnaire (LFQ): a brief, gender-neutral scale assessing functional outcome. Psychiatry Res 112(2):161–182. https://doi.org/10.1016/S0165-1781(02)00180-4

Ando A (2014) An empirical study on the applicability of “happiness” index to national land and urban planning policy. J City Plann Inst Japan 49(3):561–566

Berry BJL, Okulicz-Kozaryn A (2009) Dissatisfaction with city life: a new look at some old questions. Cities 26(3):117–124

Berry BJL, Okulicz-Kozaryn A (2013) An urban-rural happiness gradient. Taylor Franc Online. https://doi.org/10.2747/0272-3638.32.6.871

Camilla L, Giovanni P (2016) Are urbanized areas source of life satisfaction? Evidence from EU regions: are urbanized areas source of life satisfaction? Pap Reg Sci. https://doi.org/10.1111/pirs.12232

Campbell A, Converse PE, Rodgers W (1976) The quality of American life: perceptions, evaluations, and satisfactions. Russell Sage Foundation, New York

Charbel EB, Ali HM, Laura D-L, Amelia B-V, Rebecca WS, Chloe M, Shrey S, Mojmen N, Christopher JLM (2018) Trends and patterns of differences in infectious disease mortality among US counties, 1980–2014. JAMA 319(12):1248

Chiba Y (2021) “Agri-healing” proposes new values for agriculture and rural communities. Japan Food & Agriculture Cooperative Organization. https://jfaco.jp/report/2072

Christoph BC, Autenrieth BK, Eva AE, Asselmamm Christiane A, Pané-FarréChristiane A-F (2022) One year after the COVID-19 outbreak in Germany: long-term changes in depression, anxiety, loneliness, distress and life satisfaction. Eur Arch Psychiatry Clin Neurosci Follow J. https://doi.org/10.1007/s00406-022-01400-0

Cohen-Louck K, Levy I (2022) Happiness during a mass trauma: predicting happiness during the COVID-19 pandemic through function, (May 2022), stress, anxiety, and coping. Psychol Trauma Theory Res Pract Policy. https://doi.org/10.1037/tra0001314

Cohen-Louck K, LevyViruism I (2021) The need for a new term describing COVID-19 impact in context of viral victimization. Psychol Trauma Theory Res Pract Policy 13(1):1–8. https://doi.org/10.1037/tra0000945

Cutter SL, Ash KD, Emrich CT (2016) Urban–rural differences in disaster resilience. Ann Am Assoc Geogr 106(6):1236–1252

Deaton A (2015) The Great escape: health, wealth, and the origins of inequality. Princeton University Press, New Jersey

Department of mental health and addiction services Connecticut (2021) US. You matter: Covid-19 mental health impact survey. https://portal.ct.gov/DMHAS/Newsworthy/News-Items/COVID-19-Mental-Health-Impact-Survey

Dorn A, Cooney RE, Sabin ML (2020) COVID-19 exacerbating inequalities in the US. Lancet 395(10232):1243–1244

Easterlin RA, Angelescu L, Zweig JS (2011) The impact of modern economic growth on urban-rural differences in subjective well-being. World Dev 39(12):2187–2198

Edward LG, Joshua DG, Oren Z (2016) Unhappy cities. J Labor Econ 34:2

Faggian A, Olfert MR, Partridge MD (2011) Inferring regional well-being from individual revealed preferences: the ‘voting with your feet’ approach. Camb J Reg Econ Soc 5(1):163–180

Gertham U-G, Johannesson M (2001) The relationship between happiness, health, and social economic factors: results based on Swedish microdata. J Socio-Econ 30(6):553–557. https://doi.org/10.1016/S1053-5557(01)00118-4

Ida K, Nabeeh Z, Robert C (2018) Objective and subjective indicators of life satisfaction in Australia: how well do people perceive what supports a good life? Ecol Econ 154:361–372. https://doi.org/10.1016/j.ecolecon
John VW, Yu L (2017) Urbanisation, natural amenities and subjective well-being. 54(8):1956–1973. Sage Publications, Inc
Julian R (2020) Coronavirus: more Japanese to swap urban life for the countryside. Accessed https://www.dw.com/en/coronavirus-more-japanese-to-swap-urban-life-for-the-countryside/a-53854362
Knight J, Gunatilaka R (2010) Great expectations? The subjective well-being of rural-urban migrants in China. World Dev 38(1):113–124
Louis W (1938) Urbanism as a way of life. Am J Sociol 44(1):1–24. Published by: The University of Chicago Press
Lyubomirsky S, Lepper H (1999) A measure of subjective happiness: preliminary reliability and construct validation. Soc Indic Res 46: 137–155. The original publication is available at www.springerlink.com
Ministry of Health New Zealand (2020) COVID-19 health and wellbeing survey
Morrison PS (2011) Local expressions of subjective well-being: the New Zealand experience. Reg Stud 45(8):1039–1058. https://doi.org/10.1080/00343401003792476
Morrison PS, Weckroth M (2018) Human values, subjective well-being and the metropolitan region. Reg Stud 52(3):325–337
National Center for Health Statistics (NCHS) (2021) Household pulse survey. [Mental Health]
OECD (2006) The new rural paradigm: policies and governance
OECD Policy Responses to Coronavirus (COVID-19) (2020) Policy implications of Coronavirus crisis for rural development
Okulicz-Kozaryn A, Mazelis JM (2017) More unequal in income, more unequal in wellbeing. Soc Indic Res 132(3):953–975. https://doi.org/10.1007/s11205-016-1327-0
Peter H, Micahel A (2002) The oxford happiness survey is from personality and individual differences, Vol.33, #7, pp. 1080–1081 and developed by: from The Oxford Happiness Project, School of Psychology, Oxford Brookes University, Headington Campus, Gipsy Lane, Oxford OX3 0BP, UK
Peterson C (2005) Authentic happiness inventory (AHI). University of Pennsylvania press, Philadelphia
Piper AT (2015) Europe’s capital cities and the happiness penalty: an investigation using the European Social Survey. Soc Indicat Res 123:103–126
Plaut VC, Markus HR, Lachman ME (2002) Place matters: Consensual features and regional variation in American well-being and self. J Pers Soc Psychol 83(1):160
Pugno M (2004) The happiness paradox: a formal explanation from psycho-economics. Working paper, Department of Economics, University Trento
Qian H, Sarah J, Sahar D, Logan L, Erika P, Amber J, Susan LC (2021) Urban-rural differences in COVID-19 exposures and outcomes in the South: a preliminary analysis of South Carolina, (February 3, 2021). PLoS ONE 16(2):e0246548. https://doi.org/10.1371/journal.pone.0246548
Radloff LS (1977) The CES-D scale: a self-report depression scale for research in the general population. Appl Psychol Meas 1(3):385–401. https://doi.org/10.1177/01466216770100306
Requena Fa (2016) Rural-urban living and level of economic development as factors in subjective well-being. Soc Indicat Res 128:693–708
Robert H (2009) Be happy!· 50 principles and exercises to help you enjoy more happiness now. Hay House Inc, Carlsbad
Rozaki Z (2020) COVID-19, agriculture, and food security in Indonesia. Rev Agric Sci 8:243–260. https://doi.org/10.7831/ras.8.0.243
Sørensen JFL (2014) Rural-urban differences in life satisfaction: evidence from the European Union. Reg Stud 48(9):1451–1466
Tasaki M, Nakane Y, Kenkokanren (1998) “Seikatunoshitu” hyoukatoshiteno WHOQOL. Jpn J Behav 25(2):76–80. https://doi.org/10.2333/jbhnk.25.76
The Gallup World Poll and Lloyd’s Register Foundation (2020) The present annex to the world happiness report (WHR), chapter 4 of the WHR—Urban-Rural Happiness Differentials across the World, United Nations Sustainable Development Solutions Network
United Nation (2006) World urbanization prospects. The 2005 revision. United Nations, Population Division, New York
United Nation (2019) World urbanization prospects. The 2018 revision highlights. United Nations, Department of Economic and Social Affairs, Population Division, New York
Zahnd WE, James AS, Jenkins WD, Izadi SR, Fogleman AJ, Steward DE et al (2018) Rural–urban differences in cancer incidence and trends in the United States. Cancer Epidemiol Biomarkers Prev 27(11):1265–1274
Publisher's Note  Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

Authors and Affiliations

Yoko Mayuzumi¹

✉️ Yoko Mayuzumi
mayuzumi@bunkyo.ac.jp

¹ Bunkyo University, 5-6-1 Hanahata, Adachi, Tokyo 121-0061, Japan