

The Impact of Covid19 on the Urban-Rural Happiness Gradient

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People in the developed world tend to be less happy in cities than in rural areas, i.e., “urban-rural happiness gradient.” The recent covid19 pandemic offers an opportunity to explore one of the disadvantages of large cities and dense settlements: the greater spread of infectious diseases. Thus, in this paper, we examine how covid19 affected happiness in the largest cities compared to smaller areas using the World Values Survey. What’s remarkable is a large differential or effect size pre-post pandemic for cities v smaller areas. Cities became 2 times less happy post-pandemic v pre-pandemic compared to smaller areas. There has been 2x decrease for United Kingdom and the Netherlands. For Uruguay there has been an increase in life satisfaction across both cities and smaller places, but the increase has been 2x smaller for cities v smaller areas. In absolute terms, while .2-.5 difference on 1-10 SWB scale is small, one must take into account the massive scale of urbanization: .2-.5 on 1-10 SWB scale for millions of people is a massive slump in human wellbeing. Findings are correlational, not causal.

URBAN, RURAL, URBAN-RURAL HAPPINESS GRADIENT, HAPPINESS, LIFE SATISFACTION, SUBJECTIVE WELLBEING, COVID19

‘Here is the great city: here have you nothing to seek and everything to lose.’ Nietzsche

1 Introduction

Covid19 has changed our way of life (Olasov et al. 2022). Many changes are persistent so far and there seems to be no coming back. One of the key areas changed is urbanism. Pre-pandemic there has been city renewal, rebirth, and indeed triumphalism. Post-pandemic there is urban scepticism, scare, and indeed, in some cases, collapse. Timing is everything. Ed Glaeser wrote a bestselling book ‘Triumph of the city’ (Peck 2016) just several years before the collapse of the city. Many cities are hollowed out in important ways by the covid19 pandemic.

The covid19 pandemic has exposed the differences between urban and rural. A person’s chance of getting the virus and surviving it was closely associated to their zipcode (Chen and Krieger 2021). Urban areas were the epicenters of the virus outbreak: the dense population and inevitable close proximity to others, a defining feature of cities, resulted in rapid transmission and a fertile ground for infection. One of the disadvantages of city life is the increased spread of infectious disease¹ (Bettencourt et al. 2010, 2007). The transmission of infectious disease is a social contact process. To be sure, although the scale of covid19 was unparalleled, all major infectious disease outbreaks in the past, e.g., SARS, Ebola, Flu, occurred in metropolitan areas. Rural areas in contrast, given their lower population density and geographic isolation, provide a natural social distancing environment that slows the spread of infectious viruses. As such, covid19 affected cities more than smaller areas (Stier et al. 2021).

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¹See for example, “SIR Models for Spread of Disease” (Newman 2002, Cooper et al. 2020).

In the present study, we take a development perspective using a measure of human development, progress, or flourishing, subjective wellbeing (SWB). Our hypothesis is that since cities suffer disproportionately from infectious diseases, city happiness decreased disproportionately during the covid19 pandemic.

We start with a brief overview of how covid19 impacted different aspects of life in urban versus rural areas. Next we present the underlying theory, the urban-rural happiness gradient theory suggesting that happiness should be observed in the least dense and heterogeneous places, such as rural areas. We end the literature review by pointing to gaps in the literature and pro-urban proclivity pre-pandemic. Our empirical analysis follows and we conclude with a discussion of results and future research.

2 Urban-Rural Happiness Gradient

Berry and Okulicz-Kozaryn (2009) investigated global differences in satisfaction with urban life. In developed countries, rural residence increased happiness at double the rate that big-city residence boosted malaise, a pattern most pronounced in societies with an Anglo-Saxon heritage. Easterlin et al. (2010) found that in more advanced developed countries, rural areas approach or exceed urban areas in life satisfaction, while in developing countries the low levels of economic development result in gaps favoring urban areas over rural areas when it comes to income, education and life satisfaction. Over last decade many studies have explored the urban-rural happiness gradient around the world. This body of research has indicated that generally, rural residents tend to report higher levels of happiness compared to their urban counterparts—for recent review see Okulicz-Kozaryn and Valente (2021). There are notable exceptions, however, Millennials in the US for example (Okulicz-Kozaryn and Valente 2018).

In a recent paper, Easterlin and O'Connor (2023) points out that only few studies examine the effect of covid19 on SWB. Easterlin and O'Connor (2023) does an overall analysis for Europe, but misses urban-rural differential. Thus, this is the first study on the topic.

Health is one of the strongest predictors of SWB, if not the very strongest—decent health is clearly necessary for SWB (e.g., Campbell et al. 1976)—health is expected to be strongly linked with SWB. And cities suffer disproportionately during pandemics in terms of health. Again, cities are hotbeds of infectious disease—infections are promoted by proximity and close contact between humans—by definition cities offer the most fertile ground for infectious disease spread.

There are detailed data for the geography of pandemic in the US, and other countries likely followed a similar pattern—It is especially large central metropolitan areas that are mostly affected as compared to fringe metros and medium cities (Curtin and Heron 2022). The urban covid19 disadvantage was at the beginning of the pandemic with incidence almost 2x and mortality almost 3x in urban v rural areas. Then rates converge, and towards the end of the pandemic cities recover and rural areas have higher rates (Cuadros et al. 2021). Still, the urban (not rural) scare remains—cities are hit first, and proximity to others and chance of infection is astronomically greater in the cities. It needs to be remembered the infection rates are reported per capita, say per 100,000 population. If it was per area, say sq km, i.e., how much disease there is in an area, the urban disadvantage would have been astronomical. For instance in NYC population density is about 11k/sq km, whereas in Montana it is about 3/sq km, about 3600x difference.

3 Data

We use the World Values Survey 7-wave 1981-2022 cumulative file freely available at worldvaluessurvey.org. We proceed as follows with the sample selection: the rate of covid19 infection increased substantially later in 2020, peaked in 2021, and still had a considerable effect in 2022. Hence, we restrict the covid19 period sample to 2021 and 2022 (2023 is not available yet). Data in 2021 are only available for small developing countries with small cities (not much urbanism): Armenia, Kenya, Maldives, Morocco, and Venezuela.² Hence, for 2022 we obtain: Czechia, Libya, Netherlands, Northern Ireland, Slovakia, United Kingdom, and Uruguay. Next,

²Kenya does have large cities but it has been largely spared from covid19—at 50m population it only had 342k cases (less than 1%) and 6k deaths <https://coronavirus.jhu.edu/region/kenya>. Likewise, there are large cities in Venezuela, but it is a dictatorship largely cut off from the world, which

we checked sample sizes by year and urbanicity (X049) for each country. We excluded: Czechia—it had no city with a population larger than 500k before 2022; Libya—there were only 7 respondents in cities larger than 500k before 2022; Northern Ireland—the total sample size is 447 and there's data only for one wave; Slovakia—only 61 respondents in cities with a population larger than 500k pre-2022. Which leaves us with United Kingdom (GBR), the Netherlands (NLD), and Uruguay (URY).

4 Results

The results are set in figure 1. Each panel shows results for a separate country: United Kingdom (GBR), the Netherlands (NLD), and Uruguay (URY). Y axis is life satisfaction. X-axis is urban-rural gradient—degrees of urbanicity or urbanness. Blue bars show pre-pandemic averages (year varies by country), and green bars show pandemic/post-pandemic averages (2022).

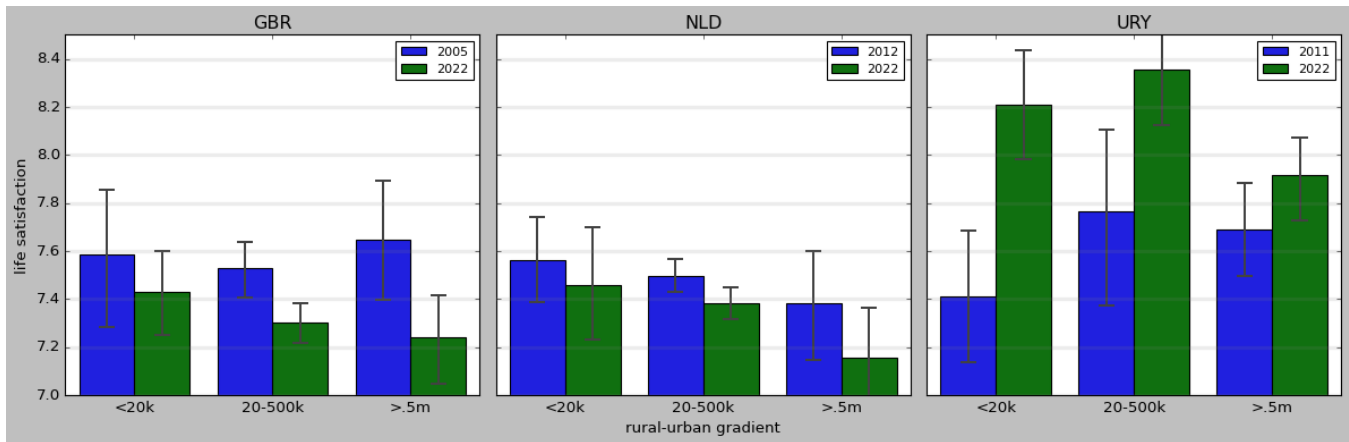


Figure 1: Life satisfaction (1 = *unhappy* to 10 = *happy*) means with 95% CI against rural urban gradient categories. *GBR* = United Kingdom, *NLD* = Netherlands, *URY* = Uruguay.

In both, United Kingdom (GBR) and the Netherlands (NLD) the biggest difference pre-post pandemic (blue v green bar) is for the largest places (> .5m). Uruguay (URY), on the other hand, experienced an increase in SWB across urbanicity, but the largest places (> .5m) increased least. Thus, across the three countries, we find support for our hypothesis of large cities happiness suffering disproportionately post pandemic. Next, we repeat the above figure 1, but with more detailed urban-rural classification to explore nuances in figure 2.

might have protected it from covid19—despite being about 30m there were only .5m cases and 5k deaths, while in neighboring Colombia of 50m there were 6.3m cases and 142k deaths <https://coronavirus.jhu.edu/region/venezuela>

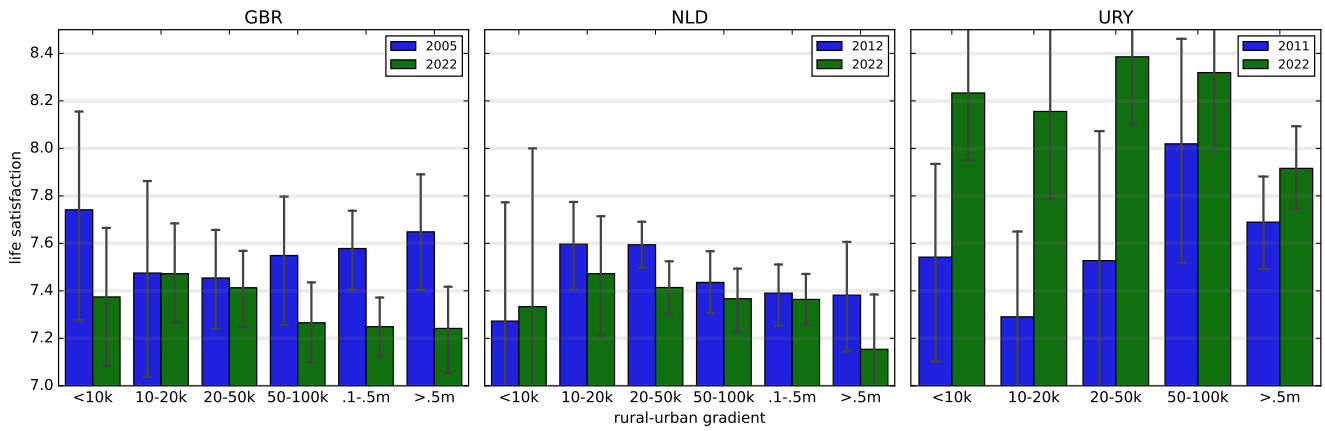


Figure 2: Life satisfaction (1 = *unhappy* to 10 = *happy*) means with 95% CI against rural urban gradient categories. *GBR* = United Kingdom, *NLD* = Netherlands, *URY* = Uruguay. Note: *URY* is missing .1-.5m cat due to small cell sizes.

In United Kingdom, pre-pandemic, the happiest places were the smallest ($< -10k$), while during the pandemic, both the smallest and largest places were most affected and saw significant reduction in SWB. It is unexpected to see this reduction in the smallest places, and the result could be due to some country specific factors.

In the Netherlands, there's not much change in subjective well being in smaller places pre and post the pandemic, except for the largest cities where there's a significant drop in SWB as expected. There was also a smaller drop in 10-20, and especially 20-50 categories.

Uruguay, a developing country, shows a different story: SWB increased across urbanicity, including the largest areas ($> 500k$), but that's also where the smallest increase occurred, as expected. Many of the CI are wide, and it is not clear which differences are significant.

Next, we test the differences with regression. First, since the focus is on cities v smaller areas (rural and towns), for simplicity, we collapsed categories up to .5m into one as rural and towns, and contrast this category with cities (larger than .5m).

There are also two technical reasons for this approach. It is a simpler exposition to have urban dichotomy as opposed to a full gradient, given that we also have two other breakdowns: pre-post COVID and by country. And, critically, the cell sizes run small with too many breakdowns for this relatively small dataset. When more data becomes available, future research should test the full urban-rural gradient.

Our hypothesis is that while the pandemic decreased SWB in general, we expect to see an even greater SWB decrease in cities. We are focused on the pre-post pandemic differences in SWB levels in big city versus smaller areas.

Bivariate regression results are set in table 1. We first separate our analyses by country and then within each country by rural and towns ($< .5m$) v cities ($> .5m$). We regress life satisfaction on a year dummy for 2022 with the base case being the latest pre-pandemic wave as shown in figures 1 and 2.

	GBR		NLD		URY	
	$< .5m$	$> .5m$	$< .5m$	$> .5m$	$< .5m$	$> .5m$
2022	-0.21**	-0.41**	-0.12**	-0.23	0.75***	0.23+
constant	7.54***	7.65***	7.50***	7.38***	7.54***	7.69***
N	3111	521	3572	373	1154	836
+ 0.10 * 0.05 ** 0.01 *** 0.001; robust std err						

Table 1: OLS regressions of life satisfaction.

Effect sizes on the year 2022 dummy are the bar length differences from fig 1. For GBR the difference pre-post pandemic is about .2 for rural areas and towns ($< .5m$), and the difference for cities ($> .5m$) is about .4, and so forth for NLD and URY. A remarkable finding in our analysis is the roughly 2 times difference for GBR and NLD, and 3 times difference for URY—this is a strong differential.

When comparing cities ($> .5m$) versus smaller areas ($< .5m$), cities became 2 to 3 times less happy post-pandemic compared to pre-pandemic levels.

Still one of the coefficients for NLD is not significant, and only weakly significant for URY, and there is left out variable bias. Differences in SWB levels should be even bigger when controlling for SWB predictors as the urban rural happiness gradient often emerges only after controlling for SWB predictors (Okulicz-Kozaryn and Valente 2021). Hence, we elaborate our models with SWB predictors in table 2.

	GBR		NLD		URY	
	$< .5m$	$> .5m$	$< .5m$	$> .5m$	$< .5m$	$> .5m$
2022	-0.18*	-0.39+	-0.20***	-0.45**	0.42***	0.21
income	0.09***	0.01	0.06***	0.14***	0.07*	0.13***
age	-0.03*	-0.08**	-0.02+	-0.06+	0.00	-0.06**
age2	0.00**	0.00**	0.00**	0.00*	-0.00	0.00**
male	-0.18**	-0.13	-0.11*	-0.27+	0.06	0.19
married or living together as married	0.53***	0.74***	0.44***	0.23	0.46**	0.06
divorced/separated/widowed	0.07	0.15	-0.11	-0.14	-0.37+	-0.19
autonomy	-0.11*	-0.07	-0.11**	-0.01	-0.06	0.06
freedom	0.44***	0.42***	0.35***	0.43***	0.43***	0.36***
trust	0.12+	0.42**	0.43***	0.28+	-0.05	0.10
postmaterialist	-0.05	-0.18	-0.11*	0.14	-0.02	0.15
god important	0.01	0.05*	0.02*	-0.01	0.05**	0.06**
constant	4.08***	5.95***	4.59***	4.80***	3.47***	4.58***
N	1985	309	2283	237	736	579
+ 0.10 * 0.05 ** 0.01 *** 0.001; robust std err						

Table 2: OLS regressions of life satisfaction.

The elaborated models in table 2 confirm our earlier results. We find that there's again roughly a 2 times difference for GBR and NLD, while for URY the differential is reduced from about 3 times to roughly 2 times as well.

As a robustness check we add "health" as a control variable in table 3. It is important to underscore that there's a confounding effect between pre-post covid19 and health by definition. And there will also be confounding effects between urbanicity and health since covid19 is more prevalent in cities as previously discussed. Hence, these regressions are less useful in determining pre-post covid19 urban-rural differentials. Taking into account health, the results on the over-time SWB difference are smaller and less significant, as expected. Remarkably though, we find that the urbanicity differentials even though less statistically significant, are still about 2 times larger for GBR and URY and even stronger for NLD. Arguably the high infections rate of covid19 in cities is in addition to other urban problems such as misanthropy and overall malaise (Okulicz-Kozaryn and Valente 2022, Wilson 1985, Rosenberg 1956, Okulicz-Kozaryn and Valente 2018, Fischer 1973, Fischer and Merton 1976). Future research is needed.

	GBR		NLD		URY	
	$< .5m$	$> .5m$	$< .5m$	$> .5m$	$< .5m$	$> .5m$
2022	-0.12	-0.26	-0.06	-0.24+	0.44***	0.23
health	0.48***	0.67***	0.62***	0.77***	0.56***	0.32**
income	0.05**	-0.01	0.04***	0.08**	0.05	0.12***
age	-0.02*	-0.07*	-0.01	-0.03	0.01	-0.05*
age2	0.00**	0.00**	0.00**	0.00+	-0.00	0.00*
male	-0.16*	-0.15	-0.09+	-0.23+	-0.01	0.14
married or living together as married	0.49***	0.60**	0.38***	0.21	0.41**	0.04
divorced/separated/widowed	0.05	0.20	-0.15	-0.27	-0.36+	-0.16
autonomy	-0.12**	-0.09	-0.10**	0.07	-0.09	0.04
freedom	0.38***	0.29***	0.29***	0.31***	0.40***	0.35***
trust	0.07	0.28*	0.34***	0.21	-0.07	0.01
postmaterialist	-0.05	-0.26+	-0.09*	0.06	0.01	0.12
god important	0.01	0.02	0.02+	0.00	0.05**	0.06**
constant	2.72***	4.29***	2.46***	2.01*	1.31+	3.31***
N	1985	309	2279	236	736	578
+ 0.10 * 0.05 ** 0.01 *** 0.001; robust std err						

Table 3: OLS regressions of life satisfaction.

Finally, we pool data for the three countries together– it is useful to formally test the differences with interactions in table 4.

	a1	a2	a3	a4	a5
post pandemic	-0.20**	-0.13+	-0.10	-0.02	-0.18*
city lg500k	0.05	0.19*	0.20*	0.11	0.07
post pandemic × city lg500k	-0.26*	-0.26*	-0.26*	-0.21+	-0.15
United Kingdom	-0.04	0.03	0.08	-0.01	-0.04
Uruguay	0.82***	0.92***	0.95***	0.68***	0.43***
2005	0.00	0.00	0.00	0.00	0.00
2011	-0.82***	-0.72***	-0.54***	-0.47***	-0.44***
2012	-0.10	0.15+	0.11	0.02	0.05
2022	0.00	0.00	0.00	0.00	0.00
income		0.14***	0.13***	0.08***	0.08***
age		-0.05***	-0.04***	-0.03***	-0.03***
age2		0.00***	0.00***	0.00***	0.00***
male		-0.16***	-0.17***	-0.16***	-0.11**
married or living together as married		0.46***	0.46***	0.39***	0.44***
divorced/separated/widowed		0.01	0.01	-0.03	-0.07
god important			0.03***	0.03***	0.02***
trust			0.38***	0.25***	0.26***
postmaterialist			-0.04	-0.05+	-0.04
autonomy			-0.10***	-0.10***	-0.09***
health				0.71***	
freedom					0.40***
constant	7.58***	7.42***	7.14***	4.40***	4.47***
N	9196	7746	6038	6032	5970

+ 0.10 * 0.05 ** 0.01 *** 0.001; robust
std err

Table 4: OLS regressions of life satisfaction.

We start with a basic model where we regress life satisfaction on a dummy for the largest cities, and post-pandemic wave dummy where “post pandemic” = 1 if *year* = 2022. We also include country dummies, as we now pull all the data together. Finally, we also include year dummies in addition to pre-post dummy since data were collected in different countries in different years.

In column a1, as expected we see that post pandemic SWB went down by -.2, and especially so for cities by an additional -.26. When adding basic controls in a2, we find that the main variable of interest testing our hypothesis, post pandemic*city lt 500k, stays about the same at -.26. We include an extended list of controls in a3, and again the coefficient stays at -.26. It is only after adding “health” in model a4 that the coefficient slightly drops to -.21. Finally, the addition of freedom in model a5 cuts the effect most substantially to -.15 and loses statistical significance. Future research should further explore why controlling for “freedom” removes the effect.³

5 Conclusion and Discussion

The covid19 pandemic has adversely impacted SWB around the world, but especially in large cities and metropolitan areas. Before the pandemic, city happiness was on the rise relative to rural areas (Okulicz-Kozaryn and Valente 2019). As rural areas have been left behind (Hanson 2015), the rural happiness advantage has decreased. A rural Californian explains (Fuller 2017, p. 2):

“In the rural parts of the state we drive more miles, we drive older cars, our economy is an agriculture- and resource-based economy that relies on tractors. You can’t move an 80,000-pound load in an electric truck. They’ve devastated ag jobs, timber jobs, mining jobs with their environmental regulations, so, yes, we have a harder time sustaining the economy, and therefore there’s more people that are in a poorer situation.”

Ironically, the covid19 pandemic made the economic advantage and prosperity of cities quickly wither away. The pandemic created significant economic turmoil particularly in large urban centers: as businesses and industries shut down, millions lost their jobs, and thousands fled to the suburbs or smaller places, hoping to avoid human interaction and protect themselves against the virus. Places like New York City, that were vibrant and full of life, became dull and empty. Still, as of 2024, much of commercial real estate in urban cores is empty.

³The original WVS code for the freedom variable is A173: “Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means ‘none at all’ and 10 means ‘a great deal’ to indicate how much freedom of choice and control you feel you have over the way your life turns out.” A rationale to look at freedom is that it confounds with city; i.e., city has more freedom than rural at least in some senses. The idea goes back at least to Ferdinand Toennies’ “Gemeinschaft und Gesellschaft” (Tönnies [1887] 2002)—city air is free—e.g., nonstandard/nonconformist types such as LGBTQ are more free in a city.

Urban and rural areas experienced and coped with the pandemic very differently. Urban areas became the center of coronavirus outbreaks around the world, and many cities saw their healthcare systems become quickly overwhelmed given the magnitude of the virus—makeshift hospitals and makeshift morgues were set up in cities like New York City.

There's always a strong correlation between subjective well being and health. Health is the key predictor of happiness—almost no one considers health unimportant (e.g., Campbell et al. 1976). The virus not only made people severely ill, but it prevented people who had any other health emergencies or issues from being properly taken care of (e.g., cancer, heart disease, diabetes). This was particularly an issue in large metropolitan areas. The number of people whose health was directly or indirectly affected by covid19 is significantly larger than the reported statistics of covid19 infection. Thus, it is no surprise that our findings show such a significant and relatively large drop in happiness levels in cities as compared to smaller places.

Understanding the discrepancies is important because policymakers can implement policies targeted to create a more healthy and livable environment for urban and rural residents based on the different challenges they experience to foster happiness. The spread of infectious disease in cities is unavoidable and will likely happen again in the near future. Learning from the challenges brought by covid19 might result in lifesaving, health and happiness promoting measures.

Again, only initial phase of infection per capita is greater in cities, then urban rural rates converge and in last stage are higher in rural as cities got hit first and recover first. But there is arguably a strong psychological effect, urban scare, that will also last well after pandemic for the foreseeable future. Likewise, urban quality of life v rural quality of life even given the same per capita infection is very different—one can easily go about daily life and even enjoy most rural activities in rural areas, while the opposite is true in cities—city way of life during the pandemic is unbearable.

The massive difference in population density of urban v rural needs to be highlighted. Again, NYC population density is about 11k/sq km, whereas in Montana it is about 3/sq km, about 3600x difference. Even if infection rate were similar across urban-rural, the difference in infection rate per sq km is massive. And this is one key factor behind urban scare—the sheer number of infections in one's proximity is astronomical.

Many thought that covid19 may be largely gone and cities safe to return to. One of the authors of this study was reckless enough to go to a large city, New York City, and surely enough just got infected with covid19 this summer (2023) when we were revising this paper. President Trump has called covid19 "Chinese Virus" to pinpoint the geographic origin, but indeed a more descriptive geographic term would be "city virus." We advise the readers to keep away from large cities—you will be safer from infectious disease and happier.

In many ways, cities cannot be fixed—there is inherent conflict, dysfunction and even misanthropy in metropolis Wirth (1938), Fischer (1972), Okulicz-Kozaryn and Valente (2022), Thrift (2005), Amin (2006), Okulicz-Kozaryn (2015), Peck (2016). Others would argue that a city can be fixed and made happier (for a review see Ballas 2013). Olasov et al. (2022) offers many ideas by 10 philosophers. For instance, to reimagine cities to offer convivial and sensual shared space for shared pleasure, "a mesh of small, safe, intimate places, rather than a series of grand urban projects."

6 Limitations and Future Research

As more data becomes available, it will be instructive to closely examine countries that were most affected by covid19. Italy and the U.S., for example, will probably show much greater negative effects on SWB than what we found in GBR, NLD and URY. Although covid19 infection rates are significantly lower now, and another massive pandemic could be decades ahead, we'll likely experience covid19 lingering effects for many years to come. This could arguably include urban scare, prevalence of misanthropolis (a metropolis full of distrust and dislike of humankind) (Okulicz-Kozaryn and Valente 2022), and possibly an urban crisis. It would be useful to study the long term effect on urban-rural gradient and whether covid19 has widened more permanently the urban-rural happiness gap that had been closing (Okulicz-Kozaryn and Valente 2018).

Again, this is the first study on the topic. We are interested in general/overall patterns to start the debate. Future research can

focus on a more direct link between injections, hospitalizations, and deaths and SWB by linking public health data with SWB data for specific locations.

Likewise there is huge difference in infection rates across countries (e.g., Italy, the US, China), and across places within countries. Such differences could be perhaps explored in a natural experiment framework where massively infected area can be matched with a similar area but with low infection rate.

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