

Covid19 and Urban Unhappiness

Adam Okulicz-Kozaryn*

Rutgers - Camden

Tuesday 28th February, 2023 16:17

Covid19 has changed our way of life. Indeed, changes seem persistent to large degree and there seems to be no coming back. One of the key areas affected 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. In present study we take a human development perspective using a measure of human flourishing, subjective wellbeing (swb). We find life satisfaction to decrease in cities v smaller areas post-pandemic in United Kingdom, the Netherlands, and Uruguay. What's remarkable is a large differential or effect sizes pre-post pandemic for cities v smaller areas. Cities v smaller areas became 2x less happy post-pandemic v pre-pandemic. To be precise, 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 relative terms, effect size differentials are remarkable—it is rare to see in SWB research 2x or 200% differentials. In absolute terms, effect sizes are large, too. While .2-.25 difference on 1-10 SWB scale is small, one must take into account massive scale of urbanization—2-.25 decrease on 1-10 SWB scale applied to millions of people is a massive slump in human development. Findings are correlational, not causal.

URBAN, RURAL, URBAN-RURAL HAPPINESS GRADIENT, HAPPINESS, SUBJECTIVE WELLBEING

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

Timing is everything. Ed Glaeser wrote a bestselling book 'Triumph of the city' just several years before the collapse of the city. Cities are hollowed out by the covid19 pandemic.

We know that one of the disadvantages of city is increased infectious disease spread. Put simply, one city feature is increased infectious disease spread. Indeed such population scaling is so consistent and strong, it is universal (Bliss 2014, Bettencourt et al. 2010, Bettencourt and West 2010, Bettencourt et al. 2007). Indeed, it could be called "law", like physics laws such as gravity.

Covid19, an infectious disease, fits this pattern (Stier et al. 2021).

Massive infectious diseases happen every now and then, SARS, Ebola, etc, and recently COVID19. The research hypothesis is that as cities suffer disproportionately from infectious diseases, city happiness decreased proportionally as well with covid19.

In present study we take a human development perspective using a measure of human flourishing, subjective wellbeing (swb). Boilerplate from Sen Stiglitz and UN!! (see slides from cSWB).

1 Data

We use World Values Survey cumulative file 1981-2022, 7 wave file. We proceed as follows with the sample selection. Covid19 didn't really take off until later in 2020, peaked in 2021, and still had a considerable effect in 2022. Hence we look at data in 2021 and 2022. Data in 2021 has only developing countries, and rather small with small cities: Armenia, Kenya, Maldives, Morocco, and Venezuela. Hence, we will focus on 2022: Czechia, Libya, Netherlands, Northern Ireland, Slovakia, United Kingdom, and Uruguay. Next, we check sample sizes by year and urbanicity (X049) for each country. We exclude: Czechia: no city $\geq 500k$ before 2022. Libya: only 7 respondents in city $\geq 500k$ before 2022. Northern Ireland: total sample size is 447 and only one wave. Slovakia: only 61 respondents in city $\geq 500k$ pre 2022. Which leaves us with United Kingdom (GBR), Netherlands (NLD), and Uruguay (URY).

*EMAIL: adam.okulicz.kozaryn@gmail.com

I thank XXX. All mistakes are mine.

2 Results

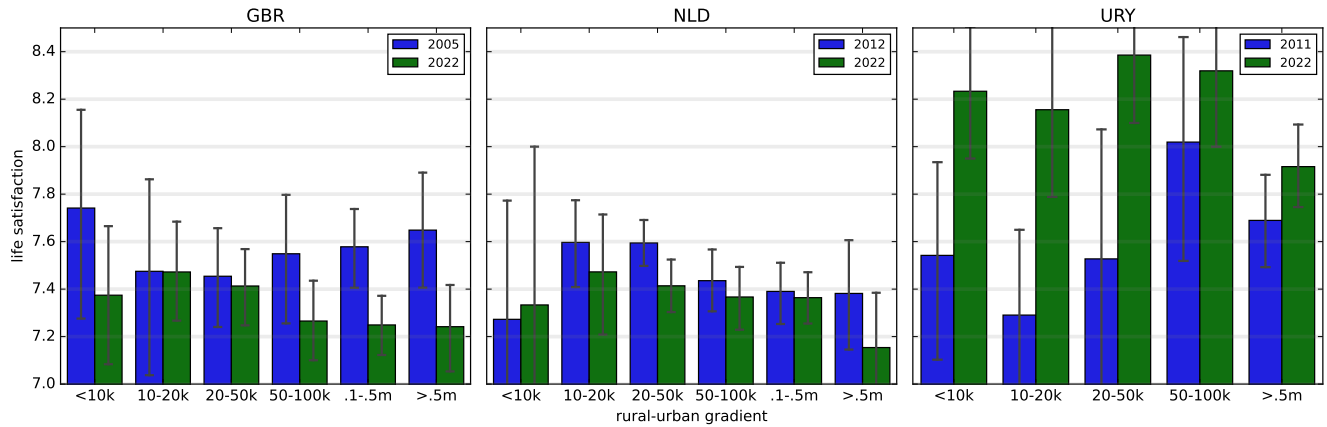


Figure 1: Life satisfaction (1 = *unhappy* to 10 = *happy*) means with 95% CI against rural urban gradient categories. *GBR* = United Kingdom, *NLD* = Netherlands, *URY* = Uruguay. Note: *URY* is missing .1-.5m cat due to small cell sizes.

GBR: so prepandemic -10k happiest; pandemic: both smallest and largest most hit; unexpected for smallest, what it could be?
may be some country specific

NLD: rural not much change pre post, except for largest cities as expected; but also weirdly 10-20, and esp 20-50

URY is a different story: SWB increased everywhere ; and increased in $\geq 500k$ too, but increased least there—so also as expected

Many of the CI are wide. Next we test the differences with regression. First, since the focus is on cities v smaller areas (rural and towns), for simplicity, we collapse categories upto .5m into one as rural and towns and contrast this category with cities (larger than .5m).

The hypothesis is that while the pandemic decreased wellbeing in general, it especially did so in the cities. Again, a city feature is increased infectious disease spread.

We break up our analyses by country and then within each country by rural and towns ($\leq .5m$) v cities ($\geq .5m$). We regress life satisfaction on 2022 dummy, base case being latest pre-pandemic wave as shown in fig ?? . Bivariate regression results are set in table 1. Effect sizes on 2022 dummy replicate findings from fig ?? . For GBR the difference pre-post pandemic is about .2 for rural areas and towns ($\leq .5m$), and the difference for cities ($\geq .5m$) is about .4, and so forth for NLD and URY. Whats remarkable is about 2x difference for GBR and NLD and 3x for URY, this is a very strong differential. Cities v smaller areas became 2x to 3x less happy post-pandemic v pre-pandemic. Still one of the coef for NLD not sig, and weakly sig for URY, and there is left out variable bias. Hence, we elaborate models with an extensive set of SWB predictors in table 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.

	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.

Again about 2x difference for GBR and NLD persists, and for URY it is reduced from about 3x to about 2x as well

Finally, as a robustness check we add health variable in table 4. Obviously, there will be confounding between pre-post covid and health by definition. And there will be also confounding between urbanicity and health as again covid is more prevalent in cities. Hence these regressions are less useful in determining pre-post covid urb-rur differentials. Now taking into account health, as expected, results on over time difference are smaller and less significant (pre-post confounding with health). Remarkably though, the urbanicity differentials even though less statistically significant are still about x2 for GBR and URY and even stronger for NLD. Perhaps and arguably covid city in addition to bad health caused other problems such as misanthropy and overall malaise. 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.

Our final set of results will pool all the data together. Earlier we split the sample by pre-post and large city v town and rural for simplicity and ease of interpretation, but it is also useful to formally test the differences with interactions.

in table ?? we start with a basic model where we regress life satisfaction on a dummy for largest cities and post-pandemic wave dummy = $1_{if yr == 2022}$, 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 as 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 additional .26. addition of basic controls in a2, post*city interaction stays about the same. extended controls in a3, same. only addition of hea in a4 cuts it to .21, and addition of freedom in a5 cuts most substantially to .15 and kills significance. freedom kills it! future research: look more at freedom

	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*	0.10	0.07
post pandemic × city lg500k	-0.27*	-0.26*	-0.25*	-0.21+	-0.14
Netherlands	0.00	0.00	0.00	0.00	0.00
United Kingdom	-0.04	0.03	0.08	-0.01	-0.04
Uruguay	0.84***	0.93***	0.95***	0.68***	0.43***
2005	0.00	0.00	0.00	0.00	0.00
2011	-0.83***	-0.73***	-0.53***	-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		0.47***	0.46***	0.39***	0.44***
divorced/separated/widowed		0.01	0.00	-0.03	-0.08
god important			0.03***	0.03***	0.02***
trust			0.38***	0.25***	0.26***
postmaterialist			-0.04	-0.05+	-0.04
autonomy			-0.11***	-0.11***	-0.09***
health				0.71***	
freedom					0.40***
constant	7.58***	7.43***	7.16***	4.41***	4.49***
N	9227	7775	6061	6055	5993
+ 0.10 * 0.05 ** 0.01 *** 0.001; robust std err					

Table 4: OLS regressions of life satisfaction.

TODO: have separate som-r.tex as opposed to having it below; and in paper say see supplementary material as opposed to see appendix!

References

- BETTENCOURT, L. AND G. WEST (2010): “A unified theory of urban living,” *Nature*, 467, 912–913.
- BETTENCOURT, L. M., J. LOBO, D. HELBING, C. KÜHNERT, AND G. B. WEST (2007): “Growth, innovation, scaling, and the pace of life in cities,” *Proceedings of the National Academy of Sciences*, 104, 7301–7306.
- BETTENCOURT, L. M., J. LOBO, D. STRUMSKY, AND G. B. WEST (2010): “Urban scaling and its deviations: Revealing the structure of wealth, innovation and crime across cities,” *PloS one*, 5, e13541.
- BLISS, L. (2014): “Moving Toward an Evolutionary Theory of Cities,” .
- STIER, A. J., M. G. BERMAN, AND L. M. BETTENCOURT (2021): “Early pandemic COVID-19 case growth rates increase with city size,” *npj Urban Sustainability*, 1, 31.