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PARIS SCHOOL OF ECONOMICS
Opening Economics

By
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The role of neighborhood deprivation in shaping health inequalities

Social inequalities in health have increased in recent decades, with the Covid-19 pandemic further accelerating this trend. These developments emphasize the importance of focusing our attention on the socio-economic gradient in health-risk behaviors and overall health, to which neighborhood deprivation is a main contributor. In England, a recent review has highlighted how the gap in life expectancy at birth between those living in the least and most deprived areas significantly increased between 2010 and 2018 (Marmot *et al.*, 2020). The outbreak of Covid-19 provides an opportunity to focus on the relationship between neighborhood inequalities and health outcomes. On the one hand, rare and extreme events such as the Covid-19 pandemic can be viewed as a major disruptor, affecting key health outcomes for populations. On the other hand, the pandemic represents a unique form of natural experiment which allows the identification of causal neighborhood effects.

Examining England during the Covid-19 period, our research, presented in two recent papers, assesses the role of neighborhood deprivation on individual health. In the first study (published in *PLoS One* in 2021), we analyze the influence of neighborhood deprivation on two dimensions of well-being, more related to mental health (or 'hedonic wellbeing') or life satisfaction ('evaluative wellbeing'). The second study (published in *Social Science and Medicine* in 2023) focuses on health-risk behaviors: smoking, drinking, physical activity, and healthy eating.

We highlight how neighborhoods may affect health through both physical and social characteristics. On the one hand, the physical neighborhood environment can affect well-being and health-related behaviors through environmental exposures, food and recreational resources, the built environment, aesthetic quality/natural spaces, services and quality of housing. On the other hand, the neighborhood environment can affect residents' health through factors related to safety/violence, social connections/cohesion, local institutions and norms.

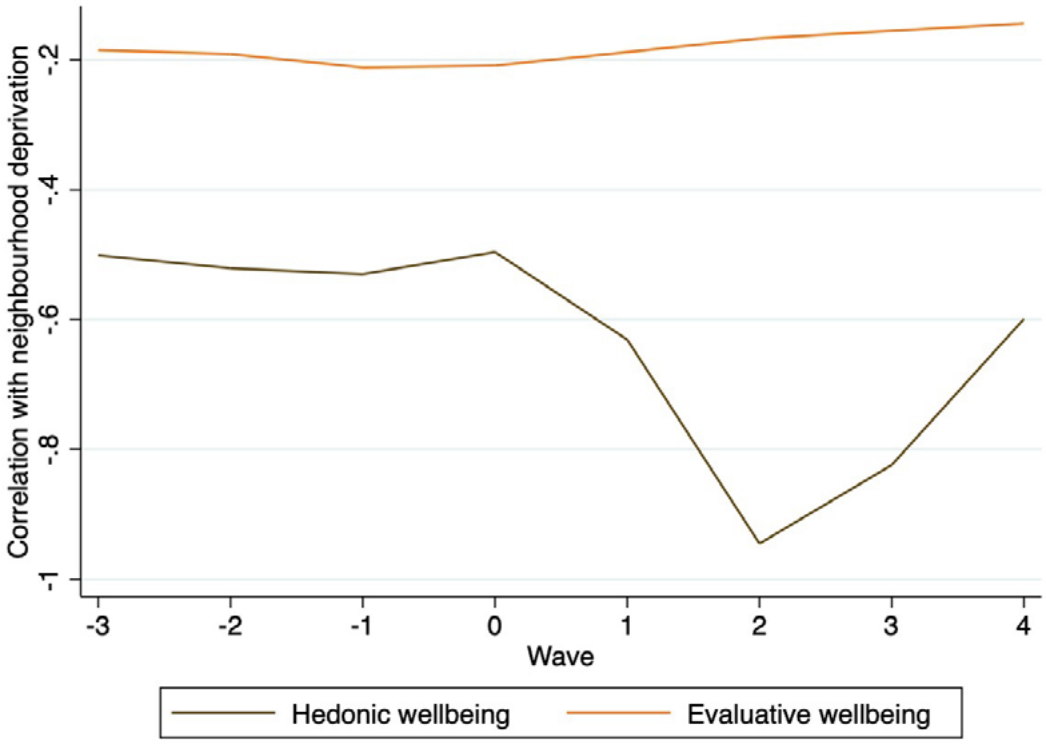
In the first paper, utilizing data from *Understanding Society*, our results show that everyone report lower levels of wellbeing in May 2020 compared to 2018, and that average well-being is lower as we move through quintiles of deprivation. Furthermore, prior to the Covid-19 lockdown, both hedonic and evaluative well-being measures are negatively correlated with neighborhood deprivation, but the restrictions

imposed during the lockdown have a different effect on the two correlations.

Figure 1 below shows that in May 2020 (Wave 2) neighborhood deprivation has a much stronger negative correlation with mental health ('hedonic wellbeing') compared to before the pandemic (Waves -3 to 0). By July (Wave 4), when the lockdown was over, the correlation starts to come back to pre-lockdown values. On life satisfaction ('evaluative wellbeing'), though, we observe a different and overall neutral pattern. Estimates validate our hypothesis that, as compared to individuals in less deprived areas, individuals in the most deprived ones have suffered much more in terms of hedonic well-being, but not in evaluative terms.

These results prompt questions about the differential impact on the two dimensions of well-being, over which an in-depth qualitative analysis could shed more light. What accounts for the widening mental health gap between more and less deprived areas, but the lack of significant change on life satisfaction? Perhaps, during a crisis, we see our overall situation in a different light. People in less deprived areas are likely to have more financial and interpersonal resources than those in more deprived ones, so could feel they have 'more to lose' in a crisis. Also, people who worked from home in lockdown were more likely to live in the least deprived areas, and may have felt a more significant loss in terms of life style, networking and future work opportunities. It may also be that people in deprived neighborhoods are less informed about Covid-19, and therefore less worried about the crisis than people who are more informed – who are likely to be living in better off areas.

Figure 1.
Neighborhood correlation with hedonic and evaluative wellbeing, OLS cross-section by wave.



Our second paper uses data from four nationally representative cohorts and looks both at short-term effects, that is in May 2020 in correspondence of the first lockdown, and long-term ones, up to May 2021, when the UK was experiencing the third and lighter lockdown.

Table 1.
Short-term effect of Covid-19 and neighborhood deprivation

VARIABLES	(1)	(2)	(3)	(4)
	Smoking	Drinking	Healthy Eating	Physical Activity
	Pre and First Lockdown	Pre and First Lockdown	Pre and First Lockdown	Pre and First Lockdown
Covid-19	0.091***	0.116***	0.007	0.047***
	(0.022)	(0.011)	(0.006)	(0.014)
Covid-19*Nhb Deprivation	0.024+	0.012	−0.015*	−0.033**
	(0.013)	(0.011)	(0.006)	(0.012)
Constant	2.504***	2.272***	1.419***	1.312***
	(0.135)	(0.045)	(0.027)	(0.066)
Individual observations	959	7757	8833	7881
Observations	1918	15,514	17,666	15,762
Pseudo R^2	0.55	0.51	0.24	0.22

Notes: ***p < 0.001, **p < 0.01, *p < 0.05, + p < 0.1. Individual and neighbourhood fixed effects. Standard error clustered at the neighbourhood level. Additional time-varying controls: economic activity, health status, tenure, financial subjective assessment.

Table 1 showcases the short-term effect of Covid-19, operationalized as a dummy variable taking value 0 before the outburst of the pandemic and 1 afterwards, and of our main variable of interest, which is an interaction term between the Covid-19 dummy and a standardized measure of neighborhood deprivation. Analyses reveal an overall effect of Covid-19 on health-related behaviors and, also, that the pandemic widened disparities in fruit and vegetable consumption, physical activity and, to a minor extent, smoking, between people living in more or less deprived areas. In the longer term, the interaction term between Covid-19 and neighborhood deprivation remains negative and significant only for physical activity, while it becomes non-significant on the other outcomes. This vanishing trend seems to indicate that, as expected, Covid-19 and related non-pharmaceutical interventions acted as a highlighter of neighborhood inequalities as people had to spend more time in their residential area. The fact that the effect vanishes once lockdown measures were eased should not therefore suggest that neighborhood deprivation matters less, but, on the contrary, that the role of the neighborhood is frequently underestimated as many confounders are at play.

We further explore heterogeneity in the combined effects of Covid-19 and area deprivation based on sex and ethnicity. In particular, women in deprived areas did less physical activity during the first lockdown than women residing in less deprived ones, and white British

individuals in more deprived neighborhoods consumed more alcohol and smoked more than non-white British counterparts.

Speculating on mechanisms behind these disparities, stress theory suggests that individuals in deprived areas, facing challenges exacerbated by the pandemic, may engage in risker behaviors, such as eating high-fat foods, drinking alcohol or smoking more, and reducing the time they dedicate to physical activity. For example, those living in deprived neighborhoods were more likely to work in risky jobs as well as much more likely to use public transport and make visits to essential shops compared to those in more affluent areas, which might have increased the risk of Covid-19 infection, leading to extra stress. At the same time, we could expect physical characteristics of the neighborhood, such as the presence of health food shops and quality supermarkets, to affect the reduction in consumption of fruit and vegetables. Data from Public Health England (PHE) highlight for example how deprived areas host five times more fast food outlets than non-deprived ones. Such outlets provide tasty and cheap food, and local residents might be tempted to resort to this kind of food, readily available in the area, during a lockdown in a pandemic.

In conclusion, this research provides valuable insights and policy implications. Our findings underscore the heightened urgency for policymakers to address and alleviate structural neighborhood disparities, which the pandemic has significantly highlighted. Overall, the global health crisis has intensified existing challenges, making it imperative to invest in policies that respond to the structural spatial inequalities and also anticipate future issues. Strategies such as tackling concentrated poverty, enhancing outdoor spaces, and establishing support centers in marginalized neighborhoods are especially pertinent and contribute to building resilience for potential future crises. These measures not only address long-standing structural issues but also respond to the specific challenges emphasized by the pandemic, ensuring a more comprehensive approach to promoting equal health resources across neighborhoods, bolstering social capital, and mitigating health-related risks in the face of an evolving societal landscapes.

References

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