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Health and wealth inequality under epidemiological uncertainty following COVID-19

Konstantinos Angelopoulos, University of Glasgow and CESifo

Spyridon Lazarakis, Lancaster University

Rebecca Mancy, University of Glasgow

Max Schroeder, University of Glasgow

Presentation for *Inequality post-COVID-19* workshop, 8 June 2021

Funding and disclaimer

- This project is supported by a grant that is funded by the Economic and Social Research Council (ESRC) as part of UK Research and Innovation's rapid response to COVID-19.
- Rebecca Mancy is supported by The Leckie Fellowship, the UK Medical Research Council (MRC) Places and Health Programme (MC_UU_00022/4) and the Chief Scientist Office (CSO) (SPHSU10) at the MRC / CSO Social and Public Health Sciences Unit, University of Glasgow.
- The project is supported by Glasgow City Archives, Glasgow Life.
- Views expressed here are those of the authors.

Post-pandemic health and wealth inequality

- Pandemics can create health and economic crises that impact households heterogeneously, increasing risk and inequality in both income and health.
- The inequality implications of COVID-19 have been examined in several studies (see, e.g. **Stantcheva (2021)** for a review, and **Marmot et al. (2020)** focusing on health inequality) and are expected to be long lasting (see e.g. **Blundell et al. (2020)** and **Jorda et al. (2020)** for economic effects, and **Banks et al. (2020)** and **Dennis et al. (2020)** for health effects).

Wealth and health inequality in the medium run

- We examine changes in wealth and health inequality in the medium run.
- Health and wealth are related, e.g. **Marmot (2004)**, **Payne (2017)**, as be seen in national-level survey data, revealing an association between health and income/socioeconomic class.

A pandemic can have multiple waves and be followed by recurrent outbreaks

- Pandemics often have multiple waves.
- Following these, further outbreaks may occur due to re-introduction of the virus, new variants, waning immunity, human behaviour (e.g. vaccine refusal), or population turnover leading to reductions in population-level immunity (e.g. **Anderson and May (1991)**, **Oxford et al. (2013)** and for COVID-19 e.g. **BMJ (2021)** and **Kissler et al. (2020)**).
- Previous pandemics have been followed by recurrent outbreaks: 1918-19 (US, and data from large cities in the UK), 1890-91 (England and Wales).
- Therefore, we consider possible outcomes in the medium run under epidemiological uncertainty.

Methods

- We develop a model with heterogeneous households under income and health risk, and compute the cross-sectional joint distribution of health and wealth that arises as a combination of household choices and exogenous factors (shocks).
- We calibrate the model to pre-COVID-19 health and income data by socioeconomic group; model predictions are consistent with pre-COVID-19 health and wealth inequality.
- Starting from the pre-COVID-19 distribution, we simulate forward under the COVID-19 shock in 2020, and uncertainty about additional waves and recurrent outbreaks thereafter.
- Epidemiological uncertainty implies that for every year there is a range of possible outcomes, i.e. a probability distribution of possible inequality outcomes. For each year, we plot the median, the interquartile range (the 50% interval around the median) and the 90% interval around the median.

Calibration of epidemiological shocks

- Progressive post-policy income drops for 2020, obtained from the HM Treasury distributional model (but slightly regressive in terms of total available resources).
- An increase in health risk (probability of receiving a severe health shock), reflecting excess mortality and reduction in patient treatment (**Marmot et al. (2020)**, **Roser et al. (2020)**, **Gardner and Fraser (2021)**).
- A consumption limit, motivated by economic restrictions, to match the observed change in consumption/savings for the top quintile (**Hacioglu-Hoke et al. (2021)**, **Tenreyro (2021)**, **Davenport et al. (2021)**).
- An expected pandemic duration of 2 years; and a 20% probability per year of recurrent outbreaks for a decade, modelled to have half the effects of the pandemic.

Main results

- Wealth and health inequality increase, lasting over a decade, despite the progressivity of income drops during the pandemic.
- Wealth inequality increases from both ends of the distribution: wealth increases for higher income/wealth households (“forced” savings); and decreases for households with low wealth.
- Health inequality increases from both ends of the distribution: higher income groups increase efforts to improve health to mitigate risk; lower income groups lack the required resources given drops in income.

Figure 1: Mean wealth per group

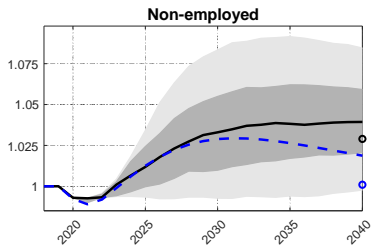
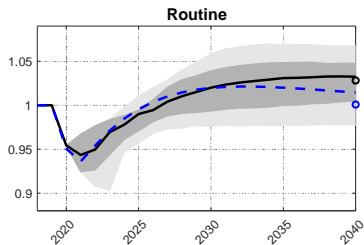
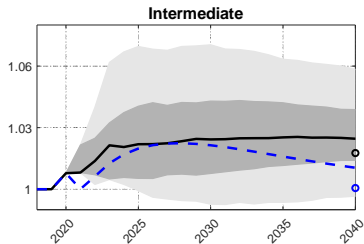
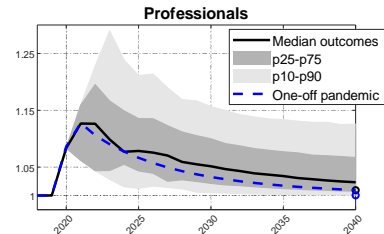


Figure 1: Key points

- In Figure 1 we see the evolution of mean wealth, after 2020, for four socioeconomic groups. The group classification is based on the job type of the head of the household: pre-COVID-19, professionals have the higher mean health/wealth/income, followed by intermediate, and then by routine. The final group refers to non-employed.
- Starting with professionals, and normalising mean wealth to 1 pre pre-COVID-19, there is an increase in mean wealth. This is driven by the restriction in consumption, and persists.
- On the other hand, for the routine job group, there is a decline in mean wealth, of 5-7%. This is driven by the drop in income for this group, and as can be seen it takes several years for wealth to return to pre-COVID-19 levels.

Figure 2: Within-group wealth inequality

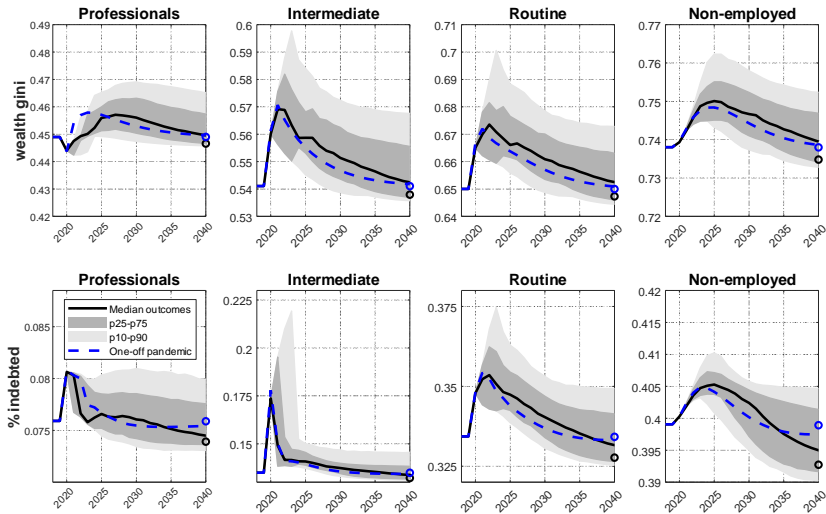


Figure 2: Key points

- There is variation regarding the effects of COVID-19 within the groups. In Figure 2 we show, in the first row, the change in within group inequality, as measured by the gini index. There is a significant increase in gini for the intermediate and routine groups, and a small decrease for professionals.
- For professionals, the reduction in gini is the effect of the consumption restriction, which imposes some homogeneity in behaviour.
- For the intermediate and routine groups, the increases in gini indicate that many households in these groups the changes in mean wealth in Figure 1 are not a very good approximation. There are households for which the effect is significantly more severe than the change in the mean.

Figure 2: Key points

- This is illustrated in the second row of Figure 2, which shows the proportion of households, within each group, that do not hold positive wealth. This proportion high pre-COVID-19, especially for routine households, and increases significantly for these groups.
- Therefore, looking at the left tail of the wealth distribution, there is an increase in the number of households without wealth, which is concentrated in the groups of households with lower income.

Figure 3: Mean health per group

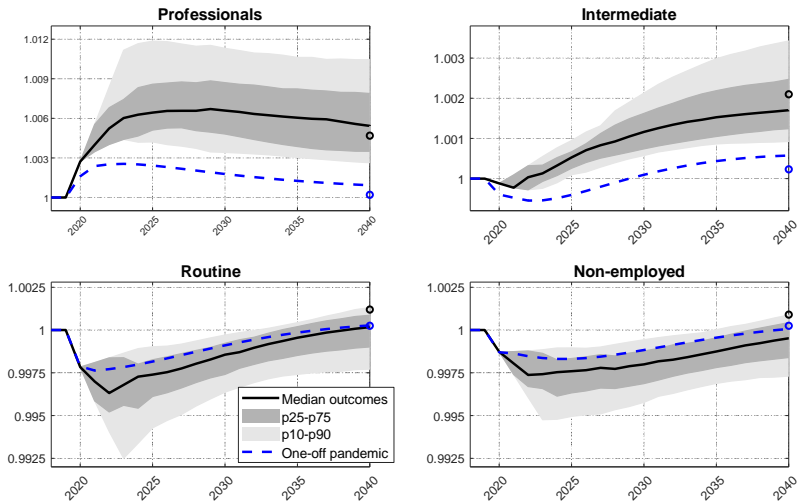


Figure 3: Key points

- In Figure 2, we plot mean health for the same socioeconomic groups, normalising pre-COVID-19 to 1 for each group. Mean health per group pre-COVID-19 was calibrated to match self-reported health in the data (Understanding Society).
- Professionals increase health on average. In response to higher health risk (precautionary behaviour), and given the increase in available resources due to the consumption restriction, they engage in activity/expenses to improve health. The precautionary incentives are seen for the intermediate group as well.
- Routine households also have strong precautionary incentives. However, they decrease expenditure to improve health, because of the fall in their income. As a result, they are exposed to the increase in health risk.

Implications

- Preparedness for recurrent outbreaks: contingent public health interventions and policy intervention to mitigate income losses resulting from any new outbreaks.
- Social insurance policy needs to be complemented with policy to foster resilience of firms and employees, and to reduce health inequality.

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