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Demography and the Coronavirus Pandemic

One of the most urgent policy issues related to the COVID-19 pandemic in Europe concerns the extent and ways in which demographics have determined different patterns of mortality between groups and regions, and whether and how the pandemic and its economic consequences will affect population dynamics in the future.

Post-pandemic policy evaluations on the spread of COVID-19 and the impact of lockdown measures should include a thorough analysis that goes beyond health indicators. They should also assess the role played by key demographic indicators like age and family structures, co-residence patterns, individual characteristics such as socio-economic status, ethnicity and mobility.

During the current COVID-19 crisis, there is a high degree of uncertainty in decision-making processes. In addition to the ad-hoc consultancy required during any type of crisis, a more permanent monitoring system based on collected evidence of population health issues and beyond is needed. It should function in close collaboration with experts from research, policy, the economy and societal organisations to overcome silo-thinking.

The COVID-19 pandemic highlights the crucial importance of effectively tackling social and health inequalities in Europe.

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Introduction

In light of the recent COVID-19 crisis, one of the most urgent policy issues is to gain a better understanding of the extent and ways in which demographics have determined different patterns of mortality in European countries due to the virus, and whether and how the pandemic and its economic consequences will affect population dynamics in the future.

European demographers have been intensively working on these questions since the pandemic began. This policy brief offers an overview of the most important crisis outcomes identified by the demographic community in Europe to date, and points towards the pivotal trends that need to be tackled in the coming months.

Demographic structure as a determinant of COVID-19 spread dynamics

The role of age structure

As the pandemic has evolved around the globe, it has been argued that countries with high proportions of older people are more likely to be hit the hardest by the novel coronavirus (Dowd et al., 2020). By considering countries' age structure, it is possible to predict, at least in the initial phase of the epidemic curve, the burden of critical cases to be expected and to help plan the expected need for hospital beds and medical staff (Verhagen et al., 2020).

Using population pyramids, Dowd et al. (2020) illustrate how the population age structure interacts with the high COVID-19 mortality rates at older ages. Holding infection prevalence constant at 10% and using age-sex specific fatality rates alone, they showed that large COVID-19 mortality rates would differ across populations simply due to age structure. The top pyramids in Figure 1 compare Italy, which has a considerably older population with 23% over the age of 65, with the relatively younger population in South Korea. The bottom panel shows two populations of similar size. Accounting for age alone, the authors estimated that the considerably older population in Brazil is likely to suffer more deaths than a relatively younger population such as Nigeria.

However, population diversity matters: For instance, older people are not a homogenous group. Younger people in metropolitan areas have also been affected by the virus. Early evidence similarly shows that deaths from COVID-19 are disproportionally higher among certain ethnic groups, for men and those with particular comorbidities. Population age structure is also clearly related to other vulnerabilities (e.g. education, socio-economic status, living and housing arrangements, pre-existing conditions and comorbidities).

Furthermore, spatial disparities also create a risk. Kashnitsky and Aburto (2020) looked at differences in local population age structures across European

Figure 1. Population composition (left) and expected deaths in population (right), Italy and the Republic of Korea (top), and Nigeria and Brazil (bottom). Projections assume 10% population infection rate and current age-sex-specific case fatality rates from Italy. Source: Dowd et al., 2020.

regions, focusing on the crude estimate of the proportion of the population expected to die due to COVID-19 in the hypothetical case of no effective suppression of the outbreak (Figure 2). It is important to note that the calculation is not an epidemiologic forecast, but provides a demographic perspective on the role – all other factors held equal – that population age structures alone could have played in the unfolding pandemic. Their results show that within Europe, disparity in population age structures could cause four-fold differences in the exposure to the risk of dying from COVID–19. The map below demonstrates the vulnerability of remote areas with relatively old populations and fewer healthcare facilities.

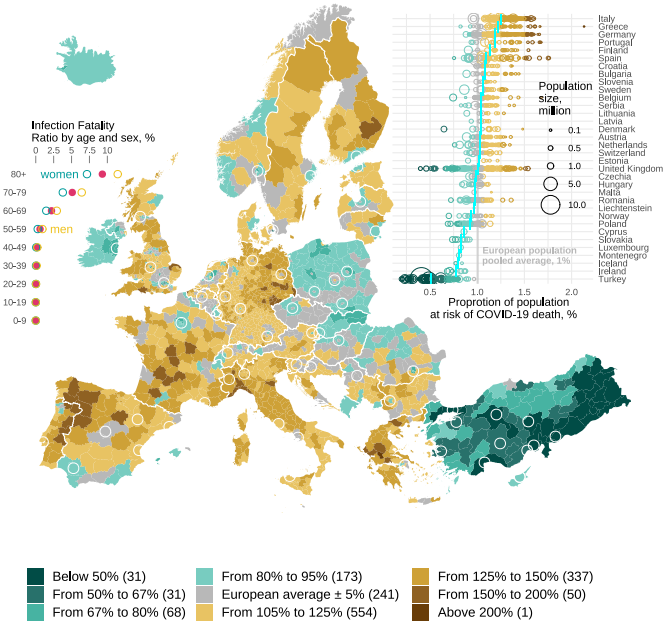

Figure 2: COVID-19 in unequally ageing European regions. NUTS-3 regions of Europe are coloured according to the deviation from European pooled estimate of the proportion of population at risk of death due to COVID-19 – 1%. These estimates assume age-specific infection-fatality ratios from Imperial College report adjusted by sex and age-specific case-fatality ratios observed in Italy – see the insert barplot on the left. The weighted average of population at risk for all the NUTS-3 regions by countries are presented in the top-right inset dotplot. Please note, this map reflects the unequal population age structures rather than the precise figures on COVID-19 fatality. Source: Eurostat, Istituto Superiore di Sanità | Design: Ilya Kashnitsky.

Intergenerational relations and care systems

In addition to age structure, it is key to consider the way in which different age groups interact in societies to understand the spread of the virus. Of pivotal importance are co-residence patterns and the age structure of households (Esteve et al., 2020). While regional traditions and habits play a role in shaping these differences, structural factors are also relevant. For instance, in societies like the U.S., it has been shown that co-residence and intergenerational contacts constitute strategies of poverty alleviation (Balbo et al., 2020). This means that people cannot easily forego their social networks for economic reasons even if this exposes them to a higher risk of contagion.

Demographers have provided evidence showing that cities where people have stronger social ties seem to have a higher number of COVID-19 cases (Mogi and Spijker, 2020; Balbo et al., 2020). Combining infection curve models from epidemiology with social network models, demographers have produced simulations to show how different types of social network interactions between similar people living in close-knit communities could aid in gradually easing lockdown measures (Block et al., 2020). We also know that among certain immigrant groups, strong intergenerational relations and co-residence prevail (de Valk and Bordone, 2018). As such, these groups may be more affected than others, even in countries where care in general is more institutionalised. Housing situation, space and place are relevant and may make a difference.

The difference between the role played by care provided in nursing care homes versus care that is provided at home by the family remains unclear. While the risk of infection in institutional care is apparently high, care within households is strongly dependent on the availability of care infrastructure, and most importantly, the proximity of family members, social networks and support from the neighbourhood. Further investigation of the role of private care arrangements under different forms of family and cohabitation models and at various stages of the life course (e.g. for widowed people) might help identify potential health risks and care needs in future pandemics.

What will be the impact of COVID-19 on demographic trends?

Impact of deaths on mortality and life expectancy trends

One crucial demographic aim is to quantify the impact of COVID-19 deaths on mortality and life expectancy trends within the European Union. This is hardly possible now due to data quality, lack of data and timing issues. Exact death registrations are lagging behind by weeks, even in the best national vital records systems. Despite elabor-

ate World Health Organization (WHO) recommendations, routines for COVID–19 testing and cause of death identification are vastly different across countries in Europe. The most prominent line of research adopted by several teams of demographers is to analyse the excess deaths – thus, substituting the direct and indirect mortality effects of the pandemic.

Current analyses of COVID–19 death tolls are still indicative in understanding how the pandemic develops; however, harmonised datasets are required. This effort is currently being led by the French Institute for Demographic Studies (INED). Their team is centralising and harmonising data online (https://dc-covid.site.ined.fr/en), along with analyses on reliable recorded deaths due to COVID-19 specified by sex, age group and place of death, with precise documentation of the limits and strengths of the data. At the Max Planck Institute for Demographic Research (MPIDR), another team is collecting confirmed COVID-19 case counts and deaths by age group and sex for as many countries and subpopulations as possible. They harmonise measures and age groups to make the data comparable among countries and regions. The MPIDR team's initial results were published by the *New York Times* on April 27 (Wu et al., 2020). Overall, they find that far more people are dying in 2020 than in previous years, undermining the idea that many people who have died from the virus may have died anyway. In Paris, for example, more than twice the usual number of people have died each day since the beginning of the pandemic, by far more than in the peak of a bad flu season.

Co-residence and intergenerational contacts

Co-residence and intergenerational ties are often seen as a social support and an asset; however, they become a potential threat in the case of the current pandemic. Given the fact that many younger individuals are asymptomatic, strong intergenerational contact in some societies may have resulted in a faster spread of the virus. Some demographers suggest that the rapid spread of COVID-19 in Italy was attributed to higher intergenerational contacts, particularly regarding younger commuters from Milan travelling back to their villages (Dowd et al., 2020; Rotondi et al., 2020). Others argue that the closing of schools and advice to avoid contact between the young and old has exposed the importance of reliance on grandparents for childcare in many countries (Dowd et al., 2020).

The studies published so far question, but cannot yet answer, whether long-standing patterns of co-residence and intergenerational contacts will change due to the COVID-19 pandemic (Balbo et al., 2020). In the 2008 economic crisis, demographers observed that young people in Europe postponed living independently due to job insecurity and the housing situation (Berrington et al., 2017). This means that children tend to live longer with their parents. The expected economic crisis after the pandemic will certainly exacerbate this trend if appropriate policies are not put in place.

Second, evidence suggests that as individuals become more educated across generations, physical distance between parents and their adult children tend to increase, mostly due to job mobility (Nazio, 2019). At the same time, more educational and economic resources imply that children can better support parents in different ways (i.e. allowing access to innovative medical practices or strategically choosing the best routes for care). In this regard, what has been common practice for many transnational migrant families may also become the reality for other families living in the same country.

Fertility rates

The impact of the COVID-19 pandemic on fertility can be divided into two patterns regarding already-falling birth rates in most European countries. During the time of the pandemic, on the one hand, we observe lower access to in-vitro fertilisation procedures, but, on the other hand, fewer options for abortion in several countries. With regard to the more long-term consequences of the coronavirus crisis, most demographers expect that fertility rates will drop, as previous research shows that people are less likely to have children in periods of uncertainty. The role played by individuals' perceptions during uncertainty is already one of the key issues on the academic agenda of fertility experts in Europe. In an interview in the *New York Times*, demographer Jennifer Johnson-Hanks argues, "Many people in childbearing ages were already worried about their futures, and now they may face unemployment as well. That kind of anxiety is not conducive to having a child" (Yuhas, 2020). New data collections – for example, the Generations & Gender Programme (https://www.ggp-i.org/) – can shed more light on this hypothesis in the near future.

Migration trends

As a result of the closing of borders, international (across-border) migration flows have largely come to an end. This includes both circular and more permanent migration movement, with major consequences for, among others, the labour market and migrant family relations. It has also resulted in many countries no longer taking in asylum

seekers or handling their cases. How migration trends will be affected by the COVID-19 pandemic in the long run is still unknown. The economic crisis that is already taking place and that is expected to continue after the lockdown may lead to a decrease in migration flows to Europe. As social phenomena are never black and white, however, there are reasons to expect contradictory trends. Previous studies have shown that relative economic improvement matters in migration decision making. In addition, due to the fact that outbreaks often occur first in large urban areas, there are new pressures as a result of the considerable urban to rural migration within some countries.

Similar to the past decade, mobility within the EU will remain important due to the differences in how the EU countries are and will potentially be hit by the economic recession, as well as opportunities to study and work abroad. Regarding flows from third countries, there are a number of initiatives inside the demographic community aiming at quantifying different migration scenarios for Europe (see https://quantmig.eu). Needless to say, the current crisis can make the difference in whether joint European action is taken in regard to migration policies and providing shelter to those fleeing wars and conflict around the globe.

Policy recommendations

– The COVID-19 pandemic highlights the crucial importance of effectively tackling social and health inequalities in Europe.

– Post-pandemic policy evaluations on the spread of COVID-19 and the impact of lockdown measures should include a thorough analysis that goes beyond health indicators. They should also assess the role played by age and family structures, co-residence patterns, individual characteristics such as socio-economic status, ethnicity and mobility.

– Public debate during the crisis has revealed a high degree of uncertainty in decision-making processes. In addition to the ad-hoc consultancy required during any type of crisis, a more permanent monitoring system based on collected evidence of population health issues and beyond is needed. It should function in close collaboration with experts from research, policy, the economy and societal organisations to overcome silo-thinking.

– Investments in data infrastructures are essential to understand the pandemic and its development, as well as its short- and long-term consequences for European populations. This crisis has also revealed clear problems in mortality reporting and lack of harmonisation across countries.

– Data that are nationally representative, reliable and comparable across Europe is needed. This recommendation concerns health and mortality data but also other domains that are affected by the pandemic, such as family relations, (in-)formal care systems and migration. Clearly, health surveillance systems should be improved, and the development of systematic electronic reporting to follow real-time trends should be pursued, but investments should not be limited to this.

– Data disaggregation by age and sex should be systematically provided in mortality statistics. It is also imperative to ensure harmonisation of data and measures across countries at the EU level to allow for comparison and the identification of best policy practices. ■

References

— Balbo, N., Billari, F. & Melegaro, A. (2020, April 6). The strength of family ties and COVID-19. *Contexts*, American Sociological Association.

— Berrington, A., Billari, F., Thévenon, O. & Vono de Vilhena, D. (2017). Becoming an adult in Europe: It's time to provide more cross-sectorial support to young people. *Population & Policy Compact* 13, Berlin: Max Planck Society/Population Europe.

— Block, P., Hoffman, M., Raabe, I. J., Dowd, J. B. & Mills, M. C. (2020). Social network-based distancing strategies to flatten the COVID-19 curve in a post-lockdown world. arXiv: 2004.07052

— de Valk, H. A. G. & Bordone, V. (2018). Co-residence of adult children with their parents: differences by migration background explored and explained. *Journal of Ethnic and Migration Studies 45* (10): 1790-1812.

— Dowd, J. B., Andriano, L., Brazel, D.M., Rotondi, V., Block, P., Ding, X., Liu, Y. & Mills, M.C. (2020). Demographic science aids in understanding the spread and fatality rates of COVID-19. *Proceedings of the National Academy of Sciences* Apr 2020, 202004911; DOI: 10.1073/pnas.2004911117

— Esteve, A., Permanyer, I. & Boertien, D. (2020). La vulnerabilidad de las provincias españolas a la COVID-19 según su estructura por edad y de coresidencia: implicaciones para el (des) confinamiento. *Perspectives Demogràfiques*, 19: 1-4.

— Kashnitsky, I. & Aburto, J. M. (2020). The pandemic threatens aged rural regions most. OSF Preprints, March 18. doi:10.31219/osf.io/abx7s.

— Mogi, R. & Spijker, J. (2020). The influence of social and economic ties to the spread of COVID-19 in Europe. SocArXiv, April 14. doi:10.31235/osf.io/sb8xn.

— Nazio, T. (2019). Who cares? Securing support in old age. *Population & Policy Compact* 21, Berlin: Max Planck Society/Population Europe.
— Rotondi, V., Andriano, L., Downd, J. B. & Mills, M. C. (2020). Early evidence that social distancing and public health interventions flatten the COVID-19 curve in Italy. OSF Preprints, April 26. doi:10.31219/osf.io/wah4e.
— Verhagen, M. D., Brazel, D. M., Dowd, J. B., Kashnitsky, I. & Mills, M. C. (2020). Predicting peak hospital demand: demographics, spatial variation, and the risk of 'hospital deserts' during COVID-19 in England and Wales. OSF Preprints, March 21. doi:10.31219/osf.io/g8s96.
— Yuhas, A. (2020, April 8). Don't Expect a Quarantine Baby Boom. *New York Times*.
— Wu, J., McCann, A., Katz, J. & Peltier, E. (2020, April 27). 40,000 Missing Deaths: Tracking the True Toll of the Coronavirus Outbreak. *New York Times*.

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