

Problems of Data Availability and Quality for COVID-19 and Older People in Low- and Middle-Income Countries

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Abstract

For all health conditions, reliable age-disaggregated data are vital for both epidemiological analysis and monitoring the relative prioritization of different age groups in policy responses. This is especially essential in the case of Coronavirus Disease-2019 (COVID-19), given the strong association between age and case fatality. This paper assesses the availability and quality of age-based data on reported COVID-19 cases and deaths for low and middle-income countries. It finds that the availability of reliable data which permit specific analyses of older people is largely absent. The paper explores the potential of excess mortality estimates as an alternative metric of the pandemic's effects on older populations. Notwithstanding some technical challenges, this may offer a better approach, especially in countries where cause of death data is unreliable.

Keywords: COVID-19, Low- and middle-income countries, Data, Ageism

Introduction

In all countries the risk of dying from COVID-19 increases markedly with advancing age (Tang et al., 2020). As a result, people at older ages make up the majority of reported COVID-19 deaths, even in countries where population aging is relatively limited (Dowd et al., 2020). It might be expected, then, that policymakers and researchers would pay particular attention to the effects of the pandemic on this age group. Yet this is clearly not the case. Global public health responses have done little to move beyond the existing situation, characterised by exclusion of and discrimination against older people (Lloyd-Sherlock et al., 2020a). This can be seen in many areas of policy and debate, some of which are discussed in other contributions to the Global Platform. This forum paper focusses specifically on data issues.

Excluding older people from routine data reporting and indicators is a time-honored (or arguably “dishonored”) tradition, reflecting normalised ageism. For much of the HIV pandemic, data on infections were not collected for people aged 50 or more, based on the misguided view that older people were not at risk of infection (Albone, 2011). Similarly, reporting on violence against women often systematically excludes women aged 50 and over (VAWG, 2016). More recently, older people have been excluded from mortality reporting and targets for non-communicable diseases (NCDs), such as heart disease and diabetes, even though they are disproportionately at risk of dying from these conditions. The main justification put forward for this was an ageist argument that policymakers should focus on so-called “premature” deaths among younger adults (Lloyd-Sherlock et al., 2016). More generally, most surveys of health and population, even in high-income countries, exclude older people in residential care facilities, but still claim that they are nationally representative (Schanze, 2017).

This paper provides an overview of current data reporting on COVID-19 and older people in low and middle-income countries (LMICs). It considers the extent to which data are available and in the public domain, and assesses their potential reliability. The paper then explores the value of age-disaggregated excess mortality estimates, as a more accurate measure of the pandemic's effects on older people, notwithstanding the challenges inherent in generating robust estimates.

The current state of data on older people and COVID-19 in low and middle-income countries

Tragically, numbers of COVID-19 cases and deaths are increasing rapidly in many LMICs. To what extent are the data that are reported capturing the experiences of people at older ages? The short answer is that the provision of specific data about people at older ages has been very limited, and much of what has been published is of questionable quality. Several LMICs provide no age-disaggregated data at all, either for reported cases or for deaths from COVID-19. Examples at the time of writing this include Indonesia, Turkey, Egypt and Kenya. A number of other countries, including Peru and Brazil, only provide age-breakdowns for deaths, but not for cases.

TABLE 1 ABOUT HERE

Table 1 summarizes data for LMICs for which we have been able to obtain data. Not all of these data are derived from official sources. In India, for example, where the National Ministry of Health does not provide age breakdowns, a crowdsourced project has compiled these data from local government bulletins and other official sources. Table 1 shows that older people made up more than half reported COVID-19 deaths in all these countries. Yet

the range is quite wide (from 50% in India to 62% in the Philippines) and does not correlate with the age structures of these populations (for example older people account for a lower share of the Philippines' population than in India).

The last column in Table 1 provides a ratio of reported cases to reported deaths for people aged 60 and over. In Mexico for each COVID-19 death there were 3.62 cases, whereas in South Africa there were 14.61. Taken at face value, this suggests that an older person in Mexico who becomes infected with COVID-19 is more than three times as likely to die than their counterpart in South Africa. If this were really true, the potential implications for global health would be huge and we should be looking closely at the "South African Miracle". It is, however, far more likely that these variations are mainly the result of problematic data reporting. Perhaps Mexico is under-counting cases among older people; perhaps South Africa is under-counting deaths; perhaps both countries are under-counting everything.

All data are likely to be imperfect and there is sometimes a case for making the best of what is available. Just because scientists struggle to explain strange patterns in the data does not necessarily mean the numbers are wrong. Research papers are, however, just starting to demonstrate the huge scale of data inaccuracies related to COVID-19 cases and deaths in LMICs. For example, a new study in Brazil's leading public health journal examined data on burials in the city of Manaus over a 10 day period and found that the number was four times higher compared to the corresponding period in previous years (Yamall et al., 2020). Of these, 1,230 deaths, just 14 were reported as caused by COVID-19. The issue of data quality is relevant for people of all ages, and is especially pertinent in LMICs where the vast majority of deaths occur outside of hospital settings and where the cause is rarely certified by a trained physician (Mikkelsen et al., 2015). More generally, it is widely recognized that data on the number of cases reflect the availability of testing much more than the actual status of the pandemic. Consequently, the data being published for different LMICs as summarized in

Table 1 come with a very large health warning and do not provide a basis for meaningful analysis.

And this issue of data quality is particularly important for older people, both because they are the group most affected by the pandemic and because cause of death is more prone to misreporting for people at older ages (Miki et al., 2018). In all countries, older people are more likely to have other health conditions, such as heart disease, and, even where COVID-19 symptoms are present, identifying the main cause of death is often challenging (Elezkurtaj et al., 2020). The experience of high-income countries shows that COVID-19 mortality has been widely under-reported in care home settings (Comas-Herrera et al., 2020). This is likely to occur in LMICs, which contain large numbers of such facilities, many of which are unregistered and not subject to oversight by public health agencies (Lloyd-Sherlock et al., 2020a). Other than anecdotal media reports, there is no publicly available information about the impact of COVID-19 in these high-risk environments.

Calculating excess mortality of older people during the pandemic

Ultimately, the best way to measure the impact of the pandemic on older people, and people of all ages, will be through careful comparison of overall mortality rates during the pandemic and for corresponding months in preceding years (Leon et al., 2020). This will permit an estimation of excess deaths which are potentially attributed to the pandemic: both directly as a result of COVID-19 or due to more indirect effects of the pandemic, such as impaired mental health and reduced access to treatment for other health conditions. Robust estimates of excess mortality will provide a more complete picture of the pandemic's overall impact on death rates. Another advantage of this approach is that it does not depend on accurate reporting of specific causes of death. In the UK between 7 March and 5 June, there were 51,804 recorded deaths directly attributed to COVID-19, plus a further 12,729 excess deaths for other causes (<https://www.bbc.co.uk/news/world-53073046>). For those LMICs where

estimates of excess mortality are available, the proportion of excess deaths attributed to COVID-19 is much lower than in high-income countries. For example, in Ecuador there were 3,358 reported COVID-19 deaths during March, April and May, but excess mortality is estimated to have been 16,107 (<https://www.bbc.co.uk/news/world-53073046>).

Developing robust estimates of excess mortality is statistically challenging for all countries, including high-income countries with relatively good data on deaths. Key challenges include harmonizing different datasets, obtaining individual data from different health authorities, dealing with gaps in population age composition data at subnational levels and estimating rates of mortality under-reporting (Sempé et al., 2020).

Excess mortality data disaggregated by age group are only publicly available for some high-income countries. Data for England and Wales show excess deaths for causes not attributed to COVID-19 occurred predominantly among people at older ages (Office for National Statistics, 2020). New studies of excess mortality in Italy and Portugal also find that under-reporting of COVID-19 mortality has been most substantial for older adults (Nogueirai et al., 2020; Magnani et al., 2020). If this pattern were to be replicated across LMICs (and there is no reason to expect that it would not be), it would mean that, even in countries where age data of reported COVID-19 cases and deaths are available, the true impact of the pandemic on older people is being vastly understated. To date, one of the only LMICs for which national data are available is Peru. They show that people aged 60 and over accounted for 78 per cent of excess mortality between March and June, representing 37,000 deaths. This compares to official figures of just 5,915 COVID-19 deaths among people aged 60 and over for the corresponding period (Sempé et al., 2020). The local study in the Brazilian city of Manaus reported an overall excess mortality of around 920 over a 10-day period, of which 69 per cent were people aged 60 (Yamall et al., 2020).

Conclusion

Collation of high-quality mortality data will benefit both health care providers and policy makers. These data will be essential, both to inform general understanding of the pandemic's epidemiology and to ensure that older people are being fairly treated (Wolkewitz & Puljak, 2020). It is to be hoped that both the availability and quality of age-disaggregated data on COVID-19 and excess deaths in LMICs will quickly improve. However, past experience of excluding older people from reporting on other aspects of health suggests that age inclusion should not be taken for granted. Also, there is growing evidence that data reporting on COVID-19, is becoming increasingly susceptible to political interference (Oleinik, 2020). Despite the disproportionate impact of the global pandemic on older people in LMICs, their profile in the media and global health agencies has been, at best, marginal (Lloyd-Sherlock et al., 2020c). Commentators in high-income countries are starting to demonstrate how the pandemic is shaped by and also feeds back into wider ageist attitudes and behaviours (Monahan et al., 2020). Reliable age-disaggregated data are needed to challenge this ageist neglect and to demonstrate its harmful consequences.

References

- Albone, R. (2011, June 6). HIV statistics and targets exclude older people—putting millions of people at risk. Help Age International. <http://www.helpage.org/blogs/rachel-albone-667/hiv-statistics-and-targetsexclude-older-people-putting-millions-of-people-at-risk-285/>
- Comas-Herrera, A., Zalakain, J., Litwin, C., Hsu, A., Lane, N. & Fernandez-Plotka, J-L. (2020, April 12). Mortality associated with COVID-19 outbreaks in care homes: early international evidence. LTC COVID. <https://ltccovid.org/2020/04/12/mortality-associated-with-covid-19-outbreaks-in-care-homes-early-international-evidence/>
- 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*, *117*(18), 9696-9698. <https://doi.org/10.1073/pnas.2004911117>
- Joe W., Kumar A., Rajpal S., Mishra U. & Subramanian SV. (2020). Equal risk, unequal burden? Gender differentials in COVID-19 mortality in India. *Journal of Global Health Sciences*, *2*(1), e17. <https://doi.org/10.35500/jghs.2020.2.e17>
- Elezkurtaj, S., Greuel, S., Ihlow, J., Michaelis, E., Bischoff, P., Kunze, C. A., & Sinn, B. V., Gerhold, M., Hauptmann, K., Ingold-Heppner, B., Miller, F., Herbst, H., Corman, V. M., Martin, H., Heppner, F.L., & Horst, D. (2020). Causes of death and comorbidities in patients with COVID-19. *MedRxiv*. <https://doi.org/10.1101/2020.06.15.20131540>
- Leon, D. A., Shkolnikov, V. M., Smeeth, L., Magnus, P., Pechholdová, M., & Jarvis, C. I. (2020). COVID-19: A need for real-time monitoring of weekly excess deaths. *The Lancet*, *395*(10234), e81. [https://doi.org/10.1016/S0140-6736\(20\)30933-8](https://doi.org/10.1016/S0140-6736(20)30933-8)
- Lloyd-Sherlock P.G., Ebrahim, S., McKee, M. & Prince, M. (2016). Institutional ageism in global health policy. *BMJ*, *354*, i4514. <https://doi.org/10.1136/bmj.i4514>

- Lloyd-Sherlock, P. G., Kalache, A., McKee, M., Derbyshire, J., Geffen, L., Casas, F. G. O., & Gutierrez, L. M. (2020a). WHO must prioritise the needs of older people in its response to the covid-19 pandemic. *BMJ*, 368, m1164.
<https://doi.org/10.1136/bmj.m1164>
- Lloyd-Sherlock, P. G., Bastos, J., Geffen, L., Giacomini, K., Redondo, N., Sasat, S. & Sempe, L. (2020b, June 9). An emergency strategy for managing COVID-19 in care homes in low and middle-income countries: the CIAT Framework (Version 1).
<https://www.corona-older.com/post/an-emergency-strategy-for-managing-covid-19-in-care-homes-in-lmics-the-ciat-framework-version-1>
- Lloyd-Sherlock, P.G., Ebrahim, S., Geffen, L. & McKee, M. (2020c). Bearing the brunt of covid-19: older people in low and middle income countries. *BMJ*, 368, m1052.
<https://doi.org/10.1136/bmj.m1052>
- Magnani, C., Azzolina, D., Ferrante, D., Gallo, E. & Gregori, D. (2020). How large was the mortality increase directly and indirectly caused by the COVID-19 epidemic? An analysis on all-causes mortality data in Italy. *International Journal of Environmental Research and Public Health*, 17(10), 3452. <https://doi.org/10.3390/ijerph17103452>
- Miki, J., Rampatige, R., Richards, N., Adair, T., Cortez-Escalante, J., & Vargas-Herrera, J. (2018). Saving lives through certifying deaths: assessing the impact of two interventions to improve cause of death data in Peru. *BMC Public Health*, 18(1), 1329. <https://doi.org/10.1186/s12889-018-6264-1>
- Mikkelsen, L., Phillips, D. E., AbouZahr, C., Setel, P. W., De Savigny, D., Lozano, R., & Lopez, A. D. (2015). A global assessment of civil registration and vital statistics systems: Monitoring data quality and progress. *The Lancet*, 386(10001), 1395-1406.
[https://doi.org/10.1016/S0140-6736\(15\)60171-4](https://doi.org/10.1016/S0140-6736(15)60171-4)

- Monahan, C., Macdonald, J., Lytle, A., Apriceno, M. & Levy, S.R. (2020). COVID-19 and ageism: How positive and negative responses impact older adults and society. *American Psychologist*. Advance online publication. <https://doi.org/10.1037/amp0000699>
- Nogueirai, P.J., Furtado, C., Vaz Carneiro, A., De Araújo Nobre, M. & Nicola, P.J. (2020). Excess mortality estimation during the COVID-19 pandemic: Preliminary data from Portugal. *Acta Medica Portuguesa*, 33(6), 376-383. <https://doi.org/10.20344/amp.13928>
- Office for National Statistics (2020, June 5) Analysis of death registrations not involving coronavirus (COVID-19), England and Wales: 28 December 2019 to 1 May 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/analysisofdeathregistrationsnotinvolvingcoronaviruscovid19englandandwales28december2019to1may2020/technicalannex>
- Oleinik, A. (2020, June 4). The politics behind how governments control coronavirus data. *The Conversation*. <https://theconversation.com/the-politics-behind-how-governments-control-coronavirus-data-139263>
- Schanze, J. L. (2017, February). Report on sampling practices for the institutionalized population in social surveys. Deliverable 2.16 of the SERISS project funded under the European Union's Horizon 2020 research and innovation programme GA No, 654221. https://seriss.eu/wp-content/uploads/2017/02/SERISS_WP2_D2.16_Sampling-the-institutionalized-population.pdf
- Sempé, L. & Lloyd-Sherlock, P. (2020). Estimating excess of deaths during COVID-19 pandemics - A step-by-step tutorial and guidance. <https://github.com/lsempe77/Excess-Mortality>.

- Tang, D., Comish, P., & Kang, R. (2020). The hallmarks of COVID-19 disease. *Plos Pathogens*, **16**(5), e1008536. <https://doi.org/10.1371/journal.ppat.1008536>
- Violence Against Women and Girls (VAWG). (2016, May). Resource Guide. Brief on Violence Against Older Women. https://www.un.org/esa/socdev/documents/ageing/vawg_brief_on_older_women.pdf
- Wolkewitz, M. & Puljak, L. (2020). Methodological challenges of analysing COVID-19 data during the pandemic. *BMC Medical Research Methodology*, **20**(81). <https://doi.org/10.1186/s12874-020-00972-6>
- Yamall, O., Jesem, D., da Cunha, G., Marrero, L., Horta, B. & da Costa Leite, I. (2020). Explosion in mortality in the Amazonian epicenter of the COVID-19 epidemic. *Cadernos de Saude Publica*, **36**(7), 1-8. <https://doi.org/10.1590/0102-311x00120020>

Table 1. Age Disaggregated Data for Reported Cases and Mortality Attributed to COVID-19, Selected Countries.

Country	Date	Total reported cases	Total reported deaths	% of total population aged 60+	Last available disaggregated data	% cases for people 60+	% deaths for people 60+	Ratio of cases to deaths for people 60+
Pakistan	26 Aug 2020	294,638	6,274	6.7	2 June 2020	12.7	54.2	11.2
Mexico	26 Aug 2020	573,888	62,076	11.2	16 Aug 2020	19.7	58.5	3.1
South Africa	26 Aug 2020	615,701	13,502	8.5	27 June 2020	11.2	55.4	11.6
Philippines	26 Aug 2020	205,581	3,234	8.6	31 July 2020	12.3	61.8	10.5
India	26 Aug 2020	3,381,052	61,664	10.1	21 Aug 2020	8.8	49.7	10.1

Note. Sources (all accessed 27 August 2020):

Pakistan: <http://covid.gov.pk/stats/pakistan>;

Mexico: <https://coronavirus.gob.mx/datos/>;

South Africa: <https://www.nicd.ac.za/diseases-a-z-index/covid-19/surveillance-reports/>;

Philippines: <https://ncovtracker.doh.gov.ph/>;

India: <https://api.covid19india.org/>.

All above sources compiled by Riffe, T., & Acosta, E. (2020). COVerAGE-DB: A database of COVID-19 cases and deaths by age. <https://doi.org/10.17605/OSF.IO/MPWJQ>

UN Population Division, World Population Prospects 2019 <https://population.un.org/wpp/>.