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Perspectives

Considering potential benefits, as well as harms, from the COVID-19 disruption to cancer screening and other healthcare services

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Key points

- An excess of deaths globally in 2020 was attributed to COVID-19 and other causes. The mortality burden disproportionately affected the least well off and most marginalised
- Pandemic responses to prevent the spread of COVID-19 may have also prevented deaths from non-COVID causes, including those resulting from unnecessary healthcare diagnoses, tests and treatments

Abstract

Since 2020, hundreds of thousands of more deaths than expected have been observed across the globe. Amid the coronavirus 2019 (COVID-19) pandemic, current research priorities are to control the spread of infection and minimise loss of life. However, there may be future opportunities to learn from the pandemic to build a better healthcare system that delivers maximum health benefits with minimum harm. So far, much research has focused on foregone benefits of healthcare services such as cancer screening during the pandemic. A more balanced approach is to recognise that all healthcare services have potential harms as well as benefits. In this way, we may be able to use pandemic 'natural experiments' to identify cases where a reduction in a healthcare service has not been harmful to the population and some instances where this may have even been beneficial.

Impact of the COVID-19 pandemic

The year 2020 saw over 500 000 more deaths than expected in the US alone[1] and increases in fatalities across the globe.[2] These global excess deaths can be grouped into three categories: known coronavirus disease 2019 (COVID-19) deaths, missed COVID-19 fatalities and deaths from other causes. The most apparent cause of excess deaths are those in people diagnosed with COVID-19. However, there were many more excess deaths in 2020 than those directly attributed to COVID-19.[3] A less obvious cause of excess deaths is missed and unreported cases of COVID-19 due to undertesting and underdiagnosis. Even in Australia, excess deaths attributed to pneumonia in late March and April 2020 suggest some missed COVID-19

Key points (continued)

- Research considering potential benefits as well as harms from the healthcare disruption caused by COVID-19 could help healthcare services deliver maximum health benefits with minimum risk of harm

deaths in the early stages of the pandemic, when access to testing was more limited.[4] The least apparent cause of excess deaths is the non-COVID-19 deaths caused by the indirect effects of the pandemic, including the massive disruption to healthcare systems.

While Australia has fared better than most countries in terms of deaths from COVID-19 and other causes[5,6], we must recognise this toll and take it seriously. Globally, there continues to be great suffering experienced by frontline healthcare workers and everyone watching the pandemic unfold, and their lives change. Of concern, we have also seen the pandemic exacerbate health inequalities due to social determinants of health, with the mortality burden (both directly and indirectly caused by SARS-CoV-2) falling disproportionately on the least well-off and the most culturally and linguistically marginalised, including people of colour.[7] We need to acknowledge those deaths and do better to fight against structural racism and injustice by addressing the root causes of longstanding, pervasive health inequities.

Has the pandemic saved lives?

But within the overall global picture of tragedy, there are some glimmers of hope. Some changes forced on society by the pandemic may have saved lives. The deaths averted during the pandemic have resulted from some obvious and less obvious factors. Most apparent is the fewer deaths from influenza[8], pneumonia, and other non-SARS-CoV-2 respiratory pathogens, which is most likely a result of pandemic control measures.[5,9] Less obvious is the potential deaths saved through air pollution reductions due to lockdowns imposed by many countries, with modelling suggesting >300 000 deaths were prevented in China and Europe alone.[10] And the least obvious and most counterintuitive is the possibility that lives have been saved through reduced use of healthcare that would otherwise have caused harm.[11] These deaths may have been avoided because some people have avoided unnecessary tests, diagnoses and treatments, and the risk of harm from those interventions which outweighed the potential for benefit.

The absolute benefit delivered by healthcare commonly increases with the severity of disease or baseline risk of the individuals tested, diagnosed, and treated (e.g. higher absolute benefits with blood pressure- and cholesterol-lowering treatments for individuals with higher baseline risk compared to those with lower baseline risk[12,13]). On the other hand, the probability of harm may be more or less constant across differing baseline risks.[14] Therefore, some low risk patients diagnosed with earlier or milder disease may be more likely to be harmed than to benefit from diagnosis and treatment.[15] Within the general population, only a small number of people (those with severe disease or high baseline risk) may benefit from the provision of tests, diagnoses and treatment. In contrast, many may be harmed if these are provided indiscriminately. For example, within a screening population (people without symptoms and not known to be at increased risk), only a small proportion of people will have a cancer with a high lethality risk where early detection may be beneficial. In contrast, very large numbers of people are at risk of being diagnosed and treated for preneoplastic lesions or low risk cancers.[16] On the other hand, within a cancer surveillance population (people undergoing monitoring for new or recurrent cancer after treatment of a first primary cancer), a larger proportion of people may have a high risk cancer and benefit from early detection.

Potential benefits of healthcare disruptions

Much research into the health impacts of healthcare disruptions due to the COVID-19 pandemic has understandably focused on the likely negative consequences of missed care and possible solutions to mitigate these. This has primarily been in the form of modelling studies forecasting the potential impacts of reduced healthcare services on future clinical outcomes such as mortality. However, we need to recognise that all healthcare services (including tests and diagnoses and treatments) have potential harms and benefits and include both types of clinical impacts in such modelling studies. For example, although we might expect that suspension of cancer screening such as mammography screening and a reduction in Prostate-Specific Antigen (PSA) testing to screen for prostate cancer could result in decreased benefits from earlier detection and treatment of cancers, there may also be decreased harm.[17] Cancer screening tests may increase mortality risk through a number of pathways.[18,19] This includes consequences of the invasive test(s) needed to confirm

diagnosis after a positive screening test (e.g. sepsis after prostate biopsies)[20,21]; psychological implications of the disease label (e.g. increased rates of myocardial infarction and suicide after prostate cancer diagnosis)[22-24]; consequences of treatment of overdiagnosed cancers (e.g. deaths due to surgical complications and radiation effects after treatment for breast cancer).[25,26] Future modelling studies could be informed by empirical evidence of both benefits and harms of healthcare services (or benefits and harms of healthcare service disruptions) on overall mortality and morbidity and disease-specific outcomes.

In Australia, we estimated that prior to the COVID-19 pandemic, cancer overdiagnosis – the most serious harm from cancer screening – resulted in approximately 4000 Australian women overdiagnosed with breast cancer each year and more than 8500 Australian men overdiagnosed with prostate cancer.[27] The pandemic-related reduction in the number of healthy people undergoing these, and other medical tests, may have meant less overdiagnosis and overtreatment of cancers and other conditions since 2020. The size of any decrease in cancer diagnoses is likely to vary globally across geographical regions according to the disruption in screening services. It will be quantifiable once 2020 and subsequent data are available. Observed decreases will reflect both missed cancers where early detection would have benefited and reduced overdiagnosis where early detection would have harmed, and disentangling the two may be difficult. Surrogate outcomes such as biological markers of disease severity/risk among diagnoses may indicate the extent to which the spectrum of disease shifted in 2020[16] and since, with recent findings of proportionately more significant reductions in healthcare use among those with less severe disease[28] supporting the existence of such a spectrum shift. Observed decreased cancer diagnoses in age groups where screening is not recommended based on available evidence, but was common in pre-pandemic times, may also provide indirect evidence of decreased overdiagnosis (e.g. prostate cancer screening in men <55 years or >69 years; breast cancer screening in women <40 years or >74 years).[29]

Learnings from this 'natural experiment'

In some cases, it may be possible to identify reductions in healthcare, particularly low-value care, that have not been harmful overall or have even been beneficial, at least for short-term health outcomes. Such findings should not be overinterpreted, and long-term impacts need to be considered as well as short-term ones. But by learning as much as possible about the positives as well as the negatives from 'natural experiments' during the pandemic[11], we can aim for a post-pandemic 'new normal' where healthcare services deliver maximum benefit for the health of populations and individuals, and minimum risk of harm.[30,3,]

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Author MS is a citizen advocate, who has been overdiagnosed with prostate cancer. He was a keynote speaker at the 2019 Preventing Overdiagnosis Conference and is a patient/citizen partner on a number of research projects with the Wiser Healthcare Research Collaboration.

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Author contributions

KB conceived and developed the ideas, drafted and edited the paper. All other authors developed the ideas, edited the paper, and approved the final manuscript for submission.

References

1. Woolf SH, Chapman DA, Sabo RT, Zimmerman EB. Excess deaths from COVID-19 and other causes in the US, March 1, 2020, to January 2, 2021. JAMA 2021:325(17):1786–9.
2. Kontis V, Bennett JE, Rashid T, Parks RM, Pearson-Stuttard J, Guillot M, et al. Magnitude, demographics and dynamics of the effect of the first wave of the COVID-19 pandemic on all-cause mortality in 21 industrialized countries. Nat Med 2020: 26(12)1919–28.
3. Fineberg HV. The toll of COVID-19. JAMA. 2020;324(15):1502–3.
4. Australian Bureau of Statistics. Measuring excess mortality in Australia during the COVID-19 pandemic. Canberra: ABS; 2020 [cited 2022 Apr 7]. Available from: www.abs.gov.au/articles/measuring-excess-mortality-australia-during-covid-19-pandemic

5. Gregory G, Zhu L, Hayen A, Bell KJL, Learning from the pandemic: mortality trends and seasonality of deaths in Australia in 2020, Int J Epidemiol. 2022;dyac032.
6. Stanaway F, Irwig LM, Teixeira-Pinto A, Bell KJL. COVID-19: estimated number of deaths if Australia had experienced a similar outbreak to England and Wales. Med J Aust. 2021;214:95-95.e1.
7. Marmot M, Allen J. COVID-19: exposing and amplifying inequalities. J Epidemiol Community Health. 2020;74:681–2.
8. World Health Organization. Influenza update N° 379. Geneva: WHO; Oct 2020 [Cited 2021 April 09]. Available from: www.who.int/publications/m/item/influenza-update-n-379
9. Olsen SJ, Azziz-Baumgartner E, Budd AP, Brammer L, Sullivan S, Pineda RF, et al. Decreased influenza activity during the COVID-19 pandemic - United States, Australia, Chile, and South Africa, 2020. MMWR Morb Mortal Wkly Rep. 2020;69:1305–9.
10. Giani P, Castruccio S, Anav A, Howard D, Hu W, Crippa P. Short-term and long-term health impacts of air pollution reductions from COVID-19 lockdowns in China and Europe: a modelling study. Lancet Planet Health. 2020;4:e474–82.
11. Moynihan R, Johansson M, Maybee A, Lang E, Légaré F. Covid-19: an opportunity to reduce unnecessary healthcare. BMJ. 2020;370:m2752.
12. Cholesterol Treatment Trialists Collaboration. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. Lancet. 2012;380:581–90.
13. Blood Pressure Lowering Treatment Trialists Collaboration. Blood pressure-lowering treatment based on cardiovascular risk: a meta-analysis of individual patient data. Lancet. 2014;384:591–98.
14. Glasziou PP, Irwig LM. An evidence based approach to individualising treatment. BMJ. 1995;311:1356.
15. Doust J, Vandvik PO, Qaseem A, Mustafa RA, Horvath AR, Frances A, et al. Guidance for modifying the definition of diseases: a checklist. JAMA Intern Med. 2017;177:1020–5.
16. Srivastava S, Koay EJ, Borowsky AD, De Marzo AM, Ghosh S, Wagner PD, et al. Cancer overdiagnosis: a biological challenge and clinical dilemma. Nat Rev Cancer. 2019;19:349–58.
17. Jacklyn G, Bell K, Hayen A. Assessing the efficacy of cancer screening. Public Health Res Pract. 2017;27:2731727.
18. Black WC, Haggstrom DA, Gilbert Welch H. All-cause mortality in randomized trials of cancer screening. J Natl Cancer Inst. 2002;94:167–73.
19. Prasad V, Lenzer J, Newman DH. Why cancer screening has never been shown to "save lives" – and what we can do about it. BMJ. 2016;352:h6080.
20. Loeb S, Carter HB, Berndt SI, Ricker W, Schaeffer EM. Complications after prostate biopsy: data from SEER-Medicare. J Urol. 2011;186:1830–4.
21. Gallina A, Suardi N, Montorsi F, Capitanio U, Jeldres C, Saad F, et al. Mortality at 120 days after prostatic biopsy: A population-based study of 22,175 men. Int J Cancer. 2008;123:647–52.
22. Fang F, Keating NL, Mucci LA, Adami H-O, Stampfer MJ, Valdimarsdóttir U, et al. Immediate risk of suicide and cardiovascular death after a prostate cancer diagnosis: cohort study in the United States. J Natl Cancer Inst. 2010;102:307–14.
23. Shirley M. A personal perspective on overdiagnosis of prostate cancer 2019. Sydney: Preventing Overdiagnosis; 2019 [cited 2021 April 09]. Available from: https://2454211.mediaspace.kaltura.com/media/A+personal+perspective+on+overdiagnosis+of+Prostate+Cancer+Michael+Shirley/0_9dii2ius/146828052
24. Smith DP, Calopedos R, Bang A, Yu XQ, Egger S, Chambers S, et al. Increased risk of suicide in New South Wales men with prostate cancer: Analysis of linked population-wide data. PLoS One. 2018;13:e0198679.
25. Marmot MG, Altman DG, Cameron DA, Dewar JA, Thompson SG, Wilcox M, et al. The benefits and harms of breast cancer screening: an independent review. Br J Cancer, 2013;108:2205–40.
26. Baum M. Harms from breast cancer screening outweigh benefits if death caused by treatment is included. BMJ 2013;346:f385.
27. Glasziou PP, Jones MA, Pathirana T, Barratt AL, Bell KJL. Estimating the magnitude of cancer overdiagnosis in Australia. Med J Aust. 2020;212:163–68.
28. Moynihan R, Sanders S, Michaleff ZA, Scott AM, Clark J, To EJ, et al. Impact of COVID-19 pandemic on utilisation of healthcare services: a systematic review. BMJ Open. 2021;11:e045343.
29. Kerr EA, Klamerus ML, Markovitz AA, Sussman JB, Bernstein SJ, Caverly TJ, et al. Identifying recommendations for stopping or scaling back unnecessary routine services in primary care. JAMA Intern Med. 2020;180:1500–8.

30. Sorenson C, Japinga M, Crook H, McClellan M. Building a better health care system post-Covid-19: steps for reducing low-value and wasteful care. NEJM Catal Innov Care Deliv. 2020. Available from: https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0368

31. Auener S, Kroon D, Wackers E, Dulmen Sv, Jeurissen P. COVID-19: A window of opportunity for positive healthcare reforms. Int J Health Policy Manag. 2020;9:419–22.