

The complex impact of COVID-19 on cancer outcomes in Australia

In 2019, before the coronavirus disease 2019 (COVID-19) pandemic, about 145 000 new cases of cancer (excluding non-melanoma skin cancer) were diagnosed, and there were nearly 50 000 cancer-related deaths in Australia.¹ The cancer burden is expected to remain substantial over the next quarter-century, with an estimated cumulative 4.56 million new cases and 1.45 million cancer deaths in that period.² The impact of the pandemic on cancer care and outcomes is multifaceted and expected to be heterogeneous across settings and subpopulations. This is partly due to differences in the stringency of public health controls, and thus the extent and timing of health services disruptions, which varied greatly between jurisdictions during the pandemic. The effect on specific cancer types also depends on their natural history, cancer control measures already in place, and susceptibility of those measures to broader public health controls. This article summarises the known data on the impact of the pandemic on cancer services, identifies gaps in current knowledge, and discusses the implications for future research priorities.

Modelling was performed in early 2020 to pre-emptively assess the impact of cancer screening disruptions in Australia.³ Among the three national cancer screening programs (breast, cervical and bowel), only BreastScreen Australia was paused nationally, in March–April 2020. In the second quarter of 2020, throughput among the target age group (50–74 years) was 44% of pre-COVID-19 (2018) rates at a national level, ranging from 32% in Victoria to 83% in the Australian Capital Territory. By the final quarter of 2020, national throughput matched that of the final quarter of 2018, but this varied between jurisdictions, ranging from a 86% reduction in Victoria to a 110% increase in Queensland and Tasmania.⁴ In 2020–2021 and 2021–2022, the national age-standardised participation rates for the target age group were 87% and 91% of the 2018–2019 rate, respectively.⁴ Modelling had predicted that a 3-month total pause to BreastScreen services would result in an approximate 4% decline in the detection of invasive breast cancers,³ but in reality, disruptions of this severity did not occur. Subsequent evaluation of the impact of screening-related delays in BreastScreen NSW found no significant differences on mean breast tumour size.⁵ However, the longer term impact of prioritising re-screening over first time screens during the recovery phase (with a related shift to older screening participants), and a slower return to screening by women speaking a language other than English at home,⁶ is yet to be fully understood.

For the National Bowel Cancer Screening Program, modelling predicted that a 3-month total pause would be associated with 1672 additional colorectal cancer diagnoses (relative increase, 0.3%) and 979 additional deaths (relative increase, 0.5%) through to 2050.⁷ Before the pandemic, the national 2-yearly participation rate

had increased from 39% in 2014–2015 to 44% in 2018–2019.⁴ However, a subsequent decrease was observed in 2020–2021 (41%).⁸ Modelling has emphasised the effectiveness of catch-up screening for mitigating impact,^{7,9} and a current national health promotion campaign, focused on increasing participation, will likely help to ameliorate the effects of the 2020–2021 dip in participation.¹⁰

The impact on the National Cervical Screening Program is difficult to quantify because the pandemic coincided with an expected trough in participation resulting from a change from 2-yearly to 5-yearly intervals with the 2017 transition to primary human papillomavirus (HPV) screening. However, there is some indication that coverage rates in 2020 were lower than expected, even considering the transitional effects, with an observed percentage of women up to date with screening at the end of 2020 of about 65%, compared with 71% expected.¹¹ Nevertheless, the resilience of the National Cervical Screening Program was likely increased by the transition to HPV screening, which is more sensitive and allows screening at a longer interval, and more than half of eligible women had been HPV-screened before the onset of the crisis.¹²

As for screening-related disruptions, the potential consequences of a delayed cancer diagnosis include a stage shift in invasive cancer, and increases in mortality and morbidity due to a requirement for more intensive treatment. Diagnosis of symptomatic cancer appears to have been impacted during the pandemic, potentially related to service level disruptions or via individuals delaying primary care or specialist visits. In 2020, there was an overall 8% reduction in Medical Benefits Schedule claims for selected diagnostic services (163 595 fewer services), compared with the expected volume in 2020 (based on a linear projection from 2017–2019 data).¹³ For example, diagnostic procedures related to lung cancer were 9% lower than expected.¹³

Another concern is the potential for cancer treatment delays. An international systematic review has reported an overall 6–8% increased risk of mortality for each 4-week delay for surgery, with estimates for delays in systemic treatment and radiotherapy varying by cancer type (considering bladder, breast, colon, rectum, lung, cervix, and head and neck cancers).¹⁴ Australia experienced temporary suspensions of non-urgent surgeries nationally in March–April 2020, and at specific sites in August–September 2021 (sites in New South Wales, Western Australia) and January–July 2022 (sites in Victoria, NSW). Overall, a 9% reduction in selected treatment-related services (14 600 fewer services) was documented in 2020, although this was not consistent across cancer types — for example, the number of lung cancer treatments were similar to expected.¹³ Overall, the net impact on waiting times for specific services is currently difficult to quantify.

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In the early (pre-vaccination) stages of the pandemic, COVID-19 also potentially had a direct short term comorbid effect for newly diagnosed cancer patients. Early reports suggested increased mortality risk potentially due to a compromised immune system, especially for lung and haematological cancers. However, the early evidence was characterised by multiple sources of bias and methodological problems such as inadequate follow-up, limited patient numbers, limited ascertainment of cancer status, and lack of adjustment for confounders such as comorbidities.¹⁵ Ongoing work by the International Partnership for Resilience in Cancer Systems (formerly the COVID-19 and Cancer Global Modelling Consortium)¹⁶ will result in an updated international evidence synthesis on this topic.

It will be critical to assess the impact of these complex and interacting effects on cancer outcomes as cancer registrations and deaths data emerge. National cancer registration data for 2020 are not yet available. Some jurisdictional level data have been released, albeit using a range of metrics and comparisons, making direct comparisons difficult. Focusing, for now, on relative changes, NSW data indicate a slight reduction in overall age-standardised cancer incidence in 2020 compared with 2019, with rates reducing from 567 to 557 per 100 000 (2%) in males and from 439 to 427 per 100 000 (3%) in females; available data for Queensland and South Australia also indicate a slight reduction in the overall age-standardised incidence rates for cancer in 2020 compared with 2019.¹⁷⁻¹⁹ In Victoria, where public health controls were particularly stringent, a reduction in cancer pathology notifications was reported with a 10% overall reduction between 1 April and 15 October 2020.²⁰ The largest falls occurred for prostate cancer (26%), head and neck cancer (15%), melanoma (13%) and breast cancer (10%); more than two-thirds of the missed cancers were prostate, melanoma and breast.²⁰ Updated analysis indicated a 7% relative reduction in cancer diagnoses for the entirety of 2020, and a 4% reduction for 2021, compared to expected numbers.²¹

No major adverse impact on cancer mortality has yet been documented at the population level. In Victoria, cancer mortality in 2020 and 2021 was slightly lower (4% and 5%, respectively) than predicted based on 2018–2019 data.²¹ Similarly, slight reductions in mortality rates were also observed in NSW and Queensland,^{17,19} whereas SA reported a slight increase (0.6%), which could reflect year-on-year variation.¹⁸ These findings appear consistent with national data on doctor-certified deaths from cancer which, compared with 2019, slightly decreased in 2020 and were close to predicted rates by 2021.²²

Overall, the available data suggest a decline in detection of some cancer types; however, some of the impacted cancer types are those associated with longer survival times and/or some level of overdiagnosis (breast, prostate, melanoma, colon); longer term comparisons are thus required to understand any impact on survival or mortality. It is also possible that longer term trends driven by treatment improvements are offsetting the impacts of the pandemic for some

cancers. It remains conceivable, however, that a detrimental effect on mortality will become apparent over the longer term. Future best practice analyses should be designed for each cancer type according to the natural history and the control measures available, and consider that COVID-19 may have exposed and exacerbated existing gaps in detection and cancer care, particularly for those already experiencing disadvantage.²³ To quantify the longer term effects of the crisis on both outcomes and equity, critical areas where further evidence is needed include detailed quantitative information on health services disruptions, national cancer registration data for 2020 and beyond, and high quality studies examining outcomes in cancer patients including subpopulations most at risk, such as those with poorer access to health services either before or during the pandemic. Early assessments flagged a concern that the psychosocial impacts on people affected by cancer would have long-lasting consequences,²⁴ and a better understanding of both the short term and sustained impacts on patients, supportive care givers, and clinicians is warranted.

In conclusion, although health services were disrupted and there is evidence that the pandemic affected cancer screening, diagnosis and treatment services in Australia, there is no indication yet of increased cancer mortality at a whole-of-population level. Ongoing review and analysis of cancer data are expected to yield valuable insights about longer term impacts and, in turn, help inform how Australia can best protect its evidence-based, effective and sometimes hard-won cancer control strategies by preparing for any future major disruptors.

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