Cancer control in New South Wales 2018

Statewide report

Appendices

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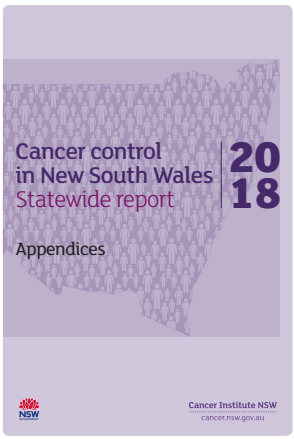

Cancer control in NSW: Statewide report, 2018

Appendices

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Appendices

Appendix 1:
2018 key performance indicators

Cancer statistics	· Standardised incidence and mortality ratios (SIR/SMR) for cancer in NSW · Five-year all-cause survival in people with cancer in NSW, by cancer type · Five-year relative cancer survival in NSW
Cancer prevention	· Current smoking prevalence in NSW adults · Proportion of women who smoked during pregnancy · Current smoking in Aboriginal adults · Sun protection behaviours among NSW adults · Proportion of adults who consume alcohol at levels within recommended guidelines · Proportion of NSW adults who undertake adequate physical activity · Proportion of NSW adults with adequate fruit consumption · Proportion of NSW adults with adequate vegetable consumption · Proportion of NSW adults who are a healthy weight
Breast screening	· Biennial breast screening participation rate for NSW women aged 50–74 years · Proportion of eligible Breastscreen NSW clients aged 50–74 years, by screening category
Cervical screening	· Biennial cervical screening participation rate for NSW women aged 20–69 years · Five-year cervical screening participation rate for NSW women aged 20–69 years · Human papillomavirus (HPV) vaccination rates
Bowel screening	· Annual bowel screening participation rate for NSW people aged 50–74 years · Biennial bowel screening participation rate by Australian state and territory
Patient experience of cancer treatment and psycho-oncology	· Function of patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals · Self-reported tobacco use for patients with cancer attending an outpatient cancer clinic in NSW · Self-assessed symptom scores for outpatients with cancer undergoing active treatment · Self-efficacy scores for outpatients with cancer undergoing active treatment · Aspects of care responses for people with cancer attending an outpatient cancer clinic · Self-assessed ratings of anxiety and depression for outpatients with cancer undergoing active treatment · Self-efficacy scores regarding 'keeping a positive attitude' and 'controlling negative feelings' for outpatients with cancer undergoing active treatment

Radiotherapy treatment services

- Proportion of people with early breast cancer receiving hypofractionated or nonhypofractionated regimens of external beam radiotherapy (EBRT)
- Proportion of patients with bone metastases receiving single or multiple fraction regimens of external beam radiotherapy with palliative treatment intent

Cancer treatment and services

- Resection rate as a proportion of estimated incidence for a specified cancer, multiple cancer types
- Surgical resection caseload, for specified cancer types
- Public and private hospital inflows and outflows, multiple cancer types
- Proportion of breast cancer resections with sentinel lymph node biopsy (SLNB)
- Breast-conserving surgery as a proportion of breast cancer resections
- Proportion of mastectomy for invasive breast cancer with immediate breast reconstructive surgery for primary invasive breast cancer
- Emergency resections by public hospital, multiple cancer types
- Proportion of people with early breast cancer receiving hypofractionated or nonhypofractionated regimens of external beam radiotherapy (EBRT)
- Proportion of patients with bone metastases receiving single or multiple fraction regimens of external beam radiotherapy with palliative treatment intent

Cancer research: Clinical trials

- Ratio of cancer clinical trial enrolments to cancer incidence in NSW
- Number of cancer clinical trials open for recruitment by trial category in NSW
- Number of enrolments in cancer clinical trials by trial category in NSW
- Proportion of cancer clinical trials open for recruitment for more than 180 days with nil recruitment in NSW

Appendix 2: Key performance indicators: Technical document

Introduction

This section provides background information for each of the 2018 Cancer control in NSW key performance indicators (KPIs), including:

- rationale for inclusion
- an assessment of what the indicator is attempting to measure
- technical information about the derivation of the indicator, as appropriate.

A short literature review accompanies each indicator as further support for inclusion.

Overview indicators

Indicator name	Standardised incidence and mortality ratios (SIR/SMR) for cancer in NSW
Related charts	Local health districts with cancer incidence and mortality rates significantly higher or lower than NSW, 2011–2015
Intent	To compare the incidence / mortality rate in the area of interest (local health district (LHD) with the incidence / mortality rate for NSW; for various cancers types and clinical cancer groups.
Background and evidence	The standardised incidence ratio (SIR) and standardised mortality ratio (SMR) are common measurements in cancer statistics.[1] They are used to compare the occurrence of cancer (or mortality of people with cancer) in the population of the area of interest with that of the entire population (NSW, in this case). This takes into account the age and gender distribution of the area. A SIR of 1 means that the number of new cases is exactly the same as would be expected for the LHD given the age and gender distribution, and the observed rates for NSW. A SIR of 1.5 can be interpreted as 50% more cases in an LHD than expected. Similarly, a SIR of 0.9 can be interpreted as 10% less cases in an area than expected. The same principle can be used to interpret SMR. However, this is referring to more or less deaths when comparing LHD and NSW for a given cancer. Non-overlapping 95% confidence intervals are used to decide whether there is a significant difference in the rates of new cancer cases/deaths between the NSW area and the area of interest.[2] Confidence intervals that do not overlap suggest a distinct difference between the two populations that is larger than what is expected due to chance. These are depicted on the chart by using red to denote significantly higher and green to denote significantly lower rates. Overlapping confidence intervals suggest any difference in rates could be due to chance.[2]
Numerator	SIR: The observed number of new cases diagnosed of the specific cancer type in the LHD of interest, notified to the NSW Cancer Registry. SMR: The observed number of deaths among people diagnosed with the specific cancer type who lived in the LHD of interest. See inclusions for ICD (International Statistical Classification of Diseases and Related Health Problems) codes included for each cancer type.
Denominator	The expected number of cases for the area of interest. First, age-specific rates are calculated by dividing the number of cases in NSW by the population in the age group specified. These age-specific rates are then applied to the population of interest to derive a weighted expected number of cases in the population.
Calculation	SIR/SMR = Observed number of 'cases' or 'deaths', divided by the expected number of new cases or 'deaths' respectively.
Data source	• Institute Data Warehouse, Cancer Institute NSW (sourced from the NSW Cancer Registry (NSWCR)).

Indicator name	Standardised incidence and mortality ratios (SIR/SMR) for cancer in NSW (cont.)
Data source (cont.)	• Non-melanoma skin cancer mortality data sourced from the Cause of Death Unit Record File, via Secure Analytics for Population Health Research and Intelligence (SAPHaRI), NSW Ministry of Health. Population data sourced via SAPHaRI, NSW Ministry of Health.
Inclusions	Primary invasive cancers, based on ICD-O-3 topography and morphology codes, for the following cancer types:[3] • Bowel: C18-C21 • Colon: C18 • Rectal: C19-C21 • Breast: C50 • Cancer unknown primary: C26,C39,C48,C76,C80 • Gynaecological: C51-C58 • Cervical: C53 • Ovarian: C56, C57.0-C57.7 • Uterine: C54,C55 • Head and neck: C01-C14,C30-C32 • Lymphohaematopoietic: C42, C77, M967-M972, M974, M975, M976, M9822-M9827, M985, M9862-8, M987-M988, M989-M993, M9930, M994, M995-M997 (excl. M9963), M9987, M974, M959, M965-M966, M973, M980, M9820, M9821, M984, M9860, M9861, M998 • Leukaemia: M980-M994, M9963 excl. M9963 • Multiple myeloma: M973 • Myelodysplasia: M998 • Non-Hodgkins lymphoma: M959, M967-M972, M976 • Neurological: C71, C72 • Respiratory: C33, C34, C37, C38, M905 • Skin: C00, C44, M872-M879, M914 • Thyroid and other endocrine: C73-C75 • Upper gastrointestinal: C15-C17, C22-C25 • Urogenital: C60-C68
Exclusions	• Insitu lesions for breast cancer and cutaneous melanoma are registered by the NSW Cancer Registry, but are not included in any reported statistics. • Multiple primary tumours. • Eye, bone and connective tissue clinical groups are excluded as these have small numbers and data are unreliable for comparison at the LHD level.
Notes	• Cases may refer to incident cases or mortality cases. • Age is categorised into 18 five-year age groups from 0–4 years to 85 years and over. • The definitions used for ovarian and head and neck cancers in these incidence and mortality indicators differ from the definitions used in the surgical indicators. • Albury residents were included in Murrumbidgee LHD
References	1. Breslow NE, Day NE. Statistical methods in cancer research. Volume II–The design and analysis of cohort studies. IARC scientific publications. 1987(82):1-406. 2. Cancer Institute NSW. Standardised Incidence Mortality, Glossary. Available at https://www.cancer.nsw.gov.au/glossary (accessed 04 February 2019). 3. Cancer Institute NSW (2017) Clinical cancer group and Cancer type, Glossary. Available at https://www.cancer.nsw.gov.au/glossary (accessed 04 February 2019).

Indicator name	Five-year all-cause survival in people with cancer in NSW, by cancer type
Related charts	Five-year all-cause survival, by cancer type, NSW and local health district (LHD) of residence, 2005–2009 and 2010–2014
Intent	To measure the five-year survival of specific cancers across NSW, to identify differences between local health districts (LHDs) and trends over time.
Background and evidence	All-cause survival refers to the probability of being alive for a given amount of time after diagnosis and reflects the severity of a cancer diagnosis and other causes of death. Population-based survival statistics are essential for monitoring progress in cancer control and highlighting areas of improvement and need.[1] The top 20% value on the all-cause survival by LHD, and resection rate by LHD, have been calculated using the Achievable Benchmark of Care (ABC) method.[2] Using this method, the LHDs are ranked in descending order of performance, and the highest performing LHDs are selected until the subset includes 20% of all people. The indicator is then re-calculated across this subset of LHDs. This method produces an objective and attainable level of performance.
Numerator	Number of people diagnosed with the specific cancer, residing in the LHD of interest, and alive five years following diagnosis.
Denominator	Total number of people diagnosed with the specific cancer in the reporting period, residing in the LHD of interest.
Calculation	(Numerator/denominator)*100, adjusted by age and gender using proportional hazards models.
Data source	• NSW Cancer Registry, Cancer Institute NSW. • Mortality follow-up is from linked death data from the NSW Registry of Births, Deaths and Marriages.
Inclusions	People aged 15 to 100 years diagnosed with the following cancer types between 2010 and 2015 (ICD-10-AM): • Bladder: C67 • Breast: C50 • Colon: C18 • Gastric: C16 • Head and neck: C01-C14, C30-C32 • Kidney: C64-C65 • Liver: C22 • Lung: C34 • Melanoma: C43 • Oesophageal: C15 • Ovarian: C56, C57.0-C57.7 • Pancreatic: C25 • Prostate: C61 • Rectal: C19-C21
Exclusions	Cancer cases notified to the NSW Cancer Registry by 'death certificate only', or records with a date of diagnosis after date of death.
Notes	• People diagnosed between 2013–2015 do not have five complete years of follow-up and are censored in the survival analysis. • Albury residents were included in Murrumbidgee LHD. • The definitions used for head and neck and ovarian cancers in this indicator are the same as those used in reporting incidence and mortality on the Cancer Institute NSW website. They differ from those used to report surgical resections. • The benchmark rate is computed by first ranking local health districts (LHD) by survival (lowest to highest) and then using the observed survival rate from the LHD at the 80th percentile of the total cohort.
References	1. Mariotto AB, Noone AM, Howlader N, Cho H, Keel GE, Garshell J, et al. Cancer survival: an overview of measures, uses, and interpretation. J Natl Cancer Inst Monogr. 2014;2014(49):145-86. 2. Weissman NW, Allison JJ, Kiefe CI, Farmer RM, Weaver MT, Williams OD, et al. Achievable benchmarks of care: the ABCs of benchmarking. J Eval Clin Pract.. 1999;5(3):269-81.

Indicator name	Five-year relative cancer survival in NSW
Related charts	• Five-year relative survival for all persons diagnosed with cancer, by age group and period of diagnosis, NSW, 1972–2014 • Five-year relative survival, for all persons diagnosed with cancer, by age group and period of diagnosis, NSW, 1980–1989 and 2010–2014
Intent	To monitor the five-year relative survival of people with cancer, from various age groups, across NSW. Survival from cancer is a key indicator of cancer prognosis, control and treatment. Population-based survival statistics are essential for monitoring progress in cancer treatment and highlighting areas of improvement and need.
Background and evidence	Relative survival is an estimate of the probability of surviving cancer for a given amount of time after diagnosis in the absence of other causes of death. This measure of survival is independent of background mortality, allowing comparisons to be made across time and age groups. Examined together, population-based survival, incidence and mortality statistics are a valuable source of information on progress in cancer control.[1–3]
Numerator	The observed (all cause) survival proportion for people (0–100 years) diagnosed with cancer in NSW, by period and age group.
Denominator	The expected survival proportion for the NSW population, by period and age group.
Calculation	The relative survival Ederer II estimator was used to estimate the relative survival. The cohort approach was used to calculate the relative survival in 1972–2009. The period approach was used to calculate the relative survival in 2010–2015.
Data source	• NSW Cancer Registry, Cancer Institute NSW. • Mortality data from the NSW Registry of Births, Deaths and Marriages. • Australian Bureau of Statistics (ABS), NSW life tables 1972–2015.
Inclusions	• NSW residents diagnosed with cancer 1972–2014 aged 0–100 years at diagnosis. • The first cancer case of each person across 1972–2014 was included.
Exclusions	• Cancer cases notified to the NSW Cancer Registry by 'death certificate only'. • Records for people with unknown age or age greater than 100 years at diagnosis. • Records with a date of diagnosis after date of death. • Myelodysplastic syndromes were excluded because, prior to 2003 registrations were incomplete.
Notes	N/A
References	1. Dickman PW, Coviello E. Estimating and Modeling Relative Survival. The Stata Journal. 2015;15(1):186-215. 2. Australian Bureau of Statistics. 3302.0.55.001 - Life Tables, States, Territories and Australia. Canberra: ABS, (accessed 31 Oct 2018) 3. Cancer Australia. National Cancer Control Indicators. 5-year relative survival. Canberra: Cancer Australia, 2017. Available at: https://ncci.canceraustralia.gov.au/outcomes/relative-survival-rate/5-year-relative-survival (accessed 11 September 2018).

Indicator name	Five-year relative survival, by cancer type
Related charts	Five-year relative survival, by cancer type, for Australia and selected states, 2005–2009 and 2010–2014
Intent	To compare the five-year relative survival of people with cancer in NSW and other Australian states and territories. Survival from cancer is a key indicator of cancer prognosis, control and treatment. Population-based survival statistics are essential for monitoring progress in cancer treatment and highlighting areas of improvement and need.

Indicator name	Five-year relative survival, by cancer type (cont.)
Background and evidence	Relative survival is an estimate of the probability of surviving cancer for a given amount of time after diagnosis in the absence of other causes of death. This measure of survival is independent of background mortality, allowing comparisons to be made across time and age groups. Examined together, population-based survival, incidence and mortality statistics are a valuable source of information on progress in cancer control. The first article from CONCORD-3 developed by London School of Hygiene and Tropical Medicine published in The Lancet 1 included data from all 8 Australian cancer registries in 2000-2014. The age-standardised relative survival in 2005-2009 and 2010-2014 is included in RBCO reporting.
Numerator	The observed (all cause) survival proportion for people (15–99 years) diagnosed with cancer in Australia, by state and territory and period.
Denominator	The expected survival proportion (life tables) for the Australian populations, by state and territory, and period.
Calculation	The age-standardised five-year survival Pohar-Perme estimator was used to estimate the net survival. The cohort approach was used to calculate the relative survival in 2005-2009. The period approach was used to calculate the relative survival in 2010–2014. Estimates were age-standardised with the International Cancer Survival Standard weights.
Data source	Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Niksic M, et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual record s from 322 population-based registries in 71 countries. Lancet 2018 Mar 40-6736(17)33326-3.
Inclusions	Australia residents diagnosed with cancer in 2005–2014, aged 15–99 years at diagnosis for adults. Both first and higher-order primary cancers diagnosed at index sites were included.
Exclusions	• Cancer cases registered from a death certificate only (DCO) or detected at autopsy. • Records for people with unknown age or age greater than 100 years at diagnosis. • Records with sex site errors, invalid dates, impossible date sequence, and possible errors, including a wide range of inconsistencies between age, tumour site, and morphology. • Case counts may differ to reported incidence as cases notified by Death Certificate Only are excluded from relative survival analyses. This is due to unknown survival time as the death certificate is the only evidence for a diagnosis of cancer. • People aged over 100 years at diagnosis are excluded from relative survival analysis as Australian Bureau of Statistics (ABS) life tables are available for age ranged 0-100 years.
Notes	N/A
References	1. Allemani C, Matsuda T, Di Carlo V, Harewood R, Matz M, Niksic M, et al. Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual record s from 322 population-based registries in 71 countries. Lancet 2018 Mar 40-6736(17)33326-3.

Cancer prevention indicators

Indicator name	Current smoking prevalence in NSW adults
Related charts	• Current smoking prevalence in adults, by LHD (ranked), 2012 and 2017 • Smoking prevalence in adults, trend, NSW, by LHD, 2008–2017 • Current smoking prevalence in adults, by gender and age, NSW, 2017
Intent	To monitor smoking rates among NSW adults, by geographical areas and trends over time; to inform tobacco control efforts.
Background and evidence	Tobacco smoking remains the number one cause of preventable disease and death in Australia.[1] As such, any action that reduces smoking prevalence is likely to have a considerable impact on reducing the burden of death and disease in NSW.[2]
Numerator	Survey respondents residing in NSW and/or the relevant LHD who reported smoking daily or occasionally.
Denominator	All survey respondents residing in NSW and/ or the relevant LHD.
Calculation	Proportion of survey respondents, based on population weights.
Data source	NSW Adult Population Health Survey, NSW Ministry of Health.
Inclusions	Only for persons aged 16 years and older.
Exclusions	N/A
Notes	• The target sample size was approximately 1,000 persons residing in each health administrative area (total sample size 8,000–16,000, depending on the number of health administrative areas included). However, the exact sample size varies depending on the number of health administrative areas, which may influence the robustness of the result. The data reported uses actual estimates (not smoothed estimates) from the Health Statistics NSW website (www.healthstats.nsw.gov.au). • Any tobacco control measures implemented by the Federal Government, NSW Government (including the Cancer Institute NSW), individual LHDs, or individual primary health networks is likely to impact this indicator. This includes measures such as tax increases, mass media campaigns and GP-based interventions.
References	1. Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD. The Burden of Disease and Injury in Australia 2003. Canberra: Australian Institute of Health and Welfare, 2007. 2. NSW Ministry of Health. NSW Tobacco Strategy 2012–2017. Sydney: NSW Ministry of Health, 2012.

Indicator name	Proportion of women who smoked during pregnancy
Related charts	• Proportion of women who smoked during pregnancy, by LHD (ranked), 2011 and 2016 • Proportion of women who smoked during pregnancy, by population type, NSW, 2012–2016 • Proportion of Aboriginal women who smoked during pregnancy, by LHD (ranked), 2011 and 2016
Intent	To monitor smoking rates in pregancy among NSW women, by geographical areas and trends over time; to inform tobacco control efforts.
Background and evidence	Although the prevalence of smoking has been steadily declining in the past decade[1],encouraging and supporting women who smoke during pregnancy remains a key public health priority outlined in the NSW Tobacco Strategy 2012–2017.[2] The Ministry of Health's NSW Perinatal Data Collection (PDC) collects data on smoking during pregnancy. The PDC is a population-based surveillance system covering all births in NSW public and private hospitals, as well as home births. The PDC is a statutory data collection under the *NSW Public Health Act 2010*.
Numerator	All women who have smoked during pregnancy within NSW and/or the relevant LHD. The data is also broken down by Aboriginality (Aboriginal and non-Aboriginal).

Indicator name	Proportion of women who smoked during pregnancy (cont.)
Denominator	All survey respondents who are pregnant.
Calculation	Proportion of survey respondents, based on population weights.
Data source	NSW Perinatal Data Collection (PDC), NSW Ministry of Health.
Inclusions	Any smoking in pregnancy is included.
Exclusions	N/A
Notes	• Any tobacco control measures implemented by the Federal Government, NSW Government (including the Cancer Institute NSW), or individual LHDs or primary health networks is likely to impact this indicator. This includes measures such as tax increases; mass media campaigns; and GP, mid-wife, or hospital-based interventions. • This indicator provides an estimate of the proportion of women in NSW who smoked during pregnancy overall, and for Aboriginal and non-Aboriginal women. There is a large enough sample size in some LHDs to provide robust estimates. • The estimates for smoking in pregnancy by Aboriginality also need to be interpreted with caution given some LHDs have small sample sizes with wide confidence intervals. The data reported uses actual estimates (not smoothed estimates) from the Health Statistics NSW website (www.healthstats.nsw.gov.au).
References	1. Centre for Epidemiology and Evidence, NSW Ministry of Health. NSW Population Health Surveys. Available at http://www.healthstats.nsw.gov.au (accessed 11 September 2018). 2. NSW Ministry of Health. NSW Tobacco Strategy 2012–2017. [Internet] Edition; 2012. Available at https://www.health.nsw.gov.au/tobacco/publications/nsw-tobacco-strategy-2012.pdf (accessed 7 September 2018).

Indicator name	Current smoking in Aboriginal adults
Related charts	Smoking prevalence in Aboriginal adults, trend, NSW, 2008–2017
Intent	To highlight the proportion of Aboriginal adults who smoke daily or occasionally in NSW.
Background and evidence	The Ministry of Health's NSW Population Health Survey collects data on smoking prevalence each year, and is committed to continuing to do so under the NSW Tobacco Strategy 2012–2017.[1] The Population Health Survey is an annual telephone survey of all state residents living in private households and, from 2012, residents of NSW that have access to a mobile phone.[2] The target sample was approximately 1,000 persons in each of the health administrative areas (total sample 8,000–16,000, depending on the number of administrative areas). Data is from 2002 onwards. Tobacco smoking remains the number one cause of preventable disease and death in Australia.[3] As such, any action that contributes to reducing smoking prevalence is likely to have considerable impact on reducing the burden of death and disease in NSW. Prevalence of smoking is significantly higher in the NSW Aboriginal population compared with the overall NSW population.
Numerator	All smoking Aboriginal adults in NSW aged 16 years and over. The indicator covering current smoking includes those who smoked daily or occasionally. The question used to define the indicator was: 'Which of the following best describes your smoking status: smoke daily; smoke occasionally; do not smoke now but I used to; I have tried it a few times but never smoked regularly; or, I have never smoked?'.
Denominator	All Aboriginal respondents.
Calculation	Proportion of survey respondents, based on population weights.
Data source	NSW Adult Population Health Survey, NSW Ministry of Health.

Indicator name	Current smoking in Aboriginal adults (cont.)
Inclusions	N/A
Exclusions	N/A
Notes	• Any tobacco control measures implemented by the Federal Government, NSW Government (including the Cancer Institute NSW), or individual LHDs or primary health networks is likely to impact this indicator. This includes measures such as mass media campaigns, provision of cessation services to support smokers to quit (Quitline and iCanQuit.com.au), embedding brief interventions for smoking cessation in clinical care, GP-based interventions and community-led interventions. • This indicator is not available at the local health district (LHD) level, due to small sample size restrictions. The data is presented at NSW level only, so overall trends in the smoking rate can be monitored.
References	1. NSW Ministry of Health. NSW Tobacco Strategy 2012–2017. [Internet] Edition; 2012. Available at https://www.health.nsw.gov.au/tobacco/publications/nsw-tobacco-strategy-2012.pdf (accessed 7 September 2018). 2. Centre for Epidemiology and Evidence, NSW Ministry of Health. NSW Population Health Surveys. Available at http://www.healthstats.nsw.gov.au (accessed 1 June 2018). 3. Australian Institute of Health and Welfare. Australian Burden of Disease Study: Impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra: AIHW, 2016.

Indicator name	Sun protection behaviours among NSW adults
Related charts	Proportion of adults who 'always' or 'often' used sun protection when out in the sun for more than 15 minutes, by behaviour type, NSW, 2014 and 2016
Intent	To monitor sun protection behaviours among NSW adults, by geographical areas and trends over time; to inform skin cancer control efforts.
Background and evidence	The goals of the NSW Skin Cancer Prevention Strategy are to [1]: • Increase implementation of comprehensive and effective sun protection policies and guidelines • Improve access to adequate shade • Increase the adoption of sun protection behaviours The sun protection behaviours monitored are the use of: sunglasses, protective clothing, sun safe hat, sunscreen and seek shade.
Numerator	All NSW adults respondents that answerd always/often
Denominator	All adults within each LHD. The question used to define this indicator is: 'Still thinking about the last four weeks, how often did you use each skin protection behaviour when you were exposed to the sun for 15mins or more: Always; Often; Sometimes; or, Rarely/Never?'. The sun protection behaviours monitored are the use of: sunglasses, protective clothing, sun safe hat, sunscreen and seek shade.
Calculation	(Numerator/denominator)*100
Data source	NSW Adult Population Health Survey, NSW Ministry of Health.
Inclusions	N/A
Exclusions	N/A
Notes	N/A
References	1. Cancer Institute NSW. NSW Skin Cancer Prevention Strategy. Available at https://www.cancer.nsw.gov.au/nsw-skin-cancer-strategy (accessed 7 September 2018).

Indicator name	Proportion of NSW adults who undertake adequate physical activity
Related charts	Proportion of NSW adults who undertake adequate physical activity, by LHD (ranked), 2012 and 2017
Intent	To monitor physical activity among NSW adults, by geographical areas and trends over time; to inform efforts to promote healthy lifestyles.
Background and evidence	Physical activity at the lower end of scale (i.e. 150 minutes of moderate / 75 minutes of vigorous) provides considerable health benefits, including reduced risk of cardiovascular disease, type-2 diabetes, psychosocial and musculoskeletal problems. Physical activity at the upper end of the scale (i.e. 300 minutes of moderate / 150 minutes of vigorous) is required for the prevention of unhealthy weight gain and some cancers.[1]
Numerator	Number of survey respondents who reported consuming two or fewer standard drinks per day.
Denominator	Weighted number of survey respondents.
Calculation	(Numerator/denominator)*100
Data source	NSW Population Health Survey (sourced from HealthStats NSW, Centre of Epidemiology and Evidence, NSW Ministry of Health).
Inclusions	N/A
Exclusions	N/A
Notes	• The indicator shows self-reported data collected through computer-assisted telephone interviewing (CATI). Estimates were weighted to adjust for differences in the probability of selection among respondents and were benchmarked to the estimated residential population using the latest available Australian Bureau of Statistics mid-year population estimates. Adults are defined as persons aged 16 years and over in the NSW Population Health Survey. • In order to address diminishing coverage of the population by landline telephone numbers (<85% since 2010), a mobile phone number sampling frame was introduced into the 2012 survey. LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimate.
References	1. Department of Health. Australia's Physical Activity and Sedentary Behaviour Guidelines. Available at http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines (accessed 11 September 2018).

Indicator name	Proportion of adults who consume alcohol at levels within recommended guidelines**
Related charts	• Proportion of NSW adults who consumed alcohol within recommended levels, by LHD (ranked), NSW, 2012 and 2017 • Proportion of NSW adults who consumed alcohol within recommended levels, trend, NSW, 2008 to 2017
Intent	To monitor alcohol comsumption among NSW adults, by geographical areas and trends over time; to inform efforts to reduce alcohol comsumption.
Background and evidence	The Population Health Survey is an annual telephone survey of all state residents living in private households, and from 2012, residents of NSW that have access to a mobile phone.[1] The target sample was approximately 1,000 persons in each of the health administrative areas (total sample 8,000–16,000, depending on the number of administrative areas). Data is available from 2002 onwards. ** In 2009, the National Health and Medical Research Council (NHMRC) published new guidelines to reduce the health risks from drinking alcohol.[2] These guidelines focus on the effects of alcohol during, and immediately after, drinking; and introduce the concept of lifetime risk of alcohol-related disease or injury. Guideline 1 states that the lifetime risk of harm from alcohol-related disease or injury is reduced by drinking no more than two standard drinks on any day when drinking alcohol.
Numerator	Respondents who consumed more than two standards drinks per day.

Indicator name	Proportion of adults who consume alcohol at levels within recommended guidelines** (cont.)
Denominator	Proportion of survey respondents, based on population weights.
Calculation	Number of respondents that indicated they consume less than two standard drinks per day / total respondents (weighted)
Data source	NSW Adult Population Health Survey, NSW Ministry of Health.
Inclusions	N/A
Exclusions	N/A
Notes	• The NSW Ministry of Health is the lead agency for the implementation and evaluation of a comprehensive approach to reduce the harms associated with alcohol use. • This indicator provides an estimate of the proportion of adults in NSW who consume more than two standard drinks on a day when they consume alcohol. There is a large enough sample size within each LHD to provide robust estimates. However, the exact sample size varies depending on the number of health administrative areas, which may influence the robustness of the result. The data reported uses actual estimates (not smoothed estimates) from the Health Statistics NSW website (www.healthstats.nsw.gov.au).
References	1. National Health and Medical Research Council. Australian guidelines to reduce health risks from drinking alcohol. Available at https://nhmrc.gov.au/sites/default/files/documents/reports/alcohol-harm-reduction.pdf (accessed 5 March 2019). 2. Centre for Epidemiology and Evidence, NSW Ministry of Health, NSW Population Health Surveys. Available at http://www.healthstats.nsw.gov.au (accessed 11 September 2018).

Indicator name	Proportion of NSW adults with adequate fruit consumption
Related charts	Proportion of adults who have adequate fruit consumption, by LHD (ranked), NSW 2012 and 2017
Intent	To monitor adequate fruit consumption among NSW adults, by geographical areas and trends over time; to inform health promotion programs and initiatives.
Background and evidence	Nutrition contributes significantly to healthy weight, quality of life and wellbeing, resistance to infection and protection against chronic disease and premature death. Healthy eating promotes physical growth and cognitive development during childhood. Children are nutritionally vulnerable and their nutrient and energy requirements per kilo of bodyweight are greater than adults. There is a relationship between nutrition in childhood and adolescence, and the development of diseases in adulthood. In 2013, the National Health and Medical Research Council (NHRMC) updated the Australian dietary recommendations. These are fully described in the Australian Dietary Guidelines: Educator Guide 2013. Adults are recommended to eat five serves of vegetables and two serves of fruit per day.[1]
Numerator	Number of respondents that indicated they had the required number of fruit serves each day(i.e. two or more serves of fruit a day).
Denominator	Proportion of survey respondents, based on population weights.
Calculation	Number of respondents that indicated they had the required number of fruit serves each day / total respondents (weighted)
Data source	NSW Population Health Survey, NSW Ministry of Health.
Inclusions	N/A
Exclusions	N/A

Indicator name	Proportion of NSW adults with adequate fruit consumption (cont.)
Notes	• The indicator shows self-reported data collected through computer-assisted telephone interviewing (CATI). Estimates were weighted to adjust for differences in the probability of selection among respondents and were benchmarked to the estimated residential population using the latest available Australian Bureau of Statistics mid-year population estimates. Adults are defined as persons aged 16 years and over in the NSW Population Health Survey. • In order to address diminishing coverage of the population by landline telephone numbers (<85% since 2010), a mobile phone number sampling frame was introduced into the 2012 survey. LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimate.
References	1. Department of Health & Ageing. Dietary guidelines for Australians. Available at https://www.eatforhealth.gov.au/ (accessed 5 March 2019).

Indicator name	Proportion of NSW adults with adequate vegetable consumption
Related charts	Proportion of adults who have adequate vegetable consumption, by LHD (ranked), NSW, 2012 and 2017
Intent	To monitor adequate vegetable consumption among NSW adults, by geographical areas and trends over time; to inform health promotion programs and initiatives.
Background and evidence	Nutrition significantly contributes to healthy weight; quality of life and wellbeing; resistance to infection; protection against chronic disease; and premature death. Healthy eating promotes physical growth and cognitive development during childhood. In 2013, the National Health and Medical Research Council (NHMRC) updated the Australian dietary recommendations. These are fully described in the Australian Dietary Guidelines: Educator Guide 2013, which recommends adults eat five serves of vegetables and two serves of fruit per day.[1]
Numerator	Number of respondents that indicated they had the required number of vegetable serves each day.
Denominator	Proportion of survey respondents, based on population weights.
Calculation	Number of respondents that indicated they had the required number of vegetable serves each day / total respondents (weighted)
Data source	NSW Population Health Survey, NSW Ministry of Health.
Inclusions	N/A
Exclusions	N/A
Notes	• The indicator shows self-reported data collected through computer-assisted telephone interviewing (CATI). Estimates were weighted to adjust for differences in the probability of selection among respondents, and were benchmarked to the estimated residential population using the latest available Australian Bureau of Statistics mid-year population estimates. Adults are defined as persons aged 16 years and over in the NSW Population Health Survey. • In order to address diminishing coverage of the population by landline telephone numbers (<85% since 2010), a mobile phone number sampling frame was introduced into the 2012 survey. LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimate.
References	1. Department of Health & Ageing. Dietary guidelines for Australians. Available at https://www.eatforhealth.gov.au/ (accessed 5 March 2019).

Indicator name	Proportion of NSW adults who are a healthy weight
Related charts	Proportion of adults who are a healthy weight, by LHD (ranked), 2012 and 2017
Intent	To monitor the proprtion of adults in NSW who are a healthy weight, by geographical areas and trends over time; to inform health promotion programs and initiatives.

Indicator name	Proportion of NSW adults who are a healthy weight (cont.)
Background and evidence	There are health problems associated with being either underweight or overweight. While being underweight can be a serious risk to health (leading to malnutrition and other health problems, such as osteoporosis), the public health focus is on excess body weight, as this is a much greater problem among the Australian population. Excess weight, especially obesity, is a risk factor for cardiovascular disease, type 2 diabetes, some musculoskeletal conditions and some cancers. As the level of excess weight increases, so does the risk of developing these conditions. In addition, being overweight can lessen one's ability to control or manage chronic disorders. Body Mass Index (BMI) is calculated as follows: BMI = weight(kg)/height(m)^2. BMI scores between 18.5 and 24.9 are healthy weight. The NSW Healthy Eating and Active Living Strategy 2013–2018 [1] provides a whole-of-government framework to promote and support healthy eating and active living in NSW, and to reduce the impact of lifestyle-related chronic disease. The strategy has four key strategic directions: 1. Environments to support healthy eating and active living 2. Statewide healthy eating and active living support programs 3. Healthy eating and active living advice as part of routine service delivery 4. Education and information to enable informed and healthy choices
Numerator	Number of respondents that indicated they are healthy weight .
Denominator	Proportion of survey respondents, based on population weights.
Calculation	Number of respondents that indicated they are healthy weight / total respondents (weighted)
Data source	NSW Population Health Survey, NSW Ministry of Health.
Inclusions	This includes a small proportion of people who are underweight. In 2017, this was estimated to be 3% of the NSW adult population.[2]
Exclusions	N/A
Notes	• The indicator shows self-reported data collected through computer-assisted telephone interviewing (CATI). Estimates were weighted to adjust for differences in the probability of selection among respondents, and were benchmarked to the estimated residential population using the latest available Australian Bureau of Statistics mid-year population estimates. Adults are defined as persons aged 16 years and over in the NSW Population Health Survey. • In order to address diminishing coverage of the population by landline telephone numbers (<85% since 2010), a mobile phone number sampling frame was introduced into the 2012 survey. LL/UL 95%CI = lower and upper limits of the 95% confidence interval for the point estimate.
References	1. NSW Ministry of Health. Preventing overweight and obesity in New South Wales 2013–2018. Sydney: NSW Ministry of Health, 2013. Available at http://www.health.nsw.gov.au/heal/Publications/nsw-healthy-eating-strategy.pdf (accessed 15 September 2017). 2. Centre for Epidemiology and Evidence, NSW Ministry of Health. NSW Population Health Surveys. Available at http://www.healthstats.nsw.gov.au (accessed 30 May 2018).

Breast screening indicators

Indicator name	Biennial breast screening participation rate for NSW women aged 50–74 years
Related charts	• Biennial breast screening participation rate for NSW women aged 50–74, by LHD (ranked), NSW, 2011–2012 and 2016–2017 • Biennial breast screening participation rate for Aboriginal women aged 50–74, by LHD (ranked), NSW, 2011–2012 and 2016–2017 • Biennial breast screening participation rate trends for women aged 50–74, by population type, NSW, 2014–2017 • Biennial breast screening participation rate for culturally and linguistically diverse women aged 50–74, by LHD (ranked), NSW, 2011–2012 and 2016–2017
Intent	To demonstrate variation in breast screening rates within and across local health districts (LHDs), with a goal to increase screening rates, and reduce morbidity and mortality associated with breast cancer.
Background and evidence	Mammography screening is proven to reduce mortality attributable to breast cancer, by detecting early-stage breast cancer.[1] BreastScreen NSW (the Program) provides a two-yearly mammographic screening service to women in NSW, and specifically targets those in the 50–74 year age group. It is evident that by improving the participation rate in mammography screening, the Program can increase the detection of breast cancer at an early stage and reduce morbidity and mortality in women that is associated with breast cancer.[1] Marketing campaigns and strategies used in promoting BreastScreen to improve recruitment may have an effect on increasing the participation rate. The measurement and monitoring of the BreastScreen participation rate in NSW is used to assess the accessibility, efficiency and effectiveness of the Program. An increased participation rate will demonstrate a substantial reduction in mortality from breast cancer; therefore, BreastScreen Australia recommends women to have a routine rescreen every two years.[1] For some women, such as those with a previous diagnosis of breast cancer and those who have a family history of breast cancer, annual screening is available.
Numerator	• Number of women aged 50–74 years residing in the LHD who were screened by a BreastScreen NSW provider at least once during the reporting period. • Number of Aboriginal women aged 50–74 years residing in the LHD who were screened by a BreastScreen NSW provider at least once during the reporting period. • Number of CALD women aged 50–74 years residing in the LHD who were screened by a BreastScreen NSW provider at least once during the reporting period.
Denominator	• Average projected population for women aged 50–74 years residing in the LHD for the reporting period. • Average projected population of Aboriginal women aged 50–74 years residing in LHD for the reporting period. • Average projected population of women aged 50–74 years who speak languages other than English at home, residing in the LHD for the reporting period.
Calculation	(Numerator/denominator)*100
Data source	• Screening data sourced from BreastScreen NSW. • Population data for Aboriginal women is sourced from the Aboriginal Estimated Resident Population (ERP) from the Australian Bureau of Statistics to align with the BreastScreen National Accreditation Standards. • Projected population data for all women sourced from the Epidemiology and Surveillance Branch, NSW Ministry of Health. • Population data for CALD women is derived using the Australian Bureau of Statistics Census.
Inclusion	N/A
Exclusions	• Women who have had more than one screening episode in the 24-month reporting period are to be counted once only. • Aboriginal women whose Aboriginal status is not stated or missing are excluded from the numerator. • CALD women whose language spoken at home is not stated or missing, they are excluded from the numerator.

Indicator name	Biennial breast screening participation rate for NSW women aged 50–74 years (cont.)
Notes	• No attempt has been made to adjust the population for women who have previously had breast cancer. • This indicator only captures women screened by the BreastScreen NSW program. The overall screening rate of NSW women is likely to be higher due to the use of private radiology services, and the possibility of ostensibly diagnostic mammography being used for screening.
References	1. Australian Institute of Health and Welfare. Analysis of cancer outcomes and screening behaviour for national cancer screening programs in Australia. Available at https://www.aihw.gov.au/reports/cancer-screening/cancer-outcomes-screening-behaviour-programs/contents/table-of-contents (accessed 16 January 2019).

Indicator name	Proportion of eligible Breastscreen NSW clients aged 50–74, by screening category
Related charts	Proportion of women aged 50–74 who were screened by BreastScreen in the last 24 months; were screened but not in the last 24 months; and have never been screened by BreastScreen, NSW, 2014–2017
Intent	To demonstrate gap between the proportion of women who attend BreastScreen NSW regularly, and those who have attended screening in the past but have not returned for rescreening.
Background and evidence	Achieving and maintaining a high screening coverage is important to increase the likelihood of breast cancers being detected early and facilitating early treatment, which is associated with better treatment outcomes.[1] The 'Never-screened' rate measures the number of individual women aged 50–74 years, as at 31 December each year, who have never attended breast screening. It assists in interpreting trends in overall BreastScreen participation, providing clarification of whether the participation rate is substantially lower than total program coverage due to late and lapsed screeners, or whether the biennial participation rate is a good approximation of the total coverage of the Program. Reductions in the 'Never-screened' rate would reflect an improvement in program coverage. Achieving and maintaining a high screening coverage improves the probability of early detection of breast cancers and pre-cancerous lesions, facilitating access to treatment and better treatment outcomes. Marketing campaigns and strategies used in promoting BreastScreen to improve recruitment may have an effect on increasing the participation rate. Any changes to policies and initiatives in recruiting new women for screening will impact on this indicator.
Numerator	• Number of women aged 50–74, as at 31 December of each year, who were screened by BreastScreen NSW in the last 24 months. • The difference between the number of individual women aged 50–74 on 31 December of each year who have never had a screening mammogram with BreastScreen NSW, and the number of women aged 50–74 as at 31 December of each year, who were screened in the last 24 months. • Population projection of the current number of women aged 50–74 residing in NSW, on 31 December of each year, less the number of individual women aged 50–74 years on 31 December of each year who have never had a screening mammogram with BreastScreen NSW.
Denominator	Average of the projected population for women aged 50–74 in each year in NSW.
Calculation	(Numerator/denominator)*100
Data source	• Screening data sourced from BreastScreen NSW. • Projected population data sourced from the Epidemiology and Surveillance Branch, NSW Ministry of Health.
Inclusions	N/A
Exclusions	• Women who have had more than one screening episode since the start of the BreastScreen NSW program are to be counted only once, taking their most recent screening episode. • No attempt has been made to adjust the population for women who have previously had breast cancer and are therefore not eligible for breast cancer screening through BreastScreen Australia.
Notes	• The number of women screened for this indicator is different from the 24-month participation rate indicator, which counts women aged 50–74 at the time of their screen. The different methodology is adopted here to be comparable to the 'Never-screened' rate in this indicator.

Indicator name	Proportion of eligible Breastscreen NSW clients aged 50–74, by screening category (cont.)
Notes (cont.)	• This indicator is an estimate, using population projections. It is not derived from a matching of individual Census records with individual patient records. As such, the indicator is influenced by assumptions made in determining projections and by the quality of the data upon which these projections are based. The indicator will overestimate the 'Never-screened' rate, as not all women residents in NSW are eligible for BreastScreen. • The BreastScreen service is limited to those women who are eligible for Medicare. However, the difference between the number of resident women and the number of resident women who are eligible for Medicare is assumed to be small; therefore, the magnitude of the overestimate is likely to be minimal.
References	1. Australian Institute of Health and Welfare. Analysis of cancer outcomes and screening behaviour for national cancer screening programs in Australia. Available at https://www.aihw.gov.au/reports/cancer-screening/cancer-outcomes-screening-behaviour-programs/contents/table-of-contents (accessed 16 January 2019).

Cervical screening indicators

Indicator name	Biennial cervical screening participation rate for NSW women aged 20–69 years
Related charts	• Biennial cervical screening participation rate for NSW women aged 20–69, by LHD (ranked), NSW, July 2010 – June 2012 and July 2015 – June 2017 • Biennial cervical screening participation rate for women, by age group, trend, NSW, July 2013 – June 2017
Intent	This indicator demonstrates the effectiveness of the NSW Cervical Screening Program (CSP) at ensuring women's compliance with its guidelines for screening. The indicator helps to identify locations for implementation of interventions so that a significant reduction in incidence and mortality is achieved for cervical cancer.
Background and evidence	In December 2017, the Cervical Screening Test replaced the Pap test in Australia. Cervical cancer is one of the most preventable cancers [1]. Routine cervical screening is your best protection against cervical cancer. The Cervical Screening Test is expected to protect up to 30% more women. The Cervical Screening Test is more effective than the Pap test at preventing cervical cancers, because it detects the human papillomavirus (known as HPV), whereas the Pap test looked for cell changes in the cervix. HPV is a common infection that can cause cervical cell changes that may lead to cervical cancer. The Cervical Screening Test is more effective than the Pap test at preventing cervical cancers. It is recommended that women aged between 25 and 74 screen every 5 years.
Numerator	Number of women aged 20–69 residing in the relevant catchment area, and screened during a 24-month reporting period.
Denominator	Female population aged 20–69, adjusted for the proportion of women who have had a hysterectomy.
Calculation	The biennial cervical screening rate was calculated by the NSW CSP from the number of women aged 20–69 who had a cervical cytology test at least once during a two-year reporting period, as a percentage of the target population of eligible NSW women residents aged 20–69 years (based on geocoded address at time of test).
Data source	• Screening data sourced from the NSW Pap Test Register (PTR), Cancer Institute NSW. • Population data sourced from Secure Analytics for Population Health Research and Intelligence (SAPHARI), projected population data for the designated years. • Hysterectomy fractions sourced from the NSW Health Survey, NSW Ministry of Health.
Inclusions	• All cervical cytology tests, including: – conventional smear (Pap), or – liquid-based specimen, or – combined conventional smear (Pap) AND liquid-based specimen. • De-identified tests are included in the state count but excluded from finer geographical breakdowns as this information is not available.
Exclusions	N/A
Notes	• Duplication may arise when existing screeners do not inform the NSW PTR of any changes to their personal information, such as changes to name or address. This may result in new records being created for them by the PTR during the matching process for subsequent tests; thereby resulting in over-estimation of the participation rate. Records are de-duplicated at regular intervals but there may be duplicates if a measurement is taken prior to the de-duplication activities. • Cervical cytology tests for women residing on the NSW border that are sent to laboratories in other states for processing but not reported to the NSW PTR could result in underestimation of the NSW biennial participation rate.
References	1. Department of Health. National Cervical Screening Program. Available at http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/cervical-screening-1 (accessed 05 March 2019).

Indicator name	Five-year cervical screening participation rate for NSW women aged 20–69 years
Related charts	Five-year cervical screening participation rate for women aged 20–69, by LHD (ranked), NSW, July 2007 – June 2012 and July 2012 – June 2017
Intent	This indicator provides an indication of future participation in the renewed program from 1 December 2017 when the screening interval changed from two to five years.
Background and evidence	Following a comprehensive review of the current evidence for cervical screening, the Medical Services Advisory Committee (MSAC) has recommended that a HPV test every five years is more effective at protecting against cervical cancer than the current two-yearly Pap test program.[1] While the Pap test detects abnormal cell changes, a HPV test detects the virus that causes the abnormal cell changes. From 1 December 2017, a renewed cervical screening program was implemented. Primary HPV screening will be used instead of the Pap test at five-yearly intervals between the ages of 25 and 74. This indicator provides an estimation of likely five-yearly participation rates.
Numerator	Number of women aged 20–69 residing in the relevant catchment area, and screened during a 60-month reporting period.
Denominator	Female population aged 20–69, adjusted for proportion of women who have had a hysterectomy.
Calculation	The five-year participation rate was calculated by the NSW CSP from the number of women aged 20–69 who had a cervical cytology test at least once during a five-year reporting period, as a percentage of the target population of eligible NSW women residents aged 20–69 years (based on geocoded address at time of test).
Data source	• Screening data sourced from the NSW Pap Test Register (PTR), Cancer Institute NSW. • Population data sourced from Secure Analytics for Population Health Research and Intelligence (SAPHARI), projected population data for the designated years. • Hysterectomy fractions sourced from the NSW Health Survey, NSW Ministry of Health.
Inclusions	• All cervical cytology tests, including: – conventional smear (Pap), or – liquid-based specimen, or – combined conventional smear (Pap) AND liquid-based specimen. • De-identified tests are included in the state count but excluded from finer geographical breakdowns as this information is not available.
Exclusions	N/A
Notes	• Duplication may arise when existing screeners do not inform the NSW PTR of any changes to their personal information, such as changes to name or address. This may result in new records being created for them by the PTR during the matching process for subsequent tests; thereby resulting in an over-estimation of the participation rate. Records are de-duplicated at regular intervals but there may be duplicates if a measurement is taken prior to the de-duplication activities. Cervical cytology tests for women residing on the NSW border that are sent to laboratories in other states for processing, but not reported to the NSW PTR, could result in an underestimation of the NSW five-year participation rate.
References	1. Medical Services Advisory Committee. National Cervical Screening Program Renewal: Executive Summary Report. Canberra: Department of Health and Ageing, 2013.

Indicator name	Human papillomavirus (HPV) vaccination rates
Related charts	• Proportion of females aged 15 who were fully immunised against HPV, by primary health network (PHN) (ranked), NSW, 2014–2015 and 2015–2016 • Proportion of males aged 15 who were fully immunised against HPV, by primary health network (PHN) (ranked), NSW, 2014–2015 and 2015–2016
Intent	This is the lead indicator for cervical cancer incidence.

Indicator name	Human papillomavirus (HPV) vaccination rates (cont.)
Background and evidence	The National HPV Vaccination Program began in 2007 for females, and was extended to include males in 2013. Since 2007, the National HPV Vaccination Program has been credited with dramatically reducing the incidence of the HPV virus in Australia.[1] NSW Health works in partnership with schools to offer the HPV vaccine to all males and females aged 12–13 years as part of a school-based vaccination program. Human papillomavirus (HPV) is the name given to a group of viruses that affect both females and males. Almost all cases of cervical cancer are due to HPV infection. HPV also causes cancers in other parts of the body, including the vulva, vagina, penis, anus, and the mouth and throat. Vaccinating males will prevent male cancers and importantly, will also help to protect females from cervical cancer.[2]
Numerator	The number of 15-year-olds who have received three doses of the HPV vaccine according to the schedule by 30 June 16.
Denominator	The number of 13-year-olds at 30 June 2014, based on the Australian Bureau of Statistics Estimated Residential Population (ERP). This reflects the population at the time vaccinations were likely administered.
Calculation	Numerator/Denominator
Data source	Australian Institute of Health and Welfare
Inclusions	Data is only available at a primary health network (PHN) level.
Exclusions	N/A
Notes	• For doses of HPV vaccines delivered through the school-based HPV Vaccination Program, HPV Register data are considered close to complete. This is except for vaccinated individuals who do no consent to their data being provided to the HPV Register. The completeness of data for doses delivered outside the school-based program (e.g. by GPs) may vary across Australia. • Due to known issues with variability in population estimates by sex and single year of age for some areas of geography, the variability in the population for the same cohort of adolescents between two time points was calculated to identify areas with a substantial population increase or decrease over the period. • Variability in the population was calculated as the absolute percentage change between the number of adolescents aged 13 (vaccination year) and the number aged 15 (reporting year) two years later, using the ERP summarised to geography (either PHN area or SA4) for each financial year reported.
References	1. Department of Health. Immunise Australia Program. Available at http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home~handbook10part4~handbook10-4-6 (accessed 13 September 2017). 2. Department of Health. HPV Information. Available https://beta.health.gov.au/services/human-papillomavirus-hpv-immunisation-service (accessed 5 March 2019).

Bowel screening indicators

Indicator name	Annual bowel screening participation rate for NSW people aged 50–74 years
Related charts	• Annual bowel screening participation rate for people aged 50–74, by LHD (ranked), NSW, 2012–2017 • Annual bowel screening participation rate for people aged 50–74, trend, NSW, 2012–2017 • Annual bowel screening participation rate, by gender and age group, NSW, 2017 • Age of participants invited to the National Bowel Cancer Screening Program, 2014–2020
Intent	This indicator demonstrates the degree to which the National Bowel Cancer Screening Program (NBCSP) is achieving its primary objective to reduce bowel cancer incidence, morbidity and mortality in NSW. The indicator helps to identify relevant locations for implementation of interventions so that a significant reduction in incidence and mortality is achieved.
Background and evidence	Bowel cancer can develop without any early warning signs or symptoms. Immunochemical faecal occult blood tests (iFOBTs) can detect evidence of non-visible blood in the stool, which is a common sign of a bowel abnormality, such as adenoma or cancer. Biennial screening using iFOBTs aims to identify individuals with signs of potential bowel abnormality, allowing earlier investigation by colonoscopy, and earlier treatment for cancer or pre-cancerous lesion/s. The most useful indicator demonstrating the Program's reach and effectiveness is bowel screening participation data.[1]
Numerator	The percentage of people invited to screen through the NBCSP in a 12-month period who returned a completed bowel screening test within the defined 12-month period, or the following six months.
Denominator	Number of persons invited to screen through the NBCSP within the specified geographical boundaries. The eligible population are persons aged 50, 55, 60, 64, 65, 70, 72, 74 years registered with Medicare, or registered with a Department of Veterans Affairs Gold Card.
Calculation	Participation data is calculated on the percentage of people invited to screen through the NBCSP in a 12-month period who returned at least one screening test for analysis.
Data source	All bowel cancer screening data is provided by the NBCSP.
Inclusions	The NBCSP is unable to exclude persons from the denominator who are unlikely to require screening, such as those with a previous diagnosis of bowel cancer; those who have had a colonoscopy in the past five years; or those who have completed a iFOBT within the past two years, as they cannot reliably be identified.
Exclusions	Invitees who are outside the target ages or did not live in Australia at the time of invitation are excluded from reported participation data.
Notes	• All kits returned are analysed and processed by the NBCSP. • Persons are counted only once in the reporting period. • Persons in the eligible population who had opted off the NBCSP (due to reasons, such as having regular colonoscopies) or suspended their participation are included in participation data as many have progressed through the screening pathway before opting-off or suspending participation.
References	1. Australian Institute of Health and Welfare. National Bowel Cancer Screening Program Monitoring Report: Cancer series no.75. Cat. No. CAN71. Canberra: AIHW, 2013.

Indicator name	Biennial bowel screening participation rate, by state
Related charts	Biennial bowel screening participation rate for people aged 50–74,by Australian state and territory (ranked), 2014–2015 and 2015–2016
Intent	Participation should be monitored to ensure acceptability, equity and uptake of the National Bowel Cancer Screening Program (NBCSP), with the aim that reductions in incidence of, and morbidity and mortality from, bowel cancer can be achieved. Without participation, the NBCSP cannot achieve earlier detection.

Indicator name	Biennial bowel screening participation rate, by state (cont.)
Background and evidence	Bowel cancer can develop without any early warning signs or symptoms. Immunochemical faecal occult blood tests (iFOBTs) can detect evidence of non-visible blood in the stool, which is a common sign of a bowel abnormality, such as adenoma or cancer. Biennial screening using iFOBTs aims to identify individuals with signs of potential bowel abnormality, allowing earlier investigation by colonoscopy and earlier treatment for cancer or pre-cancerous lesion/s. The most useful indicator demonstrating the reach and effectiveness of the NBCSP is bowel screening participation data.[1]
Numerator	The number of people who returned their bowel screening screening test within the reporting period.
Denominator	The number of people aged 50–74 who were invited to screen through the NBCSP during the reporing period.
Calculation	The percentage of people invited to screen through the NBCSP between 1 January 2016 and 31 December 2017 who returned a completed screening test within that period, or by 30 June 2018.
Data source	Australian Institute of Health and Welfare.[1]
Inclusions	All invitations issued and iFOBT kits returned are recorded in the register.
Exclusions	• The number of individuals who were sent a screening invitation • Excludes those who deferred or opted out without completing their screening test.
Notes	Participation is measured over two years to align with the two-year recommended screening interval. A consequence of this is that there are 'rolling' participation rates, in which there is an overlap of one calendar year between any two consecutively reported participation rates.
References	1. Australian Institute of Health and Welfare. National Bowel Cancer Screening Program Monitoring Report: Cancer series no.75. Cat. No. CAN71. Canberra: AIHW, 2013.

Patient experience and psycho-oncology indicators

The Cancer Institute NSW has partnered with the Bureau of Health Information (BHI) to report patient-reported measures. The below indicators and measures are from the NSW Patient Survey Program, Outpatient Cancer Clinics Survey (2017) and Adult Admitted Patients Survey (2015). Further information on the survey questions, sample, methodology, and analysis is available from the BHI website (http://www.bhi.nsw.gov.au/nsw_patient_survey_program).

Indicator name	Function of patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals
Related charts	Function of patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals, by local health district (LHD) and specialty health network (ranked), November 2017
Intent	To assess the level of physical limitation being experienced by patients who are being treated for cancer, and who are in an active phase of treatment; to gauge the patient mix across hospitals and local health districts (LHDs).
Background and evidence	The question is based on the Eastern Cooperative Oncology Group (ECOG) Performance Status Scale.[1] This is not a performance question; it is an indicator of physical limitations being suffered by patients being treated for cancer. Therefore it provides contextual information about the patient cohort, particularly the extent of any limitations to undertaking activities of normal daily living. This indicator has been restricted to those in an active phase of treatment in order to make a more fair comparison between LHDs.
Numerator	The weighted number of people who were classified as being in an active phase of treatment based on their response to Q61 and responded to the individual response options for Q61: "Which of the following statements best describes how well you were able to carry out ordinary tasks and daily activities? Over the past month I would generally rate my activity as:" The responses were: • Able to carry out normal activities with no limitations. • Able to be up and about with fairly normal activities. • Not feeling up to most things; in bed or chair less than half the day. • Able to do little activity; spend most of the day in bed or chair. • Pretty much bedridden, rarely out of bed.
Denominator	The weighted number of respondents to the survey who reported they attended the clinic because they have, or have had, cancer (Q57), and who responded to Q61 and were classified as being in an active phase of treatment based on their response to Q61.
Calculation	The weighted proportion is calculated using the SURVEYFREQ procedure in SAS v9.4. Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey.
Data source	Outpatient Cancer Clinics Survey, 2017, Bureau of Health Information.
Inclusions	• See Appendix 4.1 for included facilities. • Respondents who reported attending the clinic because they have, or have had, cancer (Q57), and who were classed as being in an active phase of treatment (Q61).
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address details to allow sampling.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) datamart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP datamart for sampling.
References	1. ECOG-ACRIN Cancer Research Group. ECOG Performance Status. Available at https://ecog-acrin.org/resources/ecog-performance-status (accessed 18 September 2018).

Indicator name	Self-reported tobacco use for patients with cancer attending an outpatient cancer clinic in NSW
Related charts	Smoking status of patients attending an outpatient cancer clinic in NSW public hospitals, by local health district (LHD) and specialty health network, November 2017
Intent	To assess the smoking status of patients attending outpatient cancer clinics in NSW public hospitals, and to explore variation across hospitals and local health districts (LHDs).
Background and evidence	The World Health Organisation singles out tobacco use as the greatest avoidable risk factor for cancer mortality worldwide.[1-3] The International Agency for Research on Cancer (IARC) identifies tobacco use as, not only the largest cause of lung cancer, but it also causes cancer in other areas around the body; for example, the stomach, kidney and liver.[4] It is also relevant to assess tobacco use in patients who have been diagnosed with cancer, as smoking cessation at the time of diagnosis has the potential to lead to a better prognosis.[5]
Numerator	The weighted number of people who responded to any of the following response options in question Q49: • Asked if you smoke • Advised you to quit smoking • Offered to refer you to the Quitline or a smoking support service/professional • Offered you nicotine replacement therapy (e.g. patches, gum) • Provided other help to quit smoking
Denominator	The weighted number of respondents to the survey who responded to the response options in Q49 mentioned in the numerator.
Calculation	The weighted proportion, calculated using the SURVEYFREQ procedure in SAS v9.4. Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey.
Data source	Outpatient Cancer Clinics Survey, 2017, Bureau of Health Information.
Inclusions	• Respondents who reported attending the clinic because they have or have had cancer (Q57). • See Appendix 4.1 for included facilities.
Exclusions	• People who responded 'Don't know/can't remember' to Q49. • Patients attending outpatient cancer clinics that were unable to provide sufficient name and address detail to allow sampling.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) datamart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP datamart for sampling
References	1. World Health Organization. Cancer Prevention. http://www.who.int/cancer/prevention/en/ (accessed: September 2017). 2. US Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: a Report of the Surgeon General. Atlanta, GA: 2014. 3. Cancer Australia. Tobacco. Available at: https://canceraustralia.gov.au/publications-and-resources/position- statements/lifestyle-risk-factors-and-primary-prevention-cancer/lifestyle-risk-factors/tobacco (accessed: September 2017). 4. International Agency for Research on Cancer. Personal Habits and Indoor Combustions. Volume 100E. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Lyon: IARC, 2012. 5. Izano M, Satariano WA, Hiatt RA, Braithwate D. Smoking and mortality after breast cancer diagnosis: the health and functioning in women study. Cancer Med. 2015; 4(2): 315-324.

Indicator name	Self-assessed symptom scores for outpatients with cancer undergoing active treatment
Related charts	Self-assessed symptom scores for patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals, by LHD and specialty health network, November 2017
Intent	People with cancer visiting outpatient clinics during active treatment may experience physical and emotional symptoms that can interfere with their quality of life.[1] Symptom control is an important aspect of cancer care, so understanding symptom severity and variations across NSW can help to target improvement efforts
Background and evidence	This indicator provides symptom profiles of people with cancer using the Edmonton Symptom Assessment System (ESAS).[1] ESAS has been successfully used for people with cancer across a wide range of settings and countries and has been shown to be a valid and reliable instrument.[2,3] Several studies have demonstrated that if a system assessment scale is used in routine care, more symptoms will be identified and addressed, resulting in improved outcomes for people with cancer.[4]
Numerator	The result for each question, scored from 0 (lowest) to 10 (highest) based on the severity of that symptom at the time the respondent filled out the questionnaire.
Denominator	The number of respondents to the survey who reported that they were in an active phase of cancer treatment and who answered the question.
Calculation	The weighted mean was calculated for each symptom.
Data source	Outpatient Cancer Clinics Survey, 2017, Bureau of Health Information.
Inclusions	• Respondents who reported attending the clinic because they have or have had cancer (Q57) and who were classed as being in an active phase of treatment (Q61). • See Appendix 4.1 for included facilities.
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address detail to allow sampling.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) datamart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP datamart for sampling.
References	1. Bruera E, Miller MJ, Selmser P, Macmillan K. The Edmonton Symptom Assessment System (ESAS): A simple method for the assessment of palliative care patients. J Palliat Care. 1991;7(2):6-9. 2. Dudgeon DJ, Harlos M, Clinch JJ. The Edmonton Symptom Assessment Scale (ESAS) as an audit tool. Journal of palliative care 1999;15(3):14-9. 3. Carvajal A, Centeno C, Watson R, Bruera E. A comprehensive study of psychometric properties of the Edmonton Symptom Assessment System (ESAS) in Spanish advanced cancer patients. Eur J Cancer. 2011;47(12),1863–1872. 4. Browner IS, Smith TJ. Symptom assessment in elderly cancer patients receiving palliative care. Ann Oncol. 2013;24(7),vii25-vii29.

Indicator name	Self-efficacy scores for outpatients with cancer undergoing active treatment
Related charts	Self-efficacy scores for patients attending an outpatient cancer clinic in NSW public hospitals, by hospital, local health district (LHD) and specialty health network, November 2017
Intent	To assess the variability in patients' ability to deal with the emotional aspects of undergoing active cancer treatment, as well as aspects of communication and seeking information for these patients.
Background and evidence	The Communication and Attitudinal Self-Efficacy Scale for cancer (CASE-cancer) tool was developed as a tool to gauge people with cancers' self-efficacy. Self-efficacy has been identified as an important determinant of health behaviour, change, and maintenance.[1,2]

Indicator name	Self-efficacy scores for outpatients with cancer undergoing active treatment (cont.)
Background and evidence (cont.)	It assesses three dimensions, which are presented as domains in the analysis: • Maintaining a positive attitude. • Understanding and participating in care. • Seeking and obtaining information. Each of these domains have four sub-questions.
Numerator	Each of the 12 CASE-cancer sub-questions were scored, with strongly agree=10, slightly agree=6.67, slightly disagree=3.33, and strongly disagree=0. These are then summed to give a result for each of the three domains.
Denominator	The number of respondents to each CASE-cancer sub-question.
Calculation	The weighted mean is calculated for each sub-question.
Data source	Outpatient Cancer Clinics Survey, 2017, Bureau of Health Information.
Inclusions	• Respondents who reported attending the clinic because they have or have had cancer (Q57) and who were classed as being in an active phase of treatment (Q61). • See Appendix 4.1 for included facilities
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address detail to allow sampling.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) datamart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP datamart for sampling.
References	1. Holloway A, Watson HE. Role of self-efficacy and behaviour change. Int J Nurs Prac. 2002;8(2),106-15. 2. Wolf MS, Chang CH, Davis T, Makoul G. Development and validation of the Communication and Attitudinal Self-Efficacy scale for cancer (CASE-cancer). Patient education and counseling. 2005;57(3):333-41.

Indicator name	Aspects of care responses for people with cancer attending an outpatient cancer clinic
Related charts	Patient-reported responses to aspects of care for patients attending an outpatient cancer clinic in NSW public hospitals, by local health district (LHD) and specialty health network, November 2017
Intent	To assess various aspects of patient care in cancer outpatient clinics, and to explore variation across hospitals and local health districts (LHDs).
Background and evidence	There are a variety of aspects of patient care that contribute to the overall patient experience. These aspects of care are related to issues such as the type, quality and specifics of the care provided to the patient, which all contribute to the overall quality of the health care provided.[1] Furthermore, ensuring optimal patient care in relation to these aspects of care have the potential to improve clinical outcomes and quality of life.[2,3]
Numerator	The weighted number of responses to the most positive category for the following questions. Questions were grouped based on topic. The response option included is provided in brackets after the question: **Assistance and responsiveness** • Did a health professional discuss your worries or fears with you [for those who reported having worries or fears]? (Yes, completely) **Care needs and expectations** • Has a health professional at this clinic advised you to quit smoking? (Yes)

Indicator name	Aspects of care responses for people with cancer attending an outpatient cancer clinic (cont.)
Numerator (cont.)	**Communication and information** • Were you told how long you had to wait [for appointment to start]? (Yes) • Were you given enough information about how to manage the side effects of your treatment? (Yes, completely) **Complications** • In the past 3 months, have you gone to an emergency department because of complications? [responses from all patients] (No) • In the past 3 months, have you gone to an emergency department because of complications? [responses restricted to patients in active phase of treatment] (No) **Comprehensive and whole-person care** • Do you have a written care plan? (Yes) **Coordination and continuity** • Were you told who to contact if you were worried about your condition or treatment after you left the clinic? (Yes) • How well organised was the care you received in the clinic? (Very well organised) **Engagement and participation** • Were you asked about your preference for care and treatment when developing this plan? (Yes) **Overall experience** • Overall, how would you rate the health professionals who treated you? (Very good) • Were you treated with respect and dignity while you were at the clinic? (Yes, always) • Overall, how would you rate the care you received in the clinic? (Very good) **Trust and confidence** • Did you have confidence and trust in the health professionals? (Yes, definitely)
Denominator	The number of respondents to each question including all response options except "don't know/can't remember" (where applicable), weighted to take into account the proportion of patients treated at that clinic.
Calculation	The weighted percentage was calculated for each group.
Data source	Outpatient Cancer Clinics Survey, 2017, Bureau of Health Information.
Inclusions	• Respondents who reported attending the clinic because they have or have had cancer (Q57). • See Appendix 4.1 for included facilities
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address detail to allow sampling.
Notes	• Results are based on all eligible respondents to the individual questions, with the exception of 'In the past 3 months, have you gone to an emergency department because of complications' which is presented for all respondents followed by respondents in an active phase of treatment only (see Patient Case Mix indicator for further information). Respondents in an active phase of treatment were presented separately to gauge whether they are at higher risk of attending an emergency department and to provide a more even cohort for comparison of rates between LHDs. • Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) datamart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP datamart for sampling.
References	1. Australian Commission on Safety and Quality in Health Care. Patient-centred care: Improving quality and safety through partnerships with patients and consumers. 2011. Sydney: ACSQHC. 2. Street RL, Mazor KM, Arora N. Assessing patient-centred communication in cancer care: measures for surveillance of communication outcomes. J Oncol Pract 2016; 12(12): 1198-1202. 3. Arora NK, Weaver KE, Clayman ML, Oakley-Girvan I, Potosky AL. Physicians' decision-making style and psychosocial outcomes among cancer survivors. Patient Edyc Couns 2009; 77(3): 404-412.

Indicator name	Self-assessed ratings of anxiety and depression for outpatients with cancer undergoing active treatment
Related charts	• Self-assessed rating for depression for patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals, by local health district (LHD) and specialty health network (ranked), November 2017 • Self-assessed rating for anxiety for patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals by local health district (LHD) and specialty health network (ranked), November 2017
Intent	People with cancer visiting outpatient clinics during an active phase of treatment may experience emotional symptoms that can interfere with their quality of life.[1] Specifically, identifying self-assessed ratings of anxiety and depression may assist in detecting distress.[2]
Background and evidence	This indicator assesses self-reported rating of anxiety and depression using the Edmonton Symptom Assessment System (ESAS).[1] The ESAS has been successfully used for people with cancer across a wide range of settings and countries and has been shown to be a valid and reliable instrument.[3,4]
Numerator	The severity of anxiety and depression at the time the respondent filled out the questionnaire (these are two of the nine components of the ESAS). Scores were grouped into the same categories used by Cancer Care Ontario:[5] • 0: No symptoms • 1–3: Mild symptoms • 4–6: Moderate symptoms • 7–10: Severe symptoms
Denominator	The weighted number of respondents to the relevant component of the ESAS who reported that they were in an active phase of cancer treatment.
Calculation	The weighted proportion was calculated for each symptom severity category.
Data source	Survey of Outpatient Cancer Clinics, Novermber 2017, Bureau of Health Information.
Inclusions	Patients who reported that they were currently in a course of treatment (Q61, responses 2 and 5) were classed as being in an active phase of treatment. See Appendix 3.1 for included facilities.
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address details to allow sampling. This included St George and Sutherland Hospitals.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) data mart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP data mart for sampling. • Results were suppressed for LHDs with fewer than 30 survey respondents due to small numbers.
References	1. Bruera EKN, Miller MJ, Selmser P, Macmillan K. The Edmonton Symptom Assessment System (ESAS): A simple method for the assessment of palliative care patients. J Palliat Care 1991;7,6–9. 2. Bagha SM, Macedo A, Jacks LM, Lo C, Zimmerman C, Rodin G, Li M. The utility of the Edmonton Symptom Assessment System in screening for anxiety and depression. Eur J Care 2013;22(1):60-9. 3. Dudgeon DJ, Harlos M, Clinch JJ. The Edmonton Symptom Assessment Scale (ESAS) as an audit tool. J Palliat Care 1999;15(3):14-9. 4. Carvajal A, Centeno C, Watson R, Bruera E. A comprehensive study of psychometric properties of the Edmonton Symptom Assessment System (ESAS) in Spanish advanced cancer patients. Eur J Cancer 2011;47(12),1863–1872. 5. Cancer Quality Council of Ontario. Symptom Assessment and Management. Available at http://www.csqi.on.ca/by_patient_journey/treatment/symptom_assessment_and_management/ (accessed 26 Oct 2017).

Indicator name	Self-efficacy scores regarding 'keeping a positive attitude' and 'controlling negative feelings' for outpatients with cancer undergoing active treatment
Related charts	• Self-assessed rating regarding keeping a positive attitude, patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals,by local health district (LHD) and specialty health network (ranked), November 2017 • Self-assessed rating regarding controlling negative feelings, patients in an active phase of treatment attending an outpatient cancer clinic in NSW public hospitals, by local health district (LHD) and specialty health network (ranked), November 2017
Intent	To identify the level of self-efficacy of patients in an active phase of treatment in terms of their ability to control negative feelings and be able to maintain a positive attitude.
Background and evidence	The Communication and Attitudinal Self-Efficacy Scale (CASE-cancer) tool was developed as a tool to gauge people with cancers' self-efficacy.[1] Self-efficacy has been identified as an important determinant of health behaviour, change, and maintenance.[2] The CASE-cancer tool assesses three dimensions, one of which is 'maintaining a positive attitude'. Two of the questions in this component are presented here: "It is easy for me to keep a positive attitude" and "I am confident that I can control my negative feelings about cancer". It has been shown that the level of self-efficacy of patients may be lower when they are in an active phase of treatment.[3]
Numerator	The weighted number of responses to each of the categories (strongly agree, slightly agree, slightly disagree, strongly disagree) for the components of the CASE-cancer questions "It is easy for me to keep a positive attitude" and "I am confident that I can control my negative feelings about cancer".
Denominator	The weighted number of respondents to the relevant component of the CASE-cancer who reported that they were in an active phase of cancer treatment.
Calculation	The weighted proportion was calculated for each response category.
Data source	Survey of Outpatient Cancer Clinics, November 2017, Bureau of Health Information.
Inclusions	Patients who reported that they were currently in a course of treatment (Q61, responses 2 and 5) were classed as being in an active phase of treatment. See Appendix 3.1 for included facilities.
Exclusions	Patients attending outpatient cancer clinics that were unable to provide sufficient name and address details to allow sampling.
Notes	• Weights take into account the distribution of people accessing the outpatient cancer clinics included in the survey. • Results do not take into account age, gender or stage of cancer. • Included facilities were based on data extracted from the Non-admitted Patient (NAP) data mart held by the Health System Performance and Reporting Branch of the NSW Ministry of Health. Additional information was provided by individual hospitals where there was insufficient information available from the NAP data mart for sampling. • Results were suppressed for LHDs with fewer than 30 survey respondents due to small numbers.
References	1. Wolf MS, et al. Development and validation of the communication and attitudinal self-efficacy scale for cancer (CASE-cancer). Patient Educ Couns 2005;57(3),333–341. 2. Holloway A, Watson HE. Role of self-efficacy and behaviour change. Int J Nurs Prac 2002;8(2),106–15. 3. Bureau of Health Information. Patient Perspectives – how do outpatient cancer clinics preform? Experiences and outcomes of care, February and March 2015. Sydney (NSW): BHI, 2016.

Radiotherapy treatment services indicators

Indicator name	Proportion of people with early-stage breast cancer receiving hypofractionated or non-hypofractionated regimens of external beam radiotherapy (EBRT)
Related charts	Proportion of early-stage breast cancer patients who received hypofractionated or non-hypofractionated regimens of external beam radiotherapy in NSW public and private facilities, with median age, by selected LHDs (ranked), 2014–2017
Intent	To demonstrate variation in the use of 'hypofractionated' versus 'non-hypofractionated' radiotherapy regimens across NSW.
Background and evidence	Recent publications confirm that hypofractionated radiotherapy has equal or better efficacy (as measured by survival, mortality and recurrence rates) as non-hypofractionated external beam radiotherapy (EBRT) for women with early-stage breast cancer.[1-5] Women who received hypofractionated EBRT experienced similar late toxicity rates and, in some cases, fewer breast symptoms, as women who received non-hypofractionated radiotherapy regimens.[1,4-5] An Australian clinical practice guideline states that hypofractionated EBRT can be offered as a suitable alternative to non-hypofractionated EBRT for women aged 50 years and over with stage T1-2 N0M0, low to intermediate grade breast cancer who have undergone breast conserving-surgery with clear surgical margins.[6] Internationally, evidence shows that on average <40% of eligible women receive hypofractionated EBRT.[7–10] The cost of EBRT delivery is 22–40% lower for hypofractionated regimens compared with non-hypofractionated regimens. More women could be treated with existing EBRT resources if all eligible people received hypofractionated regimens rather than non-hypofractionated regimens.[8–9,11–13] Increased uptake of hypofractionated radiotherapy among eligible women could reduce health care costs and enable more people to be treated with existing radiotherapy resources.
Numerator	• Number of women with early-stage breast cancer who received EBRT with a dose per fraction of 1.8–2.0Gy (non-hypofractionation). • Number of women with early-stage breast cancer who received EBRT with a dose per fraction greater than 2.0Gy (hypofractionation).
Denominator	Number of women with early-stage breast cancer who received EBRT with a dose per fraction equal to or greater than 1.8Gy.
Calculation	(Numerator/denominator)*100
Data source	Enhanced Radiation Oncology Data (EROD), Cancer Institute NSW.
Inclusions	• Women with early-stage breast cancer, treatment of curative intent. • Local health districts with Tumor, Node, Metastases (TNM) staging completeness greater than 60% were reported in this indicator. Facilities included in the EROD extract: Blacktown Cancer and Haematology Centre, Calvary Mater Newcastle, Central Coast Cancer Centre, Central West Cancer Centre, Crown Princess Mary Cancer Centre, Genesis CancerCare Hurstville, Genesis CancerCare Newcastle, Genesis CancerCare - Macquarie University Hospital, Icon Radiation Oncology Centres – Gosford, Icon Radiation Oncology Centres - Wahronga, Illawarra Cancer Care Centre, Liverpool Cancer Therapy Centre, Macarthur Cancer Therapy Centre, Mid North Coast Cancer Institute - Coffs Harbour, Mid North Coast Cancer Institute - Port Macquarie, Nelune Comprehensive Cancer Centre, North Coast Cancer Institute - Lismore Cancer Care and Haematology Unit, North Sydney Cancer Centre, North West Cancer Centre, Riverina Cancer Care Centre, Shoalhaven Cancer Care Centre, St George Cancer Care Centre.
Exclusions	• Boost treatment doses • Local health districts with TNM staging completeness less than 60%.
Notes	• Early-stage breast cancer is defined as ICD-O-3 C50 and TNM stage I or IIA. • Cases may include node positive early-stage breast cancer as information on lymph node involvement was incomplete. • The data from the EROD were not loaded to the NSW Cancer Registry (NSWCR), and were not cleaned, validated or passed through NSWCR business rules. • Additional cohort inclusion and exclusion criteria are currently under review at time of reporting

Indicator name	Proportion of people with early breast cancer receiving hypofractionated or non-hypofractionated regimens of external beam radiotherapy (EBRT) (cont.)

References

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Indicator name	Proportion of patients with bone metastases receiving single or multiple fraction regimens of external beam radiotherapy with palliative treatment intent

Related charts

Proportion of patients with bone metastases receiving single or multiple fraction regimens of external beam radiotherapy with palliative treatment intent in NSW public facilities, with median age, by local health district (LHD) and specialty health network (ranked), 2014–2017

Intent

To demonstrate variation in the use of single versus multiple fraction radiotherapy regimens for uncomplicated painful bone metastases across NSW.

Background and evidence

External beam radiotherapy (EBRT) is the recommended treatment for uncomplicated painful bone metastases. Long-term evidence supports the use of fewer fractions of radiation to treat painful bone metastases, as there has long been found to be no differences between the speed of onset of pain, or pain relief between treatment regimens of varying number of fractions.[1-3]

Single fraction regimens can be beneficial to the patient and health care system by providing more convenient treatment and by being more cost effective. Re-treatment rates in single fraction regimes are higher (21.5%) compared to multiple fractions (7.4%).[3]

Despite evidence supporting the use of single fraction radiotherapy, recent estimates indicate that most centres continue to prescribe multiple fraction regimens for the treatment of bone metastases, both in Australia and internationally.[4,5]

Indicator name	Proportion of patients with bone metastases receiving single or multiple fraction regimens of external beam radiotherapy with palliative treatment intent (cont.)
Background and evidence (cont.)	Factors including location of centre and centre type were independently predictive of the use of single fraction radiotherapy.[4] This suggests variation in access to single fraction radiotherapy for eligible patients. Variation in the proportion of patients with bone metastases treated by more than five radiation fractions may indicate; • inequality of access to evidence-based care • variation in the distribution of clinical characteristics that indicate the use of this treatment • patient preference. There is potential to increase the use of single fraction radiotherapy, resulting in more convenient treatment for people and increased cost-effectiveness for radiotherapy departments.
Numerator	• Number of people who were treated with >5 fractions of EBRT for bone metastases. • Number of people who were treated with 2-5 fractions of EBRT for bone metastases. • Number of people who were treated with a single fraction of EBRT for bone metastases.
Denominator	Number of people who were treated with palliative EBRT for bone metastases.
Calculation	(Numerator/denominator)*100
Data source	Enhanced Radiation Oncology Data (EROD), Cancer Institute NSW.
Inclusions	Facilities included in the EROD extract: Blacktown Cancer and Haematology Centre, Calvary Mater Newcastle, Central Coast Cancer Centre, Central West Cancer Centre, Chris O'Brien Lifehouse, Crown Princess Mary Cancer Centre, Genesis CancerCare Hurstville, Genesis CancerCare Newcastle, Genesis CancerCare - Macquarie University Hospital, Genesis CancerCare - St. Vincent's Clinic, Genesis CancerCare - The Mater Hospital, Icon Radiation Oncology Centres – Gosford, Icon Radiation Oncology Centres - Wahronga, Illawarra Cancer Care Centre, Liverpool Cancer Therapy Centre, Macarthur Cancer Therapy Centre, Mid North Coast Cancer Institute - Coffs Harbour, Mid North Coast Cancer Institute - Port Macquarie, Nelune Comprehensive Cancer Centre, Nepean Cancer Care Centre, North Coast Cancer Institute - Lismore Cancer Care and Haematology Unit, North Sydney Cancer Centre, North West Cancer Centre, Riverina Cancer Care Centre, Shoalhaven Cancer Care Centre, St George Cancer Care Centre
Exclusions	N/A
Notes	• Data from source systems were not cleaned, validated or passed through system business rules. • Bone metastases were identified by specialists at the Cancer Institute NSW from the descriptive text field for 'site of treatment'. • Fractions were estimated using an operational definition. The programming logic to estimate fractions is complex owing to differences in the recording of treatments between individual radiotherapy centres. • The data from the EROD were not loaded to the NSW Cancer Registry (NSWCR), and were not cleaned, validated or passed through NSWCR business rules.
References	1. Price P, Hoskin PJ, Easton D, Austin D, Palmer SG, Yarnold JR. Prospective randomised trial of single and multifraction radiotherapy schedules in the treatment of painful bony metastases. Radiother Oncol. 1986; 6(4):247-55. 2. Sze WM, Shelley M, Held I, Mason M. Palliation of metastatic bone pain: single fraction versus multifraction radiotherapy - a systematic review of the randomised trials Cochrane Database of Systematic Reviews; 2004(2): Cd004721. 3. Chow E, Zeng L, Salvo N, Dennis K, Tsao M, Lutz S. Update on the systematic review of palliative radiotherapy trials for bone metastases. Clin Oncol. 2012;24(2):112-24. 4. Fairchild A, Barnes E, Ghosh S, Ben-Josef E, Roos D, Hartsell W, et al. International patterns of practice in palliative radiotherapy for painful bone metastases: evidence-based practice? Int J Radiat Oncol Biol Phys. 2009;75(5):1501-10. 5. Bradley NM, Husted J, Sey MS, Husain AF, Sinclair E, Harris K, et al.Review of patterns of practice and patients' preferences in the treatment of bone metastases with palliative radiotherapy. Supportive care in cancer. 2007;15(4):373-85.

Cancer treatment and services indicators

Indicator name	Resection rate as a proportion of estimated incidence for a specified cancer, multiple cancer types
Related charts	Resections as a proportion of estimated incidence, by cancer type, by LHD of residence, 2010–2013 and 2014–2017
Intent	To measure variation in the use of major surgical resections after diagnosis across local health districts (LHDs).
Background and evidence	There is evidence of variation in the proportion of people with cancer receiving surgery with curative intent in Australia and internationally.[1-4] Use of surgery can be optimised by the referral of cases for multidisciplinary review at a specialist centre that has the capability to undertake complex surgery and post-operative patient management. Referral pathways from primary and tertiary care may affect the number of people who receive staging and surgical evaluation in multidisciplinary settings. Even when reviewed at a specialist service, people at greater social disadvantage can have lower uptake of treatment.[2,5] The top 20% value on the all-cause survival by LHD and resection rate by LHD have been calculated using the Achievable Benchmark of Care (ABC) method.[2] Using this method, the LHDs are ranked in descending order of performance and the highest performing LHDs are selected until the subset includes 20% of all people. The indicator is then re-calculated across this subset of LHDs. This method produces an objective and attainable level of performance.
Numerator	Number of people undergoing major surgical resections using procedure codes as defined for each cancer in the 'Inclusions' field.
Denominator	Number of people with a first diagnosis of the specified cancer, defined as first admissions within 10 years
Calculation	(Numerator/denominator)*100
Data source	Admitted Patient, Emergency Department Attendance and Deaths Register (APEDDR); Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health.
Inclusions	Major surgical resections with curative intent. **Lung (C34)** 38438-00, 38438-01, 38438-02, 38440-00, 38440-01, 38441-00, 38441-01 **Gastric (C16)** 30518-00, 30518-01, 30518-02, 30521-00, 30523-00, 30524-00, 30535-00, 30536-00, 30536-01, 30541-00, 30541-01, 30545-00, 30545-01, 30550-00, 30550-01 **Oesophageal (C15)** 30535-00, 30536-00, 30536-01, 30541-00, 30541-01, 30545-00, 30545-01, 30550-00, 30550-01 **Ovarian (C56 C57.0 C48.1 C48.2)** 35637-10, 35638-02, 35638-03, 35638-11, 35638-12, 35638-13, 35653-02, 35653-03, 35653-04, 35661-00, 35664-00, 35664-01, 35667-00, 35667-01, 35670-00, 35673-00, 35673-01, 35673-02, 35713-07, 35713-11, 35713-14, 35717-01, 35717-04, 35717-05, 35753-00, 35753-01, 35753-02, 35756-01, 35756-02, 35756-03, 90328-00, 90448-02, 90328-01, 90450-00, 90450-01, 90450-02 **Pancreatic (C25)** 30583-00, 30584-00, 30593-00, 30593-01 **Primary liver (C22)** 30414-00, 30415-00, 30418-00, 30421-00, 90346-00 See Appendix 4.2 for descriptions of the procedures codes.
Exclusions	A large proportion of people diagnosed with cancer who live in local health districts (LHDs) near the NSW border receive their treatment interstate. Data from interstate hospitals cannot be included in linked datasets, so the following LHDs with a high proportion of residents travelling interstate for surgery are excluded from this indicator: • Northern NSW LHD • Southern NSW LHD • Murrumbidgee LHD (incorporating Albury) • Far West LHD

Indicator name	Resection rate as a proportion of estimated incidence for a specified cancer, multiple cancer types (cont.)
Notes	• In order to provide more timely data, linked hospital admissions data are used rather than cancer registry data. A ten-year look-back period was used to identify a person's first admission for the specific cancer as a proxy for an incident case. • No adjustment is made for stage of cancer at diagnosis, age, comorbidity, and other factors that may affect the proportion undergoing resection. The estimate of cancer incidence used in the denominator will be affected by the patterns of treatment for the cancer and accuracy of cancer coding at hospitals. • Cardia cancers (C16.0) have been included with gastric cancer and include people resected by an oesophagectomy or gastrectomy. • Ampullary and periampullary cancers a not included with pancreatic cancer as these cancers have resection rates and outcomes. • NSW private data are reported for January 2014 to June 2017.
References	1. Currow DC, You H, Aranda S, McCaughan BC, Morrell S, Baker DF, et al. What factors are predictive of surgical resection and survival from localised non-small cell lung cancer? MJA. 2014;201(8):475-80. 2. Jorgensen ML, Young JM, Dobbins TA, Solomon MJ. Predictors of variation in colorectal cancer care and outcomes in New South Wales: a population-based health data linkage study. Med J Aust. 2014; 200(7):403-7. 3. Coupland VH, Lagergren J, Lüchtenborg M, Jack RH, Allum W, Holmberg L, et al. Hospital volume, proportion resected and mortality from oesophageal and gastric cancer: a population-based study in England, 2004–2008. Gut. 2013;62(7):961-6. 4. Coupland VH, Konfortion J, Jack RH, Allum W, Kocher HM, Riaz SP, et al. Resection rate, hospital procedure volume and survival in pancreatic cancer patients in England: Population-based study, 2005–2009. EJSO. 2016;42(2):190-6. 5. Shapiro M, Chen Q, Huang Q, Boosalis VA, Yoon CH, Saund MS, et al. Associations of socioeconomic variables with resection, stage, and survival in patients with early-stage pancreatic cancer. JAMA surgery. 2016;151(4):338-45. 6. Weissman N, Allison J, Kiefe C, et al. Achievable benchmarks of care: the ABCs of benchmarking. Journal of Eval in Clin Prac. 1999: 5(3)269-281.

Indicator name	Surgical resection caseload, for specified cancer types
Related charts	• [Cancer type] resections in NSW public hospitals (ranked), 2012 and 2017 • [Cancer type] resections in NSW private hospitals (ranked), 2012 and 2017
Intent	To report resection caseload at institution level for specific cancers and provide information on variation.
Background and evidence	There is consistent international evidence showing that for rare and complex cancer treatment, specialist centres are associated with lower post-operative mortality and better longer-term survival.[1-5] Specialist centres in NSW are those that meet the minimum suggested annual caseload and specified quality measures. The current minimum suggested caseload depends on the specific cancer. See notes section below.
Numerator	Number of resections as defined for the specific cancer.
Denominator	N/A
Calculation	Number of resections using procedure codes as defined for each cancer in the 'Inclusions' field. This may be provided as a mean or total over a period of time or as a trend over time
Data source	Combined Admitted Patient Epidemiology Data (CAPED) Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health.
Inclusions	**Bladder (C67)** 37014-00 **Breast (C50)** 31500-00, 31515-00, 31518-00, 31518-01, 31524-00, 31524-01

Indicator name	Surgical resection caseload, for specified cancer types (cont.)
Inclusions (cont.)	**Colon (C18) Rectal (C19 C20 C21)** 32000-00, 32000-01, 32000-02, 32000-03, 32003-00, 32003-01, 32003-02, 32003-03, 32004-00, 32004-01, 32004-02, 32004-03, 32005-00, 32005-01, 32005-02, 32005-03, 32006-00, 32006-01, 32006-02, 32006-03, 32009-00, 32009-01, 32012-00, 32012-01, 32015-00, 32024-00, 32025-00, 32026-00, 32028-00, 32030-00, 32030-01, 32039-00, 32047-00, 32051-00, 32051-01, 32060-00, 32112-00, 92208-00 **Gastric (C16)** 30518-00, 30518-01, 30518-02, 30521-00, 30523-00, 30524-00 **Head and neck** **Primary head and neck:** C0-C10.2, C10.4-C14, C15.3, C30.0 C31.0, C31.1, C32, C33 **Melanoma of skin of head and neck:** C43.0-C43.4 (only surgeries with an indicator of complexity) **Non-melanoma skin cancer of head and neck:** C44.0-C44.4 (only surgeries with an indicator of complexity) Other: all other malignant neoplasms, excluding thyroid (C73) 30247-00, 30250-00, 30255-00, 30259-00, 30275-00, 30294-00, 30294-01, 31423-01, 31435-00, 34148-00, 34151-00, 34154-00, 38453-00, 38453-02, 39640-00, 39642-00, 39646-00, 39650-00, 39700-00, 41545-00, 41548-00, 41581-00, 41728-00, 41779-01, 41782-00, 41785-00, 41785-01, 41834-00, 41837-00, 41840-00, 41843-00, 42539-00, 42543-00, 45596-00, 45597-00, 45599-00, 45602-00, 45602-01, 45605-00, 45605-01, 45611-00, 45720-00, 45720-01, 45720-02, 45720-03, 45723-00, 45723-01, 45723-02, 45723-03, 45726-00, 45726-01, 45726-02, 45726-03, 45729-00, 45729-01, 45729-02, 45729-03, 45731-00, 45731-01, 45732-00, 45732-01, 45735-00, 45738-00, 45741-00, 45744-00, 45747-00, 45752-00, 45753-00, 45754-00, 45755-00, 45863-00, 45873-00, 52120-00, 90138-00, 90679-00, 90679-01, 90679-02, 90679-03, 90680-00, 90680-01, 90680-02, 90680-03 **Indicators of complexity:** **Neck dissection:** 31423-01, 31435-00 **Free flap:** 45562-00, 45562-01 **Kidney (C64 C65)** 36516-00, 36516-01, 36516-02, 36516-03, 36519-02, 36519-03, 36522-00, 36522-01, 36525-00, 36525-01, 36528-00, 36528-01, 36529-00 **Lung (C34)** 38438-00, 38438-01, 38438-02, 38440-00, 38440-01, 38441-00, 38441-01 **Melanoma (C43, principal diagnosis only)** 31205-00, 31230-00, 31230-01, 31230-02, 31230-03, 31230-04, 31230-05, 31235-00, 31235-01, 31235-02, 31235-03, 31235-04, 45665-00, 45665-01, 45665-02 **Neurological (C71, C72.8, C72.9)** 39640-00, 39642-00, 39646-00, 39650-00, 39653-00, 39658-00, 39660-02, 39662-02, 39709-00, 39709-01, 39712-03, 39712-04, 41575-00, 41581-00, 90032-00. **Oesophageal (C15 C16.0)** 30535-00, 30536-00, 30536-01, 30541-00, 30541-01, 30545-00, 30545-01, 30550-00, 30550-01 **Pancreatic (C25 C24 C17.0)** 30583-00, 30584-00, 30593-00, 30593-01 **Primary liver (C22), Secondary Liver (C78.7)** 30414-00, 30415-00, 30418-00, 30421-00, 90346-00 **Ovarian (C56 C57.0 C48.1 C48.2)** 35637-10, 35638-02, 35638-03, 35638-11, 35638-12, 35638-13, 35653-02, 35653-03, 35653-04, 35661-00, 35664-00, 35664-01, 35667-00, 35667-01, 35670-00, 35673-00, 35673-01, 35673-02, 35713-07, 35713-11, 35713-14, 35717-01, 35717-04, 35717-05, 35753-00, 35753-01, 35753-02, 35756-01, 35756-02, 35756-03, 90328-00, 90328-01, 90448-02, 90450-00, 90450-01, 90450-02 See Appendix 4.2 for description of procedure codes.
Exclusions	Resections at Albury Base Hospital have not been included in this report as this hospital reports services to the Victorian Department of Health. Resections in the two NSW children's hospitals are also excluded.
Notes	The current recommendations for minimum suggested annual caseload are as follows: • **Bladder ≥ 6** Bladder cancer recommendation based on international studies and local clinician endorsement. • **Breast ≥ 36** Based on analysis of unplanned readmission in NSW data for breast cancer resections. • **Colon ≥ 12** Recommendation based on hospital-level distribution of colon cancer resections in NSW. • **Complex head and neck ≥ 25** Recommendation based on local Clinical Advisory Group endorsement.

Indicator name	Surgical resection caseload, for specified cancer types (cont.)
Notes (cont.)	• **Gastric cancer ≥ 6** Recommendation based on international studies and hospital-level distribution of gastrectomies in NSW. • **Kidney cancer** = no minimum suggested caseload determined at time of reporting. • **Lung cancer ≥ 18** Recommendation based on hospital-level distribution of lung cancer resections in NSW. • Melanoma = no minimum suggested caseload determined at time of reporting. • **Neurological ≥ 12** Recommendation based on hospital level distribution of neurological cancer resection in NSW. • **Ovarian** = no minimum suggested caseload. Ovarian resections are recommended to be performed at one of the seven specialist gynaecological oncology centres. • **Oesophageal ≥ 6** Recommendation based on international studies, analysis of NSW data, and hospital-level distribution of oesophagectomies in NSW. • **Pancreatic ≥ 6** Recommendation based on international studies, analysis of NSW data, and hospital-level distribution of pancreatectomies in NSW. • **Primary liver** = no minimum suggested caseload determined at time of reporting. • **Rectal ≥ 12** Recommendation based on hospital-level distribution of rectal cancer resections in NSW. • **Secondary liver** = no minimum suggested caseload determined at time of reporting.
References	1. Brusselaers N, Mattsson F, Lagergren J. Hospital and surgeon volume in relation to long-term survival after oesophagectomy: systematic review and meta-analysis. Gut. 2014;63(9):1393-400. 2. Huo YR, Phan K, Morris DL, Liauw W. Systematic review and a meta-analysis of hospital and surgeon volume/outcome relationships in colorectal cancer surgery. Journal of gastrointestinal oncology. 2017;8(3):534-46. 3. Lüchtenborg M, Riaz SP, Coupland VH, Lim E, Jakobsen E, Krasnik M, et al. High procedure volume is strongly associated with improved survival after lung cancer surgery. Journal of Clinical Oncology. 2013;31 (25):3141-6. 4. Morche J, Mathes T, Pieper D. Relationship between surgeon volume and outcomes: a systematic review of systematic reviews. Systematic reviews. 2016;5(1):204. 5. Reames BN, Ghaferi AA, Birkmeyer JD, Dimick JB. Hospital volume and operative mortality in the modern era. Annals of surgery. 2014;260 (2):244.

Indicator name	Public and private hospital inflows and outflows, multiple cancer types
Related charts	Average annual flows of people for [cancer type] resections, by local health district (LHD) of residence, 2014–2017
Intent	To inform service delivery planning by summarising the flow of people for complex cancer surgery between local health districts (LHDs), and between the public and private health systems.
Background and evidence	N/A
Numerator	• Number of people receiving surgery for the specified cancer in a public hospital within the LHD in which they live. • Number of people receiving surgery for the specified cancer in a private hospital within the LHD in which they live. • Number of people receiving surgery for the specified cancer in a public hospital outside the LHD in which they live. • Number of people receiving surgery for the specified cancer in a private hospital outside the LHD in which they live.
Denominator	N/A
Calculation	Number of people in each category.

Indicator name	Public and private hospital inflows and outflows, multiple cancer types (cont.)
Data source	• Combined Admitted Patient Epidemiology Data (CAPED) through Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health for interstate residents. • Breast sentinel lymph node, and mastectomy data source: Admitted Patient, Emergency Department Attendance and Deaths Register (APEDDR); Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health.
Inclusions	**Bladder (C67)** 37014-00 **Breast (C50)** 31500-00, 31515-00, 31518-00, 31518-01, 31524-00, 31524-01 **Colon (C18) Rectal (C19 C20 C21)** 32000-00, 32000-01, 32000-02, 32000-03, 32003-00, 32003-01, 32003-02, 32003-03, 32004-00, 32004-01, 32004-02, 32004-03, 32005-00, 32005-01, 32005-02, 32005-03, 32006-00, 32006-01, 32006-02, 32006-03, 32009-00, 32009-01, 32012-00, 32012-01, 32015-00, 32024-00, 32025-00, 32026-00, 32028-00, 32030-00, 32030-01, 32039-00, 32047-00, 32051-00, 32051-01, 32060-00, 32112-00, 92208-00 **Gastric (C16)** 30518-00, 30518-01, 30518-02, 30521-00, 30523-00, 30524-00 **Head and neck** Primary head and neck: C0-C10.2, C10.4-C14, C15.3, C30.0 C31.0, C31.1, C32, C33 Melanoma of skin of head and neck: C43.0-C43.4 (only surgeries with an indicator of complexity) Non-melanoma skin cancer of head and neck: C44.0-C44.4 (only surgeries with an indicator of complexity) Other: all other malignant neoplasms, excluding thyroid (C73) 30247-00, 30250-00, 30255-00, 30259-00, 30275-00, 30294-00, 30294-01, 31423-01, 31435-00, 34148-00, 34151-00, 34154-00, 38453-00, 38453-02, 39640-00, 39642-00, 39646-00, 39650-00, 39700-00, 41545-00, 41548-00, 41581-00, 41728-00, 41779-01, 41782-00, 41785-00, 41785-01, 41834-00, 41837-00, 41840-00, 41843-00, 42539-00, 42543-00, 45596-00, 45597-00, 45599-00, 45602-00, 45602-01, 45605-00, 45605-01, 45611-00, 45720-00, 45720-01, 45720-02, 45720-03, 45723-00, 45723-01, 45723-02, 45723-03, 45726-00, 45726-01, 45726-02, 45726-03, 45729-00, 45729-01, 45729-02, 45729-03, 45731-00, 45731-01, 45732-00, 45732-01, 45735-00, 45738-00, 45741-00, 45744-00, 45747-00, 45752-00, 45753-00, 45754-00, 45755-00, 45863-00, 45873-00, 52120-00, 90138-00, 90679-00, 90679-01, 90679-02, 90679-03, 90680-00, 90680-01, 90680-02, 90680-03 **Indicators of complexity:** Neck dissection: 31423-01, 31435-00 Free flap: 45562-00, 45562-01 **Kidney (C64 C65)** 36516-00, 36516-01, 36516-02, 36516-03, 36519-02, 36519-03, 36522-00, 36522-01, 36525-00, 36525-01, 36528-00, 36528-01, 36529-00 **Lung (C34)** 38438-00, 38438-01, 38438-02, 38440-00, 38440-01, 38441-00, 38441-01 **Melanoma (C43, principal diagnosis only)** 31205-00, 31230-00, 31230-01, 31230-02, 31230-03, 31230-04, 31230-05, 31235-00, 31235-01, 31235-02, 31235-03, 31235-04, 45665-00, 45665-01, 45665-02 **Neurological (C71, C72.8, C72.9)** 39640-00, 39642-00, 39646-00, 39650-00, 39653-00, 39658-00, 39660-02, 39662-02, 39709-00, 39709-01, 39712-03, 39712-04, 41575-00, 41581-00, 90032-00. **Oesophageal (C15 C16.0)** 30535-00, 30536-00, 30536-01, 30541-00, 30541-01, 30545-00, 30545-01, 30550-00, 30550-01 **Pancreatic (C25 C24 C17.0)** 30583-00, 30584-00, 30593-00, 30593-01 **Primary liver (C22), Secondary Liver (C78.7)** 30414-00, 30415-00, 30418-00, 30421-00, 90346-00 **Ovarian (C56 C57.0 C48.1 C48.2)** 35637-10, 35638-02, 35638-03, 35638-11, 35638-12, 35638-13, 35653-02, 35653-03, 35653-04, 35661-00, 35664-00, 35664-01, 35667-00, 35667-01, 35670-00, 35673-00, 35673-01, 35673-02, 35713-07, 35713-11, 35713-14, 35717-01, 35717-04, 35717-05, 35753-00, 35753-01, 35753-02, 35756-01, 35756-02, 35756-03, 0328-00, 90328-01, 90448-02, 90450-00, 90450-01, 90450-02 See Appendix 4.3 for descriptions of the procedure codes.

Indicator name	Public and private hospital inflows and outflows, multiple cancer types (cont.)
Exclusions	N/A
Notes	• Interstate hospital data for NSW residents undergoing surgery are available up to (and including) 30 June 2017. The volume of interstate hospital admissions for the six months to December 2017 are estimated using an average of the same period in the previous two years. • NSW private data are reported for January 2014 to June 2017 for breast sentinel lymph node, breast reconstructive surgery and mastectomy.
References	1. N/A

Indicator name	Proportion of breast cancer resections with sentinel lymph node biopsy (SLNB)
Related charts	• Proportion of breast cancer resections with sentinel lymph node biopsy (SLNB) in NSW public hospitals, by hospital (ranked), 2012 and 2017 • Proportion of breast cancer resections with sentinel lymph node biopsy (SLNB) in NSW private hospitals, by hospital (ranked), 2012 and 2017
Intent	To measure variation in the use of sentinel lymph node biopsy (SLNB) in the surgical staging of primary invasive breast cancer at first diagnosis.
Background and evidence	Sentinel lymph node biopsy (SLNB) is recommended for women with early-stage breast cancer with clinically negative nodes to determine if AND is necessary.[1] Randomised control trials of SLNB with AND where positive nodes are detected compared to AND alone have demonstrated reduced arm morbidity and improved quality of life in the SLNB treatment group.[2,3] SLNB should be performed by an appropriately-trained surgeon with access to the full range of multidisciplinary services.[1] An evaluation of the implementation of SLNB in Australia found that best practice guidelines were widely adopted. There was, however, evidence of variation in the use of SLNB for women with early-stage breast cancer.[4] There is the potential to increase the use of SLNB, which could decrease morbidity associated with the management of axillary lymph nodes for women with breast cancer.
Numerator	Number of women who have SLNB in the breast resection episode without axillary node dissection (AND). • Number of women who have SLNB with AND in the breast resection episode. • Number of women who have SLNB in the breast resection episode with AND in a subsequent episode within three months of the breast resection episode. • Number of women who have AND in or within three months of the breast resection episode without SLNB. • Number of women who did not have SLNB in the breast resection episode or AND in or within three months of the breast resection episode.
Denominator	Number of women undergoing a first breast resection for primary invasive breast cancer.
Calculation	(Numerator/denominator)*100
Data source	Admitted Patient, Emergency Department Attendance and Deaths Register (APEDDR); Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health.
Inclusions	Women undergoing a first resection for primary invasive breast cancer (C50). Breast cancer resection: 31500-00, 31518-00, 31518-01, 31524-00, 31524-01 SLNB: 30300-00 AND: 30335-00, 30336-00 See Appendix 4.3 for descriptions of the procedure codes.
Exclusions	Resections at Albury Base Hospital have not been included in this indicator as this hospital reports services to the Victorian Department of Health.

Indicator name	Proportion of breast cancer resections with sentinel lymph node biopsy (SLNB) (cont.)
Notes	NSW private data are reported for January 2014 to June 2017
References	1. National Breast and Ovarian Cancer Centre. Recommendations for use of sentinel lymph node biopsy in early (operable) breast cancer. Surry Hills: National Breast and Ovarian Cancer Centre, Surry Hills; 2008. 2. Purushotham AD, Upponi S, Klevesath MB, Bobrow L, Millar K, Myles JP, et al. Morbidity after sentinel lymph node biopsy in primary breast cancer: results from a randomized controlled trial. J Clin Oncol. 2005;23(19):4312-21. 3. Mansel RE, Fallowfield L, Kissin M, Goyal A, Newcombe RG, Dixon JM, et al. Randomized multicenter trial of sentinel node biopsy versus standard axillary treatment in operable breast cancer: the ALMANAC trial. JNCI. 2006;98(9):599-609. 4. Morris T, Wetzig N, Sinclair S, Kollias J, Zorbas H. Evaluation of implementation of sentinel node biopsy in Australia. ANZ J Surg. 2012;82(7-8):541-7.

Indicator name	Breast-conserving surgery as a proportion of breast cancer resections
Related charts	• Breast-conserving surgery as a proportion of breast cancer resections in NSW public hospitals, by hospital (ranked), 2012 and 2017 • Breast-conserving surgery as a proportion of breast cancer resections in NSW private hospitals, by hospital (ranked), 2012 and 2017
Intent	To measure variation in the proportion of women undergoing breast-conserving as the first resection procedure for primary invasive breast cancer.
Background and evidence	Recent estimates indicate that the majority of women with primary invasive breast cancer in Australia are treated with breast-conserving surgery rather than mastectomy.[1] Certain clinical characteristics, such as multifocal or large tumours, diffuse micro-calcifications and prior radiotherapy, indicate the use of mastectomy rather than breast-conserving surgery.[2] Equivalent long-term survival outcomes for early invasive breast cancer treated by mastectomy and breast-conserving surgery with radiotherapy have been demonstrated by randomised controlled trials and observational studies.[3,4] Better quality of life and greater satisfaction with treatment have been demonstrated following breast-conserving surgery.[5,2] However, there is evidence that breast-conserving surgery has a higher risk of local recurrence of breast cancer.[6] Treatment by mastectomy varied by remoteness of residence and by surgeon caseload, with women in more remote areas and those with a lower surgeon caseload more likely to have a mastectomy. This suggests variation in access to breast-conserving surgery among eligible women, which may indicate inequality of access to breast-conserving surgery and adjuvant radiotherapy.[7-9] Increases in breast screening rates, changes in the population being screened, and the sensitivity of screening tools may affect this indicator, as early detection may reduce the use of mastectomy for initial treatment of primary invasive breast cancer. This indicator may also be affected by patient preference, with some women who are eligible for breast-conserving surgery choosing mastectomy.[3,4]
Numerator	Number of women who had a breast-conserving surgery as their first breast resection for primary invasive breast cancer.
Denominator	Number of women undergoing a first breast resection for primary invasive breast cancer.
Calculation	(Numerator/denominator)*100
Data source	Admitted Patient, Emergency Department Attendance and Deaths Register (APEDDR); Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health.
Inclusions	Women undergoing a first resection for primary invasive breast cancer (C50). **Mastectomy:** 31518-00, 31518-01, 31524-00, 31524-01 **Breast-conserving surgery:** 31500-00 See Appendix 4.3 for descriptions of the procedure codes.

Indicator name	Breast-conserving surgery as a proportion of breast cancer resections (cont.)
Exclusions	Resections at Albury Base Hospital have not been included in this indicator as this hospital reports services to the Victorian Department of Health.
Notes	NSW private data are reported for January 2014 to June 2017
References	1. Roder D, Zorbas H, Kollias J, Pyke C, Walters D, Campbell I, et al. Factors predictive of treatment by Australian breast surgeons of invasive female breast cancer by mastectomy rather than breast conserving surgery. Asian Pacific J Cancer Prev. 2013;14(1):539-45. 2. Fajdic J, Djurovic D, Gotovac N, Hrgovic Z. Criteria and procedures for breast conserving surgery. Acta Inform Med. 2013;21(1):16-9. 3. Adkisson CD, Bagaria SP, Parker AS, Bray JM, Gibson T, Thomas CS, et al. Which eligible breast conservation patients choose mastectomy in the setting of newly-diagnosed breast cancer? Ann Surg Oncol. 2012;19(4):1129-36. 4. Col NF, Duffy C, Landau C. Commentary - surgical decisions after breast cancer: can patients be too involved in decision-making? Health Serv Res. 2005;40(3):769-79. 5. Singletary SE. Surgical margins in patients with early-stage breast cancer treated with breast conservation therapy. Am J Surg. 2002;184(5):383-93. 6. Moyer A. Psychosocial outcomes of breast-conserving surgery versus mastectomy: a meta-analytic review. Health Psychol. 1997;16(5):284-98. 7. Hwang ES, Lichtensztajn DY, Gomez SL, Fowble B, Clarke CA. Survival after lumpectomy and mastectomy for early-stage invasive breast cancer. Cancer. 2013;119(7):1402-11. 8. Jatoi I and Proschan MA. Randomized trials of breast-conserving therapy versus mastectomy for primary breast cancer: a pooled analysis of updated results. Am J Clin Oncol. 2005;28(3):289-94. 9. Arndt V, Stegmaier C, Ziegler H, Brenner H.. Quality of life over 5 years in women with breast cancer after breast-conserving therapy versus mastectomy: a population-based study. J Cancer Res Clin Oncol. 2008;134(12):1311-8.

Indicator name	Proportion of mastectomy for invasive breast cancer with immediate breast reconstructive surgery for primary invasive breast cancer
Related charts	• Proportion of mastectomies for invasive breast cancer with immediate breast reconstruction in NSW public hospitals, by LHD and specialty health network (ranked), 2012 and 2017 • Proportion of mastectomies for invasive breast cancer with immediate breast reconstruction in NSW public hospitals, by hospital (ranked), 2012 and 2017 • Proportion of mastectomies for invasive breast cancer with immediate breast reconstruction in NSW private hospitals, by hospital (ranked), 2012 and 2017
Intent	To measure variation in the use of immediate breast reconstruction among women undergoing mastectomy for primary invasive breast cancer
Background and evidence	Breast reconstruction is an important component of care following mastectomy, assisting women to recover from the physical and psychological trauma of breast cancer treatment. Despite recognition of reconstruction as a component of breast cancer treatment and public funding for the procedure, uptake is poor and has increased only gradually in recent decades.[1] Treatment guidelines for primary breast cancer recommend that breast reconstruction is discussed with all women considering mastectomy.[2] Analysis of hospital administrative data in England and the United States estimates that around 16 per cent of women who undergo mastectomy for invasive breast cancer have immediate breast reconstruction.[3,4] Surgical audit data suggests lower uptake in Australia, with immediate breast reconstruction reported for fewer than one in ten women.[1] Reconstruction can be performed during the same operation as the mastectomy, or it can be delayed. It can be easier to achieve good cosmetic outcomes with immediate breast reconstruction [5] and it can reduce the number of operations and total recovery time. Key clinical issues in considering an immediate reconstruction are the presence of comorbid health conditions and the need for post-mastectomy radiotherapy.[2,6–7] Immediate reconstruction may not be appropriate for patients that will undergo radiotherapy as it may increase the risk of implant related toxicity and implant failures.[8]
Numerator	Number of mastectomies for women with primary invasive breast cancer that had at least an initial breast reconstruction procedure in the same admission episode as the mastectomy.

Indicator name	Proportion of mastectomy for invasive breast cancer with immediate breast reconstructive surgery for primary invasive breast cancer (cont.)
Denominator	Number of mastectomies for women with primary invasive breast cancer.
Calculation	(Numerator/denominator)*100
Data source	Combined Admitted Patient Epidemiology Data (CAPED), Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health for interstate residents.
Inclusions	Mastectomies for primary invasive breast cancer (C50). **Breast reconstruction:** Block 1753 - all codes and 45539-00, 45530-02, 45533-00 **Mastectomy:** 31518-00, 31518-01, 31524-00, 31524-01
Exclusions	See Appendix 4.3 for descriptions of the procedure codes.
Notes	• Resections at Albury Base Hospital have not been included in this indicator as this hospital reports services to the Victorian Department of Health. • Breast reconstruction can be undertaken over a number of stages. It is not necessary for all stages to be complete to be counted in this indicator.
References	1. Roder D, Zorbas H, Kollias J, Pyke C, Walters D, Campbell I, et al. Factors predictive of immediate breast reconstuction following mastectomy for invasive breast cancer in Australia. Breast. 2013;22(6):1220-5. 2. National Institute for Health and Care Excellence. Early and locally advanced breast cancer: diagnosis and treatment. London: NICE;, 2009. 3. Lang JE, Summers DE, Cui H, Carey JN, Viscusi RK, Hurst CA, et al. Trends in post-mastectomy reconstruction: a SEER database analysis. J Surg Oncol. 2013;108(3):163-8. 4. Jeevan R, Cromwell DA, Browne JP, Trivella M, Pereira J, Caddy CM, et al. Regional variation in use of immediate breast reconstruction after mastectomy for breast cancer in England. EJSO. 2010;36(8):750-5. 5. Serletti JM, Fosnot J, Nelson JA, Disa JJ, Bucky LP. Breast reconstruction after breast cancer. Plast Reconstr Surg. 2011; 127(6):124e-135e. 6. Veronesi P, Ballardini B, De Lorenzi F, Magnoni F, Lissidini G, Caldarella P, et al. Immediate breast reconstruction after mastectomy. Breast. 2011;20(Suppl 3):S104-7. 7. Robb G. Immediate versus delayed breast reconstruction. Breast Cancer Research. 2007;9(1):S9 8. Jagsi R, Momoh AO, Qi J, Hamill JB, Billig J, Kim HM, et al. Impact of Radiotherapy on Complications and Patient-Reported Outcomes After Breast Reconstruction. Journal of the National Cancer Institute. 2018;110(2).

Indicator name	Emergency resections by public hospital, multiple cancer types
Related charts	• Colon cancer resections in NSW public hospitals (ranked), 2012 and 2017 • Gastric cancer resections in NSW public hospitals (ranked), 2012 and 2017 • Ovarian cancer resections in NSW public hospitals (ranked), 2012 and 2017
Intent	To provide additional information/ contextual information around volume of surgery conducted at hospitals within the LHD.
Background and evidence	This indicator provides background information to determine whether hospitals with low caseloads for cancer surgery are actually only doing emergency procedures.
Numerator	Number of emergency resections as indicated by emergency modifier in the anaesthetic procedure code.
Denominator	Total number of resections.
Calculation	(Numerator/denominator)*100

Indicator name	Emergency resections by public hospital, multiple cancer types (cont.)
Data source	Combined Admitted Patient Epidemiology Data (CAPED), Secure Analytics for Population Health Research and Intelligence (SAPHaRI), Centre for Epidemiology and Evidence, NSW Ministry of Health for interstate residents.
Inclusions	**Colon (C18) Rectal (C19 C20 C21)** 32000-00, 32000-01, 32000-02, 32000-03, 32003-00, 32003-01, 32003-02, 32003-03, 32004-00, 32004-01, 32004-02, 32004-03, 32005-00, 32005-01, 32005-02, 32005-03, 32006-00, 32006-01, 32006-02, 32006-03, 32009-00, 32009-01, 32012-00, 32012-01, 32015-00, 32024-00, 32025-00, 32026-00, 32028-00, 32030-00, 32030-01, 32039-00, 32047-00, 32051-00, 32051-01, 32060-00, 32112-00, 92208-00 **Gastric (C16)** 30518-00, 30518-01, 30518-02, 30521-00, 30523-00, 30524-00 **Ovarian (C56 C57.0 C48.1 C48.2)** 35637-10, 35638-02, 35638-03, 35638-11, 35638-12, 35638-13, 35653-02, 35653-03, 35653-04, 35661-00, 35664-00, 35664-01, 35667-00, 35667-01, 35670-00, 35673-00, 35673-01, 35673-02, 35713-07, 35713-11, 35713-14, 35717-01, 35717-04, 35717-05, 35753-00, 35753-01, 35753-02, 35756-01, 35756-02, 35756-03, 90328-00, 90328-01, 90448-02, 90450-00, 90450-01, 90450-02 See Appendix 4.3 for descriptions of the procedure codes.
Exclusions	N/A
Notes	• Emergency resections are identified from the second character ('0') of the two-digit extension to the Australian Classification of Health Intervention codes for anaesthesia (92508 to 92515 and 92519). • To be coded as an emergency procedure, the information must be documented on the anaesthetic form at the time the procedure took place. Where there is no documentation of the emergency modifier, the procedure will be coded as non-emergency or unknown ('9').[1]
References	1. Australian Consortium for Classification Development (2015) Australian Coding Standard 0031 ANAESTHESIA; in Australian Coding Standards for ICD-10-AM and ACHI, 9th Edition. Independent Hospital Pricing Authority.

Cancer research: Clinical trials indicators

Indicator name	Ratio of cancer clinical trial enrolments to cancer incidence in NSW
Related charts	• Ratio of cancer clinical trial enrolments to cancer incidence (per 100 cases), by local health district (LHD) (ranked), NSW, 2016–2017 FY and 2017–2018 FY • Ratio of cancer clinical trial enrolments to cancer incidence (per 100 cases), by clinical group (ranked), NSW, 2016–2017 FY and 2017–2018 FY
Intent	To monitor participation in cancer clinical trials relative to cancer incidence (by LHD and clinical grouping) to inform initiatives to increase participation in clinical trials.
Background and evidence	Establishing NSW as a destination of choice for cancer clinical trials is a key focus of the NSW Cancer Plan to achieve the objective of building globally-relevant cancer research capacity within NSW. When individuals and health care organisations are engaged in research, there is evidence that this improves processes of care and health outcomes for all patients, even if they are not participating in the research.[1–4] It has been demonstrated in both colorectal and ovarian cancer that the research activity of a hospital contributes to superior patient survival.[4,5] Clinical trials are a key research tool for the development of new interventions, tests and procedures to improve cancer outcomes. Clinical trials also provide participants with alternative treatment options and access to new treatments before they are widely available.
Numerator	Number of enrolments into cancer clinical trials (by LHD or clinical group) during the reporting period.
Denominator	Number of incident cancer cases (by LHD or clinical group) during the reporting period.
Calculation	(Numerator/denominator)*100
Data source	• Clinical trial enrolment data was sourced from the NSW Clinical Trials Portal, Cancer Institute NSW. • Incidence data was sourced from the NSW Cancer Registry, Cancer Institute NSW.
Inclusions	Cancer clinical trials with an interventional study design which involves the participant receiving a form of intervention, such as a new medicine, in order to evaluate it.
Exclusions	Non-interventional cancer clinical trials have been excluded.
Notes	• This indicator is dependent on the accuracy and completeness of reporting from LHDs, so may not include all cancer clinical trial activity within LHDs. • Due to delays in obtaining timely cancer incidence data, the time periods used for the reporting of cancer incidence and clinical trial enrolments do not align. • Clinical trials enrolments for some cancer types, such as eye cancers and cancer of unknown primary, are not included in a clinical grouping, but are included in the 'all cancers' category. • This indicator reports on the place of residence of incident cancer cases, not the place of treatment or where a clinical trial may take place.
References	1. Boaz A, Hanney S, Jones T, et al. Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. BMJ Open. 2015;5:e009415. doi:10.1136/bmjopen-2015–009415. 2. Ozdemir B, Karthikesalingam A, Sinha S, et al. Research activity and the association with mortality. PLoS ONE. 2015;10(2):e0118253. doi:10.1371/journal.pone.0118253. 3. Clarke M, Loudon K. Effects on patients of their healthcare practitioner's or institution's participation in clinical trials: a systematic review. Trials. 2011;12:16. doi: 10.1186/1745–6215–12–16. 4. Downing A, Morris E, Corrigan N, et al. High hospital research participation and improved colorectal cancer survival outcomes: a population-based study. Gut. 2017;66:89–96. doi: 10.1136/gutjnl-2015-311308. 5. Rochon J, du Bois A, Lange T. Mediation analysis of the relationship between institutional research activity and patient survival. BMC Med Res Methodol. 2014;14:9. doi: 10.1186/1471-2288-14-9.

Indicator name	Number of cancer clinical trials open for recruitment, by trial category in NSW
Related charts	• Number of cancer clinical trials open for recruitment, by trial category, NSW, 2014, 2015, 2016–2017 FY and 2017–2018 FY • Number of cancer clinical trials open for recruitment, by trial category, by LHD and specialty health network (ranked), 2017–2018 FY
Intent	To monitor the number of cancer clinical trials open for recruitment in NSW and within NSW local health districts (LHDs), by trial category.
Background and evidence	Establishing NSW as a destination of choice for cancer clinical trials is a key focus of the *NSW Cancer Plan* to achieve the objective of building globally-relevant cancer research capacity within NSW. When individuals and health care organisations are engaged in research, there is evidence that this improves processes of care and health outcomes for all patients, even if they are not participating in the research.[1–4] It has been demonstrated in both colorectal and ovarian cancer that the research activity of a hospital contributes to superior patient survival.[4,5] Clinical trials are a key research tool for the development of new interventions, tests and procedures to improve cancer outcomes. Clinical trials also provide participants with alternative treatment options and access to new treatments before they are widely available.
Numerator	Number of cancer clinical trials open to recruitment for at least one day during the reporting period, by trial category (portfolio, non-portfolio and commercial).
Denominator	N/A
Calculation	Number of cancer clinical trials in each category within the reporting period.
Data source	NSW Clinical Trials Portal, Cancer Institute NSW.
Inclusions	• Cancer clinical trials with an interventional study design which involves the participant receiving a form of intervention, such as a new medicine, in order to evaluate it. • Trials were determined as 'open' if the recruitment open date is before the end date of the reporting period, and there is no evidence that the recruitment has closed on the NSW Clinical Trials Portal.
Exclusions	Non-interventional cancer clinical trials have been excluded.
Notes	• This indicator is dependent on the accuracy and completeness of reporting from LHDs, so may not include all cancer clinical trial activity within LHDs. • If a trial is open at multiple clinical trial units within an LHD, it is only counted once. • Portfolio trials are investigator-initiated clinical trials which meet the Cancer Institute NSW portfolio criteria (see https://www.cancer.nsw.gov.au/data-research/clinical-trials/clinical-trial-program-overview) and are eligible for funding. • Non-portfolio trials are investigator-initiated clinical trials which do not meet the Cancer Institute NSW portfolio criteria. • Commercial trials are those which are funded by, and for which the data are owned by, pharmaceutical or biotechnology companies.
References	1. Boaz A, Hanney S, Jones T, et al. Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. BMJ Open. 2015;5:e009415. doi:10.1136/bmjopen-2015–009415. 2. Ozdemir B, Karthikesalingam A, Sinha S, et al. Research activity and the association with mortality. PLoS ONE. 2015;10(2):e0118253. doi:10.1371/journal.pone.0118253. 3. Clarke M, Loudon K. Effects on patients of their healthcare practitioner's or institution's participation in clinical trials: a systematic review. Trials. 2011;12:16. doi: 10.1186/1745–6215–12–16. 4. Downing A, Morris E, Corrigan N, et al. High hospital research participation and improved colorectal cancer survival outcomes: a population-based study. Gut. 2017;66:89–96. doi: 10.1136/gutjnl-2015-311308. 5. Rochon J, du Bois A, Lange T. Mediation analysis of the relationship between institutional research activity and patient survival. BMC Med Res Methodol. 2014;14:9. doi: 10.1186/1471-2288-14-9.

Indicator name	Number of enrolments in cancer clinical trials, by trial category in NSW
Related charts	• Number of enrolments in cancer clinical trials, by trial category, NSW, 2014, 2015, 2016–2017 FY and 2017–2018 FY • Number of enrolments in cancer clinical trials, by trial category, by LHD and specialty health network (ranked), 2017–2018 FY
Intent	To monitor the number of enrolments into cancer clinical trials in NSW and within NSW local health districts (LHDs), by trial category.
Background and evidence	Establishing NSW as a destination of choice for cancer clinical trials is a key focus of the NSW Cancer Plan to achieve the objective of building globally-relevant cancer research capacity within NSW. When individuals and health care organisations are engaged in research, there is evidence that this improves processes of care and health outcomes for all patients, even if they are not participating in the research.[1–4] It has been demonstrated in both colorectal and ovarian cancer that the research activity of a hospital contributes to superior patient survival.[4,5] Clinical trials are a key research tool for the development of new interventions, tests and procedures to improve cancer outcomes. Clinical trials also provide participants with alternative treatment options and access to new treatments before they are widely available.
Numerator	Number of enrolments into cancer clinical trials during the reporting period by trial category (portfolio, non-portfolio and commercial).
Denominator	N/A
Calculation	Number of enrolments in each trial category within the reporting period.
Data source	NSW Clinical Trials Portal, Cancer Institute NSW.
Inclusions	• Cancer clinical trials with an interventional study design which involves the participant receiving a form of intervention, such as a new medicine, in order to evaluate it. • Trials were determined as 'open' if the recruitment open date is before the end date of the reporting period, and there is no evidence that the recruitment has closed on the NSW Clinical Trials Portal.
Exclusions	Non-interventional cancer clinical trials have been excluded.
Notes	• This indicator is dependent on the accuracy and completeness of reporting from LHDs, so may not include all cancer clinical trial activity within LHDs. • If a trial is open at multiple clinical trial units within an LHD, it is only counted once. • Portfolio trials are investigator-initiated clinical trials which meet the Cancer Institute NSW portfolio criteria (see https://www.cancer.nsw.gov.au/data-research/clinical-trials/clinical-trial-program-overview) and are eligible for funding. • Non-portfolio trials are investigator-initiated clinical trials which do not meet the Cancer Institute NSW portfolio criteria. • Commercial trials are those which are funded by, and for which the data are owned by, pharmaceutical or biotechnology companies.
References	1. Boaz A, Hanney S, Jones T, et al. Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review. BMJ Open. 2015;5:e009415. doi:10.1136/bmjopen-2015–009415. 2. Ozdemir B, Karthikesalingam A, Sinha S, et al. Research activity and the association with mortality. PLoS ONE. 2015;10(2):e0118253. doi:10.1371/journal.pone.0118253. 3. Clarke M, Loudon K. Effects on patients of their healthcare practitioner's or institution's participation in clinical trials: a systematic review. Trials. 2011;12:16. doi: 10.1186/1745–6215–12–16. 4. Downing A, Morris E, Corrigan N, et al. High hospital research participation and improved colorectal cancer survival outcomes: a population-based study. Gut. 2017;66:89–96. doi: 10.1136/gutjnl-2015-311308. 5. Rochon J, du Bois A, Lange T. Mediation analysis of the relationship between institutional research activity and patient survival. BMC Med Res Methodol. 2014;14:9. doi: 10.1186/1471-2288-14-9.

Indicator name	Proportion of cancer clinical trials open for recruitment for more than 180 days with nil recruitment in NSW
Related charts	Proportion of cancer clinical trials open for recruitment for more than 180 days with nil recruitment, by local health district (LHD) and specialty health network (ranked), 2017–2018 FY
Intent	To quantify the number and proportion of cancer clinical trials that have been open for recruitment for more than 180 days within a local health district (LHD) and have not enrolled a participant.
Background and evidence	When a clinical trial fails to enrol and retain a target sample (number of participants), this compromises its prospect of delivering a statistically informative answer to the primary question.[1] It is estimated that between 22% and 38% of cancer clinical trials internationally close with insufficient enrolment.[2,3] An investigation into the reason for termination of trials in the United States Trial Registry reported the lead reason to be an insufficient accrual rate (57%).[4] The most commonly-reported reason for low accrual rates into a trial is that the supply of suitable patients becomes a fraction of what it was assumed to be before the trial began; a phenomenon known as 'Lasagna's Law', whereby invariably most researchers who conduct clinical trials overestimate the number of eligible participants.[5,6] Clinical trials are expensive to set up, so it is important for hospitals and cancer centres to review trials which are not enrolling people and have been open for a long period of time.
Numerator	Number of cancer clinical trials in an LHD with at least one site that was open to recruitment for at least 180 days and never enrolled a participant during the reporting period.
Denominator	Number of cancer clinical trials in an LHD that were open to recruitment for at least 180 days during the reporting period.
Calculation	(Numerator/denominator)*100
Data source	NSW Clinical Trials Portal, Cancer Institute NSW.
Inclusions	Cancer clinical trials that were open for at least 180 days during the reporting period.
Exclusions	Trials which have already been closed during the reporting period are excluded.
Notes	• This indicator is dependent on the accuracy and completeness of reporting from LHDs, so may not include all cancer clinical trial activity within LHDs. • The 180-day grace period for nil recruitment is based on cumulative enrolment, which may span more than one reporting period.
References	1. Schroen T, Petroni G, Wang H, et al. Achieving sufficient accrual to address the primary endpoint in phase III clinical trials from U.S. Cooperative Oncology Groups. Clin Cancer Res. 2012; 18(1):256-62. doi: 10.1158/1078-0432.CCR-11-1633. 2. Korn E, Freidlin B, Mooney M, et al. Accrual experience of National Cancer Institute Cooperative Group phase III trials activated from 2000 to 2007. J Clin Oncol. 2010; 28:5197-5201. doi: 10.1200/JCO.2010.31.5382. 3. Cheng S, Dietrich M, Dilts D. A sense of urgency: evaluating the link between clinical trial development time and the accrual performance of Cancer Therapy Evaluation Program (NCI-CTEP) sponsored studies. Clin Cancer Res. 2010;16:5557-63. doi: 10.1158/1078-0432.CCR-10-0133 4. Williams R, Tse T, DiPiazza K, et al. Terminated trials in the ClinicalTrials.gov results database: evaluation of availability of primary outcome data and reasons for termination. PLoS ONE. 2015;10(5): e0127242. doi:10.1371/journal.pone.0127242. 5. van der Wouden J, Blankenstein A, Huibers M, et al. Survey among 78 studies showed that Lasagna's law holds in Dutch primary care research. J Clin Epidemiol. 2007;60:819–24. doi: 10.1016/j.jclinepi.2006.11.010. 6. Carlisle B, Kimmelman J, Ramsay T, et al. Unsuccessful trial accrual and human subjects protections: an empirical analysis of recently closed trials. Clin Trials. 2015;12(1):77–83. doi: 10.1177/1740774514558307.

Appendix 3: Cancer treatment and services

3.1 Hospitals sampled in the 2017 Outpatient Cancer Clinics Survey (conducted by the Bureau of Health Information)

Central Coast

- Gosford Hospital
- Wyong Hospital

Far West

- Broken Hill Base Hospital*

Hunter New England

- Armidale and New England Hospital
- Calvary Mater Newcastle
- John Hunter Hospital
- Manning Base Hospital
- Moree District Hospital*
- Muswellbrook District Hospital*
- Tamworth Base Hospital

Illawarra Shoalhaven

- Milton and Ulladulla Hospital*
- Shoalhaven and District Memorial Hospital
- Wollongong Hospital

Mid North Coast

- Coffs Harbour Base Hospital
- Port Macquarie Base Hospital

Murrumbidgee

- Deniliquin Health Service*
- Griffith Community Health*
- Griffith Base Hospital*
- Wagga Wagga Base Hospital*
- Young Health Service*

Nepean Blue Mountains

- Nepean Hospital

Northern NSW

- Grafton Base Hospital
- Lismore Base Hospital
- The Tweed Hospital

Northern Sydney

- Manly District Hospital
- Royal North Shore Hospital

South Eastern Sydney

- Prince of Wales Hospital
- Royal Hospital for Women

South Western Sydney

- Bankstown/Lidcombe Hospital
- Campbelltown Hospital
- Liverpool Hospital

Southern NSW

- Bega Valley Community Health
- Bourke Valley Community Health
- Cooma Health Service*
- Eurobodalla Community Health
- Goulburn Community Health Service*
- Queanbeyan Health Service*

St Vincent's Health Network

- St Vincent's Hospital, Darlinghurst

Sydney

- Concord Hospital
- Royal Prince Alfred Hospital

Western NSW

- Bathurst Base Hospital
- Cowra District Hospital*
- Dubbo Base Hospital
- Mudgee District Hospital*
- Orange Health Service
- Parkes District Hospital*

Western Sydney

- Blacktown Hospital
- Westmead Hospital

Private facilities^

- Chris O'Brien Lifehouse
- Radiation Oncology Institute, Wahroonga
- Sydney Adventist Private Hospital

* Indicates facilities not reported at facility level due to less than 30 respondents.

^ Indicates private facilities included in the NSW total.

Notes:

1. LHD results include all respondents who attended public facilities within the LHD, even if the facility has <30 respondents.
2. LHD results do not include respondents from private facilities.
3. NSW results include respondents from private facilities.

3.2 Surgical procedure codes

Breast (C50)

31500-00	Excision of lesion of breast
31515-00	Re-excision of lesion of breast
31518-00	Simple mastectomy, unilateral
31518-01	Simple mastectomy, bilateral
31524-00	Subcutaneous mastectomy, unilateral
31524-01	Subcutaneous mastectomy, bilateral

Colorectal (C18 C19 C20 C21)

32000-00	Limited excision of large intestine with formation of stoma
32000-01	Right hemicolectomy with formation of stoma
32000-02	Laparoscopic limited excision of large intestine with formation of stoma
32000-03	Laparoscopic right hemicolectomy with formation of stoma
32003-00	Limited excision of large intestine with anastomosis
32003-01	Right hemicolectomy with anastomosis
32003-02	Laparoscopic limited excision of large intestine with anastomosis
32003-03	Laparoscopic right hemicolectomy with anastomosis
32004-00	Subtotal colectomy with formation of stoma
32004-01	Extended right hemicolectomy with formation of stoma
32004-02	Laparoscopic subtotal colectomy with formation of stoma
32004-03	Laparoscopic extended right hemicolectomy with formation of stoma
32005-00	Subtotal colectomy with anastomosis
32005-01	Extended right hemicolectomy with anastomosis
32005-02	Laparoscopic subtotal colectomy with anastomosis
32005-03	Laparoscopic extended right hemicolectomy with anastomosis
32006-00	Left hemicolectomy with anastomosis
32006-01	Left hemicolectomy with formation of stoma
32006-02	Laparoscopic left hemicolectomy with anastomosis
32006-03	Laparoscopic left hemicolectomy with formation of stoma
32009-00	Total colectomy with ileostomy
32009-01	Laparoscopic total colectomy with ileostomy
32012-00	Total colectomy with ileorectal anastomosis
32012-01	Laparoscopic total colectomy with ileorectal anastomosis
32015-00	Total proctocolectomy with ileostomy
32024-00	High anterior resection of rectum
32025-00	Low anterior resection of rectum
32026-00	Ultra low anterior resection of rectum
32028-00	Ultra low anterior resection of rectum with hand sutured coloanal anastomosis
32030-00	Rectosigmoidectomy with formation of stoma
32030-01	Laparoscopic rectosigmoidectomy with formation of stoma
32039-00	Abdominoperineal proctectomy
32047-00	Perineal proctectomy
32051-00	Total proctocolectomy with ileo-anal anastomosis
32051-01	Total proctocolectomy with ileo-anal anastomosis and formation of temporary ileostomy
32060-00	Restorative proctectomy
32112-00	Perineal rectosigmoidectomy
92208-00	Anterior resection of rectum, level unspecified

Gastric (C16)

30518-00	Partial distal gastrectomy with gastroduodenal anastomosis
30518-01	Partial distal gastrectomy with gastrojejunal anastomosis
30518-02	Partial proximal gastrectomy with oesophagogastric anastomosis
30521-00	Total gastrectomy
30523-00	Subtotal gastrectomy
30524-00	Radical gastrectomy

Head and neck

30247-00	Total excision of parotid gland
30250-00	Total excision of parotid gland with preservation of facial nerve
30255-00	Removal of submandibular ducts
30259-00	Excision of sublingual gland
30275-00	Radical excision of intraoral lesion
30294-00	Cervical oesophagectomy
30294-01	Laryngopharyngectomy and plastic reconstruction
31423-01	Regional excision of lymph nodes of neck
31435-00	Radical excision of lymph nodes of neck
34148-00	Resection of lesion of carotid artery <= 4 cm in diameter

34151-00	Resection of lesion of carotid artery > 4 cm in diameter
34154-00	Resection of recurrent lesion of carotid artery
38453-00	Resection of endotracheal lesion with anastomosis
38453-02	Resection of endotracheal lesion with graft
39640-00	Removal of lesion involving anterior cranial fossa
39642-00	Removal of lesion involving anterior cranial fossa with clearance of paranasal sinus extension
39646-00	Removal of lesion involving anterior cranial fossa with radical clearance of paranasal sinus and orbital fossa extension
39650-00	Removal of lesion involving middle cranial and infratemporal fossae
39700-00	Excision of lesion of skull
41545-00	Mastoidectomy
41548-00	Obliteration of mastoid cavity
41581-00	Removal of lesion involving infratemporal fossa
41728-00	Lateral rhinotomy with removal of intranasal lesion
41779-01	Total excision of tongue
41782-00	Partial pharyngectomy
41785-00	Partial pharyngectomy with partial glossectomy
41785-01	Partial pharyngectomy with total glossectomy
41834-00	Total laryngectomy
41837-00	Hemilaryngectomy
41840-00	Supraglottic laryngectomy
41843-00	Laryngopharyngectomy
42539-00	Exploratory orbitotomy with excision of lesion, requiring removal and replacement of bone
42543-00	Exploratory orbitotomy, retrobulbar aspect, with excision of lesion
45562-00	Noninnervated free flap
45562-01	Innervated free flap
45596-00	Total resection of 1 maxilla
45597-00	Total resection of both maxillae
45599-00	Total resection of both sides of mandible
45602-00	Subtotal resection of mandible
45602-01	Subtotal resection of maxilla
45605-00	Partial resection of mandible
45605-01	Partial resection of maxilla
45611-00	Mandibular condylectomy
45720-00	Osteotomy of mandible, unilateral
45720-01	Osteotomy of maxilla, unilateral
45720-02	Ostectomy of mandible, unilateral
45720-03	Ostectomy of maxilla, unilateral
45723-00	Osteotomy of mandible with internal fixation, unilateral
45723-01	Osteotomy of maxilla with internal fixation, unilateral
45723-02	Ostectomy of mandible with internal fixation, unilateral
45723-03	Ostectomy of maxilla with internal fixation, unilateral
45726-00	Osteotomy of mandible, bilateral
45726-01	Osteotomy of maxilla, bilateral
45726-02	Ostectomy of mandible, bilateral
45726-03	Ostectomy of maxilla, bilateral
45729-00	Osteotomy of mandible with internal fixation, bilateral
45729-01	Osteotomy of maxilla with internal fixation, bilateral
45729-02	Ostectomy of mandible with internal fixation, bilateral
45729-03	Ostectomy of maxilla with internal fixation, bilateral
45731-00	Osteotomies or ostectomies of mandible, <= 3 procedures
45731-01	Osteotomies or ostectomies of maxilla, <= 3 procedures
45732-00	Osteotomies or ostectomies of mandible, <= 3 procedures, with internal fixation
45732-01	Osteotomies or ostectomies of maxilla, <= 3 procedures, with internal fixation
45735-00	Osteotomies or ostectomies of mandible and maxilla, 4 procedures
45738-00	Osteotomies or ostectomies of mandible and maxilla, 4 procedures, with internal fixation
45741-00	Osteotomies or ostectomies of mandible and maxilla, 5 procedures
45744-00	Osteotomies or ostectomies of mandible and maxilla, 5 procedures, with internal fixation
45747-00	Osteotomies or ostectomies of mandible and maxilla, >= 6 procedures
45752-00	Osteotomies or ostectomies of mandible or maxilla, >= 6 procedures, with internal fixation
45753-00	Midfacial osteotomies
45754-00	Midfacial osteotomies with internal fixation
45755-00	Temporomandibular meniscectomy
45863-00	Exploration of temporomandibular joint with condylectomy or condylotomy

45873-00	Exploration of the temporomandibular joint with meniscus, capsular and condylar surgery using tissue flaps, cartilage gr
52120-00	Partial resection of mandible with condylectomy
90138-00	Excision of lesion of salivary gland
90679-00	Osteotomy of zygoma, unilateral
90679-01	Osteotomy of zygoma, bilateral
90679-02	Ostectomy of zygoma, unilateral
90679-03	Ostectomy of zygoma, bilateral
90680-00	Osteotomy of zygoma with internal fixation, unilateral
90680-01	Osteotomy of zygoma with internal fixation, bilateral
90680-02	Ostectomy of zygoma with internal fixation, unilateral
90680-03	Ostectomy of zygoma with internal fixation, bilateral

Liver (C22)

30414-00	Excision of lesion of liver
30415-00	Segmental resection of liver
30418-00	Lobectomy of liver
30421-00	Trisegmental resection of liver
90346-00	Total hepatectomy

Lung (C34)

38438-00	Segmental resection of lung
38438-01	Lobectomy of lung
38438-02	Pneumonectomy
38440-00	Wedge resection of lung
38440-01	Radical wedge resection of lung
38441-00	Radical lobectomy
38441-01	Radical pneumonectomy

Oesophageal (C15 C16.0)

30535-00	Oesophagectomy by abdominal and transthoracic mobilisation, with thoracic oesophagogastric anastomosis
30536-00	Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagogastric anastomosis
30536-01	Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagostomy
30541-00	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagogastric anastomosis
30541-01	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagojejunal anastomosis
30545-00	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis, large intestine interposition and anast
30545-01	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis using Roux-en-Y reconstruction
30550-00	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis, large intestine interposition and anast
30550-01	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis using Roux-en-Y reconstruction

Pancreatic (C25 C24 C17.0)

30583-00	Distal pancreatectomy
30584-00	Pancreaticoduodenectomy with formation of stoma
30593-00	Pancreatectomy
30593-01	Pancreatectomy with splenectomy

Ovarian (C56 C57.0 C48.1 C48.2)

35637-10	Laparoscopic excision of lesion of pelvic cavity
35638-02	Laparoscopic oophorectomy, unilateral
35638-03	Laparoscopic oophorectomy, bilateral
35638-11	Laparoscopic salpingo-oophorectomy, unilateral
35638-12	Laparoscopic salpingo-oophorectomy, bilateral
35638-13	Laparoscopic unilateral oophorectomy with bilateral salpingectomy
35653-02	Abdominal hysterectomy with unilateral salpingo-oophorectomy
35653-03	Abdominal hysterectomy with bilateral salpingo-oophorectomy
35653-04	Total abdominal hysterectomy with removal of adnexa
35661-00	Abdominal hysterectomy with extensive retroperitoneal dissection
35664-00	Radical abdominal hysterectomy with radical excision of pelvic lymph nodes
35664-01	Radical vaginal hysterectomy with radical excision of pelvic lymph nodes
35667-00	Radical abdominal hysterectomy
35667-01	Radical vaginal hysterectomy

35670-00	Abdominal hysterectomy with radical excision of pelvic lymph nodes
35673-00	Vaginal hysterectomy with unilateral salpingo-oophorectomy
35673-01	Vaginal hysterectomy with bilateral salpingo-oophorectomy
35673-02	Vaginal hysterectomy with removal of adnexa
35713-07	Oophorectomy, unilateral
35713-11	Salpingo-oophorectomy, unilateral
35713-14	Excision of lesion of pelvic cavity
35717-01	Oophorectomy, bilateral
35717-04	Salpingo-oophorectomy, bilateral
35717-05	Unilateral oophorectomy with bilateral salpingectomy
35753-00	Laparoscopically assisted vaginal hysterectomy with unilateral salpingo-oophorectomy
35753-01	Laparoscopically assisted vaginal hysterectomy with bilateral salpingo-oophorectomy
35753-02	Laparoscopically assisted vaginal hysterectomy with removal of adnexa
35756-01	Laparoscopically assisted vaginal hysterectomy proceeding to abdominal hysterectomy with unilateral salpingo-oophorectom
35756-02	Laparoscopically assisted vaginal hysterectomy proceeding to abdominal hysterectomy with bilateral salpingo-oophorectomy
35756-03	Laparoscopically assisted vaginal hysterectomy proceeding to abdominal hysterectomy with removal of adnexa
90328-00	Excision of lesion of peritoneal tissue
90328-01	Excision of lesion of peritoneal tissue with intestinal resection
90448-02	Total laparoscopic abdominal hysterectomy with removal of adnexa
90450-00	Anterior pelvic exenteration
90450-01	Posterior pelvic exenteration
90450-02	Total pelvic exenteration

3.3 NSW local health districts (LHDs) and hospital networks

The following LHDs, hospital networks and hospitals performed the resections for all cancers detailed in this report.

Metropolitan NSW local health districts:

- Central Coast
- Illawarra Shoalhaven
- Nepean Blue Mountains
- Northern Sydney
- South Eastern Sydney
- South Western Sydney
- St Vincent's Health Network
- Sydney
- Western Sydney

Rural and regional NSW local health districts:

- Far West
- Hunter New England
- Mid North Coast
- Murrumbidgee
- Northern NSW
- Southern NSW
- Western NSW

Major

- Auburn Hospital
- Blacktown Hospital
- Campbelltown Hospital
- Canterbury Hospital
- Coffs Harbour Base Hospital
- Dubbo Base Hospital
- Fairfield Hospital
- Hornsby and Ku-Ring-Gai Hospital
- Lismore Base Hospital
- Maitland Hospital
- Manly District Hospital
- Manning Base Hospital
- Mona Vale and District Hospital
- Orange Health Service
- Port Macquarie Base Hospital
- Shoalhaven and District Memorial Hospital
- Sutherland Hospital
- Tamworth Base Hospital
- The Tweed Hospital
- Wagga Wagga Base Hospital
- Wyong Hospital

Principal referral

- Bankstown / Lidcombe Hospital
- Concord Hospital
- Gosford Hospital
- John Hunter Hospital
- Liverpool Hospital
- Nepean Hospital
- Prince of Wales Hospital
- Royal North Shore Hospital
- Royal Prince Alfred Hospital
- St George Hospital
- St Vincents Hospital, Darlinghurst
- Westmead Hospital
- Wollongong Hospital

District group 1

- Armidale and New England Hospital
- Bathurst Base Hospital
- Belmont Hospital
- Bowral and District Hospital
- Broken Hill Base Hospital
- Goulburn Base Hospital
- Grafton Base Hospital
- Griffith Base Hospital
- Mount Druitt Hospital
- Ryde Hospital
- Shellharbour Hospital
- South East Regional Hospital

District group 2

- Ballina District Hospital
- Blue Mountains District Anzac Memorial Hospital
- Bulli District Hospital
- Casino and District Memorial Hospital
- Cessnock District Hospital
- Cooma Health Service
- Cowra District Hospital
- Forbes District Hospital
- Kempsey Hospital
- Kurri Kurri District Hospital
- Lithgow Health Service
- Moree District Hospital
- Moruya District Hospital
- Mudgee District Hospital
- Parkes District Hospital
- Queanbeyan Health Service
- Singleton District Hospital
- Young Health Service

Public contract

- Hawkesbury District Health Service

Ungrouped acute

- Calvary Mater Newcastle
- Royal Hospital for Women
- Sydney/Sydney Eye Hospital

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