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Australian Institute of Health and Welfare

National Bowel Cancer Screening Program

Monitoring report 2017

Australian Government
Australian Institute of Health and Welfare

Authoritative information and statistics to promote better health and wellbeing

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National Bowel Cancer Screening Program

Monitoring report 2017

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Abbreviations

ABDS	Australian Burden of Disease Study
ABS	Australian Bureau of Statistics
ACD	Australian Cancer Database
ACT	Australian Capital Territory
ASGS	Australian Statistical Geography Standard
AIHW	Australian Institute of Health and Welfare
ASR	age-standardised rate
DALY	disability-adjusted life year
ICD	International Classification of Diseases and Related Health Problems
iFOBT	immunochemical faecal occult blood test
IRSD	Index of Relative Socio-economic Disadvantage
NBCSP	National Bowel Cancer Screening Program
NMD	National Mortality Database
NSW	New South Wales
NT	Northern Territory
PHCP	primary health-care practitioner (general practitioner or other primary health-care provider)
Qld	Queensland
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia
YLL	years of life lost

Symbols

–	nil or rounded to zero
. .	not applicable
n.a.	not available
n.p.	not publishable because of small numbers, confidentiality or other concerns about the quality of the data
N	number

Summary

The National Bowel Cancer Screening Program (NBCSP) began in 2006. It aims to reduce the morbidity and mortality from bowel cancer by actively recruiting and screening the eligible target population aged between 50 and 74 for early detection or prevention of the disease.

This monitoring report is the second to examine the NBCSP using new key performance indicators.

Participation

Of the 2.6 million people invited between January 2014 and December 2015, 39% participated in the program. The national participation rate was slightly higher than that for the previous rolling 2-year period (2013–2014) (37%). The re-participation rate for people who had taken part in an earlier invitation round and were receiving a subsequent screening invitation was 76%.

Screening results

In 2015, about 41,000 Australians returned a positive screening test, giving an 8% screening positivity rate. Of the people who received a positive screening test, 70% had reported a follow-up diagnostic assessment. The median time from positive screening test result to diagnostic assessment was 53 days.

Cancers and adenomas detected

Data for cancer and adenoma diagnoses were not considered complete enough to allow formal performance indicator reporting. However, of the data available for participants who had a diagnostic assessment in 2015, 1 in 29 were diagnosed with a confirmed or suspected cancer (168 and 807, respectively) and adenomas were diagnosed in a further 3,538 participants (1 in 8 participants assessed). Adenomas are benign growths that have the potential to become cancerous; their removal lowers the risk of future bowel cancers in these participants.

Population groups

Participants who self-identified as Indigenous, participants who lived in *Very remote* areas and participants who lived in low socioeconomic areas had higher screening positivity rates, yet had a lower follow-up diagnostic assessment rate and a longer median time between a positive screen and assessment.

Since the NBCSP began

Since the program began in August 2006, about 3.5 million NBCSP screening tests have been completed, with about 186,000 participants having a diagnostic assessment to follow up a positive screening result. From the data available for participants who have had diagnostic assessment, 1 in 32 have been diagnosed with a confirmed or suspected cancer and 1 in 7 have had an adenoma detected. A previous data linkage study by the Australian Institute of Health and Welfare found that the NBCSP is contributing to reducing morbidity and mortality from bowel cancer in Australia (AIHW 2014a).

Data at a glance

Table 1.0: Summary of NBCSP performance indicators[a], Australia

Indicator		Definition	Value
PI 1*	Participation rate	The percentage of people invited to screen through the NBCSP between **1 January 2014 and 31 December 2015** who returned a completed screening test within that period or by **30 June 2016**.	39%
PI 2	Screening positivity rate	The percentage of people who returned a valid NBCSP screening test and received a positive screening result (warranting further assessment) between **1 January 2015 and 31 December 2015**.	8%
PI 3	Diagnostic assessment rate	The percentage of people who returned a positive NBCSP screening test (warranting further assessment) between **1 January 2015 and 31 December 2015** and had follow-up diagnostic assessment within that period or by **31 December 2016**.	70%
PI 4	Time between positive screen and diagnostic assessment	For those who received a positive NBCSP screening test (warranting further assessment) between **1 January 2015 and 31 December 2015**, the median time between the positive screen and a follow-up diagnostic assessment within that period, or by **31 December 2016**.	53 days
PI 9	Adverse events—hospital admission	The rate at which people who had a diagnostic assessment between **1 January 2015 and 31 December 2015** were admitted to hospital within 30 days of their assessment.	9 per 10,000 assessments
PI 10	Incidence of colorectal cancer	The (estimated) incidence of colorectal cancer per 100,000 estimated resident population in **2017**[b].	58 cases per 100,000 people
PI 11	Mortality from colorectal cancer	The (estimated) mortality of colorectal cancer per 100,000 estimated resident population in **2017**[b].	14 deaths per 100,000 people

*PI = performance indicator. Hereafter in this report, the abbreviation is used whenever referring to a specific indicator (e.g. PI 3 Diagnostic assessment rate); otherwise the full expression is used.

(a) NBCSP performance indicators presented here are different from the performance measures reported in monitoring reports before 2016. See Appendix C for further details.

(b) Rates for 2017 are estimated based on data to 2012–2013. See Appendix D for further details.

Notes

1. PIs 3 to 9 rely on information being reported back to the Register. As the return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
2. PI 5a (adenoma detection rate), PI 5b (positive predictive value (PPV) of diagnostic assessment for detecting adenoma), PI 6a (colorectal cancer detection rate), PI 6b (PPV of diagnostic assessment for detecting colorectal cancer), PI 7 (interval cancer rate) and PI 8 (cancer clinico-pathological stage) are not reported due to data incompleteness or unavailability. See 'Current reporting limitations' on page 4 for more details.

1 Introduction

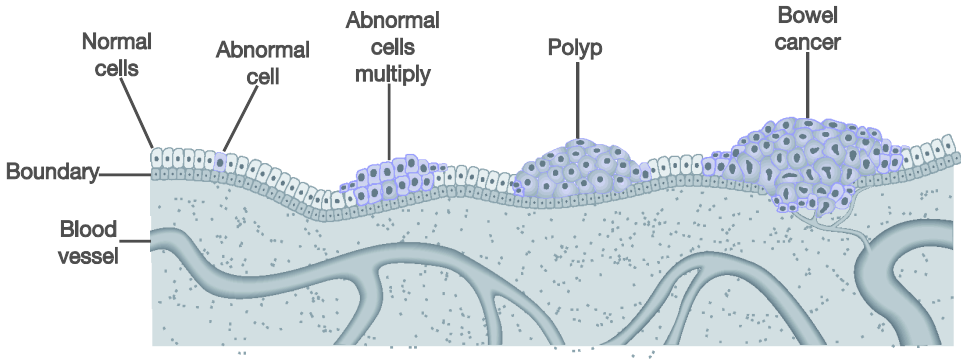
1.1 Purpose of this report

This monitoring report is the second to monitor data for the National Bowel Cancer Screening Program (NBCSP) based on the NBCSP key performance indicators (AIHW 2014b). To ensure that the most recent data are used for each indicator, the time frame in which each performance indicator is analysed can vary. However, where possible, analysis for indicators includes the period from 1 January 2015 to 31 December 2015.

1.2 Bowel cancer facts

Defining bowel cancer

Bowel cancer (or colorectal cancer) generally develops through a multistage process in which a series of cellular mutations occur over time. Most bowel cancers start in the epithelial cells, which form part of the inner lining of the large bowel (intestinal mucosa layer). Early stages of these mutations result in benign polyps. However, polyps may undergo further mutations and become a benign adenoma and, ultimately, a malignant bowel cancer (Figure 1.1). Later stages of bowel cancer can spread to other sites in the body through the lymphatic or vascular system.



© Cancer Council Victoria 2013.

Source: Cancer Council Victoria 2013.

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Figure 1.1: Beginnings of bowel cancer

Stage

Bowel cancer stage describes the extent or spread of cancer in the body at the time of diagnosis. Staging is usually based on the size of the tumour, whether lymph nodes contain cancer, and whether the cancer has spread from the original site to other parts of the body (Sobin et al. 2010). Bowel cancer stages are generally defined using the Australian Clinico-Pathological Staging (ACPS) classification system. Prognosis is often related to what stage of development the cancer has reached when first diagnosed, with smaller, less developed cancers having better prognoses than advanced cancers (Table 1.1).

Table 1.1: Defined Australian clinico-pathological stages of bowel cancer

Australian clinico-pathological stage	Description	Survival estimates
A	Cancer is contained within superficial layers of the bowel	93% 5-year survival rate
B	Cancer has spread to outer surface of the bowel wall	82% 5-year survival rate
C	Cancer has spread to the lymph nodes	59% 5-year survival rate
D	Cancer has spread to other sites in the body	8% 5-year survival rate

Note: Survival estimates were sourced from an American study (O'Connell et al. 2004) which used a comparable classification system. Similar rates have been shown in Australia (Morris et al. 2007).

Risk factors for bowel cancer

A risk factor is any factor associated with an increased likelihood of a person's developing a health disorder or health condition. It is not known what causes bowel cancer; however, as at December 2016, several risk factors have been identified that may increase the chance of developing bowel cancer (Bouvard et al. 2015; IARC 2014; WCRF & AICR 2007).

Personal and lifestyle factors

Personal and lifestyle factors associated with an increased risk of bowel cancer include:

- excess body fat and physical inactivity
- high intake of particular foods (such as processed meat)
- high alcohol consumption
- smoking.

Family history and genetic susceptibility

Some gene mutations increase the risk of bowel cancers being passed from parent to child. About 20% of bowel cancers can be attributed to a hereditary component (Weitz et al. 2005).

Ionising radiation

Ionising radiation from radiology (diagnostic X-rays), working in the nuclear industry and natural sources can be a risk factor for bowel cancer.

Bowel cancer treatment

The aim of bowel cancer treatment is generally to remove the cancer and any cancer cells that may be left in the bowel or other parts of the body. However, treatment can vary based on individual factors such as type of cells involved, size of the tumour and bowel cancer stage—some patients may receive palliative care. Treatment of bowel cancer commonly involves surgery to remove the cancer, with or without added chemotherapy or radiation therapy.

Early diagnosis of bowel cancer can improve treatment outcomes and survival. Further, removal of non-benign polyps (polypectomy) and adenomas during a colonoscopy reduces the risk of their developing into bowel cancer. The excision of adenomatous polyps, together with regular surveillance, has been found to reduce bowel cancer incidence (Winawer et al. 1993) and mortality (Zauber et al. 2012).

1.3 Bowel cancer screening

Bowel cancer may be present for many years before showing symptoms such as visible rectal bleeding, change in bowel habit, bowel obstruction or anaemia. Often, symptoms such as these are not exhibited until the cancer has reached a relatively advanced stage. However, non-visible bleeding of the bowel may have been occurring in the pre-cancerous stages (Figure 1.1) for some time. The relatively slow development pathway of bowel cancer means that pre-cancerous and early stage cancers can potentially be screened for and treated. This makes bowel cancer a valid candidate for population screening (Standing Committee on Screening 2016).

A common method of bowel cancer screening is through the use of an immunochemical faecal occult blood test (iFOBT). An iFOBT is a non-invasive test that can detect microscopic amounts of blood in a bowel motion, which may indicate a bowel abnormality such as an adenoma or cancer.

National Bowel Cancer Screening Program

In Australia, government-funded, population-based bowel cancer screening is available through the NBCSP. The NBCSP started in 2006 and is managed by the Department of Health in partnership with state and territory governments. The goal of the NBCSP is to reduce the morbidity and mortality from bowel cancer by actively recruiting and screening the target population for early detection or prevention of the disease.

The Australian Institute of Health and Welfare (AIHW) recently conducted a study of people diagnosed with bowel cancer between 2006 and 2008. This study showed that NBCSP invitees (particularly those who participated) who had been diagnosed with bowel cancer had less risk of dying from bowel cancer, and were more likely to have less advanced bowel cancers when diagnosed, than non-invitees. These findings show that the NBCSP is contributing to reducing morbidity and mortality from bowel cancer in Australia (AIHW 2014a).

The Clinical Practice Guidelines for the Prevention, Early Detection and Management of Colorectal Cancer were endorsed by the National Health and Medical Research Council in 2005 and are currently under review. These guidelines recommended that bowel cancer screening for the asymptomatic Australian population begin at age 50 (ACN 2005). The program's approach to invite eligible people aged between 50 and 74 to screen is consistent with that of other international bowel cancer screening programs. The upper age of 74 is based on consideration of the relative risk of bowel cancer in people aged 75 and older who are asymptomatic, the risk to these individuals who undertake screening (in particular, from follow-up diagnostic assessment procedures) and the existence of comorbidities. Currently, the Australian Government is rolling out biennial screening for those in the target age group, which will be completed by 2020 (see Appendix C). The staged rollout is to help ensure that health services, such as diagnostic assessment and treatment options, are able to meet an increased demand.

Once fully rolled out, eligible Australians will be sent an iFOBT screening kit and invited to screen every 2 years between their 50th and 74th birthdays. To participate, invitees complete the screening test and post it to the NBCSP pathology laboratory for analysis. Results are sent to the participant, to the participant's nominated primary health-care practitioner (PHCP) and to the NBCSP Register. Participants with a positive screening result, indicated

by blood in the stool sample, are advised to consult their PHCP to discuss further diagnostic assessment—in most cases, this will be a colonoscopy.

For more information on the NBCSP see <http://www.cancerscreening.gov.au>.

Monitoring the NBCSP

NBCSP participant data come from a variety of sources throughout the screening pathway. Data are collected from forms completed and returned to the NBCSP Register by participants; from PHCPs, colonoscopists and pathologists; and from other medical staff. However, form return is not mandatory, which may mean monitoring data are not complete.

This report is the second to present national data for the NBCSP using key performance indicators. The National Bowel Cancer Screening Program Report and Indicator Working Group developed these indicators and they have been endorsed by the Standing Committee on Screening, the Community Care and Population Health Principal Committee, the National Health Information Standards and Statistics Committee, and the National Health Information and Performance Principal Committee. The indicators are consistent with the five Australian Population-Based Screening Framework steps: recruitment, screening, assessment, diagnosis, and outcomes (AIHW 2014b). See Appendix C for a summary of changes in monitoring the NBCSP.

Current reporting limitations

Except for participation and iFOBT results, completion of other NBCSP forms by practitioners is not mandatory and therefore data—and results—for performance indicators 3 to 9 are not complete. As well, data identifying whether individual diagnostic assessments were public or private medical procedures are currently unreliable and cannot be used for reporting.

Other limitations of the NBCSP data include the unavailability of population subgroup identification at the time of invitation. Identification of participants as being an Aboriginal and/or Torres Strait Islander, having a disability or speaking a language other than English at home is by self-identification through the participants' return of a completed participant details form, along with their iFOBT for analysis. As membership of these subgroups is reliably known only for those who participate, it is not possible to accurately determine NBCSP participation rates for these subgroups due to the lack of denominators for them. Ways to improve upon these limitations are constantly being investigated, and Chapter 5 in this report gives estimates of participation for these subgroups using proportions from the Census.

Some performance indicators are aspirational, in that there was either a lack of national data or a lack of completeness of data at the time of their creation. In this report, PI 5a (adenoma detection rate), PI 5b (positive predictive value (PPV) of diagnostic assessment for detecting adenoma), PI 6a (colorectal cancer detection rate) and PI 6b (the PPV of diagnostic assessment for detecting colorectal cancer) are not formally reported due to data incompleteness. These indicators require improved data return from histopathology. As well, PI 7 (interval cancer rate) and PI 8 (cancer clinico-pathological stage) are not formally reported due to data unavailability. These performance indicators require data linkage of NBCSP records to the Australian Cancer Database (ACD) once it contains cancer staging data (which are not yet available). Lastly, PI 9 (adverse events—hospital admission) requires linkage with complete national hospital admissions data, which is not currently performed.

However, the NBCSP Register currently has incomplete information on adverse events, and this will be used until a more complete adverse event data source becomes available.

Expenditure on the NBCSP in 2014–15

The NBCSP is funded through direct appropriation from the Australian Government, plus a National Partnership payment for the jurisdictional participant follow-up functions. NBCSP invitations are managed and sent out centrally, with states and territories providing local program promotion and a follow-up function for those who receive positive screening results.

In 2014–15, an estimated $51.8 million was spent on the NBCSP (Table A1.1). As the rollout of biennial screening for those aged 50–74 expands (due to be completed by 2020), this amount is expected to increase.

2 Picture of bowel cancer in Australia

2.1 Number of new cases

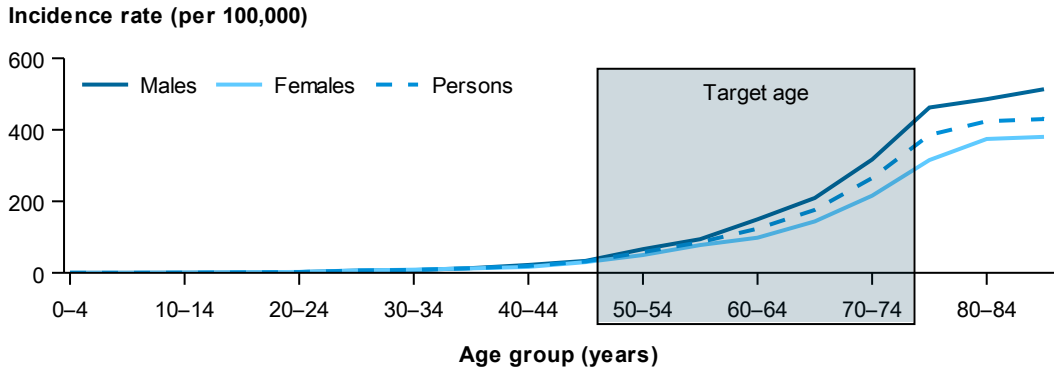
In 2017, it is estimated that 16,682 people will be diagnosed with bowel cancer—an age-standardised rate (ASR) of 58 cases diagnosed per 100,000 people. Of these, 8,512 (51%) will be in the NBCSP target age group (50–74). It is estimated that, in 2017, bowel cancer will be the second most commonly diagnosed cancer in Australia (after breast cancer).

9,127 new cases estimated for 2017

7,555 new cases estimated for 2017

Target age group (50–74 years)	All ages
8,512 new cases estimated for 2017 130 new cases per 100,000 target-age people	16,682 new cases estimated for 2017 58 new cases per 100,000 people

Bowel cancer risk increases with age. In 2017, the incidence rate is expected to remain higher for people aged 45 and older than for younger people (Figure 2.1).



Notes

1. The 2017 estimates are based on 2004–2013 incidence data. See Appendix D for further information.
2. Age-specific rates are expressed per 100,000 people.
3. Data for this figure are in Table A3.22.

Source: AIHW ACD 2013.

Figure 2.1: Age-specific incidence rates of bowel cancer, by sex, Australia, 2017

It is estimated that a person's risk of being diagnosed with bowel cancer sometime between the ages of 50 and 74 is 35 in 1,000 (about 1 in 29) (Figure 2.2). This increase in absolute risk from age 50 is part of the evidence base behind the guideline that bowel screening programs begin at age 50 (ACN 2005).

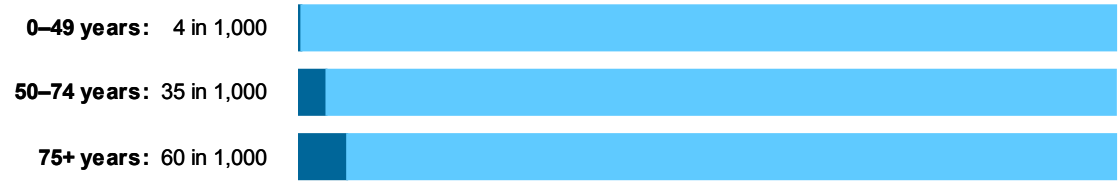


Figure 2.2: Age-specific incidence risk of bowel cancer, Australia, 2017

2.2 Number of deaths

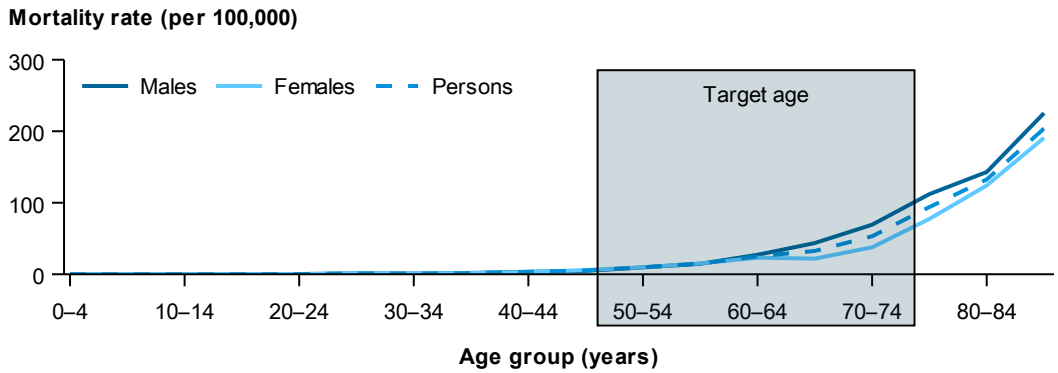
In 2017, it is estimated that there will be about 4,114 bowel cancer deaths, which is equivalent to 14 deaths for every 100,000 people. Of these, 1,615 (39%) will be in the NBCSP target age group (50–74). It is estimated that bowel cancer will remain the second leading cause of cancer death in Australia (after lung cancer).

2,136 deaths estimated for 2017

1,978 deaths estimated for 2017

Target age group (50–74 years)	All ages
1,615 deaths estimated in 2017 25 deaths per 100,000 target-age people	4,114 deaths estimated in 2017 14 deaths per 100,000 people

It is estimated that, in 2017, the mortality rate will be higher for people aged 50 and older than for younger people (Figure 2.3).



Notes

1. The 2017 estimates are based on 1997–2013 mortality data for males and 2006–2013 mortality data for females. See Appendix D for further information.
2. Age-specific rates are expressed per 100,000 people.
3. Data for this figure are in Table A3.26.

Source: AIHW National Mortality Database (NMD).

Figure 2.3: Age-specific mortality rates of bowel cancer, by sex, Australia, 2017

The risk of dying from bowel cancer increases with age. It is estimated that the risk of dying from bowel cancer sometime between the ages of 50 and 74 is 7 in 1,000 (Figure 2.4). The risk of dying from bowel cancer before age 50 is less than 1 in 1,000. It is expected that once biennial screening for those aged 50–74 has been in place for a number of years, the risk of diagnosis and death for those aged 75 and older will also be reduced, as those people will have been consistently invited to screen for abnormalities over the preceding 25 years.

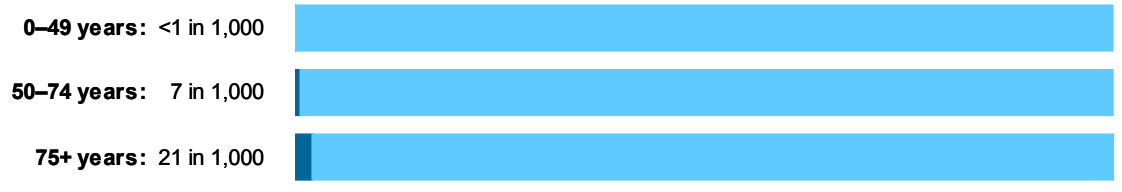


Figure 2.4: Age-specific mortality risk of bowel cancer, Australia, 2017

2.3 Survival

Information on survival gives an indication of cancer prognosis and the effectiveness of treatment available. Survival of less than 100% suggests that those with bowel cancer had a lower chance of surviving for at least 5 years after diagnosis than the general population.

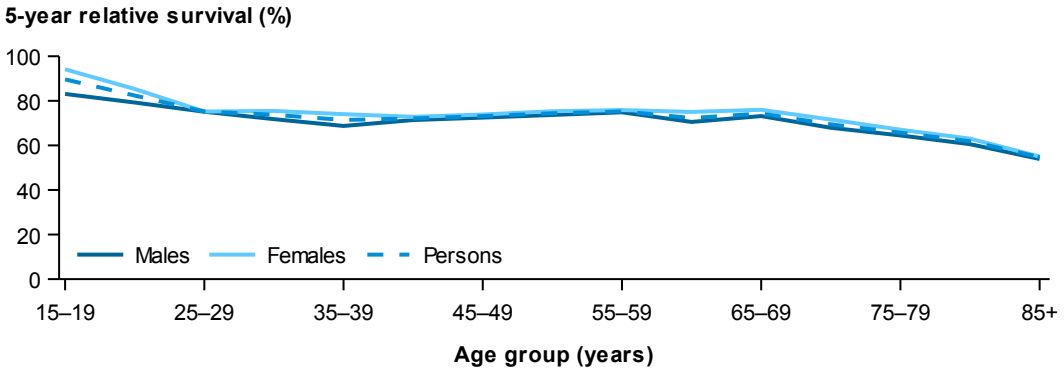
Between 2009 and 2013, Australians diagnosed with bowel cancer had a 69% chance of surviving for 5 years compared with their counterparts in the general population. For the NBCSP target age group (50–74), 5-year relative survival was 73%.

68% 5-year relative survival

69% 5-year relative survival

Target age group (50–74 years)	All ages
73% 5-year relative survival (2009–2013)	69% 5-year relative survival (2009–2013)

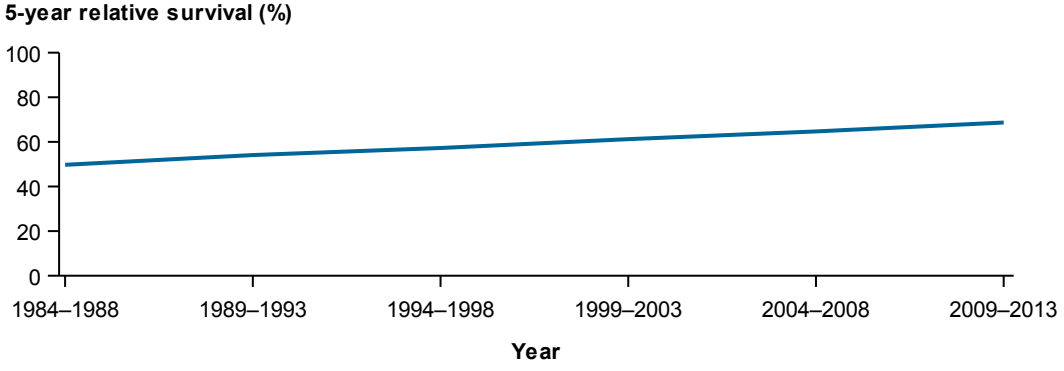
Between 2009 and 2013, 5-year relative survival was lower for people over the age of 70 than for younger people (Figure 2.5; Table A2.1).



Note: Data for this figure are in Table A2.1.
Source: AIHW ACD 2013.

Figure 2.5: Five-year relative survival from bowel cancer, by age, Australia, 2009–2013

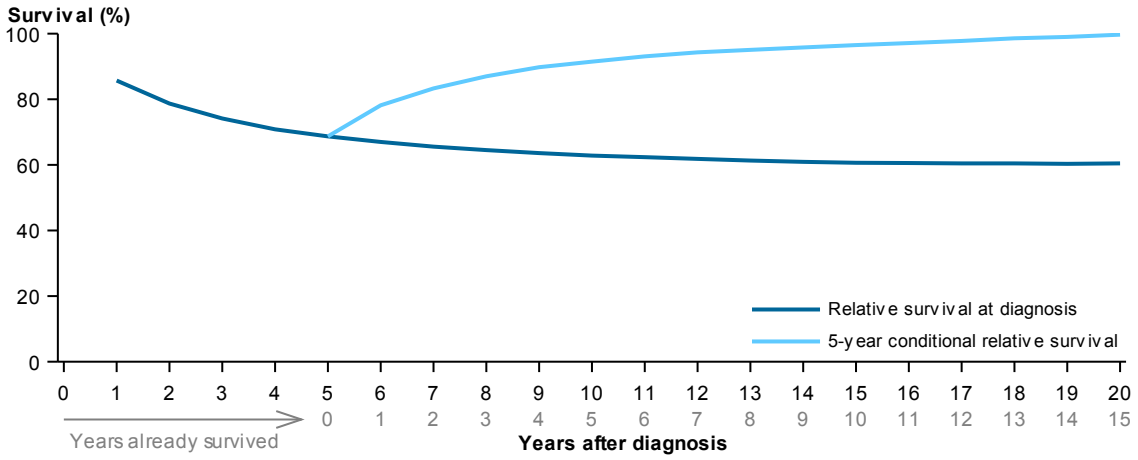
Between 1984–88 and 2009–13, the 5-year relative survival rate increased from 50% to 69% (Figure 2.6; Table A2.2).



Note: Data for this figure are in Table A2.2.
Source: AIHW ACD 2013.

Figure 2.6: Trend in 5-year relative survival from bowel cancer, all ages, Australia, 1984–88 to 2009–13

While people first diagnosed with bowel cancer had a lower (69%) chance of surviving for at least 5 years after diagnosis than the general population, among those who had already survived 5 years from their initial bowel cancer diagnosis, the chance of surviving for at least another 5 years (5-year conditional survival) was 92% (Figure 2.7; Table A2.3).



Notes

1. Conditional survival estimates show the probability of surviving bowel cancer for a given number of years provided an individual has already survived a specified amount of time after diagnosis.
2. Data for this figure are in Table A2.3.

Source: AIHW ACD 2013.

Figure 2.7: Relative survival at diagnosis and 5-year conditional survival from bowel cancer, all ages, Australia, 2009–2013

Prevalence of bowel cancer

Cancer survivorship focuses on the health and life of a person diagnosed with cancer after treatment until the end of life (NCI 2015). Cancer survivorship is more than simply not dying from cancer; it focuses on living with, and life after, a cancer diagnosis (Jackson et al. 2013). Survivorship covers the physical, psychosocial and economic issues of cancer, including the later effects of treatment, secondary cancers and quality of life (NCI 2015).

Prevalence is the number of people alive (surviving) after a diagnosis of cancer. At the end of 2012, there were 52,630 Australians alive who had been diagnosed with bowel cancer in the previous 5 years and 84,301 who had been diagnosed in the previous 10 years (Table 2.1).

Table 2.1: Prevalence of bowel cancer, by sex, Australia, end of 2012

	5-year prevalence		10-year prevalence	
Sex	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Males	29,049	254.6	45,865	402.0
Females	23,581	204.8	38,436	333.9
Persons	52,630	229.6	84,301	367.8

Source: AIHW ACD 2013.

2.4 Burden of bowel cancer

Burden of disease analysis is used to assess and compare the impact of different diseases and injuries on a population. It involves determining their impact in terms of the number of years

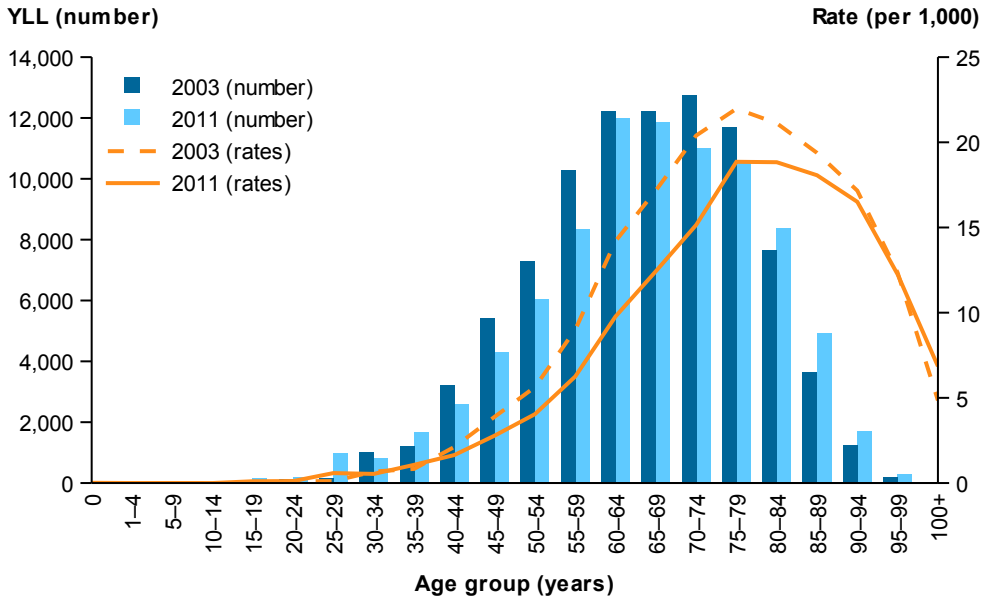
of healthy life lost through living with an illness or injury (the non-fatal burden, years lived with disability, or YLD) and the number of years of life lost through dying prematurely from an illness or injury (the fatal burden, years of life lost, or YLL). The non-fatal and fatal burden can then be combined into a summary measure of health called the disability-adjusted life year (DALY). Burden of disease studies can also estimate the contribution of specific risk factors to disease burden (known as the attributable burden).

The recent Australian Burden of Disease Study (ABDS) 2011, undertaken by the AIHW, found that there were over 90,000 years of healthy life lost (from fatal and non-fatal outcomes) due to bowel cancer in 2011 (AIHW 2016a). This meant bowel cancer accounted for 2.1% of the total disease burden in Australia, making it the 13th most burdensome disease overall (12th in males and 16th in females). Bowel cancer was the second most burdensome cancer in 2011 behind lung cancer, accounting for 11% of the total cancer burden (11% of the fatal cancer burden and 13% of the non-fatal burden).

Changes in burden since 2003

As the NBCSP was introduced in 2006, comparisons of the burden before and after this date are of interest. Burden of disease estimates for 2003 from the previous ABDS (Begg et al. 2007) cannot be compared with estimates from this recent study due to major methodological differences (see AIHW 2016a). Instead, estimates for 2003 have been recalculated using the updated methods from the 2011 study to enable comparisons.

Between 2003 and 2011, the ASR of total burden from bowel cancer dropped from 4.8 to 3.8 DALYs per 1,000 people. This reduction was primarily due to a drop in fatal burden from 4.5 to 3.5 YLL per 1,000 people. This reduction in YLL ASRs was driven by a shift towards people dying from bowel cancer at older ages, with 2011 rates similar to 2003 rates for people who were 5–10 years younger (particularly for people aged 60–79) (Figure 2.8).



Source: AIHW 2016a.

Figure 2.8: Change in fatal burden—YLL number and age-specific rate (per 1,000 people) —from bowel cancer, 2003 and 2011

Contribution of risk factors to bowel cancer burden

The ABDS 2011 also calculated the proportion of the bowel cancer burden in 2011 that was attributable to a number of preventable risk factors. Note that, as a person can have more than one risk factor and many risk factors are interrelated, the burden attributable to different risk factors cannot be simply added together (AIHW 2016a).

After analysis to adjust for interrelated risk factors, the study estimated that about 43% of bowel cancer burden in 2011 was attributable to eight risk factors combined: alcohol use, diet low in fibre, diet low in milk, diet high in processed meat, diet high in red meat, high body mass, physical inactivity, and tobacco use (AIHW, unpublished data). Of these risk factors, physical inactivity and high body mass contributed the most individually to bowel cancer burden in 2011 (31% and 13% of the bowel cancer burden, respectively; although, as they are likely to be interrelated, their combined burden will be less than the sum of the individual burden estimates). A greater proportion of bowel cancer burden in males was due to high body mass than in females (18% compared to 6%) (Table 2.2).

Note that the estimates for high body mass reported here are based on revised methods and enhancements developed as part of an extension project undertaken by the AIHW that looked at the impact of overweight and obesity on chronic conditions (AIHW 2017b). These estimates will differ from those presented in earlier publications from the ABDS 2011 (AIHW 2016a).

See *Australian Burden of Disease Study 2011: methods and supplementary material* (AIHW 2016b) for more information on the methods used for other risk factors.

Table 2.2: Bowel cancer burden attributed to selected risk factors (DALYs and proportion), 2011

	Males		Females		Persons	
Risk factor	Attributable DALYs	Proportion of bowel cancer burden (%)	Attributable DALYs	Proportion of bowel cancer burden (%)	Attributable DALYs	Proportion of bowel cancer burden (%)
Physical inactivity	16,057	30.2	12,513	31.8	28,570	30.9
High body mass[(a)]	9,307	17.5	2,513	6.4	11,819	12.8
Diet low in milk	5,821	11.0	4,393	11.2	10,214	11.1
Diet low in fibre	5,127	9.7	3,855	9.8	8,982	9.7
Tobacco use	3,466	6.5	3,747	9.5	7,213	7.8
Diet high in processed meat	4,744	8.9	2,380	6.1	7,124	7.7
Alcohol use	2,465	4.6	2,365	6.0	4,830	5.2
Diet high in red meat	2,518	4.7	1,081	2.7	3,600	3.9

(a) Estimates for high body mass are based on revised methods and enhancements developed as part of an extension project undertaken by the AIHW that looked at the impact of overweight and obesity on chronic conditions (AIHW 2017b). These estimateswill differ from those presented in earlier publications from the ABDS 2011 (AIHW 2016a).

Note: Attributable burden from multiple risk factors cannot by combined or added together due to the complex pathways and interactions between risk factors.

Sources: AIHW 2016a, 2017b (BMI estimates); AIHW analysis of ABDS 2011 (unpublished data).

3 Performance indicators

3.1 Summary

The Population Based Screening Framework (Standing Committee on Screening 2016) uses five incremental stages to describe a population screening pathway. The performance indicator data in this monitoring report have been applied to these stages in Figure 3.1 to show how the indicators relate to the framework. For further information on these indicator outcomes over the life of the NBCSP see Appendix B.

Note that data for diagnostic assessments, adenomas and cancers detected and hospital admissions (PIs 3–9) rely on information being reported back to the Register; this reporting is not mandatory and is known to be incomplete.

Recruitment

Of those invited in the 2-year period for 2014–2015, 39% participated in the NBCSP (Table A3.2). This was up from 37% in the previous rolling 2-year period (2013–2014) (Table A3.5). The participation rate was higher for people receiving a subsequent screening invitation (42% for those receiving their second, third or later screening invitation) than for those receiving their initial invitation to screen (35%) (Figure 3.2; Table A3.3). For those invitees who had participated in an earlier round, the re-participation rate was 76%.

Screening and assessment

In 2015, about 41,000 participants returned a positive screening test, giving an 8.3% screening positivity rate (Table A3.6). People who receive a positive screening result are encouraged to visit their PHCP for referral to diagnostic assessment. Of the people who received a positive screening test, 70% had a diagnostic assessment recorded (Table A3.10). Of those who had a diagnostic assessment, the median time between a positive screening result and a diagnostic assessment was 53 days (Table A3.17).

Diagnosis

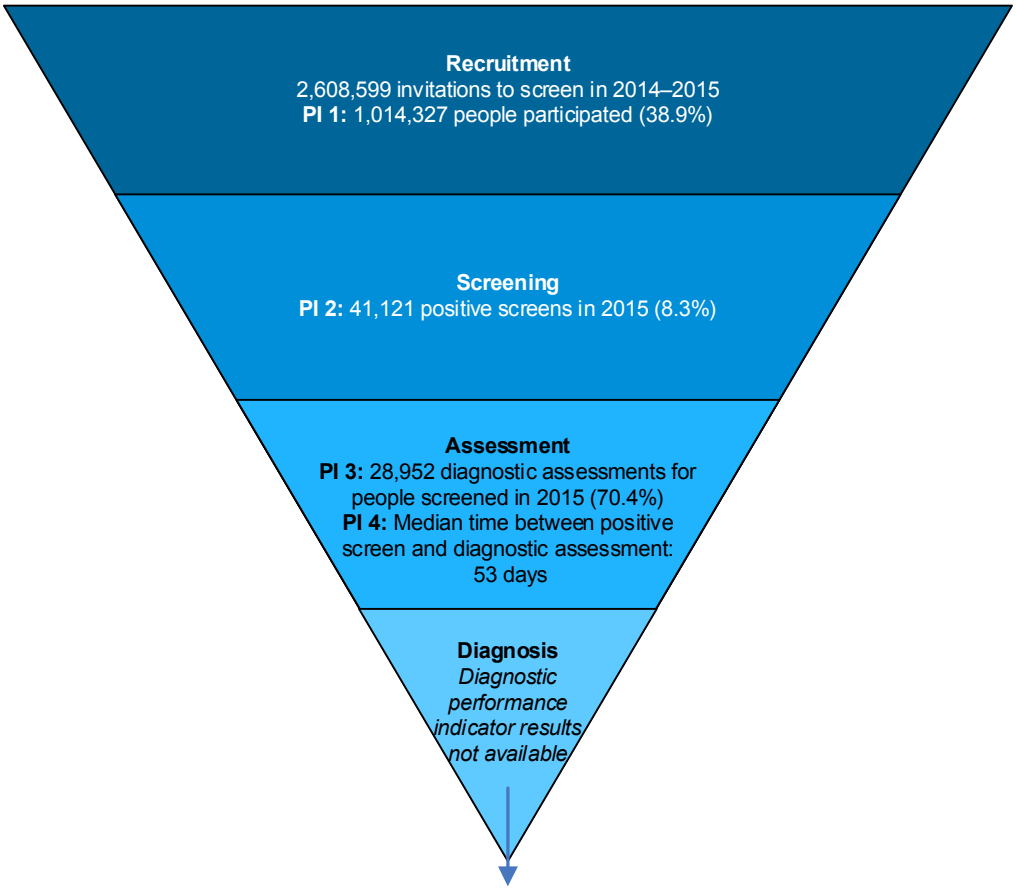
Diagnosis data were not considered to be complete enough to allow formal performance indicator reporting. However, using the available data for those assessed in 2015, there were 168 confirmed cancers, 807 suspected cancers and 3,538 adenomas detected (Table A4.1).

See Chapter 4 for a summary of bowel abnormality detection results, based on available assessment and diagnosis data. Further, see *Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program* (AIHW 2014a) for the most recent accurate PPV of diagnostic assessment for detecting bowel (colorectal) cancer.

Outcomes

In 2015, 24 people who underwent a diagnostic assessment were admitted to hospital within 30 days of this procedure, giving a hospital admission rate after assessment of 9 per 10,000 assessments (Table A3.21).

In 2017, it is estimated that 16,682 people will be diagnosed with bowel cancer (Table A3.22) and that 4,114 people will die from bowel cancer (Table A3.26).



Assessment details

Those assessed in 2015[(a)]

No cancer or adenoma	16,197	(58.1%)
Polyp awaiting histopathology	7,144	(25.6%)
Non-advanced adenomas	1,845	(6.6%)
Advanced adenomas	1,693	(6.1%)
Suspected cancer	807	(2.9%)
Confirmed cancer	168	(0.6%)

Outcomes

For morbidity and mortality

PI 9: Adverse events	9 per 10,000	(2015)
PI 10: Incidence	58 per 100,000	(2017)
PI 11: Mortality	14 per 100,000	(2017)

(a) Based on available data. Percentages may not sum to 100% due to rounding. 'No cancer or adenoma' also includes 6,163 assessments with no record of outcome.

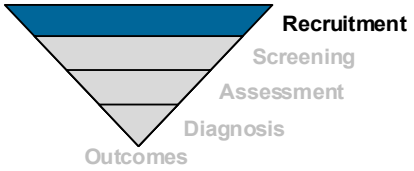
Notes

1. The recruitment indicator is reported against the 2-year calendar period 2014–2015, with follow-up to June 2016. The screening indicator is reported against the year 2015. The assessment and adverse events indicators are reported against the year 2015, with follow-up to December 2016. Incidence and mortality are estimated rates for 2017.
2. Assessment, diagnosis and outcomes (PIs 3 to 9) rely on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. PI 5a (adenoma detection rate), PI 5b (PPV of diagnostic assessment for detecting adenoma), PI 6a (colorectal cancer detection rate), PI 6b (PPV of diagnostic assessment for detecting colorectal cancer), PI 7 (interval cancer rate) and PI 8 (cancer clinico-pathological stage) are not reported due to data incompleteness or unavailability. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at December 2016.

Figure 3.1: Summary of NBCSP performance indicators for this report, Australia

3.2 Recruitment



PI 1—Participation rate

Definition: The percentage of people invited to screen through the NBCSP between **1 January 2014 and 31 December 2015** who returned a completed screening test within that period or by **30 June 2016** (AIHW 2014b).

Rationale: Participation should be monitored to ensure acceptability, equity and uptake, with the aim that reductions in incidence, morbidity and mortality can be achieved. Without participation, the NBCSP cannot achieve earlier detection.

Data quality: All invitations issued and iFOBT kits returned are recorded in the Register.

Guide to interpretation: The number of individuals who were sent a screening invitation excludes those who suspended or opted off without completing their screening test. Appendix A contains details on the number of invitees who suspended or opted off.

Data on participation by Indigenous status, language spoken at home or disability status are not currently available due to the lack of denominators for these subgroups. See Chapter 5 for estimates of participation for these subgroups.

Participation is measured over 2 years to align with the 2-year recommended screening interval. A consequence of this is that there are 'rolling' participation rates, in which there is an overlap of 1 calendar year between any two consecutively reported participation rates.

National participation rate: 39%.

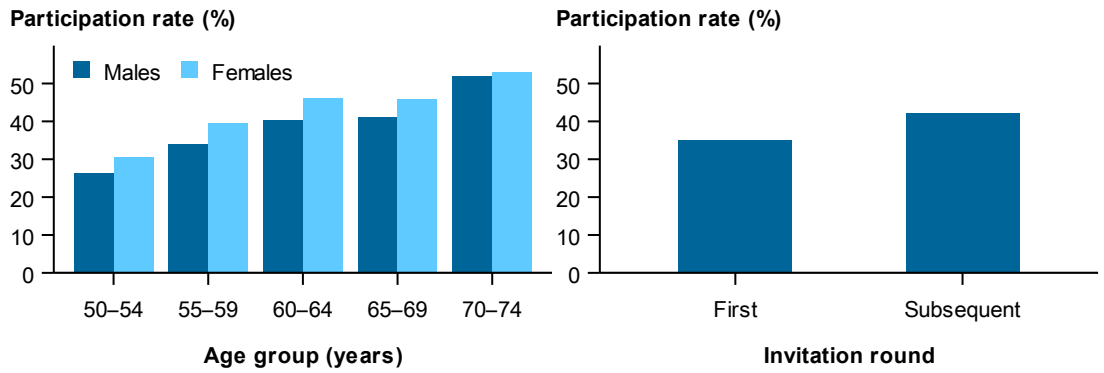
The following figures apply for the 2,608,599 eligible people invited from 1 January 2014 to 31 December 2015:

Australia-wide: A total of 1,014,327 people participated in the NBCSP, giving an overall Australia-wide participation rate of 39% (Table A3.2).

Sex: Male (37%) invitees had a lower participation rate than females (41%) (Figure 3.2).

Age: The participation rate increased with each invitation age group, from 29% for people aged 50–54 to 53% for people aged 70–74 (Figure 3.2).

Invitation round: The participation rate was higher for people receiving their second or later (subsequent) screening invitation (42% compared with 35%) (Figure 3.2). The re-participation rate for those who had participated previously and were receiving a subsequent invitation was 76%.



Notes

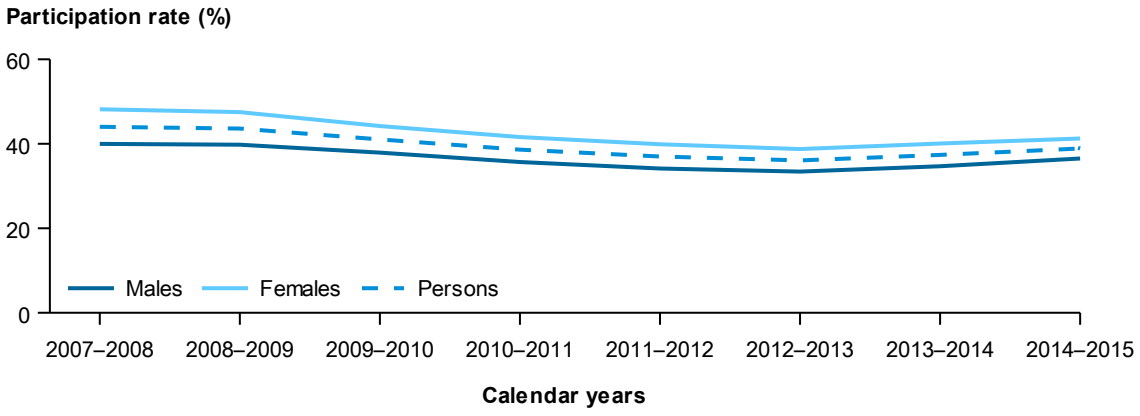
1. Subsequent invitation round includes second, third and subsequent invitation rounds.
2. Data for this figure are in tables A3.2 and A3.3.

Source: NBCSP Register as at 31 December 2016.

Figure 3.2: Participation of people aged 50–74, by sex and age and by invitation round, 2014–2015

Trend: Monitoring reports before 2016 analysed participation differently from the indicator used in this report. This means that trend comparisons with the rates published in those earlier reports cannot be made. To allow a trend comparison over time, the new participation indicator specifications have been applied retrospectively to earlier years of program data within this report (Figure 3.3; Table A3.5).

Using this indicator across all program data to date, the participation rate decreased from 44% in 2007–2008 to 36% in 2012–2013, then increased to 39% in 2014–15 (Figure 3.3).



Notes

1. Data presented are for rolling 2-year participation periods.
2. Trend data use the performance indicator specifications retrospectively on previous years' data.
3. Data for this figure are in Table A3.5.

Source: NBCSP Register as at 31 December 2016.

Figure 3.3: Participation of people aged 50–74, by sex, 1 January 2007–31 December 2008 to 1 January 2014–31 December 2015

State and territory: The participation rate was highest for people living in South Australia (46%) and lowest for people living in the Northern Territory (29%) (Figure 3.4).

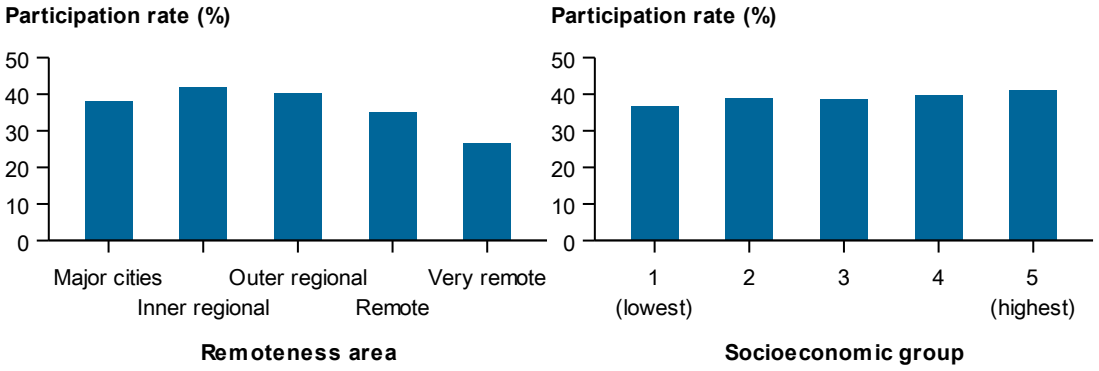
Note: Data for this figure are in Table A3.4.

Source: NBCSP Register as at 31 December 2016.

Figure 3.4: Participation of people aged 50–74, by state and territory, 2014–2015

Remoteness area: The participation rate was highest for people living in *Inner regional* areas (42%) and lowest for people living in *Very remote* areas (27%) (Figure 3.5).

Socioeconomic group: The participation rate was highest for people living in the highest socioeconomic areas (41%) and lowest for people living in the lowest socioeconomic areas (37%) (Figure 3.5).

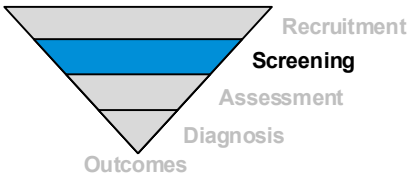


Note: Data for this figure are in Table A3.4.

Source: NBCSP Register as at 31 December 2016.

Figure 3.5: Participation of people aged 50–74, by remoteness area and socioeconomic group, 2014–2015

3.3 Screening



PI 2—Screening positivity rate

Definition: The percentage of people who returned a valid NBCSP screening test and received a positive screening result (warranting further assessment) between **1 January 2015 and 31 December 2015** (AIHW 2014b).

Rationale: The positive screening test rate determines the diagnostic assessment workload and lesion detection rate. It is important that the accepted positivity range is reviewed and revised if necessary. Monitoring this is important for program planning and quality assurance. Further, monitoring the positivity rate by various stratifications may reveal emerging positive or negative trends that need to be investigated, and rectified if necessary.

Data quality: All iFOBT results are recorded in the Register.

Guide to interpretation: This indicator counts all tests analysed in the defined period, not tests analysed from those invited in the defined period; therefore, the cohort monitored is different from that in the participation indicator.

National screening positivity rate: 8.3%.

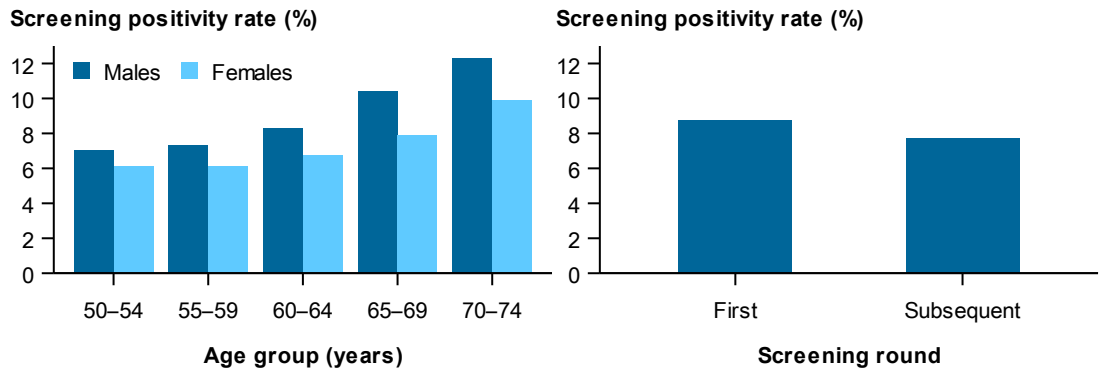
The following apply for the 495,133 invitees who had a screening test analysed in 2015:

Australia-wide: A total of 41,121 people received a positive screening test result, giving an overall Australia-wide screening positivity rate of 8.3% (Table A3.6).

Sex: Male participants had a higher screening positivity rate than females (9.3% compared with 7.4%) (Figure 3.6).

Age: The screening positivity rate increased with each age group, from 6.6% for people aged 50–54 to 11.1% for people aged 70–74 (Figure 3.6).

Screening round: The screening positivity rate was highest for people during their first round of screening (8.7% compared with 7.7%) (Figure 3.6).



Notes

1. 'Subsequent' includes subsequent screens both ≤2 years and >2 years after the first NBCSP screening round.
2. Data for this figure are in tables A3.6 and A3.7.

Source: NBCSP Register as at 31 December 2016.

Figure 3.6: Screening positivity rate of people aged 50–74, by sex and age and by screening round, 2015

State and territory: The screening positivity rate was highest for people living in Tasmania (9.0%) and lowest for people living in the Australian Capital Territory (7.8%) (Figure 3.7).

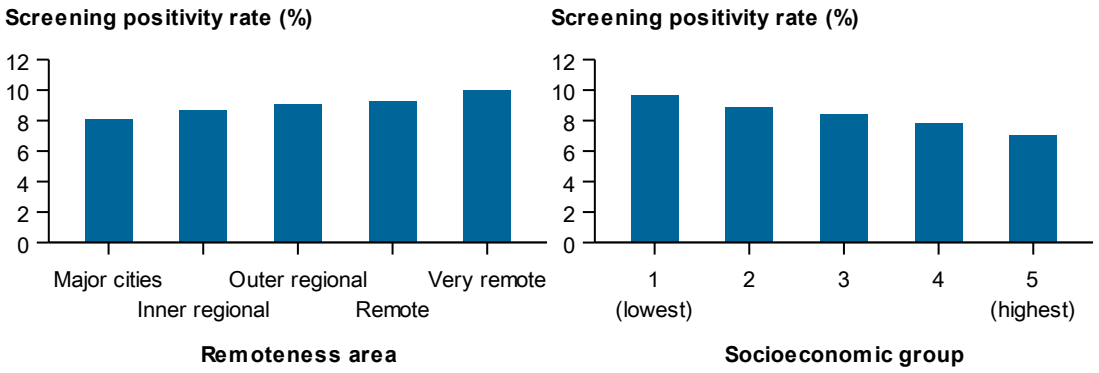
Note: Data for this figure are in Table A3.8.

Source: NBCSP Register as at 31 December 2016.

Figure 3.7: Screening positivity rate of people aged 50–74, by state and territory, 2015

Remoteness area: The screening positivity rate was highest for people living in *Very remote* areas (10.0%) and lowest for people living in *Major cities* (8.1%) (Figure 3.8).

Socioeconomic group: The screening positivity rate was highest for people living in the lowest socioeconomic areas (9.7%) and lowest for people living in the highest socioeconomic areas (7.0%) (Figure 3.8).



Note: Data for this figure are in Table A3.8.

Source: NBCSP Register as at 31 December 2016.

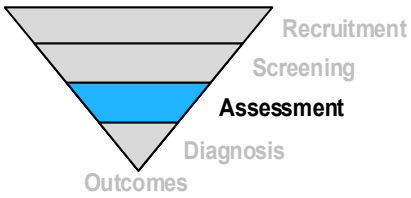
Figure 3.8: Screening positivity rate of people aged 50–74, by remoteness area and socioeconomic group, 2015

Indigenous status: Indigenous Australians had a higher screening positivity rate than non-Indigenous Australians (11.3% compared with 8.2%) (Table A3.9).

Language spoken at home: Those who speak a language other than English at home had a similar screening positivity rate to those who speak English at home (8.7% and 8.2%, respectively) (Table A3.9).

Disability status: Those reporting a severe or profound activity limitation had a higher screening positivity rate than those who did not report such a limitation (12.7% compared with 8.0%) (Table A3.9). Reasons for this difference are not well understood, but may include a lower level of physical activity (Wolin et al. 2011) or comorbidities and medications that increase the likelihood of a positive iFOBT screening result in people with a severe or profound activity limitation.

3.4 Assessment



PI 3—Diagnostic assessment rate

Definition: The percentage of people who returned a positive NBCSP screening test (warranting further assessment) between **1 January 2015 and 31 December 2015** and had follow-up diagnostic assessment within that period or by **31 December 2016** (AIHW 2014b).

Rationale: The appropriate movement of people from participation to diagnostic assessment is a key indicator of the efficiency and the impact of the program in reducing morbidity and mortality from bowel cancer. While not all participants with a positive screen will necessarily have an assessment, according to the Population Based Screening Framework (Standing Committee on Screening 2016), systems should be in place to ensure timely follow-up to diagnostic assessment for individuals with a positive screening test.

Data quality: This indicator relies on information being reported to the Register; however, this reporting is not mandatory, leading to incomplete data. Therefore, there is an unknown level of under-reporting for this indicator, and levels of under-reporting may differ across groups (for example, across jurisdictions, and across remoteness and socioeconomic areas).

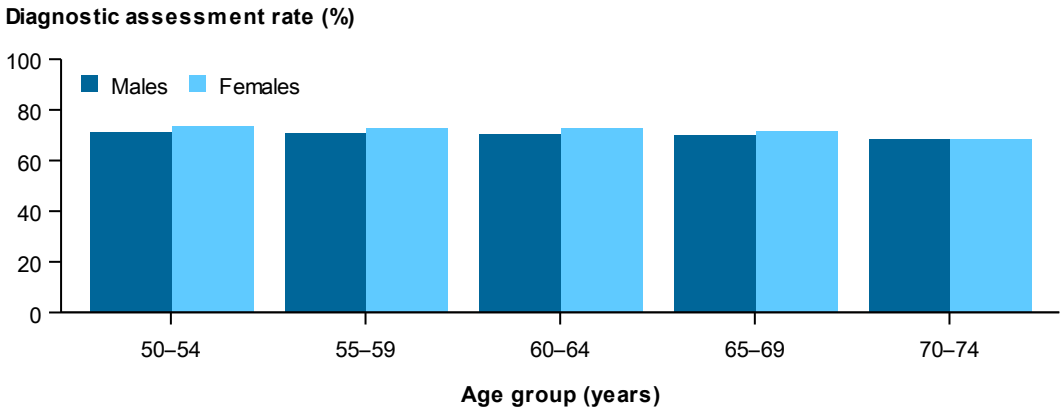
Guide to interpretation: This indicator includes all those with a positive screen in the defined period, not all those invited in the defined period.

National diagnostic assessment rate: 70%.

The following applies for the 41,121 participants with a positive screening test in 2015:

Australia-wide: A total of 28,952 people reported a follow-up diagnostic assessment (colonoscopy)—an overall Australia-wide diagnostic assessment rate of 70% (Table A3.10).

Sex and age: Diagnostic assessment rates were similar for males and females, but decreased with age group: from 72% for people aged 50–54 to 68% for people aged 70–74 (Figure 3.9).



Notes

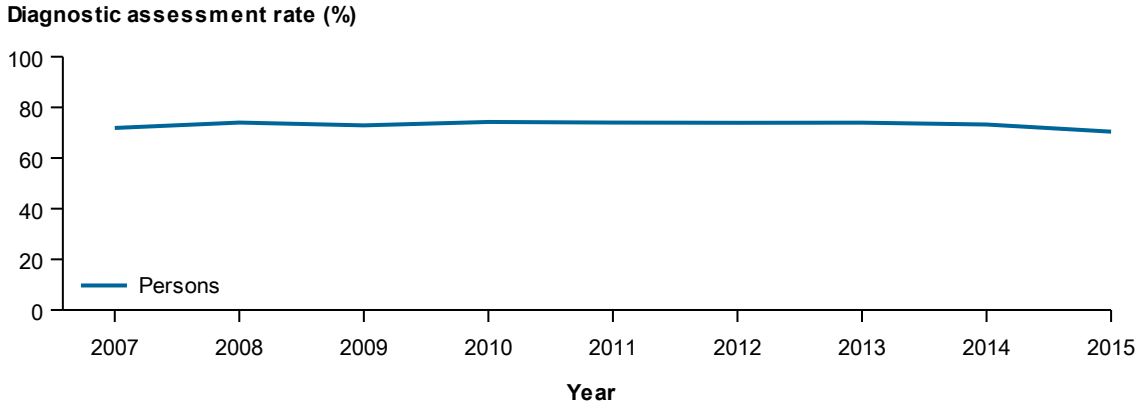
1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, are based on the diagnostic assessment date.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. Data for this figure are in Table A3.10.

Source: NBCSP Register as at 31 December 2016.

Figure 3.9: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by sex and age, 2015

Trend: Monitoring reports before 2016 analysed the diagnostic assessment rate differently from the indicator used in this report. This means that trend comparisons with the rates published in those earlier reports cannot be made. To allow a trend comparison over time, the new indicator specifications have been applied retrospectively to earlier years of program data within this report (Figure 3.10; Table A3.13).

Using this diagnostic assessment rate indicator across all program data to date, the follow-up diagnostic assessment rate fluctuated between 72% and 74% between 2007 and 2014, and dropped to 70% in 2015. Differences in form return and varying pathway practices for diagnostic assessment between years may be contributing factors to this outcome.



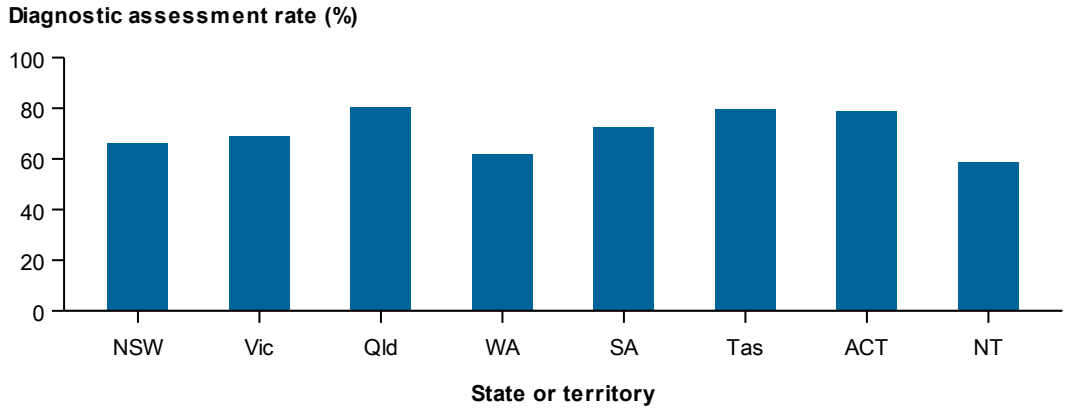
Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. Trend data uses the performance indicator specifications retrospectively on previous years' data.
4. Data for this figure are in Table A3.13.

Source: NBCSP Register as at 31 December 2016.

Figure 3.10: Diagnostic assessment rate (colonoscopy) of people aged 50–74, 2007 to 2015

State and territory: The follow-up diagnostic assessment rate was highest for people living in Queensland and Tasmania (both 80%) and lowest for people living in the Northern Territory (59%) (Figure 3.11). Note that differences in form return and varying pathway practices for diagnostic assessment may affect the results across jurisdictions.



Notes

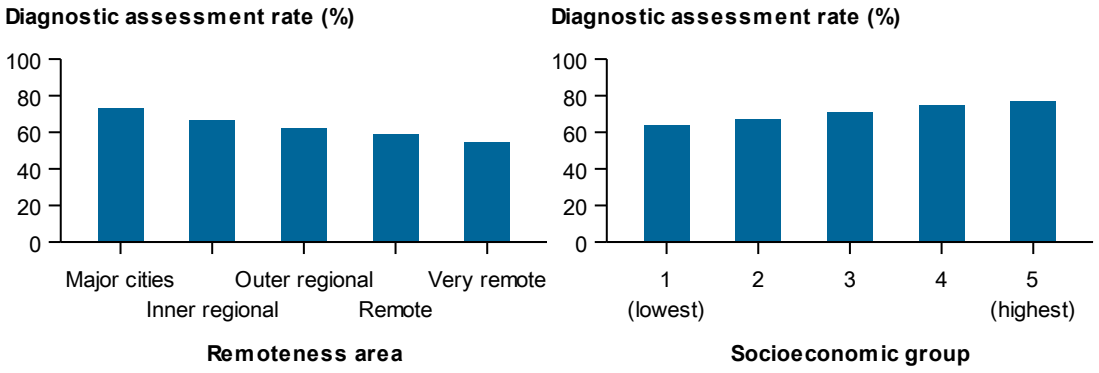
1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. Differences across jurisdictions may involve differences in form return and varying pathway practices for diagnostic assessment.
4. Data for this figure are in Table A3.11.

Source: NBCSP Register as at 31 December 2016.

Figure 3.11: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by state and territory, 2015

Remoteness area: The follow-up diagnostic assessment rate was highest for people living in *Major cities* (73%) and lowest for people living in *Very remote* areas (54%) (Figure 3.12).

Socioeconomic group: The follow-up diagnostic assessment rate was highest for people living in the highest socioeconomic areas (77%) and lowest for people living in the lowest socioeconomic areas (64%) (Figure 3.12).



Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. Data for this figure are in Table A3.11.

Source: NBCSP Register as at 31 December 2016.

Figure 3.12: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by remoteness area and socioeconomic group, 2015

Indigenous status: Indigenous Australians had a lower follow-up diagnostic assessment rate than non-Indigenous Australians (57% compared with 71%) (Table A3.12).

Language spoken at home: Those who speak a language other than English at home had a lower follow-up diagnostic assessment rate than those who speak English at home (67% compared with 71%) (Table A3.12).

Disability status: Those reporting a severe or profound activity limitation had a lower follow-up diagnostic assessment rate than those who did not report such a limitation (57% compared with 72%) (Table A3.12).

PI 4—Time between positive screen and diagnostic assessment

Definition: For those who received a positive NBCSP screening test (warranting further assessment) between **1 January 2015 and 31 December 2015**, the median time between the positive screening test and a follow-up diagnostic assessment within that period or by **31 December 2016** (AIHW 2014b).

Rationale: Waiting for a definitive diagnosis following a positive screen can create anxiety. There are various steps, participant decisions and wait times in the pathway between a positive screen and a diagnostic assessment. Therefore, this indicator should not be considered a hospital wait time indicator. However, after a positive screen, further diagnostic assessment should occur in a timely fashion as there is a defined risk of bowel cancer in those with a positive screening test—and any harms (such as anxiety) from a positive screen should be minimised.

Data quality: This indicator relies on information being reported to the Register; however, this reporting is not mandatory, leading to incomplete data. Therefore, there is an unknown level of under-reporting for this indicator, and levels of under-reporting may differ across groups (for example, across jurisdictions and across remoteness and socioeconomic areas).

Guide to interpretation: This indicator includes all those with a positive screen in the defined period, not all those invited in the defined period.

The number and proportion of participants where time between positive screen and diagnostic assessment was less than or equal to 30, 60, 90, 180 or 360 days, or greater, are also included in tables A3.14–A3.16 in Appendix A to give further detail (together with median time and 90th percentile information in tables A3.17–A3.20).

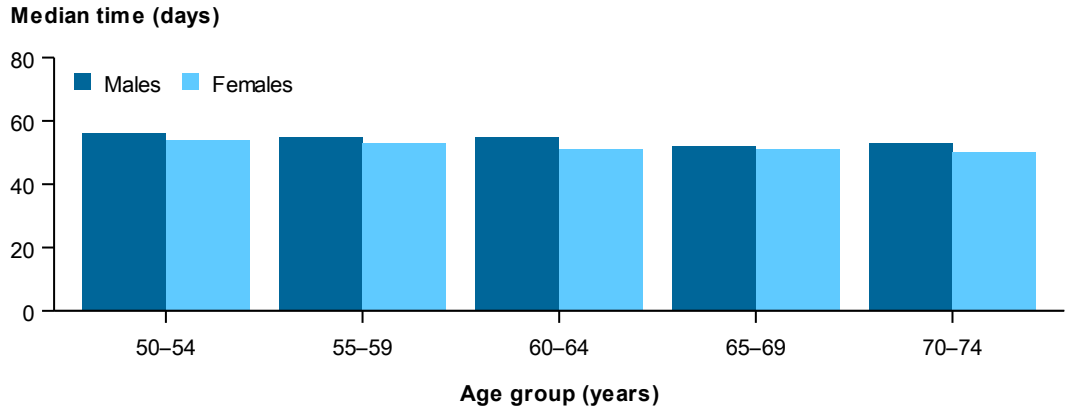
National median time between positive screen and diagnostic assessment: 53 days.

The following apply for the 41,121 participants who had a positive screening test in 2015 with a diagnostic assessment recorded:

Australia-wide: The median time between positive screen and assessment was 53 days (Table A3.17).

Sex: Males and females had a similar median time between a positive screen and assessment (54 days and 52 days, respectively) (Figure 3.13).

Age: The median time between a positive screen and diagnostic assessment decreased by age group—from 55 days for people aged 50–54 to 52 days for people aged 65–74 (Figure 3.13).



Notes

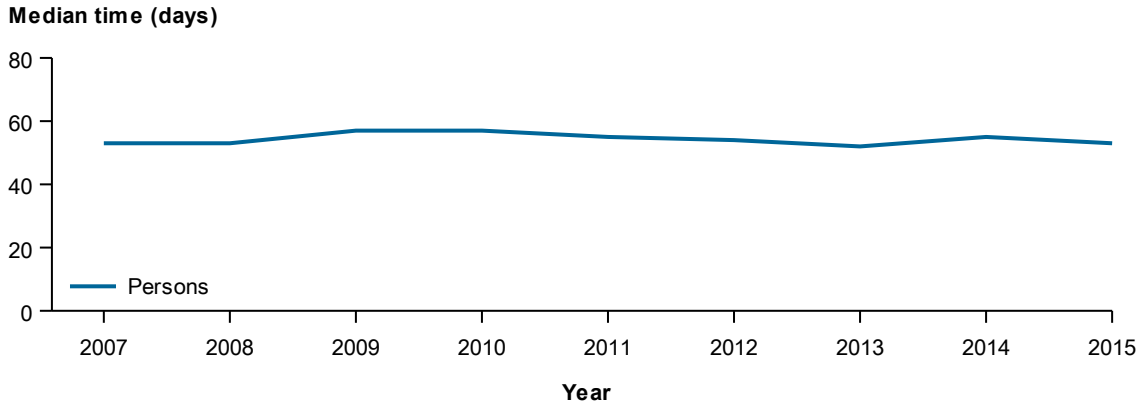
1. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
2. Data for this figure are in Table A3.17.

Source: NBCSP Register as at 31 December 2016.

Figure 3.13: Median time (in days) between positive screen and diagnostic assessment of people aged 50–74, by sex and age, 2015

Trend: Monitoring reports before 2016 did not include this analysis. This means trend comparisons with data from those earlier reports cannot be made. To allow a trend comparison over time, the new indicator specifications have been applied retrospectively to earlier years of program data within this report (Figure 3.14; Table A3.20).

Using this indicator for time between positive screen and diagnostic assessment across all program data to date, the median time between a positive screen and diagnostic assessment fluctuated between 52 and 57 days from 2007 to 2015 (Figure 3.14). Differences in form return and varying pathway practices for diagnostic assessment between years may be contributing factors to this outcome.



Notes

1. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
2. Trend data uses the performance indicator specifications retrospectively on previous years' data.
3. Data for this figure are in Table A3.20.

Source: NBCSP Register as at 31 December 2016.

Figure 3.14: Median time (in days) between positive screen and diagnostic assessment of people aged 50–74, 2007 to 2015

State and territory: The median time between a positive screen and diagnostic assessment was highest for people living in South Australia (65 days) and lowest for people living in Victoria (38 days) (Figure 3.15; Table A3.18). Note that differences in form return and varying pathway practices for diagnostic assessment may affect the results across jurisdictions.

Notes

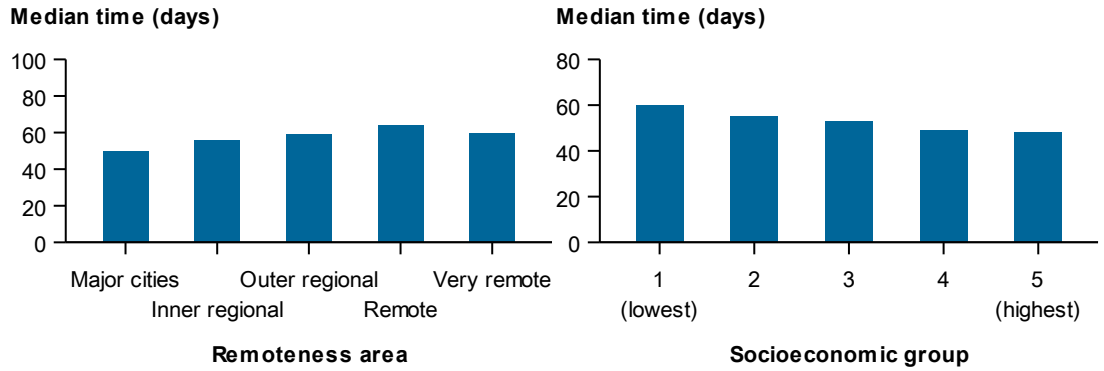
1. Differences across jurisdictions may involve differences in form return and varying pathway practices for diagnostic assessment.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
3. Data for this figure are in Table A3.18.

Source: NBCSP Register as at 31 December 2016.

Figure 3.15: Median time (in days) between positive screen and diagnostic assessment of people aged 50–74, by state and territory, 2015

Remoteness area: The median time between a positive screen and assessment was highest for people living in *Remote* areas (64 days) and lowest in *Major cities* (50 days) (Figure 3.16).

Socioeconomic group: The median time between a positive screen and assessment was highest for people living in the lowest socioeconomic areas (60 days) and lowest for people in the highest socioeconomic areas (48 days) (Figure 3.16; Table A3.18).



Notes

1. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
2. A participant's location may be divided across multiple remoteness areas proportionally. For PI 4, participants were assigned to their largest proportion remoteness area. See Appendix E for more information.
3. Data for this figure are in Table A3.18.

Source: NBCSP Register as at 31 December 2016.

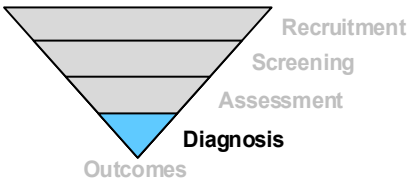
Figure 3.16: Median time (in days) between positive screen and diagnostic assessment of people aged 50–74, by remoteness area and socioeconomic group, 2015

Indigenous status: There was a longer median time between positive screen and assessment for Indigenous Australians (64 days) than for non-Indigenous Australians (52 days) (Table A3.19).

Language spoken at home: There was no difference in the median time between a positive screen and assessment for those who speak a language other than English at home and those who speak English at home (both 53 days) (Table A3.19).

Disability status: Participants reporting a severe or profound activity limitation had a longer median time between a positive screen and assessment (63 days) than participants who did not report such a limitation (52 days) (Table A3.19).

3.5 Diagnosis

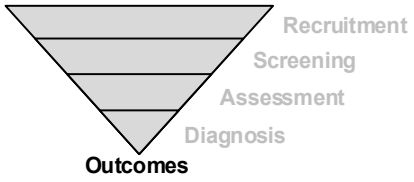


Diagnosis data available were not considered complete enough to allow formal performance indicator reporting for indicators:

- PI 5a—Adenoma detection rate
- PI 5b—Positive predictive of diagnostic assessment for detecting adenoma
- PI 6a—Colorectal cancer detection rate
- PI 6b—Positive predictive value of diagnostic assessment for detecting colorectal cancer. See *Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program* (AIHW 2014a) for the most recent accurate PPV of diagnostic assessment for detecting colorectal cancer.

See Chapter 4 for a summary of bowel abnormality detection results using available assessment and diagnosis data.

3.6 Outcomes



PI 9—Adverse events—hospital admission

Definition: The rate at which people who had a diagnostic assessment between **1 January 2015 and 31 December 2015** were admitted to hospital within 30 days of their assessment (AIHW 2014b).

Rationale: As with any invasive procedure, there is the risk of an adverse event occurring with a colonoscopy. Maximising benefit and minimising harm is an important tenet of population screening. Accordingly, it is important to report known harms from screening when monitoring the performance for the program.

Data quality: Complete data for this indicator requires linkage with hospital data, which is not currently performed. However, as the NBCSP Register currently has non-mandatory information on adverse events for participants who had an assessment, this will be used until a more complete data source becomes available. Therefore, there is currently an unknown level of under-reporting for this indicator.

Guide to interpretation: This indicator includes all those who underwent a diagnostic assessment in the defined period, not all those invited in the defined period. As per the adverse event form, unplanned hospital admissions after a colonoscopy are recorded only if they occurred within 30 days of the procedure.

National hospital admission rate: 9 per 10,000 assessments.

The following applies for the 27,854 people who had a diagnostic assessment in 2015:

Australia-wide: A total of 24 were admitted to hospital within 30 days of assessment, giving an overall Australia-wide hospital admission rate after assessment of 9 per 10,000 assessments (Table A3.21). Reporting of adverse events after a NBCSP colonoscopy is not mandatory and therefore this rate may be an underestimate.

Due to concerns about the level of data completeness, other disaggregations are not presented for this indicator.

PI 10—Incidence of colorectal cancer

Definition: The (estimated) incidence rate for colorectal cancer per 100,000 estimated resident population between **1 January 2017 and 31 December 2017** (AIHW 2014b).

Rationale: Incidence data provide contextual information about the number of new cases of colorectal cancer in the population, which can inform NBCSP planning.

Data quality: Each Australian state and territory has legislation that makes the reporting of cancer (excluding basal cell and squamous cell carcinomas of the skin) mandatory. The ACD contains data on cancers diagnosed up to and including 2013—although the 2013 incidence counts for New South Wales are estimates because the actual data were not available.

Guide to interpretation: The latest estimated incidence results (for 2017) are given where possible. However, estimated 2017 incidence numbers are not available for analysis by state and territory, by remoteness and socioeconomic areas, or by Indigenous status. Hence, for these stratifications, the latest actual data to 2012 are used.

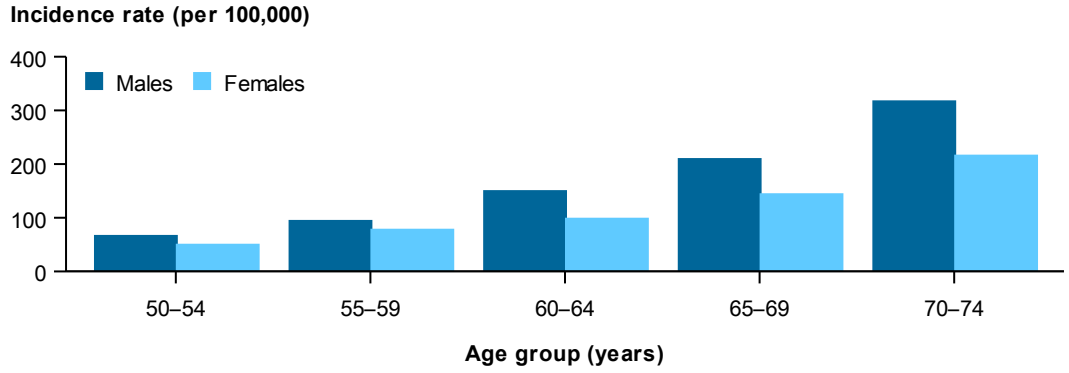
National colorectal cancer incidence rate: 58 cases per 100,000 people.

For 2017, the following estimates are made:

Australia-wide: A total of 16,682 people will be diagnosed with bowel cancer, giving an ASR of 58 cases per 100,000 people (Table A3.22).

Sex: Males will be more likely to be diagnosed with bowel cancer than females (67 cases per 100,000 males compared with 49 cases per 100,000 females) (Table A3.22). This pattern is similar for people in the target age range (152 cases per 100,000 males aged 50–74 and 108 cases per 100,000 females aged 50–74) (Figure 3.17).

Age: Bowel cancer incidence rates will be higher for older age groups. For people in the target age group, the estimated bowel cancer incidence rate will increase with increasing age, from 58 per 100,000 people aged 50–54 to 265 per 100,000 people aged 70–74 (Figure 3.17; Table A3.22).



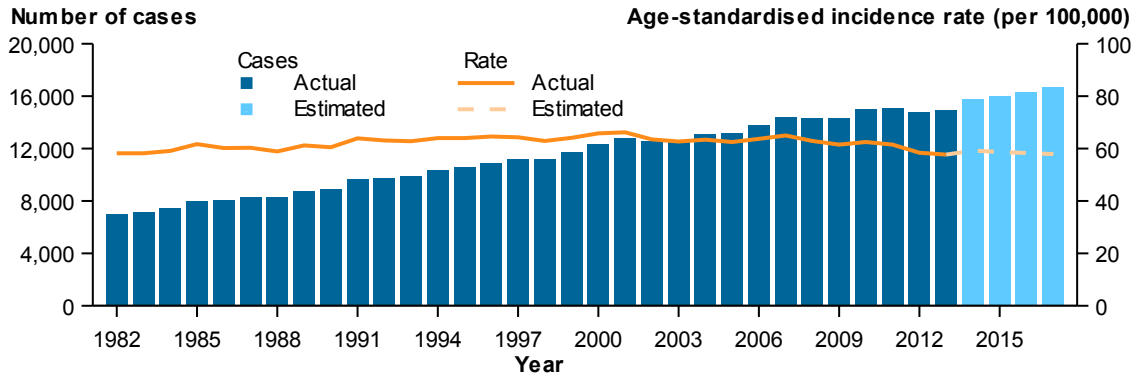
Notes

1. The 2017 estimates are based on 2004–2013 incidence data.
2. Age-specific rates are expressed per 100,000 people.
3. Data for this figure are in Table A3.22.

Source: AIHW ACD 2013.

Figure 3.17: Incidence rate of bowel cancer for people aged 50–74, by sex and age, 2017

Trend: The number of bowel cancer cases has increased from 6,983 in 1982 to an estimated 16,682 in 2017; the ASR fluctuated between 58 cases per 100,000 people and 66 cases per 100,000 (Figure 3.18). The overall effect of the ageing population is that, while the age-standardised incidence rate has recently fallen, the actual number of cases is increasing. The introduction of the NBCSP may have contributed to increases in the bowel cancer incidence count because prevalent cases of cancer are diagnosed earlier than may have been the case without screening.



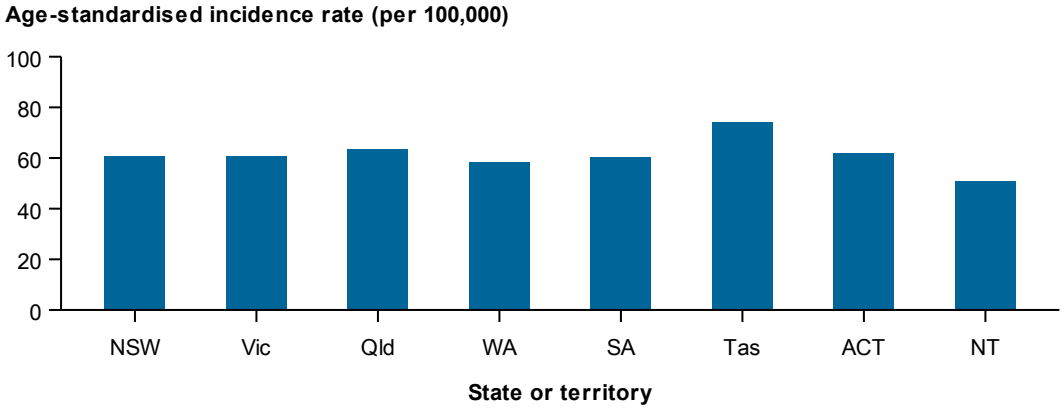
Notes

1. Estimated incidence data for 2014–2017 are based on 2004–2013 incidence data. Actual incidence data for 2014–2017 may differ from these estimated incidence data due to current and ongoing program or practice changes.
2. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
3. Data for this figure are in Table A3.25.

Source: AIHW ACD 2013.

Figure 3.18: Trend in new cases of bowel cancer, all ages combined, Australia, 1982–2017

State and territory: Between 2008 and 2012, the age-standardised incidence rate was highest in Tasmania (74 cases per 100,000 people) and lowest in the Northern Territory (51 per 100,000) (Figure 3.19).



Notes

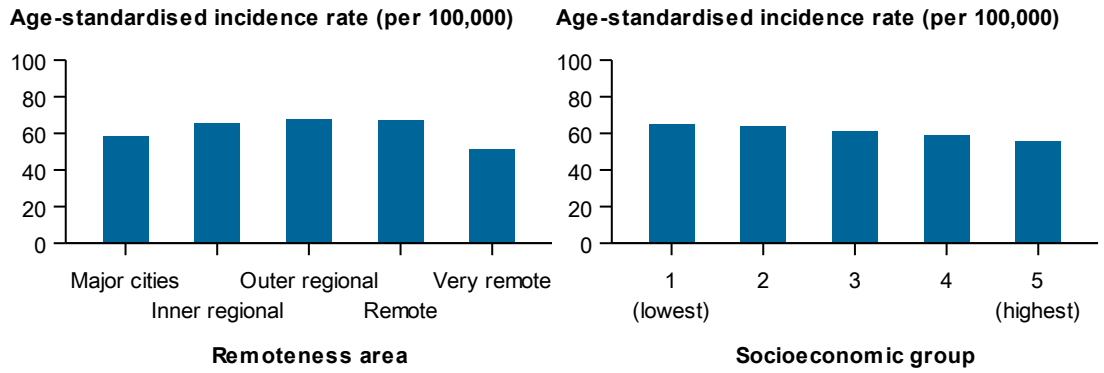
1. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. 'State or territory' refers to the state or territory of usual residence.
3. Data for this figure are in Table A3.23.

Source: AIHW ACD 2013.

Figure 3.19: Incidence rate of bowel cancer for all ages combined, by state and territory, 2008–2012

Remoteness area: In 2008–2012, the age-standardised incidence rate was highest for people living in *Outer regional* areas (68 cases per 100,000 people) and lowest for people living in *Very remote* areas (52 cases per 100,000) (Figure 3.20).

Socioeconomic group: In 2008–2012, the age-standardised incidence rate was highest for people living in the lowest socioeconomic areas (65 cases per 100,000 people) and lowest for people living in the highest socioeconomic areas (56 cases per 100,000) (Figure 3.20).



Notes

1. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. Remoteness was classified according to the Australian Statistical Geography Standard (ASGS) Remoteness Areas (see Appendix E). Incidence cells may not sum to the total due to non-concordance of some remoteness categories.
3. Socioeconomic areas were classified using the Australian Bureau of Statistics (ABS) Index of Relative Socio-Economic Disadvantage (IRSD) (see Appendix E).
4. Data for this figure are in Table A3.23.

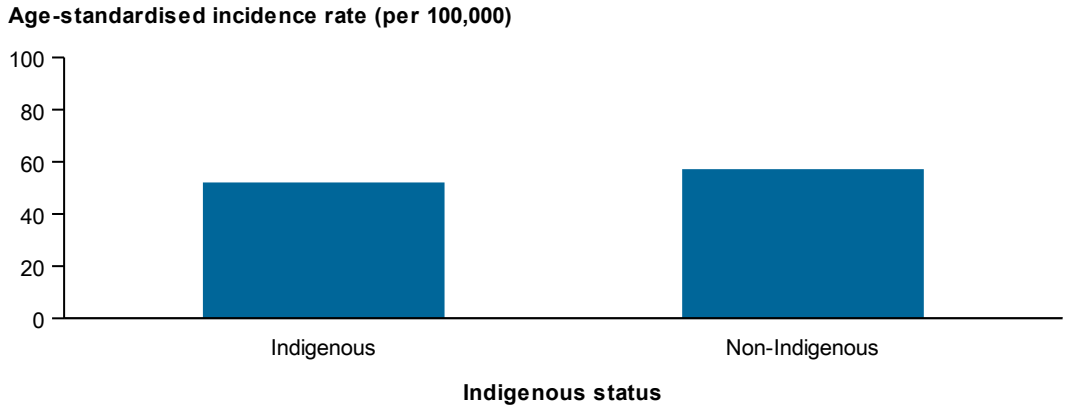
Source: AIHW ACD 2013.

Figure 3.20: Incidence rate of bowel cancer for all ages combined, by remoteness area and socioeconomic group, 2008–2012

Indigenous status: Reliable national data on the diagnosis of cancer for Indigenous Australians are not available. All state and territory cancer registries collect information on Indigenous status; however, in some jurisdictions, the quality of Indigenous status data is insufficient for analysis. Information in the ACD on Indigenous status is considered to be of sufficient completeness for reporting for New South Wales, Victoria, Queensland, Western Australia and the Northern Territory.

While the majority (83%) of Australian Indigenous people live in these five jurisdictions, the degree to which data for these jurisdictions are representative of data for all Indigenous people is unknown (ABS 2012). For the five jurisdictions analysed, 7% of the ACD had records with unknown Indigenous status for bowel cancer diagnoses between 2008 and 2012. It is unclear how many Indigenous Australians are misclassified as non-Indigenous.

In these five jurisdictions, Indigenous Australians had a lower age-standardised incidence rate than non-Indigenous Australians (52 cases per 100,000 people compared with 57 cases per 100,000) (Figure 3.21).



Notes

1. The rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. Data for this figure are in Table A3.24.

Source: AIHW ACD 2013.

Figure 3.21: Incidence rate of bowel cancer for all ages combined, by Indigenous status, New South Wales, Victoria, Queensland, Western Australia, Northern Territory, 2008–2012

PI 11—Mortality from colorectal cancer

Definition: The (estimated) mortality rate for colorectal cancer per 100,000 estimated resident population between **1 January 2017 and 31 December 2017** (AIHW 2014b).

Rationale: Mortality data provide contextual information about trends in the level of colorectal cancer mortality in the population, which can inform NBCSP planning.

Data quality: Cause of Death Unit Record File data are provided to the AIHW by the jurisdictional Registrars of Births, Deaths and Marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include causes of death coded by the ABS. It is suspected that colorectal cancer deaths are under reported due to issues with death certificate coding (see Appendix D).

Guide to interpretation: The latest estimated mortality results (for 2017) are given where possible. However, analysis by state and territory, by remoteness and socioeconomic areas and by Indigenous status stratifications use the latest actual mortality data (which were to 2014 at the time this report was prepared).

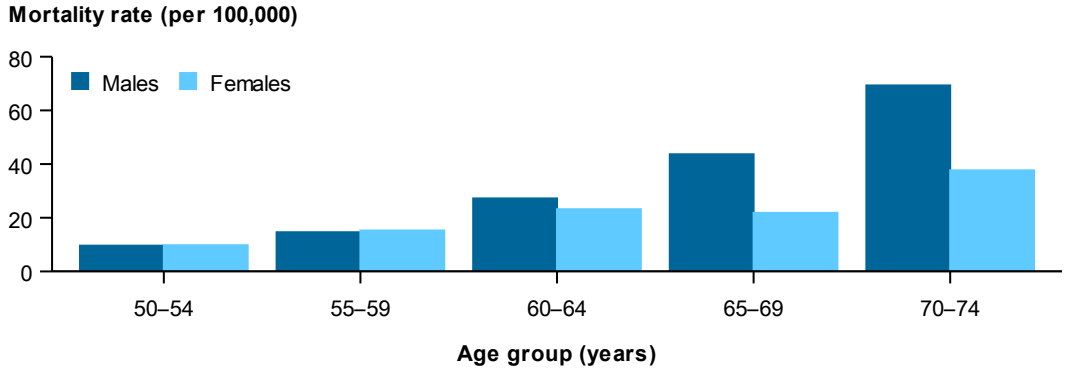
National colorectal cancer mortality rate: 14 deaths per 100,000 people.

The following estimates are made for 2017:

Australia-wide: A total of 4,114 people will die from bowel cancer, giving an ASR of 14 deaths per 100,000 people (Table A3.26).

Sex: Males will be more likely to die from bowel cancer than females (16 deaths per 100,000 males compared with 12 deaths per 100,000 females) (Table A3.26). This pattern is similar for people in the target age range (29 deaths per 100,000 males aged 50–74 and 20 deaths per 100,000 females aged 50–74) (Figure 3.22).

Age: The bowel cancer mortality rate will continue to be higher for older age groups (Table A3.26). For people in the target age range, the estimated bowel cancer mortality rate will increase from 10 deaths per 100,000 people aged 50–54 to 53 deaths per 100,000 people aged 70–74 (Figure 3.22; Table A3.26).



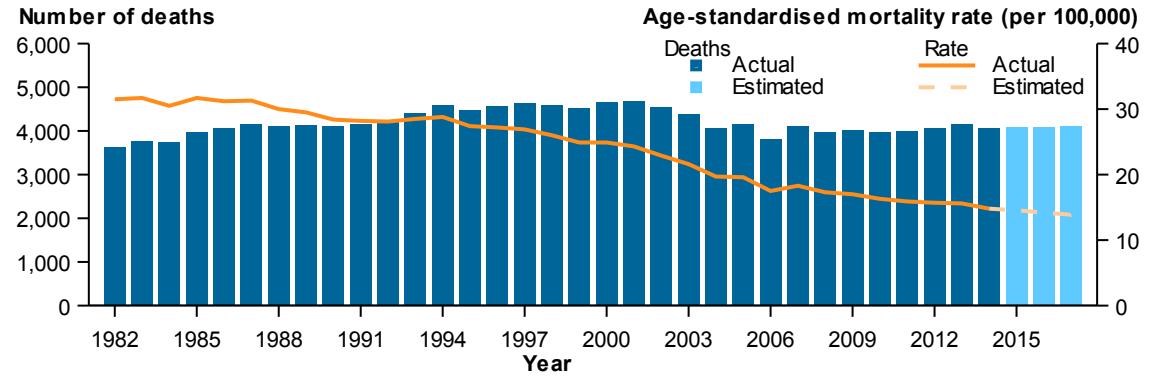
Notes

1. The 2017 estimates are based on 1997–2013 mortality data for males and 2006–2013 mortality data for females. See Appendix D for further information.
2. Age-specific rates are expressed per 100,000 people.
3. Data for this figure are in Table A3.26.

Source: AIHW NMD.

Figure 3.22: Mortality rate from bowel cancer for people aged 50–74, by sex and age, 2017

Trend: Between 1982 and 2017, the age-standardised mortality rate decreased from 32 deaths per 100,000 people to an estimated 14 deaths per 100,000 (Figure 3.23).



Notes

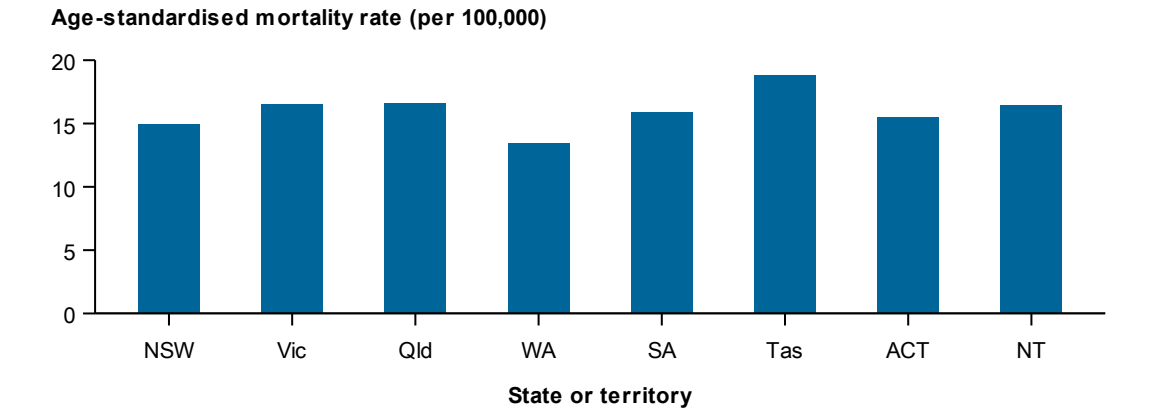
1. Estimated mortality data for 2015–2017 are based on 1997–2013 mortality data for males and 2006–2013 mortality data for females. Actual mortality data for 2015–2017 may differ from these estimated mortality data due to current and ongoing program or practice changes. See Appendix D for further information.
2. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
3. Data for this figure are in Table A3.29.

Source: AIHW NMD.

Figure 3.23: Trend in deaths from bowel cancer, all ages combined, Australia, 1982–2017

The NBCSP started in 2006 and has not yet completed its full rollout to biennially invite those in the 50–74 target age range. This makes it harder to quantify its impact on bowel cancer mortality. However, a study that the AIHW conducted of people diagnosed with bowel cancer in 2006–2008 showed that NBCSP invitees (particularly those who participated) who had been diagnosed with bowel cancer had less risk of dying from bowel cancer, and were more likely to have less advanced cancers when diagnosed than non-invitees. These findings show that the NBCSP is contributing to reducing morbidity and mortality from bowel cancer in Australia (AIHW 2014a).

State and territory: Between 2010 and 2014, the age-standardised mortality rate was highest in Tasmania (19 deaths per 100,000 people) and lowest in Western Australia (13 deaths per 100,000) (Figure 3.24).



Notes

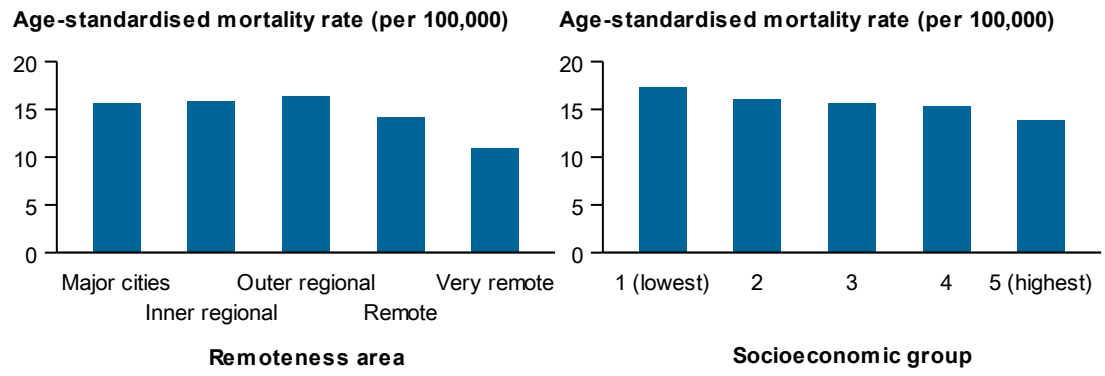
1. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. Data for this figure are in Table A3.27.

Source: AIHW NMD.

Figure 3.24: Mortality rate from bowel cancer for all ages combined, by state and territory, 2010–2014

Remoteness area: Between 2010 and 2014, the age-standardised mortality rate was highest for people living in *Outer regional* areas (16 deaths per 100,000 people) and lowest for people living in *Very Remote* areas (11 deaths per 100,000) (Figure 3.25).

Socioeconomic group: Between 2010 and 2014, the age-standardised mortality rate was highest for people living in the lowest socioeconomic areas (17 deaths per 100,000 people) and lowest for people living in the highest socioeconomic areas (14 deaths per 100,000) (Figure 3.25).



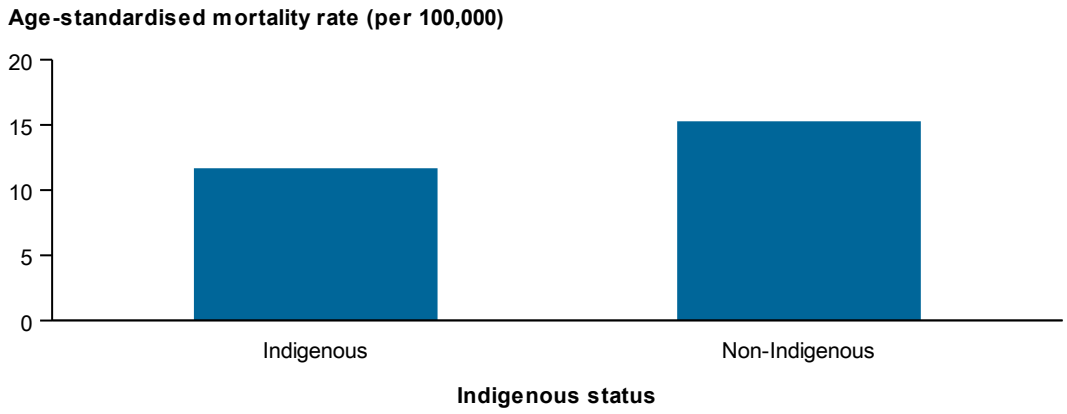
Notes

1. Rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. Remoteness was classified according to the ASGS Remoteness Areas (see Appendix E).
3. Socioeconomic areas were classified using the ABS IRSD (see Appendix E).
4. Data for this figure are in Table A3.27.

Source: AIHW NMD.

Figure 3.25: Mortality rate from bowel cancer for all ages combined, by remoteness area and socioeconomic group, 2010–2014

Indigenous status: Only mortality data from New South Wales, Queensland, Western Australia, South Australia and the Northern Territory are considered adequate for reporting by Indigenous status. In these jurisdictions, Indigenous Australians had a slightly lower age-standardised bowel cancer mortality rate than non-Indigenous Australians (12 deaths per 100,000 people compared with 15 deaths per 100,000) (Figure 3.26).



Note: Data for this figure are in Table A3.28.

Source: AIHW NMD.

Figure 3.26: Mortality rate from bowel cancer for all ages combined, by Indigenous status, New South Wales, Queensland, Western Australia, South Australia and Northern Territory, 2010–2014

4 Bowel abnormality detection results

Diagnosis data were not considered complete enough to allow for formal performance indicator reporting of NBCSP diagnostic outcomes in Chapter 3. Instead, a summary of bowel abnormality detection results for those assessed in 2015 are presented here for information, using the available data.

4.1 Bowel abnormality detection using available assessment and histopathology data

Of the 27,854 participants who had a diagnostic assessment, Australia-wide, in 2015:

- 168 (0.6%) had a bowel cancer detected and confirmed by histopathology
- 807 (2.9%) had a suspected bowel cancer that was still awaiting histopathological diagnosis
- 3,538 (12.7%) had an adenoma diagnosed by histopathology
- 16,197 (58.1%) had no adenoma or cancer recorded (includes those only known to have had a colonoscopy by a Medicare claim, with no results available)
- 7,144 (25.6%) were still awaiting histopathology outcomes for a polyp biopsy sample (that was not suspected of being bowel cancer) (Table A4.1).

5 Spotlight on participation by population subgroups

5.1 Self-reported population group identification

Determining participation rates by Indigenous status, language spoken at home, and disability status requires the number of screening invitations that were sent out to members of each of these population groups (the denominator) as well as the number of people in each population group who returned a completed screening kit (the numerator). Unfortunately, at present, reliable information is known only by self-identification through the return of a completed participant details form along with the participant's iFOBT for analysis (the numerator). That is, membership of these population groups is known only for people who participate, not for all invitees. Hence, it is not possible to accurately determine participation rates for these population groups.

An alternative method to estimate the number of invitations sent out to people in these population groups involves using the percentages of those aged 50–74 who reported as such at the Census. To do so, Census data (tables A5.1–A5.3) have been applied to the number of overall invitations (by age group and sex) to estimate invitation volumes by population groups. These estimated denominator data can then be used with the known population group numerator data gained from the returned participant details forms of those who participated.

Estimated Indigenous Australian participation

There are limitations in the data available to estimate Indigenous Australians' participation in the NBCSP due to the relatively high proportion of Indigenous status that is 'not stated' in the data sets used. An overall rate for people aged 50–74 has been estimated but these limitations should be considered in interpreting these data.

It is estimated that the participation rate for Indigenous Australians aged 50–74 who were invited in 2014–2015 was 23.5%; this compares with an estimated participation rate for non-Indigenous Australians of 40.0% (giving the overall rate of 38.9% reported for PI 1).

This high-level estimate indicates it is likely that Indigenous Australians participate at a lower rate than non-Indigenous Australians.

Opportunities to improve the accuracy of calculating Indigenous participation rates will continue to be explored. New information may become available that enables improved estimates to be produced for future reports.

Estimated participation by language spoken at home

Issue with data for language spoken at home on the NBCSP Register

Census data for these population subgroups includes a 'not stated' percentage for those who did not respond to these questions at the Census. This is equal to the 'not stated' option for those who participate and choose not to self-identify population group information on their participant details form. However, for language spoken at home, the NBCSP Register assumes all who do not self-identify a language speak English. Therefore, there is

no 'not stated' language spoken at home data for participants (numerator) to match with the 'not stated' percentage data from the Census (used for the denominator).

To resolve this issue, a participation range method has been used for language spoken at home, with a range covering from the entire 'not stated' percentage being added to the 'English' column, to the entire 'not stated' percentage being added to the 'Language other than English' column (Table A5.2).

Using the method described, estimated participation rate ranges by language spoken at home have been calculated (Table 5.1).

Table 5.1: Estimated participation rate for people aged 50–74 by language spoken at home, by sex and age, Australia, 2014–2015

		Estimated participation rate ranges		
Sex	Age group (years)	Language other than English	English	Total participation rate (%)
Males	50–54	22.5–29.8	30.8–32.9	30.6
	55–59	31.3–41.7	39.1–41.5	39.4
	60–64	36.6–48.7	45.8–48.4	46.2
	65–69	29.9–39.8	46.8–49.6	45.8
	70–74	28.1–36.2	56.6–60.2	53.1
	50–74	*29.3–38.8*	*41.7–44.3*	*41.2*
Females	50–54	18.2–22.1	27.3–28.6	26.4
	55–59	24.4–29.9	34.9–36.5	34.1
	60–64	29.1–36.1	41.0–42.9	40.2
	65–69	25.7–32.7	42.6–44.8	41.1
	70–74	28.2–35.5	55.4–58.8	51.8
	50–74	*24.2–30.0*	*37.8–39.7*	*36.5*
Persons	50–54	20.4–25.7	29.1–30.7	28.5
	55–59	27.8–35.4	37.0–39.0	36.8
	60–64	32.8–42.2	43.4–45.7	43.2
	65–69	27.8–36.1	44.7–47.2	43.5
	70–74	28.2–35.8	56.0–59.5	52.5
	50–74	**26.8–34.2**	**39.8–42.0**	**38.9**

Source: AIHW analysis of NBCSP Register as at 31 December 2016, using 2011 Census data.

From the estimated participation rate ranges in Table 5.1, it is likely that those who speak a language other than English participate at a lower rate than those who speak English. Females and older age groups have larger differences in estimated participation rates.

Estimated participation by disability status

Using the Census data in Table A5.3 to estimate denominators, estimated participation rates by disability status have been calculated (Table 5.2).

Table 5.2: Estimated participation rate for people aged 50–74 by disability status, by sex and age, Australia, 2014–2015

		Estimated participation rate			
Sex	Age group (years)	Severe or profound activity limitation	No severe or profound activity limitation	Not stated[(a)]	Total participation rate (%)
Males	50–54	27.8	26.2	28.0	26.4
	55–59	28.7	34.5	32.0	34.1
	60–64	28.7	41.3	37.0	40.2
	65–69	32.0	42.0	40.1	41.1
	70–74	39.5	53.6	46.5	51.8
	50–74	*30.9*	*37.0*	*34.8*	*36.5*
Females	50–54	35.9	30.3	32.7	30.6
	55–59	41.3	39.5	36.0	39.4
	60–64	43.3	46.7	39.3	46.2
	65–69	39.9	46.4	42.4	45.8
	70–74	32.9	56.2	42.8	53.1
	50–74	*38.2*	*41.6*	*37.7*	*41.2*
Persons	50–54	31.9	28.3	30.1	28.5
	55–59	35.1	37.0	33.8	36.8
	60–64	35.5	44.0	38.0	43.2
	65–69	35.7	44.3	41.2	43.5
	70–74	36.1	54.9	44.8	52.5
	50–74	**34.5**	**39.3**	**36.2**	**38.9**

(a) The total proportions of 'Not stated' records was 4.6% for participants and 4.9% in the Census.

Source: AIHW analysis of NBCSP Register as at 31 December 2016 using 2011 Census data.

From the estimated participation rates in Table 5.2 it is likely that those with a severe or profound activity limitation participate at a lower rate than those without such a limitation.

Appendix A: Data tables

Additional table for Chapter 1

Table A1.1: Government funding for cancer screening programs, 2014–15 ($ million)

Screening program	Expenditure
BreastScreen Australia	287.7[(a)(b)]
National Cervical Screening Program	81.5[(c)(b)]
National Bowel Cancer Screening Program	51.8[(d)(e)]

(a) Excludes mammography for breast cancer screening that occurs outside BreastScreen Australia.

(b) Includes only direct expenditure on the program by the Australian Government, and not the funding given to the states and territories through the National Healthcare Agreement.

(c) Excludes the proportion of the costs associated with general practitioner, specialist and nurse attendances that would have been for Pap smears (and therefore cannot be compared with expenditure for 2008–09, which included an estimate for these costs; excludes general practitioner incentives payments).

(d) Excludes Medicare Benefits Schedule flow-on costs; excludes general practitioner incentives payments; excludes bowel screening that occurs outside the NBCSP.

(e) Includes payments from the Australian Government to the states and territories for the NBCSP.

Note: These expenditure data include only recurrent expenditure; health infrastructure payments for cancer have been excluded as well as any health workforce expenditure.

Sources: AIHW Health Expenditure database; Medicare Australia Statistics.

Additional tables for Chapter 2

Table A2.1: Five-year relative survival from bowel cancer, by sex and age, Australia, 2009–2013

	Males		Females		Persons	
Age group (years)	5-year relative survival	95% confidence interval	5-year relative survival	95% confidence interval	5-year relative survival	95% confidence interval
0–4	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
5–9	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
10–14	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
15–19	83.1	65.8–92.2	94.2	82.7–98.2	89.6	80.9–94.6
20–24	79.2	68.2–86.9	85.3	75.9–91.3	82.4	75.5–87.5
25–29	75.1	67.5–81.2	75.2	67.3–81.5	75.2	69.9–79.7
30–34	71.8	64.9–77.5	75.5	69.1–80.7	73.7	69.2–77.7
35–39	68.7	63.7–73.2	74.0	69.2–78.2	71.4	68.0–74.6
40–44	71.4	67.7–74.7	72.8	69.2–76.1	72.1	69.5–74.5
45–49	72.5	69.9–74.9	73.9	71.1–76.4	73.1	71.3–74.9
50–54	73.7	71.7–75.5	75.3	73.2–77.3	74.4	73.0–75.8
55–59	74.8	73.3–76.3	75.9	74.1–77.5	75.3	74.1–76.4
60–64	70.5	69.1–71.9	75.0	73.4–76.6	72.3	71.2–73.3
65–69	73.2	71.8–74.4	76.0	74.5–77.4	74.3	73.3–75.2
70–74	67.9	66.5–69.3	71.6	70.0–73.1	69.5	68.4–70.5
75–79	64.5	62.8–66.1	67.0	65.3–68.7	65.7	64.5–66.9
80–84	60.6	58.3–62.8	63.0	61.0–65.0	61.8	60.3–63.3
85+	53.9	50.4–57.5	55.0	52.3–57.7	54.7	52.5–56.9
50–74	*71.5*	*70.9–72.2*	*74.5*	*73.7–75.2*	*72.7*	*72.2–73.2*
All ages	**68.1**	**67.5–68.7**	**69.4**	**68.8–70.0**	**68.7**	**68.3–69.1**

Source: ACD 2013.

Table A2.2: Trend in 5-year relative survival from bowel cancer, Australia, 1984–1988 to 2009–2013

Year	5-year relative survival (%)	95% confidence interval
1984–1988	49.7	49.0–50.4
1989–1993	54.1	53.5–54.7
1994–1998	57.3	56.7–57.8
1999–2003	61.2	60.7–61.7
2004–2008	64.7	64.2–65.1
2009–2013	68.7	68.3–69.1

Source: ACD 2013.

Table A2.3: Relative survival at diagnosis and 5-year conditional survival from bowel cancer, Australia, 2009–2013

	Relative survival		Conditional survival		
Years after diagnosis	Relative survival (%)	95% confidence interval	Years already survived	5-year conditional relative survival (%)	95% confidence interval
1	85.7	85.4–86.0	. .	. .	. .
2	78.7	78.4–79.0	. .	. .	. .
3	74.1	73.8–74.5	. .	. .	. .
4	70.8	70.4–71.2	. .	. .	. .
5	68.7	68.3–69.1	0	68.7	68.3–69.1
6	67.0	66.5–67.4	1	78.2	77.7–78.6
7	65.6	65.1–66.0	2	83.3	82.8–83.8
8	64.5	64.0–65.0	3	87.0	86.5–87.5
9	63.6	63.1–64.1	4	89.8	89.2–90.3
10	62.8	62.3–63.4	5	91.5	90.9–92.0
11	62.4	61.8–62.9	6	93.1	92.5–93.7
12	61.8	61.2–62.4	7	94.3	93.7–94.9
13	61.3	60.7–61.9	8	95.1	94.4–95.7
14	60.9	60.3–61.6	9	95.8	95.1–96.5
15	60.6	60.0–61.3	10	96.5	95.8–97.2
16	60.6	59.8–61.3	11	97.1	96.4–97.9
17	60.5	59.7–61.2	12	97.8	97.0–98.6
18	60.5	59.6–61.3	13	98.6	97.7–99.4
19	60.3	59.5–61.2	14	99.0	98.1–99.9
20	60.5	59.6–61.4	15	99.7	98.7–100.0

Source: ACD 2013.

Additional tables for Chapter 3

Recruitment

Table A3.1: Screening invitations including opt-off and suspended status of people aged 50–74, by sex and age, Australia, 2014–2015

Sex	Age group (years)	Invitations issued to eligible population (N)	Persons suspended (N)	Persons opting off (N)	Persons suspended and opted off (N)	Persons suspended and opted off (%)	Invitations (minus opted off and suspended) (N)
Males	50–54	342,053	1,699	5,499	7,198	2.1	335,158
	55–59	314,644	2,039	4,331	6,370	2.0	308,608
	60–64	293,752	2,527	5,705	8,232	2.8	285,972
	65–69	262,843	3,917	13,963	17,880	6.8	245,881
	70–74	134,701	1,560	5,999	7,559	5.6	127,637
	50–74	*1,347,993*	*11,742*	*35,497*	*47,239*	*3.5*	*1,303,256*
Females	50–54	340,432	2,478	6,619	9,097	2.7	331,825
	55–59	315,867	2,787	5,309	8,096	2.6	308,269
	60–64	299,638	3,593	6,906	10,499	3.5	289,911
	65–69	268,301	5,210	17,185	22,395	8.3	247,225
	70–74	136,874	2,042	7,444	9,486	6.9	128,113
	50–74	*1,361,112*	*16,110*	*43,463*	*59,573*	*4.4*	*1,305,343*
Persons	50–54	682,485	4,177	12,118	16,295	2.4	666,983
	55–59	630,511	4,826	9,640	14,466	2.3	616,877
	60–64	593,390	6,120	12,611	18,731	3.2	575,883
	65–69	531,144	9,127	31,148	40,275	7.6	493,106
	70–74	271,575	3,602	13,443	17,045	6.3	255,750
	50–74	**2,709,105**	**27,852**	**78,960**	**106,812**	**3.9**	**2,608,599**

Source: NBCSP Register as at 31 December 2016.

Table A3.2: Participation of people aged 50–74, by sex and age, Australia, 2014–2015

Sex	Age group (years)	Returned completed screening test (N)	Invitations (minus opted off and suspended) (N)	Participation (%)
Males	50–54	88,483	335,158	26.4
	55–59	105,125	308,608	34.1
	60–64	115,043	285,972	40.2
	65–69	101,099	245,881	41.1
	70–74	66,142	127,637	51.8
	50–74	*475,892*	*1,303,256*	*36.5*
Females	50–54	101,685	331,825	30.6
	55–59	121,595	308,269	39.4
	60–64	133,881	289,911	46.2
	65–69	113,265	247,225	45.8
	70–74	68,009	128,113	53.1
	50–74	*538,435*	*1,305,343*	*41.2*
Persons	50–54	190,168	666,983	28.5
	55–59	226,720	616,877	36.8
	60–64	248,924	575,883	43.2
	65–69	214,364	493,106	43.5
	70–74	134,151	255,750	52.5
	50–74	**1,014,327**	**2,608,599**	**38.9**

Source: NBCSP Register as at 31 December 2016.

Table A3.3: Participation of people aged 50–74, by invitation round, Australia, 2014–2015

Round	Screened in previous round	Returned completed screening test (N)	Invitations (minus opted off and suspended) (N)	Participation (%)
First	n.a.	429,823	1,225,580	35.1
Subsequent	No	162,815	828,234	19.7
	Yes	421,689	554,785	76.0
	All	*584,504*	*1,383,019*	*42.3*
All rounds	**No**[(a)]	**592,638**	**2,053,814**	**28.9**
	Yes	**421,689**	**554,785**	**76.0**
	All	**1,014,327**	**2,608,599**	**38.9**

(a) Includes all first-round invitations.

Source: NBCSP Register as at 31 December 2016.

Table A3.4: Participation of people aged 50–74, by state and territory, remoteness area and socioeconomic group, Australia, 2014–2015

Area		Returned completed screening test (N)	Invitations (minus opted off and suspended) (N)	Participation rate (%)
State or territory	NSW	309,743	860,103	36.0
	Vic	258,521	648,001	39.9
	Qld	196,015	514,295	38.1
	WA	104,655	254,867	41.1
	SA	92,960	202,982	45.8
	Tas	28,953	65,379	44.3
	ACT	17,292	41,356	41.8
	NT	6,188	21,616	28.6
Remoteness area	Major cities	680,089	1,790,045	38.0
	Inner regional	220,111	526,185	41.8
	Outer regional	98,556	244,504	40.3
	Remote	11,519	32,785	35.1
	Very remote	3,885	14,554	26.7
	Unknown	167	526	31.7
Socioeconomic group	1 (lowest)	190,716	521,137	36.6
	2	200,713	516,542	38.9
	3	196,421	510,658	38.5
	4	201,818	508,819	39.7
	5 (highest)	213,881	522,551	40.9
	Unknown	10,778	28,892	37.3
Total		**1,014,327**	**2,608,599**	**38.9**

Source: NBCSP Register as at 31 December 2016.

Table A3.5: Participation rate (%) of people aged 50–74, by sex and age, Australia, 2007–2008 to 2014–2015

Sex	Age group (years)	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
Males	50–54	31.3	34.1	32.2	29.9	28.0	26.9	26.5	26.4
	55–59	37.4	38.3	36.8	34.4	32.3	32.6	33.9	34.1
	60–64	. .	. .	. .	. .	. .	. .	40.6	40.2
	65–69	49.1	50.6	49.4	47.1	45.5	43.5	41.7	41.1
	70–74	. .	. .	. .	. .	. .	. .	. .	51.8
	50–74	*40.0*	*39.8*	*37.9*	*35.7*	*34.1*	*33.4*	*34.7*	*36.5*
Females	50–54	38.0	40.8	37.4	34.7	32.6	31.2	30.8	30.6
	55–59	47.1	47.6	44.7	41.8	39.4	38.9	39.7	39.4
	60–64	. .	. .	. .	. .	. .	. .	47.2	46.2
	65–69	56.2	57.7	55.4	52.9	51.4	49.2	46.8	45.8
	70–74	. .	. .	. .	. .	. .	. .	. .	53.1
	50–74	*48.2*	*47.5*	*44.2*	*41.6*	*39.9*	*38.7*	*40.1*	*41.2*
Persons	50–54	34.7	37.4	34.8	32.3	30.3	29.0	28.6	28.5
	55–59	42.2	42.9	40.7	38.1	35.8	35.8	36.8	36.8
	60–64	. .	. .	. .	. .	. .	. .	43.9	43.2
	65–69	52.6	54.1	52.3	49.9	48.4	46.3	44.2	43.5
	70–74	. .	. .	. .	. .	. .	. .	. .	52.5
	50–74	**44.0**	**43.6**	**41.0**	**38.6**	**37.0**	**36.1**	**37.4**	**38.9**

Note: Data presented are for rolling 2-year participation periods.

Source: NBCSP Register as at 31 December 2016.

Screening

Table A3.6: iFOBT positivity rate of people aged 50–74, by sex and age, Australia, 2015

Sex	Age group at screen (years)	Positive result (N)	Valid screening test (N)	Screening positivity (%)
Males	50–54	2,719	38,614	7.0
	55–59	3,415	46,722	7.3
	60–64	3,921	47,217	8.3
	65–69	4,665	44,789	10.4
	70–74	6,987	56,803	12.3
	50–74	*21,707*	*234,145*	*9.3*
Females	50–54	2,739	44,559	6.1
	55–59	3,305	53,972	6.1
	60–64	3,687	54,655	6.7
	65–69	3,927	49,779	7.9
	70–74	5,756	58,023	9.9
	50–74	*19,414*	*260,988*	*7.4*
Persons	50–54	5,458	83,173	6.6
	55–59	6,720	100,694	6.7
	60–64	7,608	101,872	7.5
	65–69	8,592	94,568	9.1
	70–74	12,743	114,826	11.1
	50–74	**41,121**	**495,133**	**8.3**

Source: NBCSP Register as at 31 December 2016.

Table A3.7: iFOBT positivity rate of people aged 50–74, by screening round, Australia, 2015

Screening round	Positive result (N)	Valid screening test (N)	Screening positivity (%)
First	24,601	281,201	8.7
Subsequent	16,520	213,932	7.7
All rounds	**41,121**	**495,133**	**8.3**

Source: NBCSP Register as at 31 December 2016.

Table A3.8: iFOBT positivity rate of people aged 50–74, by state and territory, remoteness area and socioeconomic group, Australia, 2015

Area		Positive result (N)	Valid screening test (N)	Screening positivity (%)
State or territory	NSW	12,433	150,327	8.3
	Vic	10,637	127,458	8.3
	Qld	7,766	95,549	8.1
	WA	4,092	50,785	8.1
	SA	3,993	45,406	8.8
	Tas	1,287	14,224	9.0
	ACT	661	8,424	7.8
	NT	252	2,960	8.5
Remoteness area	Major cities	26,584	329,962	8.1
	Inner regional	9,443	109,251	8.6
	Outer regional	4,398	48,551	9.1
	Remote	506	5,455	9.3
	Very remote	183	1,834	10.0
	Unknown	7	81	8.6
Socioeconomic group	1 (lowest)	9,087	94,042	9.7
	2	8,763	98,683	8.9
	3	8,018	95,559	8.4
	4	7,603	97,634	7.8
	5 (highest)	7,290	104,156	7.0
	Unknown	360	5,059	7.1
Total		**41,121**	**495,133**	**8.3**

Source: NNCSP Register as at 31 December 2016.

Table A3.9: iFOBT positivity rate of people aged 50–74, by Indigenous status, language spoken at home and disability status, Australia, 2015

Population group		Positive result (N)	Valid screening test (N)	Screening positivity (%)
Indigenous status	Indigenous	408	3,610	11.3
	Non-Indigenous	39,395	479,209	8.2
	Not stated	1,318	12,314	10.7
Language spoken at home	Language other than English	5,893	67,571	8.7
	English	35,228	427,562	8.2
Disability status	Severe or profound activity limitation	3,323	26,232	12.7
	No severe or profound activity limitation	35,538	446,233	8.0
	Not stated	2,260	22,668	10.0
Total		**41,121**	**495,133**	**8.3**

Source: NBCSP Register as at 31 December 2016.

Assessment

Table A3.10: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by sex and age, Australia, 2015

Sex	Age group at first positive screen (years)	Assessments (N)	Positive iFOBT result (N)	Diagnostic assessment rate (%)
Males	50–54	1,934	2,719	71.1
	55–59	2,416	3,415	70.7
	60–64	2,757	3,921	70.3
	65–69	3,265	4,665	70.0
	70–74	4,761	6,987	68.1
	50–74	*15,133*	*21,707*	*69.7*
Females	50–54	2,011	2,739	73.4
	55–59	2,395	3,305	72.5
	60–64	2,678	3,687	72.6
	65–69	2,800	3,927	71.3
	70–74	3,935	5,756	68.4
	50–74	*13,819*	*19,414*	*71.2*
Persons	50–54	3,945	5,458	72.3
	55–59	4,811	6,720	71.6
	60–64	5,435	7,608	71.4
	65–69	6,065	8,592	70.6
	70–74	8,696	12,743	68.2
	50–74	**28,952**	**41,121**	**70.4**

Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date. Therefore, the number of assessment counts may be different across indicators.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See ‘Current reporting limitations’ on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.11: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by state and territory, remoteness area and socioeconomic group, Australia, 2015

Area		Assessments (N)	Positive iFOBT result (N)	Diagnostic assessment rate (%)
State or territory	NSW	8,220	12,433	66.1
	Vic	7,350	10,637	69.1
	Qld	6,245	7,766	80.4
	WA	2,537	4,092	62.0
	SA	2,903	3,993	72.7
	Tas	1,027	1,287	79.8
	ACT	522	661	79.0
	NT	148	252	58.7
Remoteness area	Major cities	19,507	26,584	73.4
	Inner regional	6,311	9,443	66.8
	Outer regional	2,730	4,398	62.1
	Remote	300	506	59.2
	Very remote	99	183	54.4
	Unknown	5	7	71.4
Socioeconomic group	1 (lowest)	5,827	9,087	64.1
	2	5,866	8,763	66.9
	3	5,713	8,018	71.3
	4	5,684	7,603	74.8
	5 (highest)	5,625	7,290	77.2
	Unknown	237	360	65.8
Total		**28,952**	**41,121**	**70.4**

Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date. Therefore, the number of assessment counts may be different across indicators.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.12: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by Indigenous status, language spoken at home and disability status, Australia, 2015

Population group		Assessments (N)	Positive iFOBT result (N)	Diagnostic assessment rate (%)
Indigenous status	Indigenous	234	408	57.4
	Non-Indigenous	27,913	39,395	70.9
	Not stated	805	1,318	61.1
Language spoken at home	Language other than English	3,938	5,893	66.8
	English	25,014	35,228	71.0
Disability status	Severe or profound activity limitation	1,904	3,323	57.3
	No severe or profound activity limitation	25,615	35,538	72.1
	Not stated	1,433	2,260	63.4
Total		**28,952**	**41,121**	**70.4**

Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date. Therefore, the number of assessment counts may be different across indicators.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.13: Diagnostic assessment rate (colonoscopy) of people aged 50–74, by sex and age, Australia, 2007 to 2015

Sex	Age group at first positive screen (years)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Males	50–54	. .	70.0	72.9	74.8	72.8	73.2	71.8	73.3	71.1
	55–59	74.8	73.6	71.7	74.8	74.4	73.6	73.8	71.6	70.7
	60–64	. .	. .	. .	. .	. .	. .	74.2	72.7	70.3
	65–69	70.9	75.2	74.4	74.1	74.2	73.6	74.1	73.6	70.0
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	68.1
	50–74	*72.6*	*73.7*	*73.2*	*74.5*	*73.9*	*73.5*	*73.5*	*72.9*	*69.7*
Females	50–54	. .	71.8	71.7	74.9	75.6	74.5	74.1	73.4	73.4
	55–59	73.7	73.8	75.5	73.5	73.9	74.5	74.6	73.1	72.5
	60–64	. .	. .	. .	. .	. .	. .	75.8	73.8	72.6
	65–69	68.3	76.0	71.1	73.5	73.2	74.2	74.2	74.1	71.3
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	68.4
	50–74	*70.9*	*74.3*	*72.6*	*73.9*	*74.1*	*74.4*	*74.5*	*73.6*	*71.2*
Persons	50–54	. .	70.9	72.3	74.9	74.2	73.9	73.0	73.3	72.3
	55–59	74.3	73.7	73.6	74.2	74.1	74.0	74.2	72.3	71.6
	60–64	. .	. .	. .	. .	. .	. .	75.0	73.2	71.4
	65–69	69.7	75.6	72.9	73.8	73.7	73.8	74.1	73.9	70.6
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	68.2
	50–74	**71.9**	**74.0**	**72.9**	**74.2**	**74.0**	**73.9**	**74.0**	**73.2**	**70.4**

Notes

1. Calculation of the diagnostic assessment rate is based on the screening test date. In contrast, calculation of the PPVs and detection rates for both adenoma and carcinoma, and the hospital admission rate, is based on the diagnostic assessment date. Therefore, the number of assessment counts may be different across indicators.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See ‘Current reporting limitations’ on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.14: Time between positive screen and diagnostic assessment of people aged 50–74, by sex and age, Australia, 2015

Sex	Age group (years)	No diagnostic assessment		≤30 days		≤60 days		≤90 days		≤180 days		≤360 days		>360 days		All
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Males	50–54	785	28.9	442	16.3	1,035	38.1	1,408	51.8	1,786	65.7	1,921	70.7	13	0.5	2,719
	55–59	999	29.3	534	15.6	1,319	38.6	1,747	51.2	2,220	65.0	2,401	70.3	15	0.4	3,415
	60–64	1,164	29.7	629	16.0	1,525	38.9	2,053	52.4	2,597	66.2	2,747	70.1	10	0.3	3,921
	65–69	1,400	30.0	751	16.1	1,865	40.0	2,473	53.0	3,096	66.4	3,258	69.8	7	0.2	4,665
	70–74	2,226	31.9	1,100	15.7	2,738	39.2	3,650	52.2	4,527	64.8	4,744	67.9	17	0.2	6,987
	50–74	*6,574*	*30.3*	*3,456*	*15.9*	*8,482*	*39.1*	*11,331*	*52.2*	*14,226*	*65.5*	*15,071*	*69.4*	*62*	*0.3*	*21,707*
Females	50–54	728	26.6	469	17.1	1,124	41.0	1,483	54.1	1,875	68.5	2,002	73.1	9	0.3	2,739
	55–59	910	27.5	571	17.3	1,367	41.4	1,800	54.5	2,266	68.6	2,385	72.2	10	0.3	3,305
	60–64	1,009	27.4	652	17.7	1,539	41.7	2,066	56.0	2,525	68.5	2,669	72.4	9	0.2	3,687
	65–69	1,127	28.7	657	16.7	1,633	41.6	2,161	55.0	2,652	67.5	2,790	71.0	10	0.3	3,927
	70–74	1,821	31.6	951	16.5	2,318	40.3	3,066	53.3	3,735	64.9	3,922	68.1	13	0.2	5,756
	50–74	*5,595*	*28.8*	*3,300*	*17.0*	*7,981*	*41.1*	*10,576*	*54.5*	*13,053*	*67.2*	*13,768*	*70.9*	*51*	*0.3*	*19,414*
Persons	50–54	1,513	27.7	911	16.7	2,159	39.6	2,891	53.0	3,661	67.1	3,923	71.9	22	0.4	5,458
	55–59	1,909	28.4	1,105	16.4	2,686	40.0	3,547	52.8	4,486	66.8	4,786	71.2	25	0.4	6,720
	60–64	2,173	28.6	1,281	16.8	3,064	40.3	4,119	54.1	5,122	67.3	5,416	71.2	19	0.2	7,608
	65–69	2,527	29.4	1,408	16.4	3,498	40.7	4,634	53.9	5,748	66.9	6,048	70.4	17	0.2	8,592
	70–74	4,047	31.8	2,051	16.1	5,056	39.7	6,716	52.7	8,262	64.8	8,666	68.0	30	0.2	12,743
	50–74	**12,169**	**29.6**	**6,756**	**16.4**	**16,463**	**40.0**	**21,907**	**53.3**	**27,279**	**66.3**	**28,839**	**70.1**	**113**	**0.3**	**41,121**

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.15: Time between positive screen and diagnostic assessment of people aged 50–74, by state and territory, remoteness area and socioeconomic group, Australia, 2015

		No diagnostic assessment		≤30 days		≤60 days		≤90 days		≤180 days		≤360 days		>360 days		All
Area		**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
State or territory	NSW	4,213	33.9	1,332	10.7	4,102	33.0	5,911	47.5	7,660	61.6	8,191	65.9	29	0.2	12,433
	Vic	3,287	30.9	2,830	26.6	5,165	48.6	6,176	58.1	7,072	66.5	7,330	68.9	20	0.2	10,637
	Qld	1,521	19.6	1,256	16.2	3,449	44.4	4,677	60.2	5,928	76.3	6,217	80.1	28	0.4	7,766
	WA	1,555	38.0	617	15.1	1,546	37.8	1,993	48.7	2,414	59.0	2,526	61.7	11	0.3	4,092
	SA	1,090	27.3	443	11.1	1,349	33.8	1,907	47.8	2,611	65.4	2,884	72.2	19	0.5	3,993
	Tas	260	20.2	191	14.8	540	42.0	781	60.7	973	75.6	1,023	79.5	4	0.3	1,287
	ACT	139	21.0	74	11.2	241	36.5	366	55.4	485	73.4	520	78.7	2	0.3	661
	NT	104	41.3	13	5.2	71	28.2	96	38.1	136	54.0	148	58.7	—	—	252
Remoteness area[(a)]	Major cities	7,123	26.6	5,048	18.9	11,458	42.8	14,985	56.0	18,455	68.9	19,564	73.1	86	0.3	26,773
	Inner regional	3,176	33.4	1,241	13.1	3,483	36.6	4,792	50.4	6,020	63.3	6,311	66.4	17	0.2	9,504
	Outer regional	1,602	37.8	417	9.8	1,361	32.1	1,902	44.9	2,488	58.8	2,623	62.0	9	0.2	4,234
	Remote	190	43.5	35	8.0	111	25.4	163	37.3	232	53.1	246	56.3	1	0.2	437
	Very remote	76	45.8	13	7.8	46	27.7	61	36.7	80	48.2	90	54.2	—	—	166
	Unknown	2	28.6	2	28.6	4	57.1	4	57.1	4	57.1	5	71.4	—	—	7
Socioeconomic group	1 (lowest)	3,260	35.9	1,033	11.4	2,925	32.2	4,132	45.5	5,428	59.7	5,805	63.9	22	0.2	9,087
	2	2,897	33.1	1,201	13.7	3,219	36.7	4,373	49.9	5,490	62.6	5,835	66.6	31	0.4	8,763
	3	2,305	28.7	1,374	17.1	3,222	40.2	4,325	53.9	5,425	67.7	5,691	71.0	22	0.3	8,018
	4	1,919	25.2	1,488	19.6	3,463	45.5	4,449	58.5	5,387	70.9	5,665	74.5	19	0.2	7,603
	5 (highest)	1,665	22.8	1,605	22.0	3,488	47.8	4,450	61.0	5,326	73.1	5,607	76.9	18	0.2	7,290
	Unknown	123	34.2	55	15.3	146	40.6	178	49.4	223	61.9	236	65.6	1	0.3	360
Total		**12,169**	**29.6**	**6,756**	**16.4**	**16,463**	**40.0**	**21,907**	**53.3**	**27,279**	**66.3**	**28,839**	**70.1**	**113**	**0.3**	**41,121**

(a) A participant's location may be divided across multiple remoteness areas proportionally. For PI 4, participants were assigned to their largest proportion remoteness area. See Appendix E for more information.

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4.

Source: NBCSP Register as at 31 December 2016.

Table A3.16: Time between positive screen and diagnostic assessment of people aged 50–74, by Indigenous status, language spoken at home and disability status, Australia, 2015

		No diagnostic assessment		≤30 days		≤60 days		≤90 days		≤180 days		≤360 days		>360 days		All
Population group		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Indigenous status	Indigenous	174	42.6	43	10.5	112	27.5	162	39.7	220	53.9	234	57.4	—	—	408
	Non-Indigenous	11,482	29.1	6,560	16.7	15,949	40.5	21,192	53.8	26,317	66.8	27,805	70.6	108	0.3	39,395
	Not stated	513	38.9	153	11.6	402	30.5	553	42.0	742	56.3	800	60.7	5	0.4	1,318
Language spoken at home	Language other than English	1,955	33.2	1,003	17.0	2,180	37.0	2,815	47.8	3,627	61.5	3,911	66.4	27	0.5	5,893
	English	10,214	29.0	5,753	16.3	14,283	40.5	19,092	54.2	23,652	67.1	24,928	70.8	86	0.2	35,228
Disability status	Severe or profound activity limitation	1,419	42.7	356	10.7	912	27.4	1,284	38.6	1,740	52.4	1,897	57.1	7	0.2	3,323
	No severe or profound activity limitation	9,923	27.9	6,110	17.2	14,818	41.7	19,632	55.2	24,214	68.1	25,519	71.8	96	0.3	35,538
	Not stated	827	36.6	290	12.8	733	32.4	991	43.8	1,325	58.6	1,423	63.0	10	0.4	2,260
Total		**12,169**	**29.6**	**6,756**	**16.4**	**16,463**	**40.0**	**21,907**	**53.3**	**27,279**	**66.3**	**28,839**	**70.1**	**113**	**0.3**	**41,121**

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.17: Time between positive screen and diagnostic assessment of people aged 50–74, median and 90th percentile value (in days), by sex and age, Australia, 2015

Sex	Age group at first positive screen (years)	Median	90th percentile
Males	50–54	56	161
	55–59	55	162
	60–64	55	147
	65–69	52	143
	70–74	53	137
	50–74	*54*	*146*
Females	50–54	54	155
	55–59	53	143
	60–64	51	143
	65–69	51	139
	70–74	50	132
	50–74	*52*	*141*
Persons	50–54	55	158
	55–59	54	152
	60–64	53	146
	65–69	52	141
	70–74	52	135
	50–74	**53**	**144**

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.18: Time between positive screen and diagnostic assessment of people aged 50–74, median and 90th percentile value (in days), by state and territory and socioeconomic group, Australia, 2015

Area		Median	90th percentile
State or territory	NSW	61	156
	Vic	38	116
	Qld	55	141
	WA	49	127
	SA	65	181
	Tas	58	142
	ACT	64	155
	NT	62	167
Remoteness area[(a)]	Major cities	50	145
	Inner regional	56	140
	Outer regional	59	147
	Remote	64	155
	Very remote	60	188
	Unknown	35	183
Socioeconomic group	1 (lowest)	60	155
	2	55	151
	3	53	139
	4	49	135
	5 (highest)	48	133
	Unknown	48	147
Total		**53**	**144**

(a) A participant's location may be divided across multiple remoteness areas proportionally. For PI 4, participants were assigned to their largest proportion remoteness area. See Appendix E for more information.

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.19: Time between positive screen and diagnostic assessment of people aged 50–74, median and 90th percentile value (in days), by Indigenous status, language spoken at home and disability status, Australia, 2015

Population group		Median	90th percentile
Indigenous status	Indigenous	64	155
	Non-Indigenous	52	143
	Not stated	61	168
Language spoken at home	Language other than English	53	164
	English	53	141
Disability status	Severe or profound activity limitation	63	171
	No severe or profound activity limitation	52	141
	Not stated	59	165
Total		**53**	**144**

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.20: Time between positive screen and diagnostic assessment of people aged 50–74, median (in days), by sex and age, Australia, 2007 to 2015

Sex	Age group at first positive screen (years)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Males	50–54	. .	58	62	61	57	57	58	59	56
	55–59	56	54	57	59	56	56	55	56	55
	60–64	. .	. .	. .	. .	. .	. .	58	56	55
	65–69	53	52	57	55	53	50	50	55	52
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	53
	50–74	*55*	*54*	*59*	*58*	*56*	*54*	*54*	*56*	*54*
Females	50–54	. .	53	59	60	58	56	53	54	54
	55–59	53	55	57	56	53	53	53	56	53
	60–64	. .	. .	. .	. .	. .	. .	57	51	51
	65–69	51	50	55	54	50	51	48	52	51
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	50
	50–74	*52*	*52*	*56*	*56*	*53*	*53*	*51*	*53*	*52*
Persons	50–54	. .	56	60	60	58	56	56	56	55
	55–59	55	55	57	57	55	55	54	56	54
	60–64	. .	. .	. .	. .	. .	. .	57	54	53
	65–69	52	51	55	55	52	50	49	53	52
	70–74	. .	. .	. .	. .	. .	. .	. .	. .	52
	50–74	**53**	**53**	**57**	**57**	**55**	**54**	**52**	**55**	**53**

Note: This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Diagnosis

Diagnosis data were not considered complete enough to allow formal performance indicator reporting of NBCSP diagnostic outcomes. Therefore, data for the diagnostic performance indicators are not available.

See Chapter 4 for a summary of bowel abnormality detection results, using available assessment and diagnosis data.

Outcomes

Table A3.21: Hospital admissions within 30 days of assessment of people aged 50–74, by sex and age, Australia, 2015

Sex	Age group at assessment (years)	Hospital admissions (N)	Assessments (N)	Hospital admission rate (per 10,000 assessments)
Males	50–54	3	2,075	14.5
	55–59	n.p.	2,518	n.p.
	60–64	n.p.	2,857	n.p.
	65–69	4	3,416	11.7
	70–74	3	3,738	8.0
	50–74	*13*	*14,604*	*8.9*
Females	50–54	n.p.	2,074	n.p.
	55–59	n.p.	2,494	n.p.
	60–64	n.p.	2,711	n.p.
	65–69	4	2,900	13.8
	70–74	n.p.	3,071	n.p.
	50–74	*11*	*13,250*	*8.3*
Persons	50–54	4	4,149	9.6
	55–59	4	5,012	8.0
	60–64	3	5,568	5.4
	65–69	8	6,316	12.7
	70–74	5	6,809	7.3
	50–74	**24**	**27,854**	**8.6**

Notes

1. The hospital admission is calculated based on the diagnostic assessment date. This is the same as the PPV rate for adenoma and the PPV rate for carcinoma. This is different from the diagnostic assessment rate, which is calculated based on the screening test date. Therefore, assessment counts may be different across indicators.
2. This indicator relies on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at 31 December 2016.

Table A3.22: Incidence of bowel cancer, by sex and age, Australia, 2017

	Male		Female		Persons	
Age group (years)	**Number**	**Rate**	**Number**	**Rate**	**Number**	**Rate**
0–4	—	—	—	—	—	—
5–9	—	—	1	0.1	1	0.1
10–14	2	0.3	4	0.6	7	0.5
15–19	8	1.0	11	1.5	18	1.2
20–24	17	2.0	21	2.5	38	2.3
25–29	57	6.2	59	6.6	116	6.4
30–34	72	7.7	81	8.8	153	8.2
35–39	112	13.1	105	12.4	217	12.8
40–44	179	22.0	136	16.5	315	19.2
45–49	277	33.4	254	30.0	531	31.6
50–54	506	66.1	389	49.7	895	57.8
55–59	705	94.1	599	77.7	1,304	85.8
60–64	991	149.6	673	98.2	1,664	123.5
65–69	1,221	209.3	866	143.8	2,088	176.0
70–74	1,496	316.8	1,066	215.7	2,562	265.1
75–79	1,507	462.3	1,121	315.4	2,628	385.7
80–84	1,024	485.7	983	374.3	2,008	423.9
85+	953	513.5	1,185	380.3	2,138	430.0
Ages 50–74 crude rate	*4,918*	*152.2*	*3,594*	*107.7*	*8,512*	*129.6*
All ages ASR	**9,127**	**67.3**	**7,555**	**49.4**	**16,682**	**57.9**

Notes

1. The 2017 estimates are based on 2004–2013 incidence data.
2. Age-specific rates are expressed per 100,000 people. The All ages ASR rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW ACD 2013.

Table A3.23: Incidence of bowel cancer for all ages combined, by state and territory, remoteness area and socioeconomic group, Australia, 2008–2012

Area		Number	ASR
State or territory	NSW	24,451	60.7
	Vic	18,282	60.6
	Qld	14,369	63.4
	WA	6,726	58.4
	SA	6,084	60.5
	Tas	2,340	74.3
	ACT	995	61.9
	NT	368	50.9
Remoteness area	Major cities	47,559	58.8
	Inner regional	16,729	65.8
	Outer regional	7,985	67.9
	Remote	955	67.4
	Very remote	322	51.5
	Unknown	65	. .
Socioeconomic group	1 (lowest)	16,746	65.0
	2	16,446	64.1
	3	14,770	61.3
	4	12,941	58.9
	5 (highest)	12,620	56.0
	Unknown	92	. .
Total		**73,615**	**61.3**

Notes

1. The rates were age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.
2. 'State or territory' refers to the state or territory of usual residence.
3. Remoteness was classified according to the ASGS Remoteness Areas (see Appendix E). Incidence cells may not sum to the total due to non-concordance of some remoteness categories.
4. Socioeconomic areas were classified using the ABS IRSD (see Appendix E).

Source: AIHW ACD 2013.

Table A3.24: Incidence of bowel cancer for all ages combined, by Indigenous status, New South Wales, Victoria, Queensland, Western Australia, Northern Territory, 2008–2012

Indigenous status	Number	ASR
Indigenous	579	51.7
Non-Indigenous	59,040	56.8
Not stated	4,577	. .
Total	**64,196**	**61.1**

Note: The rates were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW ACD 2013.

Table A3.25: Incidence of bowel cancer for all ages combined, by sex, Australia, 1982 to 2017

	Males		Females		Persons	
Year	Number	ASR	Number	ASR	Number	ASR
1982	3,523	66.6	3,460	52.2	6,983	58.2
1983	3,724	68.2	3,433	50.6	7,157	58.2
1984	3,864	69.1	3,620	51.7	7,484	59.1
1985	4,179	72.5	3,827	53.7	8,006	61.7
1986	4,161	69.7	3,882	52.9	8,043	60.2
1987	4,330	70.9	3,934	52.2	8,264	60.3
1988	4,435	71.1	3,849	49.6	8,284	58.9
1989	4,740	74.2	4,049	51.2	8,789	61.2
1990	4,798	73.6	4,096	50.8	8,894	60.5
1991	5,180	76.5	4,466	53.8	9,646	63.9
1992	5,141	74.7	4,591	54.3	9,732	63.1
1993	5,340	74.9	4,571	52.8	9,911	62.8
1994	5,550	76.5	4,778	54.1	10,328	64.0
1995	5,753	77.4	4,816	53.2	10,569	64.0
1996	6,025	78.9	4,899	52.9	10,924	64.6
1997	6,110	77.7	5,070	53.3	11,180	64.3
1998	6,087	75.5	5,120	52.6	11,207	62.9
1999	6,278	75.9	5,446	54.3	11,724	64.1
2000	6,848	80.6	5,499	53.7	12,347	65.8
2001	6,924	79.1	5,844	55.4	12,768	66.2
2002	6,902	76.6	5,639	52.4	12,541	63.5
2003	6,896	74.7	5,763	52.5	12,659	62.7
2004	7,207	76.2	5,876	52.4	13,083	63.4
2005	7,236	74.5	5,964	51.9	13,200	62.5
2006	7,509	75.7	6,254	53.5	13,763	63.7
2007	7,900	76.9	6,533	54.8	14,433	65.0
2008	7,889	74.5	6,457	52.6	14,346	62.9
2009	7,915	73.3	6,426	51.1	14,341	61.5
2010	8,373	75.0	6,647	51.6	15,020	62.5
2011	8,280	72.4	6,835	51.9	15,115	61.5
2012	8,122	68.9	6,671	49.2	14,793	58.4
2013	8,214	67.6	6,748	48.8	14,962	57.7
2014	8,636	69.3	7,118	50.2	15,754	59.2
2015	8,785	68.6	7,246	49.9	16,031	58.7
2016	8,951	68.0	7,398	49.7	16,349	58.3
2017	9,127	67.3	7,555	49.4	16,682	57.9

Notes

1. The 2014–2017 estimates are based on 2004–2013 incidence data.
2. ASRs are expressed per 100,000 people.

Source: AIHW ACD 2013.

Table A3.26: Mortality from bowel cancer, by sex and age, Australia, 2017

	Males		Females		Persons	
Age group (years)	**Number**	**Rate**	**Number**	**Rate**	**Number**	**Rate**
0–4	—	—	—	—	—	—
5–9	—	—	—	—	—	—
10–14	—	—	—	—	—	—
15–19	—	—	1	0.1	1	0.1
20–24	2	0.2	2	0.3	4	0.2
25–29	11	1.2	11	1.2	22	1.2
30–34	9	1.0	10	1.0	19	1.0
35–39	16	1.9	14	1.6	30	1.8
40–44	28	3.5	25	3.0	53	3.3
45–49	39	4.6	50	5.9	88	5.3
50–54	73	9.6	76	9.8	150	9.7
55–59	109	14.6	118	15.3	227	14.9
60–64	180	27.2	159	23.2	339	25.1
65–69	255	43.7	131	21.8	386	32.6
70–74	327	69.3	186	37.7	513	53.1
75–79	365	112.1	275	77.4	640	94.0
80–84	302	143.0	326	124.2	628	132.5
85+	418	225.3	595	190.8	1,013	203.6
Ages 50–74 crude rate	*945*	*29.2*	*670*	*20.1*	*1,615*	*24.6*
All ages ASR	**2,136**	**15.8**	**1,978**	**12.2**	**4,114**	**13.9**

Notes

1. The 2017 estimates are based on 1997–2013 mortality data for males and 2006–2013 mortality data for females. See Appendix D for further information.
2. Colorectal cancer deaths are likely underestimates (see ABS 2016).
3. Age-specific rates are expressed per 100,000 people. The All ages ASRs were age standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW NMD.

Table A3.27: Mortality from bowel cancer for all ages combined, by state and territory, remoteness area and socioeconomic group, Australia, 2010–2014

Area		Number	ASR
State or territory	NSW	6,495	14.9
	Vic	5,390	16.5
	Qld	3,984	16.6
	WA	1,644	13.4
	SA	1,735	15.9
	Tas	622	18.8
	ACT	263	15.5
	NT	98	16.4
Remoteness area	Major cities	13,578	15.6
	Inner regional	4,353	15.8
	Outer regional	2,002	16.3
	Remote	201	14.1
	Very remote	65	10.9
	Unknown	33	. .
Socioeconomic group	1 (lowest)	4,780	17.3
	2	4,426	16.0
	3	4,037	15.6
	4	3,620	15.3
	5 (highest)	3,334	13.8
	Unknown	34	. .
Total		**20,231**	**15.7**

Notes

1. Colorectal cancer deaths are likely underestimates (see ABS 2016).
2. ASRs are standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW NMD.

Table A3.28: Mortality from bowel cancer for all ages combined, by Indigenous status, New South Wales, Queensland, Western Australia, South Australia, Northern Territory, 2010–2014

Indigenous status	Number	ASR
Indigenous	124	11.6
Non-Indigenous	13,719	15.2
Not stated[(a)]	113	. .
Total	**13,956**	**15.3**

(a) Deaths where Indigenous status was not stated were included in the Total count and ASR calculation.

Notes

1. Colorectal cancer deaths are likely underestimates (see ABS 2016).
2. ASRs are standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW NMD.

Table A3.29: Mortality from bowel cancer for all ages combined, by sex, Australia, 1983 to 2017

	Males		Females		Persons	
Year	Number	ASR	Number	ASR	Number	ASR
1983	1,933	38.1	1,825	27.2	3,758	31.7
1984	1,912	35.9	1,826	26.4	3,738	30.5
1985	2,035	37.7	1,934	27.3	3,969	31.7
1986	2,060	36.3	1,999	27.2	4,059	31.2
1987	2,151	37.5	2,004	26.6	4,155	31.3
1988	2,189	37.0	1,923	24.9	4,112	30.0
1989	2,198	36.5	1,929	24.4	4,127	29.5
1990	2,172	34.7	1,926	23.8	4,098	28.4
1991	2,198	34.2	1,964	23.5	4,162	28.2
1992	2,284	35.2	1,949	22.9	4,233	28.1
1993	2,322	34.7	2,076	23.8	4,398	28.5
1994	2,480	35.4	2,107	23.5	4,587	28.8
1995	2,400	33.9	2,068	22.5	4,468	27.4
1996	2,453	33.3	2,107	22.3	4,560	27.2
1997	2,526	33.5	2,104	21.7	4,630	26.9
1998	2,465	31.8	2,134	21.5	4,599	26.0
1999	2,463	31.0	2,064	20.1	4,527	24.9
2000	2,544	30.9	2,117	20.0	4,661	24.9
2001	2,570	30.3	2,117	19.5	4,687	24.3
2002	2,386	27.4	2,152	19.3	4,538	22.9
2003	2,383	26.6	1,990	17.5	4,373	21.6
2004	2,197	24.0	1,873	16.1	4,070	19.7
2005	2,322	24.7	1,843	15.4	4,165	19.6
2006	2,128	22.0	1,686	13.8	3,814	17.5
2007	2,242	22.5	1,877	14.9	4,119	18.3
2008	2,150	20.9	1,831	14.3	3,981	17.3
2009	2,245	21.1	1,783	13.5	4,028	17.0
2010	2,199	20.3	1,769	13.1	3,968	16.3
2011	2,213	19.7	1,774	12.6	3,987	15.9
2012	2,255	19.5	1,801	12.6	4,056	15.7
2013	2,293	19.2	1,856	12.6	4,149	15.6
2014	2,236	18.0	1,835	12.1	4,071	14.8
2015	2,156	17.0	1,922	12.5	4,078	14.6
2016	2,144	16.4	1,950	12.3	4,094	14.2
2017	2,136	15.8	1,978	12.2	4,114	13.9

Notes

1. The 2015–2017 estimates are based on 1997–2013 mortality data for males and 2006–2013 mortality data for females. See Appendix D for further information.
2. Colorectal cancer deaths are likely underestimates (see ABS 2016).
3. ASRs are standardised to the Australian population as at 30 June 2001 and expressed per 100,000 people.

Source: AIHW NMD.

Additional table for Chapter 4

Table A4.1: Available assessment outcomes of people aged 50–74, by age and sex, Australia, assessed in 2015

Sex	Age group at assessment (years)		Assessments	Available assessment results						
				No cancer or adenoma[a]	Biopsy awaiting histopathology[b]	Confirmed diminutive adenoma[c]	Confirmed small adenoma[c]	Confirmed advanced adenoma[c]	Suspected cancer[d]	Confirmed cancer[e]
Males	50–54	N	2,075	1,170	591	120	12	115	53	14
		%	. .	56.4	28.5	5.8	0.6	5.5	2.6	0.7
	55–59	N	2,518	1,426	672	170	24	147	72	7
		%	. .	56.6	26.7	6.8	1.0	5.8	2.9	0.3
	60–64	N	2,857	1,476	829	200	21	225	92	14
		%	. .	51.7	29.0	7.0	0.7	7.9	3.2	0.5
	65–69	N	3,416	1,663	996	249	27	299	155	27
		%	. .	48.7	29.2	7.3	0.8	8.8	4.5	0.8
	70–74	N	3,738	1,874	1,094	228	36	297	175	34
		%	. .	50.1	29.3	6.1	1.0	7.9	4.7	0.9
	50–74	N	*14,604*	*7,609*	*4,182*	*967*	*120*	*1,083*	*547*	*96*
		%	. .	*52.1*	*28.6*	*6.6*	*0.8*	*7.4*	*3.7*	*0.7*
Females	50–54	N	2,074	1,480	386	86	8	73	34	7
		%	. .	71.4	18.6	4.1	0.4	3.5	1.6	0.3
	55–59	N	2,494	1,713	506	115	7	105	35	13
		%	. .	68.7	20.3	4.6	0.3	4.2	1.4	0.5
	60–64	N	2,711	1,775	614	131	12	118	51	10
		%	. .	65.5	22.6	4.8	0.4	4.4	1.9	0.4
	65–69	N	2,900	1,758	710	171	21	151	64	25
		%	. .	60.6	24.5	5.9	0.7	5.2	2.2	0.9
	70–74	N	3,071	1,862	746	189	18	163	76	17
		%	. .	60.6	24.3	6.2	0.6	5.3	2.5	0.6
	50–74	N	*13,250*	*8,588*	*2,962*	*692*	*66*	*610*	*260*	*72*
		%	. .	*64.8*	*22.4*	*5.2*	*0.5*	*4.6*	*2.0*	*0.5*

(continued)

Table A4.1 (continued): Available assessment outcomes of people aged 50–74, by age and sex, Australia, assessed in 2015

Sex	Age group at assessment (years)		Assessments	Available assessment results: No cancer or adenoma[a]	Biopsy awaiting histopathology[b]	Confirmed diminutive adenoma[c]	Confirmed small adenoma[c]	Confirmed advanced adenoma[c]	Suspected cancer[d]	Confirmed cancer[e]
Persons	50–54	N	4,149	2,650	977	206	20	188	87	21
		%	. .	63.9	23.5	5.0	0.5	4.5	2.1	0.5
	55–59	N	5,012	3,139	1,178	285	31	252	107	20
		%	. .	62.6	23.5	5.7	0.6	5.0	2.1	0.4
	60–64	N	5,568	3,251	1,443	331	33	343	143	24
		%	. .	58.4	25.9	5.9	0.6	6.2	2.6	0.4
	65–69	N	6,316	3,421	1,706	420	48	450	219	52
		%	. .	54.2	27.0	6.6	0.8	7.1	3.5	0.8
	70–74	N	6,809	3,736	1,840	417	54	460	251	51
		%	. .	54.9	27.0	6.1	0.8	6.8	3.7	0.7
	50–74	**N**	**27,854**	**16,197**	**7,144**	**1,659**	**186**	**1,693**	**807**	**168**
		%	**. .**	**58.1**	**25.6**	**6.0**	**0.7**	**6.1**	**2.9**	**0.6**

(a) No cancers were suspected at assessment or confirmed non-cancerous by histopathology; no polyps identified at assessment, or polyps confirmed as non-adenomatous at histopathology. Also includes 6,163 colonoscopies with no record of outcome.

(b) Polyps detected at assessment and sent to histopathology for analysis. No histopathology report form received by Register.

(c) Confirmed adenoma figures were based on a combination of the assessment and histopathology report forms for a person received by the Register.

(d) Cancer suspected at assessment but not yet confirmed by histopathology.

(e) Cancer confirmed by histopathology.

Source: NBCSP Register as at 31 December 2016.

Additional tables for Chapter 5

Table A5.1: Percentage of the population by Indigenous status as self-identified in the 2011 Census, by sex and age

		%		
Sex	**Age group (years)**	**Indigenous**	**Non-Indigenous**	**Not stated**
Males	50–54	1.62	93.26	5.12
	55–59	1.39	93.59	5.02
	60–64	1.07	94.03	4.90
	65–69	0.89	94.23	4.88
	70–74	0.70	94.13	5.16
	50–74	*1.21*	*93.77*	*5.02*
Females	50–54	1.74	94.33	3.94
	55–59	1.48	94.57	3.95
	60–64	1.19	94.73	4.08
	65–69	1.00	94.60	4.41
	70–74	0.84	94.13	5.03
	50–74	*1.32*	*94.49*	*4.19*
Persons	50–54	1.68	93.80	4.52
	55–59	1.44	94.09	4.48
	60–64	1.13	94.38	4.49
	65–69	0.94	94.41	4.64
	70–74	0.78	94.13	5.09
	50–74	**1.27**	**94.14**	**4.60**

Source: 2011 Australian Census.

Table A5.2: Percentage of the population by language spoken at home as self-identified in the 2011 Census, by sex and age

		%		
Sex	**Age group (years)**	**English**	**Language other than English**	**Not stated**
Males	50–54	78.58	16.22	5.20
	55–59	79.95	15.07	4.98
	60–64	80.90	14.33	4.77
	65–69	80.84	14.43	4.73
	70–74	77.78	17.24	4.97
	50–74	*79.68*	*15.37*	*4.95*
Females	50–54	78.70	17.55	3.75
	55–59	79.50	16.78	3.72
	60–64	80.55	15.67	3.78
	65–69	80.75	15.15	4.10
	70–74	77.24	18.11	4.64
	50–74	*79.43*	*16.64*	*3.92*
Persons	50–54	78.64	16.89	4.46
	55–59	79.72	15.94	4.34
	60–64	80.72	15.01	4.27
	65–69	80.80	14.79	4.41
	70–74	77.50	17.69	4.80
	50–74	**79.55**	**16.02**	**4.43**

Source: 2011 Australian Census.

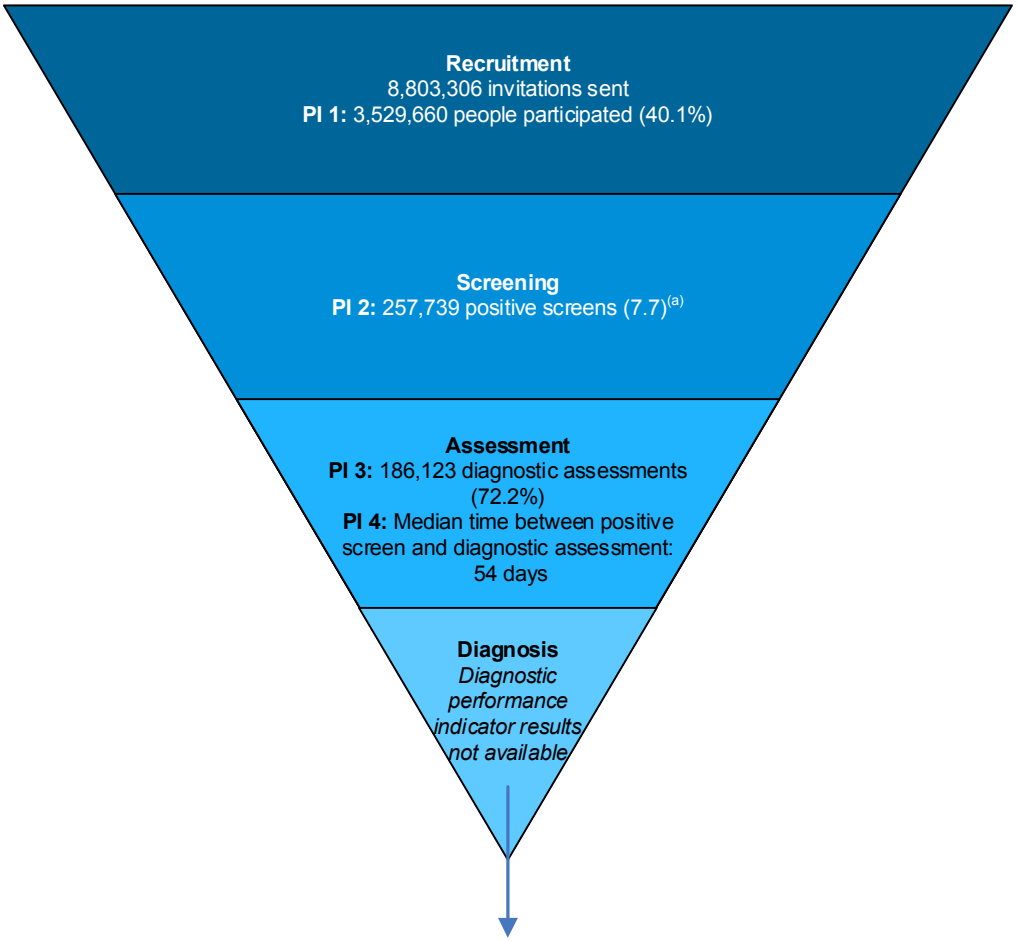
Table A5.3: Percentage of the population by disability status as self-identified in the 2011 Census, by sex and age

		%		
Sex	**Age group (years)**	**Has need for assistance with core activities**	**Does not have need for assistance with core activities**	**Not stated**
Males	50–54	3.47	90.80	5.73
	55–59	4.52	90.03	5.45
	60–64	6.81	87.99	5.20
	65–69	8.06	86.75	5.19
	70–74	9.95	84.58	5.46
	50–74	*6.01*	*88.56*	*5.43*
Females	50–54	3.71	92.01	4.28
	55–59	4.65	91.13	4.22
	60–64	5.88	89.89	4.22
	65–69	6.86	88.67	4.47
	70–74	10.60	84.38	5.02
	50–74	*5.80*	*89.82*	*4.38*
Persons	50–54	3.59	91.42	4.99
	55–59	4.59	90.59	4.83
	60–64	6.34	88.95	4.71
	65–69	7.45	87.72	4.82
	70–74	10.29	84.48	5.23
	50–74	**5.90**	**89.20**	**4.89**

Source: 2011 Australian Census.

Appendix B: Overall NBCSP outcomes

Overall outcomes (August 2006–June 2016)



Assessment details[(b)]

No cancer or adenoma	106,996	(57.5%)
Polyp awaiting histopathology	45,366	(24.4%)
Non-advanced adenomas	12,679	(6.8%)
Advanced adenomas	15,238	(8.2%)
Suspected cancer	4,332	(2.3%)
Confirmed cancer	1,512	(0.8%)

(a) Based on the 3,355,049 participants who returned a valid iFOBT.

(b) Based on available data. 'No cancer or adenoma' also includes 34,912 assessments with no record of outcome.

Notes

1. Assessment and diagnosis (PIs 3 to 9) rely on information being reported back to the Register. As return of NBCSP forms is not mandatory, there may be incomplete form return and incomplete data. See 'Current reporting limitations' on page 4 for more details.
2. PI 5a (adenoma detection rate), PI 5b (PPV of diagnostic assessment for detecting adenoma), PI 6a (colorectal cancer detection rate), PI 6b (PPV of diagnostic assessment for detecting colorectal cancer), PI 7 (interval cancer rate) and PI 8 (cancer clinico-pathological stage) are not reported due to data incompleteness or unavailability. See 'Current reporting limitations' on page 4 for more details.

Source: NBCSP Register as at December 2016.

Figure B1: Summary of NBCSP performance indicators, Australia, August 2006 to June 2016

Appendix C: National Bowel Cancer Screening Program information

Target population

The target population list is compiled from those who were registered as an Australian citizen or migrant in the Medicare enrolment file, or were registered with a Department of Veterans' Affairs gold card.

Currently, the Australian Government is rolling out biennial screening for those in the target age group. Table C1 outlines the start dates of each phase, and the target age groups.

Table C1: NBCSP phases and target populations

Phase	Start date	End date	Target ages (years)
1	7 August 2006	30 June 2008	55 and 65
2	1 July 2008	30 June 2011[(a)]	50, 55 and 65
2[(b)]	1 July 2011	30 June 2013	50, 55 and 65
3	1 July 2013	Ongoing	50, 55, 60 and 65
4	1 January 2015		50, 55, 60, 65, 70 and 74
4	1 January 2016		50, 55, 60, 64, 65, 70, 72 and 74
4	1 January 2017		50, 54, 55, 58, 60, 64, 68, 70, 72 and 74
4	1 January 2018		50, 54, 58, 60, 62, 64, 66, 68, 70, 72 and 74
4	1 January 2019		50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72 and 74

(a) Eligible birth dates, and thus invitations, ended on 31 December 2010.

(b) Ongoing NBCSP funding commenced.

Note: The eligible population for all Phase 2 and 3 start dates incorporates all those turning the target ages from 1 January of that year onwards.

Changes in monitoring the NBCSP

Regular users of annual NBCSP monitoring reports will notice that from the *National Bowel Cancer Screening Program: monitoring report 2016* (AIHW 2016c) onwards, the reports are different from earlier monitoring reports. This section has been provided to explain the major changes.

Development of performance indicators

This report presents data using performance indicators developed by the National Bowel Cancer Screening Program Report and Indicator Working Group and endorsed by relevant multi-jurisdictional information and policy subcommittees of the Australian Health Ministers' Advisory Council. Reports before 2016 presented data against performance measures that the Implementation Advisory Group agreed to in 2006 for phase 1 (2006–2008) of the program. However, these were never formalised. The NBCSP phase 2 review (2011) recommended that key performance indicators be developed to enhance program monitoring and transparency.

Due to the changes to report against performance indicators, monitoring reports before 2016 cannot be readily compared with this report. However, trend data, using the performance indicators with data for earlier reporting periods, are provided in this report. See *Key performance indicators for the National Bowel Cancer Screening Program: technical report* (AIHW 2014b) for more information on the indicators.

Changes to reporting period

The document *Clinical practice guidelines for the prevention, early detection and management of colorectal cancer* (ACN 2005) recommended a biennial screening interval for colorectal cancer screening in Australia, which is currently being put in place. Therefore, the participation indicator now reports on a 2-year period. As well, to mirror the program invitation schedule, the performance indicators are now reported by calendar year rather than financial year. This is comparable with the current BreastScreen Australia and National Cervical Screening Program reporting periods.

Changes to the cohort monitored

Each indicator uses the latest available data rather than presenting results for the same invitation cohort across all indicators. This means that some indicators report results for different time periods than others and therefore for different cohorts. Where possible, indicator reporting periods in this report include the time frame 1 January 2015 to 31 December 2015.

Changes to the structure

The introductory chapter and the performance indicator sections of the report are shorter and described differently. However, all key information has been retained. Further, a 'spotlight' section has been included (see Chapter 5 in this report), which will focus on a topic of interest in each annual report. Note that, even if some data are not presented in the text, that does not mean they are not important to monitor; all valid data available are analysed, monitored and reported in the tables in Appendix A.

Changes to incidence and mortality numbers

This report includes 2017 estimates for bowel cancer incidence and mortality rather than actual numbers, which are not yet available for 2017. Estimates for 2017 provide data relevant to the timing of this monitoring report. The latest actual (non-estimated) incidence and mortality data are used by state and territory, remoteness and socioeconomic areas, and Indigenous status analyses, as 2017 estimates for these disaggregations are not yet available.

Appendix D: Data sources

To provide a comprehensive picture of national cancer statistics in this report, a range of data sources were used, including AIHW and external data sources. These data sources are described in this appendix.

National Bowel Cancer Screening Program

This report uses NBCSP Register data to present statistics on the progression of eligible participants through the screening pathway, for those invited into the NBCSP. It covers measures of participation, iFOBT results, and follow-up investigations and outcomes. However, data for follow-up investigations rely on non-mandatory form return from clinicians and are incomplete. Analyses are presented by age, sex, state and territory, remoteness and socioeconomic areas, Indigenous status, language spoken at home and disability status.

The Data Quality Statement for the NBCSP can be found on the AIHW website at <http://meteor.aihw.gov.au/content/index.phtml/itemId/637181>.

AIHW Australian Cancer Database

All forms of cancer, except basal and squamous cell carcinomas of the skin, are notifiable diseases in each Australian state and territory. This means there is legislation in each jurisdiction that requires hospitals, pathology laboratories and various other institutions to report all cases of cancer to their central cancer registry. An agreed subset of the data collected by these cancer registries is supplied annually to the AIHW, where it is compiled into the ACD. The ACD currently contains data on all cases of cancer diagnosed from 1982 to 2012 for all states and territories; for 2013, it contains data for all jurisdictions except NSW.

Cancer reporting and registration is a dynamic process, and records in the state and territory cancer registries may be modified if new information is received. As a result, the number of cancer cases reported by the AIHW for any particular year may change slightly over time and may not always align with state and territory reporting for that same year.

The 2014–2017 estimates for incidence (plus 2013 estimates for NSW) used a method as described in Appendix D of *Cancer in Australia 2017* (AIHW 2017a).

The Data Quality Statement for the 2013 ACD can be found on the AIHW website at <http://meteor.aihw.gov.au/content/index.phtml/itemId/658607>.

AIHW Disease Expenditure Database

The AIHW Disease Expenditure Database contains estimates of expenditure by disease category, age group and sex for each of the following areas of expenditure: admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening.

The Data Quality Statement for the Disease Expenditure Database 2014–15 can be found on the AIHW website at <http://meteor.aihw.gov.au/content/index.phtml/itemId/640407>.

AIHW National Mortality Database

The AIHW NMD contains information supplied by the Registrars of Births, Deaths and Marriages and the National Coronial Information System—and coded by the ABS—for deaths from 1964 to 2014. Registration of deaths is the responsibility of each state and territory Registry of Births, Deaths and Marriages. These data are then collated and coded by the ABS and are maintained at the AIHW in the NMD.

In the NMD, both the year in which the death occurred and the year in which it was registered are provided. For the purposes of this report, actual mortality data are shown based on the year the death occurred, except for the most recent year (namely 2014), where the number of people whose death was registered is used. Previous investigation has shown that the year of death and its registration coincide for the most part. However, in some instances, deaths at the end of each calendar year may not be registered until the following year. Thus, year of death information for the latest available year is generally an underestimate of the actual number of deaths that occurred in that year.

In this report, deaths registered in 2012 and earlier are based on the final version of cause of death data; deaths registered in 2013 and 2014 are based on revised and preliminary versions, respectively, and are subject to further revision by the ABS. All years of mortality data 2015 used the 2014 NMD.

The 2015–2017 estimates for mortality were based on the 2013 NMD and used joinpoint projections analyses that included 1997–2013 data for males and 2006–2013 data for females. See Appendix D of *Cancer in Australia 2017* (AIHW 2017a) for full details.

The data quality statements underpinning the AIHW NMD can be found on the following ABS internet pages:

- ABS quality declaration summary for *Deaths, Australia* (ABS cat. no. 3302.0) <http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3302.0/>
- ABS quality declaration summary for *Causes of death, Australia* (ABS cat. no. 3303.0) <http://www.abs.gov.au/ausstats/abs%40.nsf/mf/3303.0/>.

For more information on the AIHW NMD see *Deaths data at AIHW*:

<http://www.aihw.gov.au/deaths/aihw-deaths-data/>.

Lastly, the ABS has noted that there is a high likelihood that many deaths coded to 'C26.0 Malignant neoplasms of the intestinal tract, unspecified' are deaths from colon, sigmoid, rectum and anus cancers (ABS 2016). Therefore, bowel (colorectal) cancer deaths reported here are likely to be underestimated.

Australian Burden of Disease Study

The ABDS 2011 conducted by the AIHW used a range of data sources to produce burden estimates for cancer. Deaths data for fatal burden estimates were sourced from the AIHW NMD. Data for non-fatal burden estimates came from a variety of administrative sources, including the ACD, the National Hospital Morbidity Database and Medicare Benefits Schedule claims data, as well as from a number of epidemiological studies. Data for

risk factor attribution estimates largely came from exposure data from the 2011–12 ABS Australian Health Survey.

Other inputs for the ABDS were obtained from the 2010 or 2013 Global Burden of Disease studies. These included the standard life table for fatal burden, health states and disability weights for the non-fatal burden and relative risks, and Theoretical Minimum Risk Exposure Distributions for the risk factor attribution.

Population estimates underpinning all estimates were sourced from the ABS, based on the 2011 Census of Population and Housing.

Full details on the various methods, data sources and standard inputs used in the ABDS 2011 are available in *Australian Burden of Disease Study 2011: methods and supplementary material* (AIHW 2016b).

National Death Index

The National Death Index is a database, housed at the AIHW, which contains records of all deaths occurring in Australia since 1980. The data are obtained from the Registrars of Births, Deaths and Marriages in each state and territory. The National Death Index is designed to facilitate the conduct of epidemiological studies and its use is strictly confined to medical research.

Cancer incidence records from the ACD were linked to the National Death Index and used to calculate the survival and prevalence data presented in this report.

The Data Quality Statement for the National Death Index can be found at <http://meteor.aihw.gov.au/content/index.phtml/itemId/480010>.

Population data

Throughout this report, population data were used to derive bowel cancer incidence and mortality rates. The population data were sourced from the ABS using the most up-to-date estimates available at the time of analysis.

To derive its estimates of the resident populations, the ABS uses the 5-yearly Census of Population and Housing data and adjusts it as follows:

- All respondents in the Census are placed in their state or territory, Statistical Local Area (SLA) and postcode of usual residence; overseas visitors are excluded.
- An adjustment is made for people missed in the Census.
- Australians temporarily overseas on Census night are added to the usual residence Census count.

Estimated resident populations are then updated each year from the Census data, using indicators of population change, such as births, deaths and net migration. More information is available from the ABS website at <www.abs.gov.au>.

For the Indigenous incidence and mortality comparisons in this report, the most recently released ABS Indigenous experimental estimated resident populations were used. Those estimates were based on the 2011 Census of Population and Housing.

Appendix E: Classifications

Remoteness Areas

The Remoteness Areas divide Australia for statistical purposes into broad geographic regions that share common characteristics of remoteness. The Remoteness Structure divides each state and territory into several regions on the basis of their relative access to services. There are six classes of Remoteness Area in the Remoteness Structure: *Major cities*, *Inner regional*, *Outer regional*, *Remote*, *Very remote* and *Migratory*. The category *Major cities* includes Australia's capital cities, except for Hobart and Darwin, which are classified as *Inner regional*. Remoteness Areas are based on the Accessibility and Remoteness Index of Australia, produced by the Australian Population and Migration Research Centre at the University of Adelaide.

Remoteness Area for screening data

Postcodes of participants were mapped to 2011 ASGS Remoteness Areas. Residential postcodes were used where available but non-residential identifiers (such as PO boxes) were used otherwise. As some postcodes can span different Remoteness Areas, a weighting for each Remoteness Area is attributed to the postcode. This can result in non-integer counts for remoteness classifications. For example, the Northern Territory postal area 0822 is classified as 69.3% *Very remote*, 15.9% *Remote* and 14.8% *Outer regional*. Participants with postcode 0822 have their counts apportioned accordingly.

Remoteness Area for incidence and mortality

Each unit record in the ACD contains the 2006 SLA and 2011 Statistical Area Level 2 but not the Remoteness Area. To calculate the cancer incidence rates by Remoteness Area, a correspondence was used to map the 2011 Statistical Area Level 2 to the 2011 Remoteness Area. Similarly, the cancer mortality rates by Remoteness Area were calculated by applying a correspondence from the 2011 Statistical Area Level 2 to the 2011 Remoteness Area.

Tables in this report based on geographical location were rounded to integer values. Where figures were rounded, discrepancies may occur between totals and sums of the component items. Participants whose postcode was not available in the remoteness correspondence were included in an 'Unknown' column in the relevant tables.

Index of Relative Socio-economic Disadvantage

The IRSD is one of four Socio-Economic Indexes for Areas developed by the ABS. This index is based on factors such as average household income, education levels and unemployment rates. The IRSD is not a person-based measure; rather, it is an area-based measure of socioeconomic disadvantage in which small areas of Australia are classified on a continuum from disadvantaged to affluent. This information is used as a proxy for the socioeconomic disadvantage of people living in those areas and may not be correct for each person in that area.

In this report, the first socioeconomic group (quintile 1) corresponds to geographical areas containing the 20% of the population with the greatest socioeconomic disadvantage

according to the IRSD, and the fifth group (quintile 5) corresponds to the 20% of the population with the least socioeconomic disadvantage. Caution should always be taken when analysing the results of data that have been converted using correspondences, with the potential limitations of the data taken into account.

Socioeconomic group for screening data

Participants' areas of residence were assigned to socioeconomic groups using the participant's residential postcode according to the IRSD for 2011. Socioeconomic groupings (based on IRSD rankings) were calculated with a postal area correspondence, using a population-based method at the Australia-wide level. Participants whose postcode was not available in the socioeconomic correspondence were included in an 'Unknown' column in the relevant tables.

Socioeconomic group for incidence and mortality

Socioeconomic disadvantage quintiles were assigned to cancer cases according to the IRSD of the Statistical Area Level 2 of residence at the time of diagnosis, and to deaths according to the Statistical Area Level 2 of residence at the time of death.

International Classification of Diseases for Oncology

Cancers were originally classified solely under the International Classification of Diseases and Related Health Problems (ICD) classification system, based on topographic site and behaviour. However, during the creation of the 9th Revision of the ICD in the late 1960s, working parties suggested creating a separate classification for cancers that included improved morphological information. The first edition of the International Classification of Diseases for Oncology (ICD-O) was subsequently released in 1976 and, in this classification, cancers were coded by both morphology (histology type and behaviour) and topography (site).

Since the first edition of the ICD-O, a number of revisions have been made, mainly in the area of lymphomas and leukaemias. The current edition, the 3rd Edition (ICD-O-3), was released in 2000 and is used by most state and territory cancer registries in Australia, as well as by the AIHW in regard to the ACD.

International Statistical Classification of Diseases and Related Health Problems

The ICD is used to classify diseases and other health problems (including symptoms and injuries) in clinical and administrative records. The use of a standard classification system enables the storage and retrieval of diagnostic information for clinical and epidemiological purposes that is comparable between different service providers, across countries and over time.

In 1903, Australia adopted the ICD to classify causes of death and it was fully phased in by 1906. Since 1906, the ICD has been revised nine times in response to the recognition of new diseases (for example, Acquired Immunodeficiency Syndrome, or AIDS), increased knowledge of diseases, and changing terminology in the description of diseases. The version currently in use, the ICD-10 (WHO 1992), was endorsed by the 43rd World Health Assembly

in May 1990 and officially came into use in World Health Organization member states from 1994.

International Statistical Classification of Diseases and Related Health Problems, Australian Modification

The Australian modification of the ICD-10, referred to as the ICD-10-AM (NCCH 2010), is based on the ICD-10. The ICD-10 was modified for the Australian setting by the National Centre for Classification in Health, with assistance from clinicians and clinical coders. Despite the modifications, compatibility with the ICD-10 at the higher levels of the classification (that is, up to four character codes) has been maintained. The ICD-10-AM has been used to classify diagnoses in hospital records in all states and territories since 1999–2000 (AIHW 2000).

Glossary

adenocarcinoma: A **cancer** that began in a glandular epithelial cell.

adenoma (adenomatous polyp): A **benign** tumour that arises from epithelial cells. All adenomas have **malignant** potential. Adenomas in the rectum or colon have a higher chance of developing into **cancer** (adenocarcinoma) than adenomas in most other organs. An adenoma can be classified from highest risk (advanced) to lowest risk (diminutive).

age-specific rate: The number of cases occurring in each specified age group by the corresponding population in the same age group, expressed as 'per 100,000 people'.

age-standardisation: A method of removing the influence of age when comparing populations with different age structures. This is usually necessary as the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure; then the disease rates that would have occurred with that structure are calculated and compared.

asymptomatic: Without symptoms.

benign: Describes non-cancerous tumours that may grow larger but do not spread to other parts of the body. Not **malignant**.

bowel (colorectal) cancer: Comprises **cancer** of the colon and cancer of the rectum.

cancer death: A death where the underlying cause of death is indicated as **cancer**. People with cancer who die of other causes are not counted in the mortality statistics in this publication.

cancer (malignant neoplasm): A large range of diseases whose common feature is that some of the body's cells become defective, begin to multiply out of control, can invade and damage the area around them, and can also spread to other parts of the body to cause further damage.

colonoscopy: A diagnostic assessment procedure to examine the bowel using a special scope (colonoscope), usually carried out in a hospital or day clinic.

crude rate: The number of events over a specified period of time (for example, a year) divided by the total population. The crude rate (for participation, attendance and follow-up) is the proportion of people who have proceeded to a key point on the screening pathway (at the date of the data extraction) out of those eligible to proceed to that point.

The crude proportions will generally underestimate the true proportions of the population that participated in the National Bowel Cancer Screening Program. This is because, at any point in time, there are members of the population who are eligible to proceed to the next point on the screening pathway but who have not yet had time to do so. Similarly, there is a time lag between when a person with a positive **iFOBT** result is referred for a **colonoscopy** and when they can actually have the colonoscopy.

epithelium: The tissue lining the outer layer of the body, the digestive tract and other hollow organs and structures.

false negative: A screening test result that incorrectly indicates a person does not have a marker for the condition being tested when they do have the condition. Not all screening tests are completely accurate, so false negative results cannot be discounted. Further, with

an **iFOBT** test for bowel cancer, if a **polyp**, **adenoma** or **cancer** is not bleeding at the time of the test, it may be missed by the screening test.

false positive: A screening test result that incorrectly indicates that a person has the marker being tested when they do not have the condition. As **iFOBT** tests detect blood in stool (which may be caused by a number of conditions), a false positive finding for bowel cancer may still detect other non-bowel cancer conditions, or precancerous **polyps** or **adenomas**.

Immunochemical Faecal Occult Blood Test (iFOBT): A screening test used to detect tiny traces of blood in a person's faeces that may be a sign of bowel cancer. The iFOBT is a central part of Australia's National Bowel Cancer Screening Program.

Pathologists categorise completed NBCSP iFOBTs into one of three groups:

1. correctly completed
2. incorrectly completed. Participants are given specific instructions on how to complete the iFOBT. Any tests not completed according to these instructions are classified as incorrectly completed.
3. unsatisfactory. Unsatisfactory tests refer to those tests that could not be processed due to a problem with the kit (for example, an expired kit, or a completed kit that has taken more than 2 weeks in transit to arrive for testing).

Participants with iFOBTs that are not correctly completed are requested to complete another iFOBT. Correctly completed kits are analysed.

iFOBT result: Results from correctly completed iFOBTs are further classified by pathologists into one of three groups:

1. positive (blood is detected in at least one of two samples)
2. negative (blood is not detected)
3. inconclusive (the participant is asked to complete another kit).

histopathology: The microscopic study of the structure and composition of tissues and associated disease.

incidence: The number of new cases (of an illness or event, and so on) occurring during a given period.

Indigenous: A person of Aboriginal and/or Torres Strait Islander descent who identifies as Aboriginal and/or Torres Strait Islander.

International Statistical Classification of Diseases and Related Health Problems: The World Health Organization's internationally accepted classification of death and disease. The 10th revision (ICD-10) is currently in use.

invitee: A person who has been invited to participate in the National Bowel Cancer Screening Program.

lymph node: A mass of lymphatic tissue, often bean-shaped, that produces adaptive immune system cells and through which lymph filters. These nodes are located throughout the body.

malignant: A tumour with the capacity to spread to surrounding tissue or to other sites in the body.

metastasis: The process by which cancerous cells are transferred (or spread) from one part of the body to another; for example, via the lymphatic system or the bloodstream.

morbidity: Ill health in an individual, or the level of ill health in a population or group.

opt off: Describes what invitees do who advise that they do not wish to participate in the National Bowel Cancer Screening Program, now or in the future. Invitees who opt off will not be contacted again. Invitees may elect to opt back on at a later date.

participant: A person who has agreed to participate in the National Bowel Cancer Screening Program by returning a completed **iFOBT** kit and participant details form.

polyp: A small growth of colon tissue that protrudes into the colonic or rectal lumen. Polyps are usually asymptomatic, but sometimes cause visible rectal bleeding and, rarely, other symptoms. Polyps have the potential to become **adenomas** and, later, **cancers**.

polypectomy: The removal of a **polyp**.

positive predictive value: Proportion of people with a positive **iFOBT** screen who have adenomas or cancer detected at **colonoscopy** and confirmed by **histopathology**.

prevalence: The number or proportion (of cases, instances, and so forth) in a population at a given time.

primary health-care practitioner (PHCP): A general practitioner or other primary health-care provider. This may include remote health clinics or specialists providing general practitioner services.

prognosis: The likely outcome of an illness.

radiation therapy: The treatment of disease with any type of radiation, most commonly with ionising radiation, such as X-rays, beta rays and gamma rays.

screening: Repeated testing, at regular intervals, of apparently well people to detect a medical condition at an earlier stage than would otherwise be the case. Screening tests are not diagnostic (for example, see **false positive**, **false negative** and **positive predictive value**); therefore, people who receive a positive screening result require further assessment and diagnosis to determine whether or not they have the disease or risk marker being screened for.

suspend: Describes the action of an invitee who would like to participate in the National Bowel Screening Program but is unable to do so at this time. Such invitees will be contacted once the nominated suspension period has elapsed.

target population: A population that comprises Australians aged 50–74 who were registered as Australian citizens or migrants in the Medicare enrolment file, or are registered with a Department of Veterans' Affairs gold card. The Australian Government is rolling out biennial screening for those in the target age group.

underlying cause of death: The disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury.

valid results: iFOBT results that are classified as either positive or negative. Inconclusive results are excluded.

References

ABS (Australian Bureau of Statistics) 2012. Census of Population and Housing: characteristics of Aboriginal and Torres Strait Islander Australians, 2011. ABS cat. no. 2076.0. Canberra: ABS. Viewed 5 September 2014, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2076.0main+features1102011>.

ABS 2016. Causes of death, Australia, 2015: complexities in the measurement of bowel cancer in Australia. ABS cat no. 3303.0. Canberra: ABS.

ACN (Australian Cancer Network Colorectal Cancer Guidelines Revision Committee) 2005. Guidelines for the prevention, early detection and managment of colorectal cancer. Sydney: The Cancer Council Australia and Australian Cancer Network.

AIHW (Australian Institute of Health and Welfare) 2000. Australian hospital statistics 1998–99. Health services series no. 15. Cat. no. HSE 11. Canberra: AIHW.

AIHW 2014a. Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program. Cat. no. CAN 87. Canberra: AIHW.

AIHW 2014b. Key performance indicators for the National Bowel Cancer Screening Program: technical report. Cancer series no. 87. Cat. no. CAN 84. Canberra: AIHW.

AIHW 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. Cat. no. BOD 4. Canberra: AIHW.

AIHW 2016b. Australian Burden of Disease Study 2011: methods and supplementary material. Australian Burden of Disease Study series no. 5. Cat. no. BOD 6. Canberra: AIHW.

AIHW 2016c. National Bowel Cancer Screening Program: monitoring report 2016. Cancer series no. 98. Cat. no. CAN 97. Canberra: AIHW.

AIHW 2017a. Cancer in Australia 2017. Cancer series no. 101. Cat. no. CAN 100. Canberra: AIHW.

AIHW 2017b. Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no. 11. Cat. no. BOD 12. Canberra: AIHW.

Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez AD 2007. The burden of disease and injury in Australia 2003. PHE 82. Canberra: AIHW.

Bouvard V, Loomis D, Guyton KZ, Grosse Y, Ghissassi FE, Benbrahim-Tallaa L et al. 2015. Carcinogenicity of consumption of red and processed meat. The Lancet Oncology 16(16):1599–1600.

Cancer Council Victoria 2013. Understanding bowel cancer: a guide for people with cancer, their families and friends. Melbourne: Cancer Council Victoria. Viewed 8 April 2015, <http://www.cancervic.org.au/about-cancer/cancer_types/bowel_cancer>.

IARC (International Agency for Research on Cancer) 2014. World cancer report 2014. Lyon: IARC.

Jackson J, Scheid K & Rolnick S 2013. Development of the Cancer Survivorship Care Plan: what's next? Life after cancer treatment. Clinical Journal of Oncology Nursing 17:280–4.

Morris M, Lacopetta B & Platell C 2007. Comparing survival outcomes for patients with colorectal cancer treated in public and private hospitals. Medical Journal of Australia 186:296–300.

NCCH (National Centre for Classification in Health) 2010. The International Statistical Classification of Diseases and Related Health Problems, 10th revision, Australian Modification (ICD-10-AM), Australian Classification of Health Interventions (ACHI) and Australian Coding Standards (ACS), 7th edn. Sydney: University of Sydney.

NCI (National Cancer Institute) 2015. National Cancer Institute Dictionary of Cancer Terms. Viewed 16 March 2016, <http://www.cancer.gov/publications/dictionaries/cancer-terms?expand=S>.

O'Connell JB, Magard MA & Ko CY 2004. Colon cancer survival rates with the new American Joint Committee on Cancer Sixth Edition Staging. Journal of the National Cancer Institute 96:1420–5.

Sobin L, Gospodarowicz M & Wittekind C (eds) 2010. TNM Classification of Malignant Tumours. 7th edn. Oxford: Union for Internation Cancer Control.

Standing Committee on Screening 2016. Population Based Screening Framework. Report prepared for the Community Care and Population Health Principal Committee of the Australian Health Ministers' Advisory Council. Canberra: Department of Health. Viewed 2 May 2017, <http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/population-based-screening-framework >.

WCRF & AICR (World Cancer Research Fund & American Institute for Cancer Research) 2007. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington DC: AICR.

Weitz J, Koch M, Debus J, Hohler T, Galle PR & Buchler MW 2005. Colorectal cancer. Lancet 365:153–65.

Winawer SJ, Zauber AG, Ho MN, O'Brien MJ, Gottlieb LS, Sternberg SS et al. 1993. Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. New England Journal of Medicine 329:1977–81.

Wolin KY, Yan Y & Colditx GA 2011. Physical activity and risk of colon adenoma: a meta-analysis. British Journal of Cancer 104:882–5.

WHO (World Health Organization) 1992. International Statistical Classification of Disease and Related Health problems, 10th revision. Vol. 1. Geneva: WHO.

Zauber AG, Winawer SJ, O'Brien MJ, Lansdorp-Vogelaar I, Ballegooijen M, Hankey B et al. 2012. Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. The New England Journal of Medicine 366:687–96.

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Figure B1: Summary of NBCSP performance indicators, Australia, August 2006–June 2016 73

Related publications

The following AIHW publications relating to bowel cancer and cancer screening more generally might also be of interest:

- AIHW 2017. Cervical screening in Australia 2014–2015. Cancer series no. 105. Cat. no. CAN 104. Canberra: AIHW.
- AIHW 2017. Cancer in Australia 2017. Cancer series no. 101. Cat. no. CAN 100. Canberra: AIHW.
- AIHW 2016. BreastScreen Australia monitoring report 2013–2014. Cancer series no. 100. Cat. no. CAN 99. Canberra: AIHW.
- AIHW 2016. National Bowel Cancer Screening Program: monitoring report 2016. Cancer series no. 98. Cat. no. CAN 97. Canberra: AIHW.
- AIHW 2014. Analysis of bowel cancer outcomes for the National Bowel Cancer Screening Program. Cat. no. CAN 87. Canberra: AIHW.
- AIHW 2014. Key performance indicators for the National Bowel Cancer Screening Program: technical report. Cancer series no. 87. Cat. no. CAN 84. Canberra: AIHW.

This report presents statistics on the National Bowel Cancer Screening Program (NBCSP) using key performance indicators. Of those who were invited to participate in the NBCSP between 1 January 2014 and 31 December 2015, 39% undertook screening. For those screened in 2015, 8% had a positive result warranting further assessment. One in 29 participants who underwent a follow-up diagnostic assessment was diagnosed with a confirmed or suspected cancer.