National Bowel Screening Programme Monitoring Report

January 2018 to December 2022

Health New Zealand
Te Whatu Ora

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Foreword

We are delighted to publish this first monitoring report for the National Bowel Screening Programme (NBSP). The programme offers a single faecal immunochemical test (FIT), to eligible New Zealanders aged 60-74 years. Eligible New Zealanders are invited every two years from a population register and this is an opt-off programme. The national roll out was completed in May 2022 when the Hauora a Toi Bay of Plenty District went live. Health professionals involved in delivering the NBSP have access to a series of indicator reports that allow them to monitor the performance of the programme in their district and compare this with national data. This report is to inform other health professionals and the public about the performance of the NBSP. It aims to provide reassurance that the programme will deliver the anticipated mortality benefit, is being appropriately monitored and, where performance concerns have been identified, appropriate initiatives to address these have been implemented.

I am very happy to report that over 2000 bowel cancers have now been detected by the programme with at least two thirds of these being earlier stage (stage 1 and 2). The increased proportion of stage 1 bowel cancers, over 37% compared with 11% for those diagnosed with bowel cancer as a result of symptoms, means lives are being saved and the toll of this disease for individuals and families has been significantly reduced. However, the programme as currently structured does not deliver equitable benefit to all. To address this, on the recommendations of our invaluable advisory groups and NBSP Māori and Pacific Networks, new initiatives are underway including introduction of the community invitation campaign strategy (CICS) functionality in the register.

I want to thank my National Public Health Service colleagues, in particular Mandy Mackay, Manager Screening Insights, and Dr Bronwyn Rendle, Public Health Physician, for their enormous contribution in bringing this first monitoring report to fruition. The programme results reflect the commitment of so many people across the country and this makes it a real privilege to be the clinical lead of this programme.

Ngā mihi nui,

Dr Susan Parry

Clinical Lead NBSP, Te Whatu Ora

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Executive summary

This is the first monitoring report for the NBSP. It presents key indicators from across the screening pathway and shows how the programme has performed in its first five calendar years. This report helps providers, policy makers and the public to understand how well bowel screening is working, areas for improvement and if the programme is likely to deliver the expected benefits of reducing the impact of bowel cancer.

Covering the period from 1 January 2018 to 31 December 2022, the number of districts offering bowel screening grew from three to twenty. With all areas of Aotearoa New Zealand participating by May 2022, data represents all parts of the country. During that period, 668,456 kits were returned for testing and had a definitive result. There were 27,753 that received a positive result and 23,493 people received a colonoscopy in the screening programme. There were 1,731 people diagnosed with cancer.

The indicators show that the programme is detecting bowel cancers and detecting them at an early stage. Over a third of cancers detected in the programme are identified at stage 1 (37.4%), where bowel cancer has a much greater chance of being successfully treated compared to later stages and hence a higher survival rate. This benefit is seen for Māori participating in the programme, where 36.4% of cancers are at stage 1.

Delivering on the goal and responsibility to equitably reach participants from priority groups remains unachieved within the programme. Participation for Māori was 49.6% at the end of 2022 and 40.0% for Pacific Peoples. This is compared to 62.6% for Other participants, those identified as non-Māori, non-Pacific, non-Asian. The current programme structure does not support equitable access and hence equitable benefit for Māori and Pacific peoples and addressing this is an ongoing key focus. Multiple factors have contributed to this including the single service delivery model and the programme age range. The difficulties accessing the programme are also reflected in the higher spoilt kit rates among Māori, Pacific and Asian participants. Definitive spoilt kit rates, where a participant returned a spoilt kit but couldn't be supported to subsequently return a definitive kit, increased in 2022 and were highest for Pacific (3.6%), Māori (2.6%) and Asian participants (2.7%) compared to 1.7% for other participants.

The performance of the screening test is at an expected level. The overall positivity rate was 3.9% at the end of 2022. Positivity over time and by screening round, age and sex follows predictable patterns, with higher rates seen in the first round of screening, in older age groups and for men. There are also differences by ethnicity, with Pacific and Māori participants more likely to have a positive test. The overall positive predictor value (PPV) for bowel cancer in the programme is 7.8%, which means that around eight out of every 100 people with a positive test who has a colonoscopy in the programme will have a cancer detected. Māori and Pacific participants have had a consistently lower PPV than

other participants over the five monitored years. The provisional prevalent interval cancer rate (14.8 per 10,000 definitive screens) and FIT sensitivity for colorectal cancer (CRC) (71.8%, CI 67.0-76.1) shows the NBSP is within the range of similar bowel cancer screening programmes internationally and the bowel screening pilot where the overall FIT sensitivity for CRC was 78.7% (95% CI=74.9% to 82.1%)[1] . As the programme completes the first and second screening rounds in all districts, more data will be available to be analysed to help better understand the performance of the screening test for all populations in the context of changing bowel cancer epidemiology.

Challenges in ensuring timely access to colonoscopies remain, particularly as health services continue to recover from the COVID-19 pandemic. The NBSP colonoscopy wait time indicator (CWTI) however was above the target of 90% of participants having a diagnostic procedure within 60 days of a positive FIT test in 2021 and 2022 after being below this for the two years during the pandemic. There is inequity of timely access for Māori and Pacific. However, assessment completion rates are higher for Māori and Pacific compared to other groups.

The benefits of the NBSP will begin to be fully realised once all districts have completed their first screening round (June 2024). The monitoring indicators reported indicate that in due course the anticipated mortality benefit will be achieved.

[1] Saw KS, et al. BMJ Open Gastroenterol 2023;10:e001233. doi:10.1136/bmjgast-2023-001233

Introduction

National Bowel Screening Programme

The goal of population-based cancer screening programmes is to reduce morbidity and mortality from cancer by finding cancers at an earlier, more treatable stage. Bowel screening can also find polyps that can be removed, reducing the risk that bowel cancer will develop. Early detection can reduce the chances of dying from, and the impact of, colorectal cancer at both an individual and societal level. This is particularly pertinent in Aotearoa New Zealand, which has high rates of colorectal cancer compared with other Organisation for Economic Co-operation and Development (OECD) countries (Shaw et al 2008).

The bowel screening pilot started screening Waitematā DHB residents aged 50 to 74 years in January 2012 after an initial trial of 500 in November 2011. The purpose of the BSP was to test the feasibility of rolling out a National Bowel Screening Programme (the NBSP).

The NBSP officially began in July 2017, offering free screening to New Zealanders aged 60 to 74 on a two-yearly cycle. Wairarapa DHB and Hutt Valley DHB were the first DHBs to join the national programme, with national roll-out to all districts in Aotearoa New Zealand completed by May 2022.

Purpose of this report

Ongoing, systematic monitoring against performance indicators is one of a range of systems that national screening programmes use to ensure they are working well.

This NBSP monitoring report covers 1 January 2018 to 31 December 2022, the first five calendar years of the programme. It is the first monitoring report published about the programme. This report has been written with a technical audience in mind; in particular professional groups involved in the delivery of the NBSP. Future NSBP reports will provide more comprehensive, equity-focused monitoring data as all districts complete a full round of screening (two years).

This report shows indicators from key steps in the clinical pathway of the NBSP. The programme has a larger set of indicators which are regularly reviewed by clinical and operational staff to ensure a safe, effective, and equitable screening programme. Also included in this report are provisional sensitivity and interval cancer rates and colonoscopy quality assurance reports.

Districts

Waitematā District hosted the bowel screening pilot from January 2012 and became part of the national programme in January 2018. The programme has been progressively rolled out across the country since July 2017. The table below shows the date each district (formerly district health boards or DHBs) joined the NBSP. As of December 2022, six districts were still in their first screening round.

Table 1: Dates districts joined the NBSP (in chronological order)

District	Date district joined NBSP
Hutt Valley*	July 2017
Wairarapa*	July 2017
Waitematā*	January 2018
Southern*	April 2018
Counties Manukau*	July 2018
Nelson Marlborough*	August 2018
Hawke's Bay*	October 2018
Lakes*	February 2019
Whanganui*	October 2019
MidCentral*	November 2019
Tairāwhiti*	August 2020
South Canterbury*	October 2020
Canterbury*	October 2020
Auckland*	November 2020
Waikato	March 2021
Capital and Coast	April 2021
West Coast	May 2021
Taranaki	August 2021
Northland	November 2021
Bay of Plenty	May 2022

*Districts that had completed one round (24 months) of screening as of December 2022.

A focus on equity

Equity is an essential component of a quality screening programme (National Screening Unit, 2015). This includes equity of access to the bowel screening programme and equity of care throughout the screening pathway. Priority populations for the bowel screening programme include Māori and Pacific Peoples and people living in the most deprived areas (NZ Deprivation Index deciles 9 and 10).

The NBSP works hard to increase the accessibility for priority populations, in particular Māori and Pacific participants, in the following ways.

- Districts actively engaging with communities through iwi, church and cultural networks.
- Enabling priority participants to have immediate access to screening as soon as it is available in their area.
- The National Coordination Centre actively following-up invitations when there has been no response, with phone calls and texts, including after hours.
- Outreach services, where districts reach out to people locally through text, calls and face to face visits.
- Trialling a system where people can drop off completed tests at labs rather than return them through the postal service.
- Convening Māori and Pacific networks.
- Television and social media campaigns to encourage increased awareness of the programme for Māori and Pacific.
- In 2023, the evaluation of age range extension to 50 years for Māori and Pacific Peoples in three districts.
- Introduction of the community invitation campaign strategy (CICS) functionality in the register.

Throughout this report, indicators are assessed by ethnicity, age, gender, deprivation, and screening history where relevant.

COVID-19 impact

Due to the COVID-19 pandemic, NBSP invitations were paused for three months from late March to late June 2020. Hawke's Bay DHB paused invitations for a further three-month period (six months in total). The impact of the invitation pause can be seen from March 2020 onwards (when invitation coverage was around 80%) down to a low of 53.2% in April 2021. By December 2022, invitation coverage had increased again to 88.8%.

A decrease in participation coverage (kits returned as a proportion of kits sent) has been seen since the pandemic began (from 62.2% in March 2020 to 59.0% in October 2022). The impact of the COVID-19 pandemic has been greatest for Māori. There has been less impact for Pacific Peoples, however participation for Pacific Peoples was low prior to the pandemic.

Data sources

Bowel screening data is sourced from the NBSP data warehouse. The data warehouse combines data from the previous BSP+ register and the new Bowel Screening Register (BSR), allowing for reporting across both registers. Data for this report was sourced on 04/09/2023.

Population data is sourced from Statistics New Zealand and this report uses the 2022 update of the 2018 census.

This report uses the University of Otago's NZDep index as an indicator of socio-economic deprivation. The NZDep index estimates the relative deprivation of an area using census data relating to income, home ownership, employment, qualifications, family structure, housing, access to transport and communications. Quintile 1 is the least deprived and quintile 5 is the most deprived.

The NBSP develops a database of eligible people through matching information stored in the National Health Index database (the NHI), including National Enrolment Service (NES) data. This data is then matched against healthcare events over the last three years to ensure the person is currently active in the Aotearoa New Zealand healthcare system. Ethnicity for this report is sourced from NHI records.

The Ministry of Health | Manatū Hauora does not have a database showing every person who may be in the country at any one time, and their current address. Statistics New Zealand uses census data to predict population volumes in a particular region by age, but this information is an estimate and can be used only as a guide.

Additional data for the interval cancer and sensitivity analysis was sourced from the New Zealand Cancer Registry on 22/04/2022. Additional data for the National Colonoscopist Quality Assurance report came from Provation Colonoscopy Database (PVCD) on 20/02/2023 and colonoscopy volume data for the Unplanned Admissions Report came from the National Bowel Screening Colonoscopy Quality Assurance report on 08/03/2023.

Eligibility

Bowel screening is for people aged 60 to 74 years who are eligible for publicly funded health care. However, bowel screening is not right for everyone, and so those invited are advised not to take part if they:

- have symptoms of bowel cancer
- have had a colonoscopy within the last five years
- are on a bowel polyp or bowel cancer surveillance programme
- have had, or are currently being treated for, bowel cancer
- have had their large bowel removed

- have ulcerative colitis or Crohn's disease that is currently active
- are seeing a doctor about bowel problems.

An eligible population is drawn from the NHI (described above). The register matches against the New Zealand Cancer Registry to ensure that people who have been diagnosed with bowel cancer in Aotearoa New Zealand are not invited to screen. At this point in time there are no data sources available to identify other reasons why someone should not participate in screening. This includes eligibility for publicly funded healthcare. However, individuals can contact the programme to update their status.

Reporting lags

Many indicators have a reporting lag, where there needs to be a delay before rates can be calculated for a given period. The lag duration is variable depending on the nature of the indicator. For example, there is a time lag for participation as once FIT kits are sent out, participants have six months to complete and return the kit. Therefore reporting on this indicator requires the six months to elapse.

All indicators in this report are calculated after appropriate lag periods.

Programme monitoring

Monitoring safety and performance is a critical factor in all national screening programmes. The NBSP has a set of programme performance indicators; some of these are monitored on a frequent basis (monthly / quarterly) while others are more appropriately reviewed on a less frequent basis (annual / biannual). Programme safety monitoring, including fail safe monitoring, occurs as part of the operational delivery and monitoring of the programme and is also essential to ensure all participants progress through the pathway as expected. This report shows indicators from key steps in the clinical pathway of the NBSP. Also included in this report are provisional NBSP sensitivity and interval bowel cancer rates and NBSP colonoscopy quality assurance reports.

Invitation coverage (100)

An important measure of any screening programme is its ability to invite the eligible target population. The bowel screening programme aims to invite anyone aged 60-74 years who is eligible for publicly funded healthcare to take a bowel screening test, every two years. This means that approximately half of the eligible population is invited in one year, and the other half is invited the following year. Because the NBSP invites most participants back every two years, coverage counts invitations over two-year periods. The coverage reporting period is a rolling two-year period up to the reporting end date. Districts will be included if they were live at that reporting end date. This means that the indicator includes districts at different stages of roll out.

Indicator 100: Invitation Coverage

Target: 100% of the eligible population is invited to screen.
Numerator: The number of eligible people who were invited to screen in the reporting period. Spoilt kits are excluded from the numerator.
Denominator: The number of people in the population estimates in districts which were live at the end of each two-year period.
Anchor date: The date when a kit was sent determines which time period it is counted under.

Comments

As each district rolled out the first round of the programme this indicator was initially useful to see progress as more and more of the register eligible population was invited.

As the national roll out nears completion, this indicator is more relevant for highlighting national data quality issues affecting different population groups. There is a numerator-denominator mismatch in the way the register and the census have captured ethnicity. Harris et al[2] have described the misclassification of Māori as non-Māori in the NHI resulting in a net under-count for Māori. This means that the programme has limitations in its ability to measure, understand, and act on inequities in the programme and deliver as a Te Tiriti partner. For Pacific Peoples, there is underrepresentation in population estimates such as the census[3]. These two different data issues result in the different invitation coverage patterns for Māori and Pacific Peoples.

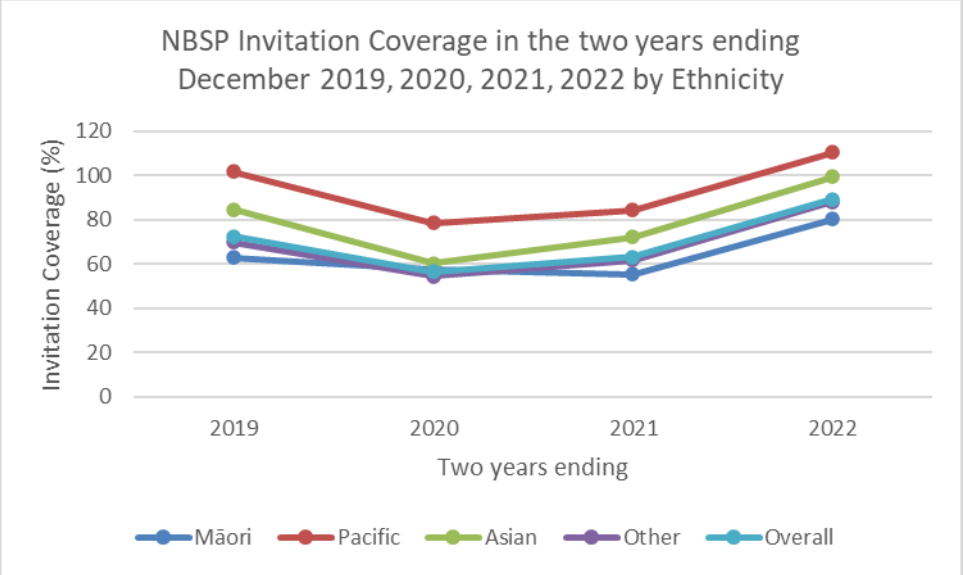


Figure 1: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Ethnicity

[2] Harris R, Paine S-J, Atkinson J et al (2022) We still don't count: the under-counting and under-representation of Māori in health and disability sector data. *New Zealand Medical Journal.* 135(1567): 54-79

[3] Ministry for Pacific Peoples (2022) *Long-Term Insights Briefing 2022* https://www.mpp.govt.nz/assets/Reports/Long-Term-Insights-Briefing/MPP-LTIB-v3.pdf

Table 2: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Ethnicity

	Ethnicity	2019	2020	2021	2022
Māori	Numerator	19290	25495	38584	64940
	Denominator	30778	44151	69824	80856
	Percentage	62.7	57.7	55.3	80.3
Pacific	Numerator	16893	18983	24880	34579
	Denominator	16622	24204	29488	31354
	Percentage	101.6	78.4	84.4	110.3
Asian	Numerator	33637	37875	54151	79268
	Denominator	39737	63008	75142	79743
	Percentage	84.6	60.1	72.1	99.4
Other	Numerator	184740	217186	333878	512893
	Denominator	264486	398839	542335	582728
	Percentage	69.8	54.5	61.6	88
Overall	Numerator	254560	299539	451493	691680
	Denominator	351623	530202	716789	774681
	Percentage	72.4	56.5	63	89.3

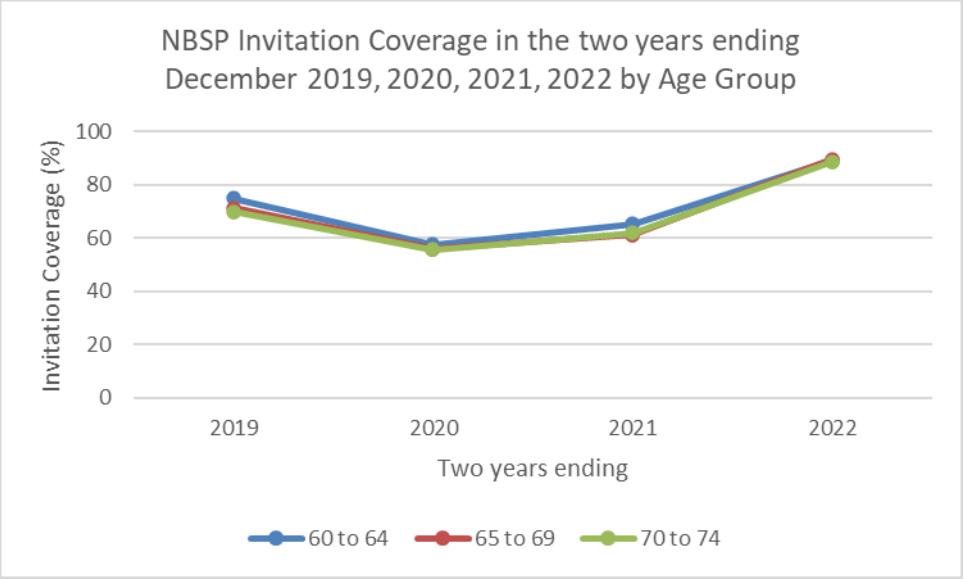


Figure 2: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Age Group

Table 3: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Age Group

Age Group		2019	2020	2021	2022
60-64	Numerator	103396	119881	183479	272239
	Denominator	137599	208332	281170	304733
	Percentage	75.1	57.5	65.3	89.3
65-69	Numerator	82814	97443	144428	229422
	Denominator	116225	174294	235885	255758
	Percentage	71.3	55.9	61.2	89.7
70-74	Numerator	68350	82215	123586	190019
	Denominator	97799	147576	199734	214190
	Percentage	69.9	55.7	61.9	88.7

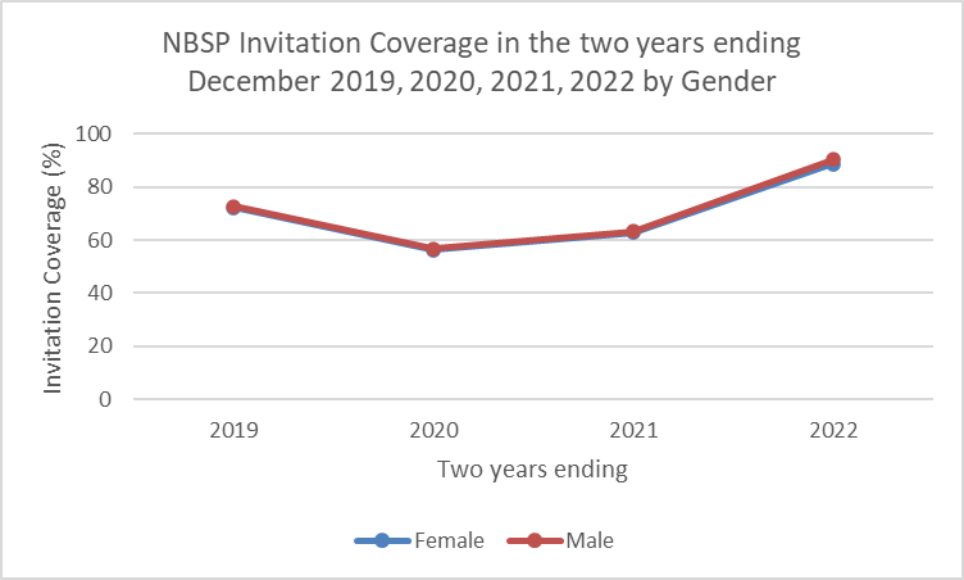


Figure 3: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Gender

Table 4: NBSP Invitation Coverage in the two years ending December 2019, 2020, 2021, 2022 by Gender

Gender		2019	2020	2021	2022
Female	Numerator	130840	153820	231803	354948
	Denominator	181238	273180	369715	401208
	Percentage	72.2	56.3	62.7	88.5
Male	Numerator	123720	145719	219690	336732
	Denominator	170385	257022	347074	373473
	Percentage	72.6	56.7	63.3	90.2

Participation (200)

Participation is an important indicator of how well the programme is reaching its target population. Participation is defined as the percentage of people with a definitive test (positive or negative FIT) out of all those who were invited by the programme. As the bowel screening programme invites participants back every two years, participation counts invitations over a two-year period.

Bowel screening uses participation to measure access to the programme. Other screening programmes use coverage, where the denominator is based on the age specific census population. There are two key reasons for this. The NBSP was the first national screening programme to have a population register to provide this information. It also means that as the programme has been rolled out district-by-district, each over a two year, adjustments do not need to be made for the proportion of the population that has been invited. There are benefits and limitations of both approaches due to accuracy of national data sets and numerator-denominator mismatch.

The NBSP target is to screen 60% of the population (60-74 year olds) every two years. The NBSP has set a participation target of 60%. This target was determined based on international findings, the results of the bowel screening pilot and from analyses estimating possible reductions in bowel cancer mortality and bowel cancer incidence. The programme target is higher than the European guidelines[4] minimum uptake recommendation, which states 45% participation is acceptable.

Indicator 200: Participation

Target: 60% of eligible people invited return a completed FIT kit.
Numerator: The number of eligible people who have returned a FIT kit with a definitive result during the reporting period.
Denominator: The number of eligible people invited to screen during each two-year period.
Anchor date: The date when a kit was sent determines which time period it is counted under.

[4] Segnan N, Patnick J, von Karsa L (eds) (2010) *European Guidelines for Quality Assurance in Colorectal Cancer Screening and Diagnosis - First Edition*. Luxembourg: Publications Office of the European Union.

Comments

Delivering on the goal and responsibility to equitably reach participants from priority groups remains unachieved within the programme. Participation for Māori was 49.6% at the end of 2022 and for Pacific Peoples it was 40.0%. The participation rate was 48.3% for Asian participants. This is compared to 62.6% for Other participants, those identified as non-Māori, non-Pacific, non-Asian. The current programme structure does not support equitable access and hence equitable benefit for Māori, Pacific Peoples and Asian participants - addressing this is an ongoing key focus. Multiple factors have contributed to this including the single service delivery model and the programme age range. Achieving equity of access and equity of benefit remains an ongoing key priority for the programme with ongoing monitoring.

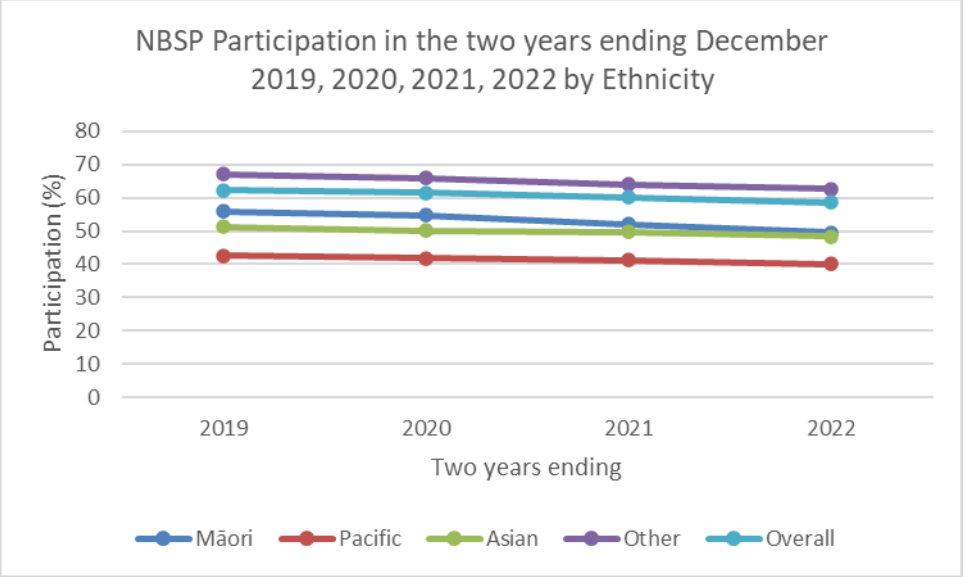


Figure 4: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Ethnicity

Table 5: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Ethnicity

Ethnicity		2019	2020	2021	2022
Māori	Numerator	11095	14391	20651	33362
	Denominator	19795	26278	39711	67265
	Percentage	56.0	54.8	52	49.6
Pacific	Numerator	7463	8229	10589	14300
	Denominator	17513	19679	25619	35768
	Percentage	42.6	41.8	41.3	40.0
Asian	Numerator	17474	19267	27613	39462
	Denominator	34103	38466	55432	81673
	Percentage	51.2	50.1	49.8	48.3
Other	Numerator	130472	151512	226797	343465
	Denominator	194404	229455	353830	548714
	Percentage	67.1	66	64.1	62.6
Overall	Numerator	167199	193619	285650	430589
	Denominator	268394	314961	474613	733423
	Percentage	62.3	61.5	60.2	58.7

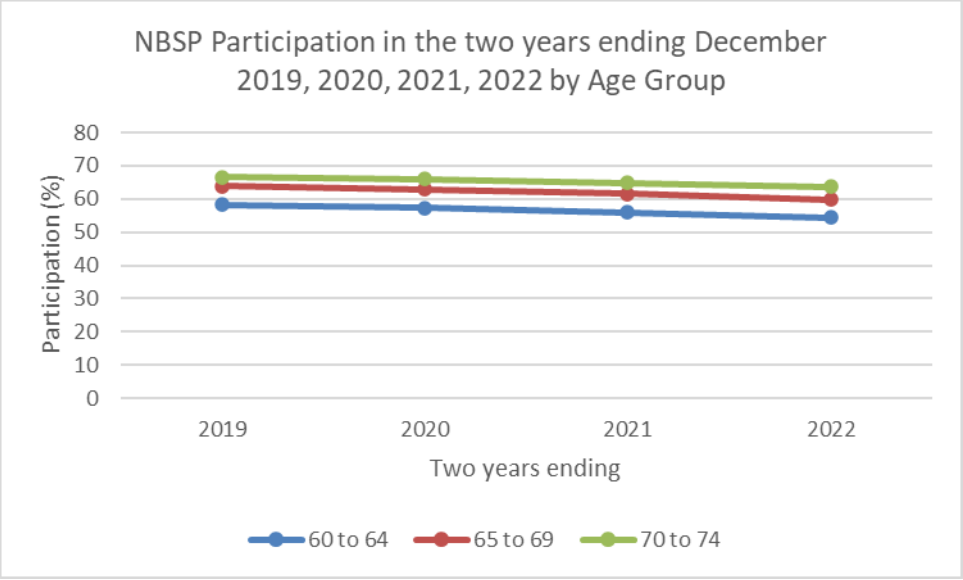


Figure 5: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Age Group

Table 6: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Age Group

Age Group		2019	2020	2021	2022
60-64	Numerator	63668	74896	110415	164776
	Denominator	109403	130618	197463	302453
	Percentage	58.2	57.3	55.9	54.5
65-69	Numerator	52209	60166	87172	133386
	Denominator	81857	95659	141483	222806
	Percentage	63.8	62.9	61.6	59.9
70-74	Numerator	51322	58557	88063	132427
	Denominator	77134	88684	135667	208164
	Percentage	66.5	66	64.9	63.6

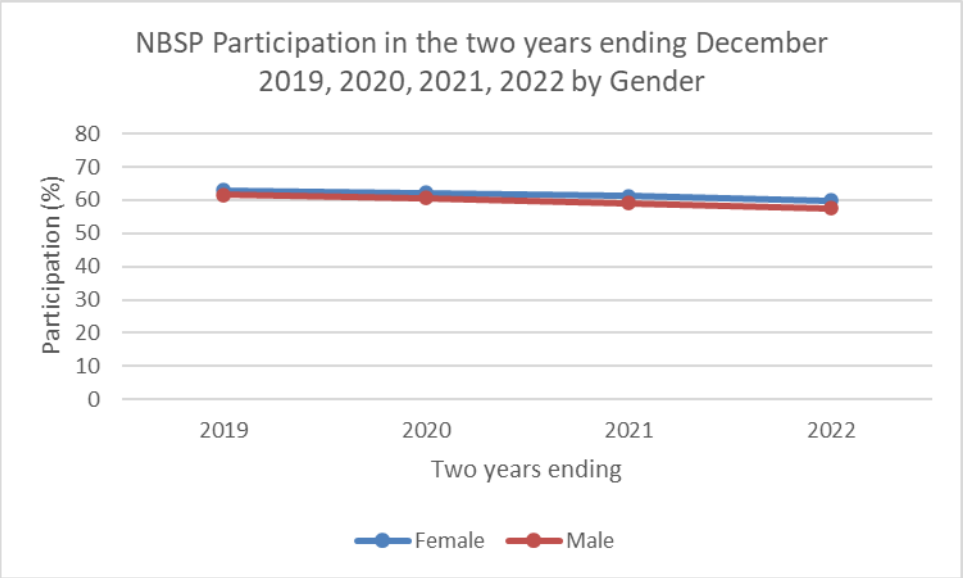


Figure 6: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Gender

Table 7: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Gender

Gender		2019	2020	2021	2022
Female	Numerator	86614	100413	149093	225268
	Denominator	137619	161420	243587	376310
	Percentage	62.9	62.2	61.2	59.9
Male	Numerator	80520	93135	136447	205167
	Denominator	130627	153335	230724	356612
	Percentage	61.6	60.7	59.1	57.5

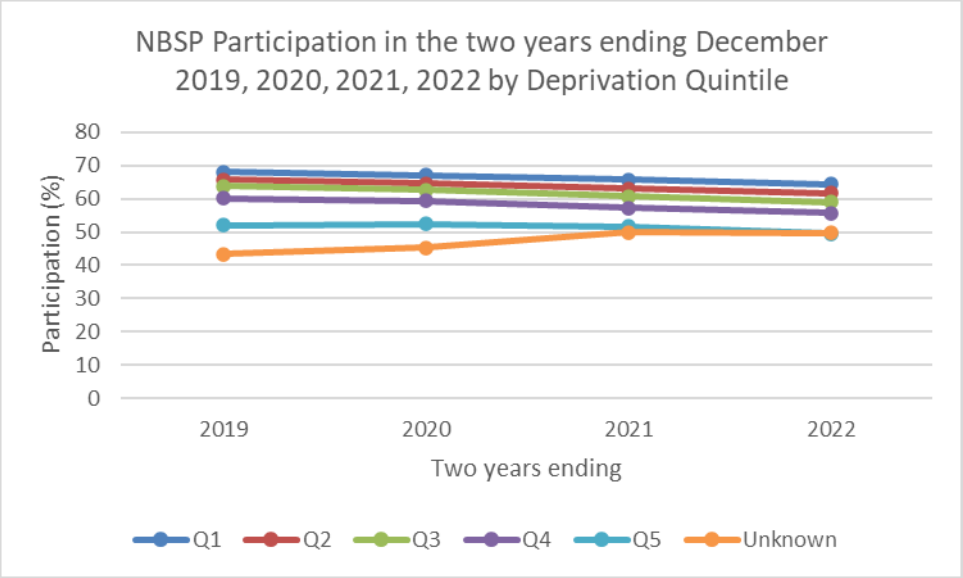


Figure 7: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Deprivation Quintile

Table 8: NBSP Participation in the two years ending December 2019, 2020, 2021, 2022 by Deprivation Quintile

Deprivation		2019	2020	2021	2022
Quintile 1	Numerator	42792	48238	75340	113837
	Denominator	62873	71771	114739	176355
	Percentage	68.1	67.2	65.7	64.5
Quintile 2	Numerator	39191	44055	63985	95474
	Denominator	59610	68113	101539	154709
	Percentage	65.7	64.7	63	61.7
Quintile 3	Numerator	33127	38026	55460	83982
	Denominator	51859	60753	91369	142026
	Percentage	63.9	62.6	60.7	59.1
Quintile 4	Numerator	28295	33462	48755	74074
	Denominator	47031	56399	85041	133017
	Percentage	60.2	59.3	57.3	55.7
Quintile 5	Numerator	20341	26586	38128	57361
	Denominator	39060	50732	73944	115535
	Percentage	52.1	52.4	51.6	49.6
Quintile Unknown	Numerator	3453	3252	3982	5861
	Denominator	7961	7193	7981	11781
	Percentage	43.4	45.2	49.9	49.7

Positivity (204)

Positivity is the proportion of people with a positive FIT kit result (also known as an abnormal result) from those who returned a definitive result in the measurement timeframe. Most participants with a positive result are referred for colonoscopy.

Differences in positivity may be due to variations within populations including prevalence of bowel cancer. Variations in positivity over time may also reflect variation in the quality of FIT analysis - this is strictly monitored by the programme. Positivity needs to be monitored closely as it impacts colonoscopy resource requirements.

The positivity rate for a population is affected by the positivity threshold - the haemoglobin level at which a test is deemed positive. The positivity threshold being used by the NBSP is 200 nanograms/millilitre of buffer (i.e. 200 ng Hb/ml buffer).

Indicator 204: Positivity

Target: No target established.
Numerator: The number of people who have returned a positive FIT kit during the calendar year.
Denominator: The number of people who completed a FIT kit and had a definitive result during the calendar year.
Anchor date: The date when a kit result was recorded in the register determines which time period it is counted under.

Comments

Positivity rates in the NBSP follow the expected trends based on bowel cancer epidemiology and the findings of the bowel screening pilot. Higher positivity rates for Māori and Pacific were also seen in the pilot. Positivity rates increase with age and men are more likely to have a positive result than women. Also as expected, the positivity rate for a first screen is higher than for subsequent screening rounds.

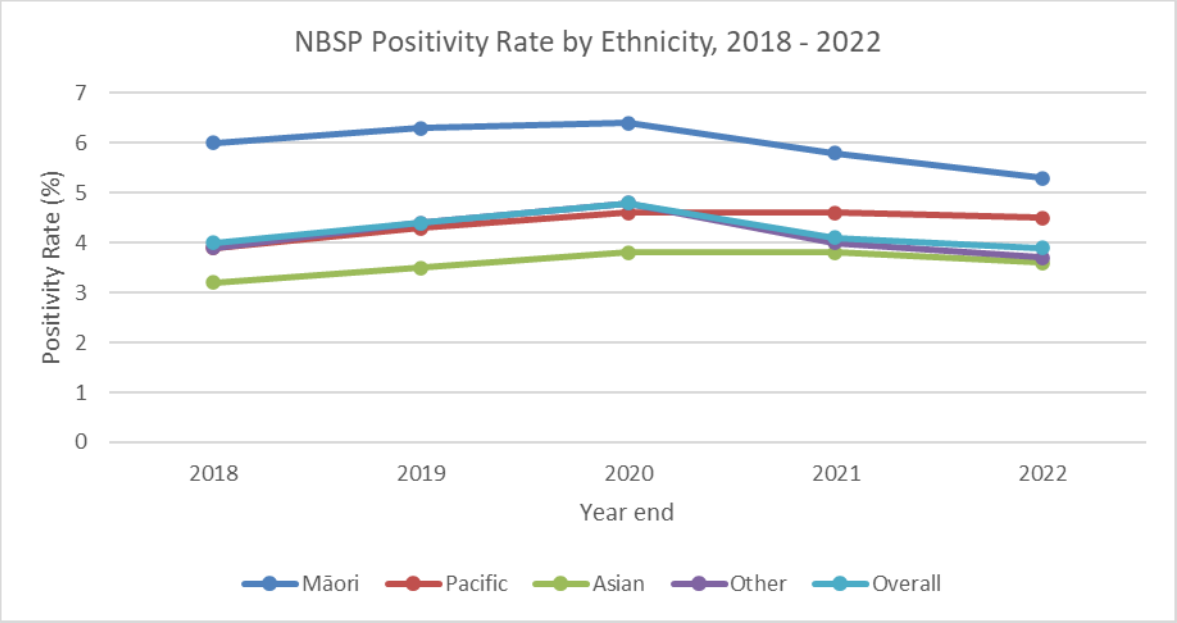


Figure 8: NBSP Positivity Rate by Ethnicity, 2018 - 2022

Table 9: NBSP Positivity Rate by Ethnicity, 2018 - 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	173	439	425	776	1025
	Denominator	2902	6959	6623	13446	19295
	Percentage	6	6.3	6.4	5.8	5.3
Pacific	Numerator	82	192	167	318	330
	Denominator	2082	4512	3629	6898	7304
	Percentage	3.9	4.3	4.6	4.6	4.5
Asian	Numerator	200	360	331	694	746
	Denominator	6269	10232	8686	18474	20768
	Percentage	3.2	3.5	3.8	3.8	3.6
Other	Numerator	1731	3419	3228	6133	6902
	Denominator	43897	78564	67690	153447	186030
	Percentage	3.9	4.4	4.8	4	3.7
Overall	Numerator	2236	4442	4151	7921	9003
	Denominator	55611	100552	86631	192265	233397
	Percentage	4	4.4	4.8	4.1	3.9

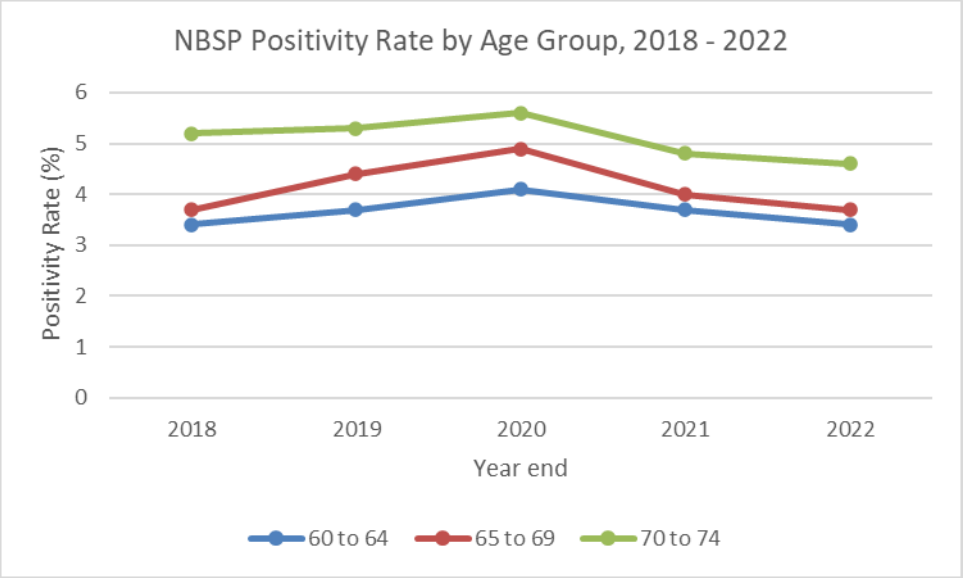


Figure 9: NBSP Positivity Rate by Age Group, 2018 – 2022

Table 10: NBSP Positivity Rate by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	711	1405	1401	2704	2971
	Denominator	21148	38196	33911	73811	88154
	Percentage	3.4	3.7	4.1	3.7	3.4
65-69	Numerator	644	1375	1316	2343	2754
	Denominator	17439	31180	26982	58427	73788
	Percentage	3.7	4.4	4.9	4	3.7
70-74	Numerator	881	1662	1434	2874	3278
	Denominator	17024	31176	25738	60027	71455
	Percentage	5.2	5.3	5.6	4.8	4.6

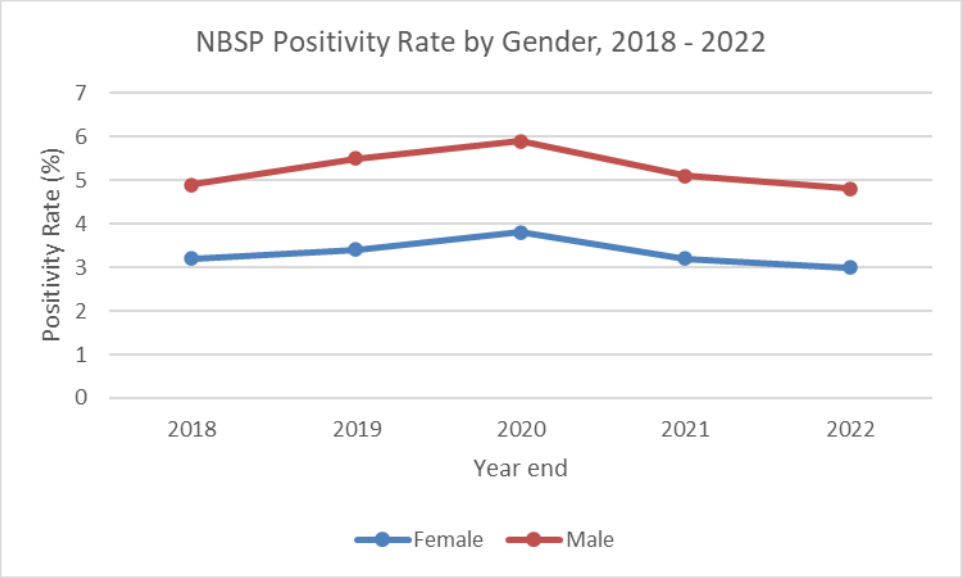


Figure 10: NBSP Positivity Rate by Gender, 2018 – 2022

Table 11: NBSP Positivity Rate by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	917	1769	1706	3249	3701
	Denominator	28878	51998	45088	100304	122205
	Percentage	3.2	3.4	3.8	3.2	3
Male	Numerator	1318	2670	2441	4670	5297
	Denominator	26713	48520	41505	91885	111117
	Percentage	4.9	5.5	5.9	5.1	4.8

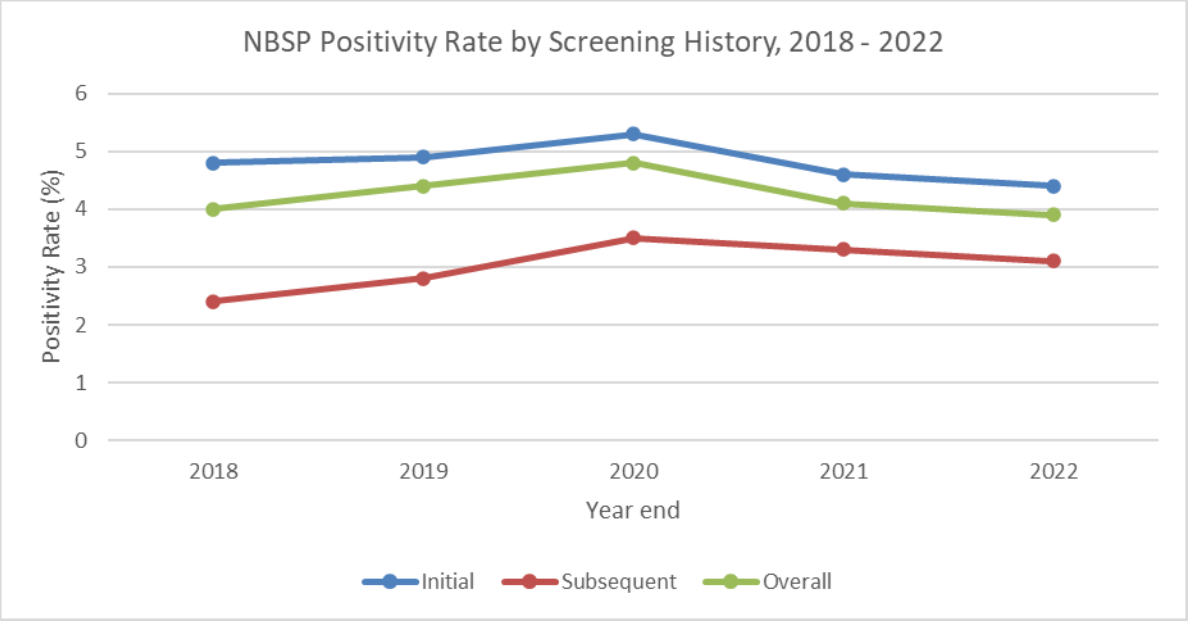


Figure 11: NBSP Positivity Rate by Screening History, 2018 – 2022

Table 12: NBSP Positivity Rate by Screening History, Jan 2018 – Dec 2022

Screening History		2018	2019	2020	2021	2022
Initial	Numerator	1803	3810	3308	5633	6238
	Denominator	37337	77832	62618	122465	143201
	Percentage	4.8	4.9	5.3	4.6	4.4
Subsequent	Numerator	433	632	843	2288	2765
	Denominator	18274	22720	24013	69800	90196
	Percentage	2.4	2.8	3.5	3.3	3.1
Overall	Numerator	2236	4442	4151	7921	9003
	Denominator	55611	100552	86631	192265	233397
	Percentage	4	4.4	4.8	4.1	3.9

Spoilt kits (206)

Kits received by the testing lab but not suitable to give definitive results are considered spoilt. There are many reasons a kit may be spoilt, but all mean that an accurate screening result is less likely. The most common reasons are delays in transit, no collection date given and expired kits.

This indicator expresses the number of spoilt kits as percentage of all kits received. A participant may return more than one spoilt kit and will be counted more than once.

Indicator 206: Spoilt Kits

Target: No target established.
Numerator: The number of spoilt FIT kits during the calendar year.
Denominator: The number of FIT kits returned during the calendar year.
Anchor date: The date when a kit was received by the lab determines which time period it is counted under.

Comments

The spoilt kit rates decreased in 2019 following equity focussed initiatives. There was disruption due to the pandemic and rates have been decreasing back to the pre-COVID-19

levels for all groups. Simultaneously, additional improvement initiatives were undertaken. The kit sent to participants has been redesigned with clearer instructions on how to do the test, prompts to put the supplied barcode on the sample tube and to write in the date the test was performed. Māori and Pacific participants who return a kit without a date, or a clearly incorrect date, are called on the day to get a correct date so that the kit can be processed. Information resources have been published in multiple languages.

The rates continue to be higher for Pacific and Asian participants, compared to Māori and Other participants. This pattern suggests that language may continue to be a barrier. The programme intends to continue to review and improve resources to support participants to complete kits that are suitable for testing.

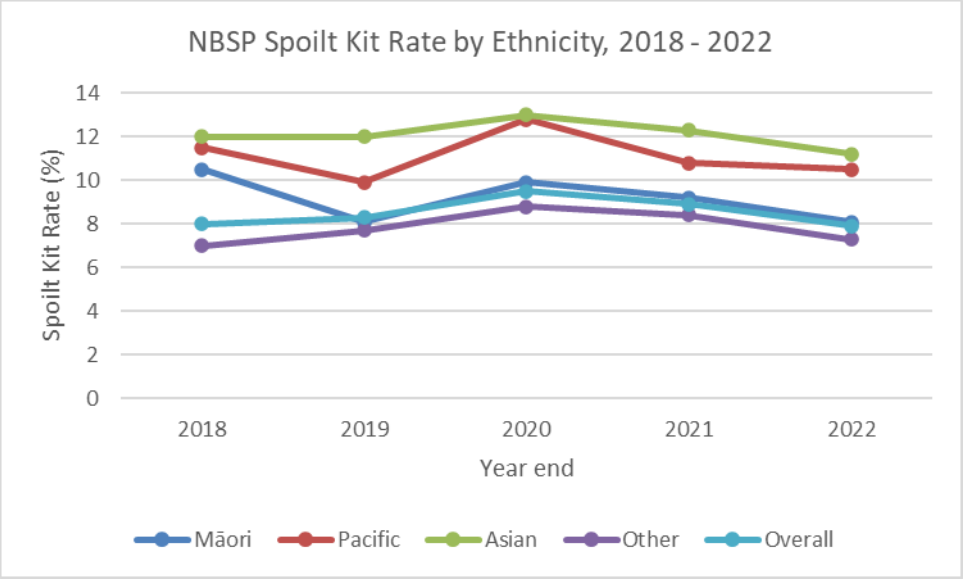


Figure 12: NBSP Spoilt Kit Rate by Ethnicity, 2018 – 2022

Table 13: NBSP Spoilt Kit Rate by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	339	612	732	1359	1708
	Denominator	3243	7574	7361	14820	21004
	Percentage	10.5	8.1	9.9	9.2	8.1
Pacific	Numerator	270	497	534	834	859
	Denominator	2354	5021	4167	7740	8172
	Percentage	11.5	9.9	12.8	10.8	10.5
Asian	Numerator	858	1397	1301	2604	2612
	Denominator	7139	11636	9998	21094	23387
	Percentage	12	12	13	12.3	11.2
Other	Numerator	3325	6562	6540	14095	14756
	Denominator	47295	85156	74263	167599	200842
	Percentage	7	7.7	8.8	8.4	7.3
Overall	Numerator	4848	9112	9107	18892	19935
	Denominator	60551	109717	95792	211253	253405
	Percentage	8	8.3	9.5	8.9	7.9

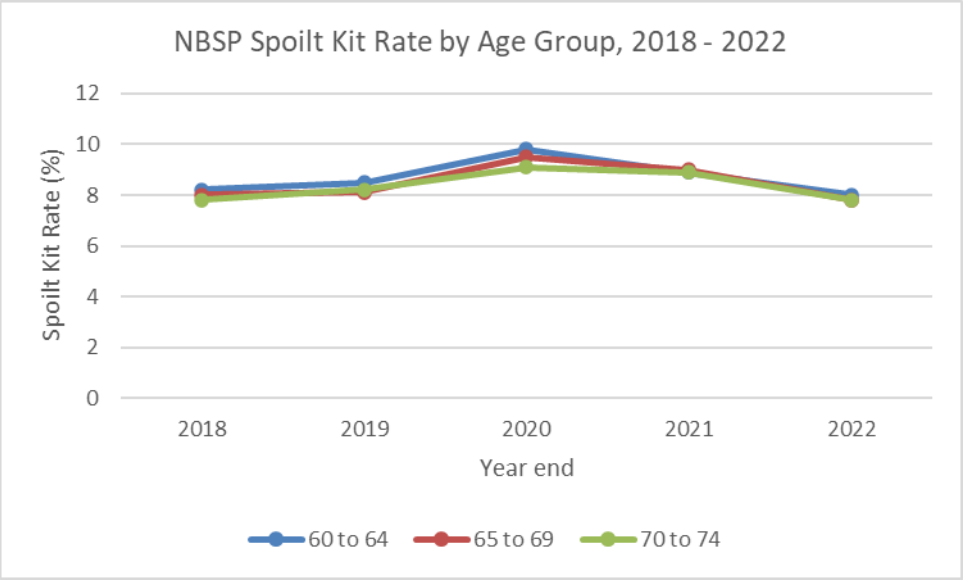


Figure 13: NBSP Spoilt Kit Rate by Age Group, 2018 – 2022

Table 14: NBSP Spoilt Kit Rate by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	1887	3570	3690	7258	7681
	Denominator	23066	41788	37620	81107	95856
	Percentage	8.2	8.5	9.8	8.9	8
65-69	Numerator	1513	2764	2838	5802	6244
	Denominator	18977	33960	29835	64262	80055
	Percentage	8	8.1	9.5	9	7.8
70-74	Numerator	1448	2778	2579	5832	6010
	Denominator	18508	33969	28337	65884	77494
	Percentage	7.8	8.2	9.1	8.9	7.8

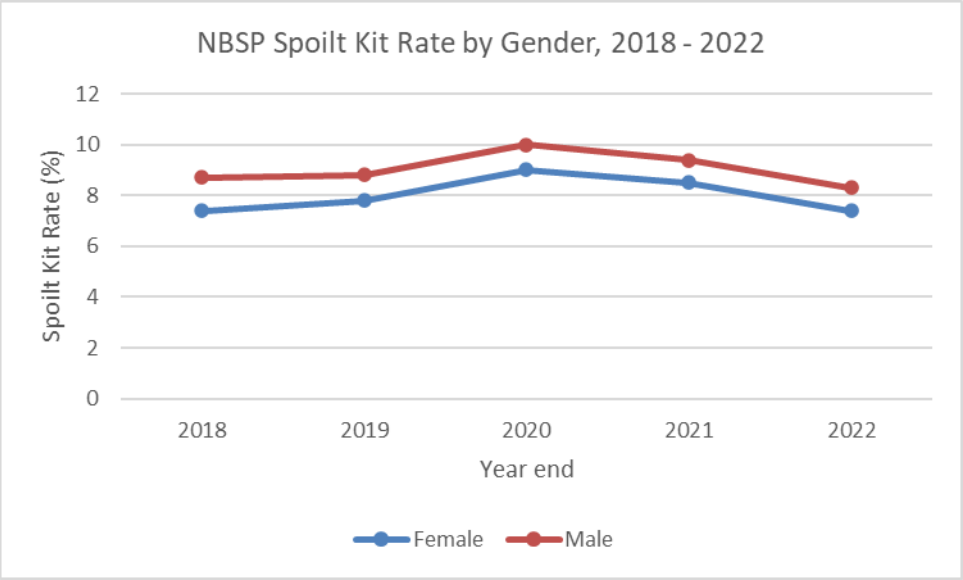


Figure 14: NBSP Spoilt Kit Rate by Gender, 2018 – 2022

Table 15: NBSP Spoilt Kit Rate by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	2306	4412	4464	9364	9829
	Denominator	31227	56430	49574	109709	132063
	Percentage	7.4	7.8	9	8.5	7.4
Male	Numerator	2540	4692	4638	9524	10097
	Denominator	29302	53245	46175	101464	121258
	Percentage	8.7	8.8	10	9.4	8.3

Definitive spoilt kit rate (207)

This indicator tells us about people who returned a spoilt kit but have not subsequently returned a definitive kit.

The indicator counts all people whose screening episode result in the register is currently spoilt and it is expressed as a percentage of all people who returned kits.

This indicator counts people, not kits and takes into account the latest kit result only. For example, a participant who initially returned a spoilt kit and then subsequently returns a negative result will not be counted. However, a participant who returned two spoilt kits but has not returned a third kit will be included as a definitive spoilt kit (because their latest returned kit is spoilt).

Indicator 207: Definitive Spoilt Kit Rate

Target: No more than 2% of people have a definitive spoilt kit.
Numerator: The number of participants who returned a spoilt kit, but have not subsequently returned a definitive FIT result in the same screening episode.
Denominator: Number of people who returned a FIT kit during the calendar year.
Anchor date: The date when a kit was received by the lab determines which time period it is counted under.

Comments

The definitive spoilt kit rate has been trending upwards for all groups since the pandemic. While the overall rate at the end of the period remains within target, the programme is not as accessible after a spoilt kit for Māori, Pacific, Asian, younger and male participants, where definitive spoilt kit rates are above target. As noted above, the rates for 2022 may potentially decrease as definitive kits can still be returned and counted within a two-year screening episode.

The programme intends to explore what is the best way to monitor this indicator in order to provide timely, actionable information.

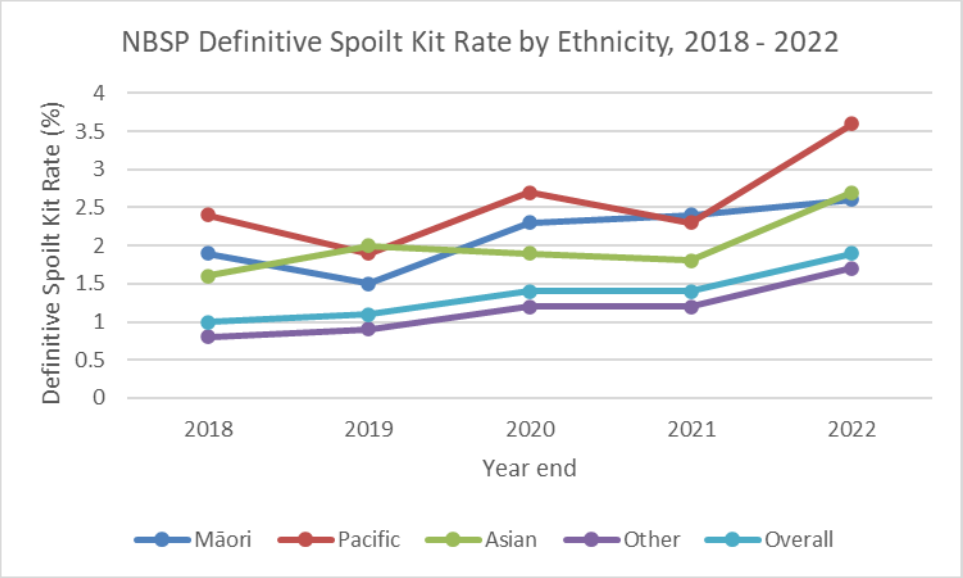


Figure 15: NBSP Definitive Spoilt Kit Rate, by Ethnicity, 2018 – 2022

Table 16: NBSP Definitive Spoilt Kit Rate, by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	57	105	153	335	512
	Denominator	2959	7064	6776	13781	19807
	Percentage	1.9	1.5	2.3	2.4	2.6
Pacific	Numerator	51	88	100	163	273
	Denominator	2133	4600	3729	7061	7577
	Percentage	2.4	1.9	2.7	2.3	3.6
Asian	Numerator	99	205	168	342	573
	Denominator	6368	10437	8854	18816	21341
	Percentage	1.6	2	1.9	1.8	2.7
Other	Numerator	355	696	831	1931	3150
	Denominator	44252	79260	68521	155378	189179
	Percentage	0.8	0.9	1.2	1.2	1.7
Overall	Numerator	576	1110	1252	2771	4508
	Denominator	56187	101662	87883	195036	237904
	Percentage	1	1.1	1.4	1.4	1.9

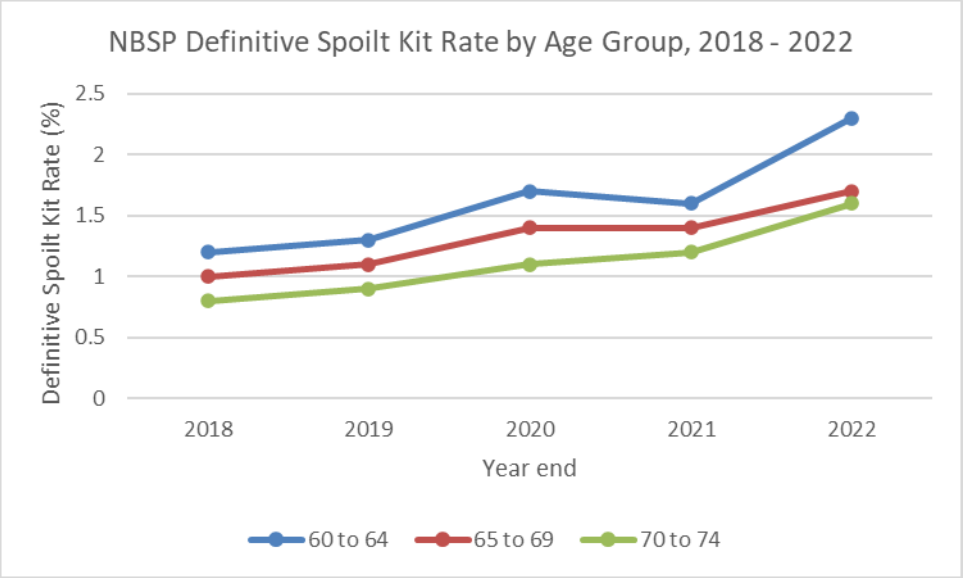


Figure 16: NBSP Definitive spoilt Kit Rate by Age Group, 2018 – 2022

Table 17: NBSP Definitive Spoilt Kit Rate by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	267	504	584	1213	2058
	Denominator	21415	38700	34495	75024	90212
	Percentage	1.2	1.3	1.7	1.6	2.3
65-69	Numerator	175	333	373	813	1305
	Denominator	17614	31513	27355	59240	75093
	Percentage	1	1.1	1.4	1.4	1.7
70-74	Numerator	134	273	295	745	1145
	Denominator	17158	31449	26033	60772	72599
	Percentage	0.8	0.9	1.1	1.2	1.6

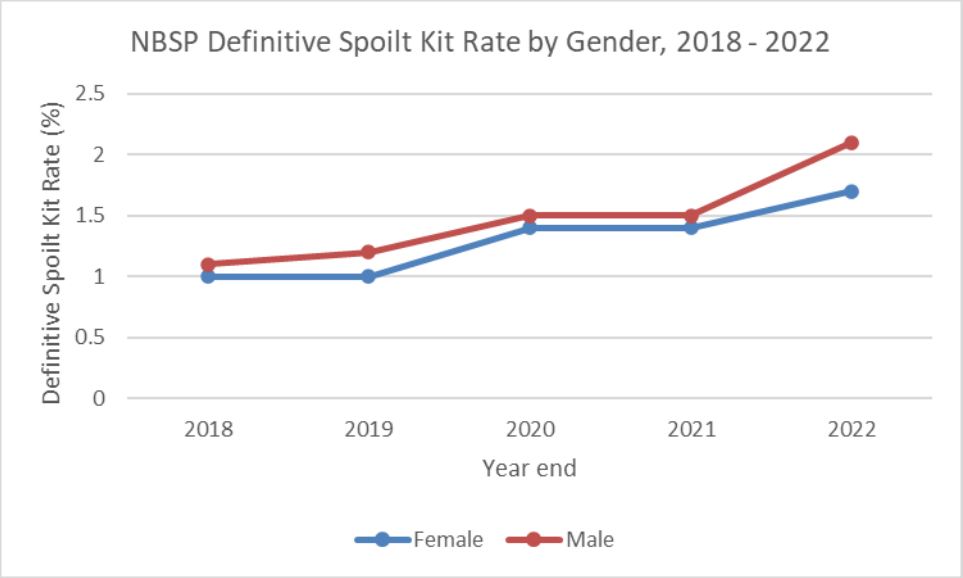


Figure 17: NBSP Definitive Spoilt Kit Rate by Gender, 2018 – 2022

Table 18: NBSP Definitive Spoilt Kit Rate by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	282	518	622	1379	2118
	Denominator	29160	52516	45710	101683	124322
	Percentage	1	1	1.4	1.4	1.7
Male	Numerator	294	592	628	1389	2386
	Denominator	27007	49112	42133	93274	113503
	Percentage	1.1	1.2	1.5	1.5	2.1

Positive Predictive Value (PPV) (300)

PPV describes one aspect of the performance of the screening test for a population. It indicates the percentage of positive screening test results that are true positive results, that is, identify bowel cancer or polyps.

The numerator is based on the most significant pathology as identified following diagnostic assessment, or as subsequently updated following treatment, as recorded in the BSR.

This section is broken down into cancer, advanced adenoma, adenoma and no biopsy; with each group further sub-grouped by ethnicity, age group and gender. Serrated lesions are monitored separately.

Indicator 300: Positive Predictive Value (PPV)

Target: No target established.
Numerator: The number of people whose most significant pathology is a lesion of the type being measured.
Denominator: The number of people with a positive FIT result who completed a publicly funded colonoscopy in the calendar year.
Anchor date: The date when a diagnostic procedure (colonoscopy) was completed determines which time period it is counted under.

Comments

The NBSP is detecting cancers, advanced adenomas and adenomas within the expected range. Overall, in 2022, for every 100 people who had a positive screening test, about eight people had a diagnosis of cancer and a further 24 people had advanced adenomas seen and removed.

PPVs are influenced by multiple factors, including the underlying incidence of bowel cancers in different populations, the threshold for positivity, the proportion of participants who may be symptomatic and the screening round. As the programme completes the first and second screening rounds in all districts, more data will be available to be analysed to help better understand these interactions.

Colonoscopy is an invasive procedure and it is therefore important to also monitor the number of people who have no significant bowel abnormality (indicated by no biopsy taken) identified at NBSP colonoscopy. Overall, 15 in 100 people have no biopsy taken at an NBSP colonoscopy. Conversely, 85% of people proceeding to NBSP colonoscopy have an abnormality detected – this indicates that the programme parameters and FIT threshold for positivity are appropriate.

Cancer

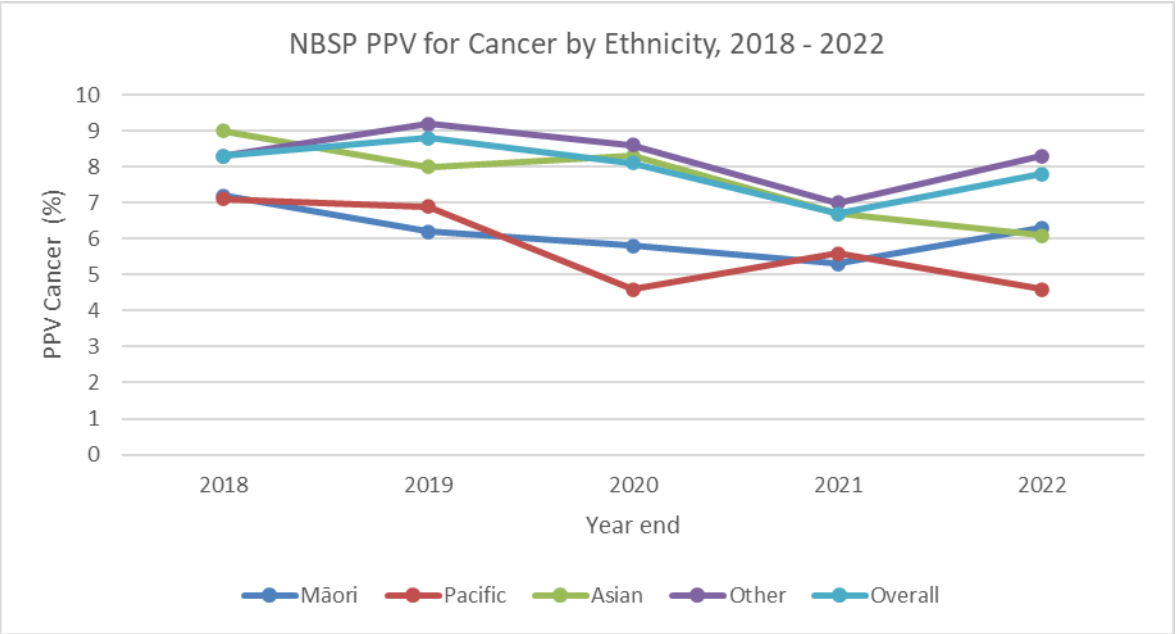


Figure 18: NBSP PPV for Cancer by Ethnicity, 2018 – 2022

Table 19: NBSP PPV for Cancer by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	9	20	21	33	52
	Denominator	125	323	362	620	820
	Percentage	7.2	6.2	5.8	5.3	6.3
Pacific	Numerator	4	10	7	14	12
	Denominator	56	145	153	252	262
	Percentage	7.1	6.9	4.6	5.6	4.6
Asian	Numerator	14	24	23	39	36
	Denominator	155	301	278	584	590
	Percentage	9	8	8.3	6.7	6.1
Other	Numerator	110	248	235	327	455
	Denominator	1324	2707	2727	4674	5450
	Percentage	8.3	9.2	8.6	7	8.3
Overall	Numerator	140	306	286	413	555
	Denominator	1692	3492	3520	6130	7122
	Percentage	8.3	8.8	8.1	6.7	7.8

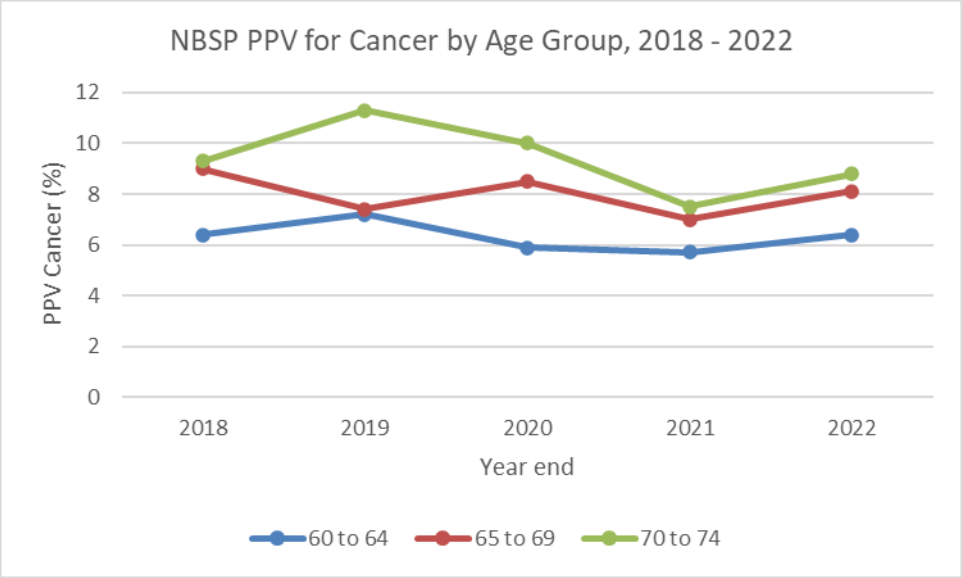


Figure 19: NBSP PPV for Cancer by Age Group, 2018 – 2022

Table 20: NBSP PPV for Cancer by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	36	81	70	119	154
	Denominator	562	1122	1189	2077	2397
	Percentage	6.4	7.2	5.9	5.7	6.4
65-69	Numerator	44	80	95	132	174
	Denominator	487	1088	1119	1882	2140
	Percentage	9	7.4	8.5	7	8.1
70-74	Numerator	60	145	121	162	227
	Denominator	643	1282	1212	2171	2585
	Percentage	9.3	11.3	10	7.5	8.8

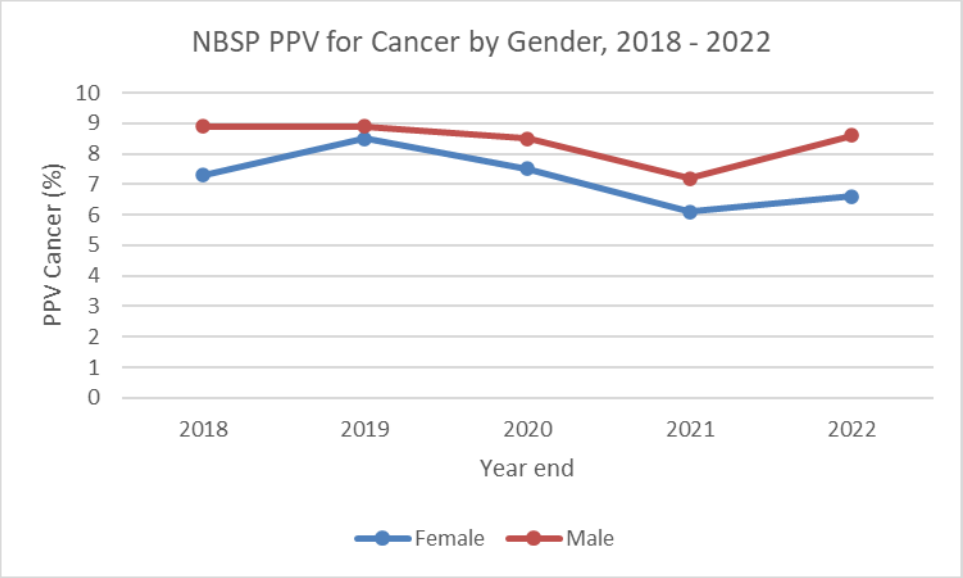


Figure 20: NBSP PPV for Cancer by Gender, 2018 – 2022

Table 21: NBSP PPV for Cancer by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	51	115	107	152	188
	Denominator	694	1359	1419	2493	2867
	Percentage	7.3	8.5	7.5	6.1	6.6
Male	Numerator	89	190	178	260	367
	Denominator	997	2130	2099	3634	4252
	Percentage	8.9	8.9	8.5	7.2	8.6

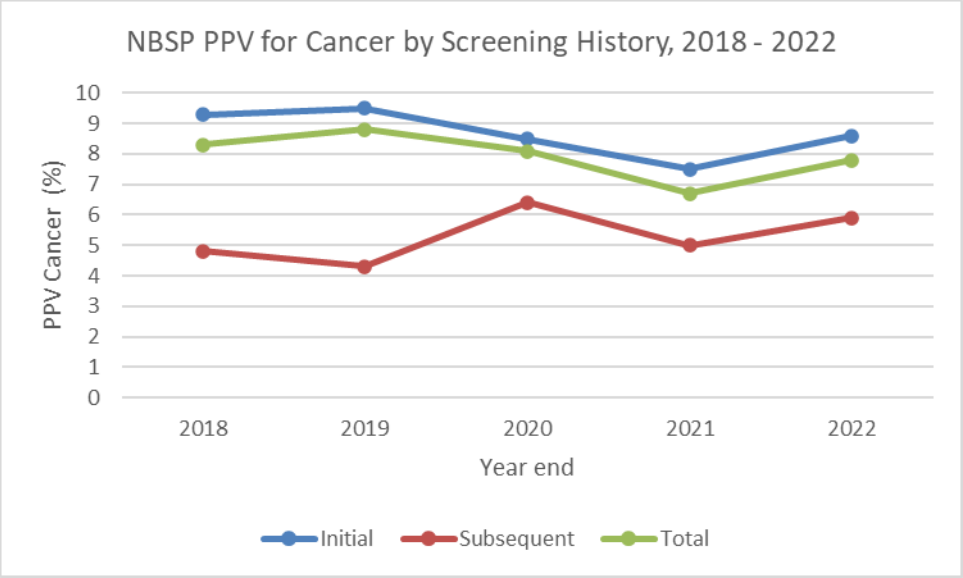


Figure 21: NBSP PPV for Cancer by Screening History, 2018 – 2022

Table 22: NBSP PPV for Cancer by Screening History, 2018 – 2022

Screening History		2018	2019	2020	2021	2022
Initial	Numerator	122	285	245	322	428
	Denominator	1317	3004	2881	4294	4974
	Percentage	9.3	9.5	8.5	7.5	8.6
Subsequent	Numerator	18	21	41	91	127
	Denominator	375	488	639	1836	2148
	Percentage	4.8	4.3	6.4	5	5.9
Total	Numerator	140	306	286	413	555
	Denominator	1692	3492	3520	6130	7122
	Percentage	8.3	8.8	8.1	6.7	7.8

Advanced Adenoma

Adenoma is advanced if:

- Adenoma ≥ 10 mm
- Adenoma with tubulovillous or villous histology. Minimum 25% of unequivocal villous component is required
- Adenoma with high-grade dysplasia

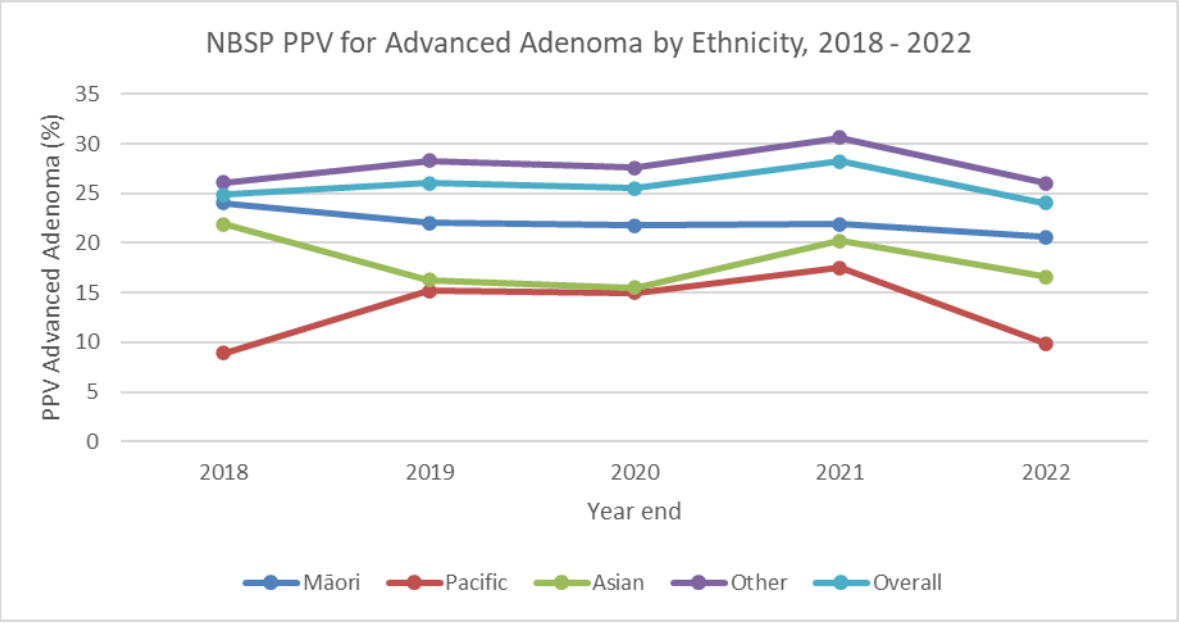


Figure 22: NBSP PPV for Advanced Adenoma by Ethnicity, 2018 – 2022

Table 23: NBSP PPV for Advanced Adenoma by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	30	71	79	136	169
	Denominator	125	323	362	620	820
	Percentage	24	22	21.8	21.9	20.6
Pacific	Numerator	5	22	23	44	26
	Denominator	56	145	153	252	262
	Percentage	8.9	15.2	15	17.5	9.9
Asian	Numerator	34	49	43	118	98
	Denominator	155	301	278	584	590
	Percentage	21.9	16.3	15.5	20.2	16.6
Other	Numerator	345	766	753	1432	1416
	Denominator	1324	2707	2727	4674	5450
	Percentage	26.1	28.3	27.6	30.6	26
Overall	Numerator	421	909	898	1730	1709
	Denominator	1692	3492	3520	6130	7122
	Percentage	24.9	26	25.5	28.2	24

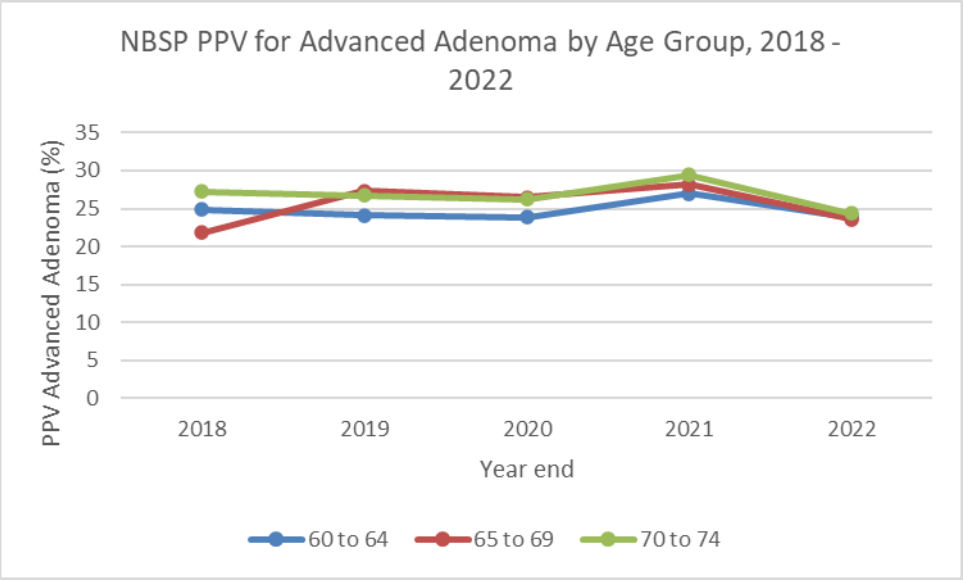


Figure 23: NBSP PPV for Advanced Adenoma by Age Group, 2018 – 2022

Table 24: NBSP PPV for Advanced Adenoma by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	140	270	284	560	573
	Denominator	562	1122	1189	2077	2397
	Percentage	24.9	24.1	23.9	27	23.9
65-69	Numerator	106	297	297	531	504
	Denominator	487	1088	1119	1882	2140
	Percentage	21.8	27.3	26.5	28.2	23.6
70-74	Numerator	175	342	317	639	632
	Denominator	643	1282	1212	2171	2585
	Percentage	27.2	26.7	26.2	29.4	24.4

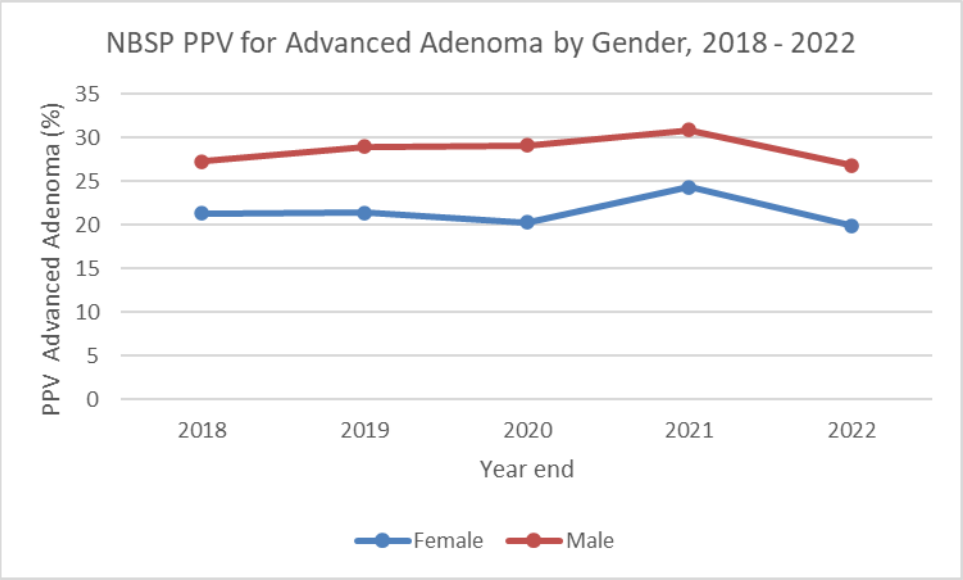


Figure 24: NBSP PPV for Advanced Adenoma by Gender, 2018 – 2022

Table 25: NBSP PPV for Advanced Adenoma by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	148	291	288	607	570
	Denominator	694	1359	1419	2493	2867
	Percentage	21.3	21.4	20.3	24.3	19.9
Male	Numerator	272	618	610	1123	1139
	Denominator	997	2130	2099	3634	4252
	Percentage	27.3	29	29.1	30.9	26.8

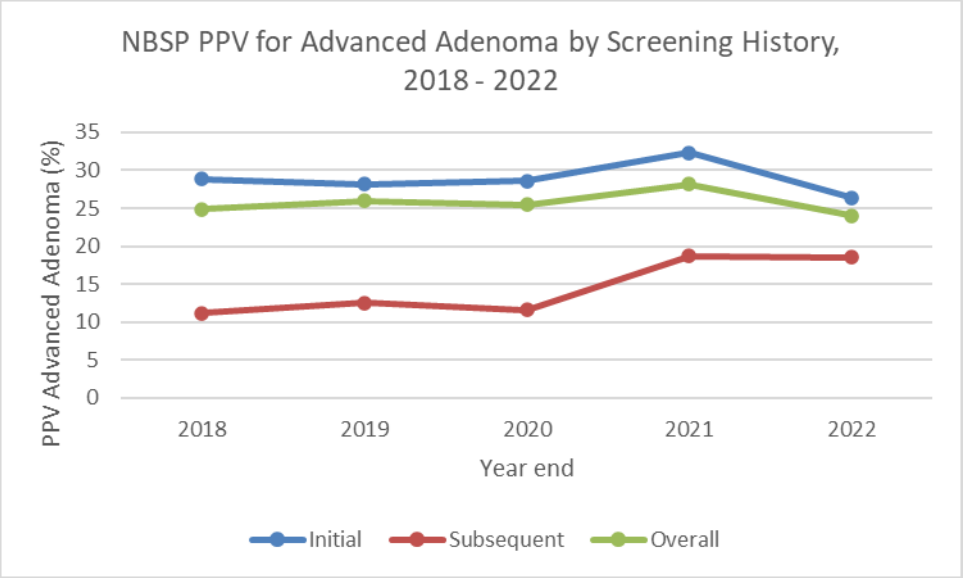


Figure 25: NBSP PPV for Advanced Adenoma by Screening History, 2018 – 2022

Table 26: NBSP PPV for Advanced Adenoma by Screening History, 2018 – 2022

Screening History		2018	2019	2020	2021	2022
Initial	Numerator	379	848	824	1386	1311
	Denominator	1317	3004	2881	4294	4974
	Percentage	28.8	28.2	28.6	32.3	26.4
Subsequent	Numerator	42	61	74	344	398
	Denominator	375	488	639	1836	2148
	Percentage	11.2	12.5	11.6	18.7	18.5
Overall	Numerator	421	909	898	1730	1709
	Denominator	1692	3492	3520	6130	7122
	Percentage	24.9	26	25.5	28.2	24

Adenoma

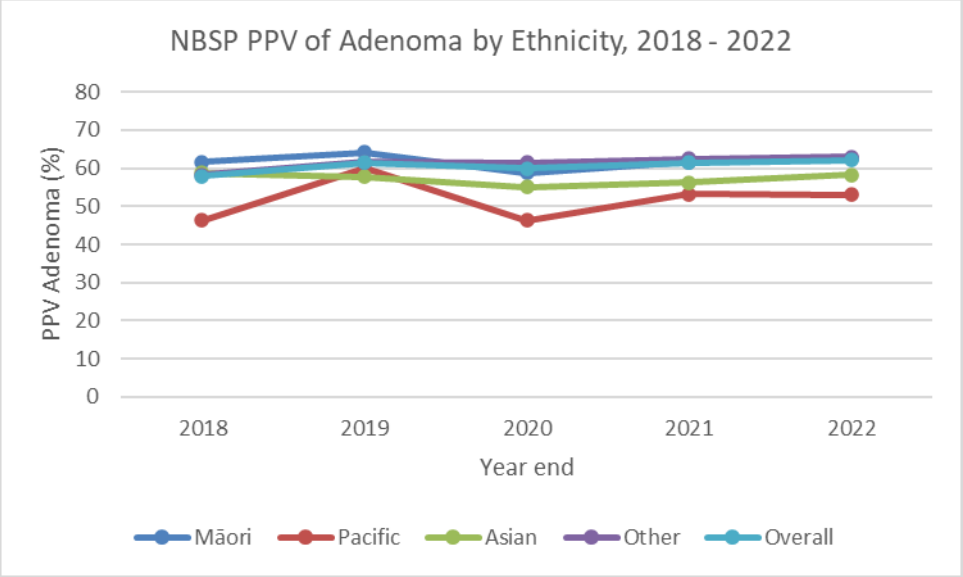


Figure 26: NBSP PPV of Adenoma by Ethnicity, 2018 – 2022

Table 27: NBSP PPV of Adenoma by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	77	207	213	382	512
	Denominator	125	323	362	620	820
	Percentage	61.6	64.1	58.8	61.6	62.4
Pacific	Numerator	26	87	71	134	139
	Denominator	56	145	153	252	262
	Percentage	46.4	60	46.4	53.2	53.1
Asian	Numerator	91	174	153	329	344
	Denominator	155	301	278	584	590
	Percentage	58.7	57.8	55	56.3	58.3
Other	Numerator	772	1668	1674	2919	3431
	Denominator	1324	2707	2727	4674	5450
	Percentage	58.3	61.6	61.4	62.5	63
Overall	Numerator	982	2143	2111	3764	4426
	Denominator	1692	3492	3520	6130	7122
	Percentage	58	61.4	60	61.4	62.1

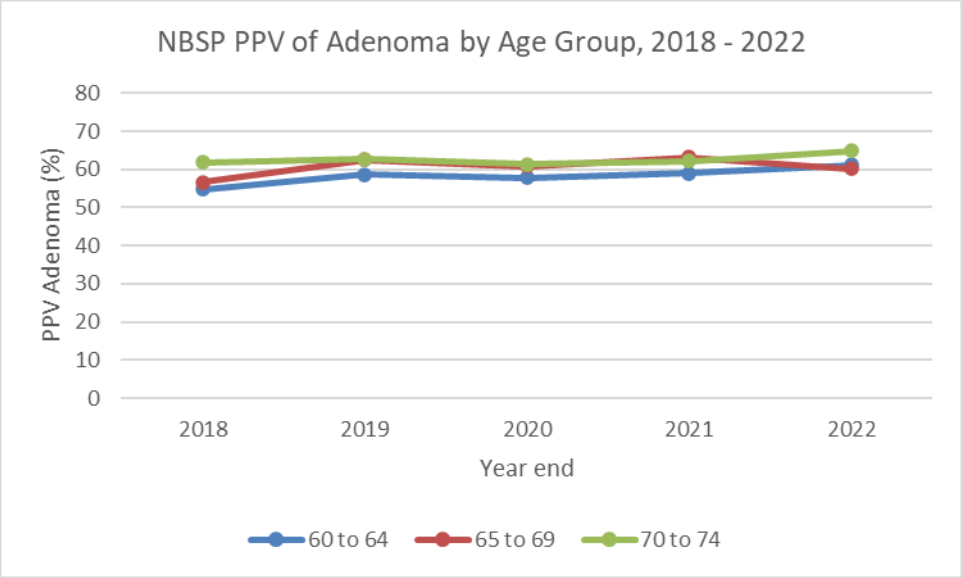


Figure 27: NBSP PPV of Adenoma by Age Group, 2018 – 2022

Table 28: NBSP PPV of Adenoma by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	308	658	687	1223	1465
	Denominator	562	1122	1189	2077	2397
	Percentage	54.8	58.6	57.8	58.9	61.1
65-69	Numerator	276	681	681	1190	1287
	Denominator	487	1088	1119	1882	2140
	Percentage	56.7	62.6	60.9	63.2	60.1
70-74	Numerator	398	804	743	1351	1674
	Denominator	643	1282	1212	2171	2585
	Percentage	61.9	62.7	61.3	62.2	64.8

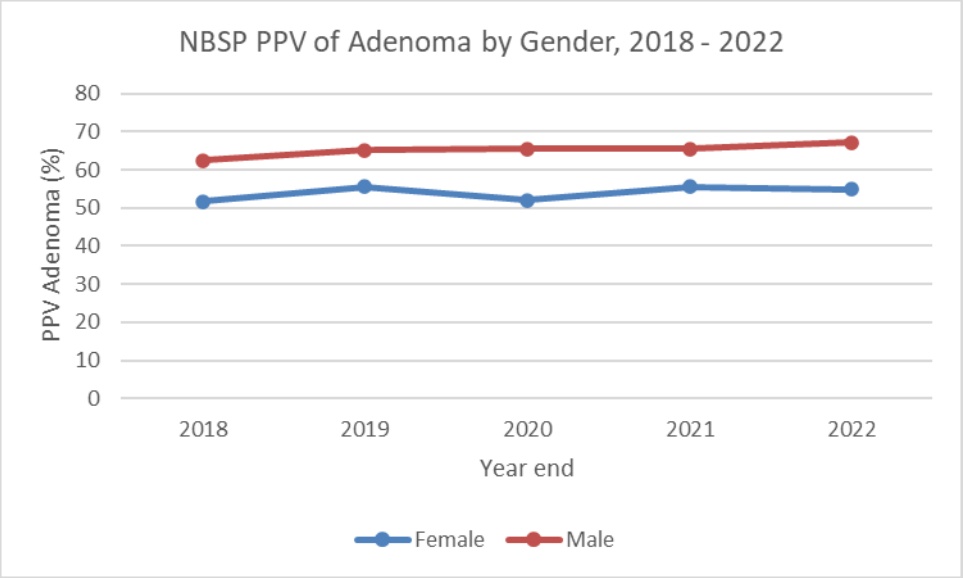


Figure 28: NBSP PPV of Adenoma by Gender, 2018 – 2022

Table 29: NBSP PPV of Adenoma by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	358	754	738	1384	1570
	Denominator	694	1359	1419	2493	2867
	Percentage	51.6	55.5	52	55.5	54.8
Male	Numerator	623	1388	1373	2378	2854
	Denominator	997	2130	2099	3634	4252
	Percentage	62.5	65.2	65.4	65.4	67.1

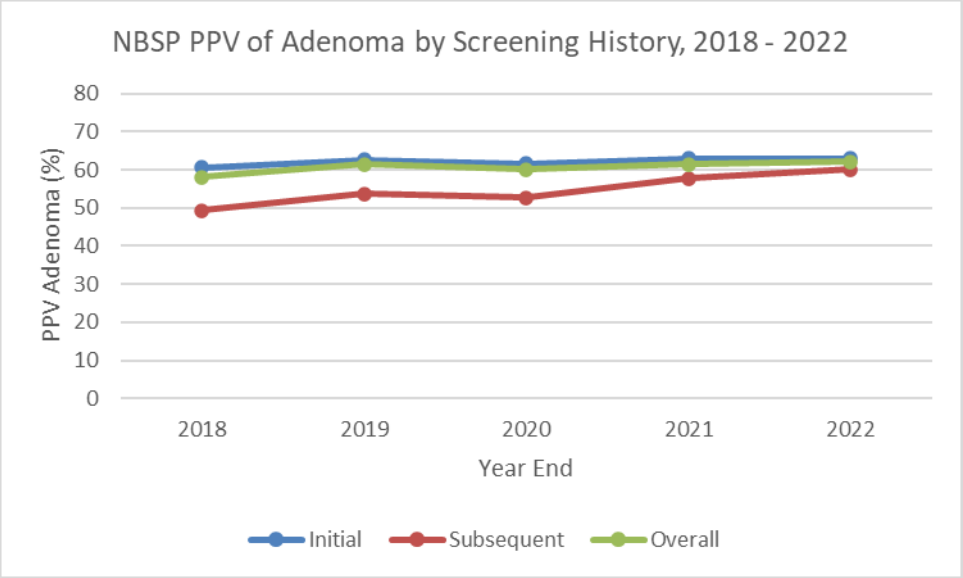


Figure 29: NBSP PPV of Adenoma by Screening History, 2018 – 2022

Table 30: NBSP PPV of Adenoma by Screening History, 2018 – 2022

Screening History		2018	2019	2020	2021	2022
Initial	Numerator	797	1881	1774	2704	3136
	Denominator	1317	3004	2881	4294	4974
	Percentage	60.5	62.6	61.6	63	63
Subsequent	Numerator	185	262	337	1060	1290
	Denominator	375	488	639	1836	2148
	Percentage	49.3	53.7	52.7	57.7	60.1
Overall	Numerator	982	2143	2111	3764	4426
	Denominator	1692	3492	3520	6130	7122
	Percentage	58	61.4	60	61.4	62.1

No Biopsy taken at colonoscopy

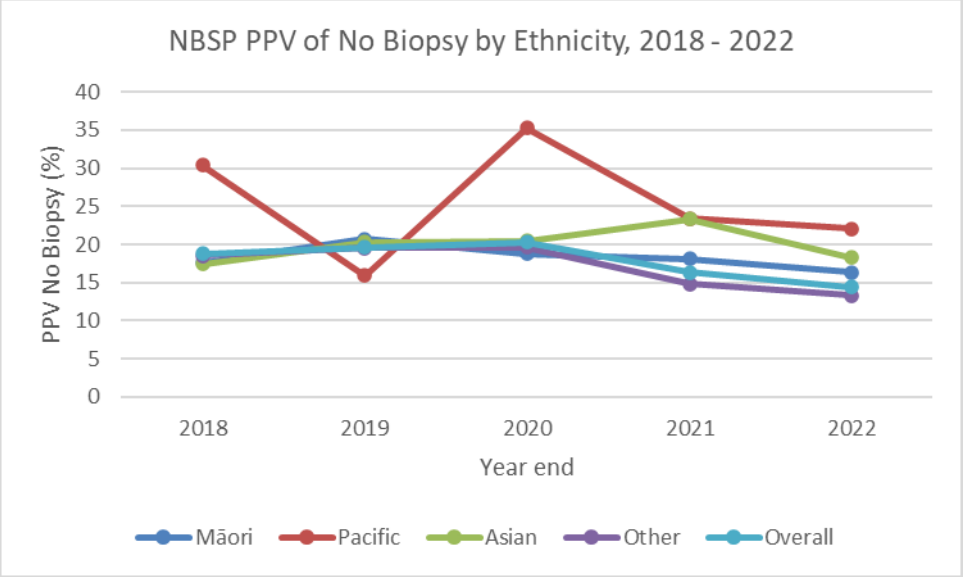


Figure 30: NBSP PPV of No Biopsy by Ethnicity, 2018 – 2022

Table 31: NBSP PPV of No Biopsy by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	22	67	68	112	134
	Denominator	125	323	362	620	820
	Percentage	17.6	20.7	18.8	18.1	16.3
Pacific	Numerator	17	23	54	59	58
	Denominator	56	145	153	252	262
	Percentage	30.4	15.9	35.3	23.4	22.1
Asian	Numerator	27	61	57	136	108
	Denominator	155	301	278	584	590
	Percentage	17.4	20.3	20.5	23.3	18.3
Other	Numerator	245	528	534	690	725
	Denominator	1324	2707	2727	4674	5450
	Percentage	18.5	19.5	19.6	14.8	13.3
Overall	Numerator	318	683	713	997	1025
	Denominator	1692	3492	3520	6130	7122
	Percentage	18.8	19.6	20.3	16.3	14.4

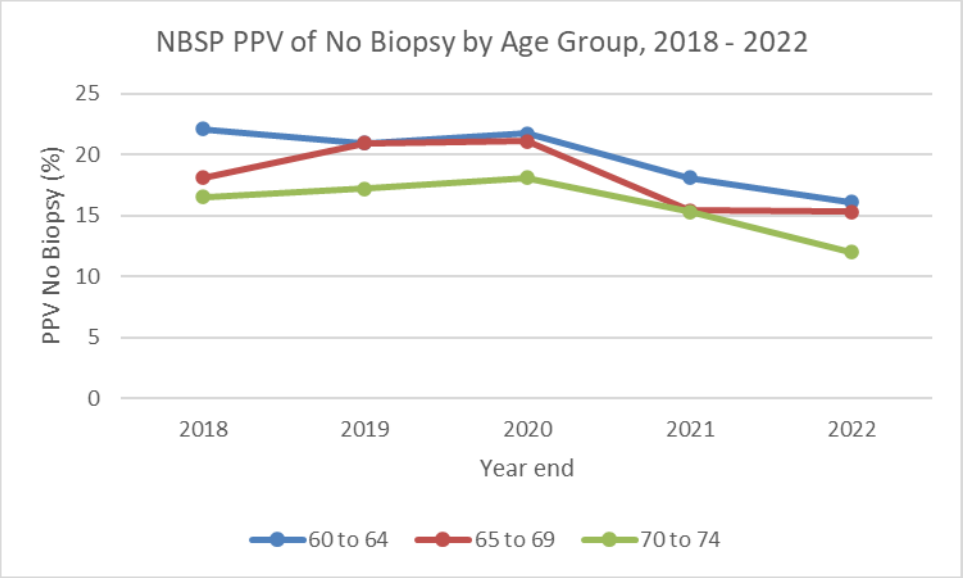


Figure 31: NBSP PPV of No Biopsy by Age Group, 2018 – 2022

Table 32: NBSP PPV of No Biopsy by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	124	235	258	376	386
	Denominator	562	1122	1189	2077	2397
	Percentage	22.1	20.9	21.7	18.1	16.1
65-69	Numerator	88	227	236	289	328
	Denominator	487	1088	1119	1882	2140
	Percentage	18.1	20.9	21.1	15.4	15.3
70-74	Numerator	106	221	219	332	311
	Denominator	643	1282	1212	2171	2585
	Percentage	16.5	17.2	18.1	15.3	12

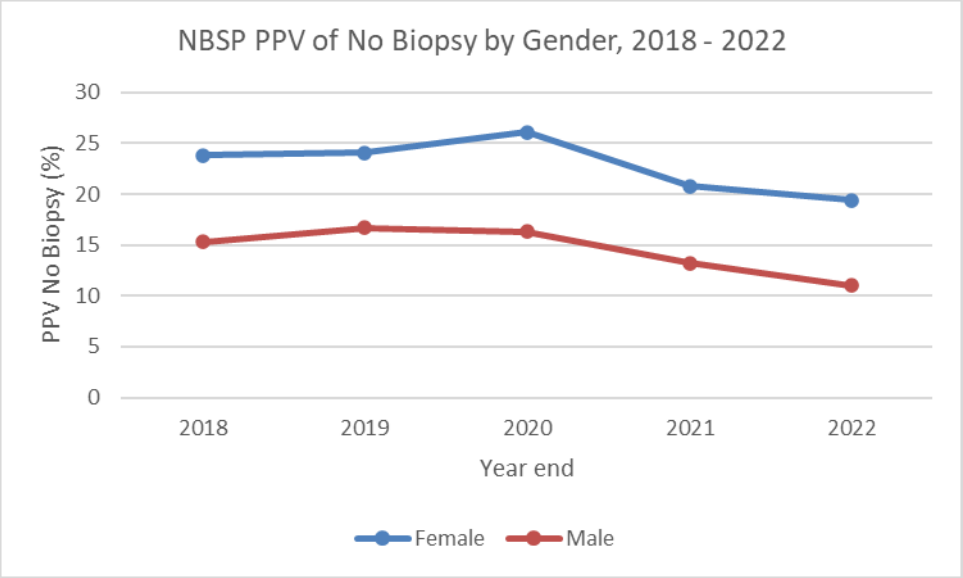


Figure 32: NBSP PPV of No Biopsy by Gender, 2018 – 2022

Table 33:NBSP PPV of No Biopsy by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	165	327	371	519	557
	Denominator	694	1359	1419	2493	2867
	Percentage	23.8	24.1	26.1	20.8	19.4
Male	Numerator	153	355	342	478	467
	Denominator	997	2130	2099	3634	4252
	Percentage	15.3	16.7	16.3	13.2	11

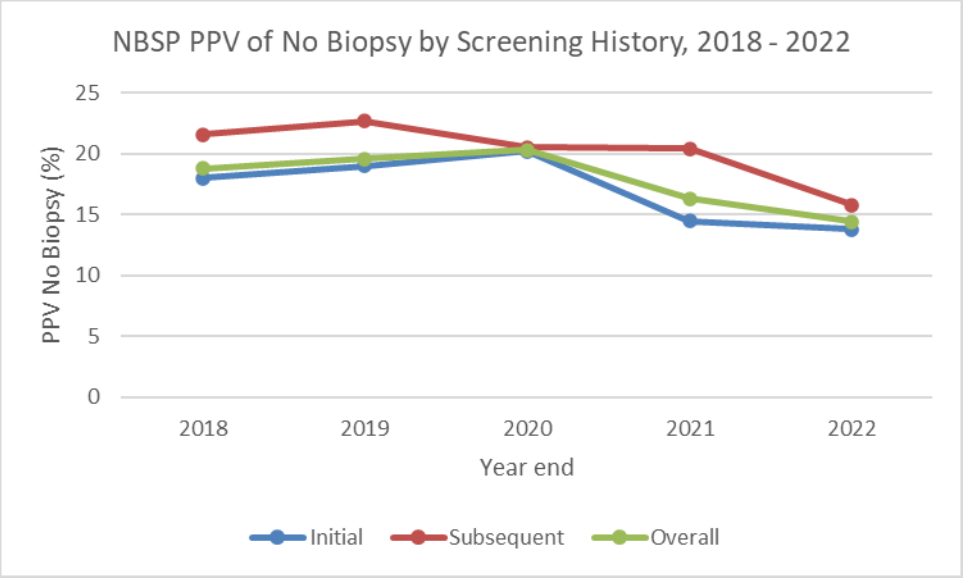


Figure 33: NBSP PPV of No Biopsy by Screening History, 2018 – 2022

Table 34: NBSP PPV of No Biopsy by Screening History, 2018 – 2022

Screening History		2018	2019	2020	2021	2022
Initial	Numerator	237	572	582	623	685
	Denominator	1317	3004	2881	4294	4974
	Percentage	18	19	20.2	14.5	13.8
Subsequent	Numerator	81	111	131	374	340
	Denominator	375	488	639	1836	2148
	Percentage	21.6	22.7	20.5	20.4	15.8
Overall	Numerator	318	683	713	997	1025
	Denominator	1692	3492	3520	6130	7122
	Percentage	18.8	19.6	20.3	16.3	14.4

Timeliness of initial contact for pre-assessment (303)

This indicator relates to the percentage of people with positive FIT results who are contacted for a colonoscopy pre-assessment within an appropriate time frame. It also includes the small number of information referrals from general practitioners (GPs), where the GP advises that the participant opts not to have a colonoscopy or decides to use the private health system and therefore a pre-assessment is not required.

Ensuring timely pre-assessment is intended to reduce anxiety after receiving a positive result.

Indicator 303: Timeliness of Initial Contact for Pre-Assessment

Target: 95% of individuals receive initial contact for colonoscopy pre-assessment within 15 working days of a positive FIT result.
Numerator: The number of people contacted for pre-assessment within 15 working days of a positive FIT result being recorded in the NBSP register.
Denominator: The number of people with a positive FIT result during the calendar year.
Anchor date: The date when a kit result was recorded in the register determines which time period it is counted under.

Comments

The timeliness target was finally achieved for the total population in 2021 but dropped to just below target in 2022. In 2022, Pacific and Asian participants tended to be contacted sooner than other groups. Timeliness was below target for Māori in 2022; this was due to one large outlier district where performance has improved in 2023. There are no other differences by age, or gender (graphs for age and gender therefore not included).

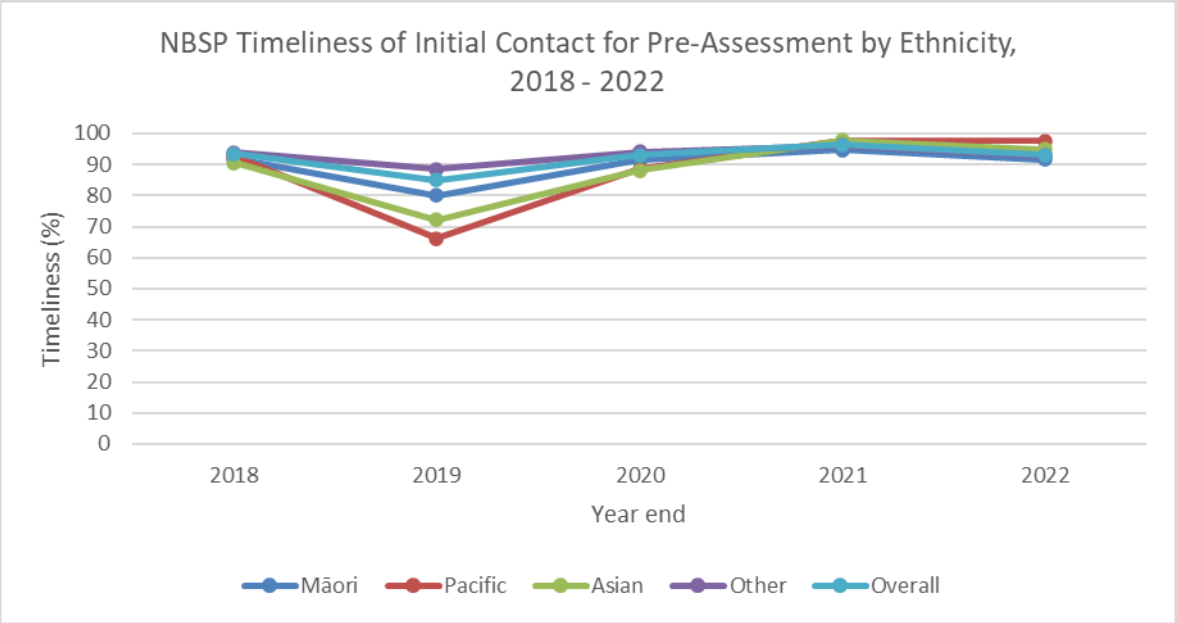


Figure 34: NBSP Timeliness of Initial Contact for Pre-Assessment by Ethnicity, 2018 - 2022

Table 35: NBSP Timeliness of Initial Contact for Pre-Assessment by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	159	347	383	724	923
	Denominator	173	433	419	764	1009
	Percentage	91.9	80.1	91.4	94.8	91.5
Pacific	Numerator	75	127	146	307	319
	Denominator	81	192	165	315	327
	Percentage	92.6	66.1	88.5	97.5	97.6
Asian	Numerator	180	253	288	652	688
	Denominator	199	351	327	667	724
	Percentage	90.5	72.1	88.1	97.8	95
Other	Numerator	1567	2896	2914	5446	5900
	Denominator	1668	3275	3099	5660	6354
	Percentage	93.9	88.4	94	96.2	92.9
Overall	Numerator	2026	3641	3731	7129	7830
	Denominator	2170	4282	4010	7406	8414
	Percentage	93.4	85	93	96.3	93.1

Table 36: NBSP Timeliness of Initial Contact for Pre-Assessment by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	642	1126	1268	2403	2585
	Denominator	688	1344	1350	2488	2760
	Percentage	93.3	83.8	93.9	96.6	93.7
65-69	Numerator	583	1150	1188	2125	2384
	Denominator	622	1332	1276	2199	2573
	Percentage	93.7	86.3	93.1	96.6	92.7
70-74	Numerator	801	1365	1275	2601	2861
	Denominator	860	1606	1384	2719	3081
	Percentage	93.1	85	92.1	95.7	92.9

Table 37: NBSP Timeliness of Initial Contact for Pre-Assessment by Gender, 2018 - 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	826	1457	1556	2889	3169
	Denominator	882	1697	1656	3008	3407
	Percentage	93.7	85.9	94	96	93
Male	Numerator	1199	2181	2172	4238	4657
	Denominator	1287	2582	2350	4396	5002
	Percentage	93.2	84.5	92.4	96.4	93.1

Preliminary interval cancer rate and sensitivity

This section presents a preliminary analysis of interval cancers following a negative FIT in participants screened in the first two years of the NBSP, from July 2017 to June 2019, during which eight out of twenty districts were involved in delivering the NBSP. A final, more detailed analysis will be published at a later date.

Interval cancers are defined as cancers which occur in the 24-month period following a negative FIT (within the time period before the next screen would have occurred). The rate of interval cancers is an important performance indicator of a screening programme, reflecting the sensitivity of the screening test as well as the incidence of newly detected cancers which were not detected on the initial screen.

Data on participants who received a negative FIT test in the NBSP between July 2017 and June 2019 was matched to colorectal cancer (CRC) diagnoses within 24 months of the screen in the New Zealand Cancer Registry (NZCR), using the National Health Index

(NHI) number. Participants that had previously been in the bowel screening pilot were excluded due to the differing age range (50–74 years) and FIT threshold (75ng Hb/mL buffer solution) used in the pilot. Data cleaning and analysis was carried out in Microsoft Excel.

Comments

The provisional prevalent interval cancer rate (14.8 per 10,000 definitive screens) and FIT sensitivity for CRC 71.8%, (CI 67.0-76.1) shows the NBSP is within the range of similar bowel cancer screening programmes internationally (with similar thresholds for positivity) and the bowel screening pilot where the overall FIT sensitivity for CRC was 78.7% (95% CI=74.9% to 82.1%)[5]. Of note, the more detailed analysis indicates that 65 of the 105 interval cancers (61.9%) had a FIT level less than 75ng Hb/mL buffer solution. The analysis will be repeated when a complete data set is available i.e. all districts have been delivering bowel screening for four years (to allow two years of screens followed by two years to develop an interval cancer).

Table 38: NBSP FIT Sensitivity, January 2017 to December 2019

Age	Interval Cancers	Screen detected	Sensitivity	(95% CI)
Total	105	267	71.8	(67, 76.1)

Table 39: NBSP Rate of Interval Cancers per 10,000 Definitive Screens, January 2017 to December 2019

FIT level	Interval Cancers	Definitive screens	Interval cancer rate per 10,000 definitive screens
Total	105	70,932	14.8

[5] Ref Saw KS, et al. BMJ Open Gastroenterol 2023;10:e001233 doi:10.1136/bmjgast-2023-001233

Diagnostic assessment completion rate (305)

This is the percentage of people with a positive FIT result who complete a publicly funded colonoscopy or CT colonography through the NBSP.

There are many reasons for the diagnostic assessment rate not being 100%. Some FIT positive participants may:

- elect to use a private health provider for their diagnostic test
- decline to have a colonoscopy
- not be suitable for diagnostic test (e.g. they may have other significant medical conditions)
- have recently had a colonoscopy.

Indicator 305: Diagnostic Assessment Completion Rate

Target: 85% or more of individuals who return a positive FIT in any given 24-month period, successfully complete a colonoscopy and/or Virtual CTC diagnostic assessment.
Numerator: The number of people who undertake a publicly funded colonoscopy or CT colonography within the National Bowel Screening Programme.
Denominator: The number of people with a positive FIT result.
Anchor date: The date when the positive kit result was received determines which time period it is counted under.

Comments

The completion rate is similar by age and ethnicity, but higher for men than women in 2022 (graph for age not included).

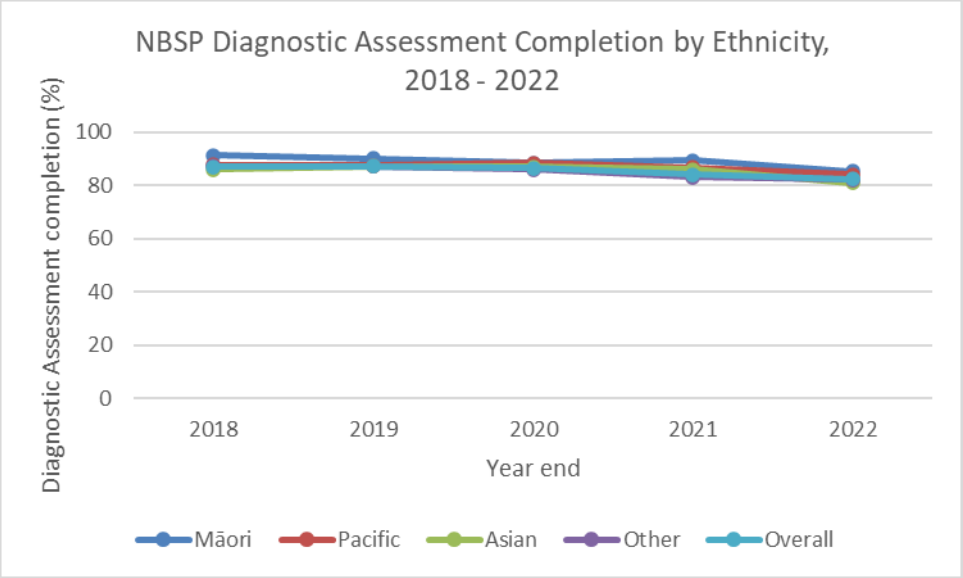


Figure 35: NBSP Diagnostic Assessment Completion by Ethnicity, 2018 – 2022

Table 40: NBSP Diagnostic Assessment Completion by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	158	396	375	691	875
	Denominator	173	439	424	772	1025
	Percentage	91.3	90.2	88.4	89.5	85.4
Pacific	Numerator	72	168	148	273	277
	Denominator	82	192	167	315	329
	Percentage	87.8	87.5	88.6	86.7	84.2
Asian	Numerator	172	314	288	598	604
	Denominator	200	360	331	694	746
	Percentage	86	87.2	87	86.2	81
Other	Numerator	1509	2987	2777	5090	5673
	Denominator	1731	3419	3226	6125	6900
	Percentage	87.2	87.4	86.1	83.1	82.2
Overall	Numerator	1945	3879	3588	6652	7429
	Denominator	2236	4442	4148	7906	9000
	Percentage	87	87.3	86.5	84.1	82.5

Table 41: NBSP Diagnostic Assessment Completion by Age Group, 2018 - 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	628	1217	1223	2229	2464
	Denominator	711	1405	1401	2692	2970
	Percentage	88.3	86.6	87.3	82.8	83
65-69	Numerator	556	1219	1134	1992	2254
	Denominator	644	1375	1314	2342	2753
	Percentage	86.3	88.7	86.3	85.1	81.9
70-74	Numerator	761	1443	1231	2431	2711
	Denominator	881	1662	1433	2872	3277
	Percentage	86.4	86.8	85.9	84.6	82.7

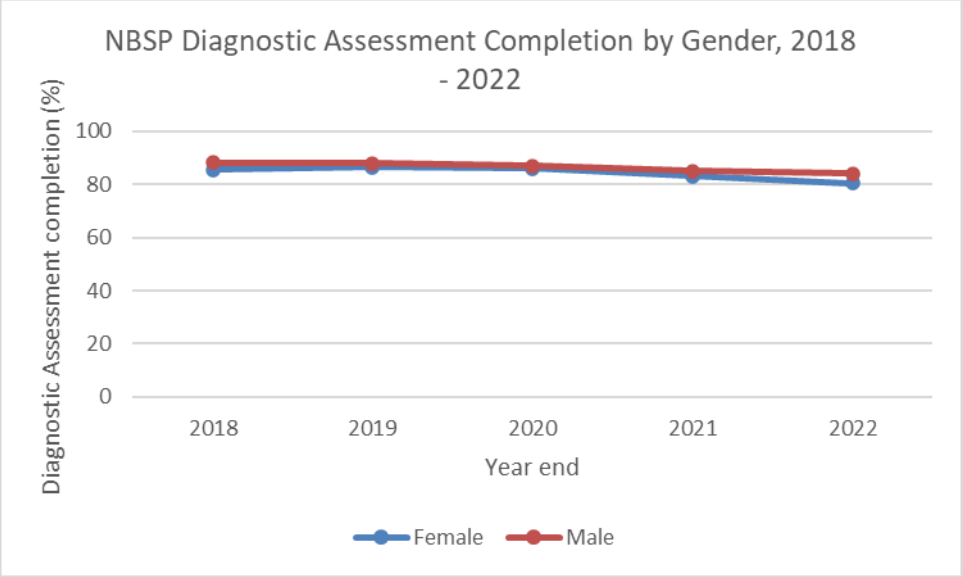


Figure 36: Diagnostic Assessment Completion by Gender, 2018 - 2022

Table 42: NBSP Diagnostic Assessment Completion by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	783	1529	1465	2692	2976
	Denominator	917	1769	1706	3245	3700
	Percentage	85.4	86.4	85.9	83	80.4
Male	Numerator	1161	2347	2120	3958	4450
	Denominator	1318	2670	2438	4659	5295
	Percentage	88.1	87.9	87	85	84

Timeliness of actual diagnostic assessment (colonoscopy wait time) (307)

A programme standard to offer a complete a colonoscopy or CTC within 60 working days of abnormal FIT result exists to reduce unnecessary anxiety to screening participants and to facilitate timely investigation of abnormal FIT results and treatment when needed.

Providing access to diagnostic assessment services in a timely manner depends on many factors including demand for colonoscopy services, capacity and waiting list management protocols.

Indicator 307: Timeliness of Actual Diagnostic Assessment (Colonoscopy Wait Time)

Target: 90% participants returning a positive FIT have their diagnostic procedure within 60 working days of positive of FIT result being recorded in any 24-month reporting period.
Numerator: Number of participants who completed their colonoscopy or CTC within 60 working days of positive FIT result being received into the register.
Denominator: Number of participants who returned a positive FIT during the reporting period for whom their pre-assessment outcome was either a colonoscopy or CTC.
Anchor date: The date when a kit result was recorded in the register determines which time period it is counted under.

Comments

For the total screening population, colonoscopy wait times have been improving since a low point was seen during the pandemic, despite increasing referral numbers to assessment. While services have not been achieving the target for Māori and Pacific participants, wait times have proportionally increased more in the last two years for those groups than for Others. The programme also monitors uptake rates for diagnostic assessment following a public referral; there is no significant difference in completion of a diagnostic procedure The colonoscopy wait time is similar by age and gender (graphs for age and gender not presented).

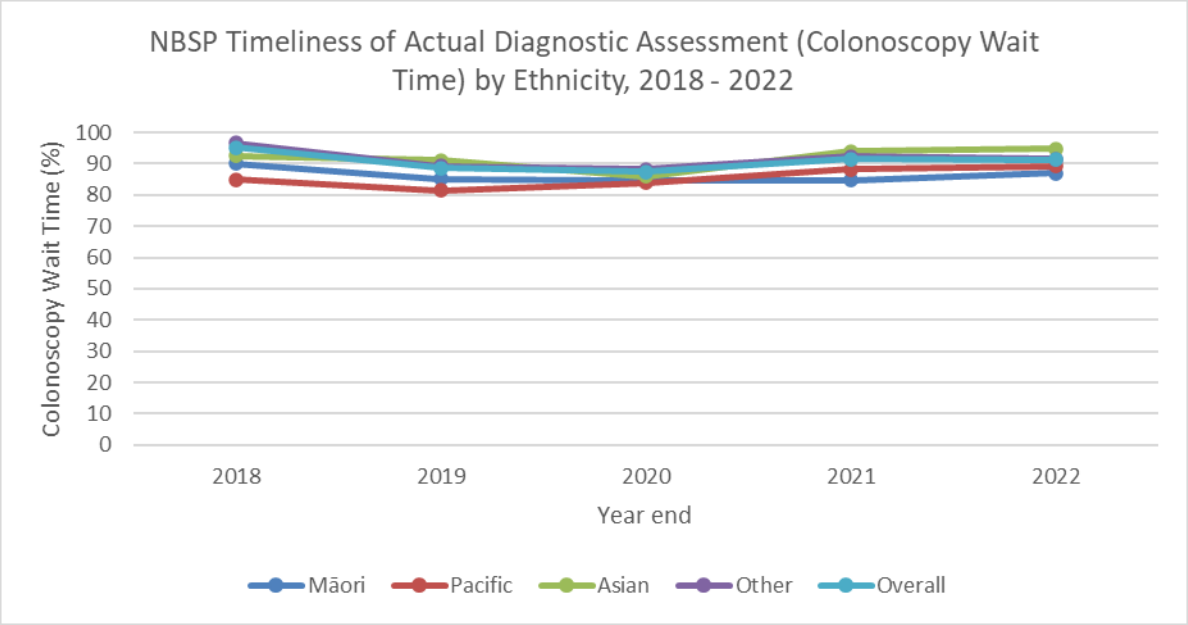


Figure 37: NBSP Timeliness of Actual Diagnostic Assessment (Colonoscopy Wait Time) by Ethnicity, 2018 – 2022

Table 43: NBSP Timeliness of Actual Diagnostic Assessment (Colonoscopy Wait Time) by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	145	340	327	593	773
	Denominator	161	399	386	700	887
	Percentage	90.1	85.2	84.7	84.7	87.1
Pacific	Numerator	62	140	126	247	249
	Denominator	73	172	150	280	279
	Percentage	84.9	81.4	84	88.2	89.2
Asian	Numerator	160	290	251	566	575
	Denominator	173	318	292	602	606
	Percentage	92.5	91.2	86	94	94.9
Other	Numerator	1467	2698	2477	4742	5230
	Denominator	1519	3021	2807	5132	5707
	Percentage	96.6	89.3	88.2	92.4	91.6
Overall	Numerator	1867	3482	3181	6148	6827
	Denominator	1959	3926	3635	6714	7479
	Percentage	95.3	88.7	87.5	91.6	91.3

Table 44: NBSP Timeliness of Actual Diagnostic Assessment (Colonoscopy Wait Time) by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	603	1081	1083	2059	2253
	Denominator	631	1237	1232	2251	2477
	Percentage	95.6	87.4	87.9	91.5	91
65-69	Numerator	528	1088	1011	1855	2068
	Denominator	558	1227	1152	2012	2272
	Percentage	94.6	88.7	87.8	92.2	91
70-74	Numerator	736	1313	1087	2234	2506
	Denominator	770	1462	1251	2451	2730
	Percentage	95.6	89.8	86.9	91.1	91.8

Table 45: NBSP Timeliness of Actual Diagnostic Assessment (Colonoscopy Wait Time) by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	760	1369	1292	2482	2727
	Denominator	789	1551	1483	2721	2992
	Percentage	96.3	88.3	87.1	91.2	91.1
Male	Numerator	1106	2110	1888	3664	4097
	Denominator	1169	2372	2149	3991	4484
	Percentage	94.6	89	87.9	91.8	91.4

Referral rate to diagnostic assessment following positive FIT (308)

This is the percentage of participants with a positive FIT result who are referred for diagnostic assessment. This diagnostic assessment could be either a colonoscopy or CTC and be through either the public or private health system.

This measure helps assess the effectiveness of the programme in targeting people appropriately for screening and the pre-assessment procedures. An effective programme requires that individuals with a positive screening test result complete the appropriate diagnostic follow-up with colonoscopy and/or CTC. Monitoring this measure provides important information to plan strategies to improve messaging relating to eligibility for screening and diagnostic follow-up. Data is stratified to assess equitable access to diagnostic assessment.

Indicator 308: Referral Rate to Diagnostic Assessment Following Positive FIT

Target: No target established.
Numerator: The number of people whose have been referred to a colonoscopy or CT colonography - either public or private.
Denominator: The number of people for whom a positive FIT result was recorded on the register during the calendar year.
Anchor date: The date when a kit result was recorded in the register determines which time period it is counted under.

Comments

After being relatively stable for all groups, the referral rate for Māori, Pacific and Asian participants decreased in 2022. Review of 2023 data shows a favourable increase for Māori participants. The referral rate is similar by age and gender (graphs for age and gender not presented).

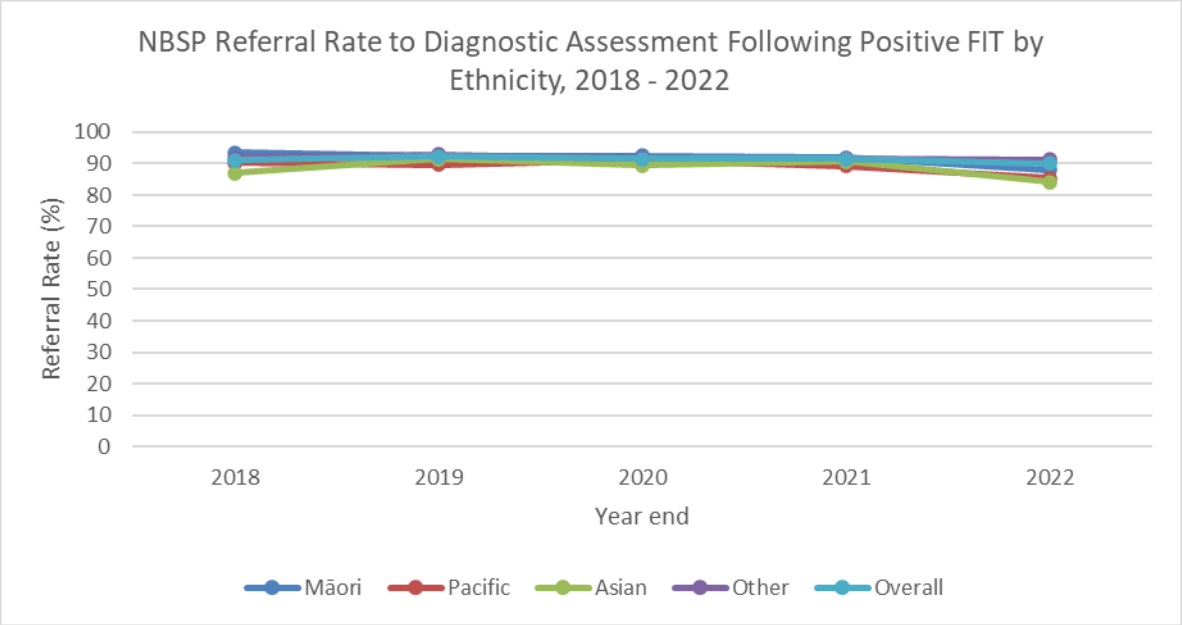


Figure 38: NBSP Referral Rate to Diagnostic Assessment Following Positive FIT by Ethnicity, 2018 – 2022

Table 46: NBSP Referral Rate to Diagnostic Assessment Following Positive FIT by Ethnicity, 2018 – 2022

Ethnicity		2018	2019	2020	2021	2022
Māori	Numerator	162	405	392	711	903
	Denominator	173	439	424	774	1025
	Percentage	93.6	92.3	92.5	91.9	88.1
Pacific	Numerator	74	172	152	283	281
	Denominator	82	192	167	317	329
	Percentage	90.2	89.6	91	89.3	85.4
Asian	Numerator	174	329	296	629	628
	Denominator	200	360	331	694	746
	Percentage	87	91.4	89.4	90.6	84.2
Other	Numerator	1590	3181	2958	5624	6296
	Denominator	1731	3419	3225	6127	6900
	Percentage	91.9	93	91.7	91.8	91.2
Overall	Numerator	2034	4104	3798	7247	8108
	Denominator	2236	4442	4147	7912	9000
	Percentage	91	92.4	91.6	91.6	90.1

Table 47: NBSP Referral Rate to Diagnostic Assessment Following Positive FIT by Age Group, 2018 – 2022

Age Group		2018	2019	2020	2021	2022
60-64	Numerator	658	1303	1291	2472	2704
	Denominator	711	1405	1401	2698	2970
	Percentage	92.5	92.7	92.1	91.6	91.0
65-69	Numerator	583	1277	1199	2164	2462
	Denominator	644	1375	1314	2342	2752
	Percentage	90.5	92.9	91.2	92.4	89.5
70-74	Numerator	793	1524	1308	2611	2942
	Denominator	881	1662	1432	2872	3278
	Percentage	90	91.7	91.3	90.9	89.7

Table 48: NBSP Referral Rate to Diagnostic Assessment Following Positive FIT by Gender, 2018 – 2022

Gender		2018	2019	2020	2021	2022
Female	Numerator	828	1628	1544	2969	3303
	Denominator	917	1769	1706	3247	3700
	Percentage	90.3	92	90.5	91.4	89.3
Male	Numerator	1205	2473	2251	4276	4802
	Denominator	1318	2670	2437	4663	5295
	Percentage	91.4	92.6	92.4	91.7	90.7

Colorectal cancer (CRC) stage at diagnosis (402)

This indicator represents the proportion of people diagnosed with CRC by their cancer stages.

Pathological staging is usually considered to be more accurate because it allows direct examination of the tumour in its entirety, contrasted with clinical staging which is limited by the fact that the information is obtained by making indirect observations of a tumour which is still in the body.

The cancer stage reported by this indicator is the pathological stage. Where surgery has not been performed, the clinical stage is used.

The dataset includes four rectal cancers which have been historically coded as stage 0; these cases may be updated in future reports as additional information is made available. Some rectal cancers are treated with chemotherapy before surgery, and because of the response to treatment, no cancer is found at surgery. These are included in the denominator, but not the numerator.

Data from 2018-2022 have been grouped and reported together as there are a relatively small numbers in some groups and annual trends would be difficult to interpret.

Indicator 402: Colorectal Cancer (CRC) Stage at Diagnosis

Target: Long-term target: At least 20% diagnosed with Stage 1 cancer (anticipated benefit in business case).
Numerator: The number of people diagnosed with Colorectal cancer including Polyp cancer, by cancer stage, in the reporting period.
Denominator: The total number of people diagnosed with Colorectal cancer including Polyp cancer (regardless of their cancer stages) in the reporting period.
Anchor date: The date when a kit was received by the lab determines which time period it is counted under.

Comments

For all groups, the programme is exceeding its target of at least 20% of cancers diagnosed at stage 1. It is a positive achievement for the NBSP that at least 37.4% of bowel cancers are being detected at stage 1. Stage 1 bowel cancer has a much greater chance of being successfully treated compared to later stages and hence a higher survival rate (>90% at

five years). For comparison, the proportion of bowel cancers diagnosed at stage 1 in the Aotearoa New Zealand population before screening was 12% (27% stage 2, 25% stage 3, 24% stage 4, 5% non-metastatic, unable to be further define and 7% unknown stage)[6].

The programme has been working hard to improve the quality and completeness of staging data. Specific attention is being given to addressing completeness for Māori participants where there is a higher proportion of stage data that is not in the register.

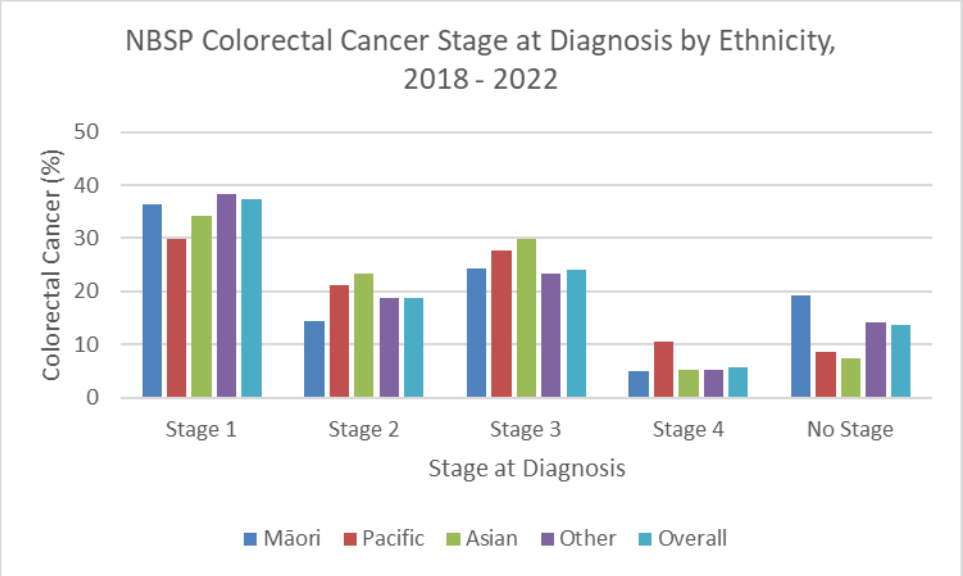


Figure 39: NBSP Colorectal Cancer Stage at Diagnosis, by Ethnicity, 2018 – 2022

Table 49: NBSP Colorectal Cancer Stage at Diagnosis, by Ethnicity, 2018 – 2022

Ethnicity		Stage 1	Stage 2	Stage 3	Stage 4	No Stage
Māori	Numerator	51	20	34	7	27
	Denominator	140	140	140	140	140
	Percentage	36.4	14.3	24.3	5.0	19.3
Pacific	Numerator	14	10	13	5	4
	Denominator	47	47	47	47	47
	Percentage	29.8	21.3	27.7	10.6	8.5
Asian	Numerator	47	32	41	7	10
	Denominator	137	137	137	137	137
	Percentage	34.3	23.4	29.9	5.1	7.3
Other	Numerator	536	263	328	74	197
	Denominator	1400	1400	1400	1400	1400
	Percentage	38.3	18.8	23.4	5.3	14.1
Overall	Numerator	648	325	418	98	238
	Denominator	1731	1731	1731	1731	1731
	Percentage	37.4	18.8	24.1	5.7	13.7

[6] Jackson et al (2015) The PIPER Project; An internal examination of colorectal cancer management in New Zealand Final Report.

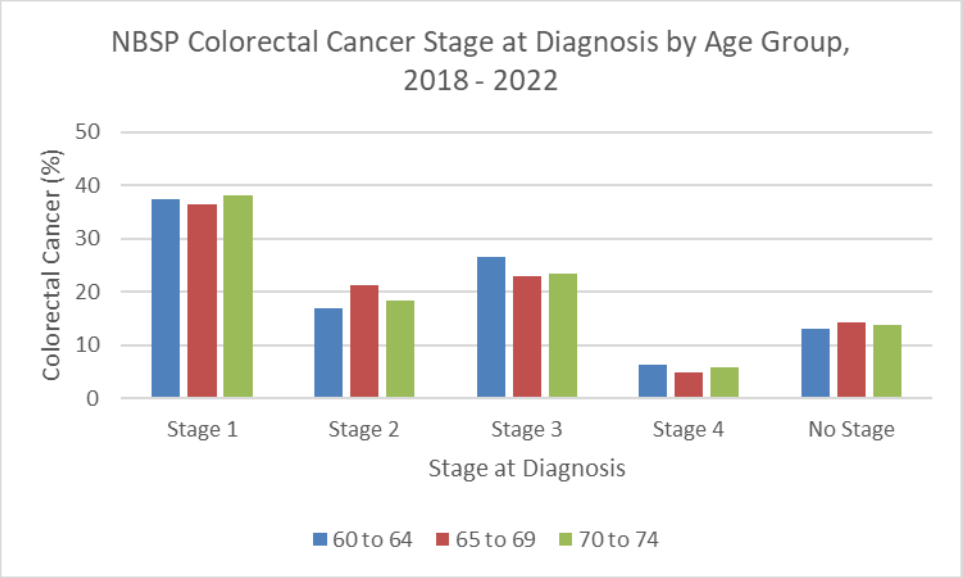


Figure 40: NBSP Colorectal Cancer Stage at Diagnosis by Age Group, 2018 - 2022

Table 50: NBSP Colorectal Cancer Stage at Diagnosis by Age Group, 2018 - 2022

Age Group		Stage 1	Stage 2	Stage 3	Stage 4	No Stage
60-64	Numerator	175	79	125	29	61
	Denominator	469	469	469	469	469
	Percentage	37.3	16.8	26.7	6.2	13.0
65-69	Numerator	193	112	121	26	76
	Denominator	530	530	530	530	530
	Percentage	36.4	21.1	22.8	4.9	14.3
70-74	Numerator	280	134	172	43	101
	Denominator	732	732	732	732	732
	Percentage	38.3	18.3	23.5	5.9	13.8

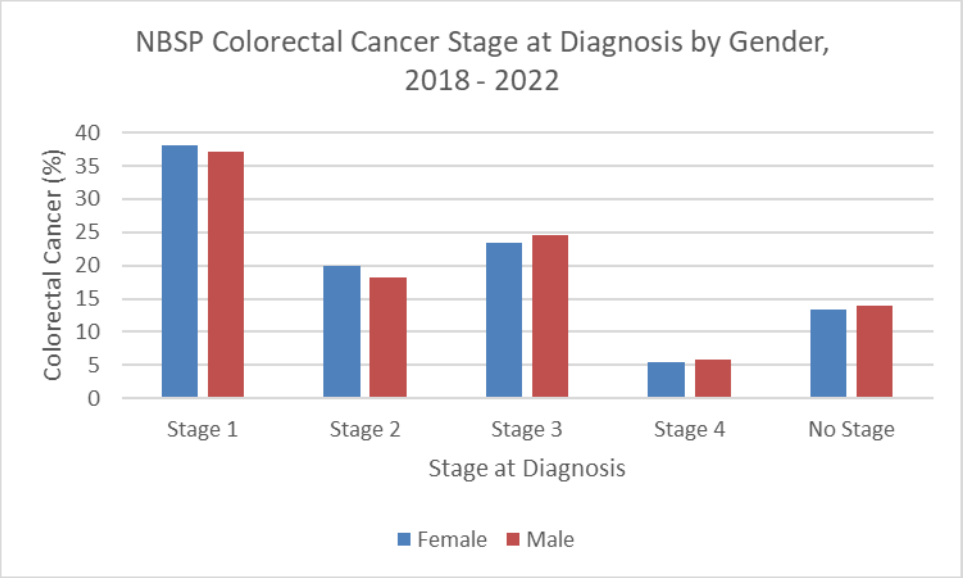


Figure 41: NBSP Colorectal Cancer Stage at Diagnosis by Gender, 2018 - 2022

Table 51: NBSP Colorectal Cancer Stage at Diagnosis by Gender, 2018 - 2022

Gender		Stage 1	Stage 2	Stage 3	Stage 4	No Stage
Female	Numerator	239	125	147	34	84
	Denominator	629	629	629	629	629
	Percentage	38.0	19.9	23.4	5.4	13.4
Male	Numerator	408	199	270	64	154
	Denominator	1099	1099	1099	1099	1099
	Percentage	37.1	18.1	24.6	5.8	14.0

NBSP quality assurance

The NBSP Colonoscopy Quality and Assurance Group meets quarterly and is made up of clinical sector leaders. The NBSP Standards for Performing Bowel Screening Colonoscopy in New Zealand are set by the Endoscopy Guidance Group of New Zealand which is hosted and supported by the NBSP[7].

Comments

All targets are met except family history recording. There are multiple ways to record family history on the electronic colonoscopy reporting system and improving data capture is an ongoing focus. However, family history is always documented at preassessment. Collecting family history is important because it can determine if an individual is at increased risk of bowel cancer which requires monitoring outside of the screening programme.

Data sources: NBSP Datamart and the Provation Colonoscopy Database (PVCD) on 20/02/2023

[7] https://eggnz.endoscopyquality.co.nz/assets/Uploads/EGGNZ-MoH-Endoscopy-Individual-Standards-2021-FINAL3.pdf

National colonoscopist quality assurance report

NBSP Clinical Lead Report

Time period: 01 Jan 2021 to 31 Dec 2022
DHB: National

	Number	Percentage		Target
NBSP scopes performed*	14464			
Scopes with family history completed	11909	82%		≥ 95%
Scopes where caecum reached	13933	96%		≥ 95%
Adenoma detection rate	9195	64%		≥ 55%
Scopes that reached caecum and no tissue collected	2027			
withdrawal >=6min	1928	95%		≥ 90%
Repeat colonoscopies (poor bowel prep)~	559	4%		< 5%

DHB performance against standards

DHB active in period	20	
Share of total national scope volume by DHB	Highest:	13%
	Lowest:	1%

	Number of DHB			
Standard	*Green flag*	*Amber flag*	*Red flag*	*Not applicable*
Family history completed	7	-	13	-
Caecal intubation rate	16	3	1	-
Adenoma detection rate	20	-	-	-
Colonoscope withdrawal time	18	2	-	-

Notes:

Target met

Target met with 95% confidence interval

Target not met

Targets are taken from the National Bowel Screening Programme Interim Quality Standards

* All results in this report are for the first colonoscopy in a participant's episode
Data was provided by BSP+ DHBs up to June 2021, otherwise data is taken from Provation

~ BBPS <6 or any segment value is 0 or 1

Figure 1: Caecal intubation rate (with 95% CI markers)

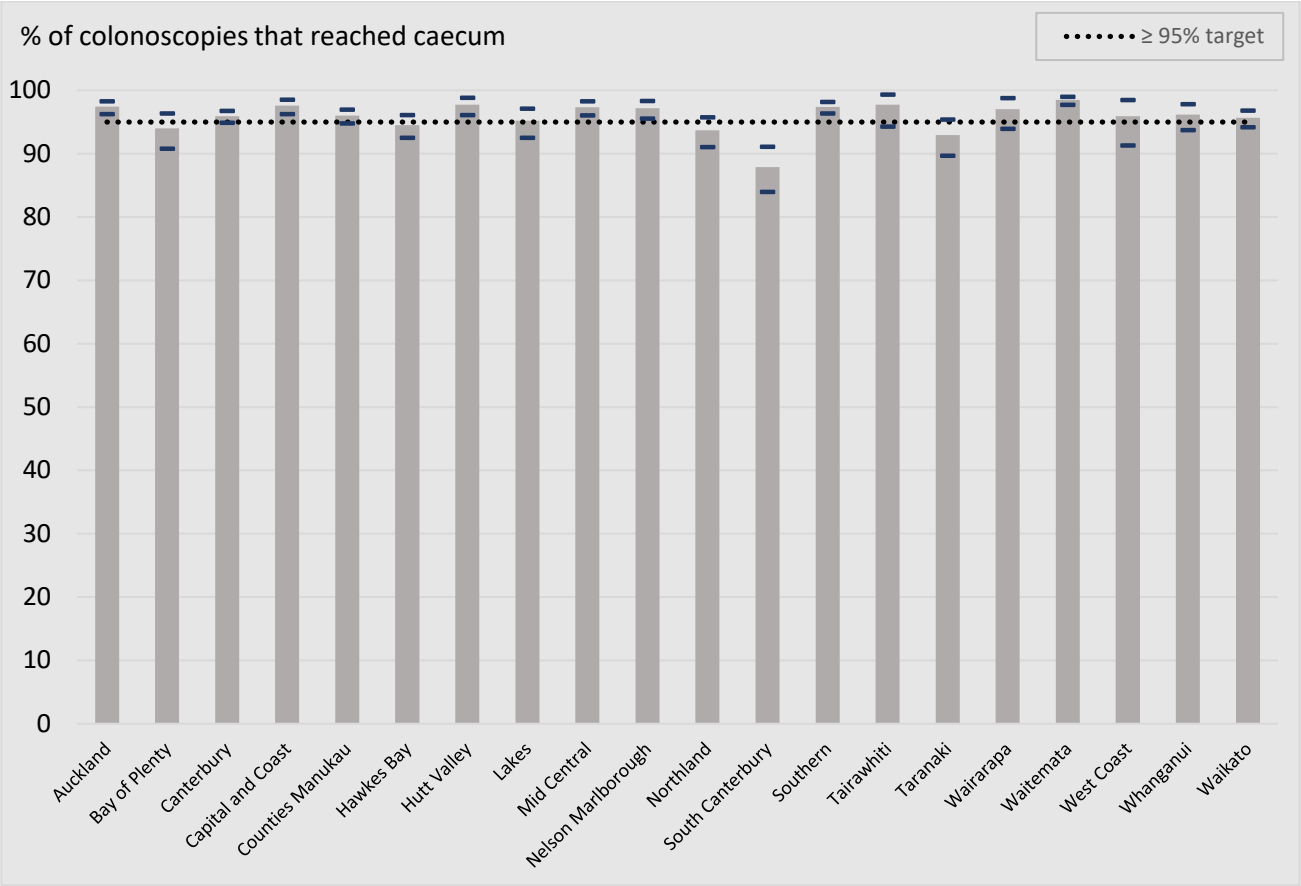


Figure 2: Adenoma detection rate (with 95% CI markers)

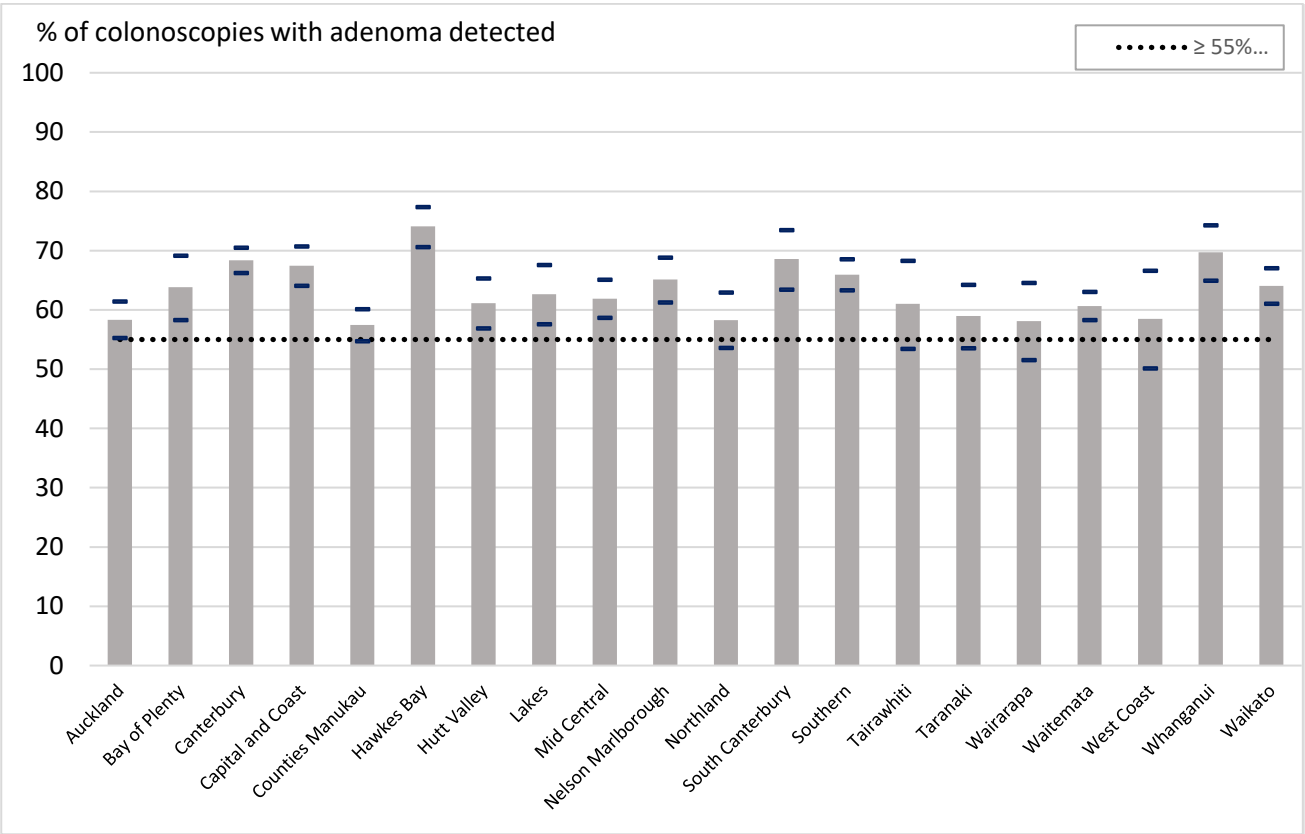
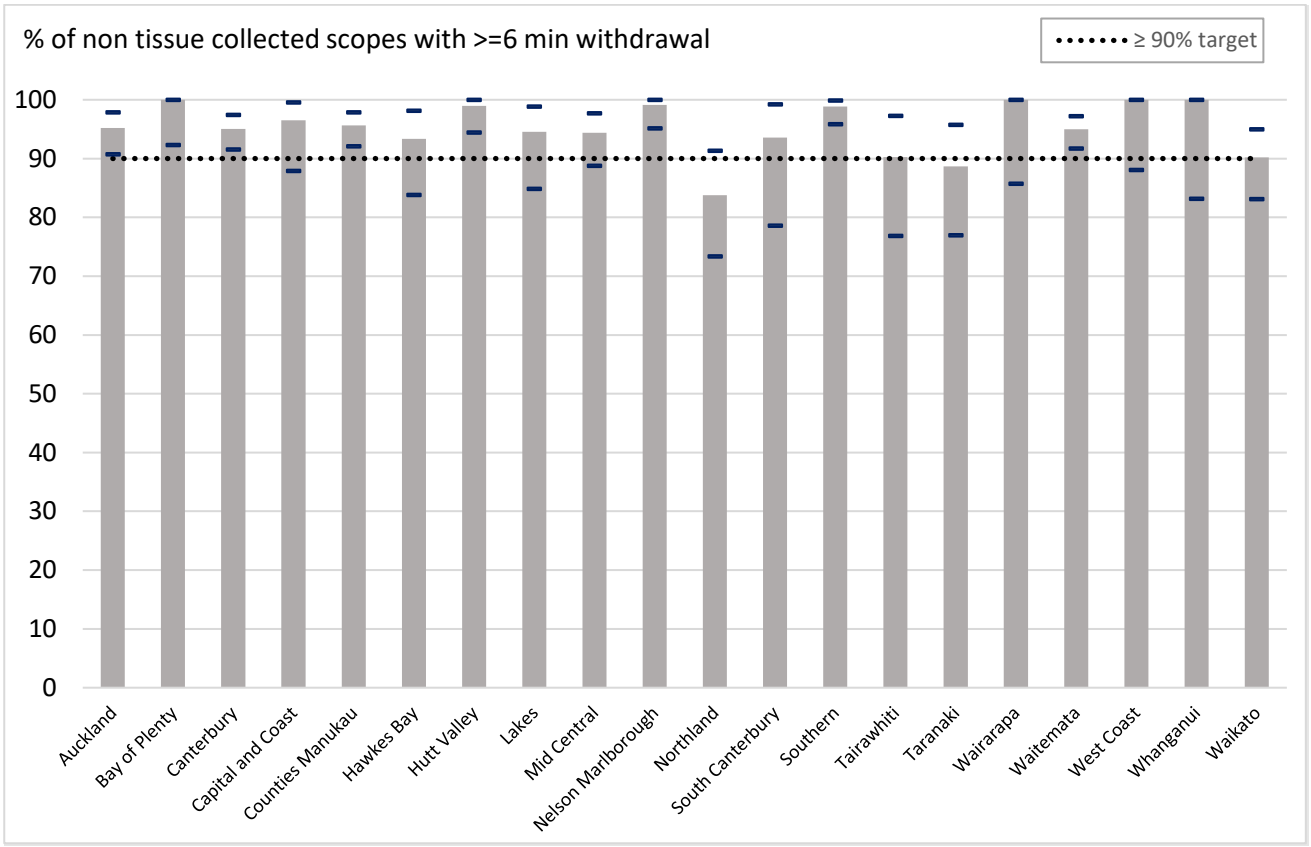


Figure 3: Non tissue collected scopes with >=6 min withdrawal rate (with 95% CI markers)



Unplanned admission rate

Unplanned admissions are reported by districts and have severity of unplanned admission rated by the National Screening Unit using the *UK Key Performance Indicators & Quality Assurance Standards for Colonoscopy*[8].

Unplanned admissions are reported quarterly and have a one quarter reporting lag. Unplanned admission trends and any learning from intermediate and major serious unplanned admissions are discussed at the quarterly Colonoscopy Quality Assurance Group. Potential lessons identified after review of these unplanned admissions are circulated quarterly to the NBSP district clinical leads

Post NBSP colonoscopy interval colorectal cancers are now being reviewed quarterly as another indicator of quality of NBSP colonoscopy - this data will be included in subsequent reports.

Unplanned related admissions for 2-year period ending 31 December 2022

Unplanned admission cause*	Tissue Collected				
	National	Colonoscopies	Target (per 100)	Rate (per 100)	Int & Major rate (per 100)
Perforations	7	12,437	Acceptable <0.2 Desirable <0.1	0.06 NC	0.06 (7) NC
Bleeds	89	12,437	<1	0.7 NC	0.4 (48) NC
Other	33	12,437	N/A	0.3 NC	0.06 (7) ↓
Total	**129**	**12,437**	**N/A**	**1.0 ↓**	**0.5 (62) NC**

*Prioritised Perforation>Bleed>Other

** As categorised by DHB. NBSP Clinical Director verifies this categorisation with the DHB.

Unplanned admission cause*	Non-Tissue Collected		
	National	Colonoscopies	Rate (per 100)
Perforations	0	2,027	0 NC
Bleeds	0	2,027	0 NC
Other	5	2,027	0.2 ↑
Total	**5**	**2,027**	**0.2 ↑**

[8] UK Key Performance Indicators and Quality Assurance Standards for Colonoscopy - The British Society of Gastroenterology (bsg.org.uk)