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The Bowel Screening Pilot:
Results of the First 36 Months

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July 2016

DISCLAIMER

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The Centre for Public Health Research accepts no liability or responsibility for the data or its use.

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Executive Summary

Introduction

A four-year bowel cancer screening pilot (BSP) programme using an immunochemical faecal occult blood test (iFOBT) was carried out from 2012 to 2015 among eligible 50-74 year-olds living in the Waitemata District Health Board (WDHB) area. This report is based on the participation in, and outcomes from, the first 36 months. The results describe the first (or prevalence) screening round and the first 12 months of the second round.

The second screening round has been divided into three categories depending on the screening history of the invited population:

1. Completed Round 1
   People who successfully completed an iFOBT kit in the first round.
   This category is further subdivided into:
   a. Negative iFOBT
      People with a negative iFOBT result in the first round
      This group represents an incidence screening round (ie, they were screened in Round 2 for newly arisen or previously undetected adenomas and colorectal cancer after a negative iFOBT in Round 1).
   b. Positive iFOBT, no colonoscopy
      People with a positive iFOBT result in the first round and no colonoscopy done[1]
2. Did not complete Round 1
   People who did not respond or did not successfully complete an iFOBT kit in the first round
3. Not invited in Round 1
   People who were invited for the first time in the second round (due to being too young or not in the catchment area during the first round)

The results take into account the effects of all demographic factors other than the one under consideration. For example, when considering participation by age group, the results have been adjusted to take account of the potential confounding effects of sex, ethnicity and deprivation (NZDep2013). Unless otherwise stated, all results are statistically significant; in this context, differences labelled "slightly less" or "slightly more" are statistically different but the adjusted odds ratio is either greater than 0.7 times or less than 1.5 times as much as the reference group, respectively.

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[1] Details about this subcategory have been excluded from the Executive Summary given that it comprised only 63 eligible people.

Participation

Immunochemical faecal occult blood test (iFOBT) uptake

Round 1

The participation rate[2] was 56.9% for the first (or prevalence) screening round.

Participation increased with increasing age for both females and males.

Males were slightly less likely to participate than females. This difference decreased with increasing age.

Asians, Māori and Pacific people were all less likely to participate than European/Other people.

Participation declined with increasing deprivation.

These trends by age, sex, ethnicity and deprivation were the same in Round 2 as in Round 1.

Participation in Round 1 was highest among European/Other (63.0%), followed by Asians (53.7%), Māori (46.1%) and Pacific people (30.6%).

Among European/Other participants, males had lower participation than females (61.1% vs 64.7%). In contrast, Māori male participation was higher than Māori females (48.0% vs 44.7%). Participation was similar among Pacific people and Asians between males and females. This pattern persisted in Round 2, except participation of Māori males and females was similar (45.6% and 46.4%, respectively).

Round 2

Participation in Round 2 (51.6%) was lower than in Round 1. Within Round 2, participation varied depending on the screening history of the invited population.

Participation was highest among European/Other (56.6%), followed by Asians (48.8%), Māori (46.0%) and Pacific people (36.7%). The pattern was the same as in Round 1. Although the participation of European/Other and Asians decreased from Round 1, it increased for Pacific people and remained the same for Māori.

Completed Round 1, negative iFOBT

People with a negative iFOBT result in the first round who were invited in Round 2 represent an incidence (as opposed to prevalence) screening round (ie, they are being screened for new or previously undetected disease). Participation among this group was high - 82.5%.

Participation increased with increasing age for both females and males.

Males were slightly less likely to participate than females.

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[2] This is a proportion rather than a rate, which is occurrence per unit time. "Rate" has been used synonymously with "proportion" in this report to improve readability.

Participation was highest among European/Other (83.2%), followed by Māori (81.4%), Asians (78.7%) and Pacific people (78.7%).

Asians were slightly less likely to participate than European/Other.

Participation for all age and ethnic groups for both females and males was above 60%.

Participation among people from the most deprived quintile area (NZDep Index 9-10) was slightly less than among people from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex and Asian ethnicity were similar to those found in Round 1.

Did not complete Round 1

The participation rate of this group of previous non-responders and people who had not successfully completed an iFOBT kit was very low - 23.5%.

Participation increased with increasing age for both females and males.

Unlike Round 1 and other Round 2 categories, there was no difference in participation by sex.

Asians were slightly less likely to participate and Pacific people and Māori were slightly more likely to participate than European/Other. This pattern of participation for Pacific people and Māori differs from Round 1 and other Round 2 categories.

Pacific people aged 50-59 and 60-69 years were slightly more likely to participate than European/Other of the same age.

Compared to European/Other males, Pacific and Māori males were slightly more likely, and Asian males were slightly less likely, to participate.

Participation declined with increasing deprivation.

Trends by age and deprivation were the same as those found in Round 1.

Not invited in Round 1

The majority (62%) of those being invited for the first time in Round 2 became eligible due to ageing into the target population. The participation rate was low - 41.6%. Participation of the 50-54 years age group, comprising 74.2% of this Round 2 category, was 40.5% compared to 46.1% in Round 1.

Overall participation was lower than in Round 1 and lower for every age group for both males and females.

Participation increased with increasing age from 60-64 years.

Males, particularly those aged 50-54 years, were slightly less likely to participate than females.

Participation was highest among European/Other (46.1%), followed by Asians (44.1%), Māori (35.6%) and Pacific people (28.9%).

Pacific people and Māori were less likely to participate than European/Other.

Participation among both Pacific males and females and Asian and Māori females was lower than for their European/Other counterparts.

Among European/Other and Asians aged 50-54 years, both male and female participation were lower than in Round 1. Pacific participation in this age group was higher than in Round 1; this was of marginal statistical significance. Pacific female participation was higher but there was no difference between rounds for Pacific males. There was no difference in participation by sex among Māori.

Participation generally declined with increasing deprivation.

Trends by age, sex, ethnicity and deprivation were similar to those found in Round 1.

The BSP meets the acceptable level set in the European guidelines: having less than 3% of kits not being successfully completed. Round 2 almost reaches the desirable level of less than 1% of kits not being successfully completed (Moss et al 2010).

The BSP meets the acceptable level set in the European guidelines: having a minimum uptake level of 45% for both rounds (Moss et al 2010). However, it does not meet this level for the newly invited group in Round 2.

Colonoscopy uptake

Colonoscopy uptake was 85.7%[3] in Round 1 and 82.3%[4] in Round 2.

Males were more likely to have a colonoscopy than females in both rounds.

Asian males were slightly less likely to have a colonoscopy than European/Other males in Round 1.

Colonoscopy uptake increased with increasing deprivation in Round 1. In Round 2, there was no difference in uptake by deprivation apart from those people from the most deprived quintile area (NZDep Index 9-10). This group was over 2.5 times as likely as people from the least deprived quintile area (NZDep Index 1-2) to have a colonoscopy.

Completed Round 1, negative iFOBT

Colonoscopy uptake was 83.7%.

Males were more likely to have a colonoscopy than females.

Pacific people were almost three times less likely to have a colonoscopy than European/Other participants. Pacific males were six times less likely to have a colonoscopy than European/Other males. Pacific males aged 60-69 years were almost five times less likely to have a colonoscopy than European/Other males of the same age.

Colonoscopy uptake increased with increasing deprivation.

Trends by sex and deprivation were similar to those found in Round 1.

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[3] A further 6.9% (n=361) are recorded as having colonoscopy outside of the BSP.
[4] A further 8.2% (n=154) are recorded as having colonoscopy outside of the BSP.

Did not complete Round 1

Colonoscopy uptake was 79.0%.

There were no differences in colonoscopy uptake by age, sex or ethnicity.

As in Round 1, colonoscopy uptake increased with increasing deprivation.

Not invited in Round 1

Colonoscopy uptake was 82.5%.

There were no differences in colonoscopy uptake by age, sex, ethnicity or deprivation.

The BSP meets the acceptable level set in the European guidelines: having 85% colonoscopy uptake in Round 1, but not in Round 2 (Moss et al 2010). Round 2 uptake was highest among those who had a negative iFOBT in Round 1, followed by the newly invited group.

About one percent of participants with a positive iFOBT had CT colonography[5,6] in both screening rounds.

Outcomes

Figures 7, 11 and 18 summarise the key findings for a) Round 1, b) Round 2, and c) Round 2 in those who completed Round 1 and had a negative iFOBT among those participants who had a positive iFOBT, a completed colonoscopy and histopathology results.

Immunochemical faecal occult blood test (iFOBT) positivity

Round 1

In Round 1, 7.5% of those who successfully completed a kit had a positive iFOBT result.

Positivity increased with increasing age for both males and females.

Males of every age group were more likely to have a positive iFOBT result than females.

Māori and Asians were slightly more likely to have a positive iFOBT result than European/Other participants.

Female Asians, female Pacific and male Māori were slightly more likely to have a positive iFOBT result than their European/Other counterparts.

Positivity was highest among those from the most deprived quintile areas (NZDep Index 7-8 and 9-10).

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[5] CT colonography, sometimes called virtual colonoscopy, is a radiological procedure that uses a CT scanner to visualise the bowel.

[6] Another two participants had private CT colonography.

Round 2

Positivity in Round 2 was 5.8%; this was lower than in Round 1 (7.5%).

Completed Round 1, negative iFOBT

Of the Round 2 participants who had a negative iFOBT result in Round 1 and successfully completed a kit in the second screening round, 5.4% had a positive iFOBT result.

Positivity increased with increasing age from 55-59 years. Both female and male participants aged 70-74 years were almost twice as likely to have a positive iFOBT result as their 50-54 year-old counterparts.

Males were more likely to have a positive iFOBT result than females.

Māori were more likely to have a positive iFOBT result than European/Other participants.

Male Māori were almost twice as likely to have a positive iFOBT result as their European/Other counterparts.

Māori aged 60-69 years were almost twice as likely to have a positive iFOBT result as their European/Other counterparts.

People from the most deprived quintile areas (NZDep Index 7-8 and 9-10) were more likely to have a positive iFOBT result than people from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex, Māori ethnicity and deprivation were similar to those found in Round 1.

Did not complete Round 1

Of the Round 2 participants who did not complete Round 1 but adequately completed a kit in the second screening round, 8.4% had a positive iFOBT result.

Positivity increased with increasing age.

Males were slightly more likely to have a positive iFOBT result than females.

Asian males were almost half as likely to have a positive iFOBT result as European/Other males.

Participants from quintile area NZDep Index 7-8 were more likely to have a positive iFOBT result than those from the least deprived quintile area (NZDep Index 1-2).

Trends by age and sex were the same as those found in Round 1.

Not invited in Round 1

Of the Round 2 participants who were not invited in Round 1 and successfully completed a kit in the second screening round, 5.2% had a positive iFOBT result.

Positivity increased with increasing age.

Males were more likely to have a positive iFOBT result than females.

Males of every age group and females aged 70-74 years were about twice as likely to have a positive iFOBT result as their 50-54 year-old counterparts.

Asian and Pacific females were about twice as likely to have a positive iFOBT result as their European/Other counterparts.

People from the second most deprived quintile area (NZDep Index 7-8) were more likely to have a positive iFOBT result than people from the least deprived quintile area (NZDep Index 1-2).

Trends by age and sex were the same as those found in Round 1.

Positive Predictive Values

Round 1

The positive predictive value (PPV) of a positive iFOBT for adenoma was 51.5%, advanced adenoma was 22.2%, and cancer was 4.1%. That is, 55.6% of people who had a positive iFOBT had an adenoma or cancer detected, and 26.3% had an advanced adenoma or cancer detected.

There were some age, sex and ethnic differences in the effectiveness of a positive iFOBT in detecting adenoma, advanced adenoma and cancer in Round 1 and Round 2, according to the screening history of the participants. Details are given in other sections of the report.

Round 2

The PPV of a positive iFOBT for adenoma was 42.5%, advanced adenoma was 14.7%, and cancer was 2.8%. That is, 45.3% of people who had a positive iFOBT had an adenoma or cancer detected, and 17.5% had an advanced adenoma or cancer detected.

Completed Round 1, negative iFOBT

The PPV of a positive iFOBT for adenoma was 42.3%, advanced adenoma was 13.0%, and cancer was 2.5%. That is, 44.7% of people who had a positive iFOBT had an adenoma or cancer detected, and 15.4% had an advanced adenoma or cancer detected.

Did not complete Round 1

The PPV of a positive iFOBT for adenoma was 43.8%, advanced adenoma was 18.3%, and cancer was 4.2%. That is, 47.9% of people who had a positive iFOBT had an adenoma or cancer detected, and 22.5% had an advanced adenoma or cancer detected.

The PPV for participants from quintile area NZDep Index 7-8 was about three times higher for advanced adenoma than for those from the least deprived quintile area (NZDep Index 1-2).

Not invited in Round 1

The PPV of a positive iFOBT for adenoma was 41.9%, advanced adenoma was 15.6%, and cancer was 2.4%. That is, 44.4% of people who had a positive iFOBT had an adenoma or cancer detected, and 18.0% had an advanced adenoma or cancer detected.

The PPV for the 50-54 years age group (comprising 74.2 % of those who successfully completed an iFOBT in this round) was 40.0% for adenoma, 20.0% for advanced adenoma and 1.5% for cancer. The PPVs for the same age group in Round 1 were 43.0%, 17.5% and 2.3%, respectively.

Detection rates of adenoma, advanced adenoma and colorectal cancer

Some of the participants with adenoma, advanced adenoma or cancer would have had more than one type of pathology; only the most serious type was recorded.

Round 1

The overall detection rate per 1,000 screened for adenoma was 38.8, advanced adenoma was 16.7 and cancer was 3.1.

Detection rates increased with increasing age reflecting the natural history of adenomas and colorectal cancer.

Compared to 50-54 year-old participants, detection of a colorectal cancer was more frequent for each age group except 55-59 year-olds. Adenoma and advanced adenoma were detected more frequently with increasing age.

The 70-74 year-old participants were more likely to have an adenoma, advanced adenoma or cancer detected than 50-54 year-old participants.

Males were more likely to have an adenoma, advanced adenoma or cancer detected than females. The difference between males and females existed at every age group for adenoma and advanced adenoma, and in the 65-69 years age group for cancer.

The difference between males and females for adenoma and advanced adenoma decreased with increasing age.

Asians were about 1.5 times less likely than European/Other to have an advanced adenoma detected. The difference was similar for each age group.

Asian males were less likely to have an adenoma or advanced adenoma detected than European/Other males.

Pacific people were less likely than European/Other to have an adenoma or advanced adenoma detected.

Pacific males were over 1.5 times less likely to have an adenoma detected than European/Other males.

Māori were slightly more likely to have an adenoma detected than European/Other.

Māori aged 60-69 years were 1.5 times more likely to have an adenoma detected than European/Other of the same age.

Detection rates were highest among those from the most deprived quintile areas (NZDep 7-8 and 9-10).

Round 2

The overall detection rate of adenoma was 24.8 per 1,000, advanced adenoma was 8.6 per 1,000, and cancer was 1.6 per 1,000.

Completed Round 1, negative iFOBT

The overall detection rate per 1,000 screened for adenoma was 22.9, advanced adenoma was 7.0 and cancer was 1.3.

Adenoma detection rates increased with increasing age.

Males were more likely to have an adenoma or advanced adenoma detected than females. The difference between males and females for adenoma generally decreased with increasing age.

Females aged 70-74 years were more likely to have an adenoma or advanced adenoma detected than 50-54 year-old females.

Males aged 70-74 years were more likely to have an adenoma detected than 50-54 year-old males.

Māori were more likely to have an adenoma detected than European/Other participants.

Māori males were twice as likely to have an adenoma detected as European/Other males.

Pacific people aged 70-74 years and Māori aged 50-59 years were more likely to have an adenoma detected than European/Other of the same ages.

Whilst participants from the most deprived quintile area (NZDep 9-10) were more likely to have an adenoma or advanced adenoma detected than participants from the least deprived quintile area (NZDep Index 1-2), detection of both was similarly increased for NZDep 3-4 participants.

Trends by age, sex and Māori ethnicity for adenoma were similar to those found in Round 1.

Did not complete Round 1

The overall detection rate per 1,000 screened for adenoma was 36.7, advanced adenoma was 15.4 and cancer was 3.5.

Participants aged 70-74 years were more likely to have an adenoma or cancer detected than those aged 50-54 years.

Males were more likely to have an adenoma or advanced adenoma detected than females.

Males aged 55-59 years were more likely to have an advanced adenoma detected than females of the same age.

Asians were less likely to have an adenoma detected than European/Other.

Māori males were more likely to have an adenoma detected than European/Other males.

Asian and Pacific participants were less likely to have an advanced adenoma detected than European/Other participants.

Participants from quintile area NZDep Index 7-8 were more likely to have an adenoma or advanced adenoma detected than those from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex, Asian and Māori ethnicity for adenoma were similar to those found in Round 1.

Not invited in Round 1

The overall detection rate per 1,000 screened for adenoma was 21.9, advanced adenoma was 8.1 and cancer was 1.3.

Adenoma detection rates increased with increasing age from 60-64 years.

Participants aged 70-74 years were more likely to have an adenoma or cancer detected than 50-54 year-old participants.

Males were more likely to have an adenoma or advanced adenoma detected than females.

Males in every age group were more likely to have an adenoma detected than their 50-54 year-old counterparts.

Māori aged 60-69 years were more likely to have an adenoma detected than their European/Other counterparts. This was also found in Round 1.

Trends by age and sex were similar to those found in Round 1.

The BSP detection rate in Round 1 for adenoma (3.9%) is above the range (1.33-2.23%), and for cancer (0.3%) is towards the lower end of the range (0.18-0.95%) reported in the first screening round of population-based programmes that use the iFOBT (Moss et al 2010).

The BSP markedly exceeds the UK minimum standard and target: having an adenoma detected in at least six and seven participants, respectively, per 1,000 screened by faecal occult blood test (Chilton and Rutter 2011). This is not surprising as the UK programme uses the guaiac FOBT which is less sensitive than the iFOBT.

The BSP meets the UK target of having cancer detected in at least two participants per 1,000 screened (Chilton and Rutter 2011).

Colorectal cancer

Round 1

Two hundred and twelve participants had cancer detected (3.1 per 1,000 screened; 174.4 per 100,000 invited) - 178 were European/Other, 25 were Asian, five were Pacific people and four were Māori.

Colorectal cancer increased with increasing age.

Males were more likely to have cancer than females.

Males aged 60-64, 65-69 and 70-74 years were more likely to have cancer than 50-54 year-old males.

Females aged 65-69 and 70-74 years were more likely to have cancer than 50-54 year-old females.

The extent of spread of a cancer is known as its stage. There are various staging systems and the BSP has adopted Tumour/Node/Metastasis (TNM) staging. The staging ranges from Stage 1, the least advanced, to Stage 4, the most advanced.

Most cancers were Stage I (74.0 per 100,000 invited), followed by Stage II (40.3 per 100,000 invited), Stage III (36.2 per 100,000 invited) and Stage IV (14.0 per 100,000 invited).

About 42% (n=90) of those participants with cancer detected had Stage I (ie, confined to the bowel inner lining or muscle wall) and eight percent (n=17) had Stage IV (ie, spread to a distant part of the body).

Twelve (5.7%) cancers were not staged.

Round 2

There were 53 cancers detected in the first year of Round 2.

Completed Round 1, negative iFOBT

Twenty-seven participants had cancer detected (1.3 per 1,000 screened; 110.1 per 100,000 invited) - 24 were European/Other, one was Asian and two were Māori.

Nine cancers were Stage I (36.7 per 100,000 invited), three were Stage II (12.2 per 100,000 invited), nine were Stage III (36.7 per 100,000 invited), and one was Stage IV (4.1 per 100,000 invited).

Five (18.5%) cancers were not staged.

Did not complete Round 1

Seventeen participants had cancer detected (3.5 per 1,000 screened; 81.9 per 100,000 invited). This is similar to the cancer detection rate found for Round 1 (3.1 per 1,000 screened). Nine were European/Other, two were Asian, two were Māori and three were Pacific people.[7]

There were five Stage I and five Stage II cancers (24.1 per 100,000 invited), followed by four Stage III cancers (19.3 per 100,000 invited) and one Stage IV cancer (4.8 per 100,000 invited).

Not invited in Round 1

Nine participants had cancer detected (1.3 per 1,000 screened; 52.4 per 100,000 invited) - six were European/Other and three were Asian.

Five of the nine cancers were detected in the 50-59 years age group.

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[7] Ethnicity was unknown for one participant.

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There were six Stage I (34.9 per 100,000 invited), one Stage II (5.8 per 100,000 invited) and two Stage IV cancers (11.6 per 100,000 invited).

Colonoscopy completion

Colonoscopy was incomplete[8] in less than one percent of cases in both rounds.[9]

Adverse events

About one percent of colonoscopies in both rounds resulted in readmission, comprising 49 in Round 1 and 15 in the first year of Round 2. Ninety-two percent of readmissions occurred in participants whose colonoscopy included tissue removal.[10]

In Round 1, the most common cause for readmission was bleeding. The bleeding rate was 7.9 per 1,000 colonoscopies with tissue removal (6.0 per 1,000 total completed colonoscopies).

The perforation rate was 1.2 per 1,000 colonoscopies with tissue removal and 0.9 per 1,000 colonoscopies without tissue removal (1.1 per 1,000 total completed colonoscopies).

The rate for all other complications was 3.8 per 1,000 total completed colonoscopies.

In Round 2, the most common causes for readmission were reasons other than perforation or bleeding. The rate for all other complications was 5.2 per 1,000 total completed colonoscopies.

The bleeding rate was 5.3 per 1,000 colonoscopies with tissue removal (3.9 per 1,000 total completed colonoscopies).

The perforation rate was 0.9 per 1,000 colonoscopies with tissue removal (0.6 per 1,000 total completed colonoscopies).

There was no significant difference between the bleeding and perforation rates from colonoscopies with tissue removal between the two rounds.

Different definitions for adverse events, particularly for bleeding and follow up periods, make direct comparisons with other reported data difficult.

Although the BSP slightly exceeded the UK standard for perforation (less than one in 1,000 colonoscopies) in Round 1, it met the UK standard for perforation of less than one in 500 colonoscopies involving polypectomy. Both standards were met in Round 2. The BSP also met the UK standard of having bleeding in less than one in 100 colonoscopies involving polypectomy (Chilton and Rutter 2011).

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[8] Incomplete colonoscopy refers to a colonoscopy that does not evaluate the entire colon. Reasons include poor bowel preparation and the individual's general health status.
[9] It is possible that the BSP Register has not completely captured these data.
[10] Tissue removal refers to biopsy and polypectomy.

Conclusion

The results provide information for predicting participation in prevalence and incidence rounds of a national bowel cancer screening programme and for targeting resources to increase iFOBT uptake where it is low.

The Ministry of Health's uptake target was 60% by the end of the four-year BSP. The target was met in Round 1 for European/Other females over 55 years and European/Other males over 60 years, Asian females and males aged 70-74 years, and Māori females aged 70-74 years and Māori males over 65 years. Participation for all age and ethnic groups for both females and males was above 60% among those who completed incidence screening in Round 2.

Participation was highest among European/Other, followed by Asians, Māori and Pacific people. The pattern was the same in both rounds. Although Pacific participation was significantly higher in Round 2, the participation of European/Other and Asians significantly decreased in Round 2. For Māori, it was similar in both rounds.

Participation in Round 2 was statistically significantly lower than in Round 1. Within Round 2 participation varied depending on the screening history of the invited population. Those who had previously participated had a high level of participation in marked contrast to those who had previously not responded or not successfully completed the test kit (82.4% vs 23.5%).

Of concern is the statistically significant decrease in first time participation, from the first round to the second. This highlights the challenge of maintaining a satisfactory level of iFOBT uptake over time.

Excluding the group who participated in incidence screening, the low uptake groups were the same in both rounds: younger age groups, males, the more deprived, Māori and Pacific people.

Overall, males participated slightly less than females. The statistically significantly lower participation of Māori females compared to Māori males in Round 1, and the absence of a sex difference in participation in both rounds for Asians and Pacific people, and Māori in Round 2, were all unexpected. Females are generally better informed than males about the benefits of screening as they are targeted by the national cervical and breast cancer screening programmes.

Males were more likely to have an adenoma, advanced adenoma or cancer detected than females in Round 1. They were also more likely to have an adenoma or advanced adenoma detected in incidence screening than females.

Irrespective of age, sex or ethnicity, adenoma, advanced adenoma and cancer increased with increasing deprivation in Round 1 and in one or both of the two most deprived quintile areas in Round 2.

Positivity, PPVs and detection rates for adenoma and colorectal cancer were all lower in Round 2 than in Round 1. This is not unexpected as 62.8% of participants who successfully completed an iFOBT kit in Round 2 had been previously screened.

The detection rates and PPVs in the Round 2 group who did not complete Round 1 are similar to those in Round 1, highlighting the importance of continuing to invite non-responders and those who do not successfully complete a test kit.

Controlling for age, sex and deprivation, there is evidence that Māori have more neoplasia[11] than European/Other participants. Māori were more likely to have a positive iFOBT result and adenoma detected than European/Other in both prevalence and incidence screening rounds. Māori aged 60-69 years were more likely to have an adenoma detected in prevalence screening[12] than their European/Other counterparts, irrespective of sex and deprivation.

The stage distribution of screen-detected cancers is an important indicator of a screening programme's performance. In incidence screening, the proportion in Stage I is expected to rise and to fall in Stage IV, as cancer is detected earlier. For the first year of Round 2, the number of incident cancers was small and there was no clear decreasing pattern as a third of cancers were Stage III. However, not all cancers were staged.[13]

Non-completion of colonoscopy and post-colonoscopy readmissions were low as was CT colonography uptake as an alternative to colonoscopy.

The occurrence of interval cancers[14] gives an estimate of the iFOBT's sensitivity[15] in the first round. Sensitivity was not estimated as data were available only for the first year of Round 2. It is recommended that sensitivity and specificity[16] are estimated after at least six months has passed since the end of Round 2 invitations.

If a national bowel cancer screening programme is implemented it will be important to closely monitor uptake (particularly in the low uptake groups), positivity, PPVs and detection rates, and adverse events. In the short term, staging distribution of screen-detected cancers can be used to monitor effectiveness until sufficient data exist to evaluate the programme's impact on colorectal cancer incidence and mortality.

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[11] Neoplasia refers to adenomas (including advanced adenomas) and colorectal cancer.

[12] Round 1 and the Round 2 group who were not invited in Round 1.

[13] Five cancers were not staged. However, in one instance there may have been insufficient time by the date of data extraction from the Register for surgery and staging to have occurred.

[14] Interval cancers are cancers that occur between the first and second round of screening among people with a negative iFOBT, or positive iFOBT and normal colonoscopy, in the first round.

[15] Sensitivity is the ability of a test to correctly identify those with disease. A test with high sensitivity will rarely miss those with disease (ie, have a false negative result).

[16] Specificity is the ability of a test to correctly identify those without disease.

Introduction

Although colorectal cancer incidence and mortality in New Zealand are declining in both males and females, incidence and mortality are high by international standards (National Cancer Institute 2013; Arnold et al 2016). In 2012, colorectal cancer was the third most common cancer registered and the second most common cause of death from cancer (Ministry of Health 2015a). In 2013, the age-standardised registration rate was 43.1 per 100,000; 34.3 per 100,000 for Māori and 43.8 per 100,000 for non-Māori (Ministry of Health 2015b). Although the age-standardised registration rate (which is generally a robust measure of incidence) is less for Māori than non-Māori, differences in stage at diagnosis and survival have been reported (Robson et al 2006). Early detection and removal of colorectal cancer or its precursor lesion, adenoma, by population screening can reduce colorectal cancer mortality (Lansdorp-Vogelaar and von Karsa 2010).

The Ministry of Health (the Ministry) funded Waitemata District Health Board (WDHB) to run a bowel cancer screening pilot (BSP) programme over four years from 2012–15. The BSP began with a 'soft launch' in late 2011, with full operation starting from 1 January 2012.

The BSP offers eligible people, aged between 50-74 years living in the WDHB area, colorectal cancer screening by a single sample immunochemical faecal occult blood test (iFOBT[17]) with colonoscopy as the follow-up diagnostic test among those whose screening test was positive. Colonoscopy with polypectomy also provides a therapeutic intervention that can prevent colorectal cancer.

Epidemiological analysis of data from the first 36 months was carried out to inform the evaluation of the BSP by Litmus. The evaluation will contribute to decision-making about a national bowel screening programme.

Methods

The scope of the epidemiological analysis was approved by the Ministry. It was based on the evaluation of the English bowel cancer screening pilot (Weller et al 2006).

The data were extracted by the Ministry from the BSP Register.

The results represent the first (or prevalence) screening round and the first 12 months of the second round. The first screening round commenced on 1 January 2012 and was completed on 31 December 2013. The second screening round commenced on 1 January 2014 and was completed on 31 December 2015. The full second screening round could not be analysed due to the timing of data extraction[18] and the need to allow sufficient time to pass for those people who were invited to complete the full screening pathway. Restricting the analysis to the first year of Round 2 allowed participants invited at the end of that year over eight months to complete the pathway. The first round interim analysis found 88% of participants completed the process in about six months (Read et al 2014).

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[17] The iFOBT has a cut-off level of 75 ng haemoglobin/ml.

[18] Data were extracted from the BSP Register in September 2015.

The timing of data extraction, prior to the completion of Round 2, meant that the sensitivity of the iFOBT could not reliably be calculated; so this has been excluded from the analysis.

Figure A1 of the Appendix shows the possible pathway process of a participant in the BSP.

For details of the methodology, including definitions, and results, see the Appendix.

Logistic regression has been used to investigate associations between demographic variables and screening outcomes. The results are given in the Appendix as odds ratios, both unadjusted and adjusted for all other demographic variables, with 95% confidence intervals.

Key findings are presented and only counts and percentages, together with the adjusted odds ratios, are discussed. Adjusted odds ratios allow for the effects of all demographic variables other than the one under consideration to be assessed. For example, when considering participation by age group, the results have been adjusted to take account of the potential confounding effects of sex, ethnicity and deprivation (NZDep2013).

Chi-square statistics were calculated to test for any statistically significant differences between and within the rounds.

Unless otherwise stated, the results discussed here are statistically significant;[19] in this context, differences labelled "slightly less" or 'slightly more' are statistically different but the adjusted odds ratio is either greater than 0.7 times or less than 1.5 times as much as the reference group, respectively.

Results for the two rounds are presented separately.

Results in the second round are compared with the first round. Where relevant, results for both rounds, are also compared with those reported in the pilot population-based screening programme in England (Alexander and Weller 2003; Weller et al 2006, 2007), the *European guidelines for quality assurance in colorectal cancer screening and diagnosis* (European guidelines) (Segnan et al 2010) and the UK *Quality assurance guidelines for colonoscopy* (UK guidelines) (Chilton and Rutter 2011).

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[19] The result is deemed to be statistically significant if the 95% confidence interval of the odds ratio does not include 1.

Round 1

Participation

Immunochemical faecal occult blood test (iFOBT) uptake

During the first (or prevalence) screening round, 121,567 eligible people aged 50-74 years living in the WDHB area were invited to participate. This is the denominator population used in the analysis of this section. For all demographic information about the eligible population see the Appendix, Table 1. Details of the exclusion criteria applied to determine the eligible population are also found in the Appendix.

Fifty-eight percent (n=70,685) of those who received an invitation responded by returning a kit. A large majority (n=69,229) returned a successfully completed kit resulting in a participation rate of 56.9%.

The European guidelines regard less than 3% unsuccessfully completed kits as acceptable and less than 1% as desirable (Moss et al 2010). The BSP met the acceptable level.

For all results see the Appendix, Table 2.

Participation increased with increasing age

People aged 70-74 years were almost four times as likely to participate as people aged 50-54 years. Those aged 65-69 years were more than twice as likely to participate as the youngest age group (Figure 1). This pattern was similar for males and females.

Participation differed by sex and ethnicity

Males were slightly less likely to participate than females (Figure 2). This difference decreased with increasing age.

Participation was highest among European/Other[20] (63.0%), followed by Asians (53.7%), Māori (46.1%) and Pacific people (30.6%).

Asians were slightly less likely to participate than European/Other (Figures 3 and 12). Participation was close to that of European/Other for those aged 50-59 years but Asians aged 70-74 years were about half as likely to participate as European/Other of the same age.

Pacific people were about three times less likely to participate than European/Other (Figures 3 and 12). Participation decreased with increasing age. In the 70-74 years age group, Pacific people were about six times less likely to participate than European/Other of the same age.

Pacific females were about 3.5 times less likely to participate than European/Other females whereas Pacific males were almost three times less likely to participate than European/Other males.

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[20] Of the 55,595 participants, 54,861 were European and 734 were Other.

Māori were over 1.5 times less likely to participate than European/Other (Figures 3 and 12). This difference was similar for each age group.

Māori females were almost half as likely to participate as European/Other females whereas Māori males were slightly less likely to participate than European/Other males.

Among European/Other participants, male participation was slightly lower than female participation.[21] Male participation was slightly more than female for Māori.[22] Participation among males and females was similar for Pacific people[23] and Asians.[24]

Figures 4 and 5 show participation of females and males, respectively, for each age and ethnic group. The Ministry's 60% participation target was met for European/Other females over 55 years and European/Other males over 60 years, Asian females and males aged 70-74 years, and Māori females aged 70-74 years and Māori males over 65 years.

Participation declined with increasing deprivation

Participation among people from the most deprived quintile area (NZDep Index 9-10) was 1.5 times less likely than people from the least deprived quintile area (NZDep Index 1-2) (Figure 6).

Discussion

The success of screening depends on participation. The overall participation rate of the BSP was 56.9%. This is below the target of 60% by the end of the BSP, which the Ministry set at the programme's outset, and below that reported in England of 58.5% (Weller et al 2006). Participation in the English pilot may have been even higher if the older age group (70-74 years) had been included and/or the iFOBT rather than the guaiac faecal occult blood test had been used.[25]

The European guidelines set a minimum uptake level of 45% as acceptable and recommend at least 65% as desirable (Moss et al 2010). The BSP meets the acceptable level.

Lower participation among younger age groups, males and those from more deprived areas was also found in the UK pilot (Alexander and Weller 2003).

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[21] 61.1% vs 64.7%; OR=0.86 (95%CI 0.83-0.88)

[22] 48.0% vs 44.7%; OR=1.14 (95% CI 1.03-1.27)

[23] 31.3% vs 29.9%

[24] 53.1% vs 54.2%

[25] Participation has been found to be higher when the iFOBT is used rather than the guaiac faecal occult blood test (Hol et al 2009).

Figure 1: Participation, iFOBT positivity, and colorectal cancer by age, Round 1
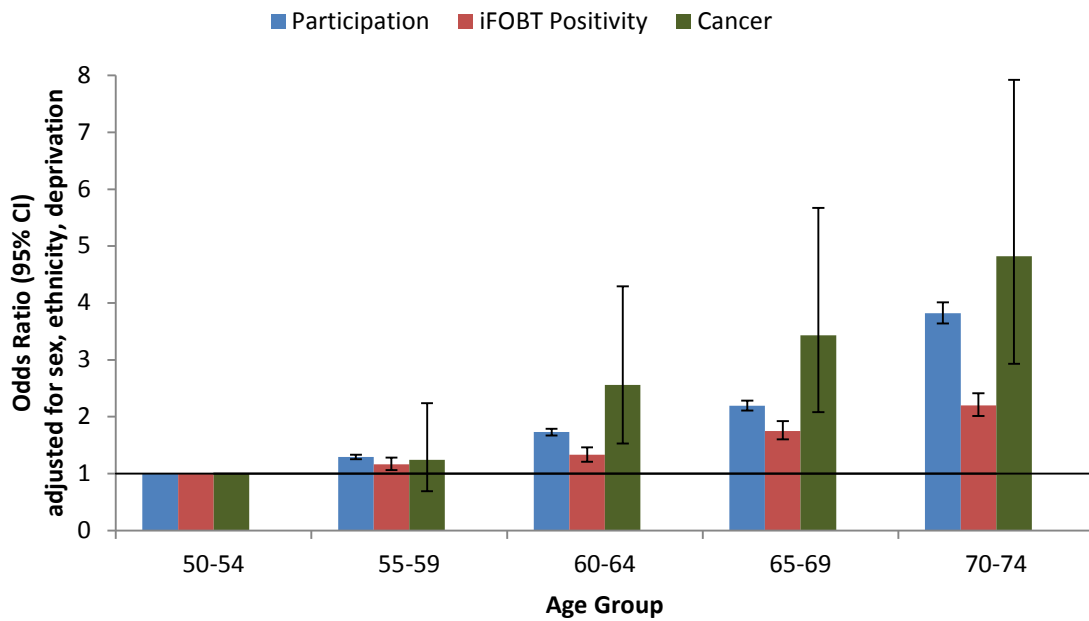
Source: BSP Register

Figure 2: Participation, iFOBT positivity, and colorectal cancer by sex, Round 1
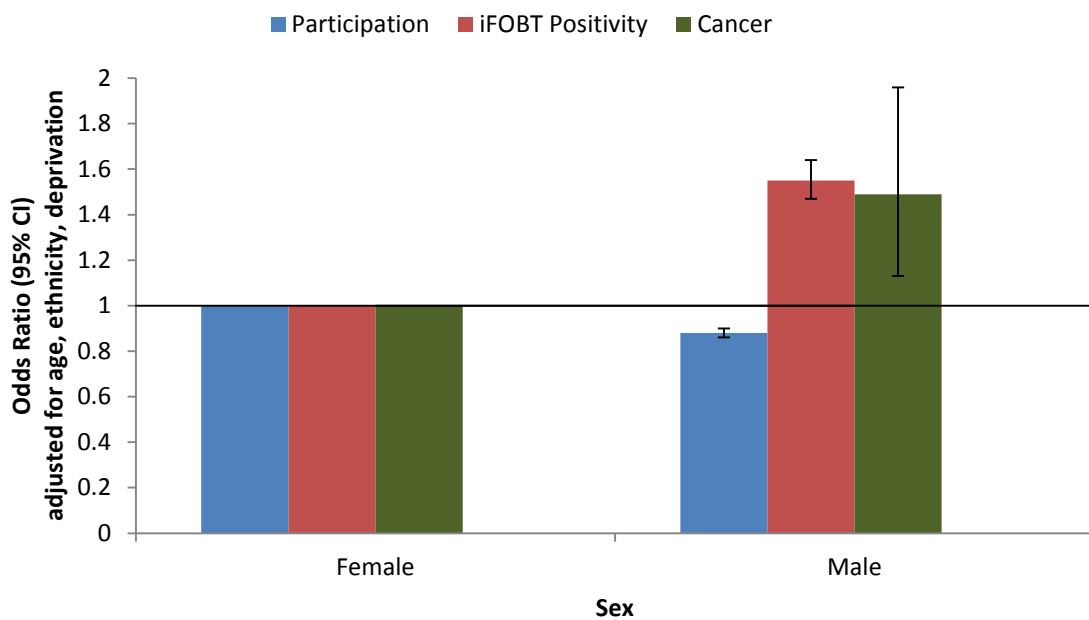
Source: BSP Register

Figure 3: Participation and iFOBT positivity by ethnicity, Round 1
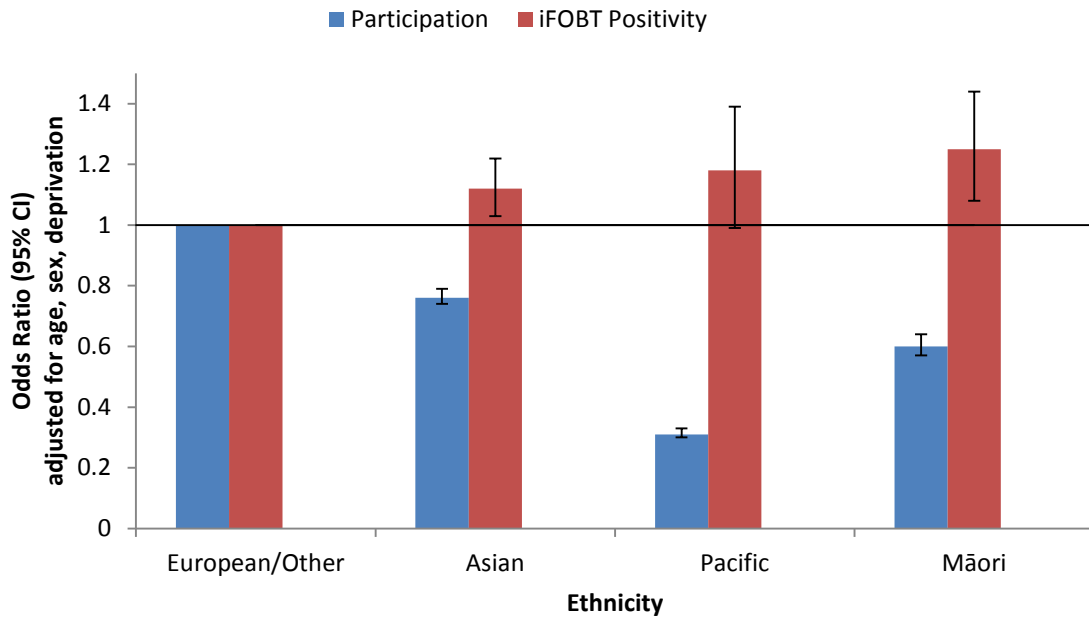
Source: BSP Register

Figure 4: Female participation by age and ethnicity, Round 1
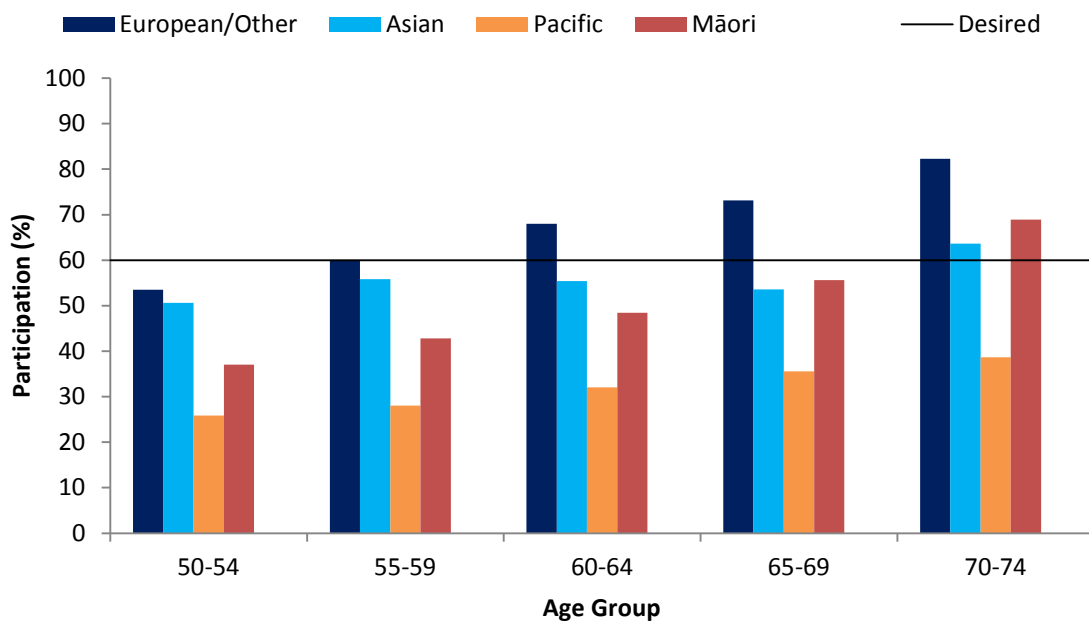
Source: BSP Register

Figure 5: Male participation by age and ethnicity, Round 1
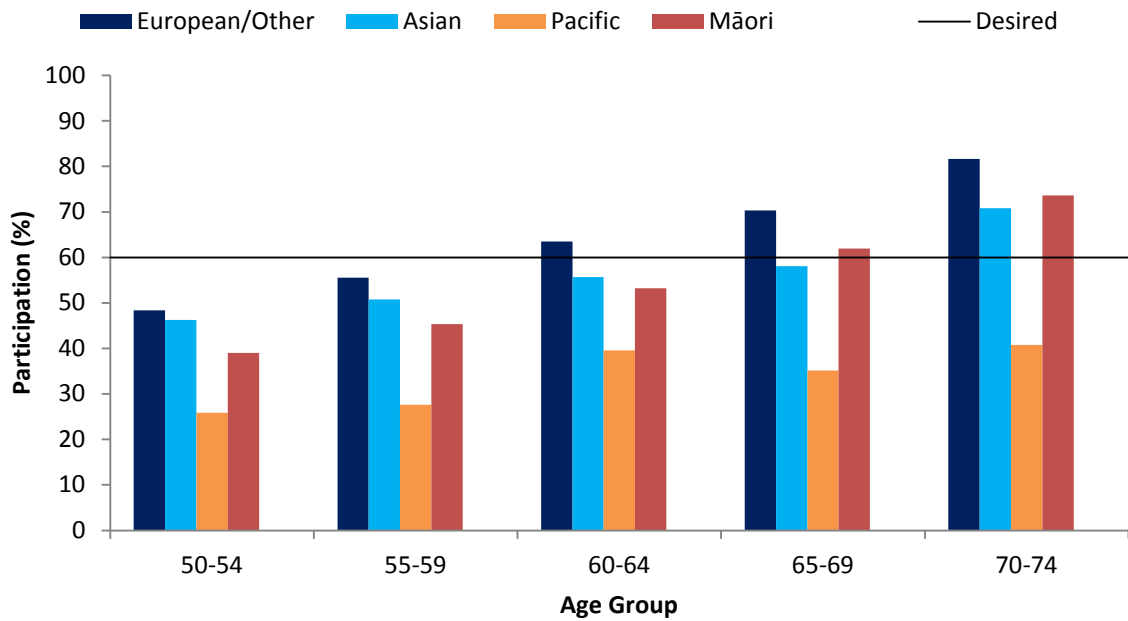
Source: BSP Register

Figure 6: Participation and iFOBT positivity by deprivation quintiles, Round 1
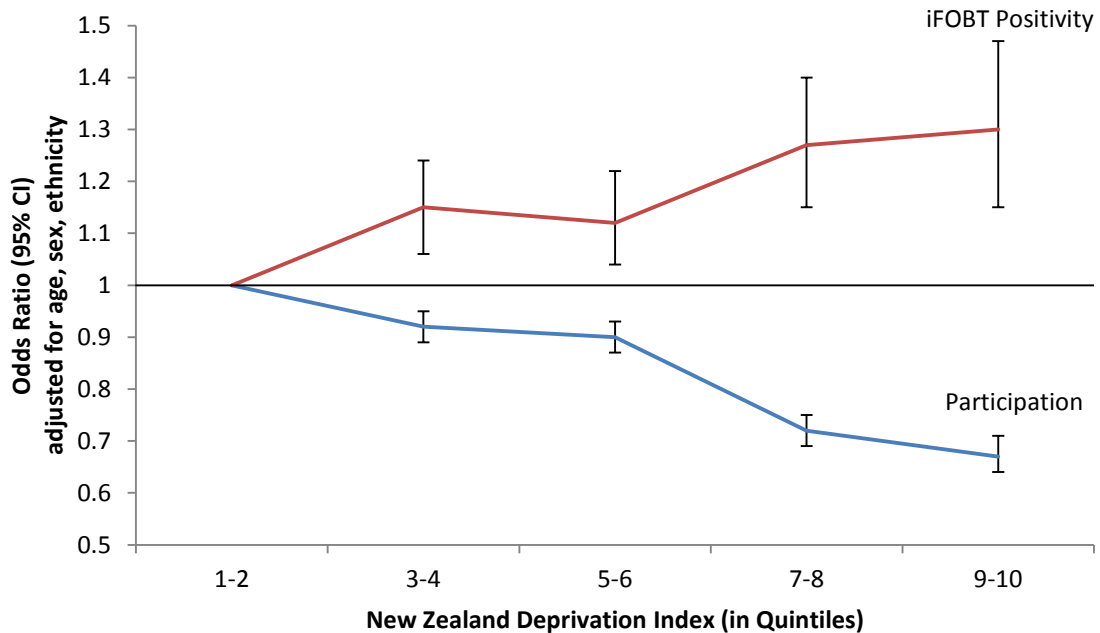
Source: BSP Register

Colonoscopy uptake

Of the participants who successfully completed a kit in the first screening round, 6.5% (n=4,467) had a publicly funded colonoscopy in the WDHB area. The outcomes in this section of the report are only for this group (n=4,467). Information on private colonoscopy was not included in the UK pilot evaluation (Alexander and Weller 2003) or first round interim analysis (Read et al 2014).

Colonoscopy uptake was 85.7%.[26] Colonoscopy was incomplete in 0.6% (n=28) of cases.[27] Seventy-six percent (n=3,414) of colonoscopies had abnormal results.

Fifty-six (1.1%) participants with a positive iFOBT had CT colonography.[28]

For all results see the Appendix, Table 3.

Colonoscopy uptake differed by sex

Males were slightly more likely to have a colonoscopy than females. Males aged 55-59 and 70-74 years were over 1.5 times more likely to have a colonoscopy than females of the same ages.

Asian males were slightly less likely to have a colonoscopy than European/Other males.

Colonoscopy uptake increased with increasing deprivation

Colonoscopy uptake among people from the most deprived quintile areas (NZDep Index 7-8 and 9-10) was twice as likely as uptake among people from the least deprived quintile area (NZDep Index 1-2).

Discussion

The colonoscopy uptake rate of 85.7 % is higher than the uptake achieved in England (80.5%) (Weller et al 2007).

The European guidelines set the acceptable colonoscopy compliance rate at 85% (Moss et al 2010). The UK has also adopted at least 85% colonoscopy uptake as a minimum standard (Chilton and Rutter 2011). Uptake in the BSP meets these standards.

Outcomes

For a summary of the outcomes of Round 1 of the BSP, see Figure 7.

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[26] A further 6.9% (n=361) are recorded as having colonoscopy outside of the BSP.

[27] It is possible that the BSP Register has not completely captured these data.

[28] Another two participants had private CT colonography.

Figure 7: Summary of BSP outcomes - Round 1
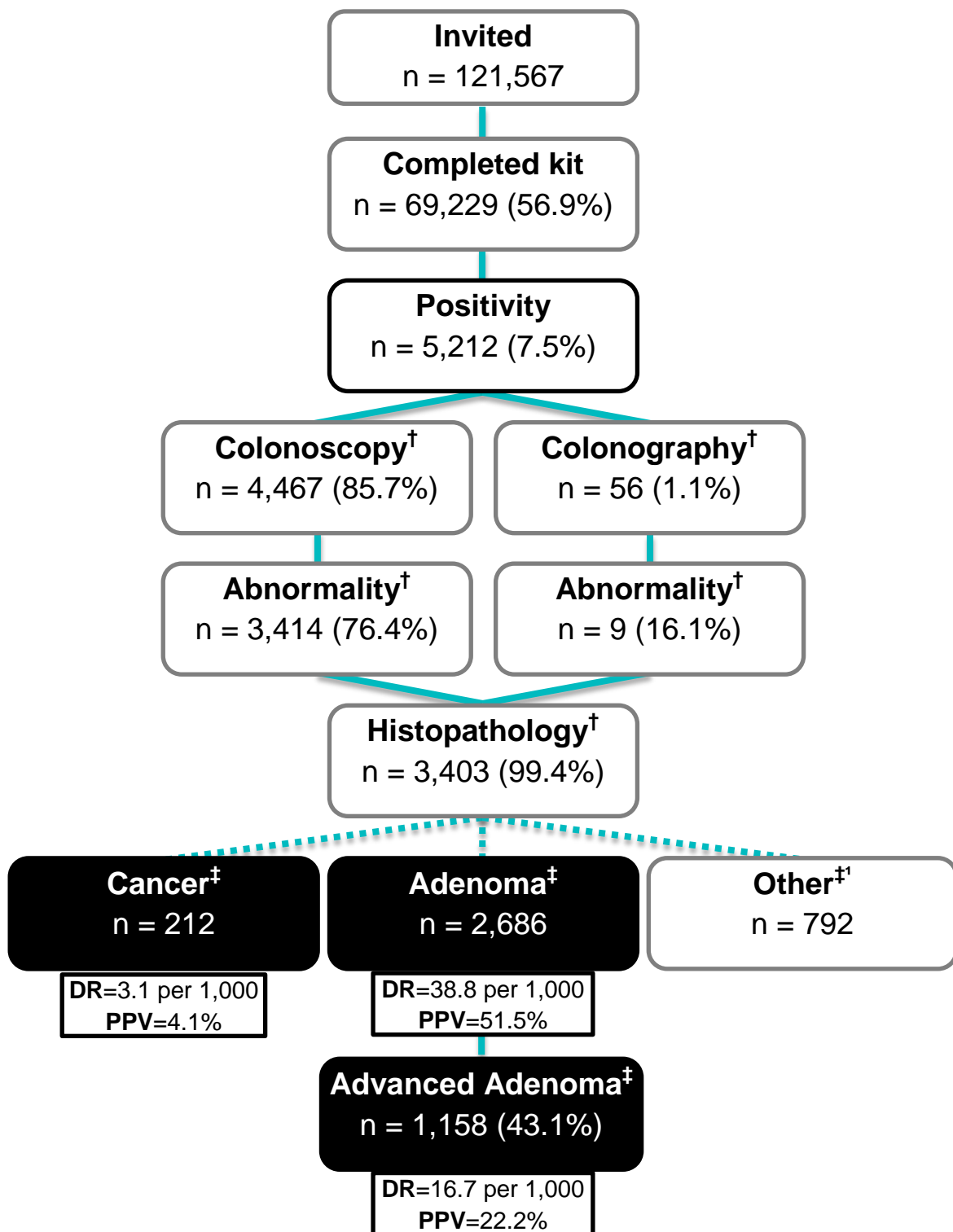
Invited
n = 121,567

Completed kit
n = 69,229 (56.9%)

Positivity
n = 5,212 (7.5%)

Colonoscopy[†]
n = 4,467 (85.7%)

Colonography[†]
n = 56 (1.1%)

Abnormality[†]
n = 3,414 (76.4%)

Abnormality[†]
n = 9 (16.1%)

Histopathology[†]
n = 3,403 (99.4%)

Cancer[‡]
n = 212

Adenoma[‡]
n = 2,686

Other[‡1]
n = 792

DR=3.1 per 1,000
PPV=4.1%

DR=38.8 per 1,000
PPV=51.5%

Advanced Adenoma[‡]
n = 1,158 (43.1%)

DR=16.7 per 1,000
PPV=22.2%

Key:
DR = Detection Rate = n / Completed kit * 1,000   **† :** WDHB
PPV = Positive Predictive Value of iFOBT = n / Positive iFOBT * 100   **‡ :** WDHB and other

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[1] There are three cases of cancer in situ included in the 'Other' category.

Immunochemical faecal occult blood test (iFOBT) positivity

Of the participants who completed an adequate kit in the first screening round (n=69,229), 7.5% had a positive iFOBT result.

For all results see the Appendix, Table 4a.

Positivity increased with increasing age (Figure 1).

Both male and female participants aged 70-74 years were more than twice as likely to have a positive iFOBT result than participants aged 50-54 years.

Positivity differed by sex and ethnicity

Males were over 1.5 times more likely to have a positive iFOBT result than females (Figure 2). This difference was found for each age group.

Māori and Asians were slightly more likely to have a positive iFOBT result than European/Other participants (Figure 3).

Asian and Pacific females and Māori males were slightly more likely to have a positive iFOBT result than their European/Other counterparts.

Positivity was highest in the most deprived quintile areas

Positivity among people from the most deprived quintile areas (NZDep Index 7-8 and 9-10) was about 1.3 times more likely than among people from the least deprived quintile area (NZDep Index 1-2) (Figure 6).

Discussion

Comparison of the positivity rate with other population-based screening programmes is limited by the use elsewhere of a guaiac faecal occult blood test rather than iFOBT and by differences in iFOBT positivity cut-off levels.[30]

If the positivity rate is too low, the screening programme will fail to adequately identify adenomas and cancer, whereas if it is too high there will be pressure on colonoscopy capacity.

The BSP positivity rate (7.5%) was within the range (4.4-11.1%) of positive iFOBT rates reported in the first round of population-based screening programmes reported elsewhere (Moss et al 2010; Major et al 2013). It was also higher than the positivity rate from the first screening round in the Netherlands (5.7%) using an iFOBT with the same cut-off level and a population of the same age range as the BSP (Hol et al 2009).

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[30] The iFOBT is more sensitive for advanced adenomas and cancer than the guaiac faecal occult blood test (Lansdorp-Vogelaar and von Karsa 2010).

A higher positivity rate with increasing age and in males compared with females has been found elsewhere (Weller et al 2007; Major et al 2013). This reflects the natural history of the disease.

Weller et al (2007) also found a higher positivity rate in more deprived areas in England.

Detection rates of adenoma, advanced adenoma and colorectal cancer

The outcomes in this section of the report are for all colonoscopies including those carried out in private health care. This allows the PPV of the iFOBT to be more accurately determined.

Following colonoscopy, 2,686 participants had at least one adenoma and no cancer detected. There were 1,158 participants who had at least one advanced adenoma and no cancer detected. Two hundred and twelve participants had cancer detected. Some of these participants had more than one type of pathology; only the most serious type was recorded.

The overall detection rate of adenoma was 38.8 per 1,000, advanced adenoma was 16.7 per 1,000, and cancer was 3.1 per 1,000.

For all results see the Appendix, Table 4a.

Detection rates increased with increasing age

This trend reflects the natural history of adenomas and colorectal cancer.

Colorectal cancer was higher for each age group except 55-59 year-olds compared to 50-54 year-old participants, whereas adenoma and advanced adenoma were higher for each age group.

The 70-74 year-old participants were almost three times more likely to have an adenoma or advanced adenoma detected than 50-54 year-old participants.

The 70-74 year-old participants were almost five times more likely to have cancer detected than 50-54 year-old participants.

Figure 1 shows increasing participation, iFOBT positivity, and colorectal cancer with age.

Detection rates differed by sex

Males were twice as likely to have an adenoma or advanced adenoma, and 1.5 times more likely to have cancer detected than females (Figure 2). The difference in detection between males and females existed at every age group for adenoma and advanced adenoma, but only in the 65-69 years age group for cancer.

The difference between males and females for adenoma and advanced adenoma decreased with increasing age.

Adenoma detection rates differed by ethnicity

Asians were about 1.5 times less likely than European/Other to have an advanced adenoma detected. The difference was similar for each age group.

Asian males were slightly less likely to have an adenoma and over 1.5 times less likely to have an advanced adenoma detected than European/Other males.

Pacific people were slightly less likely than European/Other to have an adenoma and over 1.5 times less likely to have an advanced adenoma detected.

Pacific males were over 1.5 times less likely to have an adenoma detected than European/Other males.

Māori were slightly more likely to have an adenoma detected than European/Other.

Māori aged 60-69 years were 1.5 times more likely to have an adenoma detected than European/Other of the same age.

Figure 8 shows participation and combined advanced adenoma[31] and colorectal cancer by ethnicity.

Detection rates were highest in the most deprived quintile areas

Participants from the two most deprived quintile areas (NZDep 7-8 and 9-10) were slightly more likely to have an adenoma detected than participants from the least deprived quintile area (NZDep Index 1-2). Participants from the most deprived quintile area (NZDep 9-10) were almost 1.5 times more likely to have an advanced adenoma, and twice as likely to have cancer detected as participants from the least deprived quintile area (NZDep Index 1-2) (Figure 9).

Figure 10 shows generally decreasing participation and increasing neoplasia with increasing deprivation.

Discussion

The BSP detection rate for adenoma (3.9%) is above the range (1.33-2.23%), and for cancer (0.3%) is towards the lower end of the range (0.18-0.95%) reported in the first screening round of population-based programmes elsewhere that used the iFOBT (Moss et al 2010).

The BSP markedly exceeds the UK minimum standard and target of having an adenoma detected in at least six and seven participants, respectively, per 1,000 screened by faecal occult blood test (Chilton and Rutter 2011). This is not surprising as the UK programme uses the guaiac FOBT which is less sensitive than the iFOBT.

The BSP meets the UK target of having cancer detected in at least two participants per 1,000 screened (Chilton and Rutter 2011).

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[31] Advanced adenomas are the highest-risk precursors of colorectal cancer.

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Positive Predictive Values

The positive predictive value (PPV) of a positive iFOBT for adenoma was 51.5%, for advanced adenoma 22.2%, and for cancer 4.1%. That is, 55.6% of people who had a positive iFOBT had an adenoma or cancer detected, and 26.3% had an advanced adenoma or cancer detected.

For all results see the Appendix, Table 5a.

There were some age, sex and ethnic differences in the effectiveness of a positive iFOBT in detecting adenoma, advanced adenoma and cancer.

Compared with 50-54 year-old participants, the PPV was higher for adenoma among all other age groups, and for advanced adenoma and cancer, among most other age groups. The PPV for cancer was about twice as high for the three older age groups than for 50-54 year-olds.

The PPV for adenoma and advanced adenoma was 1.5 times higher for males than females. The difference between males and females was seen in all age groups for adenoma, and the 50-54, 55-59 and 65-69 years age groups for advanced adenoma.

Compared with 50-54 year-old females, the PPV was about twice as high for both adenoma and advanced adenoma among 70-74 year-old females and, for advanced adenoma, among 65-69 year-old females.

The PPV for adenoma for Asians was slightly less than for European/Other participants.

The PPV for advanced adenoma for Asians was half that for European/Other participants.

The PPV for adenoma and advanced adenoma for Pacific people was about half that for European/Other participants.

Compared with 50-54 year-old males, the PPV for cancer was more than three times as high for 60-64 year-old males and about four times for 65-69 and 70-74 year-old males.

Discussion

The BSP PPV of a positive iFOBT for cancer of 4.1% is slightly below the range (4.5-8.6%) reported in the first screening round of population-based programmes elsewhere, whereas the PPV for adenoma of 51.5% is above the reported range (19.6-40.3%) (Moss et al 2010). At the same cut-off level (75 ng haemoglobin/ml) as the BSP, the PPV for cancer was reported as 9% in the Netherlands (Hol et al 2009). However, the more recently reported PPV for adenoma and cancer (50.6% and 4.3% respectively) from the three Canadian provincial programmes that use the iFOBT is outside of these ranges, and similar to the BSP (Major et al 2013).

Figure 8: Participation and combined advanced adenoma and colorectal cancer by ethnicity, Round 1
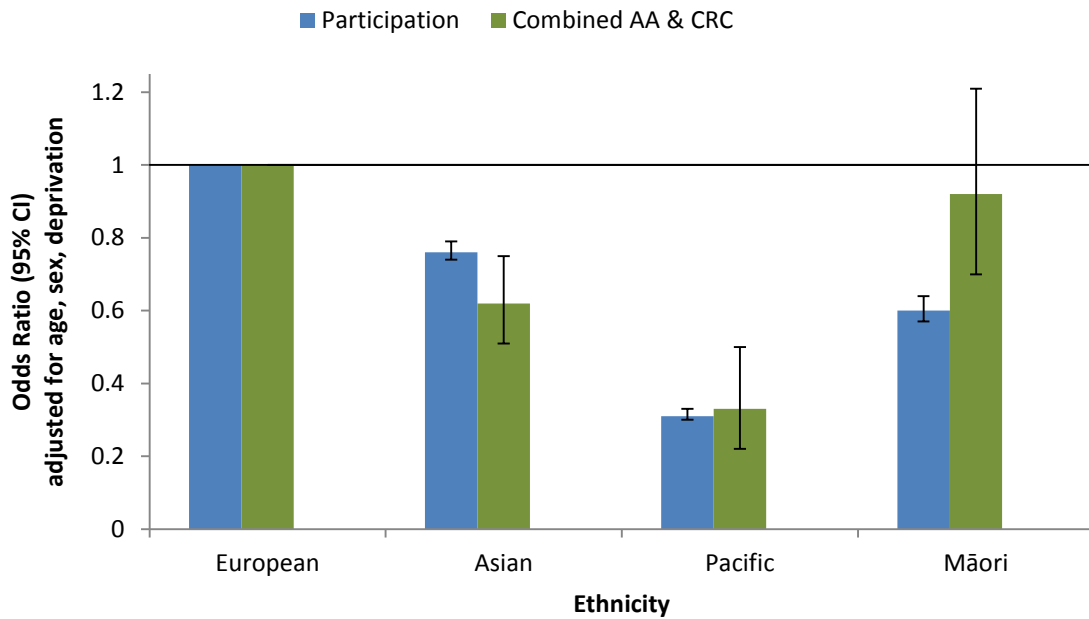
N.B. Combined AA & CRC is advanced adenoma and colorectal cancer combined.

Source: BSP Register

Figure 9: Participation and colorectal cancer by deprivation quintiles, Round 1
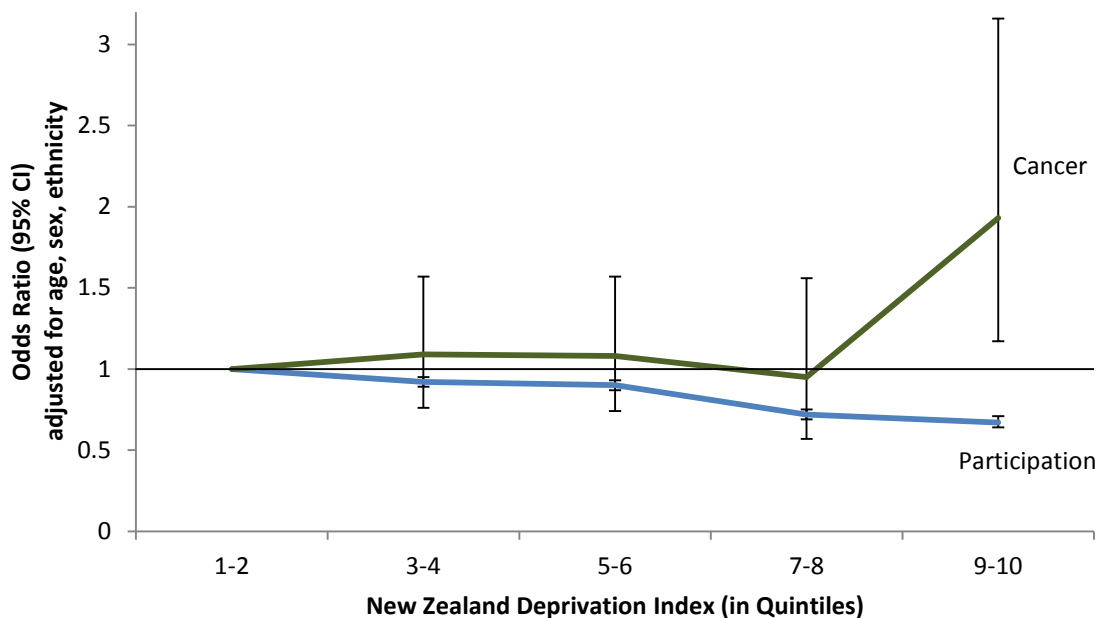
Source: BSP Register

Figure 10: Participation and neoplasia by deprivation quintiles, Round 1
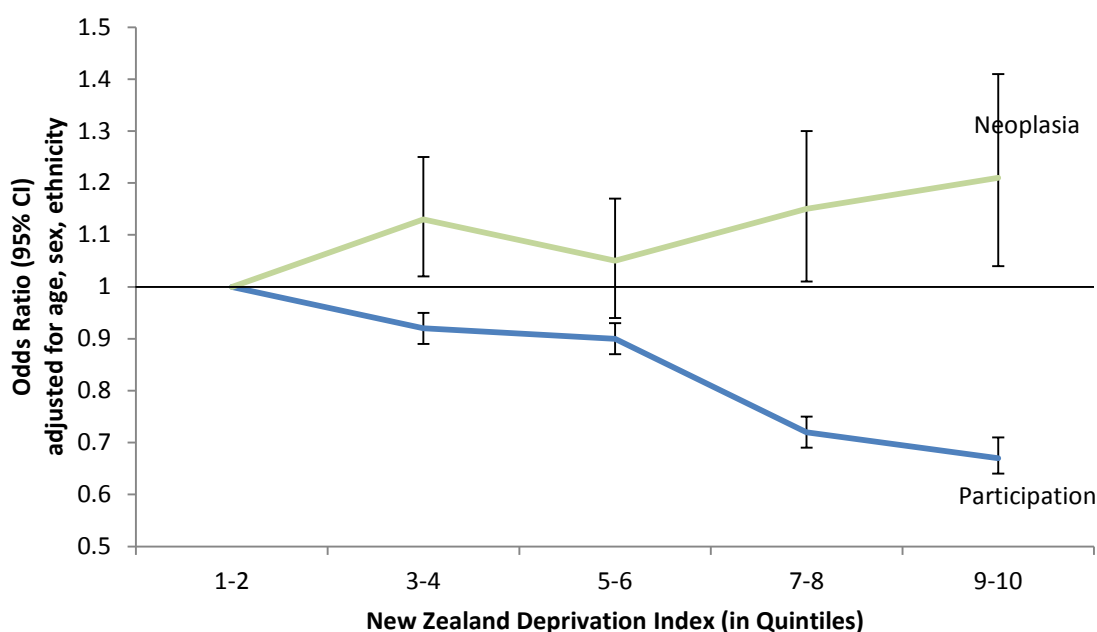
Source: BSP Register

Colorectal cancer

Two hundred and twelve participants had cancer detected (3.1 per 1,000 screened; 174.4 per 100,000 invited): 178 were European/Other, 25 were Asian, five were Pacific people and four were Māori.

Colorectal cancer increased with increasing age. Participants aged 60-64, 65-69 and 70-74 years were almost three, four and five times more likely to have cancer, respectively, than participants aged 50-54 years (Figure 1).

Males were 1.5 times as likely to have cancer as females (Figure 2).

Males aged 65-69 years were twice as likely to have cancer as females of the same age.

Males aged 60-64, 65-69 and 70-74 years were about four, six and eight times more likely to have cancer, respectively, than 50-54 year-old males.

Females aged 65-69 and 70-74 years were two to over three times more likely to have cancer than 50-54 year-old females.

The extent of spread of a cancer is known as its stage. There are various staging systems and the BSP has adopted Tumour/Node/Metastasis (TNM) staging. The staging ranges from Stage 1, the least advanced, to Stage 4, the most advanced.

Most cancers were Stage I (74.0 per 100,000 invited), followed by Stage II (40.3 per 100,000 invited), Stage III (36.2 per 100,000 invited) and Stage IV (14.0 per 100,000 invited) (Appendix, Table 6).

About 42% (n=90) of those participants with cancer detected had Stage I (ie, confined to the bowel inner lining or muscle wall) and eight percent (n=17) had Stage IV (ie, spread to a distant part of the body).

Twelve (5.7%) cancers were not staged.

Round 2

The results presented in this section focus on participation rather than outcomes because Round 2 includes a mix of first and second screening invitations. Outcome data for Round 2 are available in Figure 11 and the Appendix, Tables 4b, 5b and 6 and presented later according to screening history.

It is possible that the first year of Round 2 included some self-selected participants. The self-selected population comprises people in the eligible population who were not on the BSP Register (eg, no National Health Index, or moved into the area) but who requested screening, and people on the Register who requested screening before they received an invitation.[32] Separate analysis of this group was not part of the analytical plan approved by the Ministry and self-selected participants can no longer be identified in the BSP Register. The first round interim analysis found higher positivity and detection rates for all outcomes for the self-selected group (Read et al 2014).

Round 2 has been divided into three categories depending on the screening history of the invited population. The distribution is shown for each.

1. People who completed Round 1

   People who successfully completed an iFOBT kit in the first round.
   This category is further subdivided into:

a. Negative iFOBT

   People with a negative iFOBT result in the first round (39.2%)

   This group represents an incidence screening round (ie, they were screened in Round 2 for newly arisen or previously undetected adenomas and colorectal cancer after a negative iFOBT in Round 1).

   For a summary of the outcomes of the incidence screening round, see Figure 18.

b. Positive iFOBT, no colonoscopy

   People with a positive iFOBT result in the first round and no colonoscopy done (0.1%)

2. People who did not complete Round 1

   People who did not respond or did not successfully complete an iFOBT kit in the first round (33.2%)

3. People who were not invited in Round 1

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[32] People who requested screening pre-invitation includes Māori and Pacific people who may have attended a community education session or hui and expressed an interest to take part in the BSP. Health promoters then notified the BSP Coordination Centre and an invitation letter and iFOBT kit was sent out.

People who were invited for the first time in the second round (due to being too young or not in the catchment area during the first round) (27.5%)

To separate prevalence and incidence screening, screening outcomes together with participation results are presented separately for each of these categories.

Participation

Immunochemical faecal occult blood test (iFOBT) uptake

Data on the total eligible population invited in the first year of Round 2 (n=62,520) and the participants who successfully completed an iFOBT kit (n=32,274) are given in the Appendix, Tables 1 and 2.

Fifty-two percent (n=32,613) of those who received an invitation responded by returning a kit. Almost all (n=32,274) returned a successfully completed kit, resulting in a participation rate of 51.6%.

The European guidelines regard less than 3% inadequate kits as acceptable and less than 1% as desirable (Moss et al 2010). Round 2 almost reaches the desirable level.

Participation was lower than in Round1 (Table 1, 51.6% vs 56.9%; p<0.01).

Participation increased with increasing age

People aged 70-74 years were almost three times as likely to participate as people aged 50-54 years. Those aged 65-69 years were more than twice as likely to participate as the youngest age group. This pattern was similar for males and females, except that 70-74 year-old males were more than three times as likely to participate as 50-54 year-old males.

Participation differed by sex and ethnicity

Males were slightly less likely to participate than females.

Participation was highest among European/Other[33] (56.6%), followed by Asians (48.8%), Māori (46.0%) and Pacific people (36.7%). The pattern was the same as in Round 1. Although the participation of European/Other and Asians decreased [34] from Round 1, it increased for Pacific people[35] and remained similar among Māori.

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[33] Of the 25,257 participants, 24,902 were European and 355 were Other.
[34] European/Other participation in Round 2 (56.6%) vs Round 1 (63.0%), p<0.01. Asian participation in Round 2 (48.8%) vs Round 1 (53.7%), p<0.01.
[35] Pacific participation in Round 2 (36.7%) vs Round 1 (30.6%), p<0.01.

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Figure 11: Summary of BSP outcomes - Round 2
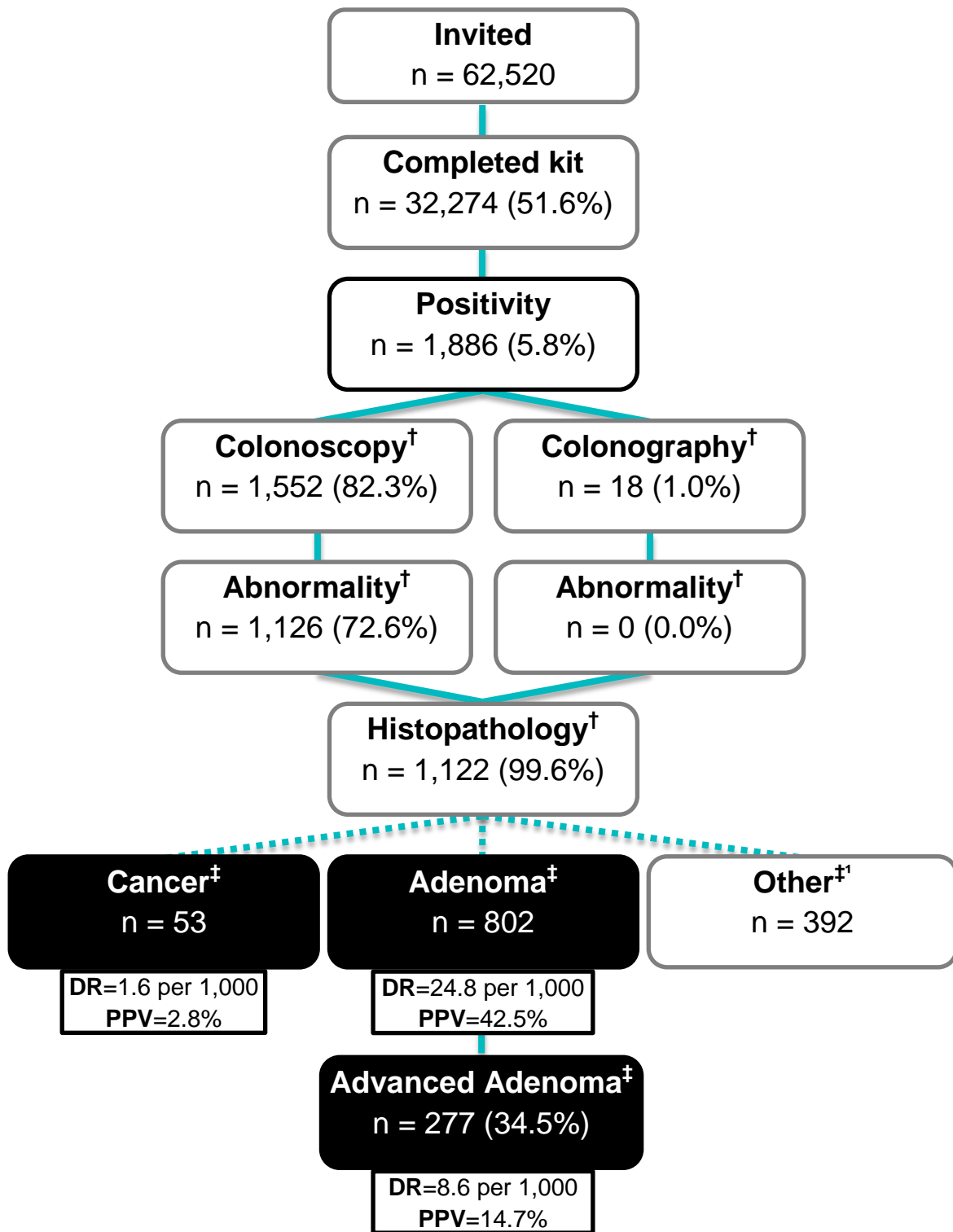
```
                    ┌─────────────────────┐
                    │      Invited        │
                    │    n = 62,520       │
                    └─────────────────────┘
                    ┌─────────────────────┐
                    │    Completed kit    │
                    │  n = 32,274 (51.6%) │
                    └─────────────────────┘
                    ┌─────────────────────┐
                    │     Positivity      │
                    │  n = 1,886 (5.8%)   │
                    └─────────────────────┘
      ┌─────────────────────┐     ┌─────────────────────┐
      │    Colonoscopy†     │     │    Colonography†    │
      │  n = 1,552 (82.3%)  │     │   n = 18 (1.0%)     │
      └─────────────────────┘     └─────────────────────┘
      ┌─────────────────────┐     ┌─────────────────────┐
      │    Abnormality†     │     │    Abnormality†     │
      │  n = 1,126 (72.6%)  │     │   n = 0 (0.0%)      │
      └─────────────────────┘     └─────────────────────┘
                    ┌─────────────────────┐
                    │   Histopathology†   │
                    │  n = 1,122 (99.6%)  │
                    └─────────────────────┘
```

Cancer‡	Adenoma‡	Other‡[1]
n = 53	n = 802	n = 392

DR=1.6 per 1,000	**DR**=24.8 per 1,000
PPV=2.8%	**PPV**=42.5%

Advanced Adenoma‡
n = 277 (34.5%)

DR=8.6 per 1,000
PPV=14.7%

Key:
DR = Detection Rate = n / Completed kit * 1,000
PPV = Positive Predictive Value of iFOBT = n / Positive iFOBT * 100

† : WDHB
‡ : WDHB and other

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[1] There is one case of cancer in situ included in the 'Other' category.

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Figure 12: Participation by ethnicity for Round 1, Round 2, Round 2 Completed Round 1 negative iFOBT, Round 2 Did not complete Round 1, and Round 2 Not invited in Round 1
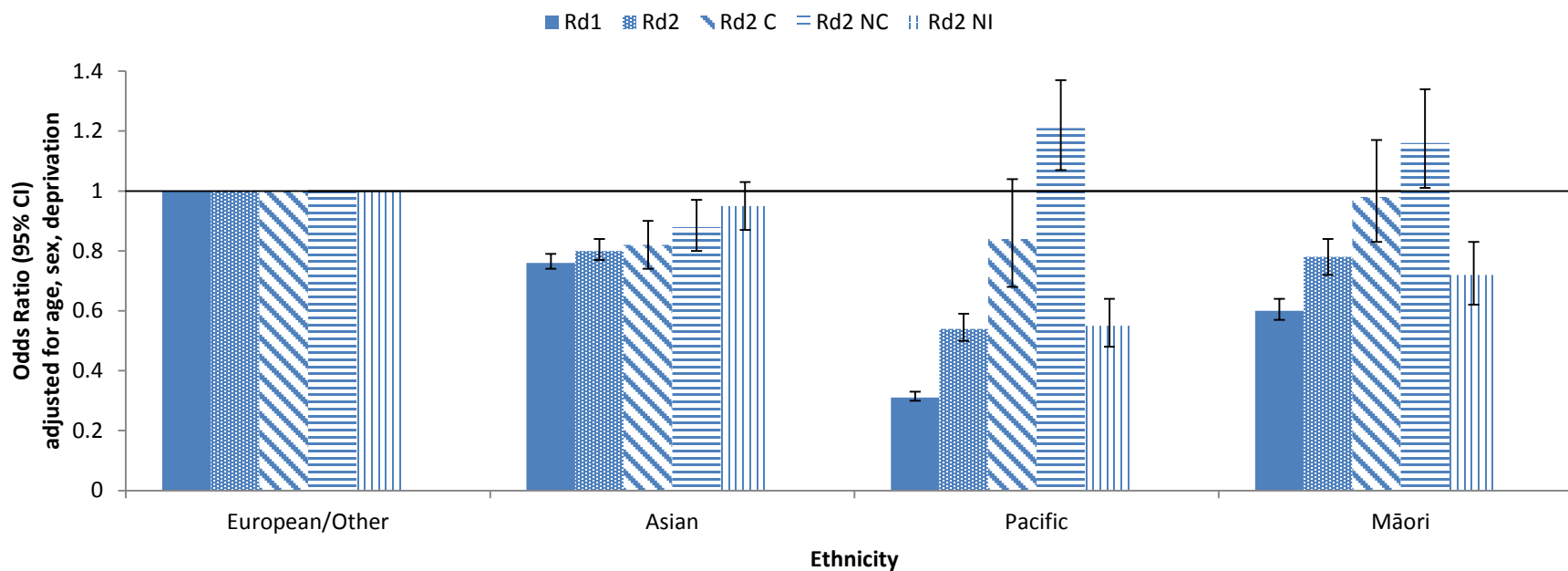
Rd1 - Round 1

Rd2 - Round 2

Rd2 C - Participants in Round 2 who completed Round 1 with a negative iFOBT result

Rd2 NC - Participants in Round 2 who did not complete Round 1

Rd2 NI - Participants in Round 2 who were not invited in Round 1

Source: BSP Register

Asians were slightly less likely to participate than European/Other (Figure 12). Participation was close to that of European/Other for those aged 50-59 years but Asians aged 70-74 years were about half as likely to participate as European/Other of the same age.

Pacific people were about half as likely to participate as European/Other (Figure 12). Participation decreased with increasing age but was higher at each age than in Round 1. In the 70-74 years age group, Pacific people were about four times less likely to participate than European/Other of the same age.

Māori were slightly less likely to participate than European/Other (Figure 12).

Māori females were almost 1.5 times less likely to participate than European/Other females whereas Māori males were slightly less likely to participate than European/Other males. Pacific females were half as likely to participate as European/Other females whereas Pacific males were over 1.5 times less likely to participate than European/Other males. Asian females and Asian males were slightly less likely to participate than their European/Other counterparts.

As in Round 1, European/Other male participation (53.8%) was lower than that of females (59.3%). Male participation was higher than female for Māori in Round 1 but similar in Round 2 (45.6% and 46.4%, respectively). There were no differences by sex in either round for Asians and Pacific people.

Participation declined with increasing deprivation

Participation among people from the most deprived quintile area (NZDep Index 9-10) was 1.5 times less likely than people from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex and deprivation were the same as those found in Round 1.

Discussion

Participation was about the same as that reported in England (51.9%).[37] Participation was also significantly lower in the second round of the English pilot. As in the BSP, that pilot found lower participation in males than females, increasing participation with age, and decreasing participation with deprivation (Weller et al 2006).

Colonoscopy uptake

Of the participants who successfully completed a kit in the second screening round, 4.8% (n=1,552) had a publicly funded colonoscopy in the WDHB area.

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[37] There are some differences in eligibility criteria between the BSP and the English pilot's second round. The latter included people with positive faecal occult blood and either negative colonoscopy or diagnosed with adenoma or cancer in the first round (accounting for 0.5% of those invited), and excluded people aged 70-74 years (Weller et al 2006).

Colonoscopy uptake was 82.3%,[38] which is lower than in Round 1 (Table 1, 82.3% vs 85.7%; p<0.01). The colonoscopy was incomplete in 0.8% (n=12) of cases.[39] Seventy-three percent (n=1,126) of colonoscopies had abnormal results.

Eighteen (1.0%) participants with a positive iFOBT had CT colonography.[40]

For all results see the Appendix, Table 3.

Colonoscopy uptake differed by sex

Males were slightly more likely to have a colonoscopy than females. Males aged 70-74 years were twice as likely to have a colonoscopy as females of the same age group. The sex differences were consistent with Round 1.

Colonoscopy uptake among people from the most deprived quintile area (NZDep Index 9-10) was over 2.5 times as likely as among people from the least deprived quintile area (NZDep Index 1-2). In Round 1, uptake also increased with increasing deprivation.

Discussion

Uptake in the BSP does not meet the European guideline and UK minimum standard of at least 85% (Moss et al 2010; Chilton and Rutter 2011).

Uptake was about the same as reported in the English pilot (82.8%) (Weller et al 2006). In England uptake was similar in males and females and although highest in the 50-54 years age group and among the least deprived, there was no clear trend with age or deprivation. Uptake by age and deprivation was in the opposite direction in the BSP and was higher in males.

Table 1: Uptake and outcomes by round

	Round 2 (%)	Round 1 (%)	
iFOBT uptake	51.6	56.9	p<0.01
Colonoscopy uptake	82.3	85.7	p<0.01
Positivity	5.8	7.5	p<0.01
PPV adenoma	42.5	51.5	p<0.01
PPV cancer	2.8	4.1	p=0.01
Adenoma	2.48	3.88	p<0.01
Cancer	0.16	0.31	p<0.01

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[38] A further 8.2% (n=154) are recorded as having colonoscopy outside of the BSP.
[39] It is possible that the BSP Register has not completely captured these data.
[40] One other participant had private CT colonography.

Outcomes

For a summary of the outcomes of Round 2 of the BSP, see Figure 11. Outcomes are discussed in more detail later according to the screening history of the population that was invited.

Of the participants who completed an adequate kit in the first year of the second screening round (n=32,274), 5.8% had a positive iFOBT result.

The overall detection rate of adenoma was 24.8 per 1,000, advanced adenoma was 8.6 per 1,000, and cancer was 1.6 per 1,000. There were 53 cancers detected.

The PPV of a positive iFOBT for adenoma was 42.5%, advanced adenoma was 14.7%, and cancer was 2.8%. That is, 45.3% of people who had a positive iFOBT had an adenoma or cancer detected, and 17.5% had an advanced adenoma or cancer detected.

Positivity, PPVs and detection rates for adenoma and colorectal cancer were all lower than those found in Round 1 (Table 1). This is not unexpected as 62.8% (n= 20,257) of participants who successfully completed an iFOBT kit in Round 2 had been previously screened.

For all results, see the Appendix, Table 4b.

Table 2 lists the outcomes for both rounds and the Round 2 categories.

Discussion

Lower positivity in the second screening round was expected based on international experience. In England, for reasons that were unclear, positivity was significantly higher in the second round than in the first. In the BSP, as in the first round, it was higher in males than females and increased with age and increasing deprivation.

Detection rates cannot be compared to those found in the English pilot as a guaiac faecal occult blood test and not the iFOBT was used in that study. The cancer detection rate in the second round of the English pilot was significantly lower than in the first round whereas the adenoma detection rate was similar (Weller et al 2006).

In England, neoplasia was higher in males, and increased with age and among the most deprived as in the BSP (Weller et al 2006).

Table 2: Positivity, detection rates and PPVs by round and Round 2 categories

	Positivity	Adenoma		Advanced adenoma		Cancer	
	%	DR[1]	PPV	DR[1]	PPV	DR[1]	PPV
Round 1	7.5	38.8	51.5%	16.7	22.2%	3.1	4.1%
Round 2	5.8	24.8	42.5%	8.6	14.7%	1.6	2.8%
Round 2 Completed Round 1	5.5	23.1	42.3%	7.1	13.0%	1.3	2.4%
Round 2 Completed Round 1 negative iFOBT	5.4	22.9	42.3%	7.0	13.0%	1.3	2.5%
Round 2 Did not complete Round 1	8.4	36.7	43.8%	15.4	18.3%	3.5	4.2%
Round 2 Not invited in Round 1	5.2	21.9	41.9%	8.1	15.6%	1.3	2.4%

[1]Detection rate per 1,000 screened

Round 2 Completed Round 1

During the second screening round, 24,596 eligible people aged 52-74 years living in the WDHB area who had successfully completed an iFOBT kit in Round 1 were invited to participate. For the analysis, this Round 2 category was subdivided into those who had a negative iFOBT result in the first round and those who had a positive iFOBT with no colonoscopy in the first round. People with a negative iFOBT result in the first round who were invited in Round 2 represent an incidence (as opposed to prevalence) screening round.

For all demographic information on the eligible population, see the Appendix, Table 1.

For all results, see the Appendix, Table 2.

Round 2: People who completed Round 1 with a negative iFOBT

There were 24,553 eligible people aged 52-74 years living in the WDHB area who had a negative iFOBT result in Round 1. This is the denominator population used in the analysis of this section.

Eighty-three percent (n=20,324) of those who received an invitation responded by returning a kit. The majority (n=20,230) returned a successfully completed kit, resulting in a participation rate of 82.5%.

For all results, see the Appendix, Table 2.

Participation increased with increasing age

People aged 70-74 years were more than twice as likely to participate as people aged 50-54 years. Those aged 65-69 years were twice and those aged 60-64 years were 1.5 times as likely to participate as the youngest age group. This pattern was similar for males and females.

Participation differed by sex and Asian ethnicity

Males were slightly less likely to participate than females (Figure 13), particularly males aged 55-59 and 60-64 years.

Participation was highest among European/Other[41] (83.2%), followed by Māori (81.4%), Asians (78.7%) and Pacific people (78.7%).

Asians were slightly less likely to participate than European/Other (Figures 12 and 14).

Asians aged 60-69 and 70-74 years were about 1.5 times less likely to participate than European/Other of the same age. Asian females were slightly less likely to participate than European/Other females.

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[41] Of the 16,699 participants, 16,500 were European and 199 were Other.

European/Other participation was 84.6% for females and 81.6% for males. Female and male participation for Māori (81.9% and 80.8%), Pacific (79.0% and 78.3%) and Asians (79.1% and 78.2%) were similar.

Female and male participation, for all age and ethnic groups, were above 60% (Figures 15 and 16).

Participation among people from the most deprived quintile area (NZDep Index 9-10) was slightly less likely than among people from the least deprived quintile area (NZDep Index 1-2) (Figure 17).

Trends by age, sex and Asian ethnicity were similar to those found in Round 1.

Discussion

Weller et al (2006) also reported high (81.1%) participation in England among those who had had a negative result in the first screening round.

Figure 13: Participation, iFOBT positivity, and neoplasia by sex, Round 2, Completed Round 1, negative iFOBT
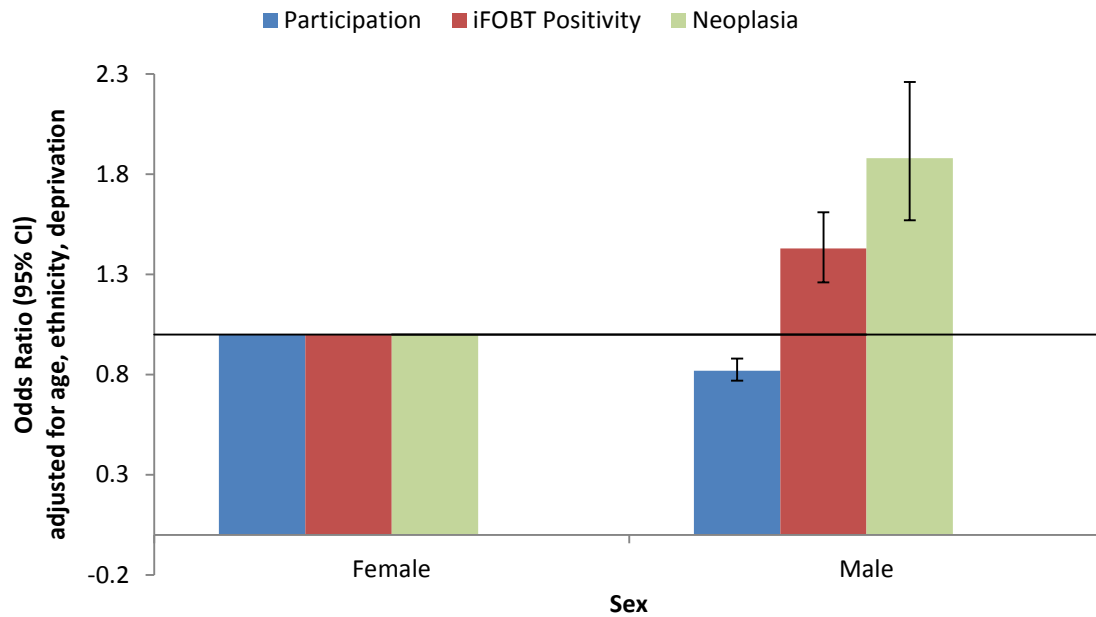
Source: BSP Register

Figure 14: Participation and iFOBT positivity by ethnicity, Round 2, Completed Round 1, negative iFOBT
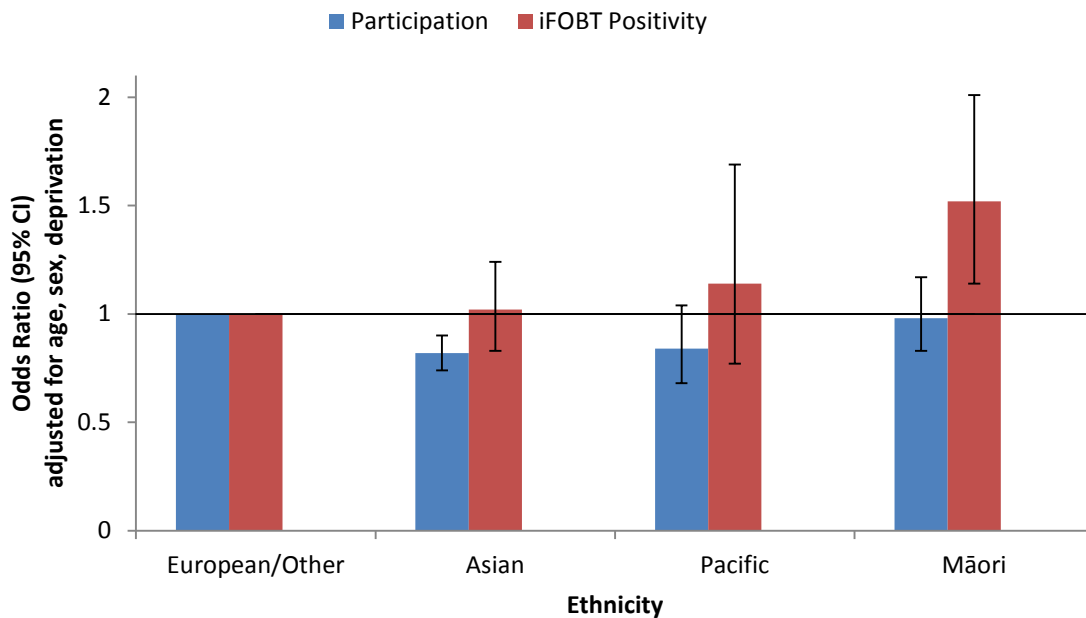
Source: BSP Register

Figure 15: Female participation by age and ethnicity, Round 2, Completed Round 1, negative iFOBT
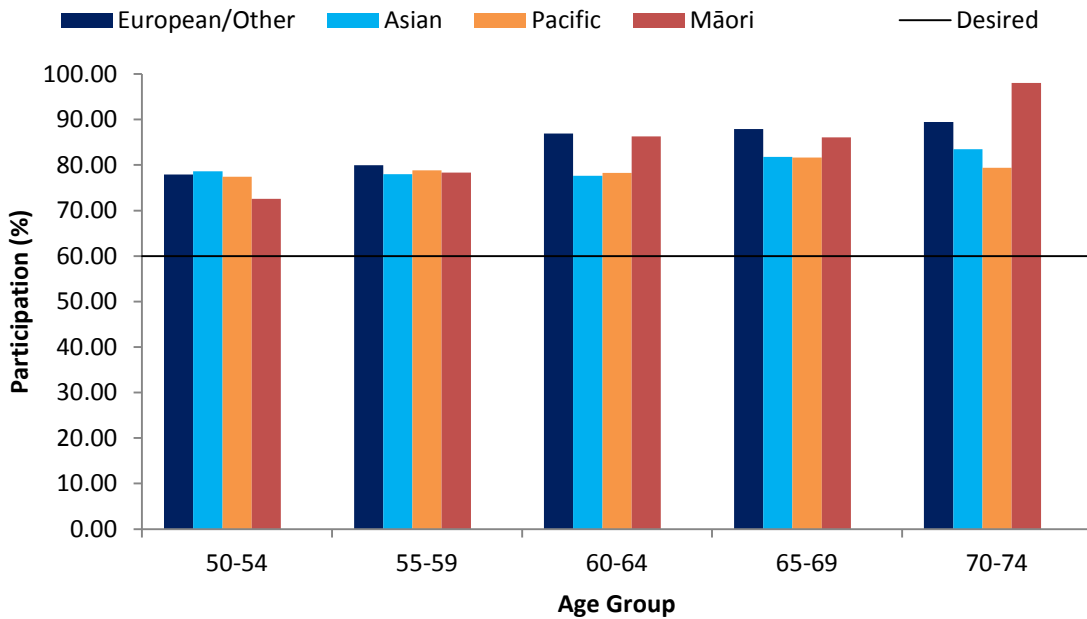
Source: BSP Register

Figure 16: Male participation by age and ethnicity, Round 2, Completed Round 1, negative iFOBT
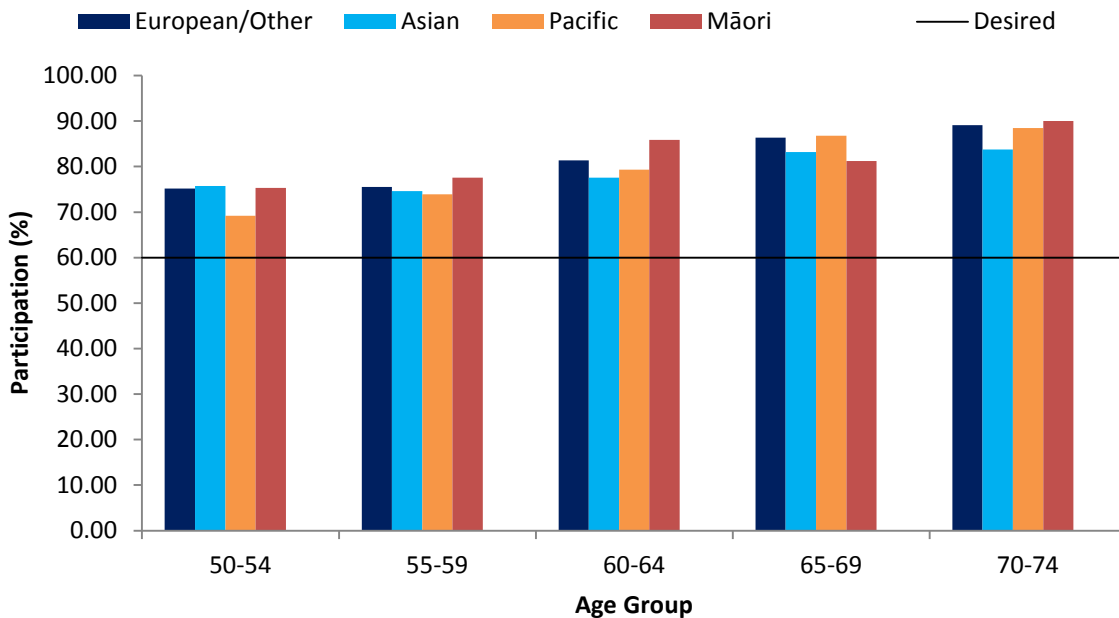
Source: BSP Register

Figure 17: Participation and iFOBT positivity by deprivation quintiles, Round 2, Completed Round 1, negative iFOBT
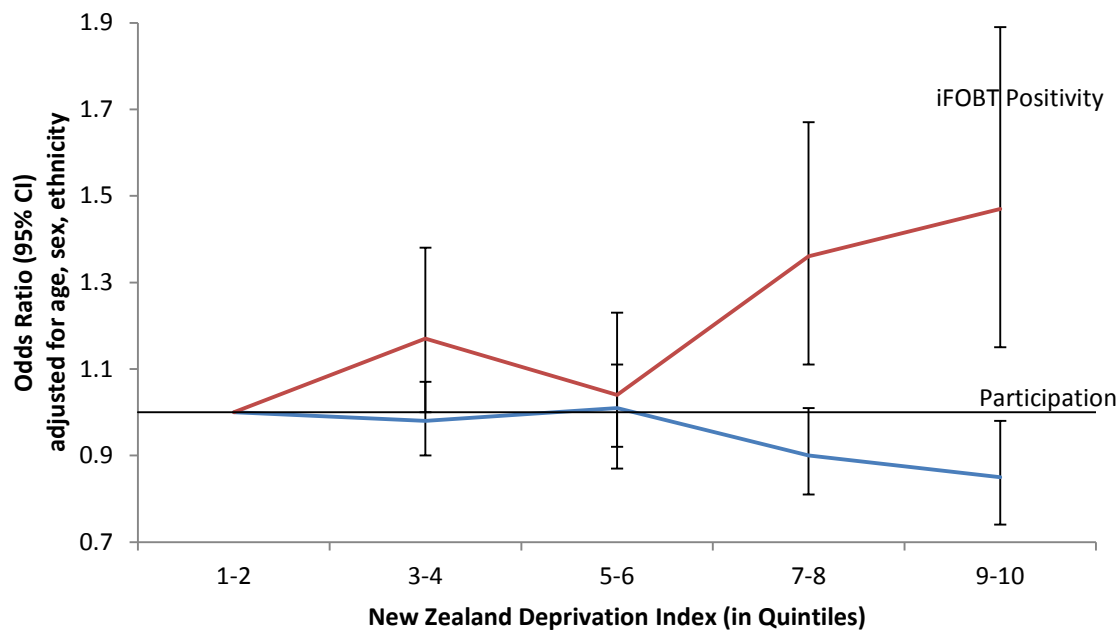
Source: BSP Register

Colonoscopy uptake

Of the Round 2 participants who had a negative iFOBT result in Round 1 and successfully completed a kit in the second screening round, 4.5% (n=917) had a publicly funded colonoscopy in the WDHB area. The outcomes in this section of the report are only for this group (n=917).

Colonoscopy uptake was 83.7%. Seventy-one percent (n=651) of colonoscopies had abnormal results.

Seven (0.6%) participants with a positive iFOBT had CT colonography.

For all results, see the Appendix, Table 3.

Colonoscopy uptake differed by sex and Pacific ethnicity

Males were almost 1.5 times more likely to have a colonoscopy than females.

Pacific people were almost three times less likely to have a colonoscopy than European/Other participants. Pacific males were six times less likely to have a colonoscopy than European/Other males. Pacific males aged 60-69 years were almost five times less likely to have a colonoscopy than European/Other males of the same age.

Figure 18: Summary of BSP outcomes - Round 2, Completed Round 1, negative iFOBT
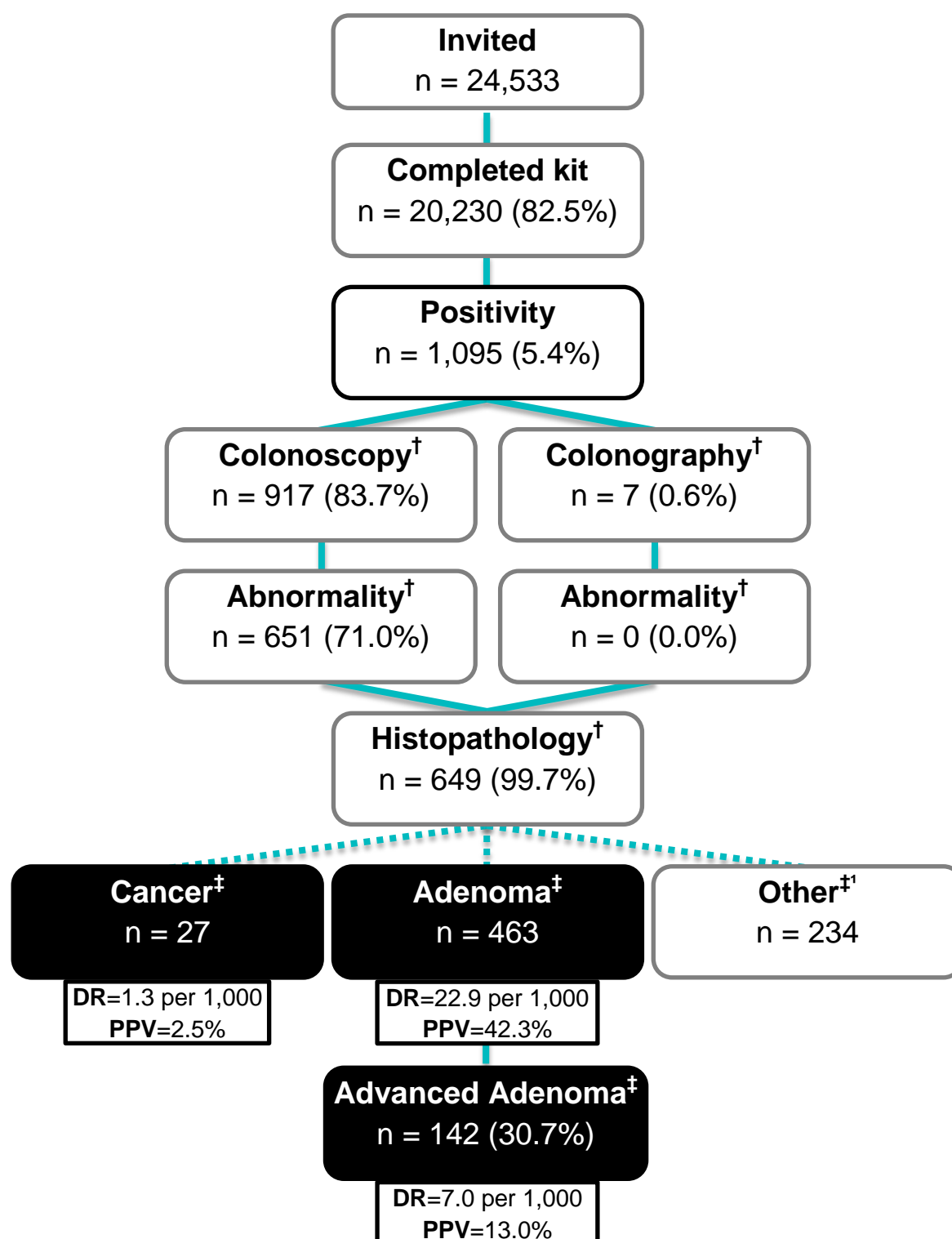
```
                    ┌─────────────────────┐
                    │      Invited        │
                    │    n = 24,533       │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │    Completed kit     │
                    │  n = 20,230 (82.5%)  │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │     Positivity       │
                    │  n = 1,095 (5.4%)    │
                    └─────────────────────┘
                          /         \
        ┌──────────────────┐     ┌──────────────────┐
        │  Colonoscopy†    │     │  Colonography†   │
        │  n = 917 (83.7%) │     │  n = 7 (0.6%)    │
        └──────────────────┘     └──────────────────┘
                 │                        │
        ┌──────────────────┐     ┌──────────────────┐
        │  Abnormality†    │     │  Abnormality†    │
        │  n = 651 (71.0%) │     │  n = 0 (0.0%)    │
        └──────────────────┘     └──────────────────┘
                          \         /
                    ┌─────────────────────┐
                    │  Histopathology†    │
                    │  n = 649 (99.7%)    │
                    └─────────────────────┘
```

Cancer‡	Adenoma‡	Other‡[1]
n = 27	n = 463	n = 234
DR=1.3 per 1,000 **PPV**=2.5%	**DR**=22.9 per 1,000 **PPV**=42.3%	

Advanced Adenoma‡
n = 142 (30.7%)

DR=7.0 per 1,000
PPV=13.0%

Key:
DR = Detection Rate = n / Completed kit * 1,000
PPV = Positive Predictive Value of iFOBT = n / Positive iFOBT * 100

† : WDHB
‡ : WDHB and other

[1] There is one case of cancer in situ included in the 'Other' category.

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Colonoscopy uptake increased with increasing deprivation

Colonoscopy uptake among people from the most deprived quintile area (NZDep Index 9-10) was over three times that among people from the least deprived quintile area (NZDep Index 1-2).

Trends by sex and deprivation were similar to those found in Round 1.

Discussion

The BSP colonoscopy uptake of 83.7% was slightly lower than the 86.8% uptake among those in the English pilot who had a negative faecal occult blood result in the first screening round (Weller et al 2006).

Outcomes

For a summary of the outcomes of this Round 2 population, see Figure 18.

Immunochemical faecal occult blood test (iFOBT) positivity

Of the Round 2 participants who had a negative iFOBT result in Round 1 and successfully completed a kit in the second screening round, 5.4% (n=1095) had a positive iFOBT result.

For all results see the Appendix, Table 4d.

Positivity increased with increasing age from 55-59 years

Both male and female participants aged 70-74 years were almost twice as likely to have a positive iFOBT result as participants aged 50-54 years.

Positivity differed by sex and Māori ethnicity

Males were almost 1.5 times more likely to have a positive iFOBT result than females (Figure 13). With the exception of the youngest age group (50-54 years), males were more likely than females to have a positive iFOBT in each age group. The extent of the difference decreased with age.

Māori were 1.5 times more likely to have a positive iFOBT result than European/Other participants (Figures 12 and 14).

Male Māori were almost twice as likely to have a positive iFOBT result as their European/Other counterparts.

Māori aged 60-69 years were almost twice as likely to have a positive iFOBT result as their European/Other counterparts.

Positivity among people from the most deprived quintile areas (NZDep Index 7-8 and 9-10) was almost 1.5 times more likely than among people from the least deprived quintile area (NZDep Index 1-2) (Figure 17).

Trends by age, sex, Māori ethnicity and deprivation were similar to those found in Round 1.

Detection rates of adenoma, advanced adenoma and colorectal cancer

The outcomes in this section of the report are for all colonoscopies including those carried out in private health care. This allows the PPV of the iFOBT to be more accurately determined.

Following colonoscopy, 463 participants had at least one adenoma and no cancer detected. There were 142 participants who had at least one advanced adenoma and no cancer detected. Twenty-seven participants had cancer detected. Some of these participants had more than one type of pathology; only the most serious type was recorded

The overall detection rate of adenoma was 22.9 per 1,000, advanced adenoma was 7.0 per 1,000, and cancer was 1.3 per 1,000.

For all results, see the Appendix, Table 4d.

Adenoma detection rates increased with increasing age

The 70-74 year-old participants were more than 2.5 times more likely to have an adenoma or advanced adenoma detected than 50-54 year-old participants.

Figure 18 shows increasing participation, iFOBT positivity, and combined advanced adenoma and colorectal cancer with age.

Adenoma detection rates differed by sex

Males were twice as likely to have an adenoma or advanced adenoma detected as females. The difference between males and females existed at every age group for adenoma and for the 50-54 and 65-69 year age groups for advanced adenoma.

The difference between males and females for adenoma generally decreased with increasing age.

Females aged 70-74 years were more than 3.5 times as likely to have an adenoma and almost 6.5 times as likely to have an advanced adenoma detected as 50-54 year-old females.

Males aged 70-74 years were more than twice as likely to have an adenoma detected as 50-54 year-old males.

Adenoma detection rates differed by Māori ethnicity

Māori were almost twice as likely to have an adenoma detected as European/Other participants.

Figure 19 shows participation and neoplasia by ethnicity.

Māori males were twice as likely to have an adenoma detected as European/Other males. Pacific people aged 70-74 years were more than three times and Māori aged 50-59 years were twice as likely to have an adenoma detected than European/Other of the same ages.

Whilst participants from the most deprived quintile area (NZDep 9-10) were 1.5 times more likely to have an adenoma detected and twice as likely to have an advanced adenoma detected as participants from the least deprived quintile area (NZDep Index 1-2), detection of both was similarly increased for NZDep 3-4 participants.

Figure 20 shows neoplasia by deprivation quintiles.

Trends by age, sex and Māori ethnicity for adenoma were similar to those found in Round 1.

Positive Predictive Values

The PPV of a positive iFOBT for adenoma was 42.3%, advanced adenoma was 13.0%, and cancer was 2.5%. That is, 44.7% of people who had a positive iFOBT had an adenoma or cancer detected, and 15.4% had an advanced adenoma or cancer detected.

For all results, see the Appendix, Table 5d.

The PPV was almost twice as high for adenoma among 70-74 year-olds as 50-54 year-olds.

The PPV for adenoma and advanced adenoma was higher for males than females.

Colorectal cancer

Twenty-seven participants had cancer detected (1.3 per 1,000 screened; 110.1 per 100,000 invited): 24 were European/Other, one was Asian and two were Māori.

Nine cancers were Stage I (36.7 per 100,000 invited), three were Stage II (12.2 per 100,000 invited), nine were Stage III (36.7 per 100,000 invited) and one was Stage IV (4.1 per 100,000 invited) (Appendix, Table 6).

Five (18.5%) cancers were not staged.

Figure 19: Participation and neoplasia by ethnicity, Round 2, Completed Round 1, negative iFOBT
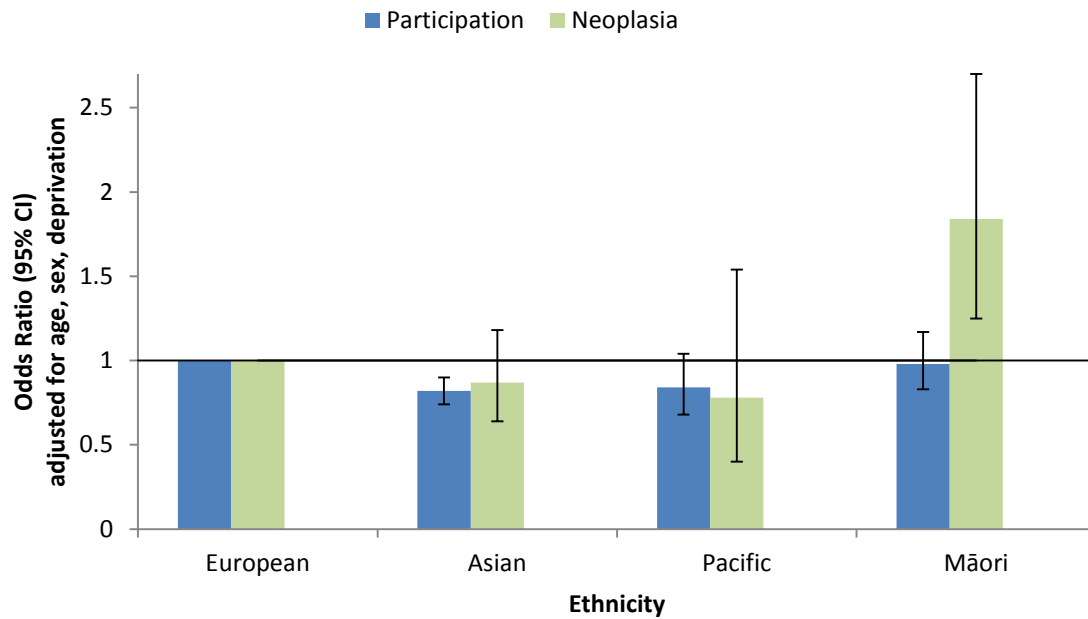
Source: BSP Register

Figure 20: Participation and neoplasia by deprivation quintiles, Round 2, Completed Round 1, negative iFOBT
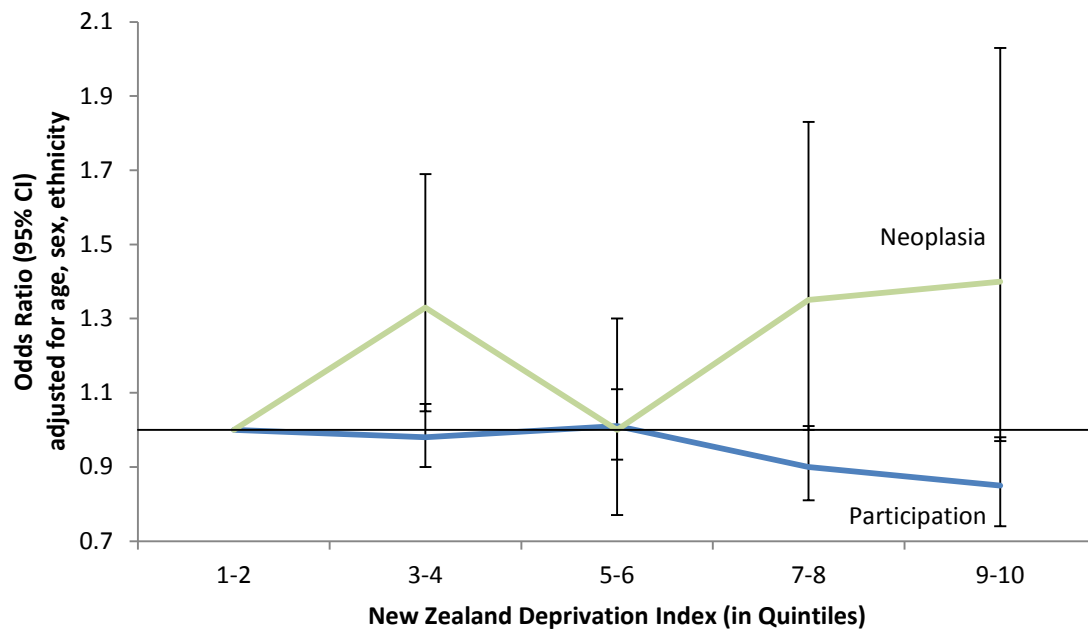
Source: BSP Register

Round 2: People who completed Round 1 with a positive iFOBT but no colonoscopy

There were 63 people invited in Round 2 who had a positive iFOBT result in the first round, but no colonoscopy was done, and who successfully completed a kit in the second screening round. Reasons for having no colonoscopy included being unfit for colonoscopy and declined colonoscopy. Nine had CT colonography in Round 1.

Twenty-seven people responded to the invitation to participate and all successfully completed an iFOBT kit (42.9%). Over half (55.6%) were aged 65-74 years. Nineteen were European/Other, three were Asian, four were Māori and one was Pacific.

Males were over 3.5 times less likely to participate than females.

Ten (37.0%) had a positive iFOBT result which included nine European/Other and one Māori.

Colonoscopy uptake was 50% (n=5). One person had CT colonography.

The PPV of a positive iFOBT for adenoma was 40.0% and advanced adenoma was 20.0%. That is, 40.0% of people who had a positive iFOBT had an adenoma detected and 20.0% had an advanced adenoma detected.

Four were diagnosed with adenoma (148.1 per 1,000), two of whom had advanced adenoma (74.1 per 1,000). There were no cases of cancer. Three were European/Other and one was Māori; both cases of advanced adenoma were European/Other.

Two people with adenoma were aged 60-64 years and two were aged 70-74 years. There was one woman with advanced adenoma in each of these age groups.

Discussion

High positivity and adenoma and advanced adenoma detection rates are not unexpected given this group had had a previous positive iFOBT.

No comparison can be made with the English pilot as the group analysed by Weller et al (2006) included people who had private colonoscopy in the first round.

Round 2: People who did not complete Round 1

Participation

Immunochemical faecal occult blood test (iFOBT) uptake

During the second screening round, 20,756 eligible people aged 50-74 years living in the WDHB area who had been invited in Round 1, but either did not respond or did not successfully complete an iFOBT kit in Round 1, were invited to participate. This is the denominator population used in the analysis of this section. For all demographic information about the eligible population see the Appendix, Table 1.

Twenty-four percent (n=5,030) of those who received an invitation responded by returning a kit. The majority (n=4,883) returned a successfully completed kit resulting in a participation rate of 23.5%.

For all results, see the Appendix, Table 2.

Participation increased with increasing age

Both male and female participation increased with age.

Participation did not differ by sex

Participation differed by ethnicity

Pacific people and Māori were slightly more likely, and Asians were slightly less likely, to participate than European/Other. This pattern of participation for Pacific people and Māori differs from Round 1 and other Round 2 categories (Figure 12).

Pacific people aged 50-59 and 60-69 years were slightly more likely to participate and Asians aged 70-74 years were 1.5 times less likely to participate than their European/Other counterparts.

Compared to European/Other males, Pacific and Māori males were slightly more likely and Asian males were slightly less likely to participate.

Participation declined with increasing deprivation

Participation among people from the most deprived quintile area (NZDep Index 9-10) was 1.5 times less likely than people from the least deprived quintile area (NZDep Index 1-2).

Trends by age and deprivation were the same as those found in Round 1.

Discussion

Participation in the English pilot was lower among those who did not complete the first screening round (13.6%) than the BSP's 23.5% (Weller et al 2006).

Colonoscopy uptake

Of the Round 2 participants who did not complete Round 1, 6.6% (n=323) had a publicly funded colonoscopy in the WDHB area. The outcomes in this section of the report are only for this group (n=323).

For all results, see the Appendix, Table 3.

Colonoscopy uptake was 79.0%. There were no differences in uptake by age, sex or ethnicity.

Colonoscopy uptake increased with increasing deprivation

Participants living in quintile areas NZDep Index 5-6 and above were 2.5 to almost three times more likely to have had a colonoscopy than those living in the least deprived quintile area (NZDep Index 1-2).

This trend by deprivation was similar to that found in Round 1.

Discussion

Colonoscopy uptake was 75% in England compared to the BSP's 79% (Weller et al 2006).

Outcomes

Immunochemical faecal occult blood test (iFOBT) positivity

Of the Round 2 participants who did not complete Round 1 and successfully completed a kit in the second screening round, 8.4% (n=409) had a positive iFOBT result.

For all results see the Appendix, Table 4e.

Positivity increased with increasing age

Participants aged 70-74 years were more than twice as likely to have a positive iFOBT result as participants aged 50-54 years.

Positivity differed by sex

Males were slightly more likely to have a positive iFOBT result than females.

Females aged 70-74 years were more than twice as likely to have a positive iFOBT as females aged 50-54 years. Males aged from 60-64 years and above were about twice as likely to have a positive iFOBT as 50-54 year-old males.

Asian males were about half as likely to have a positive iFOBT result as European/Other males.

Participants from quintile area NZDep Index 7-8 were more than 1.5 times more likely to have a positive iFOBT result than those from the least deprived quintile area (NZDep Index 1-2).

Trends by age and sex were the same as those found in Round 1.

Detection rates of adenoma, advanced adenoma and colorectal cancer

The outcomes in this section of the report are for all colonoscopies among Round 2 participants who did not complete Round 1, including those carried out in private health care.

Following colonoscopy, 179 participants had at least one adenoma and no cancer detected. There were 75 participants who had at least one advanced adenoma and no cancer detected. Seventeen participants had cancer detected. Some of these participants had more than one type of pathology; only the most serious type was recorded.

The overall detection rate of adenoma was 36.7 per 1,000, advanced adenoma was 15.4 per 1,000, and cancer was 3.5 per 1,000.

For all results see the Appendix, Table 4e.

Detection of adenomas was highest in the oldest age group

Participants aged 70-74 years were more than twice as likely to have an adenoma detected as those aged 50-54 years.

Adenoma detection rates differed by sex

Males were about twice as likely to have an adenoma or advanced adenoma detected as females.

Males aged 60-64 and 65-69 years were about twice as likely to have an adenoma detected as males aged 50-54 years and females of the same ages.

Males aged 55-59 years were almost four times more likely to have an advanced adenoma detected than females of the same age.

Females aged 70-74 years were almost three times as likely to have an adenoma detected as females aged 50-54 years.

Participants aged 70-74 years were 11 times more likely to have cancer detected than those aged 50-54 years.

Adenoma detection rates differed by Asian and Māori ethnicity

Asians were about half as likely to have an adenoma detected as European/Other participants.

Asians aged 50-59 years were 5.5 times less likely to have an adenoma detected as European/Other of the same age.

Māori males were twice as likely to have an adenoma detected as European/Other males.

Asian and Pacific participants were over 6.5 and 3.5 times respectively, less likely to have an advanced adenoma detected than European/Other participants.

Pacific people aged 60-69 years were more than 10 times more likely to have cancer detected than European/Other of the same age; however, the number of cases was small.

Adenoma and advanced adenoma detection rates were highest in the second most deprived quintile area

Participants from quintile area NZDep Index 7-8 were over 1.5 times as likely to have an adenoma detected as those from the least deprived quintile area (NZDep Index 1-2).

Participants from quintile area NZDep Index 7-8 were over three times more likely to have an advanced adenoma detected than those from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex, Asian and Māori ethnicity for adenoma were similar to those found in Round 1.

Positive Predictive Values

The PPV of a positive iFOBT for adenoma was 43.8%, advanced adenoma was 18.3%, and cancer was 4.2%. That is, 47.9% of people who had a positive iFOBT had an adenoma or cancer detected, and 22.5% had an advanced adenoma or cancer detected.

For all results, see the Appendix, Table 5e.

For adenoma, the PPV for males was over 1.5 times higher than for females.

The PPV for females aged 60-64 years was almost 3.5 times higher for adenoma than for those aged 50-54 years.

The PPV for Asians aged 50-59 years was five times less for adenoma than for European/Other 50-59 year olds.

The PPV for female Asians for adenoma was almost four times less than for European/Other females, whereas the PPV for Māori males was over five times higher than for European/Other males.

The PPV for males aged 55-59 years for advanced adenoma was over 4.5 times higher than for females of the same age.

Compared to European/Other participants, the PPV for Asians for advanced adenoma was almost six times lower and for Pacific people 4.5 times lower.

The PPV for participants from quintile area NZDep Index 7-8 was 2.5 times higher for advanced adenoma than for those from the least deprived quintile area (NZDep Index 1-2).

Colorectal cancer

Seventeen participants had cancer detected (3.5 per 1,000 screened; 81.9 per 100,000 invited). This is similar to the cancer detection rate found for Round 1 (3.1 per 1,000 screened). Nine were European/Other, two were Asian, two were Māori and three were Pacific people.[43]

There were five Stage I and five Stage II cancers (24.1 per 100,000 invited), followed by four Stage III (19.3 per 100,000 invited) and one Stage IV cancer (4.8 per 100,000 invited) (Appendix, Table 6).

Two (11.8%) cancers were not staged.

Discussion

The detection rates and PPVs in this group are similar to those in Round 1 and highlight the importance of continuing to invite non-responders and those who do not successfully complete a test kit.

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[43] Ethnicity was unknown for one participant.

Round 2: People not invited in Round 1

Participation

Immunochemical faecal occult blood test (iFOBT) uptake

During the second screening round, 17,168 eligible people aged 50-74 years living in the WDHB area were invited to participate for the first time. This is the denominator population used in the analysis of this section. This population includes people who had become eligible by reaching the minimum age (50 years) or becoming a resident in the WDHB area. Sixty-two percent (n=10,612) of these newly invited people became eligible due to age. For all demographic information about the eligible population, see the Appendix, Table 1.

Forty-two percent (n= 7,232) of those who received an invitation responded by returning a kit. The majority (n=7,134) returned a successfully completed kit resulting in a participation rate of 41.6%.

For all results, see the Appendix, Table 2.

Overall participation was lower than in Round 1 (Table 3, 41.6% vs 56.9%; p<0.01); it was also lower for every age group for both males and females. Most newly invited people were aged 50-54 years with participation of 40.5% compared to 46.1% in Round 1 (p<0.01).

Participation increased with increasing age from 60-64 years

People aged 70-74 years were about twice as likely to participate as people aged 50-54 years. Those aged 55-59 years, particularly females, were slightly less likely to participate than the youngest age group.

Participation differed by sex and ethnicity

Males, particularly those aged 50-54 years, were slightly less likely to participate than females.

Participation was highest among European/Other[44] (46.1%), followed by Asians (44.1%), Māori (35.6%) and Pacific people (28.9%).

Pacific people were almost half as likely and Māori were slightly less likely to participate than European/Other (Figure 12).

Participation among both Pacific males and females and Asian and Māori females was less likely than for their European/Other counterparts.

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[44] Of the 5,092 participants, 4,987 were European and 105 were Other.

Table 3: Participation among 50-54 year olds by ethnicity and sex

	Round 2 Not Invited Round 1 (%)	Round 1 (%)	
50-74 years	41.6	56.9	p<0.01
50-54 years	40.5	46.1	p<0.01
European/Other	44.7	51.1	p<0.01
European/Other females	48.7	53.5	p<0.01
European/Other males	40.4	48.4	p<0.01
Asian	43.3	48.8	p<0.01
Asian females	45.9	50.6	p<0.01
Asian males	39.9	46.3	p<0.01
Pacific	29.5	25.9	p=0.05
Pacific females	32.0	25.9	p=0.02
Pacific males	26.8	25.9	p=0.72
Māori	35.6	37.9	p=0.26
Māori females	37.2	37.0	p=0.95
Māori males	34.0	39.0	p=0.09

Participation among both male and female European/Other and Asians aged 50-54 years was lower than in Round 1. Whilst Pacific participation in this age group was higher than in Round 1, this was of marginal statistical significance. Pacific female participation was higher but there was no difference between rounds for Pacific males. There was no difference in participation by sex among Māori (Table 3 and Figure 21).

Figure 21: Female and male participation among 50-54 year olds by ethnicity, Round 1 and Round 2, Not invited in Round 1
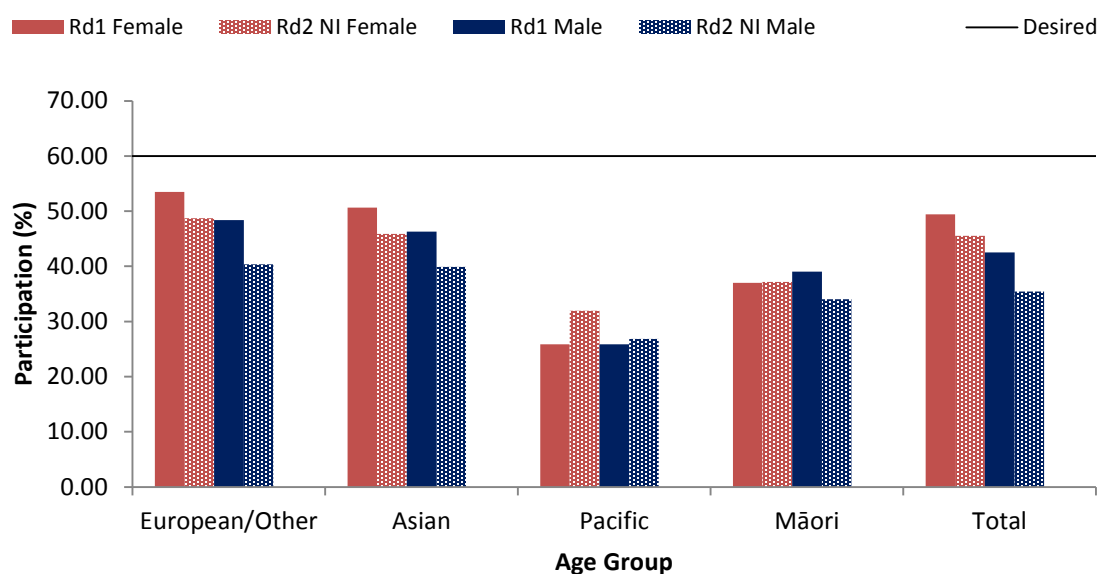
Rd1 - Round 1
Rd2 NI - Round 2, not invited in Round 1

Source: BSP Register

Participation generally declined with increasing deprivation

Participation among people from the most deprived quintile areas (NZDep Index 7-8 and 9-10) was slightly less likely than people from the least deprived quintile area (NZDep Index 1-2).

Trends by age, sex, ethnicity and deprivation were similar to those found in Round 1.

Discussion

Participation among the newly invited in the second round in England was 43.9% compared to the BSP's 41.6%.

Participation was higher in the youngest age group (49-51 years) in England in both rounds – 51.9% in the first and 44.5% in the second round compared to the BSP's 46.1% and 40.5%, respectively, among 50-54 year-olds (Weller et al 2006).

Colonoscopy uptake

Of the Round 2 participants who were not invited in Round 1, 4.3% (n=307) had a publicly funded colonoscopy in the WDHB area. The outcomes in this section of the report are only for this group (n=307).

Colonoscopy uptake was 82.5%.

For all results, see the Appendix, Table 3.

There were no differences in colonoscopy uptake by age, sex, ethnicity or deprivation.

Discussion

Colonoscopy uptake in England among this group was 81.9% compared to 82.5% in the BSP.

Outcomes

Immunochemical faecal occult blood test (iFOBT) positivity

Of the Round 2 participants who were not invited in Round 1 and successfully completed a kit in the second screening round, 5.2% (n=375) had a positive iFOBT result.

For all results see the Appendix, Table 4f.

Positivity increased with increasing age

Participants aged 65-69 and 70-74 years were almost twice as likely to have a positive iFOBT result as participants aged 50-54 years.

Positivity differed by sex and ethnicity

Males were almost 1.5 times more likely to have a positive iFOBT result than females.

Males of every age group and females aged 70-74 years were about twice as likely to have a positive iFOBT result as their 50-54 year-old counterparts.

Pacific people aged 70-74 years were over 10 times as likely to have a positive iFOBT result as their European/Other counterparts; however, the number of cases was small.

Asian and Pacific females were about twice as likely to have a positive iFOBT result as their European/Other counterparts.

Positivity among people from the second most deprived quintile area (NZDep Index 7-8) was over 1.5 times more likely than among people from the least deprived quintile area (NZDep Index 1-2).

Trends by age and sex were the same as those found in Round 1.

Detection rates of adenoma, advanced adenoma and colorectal cancer

The outcomes in this section of the report are for all colonoscopies among those participants in Round 2 who were not invited in Round 1, including those carried out in private health care.

Following colonoscopy, 156 participants had at least one adenoma and no cancer detected. There were 58 participants who had at least one advanced adenoma and no cancer detected. Nine participants had cancer detected. Some of these participants had more than one type of pathology; only the most serious type was recorded.

The overall detection rate of adenoma was 21.9 per 1,000, advanced adenoma was 8.1 per 1,000, and cancer was 1.3 per 1,000.

For all results see the Appendix, Table 4f.

Adenoma detection rates increased with increasing age from 60-64 years

Participants aged 70-74 years were about twice as likely to have an adenoma and almost 10 times more likely to have cancer detected than 50-54 year-old participants, however, the number of cases was small.

Adenoma and advanced adenoma detection rates differed by sex

Males were almost twice as likely to have an adenoma or advanced adenoma detected than females.

Males of every age group were two to over three times more likely to have an adenoma detected than their 50-54 year-old counterparts.

Māori aged 60-69 years were 4.5 times as likely to have an adenoma detected as their European/Other counterparts.

Trends by age and sex were similar to those found in Round 1.

Positive Predictive Values

The PPV of a positive iFOBT for adenoma was 41.9%, advanced adenoma was 15.6%, and cancer was 2.4%. That is, 44.4% of people who had a positive iFOBT had an adenoma or cancer detected, and 18.0% had an advanced adenoma or cancer detected.

For all results, see the Appendix, Table 5f.

The PPV was almost three times as high for adenoma and advanced adenoma among 65-69 year-olds as 50-54 year-olds.

The PPV for males aged 65-69 years was about four times higher for adenoma and advanced adenoma than among 50-54 year-old males.

The PPV for the 50-54 years age group (comprising 74.2% of those who successfully completed an iFOBT in this Round 2 category) was 37.4% for adenoma, 14.0% for

advanced adenoma and 1.2% for cancer. The PPVs for the same age group in Round 1 were 43.0%, 17.5% and 2.3%, respectively.

Colorectal cancer

Nine participants had cancer detected (1.3 per 1,000 screened; 52.4 per 100,000 invited): six were European/Other and three were Asian.

Five of the nine cancers were detected in the 50-59 years age group.

There were six Stage I (34.9 per 100,000 invited), one Stage II (5.8 per 100,000 invited) and two Stage IV cancers (11.6 per 100,000 invited) (Appendix, Table 6).

Adverse Events

There were 64 readmissions for adverse events within 30 days of a completed publicly funded colonoscopy in the WDHB area, comprising 49 in Round 1 and 15 in Round 2[45] (Appendix, Table 7). This represents 1.1% of colonoscopies in Round 1 and 1.0% of colonoscopies in Round 2.

The post-colonoscopy complications of particular concern in colorectal cancer screening are perforation and bleeding which are more common following colonoscopy with polypectomy (Chilton and Rutter 2011).

Round 1

All except four readmissions were associated with the removal of tissue[46] for histopathological examination.

The most common cause for readmission was bleeding (n=27). All these readmissions were associated with tissue removal.

The bleeding rate was 7.9 per 1,000 colonoscopies with tissue removal (6.0 per 1,000 total completed colonoscopies).

There were five readmissions for perforation, four of which were associated with tissue removal.

The perforation rate was 1.2 per 1,000 colonoscopies with tissue removal and 0.9 per 1,000 colonoscopies without tissue removal (1.1 per 1,000 total completed colonoscopies).

The rate for all other complications was 3.8 per 1,000 total completed colonoscopies.

Ninety-two percent of readmissions occurred in participants whose colonoscopy included tissue removal.

Round 2

All except one readmission was associated with the removal of tissue for histopathological examination.

The most common causes for readmission were reasons other than perforation or bleeding (n=8). With the exception of one, they were associated with tissue removal. The rate for all other complications was 5.2 per 1,000 total completed colonoscopies.

All six readmissions for bleeding and one for perforation were associated with tissue removal.

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[45] Round 2 data includes only those eligible participants invited between 1 January 2014 and 31 December 2014.

[46] Tissue removal refers to biopsy and polypectomy.

The bleeding rate was 5.3 per 1,000 colonoscopies with tissue removal (3.9 per 1,000 total completed colonoscopies).

The perforation rate was 0.9 per 1,000 colonoscopies with tissue removal (0.6 per 1,000 total completed colonoscopies).

Ninety-three percent of readmissions occurred in participants whose colonoscopy included tissue removal.

There was no significant difference between the bleeding and perforation rates from colonoscopies with tissue removal between the two rounds.[47]

Discussion

Different definitions for adverse events, particularly for bleeding and follow-up periods, make direct comparisons with other reported data difficult. The number of colonoscopies where tissue is removed also affects the incidence of adverse events.

The UK guidelines give a standard for perforation of less than one in 1,000 colonoscopies and less than one in 500 colonoscopies where polypectomy is carried out. The standard for bleeding is less than one in 100 colonoscopies where polypectomy is carried out (Chilton and Rutter 2011).

Although the BSP slightly exceeded the UK standard for perforation (less than one in 1,000 colonoscopies) in Round 1, it met the UK standard for perforation of less than one in 500 colonoscopies involving polypectomy. Both standards were met in Round 2. The BSP also met the UK standard for bleeding.

The BSP monitoring indicator for perforation or bleeding of less than 10 in 1,000 publicly funded colonoscopies was met in both rounds.

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[47] Bleeding in Round 2 vs Round 1, p=0.38. Perforation in Round 2 vs Round 1, p=0.80.

Conclusion

The results provide information for predicting participation in prevalence and incidence rounds of a national bowel cancer screening programme and for targeting resources to increase iFOBT uptake where it is low.

The Ministry of Health's uptake target was 60% by the end of the four-year BSP. The target was met in Round 1 for European/Other females over 55 years and European/Other males over 60 years, Asian females and males aged 70-74 years, and Māori females aged 70-74 years and Māori males over 65 years. Participation for all age and ethnic groups for both females and males was above 60% among those who completed incidence screening in Round 2.

Participation was highest among European/Other, followed by Asians, Māori and Pacific people. The pattern was the same in both rounds. Although Pacific participation was significantly higher in Round 2, the participation of European/Other and Asians significantly decreased in Round 2. For Māori, it was similar in both rounds.

Participation in Round 2 was statistically significantly lower than in Round 1. Within Round 2 participation varied depending on the screening history of the invited population. Those who had previously participated had a high level of participation in marked contrast to those who had previously not responded or not successfully completed the test kit (82.4% vs 23.5%).

Of concern is the statistically significant decrease in first time participation, from the first round to the second. This highlights the challenge of maintaining a satisfactory level of iFOBT uptake over time.

Excluding the group who participated in incidence screening, the low uptake groups were the same in both rounds: younger age groups, males, the more deprived, Māori and Pacific people.

Overall, males participated slightly less than females. The statistically significantly lower participation of Māori females compared to Māori males in Round 1, and the absence of a sex difference in participation in both rounds for Asians and Pacific people, and Māori in Round 2, were all unexpected. Females are generally better informed than males about the benefits of screening as they are targeted by the national cervical and breast cancer screening programmes.

Males were more likely to have an adenoma, advanced adenoma or cancer detected than females in Round 1. They were also more likely to have an adenoma or advanced adenoma detected in incidence screening than females.

Irrespective of age, sex or ethnicity, adenoma, advanced adenoma and cancer increased with increasing deprivation in Round 1 and in one or both of the two most deprived quintile areas in Round 2.

Positivity, PPVs and detection rates for adenoma and colorectal cancer were all lower in Round 2 than in Round 1. This is not unexpected as 62.8% of participants who successfully completed an iFOBT kit in Round 2 had been previously screened.

The detection rates and PPVs in the Round 2 group who did not complete Round 1 are similar to those in Round 1, highlighting the importance of continuing to invite non-responders and those who do not successfully complete a test kit.

Controlling for age, sex and deprivation, there is evidence that Māori have more neoplasia than European/Other participants. Māori were more likely to have a positive iFOBT result and adenoma detected than European/Other in both prevalence and incidence screening rounds. Māori aged 60-69 years were more likely to have an adenoma detected in prevalence screening[48] than their European/Other counterparts, irrespective of sex and deprivation.

The stage distribution of screen-detected cancers is an important indicator of a screening programme's performance. In incidence screening, the proportion in Stage I is expected to rise and to fall in Stage IV, as cancer is detected earlier. For the first year of Round 2, the number of incident cancers was small and there was no clear decreasing pattern as a third of cancers were Stage III. However, not all cancers were staged.[49]

Non-completion of colonoscopy and post-colonoscopy readmissions were low as was CT colonography uptake as an alternative to colonoscopy.

The occurrence of interval cancers[50] gives an estimate of the iFOBT's sensitivity[51] in the first round. Sensitivity was not estimated as data were available only for the first year of Round 2. It is recommended that sensitivity and specificity[52] are estimated after at least six months has passed since the end of Round 2 invitations.

If a national bowel cancer screening programme is implemented it will be important to closely monitor uptake (particularly in the low uptake groups), positivity, PPVs and detection rates, and adverse events. In the short term, staging distribution of screen-detected cancers can be used to monitor effectiveness until sufficient data exist to evaluate the programme's impact on colorectal cancer incidence and mortality.

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[48] Round 1 and the Round 2 group who were not invited in Round 1.

[49] Five cancers were not staged. However, in one instance there may have been insufficient time by the date of data extraction from the Register for surgery and staging to have occurred.

[50] Interval cancers are cancers that occur between the first and second round of screening among people with a negative iFOBT, or positive iFOBT and normal colonoscopy, in the first round.

[51] Sensitivity is the ability of a test to correctly identify those with disease. A test with high sensitivity will rarely miss those with disease (ie, have a false negative result).

[52] Specificity is the ability of a test to correctly identify those without disease.

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References

Alexander F, Weller D. 2003. *Evaluation of the UK Colorectal Cancer Screening Pilot. Final report.* London: Department of Health.
URL: http://legacy.screening.nhs.uk/policydb_download.php?doc=384 (Accessed 14 January 2016).

Arnold M, Sierra MS, Laversanne M, et al. 2016. Global patterns and trends in colorectal cancer incidence and mortality. *Gut* 0:1-9. doi:10.1136/gutjnl-2015-310912 (Accessed 10 February 2016).

Chilton A, Rutter M (eds). 2011. *Quality assurance guidelines for colonoscopy*. Sheffield: NHS Cancer Screening Programmes.

Hol L, Wilschut JA, van Ballegooijen M. 2009. Screening for colorectal cancer: random comparison of guaiac and immunochemical faecal occult blood testing at different cut-off levels. *British Journal of Cancer* 100:1103-10.

Lansdorp-Vogelaar I, von Karsa L. Chapter 1 Introduction. In: Segnan N, Patnick J, von Karsa L (eds). 2010. *European guidelines for quality assurance in colorectal cancer screening and diagnosis.* Luxembourg: European Commission.

Major D, Bryant H, Delaney M. 2013.Colorectal cancer screening in Canada: results from the first round of screening for five provincial programs. *Current Oncology* 20:252-7.

Ministry of Health. 2015a. *Cancer: New registrations and deaths 2012*.
URL: www.health.govt.nz/publication/cancer-new-registrations-and-deaths-2012 (Accessed 29 January 2016).

Ministry of Health. 2015b. *Selected cancers 2012, 2013 and 2014 (Provisional).*
URL: www.health.govt.nz/publication/selected-cancers-2012-2013-2014 (Accessed 29 January 2016).

Moss S, Ancelle-Park R, Brenner H. Chapter 3 Evaluation and interpretation of screening outcomes. In: Segnan N, Patnick J, von Karsa L (eds). 2010. *European guidelines for quality assurance in colorectal cancer screening and diagnosis.* Luxembourg: European Commission.

National Cancer Institute. 2013. International cancer screening network. Age-adjusted colorectal cancer incidence and mortality rates for 2008 for 32 countries, organized by region of the world, participating in the ICSN.
URL: www.appliedresearch.cancer.gov/icsn/colorectal/mortality.html (Accessed 10 February 2016).

Read D, Shanthakumar M, Borman B. 2014. The Bowel Screening Pilot: Results of the First 18 Months of Round One. In: Litmus, Centre for Public Health Research and Sapere Research Group. 2015. *Interim Evaluation Report of the Bowel Screening Pilot: Screening Round One.* Ministry of Health.
URL: www.health.govt.nz/system/files/documents/publications/interim-evaluation-report-bowel-screening-pilot-jun15.pdf (Accessed 14 January 2016).

Robson B, Cormack D, Purdie G. 2006. *Unequal impact: Māori and non-Māori cancer statistics 1996-2001.* Wellington: Ministry of Health.
URL: www.health.govt.nz/system/files/documents/publications/unequal-impact-maori-nonmaori-cancer-statistics-96-01.pdf (Accessed 10 February 2016).

Segnan N, Patnick J, von Karsa L (eds). 2010. *European guidelines for quality assurance in colorectal cancer screening and diagnosis.* Luxembourg: European Commission.

Weller D, Moss S, Butler P, et al. 2006. *English pilot of bowel cancer screening: an evaluation of the second round. Final report to the Department of Health.* Edinburgh: University of Edinburgh.
URL: http://webarchive.nationalarchives.gov.uk/20150506150512/http://www.cancerscreening.nhs.uk/bowel/pilot-2nd-round-evaluation.pdf (Accessed 14 January 2016).

Weller D, Coleman D, Robertson R, et al. 2007. The UK colorectal cancer screening pilot: results of the second round of screening in England. *British Journal of Cancer* 97:1601-5.

Appendix: BSP Methodology and Analysis

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Barry Borman

The Ministry of Health (the Ministry) supplied the Centre for Public Health Research (CPHR) with the data and approved terms and definitions, and approved the analytical methodology used in the evaluation of the bowel cancer screening pilot (BSP). The analysis follows on from the first round interim analysis (Read et al 2014) and was based on the evaluation of the United Kingdom bowel cancer screening pilot (Weller et al 2007); the *European guidelines for quality assurance in colorectal cancer screening and diagnosis* (Segnan et al 2010); the United Kingdom *Quality assurance guidelines for bowel cancer screening* (Chilton and Rutter 2011); the Ministry's *Bowel screening pilot indicator methodology* (Ministry of Health 2014); and the Ministry's *Bowel screening pilot interim quality standards* (Ministry of Health 2012).

The analysis investigates the complete two year screening in the first round of the BSP, and the first year of screening in the second round.

Interval cancers are those BSP participants who were diagnosed with colorectal cancer after a negative immunochemical faecal occult blood test (iFOBT), or positive iFOBT and normal colonoscopy, result in the two-year interval between the first round screening result and the invitation to the second round screening. As the second round was not completed at the time of data extraction, interval cancers were not analysed and consequently sensitivity was not estimated. Interval cancers based on the first round and the first year of the second round would overestimate sensitivity.

Coverage was not analysed as information solely in the BSP Register cannot estimate it.

Data Source – Bowel Screening Pilot Register

The sole data source used for the epidemiological analysis was the BSP Register. Data were extracted on 16 September 2015.

A colorectal cancer screening service was available to the target population in the Waitemata District Health Board (WDHB) area. There has been a dedicated population register to identify eligible participants, and a Programme Register to store the eligible participant's screening history.

A population-based programme was used for the BSP, aimed at inviting people for screening who are at an average risk from developing colorectal cancer.

The population register data used to identify and invite the target population for the BSP were sourced from the National Health Index (NHI), containing unique identifiers assigned to every person that uses health and disability support services in New Zealand. The NHI includes demographic details about a person such as name, address, sex, ethnicities, date of birth and date of death. It does not include any clinical information about a person.

Screening Test

The screening test used in the BSP was a single sample immunochemical faecal occult blood test. The screening timeframe for the BSP is two years, meaning that eligible people will be recalled for a screening test every two years.

Screening Round

The BSP has been set up with two rounds. In the first round, participants were invited between 1 January 2012 and 31 December 2013. The second round consists of participants invited between 1 January 2014 and 31 December 2015.

Population Base

The NHI captures every person that uses health and disability services in New Zealand. This includes people who are not New Zealand residents, such as overseas visitors and non-residents that live in New Zealand, but are not entitled to publicly funded healthcare.

To avoid over-inflating the identified population with people that were not eligible for publicly funded healthcare, work was undertaken by the Ministry to ensure that only the target population was identified and loaded into the BSP Register.

Target Population

The target population for the BSP Register were men and women aged between 50-74 years at the time of invitation, who were both resident in the WDHB, and eligible for publicly funded healthcare.

Eligible Population

The eligible population for the BSP included men and women aged between 50-74 years at the time of invitation, who were resident in the WDHB area, eligible for publicly funded healthcare, and did not meet the Ministry's ineligibility criteria during their life in the pilot.

Ineligibility Criteria

Reasons for a person to be ineligible for screening included: (1) having had a colonoscopy within the last five years, (2) are on a bowel polyp or bowel cancer surveillance programme, (3) having had or are currently being treated for bowel cancer, (4) having had their large bowel removed, currently being treated for ulcerative colitis or Crohn's Disease, (5) currently awaiting bowel investigations.

Invited Population

The invited population were those members of the eligible population who were sent an invitation for screening by mail. This included people who opted not to respond as well as those that may not have received the invitation.

Of those that fitted the ineligibility criteria, the BSP Register was only able to identify people who had had a colorectal cancer registered in the Cancer Registry in New Zealand. These people were not sent an invitation.

Others fitting the ineligibility criteria were therefore required to opt-out after they received the notification letter or invitation with the kit. These people were then flagged as ineligible in the BSP Register.

Figure A1 depicts the possible pathway process of an eligible participant that went through the BSP.

iFOBT Kits

All returned iFOBT kits were tested at a laboratory and classified as positive (abnormal), negative (normal), or incomplete (spoilt or expired).

For every round, each participant was counted once, regardless of the number of iFOBT kits they returned. A prioritised iFOBT kit result was recorded for a participant based on the following order: Abnormal, Normal, Spoilt, and Expired.

Colonoscopy and Colonography

For every round, each participant was counted once, regardless of the number of follow-up colonoscopies performed. Where more than one colonoscopy was performed, a prioritised colonoscopy result for a participant was recorded based on the following order: Abnormal, Normal, No Result.

The analysis of colonoscopy data did not include participants who had a CT colonography. However, any histopathology results from a participant who had CT colonography were included in consequent analysis.

Figure A1: Bowel Screening Pilot – Pathway Process

EligibleAndOrResponder
Eligible population aged 50-74

FirstKitSentDate
Participant sent a iFOBT kit

No response: Non-responder

PrioritisedKitResultReceiptDate
Participant returns a completed kit

Spoilt/Expired kit

Resend new kit

Positive iFOBT: Abnormal

Negative iFOBT: Normal

Refer investigation

PrioritisedDiagnosticTest_actual + PrioritisedDiagnosticTest_testTy
Colonoscopy

No Colonoscopy or Colonography

Abnormal | Normal | No Result

PrioritisedDiagnosticTest_actual + PrioritisedDiagnosticTest_testTy
CT Colonography

Abnormal | Normal | No Result

PrioritisedHistopathology_resul0
Histopathology

Cancer detected* | Adenoma detected | Other

Advanced Adenoma | Non-advanced Adenoma

* Cancer detection includes 'Adenocarcinoma', 'Cancer', 'Carcinoid', 'Carcinoma', 'Malignant polyp', and 'Squamous cell carcinoma'

Histopathology

Results from the histopathology[53] recorded participants as having a cancer (ie, *'Adenocarcinoma', 'Cancer', 'Carcinoid', 'Carcinoma', 'Malignant polyp',* or *'Squamous cell carcinoma'*) or adenoma (ie, *'Adenoma'*), or other (*'Cancer in situ', 'Other',* or *'Serrated polyp'*).

For every round, each participant was counted once, regardless of the number of follow-up histopathology examinations performed. Where histopathology examinations were

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[53] An updated histopathology result field was used, which was based on information from 'treatment', from the initial biopsy findings at colonoscopy, and from any available staging data.

performed more than once, the prioritised histopathology result for a participant was recorded based on the following order: Cancer, Adenoma, Other.

An adenoma was classified as an advanced adenoma if the field *'PrioritisedHistopathology_Advanced'* was flagged as 'True'. This was a result of either its size being 10mm or greater, or it contained high-grade dysplasia or a villous component (ie, villous or tubulovillous).

Pathway Process in Round 1

The complete pathway of a participant (ie, *invitation –> iFOBT completion –> pre-assessment –> colonoscopy –> histopathology*) took on average three months, with 90% of all participants taking just over six months to complete.

Ninety percent of participants who returned an iFOBT kit did so within three months of being sent their invitation. Ninety percent of participants who had a colonoscopy did so in around three months of returning a positive iFOBT kit result. Ninety-five percent of participants had a histopathology result within two weeks of a specimen being taken at colonoscopy.

Exclusions from the Analysis

The data were extracted from the BSP Register by the Ministry on 16 September 2015. The extract contained data from 248,786 records on the BSP Register from 23 November 2011 – 15 September 2015.

Step 1: Ministry of Health's Ineligibility Flags

There were 12,942 records not flagged as *'EligibleAndOrResponder'* and thus considered ineligible for screening and excluded from the analysis.

A further 21 records were excluded where the *'AgeAtStart'* was either less than 50, or greater than 74.

Step 2: A 36-month Cut-off Period for Invitation Date

A 36-month cut-off period based on the date of invitation from 1 January 2012 – 31 December 2014 was used, allowing for participants invited in the last week of December 2014 to have over eight months (up until 16 September 2015) to progress through the pilot pathway. The findings from the first round interim analysis (Read et al 2014) indicated it was necessary to allow at least six months for participants to complete their pilot pathway from being invited to complete an iFOBT to receiving a histopathology result following colonoscopy.

The cut-off period excluded 449 records invited between 23 November 2011 and 1 January 2012 (as part of the 'soft launch' of the BSP). A further 51,287 records invited between 1 January 2015 and 16 September 2015 were excluded.

The final dataset available for analysis comprised 184,087 records.

Public and Private Healthcare

All analyses of colonoscopy results only included participants who attended a public healthcare facility (ie, either medical facility '24 – Waitakere hospital' or '313 – North Shore hospital') for their colonoscopy. All other facilities were categorised as private healthcare.

All analyses of histopathology results (ie, cancer, adenoma, or other) included participants who attended either a public or private healthcare facility for colonoscopy.

Staging of Colorectal Cancers

Colorectal cancers were staged by the Ministry according to the Tumour/Node/Metastasis (TNM) staging criteria for colorectal cancers.

The stages were:
Stage 1
Stage 2 - Stage 2a, Stage 2b, Stage 2c
Stage 3 - Stage 3a, Stage 3b, Stage 3c
Stage 4 - Stage 4a, Stage 4b

Severity Categorisation of Adverse Events

As per the United Kingdom *Quality assurance guidelines for bowel cancer screening* (Chilton and Rutter 2011), the reasons for readmission were categorised on the basis of the following priority: Perforation, Bleeding, and Other. For example, if a person had perforation and bleeding, they were categorised as perforation.

Self-Selected Participants

The BSP team at WDHB had informed the Ministry of the unreliability of the fields containing information about whether a participant is 'self-enrolled', 'self-registered', or a 'general participant'[54]. Therefore, a separate analysis of self-selected participants was not done, and all participants were evaluated together for the report.

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[54]Ministry of Health, personal communication, 5 October 2015.

Epidemiological Analysis

The analysis of the BSP was based on the evaluation of a similar screening pilot in the United Kingdom (Weller et al 2007), with appropriate modifications made for local context (ie, ethnicity and deprivation (NZDep2013)). The analysis plan was approved by the Ministry on 8 May 2015.

The analysis was carried out on a number of demographic variables: age (in five-year age groups), sex (female, male), ethnicity (European/Other, Asian, Pacific, Māori), and NZDep2013 (decile and quintile groups).

Logistic regression was used to investigate associations between the various demographic variables and measures of uptake and detection. Counts and percentages, together with the associated unadjusted odds ratios and 95% confidence intervals, were calculated for each category of the demographic variables. Adjusted odds ratios and 95% confidence intervals, controlling for the effects of other demographic variables (ie, age group, sex, ethnicity and deprivation quintiles), were also calculated.

Chi-square statistics were calculated to test for any statistically significant differences between Round 1 and Round 2.

Data Processing

The analysis contained data from 1 January 2012 – 16 September 2015, for eligible participants invited from 1 January 2012 – 31 December 2014. The dynamic[55] BSP Register database was extracted and linked to produce a flat file Excel spreadsheet and provided to CPHR on 5 October 2015. Analysis was carried out using the SAS 9.4 programme.

The dataset consisted of one record per person per round in order to produce results on participation, and screening performance. The dataset followed each eligible participant with information recorded about their demography, date of invitation, response date of iFOBT kits, iFOBT kit results, public healthcare service codes for colon examination, whether the examination was a colonoscopy or colonography, colonoscopy and/or colonography results, histopathology examination date and results, including details about neoplasia size and type. Figure 2 below shows a summary of these eligible participants' progression through the pilot.

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[55] From an analytical perspective, the date of extraction from a dynamic database is critical. The same analysis for an extract from a different date may yield different results. In addition, the definition of colorectal cancer has changed over the period of the pilot.

Figure A2. Flow diagram of eligible participants in Round 1 of the Pilot between 1 January 2012 – 31 December 2013
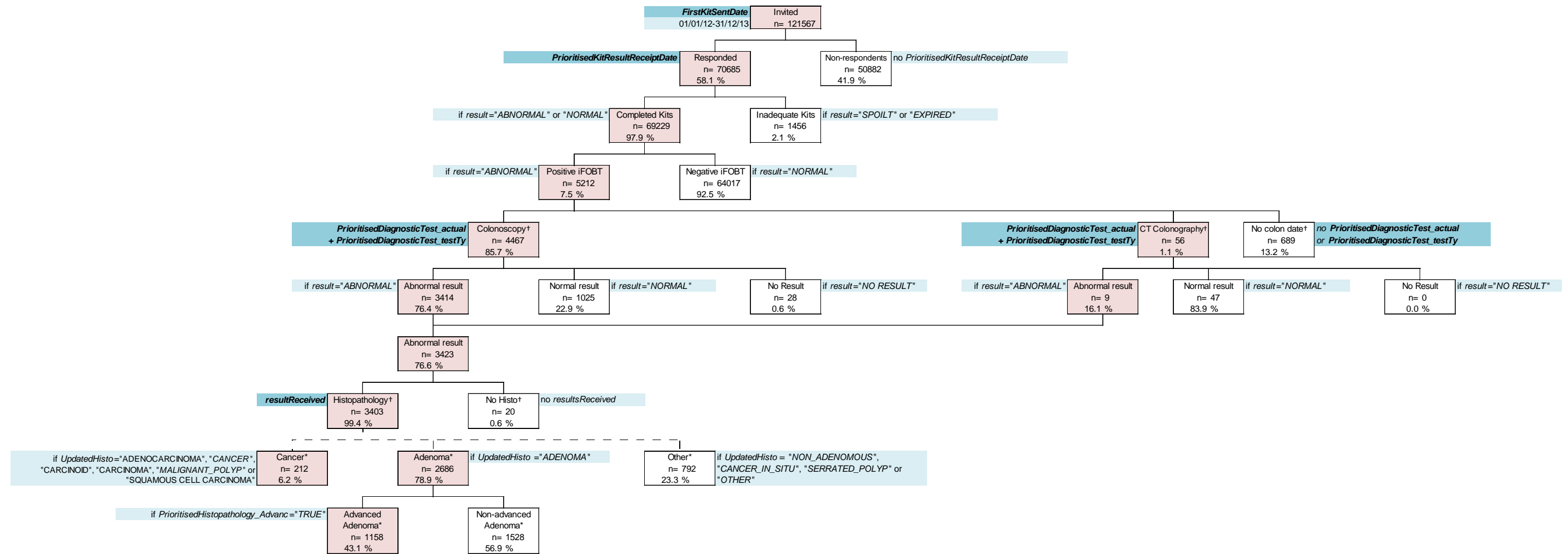
Key:
† WDHB public healthcare facility
* WDHB and other healthcare facilities

Figure A3. Flow diagram of eligible participants in the first year of Round 2 of the Pilot between 1 January 2014 – 31 December 2014

FirstKitSentDate 01/01/14-31/12/14 | Invited n= 62520

PrioritisedKitResultReceiptDate | Responded n= 32613 52.2 % | Non-respondents n= 29907 47.8 % no *PrioritisedKitResultReceiptDate*

if *result="ABNORMAL"* or *"NORMAL"* | Completed Kits n= 32274 99.0 % | Inadequate Kits n= 339 1.0 % if *result="SPOILT"* or *"EXPIRED"*

if *result="ABNORMAL"* | Positive iFOBT n= 1886 5.8 % | Negative iFOBT n= 30388 94.2 % if *result="NORMAL"*

PrioritisedDiagnosticTest_actual + PrioritisedDiagnosticTest_testTy | Colonoscopy† n= 1552 82.3 % | **PrioritisedDiagnosticTest_actual + PrioritisedDiagnosticTest_testTy** | CT Colonography† n= 18 1.0 % | No colon date† n= 316 16.8 % no *PrioritisedDiagnosticTest_actual* or *PrioritisedDiagnosticTest_testTy*

if *result="ABNORMAL"* | Abnormal result n= 1126 72.6 % | Normal result n= 414 26.7 % if *result="NORMAL"* | No Result n= 12 0.8 % if *result="NO RESULT"* | if *result="ABNORMAL"* | Abnormal result n= 0 0.0 % | Normal result n= 18 100.0 % if *result="NORMAL"* | No Result n= 0 0.0 % if *result="NO RESULT"*

Abnormal result n= 1126 72.6 %

resultReceived | Histopathology† n= 1122 99.6 % | No Histo† n= 4 0.4 % no *resultsReceived*

if *UpdatedHisto="ADENOCARCINOMA"*, *"CANCER"*, *"CARCINOID"*, *"CARCINOMA"*, *"MALIGNANT_POLYP"* or *"SQUAMOUS CELL CARCINOMA"* | Cancer* n= 53 4.7 % | Adenoma* n= 802 71.5 % | if *UpdatedHisto ="ADENOMA"* | Other* n= 392 34.9 % | if *UpdatedHisto = "NON_ADENOMOUS"*, *"CANCER_IN_SITU"*, *"SERRATED_POLYP"* or *"OTHER"*

if *PrioritisedHistopathology_Advanc="TRUE"* | Advanced Adenoma* n= 277 34.5 % | Non-advanced Adenoma* n= 525 65.5 %

Key:
† WDHB public healthcare facility
* WDHB and other healthcare facilities

Indicator Variables

The analysis was based on the eligible participants being categorised by the following indicators:

Indicator	Defined by
Round 1	Pilot round number = 'Round 1'
Round 2	Pilot round number = 'Round 2'
Round 2 – Completed Round 1	Pilot round number = 'Round 2' and Denominator Inclusion = 'IncidenceDenominator'
Round 2 – Did not complete Round 1	Pilot round number = 'Round 2' and Denominator Inclusion = 'PrevalenceDenominator' and Person episode number = '2'
Round 2 – Not invited in Round 1	Pilot round number = 'Round 2' and Denominator Inclusion = 'PrevalenceDenominator' and Person episode number = '1'
Invited	Sent date of first kit
Responded	Receipt date of prioritised iFOBT kit result
Completed kit	'Abnormal' or 'Normal' prioritised iFOBT kit result
Positive iFOBT	'Abnormal' prioritised iFOBT kit result
Colonoscopy	Actual date of diagnostic test and type of test is 'Colonoscopy'
Colonography	Actual date of diagnostic test and type of test is 'Virtual CT Colonography'
Histopathology	Date prioritised histopathology result was received
Adenoma	Updated prioritised histopathology result of 'Adenoma'
Advanced Adenoma	Updated prioritised histopathology result of 'Adenoma' and 'PrioritisedHistopathology_Advanced' flagged as 'True' (ie, either of: size≥10mm, high grade dysplasia, or a villous component)
Cancer[56]	Updated prioritised histopathology result of 'Adenocarcinoma', 'Cancer', 'Carcinoid', 'Carcinoma', 'Malignant polyp', or 'Squamous cell carcinoma'
Public healthcare facility	Prioritised Medical Facility ID with '24' (Waitakere hospital) or '313' (North Shore hospital) categorised as 'WDHB' public healthcare facility. All other facility IDs were categorised as 'other' healthcare for the analyses.

Demographic Factors Affecting Indicator Variables

Demographic factor	Comment
Age	Grouped into five-year age bands ranging from 50-54 years to 70-74 years
Sex	"Unknown" was recoded as a missing value
Ethnicity	Prioritised by: Māori, Pacific, Asian, European/Other and Unknown. "Unknown" was recoded as a missing value
Deprivation	Deciles ranging from 1 (least deprived) to 10 (most deprived) Grouped by quintiles ranging from 1 (NZDep of 1 and 2 combined) to 5 (NZDep of 9 and 10 combined). "Unknown" was recoded as a missing value

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[56] As defined by the Ministry as at 30 September 2015.

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Other Definitions in the Analysis

- Screening Round 1 – The first round of the screening was run for a two-year period, from 1 January 2012 – 31 December 2013.
- Screening Round 2 – The second round of the screening was run for a two-year period, from 1 January 2014 – 31 December 2015. As the extracted dataset lies within this timeframe, the analysis was conducted for the first year of this screening round.
- Uptake / Overall Participation – This is the percentage of participants with a successfully completed iFOBT kit result out of all those who received an invitation with an iFOBT kit.
- Positivity Rate – This is the percentage of participants with a positive iFOBT kit result out of all those who returned a successfully completed iFOBT kit.
- Adenoma Detection Rate – This is the number of participants diagnosed with any adenoma per 1,000 screened with an iFOBT kit result available.
- Advanced Adenoma Detection Rate – This is the number of participants diagnosed with any advanced adenoma per 1,000 screened with an iFOBT kit result available.
- Colorectal Cancer Detection Rate – This is the number of participants diagnosed with any colorectal cancer per 1,000 screened with an iFOBT kit result available.
- Positive Predictive Value of Positive iFOBT:
  - → for Adenoma – This is the percentage of participants with any adenoma in those having a positive iFOBT kit result.
  - → for Advanced Adenoma – This is the percentage of participants with an advanced adenoma in those having a positive iFOBT kit result.
  - → for Cancer – This is the percentage of participants with cancer in those having a positive iFOBT kit result.
- Colorectal Cancer Stage at Diagnosis (including polyp cancers) – This is the Tumour/Node/Metastasis (TNM) staging for detected colorectal cancer. In cases where more than one staging was given for an individual, only the most serious staging result was included.

Reference Group – When comparing demographic variables that did not have any natural ordering (eg, sex and ethnicity) and how they affect the indicator outcomes, the reference was based on the group with the most participants. Where a variable had a natural order (eg, age and NZDep2013), the reference chosen was the lowest in the category. This also helped avoid making comparisons within a variable against a relatively small group.

References

Chilton A, Rutter M (eds). 2011. *Quality assurance guidelines for colonoscopy.* Sheffield: NHS Cancer Screening Programmes.

Ministry of Health. 2014. *Bowel Screening Pilot Indicator Methodology.* Wellington: Ministry of Health.

Ministry of Health. 2012. *Bowel Screening Pilot Interim Quality Standards version 2.0.* Wellington: Ministry of Health.

Read D, Shanthakumar M, Borman B. 2014. The Bowel Screening Pilot: Results of the First 18 Months of Round One. In: Litmus, Centre for Public Health Research and Sapere Research Group. 2015. *Interim Evaluation Report of the Bowel Screening Pilot: Screening Round One.* Ministry of Health. URL: www.health.govt.nz/system/files/documents/publications/interim-evaluation-report-bowel-screening-pilot-jun15.pdf (Accessed 14 January 2016)

Segnan N, Patnick J, von Karsa L (eds). 2010. *European guidelines for quality assurance in colorectal cancer screening and diagnosis.* Luxembourg: European Commission.

Weller D, Coleman D, Robertson R, et al. 2007. The UK colorectal cancer screening pilot: results of the second round of screening in England. *British Journal of Cancer*, 97:1601-5.

Tables

Table 1. Demographic information (after exclusion criteria)

Table 2. Uptake of screening by demographic factors

Table 3. Uptake of colonoscopy by demographic factors

Table 4a. Screening outcomes (Positivity and Detection) by demographic factors in Round 1

Table 4b. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2

Table 4c. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2, who completed Round 1

Table 4d. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2, who completed Round 1 with negative iFOBT

Table 4e. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2, who did not complete Round 1

Table 4f. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2, who were not invited in Round 1

Table 5a. Positive Predictive Value of Positive iFOBT by demographic factors in Round 1

Table 5b. Positive Predictive Value of Positive iFOBT by demographic factors in the first year of Round 2

Table 5c. Positive Predictive Value of Positive iFOBT by demographic factors in the first year of Round 2, who completed Round 1

Table 5d. Positive Predictive Value of Positive iFOBT by demographic factors in the first year of Round 2, who completed Round 1 with negative iFOBT

Table 5e. Positive Predictive Value of Positive iFOBT by demographic factors in the first year of Round 2, who did not complete Round 1

Table 5f. Positive Predictive Value of Positive iFOBT by demographic factors in the first year of Round 2, who were not invited in Round 1

Table 6. The Tumour/Node/Metastases (TNM) stages of detected colorectal cancers

Table 7. Adverse events (Readmissions within 30 days of BSP colonoscopy)

Table 8. Time to colonoscopy

Table 1. Demographic information (after exclusion criteria)

	Round 1 Invited[1] n	%	Round 1 Responders[2] n	%	Round 2 Invited[3] n	%	Round 2 Responders[4] n	%	R2 Completed R1 Invited[3] n	%	R2 Completed R1 Responders[4] n	%	R2 Completed R1 neg iFOBT Invited[3] n	%	R2 Completed R1 neg iFOBT Responders[4] n	%	R2 Completed R1 pos iFOBT no colonoscopy Invited[3] n	%	R2 Completed R1 pos iFOBT no colonoscopy Responders[4] n	%	R2 Did not complete R1 Invited[3] n	%	R2 Did not complete R1 Responders[4] n	%	R2 Not invited in R1 Invited[3] n	%	R2 Not invited in R1 Responders[4] n	%
Total	121567	-	70685	-	62520	-	32613	-	24596	-	20351	-	24533	-	20324	-	63	-	27	-	20756	-	5030	-	17168	-	7232	-
Age (years)																												
50-54	36326	29.88	17225	24.37	21787	34.85	9387	28.78	3867	15.72	2970	14.59	3860	15.69	2967	14.58	7	0.03	3	0.01	4865	23.44	1035	20.58	13055	76.04	5382	74.42
55-59	28045	23.07	15045	21.28	13741	21.98	6649	20.39	6008	24.43	4692	23.06	6002	24.40	4690	23.05	6	0.02	2	0.01	6215	29.94	1396	27.75	1518	8.84	561	7.76
60-64	24198	19.91	14737	20.85	11177	17.88	6278	19.25	5577	22.67	4659	22.89	5559	22.60	4652	22.86	18	0.07	7	0.03	4525	21.80	1134	22.54	1075	6.26	485	6.71
65-69	19665	16.18	13193	18.66	9395	15.03	5919	18.15	5261	21.39	4575	22.48	5244	21.32	4568	22.45	17	0.07	7	0.03	3213	15.48	883	17.55	921	5.36	461	6.37
70-74	13333	10.97	10485	14.83	6420	10.27	4380	13.43	3883	15.79	3455	16.98	3868	15.73	3447	16.94	15	0.06	8	0.04	1938	9.34	582	11.57	599	3.49	343	4.74
Sex																												
Female	63303	52.07	38231	54.09	32195	51.50	17843	54.71	13459	54.72	11287	55.46	13428	54.59	11271	55.38	31	0.13	16	0.08	10104	48.68	2543	50.56	8632	50.28	4013	55.49
Male	58259	47.92	32452	45.91	30321	48.50	14770	45.29	11136	45.28	9064	44.54	11104	45.15	9053	44.48	32	0.13	11	0.05	10651	51.32	2487	49.44	8534	49.71	3219	44.51
Indeterminate/Unknown[ε]	5	0.00	2	0.00	4	0.01	0	0.00	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	2	0.01	0	0.00
Age (years) - Sex																												
50-54																												
Female	19089	15.70	9658	13.66	11119	17.78	5272	16.17	2185	8.88	1701	8.36	2182	8.87	1699	8.35	3	0.01	2	0.01	2349	11.32	522	10.38	6585	38.36	3049	42.16
Male	17236	14.18	7566	10.70	10666	17.06	4115	12.62	1682	6.84	1269	6.24	1678	6.82	1268	6.23	4	0.02	1	0.00	2516	12.12	513	10.20	6468	37.67	2333	32.26
Indeterminate/Unknown[ε]	1	0.00	1	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	0.01	0	0.00
55-59																												
Female	14693	12.09	8308	11.75	7174	11.47	3702	11.35	3376	13.73	2698	13.26	3373	13.71	2696	13.25	3	0.01	2	0.01	3072	14.80	716	14.23	726	4.23	288	3.98
Male	13350	10.98	6736	9.53	6566	10.50	2947	9.04	2631	10.70	1994	9.80	2628	10.68	1994	9.80	3	0.01	0	0.00	3143	15.14	680	13.52	792	4.61	273	3.77
Indeterminate/Unknown[ε]	2	0.00	1	0.00	1	0.00	0	0.00	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
60-64																												
Female	12469	10.26	7905	11.18	5714	9.14	3412	10.46	3028	12.31	2593	12.74	3019	12.27	2587	12.71	9	0.04	6	0.03	2147	10.34	560	11.13	539	3.14	259	3.58
Male	11728	9.65	6832	9.67	5463	8.74	2866	8.79	2549	10.36	2066	10.15	2540	10.33	2065	10.15	9	0.04	1	0.00	2378	11.46	574	11.41	536	3.12	226	3.13
Indeterminate/Unknown[ε]	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
65-69																												
Female	10195	8.39	6971	9.86	4864	7.78	3170	9.72	2851	11.59	2490	12.24	2842	11.55	2488	12.23	9	0.04	2	0.01	1543	7.43	442	8.79	470	2.74	238	3.29
Male	9469	7.79	6222	8.80	4530	7.25	2749	8.43	2410	9.80	2085	10.25	2402	9.77	2080	10.22	8	0.03	5	0.02	1669	8.04	441	8.77	451	2.63	223	3.08
Indeterminate/Unknown[ε]	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00
70-74																												
Female	6857	5.64	5389	7.62	3324	5.32	2287	7.01	2019	8.21	1805	8.87	2012	8.18	1801	8.85	7	0.03	4	0.02	993	4.78	303	6.02	312	1.82	179	2.48
Male	6476	5.33	5096	7.21	3096	4.95	2093	6.42	1864	7.58	1650	8.11	1856	7.55	1646	8.09	8	0.03	4	0.02	945	4.55	279	5.55	287	1.67	164	2.27
Indeterminate/Unknown[ε]	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Sex - Age (years)																												
Female: 50-54	19089	15.70	9658	13.66	11119	17.78	5272	16.17	2185	8.88	1701	8.36	2182	8.87	1699	8.35	3	0.01	2	0.01	2349	11.32	522	10.38	6585	38.36	3049	42.16
Female: 55-59	14693	12.09	8308	11.75	7174	11.47	3702	11.35	3376	13.73	2698	13.26	3373	13.71	2696	13.25	3	0.01	2	0.01	3072	14.80	716	14.23	726	4.23	288	3.98
Female: 60-64	12469	10.26	7905	11.18	5714	9.14	3412	10.46	3028	12.31	2593	12.74	3019	12.27	2587	12.71	9	0.04	6	0.03	2147	10.34	560	11.13	539	3.14	259	3.58
Female: 65-69	10195	8.39	6971	9.86	4864	7.78	3170	9.72	2851	11.59	2490	12.24	2842	11.55	2488	12.23	9	0.04	2	0.01	1543	7.43	442	8.79	470	2.74	238	3.29
Female: 70-74	6857	5.64	5389	7.62	3324	5.32	2287	7.01	2019	8.21	1805	8.87	2012	8.18	1801	8.85	7	0.03	4	0.02	993	4.78	303	6.02	312	1.82	179	2.48
Male: 50-54	17236	14.18	7566	10.70	10666	17.06	4115	12.62	1682	6.84	1269	6.24	1678	6.82	1268	6.23	4	0.02	1	0.00	2516	12.12	513	10.20	6468	37.67	2333	32.26
Male: 55-59	13350	10.98	6736	9.53	6566	10.50	2947	9.04	2631	10.70	1994	9.80	2628	10.68	1994	9.80	3	0.01	0	0.00	3143	15.14	680	13.52	792	4.61	273	3.77
Male: 60-64	11728	9.65	6832	9.67	5463	8.74	2866	8.79	2549	10.36	2066	10.15	2540	10.33	2065	10.15	9	0.04	1	0.00	2378	11.46	574	11.41	536	3.12	226	3.13
Male: 65-69	9469	7.79	6222	8.80	4530	7.25	2749	8.43	2410	9.80	2085	10.25	2402	9.77	2080	10.22	8	0.03	5	0.02	1669	8.04	441	8.77	451	2.63	223	3.08
Male: 70-74	6476	5.33	5096	7.21	3096	4.95	2093	6.42	1864	7.58	1650	8.11	1856	7.55	1646	8.09	8	0.03	4	0.02	945	4.55	279	5.55	287	1.67	164	2.27
Indeterminate/Unknown[ε]: 50-54	1	0.00	1	0.00	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	0.01	0	0.00
Indeterminate/Unknown[ε]: 55-59	2	0.00	1	0.00	1	0.00	0	0.00	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Indeterminate/Unknown[ε]: 60-64	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Indeterminate/Unknown[ε]: 65-69	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00
Indeterminate/Unknown[ε]: 70-74	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ethnicity																												
European/Other	88265	72.61	56651	80.15	44585	71.31	25485	78.14	20114	81.78	16790	82.50	20067	81.59	16771	82.41	47	0.19	19	0.09	13429	64.70	3537	70.32	11042	64.32	5158	71.32
* European*	*86595*	*98.11*	*55886*	*98.65*	*43657*	*97.92*	*25123*	*98.58*	*19863*	*98.75*	*16587*	*98.79*	*19816*	*98.75*	*16568*	*98.79*	*47*	*100.00*	*19*	*100.00*	*13107*	*97.60*	*3485*	*98.53*	*10687*	*96.79*	*5051*	*97.93*
* Other*	*1670*	*1.89*	*765*	*1.35*	*928*	*2.08*	*362*	*1.42*	*251*	*1.25*	*203*	*1.21*	*251*	*1.25*	*203*	*1.21*	*0*	*0.00*	*0*	*0.00*	*322*	*2.40*	*52*	*1.47*	*355*	*3.21*	*107*	*2.07*
Asian	16678	13.72	9168	12.97	8892	14.22	4400	13.49	2961	12.04	2344	11.52	2955	12.01	2341	11.50	6	0.02	3	0.01	2808	13.53	664	13.20	3123	18.19	1392	19.25
Pacific	6043	4.97	1939	2.74	3183	5.09	1191	3.65	569	2.31	449	2.21	568	2.31	448	2.20	1	0.00	1	0.00	1645	7.93	458	9.11	969	5.64	284	3.93
Māori	5693	4.68	2702	3.82	2963	4.74	1382	4.24	916	3.72	750	3.69	909	3.70	746	3.67	7	0.03	4	0.02	1156	5.57	308	6.12	891	5.19	324	4.48
Unknown[ε]	4888	4.02	225	0.32	2897	4.63	155	0.48	36	0.15	18	0.09	34	0.14	18	0.09	2	0.01	0	0.00	1718	8.28	63	1.25	1143	6.66	74	1.02
Age (years) - Ethnicity																												
50-59																												
European/Other	44107	36.28	24406	34.53	24116	38.57	11846	36.32	7646	31.09	5956	29.27	7639	31.06	5953	29.25	7	0.03	3	0.01	7083	34.13	1670	33.20	9387	54.68	4220	58.35
Asian	10018	8.24	5241	7.41	5586	8.93	2611	8.01	1479	6.01	1143	5.62	1476	6.00	1142	5.61	3	0.01	1	0.00	1548	7.46	342	6.80	2559	14.91	1126	15.57
Pacific	3583	2.95	1001	1.42	1968	3.15	675	2.07	269	1.09	203	1.00	268	1.09	202	0.99	1	0.00	1	0.00	855	4.12	222	4.41	844	4.92	250	3.46
Māori	3678	3.03	1530	2.16	2012	3.22	815	2.50	465	1.89	356	1.75	464	1.89	356	1.75	1	0.00	0	0.00	737	3.55	172	3.42	810	4.72	287	3.97
Unknown[ε]	2985	2.46	92	0.13	1846	2.95	89	0.27	16	0.07	4	0.02	15	0.06	4	0.02	1	0.00	0	0.00	857	4.13	25	0.50	973	5.67	60	0.83
60-69																												
European/Other	33245	27.35	23178	32.79	15329	24.52	9865	30.25	9052	36.80	7780	38.23	9025	36.69	7771	38.18	27	0.11	9	0.04	5064	24.40	1441	28.65	1213	7.07	644	8.90
Asian	5336	4.39	3024	4.28	2643	4.23	1426	4.37	1171	4.76	939	4.61	1168	4.75	937	4.60	3	0.01	2	0.01	996	4.80	254	5.05	476	2.77	233	3.22
Pacific	2017	1.66	748	1.06	955	1.53	407	1.25	240	0.98	196	0.96	240	0.98	196	0.96	0	0.00	0	0.00	617	2.97	185	3.68	98	0.57	26	0.36
Māori	1639	1.35	896	1.27	783	1.25	445	1.36	359	1.46	307	1.51	354	1.44	304	1.49	5	0.02	3	0.01	351	1.69	105	2.09	73	0.43	33	0.46
Unknown[ε]	1626	1.34	84	0.12	862	1.38	54	0.17	16	0.07	12	0.06	16	0.07	12	0.06	0	0.00	0	0.00	710	3.42	32	0.64	136	0.79	10	0.14
70-74																												
European/Other	10913	8.98	9067	12.83	5140	8.22	3774	11.57	3416	13.89	3054	15.01	3403	13.84	3047	14.97	13	0.05	7	0.03	1282	6.18	426	8.47	442	2.57	294	4.07
Asian	1324	1.09	903	1.28	663	1.06	363	1.11	311	1.26	262	1.29	311	1.26	262	1.29	0	0.00	0	0.00	264	1.27	68	1.35	88	0.51	33	0.46
Pacific	443	0.36	190	0.27	260	0.42	109	0.33	60	0.24	50	0.25	60	0.24	50	0.25	0	0.00	0	0.00	173	0.83	51	1.01	27	0.16	8	0.11
Māori	376	0.31	276	0.39	168	0.27	122	0.37	92	0.37	87	0.43	91	0.37	86	0.42	1	0.00	1	0.00	68	0.33	31	0.62	8	0.05	4	0.06
Unknown[ε]	277	0.23	49	0.07	189	0.30	12	0.04	4	0.02	2	0.01	3	0.01	2	0.01	1	0.00	0	0.00	151	0.73	6	0.12	34	0.20	4	0.06
Sex - Ethnicity																												
Female: European/Other	46181	37.99	30397	43.00	23148	37.02	13836	42.42	10902	44.32	9240	45.40	10876	44.22	9226	45.33	26	0.11	14	0.07	6582	31.71	1740	34.59	5664	32.99	2856	39.49
Female: Asian	9471	7.79	5262	7.44	5066	8.10	2565	7.86	1716	6.98	1368	6.72	1714	6.97	1367	6.72	2	0.01	1	0.00	1573	7.58	379	7.53	1777	10.35	818	11.31

Female: Pacific	3300	2.71	1027	1.45	1737	2.78	651	2.00	311	1.26	247	1.21	310	1.26	246	1.21	1	0.00	1	0.00	909	4.38	249	4.95	517	3.01	155	2.14
Female: Māori	3231	2.66	1483	2.10	1631	2.61	767	2.35	520	2.11	427	2.10	519	2.11	427	2.10	1	0.00	0	0.00	657	3.17	166	3.30	454	2.64	174	2.41
Female: Unknown£	1120	0.92	62	0.09	613	0.98	24	0.07	10	0.04	5	0.02	9	0.04	5	0.02	1	0.00	0	0.00	383	1.85	9	0.18	220	1.28	10	0.14
Male: European/Other	42083	34.62	26253	37.14	21435	34.29	11649	35.72	9211	37.45	7550	37.10	9190	37.36	7545	37.07	21	0.09	5	0.02	6847	32.99	1797	35.73	5377	31.32	2302	31.83
Male: Asian	7206	5.93	3906	5.53	3826	6.12	1835	5.63	1245	5.06	976	4.80	1241	5.05	974	4.79	4	0.02	2	0.01	1235	5.95	285	5.67	1346	7.84	574	7.94
Male: Pacific	2742	2.26	912	1.29	1445	2.31	540	1.66	258	1.05	202	0.99	258	1.05	202	0.99	0	0.00	0	0.00	735	3.54	209	4.16	452	2.63	129	1.78
Male: Māori	2461	2.02	1218	1.72	1332	2.13	615	1.89	396	1.61	323	1.59	390	1.59	319	1.57	6	0.02	4	0.02	499	2.40	142	2.82	437	2.55	150	2.07
Male: Unknown£	3767	3.10	163	0.23	2283	3.65	131	0.40	26	0.11	13	0.06	25	0.10	13	0.06	1	0.00	0	0.00	1335	6.43	54	1.07	922	5.37	64	0.88
Unknown£: European/Other	1	0.00	1	0.00	2	0.00	0	0.00	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00
Unknown£: Asian	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Unknown£: Pacific	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00
Unknown£: Māori	1	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Unknown£: Unknown£	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00
Deprivation Index (NZDep)																												
1 (least)	16665	13.71	10359	14.66	8691	13.90	4885	14.98	3806	15.47	3168	15.57	3802	15.46	3165	15.55	4	0.02	3	0.01	2610	12.57	683	13.58	2275	13.25	1034	14.30
2	19281	15.86	11779	16.66	9890	15.82	5406	16.58	4102	16.68	3394	16.68	4097	16.66	3392	16.67	5	0.02	2	0.01	3070	14.79	800	15.90	2718	15.83	1212	16.76
3	17418	14.33	10484	14.83	8758	14.01	4692	14.39	3567	14.50	2948	14.49	3557	14.46	2943	14.46	10	0.04	5	0.02	2735	13.18	678	13.48	2456	14.31	1066	14.74
4	14560	11.98	8694	12.30	7523	12.03	4002	12.27	2987	12.14	2478	12.18	2976	12.10	2473	12.15	11	0.04	5	0.02	2332	11.24	546	10.85	2204	12.84	978	13.52
5	15705	12.92	9465	13.39	8051	12.88	4310	13.22	3339	13.58	2793	13.72	3332	13.55	2790	13.71	7	0.03	3	0.01	2579	12.43	610	12.13	2133	12.42	907	12.54
6	11261	9.26	6686	9.46	5771	9.23	3096	9.49	2329	9.47	1955	9.61	2318	9.42	1952	9.59	11	0.04	3	0.01	1917	9.24	491	9.76	1525	8.88	650	8.99
7	8028	6.60	4079	5.77	4243	6.79	1982	6.08	1423	5.79	1163	5.71	1420	5.77	1161	5.70	3	0.01	2	0.01	1610	7.76	358	7.12	1210	7.05	461	6.37
8	8563	7.04	4377	6.19	4231	6.77	1944	5.96	1407	5.72	1131	5.56	1400	5.69	1130	5.55	7	0.03	1	0.00	1705	8.21	390	7.75	1119	6.52	423	5.85
9	9394	7.73	4467	6.32	5014	8.02	2174	6.67	1556	6.33	1256	6.17	1551	6.31	1253	6.16	5	0.02	3	0.01	2030	9.78	440	8.75	1428	8.32	478	6.61
10 (most)	639	0.53	260	0.37	321	0.51	111	0.34	72	0.29	57	0.28	72	0.29	57	0.28	0	0.00	0	0.00	158	0.76	33	0.66	91	0.53	21	0.29
Unknown£	53	0.04	35	0.05	27	0.04	11	0.03	8	0.03	8	0.04	8	0.03	8	0.04	0	0.00	0	0.00	10	0.05	1	0.02	9	0.05	2	0.03
Deprivation Index (NZDep) in quintiles																												
1 (least)	35946	29.57	22138	31.32	18581	29.72	10291	31.55	7908	32.15	6562	32.24	7899	32.11	6557	32.22	9	0.04	5	0.02	5680	27.37	1483	29.48	4993	29.08	2246	31.06
2	31978	26.30	19178	27.13	16281	26.04	8694	26.66	6554	26.65	5426	26.66	6533	26.56	5416	26.61	21	0.09	10	0.05	5067	24.41	1224	24.33	4660	27.14	2044	28.26
3	26966	22.18	16151	22.85	13822	22.11	7406	22.71	5668	23.04	4748	23.33	5650	22.97	4742	23.30	18	0.07	6	0.03	4496	21.66	1101	21.89	3658	21.31	1557	21.53
4	16591	13.65	8456	11.96	8474	13.55	3926	12.04	2830	11.51	2294	11.27	2820	11.47	2291	11.26	10	0.04	3	0.01	3315	15.97	748	14.87	2329	13.57	884	12.22
5 (most)	10033	8.25	4727	6.69	5335	8.53	2285	7.01	1628	6.62	1313	6.45	1623	6.60	1310	6.44	5	0.02	3	0.01	2188	10.54	473	9.40	1519	8.85	499	6.90
Unknown£	53	0.04	35	0.05	27	0.04	11	0.03	8	0.03	8	0.04	8	0.03	8	0.04	0	0.00	0	0.00	10	0.05	1	0.02	9	0.05	2	0.03

£ Unknown responses were coded as missing values

[1] People who received an invitation and immunochemical Faecal Occult Blood Test (iFOBT) kit between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

[2] People who responded to the invitation with a completed immunochemical Faecal Occult Blood Test (iFOBT) kit between 01 Jan 2012 and 16 Sep 2015, and did not meet the exclusion criteria

[3] People who received an invitation and immunochemical Faecal Occult Blood Test (iFOBT) kit between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

[4] People who responded to the invitation with a completed immunochemical Faecal Occult Blood Test (iFOBT) kit between 01 Jan 2014 and 16 Sep 2015, and did not meet the exclusion criteria

Table 2. Uptake of screening by demographic factors

| | Round 1 | | | | | | | Round 2 | | | | | | | Round 2 - Completed Round 1 | | | | | | | |
	Number invited[1]	Responders[2] n	%	Responders with completed kits[3] n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Number invited[4]	Responders[5] n	%	Responders with completed kits[6] n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Number invited[4]	Responders[5] n	%	Responders with completed kits[6] n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Number invited[4]
Total	121567	70685	58.14	69229	56.95	-	-	62520	32613	52.16	32274	51.62	-	-	24596	20351	82.74	20257	82.36	-	-	24533
Age (years)																						
50-54	36326	17225	47.42	16763	46.15	Reference	Reference	21787	9387	43.09	9249	42.45	Reference	Reference	3867	2970	76.80	2958	76.49	Reference	Reference	3860
55-59	28045	15045	53.65	14704	52.43	1.29 (1.25, 1.33) 0.0000 ***	1.29 (1.25, 1.33) 0.0000 ***	13741	6649	48.39	6578	47.87	1.24 (1.19, 1.30) 0.0000 ***	1.23 (1.18, 1.29) 0.0000 ***	6008	4692	78.10	4663	77.61	1.07 (0.97, 1.17) 0.1957	1.07 (0.97, 1.17) 0.1903	6002
60-64	24198	14737	60.90	14464	59.77	1.73 (1.68, 1.79) 0.0000 ***	1.73 (1.67, 1.79) 0.0000 ***	11177	6278	56.17	6223	55.68	1.70 (1.63, 1.78) 0.0000 ***	1.70 (1.62, 1.78) 0.0000 ***	5577	4659	83.54	4643	83.25	1.53 (1.38, 1.69) 0.0000 ***	1.52 (1.37, 1.69) 0.0000 ***	5559
65-69	19665	13193	67.09	12978	66.00	2.26 (2.18, 2.35) 0.0000 ***	2.19 (2.11, 2.28) 0.0000 ***	9395	5919	63.00	5871	62.49	2.26 (2.15, 2.37) 0.0000 ***	2.22 (2.11, 2.34) 0.0000 ***	5261	4575	86.96	4549	86.47	1.96 (1.76, 2.19) 0.0000 ***	1.94 (1.74, 2.16) 0.0000 ***	5244
70-74	13333	10485	78.64	10320	77.40	4.00 (3.82, 4.18) 0.0000 ***	3.82 (3.64, 4.01) 0.0000 ***	6420	4353	68.22	4353	67.80	2.85 (2.69, 3.03) 0.0000 ***	2.79 (2.62, 2.96) 0.0000 ***	3883	3455	88.98	3444	88.69	2.41 (2.13, 2.73) 0.0000 ***	2.39 (2.11, 2.71) 0.0000 ***	3868
Sex																						
Female	63303	38231	60.39	37498	59.24	Reference	Reference	32195	17843	55.42	17674	54.90	Reference	Reference	13459	11287	83.86	11243	83.54	Reference	Reference	13428
Male	58259	32452	55.70	31729	54.46	0.82 (0.80, 0.84) 0.0000 ***	0.88 (0.86, 0.90) 0.0000 ***	30321	14770	48.71	14600	48.15	0.76 (0.74, 0.79) 0.0000 ***	0.82 (0.80, 0.85) 0.0000 ***	11136	9064	81.39	9014	80.94	0.84 (0.78, 0.89) 0.0000 ***	0.82 (0.77, 0.87) 0.0000 ***	11104
Unknown£	5	2	40.00	2	40.00	-	-	4	0	0.00	0	0.00	-	-	1	0	0.00	0	0.00	-	-	1
Age (years) - Sex																						
50-54, Female	19089	9658	50.59	9438	49.44	Reference	Reference	11119	5272	47.41	5199	46.76	Reference	Reference	2185	1701	77.85	1698	77.71	Reference	Reference	2182
50-54, Male	17236	7566	43.90	7324	42.49	0.76 (0.72, 0.79) 0.0000 ***	0.84 (0.81, 0.88) 0.0000 ***	10666	4115	38.58	4050	37.97	0.70 (0.66, 0.74) 0.0000 ***	0.78 (0.74, 0.83) 0.0000 ***	1682	1269	75.45	1260	74.91	0.86 (0.74, 0.99) 0.0418 *	0.86 (0.74, 1.00) 0.0510	1678
55-59, Female	14693	8308	56.54	8137	55.38	Reference	Reference	7174	3702	51.60	3672	51.18	Reference	Reference	3376	2698	79.92	2685	79.53	Reference	Reference	3373
55-59, Male	13350	6736	50.46	6566	49.18	0.78 (0.74, 0.82) 0.0000 ***	0.85 (0.81, 0.90) 0.0000 ***	6566	2947	44.88	2906	44.26	0.76 (0.71, 0.81) 0.0000 ***	0.82 (0.77, 0.88) 0.0000 ***	2631	1994	75.79	1978	75.18	0.78 (0.69, 0.88) 0.0001 ***	0.78 (0.69, 0.89) 0.0001 ***	2628
60-64, Female	12469	7905	63.40	7761	62.24	Reference	Reference	5714	3412	59.71	3384	59.22	Reference	Reference	3028	2593	85.63	2585	85.37	Reference	Reference	3019
60-64, Male	11728	6832	58.25	6703	57.15	0.81 (0.77, 0.85) 0.0000 ***	0.88 (0.84, 0.93) 0.0000 ***	5463	2866	52.46	2839	51.97	0.74 (0.69, 0.80) 0.0000 ***	0.79 (0.74, 0.86) 0.0000 ***	2549	2066	81.05	2058	80.74	0.72 (0.62, 0.83) 0.0000 ***	0.71 (0.62, 0.82) 0.0000 ***	2540
65-69, Female	10195	6971	68.38	6866	67.35	Reference	Reference	4864	3170	65.17	3150	64.76	Reference	Reference	2851	2490	87.34	2479	86.95	Reference	Reference	2842
65-69, Male	9469	6222	65.71	6112	64.55	0.88 (0.83, 0.94) 0.0000 ***	0.92 (0.87, 0.98) 0.0103 *	4530	2749	60.68	2721	60.07	0.82 (0.75, 0.89) 0.0000 ***	0.87 (0.80, 0.95) 0.0017 **	2410	2085	86.51	2070	85.89	0.91 (0.78, 1.07) 0.2630	0.91 (0.77, 1.06) 0.2340	2402
70-74, Female	6857	5389	78.59	5296	77.23	Reference	Reference	3324	2287	68.80	2269	68.26	Reference	Reference	2019	1805	89.40	1796	88.95	Reference	Reference	2012
70-74, Male	6476	5096	78.69	5024	77.58	1.02 (0.94, 1.11) 0.6353	1.03 (0.94, 1.12) 0.5234	3096	2093	67.60	2084	67.31	0.96 (0.86, 1.06) 0.4163	0.98 (0.88, 1.10) 0.7682	1864	1650	88.52	1648	88.41	0.95 (0.78, 1.16) 0.5935	0.96 (0.78, 1.17) 0.6751	1856
Unknown£	5	2	40.00	2	40.00	-	-	4	0	0.00	0	0.00	-	-	1	0	0.00	0	0.00	-	-	1
Sex - Age (years)																						
Female: 50-54	19089	9658	50.59	9438	49.44	Reference	Reference	11119	5272	47.41	5199	46.76	Reference	Reference	2185	1701	77.85	1698	77.71	Reference	Reference	2182
Female: 55-59	14693	8308	56.54	8137	55.38	1.27 (1.22, 1.33) 0.0000 ***	1.28 (1.22, 1.34) 0.0000 ***	7174	3702	51.60	3672	51.18	1.19 (1.13, 1.27) 0.0000 ***	1.20 (1.13, 1.27) 0.0000 ***	3376	2698	79.92	2685	79.53	1.11 (0.98, 1.27) 0.1048	1.11 (0.97, 1.27) 0.1184	3373
Female: 60-64	12469	7905	63.40	7761	62.24	1.69 (1.61, 1.77) 0.0000 ***	1.68 (1.61, 1.77) 0.0000 ***	5714	3412	59.71	3384	59.22	1.65 (1.55, 1.76) 0.0000 ***	1.68 (1.57, 1.80) 0.0000 ***	3028	2593	85.63	2585	85.37	1.67 (1.45, 1.93) 0.0000 ***	1.66 (1.44, 1.92) 0.0000 ***	3019
Female: 65-69	10195	6971	68.38	6866	67.35	2.11 (2.01, 2.22) 0.0000 ***	2.08 (1.97, 2.19) 0.0000 ***	4864	3170	65.17	3150	64.76	2.09 (1.95, 2.24) 0.0000 ***	2.09 (1.94, 2.24) 0.0000 ***	2851	2490	87.34	2479	86.95	1.91 (1.65, 2.22) 0.0000 ***	1.87 (1.61, 2.17) 0.0000 ***	2842
Female: 70-74	6857	5389	78.59	5296	77.23	3.47 (3.26, 3.70) 0.0000 ***	3.43 (3.21, 3.66) 0.0000 ***	3324	2287	68.80	2269	68.26	2.45 (2.26, 2.66) 0.0000 ***	2.47 (2.27, 2.68) 0.0000 ***	2019	1805	89.40	1796	88.95	2.31 (1.95, 2.74) 0.0000 ***	2.25 (1.89, 2.67) 0.0000 ***	2012
Male: 50-54	17236	7566	43.90	7324	42.49	Reference	Reference	10666	4115	38.58	4050	37.97	Reference	Reference	1682	1269	75.45	1260	74.91	Reference	Reference	1678
Male: 55-59	13350	6736	50.46	6566	49.18	1.31 (1.25, 1.37) 0.0000 ***	1.30 (1.24, 1.36) 0.0000 ***	6566	2947	44.88	2906	44.26	1.30 (1.22, 1.38) 0.0000 ***	1.27 (1.19, 1.35) 0.0000 ***	2631	1994	75.79	1978	75.18	1.01 (0.88, 1.17) 0.8417	1.02 (0.88, 1.17) 0.8048	2628
Male: 60-64	11728	6832	58.25	6703	57.15	1.81 (1.72, 1.89) 0.0000 ***	1.79 (1.70, 1.88) 0.0000 ***	5463	2866	52.46	2839	51.97	1.77 (1.65, 1.89) 0.0000 ***	1.73 (1.61, 1.85) 0.0000 ***	2549	2066	81.05	2058	80.74	1.40 (1.21, 1.63) 0.0000 ***	1.39 (1.20, 1.62) 0.0000 ***	2540
Male: 65-69	9469	6222	65.71	6112	64.55	2.46 (2.34, 2.60) 0.0000 ***	2.33 (2.21, 2.46) 0.0000 ***	4530	2749	60.68	2721	60.07	2.46 (2.29, 2.64) 0.0000 ***	2.38 (2.21, 2.56) 0.0000 ***	2410	2085	86.51	2070	85.89	2.04 (1.74, 2.39) 0.0000 ***	2.00 (1.71, 2.35) 0.0000 ***	2402
Male: 70-74	6476	5096	78.69	5024	77.58	4.68 (4.38, 5.00) 0.0000 ***	4.30 (4.01, 4.61) 0.0000 ***	3096	2093	67.60	2084	67.31	3.36 (3.09, 3.66) 0.0000 ***	3.18 (2.91, 3.48) 0.0000 ***	1864	1650	88.52	1648	88.41	2.56 (2.14, 3.06) 0.0000 ***	2.53 (2.11, 3.03) 0.0000 ***	1856
Unknown£	5	2	40.00	2	40.00	-	-	4	0	0.00	0	0.00	-	-	1	0	0.00	0	0.00	-	-	1
Ethnicity																						
European/Other	88265	56651	64.18	55595	62.99	Reference	Reference	44585	25485	57.16	25257	56.65	Reference	Reference	20114	16790	83.47	16718	83.12	Reference	Reference	20067
European	*86595*	*55886*	*64.54*	*54861*	*63.35*	*-*	*-*	*43657*	*25123*	*57.55*	*24902*	*57.04*	*-*	*-*	*19863*	*16587*	*83.51*	*16519*	*83.16*	*-*	*-*	*19816*
Other	*1670*	*765*	*45.81*	*734*	*43.95*	*-*	*-*	*928*	*362*	*39.01*	*355*	*38.25*	*-*	*-*	*251*	*203*	*80.88*	*199*	*79.28*	*-*	*-*	*251*
Asian	16678	9168	54.97	8962	53.74	0.68 (0.66, 0.71) 0.0000 ***	0.76 (0.74, 0.79) 0.0000 ***	8892	4400	49.48	4338	48.79	0.73 (0.70, 0.76) 0.0000 ***	0.80 (0.77, 0.84) 0.0000 ***	2961	2344	79.16	2339	78.66	0.75 (0.68, 0.82) 0.0000 ***	0.82 (0.74, 0.90) 0.0001 ***	2955
Pacific	6043	1939	32.09	1847	30.56	0.26 (0.24, 0.27) 0.0000 ***	0.31 (0.30, 0.33) 0.0000 ***	3183	1191	37.42	1168	36.69	0.44 (0.41, 0.48) 0.0000 ***	0.54 (0.50, 0.59) 0.0000 ***	569	449	78.91	448	78.73	0.75 (0.61, 0.92) 0.0062 **	0.85 (0.69, 1.05) 0.1347	568
Māori	5693	2702	47.46	2624	46.09	0.50 (0.48, 0.53) 0.0000 ***	0.60 (0.57, 0.64) 0.0000 ***	2963	1382	46.64	1364	46.03	0.65 (0.61, 0.70) 0.0000 ***	0.78 (0.72, 0.84) 0.0000 ***	916	750	81.88	744	81.22	0.88 (0.74, 1.04) 0.1356	0.98 (0.82, 1.16) 0.7948	909
Unknown£	4888	225	4.60	201	4.11	-	-	2897	155	5.35	147	5.07	-	-	36	18	50.00	18	50.00	-	-	34
Age (years) - Ethnicity																						
50-59, European/Other	44107	24406	55.33	23840	54.05	Reference	Reference	24116	11846	49.12	11700	48.52	Reference	Reference	7646	5956	77.90	5923	77.47	Reference	Reference	7639
50-59, Asian	10018	5241	52.32	5108	50.99	0.88 (0.85, 0.92) 0.0000 ***	0.92 (0.88, 0.96) 0.0001 **	5586	2611	46.74	2609	46.17	0.91 (0.86, 0.96) 0.0016 **	0.94 (0.89, 1.00) 0.0376 *	1479	1143	77.28	1138	76.94	0.97 (0.85, 1.11) 0.6608	0.97 (0.85, 1.11) 0.6767	1476
50-59, Pacific	3583	1001	27.94	956	26.68	0.31 (0.29, 0.33) 0.0000 ***	0.36 (0.34, 0.39) 0.0000 ***	1968	675	34.30	662	33.64	0.54 (0.49, 0.59) 0.0000 ***	0.63 (0.57, 0.69) 0.0000 ***	269	203	75.46	203	75.46	0.89 (0.67, 1.19) 0.4409	0.93 (0.70, 1.25) 0.6448	268
50-59, Māori	3678	1530	41.60	1481	40.27	0.57 (0.54, 0.61) 0.0000 ***	0.63 (0.58, 0.67) 0.0000 ***	2012	815	40.51	803	39.91	0.70 (0.64, 0.77) 0.0000 ***	0.77 (0.70, 0.84) 0.0000 ***	465	356	76.56	353	75.91	0.92 (0.74, 1.14) 0.4377	0.93 (0.75, 1.16) 0.5180	464
60-69, European/Other	33245	23178	69.72	22809	68.61	Reference	Reference	15329	9865	64.36	9799	63.92	Reference	Reference	9052	7780	85.95	7750	85.62	Reference	Reference	9025
60-69, Asian	5336	3024	56.67	2965	55.57	0.57 (0.54, 0.61) 0.0000 ***	0.60 (0.56, 0.63) 0.0000 ***	2643	1426	53.95	1404	53.12	0.64 (0.59, 0.69) 0.0000 ***	0.66 (0.61, 0.72) 0.0000 ***	1171	939	80.19	931	79.50	0.65 (0.56, 0.76) 0.0000 ***	0.67 (0.57, 0.78) 0.0000 ***	1168
60-69, Pacific	2017	748	37.08	716	35.50	0.25 (0.23, 0.28) 0.0000 ***	0.29 (0.26, 0.32) 0.0000 ***	955	407	42.62	399	41.78	0.41 (0.35, 0.46) 0.0000 ***	0.49 (0.43, 0.56) 0.0000 ***	240	196	81.67	195	81.25	0.73 (0.52, 1.01) 0.0589	0.81 (0.58, 1.14) 0.2218	240
60-69, Māori	1639	896	54.67	876	53.45	0.53 (0.48, 0.58) 0.0000 ***	0.56 (0.51, 0.62) 0.0000 ***	783	445	56.83	446	56.19	0.72 (0.63, 0.84) 0.0000 ***	0.78 (0.67, 0.90) 0.0009 **	359	307	85.52	304	84.68	0.93 (0.69, 1.24) 0.6203	0.96 (0.71, 1.29) 0.7857	359
70-74, European/Other	10913	9067	83.08	8946	81.98	Reference	Reference	5140	3774	73.42	3758	73.11	Reference	Reference	3416	3054	89.40	3045	89.14	Reference	Reference	3403
70-74, Asian	1324	903	68.20	889	67.15	0.45 (0.40, 0.51) 0.0000 ***	0.47 (0.41, 0.53) 0.0000 ***	663	363	54.75	355	53.54	0.42 (0.36, 0.50) 0.0000 ***	0.44 (0.37, 0.52) 0.0000 ***	311	262	84.24	260	83.60	0.62 (0.45, 0.85) 0.0034 **	0.61 (0.44, 0.85) 0.0032 **	311
70-74, Pacific	443	190	42.89	175	39.50	0.14 (0.12, 0.17) 0.0000 ***	0.16 (0.13, 0.20) 0.0000 ***	260	109	41.92	107	41.15	0.26 (0.20, 0.33) 0.0000 ***	0.28 (0.21, 0.36) 0.0000 ***	60	50	83.33	50	83.33	0.61 (0.31, 1.21) 0.1576	0.60 (0.30, 1.22) 0.1587	60
70-74, Māori	376	276	73.40	267	71.01	0.54 (0.43, 0.68) 0.0000 ***	0.58 (0.46, 0.73) 0.0000 ***	168	122	72.62	121	72.02	0.95 (0.69, 1.37) 0.7542	0.97 (0.69, 1.37) 0.8510	92	87	94.57	87	94.57	2.12 (0.86, 5.25) 0.1048	2.09 (0.84, 5.18) 0.1129	91
Unknown£	4888	225	4.60	201	4.11	-	-	2897	155	5.35	147	5.07	-	-	36	18	50.00	18	50.00	-	-	34
Sex - Ethnicity																						
Female: European/Other	46181	30397	65.82	29882	64.71	Reference	Reference	23148	13836	59.77	13727	59.30	Reference	Reference	10902	9240	84.76	9211	84.49	Reference	Reference	10876
Female: Asian	9471	5262	55.56	5135	54.22	0.65 (0.62, 0.68) 0.0000 ***	0.73 (0.69, 0.76) 0.0000 ***	5066	2565	50.63	2529	49.92	0.68 (0.64, 0.73) 0.0000 ***	0.76 (0.71, 0.81) 0.0000 ***	1716	1368	79.72	1366	79.52	0.69 (0.61, 0.79) 0.0000 ***	0.78 (0.68, 0.88) 0.0001 ***	1714
Female: Pacific	3300	1027	31.12	988	29.94	0.23 (0.22, 0.25) 0.0000 ***	0.28 (0.26, 0.30) 0.0000 ***	1737	651	37.48	638	36.73	0.40 (0.36, 0.44) 0.0000 ***	0.48 (0.43, 0.53) 0.0000 ***	311	247	79.42	246	79.10	0.69 (0.53, 0.92) 0.0103 *	0.80 (0.60, 1.06) 0.1194	310
Female: Māori	3231	1483	45.90	1443	44.66	0.44 (0.41, 0.47) 0.0000 ***	0.52 (0.49, 0.56) 0.0000 ***	1631	767	47.03	757	46.41	0.59 (0.54, 0.66) 0.0000 ***	0.70 (0.63, 0.77) 0.0000 ***	520	427	82.12	425	81.73	0.82 (0.63, 1.06) 0.0911	0.93 (0.73, 1.17) 0.5175	519
Male: European/Other	42083	26253	62.38	25712	61.10	Reference	Reference	21435	11649	54.35	11530	53.79	Reference	Reference	9211	7550	81.97	7507	81.50	Reference	Reference	9190
Male: Asian	7206	3906	54.20	3827	53.11	0.72 (0.69, 0.76) 0.0000 ***	0.81 (0.77, 0.85) 0.0000 ***	3826	1835	47.96	1809	47.28	0.77 (0.72, 0.83) 0.0000 ***	0.85 (0.80, 0.92) 0.0000 ***	1245	976	78.39	973	78.15	0.81 (0.70, 0.94) 0.0047 **	0.87 (0.75, 1.01) 0.0710	1241
Male: Pacific	2742	912	33.26	859	31.33	0.29 (0.27, 0.32) 0.0000 ***	0.37 (0.34, 0.40) 0.0000 ***	1445	540	37.37	530	36.68	0.50 (0.45, 0.56) 0.0000 ***	0.63 (0.56, 0.70) 0.0000 ***	258	202	78.29	202	78.29	0.82 (0.61, 1.11) 0.1924	0.91 (0.67, 1.25) 0.5725	258
Male: Māori	2461	1218	49.49	1180	47.95	0.59 (0.54, 0.64) 0.0000 ***	0.72 (0.67, 0.78) 0.0000 ***	1332	615	46.17	607	45.57	0.72 (0.64, 0.80) 0.0000 ***	0.89 (0.79, 0.99) 0.0390 *	396	323	81.57	319	80.56	0.94 (0.73, 1.21) 0.6357	1.03 (0.80, 1.34) 0.8042	390
Unknown£	4892	227	4.64	203	4.15	-	-	2900	155	5.34	147	5.07	-	-	37	18	48.65	18	48.65	-	-	35
Deprivation Index (NZDep)																						
1 (least)	16665	10359	62.16	10176	61.06	Reference	Reference	8691	4885	56.21	4844	55.74	Reference	Reference	3806	3168	83.24	3155	82.90	Reference	Reference	3802
2	19281	11779	61.09	11561	59.96	0.96 (0.92, 1.00) 0.0341 *	0.94 (0.90, 0.98) 0.0057 **	9890	5406	54.66	5348	54.07	0.94 (0.88, 0.99) 0.0232 *	0.91 (0.86, 0.97) 0.0026 **	4102	3394	82.74	3375	82.28	0.96 (0.85, 1.08) 0.4688	0.94 (0.84, 1.06) 0.3298	4097
3	17418	10480	60.17	10288	59.07	0.92 (0.88, 0.96) 0.0002 **	0.89 (0.85, 0.93) 0.0000 ***	8758	4692	53.57	4638	52.96	0.89 (0.84, 0.95) 0.0002 **	0.87 (0.82, 0.93) 0.0000 ***	3567	2948	82.65	2935	82.28	0.96 (0.85, 1.08) 0.4875	0.93 (0.83, 1.06) 0.2767	3557
4	14560	8694	59.71	8535	58.62	0.90 (0.86, 0.95) 0.0000 ***	0.88 (0.84, 0.93) 0.0000 ***	7523	4002	53.20	3975	52.84	0.90 (0.84, 0.96) 0.0023 **	0.86 (0.80, 0.92) 0.0000 ***	2987	2478	82.96	2469	82.66	0.98 (0.87, 1.12) 0.7971	0.97 (0.85, 1.10) 0.6310	2976
5	15705	9465	60.27	9292	59.17	0.92 (0.88, 0.97) 0.0005 **	0.88 (0.84, 0.93) 0.0000 ***	8051	4310	53.53	4267	53.00	0.90 (0.84, 0.96) 0.0023 **	0.86 (0.81, 0.92) 0.0000 ***	3339	2793	83.65	2789	83.23	1.02 (0.90, 1.21) 0.4487	0.99 (0.86, 1.14) 0.5342	3332
6	11261	6686	59.37	6542	58.09	0.88 (0.84, 0.93) 0.0000 ***	0.86 (0.81, 0.90) 0.0000 ***	5771	3096	53.65	3068	53.16	0.90 (0.84, 0.96) 0.0023 **	0.86 (0.80, 0.93) 0.0000 ***	2329	1955	83.94	1948	83.64	1.05 (0.92, 1.21) 0.4487	0.99 (0.86, 1.14) 0.8623	2318
7	8028	4079	50.81	3961	49.34	0.62 (0.59, 0.66) 0.0000 ***	0.69 (0.65, 0.73) 0.0000 ***	4243	1982	46.71	1960	46.19	0.68 (0.63, 0.73) 0.0000 ***	0.70 (0.65, 0.76) 0.0000 ***	1423	1163	81.73	1161	81.59	0.91 (0.78, 1.07) 0.2679	0.90 (0.77, 1.06) 0.2162	1400
8	8663	4377	51.12	4251	49.64	0.63 (0.60, 0.66) 0.0000 ***	0.67 (0.63, 0.70) 0.0000 ***	4231	1944	45.95	1918	45.33	0.66 (0.61, 0.71) 0.0000 ***	0.70 (0.65, 0.76) 0.0000 ***	1407	1131	80.38	1124	79.89	0.82 (0.70, 0.97) 0.0237 *	0.83 (0.71, 0.98) 0.0237 *	1400
9	9394	4467	47.55	4340	46.20	0.55 (0.52, 0.58) 0.0000 ***	0.66 (0.62, 0.70) 0.0000 ***	5014	2174	43.36	2139	42.66	0.60 (0.55, 0.63) 0.0000 ***	0.70 (0.65, 0.75) 0.0000 ***	1556	1256	80.72	1247	80.14	0.83 (0.72, 0.97) 0.0171 *	0.82 (0.70, 0.97) 0.0171 *	1551
10 (most)	639	260	40.69	250	39.12	0.41 (0.35, 0.48) 0.0000 ***	0.52 (0.44, 0.62) 0.0000 ***	321	111	34.58	107	33.33	0.40 (0.31, 0.50) 0.0000 ***	0.42 (0.33, 0.54) 0.0000 ***	72	57	79.17	56	77.78	0.72 (0.41, 1.27) 0.2560	0.77 (0.43, 1.38) 0.3749	72
Unknown£	53	35	66.04	34	64.15	-	-	27	11	40.74	10	37.04	-	-	8	8	100.00	8	100.00	-	-	8
Deprivation Index (NZDep) quintiles																						
1 (least)	35946	22138	61.59	21736	60.47	Reference	Reference	18581	10291	55.38	10192	54.85	Reference	Reference	7908	6562	82.98	6530	82.57	Reference	Reference	7899
2	31978	19178	59.97	18823	58.86	0.94 (0.91, 0.96) 0.0000 ***	0.92 (0.89, 0.95) 0.0000 ***	16281	8694	53.40	8613	52.90	0.92 (0.89, 0.96) 0.0003 ***	0.91 (0.87, 0.96) 0.0001 ***	6554	5426	82.79	5404	82.45	0.99 (0.91, 1.08) 0.8486	0.98 (0.90, 1.07) 0.6416	6533
3	26966	16151	59.89	15834	58.72	0.93 (0.90, 0.96) 0.0000 ***	0.90 (0.87, 0.93) 0.0000 ***	13822	7406	53.58	7335	53.07	0.93 (0.89, 0.97) 0.0014 **	0.91 (0.87, 0.95) 0.0001 ***	5668	4748	83.77	4727	83.40	1.06 (0.97, 1.16) 0.2087	1.00 (0.91, 1.10) 0.9687	5650
4	16591	8456	50.97	8212	49.50	0.64 (0.62, 0.66) 0.0000 ***	0.72 (0.69, 0.75) 0.0000 ***	8474	3926	46.33	3878	45.76	0.69 (0.66, 0.73) 0.0000 ***	0.74 (0.70, 0.78) 0.0000 ***	2830	2294	81.06	2285	80.74	0.88 (0.79, 0.99) 0.0292 *	0.89 (0.80, 1.00) 0.0509	2820
5 (most)	10033	4727	47.11	4590	45.75	0.55 (0.53, 0.58) 0.0000 ***	0.67 (0.64, 0.71) 0.0000 ***	5335	2285	42.83	2246	42.10	0.60 (0.56, 0.64) 0.0000 ***	0.65 (0.61, 0.69) 0.0000 ***	1628	1313	80.65	1303	80.04	0.85 (0.74, 0.98) 0.0150 *	0.85 (0.74, 0.98) 0.0229 *	1623
Unknown£	53	35	66.04	34	64.15	-	-	27	11	40.74	10	37.04	-	-	8	8	100.00	8	100.00	-	-	8

£ "Unknown" responses were coded as missing values

[1] People who received an invitation and immunochemical Faecal Occult Blood Test (iFOBT) kit between 1st Jan 2012 and 31st Dec 2013, and did not meet the exclusion criteria

[2] People who responded to the invitation with a completed immunochemical Faecal Occult Blood Test (iFOBT) kit between 1st Jan 2012 and 16th Sep 2015, and did not meet the exclusion criteria

[3] People who responded to the invitation with a successfully completed immunochemical Faecal Occult Blood Test (iFOBT) kit (i.e. result of "Abnormal" or "Normal") between 1st Jan 2012 and 16th Sep 2015, and did not meet the exclusion criteria

[4] People who received an invitation and immunochemical Faecal Occult Blood Test (iFOBT) kit between 1st Jan 2014 and 31st Dec 2013, and did not meet the exclusion criteria

[5] People who responded to the invitation with a completed immunochemical Faecal Occult Blood Test (iFOBT) kit between 1st Jan 2014 and 16th Sep 2015, and did not meet the exclusion criteria

[6] People who responded to the invitation with a successfully completed immunochemical Faecal Occult Blood Test (iFOBT) kit (i.e. result of "Abnormal" or "Normal") between 1st Jan 2014 and 16th Sep 2015, and did not meet the exclusion criteria

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group
Statistically lower than reference group

Round 2 - Completed Round 1 with negative iFOBT										Round 2 - Did not complete Round 1											Round 2 - Not invited in Round 1										
Responders n	%	Completed kits n	%	Unadj OR	95% CI	p	Adj OR	95% CI	p	Number invited	Responders n	%	Completed kits n	%	Unadj OR	95% CI	p	Adj OR	95% CI	p	Number invited	Responders n	%	Completed kits n	%	Unadj OR	95% CI	p	Adj OR	95% CI	p
20324	82.84	20230	82.46	-			-			20756	5030	24.23	4883	23.53	-			-			17168	7232	42.12	7134	41.55	-			-		
2967	76.87	2955	76.55	Reference			Reference			4865	1035	21.27	999	20.53	Reference			Reference			13055	5382	41.23	5292	40.54	Reference			Reference		
4690	78.14	4661	77.66	1.06	(0.97,1.17)	0.2024	1.07	(0.97,1.17)	0.1904	6215	1396	22.46	1358	21.85	1.08	(0.99,1.19)	0.0931	1.08	(0.98,1.19)	0.1083	1518	561	36.96	557	36.69	0.85	(0.76,0.95)	0.0039**	0.88	(0.78,0.98)	0.0225*
4652	83.68	4636	83.40	1.54	(1.39,1.70)	0.0000***	1.53	(1.38,1.70)	0.0000***	4525	1134	25.06	1095	24.20	1.24	(1.12,1.36)	0.0000***	1.26	(1.14,1.39)	0.0000***	1075	485	45.12	485	45.12	1.21	(1.06,1.37)	0.0034**	1.24	(1.08,1.41)	0.0015**
4568	87.11	4542	86.61	1.98	(1.78,2.21)	0.0000***	1.96	(1.75,2.18)	0.0000***	3213	883	27.48	862	26.83	1.42	(1.28,1.58)	0.0000***	1.45	(1.30,1.61)	0.0000***	921	461	50.05	460	49.95	1.46	(1.28,1.67)	0.0000***	1.49	(1.30,1.72)	0.0000***
3447	89.12	3436	88.83	2.44	(2.15,2.76)	0.0000***	2.41	(2.13,2.74)	0.0000***	1938	582	30.03	569	29.36	1.61	(1.43,1.81)	0.0000***	1.64	(1.45,1.85)	0.0000***	599	343	57.26	340	56.76	1.93	(1.63,2.27)	0.0000***	1.90	(1.60,2.26)	0.0000***
11271	83.94	11227	83.61	Reference			Reference			10104	2543	25.17	2472	24.47	Reference			Reference			8632	4013	46.49	3959	45.86	Reference			Reference		
9053	81.53	9003	81.08	0.84	(0.79,0.90)	0.0000***	0.82	(0.77,0.88)	0.0000***	10651	2487	23.35	2411	22.64	0.90	(0.85,0.96)	0.0019**	1.00	(0.93,1.06)	0.9034	8534	3219	37.72	3175	37.20	0.70	(0.66,0.74)	0.0000***	0.78	(0.73,0.83)	0.0000***
0	0.00	0	0.00							1	0	0.00	0	0.00							2	0	0.00	0	0.00						
1699	77.86	1696	77.73	Reference			Reference			2349	522	22.22	502	21.37	Reference			Reference			6585	3049	46.30	2999	45.54	Reference			Reference		
1268	75.57	1259	75.03	0.86	(0.74,1.00)	0.0500	0.86	(0.74,1.00)	0.0564	2516	513	20.39	497	19.75	0.91	(0.79,1.04)	0.1630	1.03	(0.90,1.19)	0.6466	6468	2333	36.07	2293	35.45	0.66	(0.61,0.70)	0.0000***	0.74	(0.69,0.80)	0.0000***
2696	79.93	2683	79.54	Reference			Reference			3072	716	23.31	701	22.82	Reference			Reference			726	288	39.67	286	39.39	Reference			Reference		
1994	75.88	1978	75.27	0.78	(0.69,0.88)	0.0001***	0.79	(0.70,0.89)	0.0001***	3143	680	21.64	657	20.90	0.89	(0.79,1.01)	0.0678	0.99	(0.87,1.12)	0.8292	792	273	34.47	271	34.22	0.80	(0.65,0.99)	0.0367*	0.91	(0.73,1.13)	0.3733
2587	85.69	2579	85.43	Reference			Reference			2147	560	26.08	540	25.15	Reference			Reference			539	259	48.05	259	48.05	Reference			Reference		
2065	81.30	2057	80.98	0.73	(0.63,0.84)	0.0000***	0.72	(0.62,0.83)	0.0000***	2378	574	24.14	555	23.34	0.91	(0.79,1.04)	0.1553	1.00	(0.87,1.15)	0.9954	536	226	42.16	226	42.16	0.79	(0.62,1.00)	0.0526	0.85	(0.66,1.09)	0.2020
2488	87.54	2477	87.16	Reference			Reference			1543	442	28.65	433	28.06	Reference			Reference			470	238	50.64	238	50.64	Reference			Reference		
2080	86.59	2065	85.97	0.90	(0.77,1.06)	0.2087	0.90	(0.76,1.05)	0.1813	1669	441	26.42	429	25.70	0.89	(0.76,1.04)	0.1319	0.97	(0.82,1.14)	0.6848	451	223	49.45	222	49.22	0.94	(0.73,1.22)	0.6679	1.01	(0.77,1.33)	0.9540
1801	89.51	1792	89.07	Reference			Reference			993	303	30.51	296	29.81	Reference			Reference			312	179	57.37	177	56.73	Reference			Reference		
1646	88.69	1644	88.58	0.95	(0.78,1.16)	0.6302	0.97	(0.79,1.18)	0.7510	945	279	29.52	273	28.89	0.96	(0.79,1.16)	0.6568	0.98	(0.80,1.19)	0.8184	287	164	57.14	163	56.79	1.00	(0.73,1.39)	0.9875	1.07	(0.75,1.53)	0.6998
1699	77.86	1696	77.73	Reference			Reference			2349	522	22.22	502	21.37	Reference			Reference			6585	3049	46.30	2999	45.54	Reference			Reference		
2696	79.93	2683	79.54	1.11	(0.98,1.27)	0.1056	1.11	(0.97,1.27)	0.1195	3072	716	23.31	701	22.82	1.09	(0.96,1.24)	0.2037	1.10	(0.97,1.26)	0.1396	726	288	39.67	286	39.39	0.78	(0.66,0.91)	0.0016**	0.81	(0.69,0.95)	0.0103*
2587	85.69	2579	85.43	1.68	(1.46,1.94)	0.0000***	1.67	(1.44,1.92)	0.0000***	2147	560	26.08	540	25.15	1.24	(1.08,1.42)	0.0027**	1.28	(1.11,1.47)	0.0007**	539	259	48.05	259	48.05	1.11	(0.93,1.32)	0.2611	1.16	(0.97,1.39)	0.1091
2488	87.54	2477	87.16	1.94	(1.68,2.26)	0.0000***	1.90	(1.63,2.21)	0.0000***	1543	442	28.65	433	28.06	1.44	(1.24,1.67)	0.0000***	1.49	(1.28,1.73)	0.0000***	470	238	50.64	238	50.64	1.23	(1.02,1.48)	0.0325*	1.28	(1.06,1.56)	0.0120*
1801	89.51	1792	89.07	2.33	(1.96,2.77)	0.0000***	2.26	(1.90,2.69)	0.0000***	993	303	30.51	296	29.81	1.56	(1.32,1.85)	0.0000***	1.67	(1.41,1.99)	0.0000***	312	179	57.37	177	56.73	1.57	(1.25,1.97)	0.0001***	1.57	(1.24,1.99)	0.0002**
1268	75.57	1259	75.03	Reference			Reference			2516	513	20.39	497	19.75	Reference			Reference			6468	2333	36.07	2293	35.45	Reference			Reference		
1994	75.88	1978	75.27	1.01	(0.88,1.17)	0.8609	1.02	(0.88,1.17)	0.7996	3143	680	21.64	657	20.90	1.07	(0.94,1.22)	0.2862	1.05	(0.92,1.21)	0.4359	792	273	34.47	271	34.22	0.95	(0.81,1.11)	0.4928	0.96	(0.81,1.13)	0.5945
2065	81.30	2057	80.98	1.42	(1.22,1.64)	0.0000***	1.41	(1.21,1.64)	0.0000***	2378	574	24.14	555	23.34	1.24	(1.08,1.42)	0.0023**	1.23	(1.07,1.42)	0.0035**	536	226	42.16	226	42.16	1.33	(1.11,1.59)	0.0019**	1.33	(1.10,1.60)	0.0031**
2080	86.59	2065	85.97	2.04	(1.74,2.39)	0.0000***	2.01	(1.71,2.36)	0.0000***	1669	441	26.42	429	25.70	1.41	(1.21,1.63)	0.0000***	1.42	(1.22,1.65)	0.0000***	451	223	49.45	222	49.22	1.77	(1.46,2.14)	0.0000***	1.74	(1.42,2.13)	0.0000***
1646	88.69	1644	88.58	2.58	(2.15,3.09)	0.0000***	2.56	(2.13,3.07)	0.0000***	945	279	29.52	273	28.89	1.65	(1.39,1.96)	0.0000***	1.61	(1.35,1.92)	0.0000***	287	164	57.14	163	56.79	2.39	(1.88,3.04)	0.0000***	2.36	(1.83,3.04)	0.0000***
0	0.00	0	0.00							1	0	0.00	0	0.00							2	0	0.00	0	0.00						
16771	83.58	16699	83.22	Reference			Reference			13429	3537	26.34	3447	25.67	Reference			Reference			11042	5158	46.71	5092	46.11	Reference			Reference		
16568	*83.61*	*16500*	*83.27*	-			-			*13107*	*3485*	*26.59*	*3396*	*25.91*	-			-			*10687*	*5051*	*47.26*	*4987*	*46.66*	-			-		
203	*80.88*	*199*	*79.28*	-						*322*	*52*	*16.15*	*51*	*15.84*	-			-			*355*	*107*	*30.14*	*105*	*29.58*	-			-		
2341	79.22	2326	78.71	0.75	(0.68,0.82)	0.0000***	0.82	(0.74,0.90)	0.0001***	2808	664	23.65	633	22.54	0.84	(0.77,0.93)	0.0005**	0.88	(0.80,0.97)	0.0096**	3123	1392	44.57	1376	44.06	0.92	(0.85,1.00)	0.0419*	0.95	(0.87,1.03)	0.1895
448	78.87	447	78.70	0.75	(0.61,0.91)	0.0047**	0.84	(0.68,1.04)	0.1106	1645	458	27.84	440	26.75	1.06	(0.94,1.19)	0.3449	1.21	(1.07,1.37)	0.0023**	969	284	29.31	280	28.90	0.48	(0.41,0.55)	0.0000***	0.55	(0.48,0.64)	0.0000***
746	82.07	740	81.41	0.88	(0.74,1.05)	0.1547	0.98	(0.83,1.17)	0.8501	1156	308	26.64	303	26.21	1.03	(0.90,1.18)	0.6854	1.16	(1.01,1.34)	0.0346*	891	324	36.36	317	35.58	0.65	(0.56,0.74)	0.0000***	0.72	(0.62,0.83)	0.0000***
18	52.94	18	52.94							1718	63	3.67	60	3.49							1143	74	6.47	69	6.04						
5953	77.93	5920	77.50	Reference			Reference			7083	1670	23.58	1621	22.89	Reference			Reference			9387	4220	44.96	4156	44.27	Reference			Reference		
1142	77.37	1137	77.03	0.97	(0.85,1.11)	0.6960	0.98	(0.85,1.12)	0.7187	1548	342	22.09	330	21.32	0.91	(0.80,1.04)	0.1816	0.95	(0.83,1.09)	0.4754	2559	1126	44.00	1111	43.42	0.97	(0.90,1.05)	0.4381	0.99	(0.90,1.08)	0.7599
202	75.37	202	75.37	0.89	(0.67,1.18)	0.4139	0.93	(0.70,1.24)	0.6260	855	222	25.96	212	24.80	1.11	(0.94,1.31)	0.2109	1.26	(1.06,1.50)	0.0097**	844	250	29.62	247	29.27	0.52	(0.45,0.61)	0.0000***	0.60	(0.51,0.70)	0.0000***
356	76.72	353	76.08	0.92	(0.74,1.15)	0.4778	0.94	(0.75,1.17)	0.5670	737	172	23.34	170	23.07	1.01	(0.84,1.21)	0.9115	1.10	(0.92,1.33)	0.2990	810	287	35.43	280	34.57	0.66	(0.57,0.77)	0.0000***	0.72	(0.62,0.84)	0.0000***
7771	86.11	7741	85.77	Reference			Reference			5064	1441	28.46	1406	27.76	Reference			Reference			1213	644	53.09	643	53.01	Reference			Reference		
937	80.22	929	79.54	0.64	(0.55,0.75)	0.0000***	0.66	(0.56,0.77)	0.0000***	996	254	25.50	240	24.10	0.83	(0.71,0.97)	0.0175*	0.86	(0.73,1.01)	0.0631	476	233	48.95	233	48.95	0.85	(0.69,1.05)	0.1332	0.88	(0.71,1.09)	0.2334
196	81.67	195	81.25	0.72	(0.52,1.00)	0.0495*	0.80	(0.57,1.12)	0.1853	617	185	29.98	178	28.85	1.05	(0.88,1.27)	0.5706	1.28	(1.05,1.56)	0.0148*	98	26	26.53	26	26.53	0.32	(0.20,0.51)	0.0000***	0.38	(0.24,0.62)	0.0001**
304	85.88	301	85.03	0.94	(0.70,1.27)	0.6943	0.97	(0.72,1.31)	0.8412	351	105	29.91	103	29.34	1.08	(0.85,1.37)	0.5232	1.20	(0.94,1.52)	0.1481	73	33	45.21	33	45.21	0.73	(0.46,1.18)	0.1962	0.77	(0.47,1.24)	0.2769
3047	89.54	3038	89.27	Reference			Reference			1282	426	33.23	420	32.76	Reference			Reference			442	294	66.52	293	66.29	Reference			Reference		
262	84.24	260	83.60	0.61	(0.45,0.84)	0.0026**	0.60	(0.44,0.84)	0.0023**	264	68	25.76	63	23.86	0.64	(0.47,0.87)	0.0047**	0.64	(0.47,0.87)	0.0043**	88	33	37.50	32	36.36	0.29	(0.18,0.47)	0.0000***	0.32	(0.20,0.53)	0.0000***
50	83.33	50	83.33	0.60	(0.30,1.19)	0.1463	0.59	(0.29,1.19)	0.1417	173	51	29.48	50	28.90	0.83	(0.59,1.18)	0.3087	0.84	(0.58,1.21)	0.3437	27	8	29.63	7	25.93	0.18	(0.07,0.43)	0.0001**	0.25	(0.10,0.63)	0.0034**
86	94.51	86	94.51	2.07	(0.83,5.12)	0.1173	2.03	(0.82,5.04)	0.1273	68	31	45.59	30	44.12	1.62	(0.99,2.65)	0.0548	1.59	(0.96,2.61)	0.0694	8	4	50.00	4	50.00	0.51	(0.13,2.06)	0.3438	0.47	(0.12,1.95)	0.3012
18	52.94	18	52.94							1718	63	3.67	60	3.49							1143	74	6.47	69	6.04						
9226	84.83	9197	84.56	Reference			Reference			6582	1740	26.44	1698	25.80	Reference			Reference			5664	2856	50.42	2818	49.75	Reference			Reference		
1367	79.75	1355	79.05	0.69	(0.61,0.78)	0.0000***	0.77	(0.68,0.88)	0.0001***	1573	379	24.09	364	23.14	0.87	(0.76,0.99)	0.0295*	0.90	(0.79,1.02)	0.1093	1777	818	46.03	809	45.53	0.84	(0.76,0.94)	0.0019**	0.89	(0.79,0.99)	0.0291*
246	79.35	245	79.03	0.69	(0.52,0.91)	0.0084**	0.79	(0.59,1.05)	0.1020	909	249	27.39	238	26.18	1.02	(0.87,1.19)	0.8037	1.18	(1.00,1.40)	0.0548	517	155	29.98	154	29.79	0.43	(0.35,0.52)	0.0000***	0.49	(0.40,0.60)	0.0000***
427	82.27	425	81.89	0.83	(0.66,1.04)	0.1011	0.93	(0.74,1.18)	0.5486	657	166	25.27	163	24.81	0.95	(0.79,1.14)	0.5806	1.08	(0.90,1.31)	0.4115	454	174	38.33	169	37.22	0.60	(0.49,0.73)	0.0000***	0.64	(0.52,0.78)	0.0000***
7545	82.10	7502	81.63	Reference			Reference			6847	1797	26.25	1749	25.54	Reference			Reference			5377	2302	42.81	2274	42.29	Reference			Reference		
974	78.49	971	78.24	0.81	(0.70,0.94)	0.0042**	0.87	(0.75,1.01)	0.0642	1235	285	23.08	269	21.78	0.81	(0.70,0.94)	0.0050**	0.85	(0.74,0.99)	0.0336*	1346	574	42.64	567	42.12	0.99	(0.88,1.12)	0.9120	1.03	(0.91,1.17)	0.6082
202	78.29	202	78.29	0.81	(0.60,1.10)	0.1736	0.91	(0.66,1.24)	0.5318	735	209	28.44	202	27.48	1.10	(0.93,1.31)	0.2533	1.25	(1.04,1.50)	0.0150*	452	129	28.54	126	27.88	0.53	(0.43,0.65)	0.0000***	0.64	(0.51,0.80)	0.0001**
319	81.79	315	80.77	0.95	(0.73,1.22)	0.6667	1.04	(0.80,1.35)	0.7566	499	142	28.46	140	28.06	1.14	(0.93,1.39)	0.2154	1.27	(1.04,1.57)	0.0218*	437	150	34.32	148	33.87	0.70	(0.57,0.86)	0.0006**	0.82	(0.67,1.01)	0.0664
18	51.43	18	51.43							1719	63	3.66	60	3.49							1144	74	6.47	69	6.03						
3165	83.25	3152	82.90	Reference			Reference			2610	683	26.17	663	25.40	Reference			Reference			2275	1034	45.45	1026	45.10	Reference			Reference		
3392	82.79	3373	82.33	0.96	(0.86,1.08)	0.5004	0.95	(0.84,1.06)	0.3510	3070	800	26.06	781	25.44	1.00	(0.89,1.13)	0.9742	0.98	(0.86,1.10)	0.6895	2718	1212	44.59	1192	43.86	0.95	(0.85,1.06)	0.3786	0.92	(0.81,1.03)	0.1396
2943	82.74	2930	82.37	0.96	(0.85,1.09)	0.5478	0.94	(0.83,1.06)	0.3050	2735	678	24.79	654	23.91	0.92	(0.81,1.05)	0.2064	0.91	(0.80,1.04)	0.1633	2456	1066	43.40	1049	42.71	0.91	(0.81,1.02)	0.0983	0.87	(0.78,0.99)	0.0289*
2473	83.10	2464	82.80	0.99	(0.87,1.13)	0.9068	0.98	(0.86,1.11)	0.7280	2332	546	23.41	535	22.94	0.87	(0.77,1.00)	0.0440*	0.83	(0.73,0.95)	0.0076**	2204	978	44.37	971	44.06	0.96	(0.85,1.08)	0.4828	0.93	(0.82,1.05)	0.2186
2790	83.73	2776	83.31	1.03	(0.91,1.17)	0.6452	0.97	(0.85,1.10)	0.5927	2579	610	23.65	592	22.95	0.87	(0.77,0.99)	0.0396*	0.85	(0.75,0.97)	0.0145*	2133	907	42.52	896	42.01	0.88	(0.78,0.99)	0.0386*	0.86	(0.76,0.98)	0.0202*
1952	84.21	1945	83.91	1.08	(0.94,1.24)	0.3069	1.01	(0.87,1.16)	0.9221	1917	491	25.61	479	24.99	0.98	(0.85,1.12)	0.7505	0.92	(0.80,1.06)	0.2310	1525	650	42.62	641	42.03	0.88	(0.77,1.01)	0.0620	0.85	(0.75,0.98)	0.0250*
1161	81.76	1159	81.62	0.92	(0.78,1.07)	0.2767	0.91	(0.77,1.06)	0.2260	1610	358	22.24	345	21.43	0.80	(0.69,0.93)	0.0033**	0.74	(0.63,0.86)	0.0001***	1210	461	38.10	454	37.52	0.73	(0.63,0.84)	0.0000***	0.75	(0.65,0.87)	0.0002**
1130	80.71	1123	80.21	0.84	(0.72,0.98)	0.0247*	0.85	(0.72,0.99)	0.0424*	1705	390	22.87	377	22.11	0.83	(0.72,0.96)	0.0135*	0.77	(0.67,0.90)	0.0009**	1119	423	37.80	417	37.27	0.72	(0.62,0.84)	0.0000***	0.75	(0.65,0.87)	0.0003**
1253	80.79	1244	80.21	0.84	(0.72,0.97)	0.0196*	0.83	(0.71,0.97)	0.0203*	2030	440	21.67	424	20.89	0.78	(0.67,0.89)	0.0003**	0.68	(0.58,0.78)	0.0000***	1428	478	33.47	468	32.77	0.59	(0.52,0.68)	0.0000***	0.63	(0.54,0.73)	0.0000***
57	79.17	56	77.78	0.72	(0.41,1.27)	0.2551	0.77	(0.43,1.38)	0.3774	158	33	20.89	32	20.25	0.75	(0.50,1.11)	0.1486	0.61	(0.41,0.91)	0.0149*	91	21	23.08	19	20.88	0.32	(0.19,0.54)	0.0000***	0.36	(0.21,0.61)	0.0001**
6557	83.01	6525	82.61	Reference			Reference			5680	1483	26.11	1444	25.42	Reference			Reference			4993	2246	44.98	2218	44.42	Reference			Reference		
5416	82.90	5394	82.57	1.00	(0.91,1.09)	0.9498	0.98	(0.90,1.07)	0.7185	5067	1224	24.16	1189	23.47	0.90	(0.82,0.98)	0.0186*	0.89	(0.81,0.97)	0.0098**	4660	2044	43.86	2020	43.35	0.96	(0.88,1.04)	0.2878	0.94	(0.87,1.03)	0.1687
4742	83.93	4721	83.56	1.07	(0.98,1.17)	0.1458	1.01	(0.92,1.11)	0.8049	4496	1101	24.49	1071	23.82	0.92	(0.84,1.00)	0.0630	0.89	(0.81,0.98)	0.0156*	3658	1557	42.56	1537	42.02	0.91	(0.83,0.99)	0.0258*	0.90	(0.82,0.99)	0.0249*
2291	81.24	2282	80.92	0.89	(0.80,1.00)	0.0451*	0.90	(0.81,1.01)	0.0732	3315	748	22.56	722	21.78	0.82	(0.74,0.90)	0.0001***	0.77	(0.69,0.85)	0.0000***	2329	884	37.96	871	37.40	0.75	(0.68,0.83)	0.0000***	0.79	(0.71,0.88)	0.0000***
1310	80.71	1300	80.10	0.85	(0.74,0.97)	0.0163*	0.85	(0.74,0.98)	0.0265*	2188	473	21.62	456	20.84	0.77	(0.69,0.87)	0.0000***	0.68	(0.60,0.77)	0.0000***	1519	499	32.85	487	32.06	0.59	(0.52,0.67)	0.0000***	0.64	(0.56,0.73)	0.0000***
8	100.00	8	100.00							10	1	10.00	1	10.00							9	2	22.22	1	11.11						

Table 3. Uptake of public colonoscopy by demographic factors

	Round 1[a]					Round 2[b]					Round 2[b] - Completed Round 1[e]							
	Positive iFOBT*	n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Positive iFOBT*	n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Positive iFOBT*	n	%	Unadjusted OR (95% CI)	Adjusted† OR (95% CI)	Positive iFOBT*	n	%
Total	5212	4467*	85.71	-	-	1886	1552	82.29	-	-	1105	922	83.44	-	-	1095	917	83.74
Age (years)																		
50-54	910	770	84.62	Reference	Reference	430	350	81.40	Reference	Reference	122	101	82.79	Reference	Reference	121	100	82.64
55-59	918	791	86.17	1.13 (0.87, 1.47) 0.3483	1.11 (0.86, 1.45) 0.4282	327	276	84.40	1.24 (0.84, 1.82) 0.2790	1.19 (0.81, 1.76) 0.3802	199	170	85.43	1.22 (0.66, 2.25) 0.5271	1.18 (0.64, 2.19) 0.5969	199	170	85.43
60-64	1034	867	83.85	0.94 (0.74, 1.21) 0.6438	0.93 (0.72, 1.19) 0.5584	385	311	80.78	0.96 (0.68, 1.36) 0.8225	0.93 (0.65, 1.33) 0.6799	260	205	78.85	0.77 (0.44, 1.35) 0.3686	0.75 (0.42, 1.31) 0.3104	256	203	79.30
65-69	1181	1019	86.28	1.14 (0.90, 1.46) 0.2824	1.11 (0.86, 1.42) 0.4154	378	310	82.01	1.04 (0.73, 1.49) 0.8215	1.02 (0.71, 1.46) 0.9338	264	221	83.71	1.07 (0.60, 1.89) 0.8202	1.07 (0.60, 1.92) 0.8126	262	221	84.35
70-74	1169	1020	87.25	1.24 (0.97, 1.60) 0.0849	1.20 (0.93, 1.55) 0.1525	366	305	83.33	1.14 (0.79, 1.65) 0.4756	1.10 (0.76, 1.60) 0.6183	260	225	86.54	1.34 (0.74, 2.41) 0.3351	1.32 (0.72, 2.41) 0.3728	257	223	86.77
Sex																		
Female	2283	1907	83.53	Reference	Reference	871	699	80.25	Reference	Reference	519	419	80.73	Reference	Reference	513	417	81.29
Male	2929	2560	87.40	1.37 (1.17, 1.60) 0.0001***	1.37 (1.17, 1.60) 0.0001***	1015	853	84.04	1.30 (1.02, 1.64) 0.0320*	1.35 (1.06, 1.72) 0.0147*	586	503	85.84	1.45 (1.05, 1.99) 0.0232*	1.48 (1.07, 2.05) 0.0170*	582	500	85.91
Unknown£	0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00
Age (years) - Sex																		
50-54, Female	418	343	82.06	Reference	Reference	215	173	80.47	Reference	Reference	62	49	79.03	Reference	Reference	62	49	79.03
50-54, Male	492	427	86.79	1.44 (1.00, 2.06) 0.0494*	1.42 (0.98, 2.05) 0.0627	215	177	82.33	1.13 (0.70, 1.84) 0.6202	1.21 (0.73, 2.01) 0.4680	60	52	86.67	1.72 (0.66, 4.52) 0.2675	1.74 (0.64, 4.68) 0.2764	59	51	86.44
55-59, Female	421	350	83.14	Reference	Reference	145	120	82.76	Reference	Reference	90	76	84.44	Reference	Reference	90	76	84.44
55-59, Male	497	441	88.73	1.60 (1.10, 2.33) 0.0150*	1.58 (1.08, 2.31) 0.0188*	182	156	85.71	1.25 (0.69, 2.27) 0.4648	1.22 (0.66, 2.26) 0.5283	109	94	86.24	1.15 (0.52, 2.54) 0.7212	1.13 (0.51, 2.52) 0.7646	109	94	86.24
60-64, Female	437	363	83.07	Reference	Reference	167	133	79.64	Reference	Reference	121	94	77.69	Reference	Reference	118	93	78.81
60-64, Male	597	504	84.42	1.10 (0.79, 1.54) 0.5585	1.12 (0.80, 1.57) 0.5211	218	178	81.65	1.14 (0.68, 1.89) 0.6199	1.27 (0.75, 2.15) 0.3705	139	111	79.86	1.14 (0.63, 2.07) 0.6692	1.31 (0.71, 2.43) 0.3920	138	110	79.71
65-69, Female	505	430	85.15	Reference	Reference	172	138	80.23	Reference	Reference	126	102	80.95	Reference	Reference	125	102	81.60
65-69, Male	676	589	87.13	1.18 (0.85, 1.65) 0.3278	1.25 (0.89, 1.76) 0.1893	206	172	83.50	1.25 (0.74, 2.11) 0.4114	1.28 (0.75, 2.18) 0.3679	138	119	86.23	1.47 (0.76, 2.84) 0.2477	1.44 (0.74, 2.80) 0.2839	137	119	86.86
70-74, Female	502	421	83.86	Reference	Reference	172	135	78.49	Reference	Reference	120	98	81.67	Reference	Reference	118	97	82.20
70-74, Male	667	599	89.81	1.69 (1.20, 2.39) 0.0028**	1.64 (1.16, 2.33) 0.0056**	194	170	87.63	1.94 (1.11, 3.40) 0.0205*	1.98 (1.11, 3.51) 0.0201*	140	127	90.71	2.19 (1.05, 4.57) 0.0361*	2.18 (1.02, 4.66) 0.0451*	139	126	90.65
Unknown£	0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00
Sex - Age (years)																		
Female: 50-54	418	343	82.06	Reference	Reference	215	173	80.47	Reference	Reference	62	49	79.03	Reference	Reference	62	49	79.03
Female: 55-59	421	350	83.14	1.08 (0.75, 1.54) 0.6805	1.04 (0.72, 1.49) 0.8436	145	120	82.76	1.17 (0.67, 2.01) 0.5837	1.15 (0.67, 2.00) 0.6113	90	76	84.44	1.44 (0.62, 3.32) 0.3925	1.42 (0.61, 3.31) 0.4156	90	76	84.44
Female: 60-64	437	363	83.07	1.07 (0.75, 1.53) 0.6975	1.06 (0.74, 1.52) 0.7414	167	133	79.64	0.95 (0.57, 1.57) 0.8413	0.90 (0.54, 1.51) 0.6933	121	94	77.69	0.92 (0.44, 1.95) 0.8347	0.87 (0.40, 1.85) 0.7086	118	93	78.81
Female: 65-69	505	430	85.15	1.25 (0.88, 1.78) 0.2057	1.19 (0.83, 1.70) 0.3392	172	138	80.23	0.99 (0.59, 1.63) 0.9544	0.95 (0.57, 1.58) 0.8408	126	102	80.95	1.13 (0.53, 2.40) 0.7556	1.07 (0.50, 2.33) 0.8577	125	102	81.60
Female: 70-74	502	421	83.86	1.14 (0.80, 1.60) 0.4672	1.13 (0.80, 1.62) 0.4840	172	135	78.49	0.89 (0.54, 1.45) 0.6317	0.83 (0.50, 1.38) 0.4639	120	98	81.67	1.18 (0.55, 2.54) 0.6693	1.10 (0.50, 2.43) 0.8169	118	97	82.20
Male: 50-54	492	427	86.79	Reference	Reference	215	177	82.33	Reference	Reference	60	52	86.67	Reference	Reference	59	51	86.44
Male: 55-59	497	441	88.73	1.20 (0.82, 1.76) 0.3514	1.21 (0.83, 1.78) 0.3264	182	156	85.71	1.29 (0.75, 2.22) 0.3610	1.24 (0.71, 2.17) 0.4460	109	94	86.24	0.96 (0.38, 2.43) 0.9381	1.02 (0.40, 2.62) 0.9606	109	94	86.24
Male: 60-64	597	504	84.42	0.82 (0.59, 1.16) 0.2698	0.83 (0.58, 1.17) 0.2784	218	178	81.65	0.96 (0.59, 1.56) 0.8551	0.95 (0.57, 1.59) 0.8540	139	111	79.86	0.61 (0.26, 1.43) 0.2553	0.68 (0.28, 1.61) 0.3770	138	110	79.71
Male: 65-69	676	589	87.13	1.03 (0.73, 1.45) 0.8640	1.04 (0.73, 1.48) 0.8181	206	172	83.50	1.09 (0.65, 1.81) 0.7500	1.12 (0.66, 1.89) 0.6827	138	119	86.23	0.96 (0.40, 2.34) 0.9347	1.08 (0.44, 2.68) 0.8687	137	119	86.86
Male: 70-74	667	599	89.81	1.34 (0.93, 1.93) 0.1123	1.29 (0.90, 1.87) 0.1676	194	170	87.63	1.52 (0.87, 2.64) 0.1374	1.51 (0.86, 2.67) 0.1546	140	127	90.71	1.50 (0.59, 3.84) 0.3946	1.72 (0.66, 4.53) 0.2699	139	126	90.65
Unknown£	0	0	0.00			0	0	0.00			0	0	0.00			0	0	0.00
Ethnicity																		
European/Other	4105	3514	85.60	Reference	Reference	1429	1169	81.81	Reference	Reference	896	748	83.48	Reference	Reference	887	744	83.88
European	*4056*	*3470*	*85.55*	*-*	*-*	*1408*	*1155*	*82.03*	*-*	*-*	*888*	*742*	*83.56*	*-*	*-*	*879*	*738*	*83.96*
Other	*49*	*44*	*80.80*	*-*	*-*	*21*	*14*	*66.67*	*-*	*-*	*8*	*6*	*75.00*	*-*	*-*	*8*	*6*	*75.00*
Asian	690	582	84.35	0.91 (0.73, 1.13) 0.3875	0.86 (0.68, 1.08) 0.1804	245	204	83.27	1.11 (0.77, 1.59) 0.5826	1.11 (0.76, 1.60) 0.5901	122	101	82.79	0.95 (0.58, 1.57) 0.8465	0.99 (0.59, 1.67) 0.9831	122	101	82.79
Pacific	161	144	89.44	1.42 (0.86, 2.37) 0.1739	1.17 (0.69, 1.97) 0.5609	94	80	85.11	1.27 (0.71, 2.28) 0.4207	0.95 (0.52, 1.76) 0.8815	29	22	75.86	0.62 (0.26, 1.48) 0.2837	0.36 (0.14, 0.92) 0.0333*	29	22	75.86
Māori	226	204	90.27	1.56 (1.00, 2.44) 0.0521	1.41 (0.90, 2.22) 0.1374	108	93	86.11	1.38 (0.79, 2.42) 0.2625	1.22 (0.69, 2.15) 0.5033	58	51	87.93	1.44 (0.64, 3.24) 0.3759	1.37 (0.60, 3.13) 0.4485	57	50	87.72
Unknown£	30	23	76.67			10	6	60.00			0	0	0.00			0	0	0.00
Age (years) - Ethnicity																		
50-59, European/Other	1319	1127	85.44	Reference	Reference	526	428	81.37	Reference	Reference	236	198	83.90	Reference	Reference	235	197	83.83
50-59, Asian	334	280	83.83	0.88 (0.64, 1.23) 0.4601	0.81 (0.58, 1.14) 0.2228	132	110	83.33	1.14 (0.69, 1.90) 0.6015	1.18 (0.70, 1.98) 0.5407	59	49	83.05	0.94 (0.44, 2.02) 0.8747	0.99 (0.46, 2.16) 0.9833	59	49	83.05
50-59, Pacific	63	56	88.89	1.36 (0.61, 3.03) 0.4489	1.15 (0.51, 2.61) 0.7359	40	38	95.00	4.35 (1.03, 18.34) 0.0452*	3.59 (0.83, 15.60) 0.0877	7	7	100.00	####### (0.00, 0.00) 0.9842	####### (0.00, 0.00) 0.9846	7	7	100.00
50-59, Māori	106	93	87.74	1.22 (0.67, 2.22) 0.5184	1.02 (0.55, 1.88) 0.9506	52	46	88.46	1.76 (0.73, 4.23) 0.2094	1.58 (0.64, 3.88) 0.3185	19	17	89.47	1.63 (0.36, 7.35) 0.5241	1.65 (0.36, 7.59) 0.5209	19	17	89.47
60-69, European/Other	1789	1515	84.68	Reference	Reference	594	479	80.64	Reference	Reference	428	347	81.07	Reference	Reference	423	346	81.80
60-69, Asian	252	214	84.92	1.02 (0.70, 1.47) 0.9222	0.92 (0.64, 1.35) 0.6811	85	73	85.88	1.46 (0.77, 2.78) 0.2487	1.38 (0.72, 2.66) 0.3296	50	42	84.00	1.23 (0.55, 2.71) 0.6156	1.17 (0.52, 2.63) 0.7001	50	42	84.00
60-69, Pacific	71	65	91.55	1.96 (0.84, 4.57) 0.1192	1.47 (0.62, 3.48) 0.3860	36	28	77.78	0.84 (0.37, 1.89) 0.6744	0.54 (0.22, 1.31) 0.1733	14	9	64.29	0.42 (0.14, 1.29) 0.1290	0.23 (0.07, 0.78) 0.0187*	14	9	64.29
60-69, Māori	88	80	90.91	1.81 (0.86, 3.78) 0.1156	1.63 (0.77, 3.42) 0.2007	46	40	86.96	1.60 (0.66, 3.87) 0.2959	1.32 (0.54, 3.24) 0.5421	32	28	87.50	1.63 (0.56, 4.79) 0.3707	1.35 (0.45, 4.04) 0.5882	29	27	87.10
70-74, European/Other	997	872	87.46	Reference	Reference	309	262	84.79	Reference	Reference	232	203	87.50	Reference	Reference	229	201	87.77
70-74, Asian	104	88	84.62	0.79 (0.45, 1.39) 0.4093	0.74 (0.42, 1.32) 0.3093	28	21	75.00	0.54 (0.22, 1.34) 0.1821	0.47 (0.18, 1.22) 0.1208	13	10	76.92	0.48 (0.12, 1.83) 0.2805	0.49 (0.12, 2.00) 0.3216	13	10	76.92
70-74, Pacific	27	23	85.19	0.82 (0.28, 2.42) 0.7253	0.67 (0.22, 2.03) 0.4800	18	14	77.78	0.63 (0.20, 1.99) 0.4291	0.56 (0.17, 1.85) 0.3388	8	6	75.00	0.43 (0.08, 2.22) 0.3133	0.33 (0.06, 1.95) 0.2236	8	6	75.00
70-74, Māori	32	31	96.88	4.44 (0.60, 32.84) 0.1439	4.19 (0.56, 31.36) 0.1627	10	7	70.00	0.42 (0.10, 1.68) 0.2187	0.39 (0.09, 1.62) 0.1960	7	6	85.71	0.86 (0.10, 7.38) 0.8884	0.75 (0.08, 6.82) 0.8021	7	6	85.71
Unknown£	30	23	76.67			10	6	60.00			0	0	0.00			0	0	0.00
Sex - Ethnicity																		
Female: European/Other	1760	1461	83.01	Reference	Reference	634	507	79.97	Reference	Reference	415	336	80.96	Reference	Reference	409	334	81.66
Female: Asian	336	283	84.23	1.09 (0.79, 1.50) 0.5852	1.00 (0.72, 1.39) 0.9842	149	117	78.52	0.92 (0.59, 1.42) 0.6933	0.87 (0.55, 1.36) 0.5370	71	55	77.46	0.81 (0.44, 1.48) 0.4927	0.81 (0.43, 1.53) 0.5096	71	55	77.46
Female: Pacific	79	68	86.08	1.27 (0.66, 2.42) 0.4776	0.94 (0.48, 1.84) 0.8664	44	38	86.36	1.59 (0.66, 3.84) 0.3055	1.36 (0.55, 3.39) 0.5081	10	8	80.00	0.94 (0.20, 4.51) 0.9389	0.78 (0.15, 4.00) 0.7692	10	8	80.00
Female: Māori	98	89	90.82	2.02 (1.01, 4.06) 0.0474*	1.80 (0.89, 3.64) 0.1021	44	37	84.09	1.32 (0.58, 3.04) 0.5079	1.22 (0.52, 2.82) 0.6481	23	20	86.96	1.57 (0.45, 5.41) 0.4767	1.51 (0.43, 5.31) 0.5166	23	20	86.96
Male: European/Other	2345	2053	87.55	Reference	Reference	795	662	83.27	Reference	Reference	481	412	85.65	Reference	Reference	478	410	85.77
Male: Asian	354	299	84.46	0.77 (0.57, 1.06) 0.1068	0.72 (0.52, 0.99) 0.0453*	96	87	90.63	1.94 (0.95, 3.95) 0.0673	1.87 (0.91, 3.84) 0.0890	51	46	90.20	1.54 (0.59, 4.01) 0.3762	1.52 (0.57, 4.05) 0.4019	51	46	90.20
Male: Pacific	82	76	92.68	1.80 (0.78, 4.17) 0.1697	1.56 (0.66, 3.66) 0.3080	50	42	84.00	1.05 (0.48, 2.30) 0.8933	0.63 (0.27, 1.46) 0.2853	19	14	73.68	0.47 (0.16, 1.34) 0.1584	0.16 (0.04, 0.60) 0.0070**	19	14	73.68
Male: Māori	128	115	89.84	1.26 (0.70, 2.26) 0.4427	1.14 (0.63, 2.06) 0.6754	64	56	87.50	1.41 (0.66, 3.02) 0.3816	1.21 (0.55, 2.65) 0.6377	35	31	88.57	1.30 (0.44, 3.79) 0.6335	1.20 (0.40, 3.60) 0.7515	34	30	88.24
Unknown£	30	23	76.67			10	6	60.00			0	0	0.00			0	0	0.00
Deprivation Index (NZDep)																		
1 (least)	629	504	80.13	Reference	Reference	223	180	80.72	Reference	Reference	138	115	83.33	Reference	Reference	135	115	85.19
2	805	656	81.49	1.09 (0.84, 1.42) 0.5147	1.11 (0.85, 1.44) 0.4576	284	222	78.17	0.86 (0.55, 1.32) 0.4824	0.85 (0.55, 1.33) 0.4859	175	142	81.14	0.86 (0.48, 1.55) 0.6159	0.85 (0.47, 1.54) 0.5897	174	141	81.03
3	755	654	86.62	1.61 (1.21, 2.14) 0.0012**	1.65 (1.23, 2.20) 0.0007**	250	200	80.00	0.96 (0.61, 1.51) 0.8446	0.98 (0.62, 1.56) 0.9466	149	124	83.22	0.99 (0.53, 1.85) 0.9798	0.97 (0.52, 1.82) 0.9345	148	123	83.11
4	690	594	86.09	1.53 (1.15, 2.05) 0.0040**	1.56 (1.16, 2.09) 0.0029**	242	195	80.58	0.99 (0.63, 1.57) 0.9698	0.97 (0.61, 1.55) 0.9129	157	126	80.25	0.81 (0.45, 1.47) 0.4955	0.80 (0.43, 1.46) 0.4575	155	125	80.65
5	718	615	85.65	1.48 (1.11, 1.97) 0.0072**	1.51 (1.13, 2.02) 0.0050**	247	205	83.00	1.17 (0.73, 1.87) 0.5219	1.15 (0.71, 1.85) 0.5659	161	135	83.85	1.04 (0.56, 1.95) 0.9041	1.05 (0.56, 1.95) 0.8789	160	134	83.75
6	512	452	88.28	1.87 (1.34, 2.61) 0.0002***	1.83 (1.31, 2.56) 0.0004***	182	150	82.42	1.12 (0.67, 1.86) 0.6614	1.11 (0.66, 1.85) 0.6995	83	68	81.93	0.91 (0.44, 1.86) 0.7886	0.89 (0.43, 1.84) 0.7585	81	67	82.72
7	316	291	92.09	2.89 (1.84, 4.54) 0.0000***	2.89 (1.83, 4.55) 0.0000***	164	140	85.37	1.39 (0.81, 2.41) 0.2336	1.37 (0.79, 2.40) 0.2643	86	71	82.56	0.95 (0.46, 1.93) 0.8805	0.97 (0.47, 2.02) 0.9436	86	71	82.56
8	379	330	87.07	1.67 (1.17, 2.39) 0.0050**	1.73 (1.20, 2.49) 0.0032**	126	107	84.92	1.35 (0.75, 2.43) 0.3249	1.34 (0.73, 2.46) 0.3421	63	55	87.30	1.38 (0.58, 3.27) 0.4712	1.50 (0.62, 3.63) 0.3736	63	55	87.30
9	373	341	91.42	2.64 (1.75, 3.99) 0.0000***	2.58 (1.70, 3.92) 0.0000***	161	146	90.68	2.33 (1.24, 4.35) 0.0083**	2.31 (1.21, 4.38) 0.0107*	90	83	92.22	2.37 (0.97, 5.79) 0.0578	2.88 (1.13, 7.37) 0.0268*	90	83	92.22
10 (most)	30	26	86.67	1.61 (0.55, 4.70) 0.3820	1.59 (0.54, 4.66) 0.4009	7	7	100.00	####### (0.00, 0.00) 0.9742	####### (0.00, 0.00) 0.9741	3	3	100.00	####### (0.00, 0.00) 0.9838	####### (0.00, 0.00) 0.9741	3	3	100.00
Unknown£	5	4	80.00			0	0	0.00			0	0	0.00			0	0	0.00
Deprivation Index (NZDep) quintiles																		
1 (least)	1434	1160	80.89	Reference	Reference	507	402	79.29	Reference	Reference	313	257	82.11	Reference	Reference	309	256	82.85
2	1445	1248	86.37	1.50 (1.23, 1.83) 0.0001***	1.52 (1.24, 1.86) 0.0000***	492	395	80.28	1.06 (0.78, 1.45) 0.6956	1.07 (0.78, 1.47) 0.6657	306	250	81.70	0.97 (0.65, 1.46) 0.8948	0.96 (0.63, 1.45) 0.8502	303	248	81.85
3	1230	1067	86.75	1.55 (1.25, 1.91) 0.0001***	1.54 (1.25, 1.91) 0.0001***	429	355	82.75	1.25 (0.90, 1.74) 0.1803	1.24 (0.89, 1.73) 0.2105	244	203	83.20	1.08 (0.69, 1.68) 0.7369	1.09 (0.69, 1.70) 0.7174	241	201	83.40
4	695	621	89.35	1.98 (1.51, 2.61) 0.0000***	2.02 (1.52, 2.67) 0.0000***	290	247	85.17	1.50 (1.02, 2.21) 0.0408*	1.49 (1.00, 2.23) 0.0522	149	126	84.56	1.19 (0.70, 2.03) 0.5127	1.27 (0.73, 2.19) 0.3983	149	126	84.56
5 (most)	403	367	91.07	2.41 (1.67, 3.47) 0.0000***	2.34 (1.61, 3.40) 0.0000***	168	153	91.07	2.66 (1.50, 4.72) 0.0008**	2.65 (1.48, 4.77) 0.0011**	93	86	92.47	2.68 (1.18, 6.09) 0.0190*	3.29 (1.38, 7.86) 0.0074**	93	86	92.47
Unknown£	5	4	80.00			0	0	0.00			0	0	0.00			0	0	0.00

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Bloot Test
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

[pink] Statistically higher than reference group
[green] Statistically lower than reference group

Round 2 - Completed Round 1 with negative iFOBT		Round 2 - Did not complete Round 1					Round 2 - Not invited in Round 1				
Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Positive iFOBT*	n	% (Colonoscopy Uptake)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Positive iFOBT*	n	% (Colonoscopy Uptake)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
-	-	409	323	78.97	-	-	372	307	82.53	-	-
Reference	Reference	65	51	78.46	Reference	Reference	243	198	81.48	Reference	Reference
1.23 (0.67 , 2.27) 0.5067	1.19 (0.64 , 2.22) 0.5750	93	77	82.80	1.32 (0.59 , 2.94) 0.4950	1.23 (0.54 , 2.80) 0.6175	35	29	82.86	1.10 (0.43 , 2.80) 0.8442	1.02 (0.39 , 2.71) 0.9667
0.80 (0.46 , 1.41) 0.4448	0.77 (0.44 , 1.36) 0.3758	94	79	84.04	1.45 (0.64 , 3.25) 0.3718	1.52 (0.65 , 3.52) 0.3320	31	27	87.10	1.53 (0.51 , 4.60) 0.4453	1.36 (0.44 , 4.19) 0.5884
1.13 (0.64 , 2.01) 0.6735	1.14 (0.63 , 2.04) 0.6699	79	57	72.15	0.71 (0.33 , 1.53) 0.3853	0.68 (0.31 , 1.50) 0.3378	35	32	91.43	2.42 (0.71 , 8.27) 0.1572	2.55 (0.73 , 8.90) 0.1415
1.38 (0.76 , 2.49) 0.2901	1.35 (0.74 , 2.48) 0.3275	78	59	75.64	0.85 (0.39 , 1.87) 0.6903	0.77 (0.34 , 1.73) 0.5259	28	21	75.00	0.68 (0.27 , 1.70) 0.4118	0.75 (0.29 , 1.91) 0.5444
Reference	Reference	181	139	76.80	Reference	Reference	171	141	82.46	Reference	Reference
1.40 (1.02 , 1.94) 0.0391 *	1.44 (1.04 , 1.99) 0.0296 *	228	184	80.70	1.26 (0.78 , 2.04) 0.3362	1.36 (0.82 , 2.26) 0.2304	201	166	82.59	1.01 (0.59 , 1.73) 0.9736	1.05 (0.59 , 1.87) 0.8751
		0	0	0.00			0	0	0.00		
Reference	Reference	30	22	73.33	Reference	Reference	123	102	82.93	Reference	Reference
1.69 (0.64 , 4.44) 0.2853	1.70 (0.63 , 4.59) 0.2953	35	29	82.86	1.76 (0.53 , 5.80) 0.3549	2.37 (0.54 , 10.35) 0.2501	120	96	80.00	0.82 (0.43 , 1.58) 0.5574	0.85 (0.42 , 1.71) 0.6416
Reference	Reference	45	37	82.22	Reference	Reference	10	7	70.00	Reference	Reference
1.15 (0.52 , 2.54) 0.7212	1.13 (0.51 , 2.52) 0.7646	48	40	83.33	1.08 (0.37 , 3.17) 0.8872	1.06 (0.33 , 3.39) 0.9241	25	22	88.00	3.14 (0.51 , 19.25) 0.2155	5.35 (0.33 , 86.12) 0.2371
Reference	Reference	34	29	85.29	Reference	Reference	12	10	83.33	Reference	Reference
1.06 (0.58 , 1.94) 0.8599	1.21 (0.64 , 2.26) 0.5599	60	50	83.33	0.86 (0.27 , 2.77) 0.8031	1.13 (0.32 , 4.00) 0.8464	19	17	89.47	1.70 (0.21 , 14.02) 0.6221	0.92 (0.08 , 9.90) 0.9429
Reference	Reference	32	23	71.88	Reference	Reference	14	13	92.86	Reference	Reference
1.49 (0.76 , 2.92) 0.2436	1.44 (0.73 , 2.85) 0.2905	47	34	72.34	1.02 (0.38 , 2.79) 0.9638	1.13 (0.38 , 3.36) 0.8232	21	19	90.48	0.73 (0.06 , 8.92) 0.8060	1.17 (0.08 , 17.41) 0.9073
Reference	Reference	40	28	70.00	Reference	Reference	12	9	75.00	Reference	Reference
2.10 (1.00 , 4.40) 0.0498 *	2.06 (0.95 , 4.43) 0.0661	38	31	81.58	1.90 (0.66 , 5.49) 0.2374	2.40 (0.72 , 8.04) 0.1561	16	12	75.00	1.00 (0.18 , 5.63) 1.0000	0.15 (0.01 , 2.36) 0.1778
		0	0	0.00			0	0	0.00		
Reference	Reference	30	22	73.33	Reference	Reference	123	102	82.93	Reference	Reference
1.44 (0.62 , 3.32) 0.3925	1.43 (0.61 , 3.34) 0.4077	45	37	82.22	1.68 (0.55 , 5.12) 0.3599	1.63 (0.51 , 5.19) 0.4055	10	7	70.00	0.48 (0.11 , 2.01) 0.3155	0.48 (0.10 , 2.19) 0.3412
0.99 (0.46 , 2.10) 0.9727	0.94 (0.43 , 2.02) 0.8658	34	29	85.29	2.11 (0.61 , 7.34) 0.2409	1.88 (0.51 , 6.93) 0.3399	12	10	83.33	1.03 (0.21 , 5.04) 0.9715	0.91 (0.18 , 4.71) 0.9127
1.18 (0.55 , 2.52) 0.6752	1.12 (0.51 , 2.45) 0.7716	32	23	71.88	0.93 (0.30 , 2.84) 0.8977	0.78 (0.24 , 2.54) 0.6825	14	13	92.86	2.68 (0.33 , 21.56) 0.3554	2.30 (0.27 , 19.49) 0.4455
1.23 (0.57 , 2.65) 0.6058	1.15 (0.51 , 2.56) 0.7372	40	28	70.00	0.85 (0.30 , 2.44) 0.7601	0.74 (0.25 , 2.22) 0.5887	12	9	75.00	0.62 (0.15 , 2.48) 0.4964	0.74 (0.18 , 3.14) 0.6874
Reference	Reference	35	29	82.86	Reference	Reference	120	96	80.00	Reference	Reference
0.98 (0.39 , 2.47) 0.9710	1.04 (0.41 , 2.66) 0.9359	48	40	83.33	1.03 (0.32 , 3.30) 0.9544	0.88 (0.26 , 2.97) 0.8331	25	22	88.00	1.83 (0.51 , 6.64) 0.3558	1.75 (0.45 , 6.78) 0.4166
0.62 (0.26 , 1.45) 0.2660	0.68 (0.29 , 1.63) 0.3878	60	50	83.33	1.03 (0.34 , 3.14) 0.9523	1.27 (0.39 , 4.13) 0.6886	19	17	89.47	2.12 (0.46 , 9.83) 0.3349	1.41 (0.27 , 7.39) 0.6812
1.04 (0.42 , 2.54) 0.9365	1.16 (0.46 , 2.90) 0.7488	47	34	72.34	0.54 (0.18 , 1.60) 0.2681	0.58 (0.19 , 1.80) 0.3458	21	19	90.48	2.37 (0.52 , 10.90) 0.2660	3.16 (0.64 , 15.48) 0.1566
1.52 (0.59 , 3.89) 0.3818	1.72 (0.65 , 4.54) 0.2711	38	31	81.58	0.92 (0.28 , 3.05) 0.8866	0.82 (0.23 , 2.90) 0.7553	16	12	75.00	0.75 (0.22 , 2.53) 0.6431	1.00 (0.27 , 3.69) 0.9985
		0	0	0.00			0	0	0.00		
Reference	Reference	293	226	77.13	Reference	Reference	240	195	81.25	Reference	Reference
-	*-*	*288*	*223*	*77.43*	*-*	*-*	*232*	*190*	*81.90*	*-*	*-*
-	*-*	*5*	*3*	*60.00*			*8*	*5*	*62.50*		
0.92 (0.56 , 1.53) 0.7594	0.98 (0.58 , 1.64) 0.9288	44	34	77.27	1.01 (0.47 , 2.15) 0.9836	1.06 (0.48 , 2.34) 0.8811	79	69	87.34	1.59 (0.76 , 3.33) 0.2168	1.47 (0.68 , 3.19) 0.3294
0.60 (0.25 , 1.44) 0.2557	0.35 (0.14 , 0.91) 0.0313 *	42	38	90.48	2.82 (0.97 , 8.17) 0.0569	1.95 (0.64 , 5.94) 0.2384	23	20	86.96	1.54 (0.44 , 5.40) 0.5015	1.24 (0.33 , 4.72) 0.7524
1.37 (0.61 , 3.09) 0.4437	1.32 (0.58 , 3.00) 0.5118	27	23	85.19	1.70 (0.57 , 5.10) 0.3403	1.17 (0.37 , 3.69) 0.7910	23	19	82.61	1.10 (0.36 , 3.38) 0.8730	0.83 (0.26 , 2.70) 0.7579
		3	2	66.67			7	4	57.14		
Reference	Reference	110	85	77.27	Reference	Reference	180	145	80.56	Reference	Reference
0.95 (0.44 , 2.03) 0.8849	1.00 (0.46 , 2.17) 0.9930	17	14	82.35	1.37 (0.37 , 5.16) 0.6393	1.29 (0.32 , 5.25) 0.7192	56	47	83.93	1.26 (0.56 , 2.81) 0.5720	1.29 (0.56 , 2.98) 0.5556
######## (0.00 , 0.00) 0.9841	######## (0.00 , 0.00) 0.9845	15	14	93.33	4.12 (0.52 , 32.87) 0.1817	2.43 (0.28 , 20.81) 0.4173	18	17	94.44	4.10 (0.53 , 31.88) 0.1771	3.70 (0.45 , 30.66) 0.2259
1.64 (0.36 , 7.39) 0.5198	1.66 (0.36 , 7.63) 0.5162	16	15	93.75	4.41 (0.56 , 35.06) 0.1605	3.56 (0.42 , 30.02) 0.2437	17	14	82.35	1.13 (0.31 , 4.14) 0.8576	0.93 (0.24 , 3.62) 0.9181
Reference	Reference	127	98	77.17	Reference	Reference	39	34	87.18	Reference	Reference
1.17 (0.53 , 2.59) 0.7014	1.12 (0.50 , 2.51) 0.7879	16	13	81.25	1.28 (0.34 , 4.81) 0.7124	1.32 (0.34 , 5.20) 0.6916	19	18	94.74	2.65 (0.29 , 24.41) 0.3905	2.06 (0.19 , 21.89) 0.5486
0.40 (0.13 , 1.23) 0.1096	0.22 (0.06 , 0.76) 0.0168 *	19	17	89.47	2.52 (0.55 , 11.53) 0.2351	2.12 (0.41 , 11.10) 0.3731	3	2	66.67	0.29 (0.02 , 3.87) 0.3521	0.12 (0.00 , 3.32) 0.2111
1.50 (0.51 , 4.42) 0.4597	1.25 (0.42 , 3.74) 0.6917	9	7	77.78	1.04 (0.20 , 5.26) 0.9662	0.83 (0.15 , 4.46) 0.8292	5	5	100.00	88759.54 (0.00 , #####) 0.9738	######## (0.00 , #####) 0.9730
Reference	Reference	56	43	76.79	Reference	Reference	21	16	76.19	Reference	Reference
0.46 (0.12 , 1.79) 0.2652	0.49 (0.12 , 1.99) 0.3199	11	7	63.64	0.53 (0.13 , 2.10) 0.3646	0.51 (0.11 , 2.44) 0.4020	4	4	100.00	32955.15 (0.00 , #####) 0.9489	17920.15 (0.00 , #####) 0.9424
0.42 (0.08 , 2.17) 0.2995	0.34 (0.06 , 1.99) 0.2317	8	7	87.50	2.12 (0.24 , 18.82) 0.5014	1.59 (0.15 , 16.88) 0.6990	2	1	50.00	0.31 (0.02 , 5.96) 0.4394	0.11 (0.00 , 6.58) 0.2880
0.84 (0.10 , 7.20) 0.8703	0.74 (0.08 , 6.69) 0.7883	2	1	50.00	0.30 (0.02 , 5.18) 0.4091	0.18 (0.01 , 3.84) 0.2741	1	0	0.00	0.00 (0.00 , 0.00) 0.9738	0.00 (0.00 , 0.00) 0.9693
		3	2	66.67			7	4	57.14		
Reference	Reference	120	91	75.83	Reference	Reference	99	80	80.81	Reference	Reference
0.77 (0.42 , 1.42) 0.4058	0.79 (0.42 , 1.49) 0.4673	29	20	68.97	0.71 (0.29 , 1.73) 0.4477	0.74 (0.29 , 1.88) 0.5232	49	42	85.71	1.42 (0.55 , 3.66) 0.4620	1.44 (0.51 , 4.10) 0.4942
0.90 (0.19 , 4.32) 0.8934	0.78 (0.15 , 3.97) 0.7606	21	20	95.24	6.37 (0.82 , 49.57) 0.0768	5.17 (0.61 , 43.87) 0.1322	13	10	76.92	0.79 (0.20 , 3.16) 0.7407	0.71 (0.15 , 3.46) 0.6740
1.50 (0.43 , 5.17) 0.5233	1.44 (0.41 , 5.07) 0.5667	11	8	72.73	0.85 (0.21 , 3.42) 0.8187	0.69 (0.16 , 3.06) 0.6253	10	9	90.00	2.14 (0.26 , 17.91) 0.4837	1.43 (0.15 , 13.37) 0.7512
Reference	Reference	173	135	78.03	Reference	Reference	141	115	81.56	Reference	Reference
1.53 (0.59 , 3.98) 0.3873	1.51 (0.57 , 4.02) 0.4121	15	14	93.33	3.94 (0.50 , 30.93) 0.1921	3.77 (0.46 , 31.12) 0.2183	30	27	90.00	2.03 (0.57 , 7.22) 0.2716	2.05 (0.53 , 7.87) 0.2967
0.46 (0.16 , 1.33) 0.1533	0.16 (0.04 , 0.61) 0.0071 **	21	18	85.71	1.69 (0.47 , 6.04) 0.4202	1.02 (0.26 , 4.03) 0.9720	10	10	100.00	######## (0.00 , #####) 0.9701	######## (0.00 , #####) 0.9703
1.24 (0.42 , 3.64) 0.6905	1.12 (0.37 , 3.40) 0.8349	16	15	93.75	4.22 (0.54 , 32.99) 0.1697	2.07 (0.24 , 17.70) 0.5062	13	10	76.92	0.75 (0.19 , 2.93) 0.6832	0.75 (0.17 , 3.41) 0.7101
		3	2	66.67			7	4	57.14		
Reference	Reference	38	27	71.05	Reference	Reference	47	38	80.85	Reference	Reference
0.74 (0.40 , 1.36) 0.3381	0.74 (0.40 , 1.36) 0.3314	64	43	67.19	0.83 (0.35 , 2.00) 0.6844	0.77 (0.31 , 1.86) 0.5555	45	37	82.22	1.10 (0.38 , 3.14) 0.8655	1.11 (0.36 , 3.45) 0.8527
0.86 (0.45 , 1.62) 0.6334	0.85 (0.44 , 1.61) 0.6102	51	38	74.51	1.19 (0.46 , 3.06) 0.7164	1.34 (0.51 , 3.53) 0.5587	50	38	76.00	0.75 (0.28 , 1.99) 0.5628	0.75 (0.27 , 2.13) 0.5928
0.72 (0.39 , 1.35) 0.3085	0.72 (0.38 , 1.34) 0.2959	35	26	74.29	1.18 (0.42 , 3.31) 0.7571	1.08 (0.38 , 3.08) 0.8924	50	43	86.00	1.45 (0.49 , 4.28) 0.4962	1.24 (0.40 , 3.82) 0.7102
0.90 (0.48 , 1.69) 0.7351	0.90 (0.48 , 1.71) 0.7553	47	40	85.11	2.33 (0.80 , 6.76) 0.1203	2.32 (0.79 , 6.83) 0.1272	39	30	76.92	0.79 (0.28 , 2.23) 0.6561	0.70 (0.24 , 2.08) 0.5222
0.83 (0.39 , 1.76) 0.6298	0.82 (0.39 , 1.75) 0.6154	51	43	84.31	2.19 (0.78 , 6.13) 0.1359	1.95 (0.68 , 5.58) 0.2147	48	39	81.25	1.03 (0.37 , 2.86) 0.9604	0.91 (0.30 , 2.78) 0.8685
0.82 (0.40 , 1.71) 0.6023	0.85 (0.40 , 1.79) 0.6705	45	40	88.89	3.26 (1.02 , 10.44) 0.0467 *	2.71 (0.82 , 9.02) 0.1032	33	29	87.88	1.72 (0.48 , 6.13) 0.4052	1.46 (0.39 , 5.49) 0.5751
1.20 (0.50 , 2.88) 0.6908	1.31 (0.53 , 3.22) 0.5607	35	29	82.86	1.97 (0.64 , 6.06) 0.2375	1.80 (0.55 , 5.91) 0.3341	28	23	82.14	1.09 (0.32 , 3.65) 0.8896	0.89 (0.25 , 3.15) 0.8540
2.06 (0.83 , 5.10) 0.1174	2.53 (0.98 , 6.56) 0.0555	42	36	85.71	2.44 (0.80 , 7.44) 0.1154	2.30 (0.73 , 7.23) 0.1537	29	27	93.10	3.20 (0.64 , 15.99) 0.1570	2.78 (0.52 , 15.04) 0.2343
######## (0.00 , 0.00) 0.9841	######## (0.00 , 0.00) 0.9830	1	1	100.00	######## (0.00 , 0.00) 0.9892	######## (0.00 , 0.00) 0.9895	3	3	100.00	######## (0.00 , 0.00) 0.9890	######## (0.00 , 0.00) 0.9891
		0	0	0.00			0	0	0.00		
Reference	Reference	102	70	68.63	Reference	Reference	92	75	81.52	Reference	Reference
0.93 (0.62 , 1.41) 0.7457	0.93 (0.61 , 1.41) 0.7204	86	64	74.42	1.33 (0.70 , 2.52) 0.3826	1.45 (0.75 , 2.80) 0.2719	100	81	81.00	0.97 (0.47 , 2.00) 0.9263	0.89 (0.41 , 1.94) 0.7763
1.04 (0.66 , 1.63) 0.8633	1.05 (0.66 , 1.65) 0.8448	98	83	84.69	2.53 (1.27 , 5.05) 0.0085 **	2.51 (1.24 , 5.10) 0.0106 *	87	69	79.31	0.87 (0.41 , 1.82) 0.7094	0.76 (0.35 , 1.67) 0.4938
1.13 (0.67 , 1.93) 0.6439	1.20 (0.69 , 2.09) 0.5092	80	69	86.25	2.87 (1.34 , 6.14) 0.0067 **	2.66 (1.19 , 5.98) 0.0176 *	61	52	85.25	1.31 (0.54 , 3.16) 0.5489	1.09 (0.43 , 2.79) 0.8556
2.54 (1.11 , 5.80) 0.0266 *	3.15 (1.31 , 7.54) 0.0102 *	43	37	86.05	2.82 (1.08 , 7.35) 0.0341 *	2.80 (1.04 , 7.54) 0.0412 *	32	30	93.75	3.40 (0.74 , 15.63) 0.1158	2.94 (0.60 , 14.41) 0.1840
		0	0	0.00			0	0	0.00		

Table 4a. Screening outcomes (Positivity and Detection) by demographic factors in Round 1[a]

	Completed kit[‡]	Positive iFOBT[*] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Advanced Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Cancer[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	69229	5212	7.53	-	-	2686	3.88	-	-	1158	1.67	-	-	212	0.31	-	-
Age (years)																	
50-54	16763	910	5.43	Reference	Reference	391	2.33	Reference	Reference	159	0.95	Reference	Reference	21	0.13	Reference	Reference
55-59	14704	918	6.24	1.16 (1.06, 1.27) 0.0021 **	1.16 (1.06, 1.28) 0.0019 **	471	3.20	1.39 (1.21, 1.59) 0.0000 ***	1.39 (1.21, 1.59) 0.0000 ***	195	1.33	1.40 (1.14, 1.73) 0.0016 **	1.39 (1.13, 1.72) 0.0021 **	23	0.16	1.25 (0.69, 2.26) 0.4616	1.24 (0.69, 2.24) 0.4757
60-64	14464	1034	7.15	1.34 (1.22, 1.47) 0.0000 ***	1.33 (1.21, 1.46) 0.0000 ***	522	3.61	1.57 (1.37, 1.79) 0.0000 ***	1.55 (1.35, 1.77) 0.0000 ***	221	1.53	1.62 (1.32, 1.99) 0.0000 ***	1.57 (1.28, 1.93) 0.0000 ***	47	0.32	2.60 (1.55, 4.35) 0.0003 ***	2.56 (1.53, 4.29) 0.0004 **
65-69	12978	1181	9.10	1.74 (1.59, 1.91) 0.0000 ***	1.75 (1.60, 1.92) 0.0000 ***	644	4.96	2.19 (1.92, 2.48) 0.0000 ***	2.15 (1.89, 2.45) 0.0000 ***	298	2.30	2.45 (2.02, 2.98) 0.0000 ***	2.34 (1.92, 2.85) 0.0000 ***	57	0.44	3.52 (2.13, 5.80) 0.0000 ***	3.43 (2.08, 5.67) 0.0000 ***
70-74	10320	1169	11.33	2.23 (2.03, 2.44) 0.0000 ***	2.20 (2.01, 2.41) 0.0000 ***	658	6.38	2.85 (2.51, 3.24) 0.0000 ***	2.77 (2.43, 3.15) 0.0000 ***	285	2.76	2.97 (2.44, 3.61) 0.0000 ***	2.77 (2.27, 3.37) 0.0000 ***	64	0.62	4.97 (3.04, 8.15) 0.0000 ***	4.82 (2.93, 7.92) 0.0000 ***
Sex																	
Female	37498	2283	6.09	Reference	Reference	1012	2.70	Reference	Reference	418	1.11	Reference	Reference	92	0.25	Reference	Reference
Male	31729	2929	9.23	1.57 (1.48, 1.66) 0.0000 ***	1.55 (1.47, 1.64) 0.0000 ***	1674	5.28	2.01 (1.85, 2.17) 0.0000 ***	1.98 (1.82, 2.14) 0.0000 ***	740	2.33	2.12 (1.88, 2.39) 0.0000 ***	2.08 (1.85, 2.35) 0.0000 ***	120	0.38	1.54 (1.18, 2.03) 0.0018 **	1.49 (1.13, 1.96) 0.0041 **
Unknown[£]	2	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex																	
50-54, Female	9438	418	4.43	Reference	Reference	147	1.56	Reference	Reference	53	0.56	Reference	Reference	14	0.15	Reference	Reference
50-54, Male	7324	492	6.72	1.55 (1.36, 1.78) 0.0000 ***	1.55 (1.36, 1.77) 0.0000 ***	244	3.33	2.18 (1.77, 2.68) 0.0000 ***	2.15 (1.75, 2.65) 0.0000 ***	106	1.45	2.60 (1.87, 3.62) 0.0000 ***	2.55 (1.83, 3.55) 0.0000 ***	7	0.10	0.64 (0.26, 1.60) 0.3420	0.65 (0.26, 1.63) 0.3613
55-59, Female	8137	421	5.17	Reference	Reference	179	2.20	Reference	Reference	61	0.75	Reference	Reference	12	0.15	Reference	Reference
55-59, Male	6566	497	7.57	1.50 (1.31, 1.72) 0.0000 ***	1.52 (1.33, 1.74) 0.0000 ***	292	4.45	2.07 (1.71, 2.50) 0.0000 ***	2.09 (1.73, 2.53) 0.0000 ***	134	2.04	2.76 (2.03, 3.74) 0.0000 ***	2.74 (2.02, 3.72) 0.0000 ***	11	0.17	1.14 (0.50, 2.58) 0.7598	1.13 (0.50, 2.57) 0.7661
60-64, Female	7761	437	5.63	Reference	Reference	189	2.44	Reference	Reference	84	1.08	Reference	Reference	19	0.24	Reference	Reference
60-64, Male	6703	597	8.91	1.64 (1.44, 1.86) 0.0000 ***	1.64 (1.44, 1.87) 0.0000 ***	333	4.97	2.09 (1.75, 2.51) 0.0000 ***	2.10 (1.73, 2.51) 0.0000 ***	137	2.04	1.91 (1.45, 2.51) 0.0000 ***	1.94 (1.47, 2.55) 0.0000 ***	28	0.42	1.71 (0.95, 3.06) 0.0718	1.72 (0.96, 3.08) 0.0693
65-69, Female	6866	505	7.36	Reference	Reference	238	3.47	Reference	Reference	111	1.62	Reference	Reference	21	0.31	Reference	Reference
65-69, Male	6112	676	11.06	1.57 (1.39, 1.77) 0.0000 ***	1.58 (1.40, 1.78) 0.0000 ***	406	6.64	1.98 (1.68, 2.33) 0.0000 ***	1.99 (1.69, 2.35) 0.0000 ***	187	3.06	1.92 (1.51, 2.44) 0.0000 ***	1.94 (1.53, 2.47) 0.0000 ***	36	0.59	1.93 (1.13, 3.31) 0.0168 *	1.94 (1.13, 3.33) 0.0160 *
70-74, Female	5296	502	9.48	Reference	Reference	259	4.89	Reference	Reference	109	2.06	Reference	Reference	26	0.49	Reference	Reference
70-74, Male	5024	667	13.28	1.46 (1.29, 1.65) 0.0000 ***	1.48 (1.31, 1.68) 0.0000 ***	399	7.94	1.68 (1.43, 1.97) 0.0000 ***	1.71 (1.45, 2.01) 0.0000 ***	176	3.50	1.73 (1.36, 2.20) 0.0000 ***	1.77 (1.39, 2.26) 0.0000 ***	38	0.76	1.54 (0.94, 2.55) 0.0885	1.55 (0.94, 2.56) 0.0862
Unknown[£]	2	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)																	
Female: 50-54	9438	418	4.43	Reference	Reference	147	1.56	Reference	Reference	53	0.56	Reference	Reference	14	0.15	Reference	Reference
Female: 55-59	8137	421	5.17	1.18 (1.02, 1.35) 0.0210 *	1.18 (1.03, 1.35) 0.0204 *	179	2.20	1.42 (1.14, 1.77) 0.0017 **	1.42 (1.14, 1.77) 0.0017 **	61	0.75	1.34 (0.92, 1.93) 0.1228	1.34 (0.93, 1.94) 0.1214	12	0.15	0.99 (0.46, 2.15) 0.9882	0.99 (0.46, 2.17) 0.9721
Female: 60-64	7761	437	5.63	1.29 (1.12, 1.48) 0.0003 **	1.29 (1.12, 1.48) 0.0003 **	189	2.44	1.58 (1.27, 1.96) 0.0000 ***	1.59 (1.28, 1.97) 0.0000 ***	84	1.08	1.94 (1.37, 2.74) 0.0002 **	1.89 (1.34, 2.68) 0.0003 **	19	0.24	1.65 (0.83, 3.30) 0.1545	1.65 (0.82, 3.30) 0.1570
Female: 65-69	6866	505	7.36	1.71 (1.50, 1.96) 0.0000 ***	1.74 (1.52, 1.99) 0.0000 ***	238	3.47	2.27 (1.84, 2.79) 0.0000 ***	2.29 (1.86, 2.83) 0.0000 ***	111	1.62	2.91 (2.09, 4.04) 0.0000 ***	2.82 (2.03, 3.93) 0.0000 ***	21	0.31	2.07 (1.05, 4.06) 0.0358 *	2.05 (1.04, 4.04) 0.0392 *
Female: 70-74	5296	502	9.48	2.26 (1.98, 2.58) 0.0000 ***	2.27 (1.99, 2.61) 0.0000 ***	259	4.89	3.25 (2.65, 3.99) 0.0000 ***	3.27 (2.66, 4.03) 0.0000 ***	109	2.06	3.72 (2.68, 5.18) 0.0000 ***	3.57 (2.56, 4.98) 0.0000 ***	26	0.49	3.32 (1.73, 6.37) 0.0003 ***	3.30 (1.71, 6.36) 0.0004 **
Male: 50-54	7324	492	6.72	Reference	Reference	244	3.33	Reference	Reference	106	1.45	Reference	Reference	7	0.10	Reference	Reference
Male: 55-59	6566	497	7.57	1.14 (1.00, 1.29) 0.0515	1.15 (1.01, 1.31) 0.0382 *	292	4.45	1.35 (1.14, 1.61) 0.0007 **	1.36 (1.14, 1.62) 0.0005 **	134	2.04	1.42 (1.10, 1.83) 0.0077 **	1.42 (1.09, 1.83) 0.0081 **	11	0.17	1.75 (0.68, 4.50) 0.2455	1.74 (0.68, 4.50) 0.2505
Male: 60-64	6703	597	8.91	1.36 (1.20, 1.54) 0.0000 ***	1.37 (1.20, 1.55) 0.0000 ***	333	4.97	1.52 (1.28, 1.80) 0.0000 ***	1.53 (1.29, 1.81) 0.0000 ***	137	2.04	1.42 (1.10, 1.83) 0.0071 **	1.42 (1.09, 1.83) 0.0081 **	28	0.42	4.38 (1.91, 10.04) 0.0005 **	4.34 (1.90, 9.95) 0.0005 **
Male: 65-69	6112	676	11.06	1.73 (1.53, 1.95) 0.0000 ***	1.76 (1.56, 1.99) 0.0000 ***	406	6.64	2.06 (1.75, 2.43) 0.0000 ***	2.07 (1.76, 2.44) 0.0000 ***	187	3.06	2.15 (1.69, 2.73) 0.0000 ***	2.11 (1.66, 2.69) 0.0000 ***	36	0.59	6.19 (2.75, 13.93) 0.0000 ***	6.08 (2.70, 13.69) 0.0000 ***
Male: 70-74	5024	667	13.28	2.13 (1.88, 2.40) 0.0000 ***	2.15 (1.90, 2.44) 0.0000 ***	399	7.94	2.50 (2.13, 2.95) 0.0000 ***	2.50 (2.12, 2.95) 0.0000 ***	176	3.50	2.47 (1.94, 3.15) 0.0000 ***	2.40 (1.88, 3.07) 0.0000 ***	38	0.76	7.97 (3.55, 17.85) 0.0000 ***	7.84 (3.49, 17.62) 0.0000 ***
Unknown[£]	2	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity																	
European/Other	55595	4105	7.38	Reference	Reference	2190	3.94	Reference	Reference	985	1.77	Reference	Reference	178	0.32	Reference	Reference
Asian	8962	690	7.70	1.05 (0.96, 1.14) 0.2907	1.12 (1.03, 1.22) 0.0103 *	311	3.47	0.88 (0.78, 0.99) 0.0329 *	0.95 (0.84, 1.07) 0.3980	94	1.05	0.59 (0.48, 0.73) 0.0000 ***	0.64 (0.52, 0.80) 0.0001 ***	25	0.28	0.87 (0.57, 1.32) 0.5181	1.00 (0.65, 1.52) 0.9834
Pacific	1847	161	8.72	1.20 (1.02, 1.41) 0.0318 *	1.18 (0.99, 1.39) 0.0617	53	2.87	0.72 (0.55, 0.95) 0.0204 *	0.70 (0.53, 0.93) 0.0149 *	19	1.03	0.58 (0.37, 0.91) 0.0179 *	0.58 (0.36, 0.92) 0.0214 *	5	0.27	0.85 (0.35, 2.06) 0.7109	0.82 (0.33, 2.05) 0.6743
Māori	2624	226	8.61	1.18 (1.03, 1.36) 0.0192 *	1.25 (1.08, 1.44) 0.0023 **	119	4.54	1.16 (0.96, 1.40) 0.1265	1.24 (1.02, 1.50) 0.0281 *	53	2.02	1.14 (0.86, 1.51) 0.3484	1.24 (0.94, 1.65) 0.1332	4	0.15	0.48 (0.18, 1.28) 0.1416	0.53 (0.19, 1.43) 0.2072
Unknown[£]	201	30	14.93	-	-	13	6.47	-	-	7	3.48	-	-	0	0.00	-	-
Age (years) - Ethnicity																	
50-59, European/Other	23840	1319	5.53	Reference	Reference	648	2.72	Reference	Reference	286	1.20	Reference	Reference	33	0.14	Reference	Reference
50-59, Asian	5108	334	6.54	1.19 (1.06, 1.35) 0.0050 **	1.19 (1.05, 1.35) 0.0072 **	143	2.80	1.03 (0.86, 1.24) 0.7460	1.02 (0.85, 1.23) 0.8066	41	0.80	0.67 (0.48, 0.93) 0.0155 *	0.66 (0.48, 0.93) 0.0160 *	8	0.16	1.13 (0.52, 2.45) 0.7538	1.08 (0.49, 2.36) 0.8510
50-59, Pacific	956	63	6.59	1.20 (0.93, 1.56) 0.1629	1.09 (0.83, 1.43) 0.5201	20	2.09	0.77 (0.49, 1.20) 0.2432	0.65 (0.41, 1.02) 0.0620	7	0.73	0.61 (0.29, 1.29) 0.1943	0.51 (0.24, 1.11) 0.0894	1	0.10	0.76 (0.10, 5.53) 0.7829	0.61 (0.08, 4.67) 0.6381
50-59, Māori	1481	106	7.16	1.32 (1.07, 1.62) 0.0086 **	1.26 (1.02, 1.55) 0.0310 *	47	3.17	1.17 (0.87, 1.58) 0.2982	1.09 (0.81, 1.48) 0.5711	18	1.22	1.01 (0.63, 1.64) 0.9570	0.94 (0.58, 1.53) 0.8107	2	0.14	0.98 (0.23, 4.07) 0.9729	0.89 (0.21, 3.76) 0.8742
60-69, European/Other	22809	1789	7.84	Reference	Reference	967	4.24	Reference	Reference	444	1.95	Reference	Reference	87	0.38	Reference	Reference
60-69, Asian	2965	252	8.50	1.09 (0.95, 1.25) 0.2136	1.05 (0.92, 1.21) 0.4537	116	3.91	0.92 (0.76, 1.12) 0.4036	0.90 (0.74, 1.10) 0.2991	38	1.28	0.65 (0.47, 0.91) 0.0126 *	0.65 (0.47, 0.91) 0.0129 *	14	0.47	1.24 (0.70, 2.18) 0.4577	1.13 (0.64, 2.01) 0.6724
60-69, Pacific	716	71	9.92	1.29 (1.01, 1.66) 0.0433 *	1.17 (0.90, 1.51) 0.2374	23	3.21	0.75 (0.49, 1.14) 0.1791	0.70 (0.46, 1.08) 0.1093	11	1.54	0.79 (0.43, 1.44) 0.4336	0.78 (0.42, 1.44) 0.4219	2	0.28	0.73 (0.18, 2.98) 0.6625	0.55 (0.13, 2.29) 0.4112
60-69, Māori	876	88	10.05	1.31 (1.05, 1.64) 0.0181 *	1.27 (1.02, 1.60) 0.0364 *	53	6.05	1.45 (1.09, 1.93) 0.0100 **	1.45 (1.09, 1.93) 0.0119 *	23	2.63	1.36 (0.89, 2.08) 0.1577	1.37 (0.90, 2.11) 0.1463	1	0.11	0.30 (0.04, 2.15) 0.2296	0.27 (0.04, 1.94) 0.1934
70-74, European/Other	8946	997	11.14	Reference	Reference	575	6.43	Reference	Reference	255	2.85	Reference	Reference	58	0.65	Reference	Reference
70-74, Asian	889	104	11.70	1.06 (0.85, 1.31) 0.6174	1.02 (0.82, 1.26) 0.8775	52	5.85	0.90 (0.68, 1.21) 0.5012	0.84 (0.62, 1.13) 0.2470	15	1.69	0.58 (0.35, 0.99) 0.0454 *	0.55 (0.32, 0.93) 0.0255 *	3	0.34	0.52 (0.16, 1.66) 0.2687	0.52 (0.16, 1.67) 0.2731
70-74, Pacific	175	27	15.43	1.46 (0.96, 2.21) 0.0763	1.33 (0.87, 2.05) 0.1897	10	5.71	0.88 (0.46, 1.68) 0.7031	0.78 (0.41, 1.51) 0.4663	1	0.57	0.20 (0.03, 1.44) 0.1047	0.18 (0.02, 1.28) 0.0868	2	1.14	1.77 (0.43, 7.31) 0.4289	1.87 (0.43, 8.01) 0.4020
70-74, Māori	267	32	11.99	1.09 (0.75, 1.58) 0.6676	1.05 (0.72, 1.54) 0.7845	19	7.12	1.12 (0.69, 1.79) 0.6517	1.04 (0.65, 1.68) 0.8632	12	4.49	1.60 (0.89, 2.90) 0.1179	1.52 (0.83, 2.76) 0.1720	1	0.37	0.58 (0.08, 4.17) 0.5852	0.58 (0.08, 4.26) 0.5951
Unknown[£]	201	30	14.93	-	-	13	6.47	-	-	7	3.48	-	-	0	0.00	-	-
Sex - Ethnicity																	
Female: European/Other	29882	1760	5.89	Reference	Reference	803	2.69	Reference	Reference	354	1.18	Reference	Reference	74	0.25	Reference	Reference
Female: Asian	5135	336	6.54	1.12 (0.99, 1.26) 0.0683	1.21 (1.07, 1.37) 0.0024 **	138	2.69	1.00 (0.83, 1.20) 0.9993	1.13 (0.94, 1.37) 0.1903	38	0.74	0.62 (0.44, 0.87) 0.0056 **	0.72 (0.52, 1.02) 0.0640	13	0.25	1.02 (0.57, 1.84) 0.9414	1.09 (0.60, 1.99) 0.7852
Female: Pacific	988	79	8.00	1.39 (1.10, 1.75) 0.0060 **	1.38 (1.09, 1.76) 0.0082 **	22	2.23	0.82 (0.54, 1.27) 0.3783	0.87 (0.56, 1.34) 0.5276	6	0.61	0.51 (0.23, 1.14) 0.1027	0.55 (0.24, 1.24) 0.1498	3	0.30	1.23 (0.39, 3.90) 0.7289	0.97 (0.30, 3.18) 0.9653
Female: Māori	1443	98	6.79	1.16 (0.94, 1.44) 0.1571	1.22 (0.99, 1.51) 0.0664	46	3.19	1.19 (0.88, 1.61) 0.2530	1.32 (0.97, 1.79) 0.0775	17	1.18	0.99 (0.61, 1.62) 0.9821	1.13 (0.69, 1.85) 0.6328	2	0.14	0.56 (0.14, 2.30) 0.4175	0.53 (0.13, 2.17) 0.3740
Male: European/Other	3827	2345	61.28	Reference	Reference	1387	36.24	Reference	Reference	631	16.49	Reference	Reference	104	2.72	Reference	Reference
Male: Asian	859	354	41.21	1.02 (0.90, 1.14) 0.7948	1.04 (0.92, 1.17) 0.5029	173	20.14	0.83 (0.71, 0.98) 0.0243 *	0.84 (0.71, 0.99) 0.0363 *	56	6.52	0.59 (0.45, 0.78) 0.0002 **	0.61 (0.46, 0.80) 0.0004 **	12	1.40	0.77 (0.43, 1.41) 0.4027	0.91 (0.49, 1.66) 0.7520
Male: Pacific	1180	82	6.95	1.05 (0.83, 1.33) 0.6701	1.01 (0.80, 1.29) 0.9228	31	2.63	0.66 (0.46, 0.94) 0.0230 *	0.61 (0.42, 0.88) 0.0082 **	13	1.10	0.61 (0.35, 1.06) 0.0808	0.59 (0.34, 1.04) 0.0674	2	0.17	0.57 (0.14, 2.33) 0.4383	0.70 (0.17, 2.95) 0.6301
Male: Māori	203	128	63.05	1.21 (1.00, 1.46) 0.0449 *	1.27 (1.05, 1.53) 0.0152 *	73	35.96	1.16 (0.91, 1.47) 0.2407	1.19 (0.93, 1.52) 0.1630	36	17.73	1.25 (0.89, 1.76) 0.1984	1.30 (0.92, 1.84) 0.1328	2	0.99	0.42 (0.10, 1.70) 0.2223	0.52 (0.13, 2.14) 0.3688
Unknown[£]	25712	30	0.12	-	-	13	0.05	-	-	7	0.03	-	-	0	0.00	-	-
Deprivation Index (NZDep)																	
1 (least)	10175	629	6.18	Reference	Reference	341	3.35	Reference	Reference	140	1.38	Reference	Reference	23	0.23	Reference	Reference
2	11561	805	6.96	1.14 (1.02, 1.27) 0.0207 *	1.14 (1.02, 1.27) 0.0215 *	400	3.46	1.03 (0.89, 1.20) 0.6602	1.03 (0.89, 1.19) 0.7118	180	1.56	1.13 (0.91, 1.42) 0.2691	1.12 (0.90, 1.40) 0.3105	36	0.31	1.38 (0.82, 2.33) 0.2295	1.37 (0.81, 2.31) 0.2437
3	10288	755	7.34	1.20 (1.08, 1.34) 0.0010 **	1.17 (1.04, 1.30) 0.0065 **	401	3.90	1.17 (1.01, 1.35) 0.0368 *	1.13 (0.98, 1.31) 0.1022	180	1.75	1.28 (1.02, 1.59) 0.0316 *	1.23 (0.98, 1.54) 0.0696	35	0.34	1.51 (0.89, 2.57) 0.1272	1.43 (0.85, 2.43) 0.1805
4	8535	690	8.08	1.33 (1.19, 1.49) 0.0000 ***	1.31 (1.17, 1.47) 0.0000 ***	358	4.19	1.26 (1.08, 1.47) 0.0025 **	1.25 (1.08, 1.46) 0.0035 **	159	1.86	1.36 (1.08, 1.71) 0.0084 **	1.39 (1.11, 1.76) 0.0047 **	23	0.27	1.19 (0.67, 2.13) 0.5507	1.15 (0.65, 2.06) 0.6327
5	9292	718	7.73	1.27 (1.14, 1.42) 0.0000 ***	1.19 (1.07, 1.33) 0.0021 **	344	3.70	1.11 (0.95, 1.29) 0.1850	1.04 (0.89, 1.22) 0.5851	160	1.72	1.26 (1.00, 1.58) 0.0508	1.20 (0.96, 1.52) 0.1153	33	0.36	1.57 (0.92, 2.68) 0.0958	1.40 (0.82, 2.40) 0.2129
6	6542	512	7.83	1.29 (1.14, 1.45) 0.0000 ***	1.22 (1.08, 1.38) 0.0012 **	270	4.13	1.24 (1.06, 1.46) 0.0092 **	1.17 (0.99, 1.38) 0.0583	114	1.74	1.27 (0.99, 1.63) 0.0591	1.19 (0.93, 1.54) 0.1640	18	0.28	1.22 (0.66, 2.26) 0.5317	1.12 (0.60, 2.07) 0.7275
7	3961	316	7.98	1.32 (1.14, 1.51) 0.0001 ***	1.28 (1.11, 1.48) 0.0005 **	167	4.22	1.27 (1.05, 1.53) 0.0133 *	1.29 (1.07, 1.57) 0.0081 **	68	1.72	1.25 (0.93, 1.68) 0.1315	1.32 (0.99, 1.78) 0.0615	14	0.35	1.57 (0.80, 3.05) 0.1867	1.57 (0.80, 3.06) 0.1872
8	4251	379	8.92	1.49 (1.30, 1.70) 0.0000 ***	1.43 (1.25, 1.64) 0.0000 ***	194	4.56	1.38 (1.15, 1.65) 0.0005 **	1.39 (1.16, 1.68) 0.0004 ***	67	1.58	1.15 (0.86, 1.54) 0.3571	1.22 (0.91, 1.64) 0.1671	7	0.16	0.73 (0.31, 1.70) 0.4626	0.72 (0.31, 1.70) 0.4539
9	4340	373	8.59	1.43 (1.25, 1.63) 0.0000 ***	1.36 (1.19, 1.56) 0.0000 ***	196	4.52	1.36 (1.14, 1.63) 0.0007 **	1.40 (1.16, 1.68) 0.0004 ***	81	1.87	1.36 (1.03, 1.80) 0.0278 *	1.49 (1.12, 1.97) 0.0056 **	22	0.51	2.25 (1.25, 4.04) 0.0067 **	2.32 (1.28, 4.21) 0.0057 **
10 (most)	250	30	12.00	2.07 (1.40, 3.06) 0.0003 **	1.97 (1.33, 2.92) 0.0008 **	13	5.20	1.58 (0.90, 2.80) 0.1131	1.63 (0.92, 2.90) 0.0934	7	2.80	2.06 (0.96, 4.46) 0.0648	2.29 (1.05, 4.98) 0.0363 *	1	0.40	1.77 (0.24, 13.18) 0.5759	1.87 (0.25, 13.98) 0.5436
Unknown[£]	34	5	14.71	-	-	2	5.88	-	-	2	5.88	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles																	
1 (least)	21736	1434	6.60	Reference	Reference	741	3.41	Reference	Reference	320	1.47	Reference	Reference	59	0.27	Reference	Reference
2	18823	1445	7.68	1.18 (1.09, 1.27) 0.0000 ***	1.15 (1.06, 1.24) 0.0004 ***	759	4.03	1.19 (1.07, 1.32) 0.0009 ***	1.17 (1.05, 1.30) 0.0033 **	339	1.80	1.23 (1.05, 1.43) 0.0091 **	1.22 (1.05, 1.43) 0.0111 *	58	0.31	1.14 (0.79, 1.63) 0.4923	1.09 (0.76, 1.57) 0.6297
3	15834	1230	7.77	1.20 (1.11, 1.30) 0.0000 ***	1.12 (1.04, 1.22) 0.0042 **	614	3.88	1.14 (1.02, 1.27) 0.0162 *	1.08 (0.97, 1.21) 0.1697	274	1.73	1.18 (1.00, 1.39) 0.0478 *	1.13 (0.96, 1.33) 0.1569	51	0.32	1.19 (0.82, 1.73) 0.3702	1.08 (0.74, 1.57) 0.6995
4	8212	695	8.46	1.31 (1.19, 1.44) 0.0000 ***	1.27 (1.15, 1.40) 0.0000 ***	361	4.40	1.30 (1.15, 1.48) 0.0001 ***	1.32 (1.16, 1.51) 0.0000 ***	135	1.64	1.12 (0.91, 1.37) 0.2788	1.19 (0.97, 1.46) 0.0947	21	0.26	0.94 (0.57, 1.55) 0.8142	0.95 (0.57, 1.56) 0.8269
5 (most)	4590	403	8.78	1.36 (1.21, 1.53) 0.0000 ***	1.30 (1.15, 1.47) 0.0000 ***	209	4.55	1.35 (1.16, 1.58) 0.0002 ***	1.39 (1.18, 1.63) 0.0001 ***	88	1.92	1.31 (1.03, 1.66) 0.0270 *	1.43 (1.12, 1.83) 0.0037 **	23	0.50	1.85 (1.14, 3.00) 0.0125 *	1.93 (1.17, 3.16) 0.0096 **
Unknown[£]	34	5	14.71	-	-	2	5.88	-	-	2	5.88	-	-	0	0.00	-	-

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Bloot Test
Σ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)
Statistically higher than reference group
Statistically lower than reference group

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Table 4b. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2[β]

Column groups: **Positive iFOBT*** and **Detection** (Adenoma# / Advanced Adenoma# / Cancer#). Each outcome shows n, %, Unadjusted OR (95% CI) with p-value, and Adjusted[†] OR (95% CI) with p-value.

Group	Completed kit[Σ]	Pos iFOBT n	%	Unadjusted OR (95% CI) p	Adjusted[†] OR (95% CI) p	Aden n	%	Unadjusted OR (95% CI) p	Adjusted[†] OR (95% CI) p	Adv Aden n	%	Unadjusted OR (95% CI) p	Adjusted[†] OR (95% CI) p	Cancer n	%	Unadjusted OR (95% CI) p	Adjusted[†] OR (95% CI) p
Total	32274	1886	5.84	-	-	802	2.48	-	-	277	0.86	-	-	53	0.16	-	-
Age (years)																	
50-54	9249	430	4.65	Reference	Reference	160	1.73	Reference	Reference	57	0.62	Reference	Reference	6	0.06	Reference	Reference
55-59	6578	327	4.97	1.07 (0.93, 1.24) 0.3497	1.09 (0.94, 1.26) 0.2522	128	1.95	1.13 (0.89, 1.43) 0.3167	1.14 (0.90, 1.44) 0.2796	53	0.81	1.31 (0.90, 1.91) 0.1587	1.29 (0.88, 1.87) 0.1901	7	0.11	1.64 (0.55, 4.89) 0.3735	1.64 (0.55, 4.89) 0.3735
60-64	6223	385	6.19	1.35 (1.17, 1.56) 0.0000 ***	1.37 (1.19, 1.58) 0.0000 ***	173	2.78	1.62 (1.31, 2.02) 0.0000 ***	1.64 (1.32, 2.04) 0.0000 ***	55	0.88	1.44 (0.99, 2.09) 0.0556	1.39 (0.96, 2.02) 0.0843	14	0.22	3.47 (1.33, 9.04) 0.0108 *	3.26 (1.24, 8.60) 0.0168 *
65-69	5871	378	6.44	1.41 (1.22, 1.63) 0.0000 ***	1.44 (1.25, 1.67) 0.0000 ***	164	2.79	1.63 (1.31, 2.03) 0.0000 ***	1.65 (1.32, 2.06) 0.0000 ***	59	1.00	1.64 (1.14, 2.36) 0.0082 **	1.54 (1.07, 2.22) 0.0215 *	12	0.20	3.16 (1.18, 8.41) 0.0216 *	3.21 (1.20, 8.59) 0.0202 *
70-74	4353	366	8.41	1.88 (1.63, 2.18) 0.0000 ***	1.90 (1.64, 2.20) 0.0000 ***	177	4.07	2.41 (1.94, 2.99) 0.0000 ***	2.39 (1.92, 2.98) 0.0000 ***	53	1.22	1.99 (1.37, 2.89) 0.0003 ***	1.80 (1.24, 2.63) 0.0023 **	14	0.32	4.97 (1.91, 12.94) 0.0010 **	5.00 (1.91, 13.10) 0.0011 **
Sex																	
Female	17674	871	4.93	Reference	Reference	308	1.74	Reference	Reference	104	0.59	Reference	Reference	24	0.14	Reference	Reference
Male	14600	1015	6.95	1.44 (1.31, 1.58) 0.0000 ***	1.43 (1.30, 1.57) 0.0000 ***	494	3.38	1.97 (1.71, 2.28) 0.0000 ***	1.95 (1.69, 2.26) 0.0000 ***	173	1.18	2.03 (1.59, 2.59) 0.0000 ***	2.02 (1.58, 2.58) 0.0000 ***	29	0.20	1.46 (0.85, 2.51) 0.1677	1.40 (0.81, 2.41) 0.2317
Unknown[£]	0	0	0.00			0	0.00			0	0.00			0	0.00		
Age (years) - Sex																	
50-54, Female	5199	215	4.14	Reference	Reference	64	1.23	Reference	Reference	24	0.46	Reference	Reference	4	0.08	Reference	Reference
50-54, Male	4050	215	5.31	1.30 (1.07, 1.58) 0.0080 **	1.28 (1.05, 1.55) 0.0142 *	96	2.37	1.95 (1.42, 2.68) 0.0000 ***	1.93 (1.40, 2.66) 0.0001 ***	33	0.81	1.77 (1.05, 3.00) 0.0336 *	1.80 (1.06, 3.06) 0.0284 *	2	0.05	0.64 (0.12, 3.51) 0.6085	0.67 (0.12, 3.68) 0.6476
55-59, Female	3672	145	3.95	Reference	Reference	48	1.31	Reference	Reference	17	0.46	Reference	Reference	3	0.08	Reference	Reference
55-59, Male	2906	182	6.26	1.63 (1.30, 2.03) 0.0000 ***	1.65 (1.32, 2.07) 0.0000 ***	80	2.75	2.14 (1.49, 3.07) 0.0000 ***	2.17 (1.51, 3.12) 0.0000 ***	36	1.24	2.70 (1.51, 4.81) 0.0008 **	2.67 (1.49, 4.76) 0.0009 **	4	0.14	1.69 (0.38, 7.54) 0.4944	1.77 (0.39, 7.93) 0.4579
60-64, Female	3384	167	4.93	Reference	Reference	66	1.95	Reference	Reference	25	0.74	Reference	Reference	7	0.21	Reference	Reference
60-64, Male	2839	218	7.68	1.60 (1.30, 1.97) 0.0000 ***	1.62 (1.31, 1.99) 0.0000 ***	107	3.77	1.97 (1.44, 2.69) 0.0000 ***	2.00 (1.46, 2.73) 0.0000 ***	30	1.06	1.43 (0.84, 2.45) 0.1842	1.44 (0.84, 2.46) 0.1821	7	0.25	1.19 (0.42, 3.40) 0.7422	1.09 (0.36, 3.24) 0.8832
65-69, Female	3150	172	5.46	Reference	Reference	58	1.84	Reference	Reference	16	0.51	Reference	Reference	2	0.06	Reference	Reference
65-69, Male	2721	206	7.57	1.42 (1.15, 1.75) 0.0011 **	1.43 (1.16, 1.76) 0.0009 **	106	3.90	2.16 (1.56, 2.99) 0.0000 ***	2.18 (1.58, 3.02) 0.0000 ***	43	1.58	3.14 (1.77, 5.60) 0.0001 ***	3.22 (1.81, 5.73) 0.0001 ***	10	0.37	5.81 (1.27, 26.52) 0.0232 *	5.73 (1.25, 26.21) 0.0244 *
70-74, Female	2269	172	7.58	Reference	Reference	72	3.17	Reference	Reference	22	0.97	Reference	Reference	8	0.35	Reference	Reference
70-74, Male	2084	194	9.31	1.25 (1.01, 1.55) 0.0404 *	1.25 (1.00, 1.55) 0.0453 *	105	5.04	1.62 (1.19, 2.20) 0.0020 **	1.61 (1.18, 2.19) 0.0024 **	31	1.49	1.54 (0.89, 2.67) 0.1224	1.56 (0.90, 2.71) 0.1146	6	0.29	0.82 (0.28, 2.36) 0.7071	0.85 (0.29, 2.47) 0.7698
Unknown[£]	0	0	0.00			0	0.00			0	0.00			0	0.00		
Sex - Age (years)																	
Female: 50-54	5199	215	4.14	Reference	Reference	64	1.23	Reference	Reference	24	0.46	Reference	Reference	4	0.08	Reference	Reference
Female: 55-59	3672	145	3.95	0.95 (0.77, 1.18) 0.6609	0.95 (0.77, 1.18) 0.6725	48	1.31	1.06 (0.73, 1.55) 0.7516	1.06 (0.73, 1.54) 0.7587	17	0.46	1.00 (0.54, 1.87) 0.9927	0.99 (0.53, 1.85) 0.9835	3	0.08	1.06 (0.24, 4.75) 0.9373	1.05 (0.24, 4.71) 0.9455
Female: 60-64	3384	167	4.93	1.20 (0.98, 1.48) 0.0796	1.22 (0.99, 1.50) 0.0615	66	1.95	1.60 (1.13, 2.26) 0.0082 **	1.59 (1.13, 2.26) 0.0085 **	25	0.74	1.60 (0.92, 2.81) 0.0989	1.57 (0.89, 2.76) 0.1164	7	0.21	2.69 (0.79, 9.20) 0.1143	2.77 (0.81, 9.48) 0.1054
Female: 65-69	3150	172	5.46	1.34 (1.09, 1.64) 0.0054 **	1.39 (1.13, 1.71) 0.0018 **	58	1.84	1.51 (1.05, 2.15) 0.0253 *	1.51 (1.06, 2.17) 0.0240 *	16	0.51	1.10 (0.58, 2.08) 0.7665	1.05 (0.56, 1.99) 0.8718	2	0.06	0.83 (0.15, 4.51) 0.8244	0.90 (0.16, 4.95) 0.9037
Female: 70-74	2269	172	7.58	1.90 (1.55, 2.34) 0.0000 ***	1.98 (1.60, 2.44) 0.0000 ***	72	3.17	2.63 (1.87, 3.70) 0.0000 ***	2.63 (1.87, 3.71) 0.0000 ***	22	0.97	2.11 (1.18, 3.77) 0.0116 *	2.00 (1.11, 3.59) 0.0204 *	8	0.35	4.60 (1.38, 15.28) 0.0128 *	5.04 (1.49, 17.07) 0.0093 **
Male: 50-54	4050	215	5.31	Reference	Reference	96	2.37	Reference	Reference	33	0.81	Reference	Reference	2	0.05	Reference	Reference
Male: 55-59	2906	182	6.26	1.19 (0.97, 1.46) 0.0910	1.23 (1.00, 1.51) 0.0483 *	80	2.75	1.17 (0.86, 1.57) 0.3168	1.19 (0.88, 1.62) 0.2489	36	1.24	1.53 (0.95, 2.45) 0.0806	1.50 (0.93, 2.41) 0.0946	4	0.14	2.79 (0.51, 15.23) 0.2364	2.80 (0.51, 15.33) 0.2345
Male: 60-64	2839	218	7.68	1.48 (1.22, 1.80) 0.0001 ***	1.53 (1.26, 1.86) 0.0000 ***	107	3.77	1.61 (1.22, 2.13) 0.0008 **	1.67 (1.26, 2.22) 0.0004 ***	30	1.06	1.30 (0.79, 2.14) 0.3005	1.27 (0.77, 2.09) 0.3446	7	0.25	5.00 (1.04, 24.10) 0.0447 *	4.37 (0.88, 21.71) 0.0714
Male: 65-69	2721	206	7.57	1.46 (1.20, 1.78) 0.0002 ***	1.51 (1.24, 1.85) 0.0001 ***	106	3.90	1.67 (1.26, 2.21) 0.0003 ***	1.73 (1.30, 2.30) 0.0002 ***	43	1.58	1.95 (1.24, 3.08) 0.0040 **	1.87 (1.18, 2.95) 0.0075 **	10	0.37	7.47 (1.63, 34.10) 0.0095 **	7.44 (1.62, 34.14) 0.0098 **
Male: 70-74	2084	194	9.31	1.83 (1.50, 2.24) 0.0000 ***	1.88 (1.53, 2.30) 0.0000 ***	105	5.04	2.19 (1.65, 2.90) 0.0000 ***	2.25 (1.69, 2.99) 0.0000 ***	31	1.49	1.84 (1.12, 3.01) 0.0155 *	1.70 (1.03, 2.79) 0.0364 *	6	0.29	5.84 (1.18, 28.98) 0.0307 *	5.88 (1.18, 29.41) 0.0309 *
Unknown[£]	0	0	0.00			0	0.00			0	0.00			0	0.00		
Ethnicity																	
European/Other	25257	1429	5.66	Reference	Reference	620	2.45	Reference	Reference	233	0.92	Reference	Reference	39	0.15	Reference	Reference
Asian	4338	245	5.65	1.00 (0.87, 1.15) 0.9788	1.03 (0.89, 1.18) 0.7220	93	2.14	0.87 (0.70, 1.09) 0.2176	0.92 (0.74, 1.15) 0.4674	27	0.62	0.67 (0.45, 1.00) 0.0519	0.67 (0.45, 1.00) 0.0527	6	0.14	0.90 (0.38, 2.12) 0.8016	0.96 (0.40, 2.30) 0.9307
Pacific	1168	94	8.05	1.46 (1.17, 1.81) 0.0007 **	1.32 (1.05, 1.66) 0.0161 *	34	2.91	1.19 (0.84, 1.69) 0.3272	1.10 (0.77, 1.59) 0.6003	8	0.68	0.74 (0.37, 1.50) 0.4054	0.62 (0.30, 1.28) 0.1998	3	0.26	1.67 (0.51, 5.40) 0.3953	1.44 (0.43, 4.89) 0.5555
Māori	1364	108	7.92	1.43 (1.17, 1.76) 0.0005 **	1.43 (1.16, 1.76) 0.0007 **	53	3.89	1.61 (1.21, 2.14) 0.0012 **	1.65 (1.23, 2.20) 0.0008 **	9	0.66	0.71 (0.37, 1.39) 0.3217	0.68 (0.35, 1.33) 0.2580	4	0.29	1.90 (0.68, 5.33) 0.2212	1.92 (0.67, 5.46) 0.2237
Unknown[£]	147	10	6.80	-	-	2	1.36	-	-	0	0.00	-	-	1	0.68	-	-
Age (years) - Ethnicity																	
50-59, European/Other	11700	526	4.50	Reference	Reference	207	1.77	Reference	Reference	86	0.74	Reference	Reference	8	0.07	Reference	Reference
50-59, Asian	2579	132	5.12	1.15 (0.94, 1.39) 0.1726	1.11 (0.91, 1.35) 0.3130	42	1.63	0.92 (0.66, 1.28) 0.6213	0.90 (0.64, 1.27) 0.5571	15	0.58	0.79 (0.46, 1.37) 0.4013	0.78 (0.45, 1.36) 0.3850	3	0.12	1.70 (0.45, 6.42) 0.4324	1.64 (0.42, 6.38) 0.4758
50-59, Pacific	662	40	6.04	1.37 (0.98, 1.90) 0.0651	1.19 (0.84, 1.68) 0.3279	13	1.96	1.11 (0.63, 1.96) 0.7128	0.97 (0.54, 1.74) 0.9180	4	0.60	0.82 (0.30, 2.24) 0.7006	0.71 (0.25, 2.00) 0.5166	1	0.15	2.21 (0.28, 17.70) 0.4545	1.77 (0.20, 15.75) 0.6076
50-59, Māori	803	52	6.48	1.47 (1.10, 1.97) 0.0102 *	1.36 (1.00, 1.83) 0.0431 *	24	2.99	1.71 (1.11, 2.63) 0.0141 *	1.59 (1.03, 2.46) 0.0369 *	5	0.62	0.85 (0.34, 2.09) 0.7174	0.78 (0.31, 1.94) 0.5915	1	0.12	1.82 (0.23, 14.59) 0.5718	1.69 (0.20, 14.07) 0.6258
60-69, European/Other	9799	594	6.06	Reference	Reference	269	2.75	Reference	Reference	103	1.05	Reference	Reference	18	0.18	Reference	Reference
60-69, Asian	1404	85	6.05	1.00 (0.79, 1.26) 0.9910	0.97 (0.76, 1.22) 0.7773	35	2.49	0.91 (0.63, 1.29) 0.5865	0.89 (0.62, 1.28) 0.5433	7	0.50	0.47 (0.22, 1.02) 0.0550	0.44 (0.20, 0.95) 0.0365 *	3	0.21	1.16 (0.34, 3.96) 0.8083	1.13 (0.33, 3.89) 0.8410
60-69, Pacific	399	36	9.02	1.54 (1.08, 2.19) 0.0168 *	1.31 (0.91, 1.90) 0.1454	10	2.51	0.91 (0.48, 1.72) 0.7744	0.81 (0.42, 1.57) 0.5364	1	0.25	0.24 (0.03, 1.70) 0.1519	0.18 (0.02, 1.29) 0.0868	2	0.50	2.74 (0.63, 11.84) 0.1777	2.61 (0.56, 12.16) 0.2210
60-69, Māori	440	46	10.45	1.81 (1.32, 2.48) 0.0002 ***	1.71 (1.24, 2.35) 0.0011 **	23	5.23	1.95 (1.26, 3.03) 0.0026 **	1.88 (1.21, 2.93) 0.0052 **	3	0.68	0.65 (0.20, 2.04) 0.4576	0.57 (0.18, 1.82) 0.3426	2	0.45	2.48 (0.57, 10.73) 0.2237	2.40 (0.55, 10.55) 0.2456
70-74, European/Other	3758	309	8.22	Reference	Reference	144	3.83	Reference	Reference	44	1.17	Reference	Reference	13	0.35	Reference	Reference
70-74, Asian	355	28	7.89	0.96 (0.64, 1.43) 0.8258	0.85 (0.57, 1.28) 0.4385	16	4.51	1.18 (0.70, 2.01) 0.5299	1.02 (0.60, 1.74) 0.9509	5	1.41	1.21 (0.48, 3.06) 0.6937	0.97 (0.38, 2.49) 0.9470	0	0.00	0.00 (0.00, 0.00) 0.9745	0.00 (0.00, ####) 0.9701
70-74, Pacific	107	18	16.82	2.26 (1.34, 3.80) 0.0021 **	1.83 (1.07, 3.13) 0.0284 *	11	10.28	2.88 (1.51, 5.49) 0.0013 **	2.21 (1.12, 4.36) 0.0218 *	3	2.80	2.43 (0.74, 7.97) 0.1413	1.88 (0.55, 6.44) 0.3125	0	0.00	0.00 (0.00, 0.00) 0.9860	0.00 (0.00, 0.00) 0.9842
70-74, Māori	121	10	8.26	1.01 (0.52, 1.94) 0.9868	0.91 (0.47, 1.77) 0.7794	6	4.96	1.31 (0.57, 3.03) 0.5281	1.18 (0.50, 2.75) 0.7053	1	0.83	0.70 (0.10, 5.15) 0.7290	0.58 (0.08, 4.28) 0.5924	1	0.83	2.40 (0.31, 18.50) 0.4006	1.71 (0.22, 13.46) 0.6100
Unknown[£]	147	10	6.80	-	-	2	1.36	-	-	0	0.00	-	-	1	0.68	-	-
Sex - Ethnicity																	
Female: European/Other	13727	634	4.62	Reference	Reference	240	1.75	Reference	Reference	86	0.63	Reference	Reference	16	0.12	Reference	Reference
Female: Asian	2529	149	5.89	1.29 (1.08, 1.55) 0.0061 **	1.33 (1.10, 1.61) 0.0028 **	37	1.46	0.83 (0.59, 1.18) 0.3092	0.89 (0.62, 1.26) 0.5069	11	0.43	0.69 (0.37, 1.30) 0.2530	0.69 (0.36, 1.30) 0.2468	6	0.24	2.04 (0.80, 5.21) 0.1373	2.15 (0.81, 5.66) 0.1227
Female: Pacific	638	44	6.90	1.53 (1.11, 2.10) 0.0085 **	1.34 (0.97, 1.87) 0.0796	14	2.19	1.26 (0.73, 2.17) 0.4036	1.19 (0.68, 2.10) 0.5418	5	0.78	1.25 (0.51, 3.10) 0.6254	1.12 (0.44, 2.87) 0.8082	1	0.16	1.35 (0.18, 10.15) 0.7737	1.00 (0.13, 7.93) 0.9996
Female: Māori	757	44	5.81	1.27 (0.93, 1.75) 0.1310	1.25 (0.91, 1.72) 0.1652	17	2.25	1.29 (0.79, 2.12) 0.3131	1.33 (0.80, 2.20) 0.2701	2	0.26	0.42 (0.10, 1.71) 0.2262	0.41 (0.10, 1.66) 0.2090	1	0.13	1.13 (0.15, 8.56) 0.9033	1.04 (0.13, 7.95) 0.9732
Male: European/Other	11530	795	6.90	Reference	Reference	380	3.30	Reference	Reference	147	1.27	Reference	Reference	23	0.20	Reference	Reference
Male: Asian	1809	96	5.31	0.76 (0.61, 0.94) 0.0121 *	0.76 (0.61, 0.95) 0.0148 *	56	3.10	0.94 (0.70, 1.25) 0.6564	0.94 (0.71, 1.26) 0.7001	16	0.88	0.69 (0.41, 1.16) 0.1623	0.66 (0.39, 1.11) 0.1187	0	0.00	0.00 (0.00, ####) 0.9555	0.00 (0.00, ####) 0.9661
Male: Pacific	530	50	9.43	1.41 (1.04, 1.90) 0.0258 *	1.30 (0.95, 1.78) 0.1002	20	3.77	1.15 (0.73, 1.82) 0.5484	1.04 (0.64, 1.67) 0.8829	3	0.57	0.44 (0.14, 1.39) 0.1615	0.35 (0.11, 1.12) 0.0758	2	0.38	1.90 (0.45, 8.06) 0.3867	1.87 (0.41, 8.56) 0.4202
Male: Māori	607	64	10.54	1.59 (1.22, 2.08) 0.0007 **	1.60 (1.22, 2.10) 0.0008 **	36	5.93	1.85 (1.30, 2.63) 0.0006 **	1.87 (1.30, 2.67) 0.0007 **	7	1.15	0.90 (0.42, 1.94) 0.7941	0.84 (0.39, 1.81) 0.6519	3	0.49	2.48 (0.74, 8.30) 0.1390	2.69 (0.78, 9.22) 0.1159
Unknown[£]	11530	10	0.09	-	-	2	0.02	-	-	0	0.00	-	-	1	0.01	-	-
Deprivation Index (NZDep)																	
1 (least)	4844	223	4.60	Reference	Reference	94	1.94	Reference	Reference	32	0.66	Reference	Reference	7	0.14	Reference	Reference
2	5348	284	5.31	1.16 (0.97, 1.39) 0.1015	1.16 (0.96, 1.39) 0.1167	119	2.23	1.15 (0.87, 1.51) 0.3162	1.14 (0.87, 1.51) 0.3378	36	0.67	1.02 (0.63, 1.64) 0.9381	1.02 (0.63, 1.64) 0.9494	6	0.11	0.78 (0.26, 2.31) 0.6489	0.77 (0.26, 2.28) 0.6339
3	4638	250	5.39	1.18 (0.99, 1.42) 0.0789	1.15 (0.96, 1.39) 0.1347	111	2.39	1.24 (0.95, 1.62) 0.1304	1.22 (0.92, 1.61) 0.1712	39	0.84	1.28 (0.80, 2.04) 0.3099	1.27 (0.79, 2.03) 0.3219	7	0.15	1.04 (0.37, 2.94) 0.9352	0.99 (0.35, 2.81) 0.9785
4	3975	242	6.09	1.34 (1.11, 1.62) 0.0020 **	1.32 (1.09, 1.59) 0.0040 **	107	2.69	1.40 (1.06, 1.85) 0.0192 *	1.39 (1.05, 1.84) 0.0229 *	36	0.91	1.37 (0.85, 2.22) 0.1923	1.41 (0.88, 2.28) 0.1569	2	0.05	0.35 (0.07, 1.68) 0.1880	0.33 (0.07, 1.61) 0.1673
5	4267	247	5.79	1.27 (1.06, 1.53) 0.0109 *	1.21 (1.01, 1.46) 0.0429 *	99	2.32	1.20 (0.90, 1.60) 0.2099	1.14 (0.86, 1.52) 0.3709	38	0.89	1.35 (0.84, 2.17) 0.2114	1.35 (0.84, 2.17) 0.2107	7	0.16	1.14 (0.40, 3.24) 0.8123	1.00 (0.35, 2.82) 0.9982
6	3068	182	5.93	1.31 (1.07, 1.60) 0.0092 **	1.24 (1.01, 1.52) 0.0376 *	78	2.54	1.32 (0.97, 1.79) 0.0745	1.26 (0.93, 1.71) 0.1406	20	0.65	1.29 (0.76, 2.16) 0.3437	1.28 (0.76, 2.16) 0.3506	7	0.23	1.58 (0.55, 4.51) 0.3924	1.20 (0.40, 3.60) 0.7405
7	1960	164	8.37	1.89 (1.54, 2.33) 0.0000 ***	1.82 (1.47, 2.25) 0.0000 ***	64	3.27	1.71 (1.24, 2.35) 0.0012 **	1.67 (1.21, 2.32) 0.0021 **	21	1.07	1.63 (0.94, 2.83) 0.0838	1.66 (0.95, 2.90) 0.0736	7	0.36	2.53 (0.89, 7.23) 0.0827	2.28 (0.78, 6.64) 0.1318
8	1918	126	6.57	1.46 (1.16, 1.82) 0.0011 **	1.38 (1.10, 1.74) 0.0057 **	59	3.08	1.60 (1.15, 2.23) 0.0050 **	1.56 (1.11, 2.18) 0.0099 **	28	1.46	2.23 (1.34, 3.71) 0.0021 **	2.48 (1.48, 4.16) 0.0006 ***	7	0.36	2.53 (0.89, 7.07) 0.0902	2.25 (0.78, 6.52) 0.1344
9	2139	161	7.53	1.69 (1.37, 2.08) 0.0000 ***	1.57 (1.26, 1.94) 0.0000 ***	70	3.27	1.71 (1.25, 2.34) 0.0008 **	1.63 (1.18, 2.25) 0.0031 **	21	0.98	1.49 (0.86, 2.59) 0.1567	1.47 (0.95, 2.93) 0.0736	3	0.14	0.97 (0.25, 3.76) 0.9654	0.85 (0.21, 3.36) 0.8123
10 (most)	107	7	6.54	1.45 (0.67, 3.16) 0.3488	1.36 (0.62, 2.98) 0.4361	1	0.93	0.48 (0.07, 3.45) 0.4639	0.48 (0.07, 3.48) 0.4681	0	0.00	0.00 (0.00, ####) 0.9665	0.00 (0.00, 0.00) 0.9772	0	0.00	0.00 (0.00, 0.00) 0.9851	0.00 (0.00, 0.00) 0.9839
Unknown[£]	10	0	0.00			0	0.00			0	0.00			0	0.00		
Deprivation Index (NZDep) quintiles																	
1 (least)	10192	507	4.97	Reference	Reference	213	2.09	Reference	Reference	68	0.67	Reference	Reference	13	0.13	Reference	Reference
2	8613	492	5.71	1.16 (1.02, 1.31) 0.0247 *	1.14 (1.00, 1.29) 0.0512	218	2.53	1.22 (1.01, 1.47) 0.0443 *	1.20 (0.99, 1.46) 0.0595	75	0.87	1.31 (0.94, 1.82) 0.1104	1.32 (0.95, 1.84) 0.0976	9	0.10	0.82 (0.35, 1.92) 0.6454	0.78 (0.33, 1.83) 0.5689
3	7335	429	5.85	1.19 (1.04, 1.35) 0.0112 *	1.13 (0.99, 1.29) 0.0680	177	2.41	1.16 (0.95, 1.42) 0.1527	1.11 (0.90, 1.36) 0.3326	64	0.87	1.33 (0.95, 1.85) 0.1220	1.31 (0.93, 1.85) 0.1227	14	0.19	1.50 (0.70, 3.19) 0.2950	1.24 (0.57, 2.68) 0.5875
4	3878	290	7.48	1.54 (1.33, 1.79) 0.0000 ***	1.48 (1.27, 1.73) 0.0000 ***	123	3.17	1.53 (1.23, 1.92) 0.0002 ***	1.50 (1.19, 1.89) 0.0006 ***	49	1.26	1.91 (1.32, 2.76) 0.0006 **	2.08 (1.43, 3.04) 0.0001 ***	14	0.36	2.84 (1.33, 6.04) 0.0069 **	2.59 (1.19, 5.65) 0.0165 *
5 (most)	2246	168	7.48	1.54 (1.29, 1.85) 0.0000 ***	1.44 (1.19, 1.74) 0.0001 **	71	3.16	1.53 (1.16, 2.01) 0.0023 **	1.46 (1.10, 1.94) 0.0082 **	21	0.93	1.41 (0.86, 2.30) 0.1749	1.58 (0.95, 2.61) 0.0752	3	0.13	1.05 (0.30, 3.68) 0.9426	0.92 (0.26, 3.34) 0.9043
Unknown[£]	10	0	0.00			0	0.00			0	0.00			0	0.00		

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Blood Test
Σ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)
Statistically higher than reference group
Statistically lower than reference group

Table 4c. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2[β], who completed Round 1[α]

	Completed kit[Σ]	Positive iFOBT[*] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Advanced Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Cancer[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	20257	1105	5.45	-	-	467	2.31	-	-	144	0.71	-	-	27	0.13	-	-
Age (years)																	
50-54	2958	122	4.12	Reference	Reference	43	1.45	Reference	Reference	10	0.34	Reference	Reference	2	0.07	Reference	Reference
55-59	4663	199	4.27	1.04 (0.82, 1.30) 0.7616	1.04 (0.83, 1.31) 0.7373	75	1.61	1.11 (0.76, 1.62) 0.5941	1.12 (0.76, 1.63) 0.5718	27	0.58	1.72 (0.83, 3.55) 0.1452	1.71 (0.82, 3.53) 0.1494	2	0.04	0.63 (0.09, 4.50) 0.6489	0.64 (0.09, 4.52) 0.6515
60-64	4643	260	5.60	1.38 (1.11, 1.72) 0.0042 **	1.39 (1.11, 1.73) 0.0038 **	108	2.33	1.61 (1.13, 2.31) 0.0085 **	1.62 (1.13, 2.31) 0.0084 **	37	0.80	2.37 (1.18, 4.77) 0.0158 *	2.33 (1.16, 4.70) 0.0179 *	8	0.17	2.55 (0.54, 12.02) 0.2364	2.50 (0.53, 11.80) 0.2478
65-69	4549	264	5.80	1.43 (1.15, 1.78) 0.0014 **	1.44 (1.16, 1.80) 0.0012 **	109	2.40	1.66 (1.17, 2.38) 0.0050 **	1.66 (1.16, 2.38) 0.0053 **	32	0.70	2.09 (1.02, 4.25) 0.0426 *	2.04 (1.00, 4.16) 0.0506	9	0.20	2.93 (0.63, 13.57) 0.1693	2.82 (0.60, 13.11) 0.1871
70-74	3444	260	7.55	1.90 (1.52, 2.37) 0.0000 ***	1.89 (1.51, 2.36) 0.0000 ***	132	3.83	2.70 (1.91, 3.83) 0.0000 ***	2.66 (1.87, 3.77) 0.0000 ***	38	1.10	3.29 (1.64, 6.61) 0.0008 **	3.12 (1.55, 6.30) 0.0015 **	6	0.17	2.58 (0.52, 12.79) 0.2461	2.43 (0.49, 12.12) 0.2805
Sex																	
Female	11243	519	4.62	Reference	Reference	181	1.61	Reference	Reference	56	0.50	Reference	Reference	12	0.11	Reference	Reference
Male	9014	586	6.50	1.44 (1.27, 1.62) 0.0000 ***	1.42 (1.26, 1.60) 0.0000 ***	286	3.17	2.00 (1.66, 2.42) 0.0000 ***	1.96 (1.62, 2.37) 0.0000 ***	88	0.98	1.97 (1.41, 2.76) 0.0001 ***	1.93 (1.38, 2.70) 0.0001 ***	15	0.17	1.56 (0.73, 3.33) 0.2512	1.52 (0.71, 3.26) 0.2792
Unknown[£]	0	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Age (years) - Sex																	
50-54, Female	1698	62	3.65	Reference	Reference	14	0.82	Reference	Reference	2	0.12	Reference	Reference	2	0.12	Reference	Reference
50-54, Male	1260	60	4.76	1.32 (0.92, 1.90) 0.1342	1.34 (0.93, 1.92) 0.1189	29	2.30	2.83 (1.49, 5.39) 0.0015 **	2.88 (1.51, 5.48) 0.0013 **	8	0.63	5.42 (1.15, ####) 0.0328 *	5.28 (1.11, ####) 0.0364 *	0	0.00	0.00 (0.00, ####) 0.9477	0.00 (0.00, ####) 0.9247
55-59, Female	2685	90	3.35	Reference	Reference	29	1.08	Reference	Reference	11	0.41	Reference	Reference	1	0.04	Reference	Reference
55-59, Male	1978	109	5.51	1.68 (1.26, 2.24) 0.0004 **	1.69 (1.27, 2.25) 0.0003 **	46	2.33	2.18 (1.37, 3.48) 0.0011 **	2.19 (1.37, 3.50) 0.0011 **	16	0.81	1.98 (0.92, 4.28) 0.0815	1.93 (0.89, 4.18) 0.0938	1	0.05	1.36 (0.08, 21.72) 0.8288	1.29 (0.08, 20.64) 0.8575
60-64, Female	2585	121	4.68	Reference	Reference	44	1.70	Reference	Reference	18	0.70	Reference	Reference	3	0.12	Reference	Reference
60-64, Male	2058	139	6.75	1.48 (1.15, 1.90) 0.0024 **	1.50 (1.16, 1.93) 0.0017 **	64	3.11	1.85 (1.26, 2.73) 0.0018 **	1.87 (1.27, 2.76) 0.0016 **	19	0.92	1.33 (0.70, 2.54) 0.3892	1.32 (0.69, 2.54) 0.3962	5	0.24	2.10 (0.50, 8.78) 0.3113	2.06 (0.49, 8.68) 0.3226
65-69, Female	2479	126	5.08	Reference	Reference	41	1.65	Reference	Reference	10	0.40	Reference	Reference	1	0.04	Reference	Reference
65-69, Male	2070	138	6.67	1.33 (1.04, 1.71) 0.0233 *	1.33 (1.04, 1.71) 0.0237 *	68	3.29	2.02 (1.36, 2.99) 0.0004 **	2.04 (1.38, 3.02) 0.0004 **	22	1.06	2.65 (1.25, 5.61) 0.0108 *	2.69 (1.27, 5.70) 0.0098 **	8	0.39	9.61 (1.20, 76.87) 0.0329 *	9.41 (1.17, 75.40) 0.0348 *
70-74, Female	1796	120	6.68	Reference	Reference	53	2.95	Reference	Reference	15	0.84	Reference	Reference	5	0.28	Reference	Reference
70-74, Male	1648	140	8.50	1.30 (1.01, 1.67) 0.0446 *	1.29 (1.00, 1.67) 0.0483 *	79	4.79	1.66 (1.16, 2.36) 0.0053 **	1.62 (1.14, 2.32) 0.0077 **	23	1.40	1.68 (0.87, 3.23) 0.1197	1.67 (0.87, 3.21) 0.1259	1	0.06	0.22 (0.03, 1.86) 0.1639	0.23 (0.03, 1.94) 0.1754
Unknown[£]	0	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Sex - Age (years)																	
Female: 50-54	1698	62	3.65	Reference	Reference	14	0.82	Reference	Reference	2	0.12	Reference	Reference	2	0.12	Reference	Reference
Female: 55-59	2685	90	3.35	0.92 (0.66, 1.27) 0.5978	0.92 (0.66, 1.28) 0.6163	29	1.08	1.31 (0.69, 2.49) 0.4046	1.31 (0.69, 2.49) 0.4084	11	0.41	3.49 (0.77, ####) 0.1044	3.41 (0.76, ####) 0.1105	1	0.04	0.32 (0.03, 3.49) 0.3470	0.30 (0.03, 3.35) 0.3303
Female: 60-64	2585	121	4.68	1.30 (0.95, 1.77) 0.1040	1.31 (0.96, 1.79) 0.0923	44	1.70	2.08 (1.14, 3.81) 0.0174 *	2.09 (1.14, 3.83) 0.0170 *	18	0.70	5.95 (1.38, ####) 0.0169 *	5.82 (1.35, ####) 0.0183 *	3	0.12	0.99 (0.16, 5.90) 0.9870	0.89 (0.15, 5.37) 0.8984
Female: 65-69	2479	126	5.08	1.41 (1.04, 1.93) 0.0291 *	1.45 (1.06, 1.99) 0.0194 *	41	1.65	2.02 (1.10, 3.72) 0.0236 *	2.03 (1.10, 3.74) 0.0236 *	10	0.40	3.43 (0.75, ####) 0.1115	3.26 (0.71, ####) 0.1279	1	0.04	0.34 (0.03, 3.78) 0.3814	0.30 (0.03, 3.30) 0.3219
Female: 70-74	1796	120	6.68	1.89 (1.38, 2.59) 0.0001 ***	1.94 (1.41, 2.67) 0.0000 ***	53	2.95	3.66 (2.02, 6.62) 0.0000 ***	3.70 (2.04, 6.73) 0.0000 ***	15	0.84	7.14 (1.63, ####) 0.0091 **	6.85 (1.56, ####) 0.0109 *	5	0.28	2.37 (0.46, 12.22) 0.3033	1.95 (0.37, 10.27) 0.4292
Male: 50-54	1260	60	4.76	Reference	Reference	29	2.30	Reference	Reference	8	0.63	Reference	Reference	0	0.00	Reference	Reference
Male: 55-59	1978	109	5.51	1.17 (0.84, 1.61) 0.3508	1.17 (0.85, 1.62) 0.3386	46	2.33	1.01 (0.63, 1.62) 0.9647	1.02 (0.64, 1.63) 0.9435	16	0.81	1.28 (0.54, 2.99) 0.5746	1.27 (0.54, 2.97) 0.5873	1	0.05	18217.13 (0.00, ####) 0.9537	26037.11 (0.00, ####) 0.9591
Male: 60-64	2058	139	6.75	1.45 (1.06, 1.98) 0.0196 *	1.47 (1.08, 2.01) 0.0155 *	64	3.11	1.36 (0.87, 2.12) 0.1726	1.39 (0.89, 2.18) 0.1448	19	0.92	1.46 (0.64, 3.34) 0.3724	1.46 (0.64, 3.35) 0.3704	5	0.24	77713.76 (0.00, ####) 0.9463	####### (0.00, ####) 0.9528
Male: 65-69	2070	138	6.67	1.43 (1.05, 1.95) 0.0248 *	1.45 (1.06, 1.98) 0.0207 *	68	3.29	1.44 (0.93, 2.24) 0.1035	1.47 (0.95, 2.29) 0.0864	22	1.06	1.68 (0.75, 3.79) 0.2100	1.69 (0.75, 3.81) 0.2084	8	0.39	####### (0.00, ####) 0.9441	####### (0.00, ####) 0.9509
Male: 70-74	1648	140	8.50	1.86 (1.36, 2.54) 0.0001 **	1.88 (1.38, 2.58) 0.0001 ***	79	4.79	2.14 (1.39, 3.29) 0.0006 **	2.17 (1.40, 3.35) 0.0005 **	23	1.40	2.22 (0.99, 4.97) 0.0537	2.16 (0.96, 4.87) 0.0626	1	0.06	21867.19 (0.00, ####) 0.9529	32761.88 (0.00, ####) 0.9582
Unknown[£]	0	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Ethnicity																	
European/Other	16718	896	5.36	Reference	Reference	382	2.28	Reference	Reference	122	0.73	Reference	Reference	24	0.14	Reference	Reference
Asian	2329	122	5.24	0.98 (0.80, 1.19) 0.8075	1.01 (0.83, 1.23) 0.9500	47	2.02	0.88 (0.65, 1.20) 0.4163	0.94 (0.69, 1.28) 0.6837	15	0.64	0.88 (0.51, 1.51) 0.6468	0.89 (0.52, 1.54) 0.6789	1	0.04	0.30 (0.04, 2.21) 0.2367	0.34 (0.05, 2.56) 0.2979
Pacific	448	29	6.47	1.22 (0.83, 1.79) 0.3037	1.14 (0.77, 1.69) 0.5157	9	2.01	0.88 (0.45, 1.71) 0.6994	0.85 (0.43, 1.69) 0.6466	2	0.45	0.61 (0.15, 2.47) 0.4891	0.53 (0.13, 2.20) 0.3831	0	0.00	0.00 (0.00, ####) 0.9815	0.00 (0.00, ####) 0.9683
Māori	744	58	7.80	1.49 (1.13, 1.97) 0.0045 **	1.52 (1.15, 2.01) 0.0033 **	29	3.90	1.73 (1.18, 2.55) 0.0050 **	1.85 (1.25, 2.74) 0.0020 **	5	0.67	0.92 (0.38, 2.26) 0.8562	0.93 (0.38, 2.29) 0.8723	2	0.27	1.87 (0.44, 7.95) 0.3937	2.10 (0.49, 9.04) 0.3212
Unknown[£]	18	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Age (years) - Ethnicity																	
50-59, European/Other	5923	236	3.98	Reference	Reference	89	1.50	Reference	Reference	30	0.51	Reference	Reference	3	0.05	Reference	Reference
50-59, Asian	1138	59	5.18	1.32 (0.98, 1.77) 0.0644	1.31 (0.97, 1.76) 0.0735	19	1.67	1.11 (0.68, 1.83) 0.6744	1.17 (0.70, 1.94) 0.5460	6	0.53	1.04 (0.43, 2.51) 0.9283	1.13 (0.47, 2.76) 0.7817	1	0.09	1.74 (0.18, 16.70) 0.6332	2.01 (0.20, 19.76) 0.5504
50-59, Pacific	203	7	3.45	0.86 (0.40, 1.85) 0.7009	0.80 (0.37, 1.74) 0.5768	0	0.00	0.00 (0.00, 0.00) 0.9820	0.00 (0.00, 0.00) 0.9813	0	0.00	0.00 (0.00, 0.00) 0.9845	0.00 (0.00, 0.00) 0.9833	0	0.00	0.00 (0.00, ####) 0.9825	0.00 (0.00, ####) 0.9711
50-59, Māori	363	19	5.38	1.37 (0.85, 2.22) 0.1973	1.35 (0.83, 2.19) 0.2292	10	2.83	1.91 (0.99, 3.71) 0.0554	1.98 (1.01, 3.88) 0.0460 *	1	0.28	0.56 (0.08, 4.10) 0.5667	0.65 (0.09, 4.85) 0.6781	0	0.00	0.00 (0.00, ####) 0.9769	0.00 (0.00, ####) 0.9605
60-69, European/Other	7750	428	5.52	Reference	Reference	183	2.36	Reference	Reference	59	0.76	Reference	Reference	15	0.19	Reference	Reference
60-69, Asian	931	50	5.37	0.97 (0.72, 1.31) 0.8476	0.94 (0.70, 1.28) 0.7028	19	2.04	0.86 (0.53, 1.39) 0.5403	0.85 (0.52, 1.37) 0.4982	6	0.64	0.85 (0.36, 1.96) 0.6964	0.76 (0.32, 1.77) 0.5237	0	0.00	0.00 (0.00, ####) 0.9684	0.00 (0.00, ####) 0.9449
60-69, Pacific	195	14	7.18	1.32 (0.76, 2.30) 0.3203	1.16 (0.66, 2.03) 0.6168	2	1.03	0.43 (0.11, 1.74) 0.2359	0.38 (0.09, 1.57) 0.1823	1	0.51	0.67 (0.09, 4.87) 0.6941	0.45 (0.06, 3.32) 0.4311	0	0.00	0.00 (0.00, ####) 0.9855	0.00 (0.00, ####) 0.9730
60-69, Māori	304	32	10.53	2.01 (1.38, 2.94) 0.0003 **	1.91 (1.30, 2.80) 0.0009 **	13	4.28	1.85 (1.04, 3.28) 0.0363 *	1.79 (1.00, 3.19) 0.0501	3	0.99	1.30 (0.40, 4.17) 0.6598	1.11 (0.34, 3.61) 0.8573	2	0.66	3.42 (0.78, 15.00) 0.1038	3.26 (0.72, 14.68) 0.1237
70-74, European/Other	3045	232	7.62	Reference	Reference	110	3.61	Reference	Reference	33	1.08	Reference	Reference	6	0.20	Reference	Reference
70-74, Asian	260	13	5.00	0.64 (0.36, 1.13) 0.1248	0.56 (0.31, 1.00) 0.0485 *	9	3.46	0.96 (0.48, 1.91) 0.9002	0.80 (0.40, 1.61) 0.5300	3	1.15	1.07 (0.32, 3.50) 0.9168	0.84 (0.25, 2.80) 0.7763	0	0.00	0.00 (0.00, ####) 0.9756	0.00 (0.00, ####) 0.9522
70-74, Pacific	50	8	16.00	2.31 (1.07, 4.98) 0.0325 *	1.93 (0.87, 4.26) 0.1042	7	14.00	4.34 (1.91, 9.87) 0.0005 **	3.33 (1.40, 7.94) 0.0066 **	1	2.00	1.86 (0.25, ####) 0.5438	1.50 (0.19, ####) 0.6980	0	0.00	0.00 (0.00, ####) 0.9893	0.00 (0.00, ####) 0.9783
70-74, Māori	87	7	8.05	1.06 (0.48, 2.32) 0.8824	0.96 (0.44, 2.12) 0.9242	6	6.90	1.98 (0.84, 4.63) 0.1165	1.77 (0.74, 4.20) 0.1963	1	1.15	1.06 (0.14, 7.85) 0.9535	0.90 (0.12, 6.77) 0.9205	0	0.00	0.00 (0.00, ####) 0.9859	0.00 (0.00, ####) 0.9716
Unknown[£]	18	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Sex - Ethnicity																	
Female: European/Other	9211	415	4.51	Reference	Reference	151	1.64	Reference	Reference	49	0.53	Reference	Reference	11	0.12	Reference	Reference
Female: Asian	1356	71	5.24	1.17 (0.90, 1.52) 0.2309	1.22 (0.94, 1.59) 0.1374	18	1.33	0.81 (0.49, 1.32) 0.3938	0.91 (0.55, 1.50) 0.7117	4	0.29	0.55 (0.20, 1.54) 0.2557	0.57 (0.20, 1.61) 0.2895	1	0.07	0.62 (0.08, 4.78) 0.6442	0.67 (0.08, 5.32) 0.7032
Female: Pacific	246	10	4.07	0.90 (0.47, 1.70) 0.7423	0.81 (0.42, 1.56) 0.5377	3	1.22	0.74 (0.23, 2.34) 0.6096	0.81 (0.25, 2.61) 0.7288	1	0.41	0.76 (0.10, 5.55) 0.7895	0.77 (0.10, 5.74) 0.7959	0	0.00	0.00 (0.00, ####) 0.9877	0.00 (0.00, ####) 0.9770
Female: Māori	425	23	5.41	1.21 (0.79, 1.87) 0.3810	1.23 (0.79, 1.90) 0.3587	9	2.12	1.30 (0.66, 2.56) 0.4503	1.46 (0.73, 2.90) 0.2800	2	0.47	0.88 (0.21, 3.65) 0.8647	0.93 (0.22, 3.90) 0.9260	0	0.00	0.00 (0.00, ####) 0.9839	0.00 (0.00, ####) 0.9703
Male: European/Other	973	481	49.43	Reference	Reference	231	23.74	Reference	Reference	73	7.50	Reference	Reference	13	1.34	Reference	Reference
Male: Asian	202	51	25.25	0.81 (0.60, 1.09) 0.1590	0.81 (0.60, 1.10) 0.1768	29	14.36	0.97 (0.65, 1.43) 0.8693	0.96 (0.64, 1.43) 0.8359	11	5.45	1.16 (0.62, 2.20) 0.6397	1.10 (0.58, 2.11) 0.7648	0	0.00	0.00 (0.00, ####) 0.9685	0.00 (0.00, ####) 0.9627
Male: Pacific	319	19	5.96	1.52 (0.94, 2.45) 0.0899	1.46 (0.89, 2.39) 0.1377	6	1.88	0.96 (0.42, 2.20) 0.9308	0.86 (0.37, 2.00) 0.7335	1	0.31	0.51 (0.07, 3.66) 0.5006	0.40 (0.05, 2.95) 0.3689	0	0.00	0.00 (0.00, ####) 0.9856	0.00 (0.00, ####) 0.9824
Male: Māori	18	35	194.44	1.80 (1.25, 2.59) 0.0015 **	1.83 (1.27, 2.65) 0.0013 **	20	111.11	2.11 (1.32, 3.38) 0.0019 **	2.11 (1.31, 3.41) 0.0022 **	3	16.67	0.97 (0.30, 3.08) 0.9545	0.91 (0.28, 2.94) 0.8802	2	11.11	3.64 (0.82, 16.19) 0.0901	4.00 (0.87, 18.38) 0.0744
Unknown[£]	7507	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Deprivation Index (NZDep)																	
1 (least)	3155	138	4.37	Reference	Reference	57	1.81	Reference	Reference	17	0.54	Reference	Reference	4	0.13	Reference	Reference
2	3375	175	5.19	1.20 (0.95, 1.50) 0.1256	1.18 (0.94, 1.49) 0.1475	70	2.07	1.15 (0.81, 1.64) 0.4346	1.13 (0.80, 1.61) 0.4886	19	0.56	1.05 (0.54, 2.01) 0.8953	1.03 (0.54, 1.99) 0.9214	4	0.12	0.93 (0.23, 3.74) 0.9240	0.90 (0.23, 3.61) 0.8840
3	2935	149	5.08	1.17 (0.92, 1.48) 0.1964	1.14 (0.90, 1.45) 0.2656	73	2.49	1.39 (0.98, 1.97) 0.0675	1.35 (0.95, 1.91) 0.0971	26	0.89	1.65 (0.89, 3.05) 0.1097	1.62 (0.88, 2.99) 0.1238	6	0.20	1.61 (0.45, 5.72) 0.4589	1.54 (0.44, 5.49) 0.5011
4	2469	157	6.36	1.48 (1.17, 1.88) 0.0010 **	1.45 (1.14, 1.83) 0.0021 **	71	2.88	1.61 (1.13, 2.29) 0.0082 **	1.56 (1.09, 2.22) 0.0144 *	22	0.89	1.66 (0.88, 3.13) 0.1180	1.63 (0.86, 3.08) 0.1326	1	0.04	0.32 (0.04, 2.86) 0.3072	0.32 (0.04, 2.84) 0.3046
5	2779	161	5.79	1.34 (1.06, 1.70) 0.0129 *	1.28 (1.01, 1.62) 0.0405 *	61	2.20	1.22 (0.85, 1.76) 0.2857	1.14 (0.79, 1.64) 0.4893	16	0.58	1.07 (0.54, 2.12) 0.8487	1.02 (0.51, 2.03) 0.9477	3	0.11	0.85 (0.19, 3.78) 0.8332	0.80 (0.18, 3.60) 0.7730
6	1948	83	4.26	0.97 (0.74, 1.29) 0.8469	0.93 (0.70, 1.23) 0.6108	36	1.85	1.02 (0.67, 1.56) 0.9145	0.97 (0.63, 1.48) 0.8755	10	0.51	0.95 (0.44, 2.08) 0.9030	0.93 (0.42, 2.04) 0.8540	4	0.21	1.62 (0.40, 6.49) 0.4949	1.47 (0.37, 5.92) 0.5842
7	1161	86	7.41	1.75 (1.32, 2.31) 0.0001 ***	1.69 (1.28, 2.23) 0.0003 **	31	2.67	1.49 (0.96, 2.32) 0.0769	1.44 (0.92, 2.25) 0.1088	10	0.86	1.60 (0.73, 3.51) 0.2377	1.63 (0.74, 3.59) 0.2223	4	0.34	2.72 (0.68, 10.91) 0.1570	2.75 (0.68, 11.10) 0.1550
8	1124	63	5.60	1.30 (0.96, 1.76) 0.0948	1.25 (0.92, 1.70) 0.1575	29	2.58	1.44 (0.92, 2.26) 0.1145	1.38 (0.87, 2.18) 0.1663	10	0.89	1.66 (0.76, 3.63) 0.2068	1.60 (0.73, 3.51) 0.2377	1	0.09	0.70 (0.08, 6.28) 0.7513	0.73 (0.08, 6.62) 0.7805
9	1247	90	7.22	1.70 (1.29, 2.24) 0.0001 ***	1.61 (1.21, 2.13) 0.0009 **	39	3.13	1.75 (1.16, 2.65) 0.0076 **	1.67 (1.09, 2.54) 0.0177 *	14	1.12	2.10 (1.03, 4.26) 0.0412 *	2.16 (1.05, 4.44) 0.0363 *	0	0.00	0.00 (0.00, ####) 0.9695	0.00 (0.00, ####) 0.9778
10 (most)	56	3	5.36	1.24 (0.38, 4.01) 0.7224	1.27 (0.39, 4.12) 0.6946	0	0.00	0.00 (0.00, ####) 0.9603	0.00 (0.00, ####) 0.9727	0	0.00	0.00 (0.00, ####) 0.9780	0.00 (0.00, ####) 0.9773	0	0.00	0.00 (0.00, ####) 0.9935	0.00 (0.00, ####) 0.9953
Unknown[£]	0	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	
Deprivation Index (NZDep) quintiles																	
1 (least)	6530	313	4.79	Reference	Reference	127	1.94	Reference	Reference	36	0.55	Reference	Reference	8	0.12	Reference	Reference
2	5404	306	5.66	1.19 (1.01, 1.40) 0.0333 *	1.17 (0.99, 1.38) 0.0578	144	2.66	1.38 (1.08, 1.76) 0.0089 **	1.35 (1.06, 1.72) 0.0158 *	48	0.89	1.62 (1.05, 2.49) 0.0299 *	1.60 (1.03, 2.46) 0.0350 *	7	0.13	1.06 (0.38, 2.92) 0.9142	1.05 (0.38, 2.90) 0.9239
3	4727	244	5.16	1.08 (0.91, 1.28) 0.3738	1.03 (0.87, 1.23) 0.7016	97	2.05	1.06 (0.81, 1.38) 0.6882	1.00 (0.76, 1.31) 0.9893	26	0.55	1.00 (0.60, 1.65) 0.9928	0.97 (0.58, 1.61) 0.8991	7	0.15	1.21 (0.44, 3.34) 0.7139	1.15 (0.41, 3.17) 0.7935
4	2285	149	6.52	1.39 (1.13, 1.69) 0.0015 **	1.34 (1.09, 1.65) 0.0048 **	60	2.63	1.36 (1.00, 1.86) 0.0528	1.32 (0.96, 1.81) 0.0857	20	0.88	1.59 (0.92, 2.76) 0.0963	1.64 (0.94, 2.85) 0.0815	5	0.22	1.79 (0.58, 5.47) 0.3086	1.88 (0.61, 5.82) 0.2732
5 (most)	1303	93	7.14	1.53 (1.20, 1.94) 0.0005 **	1.45 (1.14, 1.86) 0.0029 **	39	2.99	1.56 (1.08, 2.24) 0.0171 *	1.50 (1.03, 2.17) 0.0344 *	14	1.07	1.96 (1.05, 3.64) 0.0336 *	2.04 (1.09, 3.84) 0.0267 *	0	0.00	0.00 (0.00, 0.00) 0.9690	0.00 (0.00, 0.00) 0.9774
Unknown[£]	8	0	0.00	-		0	0.00	-		0	0.00	-		0	0.00	-	

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Bloot Test
Σ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)
Statistically higher than reference group
Statistically lower than reference group

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Table 4d. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2[β], who completed Round 1[α] with negative iFOBT*

		Positive iFOBT*				Adenoma#				Detection — Advanced Adenoma#				Cancer#			
	Completed kit[Σ]	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	20230	1095	5.41	-	-	463	2.29	-	-	142	0.70	-	-	27	0.13	-	-
Age (years)																	
50-54	2955	121	4.09	Reference	Reference	43	1.46	Reference	Reference	10	0.34	Reference	Reference	2	0.07	Reference	Reference
55-59	4661	199	4.27	1.04 (0.83,1.32) 0.7112	1.05 (0.83,1.32) 0.6873	75	1.61	1.11 (0.76,1.62) 0.5963	1.11 (0.76,1.63) 0.5752	27	0.58	1.72 (0.83,3.55) 0.1456	1.71 (0.82,3.53) 0.1495	2	0.04	0.63 (0.09,4.50) 0.6485	0.64 (0.09,4.52) 0.6509
60-64	4636	256	5.52	1.37 (1.10,1.71) 0.0054 **	1.38 (1.10,1.72) 0.0049 **	106	2.29	1.58 (1.11,2.27) 0.0116 *	1.59 (1.11,2.27) 0.0116 *	36	0.78	2.30 (1.14,4.65) 0.0198 *	2.27 (1.12,4.59) 0.0222 *	8	0.17	2.55 (0.54,12.03) 0.2361	2.50 (0.53,11.82) 0.2472
65-69	4542	262	5.77	1.43 (1.15,1.79) 0.0014 **	1.44 (1.16,1.80) 0.0012 **	109	2.40	1.67 (1.17,2.38) 0.0050 **	1.67 (1.16,2.38) 0.0052 **	32	0.70	2.09 (1.03,4.26) 0.0424 *	2.04 (1.00,4.17) 0.0497 *	9	0.20	2.93 (0.63,13.58) 0.1691	2.82 (0.61,13.12) 0.1868
70-74	3436	257	7.48	1.89 (1.52,2.36) 0.0000 ***	1.89 (1.51,2.36) 0.0000 ***	130	3.78	2.66 (1.88,3.77) 0.0000 ***	2.62 (1.84,3.72) 0.0000 ***	37	1.08	3.21 (1.59,6.46) 0.0011 **	3.05 (1.51,6.16) 0.0019 **	6	0.17	2.58 (0.52,12.81) 0.2454	2.43 (0.49,12.15) 0.2794
Sex																	
Female	11227	513	4.57	Reference	Reference	179	1.59	Reference	Reference	54	0.48	Reference	Reference	12	0.11	Reference	Reference
Male	9003	582	6.46	1.44 (1.28,1.63) 0.0000 ***	1.43 (1.26,1.61) 0.0000 ***	284	3.15	2.01 (1.66,2.43) 0.0000 ***	1.97 (1.63,2.38) 0.0000 ***	88	0.98	2.04 (1.45,2.87) 0.0000 ***	2.00 (1.42,2.81) 0.0001 ***	15	0.17	1.56 (0.73,3.33) 0.2514	1.52 (0.71,3.26) 0.2789
Unknown[£]	0	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Age (years) - Sex																	
50-54, Female	1696	62	3.66	Reference	Reference	14	0.83	Reference	Reference	2	0.12	Reference	Reference	2	0.12	Reference	Reference
50-54, Male	1259	59	4.69	1.30 (0.90,1.87) 0.1631	1.31 (0.91,1.90) 0.1427	29	2.30	2.83 (1.49,5.38) 0.0015 **	2.87 (1.51,5.48) 0.0013 **	8	0.64	5.42 (1.15,####) 0.0328 *	5.26 (1.11,####) 0.0367 *	0	0.00	0.00 (0.00,####) 0.9477	0.00 (0.00,####) 0.9246
55-59, Female	2683	90	3.35	Reference	Reference	29	1.08	Reference	Reference	11	0.41	Reference	Reference	1	0.04	Reference	Reference
55-59, Male	1978	109	5.51	1.68 (1.26,2.24) 0.0004 **	1.69 (1.27,2.25) 0.0003 **	46	2.33	2.18 (1.36,3.48) 0.0011 **	2.19 (1.37,3.50) 0.0011 **	16	0.81	1.98 (0.92,4.28) 0.0818	1.93 (0.89,4.18) 0.0941	1	0.05	1.36 (0.08,21.70) 0.8293	1.29 (0.08,20.64) 0.8575
60-64, Female	2579	118	4.58	Reference	Reference	43	1.67	Reference	Reference	17	0.66	Reference	Reference	3	0.12	Reference	Reference
60-64, Male	2057	138	6.71	1.50 (1.16,1.93) 0.0017 **	1.52 (1.18,1.96) 0.0012 **	63	3.06	1.86 (1.26,2.76) 0.0019 **	1.87 (1.26,2.77) 0.0018 **	19	0.92	1.41 (0.73,2.71) 0.3102	1.39 (0.72,2.70) 0.3224	5	0.24	2.09 (0.50,8.77) 0.3125	2.06 (0.49,8.67) 0.3241
65-69, Female	2477	125	5.05	Reference	Reference	41	1.66	Reference	Reference	10	0.40	Reference	Reference	1	0.04	Reference	Reference
65-69, Male	2065	137	6.63	1.34 (1.04,1.72) 0.0227 *	1.34 (1.04,1.72) 0.0230 *	68	3.29	2.02 (1.37,2.99) 0.0004 **	2.04 (1.38,3.03) 0.0004 **	22	1.07	2.66 (1.26,5.62) 0.0107 *	2.69 (1.27,5.71) 0.0097 **	8	0.39	9.63 (1.20,77.00) 0.0328 *	9.42 (1.18,75.47) 0.0347 *
70-74, Female	1792	118	6.58	Reference	Reference	52	2.90	Reference	Reference	14	0.78	Reference	Reference	5	0.28	Reference	Reference
70-74, Male	1644	139	8.45	1.31 (1.02,1.69) 0.0378 *	1.31 (1.01,1.69) 0.0413 *	78	4.74	1.67 (1.17,2.38) 0.0051 **	1.63 (1.14,2.34) 0.0074 **	23	1.40	1.80 (0.92,3.51) 0.0839	1.79 (0.92,3.50) 0.0882	1	0.06	0.22 (0.03,1.86) 0.1640	0.23 (0.03,1.94) 0.1750
Unknown[£]	0	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Sex - Age (years)																	
Female: 50-54	1696	62	3.66	Reference	Reference	14	0.83	Reference	Reference	2	0.12	Reference	Reference	2	0.12	Reference	Reference
Female: 55-59	2683	90	3.35	0.91 (0.66,1.27) 0.5959	0.92 (0.66,1.28) 0.6138	29	1.08	1.31 (0.69,2.49) 0.4053	1.31 (0.69,2.49) 0.4079	11	0.41	3.49 (0.77,####) 0.1045	3.42 (0.76,####) 0.1100	1	0.04	0.32 (0.03,3.49) 0.3468	0.30 (0.03,3.29) 0.3296
Female: 60-64	2579	118	4.58	1.26 (0.92,1.73) 0.1438	1.28 (0.93,1.75) 0.1286	43	1.67	2.04 (1.11,3.73) 0.0214 *	2.05 (1.12,3.76) 0.0206 *	17	0.66	5.62 (1.30,####) 0.0210 *	5.53 (1.28,####) 0.0223 *	3	0.12	0.99 (0.16,5.91) 0.9881	0.89 (0.15,5.37) 0.9006
Female: 65-69	2477	125	5.05	1.40 (1.03,1.91) 0.0337 *	1.44 (1.05,1.97) 0.0223 *	41	1.66	2.02 (1.10,3.72) 0.0237 *	2.03 (1.10,3.75) 0.0232 *	10	0.40	3.43 (0.75,####) 0.1116	3.29 (0.72,####) 0.1254	1	0.04	0.34 (0.03,3.78) 0.3813	0.30 (0.03,3.29) 0.3217
Female: 70-74	1792	118	6.58	1.86 (1.36,2.55) 0.0001 ***	1.91 (1.39,2.63) 0.0001 ***	52	2.90	3.59 (1.98,6.50) 0.0000 ***	3.65 (2.01,6.63) 0.0000 ***	14	0.78	6.67 (1.51,####) 0.0122 *	6.47 (1.46,####) 0.0139 *	5	0.28	2.37 (0.46,12.23) 0.3027	1.95 (0.37,10.27) 0.4291
Male: 50-54	1259	59	4.69	Reference	Reference	29	2.30	Reference	Reference	8	0.64	Reference	Reference	0	0.00	Reference	Reference
Male: 55-59	1978	109	5.51	1.19 (0.86,1.64) 0.3032	1.19 (0.86,1.65) 0.2930	46	2.33	1.01 (0.63,1.62) 0.9674	1.02 (0.63,1.63) 0.9483	16	0.81	1.28 (0.54,2.99) 0.5758	1.27 (0.54,2.97) 0.5884	1	0.05	18194.92 (0.00,####) 0.9537	25521.04 (0.00,####) 0.9588
Male: 60-64	2057	138	6.71	1.46 (1.07,2.00) 0.0174 *	1.48 (1.08,2.03) 0.0137 *	63	3.06	1.34 (0.86,2.09) 0.1978	1.37 (0.88,2.14) 0.1678	19	0.92	1.46 (0.64,3.34) 0.3728	1.46 (0.64,3.35) 0.3706	5	0.24	87649.52 (0.00,####) 0.9463	####### (0.00,####) 0.9524
Male: 65-69	2065	137	6.63	1.45 (1.06,1.98) 0.0213 *	1.46 (1.07,2.01) 0.0176 *	68	3.29	1.44 (0.93,2.24) 0.1019	1.48 (0.95,2.30) 0.0849	22	1.07	1.68 (0.75,3.79) 0.2086	1.69 (0.75,3.82) 0.2062	8	0.39	####### (0.00,####) 0.9441	####### (0.00,####) 0.9505
Male: 70-74	1644	139	8.45	1.88 (1.37,2.57) 0.0001 ***	1.91 (1.39,2.62) 0.0001 ***	78	4.74	2.11 (1.37,3.26) 0.0007 **	2.14 (1.38,3.31) 0.0006 **	23	1.40	2.22 (0.99,4.98) 0.0532	2.17 (0.96,4.88) 0.0620	1	0.06	21893.71 (0.00,####) 0.9529	32264.25 (0.00,####) 0.9578
Unknown[£]	0	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Ethnicity																	
European/Other	16699	887	5.31	Reference	Reference	379	2.27	Reference	Reference	120	0.72	Reference	Reference	24	0.14	Reference	Reference
Asian	2326	122	5.25	0.99 (0.81,1.20) 0.8931	1.02 (0.83,1.24) 0.8808	47	2.02	0.89 (0.65,1.21) 0.4473	0.94 (0.69,1.29) 0.7114	15	0.64	0.90 (0.52,1.54) 0.6916	0.90 (0.52,1.56) 0.7184	1	0.04	0.30 (0.04,2.21) 0.2367	0.34 (0.05,2.57) 0.2986
Pacific	447	29	6.49	1.24 (0.84,1.81) 0.2761	1.14 (0.77,1.69) 0.5005	9	2.01	0.88 (0.45,1.73) 0.7195	0.85 (0.43,1.69) 0.6500	2	0.45	0.62 (0.15,2.52) 0.5049	0.54 (0.13,2.22) 0.3895	0	0.00	0.00 (0.00,####) 0.9816	0.00 (0.00,####) 0.9683
Māori	740	57	7.70	1.49 (1.13,1.97) 0.0052 **	1.52 (1.14,2.01) 0.0039 **	28	3.78	1.69 (1.15,2.50) 0.0083 **	1.81 (1.22,2.69) 0.0035 **	5	0.68	0.94 (0.38,2.31) 0.8923	0.95 (0.38,2.34) 0.9076	2	0.27	1.88 (0.44,7.98) 0.3905	2.11 (0.49,9.11) 0.3170
Unknown[£]	18	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Age (years) - Ethnicity																	
50-59, European/Other	5920	235	3.97	Reference	Reference	89	1.50	Reference	Reference	30	0.51	Reference	Reference	3	0.05	Reference	Reference
50-59, Asian	1137	59	5.19	1.32 (0.99,1.77) 0.0600	1.32 (0.98,1.77) 0.0689	19	1.67	1.11 (0.68,1.83) 0.6733	1.17 (0.70,1.94) 0.5459	6	0.53	1.04 (0.43,2.51) 0.9276	1.13 (0.47,2.76) 0.7812	1	0.09	1.74 (0.18,16.71) 0.6329	2.01 (0.20,19.80) 0.5492
50-59, Pacific	202	7	3.47	0.87 (0.40,1.87) 0.7181	0.81 (0.37,1.76) 0.5880	0	0.00	0.00 (0.00,####) 0.9821	0.00 (0.00,####) 0.9813	0	0.00	0.00 (0.00,0.00) 0.9845	0.00 (0.00,0.00) 0.9833	0	0.00	0.00 (0.00,####) 0.9826	0.00 (0.00,####) 0.9713
50-59, Māori	383	19	5.38	1.38 (0.85,2.23) 0.1918	1.35 (0.83,2.19) 0.2243	10	2.83	1.91 (0.98,3.71) 0.0556	1.98 (1.01,3.88) 0.0462 *	1	0.28	0.56 (0.08,4.10) 0.5663	0.65 (0.09,4.85) 0.6776	0	0.00	0.00 (0.00,####) 0.9769	0.00 (0.00,####) 0.9605
60-69, European/Other	7741	423	5.46	Reference	Reference	182	2.35	Reference	Reference	58	0.75	Reference	Reference	15	0.19	Reference	Reference
60-69, Asian	929	50	5.38	0.98 (0.73,1.33) 0.9169	0.95 (0.70,1.29) 0.7596	19	2.05	0.87 (0.54,1.40) 0.5586	0.85 (0.53,1.38) 0.5109	6	0.65	0.86 (0.37,2.00) 0.7282	0.77 (0.33,1.80) 0.5475	0	0.00	0.00 (0.00,####) 0.9684	0.00 (0.00,####) 0.9450
60-69, Pacific	195	14	7.18	1.34 (0.77,2.33) 0.3014	1.16 (0.66,2.04) 0.6071	2	1.03	0.43 (0.11,1.75) 0.2383	0.38 (0.09,1.57) 0.1821	1	0.51	0.68 (0.09,4.95) 0.7059	0.45 (0.06,3.36) 0.4371	0	0.00	0.00 (0.00,####) 0.9855	0.00 (0.00,####) 0.9730
60-69, Māori	301	31	10.30	1.99 (1.35,2.92) 0.0005 **	1.89 (1.28,2.78) 0.0013 **	12	3.99	1.72 (0.95,3.13) 0.0730	1.67 (0.92,3.05) 0.0944	3	1.00	1.33 (0.42,4.28) 0.6286	1.15 (0.35,3.72) 0.8185	2	0.66	3.45 (0.78,15.13) 0.1014	3.29 (0.73,14.82) 0.1212
70-74, European/Other	3038	229	7.54	Reference	Reference	108	3.55	Reference	Reference	32	1.05	Reference	Reference	6	0.20	Reference	Reference
70-74, Asian	260	13	5.00	0.65 (0.36,1.15) 0.1350	0.56 (0.31,1.00) 0.0514	9	3.46	0.97 (0.49,1.94) 0.9377	0.81 (0.40,1.63) 0.5523	3	1.15	1.10 (0.33,3.61) 0.8794	0.86 (0.26,2.86) 0.8034	0	0.00	0.00 (0.00,####) 0.9756	0.00 (0.00,####) 0.9522
70-74, Pacific	50	8	16.00	2.34 (1.08,5.04) 0.0302 *	1.93 (0.87,4.27) 0.1033	7	14.00	4.42 (1.94,####) 0.0004 **	3.35 (1.40,7.98) 0.0064 **	1	2.00	1.92 (0.26,####) 0.5255	1.52 (0.19,####) 0.6890	0	0.00	0.00 (0.00,####) 0.9893	0.00 (0.00,####) 0.9783
70-74, Māori	86	7	8.14	1.09 (0.50,2.38) 0.8351	0.98 (0.44,2.16) 0.9585	6	6.98	2.03 (0.87,4.77) 0.1021	1.80 (0.76,4.29) 0.1817	1	1.16	1.11 (0.15,8.18) 0.9220	0.93 (0.12,7.00) 0.9457	0	0.00	0.00 (0.00,####) 0.9859	0.00 (0.00,####) 0.9716
Unknown[£]	18	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Sex - Ethnicity																	
Female: European/Other	9197	409	4.45	Reference	Reference	149	1.62	Reference	Reference	47	0.51	Reference	Reference	11	0.12	Reference	Reference
Female: Asian	1355	71	5.24	1.19 (0.92,1.54) 0.1915	1.23 (0.95,1.61) 0.1197	18	1.33	0.82 (0.50,1.34) 0.4229	0.92 (0.56,1.52) 0.7436	4	0.30	0.58 (0.21,1.60) 0.2909	0.59 (0.21,1.66) 0.3191	1	0.07	0.62 (0.08,4.78) 0.6437	0.67 (0.08,5.32) 0.7025
Female: Pacific	245	10	4.08	0.91 (0.48,1.73) 0.7841	0.82 (0.43,1.58) 0.5541	3	1.22	0.75 (0.24,2.38) 0.6289	0.82 (0.26,2.64) 0.7420	1	0.41	0.80 (0.11,5.81) 0.8235	0.79 (0.11,5.91) 0.8165	0	0.00	0.00 (0.00,####) 0.9877	0.00 (0.00,####) 0.9770
Female: Māori	425	23	5.41	1.23 (0.80,1.89) 0.3484	1.24 (0.80,1.92) 0.3359	9	2.12	1.31 (0.67,2.59) 0.4297	1.48 (0.74,2.94) 0.2659	2	0.47	0.92 (0.22,3.80) 0.9088	0.97 (0.23,4.05) 0.9668	0	0.00	0.00 (0.00,####) 0.9839	0.00 (0.00,####) 0.9702
Male: European/Other	971	478	49.23	Reference	Reference	230	23.69	Reference	Reference	73	7.52	Reference	Reference	13	1.34	Reference	Reference
Male: Asian	202	51	25.25	0.81 (0.61,1.10) 0.1756	0.82 (0.61,1.11) 0.1932	29	14.36	0.97 (0.66,1.44) 0.8926	0.96 (0.65,1.43) 0.8466	11	5.45	1.17 (0.62,2.21) 0.6366	1.11 (0.58,2.11) 0.7600	0	0.00	0.00 (0.00,####) 0.9685	0.00 (0.00,####) 0.9628
Male: Pacific	315	19	6.03	1.53 (0.94,2.47) 0.0855	1.46 (0.89,2.40) 0.1362	6	1.90	0.97 (0.43,2.20) 0.9380	0.86 (0.37,2.00) 0.7271	1	0.32	0.51 (0.07,3.66) 0.5002	0.40 (0.05,2.95) 0.3687	0	0.00	0.00 (0.00,####) 0.9856	0.00 (0.00,####) 0.9824
Male: Māori	18	34	188.89	1.78 (1.23,2.57) 0.0022 **	1.81 (1.25,2.63) 0.0018 **	19	105.56	2.03 (1.25,3.29) 0.0040 **	2.03 (1.25,3.32) 0.0046 **	3	16.67	0.98 (0.31,3.12) 0.9708	0.93 (0.29,2.99) 0.8992	2	11.11	3.68 (0.83,16.38) 0.0871	4.06 (0.88,18.66) 0.0717
Unknown[£]	7502	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Deprivation Index (NZDep)																	
1 (least)	3152	135	4.28	Reference	Reference	57	1.81	Reference	Reference	17	0.54	Reference	Reference	4	0.13	Reference	Reference
2	3373	174	5.16	1.22 (0.97,1.53) 0.0966	1.21 (0.96,1.52) 0.1128	69	2.05	1.13 (0.80,1.62) 0.4867	1.12 (0.78,1.59) 0.5385	19	0.56	1.04 (0.54,2.01) 0.8961	1.03 (0.54,1.99) 0.9204	4	0.12	0.93 (0.23,3.74) 0.9236	0.90 (0.23,3.61) 0.8845
3	2930	148	5.05	1.19 (0.94,1.51) 0.1557	1.16 (0.92,1.48) 0.2129	73	2.49	1.39 (0.98,1.97) 0.0668	1.35 (0.95,1.92) 0.0951	26	0.89	1.65 (0.89,3.05) 0.1091	1.62 (0.88,3.00) 0.1228	6	0.20	1.61 (0.46,5.73) 0.4581	1.55 (0.44,5.49) 0.5005
4	2464	155	6.29	1.50 (1.18,1.90) 0.0008 ***	1.46 (1.15,1.86) 0.0017 **	70	2.84	1.59 (1.11,2.26) 0.0104 *	1.54 (1.08,2.19) 0.0179 *	21	0.85	1.59 (0.83,3.01) 0.1593	1.56 (0.82,2.96) 0.1776	1	0.04	0.32 (0.04,2.86) 0.3077	0.32 (0.04,2.84) 0.3049
5	2776	160	5.76	1.37 (1.08,1.73) 0.0091 **	1.30 (1.03,1.65) 0.0293 *	60	2.16	1.20 (0.83,1.73) 0.3302	1.12 (0.78,1.62) 0.5410	15	0.54	1.00 (0.50,2.01) 0.9958	0.96 (0.48,1.93) 0.9110	3	0.11	0.85 (0.19,3.81) 0.8333	0.80 (0.18,3.60) 0.7737
6	1945	81	4.16	0.97 (0.73,1.29) 0.8384	0.93 (0.70,1.23) 0.6108	35	1.80	0.99 (0.65,1.52) 0.9815	0.94 (0.61,1.44) 0.7835	10	0.51	0.95 (0.44,2.09) 0.9042	0.93 (0.42,2.04) 0.8583	4	0.21	1.62 (0.41,6.49) 0.4944	1.48 (0.37,5.93) 0.5827
7	1159	86	7.42	1.79 (1.35,2.37) 0.0000 ***	1.73 (1.30,2.29) 0.0001 ***	31	2.67	1.49 (0.96,2.32) 0.0764	1.44 (0.92,2.25) 0.1075	10	0.86	1.60 (0.73,3.52) 0.2369	1.63 (0.74,3.59) 0.2230	4	0.35	2.73 (0.68,10.92) 0.1567	2.75 (0.68,11.10) 0.1556
8	1123	63	5.61	1.33 (0.98,1.81) 0.0701	1.28 (0.94,1.74) 0.1005	29	2.58	1.44 (0.92,2.26) 0.1146	1.38 (0.88,2.19) 0.1631	10	0.89	1.66 (0.76,3.63) 0.2069	1.70 (0.77,3.74) 0.1887	1	0.09	0.70 (0.08,6.01) 0.7596	0.73 (0.08,6.61) 0.7796
9	1244	90	7.23	1.74 (1.32,2.30) 0.0001 ***	1.65 (1.24,2.18) 0.0005 **	39	3.14	1.76 (1.16,2.66) 0.0074 **	1.67 (1.10,2.55) 0.0167 *	14	1.13	2.10 (1.03,4.27) 0.0408 *	2.16 (1.05,4.44) 0.0365 *	0	0.00	0.00 (0.00,####) 0.9696	0.00 (0.00,####) 0.9778
10 (most)	56	3	5.36	1.26 (0.39,4.10) 0.6952	1.29 (0.40,4.21) 0.6685	0	0.00	0.00 (0.00,####) 0.9604	0.00 (0.00,####) 0.9728	0	0.00	0.00 (0.00,0.00) 0.9781	0.00 (0.00,0.00) 0.9775	0	0.00	0.00 (0.00,####) 0.9935	0.00 (0.00,####) 0.9953
Unknown[£]	8	0	0.00	-	-	0	0.00			0	0.00			0	0.00		
Deprivation Index (NZDep) quintiles																	
1 (least)	6525	309	4.74	Reference	Reference	126	1.93	Reference	Reference	36	0.55	Reference	Reference	8	0.12	Reference	Reference
2	5394	303	5.62	1.20 (1.02,1.41) 0.0301 *	1.17 (1.00,1.38) 0.0530	143	2.65	1.38 (1.09,1.76) 0.0087 **	1.35 (1.06,1.72) 0.0154 *	47	0.87	1.58 (1.02,2.45) 0.0384 *	1.56 (1.01,2.42) 0.0446 *	7	0.13	1.06 (0.38,2.92) 0.9125	1.05 (0.38,2.90) 0.9233
3	4721	241	5.10	1.08 (0.91,1.29) 0.3704	1.04 (0.87,1.23) 0.6906	95	2.01	1.04 (0.80,1.36) 0.7593	0.99 (0.75,1.29) 0.9246	25	0.53	0.96 (0.58,1.60) 0.8745	0.93 (0.56,1.56) 0.7887	7	0.15	1.21 (0.44,3.34) 0.7132	1.15 (0.41,3.18) 0.7924
4	2282	149	6.53	1.41 (1.15,1.72) 0.0009 **	1.36 (1.11,1.67) 0.0033 **	60	2.63	1.37 (1.00,1.87) 0.0467 *	1.33 (0.97,1.83) 0.0759	20	0.88	1.59 (0.92,2.76) 0.0959	1.64 (0.94,2.85) 0.0820	5	0.22	1.79 (0.58,5.47) 0.3081	1.88 (0.61,5.81) 0.2740
5 (most)	1300	93	7.15	1.55 (1.22,1.97) 0.0003 **	1.47 (1.15,1.89) 0.0020 **	39	3.00	1.57 (1.09,2.26) 0.0151 *	1.51 (1.04,2.20) 0.0296 *	14	1.08	1.96 (1.06,3.65) 0.0331 *	2.04 (1.09,3.84) 0.0268 *	0	0.00	0.00 (0.00,####) 0.9690	0.00 (0.00,####) 0.9774
Unknown[£]	8	0	0.00	-	-	0	0.00			0	0.00			0	0.00		

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Bloot Test
Σ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)
Statistically higher than reference group
Statistically lower than reference group

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Table 4e. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2[β], who did not complete Round 1[α]

	Completed kit[Σ]	Positive iFOBT[*] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Advanced Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Cancer[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	4883	409	8.38	-	-	179	3.67	-	-	75	1.54	-	-	17	0.35	-	-
Age (years)																	
50-54	999	65	6.51	Reference	Reference	26	2.60	Reference	Reference	13	1.30	Reference	Reference	1	0.10	Reference	Reference
55-59	1358	93	6.85	1.06 (0.76 , 1.47) 0.7430	1.07 (0.77 , 1.49) 0.6851	38	2.80	1.08 (0.65 , 1.79) 0.7728	1.09 (0.66 , 1.82) 0.7321	18	1.33	1.02 (0.50 , 2.09) 0.9594	1.03 (0.50 , 2.11) 0.9440	3	0.22	2.21 (0.23 , 21.27) 0.4926	2.32 (0.24 , 22.40) 0.4667
60-64	1095	94	8.58	1.35 (0.97 , 1.87) 0.0738	1.34 (0.96 , 1.86) 0.0846	50	4.57	1.79 (1.11 , 2.90) 0.0178 *	1.82 (1.12 , 2.95) 0.0154 *	16	1.46	1.12 (0.54 , 2.35) 0.7546	1.13 (0.54 , 2.37) 0.7493	4	0.37	3.66 (0.41 , 32.79) 0.2463	2.94 (0.30 , 28.42) 0.3510
65-69	862	79	9.16	1.45 (1.03 , 2.04) 0.0331 *	1.46 (1.04 , 2.06) 0.0304 *	33	3.83	1.49 (0.88 , 2.51) 0.1347	1.50 (0.89 , 2.54) 0.1281	16	1.86	1.43 (0.69 , 3.00) 0.3377	1.35 (0.64 , 2.84) 0.4241	3	0.35	3.49 (0.36 , 33.57) 0.2799	3.89 (0.40 , 37.66) 0.2413
70-74	569	78	13.71	2.28 (1.61 , 3.23) 0.0000 ***	2.23 (1.57 , 3.16) 0.0000 ***	32	5.62	2.23 (1.32 , 3.78) 0.0029 **	2.21 (1.30 , 3.77) 0.0034 **	12	2.11	1.63 (0.74 , 3.61) 0.2240	1.51 (0.68 , 3.36) 0.3075	6	1.05	10.64 (1.28 , 88.57) 0.0288 *	11.13 (1.33 , 93.37) 0.0264 *
Sex																	
Female	2472	181	7.32	Reference	Reference	65	2.63	Reference	Reference	25	1.01	Reference	Reference	8	0.32	Reference	Reference
Male	2411	228	9.46	1.32 (1.08 , 1.62) 0.0072 **	1.34 (1.09 , 1.64) 0.0059 **	114	4.73	1.84 (1.35 , 2.51) 0.0001 **	1.87 (1.37 , 2.55) 0.0001 ***	50	2.07	2.07 (1.28 , 3.36) 0.0031 **	2.06 (1.27 , 3.35) 0.0035 **	9	0.37	1.15 (0.44 , 3.00) 0.7685	1.10 (0.41 , 2.97) 0.8458
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex																	
50-54, Female	502	30	5.98	Reference	Reference	8	1.59	Reference	Reference	5	1.00	Reference	Reference	0	0.00	Reference	Reference
50-54, Male	497	35	7.04	1.19 (0.72 , 1.97) 0.4950	1.15 (0.69 , 1.92) 0.5882	18	3.62	2.32 (1.00 , 5.39) 0.0501	2.35 (1.00 , 5.50) 0.0500	8	1.61	1.63 (0.53 , 5.01) 0.3966	1.47 (0.47 , 4.58) 0.5108	1	0.20	44389.66 (0.00 , ####) 0.9592	1880.58 (0.00 , ####) 0.8333
55-59, Female	701	45	6.42	Reference	Reference	15	2.14	Reference	Reference	4	0.57	Reference	Reference	1	0.14	Reference	Reference
55-59, Male	657	48	7.31	1.15 (0.75 , 1.75) 0.5183	1.20 (0.78 , 1.84) 0.4000	23	3.50	1.66 (0.86 , 3.21) 0.1324	1.77 (0.91 , 3.45) 0.0941	14	2.13	3.79 (1.24 , ####) 0.0192 *	3.92 (1.27 , ####) 0.0172 *	2	0.30	2.14 (0.19 , 23.63) 0.5355	2.40 (0.21 , 27.17) 0.4805
60-64, Female	540	34	6.30	Reference	Reference	18	3.33	Reference	Reference	6	1.11	Reference	Reference	3	0.56	Reference	Reference
60-64, Male	555	60	10.81	1.80 (1.16 , 2.81) 0.0084 **	1.79 (1.15 , 2.80) 0.0104 *	32	5.77	1.77 (0.98 , 3.20) 0.0568	1.86 (1.03 , 3.37) 0.0411 *	10	1.80	1.63 (0.59 , 4.52) 0.3456	1.78 (0.63 , 4.98) 0.2741	1	0.18	0.32 (0.03 , 3.12) 0.3286	0.00 (0.00 , ####) 0.8739
65-69, Female	433	32	7.39	Reference	Reference	10	2.31	Reference	Reference	4	0.92	Reference	Reference	1	0.23	Reference	Reference
65-69, Male	429	47	10.96	1.54 (0.96 , 2.47) 0.0714	1.57 (0.98 , 2.53) 0.0620	23	5.36	2.40 (1.13 , 5.10) 0.0232 *	2.42 (1.13 , 5.18) 0.0230 *	12	2.80	3.09 (0.99 , 9.64) 0.0526	2.87 (0.91 , 9.04) 0.0712	2	0.47	2.02 (0.18 , 22.40) 0.5656	3.30 (0.28 , 38.97) 0.3424
70-74, Female	296	40	13.51	Reference	Reference	14	4.73	Reference	Reference	6	2.03	Reference	Reference	3	1.01	Reference	Reference
70-74, Male	273	38	13.92	1.03 (0.64 , 1.67) 0.8881	1.05 (0.65 , 1.70) 0.8437	18	6.59	1.42 (0.69 , 2.92) 0.3371	1.50 (0.73 , 3.08) 0.2751	6	2.20	1.09 (0.35 , 3.41) 0.8874	1.16 (0.36 , 3.70) 0.8005	3	1.10	1.09 (0.22 , 5.42) 0.9207	1.10 (0.21 , 5.71) 0.9062
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)																	
Female: 50-54	502	30	5.98	Reference	Reference	8	1.59	Reference	Reference	5	1.00	Reference	Reference	0	0.00	Reference	Reference
Female: 55-59	701	45	6.42	1.08 (0.67 , 1.74) 0.7539	1.06 (0.66 , 1.72) 0.8019	15	2.14	1.35 (0.57 , 3.21) 0.4967	1.34 (0.56 , 3.20) 0.5061	4	0.57	0.57 (0.15 , 2.14) 0.4045	0.55 (0.15 , 2.09) 0.3824	1	0.14	26480.09 (0.00 , ####) 0.9577	43781.57 (0.00 , ####) 0.9655
Female: 60-64	540	34	6.30	1.06 (0.64 , 1.75) 0.8297	1.05 (0.63 , 1.75) 0.8530	18	3.33	2.13 (0.92 , 4.94) 0.0785	2.08 (0.89 , 4.85) 0.0902	6	1.11	1.12 (0.34 , 3.68) 0.8559	0.99 (0.30 , 3.31) 0.9896	3	0.56	###### (0.00 , ####) 0.9521	###### (0.00 , ####) 0.9608
Female: 65-69	433	32	7.39	1.26 (0.75 , 2.10) 0.3870	1.28 (0.76 , 2.14) 0.3576	10	2.31	1.46 (0.57 , 3.73) 0.4296	1.48 (0.58 , 3.82) 0.4129	4	0.92	0.93 (0.25 , 3.47) 0.9102	0.90 (0.24 , 3.40) 0.8718	1	0.23	###### (0.00 , ####) 0.9557	###### (0.00 , ####) 0.9634
Female: 70-74	296	40	13.51	2.46 (1.50 , 4.04) 0.0004 ***	2.39 (1.45 , 3.96) 0.0007 ***	14	4.73	3.07 (1.27 , 7.40) 0.0127 *	2.89 (1.19 , 7.04) 0.0192 *	6	2.03	2.06 (0.62 , 6.80) 0.2372	1.82 (0.54 , 6.16) 0.3349	3	1.01	42907.56 (0.00 , ####) 0.9496	84178.39 (0.00 , ####) 0.9587
Male: 50-54	497	35	7.04	Reference	Reference	18	3.62	Reference	Reference	8	1.61	Reference	Reference	1	0.20	Reference	Reference
Male: 55-59	657	48	7.31	1.04 (0.66 , 1.64) 0.8637	1.04 (0.66 , 1.63) 0.8788	23	3.50	0.97 (0.52 , 1.81) 0.9125	0.98 (0.52 , 1.84) 0.9470	14	2.13	1.33 (0.55 , 3.21) 0.5275	1.33 (0.55 , 3.21) 0.5275	2	0.30	1.51 (0.14 , 16.75) 0.7350	1.63 (0.15 , 18.12) 0.6908
Male: 60-64	555	60	10.81	1.60 (1.03 , 2.47) 0.0345 *	1.57 (1.01 , 2.43) 0.0463 *	32	5.77	1.63 (0.90 , 2.94) 0.1057	1.68 (0.93 , 3.04) 0.0867	10	1.80	1.12 (0.44 , 2.86) 0.8105	1.14 (0.44 , 2.92) 0.7903	1	0.18	0.90 (0.06 , 14.35) 0.9377	0.00 (0.00 , ####) 0.9592
Male: 65-69	429	47	10.96	1.62 (1.03 , 2.57) 0.0380 *	1.60 (1.01 , 2.53) 0.0464 *	23	5.36	1.51 (0.80 , 2.83) 0.2022	1.55 (0.82 , 2.93) 0.1743	12	2.80	1.76 (0.71 , 4.34) 0.2208	1.65 (0.66 , 4.10) 0.2802	2	0.47	2.32 (0.21 , 25.71) 0.4919	2.44 (0.22 , 27.25) 0.4691
Male: 70-74	273	38	13.92	2.13 (1.31 , 3.47) 0.0022 **	2.03 (1.24 , 3.32) 0.0047 **	18	6.59	1.88 (0.96 , 3.67) 0.0655	1.92 (0.98 , 3.77) 0.0588	6	2.20	1.37 (0.47 , 4.00) 0.5606	1.26 (0.43 , 3.70) 0.6693	3	1.10	5.51 (0.57 , 53.24) 0.1402	5.44 (0.56 , 53.07) 0.1451
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity																	
European/Other	3447	293	8.50	Reference	Reference	133	3.86	Reference	Reference	67	1.94	Reference	Reference	9	0.26	Reference	Reference
Asian	633	44	6.95	0.80 (0.58 , 1.12) 0.1941	0.80 (0.57 , 1.11) 0.1786	14	2.21	0.56 (0.32 , 0.98) 0.0437 *	0.57 (0.32 , 1.00) 0.0484 *	2	0.32	0.16 (0.04 , 0.65) 0.0108 *	0.15 (0.04 , 0.61) 0.0084 **	2	0.32	1.21 (0.26 , 5.62) 0.8070	1.11 (0.23 , 5.28) 0.8963
Pacific	440	42	9.55	1.14 (0.81 , 1.60) 0.4620	0.95 (0.66 , 1.38) 0.7971	16	3.64	0.94 (0.55 , 1.59) 0.8193	0.79 (0.45 , 1.38) 0.4022	3	0.68	0.35 (0.11 , 1.11) 0.0734	0.28 (0.09 , 0.92) 0.0367 *	3	0.68	2.62 (0.71 , 9.72) 0.1493	1.41 (0.34 , 5.82) 0.6346
Māori	303	27	8.91	1.05 (0.70 , 1.59) 0.8062	0.99 (0.65 , 1.52) 0.9813	16	5.28	1.39 (0.82 , 2.37) 0.2264	1.30 (0.75 , 2.26) 0.3406	3	0.99	0.50 (0.16 , 1.61) 0.2487	0.46 (0.14 , 1.48) 0.1903	2	0.66	2.54 (0.55 , 11.80) 0.2348	1.99 (0.41 , 9.74) 0.3963
Unknown[£]	60	3	5.00	-	-	0	0.00	-	-	0	0.00	-	-	1	1.67	-	-
Age (years) - Ethnicity																	
50-59, European/Other	1621	110	6.79	Reference	Reference	47	2.90	Reference	Reference	27	1.67	Reference	Reference	2	0.12	Reference	Reference
50-59, Asian	330	17	5.15	0.75 (0.44 , 1.26) 0.2742	0.69 (0.41 , 1.18) 0.1772	2	0.61	0.20 (0.05 , 0.84) 0.0283 *	0.18 (0.04 , 0.74) 0.0175 *	0	0.00	0.00 (0.00 , ####) 0.9669	0.00 (0.00 , ####) 0.9599	0	0.00	0.00 (0.00 , ####) 0.9736	0.00 (0.00 , ####) 0.9620
50-59, Pacific	212	15	7.08	1.05 (0.60 , 1.83) 0.8750	0.88 (0.48 , 1.60) 0.6811	4	1.89	0.64 (0.23 , 1.81) 0.4029	0.44 (0.15 , 1.30) 0.1371	1	0.47	0.28 (0.04 , 2.07) 0.2122	0.17 (0.02 , 1.30) 0.0875	1	0.47	3.84 (0.35 , 42.49) 0.2731	1.75 (0.13 , 24.02) 0.6772
50-59, Māori	170	16	9.41	1.43 (0.82 , 2.47) 0.2050	1.26 (0.71 , 2.22) 0.4268	11	6.47	2.32 (1.18 , 4.56) 0.0149 *	1.85 (0.91 , 3.76) 0.0878	2	1.18	1.06 (0.32 , 3.53) 0.9237	0.76 (0.22 , 2.62) 0.6673	1	0.59	4.79 (0.43 , 53.10) 0.2019	3.43 (0.29 , 40.20) 0.3832
60-69, European/Other	1406	127	9.03	Reference	Reference	63	4.48	Reference	Reference	31	2.20	Reference	Reference	2	0.14	Reference	Reference
60-69, Asian	240	16	6.67	0.72 (0.42 , 1.23) 0.2317	0.72 (0.42 , 1.24) 0.2380	7	2.92	0.64 (0.29 , 1.42) 0.2708	0.68 (0.31 , 1.52) 0.3495	1	0.42	0.19 (0.03 , 1.37) 0.0982	0.18 (0.02 , 1.31) 0.0896	2	0.83	5.90 (0.83 , 42.08) 0.0766	5.90 (0.80 , 43.33) 0.0808
60-69, Pacific	178	19	10.67	1.20 (0.72 , 2.00) 0.4759	1.06 (0.61 , 1.85) 0.8419	8	4.49	1.00 (0.47 , 2.13) 0.9934	1.00 (0.44 , 2.26) 0.9996	0	0.00	0.00 (0.00 , ####) 0.9727	0.00 (0.00 , ####) 0.9537	2	1.12	7.98 (1.12 , 56.99) 0.0385 *	10.46 (1.11 , 98.30) 0.0400 *
60-69, Māori	103	9	8.74	0.96 (0.48 , 1.96) 0.9197	0.92 (0.45 , 1.88) 0.8126	5	4.85	1.09 (0.43 , 2.77) 0.8600	1.09 (0.42 , 2.81) 0.8585	0	0.00	0.00 (0.00 , ####) 0.9792	0.00 (0.00 , ####) 0.9657	1	0.97	0.00 (0.00 , ####) 0.9807	0.00 (0.00 , ####) 0.9799
70-74, European/Other	420	56	13.33	Reference	Reference	23	5.48	Reference	Reference	9	2.14	Reference	Reference	5	1.19	Reference	Reference
70-74, Asian	63	11	17.46	1.38 (0.68 , 2.79) 0.3785	1.33 (0.65 , 2.72) 0.4350	5	7.94	1.49 (0.54 , 4.07) 0.4386	1.46 (0.53 , 4.04) 0.4624	1	1.59	0.74 (0.09 , 5.91) 0.7736	0.66 (0.08 , 5.41) 0.7022	0	0.00	0.00 (0.00 , ####) 0.9704	0.00 (0.00 , ####) 0.9567
70-74, Pacific	50	8	16.00	1.24 (0.55 , 2.77) 0.6038	0.96 (0.40 , 2.27) 0.9237	4	8.00	1.50 (0.50 , 4.53) 0.4713	1.30 (0.39 , 4.26) 0.6687	2	4.00	1.90 (0.40 , 9.06) 0.4193	1.61 (0.28 , 9.30) 0.5969	0	0.00	0.00 (0.00 , ####) 0.9736	0.00 (0.00 , ####) 0.9654
70-74, Māori	30	2	6.67	0.46 (0.11 , 1.92) 0.3037	0.40 (0.09 , 1.77) 0.2289	0	0.00	0.00 (0.00 , ####) 0.9799	0.00 (0.00 , ####) 0.9795	0	0.00	0.00 (0.00 , ####) 0.9811	0.00 (0.00 , ####) 0.9680	1	3.33	2.86 (0.32 , 25.31) 0.3444	1.62 (0.17 , 15.07) 0.6725
Unknown[£]	60	3	5.00	-	-	0	0.00	-	-	0	0.00	-	-	1	1.67	-	-
Sex - Ethnicity																	
Female: European/Other	1698	120	7.07	Reference	Reference	51	3.00	Reference	Reference	22	1.30	Reference	Reference	4	0.24	Reference	Reference
Female: Asian	364	29	7.97	1.14 (0.75 , 1.74) 0.5476	1.09 (0.71 , 1.67) 0.7037	5	1.37	0.45 (0.18 , 1.13) 0.0907	0.41 (0.16 , 1.05) 0.0642	0	0.00	0.00 (0.00 , ####) 0.9535	0.00 (0.00 , ####) 0.9417	2	0.55	2.34 (0.43 , 12.82) 0.3273	2.05 (0.36 , 11.51) 0.4167
Female: Pacific	238	21	8.82	1.27 (0.78 , 2.07) 0.3296	0.88 (0.52 , 1.50) 0.6481	6	2.52	0.84 (0.35 , 1.97) 0.6804	0.52 (0.21 , 1.30) 0.1612	3	1.26	0.97 (0.29 , 3.27) 0.9641	0.62 (0.17 , 2.30) 0.4795	1	0.42	1.79 (0.20 , 16.03) 0.6043	0.75 (0.07 , 7.67) 0.8064
Female: Māori	163	11	6.75	0.95 (0.50 , 1.80) 0.8793	0.82 (0.43 , 1.58) 0.5536	3	1.84	0.61 (0.19 , 1.96) 0.4030	0.50 (0.15 , 1.67) 0.2617	1	0.61	0.00 (0.00 , ####) 0.9689	0.00 (0.00 , ####) 0.9598	1	0.61	2.62 (0.29 , 23.53) 0.3911	2.02 (0.21 , 19.93) 0.5465
Male: European/Other	269	173	64.31	Reference	Reference	82	30.48	Reference	Reference	45	16.73	Reference	Reference	5	1.86	Reference	Reference
Male: Asian	202	15	7.43	0.54 (0.31 , 0.93) 0.0255 *	0.53 (0.30 , 0.92) 0.0231 *	9	4.46	0.70 (0.35 , 1.42) 0.3255	0.70 (0.35 , 1.43) 0.3341	2	0.99	0.28 (0.07 , 1.18) 0.0825	0.25 (0.06 , 1.07) 0.0614	0	0.00	0.00 (0.00 , ####) 0.9663	0.00 (0.00 , ####) 0.9687
Male: Pacific	140	21	15.00	1.06 (0.66 , 1.71) 0.8205	1.00 (0.60 , 1.66) 0.9947	10	7.14	1.06 (0.54 , 2.08) 0.8679	0.98 (0.48 , 2.01) 0.9649	0	0.00	0.00 (0.00 , ####) 0.9674	0.00 (0.00 , ####) 0.9661	2	1.43	3.49 (0.67 , 18.10) 0.1369	2.28 (0.38 , 13.58) 0.3662
Male: Māori	60	16	26.67	1.18 (0.68 , 2.04) 0.5601	1.16 (0.66 , 2.02) 0.6045	13	21.67	2.08 (1.13 , 3.84) 0.0189 *	2.03 (1.08 , 3.80) 0.0274 *	3	5.00	0.83 (0.25 , 2.70) 0.7560	0.75 (0.23 , 2.49) 0.6397	1	1.67	2.51 (0.29 , 21.63) 0.4025	1.81 (0.20 , 16.54) 0.5981
Unknown[£]	1749	3	0.17	-	-	0	0.00	-	-	0	0.00	-	-	1	0.06	-	-
Deprivation Index (NZDep)																	
1 (least)	663	38	5.73	Reference	Reference	15	2.26	Reference	Reference	6	0.90	Reference	Reference	3	0.45	Reference	Reference
2	781	64	8.19	1.47 (0.97 , 2.22) 0.0701	1.48 (0.97 , 2.25) 0.0657	30	3.84	1.73 (0.92 , 3.24) 0.0889	1.72 (0.91 , 3.23) 0.0925	11	1.41	1.56 (0.58 , 4.25) 0.3806	1.53 (0.56 , 4.17) 0.4055	0	0.00	0.00 (0.00 , ####) 0.9583	0.00 (0.00 , ####) 0.9584
3	654	51	7.80	1.39 (0.90 , 2.15) 0.1367	1.32 (0.85 , 2.04) 0.2197	20	3.06	1.36 (0.69 , 2.69) 0.3712	1.33 (0.67 , 2.63) 0.4084	9	1.38	1.53 (0.54 , 4.32) 0.4238	1.55 (0.55 , 4.38) 0.4113	1	0.15	0.34 (0.03 , 3.25) 0.3466	0.30 (0.03 , 2.87) 0.2931
4	535	35	6.54	1.15 (0.72 , 1.85) 0.5601	1.10 (0.68 , 1.78) 0.6991	14	2.62	1.16 (0.56 , 2.43) 0.6918	1.18 (0.56 , 2.47) 0.6637	6	1.12	1.24 (0.40 , 3.87) 0.7088	1.38 (0.44 , 4.32) 0.5790	0	0.00	0.00 (0.00 , ####) 0.9655	0.00 (0.00 , ####) 0.9645
5	592	47	7.94	1.42 (0.91 , 2.21) 0.1218	1.36 (0.87 , 2.13) 0.1764	22	3.72	1.67 (0.86 , 3.24) 0.1324	1.66 (0.85 , 3.24) 0.1397	14	2.36	2.65 (1.01 , 6.95) 0.0471 *	2.93 (1.11 , 7.72) 0.0293 *	2	0.34	0.75 (0.12 , 4.54) 0.7484	0.61 (0.10 , 3.74) 0.5964
6	479	51	10.65	1.96 (1.27 , 3.04) 0.0026 **	1.87 (1.20 , 2.92) 0.0054 **	24	5.01	2.28 (1.18 , 4.39) 0.0139 *	2.23 (1.15 , 4.32) 0.0174 *	7	1.46	1.62 (0.54 , 5.26) 0.3863	1.75 (0.58 , 5.26) 0.3184	2	0.42	0.92 (0.15 , 5.54) 0.9297	0.39 (0.04 , 4.19) 0.4194
7	345	45	13.04	2.47 (1.57 , 3.88) 0.0001 ***	2.49 (1.57 , 3.95) 0.0001 ***	19	5.51	2.52 (1.26 , 5.02) 0.0087 **	2.67 (1.32 , 5.38) 0.0060 **	10	2.90	2.93 (1.04 , 8.31) 0.0428 *	3.82 (1.34 , ####) 0.0123 *	1	0.29	0.64 (0.07 , 6.17) 0.6991	2.29 (0.50 , 10.59) 0.2889
8	377	35	9.28	1.68 (1.04 , 2.71) 0.0327 *	1.65 (1.01 , 2.70) 0.0447 *	16	4.24	1.91 (0.94 , 3.90) 0.0674	1.99 (0.97 , 4.08) 0.0604	10	2.65	2.98 (1.08 , 8.28) 0.0357 *	4.41 (1.56 , ####) 0.0050 **	5	1.33	1.57 (0.31 , 7.80) 0.5830	1.28 (0.24 , 6.93) 0.7738
9	424	42	9.91	1.81 (1.15 , 2.86) 0.0110 *	1.79 (1.11 , 2.88) 0.0160 *	18	4.25	1.92 (0.97 , 3.84) 0.0674	1.99 (0.97 , 4.08) 0.0604	3	0.71	0.78 (0.19 , 3.14) 0.7267	1.13 (0.28 , 4.62) 0.8653	3	0.71	1.57 (0.31 , 7.80) 0.5830	1.28 (0.24 , 6.93) 0.7738
10 (most)	32	1	3.13	0.53 (0.07 , 3.99) 0.5388	0.51 (0.07 , 3.83) 0.5085	1	3.13	1.39 (0.18 , ####) 0.7517	1.49 (0.19 , ####) 0.7083	0	0.00	0.00 (0.00 , ####) 0.9841	0.00 (0.00 , ####) 0.9837	0	0.00	0.00 (0.00 , ####) 0.9915	0.00 (0.00 , ####) 0.9910
Unknown[£]	1	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles																	
1 (least)	1444	102	7.06	Reference	Reference	45	3.12	Reference	Reference	17	1.18	Reference	Reference	3	0.21	Reference	Reference
2	1189	86	7.23	1.03 (0.76 , 1.38) 0.8667	0.97 (0.72 , 1.32) 0.8629	34	2.86	0.92 (0.58 , 1.44) 0.7008	0.91 (0.58 , 1.44) 0.6988	15	1.26	1.07 (0.53 , 2.16) 0.8443	1.14 (0.57 , 2.31) 0.7058	1	0.08	0.40 (0.04 , 3.89) 0.4332	0.35 (0.04 , 3.36) 0.3608
3	1071	98	9.15	1.33 (0.99 , 1.77) 0.0564	1.27 (0.94 , 1.70) 0.1137	46	4.30	1.40 (0.92 , 2.12) 0.1191	1.38 (0.91 , 2.12) 0.1332	21	1.96	1.68 (0.88 , 3.20) 0.1151	1.86 (0.97 , 3.55) 0.0616	4	0.37	1.80 (0.40 , 8.06) 0.4419	1.10 (0.22 , 5.53) 0.9115
4	722	80	11.08	1.64 (1.21 , 2.23) 0.0016 **	1.64 (1.19 , 2.27) 0.0026 **	35	4.85	1.58 (1.01 , 2.49) 0.0457 *	1.69 (1.05 , 2.71) 0.0293 *	19	2.63	2.27 (1.17 , 4.39) 0.0151 *	3.19 (1.62 , 6.29) 0.0008 **	6	0.83	4.03 (1.00 , 16.14) 0.0494 *	3.12 (0.72 , 13.55) 0.1298
5 (most)	456	43	9.43	1.37 (0.94 , 1.99) 0.0982	1.36 (0.92 , 2.02) 0.1249	19	4.17	1.35 (0.78 , 2.34) 0.2801	1.42 (0.80 , 2.53) 0.2331	3	0.66	0.56 (0.16 , 1.91) 0.3506	0.82 (0.23 , 2.87) 0.7570	3	0.66	3.18 (0.64 , 15.82) 0.1573	2.47 (0.45 , 13.47) 0.2962
Unknown[£]	1	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Blood Test
Σ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

▓ Statistically higher than reference group
▓ Statistically lower than reference group

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Table 4f. Screening outcomes (Positivity and Detection) by demographic factors in the first year of Round 2[β], who were not invited in Round 1[α]

	Completed kit[ʒ]	Positive iFOBT* n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)		Adenoma[#] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)		Advanced Adenoma[#] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)		Cancer[ρ] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)	
Total	7134	372	5.21	-		-		156	2.19	-		-		58	0.81	-		-		9	0.13	-		-	
Age (years)																									
50-54	5292	243	4.59	Reference		Reference		91	1.72	Reference		Reference		34	0.64	Reference		Reference		3	0.06	Reference		Reference	
55-59	557	35	6.28	1.39 (0.97 , 2.01) 0.0755		1.39 (0.96 , 2.01) 0.0802		15	2.69	1.58 (0.91 , 2.75) 0.1043		1.55 (0.89 , 2.72) 0.1216		8	1.44	2.25 (1.04 , 4.89) 0.0399 *		2.17 (0.99 , 4.74) 0.0527		2	0.36	6.35 (1.06 , 38.10) 0.0431 *		5.34 (0.87 , 32.78) 0.0706	
60-64	485	31	6.39	1.42 (0.96 , 2.09) 0.0757		1.42 (0.96 , 2.10) 0.0766		15	3.09	1.82 (1.05 , 3.18) 0.0336 *		1.84 (1.05 , 3.22) 0.0330 *		2	0.41	0.64 (0.15 , 2.67) 0.5410		0.64 (0.15 , 2.67) 0.5355		2	0.41	7.30 (1.22 , 43.80) 0.0297 *		6.82 (1.11 , 41.82) 0.0381 *	
65-69	460	35	7.61	1.71 (1.18 , 2.47) 0.0042 **		1.73 (1.19 , 2.51) 0.0040 **		22	4.78	2.87 (1.78 , 4.62) 0.0000 ***		2.86 (1.77 , 4.63) 0.0000 ***		11	2.39	3.79 (1.91 , 7.53) 0.0001 **		3.51 (1.75 , 7.02) 0.0004 **		0	0.00	0.00 (0.00 , 0.00) 0.9815		0.00 (0.00 , ####) 0.9685	
70-74	340	28	8.24	1.86 (1.24 , 2.80) 0.0027 **		1.97 (1.31 , 2.98) 0.0013 **		13	3.82	2.27 (1.26 , 4.11) 0.0066 **		2.35 (1.29 , 4.29) 0.0052 **		3	0.88	1.38 (0.42 , 4.51) 0.5972		1.26 (0.38 , 4.15) 0.7071		2	0.59	10.43 (1.74 , 62.64) 0.0104 *		9.50 (1.54 , 58.43) 0.0152 *	
Sex																									
Female	3959	171	4.32	Reference		Reference		62	1.57	Reference		Reference		23	0.58	Reference		Reference		4	0.10	Reference		Reference	
Male	3175	201	6.33	1.50 (1.21 , 1.85) 0.0002 **		1.45 (1.17 , 1.79) 0.0006 **		94	2.96	1.92 (1.39 , 2.65) 0.0001 ***		1.86 (1.34 , 2.58) 0.0002 **		35	1.10	1.91 (1.12 , 3.23) 0.0166 *		1.89 (1.11 , 3.22) 0.0183 *		5	0.16	1.56 (0.42 , 5.81) 0.5079		1.47 (0.39 , 5.50) 0.5695	
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Age (years) - Sex																									
50-54, Female	2999	123	4.10	Reference		Reference		42	1.40	Reference		Reference		17	0.57	Reference		Reference		2	0.07	Reference		Reference	
50-54, Male	2293	120	5.23	1.29 (1.00 , 1.67) 0.0518		1.24 (0.95 , 1.61) 0.1085		49	2.14	1.54 (1.01 , 2.33) 0.0426 *		1.51 (0.99 , 2.30) 0.0561		17	0.74	1.31 (0.67 , 2.57) 0.4323		1.35 (0.69 , 2.66) 0.3818		1	0.04	0.65 (0.06 , 7.21) 0.7287		0.68 (0.06 , 7.55) 0.7549	
55-59, Female	286	10	3.50	Reference		Reference		4	1.40	Reference		Reference		2	0.70	Reference		Reference		1	0.35	Reference		Reference	
55-59, Male	271	25	9.23	2.80 (1.32 , 5.96) 0.0073 **		2.83 (1.32 , 6.08) 0.0075 **		11	4.06	2.98 (0.94 , 9.48) 0.0641		2.99 (0.93 , 9.66) 0.0664		6	2.21	3.21 (0.64 , ####) 0.1549		3.06 (0.60 , ####) 0.1762		1	0.37	1.06 (0.07 , 16.96) 0.9696		1.08 (0.06 , 17.82) 0.9593	
60-64, Female	259	12	4.63	Reference		Reference		4	1.54	Reference		Reference		1	0.39	Reference		Reference		1	0.39	Reference		Reference	
60-64, Male	226	19	8.41	1.89 (0.90 , 3.98) 0.0946		1.97 (0.93 , 4.19) 0.0778		11	4.87	3.26 (1.02 , ####) 0.0455 *		3.41 (1.06 , ####) 0.0402 *		1	0.44	1.15 (0.07 , 18.44) 0.9231		1.34 (0.08 , ####) 0.8372		1	0.44	1.15 (0.07 , 18.44) 0.9231		1.30 (0.08 , 21.57) 0.8552	
65-69, Female	238	14	5.88	Reference		Reference		7	2.94	Reference		Reference		2	0.84	Reference		Reference		0	0.00	Reference		Reference	
65-69, Male	222	21	9.46	1.67 (0.83 , 3.37) 0.1517		1.96 (0.95 , 4.04) 0.0681		15	6.76	2.39 (0.96 , 5.98) 0.0623		3.07 (1.17 , 8.04) 0.0227 *		9	4.05	4.99 (1.07 , ####) 0.0413 *		6.26 (1.31 , ####) 0.0216 *		0	0.00	4.34 (0.94 , 20.07) 0.0605		4.72 (0.99 , 22.57) 0.0521	
70-74, Female	177	12	6.78	Reference		Reference		5	2.82	Reference		Reference		1	0.56	Reference		Reference		0	0.00	Reference		Reference	
70-74, Male	163	16	9.82	1.50 (0.69 , 3.27) 0.3115		1.47 (0.66 , 3.28) 0.3472		8	4.91	1.78 (0.57 , 5.54) 0.3229		1.71 (0.54 , 5.42) 0.3584		2	1.23	2.19 (0.20 , ####) 0.5247		1.76 (0.15 , ####) 0.6538		2	1.23	46675.68 (0.00 , ####) 0.9412		4810.25 (0.00 , ####) 0.8524	
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Sex - Age (years)																									
Female: 50-54	2999	123	4.10	Reference		Reference		42	1.40	Reference		Reference		17	0.57	Reference		Reference		2	0.07	Reference		Reference	
Female: 55-59	286	10	3.50	0.85 (0.44 , 1.63) 0.6204		0.76 (0.39 , 1.48) 0.4195		4	1.40	1.00 (0.36 , 2.81) 0.9980		0.97 (0.34 , 2.75) 0.9566		2	0.70	1.24 (0.28 , 5.37) 0.7782		1.08 (0.24 , 4.75) 0.9231		1	0.35	5.26 (0.48 , 58.16) 0.1759		3.35 (0.29 , 38.55) 0.3323	
Female: 60-64	259	12	4.63	1.14 (0.62 , 2.08) 0.6805		1.04 (0.57 , 1.93) 0.8886		4	1.54	1.10 (0.39 , 3.10) 0.8506		1.07 (0.38 , 3.04) 0.8928		1	0.39	0.68 (0.09 , 5.13) 0.7083		0.62 (0.08 , 4.71) 0.6450		1	0.39	5.81 (0.52 , 64.27) 0.1515		4.41 (0.38 , 50.64) 0.2330	
Female: 65-69	238	14	5.88	1.46 (0.83 , 2.58) 0.1915		1.45 (0.82 , 2.58) 0.2029		7	2.94	2.13 (0.95 , 4.80) 0.0670		2.12 (0.94 , 4.82) 0.0717		2	0.84	1.49 (0.34 , 6.47) 0.5974		1.37 (0.31 , 6.01) 0.6789		0	0.00	0.00 (0.00 , 0.00) 0.9813		0.00 (0.00 , ####) 0.9609	
Female: 70-74	177	12	6.78	1.70 (0.92 , 3.14) 0.0897		1.88 (1.01 , 3.51) 0.0462 *		5	2.82	2.05 (0.80 , 5.24) 0.1352		2.28 (0.88 , 5.91) 0.0912		1	0.56	1.00 (0.13 , 7.53) 0.9974		0.99 (0.13 , 7.57) 0.9915		0	0.00	0.00 (0.00 , 0.00) 0.9839		0.00 (0.00 , ####) 0.9714	
Male: 50-54	2293	120	5.23	Reference		Reference		49	2.14	Reference		Reference		17	0.74	Reference		Reference		1	0.04	Reference		Reference	
Male: 55-59	271	25	9.23	1.84 (1.17 , 2.89) 0.0080 **		2.07 (1.31 , 3.26) 0.0019 **		11	4.06	1.94 (1.00 , 3.77) 0.0517		2.00 (1.02 , 3.93) 0.0429 *		6	2.21	3.03 (1.18 , 7.76) 0.0207 *		3.24 (1.26 , 8.36) 0.0149 *		1	0.37	9.03 (0.56 , ####) 0.1308		9.03 (0.56 , ####) 0.1209	
Male: 60-64	226	19	8.41	1.66 (1.00 , 2.75) 0.0484 *		1.89 (1.13 , 3.16) 0.0146 *		11	4.87	2.34 (1.20 , 4.57) 0.0126 *		2.52 (1.28 , 4.98) 0.0075 **		1	0.44	0.60 (0.08 , 4.49) 0.6147		0.67 (0.09 , 5.06) 0.6950		1	0.44	10.19 (0.64 , ####) 0.1012		11.82 (0.71 , ####) 0.0853	
Male: 65-69	222	21	9.46	1.89 (1.16 , 3.07) 0.0101 *		2.12 (1.30 , 3.47) 0.0028 **		15	6.76	3.32 (1.83 , 6.02) 0.0001 ***		3.52 (1.93 , 6.45) 0.0000 ***		9	4.05	5.66 (2.49 , ####) 0.0000 ***		5.85 (2.54 , ####) 0.0000 ***		0	0.00	0.00 (0.00 , ####) 0.9765		0.00 (0.00 , ####) 0.9749	
Male: 70-74	163	16	9.82	1.97 (1.14 , 3.41) 0.0152 *		2.20 (1.26 , 3.84) 0.0055 **		8	4.91	2.36 (1.10 , 5.08) 0.0275 *		2.52 (1.16 , 5.46) 0.0195 *		2	1.23	1.66 (0.38 , 7.26) 0.4987		1.60 (0.36 , 7.05) 0.5379		2	1.23	28.47 (2.57 , ####) 0.0064 **		22.59 (1.96 , ####) 0.0124 *	
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Ethnicity																									
European/Other	5092	240	4.71	Reference		Reference		105	2.06	Reference		Reference		44	0.86	Reference		Reference		6	0.12	Reference		Reference	
Asian	1376	79	5.74	1.23 (0.95 , 1.60) 0.1188		1.16 (0.89 , 1.52) 0.2710		32	2.33	1.13 (0.76 , 1.69) 0.5472		1.05 (0.70 , 1.59) 0.8065		10	0.73	0.84 (0.42 , 1.67) 0.6197		0.79 (0.39 , 1.61) 0.5233		3	0.22	1.85 (0.46 , 7.42) 0.3838		1.46 (0.33 , 6.44) 0.6136	
Pacific	280	23	8.21	1.81 (1.16 , 2.83) 0.0091 **		1.58 (0.99 , 2.53) 0.0554		9	3.21	1.58 (0.79 , 3.15) 0.1965		1.36 (0.65 , 2.81) 0.4146		3	1.07	1.24 (0.38 , 4.03) 0.7174		1.05 (0.31 , 3.58) 0.9427		0	0.00	0.00 (0.00 , 0.00) 0.9787		0.00 (0.00 , ####) 0.9658	
Māori	317	23	7.26	1.58 (1.01 , 2.46) 0.0429 *		1.52 (0.97 , 2.39) 0.0686		8	2.52	1.23 (0.59 , 2.55) 0.5778		1.21 (0.58 , 2.55) 0.6108		1	0.32	0.36 (0.05 , 2.64) 0.3175		0.36 (0.05 , 2.62) 0.3098		0	0.00	0.00 (0.00 , 0.00) 0.9774		0.00 (0.00 , ####) 0.9677	
Unknown[£]	69	7	10.14					2	2.90					0	0.00					0	0.00				
Age (years) - Ethnicity																									
50-59, European/Other	4156	180	4.33	Reference		Reference		71	1.71	Reference		Reference		29	0.70	Reference		Reference		3	0.07	Reference		Reference	
50-59, Asian	1111	56	5.04	1.17 (0.86 , 1.59) 0.3104		1.11 (0.81 , 1.52) 0.4983		21	1.89	1.11 (0.68 , 1.81) 0.6813		1.07 (0.65 , 1.77) 0.7891		9	0.81	1.16 (0.55 , 2.46) 0.6947		1.15 (0.54 , 2.47) 0.7201		2	0.18	2.50 (0.42 , 14.96) 0.3166		2.35 (0.37 , 14.97) 0.3674	
50-59, Pacific	247	18	7.29	1.74 (1.05 , 2.87) 0.0314 *		1.44 (0.85 , 2.45) 0.1716		9	3.64	2.18 (1.07 , 4.41) 0.0309 *		1.80 (0.85 , 3.81) 0.1248		3	1.21	1.75 (0.53 , 5.78) 0.3590		1.50 (0.43 , 5.25) 0.5292		0	0.00	0.00 (0.00 , 0.00) 0.9837		0.00 (0.00 , ####) 0.9647	
50-59, Māori	280	17	6.07	1.43 (0.86 , 2.38) 0.1734		1.27 (0.76 , 2.13) 0.3609		3	1.07	0.62 (0.20 , 1.99) 0.4248		0.56 (0.17 , 1.80) 0.3276		1	0.36	0.51 (0.07 , 3.76) 0.5089		0.46 (0.06 , 3.43) 0.4487		0	0.00	0.00 (0.00 , 0.00) 0.9827		0.00 (0.00 , ####) 0.9633	
60-69, European/Other	643	39	6.07	Reference		Reference		23	3.58	Reference		Reference		13	2.02	Reference		Reference		1	0.16	Reference		Reference	
60-69, Asian	233	19	8.15	1.38 (0.78 , 2.43) 0.2735		1.30 (0.72 , 2.35) 0.3778		9	3.86	1.08 (0.49 , 2.38) 0.8422		0.98 (0.44 , 2.22) 0.9669		0	0.00	0.00 (0.00 , ####) 0.9561		0.00 (0.00 , ####) 0.9508		1	0.43	2.77 (0.17 , 44.42) 0.4723		2.27 (0.12 , 43.64) 0.5864	
60-69, Pacific	26	3	11.54	2.02 (0.58 , 7.02) 0.2687		1.45 (0.39 , 5.42) 0.5828		0	0.00	0.00 (0.00 , 0.00) 0.9838		0.00 (0.00 , 0.00) 0.9830		0	0.00	0.00 (0.00 , 0.00) 0.9853		0.00 (0.00 , 0.00) 0.9830		0	0.00	0.00 (0.00 , 0.00) 0.9877		0.00 (0.00 , ####) 0.9692	
60-69, Māori	33	5	15.15	2.77 (1.01 , 7.56) 0.0471 *		2.52 (0.90 , 7.03) 0.0787		5	15.15	4.81 (1.70 , ####) 0.0030 **		4.48 (1.50 , ####) 0.0071 **		0	0.00	0.00 (0.00 , 0.00) 0.9835		0.00 (0.00 , 0.00) 0.9810		0	0.00	0.00 (0.00 , 0.00) 0.9862		0.00 (0.00 , ####) 0.9678	
70-74, European/Other	293	21	7.17	Reference		Reference		11	3.75	Reference		Reference		2	0.68	Reference		Reference		2	0.68	Reference		Reference	
70-74, Asian	32	4	12.50	1.85 (0.59 , 5.77) 0.2891		1.96 (0.56 , 6.82) 0.2905		2	6.25	1.71 (0.36 , 8.08) 0.4988		1.61 (0.29 , 8.91) 0.5842		1	3.13	4.69 (0.41 , ####) 0.2121		5.01 (0.22 , ####) 0.3094		0	0.00	0.00 (0.00 , 0.00) 0.9762		0.00 (0.00 , ####) 0.9539	
70-74, Pacific	7	2	28.57	5.18 (0.95 , ####) 0.0577		10.50 (1.53 , ####) 0.0166 *		0	0.00	0.00 (0.00 , 0.00) 0.9878		0.00 (0.00 , ####) 0.9707		0	0.00	0.00 (0.00 , 0.00) 0.9865		0.00 (0.00 , 0.00) 0.9836		0	0.00	0.00 (0.00 , 0.00) 0.9889		0.00 (0.00 , ####) 0.9799	
70-74, Māori	4	1	25.00	4.32 (0.43 , ####) 0.2139		4.50 (0.43 , ####) 0.2096		0	0.00	0.00 (0.00 , 0.00) 0.9907		0.00 (0.00 , 0.00) 0.9787		0	0.00	0.00 (0.00 , 0.00) 0.9886		0.00 (0.00 , 0.00) 0.9886		0	0.00	0.00 (0.00 , 0.00) 0.9916		0.00 (0.00 , 0.00) 0.9837	
Unknown[£]	69	7	10.14					2	2.90					0	0.00					0	0.00				
Sex - Ethnicity																									
Female: European/Other	2818	99	3.51	Reference		Reference		38	1.35	Reference		Reference		15	0.53	Reference		Reference		1	0.04	Reference		Reference	
Female: Asian	809	49	6.06	1.77 (1.25 , 2.52) 0.0014 **		1.81 (1.26 , 2.60) 0.0014 **		14	1.73	1.29 (0.69 , 2.39) 0.4216		1.29 (0.68 , 2.45) 0.4310		7	0.87	1.63 (0.66 , 4.01) 0.2870		1.62 (0.64 , 4.12) 0.3082		3	0.37	10.49 (1.09 , ####) 0.0420 *		7.02 (0.68 , 73.05) 0.1028	
Female: Pacific	154	13	8.44	2.53 (1.39 , 4.63) 0.0025 **		2.44 (1.30 , 4.59) 0.0055 **		5	3.25	2.45 (0.95 , 6.33) 0.0630		2.22 (0.82 , 6.01) 0.1158		1	0.65	1.22 (0.16 , 9.31) 0.8470		1.14 (0.14 , 9.16) 0.9047		0	0.00	0.00 (0.00 , 0.00) 0.9807		0.00 (0.00 , ####) 0.9685	
Female: Māori	169	10	5.92	1.73 (0.88 , 3.37) 0.1097		1.68 (0.85 , 3.30) 0.1347		5	2.96	2.23 (0.87 , 5.74) 0.0964		2.17 (0.83 , 5.66) 0.1145		0	0.00	0.00 (0.00 , 0.00) 0.9767		0.00 (0.00 , 0.00) 0.9760		0	0.00	0.00 (0.00 , 0.00) 0.9797		0.00 (0.00 , ####) 0.9700	
Male: European/Other	2274	141	24.87	Reference		Reference		67	11.82	Reference		Reference		29	5.11	Reference		Reference		5	0.88	Reference		Reference	
Male: Asian	567	30	23.81	0.85 (0.56 , 1.27) 0.4158		0.73 (0.48 , 1.10) 0.1354		18	14.29	1.08 (0.64 , 1.83) 0.7754		0.91 (0.53 , 1.58) 0.7395		3	2.38	0.41 (0.13 , 1.36) 0.1447		0.35 (0.10 , 1.18) 0.0914		0	0.00	0.00 (0.00 , ####) 0.9648		0.00 (0.00 , ####) 0.9213	
Male: Pacific	126	10	6.76	1.30 (0.67 , 2.54) 0.4360		0.99 (0.49 , 2.00) 0.9701		4	2.70	1.08 (0.39 , 3.01) 0.8830		0.85 (0.29 , 2.49) 0.7613		2	1.35	1.25 (0.29 , 5.29) 0.7632		0.89 (0.19 , 4.14) 0.8841		0	0.00	0.00 (0.00 , ####) 0.9834		0.00 (0.00 , ####) 0.9647	
Male: Māori	148	13	18.84	1.46 (0.80 , 2.64) 0.2146		1.38 (0.75 , 2.56) 0.3016		3	4.35	0.68 (0.21 , 2.19) 0.5202		0.68 (0.21 , 2.25) 0.5330		1	1.45	0.53 (0.07 , 3.89) 0.5298		0.54 (0.07 , 4.10) 0.5483		0	0.00	0.00 (0.00 , ####) 0.9820		0.00 (0.00 , ####) 0.9654	
Unknown[£]	69	7	0.31					2	0.09					0	0.00					0	0.00				
Deprivation Index (NZDep)																									
1 (least)	1026	47	4.58	Reference		Reference		22	2.14	Reference		Reference		9	0.88	Reference		Reference		2	0.17	Reference		Reference	
2	1192	45	3.78	0.82 (0.54 , 1.24) 0.3434		0.78 (0.51 , 1.20) 0.2592		19	1.59	0.74 (0.40 , 1.37) 0.3391		0.72 (0.38 , 1.35) 0.3041		6	0.50	0.57 (0.20 , 1.61) 0.2903		0.57 (0.20 , 1.61) 0.2880		2	0.17	79812.56 (0.00 , ####) 0.9582		32389.22 (0.00 , ####) 0.9405	
3	1049	50	4.77	1.04 (0.69 , 1.57) 0.8413		1.00 (0.66 , 1.52) 0.9925		18	1.72	0.80 (0.42 , 1.49) 0.4789		0.76 (0.40 , 1.44) 0.4012		4	0.38	0.43 (0.13 , 1.41) 0.1642		0.41 (0.13 , 1.35) 0.1427		1	0.10	48957.19 (0.00 , ####) 0.9600		16419.74 (0.00 , ####) 0.9443	
4	971	50	5.15	1.13 (0.75 , 1.70) 0.5550		1.09 (0.72 , 1.65) 0.6936		22	2.27	1.06 (0.58 , 1.92) 0.8534		1.02 (0.55 , 1.88) 0.9506		8	0.82	0.94 (0.36 , 2.44) 0.8969		0.94 (0.36 , 2.46) 0.8958		1	0.10	48957.19 (0.00 , ####) 0.9600		16419.74 (0.00 , ####) 0.9443	
5	896	39	4.35	0.95 (0.61 , 1.46) 0.8093		0.89 (0.57 , 1.38) 0.5999		16	1.79	0.83 (0.43 , 1.59) 0.5738		0.76 (0.39 , 1.48) 0.4267		8	0.89	1.02 (0.39 , 2.65) 0.9708		0.97 (0.37 , 2.54) 0.9430		2	0.22	35225.04 (0.00 , ####) 0.9571		11672.00 (0.00 , ####) 0.9400	
6	641	48	7.49	1.69 (1.11 , 2.55) 0.0136 *		1.60 (1.04 , 2.45) 0.0310 *		18	2.81	1.32 (0.70 , 2.48) 0.3903		1.23 (0.65 , 2.36) 0.5217		9	1.40	1.61 (0.64 , 4.08) 0.3157		1.52 (0.59 , 3.91) 0.3809		1	0.16	74200.74 (0.00 , ####) 0.9584		29991.86 (0.00 , ####) 0.9409	
7	454	33	7.27	1.63 (1.03 , 2.59) 0.0365 *		1.49 (0.93 , 2.39) 0.0995		14	3.08	1.45 (0.74 , 2.86) 0.2819		1.35 (0.67 , 2.73) 0.3962		2	0.44	0.50 (0.11 , 2.32) 0.3765		0.50 (0.11 , 2.34) 0.3764		2	0.44	###### (0.00 , ####) 0.9568		80753.63 (0.00 , ####) 0.9375	
8	417[ε]	28	6.71	1.50 (0.93 , 2.43) 0.0999		1.35 (0.82 , 2.23) 0.2361		14	3.36	1.59 (0.80 , 3.13) 0.1841		1.47 (0.72 , 2.98) 0.2893		8	1.92	2.21 (0.85 , 5.77) 0.1051		2.20 (0.81 , 5.94) 0.1216		1	0.24	###### (0.00 , ####) 0.9568		54053.49 (0.00 , ####) 0.9375	
9	468	29	6.20	1.38 (0.85 , 2.22) 0.1891		1.24 (0.76 , 2.04) 0.3945		13	2.78	1.30 (0.65 , 2.61) 0.4540		1.26 (0.61 , 2.60) 0.5325		4	0.85	0.97 (0.30 , 3.18) 0.9654		1.07 (0.32 , 3.61) 0.9122		0	0.00	1.00 (0.00 , ####) 1.0000		1.00 (0.00 , ####) 1.0000	
10 (most)	19	3	15.79	3.91 (1.10 , ####) 0.0351 *		3.56 (0.98 , ####) 0.0529		0	0.00	0.00 (0.00 , 0.00) 0.9770		0.00 (0.00 , 0.00) 0.9836		0	0.00	0.00 (0.00 , 0.00) 0.9858		0.00 (0.00 , 0.00) 0.9889		0	0.00	1.00 (0.00 , ####) 1.0000		1.26 (0.00 , ####) 0.9999	
Unknown[£]	1	0	0.00					0	0.00					0	0.00					0	0.00				
Deprivation Index (NZDep) quintiles																									
1 (least)	2218	92	4.15	Reference		Reference		41	1.85	Reference		Reference		15	0.68	Reference		Reference		2	0.09	Reference		Reference	
2	2020	100	4.95	1.20 (0.90 , 1.61) 0.2101		1.19 (0.88 , 1.60) 0.2556		40	1.98	1.07 (0.69 , 1.67) 0.7545		1.05 (0.67 , 1.64) 0.8437		12	0.59	0.88 (0.41 , 1.88) 0.7370		0.86 (0.40 , 1.84) 0.6891		1	0.05	0.55 (0.05 , 6.06) 0.6243		0.46 (0.04 , 5.16) 0.5316	
3	1537	87	5.66	1.39 (1.03 , 1.89) 0.0331 *		1.33 (0.98 , 1.82) 0.0684		34	2.21	1.20 (0.76 , 1.90) 0.4342		1.13 (0.71 , 1.81) 0.6039		17	1.11	1.64 (0.82 , 3.30) 0.1631		1.56 (0.77 , 3.16) 0.2191		3	0.20	2.17 (0.36 , 12.98) 0.3973		1.88 (0.31 , 11.41) 0.4946	
4	871	61	7.00	1.74 (1.25 , 2.43) 0.0011 **		1.62 (1.14 , 2.30) 0.0068 **		28	3.21	1.76 (1.08 , 2.87) 0.0224 *		1.67 (1.00 , 2.78) 0.0513		10	1.15	1.71 (0.76 , 3.81) 0.1930		1.68 (0.73 , 3.87) 0.2239		3	0.34	3.83 (0.64 , 22.96) 0.1417		3.83 (0.61 , 24.27) 0.1535	
5 (most)	487	32	6.57	1.63 (1.07 , 2.46) 0.0217 *		1.50 (0.97 , 2.32) 0.0658		13	2.67	1.46 (0.77 , 2.74) 0.2435		1.43 (0.74 , 2.76) 0.2927		4	0.82	1.22 (0.40 , 3.68) 0.7289		1.31 (0.42 , 4.09) 0.6461		0	0.00	0.00 (0.00 , ####) 0.9728		0.00 (0.00 , ####) 0.9621	
Unknown[£]	1	0	0.00					0	0.00					0	0.00					0	0.00				

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria
β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria
£ "Unknown" responses were coded as missing values
* iFOBT: immunochemical Faecal Occult Bloot Test
ʒ Participants who responded with a successfully completed iFOBT kit (i.e. result of "Abnormal" or "Normal") and did not meet the exclusion criteria
ρ Includes WDHB other healthcare facility participants recorded in the BSP Register
† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)
OR=odds ratio; CI=confidence interval
*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)
Statistically higher than reference group
Statistically lower than reference group

Table 5a. Positive Predictive Value of Positive iFOBT* by demographic factors in Round 1[α]

	Positive iFOBT*	Adenoma[ρ] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)		Adv. Adenoma[ρ] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)		Cancer[ρ] n	%	Unadjusted OR (95% CI)		Adjusted[†] OR (95% CI)	
Total	5212	2686	51.53	-		-		1158	22.22	-		-		212	4.07	-		-	
Age (years)																			
50-54	910	391	42.97	Reference		Reference		159	17.47	Reference		Reference		21	2.31	Reference		Reference	
55-59	918	471	51.31	1.40 (1.16 , 1.68)	0.0004 **	1.40 (1.16 , 1.68)	0.0005 **	195	21.24	1.27 (1.01 , 1.61)	0.0419 *	1.27 (1.00 , 1.61)	0.0462 *	23	2.51	1.09 (0.60 , 1.98)	0.7828	1.08 (0.59 , 1.97)	0.8015
60-64	1034	522	50.48	1.35 (1.13 , 1.62)	0.0009 **	1.32 (1.10 , 1.59)	0.0025 **	221	21.37	1.28 (1.02 , 1.61)	0.0308 *	1.23 (0.98 , 1.55)	0.0757	47	4.55	2.02 (1.20 , 3.40)	0.0085 **	2.01 (1.19 , 3.40)	0.0087 **
65-69	1181	644	54.53	1.59 (1.34 , 1.89)	0.0000 ***	1.53 (1.29 , 1.83)	0.0000 ***	298	25.23	1.59 (1.28 , 1.98)	0.0000 ***	1.51 (1.21 , 1.88)	0.0002 **	57	4.83	2.15 (1.29 , 3.57)	0.0032 **	2.10 (1.26 , 3.50)	0.0043 **
70-74	1169	658	56.29	1.71 (1.43 , 2.04)	0.0000 ***	1.67 (1.39 , 1.99)	0.0000 ***	285	24.38	1.52 (1.23 , 1.89)	0.0001 **	1.42 (1.14 , 1.77)	0.0018 **	64	5.47	2.45 (1.49 , 4.05)	0.0004 **	2.40 (1.45 , 3.97)	0.0007 **
Sex																			
Female	2283	1012	44.33	Reference		Reference		418	18.31	Reference		Reference		92	4.03	Reference		Reference	
Male	2929	1674	57.15	1.68 (1.50 , 1.87)	0.0000 ***	1.65 (1.48 , 1.85)	0.0000 ***	740	25.26	1.51 (1.32 , 1.73)	0.0000 ***	1.49 (1.30 , 1.70)	0.0000 ***	120	4.10	1.02 (0.77 , 1.34)	0.9031	0.99 (0.75 , 1.31)	0.9412
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Age (years) - Sex																			
50-54, Female	418	147	35.17	Reference		Reference		53	12.68	Reference		Reference		14	3.35	Reference		Reference	
50-54, Male	492	244	49.59	1.81 (1.39 , 2.37)	0.0000 ***	1.76 (1.34 , 2.31)	0.0000 ***	106	21.54	1.89 (1.32 , 2.71)	0.0005 **	1.80 (1.25 , 2.59)	0.0017 **	7	1.42	0.42 (0.17 , 1.04)	0.0612	0.43 (0.17 , 1.09)	0.0767
55-59, Female	421	179	42.52	Reference		Reference		61	14.49	Reference		Reference		12	2.85	Reference		Reference	
55-59, Male	497	292	58.75	1.93 (1.48 , 2.51)	0.0000 ***	1.89 (1.45 , 2.47)	0.0000 ***	134	26.96	2.18 (1.56 , 3.05)	0.0000 ***	2.13 (1.52 , 2.99)	0.0000 ***	11	2.21	0.77 (0.34 , 1.77)	0.5393	0.75 (0.32 , 1.72)	0.4946
60-64, Female	437	189	43.25	Reference		Reference		84	19.22	Reference		Reference		19	4.35	Reference		Reference	
60-64, Male	597	333	55.78	1.66 (1.29 , 2.12)	0.0001 ***	1.62 (1.26 , 2.09)	0.0002 **	137	22.95	1.25 (0.92 , 1.70)	0.1493	1.25 (0.91 , 1.70)	0.1628	28	4.69	1.08 (0.60 , 1.96)	0.7941	1.10 (0.61 , 2.01)	0.7503
65-69, Female	505	238	47.13	Reference		Reference		111	21.98	Reference		Reference		21	4.16	Reference		Reference	
65-69, Male	676	406	60.06	1.69 (1.34 , 2.13)	0.0000 ***	1.67 (1.32 , 2.11)	0.0000 ***	187	27.66	1.36 (1.04 , 1.78)	0.0264 *	1.37 (1.04 , 1.80)	0.0242 *	36	5.33	1.30 (0.75 , 2.25)	0.3558	1.26 (0.73 , 2.20)	0.4090
70-74, Female	502	259	51.59	Reference		Reference		109	21.71	Reference		Reference		26	5.18	Reference		Reference	
70-74, Male	667	399	59.82	1.40 (1.11 , 1.76)	0.0051 **	1.41 (1.11 , 1.79)	0.0043 **	176	26.39	1.29 (0.98 , 1.70)	0.0658	1.30 (0.99 , 1.72)	0.0604	38	5.70	1.11 (0.66 , 1.85)	0.7001	1.10 (0.65 , 1.83)	0.7273
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Sex - Age (years)																			
Female: 50-54	418	147	35.17	Reference		Reference		53	12.68	Reference		Reference		14	3.35	Reference		Reference	
Female: 55-59	421	179	42.52	1.36 (1.03 , 1.80)	0.0292 *	1.38 (1.04 , 1.82)	0.0258 *	61	14.49	1.17 (0.79 , 1.73)	0.4446	1.17 (0.79 , 1.74)	0.4390	12	2.85	0.85 (0.39 , 1.85)	0.6770	0.82 (0.38 , 1.81)	0.6311
Female: 60-64	437	189	43.25	1.40 (1.07 , 1.85)	0.0157 *	1.43 (1.08 , 1.89)	0.0122 *	84	19.22	1.64 (1.13 , 2.38)	0.0096 **	1.59 (1.09 , 2.32)	0.0157 *	19	4.35	1.31 (0.65 , 2.65)	0.4499	1.29 (0.64 , 2.63)	0.4760
Female: 65-69	505	238	47.13	1.64 (1.26 , 2.14)	0.0003 **	1.65 (1.26 , 2.15)	0.0003 **	111	21.98	1.94 (1.36 , 2.77)	0.0003 **	1.86 (1.30 , 2.67)	0.0008 **	21	4.16	1.25 (0.63 , 2.49)	0.5225	1.20 (0.60 , 2.41)	0.6086
Female: 70-74	502	259	51.59	1.96 (1.51 , 2.56)	0.0000 ***	1.99 (1.52 , 2.61)	0.0000 ***	109	21.71	1.91 (1.34 , 2.73)	0.0004 **	1.80 (1.25 , 2.58)	0.0016 **	26	5.18	1.58 (0.81 , 3.06)	0.1786	1.54 (0.79 , 3.02)	0.2088
Male: 50-54	492	244	49.59	Reference		Reference		106	21.54	Reference		Reference		7	1.42	Reference		Reference	
Male: 55-59	497	292	58.75	1.45 (1.13 , 1.86)	0.0039 **	1.45 (1.13 , 1.87)	0.0040 **	134	26.96	1.34 (1.00 , 1.80)	0.0473 *	1.35 (1.00 , 1.81)	0.0475 *	11	2.21	1.57 (0.60 , 4.08)	0.3563	1.57 (0.60 , 4.08)	0.3567
Male: 60-64	597	333	55.78	1.28 (1.01 , 1.63)	0.0420 *	1.27 (1.00 , 1.62)	0.0535	137	22.95	1.08 (0.81 , 1.45)	0.5801	1.07 (0.80 , 1.43)	0.6545	28	4.69	3.41 (1.44 , 7.87)	0.0041 **	3.34 (1.44 , 7.71)	0.0048 **
Male: 65-69	676	406	60.06	1.53 (1.21 , 1.93)	0.0004 **	1.48 (1.17 , 1.88)	0.0011 **	187	27.66	1.39 (1.06 , 1.83)	0.0175 *	1.35 (1.02 , 1.78)	0.0328 *	36	5.33	3.90 (1.72 , 8.83)	0.0011 **	3.76 (1.66 , 8.54)	0.0015 **
Male: 70-74	667	399	59.82	1.51 (1.20 , 1.91)	0.0005 **	1.48 (1.17 , 1.88)	0.0013 **	176	26.39	1.31 (0.99 , 1.72)	0.0580	1.24 (0.94 , 1.64)	0.1337	38	5.70	4.19 (1.85 , 9.45)	0.0006 **	4.08 (1.80 , 9.24)	0.0008 **
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Ethnicity																			
European/Other	4105	2190	53.35	Reference		Reference		985	24.00	Reference		Reference		178	4.34	Reference		Reference	
Asian	690	311	45.07	0.72 (0.61 , 0.84)	0.0001 ***	0.75 (0.64 , 0.89)	0.0008 **	94	13.62	0.50 (0.40 , 0.63)	0.0000 ***	0.52 (0.42 , 0.66)	0.0000 ***	25	3.62	0.83 (0.54 , 1.27)	0.3901	0.90 (0.58 , 1.40)	0.6458
Pacific	161	53	32.92	0.43 (0.31 , 0.60)	0.0000 ***	0.45 (0.32 , 0.63)	0.0000 ***	19	11.80	0.42 (0.26 , 0.69)	0.0005 **	0.46 (0.28 , 0.75)	0.0019 **	5	3.11	0.71 (0.29 , 1.74)	0.4519	0.72 (0.29 , 1.81)	0.4871
Māori	226	119	52.65	0.97 (0.74 , 1.27)	0.8385	1.00 (0.76 , 1.31)	0.9867	53	23.45	0.97 (0.71 , 1.33)	0.8521	1.00 (0.72 , 1.38)	0.9917	4	1.77	0.40 (0.15 , 1.08)	0.0707	0.41 (0.15 , 1.12)	0.0815
Unknown[£]	30	13	43.33	-		-		7	23.33	-		-		0	0.00	-		-	
Age (years) - Ethnicity																			
50-59, European/Other	1319	648	49.13	Reference		Reference		286	21.68	Reference		Reference		33	2.50	Reference		Reference	
50-59, Asian	334	143	42.81	0.78 (0.61 , 0.99)	0.0394 *	0.78 (0.61 , 1.01)	0.0558	41	12.28	0.51 (0.36 , 0.72)	0.0001 **	0.51 (0.36 , 0.74)	0.0003 **	8	2.40	0.96 (0.44 , 2.09)	0.9108	0.90 (0.40 , 1.99)	0.7889
50-59, Pacific	63	20	31.75	0.48 (0.28 , 0.83)	0.0082 **	0.44 (0.25 , 0.78)	0.0044 **	7	11.11	0.45 (0.20 , 1.00)	0.0504	0.45 (0.20 , 1.02)	0.0557	1	1.59	0.63 (0.08 , 4.73)	0.6500	0.62 (0.08 , 4.67)	0.6435
50-59, Māori	106	47	44.34	0.82 (0.55 , 1.23)	0.3433	0.75 (0.50 , 1.13)	0.1660	18	16.98	0.74 (0.44 , 1.25)	0.2572	0.67 (0.39 , 1.14)	0.1416	2	1.89	0.75 (0.18 , 3.17)	0.6948	0.68 (0.16 , 2.94)	0.6022
60-69, European/Other	1789	967	54.05	Reference		Reference		444	24.82	Reference		Reference		87	4.86	Reference		Reference	
60-69, Asian	252	116	46.03	0.73 (0.56 , 0.94)	0.0172 *	0.76 (0.58 , 0.99)	0.0436 *	38	15.08	0.54 (0.37 , 0.77)	0.0008 **	0.57 (0.39 , 0.82)	0.0025 **	14	5.56	1.15 (0.64 , 2.06)	0.6354	1.07 (0.59 , 1.93)	0.8314
60-69, Pacific	71	23	32.39	0.41 (0.25 , 0.68)	0.0005 **	0.46 (0.27 , 0.77)	0.0033 **	11	15.49	0.56 (0.29 , 1.07)	0.0769	0.63 (0.32 , 1.23)	0.1763	2	2.82	0.57 (0.14 , 2.35)	0.4343	0.48 (0.11 , 2.06)	0.3270
60-69, Māori	88	53	60.23	1.29 (0.83 , 1.99)	0.2574	1.40 (0.90 , 2.18)	0.1381	23	26.14	1.07 (0.66 , 1.75)	0.7801	1.15 (0.71 , 1.89)	0.5668	1	1.14	0.22 (0.03 , 1.63)	0.1402	0.21 (0.03 , 1.54)	0.1255
70-74, European/Other	997	575	57.67	Reference		Reference		255	25.58	Reference		Reference		58	5.82	Reference		Reference	
70-74, Asian	104	52	50.00	0.73 (0.49 , 1.10)	0.1338	0.69 (0.45 , 1.03)	0.0722	15	14.42	0.49 (0.28 , 0.86)	0.0135 *	0.47 (0.27 , 0.84)	0.0099 **	3	2.88	0.48 (0.15 , 1.56)	0.2234	0.49 (0.15 , 1.61)	0.2426
70-74, Pacific	27	10	37.04	0.43 (0.20 , 0.95)	0.0374 *	0.40 (0.18 , 0.90)	0.0276 *	1	3.70	0.11 (0.02 , 0.83)	0.0321 *	0.11 (0.01 , 0.83)	0.0321 *	2	7.41	1.30 (0.30 , 5.60)	0.7292	1.53 (0.34 , 6.81)	0.5773
70-74, Māori	32	19	59.38	1.07 (0.52 , 2.20)	0.8479	0.99 (0.47 , 2.05)	0.9680	12	37.50	1.75 (0.84 , 3.62)	0.1344	1.69 (0.80 , 3.56)	0.1699	1	3.13	0.52 (0.07 , 3.89)	0.5262	0.50 (0.07 , 3.77)	0.4977
Unknown[£]	30	13	43.33	-		-		7	23.33	-		-		0	0.00	-		-	
Sex - Ethnicity																			
Female: European/Other	1760	803	45.63	Reference		Reference		354	20.11	Reference		Reference		74	4.20	Reference		Reference	
Female: Asian	336	138	41.07	0.83 (0.66 , 1.05)	0.1244	0.92 (0.72 , 1.17)	0.5009	38	11.31	0.51 (0.35 , 0.72)	0.0002 **	0.56 (0.39 , 0.81)	0.0020 **	13	3.87	0.92 (0.50 , 1.67)	0.7776	0.89 (0.48 , 1.66)	0.7134
Female: Pacific	79	22	27.85	0.46 (0.28 , 0.76)	0.0024 **	0.51 (0.30 , 0.85)	0.0095 **	6	7.59	0.33 (0.14 , 0.76)	0.0091 **	0.36 (0.15 , 0.84)	0.0179 *	3	3.80	0.90 (0.28 , 2.92)	0.8598	0.77 (0.23 , 2.58)	0.6750
Female: Māori	98	46	46.94	1.05 (0.70 , 1.58)	0.7994	1.15 (0.76 , 1.75)	0.4976	17	17.35	0.83 (0.49 , 1.42)	0.5054	0.89 (0.52 , 1.54)	0.6876	2	2.04	0.47 (0.11 , 1.96)	0.3036	0.41 (0.10 , 1.72)	0.2216
Male: European/Other	2345	1387	59.15	Reference		Reference		631	26.91	Reference		Reference		104	4.43	Reference		Reference	
Male: Asian	354	173	48.87	0.66 (0.53 , 0.83)	0.0003 **	0.63 (0.50 , 0.79)	0.0001 ***	56	15.82	0.51 (0.38 , 0.69)	0.0000 ***	0.51 (0.38 , 0.69)	0.0000 ***	12	3.39	0.76 (0.41 , 1.39)	0.3676	0.87 (0.47 , 1.63)	0.6727
Male: Pacific	82	31	37.80	0.42 (0.27 , 0.66)	0.0002 **	0.40 (0.25 , 0.63)	0.0001 ***	13	15.85	0.51 (0.28 , 0.93)	0.0285 *	0.53 (0.29 , 0.98)	0.0418 *	2	2.44	0.54 (0.13 , 2.22)	0.3922	0.68 (0.16 , 2.90)	0.6070
Male: Māori	128	73	57.03	0.92 (0.64 , 1.31)	0.6356	0.88 (0.61 , 1.27)	0.5057	36	28.13	1.06 (0.72 , 1.58)	0.7627	1.04 (0.70 , 1.56)	0.8319	2	1.56	0.34 (0.08 , 1.40)	0.1363	0.42 (0.10 , 1.75)	0.2348
Unknown[£]	30	13	43.33	-		-		7	23.33	-		-		0	0.00	-		-	
Deprivation Index (NZDep)																			
1 (least)	629	341	54.21	Reference		Reference		140	22.26	Reference		Reference		23	3.66	Reference		Reference	
2	805	400	49.69	0.83 (0.68 , 1.03)	0.0895	0.83 (0.67 , 1.03)	0.0948	180	22.36	1.01 (0.78 , 1.29)	0.9630	1.00 (0.78 , 1.29)	0.9776	36	4.47	1.23 (0.72 , 2.10)	0.4412	1.25 (0.73 , 2.14)	0.4121
3	755	401	53.11	0.96 (0.77 , 1.18)	0.6841	0.95 (0.77 , 1.18)	0.6457	180	23.84	1.09 (0.85 , 1.41)	0.4867	1.09 (0.84 , 1.40)	0.5207	35	4.64	1.28 (0.75 , 2.19)	0.3664	1.26 (0.74 , 2.16)	0.3971
4	690	358	51.88	0.91 (0.73 , 1.13)	0.3987	0.93 (0.75 , 1.16)	0.5272	159	23.04	1.05 (0.81 , 1.35)	0.7335	1.09 (0.84 , 1.42)	0.5153	23	3.33	0.91 (0.50 , 1.64)	0.7493	0.90 (0.50 , 1.62)	0.7235
5	718	344	47.91	0.78 (0.63 , 0.96)	0.0212 *	0.79 (0.64 , 0.99)	0.0362 *	160	22.28	1.00 (0.77 , 1.30)	0.9907	1.03 (0.79 , 1.34)	0.8262	33	4.60	1.27 (0.74 , 2.19)	0.3898	1.24 (0.72 , 2.14)	0.4464
6	512	270	52.73	0.94 (0.75 , 1.19)	0.6198	0.93 (0.74 , 1.19)	0.5740	114	22.27	1.00 (0.76 , 1.32)	0.9974	0.99 (0.75 , 1.32)	0.9638	18	3.52	0.96 (0.51 , 1.80)	0.8988	0.93 (0.50 , 1.75)	0.8243
7	316	167	52.85	0.95 (0.72 , 1.24)	0.6926	1.04 (0.79 , 1.37)	0.7985	68	21.52	0.96 (0.69 , 1.33)	0.7960	1.05 (0.75 , 1.46)	0.7776	14	4.43	1.22 (0.62 , 2.41)	0.5635	1.29 (0.65 , 2.55)	0.4671
8	379	194	51.19	0.89 (0.69 , 1.14)	0.3523	0.97 (0.74 , 1.26)	0.8094	67	17.68	0.75 (0.54 , 1.04)	0.0820	0.85 (0.61 , 1.18)	0.3402	7	1.85	0.50 (0.21 , 1.17)	0.1082	0.50 (0.21 , 1.18)	0.1132
9	373	196	52.55	0.94 (0.72 , 1.21)	0.6105	1.02 (0.78 , 1.33)	0.8821	81	21.72	0.97 (0.71 , 1.32)	0.8415	1.10 (0.80 , 1.51)	0.5514	22	5.90	1.65 (0.91 , 3.01)	0.1008	1.84 (1.00 , 3.38)	0.0509

	N	n	%	OR (95% CI)	p-value	OR (95% CI)	p-value	n	%	OR (95% CI)	p-value	OR (95% CI)	p-value	n	%	OR (95% CI)	p-value	OR (95% CI)	p-value
10 (most)	30	13	43.33	0.65 (0.31 , 1.35)	0.2479	0.73 (0.34 , 1.56)	0.4147	7	23.33	1.06 (0.45 , 2.53)	0.8900	1.27 (0.52 , 3.07)	0.5972	1	3.33	0.91 (0.12 , 6.96)	0.9265	0.97 (0.13 , 7.52)	0.9778
Unknown[£]	5	2	40.00	-		-		2	40.00	-		-		0	0.00	-		-	
Deprivation Index (NZDep) quintiles																			
1 (least)	1434	741	51.67	Reference		Reference		320	22.32	Reference		Reference		59	4.11	Reference		Reference	
2	1445	759	52.53	1.03 (0.89 , 1.20)	0.6474	1.04 (0.90 , 1.21)	0.5843	339	23.46	1.07 (0.90 , 1.27)	0.4647	1.09 (0.91 , 1.30)	0.3552	58	4.01	0.97 (0.67 , 1.41)	0.8914	0.96 (0.66 , 1.38)	0.8084
3	1230	614	49.92	0.93 (0.80 , 1.09)	0.3661	0.94 (0.80 , 1.10)	0.4291	274	22.28	1.00 (0.83 , 1.20)	0.9809	1.01 (0.84 , 1.22)	0.8981	51	4.15	1.01 (0.69 , 1.48)	0.9670	0.97 (0.66 , 1.43)	0.8884
4	695	361	51.94	1.01 (0.84 , 1.21)	0.9074	1.11 (0.92 , 1.33)	0.2899	135	19.42	0.84 (0.67 , 1.05)	0.1274	0.94 (0.75 , 1.18)	0.5921	21	3.02	0.73 (0.44 , 1.20)	0.2155	0.74 (0.44 , 1.24)	0.2545
5 (most)	403	209	51.86	1.01 (0.81 , 1.26)	0.9470	1.10 (0.88 , 1.39)	0.4062	88	21.84	0.97 (0.74 , 1.27)	0.8381	1.11 (0.84 , 1.46)	0.4539	23	5.71	1.41 (0.86 , 2.31)	0.1732	1.56 (0.94 , 2.59)	0.0874
Unknown[£]	5	2	40.00	-		-		2	40.00	-		-		0	0.00	-		-	

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 5b. Positive Predictive Value of Positive iFOBT* by demographic factors in the first year of Round 2[β]

	Positive iFOBT*	Adenoma[ρ]				Advanced Adenoma[ρ]				Cancer[ρ]			
	n	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	1886	802	42.52	-	-	277	14.69	-	-	53	2.81	-	-
Age (years)													
50-54	430	160	37.21	Reference	Reference	57	13.26	Reference	Reference	6	1.40	Reference	Reference
55-59	327	128	39.14	1.09 (0.81 , 1.46) 0.5871	1.05 (0.77 , 1.41) 0.7669	53	16.21	1.27 (0.84 , 1.90) 0.2543	1.18 (0.79 , 1.78) 0.4189	7	2.14	1.55 (0.51 , 4.64) 0.4379	1.44 (0.48 , 4.35) 0.5131
60-64	385	173	44.94	1.38 (1.04 , 1.82) 0.0253 *	1.33 (1.00 , 1.77) 0.0481 *	55	14.29	1.09 (0.73 , 1.63) 0.6700	1.02 (0.68 , 1.53) 0.9244	14	3.64	2.67 (1.01 , 7.01) 0.0467 *	2.41 (0.90 , 6.42) 0.0786
65-69	378	164	43.39	1.29 (0.98 , 1.71) 0.0741	1.25 (0.94 , 1.67) 0.1232	59	15.61	1.21 (0.82 , 1.79) 0.3418	1.09 (0.73 , 1.62) 0.6798	12	3.17	2.32 (0.86 , 6.23) 0.0962	2.23 (0.82 , 6.02) 0.1150
70-74	366	177	48.36	1.58 (1.19 , 2.10) 0.0015 **	1.56 (1.17 , 2.09) 0.0027 **	53	14.48	1.11 (0.74 , 1.66) 0.6178	0.98 (0.65 , 1.47) 0.9131	14	3.83	2.81 (1.07 , 7.39) 0.0362 *	2.75 (1.04 , 7.31) 0.0419 *
Sex													
Female	871	308	35.36	Reference	Reference	104	11.94	Reference	Reference	24	2.76	Reference	Reference
Male	1015	494	48.67	1.73 (1.44 , 2.09) 0.0000 ***	1.74 (1.44 , 2.09) 0.0000 ***	173	17.04	1.52 (1.17 , 1.97) 0.0019 **	1.52 (1.17 , 1.98) 0.0020 **	29	2.86	1.04 (0.60 , 1.80) 0.8942	1.02 (0.58 , 1.79) 0.9395
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex													
50-54, Female	215	64	29.77	Reference	Reference	24	11.16	Reference	Reference	4	1.86	Reference	Reference
50-54, Male	215	96	44.65	1.90 (1.28 , 2.83) 0.0015 **	1.96 (1.30 , 2.96) 0.0014 **	33	15.35	1.44 (0.82 , 2.54) 0.2023	1.58 (0.88 , 2.81) 0.1243	2	0.93	0.50 (0.09 , 2.73) 0.4201	0.57 (0.10 , 3.35) 0.5333
55-59, Female	145	48	33.10	Reference	Reference	17	11.72	Reference	Reference	3	2.07	Reference	Reference
55-59, Male	182	80	43.96	1.58 (1.01 , 2.49) 0.0464 *	1.58 (0.99 , 2.52) 0.0537	36	19.78	1.86 (1.00 , 3.46) 0.0519	1.78 (0.94 , 3.36) 0.0778	4	2.20	1.06 (0.23 , 4.83) 0.9363	1.02 (0.21 , 4.87) 0.9843
60-64, Female	167	66	39.52	Reference	Reference	25	14.97	Reference	Reference	7	4.19	Reference	Reference
60-64, Male	218	107	49.08	1.48 (0.98 , 2.22) 0.0620	1.48 (0.98 , 2.24) 0.0627	30	13.76	0.91 (0.51 , 1.61) 0.7370	0.91 (0.51 , 1.64) 0.7572	7	3.21	0.76 (0.26 , 2.21) 0.6114	0.76 (0.24 , 2.40) 0.6455
65-69, Female	172	58	33.72	Reference	Reference	16	9.30	Reference	Reference	2	1.16	Reference	Reference
65-69, Male	206	106	51.46	2.08 (1.37 , 3.16) 0.0006 **	2.13 (1.38 , 3.27) 0.0006 **	43	20.87	2.57 (1.39 , 4.76) 0.0026 **	2.48 (1.33 , 4.64) 0.0044 **	10	4.85	4.34 (0.94 , 20.07) 0.0605	4.72 (0.99 , 22.57) 0.0521
70-74, Female	172	72	41.86	Reference	Reference	22	12.79	Reference	Reference	8	4.65	Reference	Reference
70-74, Male	194	105	54.12	1.64 (1.08 , 2.48) 0.0194 *	1.67 (1.09 , 2.56) 0.0183 *	31	15.98	1.30 (0.72 , 2.34) 0.3878	1.40 (0.77 , 2.57) 0.2711	6	3.09	0.65 (0.22 , 1.92) 0.4409	0.86 (0.28 , 2.64) 0.7915
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)													
Female: 50-54	215	64	29.77	Reference	Reference	24	11.16	Reference	Reference	4	1.86	Reference	Reference
Female: 55-59	145	48	33.10	1.17 (0.74 , 1.84) 0.5027	1.14 (0.72 , 1.81) 0.5640	17	11.72	1.06 (0.55 , 2.05) 0.8694	1.03 (0.53 , 2.01) 0.9241	3	2.07	1.11 (0.25 , 5.05) 0.8883	1.09 (0.24 , 4.95) 0.9160
Female: 60-64	167	66	39.52	1.54 (1.01 , 2.36) 0.0465 *	1.49 (0.97 , 2.29) 0.0712	25	14.97	1.40 (0.77 , 2.56) 0.2708	1.34 (0.73 , 2.46) 0.3490	7	4.19	2.31 (0.66 , 8.02) 0.1882	2.39 (0.68 , 8.40) 0.1752
Female: 65-69	172	58	33.72	1.20 (0.78 , 1.85) 0.4058	1.15 (0.74 , 1.77) 0.5360	16	9.30	0.82 (0.42 , 1.59) 0.5513	0.78 (0.40 , 1.53) 0.4663	2	1.16	0.62 (0.11 , 3.43) 0.5848	0.67 (0.12 , 3.71) 0.6418
Female: 70-74	172	72	41.86	1.70 (1.12 , 2.59) 0.0136 *	1.58 (1.03 , 2.43) 0.0367 *	22	12.79	1.17 (0.63 , 2.16) 0.6232	1.02 (0.54 , 1.92) 0.9450	8	4.65	2.57 (0.76 , 8.69) 0.1281	2.75 (0.79 , 9.61) 0.1136
Male: 50-54	215	96	44.65	Reference	Reference	33	15.35	Reference	Reference	2	0.93	Reference	Reference
Male: 55-59	182	80	43.96	0.97 (0.65 , 1.45) 0.8895	0.97 (0.65 , 1.46) 0.8894	36	19.78	1.36 (0.81 , 2.29) 0.2467	1.29 (0.76 , 2.18) 0.3428	4	2.20	2.39 (0.43 , 13.22) 0.3169	2.24 (0.40 , 12.45) 0.3572
Male: 60-64	218	107	49.08	1.19 (0.82 , 1.74) 0.3557	1.22 (0.83 , 1.79) 0.3194	30	13.76	0.88 (0.52 , 1.50) 0.6400	0.84 (0.49 , 1.45) 0.5382	7	3.21	3.53 (0.73 , 17.20) 0.1181	3.01 (0.60 , 15.18) 0.1816
Male: 65-69	206	106	51.46	1.31 (0.90 , 1.93) 0.1627	1.35 (0.91 , 2.00) 0.1311	43	20.87	1.46 (0.88 , 2.40) 0.1418	1.31 (0.79 , 2.18) 0.2968	10	4.85	5.43 (1.18 , 25.11) 0.0302 *	4.93 (1.06 , 23.05) 0.0426 *
Male: 70-74	194	105	54.12	1.46 (0.99 , 2.16) 0.0561	1.52 (1.02 , 2.26) 0.0402 *	31	15.98	1.05 (0.62 , 1.79) 0.8609	0.95 (0.55 , 1.63) 0.8470	6	3.09	3.40 (0.68 , 17.04) 0.1369	3.43 (0.67 , 17.43) 0.1379
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity													
European/Other	1429	620	43.39	Reference	Reference	233	16.31	Reference	Reference	39	2.73	Reference	Reference
Asian	245	93	37.96	0.80 (0.60 , 1.05) 0.1129	0.91 (0.68 , 1.21) 0.5267	27	11.02	0.64 (0.42 , 0.97) 0.0362 *	0.65 (0.42 , 1.00) 0.0507	6	2.45	0.89 (0.37 , 2.14) 0.8023	0.98 (0.40 , 2.39) 0.9655
Pacific	94	34	36.17	0.74 (0.48 , 1.14) 0.1723	0.75 (0.48 , 1.18) 0.2137	8	8.51	0.48 (0.23 , 1.00) 0.0496 *	0.44 (0.21 , 0.93) 0.0324 *	3	3.19	1.17 (0.36 , 3.88) 0.7911	1.05 (0.31 , 3.62) 0.9360
Māori	108	53	49.07	1.26 (0.85 , 1.86) 0.2515	1.30 (0.87 , 1.94) 0.2030	9	8.33	0.47 (0.23 , 0.94) 0.0320 *	0.43 (0.21 , 0.86) 0.0181 *	4	3.70	1.37 (0.48 , 3.91) 0.5553	1.35 (0.46 , 3.96) 0.5799
Unknown[£]	10	2	20.00	-	-	0	0.00	-	-	1	10.00	-	-
Age (years) - Ethnicity													
50-59, European/Other	526	207	39.35	Reference	Reference	86	16.35	Reference	Reference	8	1.52	Reference	Reference
50-59, Asian	132	42	31.82	0.72 (0.48 , 1.08) 0.1114	0.80 (0.53 , 1.22) 0.3068	15	11.36	0.66 (0.37 , 1.18) 0.1578	0.73 (0.40 , 1.33) 0.3031	3	2.27	1.51 (0.39 , 5.76) 0.5496	1.51 (0.37 , 6.08) 0.5647
50-59, Pacific	40	13	32.50	0.74 (0.37 , 1.47) 0.3928	0.74 (0.36 , 1.54) 0.4239	4	10.00	0.57 (0.20 , 1.64) 0.2957	0.56 (0.19 , 1.70) 0.3104	1	2.50	1.66 (0.20 , 13.61) 0.6368	1.45 (0.15 , 13.56) 0.7460
50-59, Māori	52	24	46.15	1.32 (0.75 , 2.34) 0.3407	1.25 (0.69 , 2.27) 0.4532	5	9.62	0.54 (0.21 , 1.41) 0.2097	0.51 (0.19 , 1.34) 0.1718	1	1.92	1.27 (0.16 , 10.35) 0.8236	1.24 (0.14 , 10.77) 0.8462
60-69, European/Other	594	269	45.29	Reference	Reference	103	17.34	Reference	Reference	18	3.03	Reference	Reference
60-69, Asian	85	35	41.18	0.85 (0.53 , 1.34) 0.4764	0.93 (0.58 , 1.49) 0.7649	7	8.24	0.43 (0.19 , 0.95) 0.0380 *	0.42 (0.19 , 0.95) 0.0369 *	3	3.53	1.17 (0.34 , 4.06) 0.8039	1.25 (0.35 , 4.44) 0.7269
60-69, Pacific	36	10	27.78	0.47 (0.22 , 0.98) 0.0445 *	0.51 (0.23 , 1.12) 0.0952	1	2.78	0.14 (0.02 , 1.01) 0.0506	0.11 (0.02 , 0.87) 0.0359 *	2	5.56	1.88 (0.42 , 8.45) 0.4089	2.25 (0.45 , 11.31) 0.3245
60-69, Māori	46	23	50.00	1.21 (0.66 , 2.20) 0.5368	1.25 (0.68 , 2.31) 0.4778	3	6.52	0.33 (0.10 , 1.09) 0.0697	0.30 (0.09 , 0.99) 0.0487 *	2	4.35	1.45 (0.33 , 6.47) 0.6227	1.47 (0.32 , 6.83) 0.6195
70-74, European/Other	309	144	46.60	Reference	Reference	44	14.24	Reference	Reference	13	4.21	Reference	Reference
70-74, Asian	28	16	57.14	1.53 (0.70 , 3.34) 0.2876	1.47 (0.66 , 3.29) 0.3515	5	17.86	1.31 (0.47 , 3.63) 0.6040	1.13 (0.40 , 3.19) 0.8210	0	0.00	0.00 (0.00 , 0.00) 0.9754	0.00 (0.00 , ####) 0.9723
70-74, Pacific	18	11	61.11	1.80 (0.68 , 4.77) 0.2365	1.82 (0.67 , 4.97) 0.2430	3	16.67	1.20 (0.33 , 4.33) 0.7757	0.95 (0.26 , 3.55) 0.9449	0	0.00	0.00 (0.00 , 0.00) 0.9802	0.00 (0.00 , 0.00) 0.9781
70-74, Māori	10	6	60.00	1.72 (0.48 , 6.21) 0.4087	1.73 (0.47 , 6.40) 0.4106	1	10.00	0.67 (0.08 , 5.41) 0.7065	0.65 (0.08 , 5.40) 0.6934	1	10.00	2.53 (0.30 , 21.49) 0.3951	3.21 (0.33 , 31.18) 0.3149
Unknown[£]	10	2	20.00	-	-	0	0.00	-	-	1	10.00	-	-
Sex - Ethnicity													
Female: European/Other	634	240	37.85	Reference	Reference	86	13.56	Reference	Reference	16	2.52	Reference	Reference
Female: Asian	149	37	24.83	0.54 (0.36 , 0.81) 0.0031 **	0.58 (0.38 , 0.87) 0.0092 **	11	7.38	0.51 (0.26 , 0.98) 0.0426 *	0.48 (0.24 , 0.94) 0.0316 *	6	4.03	1.62 (0.62 , 4.21) 0.3221	1.82 (0.67 , 4.98) 0.2431
Female: Pacific	44	14	31.82	0.77 (0.40 , 1.47) 0.4249	0.80 (0.40 , 1.59) 0.5234	5	11.36	0.82 (0.31 , 2.13) 0.6792	0.75 (0.28 , 2.05) 0.5754	1	2.27	0.90 (0.12 , 6.93) 0.9180	0.74 (0.09 , 6.09) 0.7830
Female: Māori	44	17	38.64	1.03 (0.55 , 1.94) 0.9177	1.07 (0.57 , 2.03) 0.8321	2	4.55	0.30 (0.07 , 1.28) 0.1039	0.28 (0.07 , 1.20) 0.0865	1	2.27	0.90 (0.12 , 6.93) 0.9180	0.88 (0.11 , 6.98) 0.9077
Male: European/Other	795	380	47.80	Reference	Reference	147	18.49	Reference	Reference	23	2.89	Reference	Reference
Male: Asian	96	56	58.33	1.53 (1.00 , 2.35) 0.0524	1.55 (1.01 , 2.40) 0.0470 *	16	16.67	0.88 (0.50 , 1.55) 0.6626	0.86 (0.48 , 1.52) 0.5998	0	0.00	0.00 (0.00 , ####) 0.9613	0.00 (0.00 , 0.00) 0.9731
Male: Pacific	50	20	40.00	0.73 (0.41 , 1.30) 0.2857	0.66 (0.36 , 1.22) 0.1887	3	6.00	0.28 (0.09 , 0.92) 0.0353 *	0.23 (0.07 , 0.78) 0.0176 *	2	4.00	1.40 (0.32 , 6.11) 0.6556	1.55 (0.33 , 7.26) 0.5790
Male: Māori	64	36	56.25	1.40 (0.84 , 2.35) 0.1948	1.43 (0.84 , 2.42) 0.1846	7	10.94	0.54 (0.24 , 1.21) 0.1352	0.49 (0.21 , 1.11) 0.0864	3	4.69	1.65 (0.48 , 5.65) 0.4249	1.88 (0.52 , 6.82) 0.3369
Unknown[£]	10	2	20.00	-	-	0	0.00	-	-	1	10.00	-	-
Deprivation Index (NZDep)													
1 (least)	223	94	42.15	Reference	Reference	32	14.35	Reference	Reference	7	3.14	Reference	Reference
2	284	119	41.90	0.99 (0.69 , 1.41) 0.9547	1.03 (0.72 , 1.48) 0.8731	36	12.68	0.87 (0.52 , 1.45) 0.5833	0.89 (0.53 , 1.49) 0.6604	6	2.11	0.67 (0.22 , 2.01) 0.4708	0.66 (0.22 , 2.00) 0.4598
3	250	111	44.40	1.10 (0.76 , 1.58) 0.6225	1.14 (0.79 , 1.66) 0.4795	39	15.60	1.10 (0.66 , 1.83) 0.7040	1.16 (0.70 , 1.94) 0.5597	7	2.80	0.89 (0.31 , 2.57) 0.8282	0.87 (0.30 , 2.53) 0.8000
4	242	107	44.21	1.09 (0.75 , 1.57) 0.6538	1.15 (0.79 , 1.68) 0.4625	36	14.88	1.04 (0.62 , 1.75) 0.8725	1.14 (0.68 , 1.91) 0.6280	2	0.83	0.26 (0.05 , 1.25) 0.0925	0.25 (0.05 , 1.22) 0.0865
5	247	99	40.08	0.92 (0.64 , 1.33) 0.6485	0.94 (0.65 , 1.37) 0.7605	38	15.38	1.09 (0.65 , 1.81) 0.7531	1.17 (0.70 , 1.96) 0.5430	7	2.83	0.90 (0.31 , 2.61) 0.8461	0.85 (0.29 , 2.48) 0.7645
6	182	78	42.86	1.03 (0.69 , 1.53) 0.8865	1.10 (0.74 , 1.65) 0.6372	26	14.29	0.99 (0.57 , 1.74) 0.9854	1.12 (0.63 , 1.96) 0.7048	7	3.85	1.23 (0.42 , 3.59) 0.6989	1.03 (0.34 , 3.14) 0.9639
7	164	64	39.02	0.88 (0.58 , 1.33) 0.5362	0.94 (0.62 , 1.43) 0.7753	21	12.80	0.88 (0.49 , 1.58) 0.6624	1.02 (0.56 , 1.86) 0.9498	7	4.27	1.38 (0.47 , 4.00) 0.5581	1.30 (0.44 , 3.86) 0.6340
8	126	59	46.83	1.21 (0.78 , 1.88) 0.3983	1.34 (0.85 , 2.12) 0.2060	28	22.22	1.71 (0.97 , 2.99) 0.0630	2.24 (1.25 , 4.00) 0.0064 **	7	5.56	1.82 (0.62 , 5.30) 0.2754	1.70 (0.56 , 5.13) 0.3451
9	161	70	43.48	1.06 (0.70 , 1.59) 0.7955	1.13 (0.74 , 1.73) 0.5820	21	13.04	0.90 (0.50 , 1.62) 0.7143	1.14 (0.62 , 2.10) 0.6660	3	1.86	0.59 (0.15 , 2.30) 0.4437	0.55 (0.14 , 2.20) 0.3937

	N	n	%	OR (CI) p-value	OR (CI) p-value	n	%	OR (CI) p-value	OR (CI) p-value	n	%	OR (CI) p-value	OR (CI) p-value
10 (most)	7	1	14.29	0.23 (0.03 , 1.93) 0.1754	0.27 (0.03 , 2.31) 0.2323	0	0.00	0.00 (0.00 , 0.00) 0.9766	0.00 (0.00 , 0.00) 0.9763	0	0.00	0.00 (0.00 , 0.00) 0.9894	0.00 (0.00 , 0.00) 0.9896
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles													
1 (least)	507	213	42.01	Reference	Reference	68	13.41	Reference	Reference	13	2.56	Reference	Reference
2	492	218	44.31	1.10 (0.85 , 1.41) 0.4637	1.13 (0.87 , 1.46) 0.3608	75	15.24	1.16 (0.81 , 1.66) 0.4088	1.22 (0.85 , 1.75) 0.2719	9	1.83	0.71 (0.30 , 1.67) 0.4310	0.70 (0.29 , 1.65) 0.4095
3	429	177	41.26	0.97 (0.75 , 1.26) 0.8159	0.99 (0.76 , 1.29) 0.9341	64	14.92	1.13 (0.78 , 1.64) 0.5096	1.22 (0.84 , 1.77) 0.2987	14	3.26	1.28 (0.60 , 2.76) 0.5252	1.14 (0.52 , 2.51) 0.7381
4	290	123	42.41	1.02 (0.76 , 1.36) 0.9120	1.08 (0.79 , 1.46) 0.6399	49	16.90	1.31 (0.88 , 1.96) 0.1820	1.57 (1.04 , 2.37) 0.0313 *	14	4.83	1.93 (0.89 , 4.16) 0.0944	1.83 (0.83 , 4.06) 0.1358
5 (most)	168	71	42.26	1.01 (0.71 , 1.44) 0.9546	1.05 (0.73 , 1.52) 0.7846	21	12.50	0.92 (0.55 , 1.56) 0.7622	1.14 (0.66 , 1.95) 0.6378	3	1.79	0.69 (0.19 , 2.45) 0.5676	0.66 (0.18 , 2.39) 0.5223
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 5c. Positive Predictive Value of Positive iFOBT* by demographic factors in the first year of Round 2[β], who completed Round 1[α]

	Positive iFOBT*	Adenoma[ρ]				Advanced Adenoma[ρ]				Cancer[ρ]			
	n	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	1105	467	42.26	-	-	144	13.03	-	-	27	2.44	-	-
Age (years)													
50-54	122	43	35.25	Reference	Reference	10	8.20	Reference	Reference	2	1.64	Reference	Reference
55-59	199	75	37.69	1.11 (0.70 , 1.78) 0.6596	1.09 (0.68 , 1.76) 0.7097	27	13.57	1.76 (0.82 , 3.77) 0.1475	1.71 (0.79 , 3.68) 0.1729	2	1.01	0.61 (0.08 , 4.38) 0.6229	0.60 (0.08 , 4.37) 0.6183
60-64	260	108	41.54	1.31 (0.84 , 2.04) 0.2414	1.30 (0.83 , 2.06) 0.2522	37	14.23	1.86 (0.89 , 3.87) 0.0982	1.84 (0.88 , 3.87) 0.1066	8	3.08	1.90 (0.40 , 9.11) 0.4196	1.81 (0.38 , 8.70) 0.4605
65-69	264	109	41.29	1.29 (0.83 , 2.02) 0.2592	1.31 (0.83 , 2.07) 0.2445	32	12.12	1.54 (0.73 , 3.25) 0.2526	1.53 (0.72 , 3.25) 0.2691	9	3.41	2.12 (0.45 , 9.95) 0.3420	1.94 (0.41 , 9.22) 0.4037
70-74	260	132	50.77	1.89 (1.22 , 2.95) 0.0048 **	1.92 (1.22 , 3.03) 0.0052 **	38	14.62	1.92 (0.92 , 3.99) 0.0817	1.81 (0.86 , 3.81) 0.1183	6	2.31	1.42 (0.28 , 7.13) 0.6721	1.33 (0.26 , 6.80) 0.7300
Sex													
Female	519	181	34.87	Reference	Reference	56	10.79	Reference	Reference	12	2.31	Reference	Reference
Male	586	286	48.81	1.78 (1.40 , 2.27) 0.0000 ***	1.79 (1.40 , 2.29) 0.0000 ***	88	15.02	1.46 (1.02 , 2.09) 0.0380 *	1.48 (1.03 , 2.13) 0.0335 *	15	2.56	1.11 (0.51 , 2.39) 0.7903	1.07 (0.49 , 2.32) 0.8639
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex													
50-54, Female	62	14	22.58	Reference	Reference	2	3.23	Reference	Reference	2	3.23	Reference	Reference
50-54, Male	60	29	48.33	3.21 (1.47 , 7.01) 0.0035 **	3.23 (1.43 , 7.30) 0.0049 **	8	13.33	4.62 (0.94 , ####) 0.0599	4.89 (0.92 , ####) 0.0627	0	0.00	0.00 (0.00 , ####) 0.9432	0.00 (0.00 , ####) 0.8984
55-59, Female	90	29	32.22	Reference	Reference	11	12.22	Reference	Reference	1	1.11	Reference	Reference
55-59, Male	109	46	42.20	1.54 (0.86 , 2.75) 0.1492	1.58 (0.86 , 2.89) 0.1368	16	14.68	1.24 (0.54 , 2.82) 0.6149	1.28 (0.54 , 2.99) 0.5755	1	0.92	0.82 (0.05 , 13.36) 0.8917	0.79 (0.05 , 13.09) 0.8693
60-64, Female	121	44	36.36	Reference	Reference	18	14.88	Reference	Reference	3	2.48	Reference	Reference
60-64, Male	139	64	46.04	1.49 (0.91 , 2.46) 0.1148	1.50 (0.90 , 2.48) 0.1192	19	13.67	0.91 (0.45 , 1.82) 0.7812	0.87 (0.43 , 1.78) 0.7079	5	3.60	1.47 (0.34 , 6.27) 0.6048	1.48 (0.34 , 6.47) 0.6038
65-69, Female	126	41	32.54	Reference	Reference	10	7.94	Reference	Reference	1	0.79	Reference	Reference
65-69, Male	138	68	49.28	2.01 (1.22 , 3.32) 0.0061 **	2.05 (1.23 , 3.42) 0.0061 **	22	15.94	2.20 (1.00 , 4.85) 0.0506	2.28 (1.01 , 5.12) 0.0462 *	8	5.80	7.69 (0.95 , 62.38) 0.0561	7.40 (0.89 , 61.56) 0.0642
70-74, Female	120	53	44.17	Reference	Reference	15	12.50	Reference	Reference	5	4.17	Reference	Reference
70-74, Male	140	79	56.43	1.64 (1.00 , 2.68) 0.0492 *	1.54 (0.91 , 2.58) 0.1061	23	16.43	1.38 (0.68 , 2.78) 0.3727	1.55 (0.75 , 3.21) 0.2374	1	0.71	0.17 (0.02 , 1.44) 0.1028	0.22 (0.02 , 2.02) 0.1825
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)													
Female: 50-54	62	14	22.58	Reference	Reference	2	3.23	Reference	Reference	2	3.23	Reference	Reference
Female: 55-59	90	29	32.22	1.63 (0.78 , 3.42) 0.1966	1.66 (0.79 , 3.52) 0.1840	11	12.22	4.18 (0.89 , ####) 0.0695	4.12 (0.87 , ####) 0.0735	1	1.11	0.34 (0.03 , 3.80) 0.3790	0.34 (0.03 , 3.83) 0.3798
Female: 60-64	121	44	36.36	1.96 (0.97 , 3.95) 0.0601	2.02 (0.99 , 4.12) 0.0521	18	14.88	5.24 (1.18 , ####) 0.0299 *	5.15 (1.15 , ####) 0.0326 *	3	2.48	0.76 (0.12 , 4.69) 0.7700	0.73 (0.12 , 4.58) 0.7333
Female: 65-69	126	41	32.54	1.65 (0.82 , 3.34) 0.1604	1.65 (0.81 , 3.36) 0.1715	10	7.94	2.59 (0.55 , ####) 0.2295	2.44 (0.51 , ####) 0.2614	1	0.79	0.24 (0.02 , 2.70) 0.2478	0.22 (0.02 , 2.47) 0.2169
Female: 70-74	120	53	44.17	2.71 (1.35 , 5.44) 0.0050 **	2.86 (1.40 , 5.86) 0.0041 **	15	12.50	4.29 (0.95 , ####) 0.0588	3.98 (0.86 , ####) 0.0762	5	4.17	1.30 (0.25 , 6.92) 0.7551	1.05 (0.19 , 5.91) 0.9526
Male: 50-54	60	29	48.33	Reference	Reference	8	13.33	Reference	Reference	0	0.00	Reference	Reference
Male: 55-59	109	46	42.20	0.78 (0.41 , 1.47) 0.4430	0.81 (0.42 , 1.54) 0.5140	16	14.68	1.12 (0.45 , 2.79) 0.8106	1.11 (0.44 , 2.82) 0.8203	1	0.92	21989.26 (0.00 , ####) 0.9599	15700.96 (0.00 , ####) 0.9549
Male: 60-64	139	64	46.04	0.91 (0.50 , 1.67) 0.7664	0.97 (0.52 , 1.80) 0.9182	19	13.67	1.03 (0.42 , 2.50) 0.9494	1.07 (0.43 , 2.65) 0.8841	5	3.60	88613.45 (0.00 , ####) 0.9543	61871.39 (0.00 , ####) 0.9485
Male: 65-69	138	68	49.28	1.04 (0.57 , 1.90) 0.9030	1.10 (0.59 , 2.04) 0.7634	22	15.94	1.23 (0.52 , 2.95) 0.6384	1.25 (0.51 , 3.06) 0.6190	8	5.80	######## (0.00 , ####) 0.9523	######## (0.00 , ####) 0.9461
Male: 70-74	140	79	56.43	1.38 (0.75 , 2.54) 0.2933	1.49 (0.80 , 2.79) 0.2059	23	16.43	1.28 (0.54 , 3.04) 0.5801	1.26 (0.52 , 3.08) 0.6095	1	0.71	17085.18 (0.00 , ####) 0.9609	12217.71 (0.00 , ####) 0.9561
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity													
European/Other	896	382	42.63	Reference	Reference	122	13.62	Reference	Reference	24	2.68	Reference	Reference
Asian	122	47	38.52	0.84 (0.57 , 1.24) 0.3889	0.98 (0.66 , 1.47) 0.9336	15	12.30	0.89 (0.50 , 1.58) 0.6885	0.94 (0.52 , 1.69) 0.8373	1	0.82	0.30 (0.04 , 2.24) 0.2406	0.34 (0.05 , 2.61) 0.3023
Pacific	29	9	31.03	0.61 (0.27 , 1.34) 0.2178	0.55 (0.24 , 1.28) 0.1664	2	6.90	0.47 (0.11 , 2.00) 0.3071	0.39 (0.09 , 1.71) 0.2097	0	0.00	0.00 (0.00 , 0.00) 0.9799	0.00 (0.00 , 0.00) 0.9775
Māori	58	29	50.00	1.35 (0.79 , 2.29) 0.2737	1.42 (0.82 , 2.45) 0.2071	5	8.62	0.60 (0.23 , 1.53) 0.2828	0.58 (0.22 , 1.50) 0.2610	2	3.45	1.30 (0.30 , 5.63) 0.7279	1.38 (0.31 , 6.11) 0.6754
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Ethnicity													
50-59, European/Other	236	89	37.71	Reference	Reference	30	12.71	Reference	Reference	3	1.27	Reference	Reference
50-59, Asian	59	19	32.20	0.78 (0.43 , 1.44) 0.4328	0.86 (0.46 , 1.60) 0.6261	6	10.17	0.78 (0.31 , 1.96) 0.5944	0.82 (0.32 , 2.13) 0.6819	1	1.69	1.34 (0.14 , 13.11) 0.8019	1.46 (0.14 , 15.14) 0.7518
50-59, Pacific	7	0	0.00	0.00 (0.00 , 0.00) 0.9852	0.00 (0.00 , 0.00) 0.9851	0	0.00	0.00 (0.00 , 0.00) 0.9862	0.00 (0.00 , 0.00) 0.9860	0	0.00	0.00 (0.00 , ####) 0.9841	0.00 (0.00 , ####) 0.9987
50-59, Māori	19	10	52.63	1.84 (0.72 , 4.69) 0.2047	1.79 (0.67 , 4.75) 0.2434	1	5.26	0.38 (0.05 , 2.96) 0.3568	0.41 (0.05 , 3.38) 0.4103	0	0.00	0.00 (0.00 , ####) 0.9738	0.00 (0.00 , ####) 0.9563
60-69, European/Other	428	183	42.76	Reference	Reference	59	13.79	Reference	Reference	15	3.50	Reference	Reference
60-69, Asian	50	19	38.00	0.82 (0.45 , 1.50) 0.5198	0.89 (0.48 , 1.64) 0.7092	6	12.00	0.85 (0.35 , 2.09) 0.7277	0.85 (0.34 , 2.10) 0.7199	0	0.00	0.00 (0.00 , ####) 0.9697	0.00 (0.00 , ####) 0.9513
60-69, Pacific	14	2	14.29	0.22 (0.05 , 1.01) 0.0514	0.22 (0.05 , 1.06) 0.0586	1	7.14	0.48 (0.06 , 3.75) 0.4847	0.32 (0.04 , 2.63) 0.2877	0	0.00	0.00 (0.00 , ####) 0.9840	0.00 (0.00 , ####) 0.9734
60-69, Māori	32	13	40.63	0.92 (0.44 , 1.90) 0.8141	0.91 (0.43 , 1.92) 0.8001	3	9.38	0.65 (0.19 , 2.19) 0.4842	0.54 (0.15 , 1.89) 0.3345	2	6.25	1.84 (0.40 , 8.40) 0.4339	2.09 (0.43 , 10.13) 0.3595
70-74, European/Other	232	110	47.41	Reference	Reference	33	14.22	Reference	Reference	6	2.59	Reference	Reference
70-74, Asian	13	9	69.23	2.50 (0.75 , 8.33) 0.1371	2.28 (0.66 , 7.95) 0.1946	3	23.08	1.81 (0.47 , 6.92) 0.3865	1.45 (0.37 , 5.75) 0.5977	0	0.00	0.00 (0.00 , 0.00) 0.9802	0.00 (0.00 , ####) 0.9586
70-74, Pacific	8	7	87.50	7.76 (0.94 , ####) 0.0571	6.89 (0.80 , ####) 0.0788	1	12.50	0.86 (0.10 , 7.23) 0.8907	0.62 (0.07 , 5.48) 0.6698	0	0.00	0.00 (0.00 , 0.00) 0.9845	0.00 (0.00 , ####) 0.9715
70-74, Māori	7	6	85.71	6.65 (0.79 , ####) 0.0815	6.60 (0.76 , ####) 0.0869	1	14.29	1.01 (0.12 , 8.62) 0.9963	1.04 (0.12 , 9.13) 0.9702	0	0.00	0.00 (0.00 , 0.00) 0.9855	0.00 (0.00 , ####) 0.9665
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Ethnicity													
Female: European/Other	415	151	36.39	Reference	Reference	49	11.81	Reference	Reference	11	2.65	Reference	Reference
Female: Asian	71	18	25.35	0.59 (0.34 , 1.05) 0.0737	0.69 (0.38 , 1.25) 0.2223	4	5.63	0.45 (0.16 , 1.28) 0.1324	0.44 (0.15 , 1.30) 0.1395	1	1.41	0.52 (0.07 , 4.13) 0.5400	0.60 (0.07 , 5.00) 0.6344
Female: Pacific	10	3	30.00	0.75 (0.19 , 2.94) 0.6791	0.93 (0.22 , 3.88) 0.9200	1	10.00	0.83 (0.10 , 6.69) 0.8611	0.86 (0.10 , 7.38) 0.8925	0	0.00	0.00 (0.00 , 0.00) 0.9885	0.00 (0.00 , 0.00) 0.9805
Female: Māori	23	9	39.13	1.12 (0.48 , 2.66) 0.7902	1.31 (0.54 , 3.15) 0.5501	2	8.70	0.71 (0.16 , 3.13) 0.6521	0.77 (0.17 , 3.46) 0.7330	0	0.00	0.00 (0.00 , ####) 0.9826	0.00 (0.00 , ####) 0.9694
Male: European/Other	481	231	48.02	Reference	Reference	73	15.18	Reference	Reference	13	2.70	Reference	Reference
Male: Asian	51	29	56.86	1.43 (0.80 , 2.55) 0.2317	1.49 (0.82 , 2.71) 0.1919	11	21.57	1.54 (0.75 , 3.13) 0.2369	1.54 (0.74 , 3.20) 0.2468	0	0.00	0.00 (0.00 , ####) 0.9729	0.00 (0.00 , ####) 0.9529
Male: Pacific	19	6	31.58	0.50 (0.19 , 1.34) 0.1668	0.36 (0.13 , 1.04) 0.0597	1	5.26	0.31 (0.04 , 2.36) 0.2589	0.21 (0.03 , 1.70) 0.1447	0	0.00	0.00 (0.00 , 0.00) 0.9834	0.00 (0.00 , ####) 0.9701
Male: Māori	35	20	57.14	1.44 (0.72 , 2.89) 0.2996	1.42 (0.70 , 2.88) 0.3347	3	8.57	0.52 (0.16 , 1.76) 0.2949	0.48 (0.14 , 1.65) 0.2465	2	5.71	2.18 (0.47 , 10.08) 0.3176	3.04 (0.58 , 15.84) 0.1867
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep)													
1 (least)	138	57	41.30	Reference	Reference	17	12.32	Reference	Reference	4	2.90	Reference	Reference
2	175	70	40.00	0.95 (0.60 , 1.49) 0.8155	1.00 (0.63 , 1.59) 0.9986	19	10.86	0.87 (0.43 , 1.74) 0.6875	0.89 (0.44 , 1.80) 0.7463	4	2.29	0.78 (0.19 , 3.19) 0.7336	0.80 (0.20 , 3.31) 0.7619
3	149	73	48.99	1.36 (0.86 , 2.18) 0.1915	1.42 (0.88 , 2.29) 0.1463	26	17.45	1.50 (0.78 , 2.91) 0.2257	1.57 (0.81 , 3.06) 0.1831	6	4.03	1.41 (0.39 , 5.09) 0.6041	1.52 (0.42 , 5.56) 0.5244
4	157	71	45.22	1.17 (0.74 , 1.86) 0.4982	1.20 (0.75 , 1.93) 0.4422	22	14.01	1.16 (0.59 , 2.29) 0.6684	1.21 (0.61 , 2.40) 0.5834	1	0.64	0.21 (0.02 , 1.94) 0.1712	0.23 (0.02 , 2.07) 0.1885
5	161	61	37.89	0.87 (0.54 , 1.38) 0.5470	0.91 (0.56 , 1.46) 0.6915	16	9.94	0.79 (0.38 , 1.62) 0.5132	0.85 (0.41 , 1.76) 0.6619	3	1.86	0.64 (0.14 , 2.89) 0.5582	0.64 (0.14 , 2.96) 0.5694
6	83	36	43.37	1.09 (0.63 , 1.89) 0.7629	1.09 (0.62 , 1.90) 0.7697	10	12.05	0.98 (0.42 , 2.24) 0.9526	1.04 (0.45 , 2.40) 0.9305	4	4.82	1.70 (0.41 , 6.97) 0.4638	1.63 (0.39 , 6.80) 0.4996
7	86	31	36.05	0.80 (0.46 , 1.40) 0.4336	0.83 (0.47 , 1.46) 0.5104	10	11.63	0.94 (0.41 , 2.15) 0.8773	1.01 (0.43 , 2.33) 0.9889	4	4.65	1.63 (0.40 , 6.71) 0.4957	1.80 (0.43 , 7.51) 0.4208
8	63	29	46.03	1.21 (0.67 , 2.21) 0.5300	1.26 (0.68 , 2.34) 0.4611	10	15.87	1.34 (0.58 , 3.13) 0.4941	1.47 (0.62 , 3.46) 0.3787	1	1.59	0.54 (0.06 , 4.93) 0.5854	0.56 (0.06 , 5.25) 0.6135
9	90	39	43.33	1.09 (0.64 , 1.86) 0.7617	1.18 (0.67 , 2.07) 0.5696	14	15.56	1.31 (0.61 , 2.81) 0.4867	1.53 (0.70 , 3.34) 0.2904	0	0.00	0.00 (0.00 , 0.00) 0.9644	0.00 (0.00 , 0.00) 0.9754

	N	n	%	OR (95% CI) p-value	OR (95% CI) p-value	n	%	OR (95% CI) p-value	OR (95% CI) p-value	n	%	OR (95% CI) p-value	OR (95% CI) p-value
10 (most)	3	0	0.00	0.00 (0.00 , 0.00) 0.9762	0.00 (0.00 , 0.00) 0.9772	0	0.00	0.00 (0.00 , 0.00) 0.9856	0.00 (0.00 , 0.00) 0.9862	0	0.00	0.00 (0.00 , 0.00) 0.9935	0.00 (0.00 , 0.00) 0.9955
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles													
1 (least)	313	127	40.58	Reference	Reference	36	11.50	Reference	Reference	8	2.56	Reference	Reference
2	306	144	47.06	1.30 (0.95 , 1.79) 0.1043	1.31 (0.94 , 1.81) 0.1066	48	15.69	1.43 (0.90 , 2.28) 0.1298	1.47 (0.92 , 2.36) 0.1045	7	2.29	0.89 (0.32 , 2.49) 0.8282	0.95 (0.34 , 2.65) 0.9148
3	244	97	39.75	0.97 (0.69 , 1.36) 0.8446	0.97 (0.68 , 1.37) 0.8529	26	10.66	0.92 (0.54 , 1.57) 0.7532	0.97 (0.57 , 1.67) 0.9224	7	2.87	1.13 (0.40 , 3.15) 0.8210	1.11 (0.40 , 3.14) 0.8396
4	149	60	40.27	0.99 (0.66 , 1.47) 0.9500	0.99 (0.66 , 1.49) 0.9661	20	13.42	1.19 (0.66 , 2.14) 0.5546	1.27 (0.70 , 2.31) 0.4252	5	3.36	1.32 (0.43 , 4.12) 0.6281	1.42 (0.45 , 4.49) 0.5458
5 (most)	93	39	41.94	1.06 (0.66 , 1.69) 0.8148	1.13 (0.69 , 1.85) 0.6328	14	15.05	1.36 (0.70 , 2.65) 0.3614	1.59 (0.80 , 3.16) 0.1875	0	0.00	0.00 (0.00 , ####) 0.9642	0.00 (0.00 , 0.00) 0.9752
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 5d. Positive Predictive Value of Positive iFOBT* by demographic factors in the first year of Round 2[β], who completed Round 1[α] with negative iFOBT*

	Positive iFOBT* n	Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Advanced Adenoma[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)	Cancer[ρ] n	%	Unadjusted OR (95% CI)	Adjusted[†] OR (95% CI)
Total	1095	463	42.28	-	-	142	12.97	-	-	27	2.47	-	-
Age (years)													
50-54	121	43	35.54	Reference	Reference	10	8.26	Reference	Reference	2	1.65	Reference	Reference
55-59	199	75	37.69	1.10 (0.69 , 1.76) 0.6990	1.07 (0.67 , 1.73) 0.7694	27	13.57	1.74 (0.81 , 3.74) 0.1542	1.68 (0.78 , 3.62) 0.1880	2	1.01	0.60 (0.08 , 4.35) 0.6166	0.60 (0.08 , 4.34) 0.6132
60-64	256	106	41.41	1.28 (0.82 , 2.01) 0.2770	1.27 (0.80 , 2.00) 0.3048	36	14.06	1.82 (0.87 , 3.79) 0.1124	1.78 (0.84 , 3.74) 0.1301	8	3.13	1.92 (0.40 , 9.18) 0.4141	1.83 (0.38 , 8.82) 0.4516
65-69	262	109	41.60	1.29 (0.83 , 2.02) 0.2598	1.30 (0.83 , 2.06) 0.2536	32	12.21	1.54 (0.73 , 3.25) 0.2531	1.52 (0.72 , 3.24) 0.2743	9	3.44	2.12 (0.45 , 9.95) 0.3423	1.94 (0.41 , 9.23) 0.4032
70-74	257	130	50.58	1.86 (1.19 , 2.90) 0.0065 **	1.87 (1.18 , 2.95) 0.0078 **	37	14.40	1.87 (0.90 , 3.89) 0.0959	1.75 (0.83 , 3.70) 0.1419	6	2.33	1.42 (0.28 , 7.15) 0.6690	1.34 (0.26 , 6.85) 0.7250
Sex													
Female	513	179	34.89	Reference	Reference	54	10.53	Reference	Reference	12	2.34	Reference	Reference
Male	582	284	48.80	1.78 (1.39 , 2.27) 0.0000 ***	1.79 (1.40 , 2.29) 0.0000 ***	88	15.12	1.51 (1.05 , 2.17) 0.0247 *	1.53 (1.06 , 2.21) 0.0219 *	15	2.58	1.10 (0.51 , 2.38) 0.7999	1.06 (0.49 , 2.30) 0.8788
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex													
50-54, Female	62	14	22.58	Reference	Reference	2	3.23	Reference	Reference	2	3.23	Reference	Reference
50-54, Male	59	29	49.15	3.31 (1.51 , 7.26) 0.0027 **	3.33 (1.47 , 7.54) 0.0040 **	8	13.56	4.71 (0.96 , ####) 0.0568	5.07 (0.95 , ####) 0.0572	0	0.00	0.00 (0.00 , ####) 0.9435	0.00 (0.00 , ####) 0.8990
55-59, Female	90	29	32.22	Reference	Reference	11	12.22	Reference	Reference	1	1.11	Reference	Reference
55-59, Male	109	46	42.20	1.54 (0.86 , 2.75) 0.1492	1.58 (0.86 , 2.89) 0.1368	16	14.68	1.24 (0.54 , 2.82) 0.6149	1.28 (0.54 , 2.99) 0.5755	1	0.92	0.82 (0.05 , 13.36) 0.8917	0.79 (0.05 , 13.09) 0.8693
60-64, Female	118	43	36.44	Reference	Reference	17	14.41	Reference	Reference	3	2.54	Reference	Reference
60-64, Male	138	63	45.65	1.47 (0.89 , 2.42) 0.1365	1.46 (0.87 , 2.43) 0.1479	19	13.77	0.95 (0.47 , 1.92) 0.8835	0.90 (0.44 , 1.86) 0.7823	5	3.62	1.44 (0.34 , 6.16) 0.6222	1.47 (0.34 , 6.46) 0.6068
65-69, Female	125	41	32.80	Reference	Reference	10	8.00	Reference	Reference	1	0.80	Reference	Reference
65-69, Male	137	68	49.64	2.02 (1.22 , 3.33) 0.0060 **	2.06 (1.23 , 3.44) 0.0061 **	22	16.06	2.20 (1.00 , 4.85) 0.0507	2.28 (1.01 , 5.13) 0.0461 *	8	5.84	7.69 (0.95 , 62.37) 0.0562	7.37 (0.88 , 61.34) 0.0648
70-74, Female	118	52	44.07	Reference	Reference	14	11.86	Reference	Reference	5	4.24	Reference	Reference
70-74, Male	139	78	56.12	1.62 (0.99 , 2.66) 0.0548	1.52 (0.90 , 2.57) 0.1159	23	16.55	1.47 (0.72 , 3.01) 0.2887	1.68 (0.80 , 3.54) 0.1697	1	0.72	0.16 (0.02 , 1.42) 0.1009	0.22 (0.02 , 2.01) 0.1811
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)													
Female: 50-54	62	14	22.58	Reference	Reference	2	3.23	Reference	Reference	2	3.23	Reference	Reference
Female: 55-59	90	29	32.22	1.63 (0.78 , 3.42) 0.1966	1.67 (0.79 , 3.52) 0.1820	11	12.22	4.18 (0.89 , ####) 0.0695	4.12 (0.88 , ####) 0.0731	1	1.11	0.34 (0.03 , 3.80) 0.3790	0.34 (0.03 , 3.83) 0.3804
Female: 60-64	118	43	36.44	1.97 (0.97 , 3.97) 0.0597	2.04 (1.00 , 4.17) 0.0500 *	17	14.41	5.05 (1.13 , ####) 0.0343 *	4.97 (1.10 , ####) 0.0372 *	3	2.54	0.78 (0.13 , 4.81) 0.7914	0.75 (0.12 , 4.73) 0.7604
Female: 65-69	125	41	32.80	1.67 (0.83 , 3.38) 0.1510	1.67 (0.82 , 3.41) 0.1612	10	8.00	2.61 (0.55 , ####) 0.2253	2.47 (0.52 , ####) 0.2553	1	0.80	0.24 (0.02 , 2.72) 0.2505	0.22 (0.02 , 2.51) 0.2219
Female: 70-74	118	52	44.07	2.70 (1.34 , 5.43) 0.0052 **	2.89 (1.41 , 5.93) 0.0039 **	14	11.86	4.04 (0.89 , ####) 0.0710	3.80 (0.82 , ####) 0.0876	5	4.24	1.33 (0.25 , 7.05) 0.7395	1.07 (0.19 , 6.01) 0.9374
Male: 50-54	59	29	49.15	Reference	Reference	8	13.56	Reference	Reference	0	0.00	Reference	Reference
Male: 55-59	109	46	42.20	0.76 (0.40 , 1.43) 0.3875	0.78 (0.41 , 1.49) 0.4469	16	14.68	1.10 (0.44 , 2.74) 0.8431	1.09 (0.43 , 2.76) 0.8543	1	0.92	21841.49 (0.00 , ####) 0.9601	15486.22 (0.00 , ####) 0.9549
Male: 60-64	138	63	45.65	0.87 (0.47 , 1.60) 0.6521	0.92 (0.49 , 1.72) 0.7975	19	13.77	1.02 (0.42 , 2.48) 0.9689	1.05 (0.42 , 2.60) 0.9136	5	3.62	88679.71 (0.00 , ####) 0.9546	61787.04 (0.00 , ####) 0.9484
Male: 65-69	137	68	49.64	1.02 (0.55 , 1.88) 0.9506	1.08 (0.58 , 2.01) 0.8195	22	16.06	1.22 (0.51 , 2.92) 0.6562	1.24 (0.51 , 3.03) 0.6374	8	5.84	######## (0.00 , ####) 0.9526	######## (0.00 , ####) 0.9460
Male: 70-74	139	78	56.12	1.32 (0.72 , 2.44) 0.3692	1.41 (0.75 , 2.64) 0.2810	23	16.55	1.26 (0.53 , 3.01) 0.5973	1.24 (0.51 , 3.05) 0.6320	1	0.72	17093.34 (0.00 , ####) 0.9611	12178.37 (0.00 , ####) 0.9560
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity													
European/Other	887	379	42.73	Reference	Reference	120	13.53	Reference	Reference	24	2.71	Reference	Reference
Asian	122	47	38.52	0.84 (0.57 , 1.24) 0.3785	0.98 (0.65 , 1.46) 0.9100	15	12.30	0.90 (0.50 , 1.59) 0.7076	0.95 (0.53 , 1.72) 0.8693	1	0.82	0.30 (0.04 , 2.22) 0.2366	0.34 (0.04 , 2.59) 0.2976
Pacific	29	9	31.03	0.60 (0.27 , 1.34) 0.2144	0.55 (0.24 , 1.27) 0.1646	2	6.90	0.47 (0.11 , 2.02) 0.3119	0.39 (0.09 , 1.71) 0.2104	0	0.00	0.00 (0.00 , 0.00) 0.9799	0.00 (0.00 , 0.00) 0.9774
Māori	57	28	49.12	1.29 (0.76 , 2.21) 0.3458	1.37 (0.79 , 2.37) 0.2624	5	8.77	0.61 (0.24 , 1.57) 0.3089	0.60 (0.23 , 1.54) 0.2854	2	3.51	1.31 (0.30 , 5.68) 0.7203	1.40 (0.32 , 6.22) 0.6582
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Ethnicity													
50-59, European/Other	235	89	37.87	Reference	Reference	30	12.77	Reference	Reference	3	1.28	Reference	Reference
50-59, Asian	59	19	32.20	0.78 (0.42 , 1.43) 0.4200	0.85 (0.45 , 1.58) 0.6046	6	10.17	0.77 (0.31 , 1.95) 0.5873	0.81 (0.31 , 2.11) 0.6647	1	1.69	1.33 (0.14 , 13.05) 0.8048	1.45 (0.14 , 15.08) 0.7544
50-59, Pacific	7	0	0.00	0.00 (0.00 , 0.00) 0.9851	0.00 (0.00 , 0.00) 0.9851	0	0.00	0.00 (0.00 , 0.00) 0.9862	0.00 (0.00 , 0.00) 0.9860	0	0.00	0.00 (0.00 , ####) 0.9841	0.00 (0.00 , ####) 0.9987
50-59, Māori	19	10	52.63	1.82 (0.71 , 4.66) 0.2099	1.77 (0.67 , 4.70) 0.2521	1	5.26	0.38 (0.05 , 2.95) 0.3544	0.41 (0.05 , 3.33) 0.4027	0	0.00	0.00 (0.00 , ####) 0.9738	0.00 (0.00 , ####) 0.9563
60-69, European/Other	423	182	43.03	Reference	Reference	58	13.71	Reference	Reference	15	3.55	Reference	Reference
60-69, Asian	50	19	38.00	0.81 (0.44 , 1.48) 0.4972	0.88 (0.48 , 1.63) 0.6865	6	12.00	0.86 (0.35 , 2.10) 0.7381	0.86 (0.35 , 2.14) 0.7452	0	0.00	0.00 (0.00 , ####) 0.9696	0.00 (0.00 , ####) 0.9511
60-69, Pacific	14	2	14.29	0.22 (0.05 , 1.00) 0.0498 *	0.22 (0.05 , 1.05) 0.0574	1	7.14	0.48 (0.06 , 3.77) 0.4885	0.32 (0.04 , 2.66) 0.2923	0	0.00	0.00 (0.00 , ####) 0.9839	0.00 (0.00 , ####) 0.9733
60-69, Māori	31	12	38.71	0.84 (0.40 , 1.77) 0.6395	0.84 (0.39 , 1.81) 0.6565	3	9.68	0.67 (0.20 , 2.29) 0.5274	0.56 (0.16 , 1.97) 0.3691	2	6.45	1.88 (0.41 , 8.60) 0.4181	2.16 (0.45 , 10.51) 0.3385
70-74, European/Other	229	108	47.16	Reference	Reference	32	13.97	Reference	Reference	6	2.62	Reference	Reference
70-74, Asian	13	9	69.23	2.52 (0.75 , 8.42) 0.1329	2.32 (0.67 , 8.06) 0.1867	3	23.08	1.85 (0.48 , 7.08) 0.3707	1.51 (0.38 , 6.02) 0.5589	0	0.00	0.00 (0.00 , 0.00) 0.9801	0.00 (0.00 , ####) 0.9587
70-74, Pacific	8	7	87.50	7.84 (0.95 , ####) 0.0559	6.94 (0.81 , ####) 0.0777	1	12.50	0.88 (0.10 , 7.39) 0.9058	0.62 (0.07 , 5.44) 0.6635	0	0.00	0.00 (0.00 , 0.00) 0.9844	0.00 (0.00 , ####) 0.9715
70-74, Māori	7	6	85.71	6.72 (0.80 , ####) 0.0800	6.67 (0.77 , ####) 0.0850	1	14.29	1.03 (0.12 , 8.81) 0.9813	1.08 (0.12 , 9.42) 0.9471	0	0.00	0.00 (0.00 , 0.00) 0.9854	0.00 (0.00 , ####) 0.9666
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Ethnicity													
Female: European/Other	409	149	36.43	Reference	Reference	47	11.49	Reference	Reference	11	2.69	Reference	Reference
Female: Asian	71	18	25.35	0.59 (0.33 , 1.05) 0.0729	0.69 (0.38 , 1.25) 0.2233	4	5.63	0.46 (0.16 , 1.32) 0.1484	0.45 (0.15 , 1.34) 0.1511	1	1.41	0.52 (0.07 , 4.07) 0.5306	0.59 (0.07 , 4.94) 0.6272
Female: Pacific	10	3	30.00	0.75 (0.19 , 2.94) 0.6771	0.93 (0.22 , 3.88) 0.9215	1	10.00	0.86 (0.11 , 6.91) 0.8838	0.87 (0.10 , 7.45) 0.8995	0	0.00	0.00 (0.00 , 0.00) 0.9884	0.00 (0.00 , 0.00) 0.9804
Female: Māori	23	9	39.13	1.12 (0.47 , 2.65) 0.7937	1.30 (0.54 , 3.14) 0.5533	2	8.70	0.73 (0.17 , 3.23) 0.6819	0.80 (0.18 , 3.58) 0.7659	0	0.00	0.00 (0.00 , 0.00) 0.9825	0.00 (0.00 , ####) 0.9692
Male: European/Other	478	230	48.12	Reference	Reference	73	15.27	Reference	Reference	13	2.72	Reference	Reference
Male: Asian	51	29	56.86	1.42 (0.79 , 2.54) 0.2368	1.47 (0.81 , 2.68) 0.2076	11	21.57	1.53 (0.75 , 3.11) 0.2451	1.53 (0.73 , 3.18) 0.2568	0	0.00	0.00 (0.00 , ####) 0.9728	0.00 (0.00 , ####) 0.9527
Male: Pacific	19	6	31.58	0.50 (0.19 , 1.33) 0.1646	0.36 (0.13 , 1.04) 0.0591	1	5.26	0.31 (0.04 , 2.34) 0.2556	0.21 (0.03 , 1.70) 0.1444	0	0.00	0.00 (0.00 , 0.00) 0.9834	0.00 (0.00 , ####) 0.9701
Male: Māori	34	19	55.88	1.37 (0.68 , 2.75) 0.3830	1.33 (0.65 , 2.71) 0.4406	3	8.82	0.54 (0.16 , 1.80) 0.3141	0.49 (0.14 , 1.69) 0.2598	2	5.88	2.24 (0.48 , 10.34) 0.3031	3.13 (0.60 , 16.34) 0.1755
Unknown[ε]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep)													
1 (least)	135	57	42.22	Reference	Reference	17	12.59	Reference	Reference	4	2.96	Reference	Reference
2	174	69	39.66	0.90 (0.57 , 1.42) 0.6488	0.96 (0.60 , 1.53) 0.8520	19	10.92	0.85 (0.42 , 1.71) 0.6496	0.88 (0.43 , 1.77) 0.7170	4	2.30	0.77 (0.19 , 3.14) 0.7161	0.79 (0.19 , 3.24) 0.7383
3	148	73	49.32	1.33 (0.83 , 2.13) 0.2315	1.40 (0.86 , 2.25) 0.1722	26	17.57	1.48 (0.76 , 2.87) 0.2461	1.55 (0.79 , 3.02) 0.1986	6	4.05	1.38 (0.38 , 5.01) 0.6209	1.49 (0.40 , 5.45) 0.5455
4	155	70	45.16	1.13 (0.71 , 1.80) 0.6149	1.16 (0.72 , 1.87) 0.5315	21	13.55	1.09 (0.55 , 2.16) 0.8099	1.14 (0.57 , 2.27) 0.7150	1	0.65	0.21 (0.02 , 1.93) 0.1686	0.22 (0.02 , 2.05) 0.1852
5	160	60	37.50	0.82 (0.51 , 1.31) 0.4090	0.86 (0.54 , 1.39) 0.5459	15	9.38	0.72 (0.34 , 1.50) 0.3775	0.78 (0.37 , 1.63) 0.5082	3	1.88	0.63 (0.14 , 2.85) 0.5442	0.63 (0.14 , 2.90) 0.5510
6	81	35	43.21	1.04 (0.60 , 1.82) 0.8870	1.05 (0.59 , 1.84) 0.8754	10	12.35	0.98 (0.42 , 2.25) 0.9576	1.04 (0.45 , 2.40) 0.9335	4	4.94	1.70 (0.41 , 7.00) 0.4614	1.66 (0.40 , 6.89) 0.4870
7	86	31	36.05	0.77 (0.44 , 1.35) 0.3609	0.80 (0.45 , 1.42) 0.4482	10	11.63	0.91 (0.40 , 2.10) 0.8310	0.99 (0.42 , 2.29) 0.9735	4	4.65	1.60 (0.39 , 6.56) 0.5158	1.75 (0.42 , 7.31) 0.4442
8	63	29	46.03	1.17 (0.64 , 2.13) 0.6146	1.22 (0.66 , 2.27) 0.5226	10	15.87	1.31 (0.56 , 3.05) 0.5318	1.44 (0.61 , 3.39) 0.4076	1	1.59	0.53 (0.06 , 4.82) 0.5717	0.55 (0.06 , 5.09) 0.5945
9	90	39	43.33	1.05 (0.61 , 1.79) 0.8689	1.14 (0.65 , 2.01) 0.6400	14	15.56	1.28 (0.60 , 2.74) 0.5282	1.50 (0.68 , 3.28) 0.3146	0	0.00	0.00 (0.00 , 0.00) 0.9642	0.00 (0.00 , 0.00) 0.9752

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10 (most)	3	0	0.00	0.00 (0.00 , 0.00) 0.9762	0.00 (0.00 , 0.00) 0.9771	0	0.00	0.00 (0.00 , 0.00) 0.9856	0.00 (0.00 , 0.00) 0.9862	0	0.00	0.00 (0.00 , 0.00) 0.9935	0.00 (0.00 , 0.00) 0.9954
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles													
1 (least)	309	126	40.78	Reference	Reference	36	11.65	Reference	Reference	8	2.59	Reference	Reference
2	303	143	47.19	1.30 (0.94 , 1.79) 0.1100	1.31 (0.94 , 1.81) 0.1106	47	15.51	1.39 (0.87 , 2.22) 0.1642	1.43 (0.89 , 2.30) 0.1345	7	2.31	0.89 (0.32 , 2.48) 0.8236	0.94 (0.34 , 2.64) 0.9098
3	241	95	39.42	0.95 (0.67 , 1.33) 0.7473	0.95 (0.67 , 1.34) 0.7560	25	10.37	0.88 (0.51 , 1.51) 0.6367	0.93 (0.54 , 1.60) 0.7906	7	2.90	1.13 (0.40 , 3.15) 0.8217	1.12 (0.40 , 3.15) 0.8347
4	149	60	40.27	0.98 (0.66 , 1.46) 0.9174	0.99 (0.65 , 1.49) 0.9465	20	13.42	1.18 (0.65 , 2.11) 0.5878	1.26 (0.69 , 2.28) 0.4504	5	3.36	1.31 (0.42 , 4.06) 0.6443	1.40 (0.44 , 4.42) 0.5641
5 (most)	93	39	41.94	1.05 (0.66 , 1.68) 0.8421	1.12 (0.68 , 1.84) 0.6455	14	15.05	1.34 (0.69 , 2.62) 0.3845	1.57 (0.79 , 3.12) 0.1995	0	0.00	0.00 (0.00 , ####) 0.9641	0.00 (0.00 , 0.00) 0.9751
Unknown[£]	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 5e. Positive Predictive Value of Positive iFOBT* by demographic factors in the first year of Round 2[β], who did not complete Round 1[α]

	Positive iFOBT* n	Adenoma[ρ] n	%	Unadjusted OR (95% CI)	p	Adjusted[†] OR (95% CI)	p	Advanced Adenoma[ρ] n	%	Unadjusted OR (95% CI)	p	Adjusted[†] OR (95% CI)	p	Cancer[ρ] n	%	Unadjusted OR (95% CI)	p	Adjusted[†] OR (95% CI)	p
Total	409	179	43.77	-		-		75	18.34	-		-		17	4.16	-		-	
Age (years)																			
50-54	65	26	40.00	Reference		Reference		13	20.00	Reference		Reference		1	1.54	Reference		Reference	
55-59	93	38	40.86	1.04 (0.54 , 1.98)	0.9137	1.06 (0.55 , 2.06)	0.8556	18	19.35	0.96 (0.43 , 2.13)	0.9200	0.88 (0.38 , 2.03)	0.7659	3	3.23	2.13 (0.22 , 20.98)	0.5159	2.10 (0.21 , 21.04)	0.5292
60-64	94	50	53.19	1.70 (0.90 , 3.23)	0.1028	1.78 (0.92 , 3.45)	0.0858	16	17.02	0.82 (0.36 , 1.85)	0.6328	0.79 (0.34 , 1.84)	0.5874	4	4.26	2.84 (0.31 , 26.05)	0.3549	2.20 (0.22 , 22.07)	0.5031
65-69	79	33	41.77	1.08 (0.55 , 2.10)	0.8296	1.13 (0.57 , 2.25)	0.7233	16	20.25	1.02 (0.45 , 2.30)	0.9699	0.94 (0.40 , 2.21)	0.8880	3	3.80	2.53 (0.26 , 24.88)	0.4272	3.12 (0.30 , 32.24)	0.3400
70-74	78	32	41.03	1.04 (0.53 , 2.04)	0.9010	1.19 (0.60 , 2.38)	0.6197	12	15.38	0.73 (0.31 , 1.73)	0.4705	0.72 (0.29 , 1.78)	0.4754	6	7.69	5.33 (0.63 , 45.49)	0.1259	6.24 (0.70 , 55.91)	0.1018
Sex																			
Female	181	65	35.91	Reference		Reference		25	13.81	Reference		Reference		8	4.42	Reference		Reference	
Male	228	114	50.00	1.78 (1.20 , 2.66)	0.0045 **	1.72 (1.14 , 2.61)	0.0099 **	50	21.93	1.75 (1.04 , 2.97)	0.0365 *	1.66 (0.96 , 2.89)	0.0721	9	3.95	0.89 (0.34 , 2.35)	0.8121	1.00 (0.35 , 2.85)	0.9973
Unknown[ε]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Age (years) - Sex																			
50-54, Female	30	8	26.67	Reference		Reference		5	16.67	Reference		Reference		0	0.00	Reference		Reference	
50-54, Male	35	18	51.43	2.91 (1.02 , 8.29)	0.0452 *	3.06 (0.84 , ####)	0.0905	8	22.86	1.48 (0.43 , 5.13)	0.5354	1.46 (0.31 , 6.76)	0.6307	1	2.86	42492.27 (0.00 , ####)	0.9613	1.50 (0.00 , ####)	0.9981
55-59, Female	45	15	33.33	Reference		Reference		4	8.89	Reference		Reference		1	2.22	Reference		Reference	
55-59, Male	48	23	47.92	1.84 (0.79 , 4.26)	0.1546	1.84 (0.74 , 4.55)	0.1893	14	29.17	4.22 (1.27 , ####)	0.0187 *	4.73 (1.31 , ####)	0.0175 *	2	4.17	1.91 (0.17 , 21.86)	0.6017	1.98 (0.16 , 25.36)	0.5985
60-64, Female	34	18	52.94	Reference		Reference		6	17.65	Reference		Reference		3	8.82	Reference		Reference	
60-64, Male	60	32	53.33	1.02 (0.44 , 2.36)	0.9708	1.40 (0.53 , 3.69)	0.5012	10	16.67	0.93 (0.31 , 2.84)	0.9033	0.73 (0.19 , 2.82)	0.6527	1	1.67	0.18 (0.02 , 1.75)	0.1384	0.00 (0.00 , ####)	0.8271
65-69, Female	32	10	31.25	Reference		Reference		4	12.50	Reference		Reference		1	3.13	Reference		Reference	
65-69, Male	47	23	48.94	2.11 (0.82 , 5.40)	0.1204	2.27 (0.81 , 6.34)	0.1177	12	25.53	2.40 (0.70 , 8.26)	0.1650	1.60 (0.42 , 5.99)	0.4888	2	4.26	1.38 (0.12 , 15.86)	0.7972	3.17 (0.12 , 86.25)	0.4937
70-74, Female	40	14	35.00	Reference		Reference		6	15.00	Reference		Reference		3	7.50	Reference		Reference	
70-74, Male	38	18	47.37	1.67 (0.67 , 4.15)	0.2684	1.62 (0.63 , 4.21)	0.3186	6	15.79	1.06 (0.31 , 3.64)	0.9231	1.12 (0.30 , 4.14)	0.8664	3	7.89	1.06 (0.20 , 5.59)	0.9479	1.73 (0.22 , 13.38)	0.5990
Unknown[ε]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Sex - Age (years)																			
Female: 50-54	30	8	26.67	Reference		Reference		5	16.67	Reference		Reference		0	0.00	Reference		Reference	
Female: 55-59	45	15	33.33	1.37 (0.50 , 3.81)	0.5406	1.31 (0.45 , 3.76)	0.6188	4	8.89	0.49 (0.12 , 1.99)	0.3169	0.34 (0.08 , 1.54)	0.1618	1	2.22	31616.13 (0.00 , ####)	0.9616	28917.39 (0.00 , ####)	0.9544
Female: 60-64	34	18	52.94	3.09 (1.08 , 8.86)	0.0355 *	3.43 (1.12 , ####)	0.0302 *	6	17.65	1.07 (0.29 , 3.95)	0.9174	0.86 (0.20 , 3.60)	0.8339	3	8.82	######## (0.00 , ####)	0.9563	######## (0.00 , ####)	0.9480
Female: 65-69	32	10	31.25	1.25 (0.42 , 3.76)	0.6916	1.40 (0.44 , 4.42)	0.5691	4	12.50	0.71 (0.17 , 2.96)	0.6426	0.65 (0.14 , 3.04)	0.5850	1	3.13	44874.50 (0.00 , ####)	0.9603	39034.81 (0.00 , ####)	0.9530
Female: 70-74	40	14	35.00	1.48 (0.52 , 4.18)	0.4587	1.46 (0.50 , 4.29)	0.4868	6	15.00	0.88 (0.24 , 3.22)	0.8497	0.77 (0.19 , 3.14)	0.7122	3	7.50	######## (0.00 , ####)	0.9569	88643.76 (0.00 , ####)	0.9494
Male: 50-54	35	18	51.43	Reference		Reference		8	22.86	Reference		Reference		1	2.86	Reference		Reference	
Male: 55-59	48	23	47.92	0.87 (0.36 , 2.08)	0.7521	0.96 (0.39 , 2.39)	0.9339	14	29.17	1.39 (0.51 , 3.80)	0.5210	1.39 (0.48 , 4.02)	0.5424	2	4.17	1.48 (0.13 , 16.98)	0.7536	1.29 (0.10 , 15.84)	0.8440
Male: 60-64	60	32	53.33	1.08 (0.47 , 2.49)	0.8580	1.28 (0.53 , 3.08)	0.5825	10	16.67	0.68 (0.24 , 1.91)	0.4592	0.67 (0.23 , 1.96)	0.4635	1	1.67	0.58 (0.03 , 9.51)	0.7000	0.00 (0.00 , ####)	0.9607
Male: 65-69	47	23	48.94	0.91 (0.38 , 2.17)	0.8234	1.12 (0.45 , 2.78)	0.8031	12	25.53	1.16 (0.41 , 3.23)	0.7804	1.12 (0.39 , 3.27)	0.8308	2	4.26	1.51 (0.13 , 17.36)	0.7403	1.85 (0.14 , 25.03)	0.6428
Male: 70-74	38	18	47.37	0.85 (0.34 , 2.13)	0.7291	1.04 (0.40 , 2.72)	0.9316	6	15.79	0.63 (0.20 , 2.05)	0.4457	0.62 (0.18 , 2.12)	0.4496	3	7.89	2.91 (0.29 , 29.41)	0.3645	4.13 (0.34 , 50.18)	0.2658
Unknown[ε]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Ethnicity																			
European/Other	293	133	45.39	Reference		Reference		67	22.87	Reference		Reference		9	3.07	Reference		Reference	
Asian	44	14	31.82	0.56 (0.29 , 1.10)	0.0936	0.64 (0.32 , 1.28)	0.2075	2	4.55	0.16 (0.04 , 0.68)	0.0131 *	0.17 (0.04 , 0.73)	0.0173 *	2	4.55	1.50 (0.31 , 7.19)	0.6103	1.34 (0.27 , 6.72)	0.7248
Pacific	42	16	38.10	0.74 (0.38 , 1.44)	0.3747	0.71 (0.35 , 1.44)	0.3427	3	7.14	0.26 (0.08 , 0.87)	0.0283 *	0.22 (0.06 , 0.77)	0.0179 *	3	7.14	2.43 (0.63 , 9.35)	0.1974	1.67 (0.40 , 7.04)	0.4832
Māori	27	16	59.26	1.75 (0.79 , 3.90)	0.1712	1.70 (0.73 , 3.96)	0.2200	3	11.11	0.42 (0.12 , 1.44)	0.1691	0.31 (0.09 , 1.13)	0.0767	2	7.41	2.53 (0.52 , 12.33)	0.2522	2.61 (0.47 , 14.67)	0.2752
Unknown[ε]	3	0	0.00	-		-		0	0.00	-		-		1	33.33	-		-	
Age (years) - Ethnicity																			
50-59, European/Other	110	47	42.73	Reference		Reference		27	24.55	Reference		Reference		2	1.82	Reference		Reference	
50-59, Asian	17	2	11.76	0.18 (0.04 , 0.82)	0.0267 *	0.20 (0.04 , 0.92)	0.0395 *	0	0.00	0.00 (0.00 , ####)	0.9573	0.00 (0.00 , ####)	0.9706	0	0.00	0.00 (0.00 , ####)	0.9660	0.00 (0.00 , ####)	0.9732
50-59, Pacific	15	4	26.67	0.49 (0.15 , 1.63)	0.2425	0.36 (0.10 , 1.29)	0.1151	1	6.67	0.22 (0.03 , 1.75)	0.1521	0.15 (0.02 , 1.26)	0.0805	1	6.67	3.86 (0.33 , 45.34)	0.2830	2.73 (0.17 , 44.49)	0.4809
50-59, Māori	16	11	68.75	2.95 (0.96 , 9.06)	0.0590	2.49 (0.76 , 8.15)	0.1316	3	18.75	0.71 (0.19 , 2.68)	0.6124	0.46 (0.11 , 1.91)	0.2872	1	6.25	3.60 (0.31 , 42.16)	0.3076	2.00 (0.14 , 27.82)	0.6054
60-69, European/Other	127	63	49.61	Reference		Reference		31	24.41	Reference		Reference		2	1.57	Reference		Reference	
60-69, Asian	16	7	43.75	0.79 (0.28 , 2.25)	0.6593	0.94 (0.32 , 2.79)	0.9097	1	6.25	0.21 (0.03 , 1.63)	0.1342	0.19 (0.02 , 1.55)	0.1200	2	12.50	8.93 (1.17 , 68.41)	0.0351 *	8.46 (0.94 , 76.04)	0.0567
60-69, Pacific	19	8	42.11	0.74 (0.28 , 1.96)	0.5428	0.92 (0.31 , 2.74)	0.8766	0	0.00	0.00 (0.00 , ####)	0.9557	0.00 (0.00 , ####)	0.9508	2	10.53	7.35 (0.97 , 55.67)	0.0534	12.85 (0.92 , ####)	0.0580
60-69, Māori	9	5	55.56	1.27 (0.33 , 4.95)	0.7306	1.25 (0.30 , 5.15)	0.7558	0	0.00	0.00 (0.00 , ####)	0.9695	0.00 (0.00 , ####)	0.9673	0	0.00	0.00 (0.00 , 0.00)	0.9814	0.00 (0.00 , 0.00)	0.9804
70-74, European/Other	56	23	41.07	Reference		Reference		9	16.07	Reference		Reference		5	8.93	Reference		Reference	
70-74, Asian	11	5	45.45	1.20 (0.33 , 4.39)	0.7877	1.29 (0.34 , 4.90)	0.7107	1	9.09	0.52 (0.06 , 4.60)	0.5584	0.53 (0.06 , 4.94)	0.5791	0	0.00	0.00 (0.00 , ####)	0.9634	0.00 (0.00 , ####)	0.9587
70-74, Pacific	8	4	50.00	1.43 (0.33 , 6.33)	0.6337	1.51 (0.31 , 7.44)	0.6111	2	25.00	1.74 (0.30 , ####)	0.5352	1.32 (0.20 , 8.80)	0.7711	0	0.00	0.00 (0.00 , ####)	0.9688	0.00 (0.00 , ####)	0.9696
70-74, Māori	2	0	0.00	0.00 (0.00 , 0.00)	0.9807	0.00 (0.00 , 0.00)	0.9806	0	0.00	0.00 (0.00 , 0.00)	0.9804	0.00 (0.00 , 0.00)	0.9795	1	50.00	10.20 (0.55 , ####)	0.1190	######## (0.00 , ####)	0.9406
Unknown[ε]	3	0	0.00	-		-		0	0.00	-		-		1	33.33	-		-	
Sex - Ethnicity																			
Female: European/Other	120	51	42.50	Reference		Reference		22	18.33	Reference		Reference		4	3.33	Reference		Reference	
Female: Asian	29	5	17.24	0.28 (0.10 , 0.79)	0.0159 *	0.26 (0.09 , 0.76)	0.0134 *	0	0.00	0.00 (0.00 , ####)	0.9524	0.00 (0.00 , ####)	0.9472	2	6.90	2.15 (0.37 , 12.34)	0.3913	2.71 (0.41 , 17.70)	0.2978
Female: Pacific	21	6	28.57	0.54 (0.20 , 1.49)	0.2351	0.34 (0.11 , 1.06)	0.0629	3	14.29	0.74 (0.20 , 2.74)	0.6551	0.46 (0.10 , 2.04)	0.3047	1	4.76	1.45 (0.15 , 13.65)	0.7453	0.75 (0.06 , 9.16)	0.8203
Female: Māori	11	3	27.27	0.51 (0.13 , 2.01)	0.3336	0.37 (0.09 , 1.61)	0.1851	0	0.00	0.00 (0.00 , ####)	0.9707	0.00 (0.00 , ####)	0.9668	1	9.09	2.90 (0.30 , 28.48)	0.3610	3.50 (0.27 , 44.98)	0.3364
Male: European/Other	173	82	47.40	Reference		Reference		45	26.01	Reference		Reference		5	2.89	Reference		Reference	
Male: Asian	15	9	60.00	1.66 (0.57 , 4.88)	0.3529	1.69 (0.56 , 5.07)	0.3517	2	13.33	0.44 (0.10 , 2.01)	0.2888	0.43 (0.09 , 2.03)	0.2863	0	0.00	0.00 (0.00 , ####)	0.9745	0.00 (0.00 , 0.00)	0.9792
Male: Pacific	21	10	47.62	1.01 (0.41 , 2.50)	0.9848	0.96 (0.37 , 2.51)	0.9284	0	0.00	0.00 (0.00 , ####)	0.9674	0.00 (0.00 , ####)	0.9663	2	9.52	3.54 (0.64 , 19.50)	0.1470	2.21 (0.35 , 13.73)	0.3958
Male: Māori	16	13	81.25	4.81 (1.32 , ####)	0.0171 *	5.12 (1.31 , ####)	0.0188 *	3	18.75	0.66 (0.18 , 2.41)	0.5258	0.55 (0.14 , 2.18)	0.3957	1	6.25	2.24 (0.25 , 20.44)	0.4747	2.78 (0.22 , 34.97)	0.4284
Unknown[ε]	3	0	0.00	-		-		0	0.00	-		-		1	33.33	-		-	
Deprivation Index (NZDep)																			
1 (least)	38	15	39.47	Reference		Reference		6	15.79	Reference		Reference		3	7.89	Reference		Reference	
2	64	30	46.88	1.35 (0.60 , 3.06)	0.4672	1.34 (0.58 , 3.08)	0.4968	11	17.19	1.11 (0.37 , 3.28)	0.8547	1.15 (0.38 , 3.47)	0.8063	0	0.00	0.00 (0.00 , ####)	0.9594	0.00 (0.00 , ####)	0.9577
3	51	20	39.22	0.99 (0.42 , 2.34)	0.9803	0.98 (0.41 , 2.37)	0.9631	9	17.65	1.14 (0.37 , 3.54)	0.8170	1.19 (0.38 , 3.77)	0.7669	1	1.96	0.23 (0.02 , 2.34)	0.2157	0.19 (0.02 , 2.01)	0.1688
4	35	14	40.00	1.02 (0.40 , 2.61)	0.9634	1.12 (0.42 , 2.93)	0.8243	6	17.14	1.10 (0.32 , 3.81)	0.8762	1.30 (0.37 , 4.63)	0.6804	0	0.00	0.00 (0.00 , ####)	0.9700	0.00 (0.00 , ####)	0.9681
5	47	22	46.81	1.35 (0.57 , 3.21)	0.4981	1.45 (0.60 , 3.53)	0.4100	14	29.79	2.26 (0.77 , 6.62)	0.1358	2.73 (0.90 , 8.25)	0.0749	2	4.26	0.52 (0.08 , 3.27)	0.4849	0.41 (0.06 , 2.79)	0.3650
6	51	24	47.06	1.36 (0.58 , 3.19)	0.4761	1.52 (0.63 , 3.68)	0.3571	7	13.73	0.85 (0.26 , 2.77)	0.7852	1.11 (0.33 , 3.73)	0.8687	2	3.92	0.48 (0.08 , 3.00)	0.4296	0.18 (0.02 , 1.93)	0.1564
7	45	19	42.22	1.12 (0.47 , 2.70)	0.7998	1.26 (0.50 , 3.15)	0.6281	9	20.00	1.33 (0.43 , 4.16)	0.6201	1.83 (0.56 , 6.00)	0.3172	1	2.22	0.27 (0.03 , 2.66)	0.2593	0.18 (0.02 , 2.04)	0.1648
8	35	16	45.71	1.29 (0.51 , 3.27)	0.5902	1.43 (0.52 , 3.88)	0.4866	10	28.57	2.13 (0.68 , 6.67)	0.1924	4.90 (1.38 , ####)	0.0139 *	5	14.29	1.94 (0.43 , 8.82)	0.3887	1.47 (0.27 , 7.92)	0.6549
9	42	18	42.86	1.15 (0.47 , 2.81)	0.7589	1.27 (0.50 , 3.22)	0.6210	3	7.14	0.41 (0.10 , 1.77)	0.2325	0.63 (0.14 , 2.81)	0.5433	3	7.14	0.90 (0.17 , 4.74)	0.8986	0.65 (0.11 , 3.75)	0.6272

	N	n	%	OR (CI)	p	OR (CI)	p	n	%	OR (CI)	p	OR (CI)	p	n	%	OR (CI)	p	OR (CI)	p
10 (most)	1	1	100.00	854322.79 (0.00 , 0.00)	0.9854	794006.61 (0.00 , 0.00)	0.9855	0	0.00	0.00 (0.00 , 0.00)	0.9903	0.00 (0.00 , 0.00)	0.9900	0	0.00	0.00 (0.00 , 0.00)	0.9949	0.00 (0.00 , 0.00)	0.9951
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	
Deprivation Index (NZDep) quintiles																			
1 (least)	102	45	44.12	Reference		Reference		17	16.67	Reference		Reference		3	2.94	Reference		Reference	
2	86	34	39.53	0.83 (0.46 , 1.48)	0.5261	0.86 (0.47 , 1.57)	0.6225	15	17.44	1.06 (0.49 , 2.26)	0.8880	1.13 (0.52 , 2.46)	0.7619	1	1.16	0.39 (0.04 , 3.80)	0.4164	0.33 (0.03 , 3.32)	0.3491
3	98	46	46.94	1.12 (0.64 , 1.96)	0.6888	1.24 (0.69 , 2.21)	0.4727	21	21.43	1.36 (0.67 , 2.77)	0.3918	1.66 (0.80 , 3.47)	0.1753	4	4.08	1.40 (0.31 , 6.44)	0.6622	0.88 (0.17 , 4.61)	0.8769
4	80	35	43.75	0.99 (0.55 , 1.78)	0.9604	1.10 (0.58 , 2.08)	0.7648	19	23.75	1.56 (0.75 , 3.24)	0.2358	2.51 (1.13 , 5.56)	0.0232 *	6	7.50	2.68 (0.65 , 11.05)	0.1738	1.97 (0.43 , 9.07)	0.3826
5 (most)	43	19	44.19	1.00 (0.49 , 2.06)	0.9940	1.11 (0.52 , 2.37)	0.7799	3	6.98	0.38 (0.10 , 1.35)	0.1344	0.54 (0.15 , 2.00)	0.3557	3	6.98	2.48 (0.48 , 12.78)	0.2793	1.94 (0.36 , 10.47)	0.4394
Unknown[£]	0	0	0.00	-		-		0	0.00	-		-		0	0.00	-		-	

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 5f. Positive Predictive Value of Positive iFOBT* by demographic factors in the first year of Round 2$^\beta$, who were not invited in Round 1$^\alpha$

	Positive iFOBT*	Positive Predictive Value‡ of positive iFOBT*											
		Adenoma$^\rho$				Advanced Adenoma$^\rho$				Cancer$^\rho$			
				Unadjusted OR (95% CI)	Adjusted† OR (95% CI)			Unadjusted OR (95% CI)	Adjusted† OR (95% CI)			Unadjusted OR (95% CI)	Adjusted† OR (95% CI)
	n	n	%			n	%			n	%		
Total	372	156	41.94	-	-	58	15.59	-	-	9	2.42	-	-
Age (years)													
50-54	243	91	37.45	Reference	Reference	34	13.99	Reference	Reference	3	1.23	Reference	Reference
55-59	35	15	42.86	1.25 (0.61 , 2.57) 0.5385	1.09 (0.52 , 2.30) 0.8241	8	22.86	1.82 (0.76 , 4.34) 0.1759	1.54 (0.62 , 3.82) 0.3514	2	5.71	4.85 (0.78 , 30.10) 0.0901	3.56 (0.52 , 24.30) 0.1945
60-64	31	15	48.39	1.57 (0.74 , 3.32) 0.2417	1.52 (0.70 , 3.29) 0.2906	2	6.45	0.42 (0.10 , 1.86) 0.2553	0.41 (0.09 , 1.84) 0.2439	2	6.45	5.52 (0.88 , 34.40) 0.0674	5.96 (0.87 , 41.09) 0.0698
65-69	35	22	62.86	2.83 (1.36 , 5.88) 0.0055 **	2.83 (1.33 , 6.01) 0.0069 **	11	31.43	2.82 (1.27 , 6.27) 0.0112 *	2.66 (1.15 , 6.15) 0.0224 *	0	0.00	0.00 (0.00 , ####) 0.9692	0.00 (0.00 , ####) 0.9480
70-74	28	13	46.43	1.45 (0.66 , 3.18) 0.3568	1.44 (0.64 , 3.22) 0.3796	3	10.71	0.74 (0.21 , 2.58) 0.6336	0.62 (0.17 , 2.23) 0.4669	2	7.14	6.15 (0.98 , 38.53) 0.0522	5.03 (0.74 , 34.22) 0.0988
Sex													
Female	171	62	36.26	Reference	Reference	23	13.45	Reference	Reference	4	2.34	Reference	Reference
Male	201	94	46.77	1.54 (1.02 , 2.34) 0.0411 *	1.48 (0.95 , 2.30) 0.0850	35	17.41	1.36 (0.77 , 2.40) 0.2949	1.31 (0.71 , 2.43) 0.3836	5	2.49	1.07 (0.28 , 4.03) 0.9261	0.88 (0.21 , 3.72) 0.8665
Unknown^E	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Sex													
50-54, Female	123	42	34.15	Reference	Reference	17	13.82	Reference	Reference	2	1.63	Reference	Reference
50-54, Male	120	49	40.83	1.33 (0.79 , 2.24) 0.2821	1.45 (0.83 , 2.54) 0.1934	17	14.17	1.03 (0.50 , 2.12) 0.9381	1.25 (0.58 , 2.69) 0.5738	1	0.83	0.51 (0.05 , 5.68) 0.5828	0.70 (0.05 , 9.31) 0.7870
55-59, Female	10	4	40.00	Reference	Reference	2	20.00	Reference	Reference	1	10.00	Reference	Reference
55-59, Male	25	11	44.00	1.18 (0.27 , 5.24) 0.8290	1.32 (0.19 , 9.19) 0.7790	6	24.00	1.26 (0.21 , 7.65) 0.7993	0.48 (0.04 , 6.63) 0.5852	1	4.00	0.37 (0.02 , 6.65) 0.5038	0.28 (0.01 , 13.42) 0.5167
60-64, Female	12	4	33.33	Reference	Reference	1	8.33	Reference	Reference	1	8.33	Reference	Reference
60-64, Male	19	11	57.89	2.75 (0.61 , ####) 0.1882	4.07 (0.38 , ####) 0.2464	1	5.26	0.61 (0.03 , ####) 0.7368	1.50 (0.06 , ####) 0.8096	1	5.26	0.61 (0.03 , 10.79) 0.7368	2.26 (0.05 , 94.05) 0.6678
65-69, Female	14	7	50.00	Reference	Reference	2	14.29	Reference	Reference	0	0.00	Reference	Reference
65-69, Male	21	15	71.43	2.50 (0.61 , ####) 0.2035	2.81 (0.45 , ####) 0.2667	9	42.86	4.50 (0.80 , ####) 0.0881	2.66 (0.37 , ####) 0.3285	0	0.00	4.34 (0.94 , 20.07) 0.0605	4.72 (0.99 , 22.57) 0.0521
70-74, Female	12	5	41.67	Reference	Reference	1	8.33	Reference	Reference	0	0.00	Reference	Reference
70-74, Male	16	8	50.00	1.40 (0.31 , 6.33) 0.6621	0.68 (0.12 , 3.85) 0.6617	2	12.50	1.57 (0.13 , ####) 0.7259	1.00 (0.07 , ####) 1.0000	2	12.50	46025.78 (0.00 , ####) 0.9478	5294.08 (0.00 , ####) 0.8865
Unknown^E	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Age (years)													
Female: 50-54	123	42	34.15	Reference	Reference	17	13.82	Reference	Reference	2	1.63	Reference	Reference
Female: 55-59	10	4	40.00	1.29 (0.34 , 4.81) 0.7088	1.63 (0.41 , 6.54) 0.4883	2	20.00	1.56 (0.30 , 7.97) 0.5939	1.56 (0.28 , 8.67) 0.6108	1	10.00	6.72 (0.56 , 81.42) 0.1343	2.46 (0.16 , 37.14) 0.5165
Female: 60-64	12	4	33.33	0.96 (0.27 , 3.39) 0.9548	0.99 (0.28 , 3.55) 0.9855	1	8.33	0.57 (0.07 , 4.68) 0.5980	0.60 (0.07 , 5.08) 0.6366	1	8.33	5.50 (0.46 , 65.58) 0.1776	7.38 (0.40 , ####) 0.1783
Female: 65-69	14	7	50.00	1.93 (0.63 , 5.86) 0.2470	1.78 (0.56 , 5.67) 0.3325	2	14.29	1.04 (0.21 , 5.06) 0.9620	1.24 (0.24 , 6.36) 0.7933	0	0.00	0.00 (0.00 , 0.00) 0.9781	0.00 (0.00 , ####) 0.9544
Female: 70-74	12	5	41.67	1.38 (0.41 , 4.60) 0.6029	1.34 (0.39 , 4.59) 0.6413	1	8.33	0.57 (0.07 , 4.68) 0.5980	0.60 (0.07 , 5.07) 0.6355	0	0.00	0.00 (0.00 , 0.00) 0.9797	0.00 (0.00 , ####) 0.9633
Male: 50-54	120	49	40.83	Reference	Reference	17	14.17	Reference	Reference	1	0.83	Reference	Reference
Male: 55-59	25	11	44.00	1.14 (0.48 , 2.72) 0.7700	1.02 (0.41 , 2.54) 0.9608	6	24.00	1.91 (0.67 , 5.48) 0.2265	1.58 (0.53 , 4.70) 0.4073	1	4.00	4.96 (0.30 , 82.05) 0.2635	3.85 (0.22 , 67.15) 0.3559
Male: 60-64	19	11	57.89	1.99 (0.75 , 5.31) 0.1684	1.56 (0.55 , 4.46) 0.4075	1	5.26	0.34 (0.04 , 2.69) 0.3044	0.34 (0.04 , 2.88) 0.3240	1	5.26	6.61 (0.40 , ####) 0.1886	13.79 (0.69 , ####) 0.0865
Male: 65-69	21	15	71.43	3.62 (1.31 , 9.99) 0.0129 *	3.73 (1.29 , ####) 0.0151 *	9	42.86	4.54 (1.66 , ####) 0.0032 **	4.17 (1.43 , ####) 0.0088 **	0	0.00	0.00 (0.00 , ####) 0.9747	0.00 (0.00 , ####) 0.9707
Male: 70-74	16	8	50.00	1.45 (0.51 , 4.12) 0.4869	1.38 (0.46 , 4.16) 0.5692	2	12.50	0.87 (0.18 , 4.15) 0.8568	0.74 (0.14 , 3.81) 0.7205	2	12.50	17.00 (1.45 , ####) 0.0242 *	10.91 (0.81 , ####) 0.0715
Unknown^E	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Ethnicity													
European/Other	240	105	43.75	Reference	Reference	44	18.33	Reference	Reference	6	2.50	Reference	Reference
Asian	79	32	40.51	0.88 (0.52 , 1.47) 0.6135	0.91 (0.52 , 1.58) 0.7311	10	12.66	0.65 (0.31 , 1.35) 0.2461	0.73 (0.33 , 1.62) 0.4419	3	3.80	1.54 (0.38 , 6.30) 0.5487	1.14 (0.24 , 5.42) 0.8667
Pacific	23	9	39.13	0.83 (0.34 , 1.98) 0.6697	0.86 (0.34 , 2.19) 0.7500	3	13.04	0.67 (0.19 , 2.35) 0.5295	0.85 (0.22 , 3.30) 0.8197	0	0.00	0.00 (0.00 , ####) 0.9731	0.00 (0.00 , ####) 0.9638
Māori	23	8	34.78	0.69 (0.28 , 1.68) 0.4088	0.63 (0.25 , 1.63) 0.3449	1	4.35	0.20 (0.03 , 1.54) 0.1232	0.17 (0.02 , 1.37) 0.0963	0	0.00	0.00 (0.00 , ####) 0.9731	0.00 (0.00 , ####) 0.9681
Unknown^E	7	2	28.57	-	-	0	0.00	-	-	0	0.00	-	-
Age (years) - Ethnicity													
50-59, European/Other	180	71	39.44	Reference	Reference	29	16.11	Reference	Reference	3	1.67	Reference	Reference
50-59, Asian	56	21	37.50	0.92 (0.50 , 1.71) 0.7945	1.04 (0.54 , 2.01) 0.8960	9	16.07	1.00 (0.44 , 2.26) 0.9944	1.16 (0.49 , 2.74) 0.7360	2	3.57	2.19 (0.36 , 13.42) 0.3986	2.20 (0.29 , 16.61) 0.4444
50-59, Pacific	18	9	50.00	1.54 (0.58 , 4.05) 0.3869	1.49 (0.52 , 4.25) 0.4586	3	16.67	1.04 (0.28 , 3.83) 0.9513	1.17 (0.29 , 4.79) 0.8283	0	0.00	0.00 (0.00 , 0.00) 0.9796	0.00 (0.00 , ####) 0.9600
50-59, Māori	17	3	17.65	0.33 (0.09 , 1.19) 0.0893	0.32 (0.09 , 1.20) 0.0915	1	5.88	0.33 (0.04 , 2.55) 0.2854	0.33 (0.04 , 2.66) 0.2963	0	0.00	0.00 (0.00 , 0.00) 0.9802	0.00 (0.00 , ####) 0.9640
60-69, European/Other	39	23	58.97	Reference	Reference	13	33.33	Reference	Reference	1	2.56	Reference	Reference
60-69, Asian	19	9	47.37	0.63 (0.21 , 1.89) 0.4056	0.51 (0.13 , 1.95) 0.3254	0	0.00	0.00 (0.00 , ####) 0.9289	0.00 (0.00 , ####) 0.9498	1	5.26	2.11 (0.12 , 35.70) 0.6046	1.47 (0.04 , 48.94) 0.8306
60-69, Pacific	3	0	0.00	0.00 (0.00 , ####) 0.9748	0.00 (0.00 , 0.00) 0.9702	0	0.00	0.00 (0.00 , ####) 0.9717	0.00 (0.00 , 0.00) 0.9792	0	0.00	0.00 (0.00 , 0.00) 0.9841	0.00 (0.00 , ####) 0.9601
60-69, Māori	5	5	100.00	385453.41 (0.00 , ####) 0.9692	1396207.45 (0.00 , ####) 0.9652	0	0.00	0.00 (0.00 , ####) 0.9635	0.00 (0.00 , 0.00) 0.9745	0	0.00	0.00 (0.00 , 0.00) 0.9795	0.00 (0.00 , ####) 0.9603
70-74, European/Other	21	11	52.38	Reference	Reference	2	9.52	Reference	Reference	2	9.52	Reference	Reference
70-74, Asian	4	2	50.00	0.91 (0.11 , 7.72) 0.9304	0.86 (0.08 , 9.14) 0.9005	1	25.00	3.17 (0.21 , ####) 0.4013	2.50 (0.10 , ####) 0.5812	0	0.00	0.00 (0.00 , ####) 0.9707	0.00 (0.00 , ####) 0.9614
70-74, Pacific	2	0	0.00	0.00 (0.00 , ####) 0.9690	0.00 (0.00 , 0.00) 0.9681	0	0.00	0.00 (0.00 , ####) 0.9758	1.06 (0.00 , 0.00) 0.9999	0	0.00	0.00 (0.00 , 0.00) 0.9793	0.96 (0.00 , 0.00) 0.9999
70-74, Māori	1	0	0.00	0.00 (0.00 , 0.00) 0.9781	0.00 (0.00 , 0.00) 0.9772	0	0.00	0.00 (0.00 , 0.00) 0.9829	1.11 (0.00 , 0.00) 0.9998	0	0.00	0.00 (0.00 , 0.00) 0.9853	0.36 (0.00 , 0.00) 0.9986
Unknown^E	7	2	28.57	-	-	0	0.00	-	-	0	0.00	-	-
Sex - Ethnicity													
Female: European/Other	99	38	38.38	Reference	Reference	15	15.15	Reference	Reference	1	1.01	Reference	Reference
Female: Asian	49	14	28.57	0.64 (0.31 , 1.35) 0.2410	0.57 (0.25 , 1.29) 0.1752	7	14.29	0.93 (0.35 , 2.46) 0.8892	0.84 (0.29 , 2.45) 0.7465	3	6.12	6.39 (0.65 , 63.12) 0.1124	4.88 (0.38 , 63.24) 0.2254
Female: Pacific	13	5	38.46	1.00 (0.31 , 3.29) 0.9957	0.86 (0.24 , 3.16) 0.8235	1	7.69	0.47 (0.06 , 3.86) 0.4795	0.46 (0.05 , 4.43) 0.4991	0	0.00	0.00 (0.00 , ####) 0.9730	0.00 (0.00 , ####) 0.9566
Female: Māori	10	5	50.00	1.61 (0.44 , 5.91) 0.4769	1.28 (0.32 , 5.14) 0.7251	0	0.00	0.00 (0.00 , ####) 0.9728	0.00 (0.00 , ####) 0.9722	0	0.00	0.00 (0.00 , ####) 0.9763	0.00 (0.00 , ####) 0.9662
Male: European/Other	141	67	47.52	Reference	Reference	29	20.57	Reference	Reference	5	3.55	Reference	Reference
Male: Asian	30	18	60.00	1.66 (0.74 , 3.69) 0.2171	1.59 (0.67 , 3.79) 0.2968	3	10.00	0.43 (0.12 , 1.51) 0.1884	0.54 (0.14 , 2.06) 0.3682	0	0.00	0.00 (0.00 , ####) 0.9677	0.00 (0.00 , ####) 0.9255
Male: Pacific	10	4	40.00	0.74 (0.20 , 2.72) 0.6464	0.79 (0.19 , 3.23) 0.7458	2	20.00	0.97 (0.19 , 4.79) 0.9658	1.36 (0.24 , 7.80) 0.7268	0	0.00	0.00 (0.00 , ####) 0.9813	0.00 (0.00 , ####) 0.9616
Male: Māori	13	3	23.08	0.33 (0.09 , 1.26) 0.1041	0.38 (0.09 , 1.58) 0.1855	1	7.69	0.32 (0.04 , 2.58) 0.2856	0.31 (0.04 , 2.63) 0.2804	0	0.00	0.00 (0.00 , ####) 0.9787	0.00 (0.00 , ####) 0.9684
Unknown^E	7	2	28.57	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep)													
1 (least)	47	22	46.81	Reference	Reference	9	19.15	Reference	Reference	0	0.00	Reference	Reference
2	45	19	42.22	0.83 (0.36 , 1.89) 0.6583	0.86 (0.36 , 2.05) 0.7377	6	13.33	0.65 (0.21 , 2.00) 0.4524	0.73 (0.23 , 2.35) 0.6039	2	4.44	####### (0.00 , ####) 0.9597	28155.32 (0.00 , ####) 0.9305
3	50	18	36.00	0.64 (0.28 , 1.44) 0.2809	0.67 (0.28 , 1.57) 0.3530	4	8.00	0.37 (0.10 , 1.29) 0.1172	0.41 (0.11 , 1.49) 0.1765	0	0.00	1.00 (0.00 , 0.00) 1.0000	1.19 (0.00 , ####) 0.9991
4	50	22	44.00	0.89 (0.40 , 1.99) 0.7813	0.93 (0.40 , 2.14) 0.8602	8	16.00	0.80 (0.28 , 2.30) 0.6838	0.94 (0.31 , 2.81) 0.9114	1	2.00	51234.77 (0.00 , ####) 0.9626	12052.69 (0.00 , ####) 0.9362
5	39	16	41.03	0.79 (0.34 , 1.86) 0.5911	0.74 (0.31 , 1.81) 0.5145	8	20.51	1.09 (0.38 , 3.16) 0.8744	1.10 (0.36 , 3.31) 0.8682	2	5.13	####### (0.00 , ####) 0.9592	26619.73 (0.00 , ####) 0.9309
6	48	18	37.50	0.68 (0.30 , 1.55) 0.3590	0.65 (0.26 , 1.59) 0.3430	9	18.75	0.97 (0.35 , 2.72) 0.9604	1.02 (0.33 , 3.17) 0.9789	1	2.08	53414.97 (0.00 , ####) 0.9624	12909.46 (0.00 , ####) 0.9358
7	33	14	42.42	0.84 (0.34 , 2.05) 0.6981	0.87 (0.34 , 2.25) 0.7808	2	6.06	0.27 (0.05 , 1.35) 0.1120	0.30 (0.06 , 1.57) 0.1553	2	6.06	####### (0.00 , ####) 0.9586	41959.51 (0.00 , ####) 0.9278
8	28	14	50.00	1.14 (0.45 , 2.90) 0.7891	1.27 (0.48 , 3.40) 0.6301	8	28.57	1.69 (0.56 , 5.05) 0.3485	2.12 (0.66 , 6.80) 0.2057	1	3.57	92981.61 (0.00 , ####) 0.9605	29558.62 (0.00 , ####) 0.9301
9	29	13	44.83	0.92 (0.36 , 2.34) 0.8664	1.12 (0.41 , 3.04) 0.8291	4	13.79	0.68 (0.19 , 2.43) 0.5486	1.03 (0.26 , 4.06) 0.9665	0	0.00	1.00 (0.00 , 0.00) 1.0000	1.91 (0.00 , ####) 0.9970

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10 (most)	3	0	0.00	0.00 (0.00 , 0.00) 0.9842	0.00 (0.00 , 0.00) 0.9836	0	0.00	0.00 (0.00 , 0.00) 0.9895	0.00 (0.00 , 0.00) 0.9886	0	0.00	1.00 (0.00 , 0.00) 1.0000	1.91 (0.00 , 0.00) 0.9990
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-
Deprivation Index (NZDep) quintiles													
1 (least)	92	41	44.57	Reference	Reference	15	16.30	Reference	Reference	2	2.17	Reference	Reference
2	100	40	40.00	0.83 (0.47 , 1.47) 0.5224	0.84 (0.46 , 1.55) 0.5842	12	12.00	0.70 (0.31 , 1.59) 0.3930	0.75 (0.32 , 1.74) 0.4978	1	1.00	0.45 (0.04 , 5.10) 0.5226	0.43 (0.04 , 5.13) 0.5079
3	87	34	39.08	0.80 (0.44 , 1.45) 0.4575	0.75 (0.40 , 1.42) 0.3832	17	19.54	1.25 (0.58 , 2.68) 0.5727	1.23 (0.55 , 2.76) 0.6162	3	3.45	1.61 (0.26 , 9.86) 0.6082	1.40 (0.21 , 9.30) 0.7291
4	61	28	45.90	1.06 (0.55 , 2.02) 0.8708	1.09 (0.54 , 2.19) 0.8021	10	16.39	1.01 (0.42 , 2.41) 0.9884	1.09 (0.43 , 2.77) 0.8483	3	4.92	2.33 (0.38 , 14.36) 0.3628	2.60 (0.39 , 17.56) 0.3258
5 (most)	32	13	40.63	0.85 (0.38 , 1.93) 0.6987	0.92 (0.38 , 2.21) 0.8441	4	12.50	0.73 (0.22 , 2.40) 0.6079	0.91 (0.26 , 3.18) 0.8779	0	0.00	0.00 (0.00 , ####) 0.9689	0.00 (0.00 , ####) 0.9395
Unknown£	0	0	0.00	-	-	0	0.00	-	-	0	0.00	-	-

α Invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

β Invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* iFOBT: immunochemical Faecal Occult Bloot Test

£ "Unknown" responses were coded as missing values

‡ Positive Predictive Value: percent of people with adenoma/advanced adenoma/cancer in those who had a positive iFOBT

ρ Includes WDHB other healthcare facility participants recorded in the BSP Register

† Adjusted for all other demographic variables (i.e. Age, Sex, Ethnicity and NZDep quintiles)

OR=odds ratio; CI=confidence interval

*** P-value < 0.0001 (very strong evidence); ** P-value < 0.01 (strong evidence); * P-value < 0.05 (some evidence)

Statistically higher than reference group

Statistically lower than reference group

Table 6. The Tumour/Node/Metastasis (TNM) stages of detected colorectal cancers

	Round 1[†]		Round 2[‡]		Round 2[‡] - Completed Round 1		Round 2[‡] - Completed Round 1 with negative iFOBT		Round 2[‡] - Did not complete Round 1		Round 2[‡] - Not invited in Round 1	
	n	Rate per 100,000	n	Rate per 100,000	n	Rate per 100,000	n	Rate per 100,000	n	Rate per 100,000	n	Rate per 100,000
Population	121567	-	62520	-	24596	-	24533	-	20756	-	17168	-
Total	212	174.4	53	84.8	27	109.8	27	110.1	17	81.9	9	52.4
Stages												
1	90	74.0	20	32.0	9	36.6	9	36.7	5	24.1	6	34.9
2	49	40.3	9	14.4	3	12.2	3	12.2	5	24.1	1	5.8
2a	42	34.5	7	11.2	2	8.1	2	8.2	4	19.3	1	5.8
2b	6	4.9	1	1.6	0	0.0	0	0.0	1	4.8	0	0.0
2c	1	0.8	1	1.6	1	4.1	1	4.1	0	0.0	0	0.0
3	44	36.2	13	20.8	9	36.6	9	36.7	4	19.3	0	0.0
3a	18	14.8	4	6.4	4	16.3	4	16.3	0	0.0	0	0.0
3b	21	17.3	8	12.8	5	20.3	5	20.4	3	14.5	0	0.0
3c	5	4.1	1	1.6	0	0.0	0	0.0	1	4.8	0	0.0
4	17	14.0	4	6.4	1	4.1	1	4.1	1	4.8	2	11.6
4a	4	3.3	2	3.2	0	0.0	0	0.0	1	4.8	1	5.8
4b	13	10.7	2	3.2	1	4.1	1	4.1	0	0.0	1	5.8
Unknown	12	9.9	7	11.2	5	20.3	5	20.4	2	9.6	0	0.0

† Includes WDHB and other healthcare facility participants recorded in the BSP Register with colorectal cancer detected between 01 Jan 2012 and 16 Sep 2015, invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

‡ Includes WDHB and other healthcare facility participants recorded in the BSP Register with colorectal cancer detected between 01 Jan 2014 and 16 Sep 2015, invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

Table 7. Adverse events (Readmissions within 30 days of BSP colonoscopy)

	Round 1[†]						Round 2[‡]					
	With histopathology		Without histopathology		Total		With histopathology		Without histopathology		Total	
	n	Rate per 1,000	n	Rate per 1,000	n	Rate per 1,000	n	Rate per 1,000	n	Rate per 1,000	n	Rate per 1,000
Colonoscopy completed	3402	-	1065	-	4467	-	1122	-	430	-	1552	-
Colonoscopy complications*	45	13.2	4	3.8	49	11.0	14	12.5	1	2.3	15	9.7
for perforation	4	1.2	1	0.9	5	1.1	1	0.9	0	0.0	1	0.6
for bleeding	27	7.9	0	0.0	27	6.0	6	5.3	0	0.0	6	3.9
for events other than perforation or bleeding	14	4.1	3	2.8	17	3.8	7	6.2	1	2.3	8	5.2

† Includes only WDHB healthcare facility participants in the BSP Register between 01 Jan 2012 and 16 Sep 2015, invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

‡ Includes only WDHB healthcare facility participants in the BSP Register between 01 Jan 2014 and 16 Sep 2015, invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

* Complications were prioritised by Perforation, Bleeding, and Other

Table 8. Time to colonoscopy

	Round 1[†]		Round 2[‡]		Round 2[‡] - Completed Round 1		Round 2[‡] - Completed Round 1 with negative iFOBT	
	n	%	n	%	n	%	n	%
Colonoscopy completed	4467	-	1552	-	922	-	917	-
≤4 weeks (i.e. ≤20 working days)	1032	23.1	866	55.8	531	57.6	526	57.4
≤8 weeks (i.e. ≤40 working days)	2339	52.4	490	31.6	283	30.7	283	30.9
≤11 weeks (i.e. ≤55 working days)	673	15.1	134	8.6	79	8.6	79	8.6
>11 weeks (i.e. >55 working days)	416	9.3	60	3.9	28	3.0	28	3.1
Unknown	7	0.2	2	0.1	1	0.1	1	0.1

† Includes only WDHB healthcare facility participants in the BSP Register between 01 Jan 2012 and 16 Sep 2015, invited between 01 Jan 2012 and 31 Dec 2013, and did not meet the exclusion criteria

‡ Includes only WDHB healthcare facility participants in the BSP Register between 01 Jan 2014 and 16 Sep 2015, invited between 01 Jan 2014 and 31 Dec 2014, and did not meet the exclusion criteria

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