Dr Alasdair Patrick

Gastroenterologist and General Physician
Middlemore Hospital
Auckland

Friday, June 9, 2017

(Room 1)

14:00 - 14:55 WS #50: The GP's Role in Bowel Cancer Screening in NZ

15:05 - 16:00 WS #62: The GP's Role in Bowel Cancer Screening in NZ (Repeated)

MacMurray
CENTRE
Digestive Diseases & Endoscopy

The only fully comprehensive Gastroenterology center in Auckland

- Opened in 2009
- Largest Gastro practice in NZ
  - 12 Gastroenterologists
  - 1 Hepatologist
  - 4 Surgeons
  - Dietician
- Full diagnostic facilities on site

Dr Alasdair Patrick
Gastroenterologist

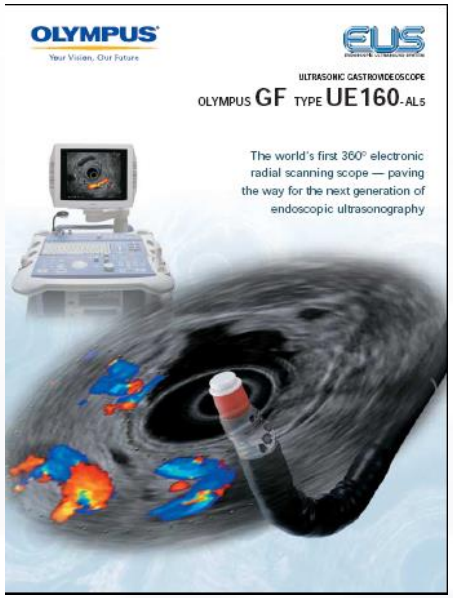
THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

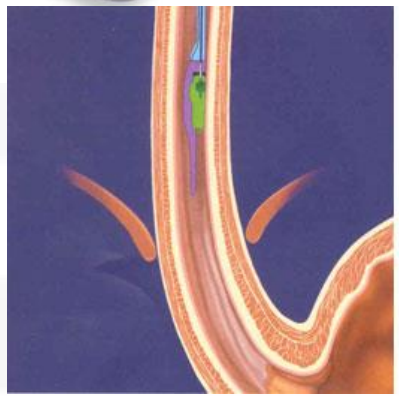
Royal Free Hampstead NHS
NHS Trust

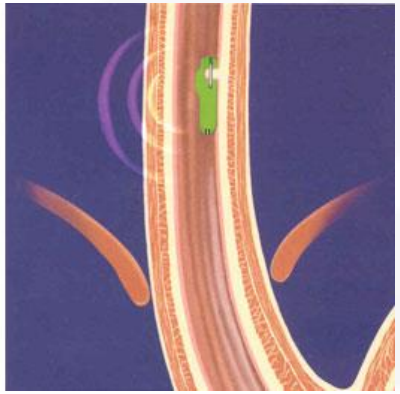
Singapore General Hospital
SingHealth

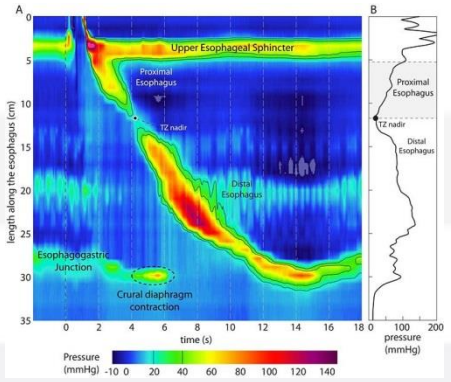
COUNTIES MANUKAU DISTRICT HEALTH BOARD
A Community Partnership

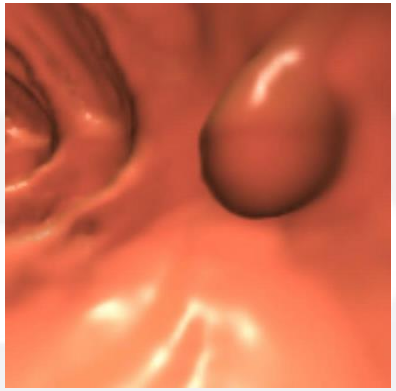
MacMurray CENTRE
Digestive Diseases & Endoscopy











Bowel cancer screening in NZ
The role of the GP

Workshop Fri 9th June: 1400-1455 and 1505-1600

Dr Alasdair Patrick

HOD- Gastroenterology Department CMDHB

Clinical lead- CMDHB bowel cancer screening

Director- MacMurray Centre

Gastroenterologist

COUNTIES MANUKAU DISTRICT HEALTH BOARD
A Community Partnership

MacMurray CENTRE
Digestive Diseases & Endoscopy

A preventable cancer!

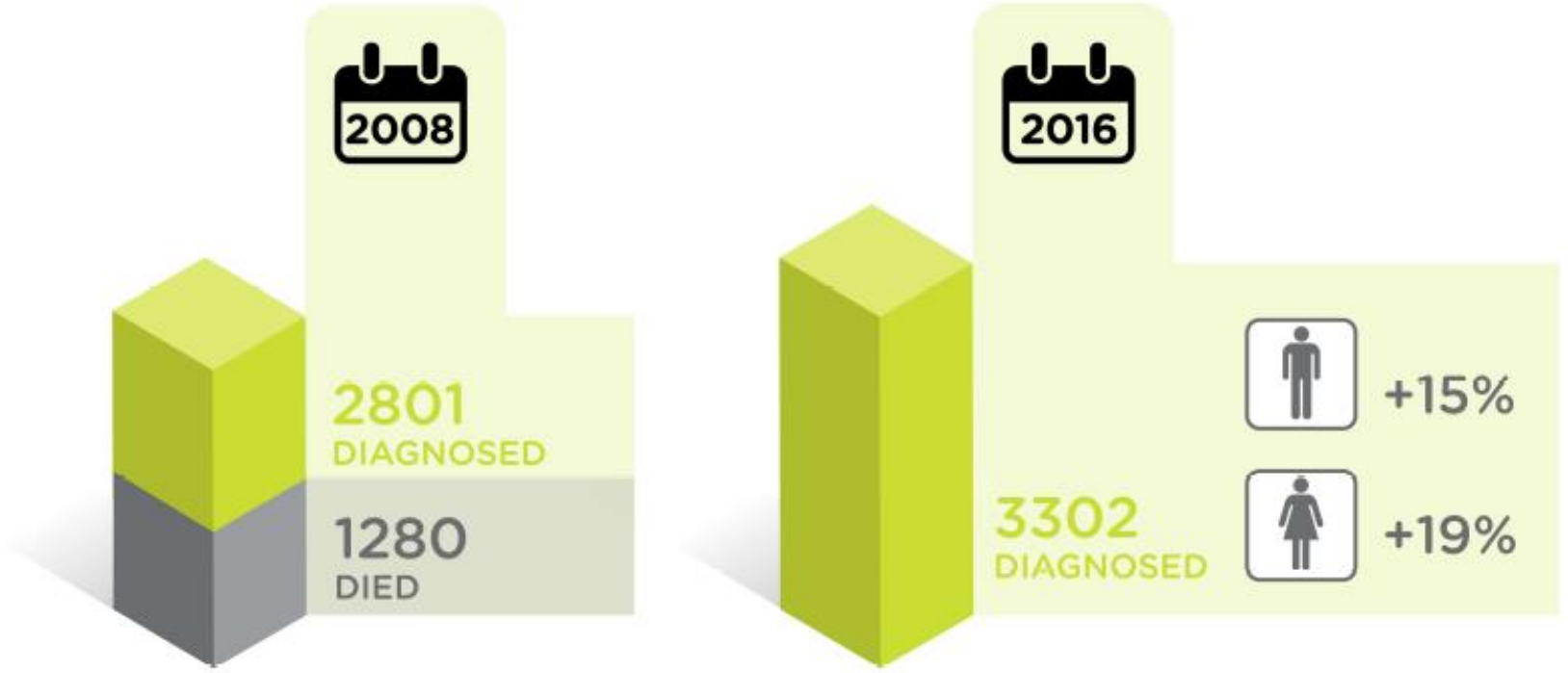
Outline

- The Past
  - Background of current situation in NZ
- The Present
  - Options for screening
  - What work has been done?
    - Workforce planning
    - Bowel screening pilot at WDHB
    - Cost of screening
- The future
  - Plan for National Screening

- GPs role in Bowel screening program (BSP)

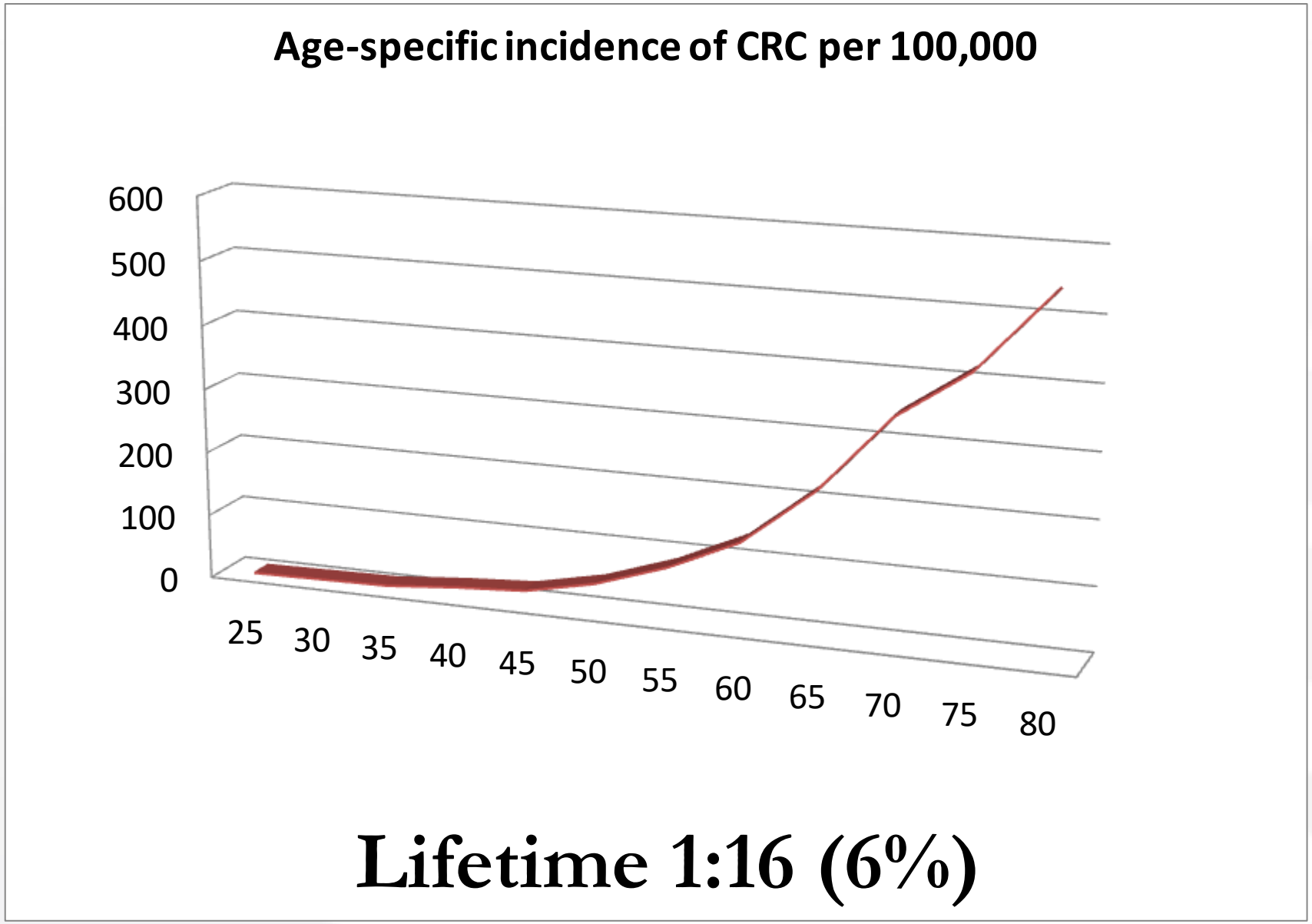

BACK
TO
THE
PAST

New Zealand bowel cancer statistics

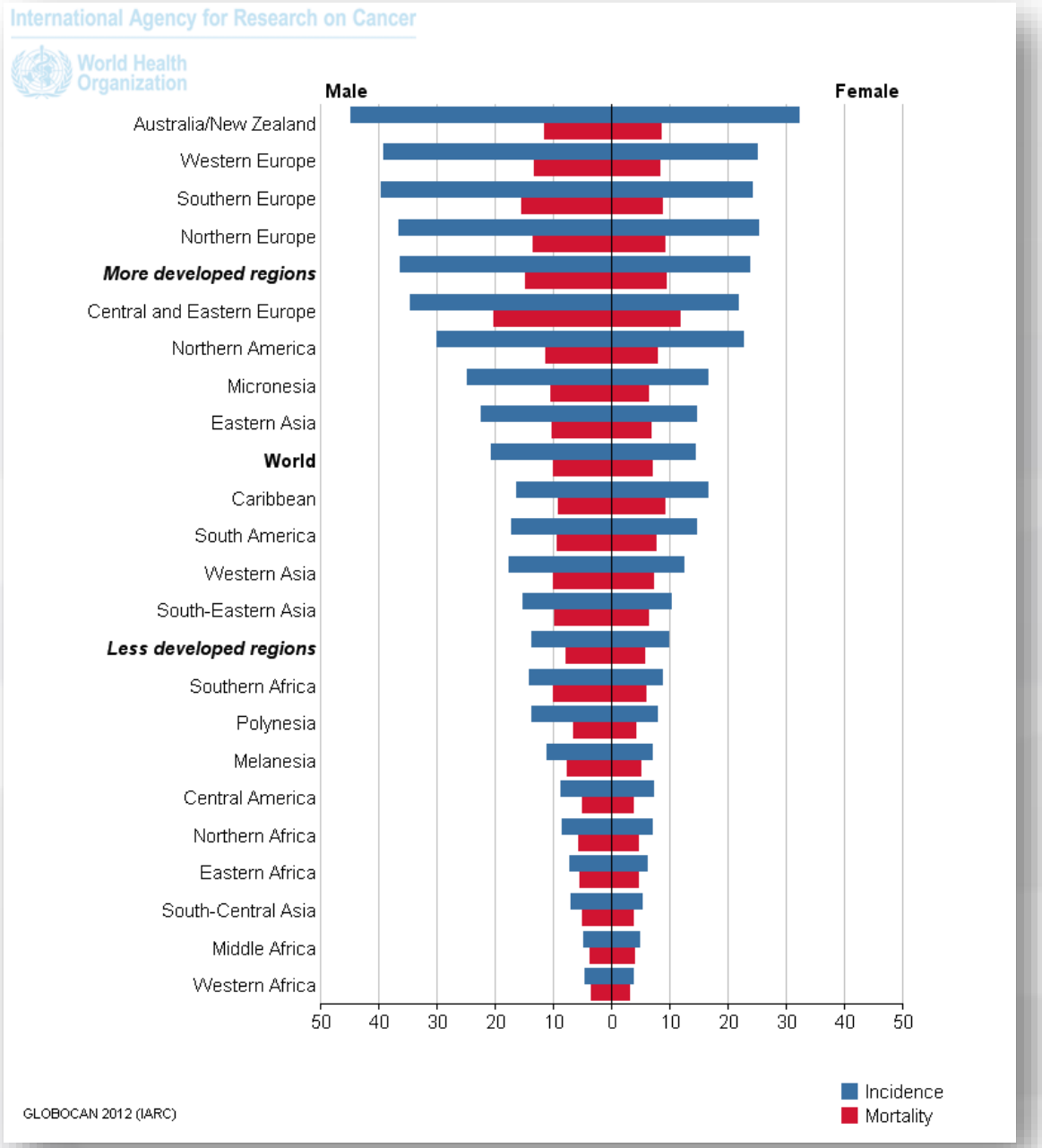


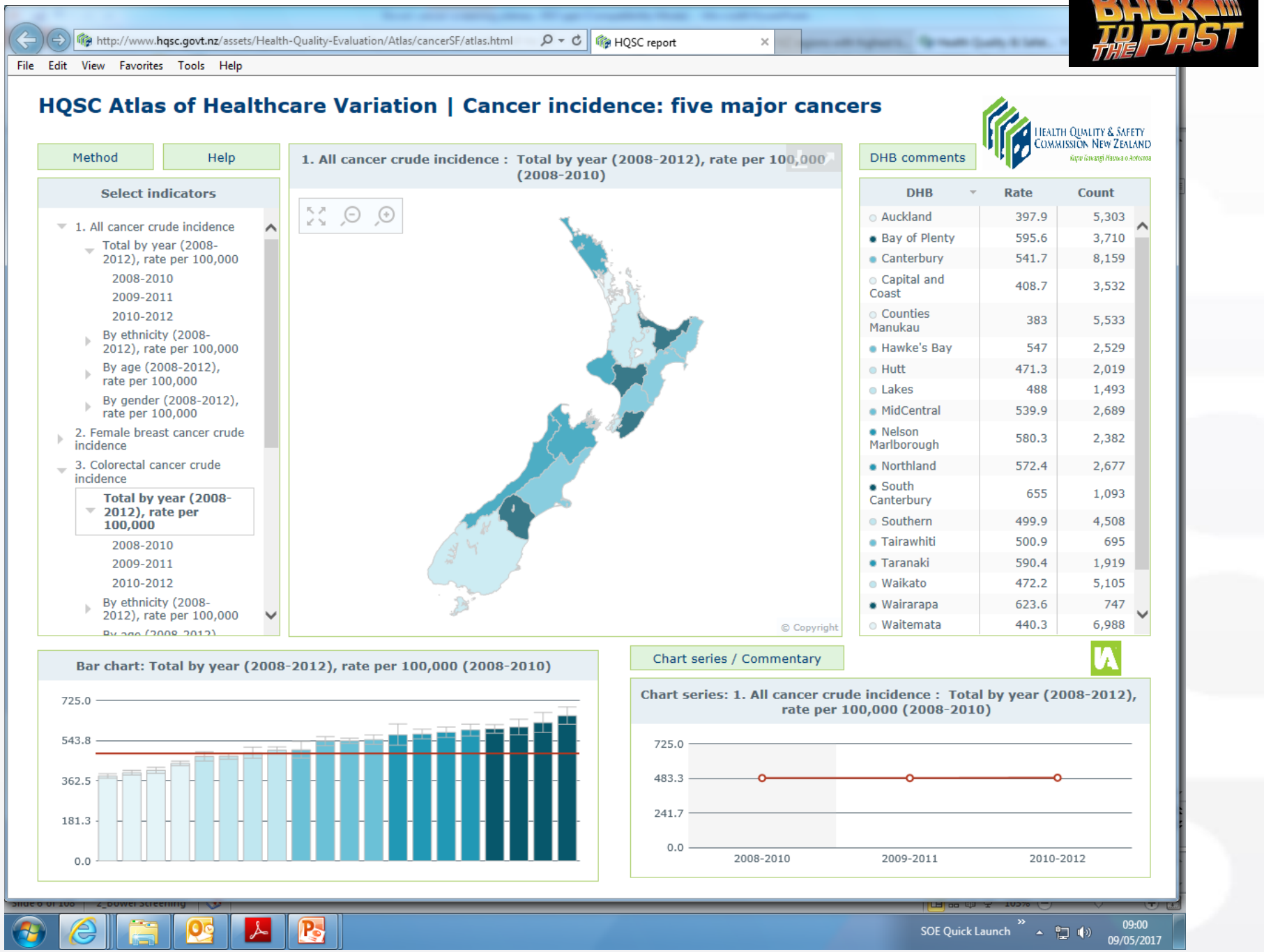
BowelScreening
Check Yourself Out

www.BowelScreeningWaitemata.co.nz | 0800 924 432



Lifetime 1:16 (6%)


International Agency for Research on Cancer
World Health Organization
Male
Female
Australia/New Zealand
Western Europe
Southern Europe
Northern Europe
More developed regions
Central and Eastern Europe
Northern America
Micronesia
Eastern Asia
World
Caribbean
South America
Western Asia
South-Eastern Asia
Less developed regions
Southern Africa
Polynesia
Melanesia
Central America
Northern Africa
Eastern Africa
South-Central Asia
Middle Africa
Western Africa
50 40 30 20 10 0 10 20 30 40 50
GLOBOCAN 2012 (IARC)
Incidence
Mortality


http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/cancerSF/atlas.html
HQSC report
File Edit View Favorites Tools Help
HQSC Atlas of Healthcare Variation | Cancer incidence: five major cancers
Health Quality & Safety Commission New Zealand
Method
Help
Select indicators
1. All cancer crude incidence
Total by year (2008-2012), rate per 100,000
2008-2010
2009-2011
2010-2012
By ethnicity (2008-2012), rate per 100,000
By age (2008-2012), rate per 100,000
By gender (2008-2012), rate per 100,000
2. Female breast cancer crude incidence
3. Colorectal cancer crude incidence
Total by year (2008-2012), rate per 100,000
2008-2010
2009-2011
2010-2012
By ethnicity (2008-2012), rate per 100,000
1. All cancer crude incidence : Total by year (2008-2012), rate per 100,000 (2008-2010)
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DHB comments
DHB Rate Count
Auckland 397.9 5,303
Bay of Plenty 595.6 3,710
Canterbury 541.7 8,159
Capital and Coast 408.7 3,532
Counties Manukau 383 5,533
Hawke's Bay 547 2,529
Hutt 471.3 2,019
Lakes 488 1,493
MidCentral 539.9 2,689
Nelson Marlborough 580.3 2,382
Northland 572.4 2,677
South Canterbury 655 1,093
Southern 499.9 4,508
Tairawhiti 500.9 695
Taranaki 590.4 1,919
Waikato 472.2 5,105
Wairarapa 623.6 747
Waitemata 440.3 6,988
Bar chart: Total by year (2008-2012), rate per 100,000 (2008-2010)
725.0
543.8
362.5
181.3
0.0
Chart series / Commentary
Chart series: 1. All cancer crude incidence : Total by year (2008-2012), rate per 100,000 (2008-2010)
725.0
483.3
241.7
0.0
2008-2010
2009-2011
2010-2012
SOE Quick Launch
09:00
09/05/2017

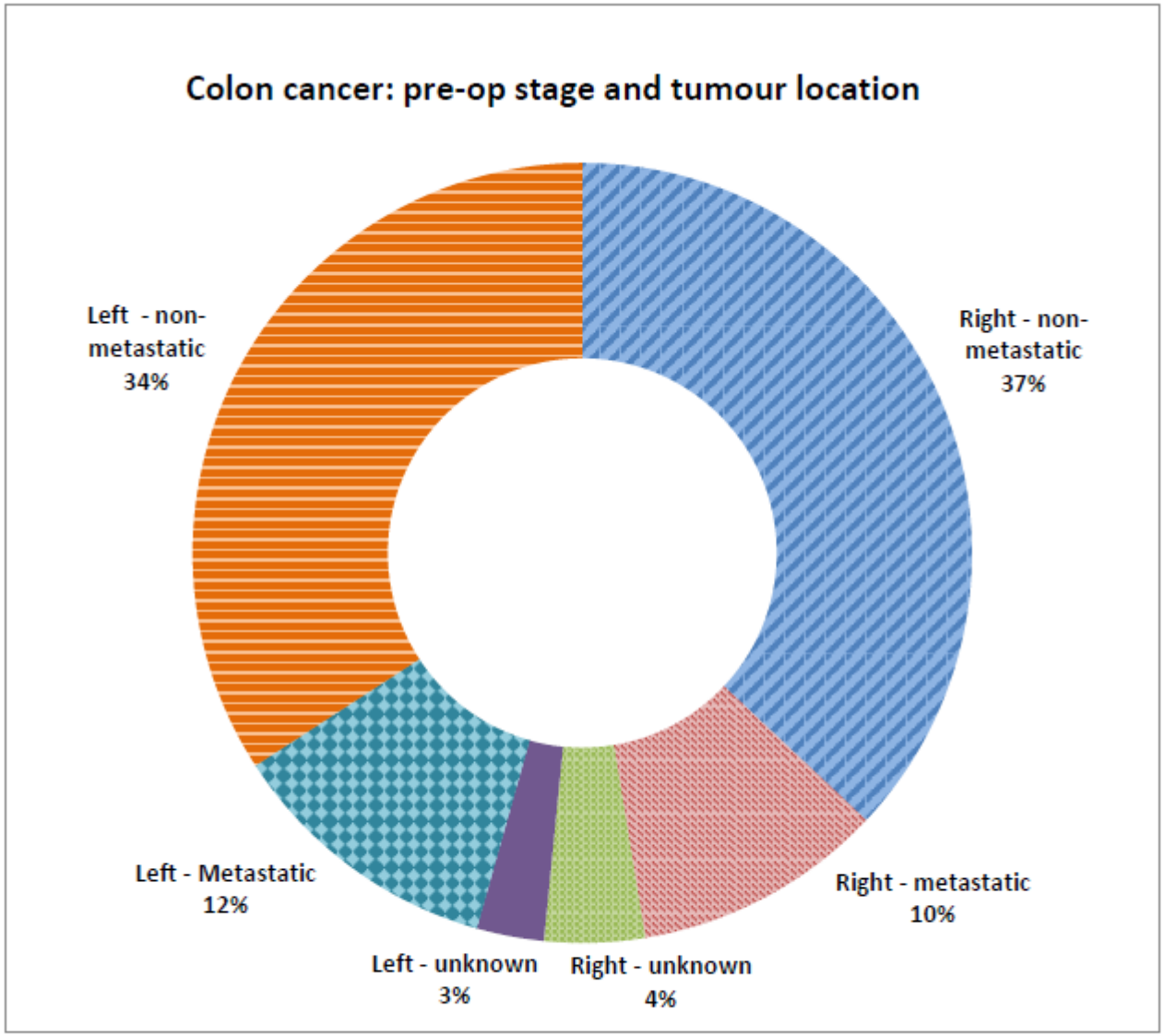


Figure 4.4-5 Doughnut plot of pre-op stage and tumour location for patients with colon cancer (excludes 44 patients where side of tumour was unknown).

Stage 1
94% 5 year survival

Stage 4
8% 5 year survival

Piper project. Findlay et al 2015

Piper project – Review 2015

Highlights: non-metastatic colon cancer – Surgical Treatment

95% of patients with non-metastatic colon cancer underwent resection of their primary

Endoscopic resection only was undertaken in 2% of cases

Complete excision was reported for 81% of cases

Median length of post-operative stay was 9 days

6% of patients had an unplanned return to theatre

Evidence of anastomotic leak was documented in 4% of patients with an anastomosis

30 day post-operative mortality was 3%, and 90 day post-operative mortality was 5%

There was no evidence of MDM discussion for 69% of patients

Piper project – Review 2015

Highlights: Metastatic CRC

52% of patients with metastatic disease had their primary resected

83% of those without primary tumour resection did not have a stoma.

Overall 7% of patients had liver resection and 1% of patients had lung resection for metastatic disease

Overall only 49% of patients with metastatic colorectal cancer received chemotherapy

Rural patients were more likely to receive chemotherapy than urban patients (unadjusted finding)

Overall for 59% of patients there was no evidence of discussion at an MDM

How have we managed risks historically in NZ?

Risk group	Increase in risk
Slight increase	≤ 2 x
Moderate increase	3 – 6 x
High risk	> 50% risk of CRC

Patients put in risk groups and guidelines are followed

Example of a case of Mrs Common

- 56 year old
- Fit and well
- Father diagnosed aged 56 with bowel cancer and died aged 57
- No other family history of note

- What risk category is she in?
- Would you advise her to be screened for bowel cancer?

Chapter 5. Familial risk

Category 1. Individuals with a slight increase in risk of colorectal cancer

Individuals with a slight increase in risk of colorectal cancer due to family history.

- One first-degree relative with colorectal cancer diagnosed over the age of 55 years.

No specific surveillance recommendations are made for this group at this time given the slight increase in risk, the uncertainty regarding the age at which this additional risk is expressed and the concern regarding the appropriateness of colonoscopy as a surveillance procedure in this group.	NZGG 2004	✓
Prompt investigation of lower bowel symptoms is advised.	NZGG 2004	✓
Individuals requesting information should be fully informed regarding their absolute risk of developing colorectal cancer and advised of the reasons for this recommendation.	NZGG 2004	✓

Category 2. Individuals with a moderate increase in risk of colorectal cancer		
Individuals with a moderately increased risk of colorectal cancer have one or more of the following: • one first-degree relative with colorectal cancer diagnosed under the age of 55 years • two first-degree relatives on the same side of the family with colorectal cancer diagnosed at any age.		
Offer colonoscopy every 5 years from the age of 50 years (or from an age 10 years before the earliest age at which colorectal cancer was diagnosed in the family, whichever comes first).	NZGG 2004	C
Fully inform individuals about their risk of developing colorectal cancer and the reason for this recommendation.	NZGG 2004	✓
Individuals should be informed that colonoscopy is generally a safe procedure, but it is an invasive procedure with some rare but recognised risks.	NZGG 2004	✓

Familial risk *continued*

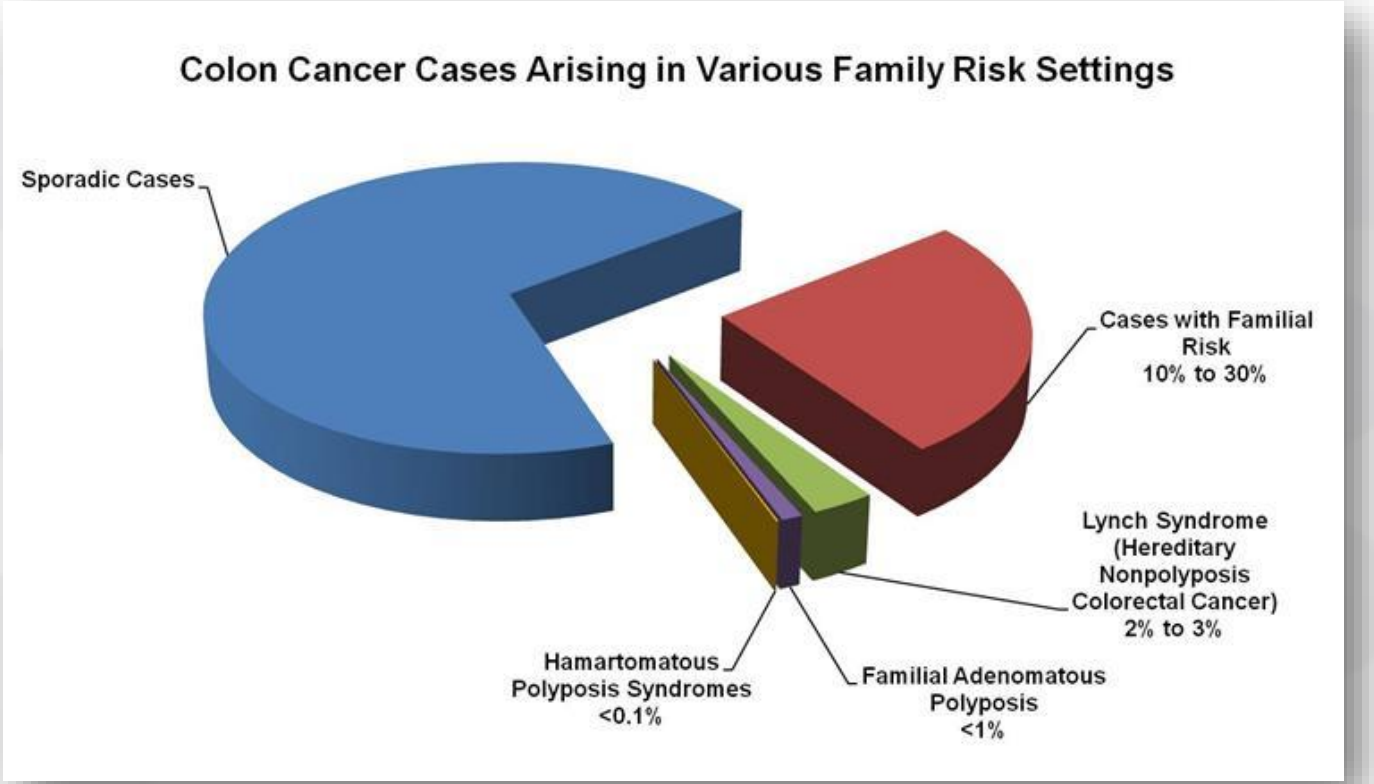
Category 3. Individuals with a potentially high risk of colorectal cancer

Individuals with a potentially high risk of risk of colorectal cancer have one or more of the following:

- a family history of familial adenomatous polyposis (FAP), hereditary non-polyposis colorectal cancer or other familial colorectal cancer syndromes
- one first-degree relative plus two or more first- or second-degree relatives all on the same side of the family with a diagnosis of colorectal cancer at any age
- two first-degree relatives, or one first-degree relative plus one or more second degree-relatives, all on the same side of the family with a diagnosis of colorectal cancer and one such relative:
  - was diagnosed with colorectal cancer under the age of 55 years or
  - developed multiple bowel cancers, or
  - developed an extracolonic tumour suggestive of hereditary non-polyposis colorectal cancer (ie, endometrial, ovarian, stomach, small bowel, renal pelvis, pancreas or brain)
- at least one first- or second-degree family member diagnosed with colorectal cancer in association with multiple bowel polyps
- a personal history or one first-degree relative with colorectal cancer diagnosed under the age of 50, particularly where colorectal tumour immunohistochemistry has revealed loss of protein expression for one of the mismatch repair genes (MLH1, MSH2, MSH6 and PMS2)
- a personal history or one first-degree relative with multiple colonic polyps.

Refer to: • a cancer genetic service or the New Zealand Familial Gastrointestinal Cancer Registry • a bowel cancer specialist to plan appropriate surveillance and management.	NZGG 2011	✓

Does our focus on familial risk help?



It is important not to forget the risks factors in sporadic cases!

Box 5.2 Key risk factors for colorectal cancer

- Personal history of colorectal cancer, colorectal adenomas or longstanding extensive ulcerative colitis[i]
- Family history of familial adenomatous polyposis (FAP), hereditary non-polyposis colorectal cancer (HNPCC) or other familial colorectal cancer syndromes[i]
- Inactive lifestyle[ii]
- Obesity[ii]
- Alcohol[ii]
- Smoking[ii]

Sources:

i New Zealand Guidelines Group. Surveillance and management of groups at increased risk of colorectal cancer. Wellington: NZGG; 2004.

ii Australian Cancer Network Colorectal Cancer Guidelines Revision Committee. Guidelines for the prevention, early detection and management of colorectal cancer. Sydney: The Cancer Council Australia and Australian Cancer Network; 2005.

Guideline — Physical activity and obesity
Engage in moderate to vigorous physical activity for 30–60 minutes/day, and avoid excessive weight gain. Weight should be maintained in the healthy weight range of BMI

Guideline — Tobacco smoking
Avoid tobacco smoking

Guideline — Energy Intake
Limit energy intake in most men to <2500 calories (10,480 kJ) per day and in most women to <2000 calories (8360 kJ) per day.

Guideline — Alcohol
Alcohol consumption should be limited or avoided. For people who do drink alcohol, recommended amounts for men are no more than 2 standard drinks per day and for women no more than one standard drink a day.

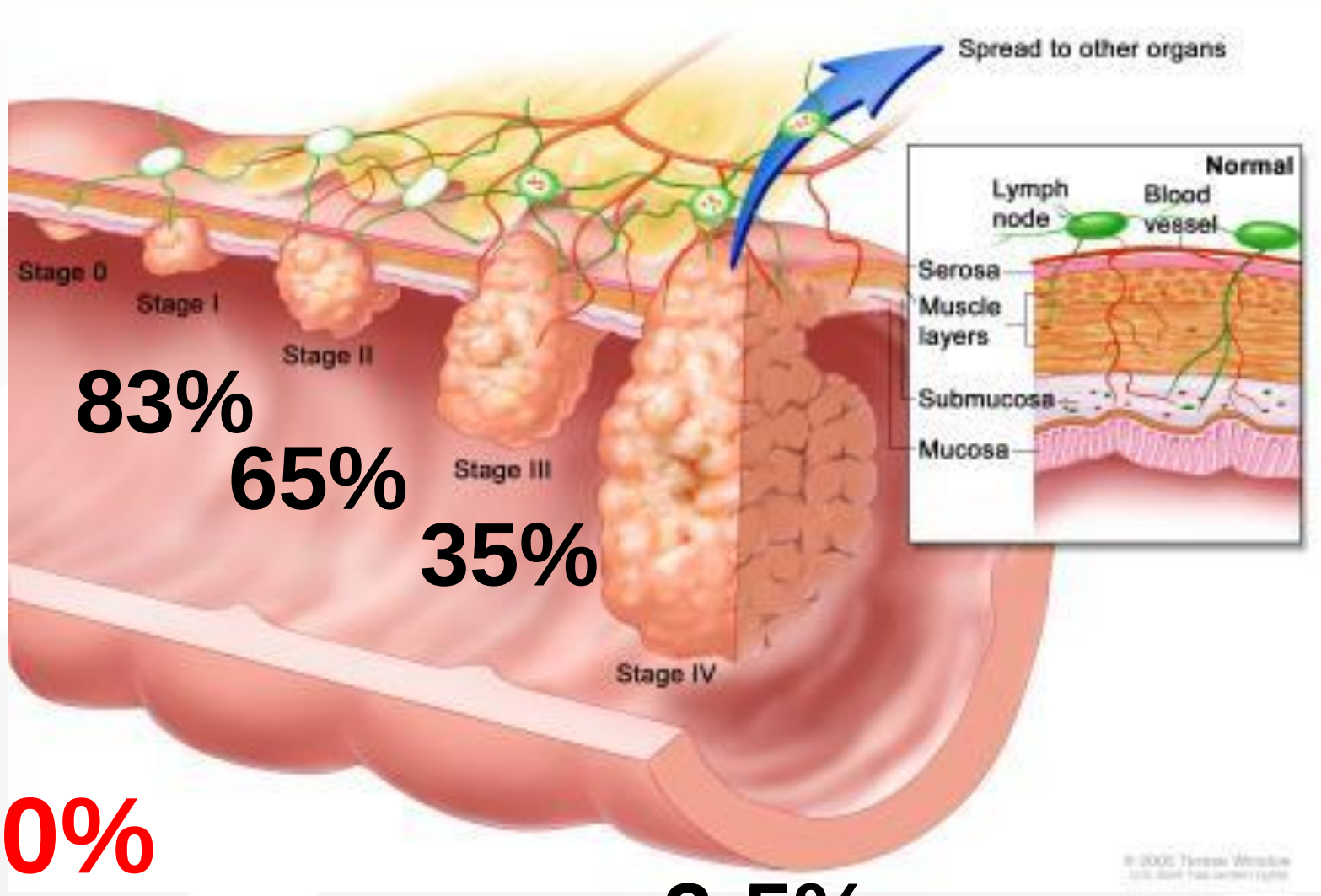
What should we do with average risk individuals?

Definition of a screening

A strategy used in a population to detect a disease in individuals without signs or symptoms of that disease

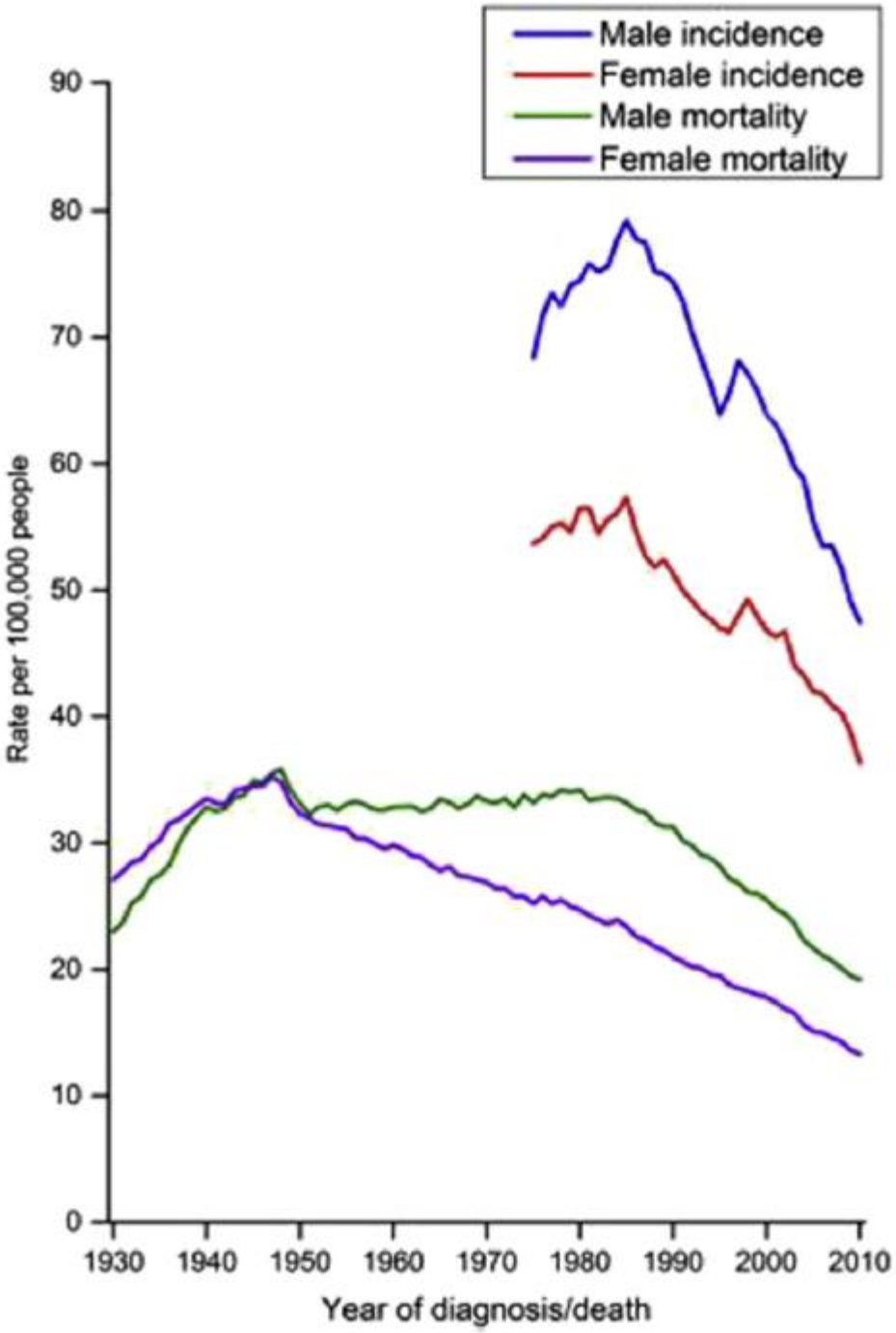
- Aim is to detect early disease to enable timely intervention and therefore to lower mortality and morbidity

Is bowel cancer a good target for screening?


Spread to other organs
Normal
Lymph node
Blood vessel
Serosa
Muscle layers
Submucosa
Mucosa
Stage 0
Stage I
Stage II
Stage III
Stage IV
83%
65%
35%
100%
3-5%

Should NZ screen?

- NZ has the highest rate of bowel cancer in the world
  - 3000+ cases per year
  - 1200 deaths per year
    - Maori 30% more likely to die
- Screening reduces mortality by 16-90%
- 80 cases are expected do be discovered in each DHB in the first year (From BSP data)



Decline in USA from screening

Obuch et al

Options for screening!

1. Detect cancer
   - Stool tests
     - Most polyps never bleed
2. Detect pre-cancerous lesions
   - CT colonography
   - Colon capsule
   - Colonoscopy
   - Flexible sigmoidoscopy
   - Others

Detecting cancer: Stool samples

Fecal occult blood (FOB)

- 4/100 are equivocal
  - False positive dramatically increase the cost
- 2/100 are abnormal
- Sensitivity for cancer less than half
  - Gives false reassurance
- “it is a crap test”

UK gFOB screening program

- Results in reduction in CCC mortality of 16% (RR 0.84, CI 0.77-0.93)
- If 10,000 people offered, 2/3 uptake=8.5 deaths prevented in 10 years

- Cost dramatically increased with false negatives requiring colonoscopy

Detecting cancer: Stool samples

Fecal immunochemical test (iFOBT)

- Detects the globin part of Hb
- Require only one sample
- Are quantitative so sensitivity can be ‘set’
- Higher sensitivity (approximately 70%)
  - Less false positives
  - May detect advanced adenomas

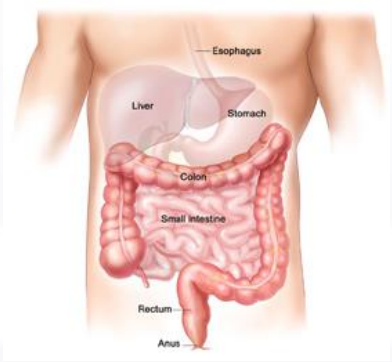
- Does not pick up most polyps

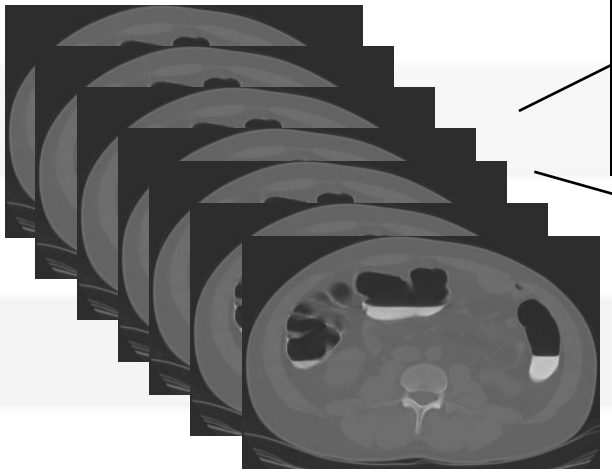
This is what NZ pilot used

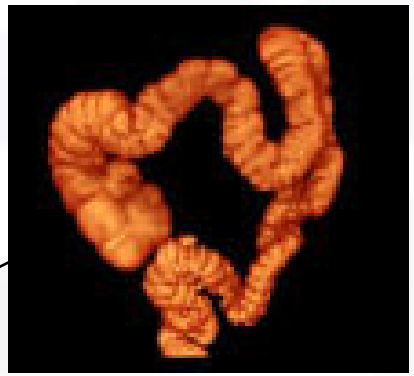
Australia based iFOBT

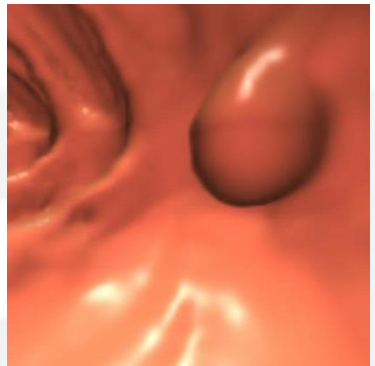
Detect 70% of cancers and reduce deaths by 36%

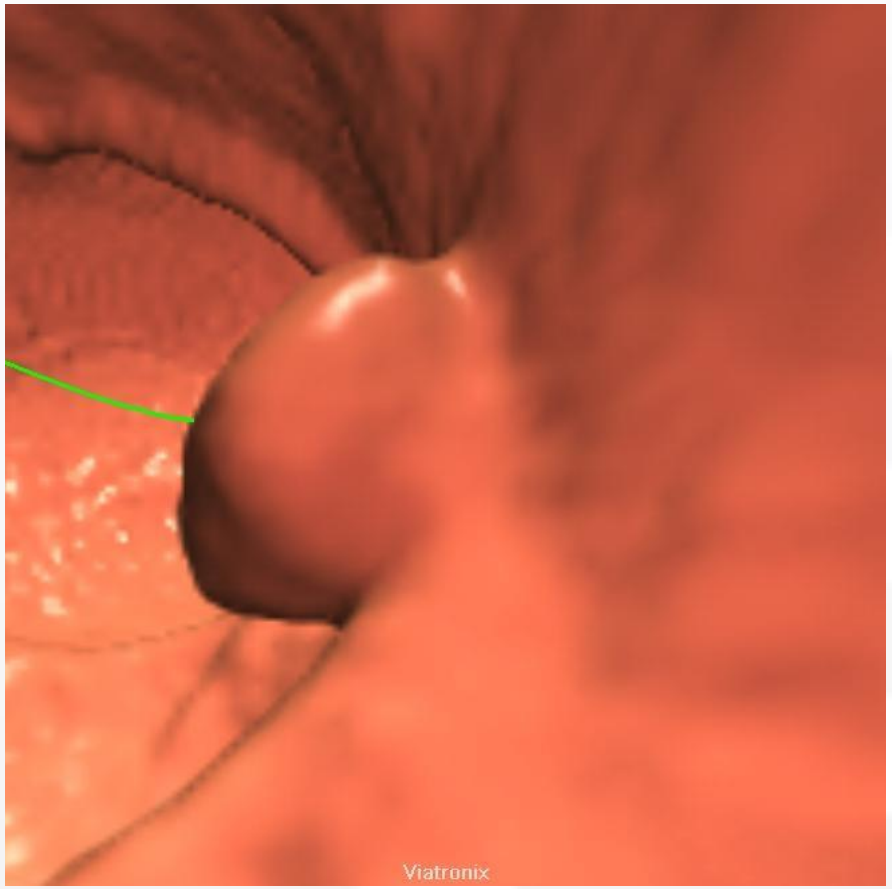
Detecting pre-cancer lesions:
CT colonography

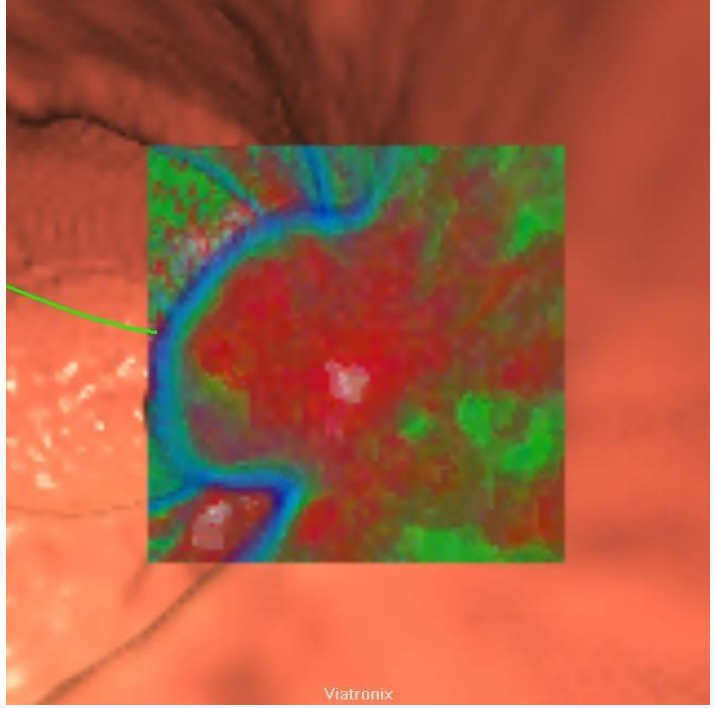


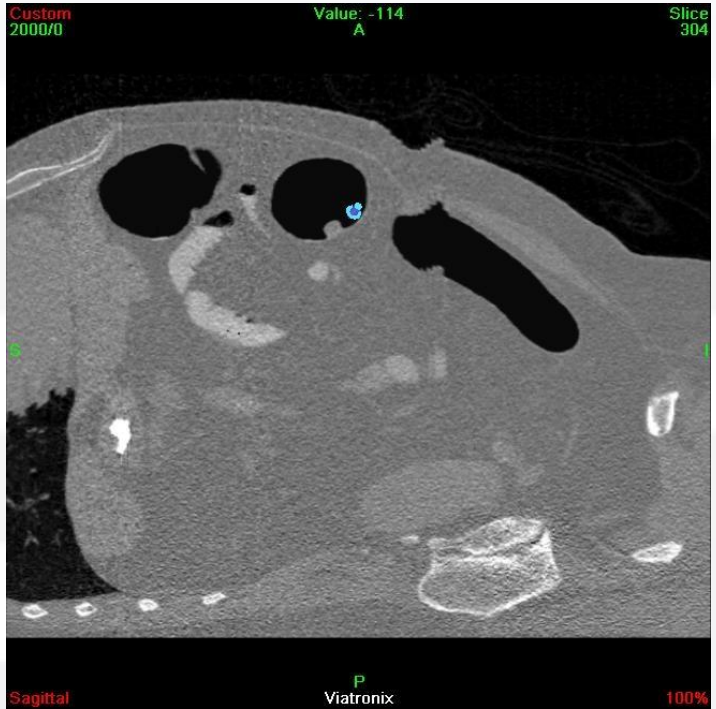







Viatronix


Viatronix


Custom
2000/0
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A
Slice
304
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I
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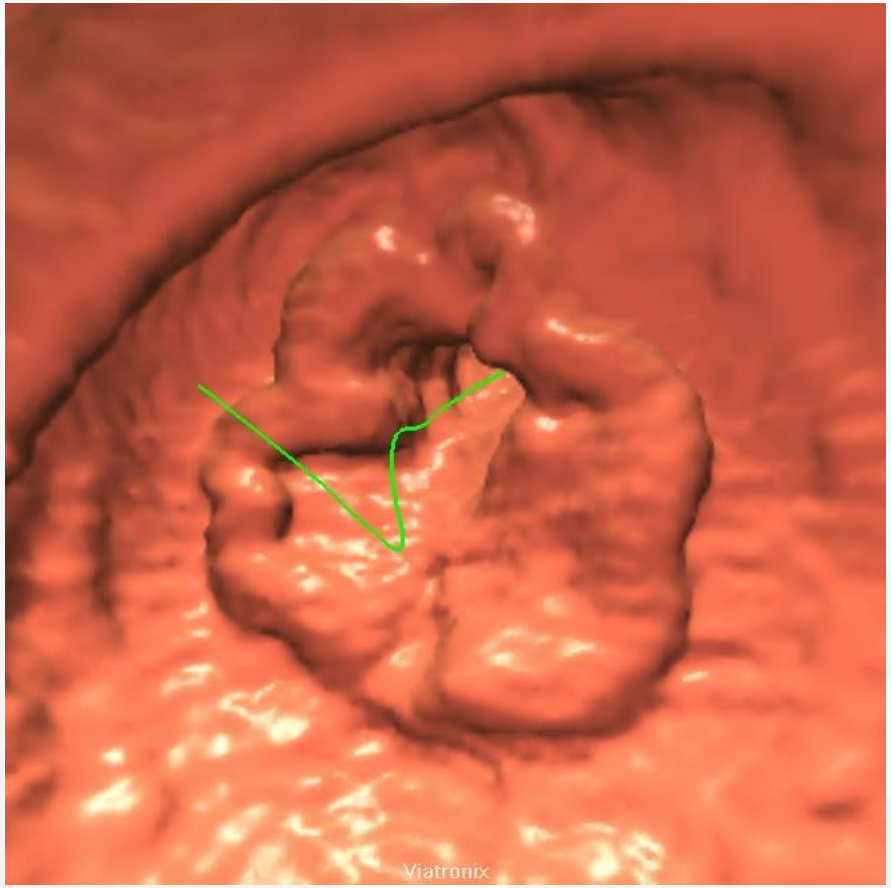
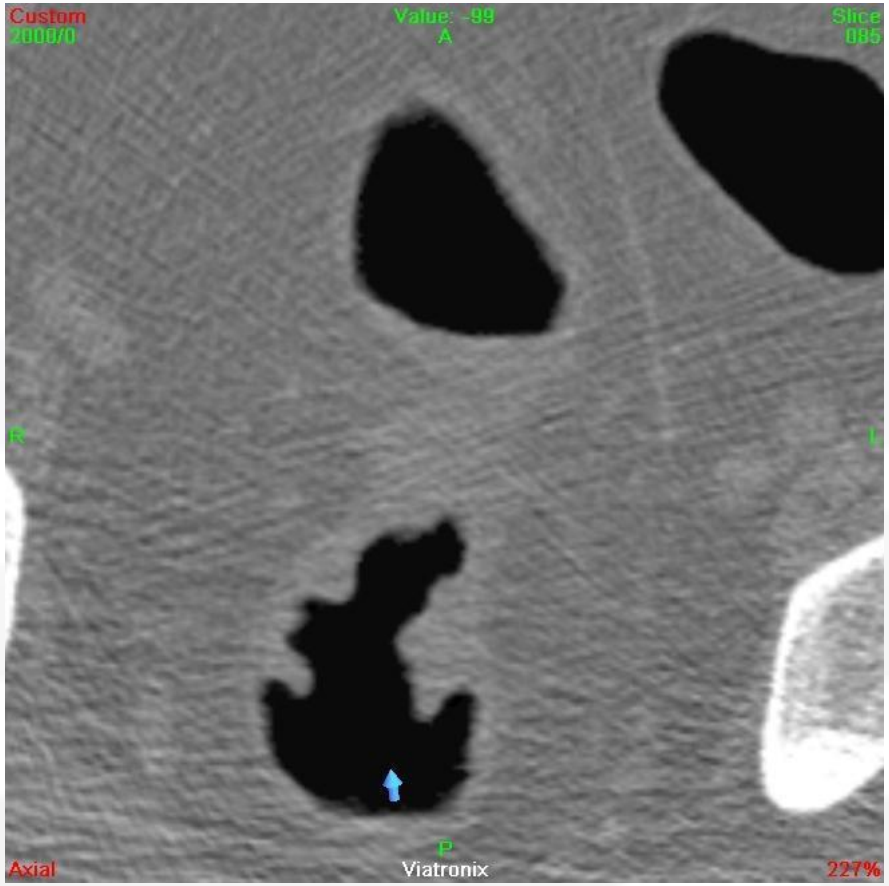
Sagittal
Viatronix
100%


Viatronix


Custom
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Slice
085
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Axial
Viatronix
227%

CTC

Potential advantages

- Unsedated
- Safe
  - no perforation with CO_2
- 100% caecal visualisation, >99% mucosal visualisation
- Stricture fly-through

Potential disadvantages

- Radiation dose 2-3mSv
- Radiology also stretched
- Bowel prep required
- Extra-intestinal findings
- Only diagnostic

CTC now!

Very contentious

- Many vested interests

Not recommended by the FDA or any other screening program

Concerns regarding radiation exposure

Colon capsule

4 images/s for 10 hours

Delayed activation

Colon capsule

- Landmark study published Gossum et al NEJM 2009
- 328 patients
  - Advanced adenomas 73%
  - Cancers 14/19

Colon capsule

Main issue is bowel prep (4L plus 2 fleet and meds)

Concerns re cost

- Disposable cost
- Reading time
- Colonoscopy may be needed

Screening RCT in Spain 2015

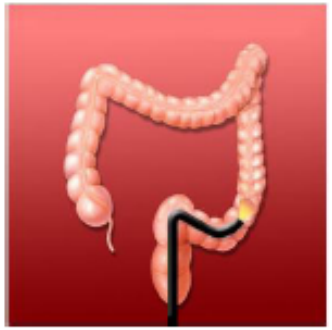
Adherence better with colonoscopy

UK Flexible Sigmoidoscopy Screening Trial

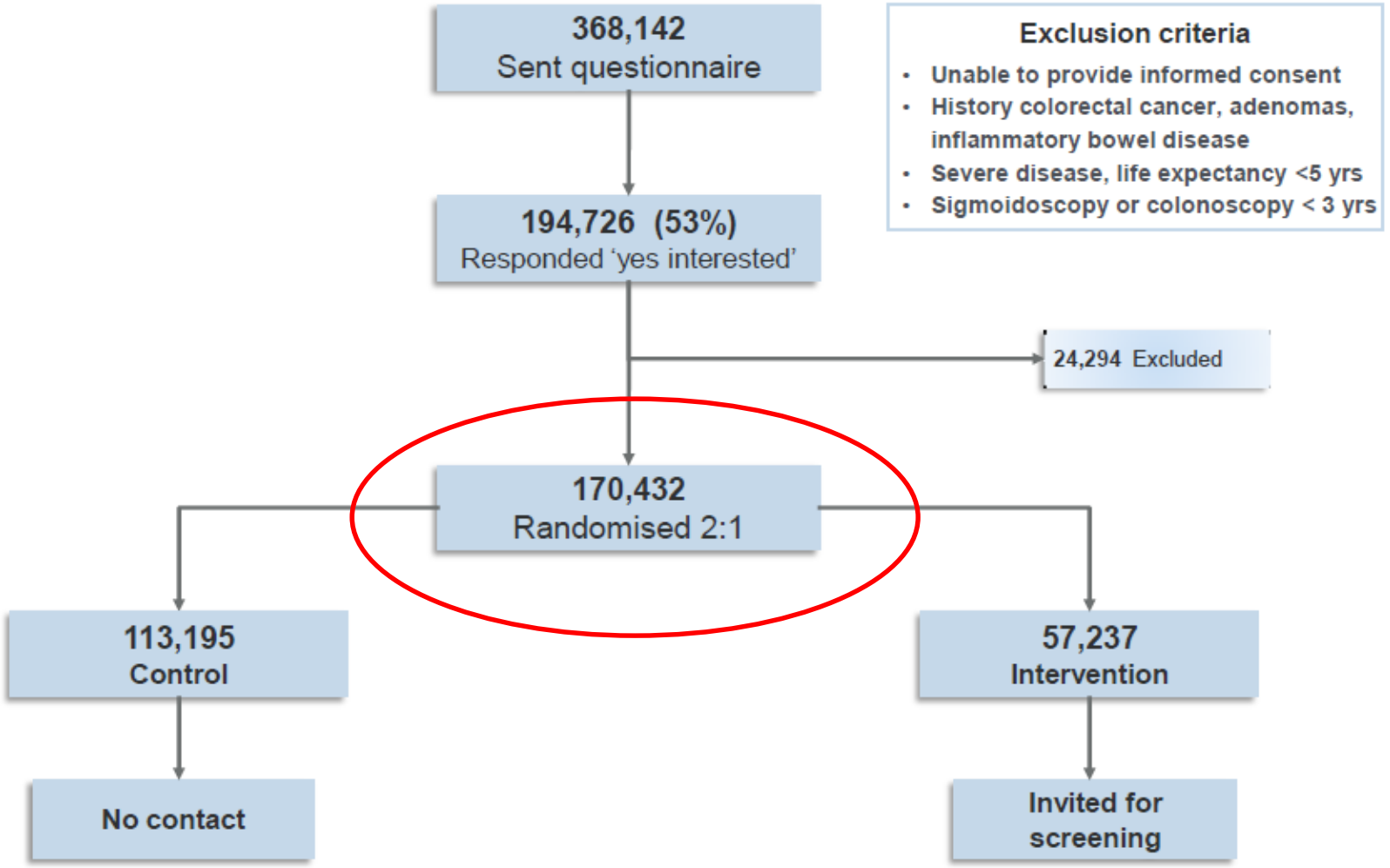
Examine efficacy and duration of effect of:

- a once-only flexible sigmoidoscopy screen between ages 55 and 64 years
- removal of small polyps (< 10 mm) during screening
- colonoscopy only for high-risk adenomas:

  ≥3, ≥ 10 mm, ≥ 25% villous, high grade dysplasia

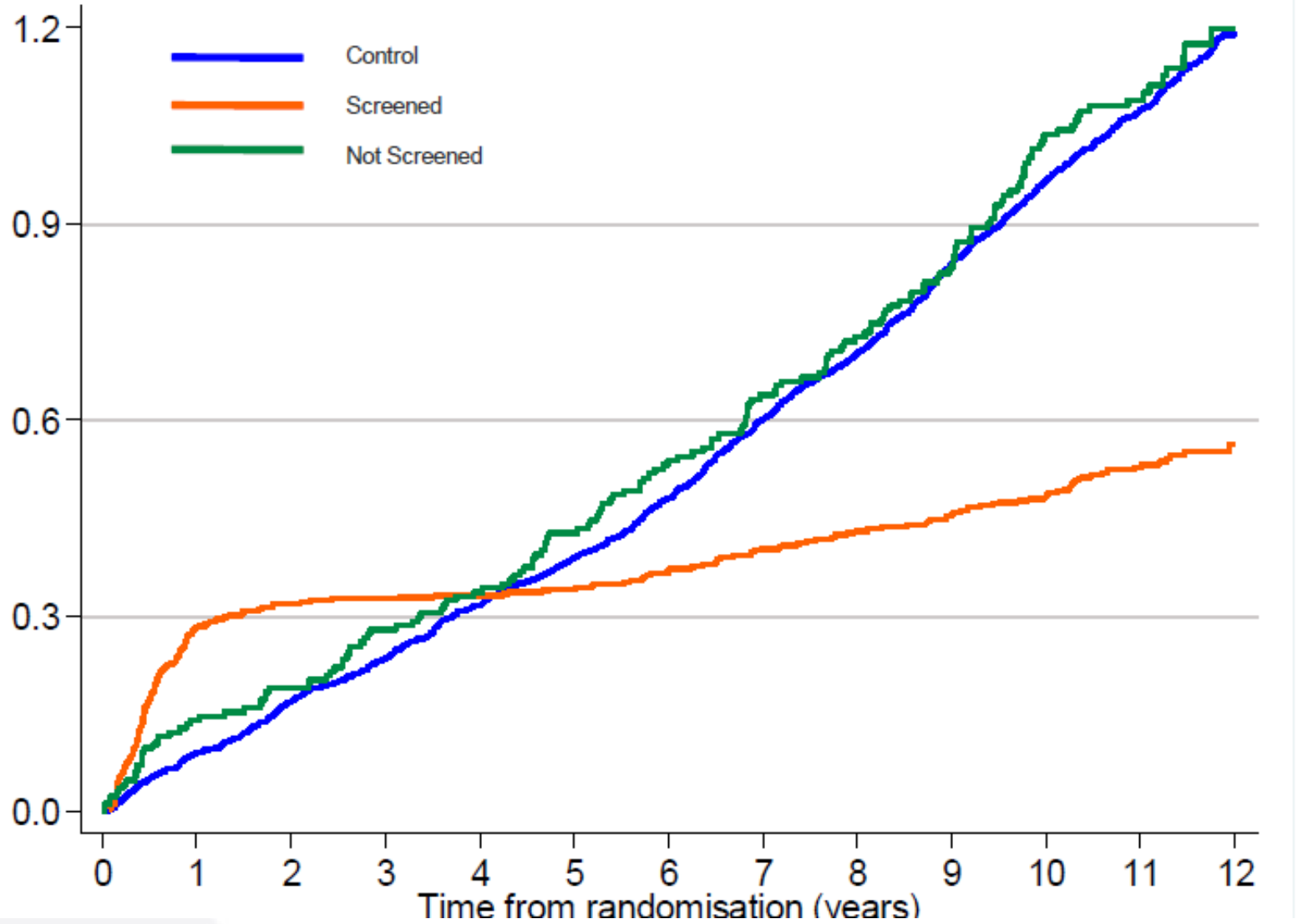


Trial recruitment



Atkin et al. Lancet. 2010;375: 1624-33

Cumulative incidence distal cancer (%)



Situation now in UK

This has been added as option to screening program

Changing gFOB to FIT

High uptake may bias these results

Modeling in NZ suggests

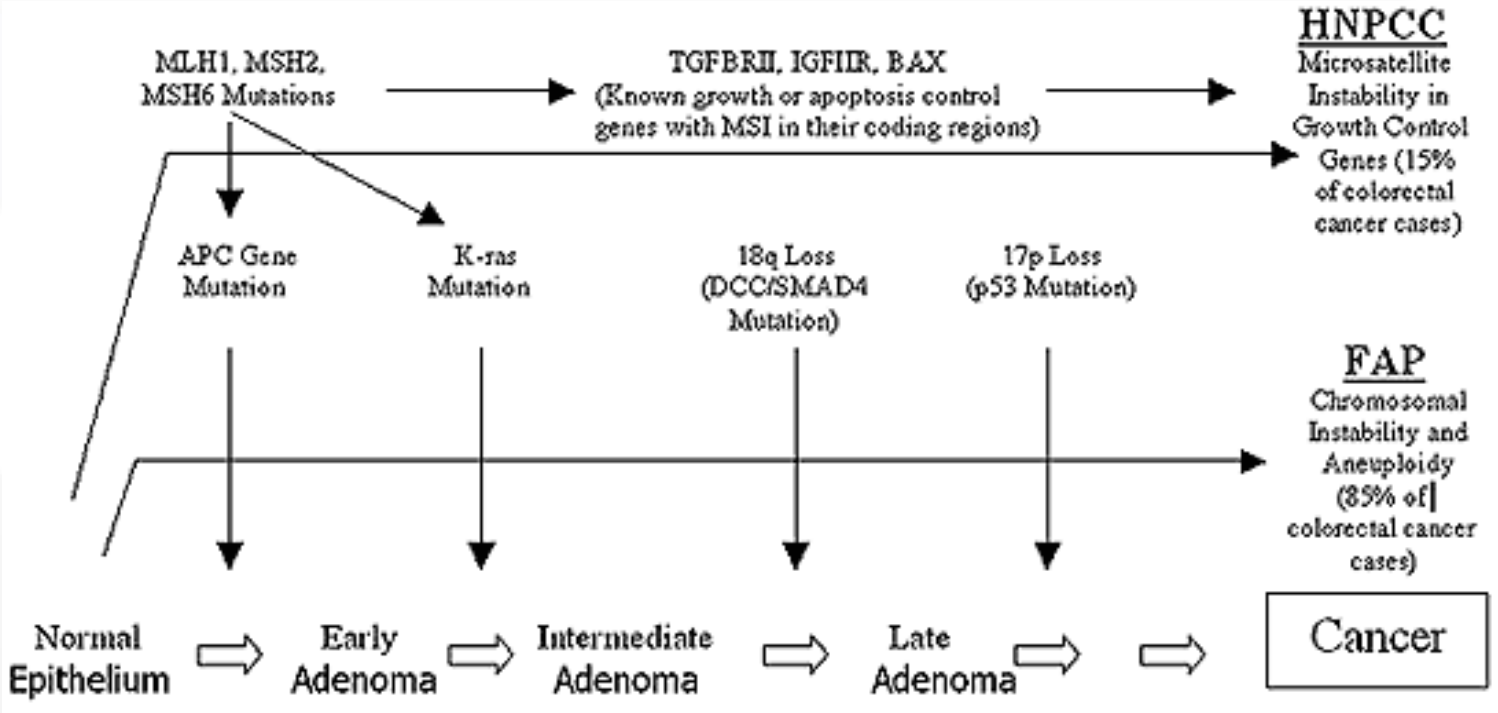
- Single sigmoidoscopy is cheapest option and reduce CRC deaths by 16%
- FIT most cost effective and reduce CRC deaths by 27%

Sarfati et al NZMJ 2016

Colonoscopy

- The gold standard
- Safe but small risks (1/1000)
- Diagnostic and therapeutic
- If started by age 50 reduce CRC by 90%
    - NEJM 329: 1993
- The only recommended method in USA
- Germans started in 2002 aged 55-79
    - First 9 years prevented estimated 180,000 cancers (4.4m)
    - 1/28 colonoscopy prevented a cancer
- Expensive on a population basis

Future directions



None validated yet

The future?

Gut Online First, published on January 31, 2011 as 10.1136/gut.2010.218305

PRESS RELEASE

Colorectal cancer screening with odour material by canine scent detection

Hideto Sonoda,[1,6] Shunji Kohnoe,[1,6] Tetsuro Yamazato,[2] Yuji Satoh,[3] Gouki Morizono,[4] Kentaro Shikata,[5] Makoto Morita,[6] Akihiro Watanabe,[6] Masaru Morita,[1] Yoshihiro Kakeji,[1] Fumio Inoue,[4] Yoshihiko Maehara[1]

Sensitivity 0.91, specificity 0.99

What test for screening do other countries use?

47 countries with existing screening programs

- 28 use FIT
- 10 use gFOBT
- 7 use mixed modalities
- 1 uses colonoscopy
- 1 region in Italy uses FS

What has been done so far?

- Workforce planning
- Workforce challenges are being addressed
  - Nurse endoscopists
  - More Gastroenterology trainees
  - NZSOG in process of setting up quality assurance and accreditation framework

WDHB Bowel Screening Pilot

The first 6 years…

NZ Bowel Screening Pilot (BSP)

- iFOB (OC-sensor, Eiken) selected
- Competitive RFP won by WDHB with support of ADHB and CMDHB
- Details of the program
  - WDHB residents
  - 50 – 74 years of age
  - Commenced October 17th 2011 until Dec 2015
  - Two 2-year screening cycles
- Extended for another 2 years

Exclusion Criteria

- Colonoscopy in the last five years
- Previous colorectal cancer and/or in a surveillance program
- Patients with known IBD

Waitemata
District Health Board
Best Care for Everyone

Colonoscopy in BSP

-organizational aspects

Dedicated screening unit with separate governance

Quality of procedure guarantee

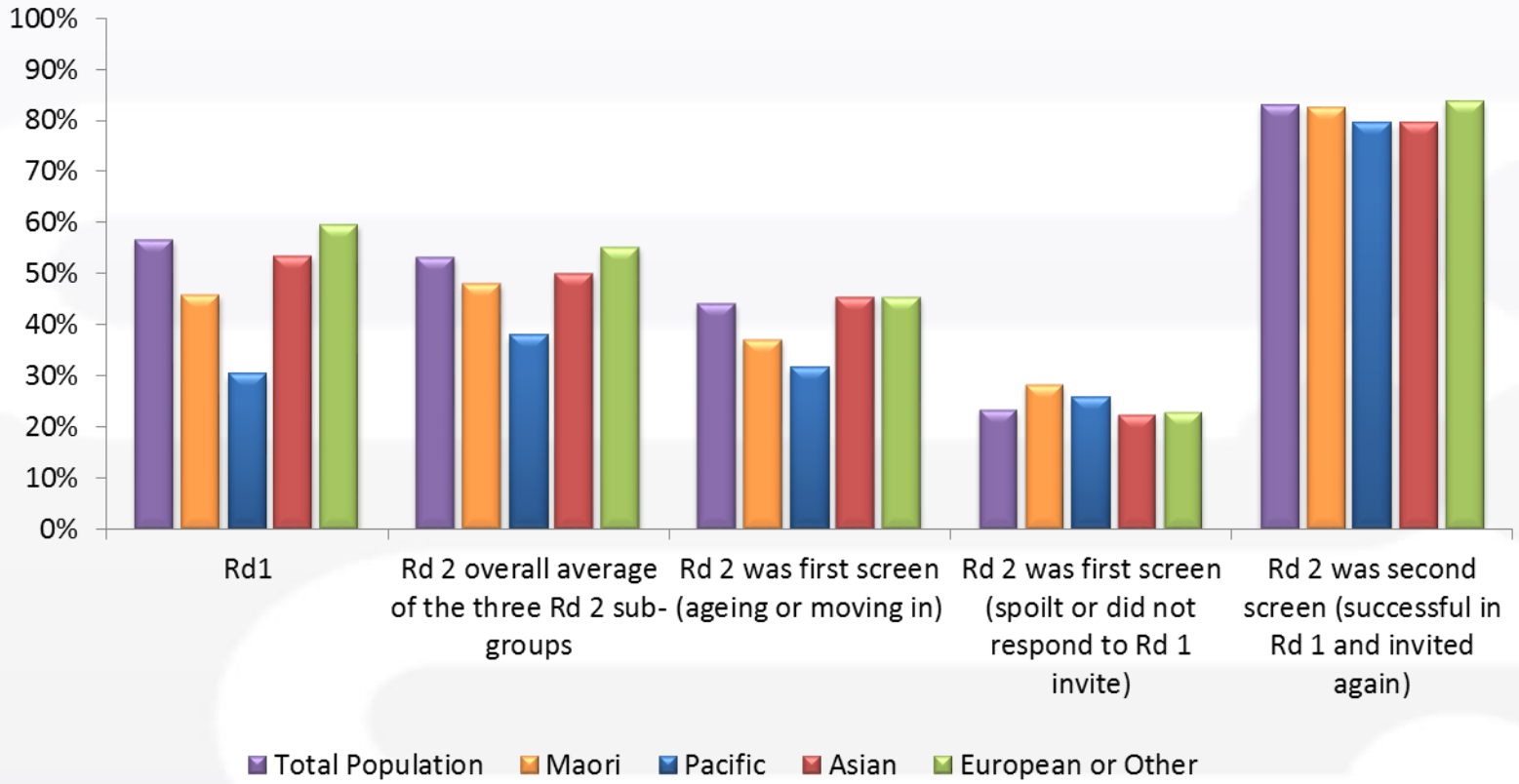
Colonoscopists needed audited completion rates of >90% with mean withdrawal times of >6minutes to enter programme with 100 procedures in prior 12 months

Failed colonoscopies undergo CT colonography

Lead endoscopist provides 3 monthly feedback to endoscopists

Fortnightly quality meeting to review complications (patients admitted within 30 days of colonoscopy)

BSP Results:
Uptake of screening by ethnicity



Round 1 results:

Waitemata District Health Board
Best Care for Everyone

Between 1 January 2012 and 31 December 2013:*

- Coverage 97.5% (based on census data)
- The programme participation rate was 56.8% (aim 60%)
- Overall positivity rate was 7.5% (6 to 8)
- 96% of those with a +ve FIT went to colonoscopy

* Data pulled Sept 2015

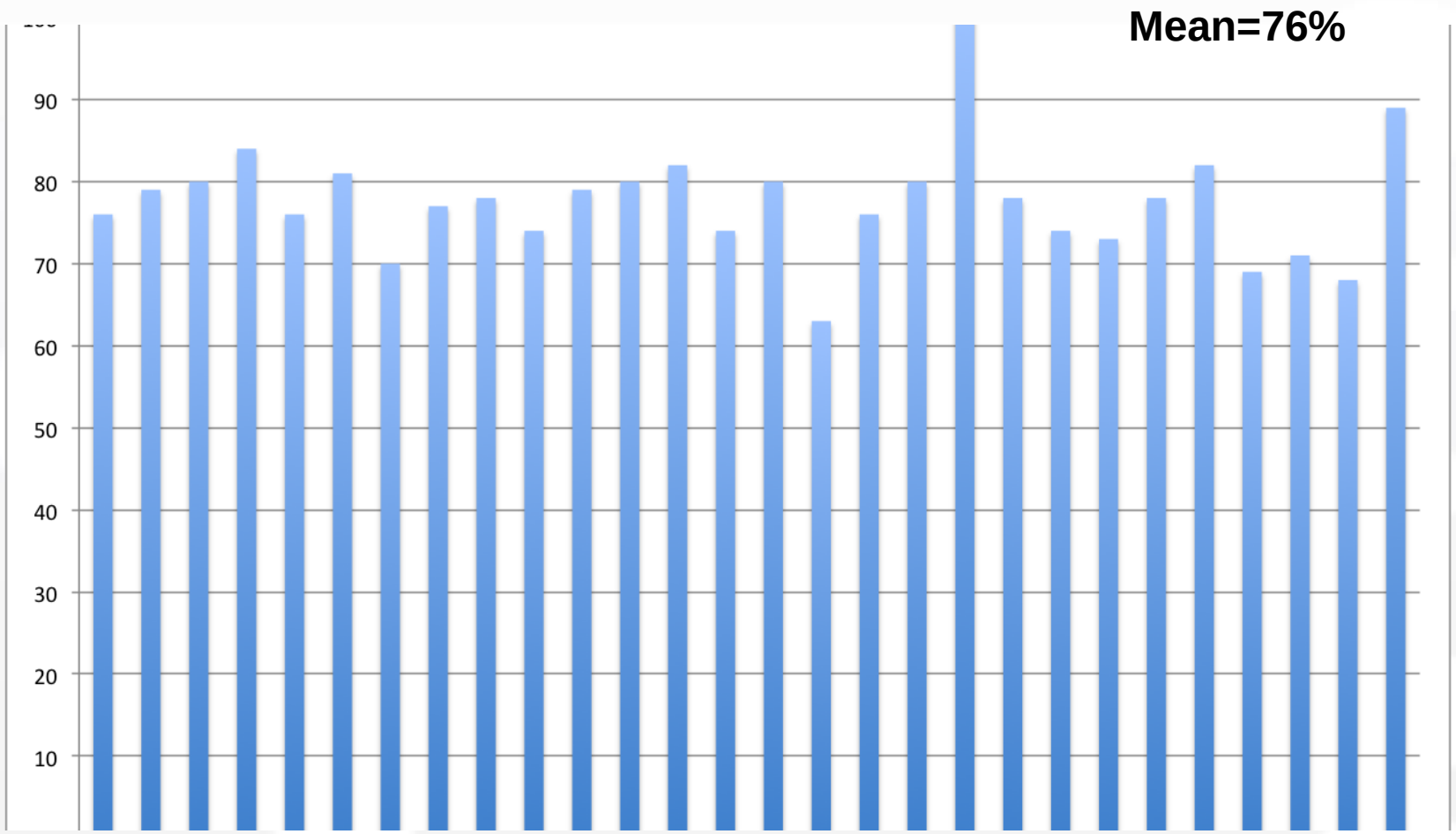
Bowel Screening Pilot results to March 2015 (pulled 1/8/2015)

	Rd 1	Rd 2
CRC detection rate DR/1000 screened	3.1 (1-8-9.5)	1.6
Advanced adenoma DR/1000 screened	15.5	7.5
Adenoma DR/1000 screened	36.2 (13.3-22.3)	23.2
PPV CRC %	4.4 (4.5-8.6)	2.9
PPV Advanced adenoma %	24	15.3
PPV adenoma %	56.1 (9.6-40.3)	47.7

Those with low risk adenoma returned to screening

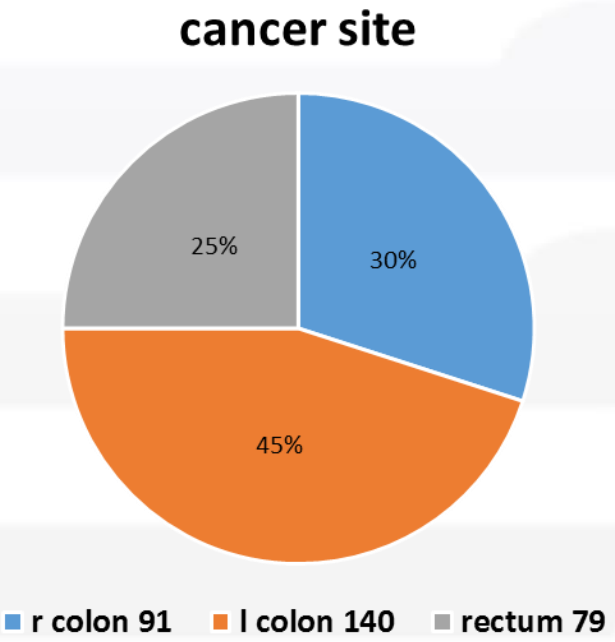
Remainder offered ongoing colonoscopic surveillance

% Polyp detection rate for endoscopists



Bowel Screening findings 2012-2015

- **315 cancers in 303 patients**
  - **310 cancers/299 patients treated in public/private (8358 colos in 8187pts)**
  - **43 cancers/39 patients treated in private**
  - **171 males**
  - **128 females**



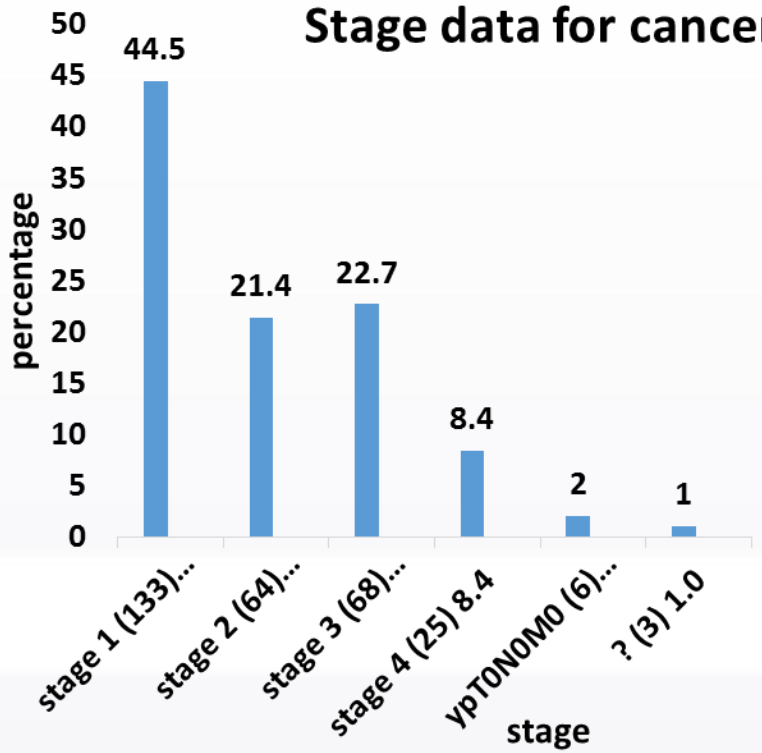


Table 3.3-2 Expected number of cases of colon cancers by stage

Stage	N	%
Stage I	419	11
Stage II	1752	46
Stage III	952	25
Stage IV	685	18
Total	3808	100

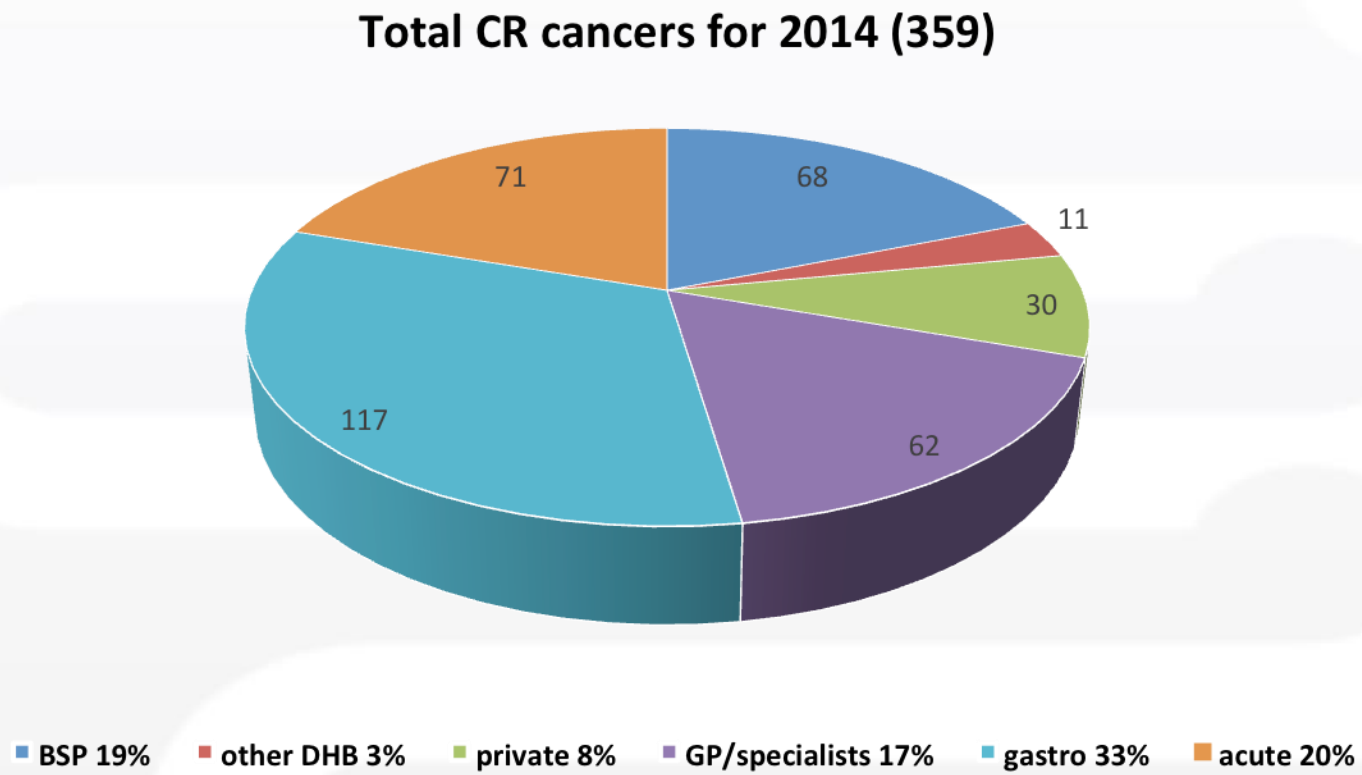
Piper project. Findlay et al 2015

Impact on CTC in first round

- 20 had CTC as primary investigation-
  - polyp detection rate was only 30% v 76% in colonoscopy cohort

- 68 had CTC for failed colonoscopy

BSP vs Symptomatic cancer workload



⇨ **20% increase in symptomatic demand**

BSP Endoscopy adverse events

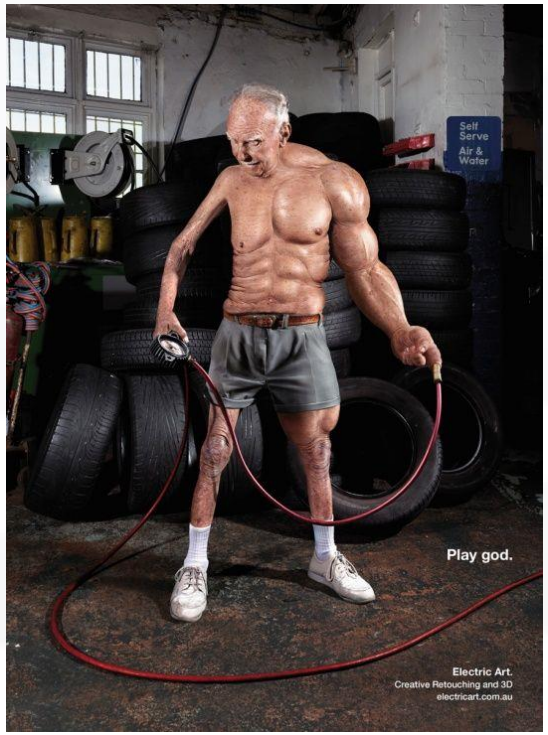
- 85 patients admitted in the first 3.5 years of BSP (1.2% of total colonoscopies)
- The most frequent complications included bleeding, perforation, pain and hypotension

Perforation

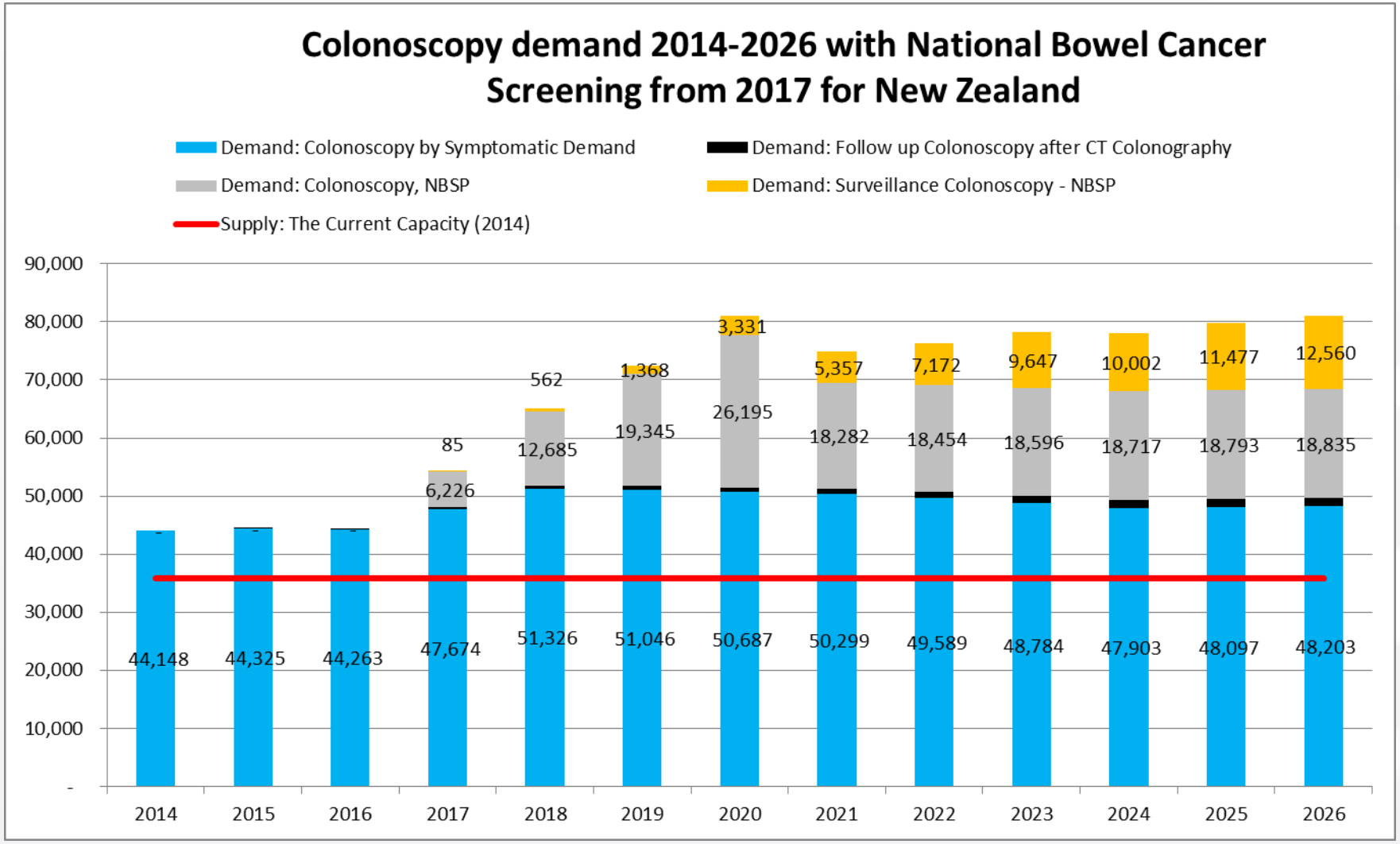
- 7 perforations
- 2 required surgery
- 22 patients admitted with pain and no evidence of free perforation on CT etc

Workforce approximations for each DHB

- Need ½ a surgeon
- Need ½ a pathologist
- Need 1 new theatre
- Need 3-4 Gastroenterologists
- Need 5-7 nurses and administrators
- $500,000 worth of equipment



National roll out as per WDHB (age 50-74 yrs.)



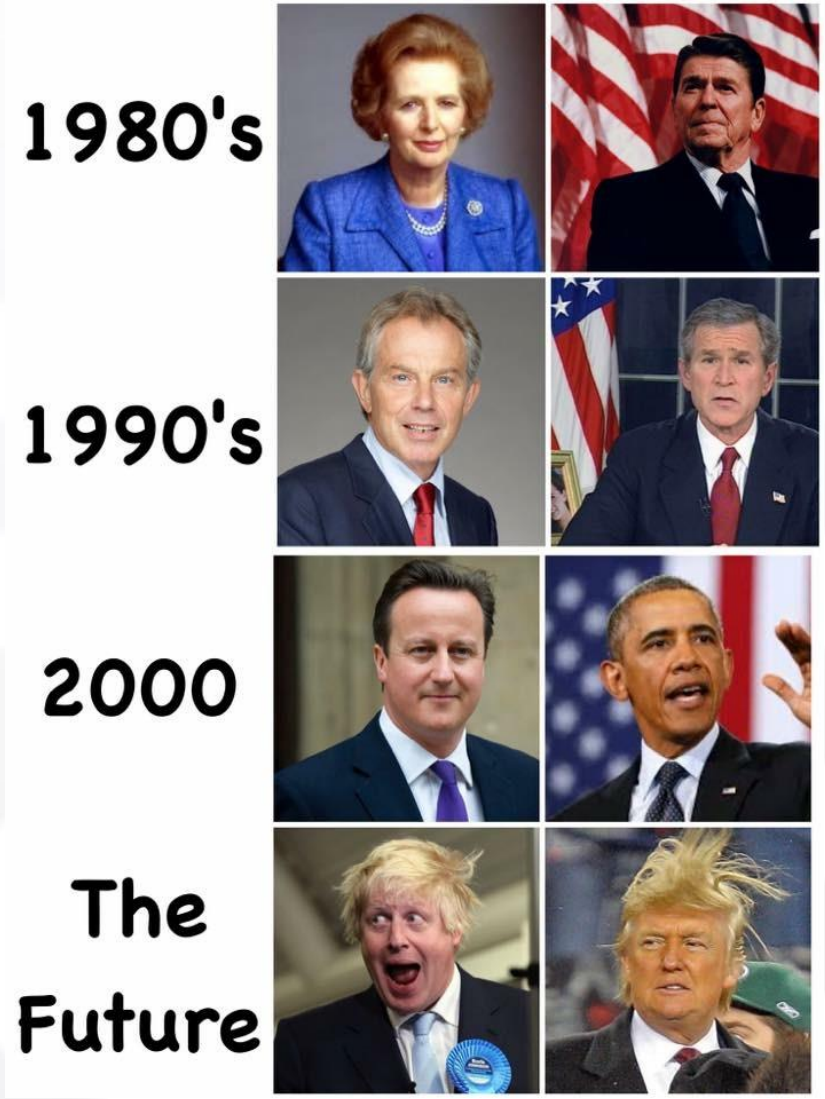
Cost of screening

Table 21 Cost-effectiveness of bowel cancer screening - based on national generalisation of the Pilot – life time costs and benefits of the average person – Whole population

Treatment	Costs	QALYs	Incremental		Cost per QALY (95%CI)
			Costs (95% CI)	QALYs (95%CI)	
No screening	$2,643	17.661	-$98 (-$627 - $219)	0.0730 (0.0451 - 0.1084)	Dominates* (-$5,786 - $4,850)
Screening	$2,544	17.734			

Tom Love MOH review 2016

The Future:
Normally things get better with time.



Budget 2016 Announcement

- $39.3 over 4 years for design, planning and set up
- Extra money for IT infra-structure
- Money for implementation in 2017 budget
- Progressive roll out from mid 2017
  - Starting with Lower Hutt and Wairarapa
  - **Narrowed criteria to 60-74 year olds**
  - **Changed FIT sensitivity**

Indicative roll-out order

Confirmed roll-outs for throughout 2017/18 financial year:

Waitemata DHB – Pilot ends Dec 2017

Waitemata joins NBSP January 2018

Hutt Valley DHB – July 2017

Wairarapa DHB – July 2017

Counties Manukau DHB

Southern DHB

Indicative times for other DHBs

Throughout **2018/19** financial year:

Northland DHB

Auckland DHB

Waikato DHB

Hawkes Bay DHB

Whanganui DHB

MidCentral DHB

Capital & Coast DHB

Nelson Marlborough DHB

Canterbury DHB

South Canterbury DHB

Throughout 2019/20 financial year:

- **Bay of Plenty DHB**
- **Tairawhiti DHB**
- **Lakes DHB**
- **Taranaki DHB**
- **West Coast**

The future:
What will be the role of the GP?

GP job is fundamental and will be the key to success

Four main differences with BSP compared to other screening programs

No other program relies on GPs

A population register is used

It is invitation based as opposed to enrolment based

The test is done in the patients home

How patients take part in BSP

NHI database is used (60-74 years old)

Quarterly data extracts from PHO database to enhance the national database

Around the time of their birthday they are sent a pre-invitation and 4 weeks later the pack is sent to them including the test kit

<u>It is vital that GPs:</u>

Promote and endorse the program to their patients

Encourage minority groups to ensure equity

Encourage those who have not sent in the sample

Inform BSP of those who are ineligible

Exclusion criteria

Those who have had a colonoscopy in the last 5 years

Those on a bowel polyp or bowel cancer surveillance program

Those who have had or are being treated for bowel cancer

Those who have had their bowel removed

Those who have IBD

Those who are awaiting other bowel investigations

Those who are medically inappropriate

Those who are not ‘average’ risk

Pilot evaluation:
Key findings for General Practice

75% of participants obtained their positive FIT result from their GP

No strong preference on who informed them re result

Positives: timely, free and convenient, reassuring, GP in loop, colonoscopy services explained well

Pilot evaluation
Key findings for General Practice

Some Māori and Pacific BSP participants who received results from the Endoscopy Unit perceived this as:

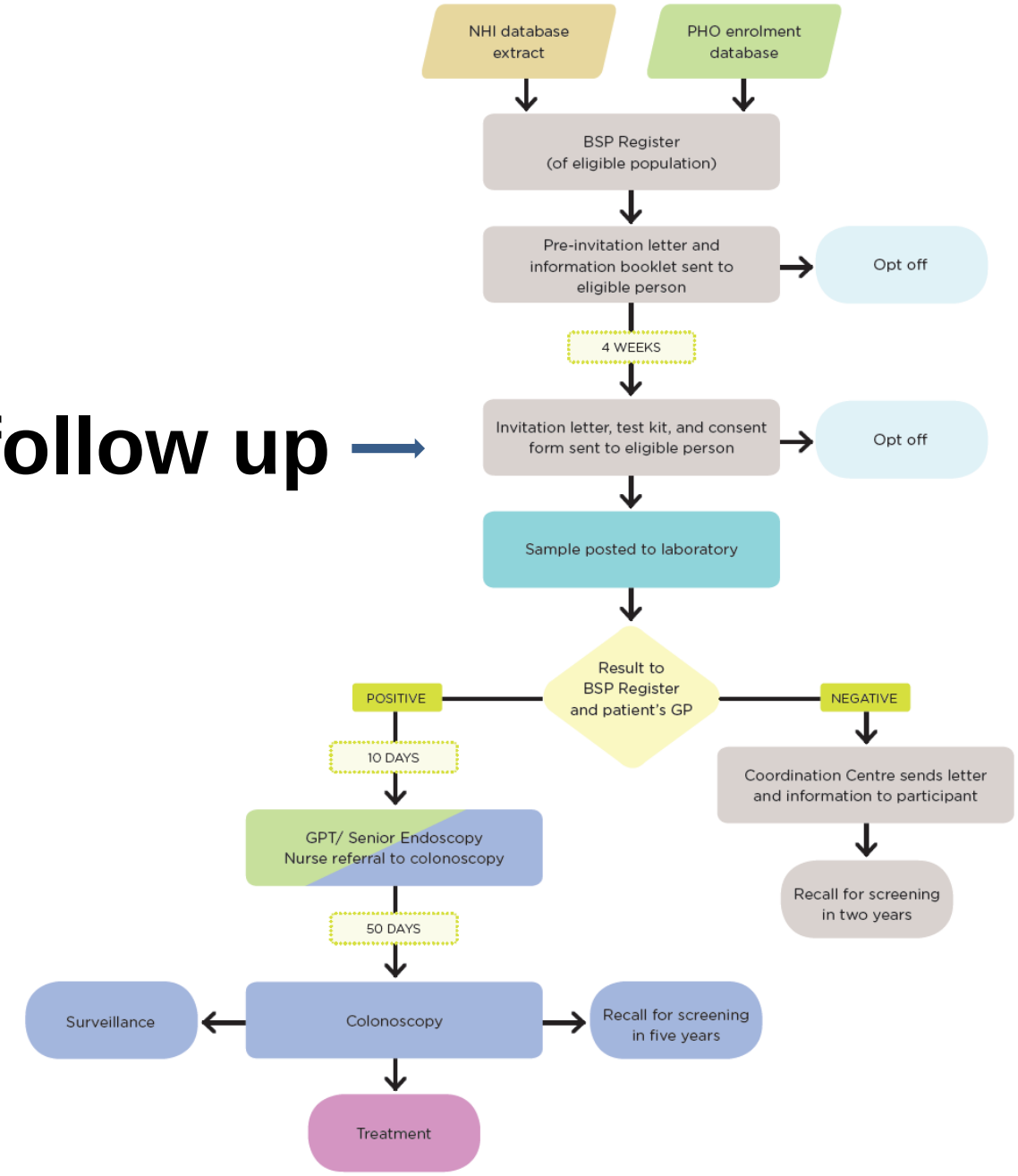
potentially cheaper + timely referral to colonoscopy

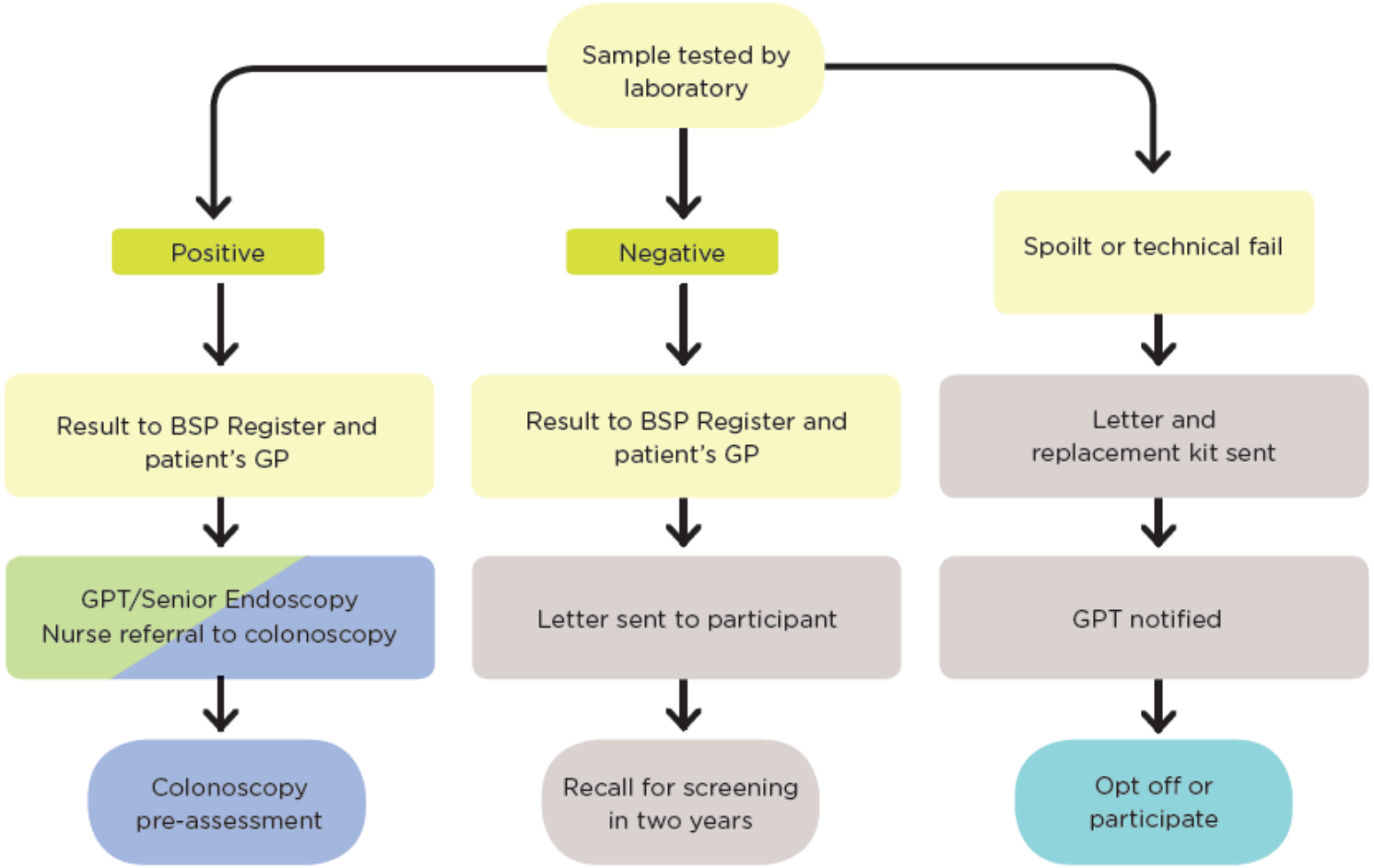
GP awareness was critical

participants who benefit from GP consultation

- those who are highly anxious,
- those with co-morbid conditions
- those who are reluctant to have a colonoscopy

Active follow up




Sample tested by laboratory
Positive
Negative
Spoilt or technical fail
Result to BSP Register and patient's GP
Result to BSP Register and patient's GP
Letter and replacement kit sent
GPT/Senior Endoscopy Nurse referral to colonoscopy
Letter sent to participant
GPT notified
Colonoscopy pre-assessment
Recall for screening in two years
Opt off or participate

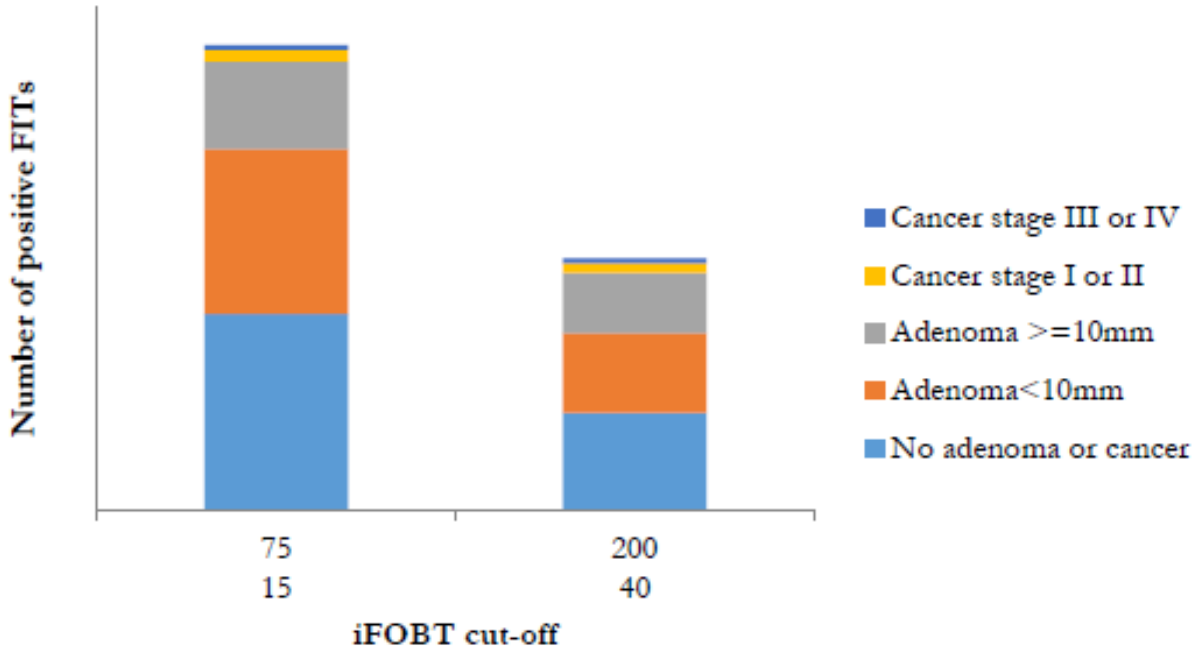
Change in cut-off reduces positivity from 6.8 to 3.7% (46%)

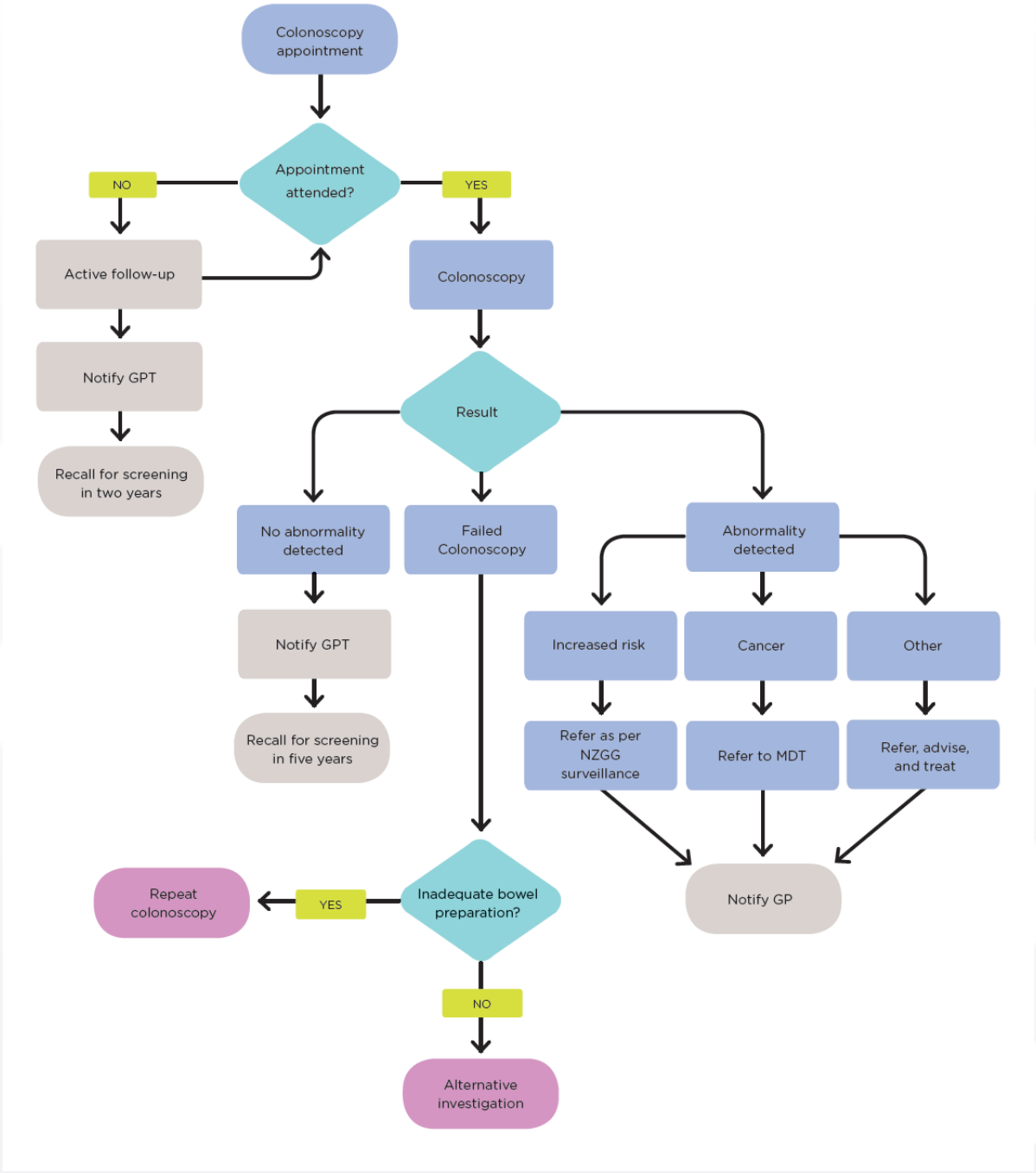
Table 8 Estimated sensitivity of a single iFOBT at different cut-off levels

Cut-off (ng HB/mL)	Specificity	Sensitivity, base value (95% CI)			
	Adenoma or cancer	Adenoma <10mm	Adenoma >= 10mm	Cancer – Stage 1 or 2	Cancer – Stage 3 or 4
75	94.7% (94.4% - 95%)	7.7% (7.1% - 8.4%)	25.2% (22.2% - 28.2%)	59.7% (27% - 92.5%)	85.9% (67.4% - 100%)
100	95.5% (95.2% - 95.8%)	7% (6.4% - 7.6%)	22.8% (20.1% - 25.5%)	56.5% (25.6% - 87.5%)	78.3% (61.4% - 95.1%)
150	96.4% (96.1% - 96.7%)	4.6% (4.2% - 5%)	19.8% (17.4% - 22.1%)	51.8% (23.5% - 23.5%)	73.5% (57.7% - 89.3%)
200	97% (96.7% - 97.3%)	3.7% (3.4% - 4.1%)	17.4% (15.4% - 19.5%)	50.4% (22.8% - 78%)	70.6% (55.4% - 85.8%)
250	97.4% (97.1% - 97.7%)	3.1% (2.8% - 3.4%)	15.8% (13.9% - 17.6%)	47.7% (21.6% - 73.9%)	66.8% (52.4% - 81.2%)

Reduction in findings with cut off change

Figure 13 Comparison of the number of positive iFOBTs (FITs) at different cut-offs




Colonoscopy appointment
Appointment attended?
NO
YES
Active follow-up
Colonoscopy
Notify GPT
Result
Recall for screening in two years
No abnormality detected
Failed Colonoscopy
Abnormality detected
Notify GPT
Increased risk
Cancer
Other
Recall for screening in five years
Refer as per NZGG surveillance
Refer to MDT
Refer, advise, and treat
Repeat colonoscopy
YES
Inadequate bowel preparation?
Notify GP
NO
Alternative investigation

Summary: What is the role for the GP?

- Promote and endorse the program
- Help BSP identify appropriate participants
- Chase up recidivists and non attenders

- Receive the results
- Inform the patient of a positive result & refer for a colonoscopy (10 days)
  - After this the BSP takes over

Conclusions

Can and should we do it in NZ?…….YES

"It is possible to organise a programme largely within the existing resources of an endoscopy unit"

- Train more endoscopists

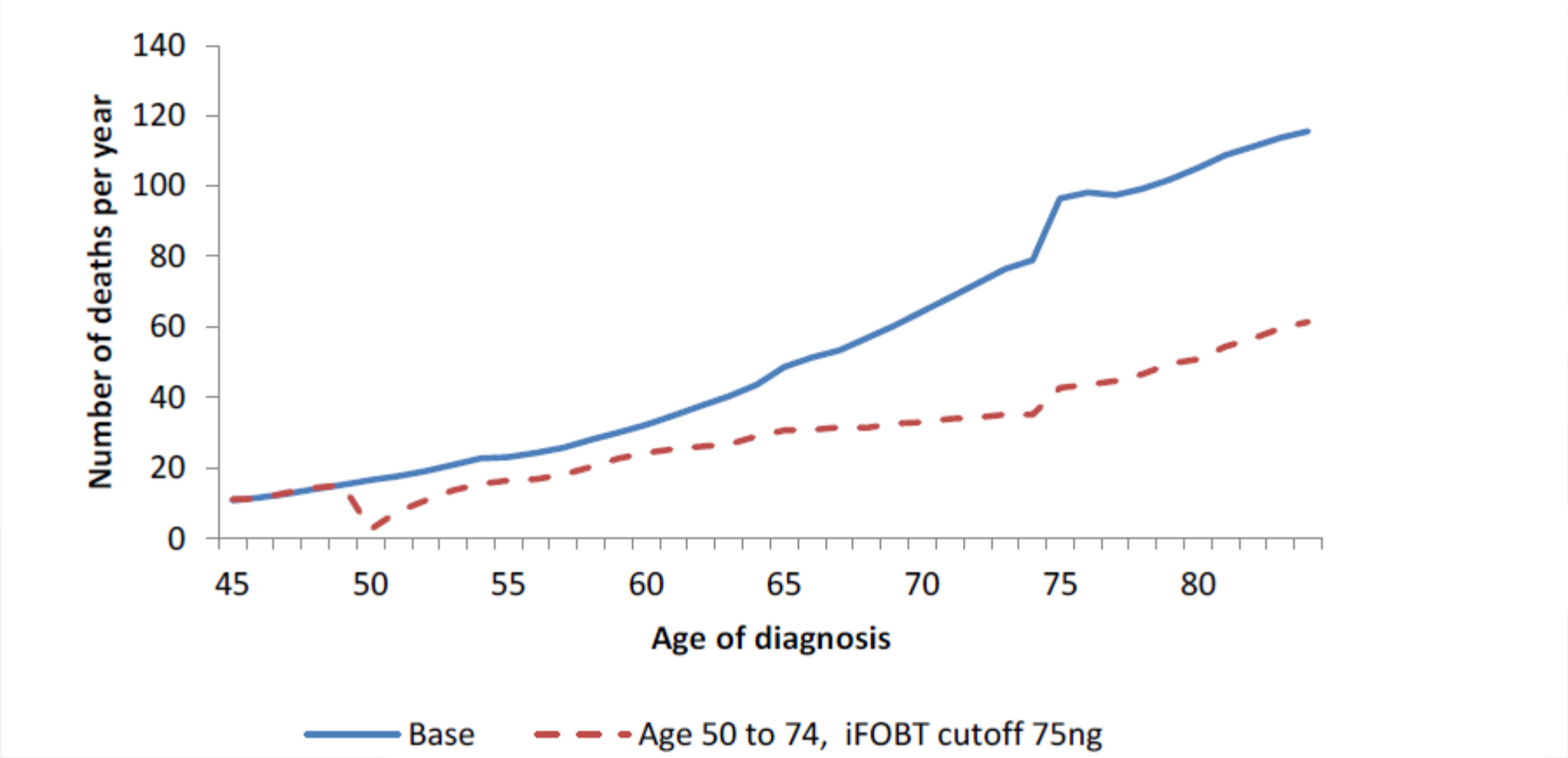
We will need to accept that the 'Gold Plated' model may not be what we start with

Regional staged rollout as regions become ready and can demonstrate ability to meet quality standards

Private will/must have a role

GPs the key role in success of BSP

Conclusion: Benefit for NZ if we screen



Dr Alasdair Patrick
Gastroenterologist

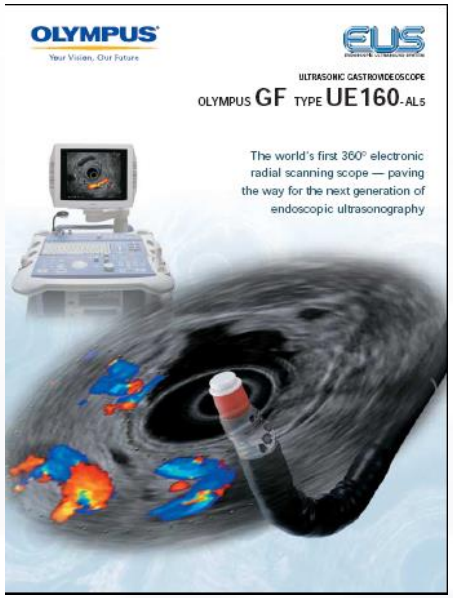
THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

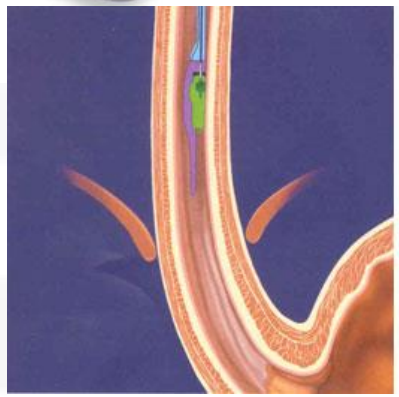
Royal Free Hampstead NHS
NHS Trust

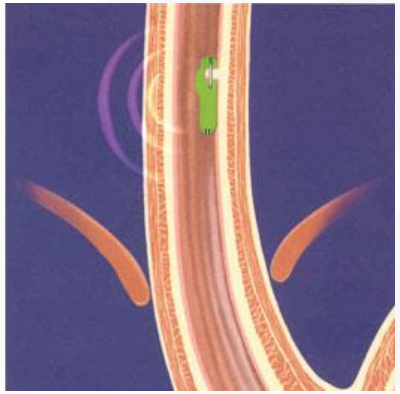
Singapore General Hospital
SingHealth

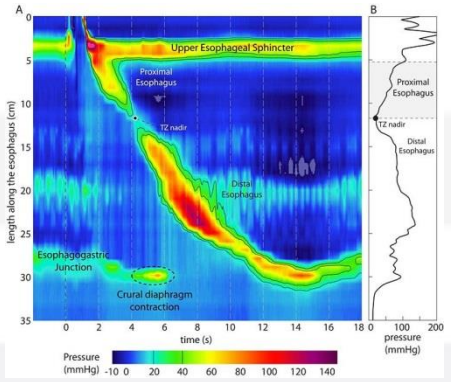
COUNTIES MANUKAU DISTRICT HEALTH BOARD
A Community Partnership

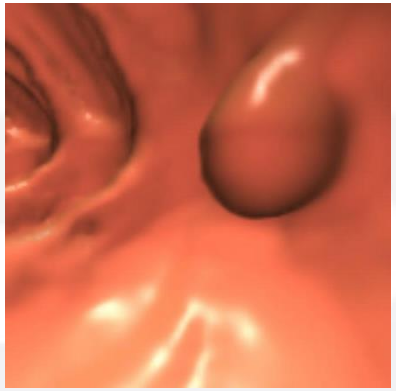
MacMurray CENTRE
Digestive Diseases & Endoscopy











MacMurray
CENTRE
Digestive Diseases & Endoscopy

The only fully comprehensive Gastroenterology center in Auckland

- Opened in 2009
- Largest Gastro practice in NZ
  - 12 Gastroenterologists
  - 1 Hepatologist
  - 4 Surgeons
  - Dietician
- Full diagnostic facilities on site