


**Colorectal Cancer Screening in perspective**

Graeme P Young,  
Flinders University.

Moving Forward on Bowel Cancer Screening in Australia, Melbourne Nov 2006



---

---

---

---

---

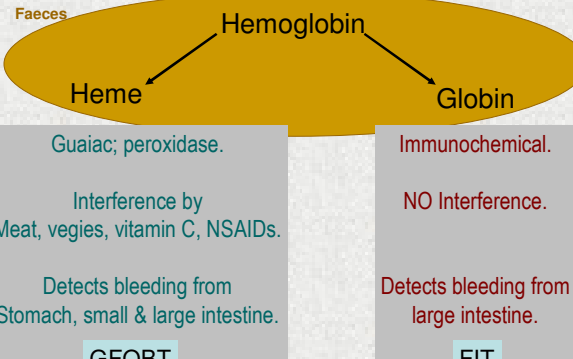
---

---

---

**FOBT are not all the same**

Faeces



**Heme**  
Guaiaac; peroxidase.  
Interference by Meat, vegies, vitamin C, NSAIDs.  
Detects bleeding from Stomach, small & large intestine.  
GFOBT

**Globin**  
Immunochemical.  
NO Interference.  
Detects bleeding from large intestine.  
FIT

---

---

---

---

---


---

---

---

**Test selection**

- One seeks the best test
- Criteria for the best test
  - Performance - traditional measures
  - Performance - Surrogate measures
  - Suitability for the target population and relevant health system - flexibility
- What does an FOBT react to?
- Who controls the criteria?



---

---

---

---

---

---

---

---

### Answers!

- What does an FOBt react to?
  - Test analyte (haem, globin etc) at a detection limit set by the manufacturer
- On what basis does a manufacturer choose the analytic cut-off that determines “positivity”?
  - A: rarely based on screening outcomes!
  - Some tests deliberately configured to overcome inherent problems, e.g. Hemocult Sensa, FIT in general



---

---

---

---

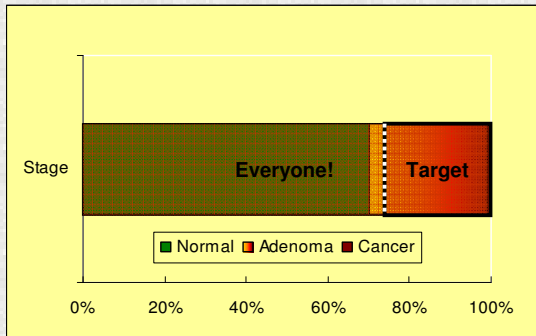
---

---

---

---

### FOBt refine risk for neoplasia



---

---

---

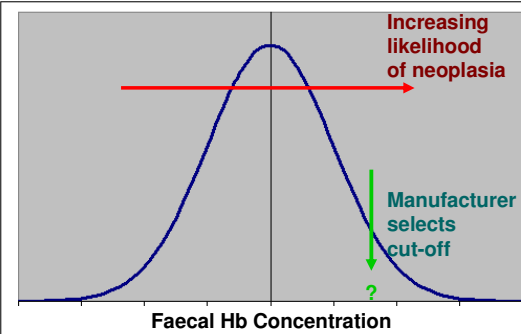
---

---

---

---

---



---

---

---

---

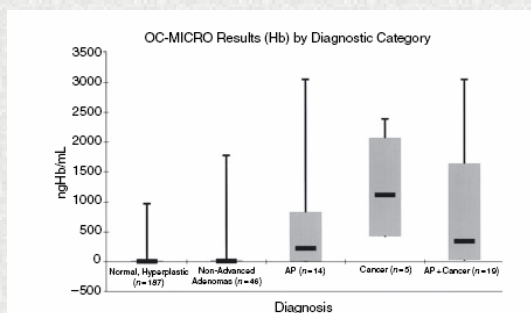
---

---

---

---

### Faecal [Hb] by diagnosis



Levi et al, Alim Pharmacol Thera; 2006;




---

---

---

---

---

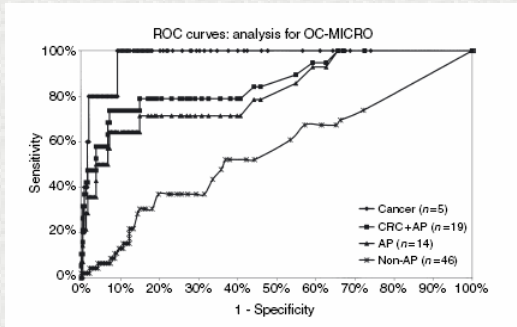
---

---

---

---

---



Levi et al, Alim Pharmacol Thera; 2006;




---

---

---

---

---

---

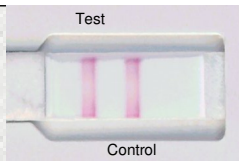
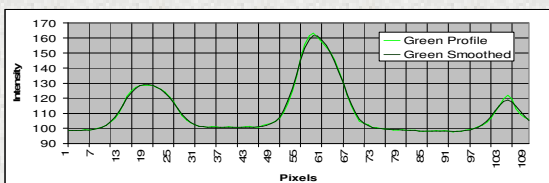
---

---

---

---

### Quantification by test Strip Analysis




---

---

---

---

---

---

---

---

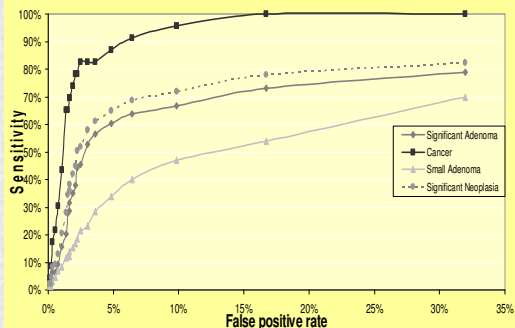
---

---

Quantification provides flexibility

ROC analysis

Smith et al, in preparation




---

---

---

---

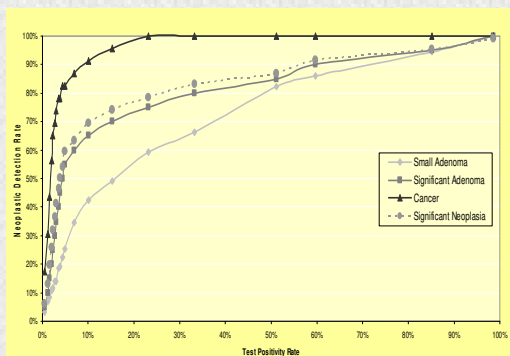
---

---

---

---

Detection versus positivity rate



N=4,100 approx

---

---

---

---

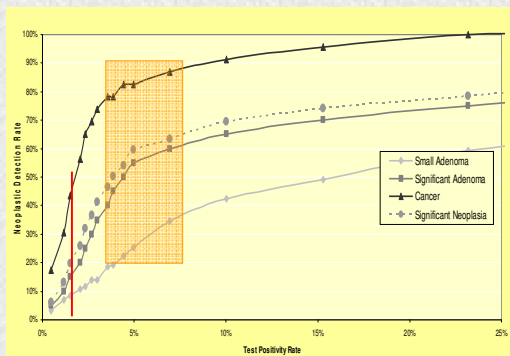
---

---

---

---

Detection versus positivity rate



N=4,100 approx

---

---

---

---

---

---

---

---

## Stool number versus sensitivity

Table 3. Sensitivity, specificity, predictive values and 95% CIs for cancer (n = 5), cancer + advanced adenomas (n = 19) at different faecal haemoglobin thresholds\* and numbers of tests prepared by the 252 examinees

Threshold (ng/mL)/ number of tests prepared	Pathology	Sensitivity [% (95% CI)]	Specificity [% (95% CI)]	PPV [% (95% CI)]	NPV [% (95% CI)]
75/three tests	CRC	100 (100-100)	88 (84-92)	15 (3-27)	100 (100-100)
	CRC + AP	74 (54-94)	92 (89-95)	41 (25-58)	98 (96-100)
100/three tests	CRC	100 (100-100)	90 (86-93)	16 (3-29)	100 (100-100)
	CRC + AP	74 (54-94)	93 (89-96)	45 (28-63)	98 (96-100)
100/two tests	CRC	100 (100-100)	93 (90-96)	23 (5-39)	100 (100-100)
	CRC + AP	63 (42-85)	95 (91-98)	52 (32-73)	97 (95-99)
150/three tests	CRC	80 (45-100)	91 (88-94)	15 (1-28)	99.6 (99-100)
	CRC + AP	58 (36-80)	93 (90-96)	41 (22-59)	96 (94-99)
200/three tests	CRC	80 (45-100)	92 (89-95)	17 (2-32)	99.6 (99-100)
	CRC + AP	58 (36-80)	94 (92-97)	46 (22-66)	97 (94-99)

\* Utilizing the highest of the I-FOBT measurements in each patient.  
 CI, confidence interval; CRC, colorectal cancer; AP, advanced adenomatous polyps; PPV, positive predictive value; NPV, negative predictive value.

Levi et al, Alim Pharmacol Thera; 2006;



## Conclusions

- Faecal Hb concentration predicts presence of colorectal neoplasia
  - Cancer or advanced adenomas
- Quantification provides flexibility
  - Not restricted by manufacturer's setting
  - Sensitivity/specificity ratio is selectable
  - Match positivity rate to colonoscopic capability

