大腸直腸癌篩檢

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台灣大腸直腸癌的發生率

2010年與2009年國人常見癌症發生人數比較

平均每37.4分鐘一例

		癌症時鐘(每幾分鐘發生一例)	2010年			2009年			2010年發生人數增減值	2010年發生率增減值
			個案數	標準化率	年齡中位數	個案數	標準化率	年齡中位數		
1	大腸	37.4	14,040	45.3	66	12,488	41.4	67	1,552	3.9
2	肝及肝內膽管	47.7	11,023	36.1	65	11,080	37.3	65	-57	-1.2
3	肺、支氣管及氣管	49.5	10,615	33.6	70	10,643	34.8	70	-28	-1.2
4	女性乳房	54.4	9,655	63.2	52	8,926	59.9	52	729	3.3
5	口腔、口咽及下咽	80.1	6,560	21.7	54	6,480	22.0	53	80	-0.3
6	攝護腺	119.7	4,392	28.8	74	4,013	26.9	74	379	1.9
7	胃	136.4	3,854	12.0	70	3,848	12.4	70	6	-0.4
8	皮膚	176.5	2,978	9.3	73	2,928	9.5	72	50	-0.2
9	子宮體	302.6	1,737	11.3	54	1,496	9.9	53	241	1.4
10	子宮頸	312.9	1,680	10.8	56	1,796	11.9	55	-116	-1.1
	全癌症	5.8	90,649	296.7	62	87,189	293.4	63	3,460	3.3

註： 1.發生序位係以2010年癌症發生人數由高至低排序。
2.2010年與2009年癌症發生人數增減情形：2010年發生人數-2009年發生人數。
3.發生時鐘係指每分鐘有多少名新診斷個案。
4.台灣癌症登記資料庫(不含原位癌)

Health Promotion Administration, Ministry of Health and Welfare, Taiwan

台灣大腸直腸癌的死亡率

	所有癌症死亡原因	氣管、支氣管和肺癌	肝和肝內膽管癌	結腸、直腸和肛門癌	女性乳房癌	口腔癌	胃癌	前列腺(攝護腺)癌	胰臟癌	食道癌	子宮頸及部位未明示子宮癌
兩性死亡人數					民國 101年						單位:人
總計	43,665	8,587	8,116	5,131	1,912	2,566	2,386	1,187	1,629	1,581	669

癌症主要死亡原因死亡人數、死亡率－按5歲年齡組及性別分

	男性所有癌症死亡原因	氣管、支氣管和肺癌	肝和肝內膽管癌	結腸、直腸和肛門癌	口腔癌	胃癌	食道癌	前列腺(攝護腺)癌	胰臟癌	非何杰金氏淋巴瘤	白血病
男性死亡人數					民國 101年						單位:人
總計	27,270	5,628	5,596	2,956	2,359	1,502	1,477	1,187	935	605	580

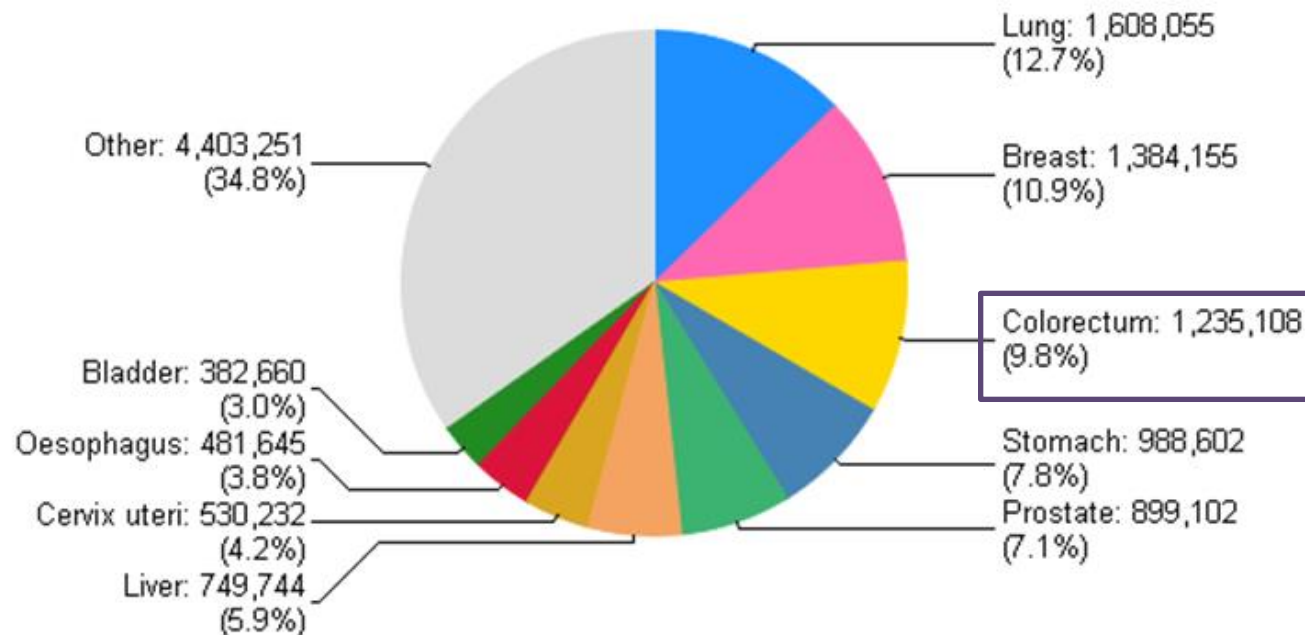|	女性所有癌症死亡原因	氣管、支氣管和肺癌	肝和肝內膽管癌	結腸、直腸和肛門癌	女性乳房癌	胃癌	胰臟癌	子宮頸及部位未明示子宮癌	卵巢癌	非何杰金氏淋巴瘤	白血病
女性死亡人數					民國 101年						單位:人
總計	16,395	2,959	2,520	2,175	1,912	884	694	669	528	410	364

第三名

大腸直腸癌_全球

- 全世界第三多的癌症
- 占整體的9.4-10%

World: Both sexes
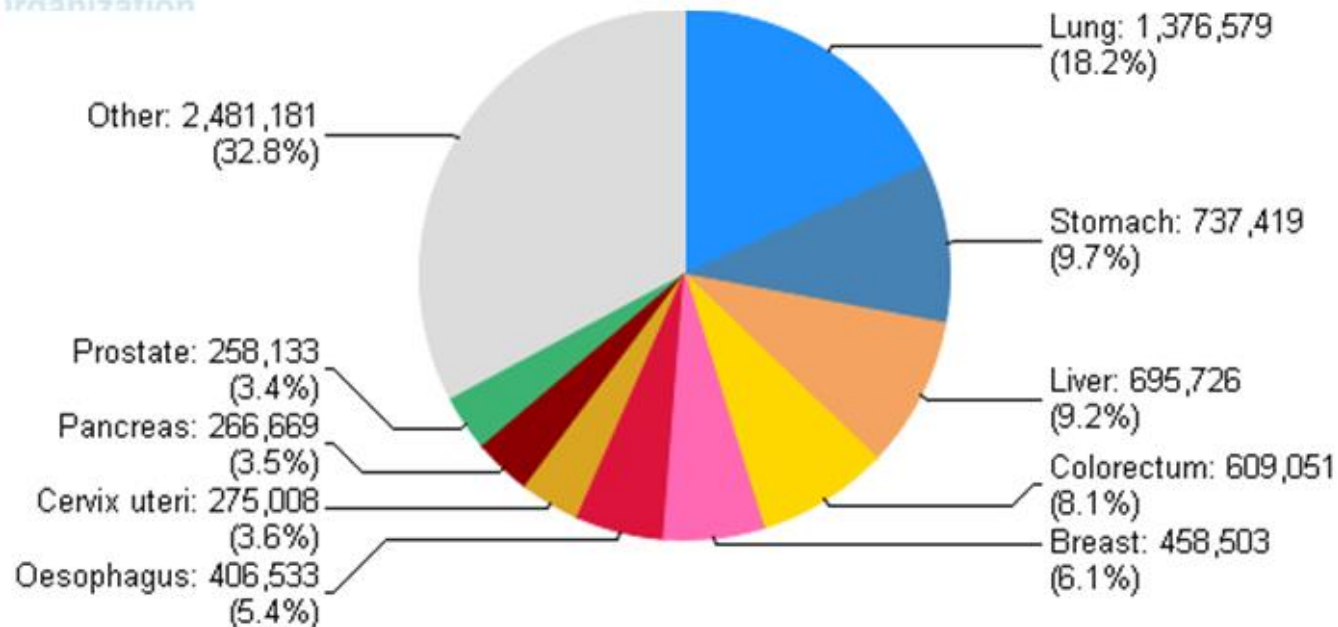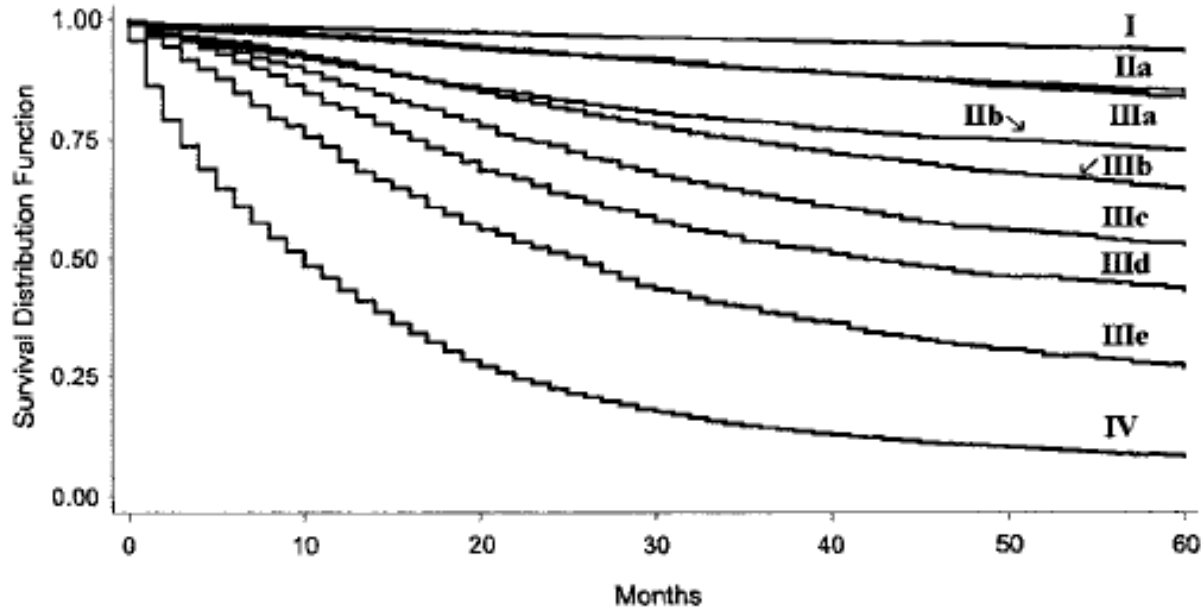Estimated number of cancer cases, all ages (total: 12662,554)

- Lung: 1,608,055 (12.7%)
- Breast: 1,384,155 (10.9%)
- Colorectum: 1,235,108 (9.8%)
- Stomach: 988,602 (7.8%)
- Prostate: 899,102 (7.1%)
- Liver: 749,744 (5.9%)
- Cervix uteri: 530,232 (4.2%)
- Oesophagus: 481,645 (3.8%)
- Bladder: 382,660 (3.0%)
- Other: 4,403,251 (34.8%)

Globocan 2008

大腸直腸癌_全球

- 在全世界癌症相關死因中佔第四位
- 占癌症死亡的8.1%

World: Both sexes
Estimated number of cancer deaths, all ages (total: 7564,802)

Lung: 1,376,579 (18.2%)
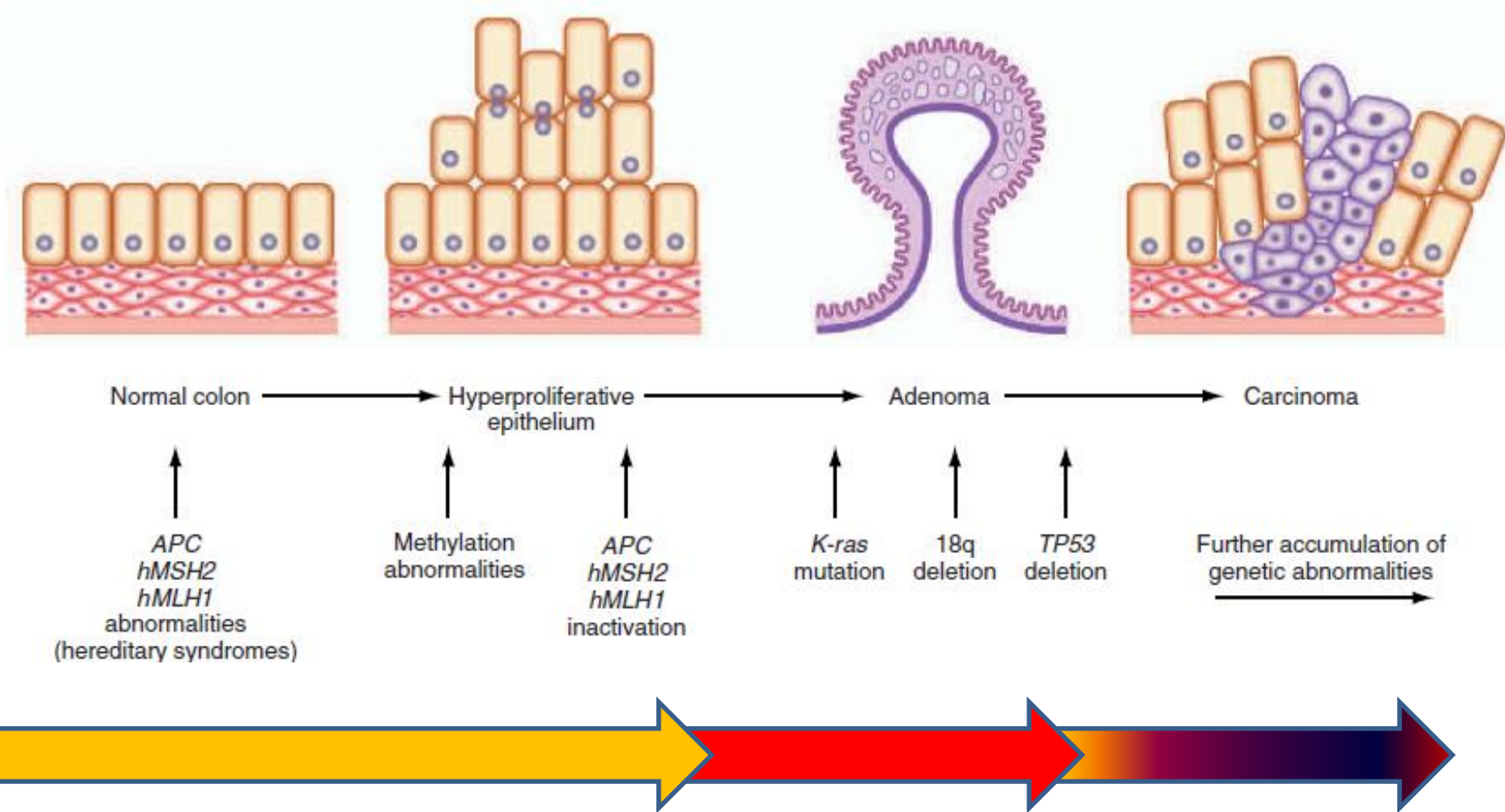Other: 2,481,181 (32.8%)
Stomach: 737,419 (9.7%)
Liver: 695,726 (9.2%)
Prostate: 258,133 (3.4%)
Pancreas: 266,669 (3.5%)
Cervix uteri: 275,008 (3.6%)
Oesophagus: 406,533 (5.4%)
Colorectum: 609,051 (8.1%)
Breast: 458,503 (6.1%)

大腸直腸癌的存活率

Stage	0 mo		30 mo			60 mo		
	Survival, %	No.	Survival, %	No.	P*	Survival, %	No.	P*
I	100	14500	96.1	8581	—	93.2	4514	—
IIa	100	28535	91.0	2105	<.001	84.7	8494	<.001
IIb	100	5826	80.2	3060	<.001†	72.2	1611	<.001†
IIIa	100	1989	91.4	1120	NS‡	83.4	551	NS‡
IIIb	100	15946	77.3	7786	<.001§	64.1	3579	<.001§
IIIc	100	4092	67.1	1697	<.001	52.3	725	<.001
IIId	100	2655	57.3	908	<.001	43.0	384	<.001
IIIe	100	1853	43.1	434	<.001	26.8	141	<.001
IV	100	20802	17.3	1832	<.001	8.1	432	<.001

- 侷限性疾病
    五年存活率 90%
- 局部性疾病
    五年存活率 68%
- 遠端轉移
    五年存活率 10%

大腸直腸癌的發生

| Normal colon | → | Hyperproliferative epithelium | → | Adenoma | → | Carcinoma |

APC
hMSH2
hMLH1
abnormalities
(hereditary syndromes)

Methylation
abnormalities

APC
hMSH2
hMLH1
inactivation

K-ras
mutation

18q
deletion

TP53
deletion

Further accumulation of
genetic abnormalities

Sleisenger and Fordtran's 9th Edition

大腸直腸癌篩檢的影響力

Death rates per 100,000

1990
2005

(-) 31.8%

(-) 28.0%

Male   Female
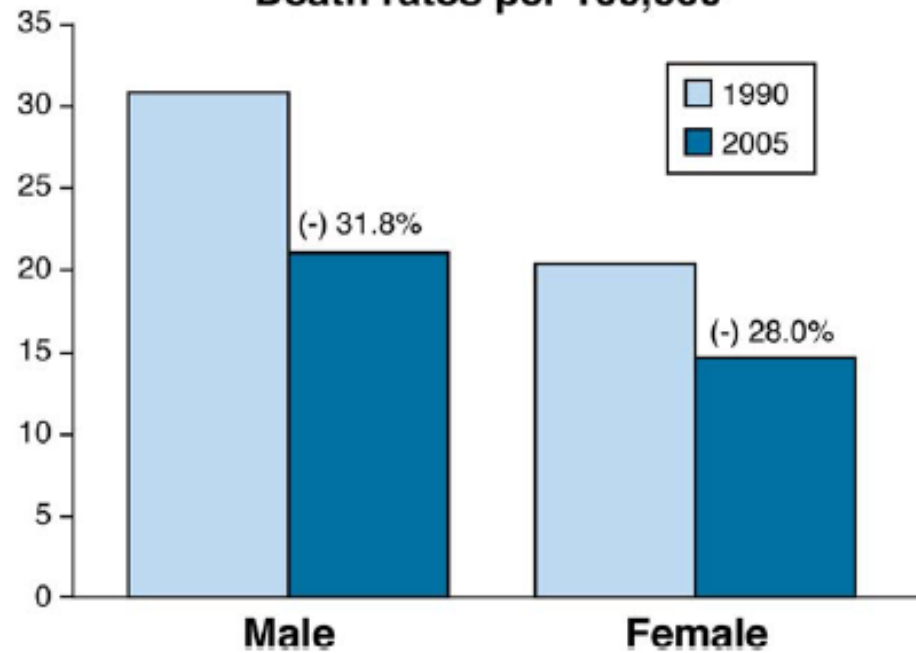
Figure 1. Death rates from CRC per 100,000 population.[1]

Colorectal cancer incidence per 100,000

Males
Females
Screen rates (%)
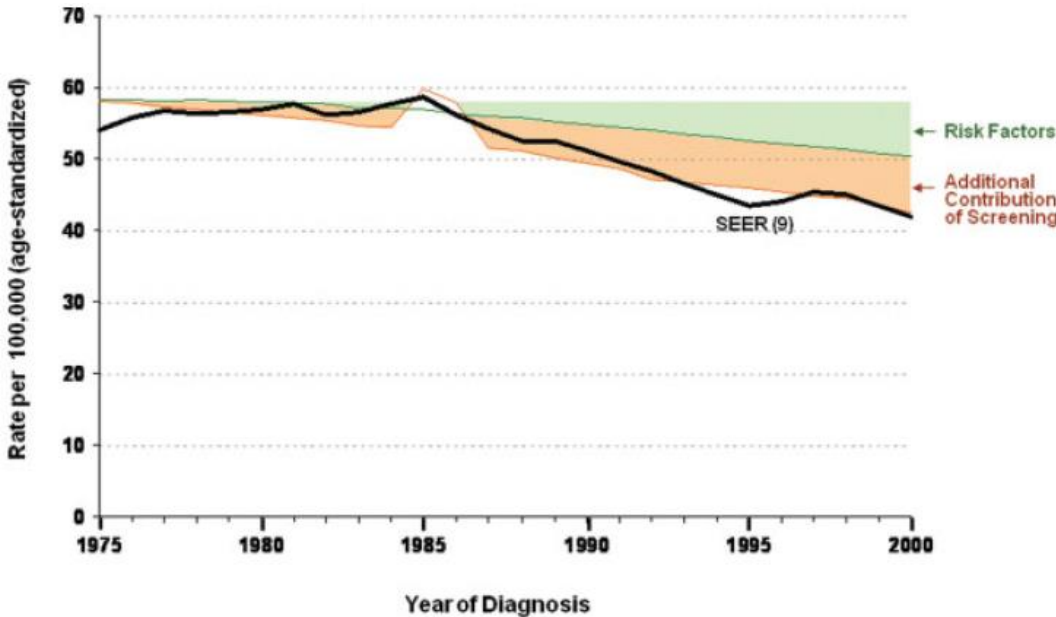
1975 1980 1985 1990 1995 2000 2005
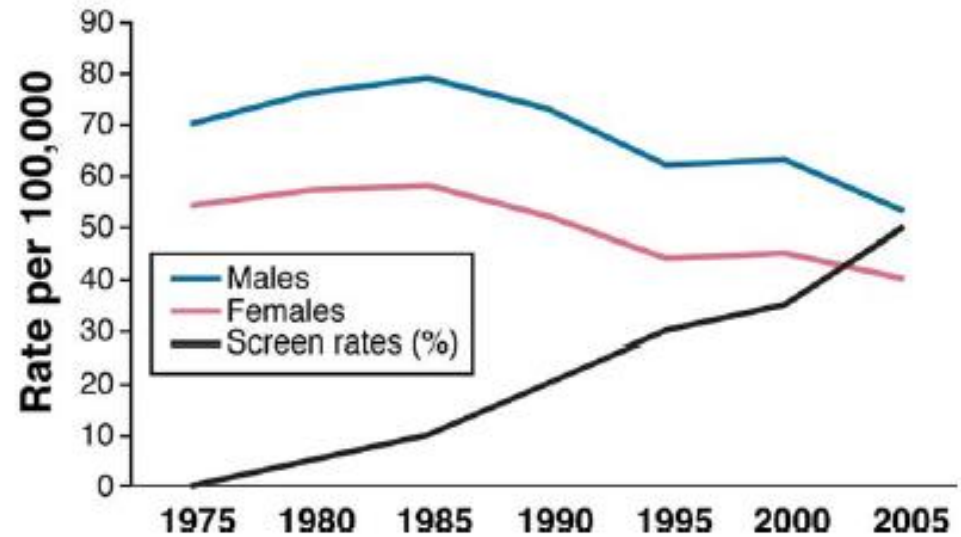
Figure 2. CRC incidence rates per 100,000 and rates of CRC screening in individuals older than age 50.[1]

大腸直腸癌篩檢的影響力

發生率的下降: 22%
- 危險因子改變: 11%(50%)
- **篩檢: 11%(50%)**
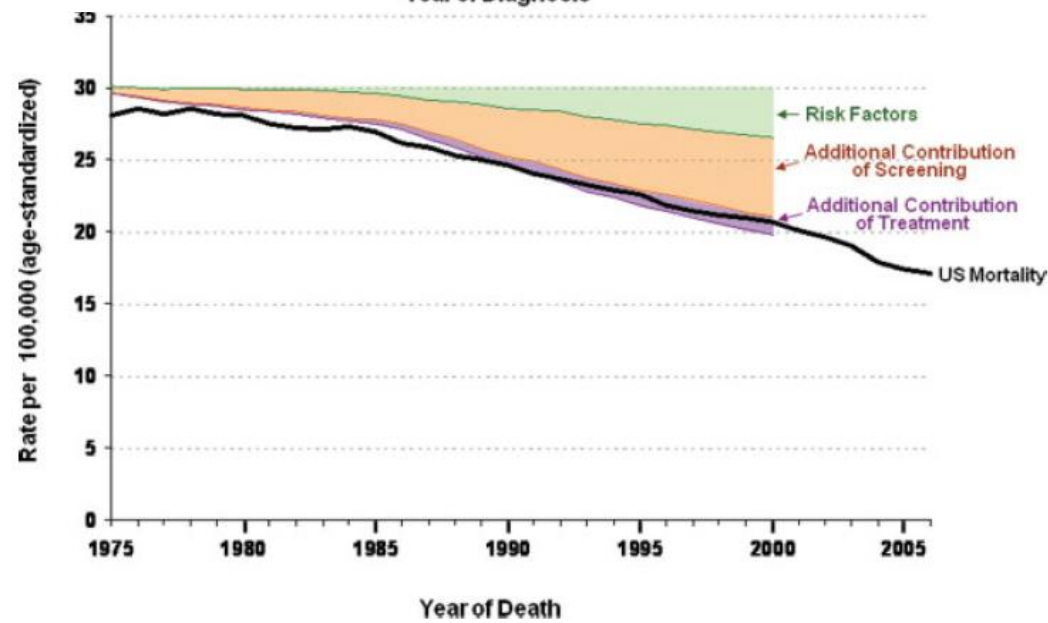
死亡率的下降: 26%
- 危險因子改變: 9%(35%)
- **篩檢: 14%(53%)**
- 治療進步: 3%(12%)

Cancer 2010;116:544–73

大腸直腸癌的篩檢工具

Table 2. Screening Tests for Colorectal Cancer

Screening Test	Sensitivity	Specificity	Cost	Interval	Patient Information
gFOBT	Variable	Variable	Low	Annual	Two samples from 3 consecutive stools at home Low risk Positive result requires follow-up colonoscopy
iFOBT	Variable	Variable	Medium	Annual	Stool sample Low risk Positive result requires follow-up colonoscopy
sDNA	Variable	High	High	Uncertain	Adequate stool sample (30-g minimum) Low risk Positive result requires follow-up colonoscopy
DCBE	Low	Low	Low	5 y	Complete bowel preparation Risks include perforation and bleeding Positive result requires follow-up colonoscopy
Flexible sigmoidoscopy	Medium	Medium	High	5 y	Complete bowel preparation Low risk Positive result requires follow-up colonoscopy
Colonoscopy	High	High	High	10 y	Complete bowel preparation Risks include perforation and bleeding
CTC	Medium	Medium	High	5 y	Complete bowel preparation Low risk Polyps require follow-up colonoscopy

CTC = computed tomography colonography; DCBE = double-contrast barium enema; gFOBT = guaiac-based fecal occult blood test; iFOBT = immunochemical-based fecal occult blood test; sDNA = stool DNA panel.

篩檢方式的效力

Table 2. Types of CRC Screening Tests and Efficacy in Clinical Trials

Screening test	Evidence	Mortality reduction	Incidence reduction	One-time sensitivity for CRC	One-time sensitivity for advanced adenoma
Stool-based tests					
gFOBT-standard[9,13–16]	RCTs	15%–33%	18%	13%–50%	11%–24%
gFOBT-SENSA[7,13]	Cross-sectional	—	—	50%–75%	20%–25%
FIT[7]	Cross-sectional	—	—	60%–85%	20%–50%
Stool DNA-old[14]	Cross-sectional	—	—	51%	18%
Stool DNA-new[15]	Cohort	—	—	80%+	40%
Structural examinations of colon					
CTC[27–30]	Cross-sectional	—	—	>90%	90%
Sigmoidoscopy[41–43]	Case-control RCT	60% distal colon	—	>95% distal colon	30%–70%
Colonoscopy[27–30,42–44,47–51]	Case-control cohort	31%	53%–72%	95%	88%–98%

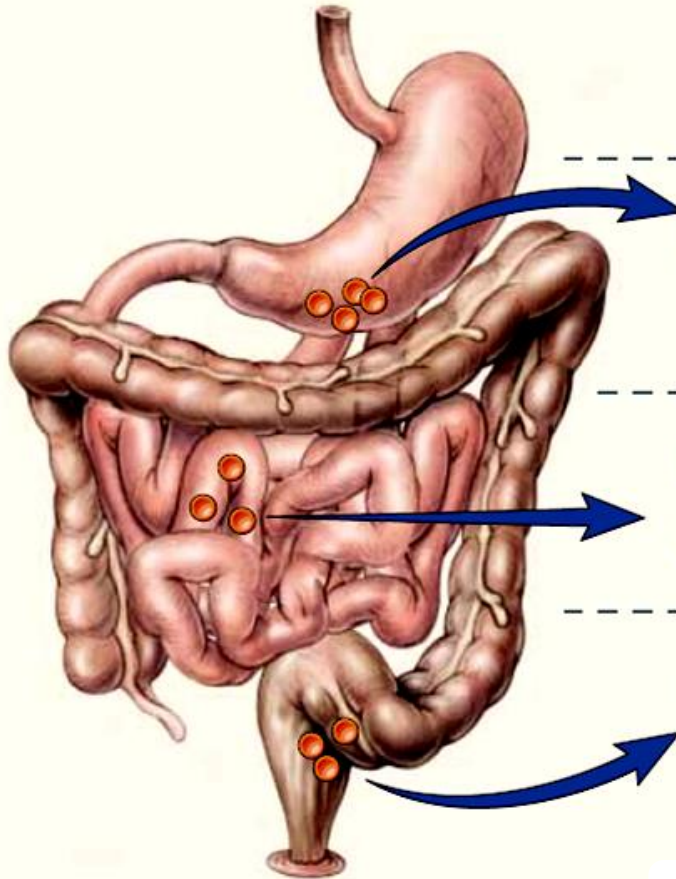最能正確早期偵測並預防大腸直腸癌發生的篩檢方式: 大腸鏡!!

糞便潛血檢測的篩檢方式

零陵香糞便潛血測定 (Guaiac-FOBT)
糞便免疫化學潛血測定 (FIT)

糞便潛血檢查的基本原理

Sites of Gastrointestinal Bleeding

Relative Likelihood of a Positive Fecal Occult-Blood Test
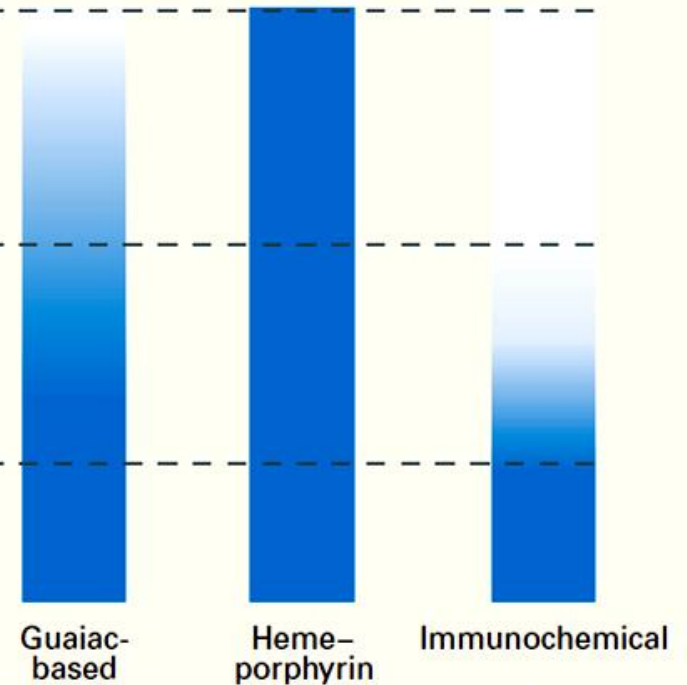
Upper gastrointestinal tract
Porphyrins, partially degraded heme, degraded globin

Middle gastrointestinal tract
Porphyrins, partially degraded heme, partially degraded globin

Lower gastrointestinal tract
Intact heme and intact globin

Guaiac-based | Heme–porphyrin | Immunochemical

兩者間的差異

Type of FOBT	飲食限制	藥物干擾	腫瘤偵測的特異性	癌症偵測的敏感度
Guaiac FOBT	紅肉 部分蔬果	Vit. C, NSAIDs	Depending on test brand and usage (90~98%)	35~67% with one-time testing
FIT	無	無	Depending on sens. Level chosen (95%)	65~90% with one-time testing

Young et al, Digestion 2007;76:26–33

Guaiac FOBT對CRC死亡率的衝擊

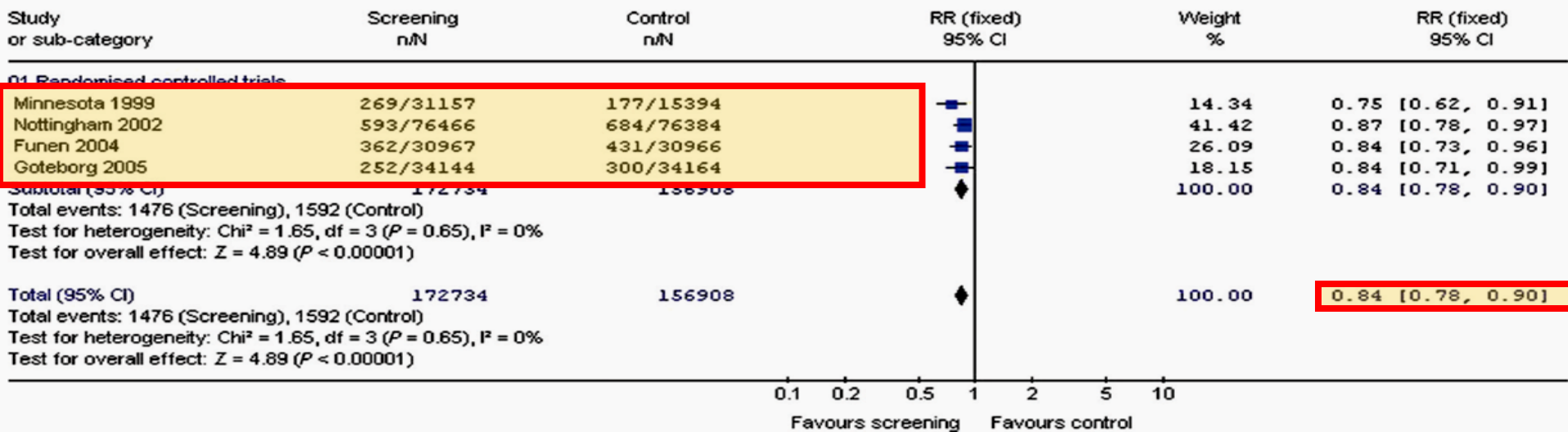| Review: | Screening for colorectal cancer using the faecal occult blood test, Hemoccult (published update) |
| Comparison: | 01 All Hemoccult Screening Groups Versus Control Groups |
| Outcome: | 01 Colorectal cancer mortality (Fixed) |

Study or sub-category	Screening n/N	Control n/N	RR (fixed) 95% CI	Weight %	RR (fixed) 95% CI
01 Randomised controlled trials					
Minnesota 1999	269/31157	177/15394		14.34	0.75 [0.62, 0.91]
Nottingham 2002	593/76466	684/76384		41.42	0.87 [0.78, 0.97]
Funen 2004	362/30967	431/30966		26.09	0.84 [0.73, 0.96]
Goteborg 2005	252/34144	300/34164		18.15	0.84 [0.71, 0.99]
Subtotal (95% CI)	172734	156908		100.00	0.84 [0.78, 0.90]

Total events: 1476 (Screening), 1592 (Control)
Test for heterogeneity: Chi² = 1.65, df = 3 (P = 0.65), I² = 0%
Test for overall effect: Z = 4.89 (P < 0.00001)

| Total (95% CI) | 172734 | 156908 | | 100.00 | 0.84 [0.78, 0.90] |

Total events: 1476 (Screening), 1592 (Control)
Test for heterogeneity: Chi² = 1.65, df = 3 (P = 0.65), I² = 0%
Test for overall effect: Z = 4.89 (P < 0.00001)

0.1 0.2 0.5 1 2 5 10
Favours screening   Favours control

Figure 1. Effects of screening with Hemoccult on mortality from CRC (fixed effects model).

Guaiac FOBT可減少16%的大腸直腸癌死亡率

Hewitson et al, Am J Gastroenterol 2008;103:1541–1549

FIT對CRC死亡率的衝擊?

Table 2. Types of CRC Screening Tests and Efficacy in Clinical Trials

Screening test	Evidence	Mortality reduction	Incidence reduction	One-time sensitivity for CRC	One-time sensitivity for advanced adenoma
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CTC[27–30]	Cross-sectional	—	—	>90%	90%
Sigmoidoscopy[41–43]	Case-control RCT	60% distal colon	—	>95% distal colon	30%–70%
Colonoscopy[27–30,42–44,47–51]	Case-control cohort	31%	53%–72%	95%	88%–98%

RCT, randomized controlled trial.

Adapted from Lieberman DA. Screening for colorectal cancer. *N Engl J Med* 2009;361:1179–1187.

FIT與Guaiac-FOBT兩者比較
-腫瘤偵測率-

Test performance	G-FOBT		FIT		Difference	
	n	%	n	%	%	95% CI
Detection rate --- Intention to screen						
All advanced adenomas and cancer	57	**0.6**	145	**1.4**	0.9	(0.6-1.1)
Cancer	11	**0.1**	24	**0.2**	0.1	(0.0-0.2)
Detection rate --- Per protocol						
All advanced adenomas and cancer	57	**1.2**	145	**2.4**	1.2	(0.7-1.7)
Cancer	11	**0.2**	24	**0.4**	0.2	(0.0-0.4)

- AAP(Adenoma with advanced pathology): ①Size > 1cm, ②具 Villous architexture, ③具 high-grade dysplasia

VAN ROSSUM et al, Gastroenterology 2008;135:82–90

FIT與Guaiac-FOBT兩者比較
-敏感度-

LA-FOBT
(Latex-agglutination FOBT)

Table 4 Performances of LA-FOBT and G-FOBT for colorectal neoplasia screening

	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)
Advanced adenomas				
LA-FOBT	56.8 (41.8–70.7)#	94.5 (91.2–96.7)	36.5 (29.7–46.1)	97.5 (94.5–99.0)
G-FOBT	19.8 (6.7–43.4)	97.4 (94.5–98.8)	29.4 (17.9–44.2)	95.6 (92.0–97.7)
Colorectal cancer				
LA-FOBT	100 (73.2–100)#	92.7 (89.3–95.0)	10.8 (6.3–17.8)	100 (98.0–100.0)
G-FOBT	54.2 (27.3–79.1)	96.9 (93.9–98.5)	13.6 (6.4–25.5)	99.6 (97.4–100.0)
Significant neoplasia[a]				
LA-FOBT	61.0 (47.8–72.9)#	95.1 (91.9–97.1)	43.4 (34.8–52.4)	97.5 (94.5–99.0)
G-FOBT	23.8 (10.8–43.5)	97.7 (94.9–99.0)	39.0 (17.9–44.0)	95.4 (92.0–97.7)

[#] $P < 0.001$ compared with G-FOBT
[a] Advanced adenoma or cancer

Parra-Blanco A, J Gastroenterology (2010) 45:703-712

民眾參與篩檢意願

Test performance	G-FOBT		FIT		Difference	
	n	%	n	%	%	95% CI
Participation rate	4836	46.9	6157	59.6	12.7	(11.3-14.1)
FOBT positive rate	117	2.4	339	5.5	3.1	(2.3-3.8)

民眾參與意願比較

Fig. 2. Compliance rate to the two screening modalities according to the geographical distribution of the study centres. *Note:* in white the study areas.
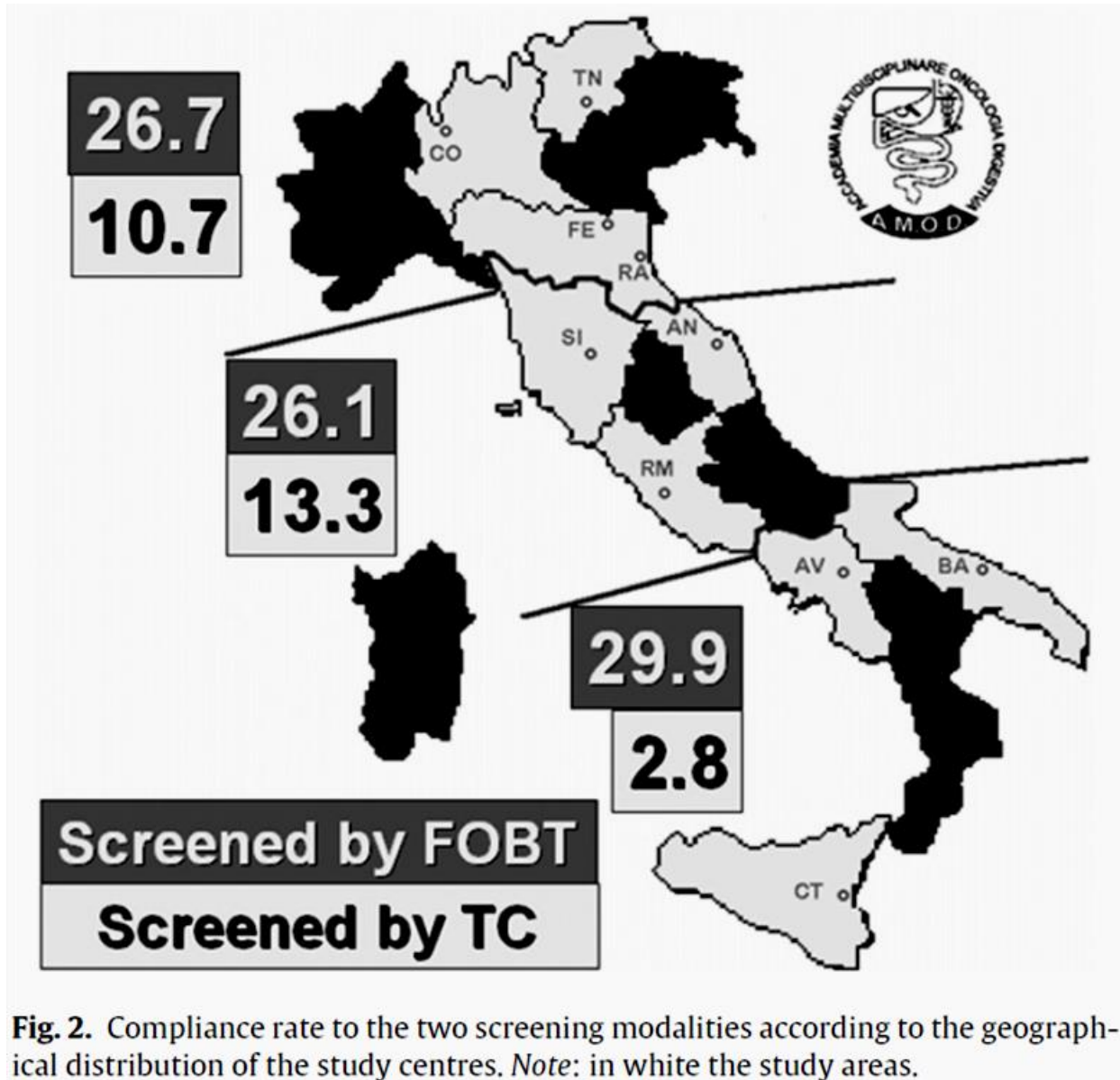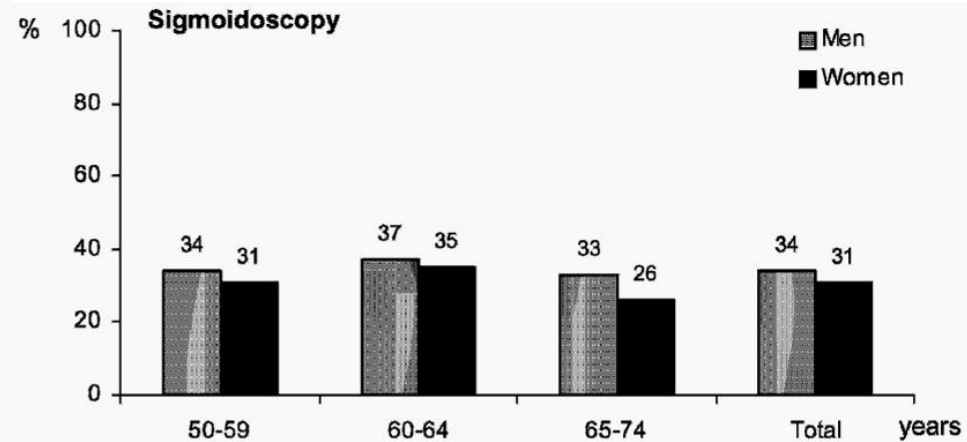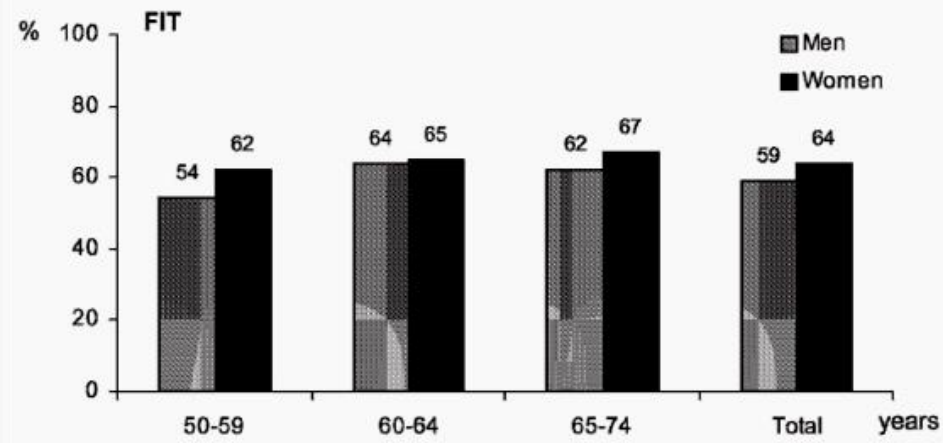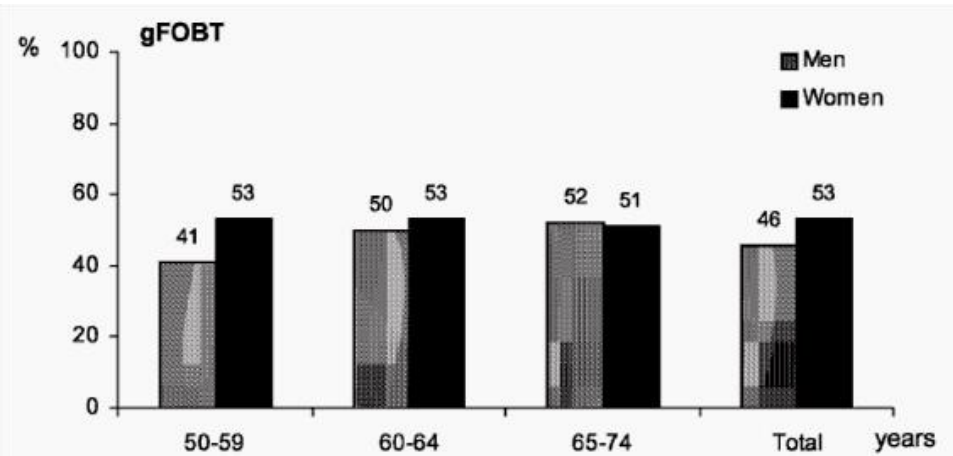
民眾參與意願

FIT相較於gFOBT的優勢

- 對於下消化道出血偵測具特異性
- 民眾參與意願較高
  - 不需飲食限制
  - 不需多次採集檢體
- 對於CRC的偵測敏感度較高
- 對於advanced adenoma的偵測敏感度較高
- 機械判讀
  - 適合大規模篩檢
- 可調整Cut-off value以調節後續大腸鏡篩檢的人力需求

FIT的侷限

FIT對於大腸近端病灶及遠端病灶的敏感度差異

Table 3. Sensitivity and Specificity of Immunochemical FOBT Stratified According to the Location of Neoplasia

	Proximal colon (95% CI)	Distal colon (95% CI)	P
Sensitivity %			
Advanced neoplasia	16.3 (11.3–21.3)	30.7 (26.7–34.8)	.00007
Adenoma ≥10 mm[a]	11.2 (6.6–15.8)	24.5 (20.1–29.1)	.0003
High-grade dysplasia	34.6 (16.3–52.9)	32.3 (22.8–41.8)	.82
Invasive cancer	56.5 (36.3–76.8)	69.6 (57.6–81.7)	.26
Dukes' stage A	42.9 (6.2–79.5)	55.2 (37.1–73.3)	.56
Dukes' stage B	50.0 (1.0–99.0)	83.3 (53.5–100.0)	.26
Dukes' stages C or D	55.6 (23.1–88.0)	92.9 (79.4–100.0)	.03
Specificity %			
Advanced neoplasia	94.5 (94.2–94.8)	95.0 (94.7–95.3)	
Invasive cancer	94.4 (94.1–94.7)	94.5 (94.2–94.8)	

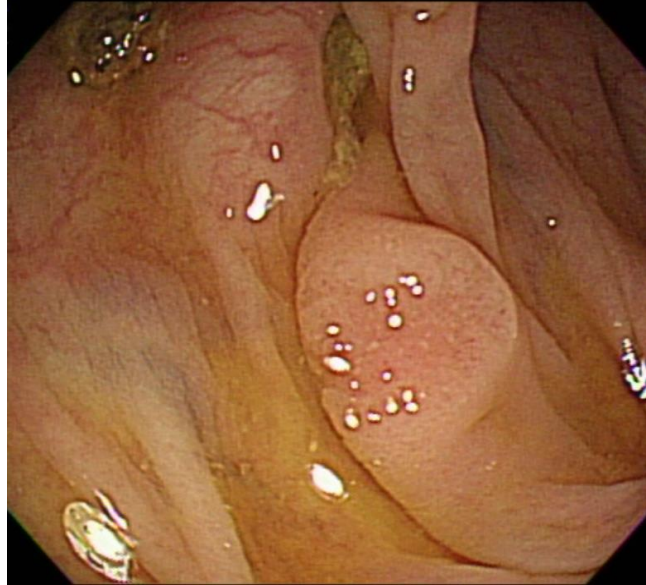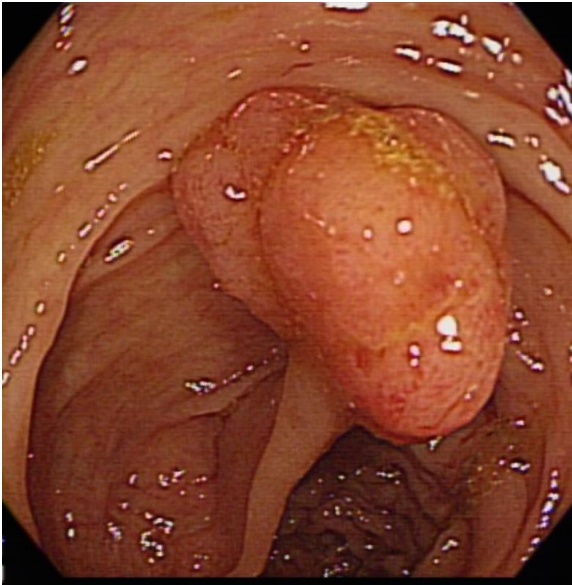MORIKAWA et al, Gastroenterology 2005;129:422–428

對於癌前病灶的偵測

- 在近端病灶, 女性及年輕人較差

Table 2. Positivity rates and mean Hb values of FIT in relation to location of adenomas, gender, and age in the group of 329 participants with a complete screening colonoscopy and available FIT results

	Total	Location			Gender			Age		
		Proximal only[a]	≥1 Distal[a]	P[b]	Women	Men	P[b]	<55 y	≥55 y	P[b]
Positivity rate, %										
100.0 ng/mL	3	0	8.3	0.064	1	5.8	0.019	1.8	4.5	0.203
50.0 ng/mL	4.6	0	11.7	0.016	2.6	7.3	0.06	4.1	5.1	0.793
27.5 ng/mL	7.9	7.7	18.3	0.012	5.7	10.9	0.099	7	8.3	0.682
Concentration Hb, ng/mL										
In group with positive FIT	470.7 ± 657.3	None	808.9 ± 847.0	n/a	95.5 ± 24.1	770.9 ± 768.3	0.023	239.7 ± 393.7	805.8 ± 825.1	0.03
In group with adenomas	70.0 ± 315.7	3.0 ± 9.1	99.1 ± 375.2	0.008	18.6 ± 2.8	133.1 ± 439.6	0.127	33.8 ± 173.6	104.6 ± 407.2	0.303
In group with adenomas ≥10 mm	319.7 ± 643.8	9.3 ± 16.2	381.7 ± 691.7	0.106	26.1 ± 32.7	686.6 ± 853.3	0.088	146.2 ± 368.9	493.1 ± 822.7	0.503
In group with advanced adenomas	153.1 ± 464.8	7.1 ± 13.9	205.3 ± 534.2	0.082	14.7 ± 26.3	291.6 ± 634.8	0.635	63.4 ± 244.6	263.9 ± 633.5	0.303

[a]Proximal group consists of subjects with proximal adenomas only, distal group of subjects with at least 1 distal adenoma, for the calculation of positivity rates subjects without colonic pathology were added to the proximal and the distal group, resulting in a total number of subjects of 269 and 303, respectively.
[b]On the basis of χ^2 forth comparison of positivity rates and on the Mann–Whitney U test for mean Hb stool concentration.

American Association for cancer research. Cancer Prevention Research 2011; 4(10); 1563-1571
Br J cancer 2011;104:1779-1785

近端病灶的風險

大腸息肉的多樣性

- 非突起型大腸息肉:
  - ➢ 扁平型大腸息肉: 盛行率: 2.8%, 57.9%位在近端大腸
  - ➢ 凹陷型大腸息肉: 盛行率: 0.16%, 46.7% 位在近端大腸

近端病灶的風險

	No. neoplastic lesions and incidence of Ca (M/SM)					
	All polypoid lesions		All nonpolypoid lesions (0-IIa, IIb, IIc)		Depressed lesions (all IIc)	
	No. lesions (%)	No. lesions with Ca (%)	No. lesions (%)	No. lesions with Ca (%)	No. lesions (%)	No. lesions with Ca (%)
Rembacken et al., UK [10] (n = 327/1000 pts)	204 (62.4)	2 (1.0)	123 (37.6)	4 (3.3)	4 (1.2)	2 (50.0)
Parra et al., Spain [11] (n = 490/1300 pts)	376 (76.7)	10 (2.7)	114 (23.3)	8 (7.0)	3 (0.6)	2 (66.6)
Soetikno et al., USA [13] (n = 1535/1819 pts)	1308 (85.2)	13 (1.0)	227 (14.8)	15 (6.6)	18 (1.2)	6 (33.3)
Chiu et al., Taiwan [14] (n = 5682/12 731 pts)	4653 (81.9)	79 (1.7)	1029 (18.1)	60 (5.8)	39 (0.7)	20 (51.3)

Ca, cancer; M, mucosal invasive cancers; SM, submucosal invasive cancers.

Matsuda T et al. Digestive Endoscopy 2010;22:S57

大腸鏡為基礎的大腸直腸癌篩檢

腫瘤偵測率

Table 5. Prevalence ORs of Advanced Adenomas and CRC by Screening Strategies

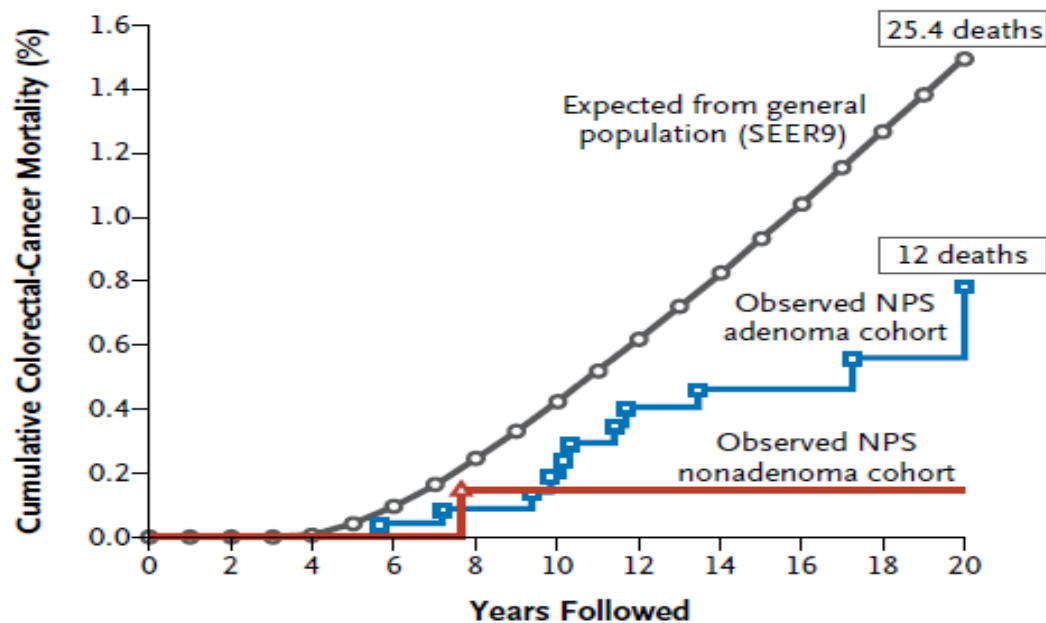|	OR[a]	95% CI
All neoplasms		
All subjects		
FS, n = 1922	1	
FIT, n = 1965	0.22	0.14–0.35
TC, n = 1596	1.42	1.08–1.88
55–59 y, n = 3089	1	
60–64 y, n = 2394	1.04	0.78–1.38
Women, n = 2783	1	
Men, n = 2700	2.04	1.55–2.70

NOTE. Multivariable ORs, 95% CI.
[a]ORs adjusted for screening center and for all other variables in the table.

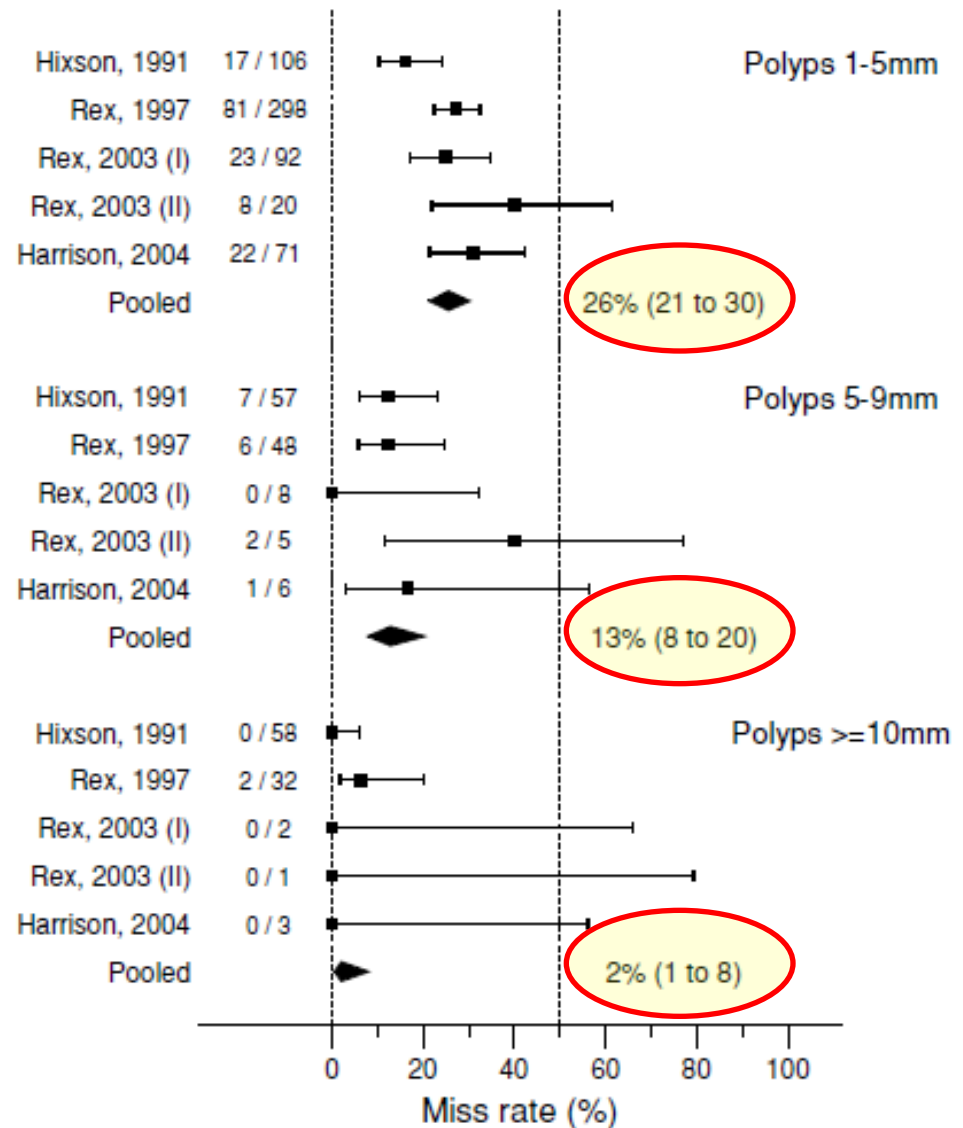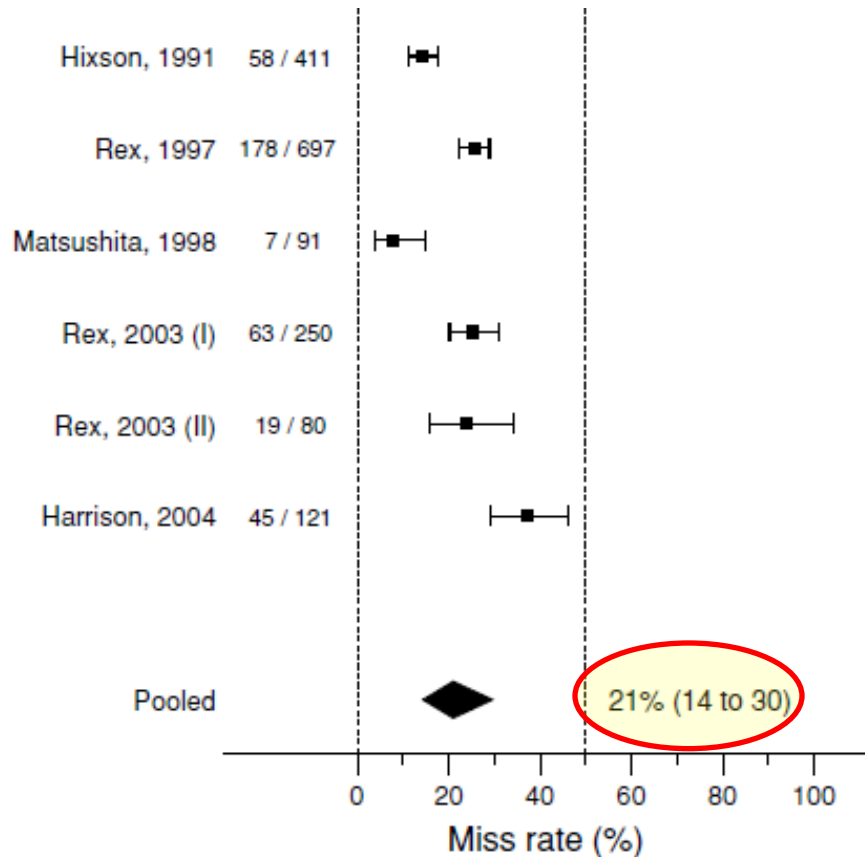使用大腸鏡做篩檢時對於**advanced neoplasia**有較高的偵測率

息肉切除對大腸直腸癌發生率的影響
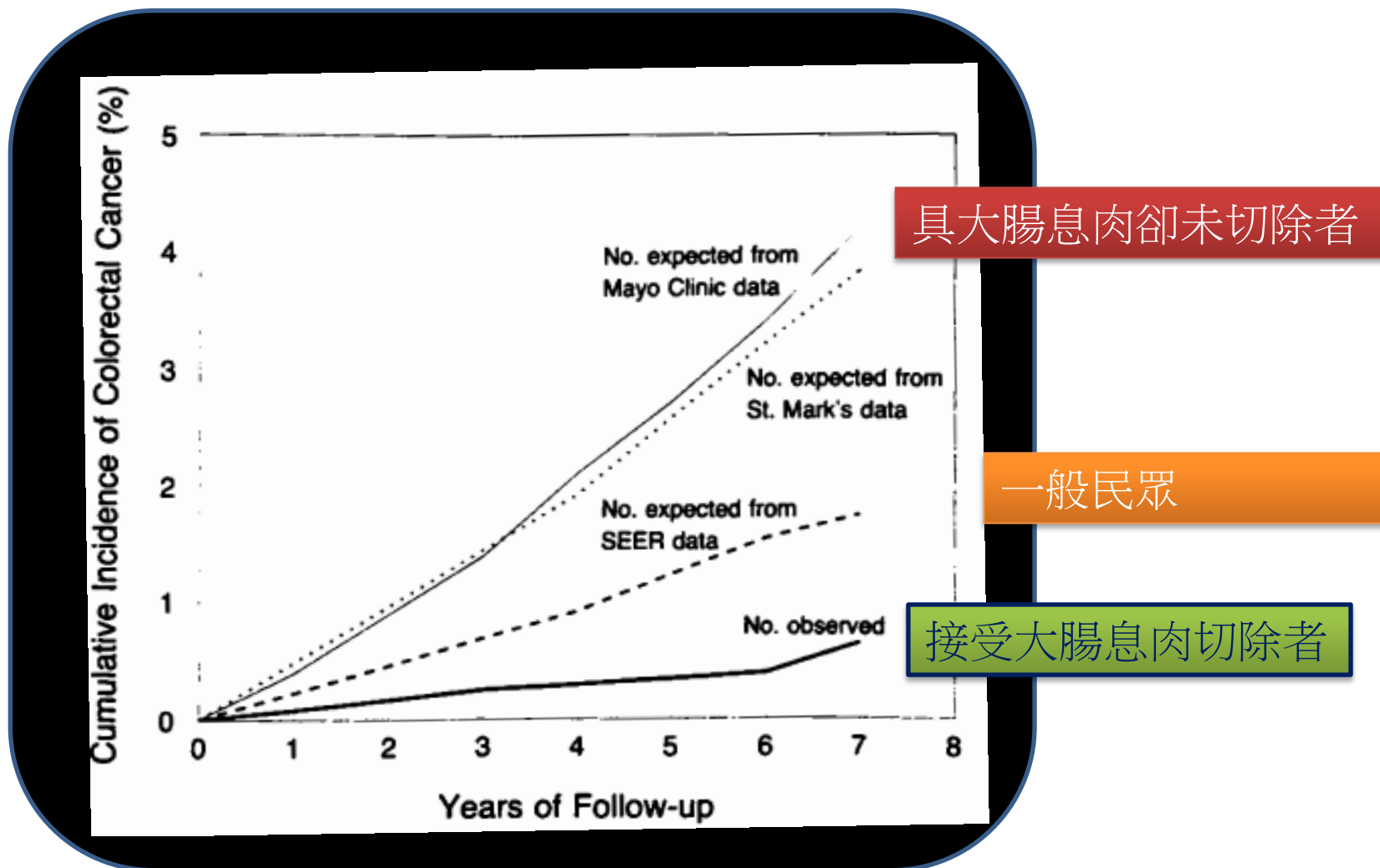
具大腸息肉卻未切除者

一般民眾

接受大腸息肉切除者

息肉切除對大腸直腸癌死亡率的影響

經大腸鏡息肉切除者確實能預防大腸直腸癌死亡率的發生

大腸鏡的侷限

大腸鏡是否為篩檢的首選?

平均失誤率: 21%

腺瘤偵測率與間期癌的相關性
ADR and Risk of Interval Cancer
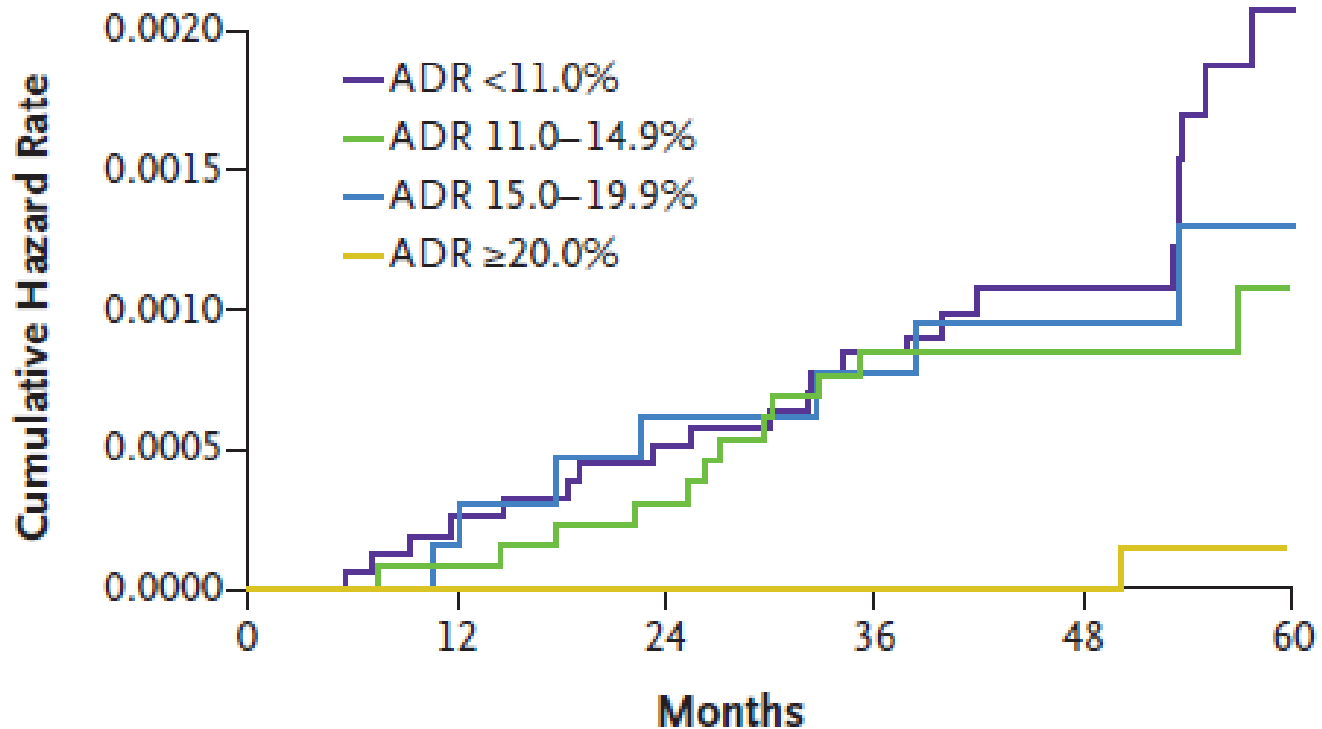
操作者是决定因素之一

Risk of CRC after negative colonoscopy (multivariate models)				
	Early CRC		CRC occurring > 3 yrs of index CFS	
Index CFS performed by:				
	Hazard ratio	95% CI	Hazard ratio	95% CI
Rural surgeons	3.34	1.69-6.61	1.74	0.88-3.45
Urban surgeons	1.68	1.03-2.74	1.14	0.59-2.21
Internists	2.09	1.09-4.02	1.39	0.63-3.04
Family practice	2.92	1.29-6.20	1.13	0.64-2.0
Gastroenterologists	1.0	Reference	1.0	Reference

The Risk Factors of PCCRC

Table 3. Multivariate Model Generalized Estimating Equation Logistic Predicting PCCRC

	Proximal cancers		Distal cancers	
	OR (95% CI)	P value	OR (95% CI)	P value
Age (for every 10-year increase)	1.05 (0.98–1.13)	.17	1.18 (1.08–1.28)	.0001
Sex				
Female	1.00 (referent)	.83	1.00 (referent)	.005
Male	1.02 (0.86–1.20)		0.79 (0.66–0.93)	
Charlson score				
0	1.00 (referent)	.004	1.00 (referent)	<.0001
1	1.27 (0.98–1.65)		1.88 (1.44–2.46)	
2	1.60 (1.09–2.34)		2.29 (1.58–3.31)	
3+	2.02 (1.34–3.03)		2.78 (1.78–4.35)	
Log (endoscopist volume)	1.00 (0.89–1.13)	1.00	0.94 (0.84–1.05)	.28
% Completeness for endoscopist				
<80%	1.00 (referent)	.002	1.00 (referent)	.03
80%–84%	1.16 (0.86–1.56)		0.90 (0.65–1.25)	
85%–89%	0.69 (0.51–0.93)		0.65 (0.47–0.89)	
90%–94%	0.66 (0.50–0.87)		0.71 (0.54–0.93)	
95%+	0.72 (0.53–0.97)		0.73 (0.54–0.97)	
% Polypectomy for endoscopist				
<10%	1.00 (referent)	.0001	1.00 (referent)	.39
10%–14%	1.11 (0.81–1.53)		0.99 (0.73–1.35)	
15%–19%	0.75 (0.54–1.04)		0.78 (0.57–1.06)	
20%–24%	0.75 (0.52–1.07)		0.82 (0.58–1.16)	
25%–29%	0.52 (0.35–0.79)		0.87 (0.61–1.24)	
30%+	0.61 (0.42–0.89)		0.79 (0.54–1.14)	
Specialty of endoscopist				
Gastroenterologist	1.00 (referent)	.006	1.00 (referent)	.001
Surgeon	1.23 (0.96–1.57)		0.96 (0.73–1.25)	
Other	1.87 (1.34–2.60)		1.67 (1.13–2.46)	
Setting of colonoscopy				
Academic hospital	1.00 (referent)	.05	1.00 (referent)	.05
Community hospital	1.11 (0.83–1.50)		0.96 (0.73–1.25)	
Nonhospital	1.88 (1.2–2.92)		1.67 (1.13–2.46)	

近端病灶偵測效力??

	Location			
	All	Right-sided (Proximal)	Left-sided (Distal)	Reference
Prevalence Ratios (95% CI)	0.52(0.37-0.73)	1.05(0.63-1.76)	0.33(0.21-0.53)	J Natl Cancer Inst 2010;102:89–95
Mortality Ratios (95% CI)	0.71(0.61-0.82)	0.95(0.77-1.17)	0.53(0.42-0.67)	GASTROENTEROLOGY 2010;139:1128–1137
Mortality Ratios (95% CI)	0.63(0.57-0.69)	0.99(0.86-1.14)	0.33(0.28-0.39)	*Ann Intern Med. 2009;150:1-8*

可能原因:
- 近端大腸多生長快速的腫瘤(rapid-growth neoplasm)
- 近端大腸大多清腸狀況不佳
- 大腸鏡無法順利完成

大腸鏡相關併發症

Table 3. Number and Incidence of Serious Complications in the First 30 Days following Colonoscopy with and without Biopsy*

Variable	All Colonoscopies (n = 16 318)		Colonoscopy without Biopsy (n = 5235)		Colonoscopy with Biopsy (n = 11 083)	
	Number	Incidence (95% CI)	Number	Incidence (95% CI)	Number	Incidence (95% CI)
All serious complications	82	5.0 (4.0–6.2)	4	0.8 (0.2–1.8)	78	7.0 (5.6–8.7)
Any bleeding	53	3.2 (2.5–4.2)	0	0.0 (0.0–0.6)	53	4.8 (3.6–6.2)
Surgery or transfusion	15	0.9 (0.5–1.5)	0	0.0 (0.0–0.6)	15	1.4 (0.8–2.2)
No surgery or transfusion	38	2.3 (1.7–3.1)	0	0.0 (0.0–0.6)	38	3.4 (2.5–4.6)
Perforation	15	0.9 (0.5–1.5)	3	0.6 (0.1–1.5)	12	1.1 (0.6–1.8)
Postpolypectomy syndrome	6	0.4 (0.1–0.7)	0	0.0 (0.0–0.6)	6	0.5 (0.2–1.1)
Any diverticulitis	6	0.4 (0.1–0.7)	1	0.2 (0.0–0.8)	5	0.5 (0.2–1.0)
Surgery	2	0.1 (0.0–0.4)	1	0.2 (0.0–0.8)	1	0.1 (0.0–0.4)
No surgery	4	0.2 (0.1–0.6)	0	0.0 (0.0–0.6)	4	0.4 (0.1–0.8)
Other serious illness	2	0.1 (0.0–0.4)	0	0.0 (0.0–0.6)	2	0.2 (0.0–0.6)

* Incidence per 1000 procedures.

民眾參與意願

Table 1. Attendance Rates by Gender and Age

	55–59 y		60–64 y		Total	
	Invited n	Attendees n (%)	Invited n	Attendees n (%)	Invited n	Attendees n (%)
TC "once only"						
Women	1823	454 (24.9)	1327	332 (25.0)	3150	786 (25.0)
Men	1714	484 (28.2)	1157	327 (28.3)	2871	811 (28.2)
Total[a]	3537	938 (26.5)	2484	659 (26.5)	6021	1597 (26.5)
FS "once only"						
Women	1847	557 (30.2)	1308	387 (29.6)	3155	944 (29.9)
Men	1716	596 (34.7)	1147	404 (35.2)	2863	1000 (34.9)
Total[a]	3563	1153 (32.4)	2455	791 (32.2)	6018	1944 (32.3)
FIT						
Women	1870	598 (32.0)	1297	463 (35.7)	3167	1061 (33.5)
Men	1803	535 (29.7)	1105	369 (33.4)	2908	904 (31.1)
Total[a]	3673	1133 (30.8)	2402	832 (34.6)	6075	1965 (32.3)

NOTE. Number of patients (n) and proportion of attendees (%).
[a]Because the participation to FOBT was higher among older people, we can estimate that the participation rate to FOBT, standardized to the actual age distribution of the source population, would be 32.8%, whereas the participation to FS and TC would not be changed.

倘若只能選擇一項篩檢方式, 大腸鏡的參與意願是比較低的!!

Colonoscopy與FIT比較

Colonoscopy

- 術前清腸使人不悅
- 民眾參與意願較低
- 侵入性檢查
- 執行者決定檢查效力
- 花費較高
- 對於近端病灶保護力仍較低

FIT

- 病灶偵測率較大腸鏡差
- 對近端病灶偵測力不佳
- 仍需大腸鏡做後續診斷

- 整體病灶偵測率較高
- 降低CRC發生率程度較高
- 降低CRC死亡率程度較高

- 民眾參與意願較高
- 對於CRC偵測具可接受的敏感度
- 機械判讀
- 費用較低廉

No RCT!!

No RCT!!

目前的篩檢政策

目前大腸直腸癌的篩檢政策

- 台灣
  - 政府目前補助50-74歲民眾每2年一次免疫法定量糞便潛血檢查

- American College of Physicians guideline
  - 50~75歲的一般民眾
  - 40~75歲具大腸直腸癌家族史的民眾
    - 每年糞便潛血檢查
    - 每五年軟式乙狀結腸鏡
    - 每十年大腸鏡檢

Bureau of Health Promotion, Departement of Health, R.O.C. 2003
ACP guideline, Ann Intern Med. 2012;156:378-386

台灣的困境

- 民眾參與意願低(38%)
  - 口腔癌60%、乳癌57%、子宮頸癌48%
- 大腸鏡執行效力不明
  - Cecal intubation rate?
  - Detection rate?
  - Complication rate?
  - Colon preparation issue
- 執行人力不足

內視鏡醫師的負擔

- 台灣50-74歲人口總數
  - 截至2013年10月: 636萬5781人
- 消化系內視鏡專科醫師人數
  - 約 1350人

如果大家都來做篩檢.....

…If colonoscopy for screening test:

6,365,781 in Oct. 2013

FIT rate CFS rate	20%	40%	60%	80%
70%	35,648	71,296	106,944	142,592
80%	40,740	81,480	122,220	162,960
90%	45,833	91,666	137,499	183,332

…If FIT positive rate is 4%

不只有篩檢 還有後續追蹤

Surveillance Recommendations after Colonoscopic Polypectomy		
FINDINGS ON COLONOSCOPY	**NEXT COLONOSCOPY**	**COMMENT**
Small rectal hyperplastic polyps	10 years	Considered equivalent to normal colonoscopy
One or two small (<1 cm) tubular adenomas with only LGD (low-risk adenoma)	5-10 years	Specific follow-up interval is determined by prior colonoscopic findings, family history, patient preference, and clinical judgment
3-10 adenomas, any adenoma ≥1 cm, or any adenoma with villous features or HGD	3 years	If the 3-year examination is normal, or shows only a low-risk adenoma, repeat again in 5 years
>10 adenomas at one examination	<3 years	Use clinical judgment; consider familial syndrome
Suggestive of HNPCC*	2-3 years	Consider more frequent intervals
Piecemeal removal of a sessile adenoma	2-6 months	Follow-up interval based on clinical judgment

*Features suggestive of HNPCC include right-sided cancers that are poorly differentiated and mucus-producing tumors with intense lymphocytic infiltrates; tumors demonstrate microsatellite instability.

HGD, high-grade dysplasia; HNPCC, hereditary nonpolyposis colorectal cancer; LGD, low-grade dysplasia.

Modified from Winawer SJ, Zauber AG, Fletcher RH, et al. Guidelines for colonoscopy surveillance after polypectomy: A consensus update by the US Multi-Society Task Force on Colorectal Cancer and the American Cancer Society. CA Cancer J Clin 2006; 56:143-59.

內視鏡醫師沉重的負擔

Nnoaham, Gut 2008;57:1238–1245