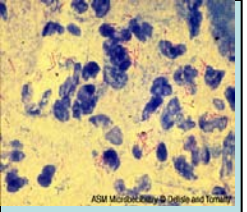
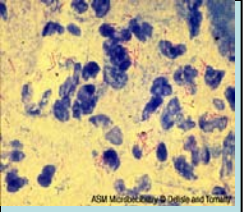


長照機構潛伏結核治療與照護經驗分享

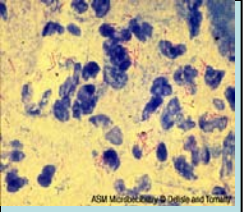
魏嵩璽

疾病管制局防疫醫師

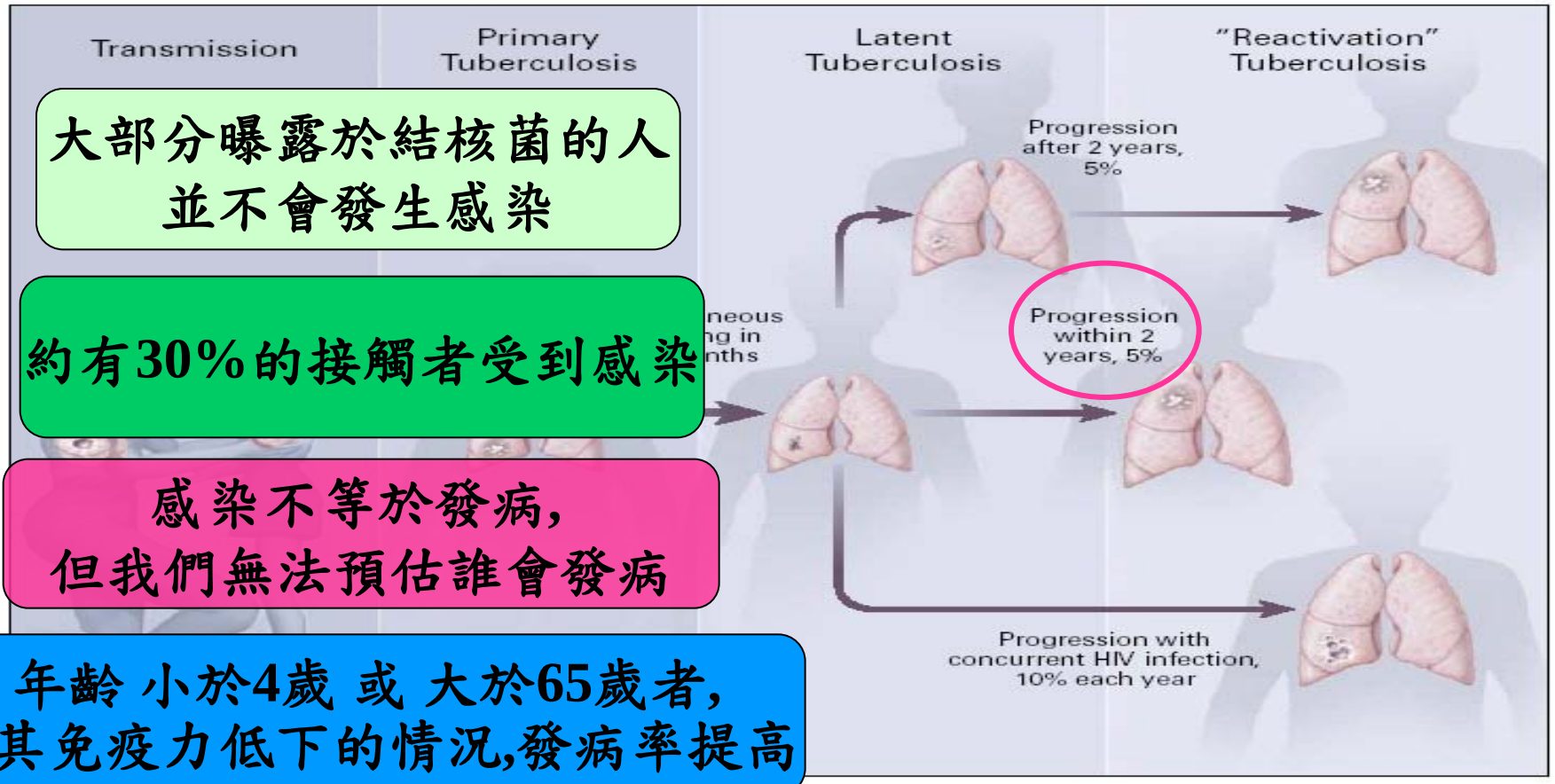


大綱

- 台灣結核病流行現況
- 抽血檢驗結核感染準嗎?
- 長照機構的潛伏結核感染治療



肺結核的自然病程



大部分曝露於結核菌的人
並不會發生感染

約有30%的接觸者受到感染

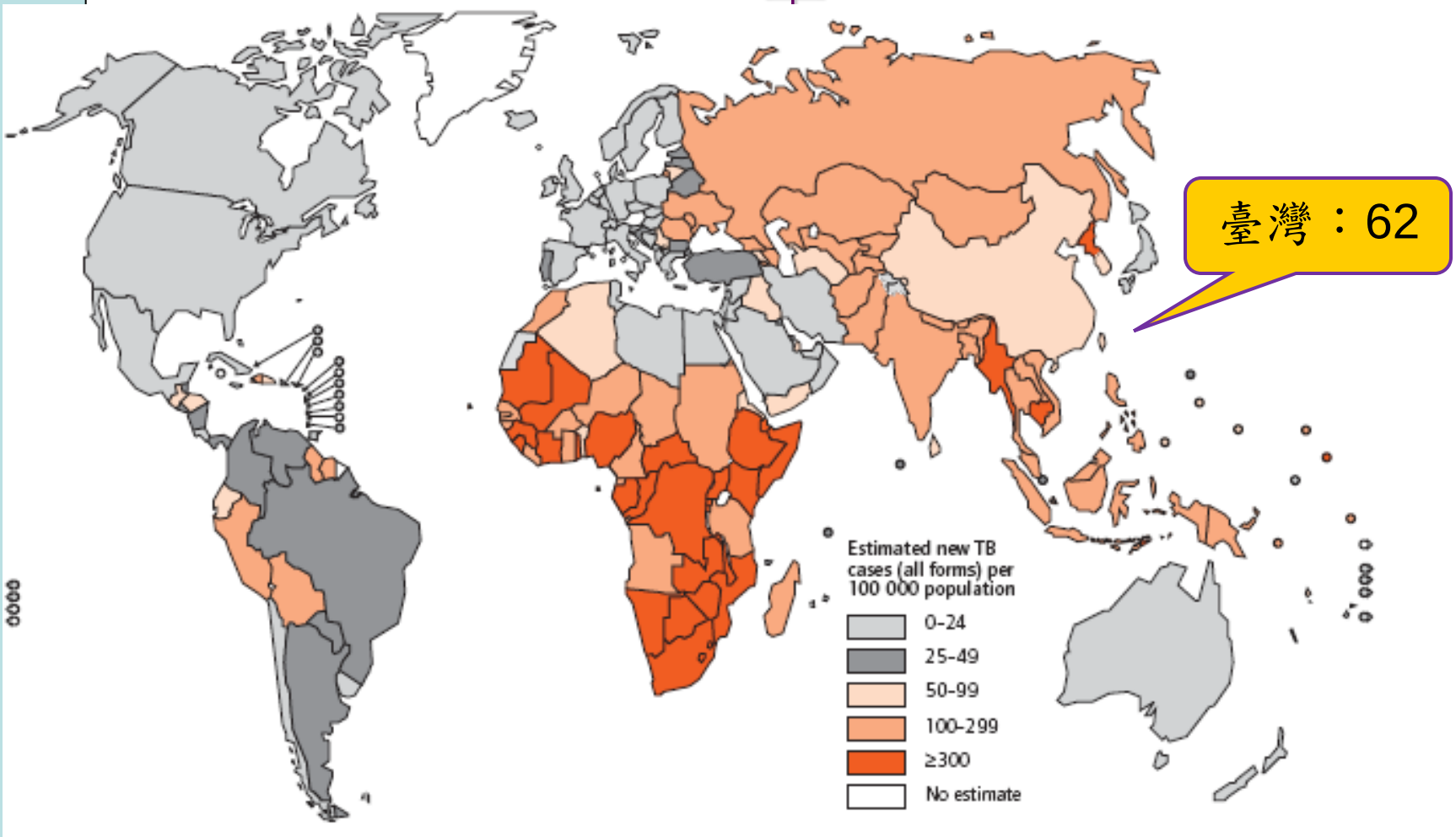
感染不等於發病,
但我們無法預估誰會發病

年齡 小於4歲 或 大於65歲者,
或其免疫力低下的情況,發病率提高

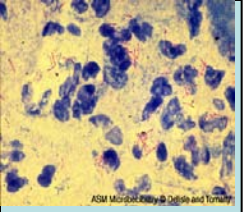
Figure 3. Transmission of Tuberculosis and Progression from Latent Infection to Reactivated Disease.
Among persons who are seronegative for the human immunodeficiency virus (HIV), approximately 30 percent of heavily exposed persons will become infected. In 5 percent of persons with latent infection, active disease will develop within two years, and in an additional 5 percent, progression to active disease will occur later. The rate of progression to active disease is dramatically increased among persons who are coinfected with HIV.

Management of tuberculosis in the United States, NEJM 2001/07/19

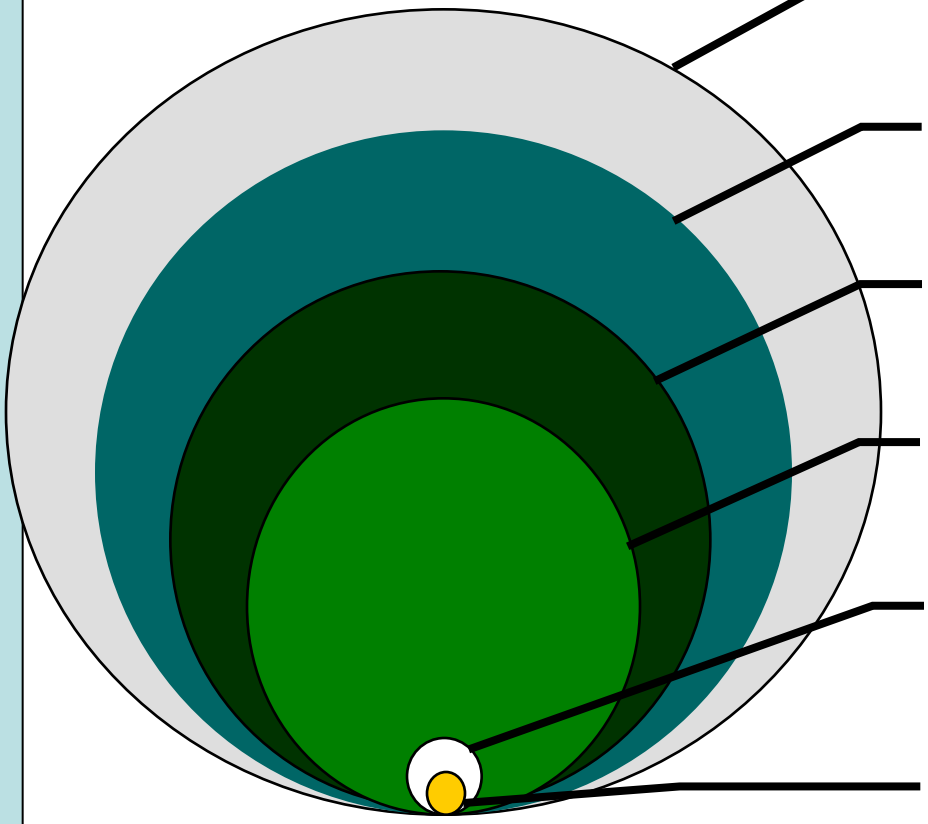
2008年估計之結核病發生率



資料來源：WHO, Global TB Control - a short update to the 2009 report



2009年結核病通報與確診監測



通報：16,700

確診新案：13,400

痰塗片/痰培養陽性：76%

痰塗片陽性： 39%

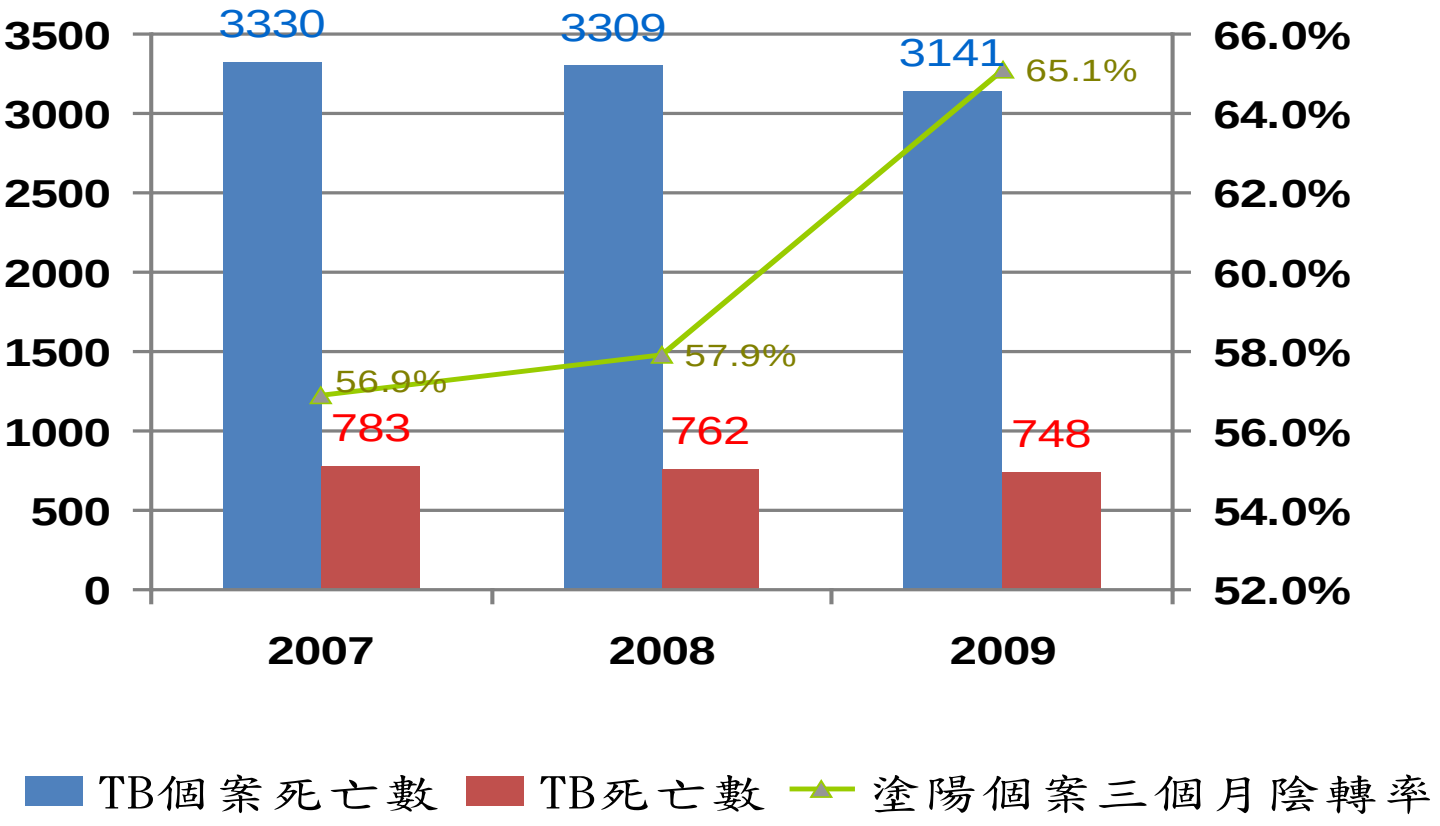
多重抗藥性結核病人：333
(管理照護中，含2009年以前通報個案)

慢性病人: 29
(管理照護中，含2009年以前通報個案)

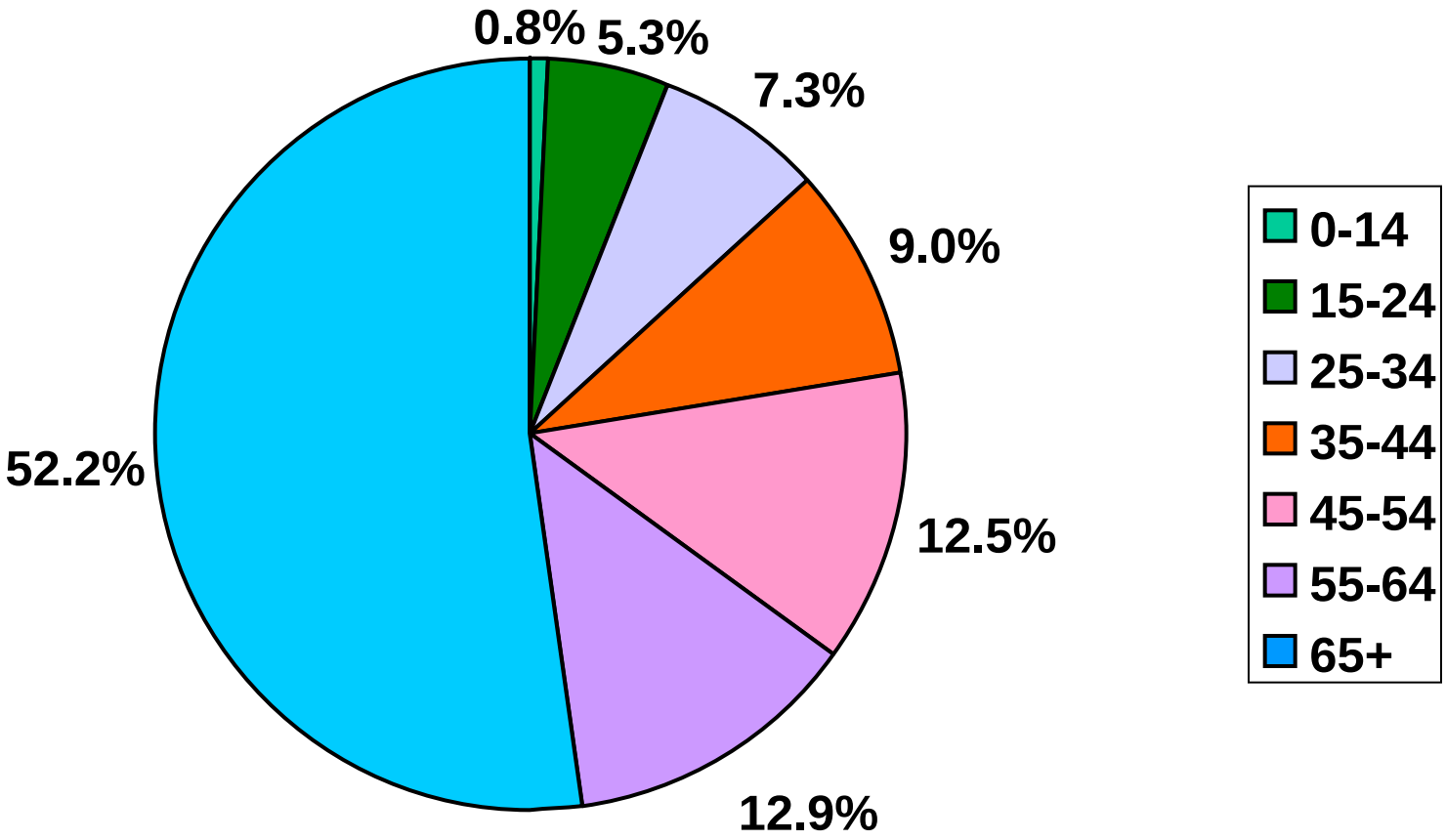
2009年結核病發生率估計：每十萬人口58人

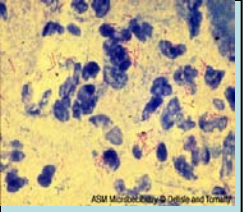
註：以上係20

2007-2009年結核病個案管理指標監測



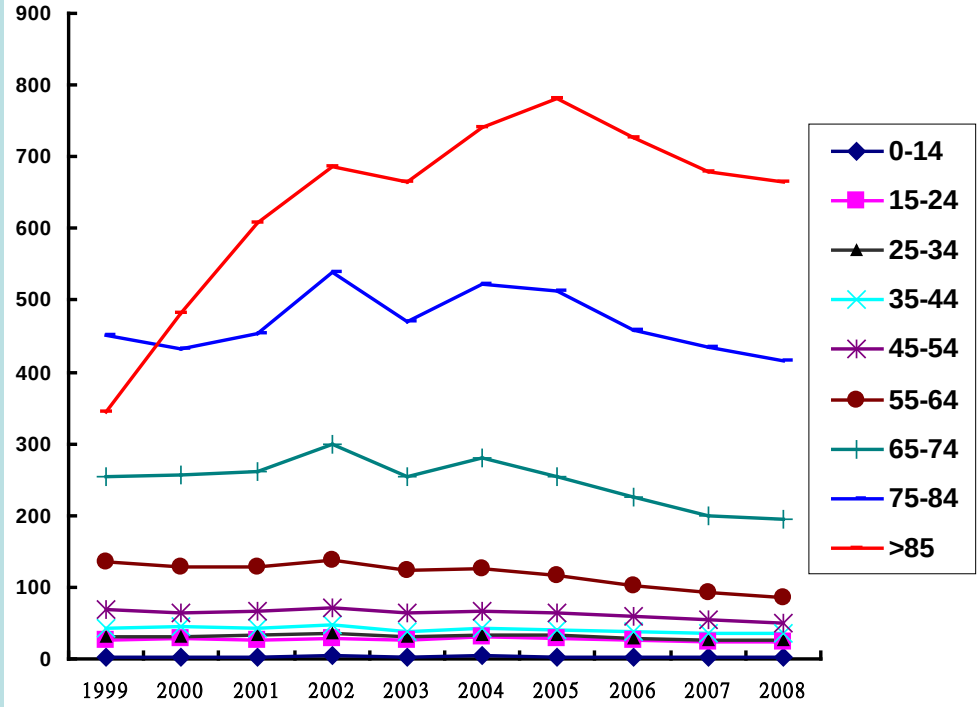
2008年新確診結核病個案之年齡分佈



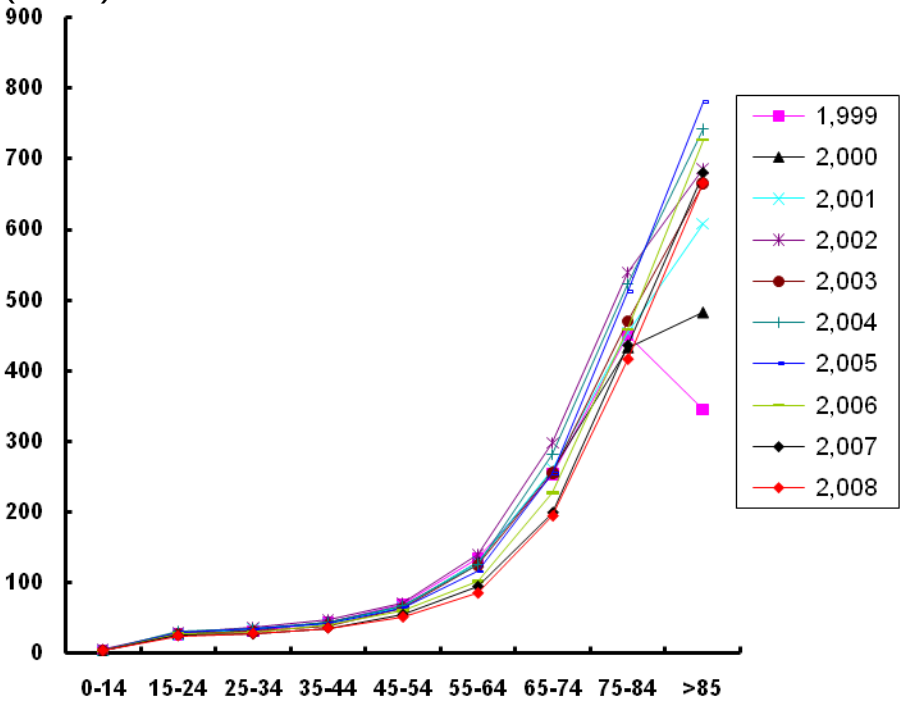


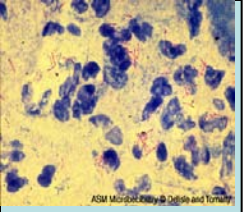
年齡別結核病發生率

(1/10^5)

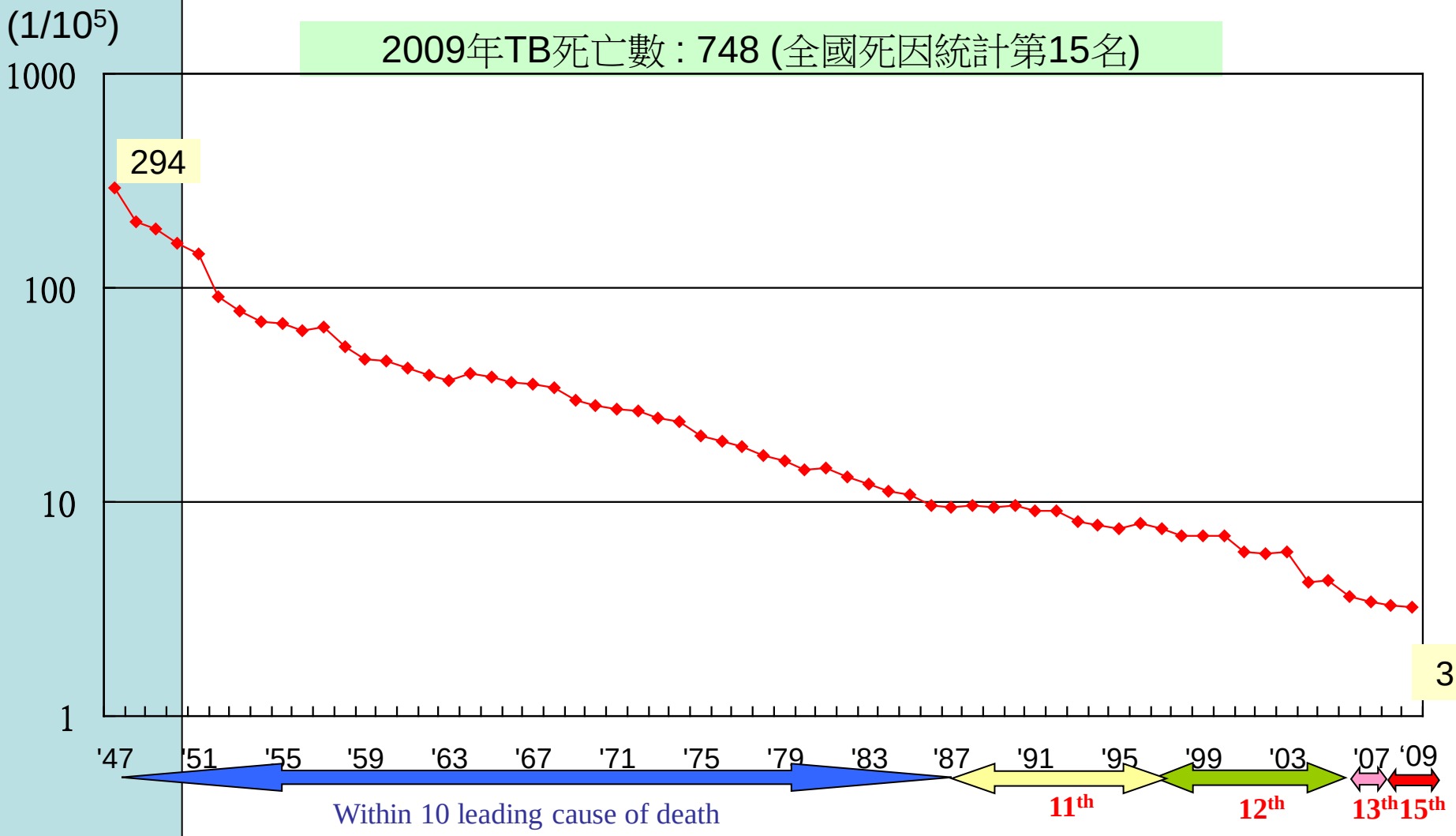


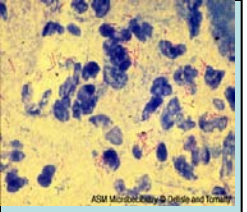
(1/10^5)



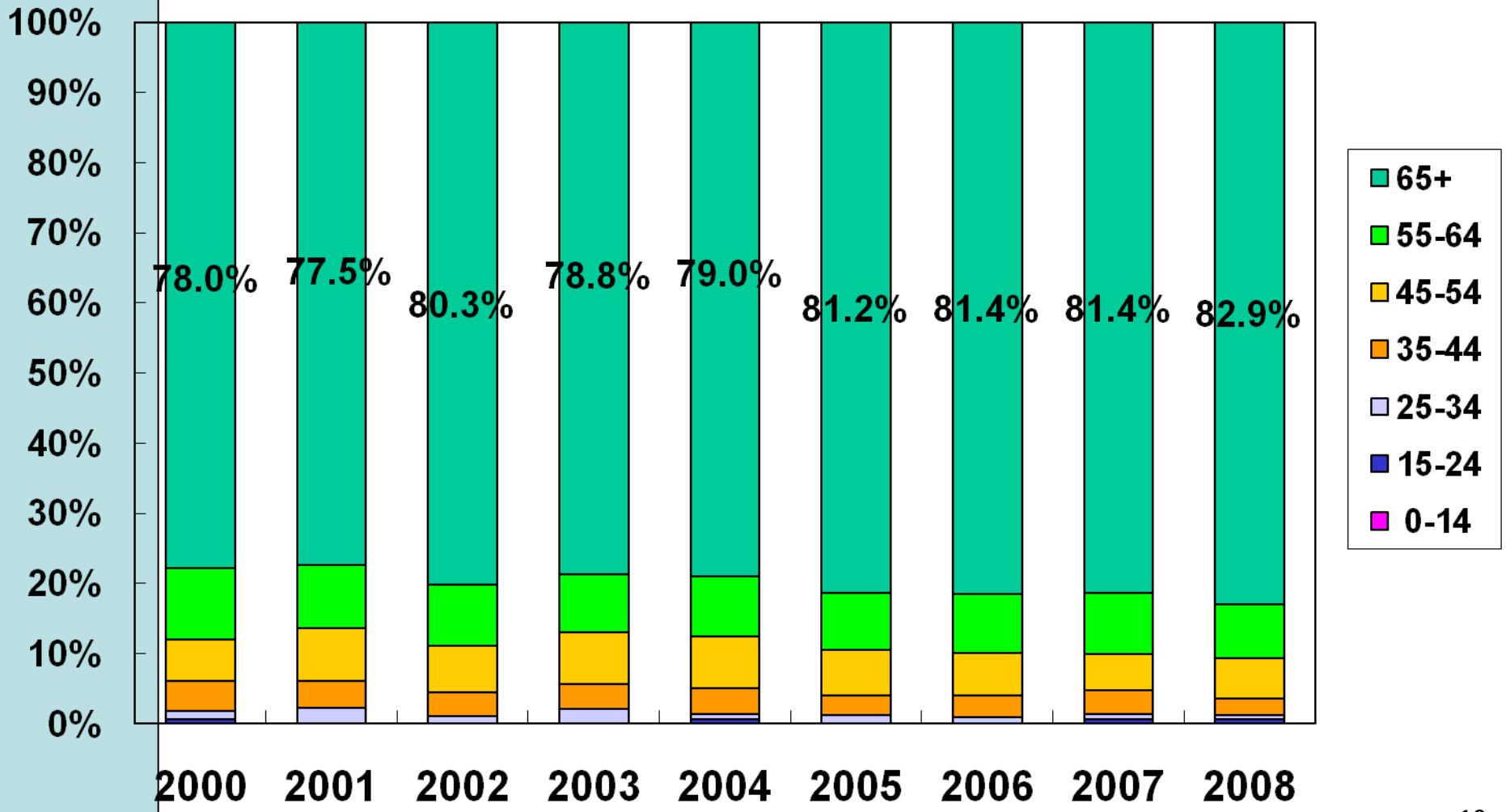


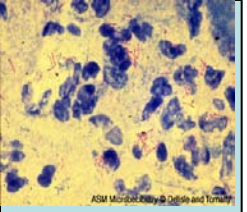
1947-2009 年臺灣結核病死亡率趨勢



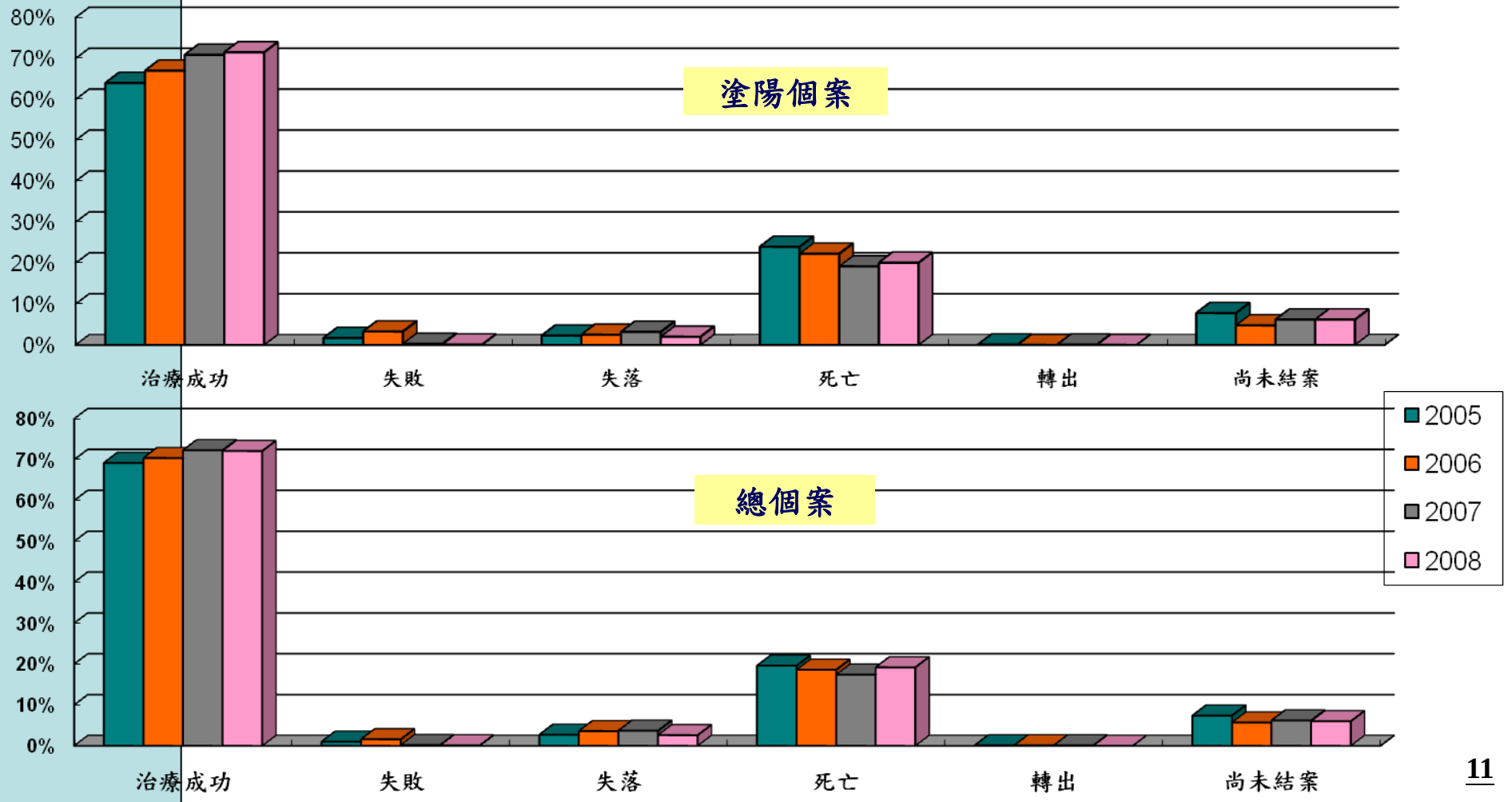


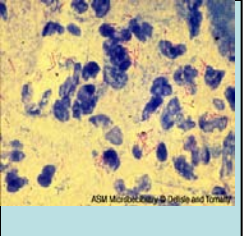
結核病死亡個案之年齡分佈



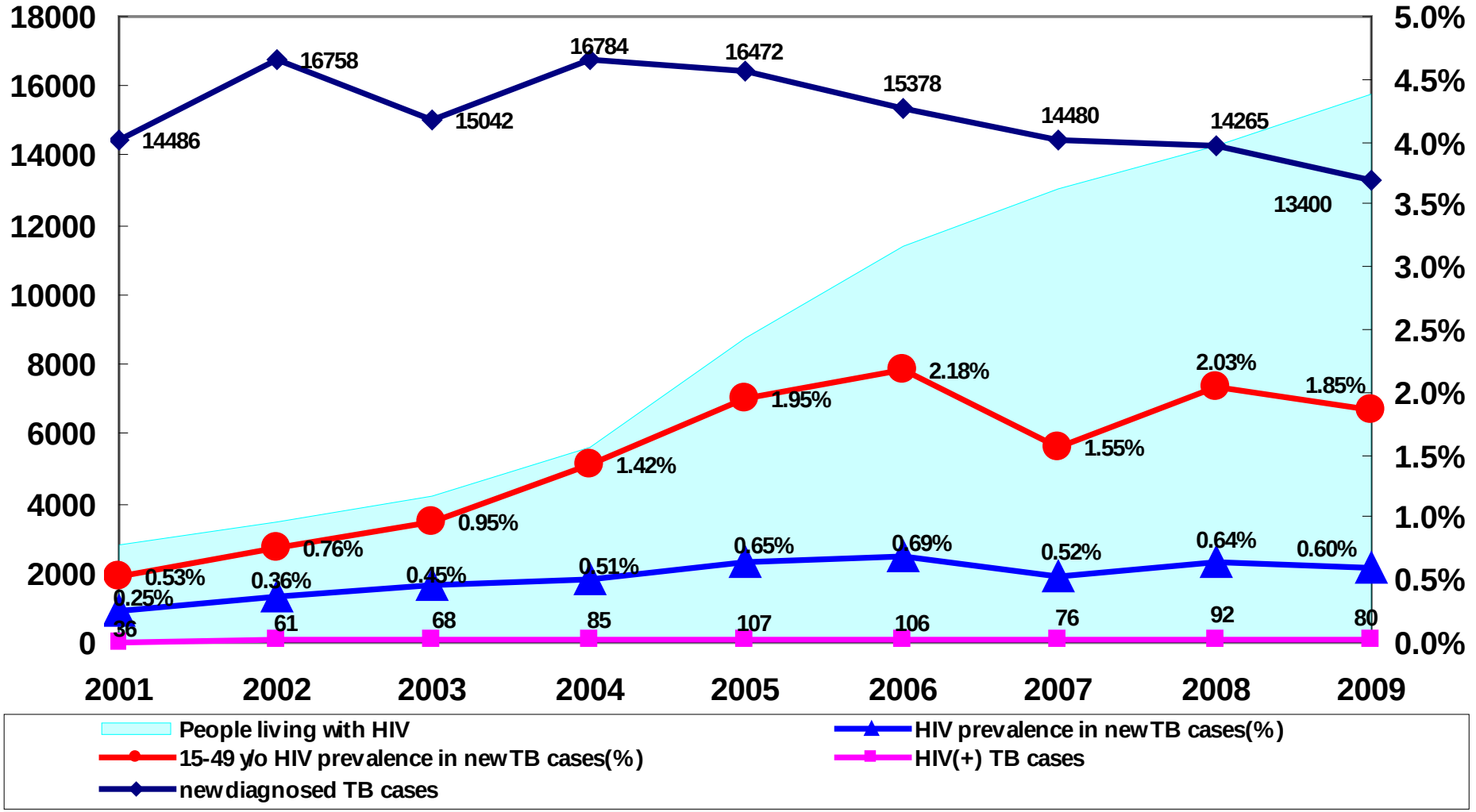


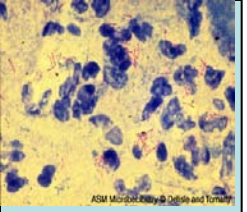
結核病個案追蹤十二個月治療結果監測 2005-2008



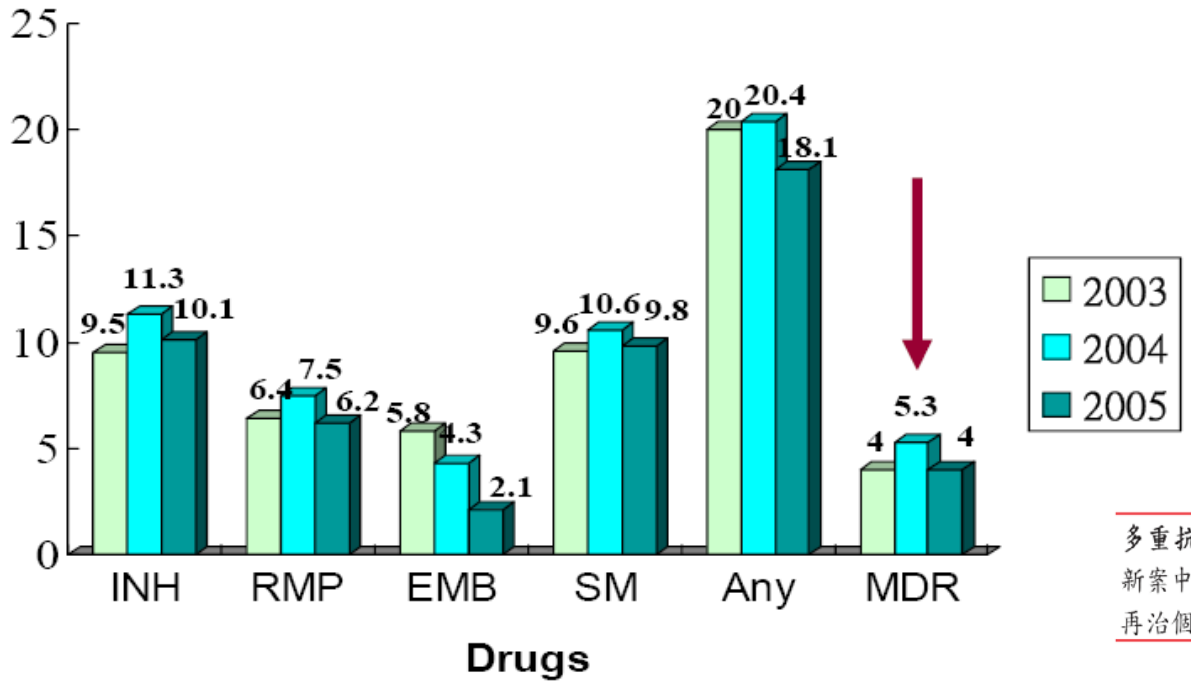


臺灣新診斷結核病個案之HIV盛行率趨勢





臺灣結核病抗藥性監測
2003-2005



台灣

監測和流行病學

人口數(千人)	22 917
2007年結核病負擔推估	所有病人
發生率	
所有結核病（千人）	20
所有結核病（每十萬人口）	85
2006-2007年發生率變動（%）	-6.0
塗陽新案(千人)	7
塗陽新案(每十萬人口)	32
結核病新案中HIV發生率（佔所有結核病個案%）	0.6
盛行率	
所有結核病（千人）	25
所有結核病（每十萬人口）	111
死亡率	
所有結核病（千人）	0.8
所有結核病（每十萬人口）	3.4
多重抗藥性結核	
新案中多重抗藥性結核百分比	1.0
再治個案中多重抗藥性結核百分比	6.2

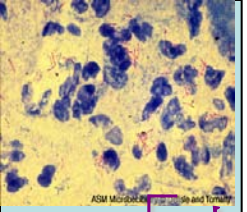
多重抗藥性結核

新案中多重抗藥性結核百分比	1.0
再治個案中多重抗藥性結核百分比	6.2

EID 2008;14 (5)

資料來自九家合約實驗室，約涵蓋50%全國檢體

臺灣結核病防治年報 (TCDC), 2009



「加強結核病防治—十年減半全民動員計畫」

~ 國家型結核病防治計畫 ~

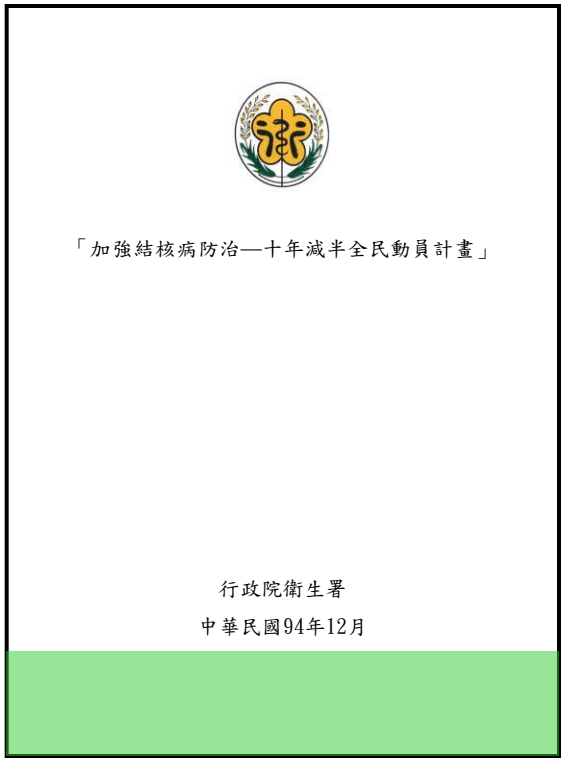
實施期程 : 2006 – 2015

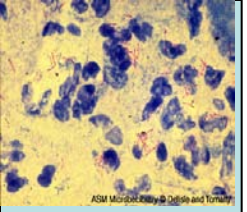
行政院核定 : July 2006

目標 : 十年結核病發生率/新案發生數減半

每十萬人口 67人 → 34 人

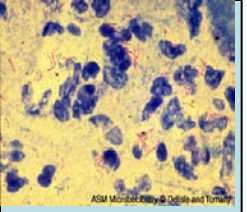
每年新案發生數 15,000 → 7,500人





臺灣結核病防治績效

比較期間	發生數	發生率 (1/10^5)	發生率降幅(%)	死亡數	死亡率 (1/10^5)	死亡率降幅(%)
2005年	16,472	72.5		970	4.3	
2006年	15,378	67.4	7.0	832	3.6	16.3
2007年	14,480	63.2	6.2	783	3.4	5.6
2008年	14,265	62.0	1.9	762	3.3	2.9
2009年	13,400	58.0	6.5	748	3.2	3.0
			20.0			25.6



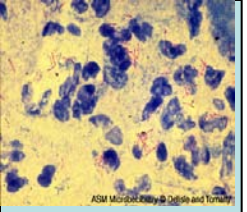
臺灣現行結核病防治行動方案

十年減半2025 全民動員

- **Plan 1**— 主動巡檢及接觸者檢查
- **Plan 2**— 實驗室品管
- **Plan 3**— 直接觀察治療-都治
- **Plan 4**— 提升醫療照護品質及院內感控
- **Plan 5**— MDR照護體系及進階都治(DOTS-Plus)
- **Plan 6**— 結核病人飛航管制及處理
- **Plan 7**— 監測管理系統
- **Plan 8**— 健保相關議題
- **Plan 9**— 縣市考評
- **Plan 10**— 潛伏結核感染之治療
- **Plan 11**— 結核病接觸者追蹤進階計畫
- **Plan 12**— 外勞定期篩檢及遣返
- **Plan 13**— 卡介苗預防接種
- **Plan 14**— 國際合作 & 研究計畫(PETTS、DOTS 評估)
- **Plan 15**— 強制隔離治療

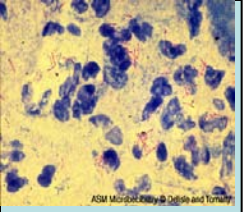
接觸者檢查落實及開始高危險群LTBI治療

- 接觸者檢查落實
  - 目的: 最划算的發現個案手段
  - 作法:
    - ＜13歲，指標個案確診後一個月內完成TST及CXR, 找到同時已發病及潛伏感染的接觸者; 若指標個案Smear +, culture + 或有空洞，則將病人轉介給合作醫師，依TST進行LTBI診斷並選擇進行LTBI治療或prophylaxis 。
    - 指標個案若為單純肺外，接觸者雖＜13歲亦僅接受胸部X光檢查即可。
  - 2009年有2,643名接觸者進入LTBI治療，其中2,392人(90.5%)參加DOPT。
- 2010年開始試辦擴大潛伏結核感染治療
  - 台北、高雄
  - 接觸者追蹤及定義
  - 包含成人
  - Quantiferon



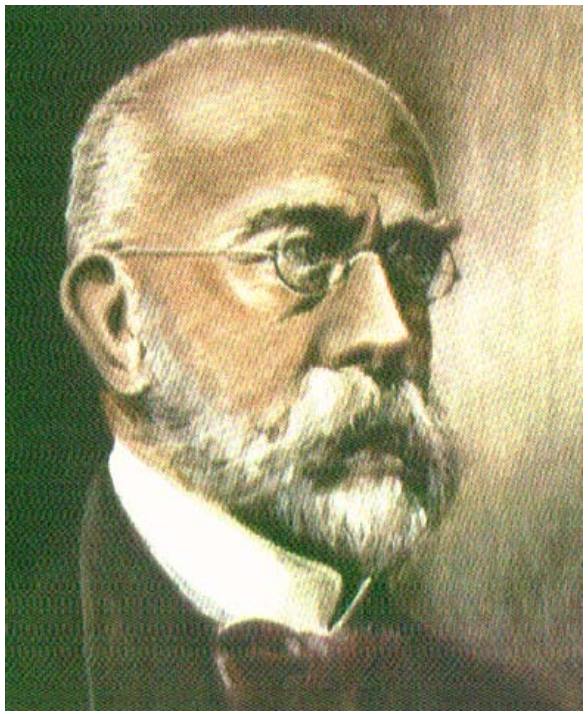
大綱

- 台灣結核病流行現況
- 抽血檢驗結核感染準嗎?
- 長照機構的潛伏結核感染治療



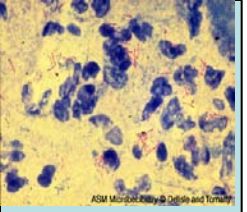
Koch's Old Tuberculin

Robert Koch (1843-1910)



1882
Discovery of the
Tubercle Bacillus

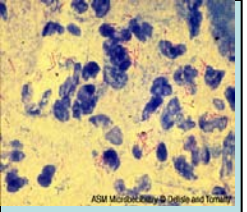
- Old tuberculin (OT)
  - Take 6-weeks-old culture of tubercle bacilli in 5% glycerin bouillon;
  - Evaporate it down to 1/10 of original volume;
  - Kill the bacilli by heat and then filter.



Koch´s Old Tuberculin

- To cure TB?? Not effective
- However, TB patients who received tuberculin had generalized systemic reactions, including fever, muscle aches, and abdominal discomfort with nausea and vomiting, in contrast to people without TB who did not develop this violent reaction.
- →TST test (Mantoux test)

Kaufmann 2000, Gradmann 2001, Gradmann 2006

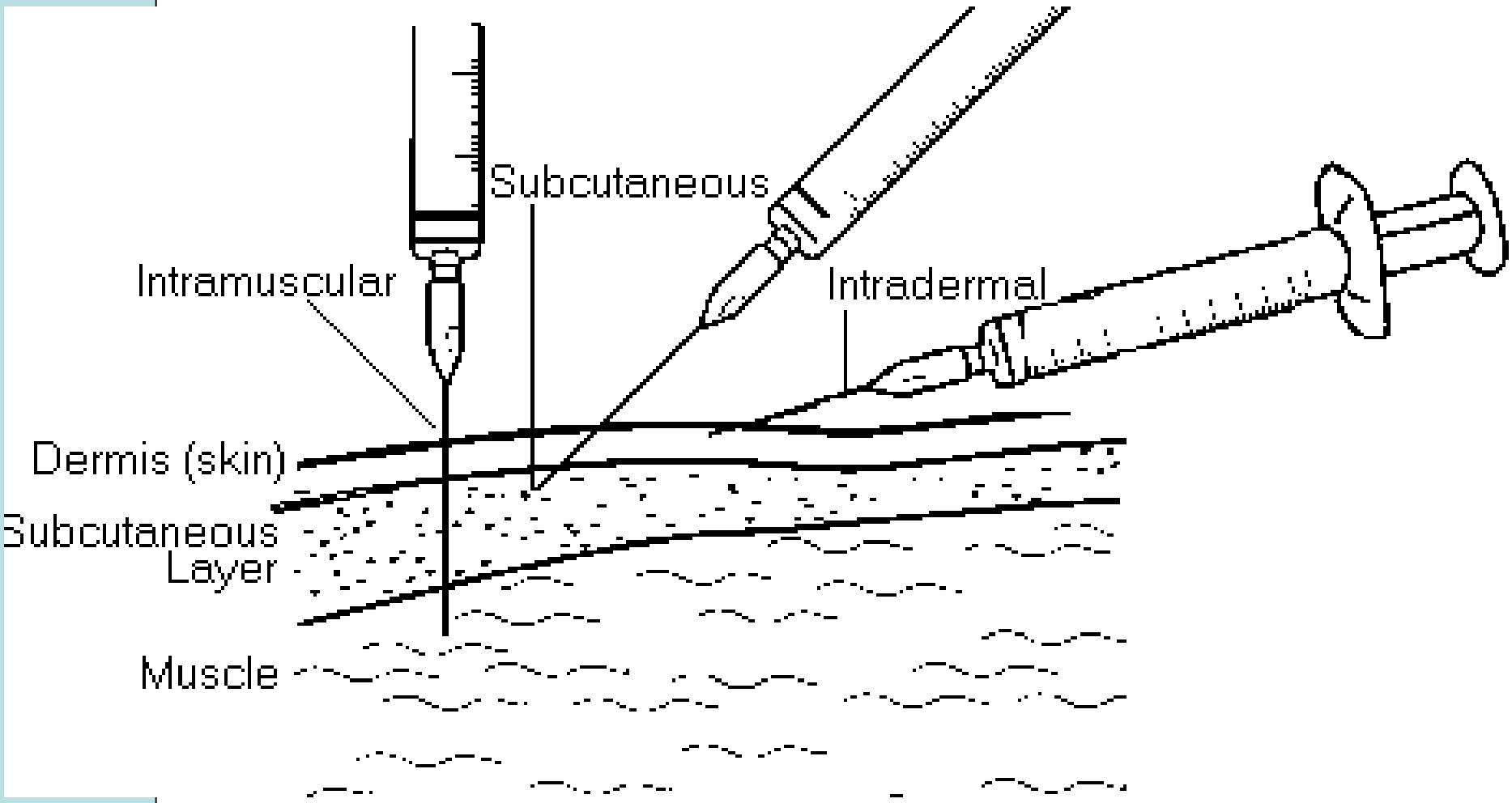


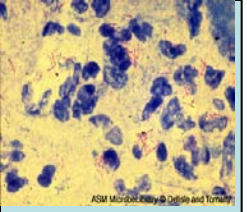
Purified Protein Derivative (PPD)

- In 1934, Siebert made a simple protein precipitate of the old tuberculin and named it purified protein derivative (PPD).
- Limitation:
  - BCG vaccination
  - NTM infection
  - 檢驗施打方式
  - 判讀方式

Florence Siebert (1897-1991)

針頭位置 (肌肉, 皮下, 皮内 注射)

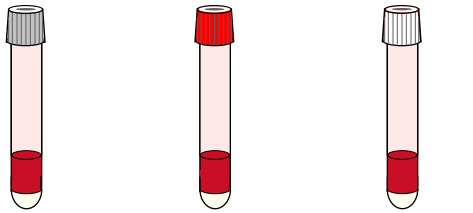




QuantiFERON-TB Gold In Tube

Since 2001

Stage One – Blood Incubation and Harvesting

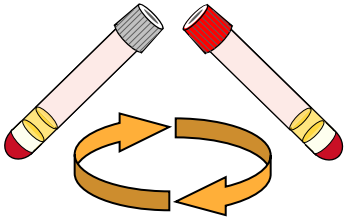


Nil Control

ESAT-6 CFP-10 TB7.7(p4)

Mitogen Control

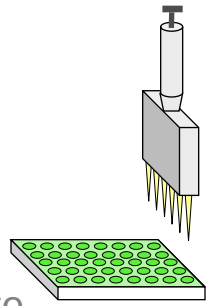
Step 1: Collect 1mL of blood (X3). Incubate 37ºC, 16-24 hrs.



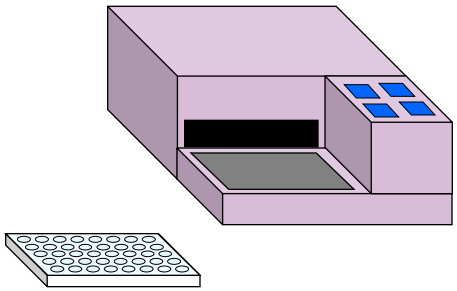
Step 2: Centrifuge tubes for 5 minutes.

IFN-γ stable refrigerated for at least 4 weeks.

Stage Two – Human IFN-γ ELISA (ELISA stage is easily automated on existing machines)

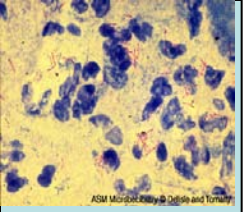


Step 3: Add plasma and conjugate to ELISA plate. Incubate 120 minutes at room temperature.



Step 4: Wash and add substrate. Read absorbance after 30 min.

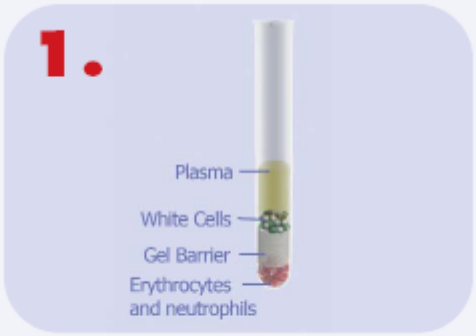
Step 5: Software calculates results and prints report.



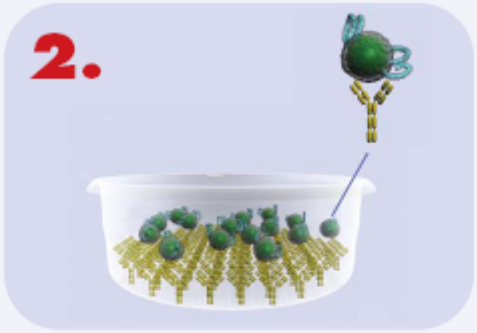
The Science behind T-SPOT®

Simplified, validated ELISpot method

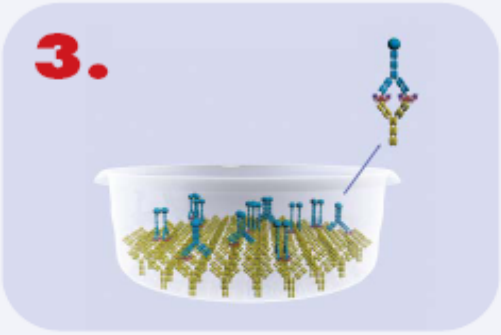
Since 2008



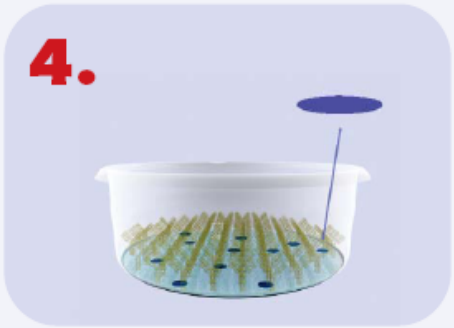
Collect blood sample, centrifuge to separate white blood cells which are washed



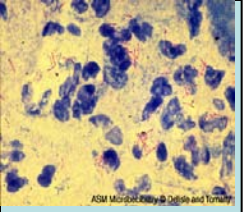
Add WBCs [●] and specific TB antigens [●] to wells pre-coated with antibodies to IFN-γ [Y] and incubate 16 to 20 hours (37° C, CO_2).



IFN-γ [●] is released from activated T cells and captured. Wash wells, add secondary conjugated antibody [Y]. Incubate for one hour.



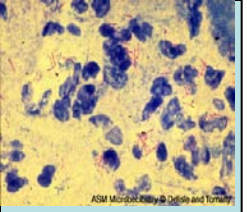
Wells are washed. A substrate is added which produces spots [●] where interferon gamma was secreted by T cells. Spots are counted.



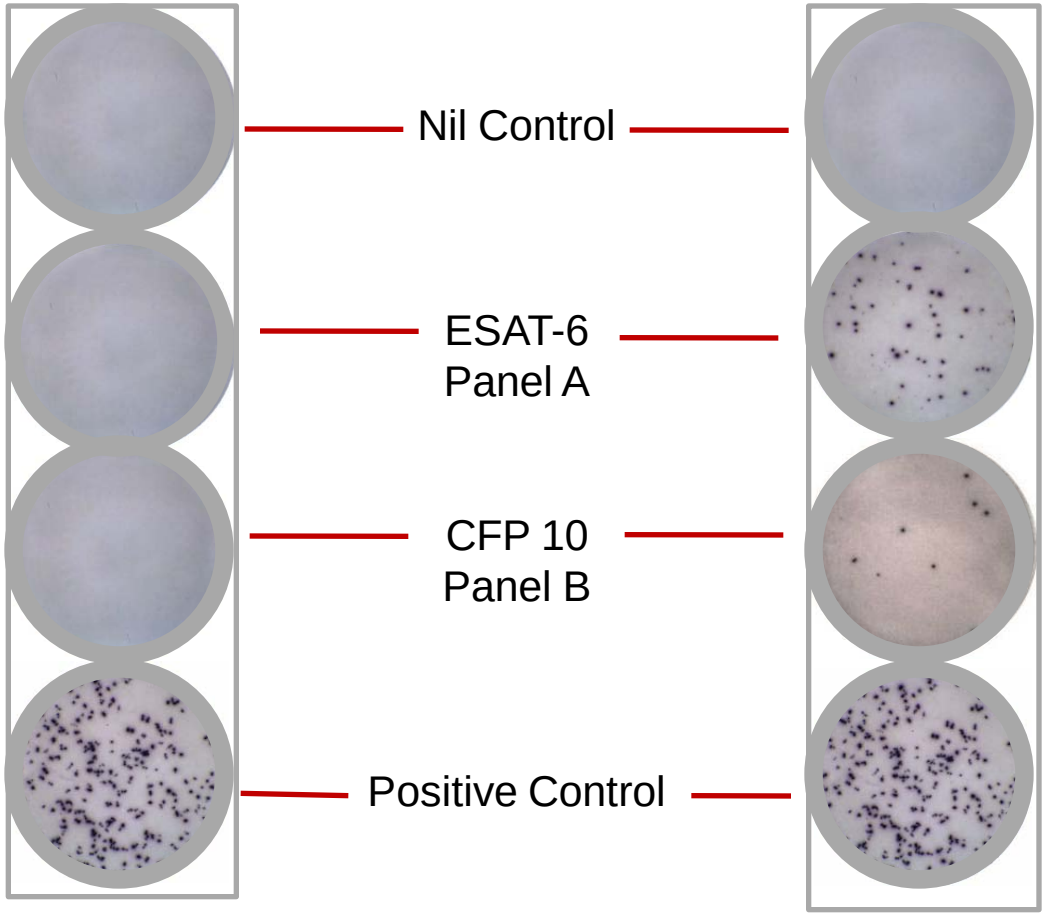
Performing the T-SPOT.*TB* Test

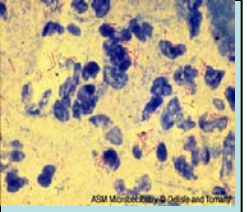
- T cells are stimulated using TB antigens (ESAT-6 and CFP 10) not present in BCG and most non-tuberculosis mycobacteria

- 4 wells per sample
  - Negative Control
  - Panel A (ESAT-6)
  - Panel B (CFP 10)
  - Positive Control



Interpretation of Results





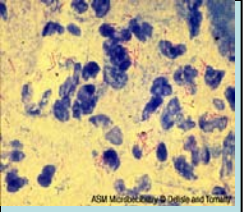
Estimates of Sensitivity-QFT-GIT

- 11 studies that compared QFT-GIT and TST in patients with TB infection (not necessarily culture-confirmed)
  - 6 studies demonstrated no statistically significant difference
  - 3 studies demonstrated greater sensitivity for TST
  - 2 studies demonstrated greater sensitivity for QFT-GIT
- In studies comparing sensitivities of QFT-GIT to that of TST in culture-confirmed TB patients
  - pooled QFT-GIT sensitivity was 83% and pooled TST sensitivity was 89%

TABLE 4. QuantiFERON-TB Gold-In-Tube test (QFT-GIT) sensitivity,* by country in which study was conducted — 14 countries, 2006–2009

pooled QFT-GIT sensitivity was 81%

Country	Subjects	Confirmed TB†		HIV§-positive		QFT-GIT results								% TST+ vs. QFT-GIT+ p-value††
							Positive		Indeterminate		ve			
		No. confirmed/ No. with TB diagnosis	(%)	No. +/ No. tested	(%)	Inter-pretation criteria**	No. +/ No. valid	(%)	No. +/ No. tested	(%)	Cutoff	No. +/ No. tested	(%)	
South Africa§§	Children	154/154	(100)	26/41	(63)	A	100/131	(76)	23/154	(15)	Stratified	131/146	(90)	<0.01
Germany¶¶	Children	28/28	(100)	NR***	NR	B	26/28	(93)	ND†††	ND	5 mm	28/28	(100)	0.49
India§§§	Adults	58/60	(97)	3/60	(5)	A	44/60	(73)	0/60	(0)	ND	ND	ND	ND
The Gambia¶¶¶	Adults	75/75	(100)	7/77	(9)	B	48/75	(64)	ND	ND	ND	ND	ND	ND
Spain****	Adults & children	NR/42	(NR)	NR	NR	C	33/42	(79)	0/42	(0)	5 mm	40/42	(95)	0.05
Italy††††	Mostly adults	17/17	(100)	NR	NR	C	14/17	(82)	0 17	(0)	NR	9/12	(75)	0.97
Singapore§§§§	Adults	286/286	(100)	7/238	(3)	A	224/270	(83)	10/286	(4)	10 mm	206/217	(95)	<0.01
											15 mm	158/217	(73)	ND
Japan¶¶¶¶	Adults	100/100	(100)	1/ 100	(1)	D	87/94	(93)	6/100	(6)	ND	ND	ND	ND
Denmark*****	Adults	68/ 80	(85)	10/ 56	(18)	C	65/76	(86)	4/80	(5)	10 mm	9/12 (75)	(75)	0.58
Czech	Adults	22/22	(100)	0/22	(0)	C	19/22	(86)	0/22	(0)	5	12/22	(55)	0.05
Republic†††††		0/31	(0)	0/31	(0)		24/28	(86)	3/31	(6)		22/31	(71)	ND
Zambia§§§§§	Adults	0/112	(0)	59/ 96	(62)	A	83/96	(86)	16/112	(14)	5 mm¶¶¶¶¶	62/92¶¶¶¶¶	(67) ¶¶¶¶¶	<0.01
											10 mm¶¶¶¶¶	48/92¶¶¶¶¶	(52) ¶¶¶¶¶	ND
Austria******	HIV+ adults	10/11	(91)	11/11	(100)	D	10/11	(91)	0/11	(0)	5 mm	8/10	(80)	0.92
Multiple	Adults	121/121	(100)	3/NR	(NR)	C	99/117	(85)	4/121	(3)	10 or 15	114/136	(84)	1.0
European†††††		0/34	(0)	0/NR	NR)		22/34	(65)	0/34	(0)		37/41	(90)	0.02
United	Children	25/25	(100)	0/35	(0)	D	20/23	(87)	2/25	(8)	10 mm	21/24	(86)	1.0
Kingdom§§§§§§		0/38	(0)				20/36	(56)	2/38	(5)		24/38	(63)	0.67

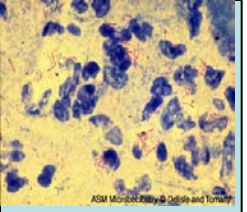


Estimates of Sensitivity-T-spot

- 12 studies comparing T-Spot and TST sensitivity in TB patients (not necessarily culture-confirmed)
  - 9 demonstrated no statistically significant difference
  - 3 demonstrated greater sensitivity for T-Spot
- 5 studies in patients with culture-confirmed tuberculosis
  - Pooled T-Spot sensitivity was 90%
  - Pooled TST sensitivity was 89%

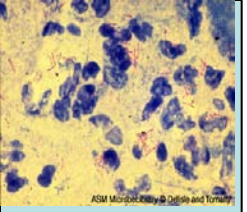
		Confirmed TB†		HIV†-positive		T-Spot results				TST¶ results			% TST+ vs. QFT-GIT+ p-value††
							Positive		Indeterminate				
Country	Subjects	No. confirmed/ No. with TB diagnosis	(%)	No. +/ No. tested	(%)	Interpretation criteria**	No. +/ No. valid	(%)	No. +/ No. tested	(%)			(%)	
Singapore§§	Adults	286/286	(100)	7/238	(3)	A	254/270	(94)	3/286	(1)			(95)	0.94
													(73)	ND¶¶
Spain***	Adults & children	NR/42	(NR)	NR†††	NR	B	36/39	(86)	3/42	(7)			(95)	0.93
Germany§§§	Children aged 0–7 yrs	28/28	(100)	NR	NR	B	26/28	(93)	0/28	(0)			(100)	0.49
South Korea¶¶¶	Adults	37/65	(57)	0/31	(0)	C	83/87	(95)	0/87	(0)	5 mm	64/87	(74)	<0.01
											10 mm	55/87	(67)	<0.01
Germany****	Adults	58/65	(89)	NR	NR	D	40/40	(100)	0/40	(0)	NR	35/40	(88)	0.05
Italy††††	Adults	23/23	(100)	0/23	(0)	E	21/23	(91)	NR	NR	ND	ND	ND	ND
Italy§§§§	Adults & children aged >15 yrs	13/24	(54)	NR	NR	F	20/24	(83)	0/24	(0)	5 mm	14/20	(54)	0.49
Germany¶¶¶¶	Adults	8/12	(67)	NR	NR	G	12/12	(100)	0/12	(0)	6 mm	8/10	(80)	0.39
South Korea*****	Adults & children aged >15 yrs	58/67	(87)	0/67	(0)	H	59/64	(92)	3/67	(4)	10 mm	45/66	(68)	<0.01
Switzerland†††††	Adults	89/89	(100)	0/89	(0)	I	61/61	(100)	1/62	(2)	ND	ND	ND	ND
Taiwan§§§§§	Adults & children aged 2–84 yrs	37/39	(95)	3/NR	(ND)	J	34/39	(87)	NR	NR	ND	ND	ND	ND
Switzerland¶¶¶¶¶	Adults & children aged >15 yrs	58/58	(100)	0/58	(0)	K	57/58	(98)	0/58	(2)	ND	ND	ND	ND
Turkey******	Adults	NR/28	NR/28	NR	NR	B	26/28	(93)	NR	NR	10 mm	23/28	(82)	0.42
Turkey††††††	Adults & children aged >15 yrs	100/100	(100)	0/100	(0)	L	90/96	(93)	4/100	(4)	10 mm	80/99	(81)	0.79
Multiple European§§§§§§	Adults	69/69	(100)	3/NR	(NR)	B	62/69	(90)	0/69	(0)	10 or 15	114/136	(84)	0.06
		0/19	(0)	0/NR	(NR)		13/19	(68)	0/19	(0)		37/41	(90)	0.09
Taiwan¶¶¶¶¶	Adults with extra-pulmonary TB	50/50	(100)	2/NR	(NR)	M	40/50	(80)	NR	NR	ND	ND	ND	ND
		0/39	(0)				31/39	(79)						
United Kingdom*******	Children	25/25	(100)	0/35	(0)	F	14/24	(58)	1/25	(9)	10 mm	21/24	(88)	0.05
		0/28	(0)				17/34	(50)	4/28	(11)		24/28	(83)	0.39
Japan†††††††	Adults	49/49	(100)	NR	NR	N	47/47	(100)	2/49	(4)	ND	ND	ND	ND

pooled T-spot sensitivity was 91%



Head to head comparison in sensitivity

- 3 studies comparing the sensitivity of TST, QFT-GIT, and T-Spot, pooled sensitivity for TST, T-Spot, and QFT-GIT were 95%, 91%, and 84%, respectively
- The largest study in Singapore involved > 270 persons with culture-confirmed active tuberculosis
  - Sensitivity of T-Spot and of TST (using a 10-mm cutoff) were similar (94% and 95% respectively; p=0.84), significantly greater than QFT-GIT (83%; p<0.01).



Estimates of Specificity

- QFT-GIT and T-Spot are expected to be more specific than a TST
  - these tests are relatively specific to M. tuberculosis

pooled QFT-GIT specificity 99%

pooled TST specificity 85%

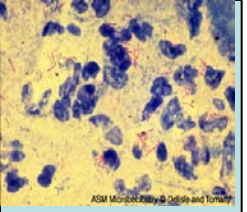
		BCG†-vaccinated		HIV§-positive			sults			Results			
							ntive	In			Negative		
Country	Subjects	No. vaccinated/ No. evaluated	(%)	No. +/ No. tested	(%)	Inter-pretation criteria**	No. +/ No. valid	(%)	No. +/ No. tested	(%)	Cutoff	No. +/ No. tested	(%)	% TST- vs. % QFT-GIT- p-value††
Germany§§	Children aged 0–11 yrs w/ lymphadenitis	0/23	(0)	NR¶¶	NR	A	19/19	(100)	ND***	ND	5	2/23	(9)	<0.01
											10	5/23	(22)	<0.01
Germany§§	Children aged 0–7 yrs w/ respi-rator infection	0/22	(0)	NR	NR	A	21/21	(100)	ND	ND	5	22/22	(100)	1.0
											10	22/22	(100)	1.0
Japan†††	Adult students	140/168	(83)	0/168	(0)	B	158 160	(99)	6/168	(4)	ND	ND	ND	ND
Denmark§§§	High school students & staff	38/124	(31)	0/124	(0)	C	124/124	(100)	0	(0)	10	116/124	(94)	<0.01
Italy¶¶¶	Mostly adults	1/14	(7)	0/14	(0)	C	14/14	(100)	0/14	(0)	NR	8/8	(100)	ND

Country	Subjects	BCG† vaccinated: No. vaccinated/ No. evaluated	BCG† vaccinated: (%)	HIV§ status	T-Spot results: Inter-pretation criteria**	T-Spot results: Negative: No. +/ No. valid	T-Spot results: Negative: (%)	T-Spot results: Indeterminate: No. +/ No. tested	T-Spot results: Indeterminate: (%)	TST¶ results: Cutoff	TST¶ results: Negative: No. +/ No. tested	TST¶ results: Negative: (%)	% TST- vs. % T-Spot- p-value††
Germany§§	Children aged 0–11 yrs w/ lymphadenitis	0/19	(0)	NR¶¶	A	18/19	(95)	4/23	(17)	5	2/23	(9)	<0.01
										10	5/23	(22)	<0.01
Germany***	Children aged 0–7 yrs w/ other respiratory infection	0/21	(0)	NR	A	21/21	(100)	1/22	(5)	5	22/22	(100)	1.0
										10	22/22	(100)	1.0
South Korea†††	High school students	131/131	(100)	NR	B	111/ 131	(85)	0/131	(0)	10	103/131	(79)	0.26
										15	125/131	(95)	<0.01
United States§§§	Adults with & w/o prior MAC¶¶¶ disease	0/18	(0)	NR	C	17/18	(94)	0/18	(0)	ND	ND	ND	ND

Pooled T-spot specificity: 88%

Pooled TST specificity: 86%

- The lower estimates of TST specificity compared with QFT-GIT and T-Spot might be attributable to
  - false-positive TST results following BCG vaccination
  - exposure to nontuberculous mycobacteria.

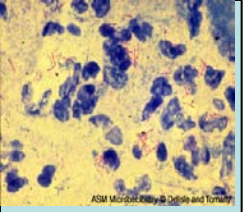


大綱

- 台灣結核病流行現況
- 抽血檢驗結核感染準嗎?
- 長照機構的潛伏結核感染治療

人口密集機構

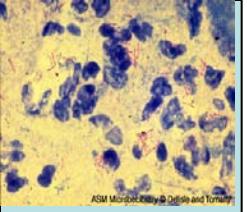
- 人口密集機構內之住民及工作人員(含流動工作人員)，含：
  - 老人福利機構
    - 長期照顧機構：長期照護型、養護型、失智照顧型
    - 安養機構
  - 身心障礙福利機構
  - 一般護理之家、精神護理之家
  - 精神復健機構
  - 榮民之家
  - 兒童、少年安置及教養機構
  - 矯正機關
- 因機構類型及住民特性迥異，各機構對於指引的運用，仍需依實際之可行性與適用性，修訂內化為適合單位所需之作業程序



人口密集機構特性

- 它是一個獨立自主的環境
- 入住機構內的住民可能存有潛在性疾病
- 與急性照護機構相較：
  - 較多的群體互動
  - 住民和護理人員的比例高
- 通常缺乏感染症診斷能力
- 病程的記錄常常缺乏

住民常為老年及免疫功能低下者



人口密集機構結核感染群聚??

- 定期胸部X光檢查，住民常出現異常
  - 肺炎?支氣管炎?
  - 以往感染??
  - 呼吸器造成肺浸潤?
- 痰液抹片 常出現異常?
  - NTM?
- 不斷出現的結核個案很困擾?
  - 醫療人員的士氣
  - 衛生單位的調查
  - 家屬的質疑

長照機構潛伏結核感染治療成果

六家長照機構目前近四年來的TB通報病例

年度	TB個案	○信護理之家	洪○鄰護理之家	慈　○養護中心	○○精神養護	○華護理之家	嘉○護理之家	合計
95	通報數	0	8	2	0	0	0	10
	死亡			1				
96	通報數	1	10	2	0	0	7	20
	死亡						3	
97	通報數	2	2	5	1	1	2	13
	排除		2	2				
	死亡	1		1			2	
98	通報數	3	1	3	3	3	6	19
	排除	3						
	死亡					3	1	

六家長照機構住民與員工的基本資料

	長期養護中心					
	住民		員工		合計	
	(n=450)		(n=219)		(n=669)	
長期照護機構						
台中○華護理之家	47	(10.4%)	15	(6.8%)	62	(9.3%)
埔里○南養護中心	133	(29.6%)	39	(17.8%)	172	(25.7%)
彰化○恩養護中心	116	(25.8%)	66	(30.1%)	182	(27.2%)
彰化○信護理之家	80	(17.8%)	30	(13.7%)	110	(16.4%)
彰化○○附設護理之家	27	(6.0%)	22	(10.0%)	49	(7.3%)
嘉義○○醫院附設護理之家	47	(10.4%)	47	(21.5%)	94	(14.1%)
性別						
男	269	(59.8%)	40	(18.3%)	309	(46.2%)
女	181	(40.2%)	179	(81.7%)	360	(53.8%)

六家長照機構住民與員工的胸部X光檢查結果

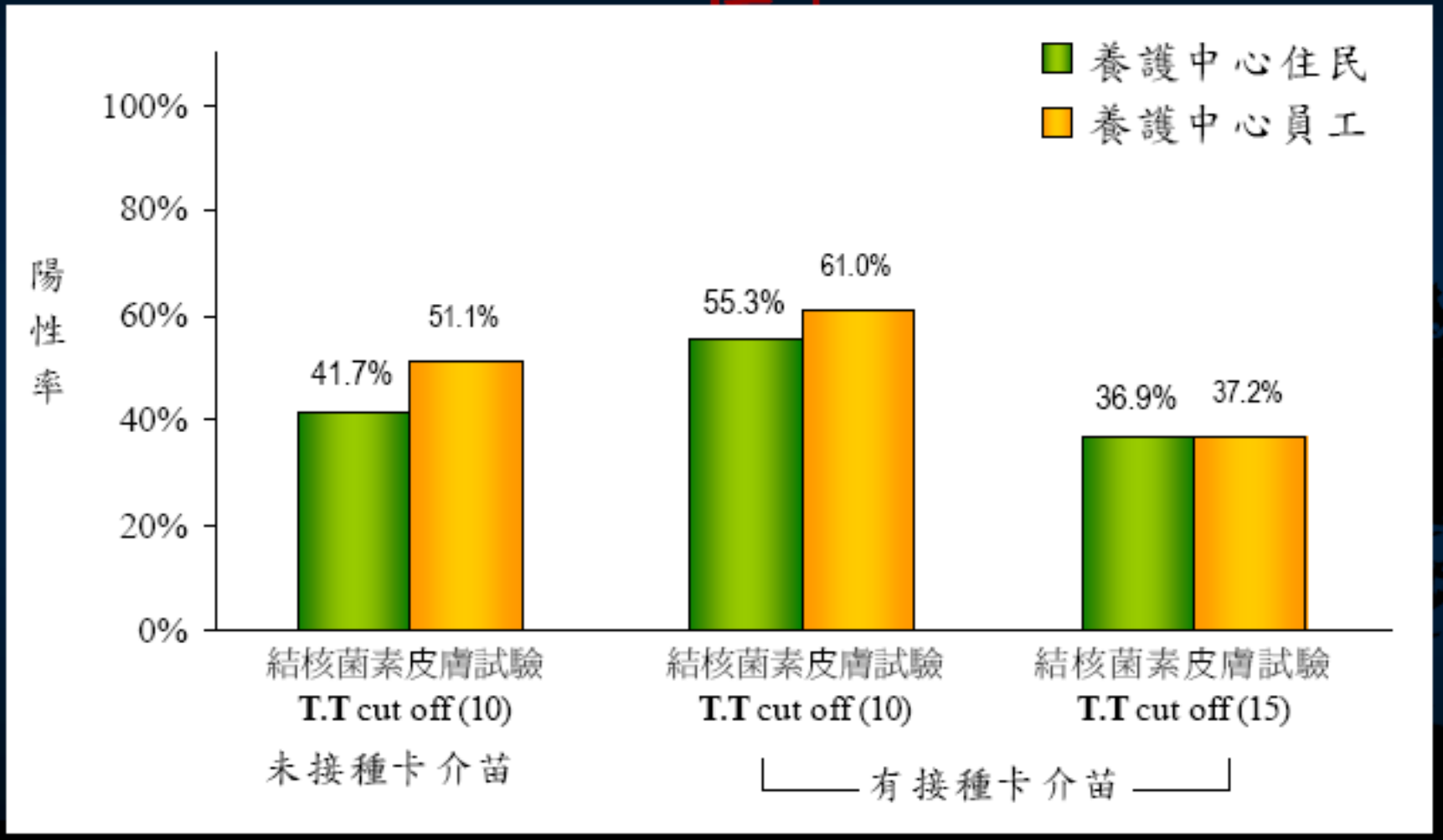
長期養護中心					
胸部X光診斷	住民 (n=450)		員工 (n=219)		合計 (n=669)	
正常	233	(77.4%)	163	(93.7%)	396	(83.4%)
異常	68	(22.6%)	11	(6.3%)	79	(16.6%)
受診數	301		174		475	
異常診斷 (多項)						
輕度肺結核	1	(0.3%)	0	(0.0%)	1	(0.2%)
中度肺結核	0	(0.0%)	0	(0.0%)	0	(0.0%)
中度肺結核有空洞	0	(0.0%)	0	(0.0%)	0	(0.0%)
重度肺結核	1	(0.3%)	0	(0.0%)	1	(0.2%)
重度肺結核有空洞	0	(0.0%)	0	(0.0%)	0	(0.0%)
肺積水(肋膜積水)	5	(1.7%)	0	(0.0%)	5	(1.1%)
肺部纖維化	13	(4.3%)	0	(0.0%)	13	(2.7%)
支氣管擴張	4	(1.3%)	1	(0.6%)	5	(1.1%)
肺腫瘤	0	(0.0%)	3	(1.7%)	3	(0.6%)
肺浸潤	35	(11.6%)	3	(1.7%)	38	(8.0%)
其他肺疾病	23	(7.6%)	4	(2.3%)	27	(5.7%)
心臟肥大	37	(12.3%)	2	(1.1%)	39	(8.2%)

先評估
有疤或
無疤

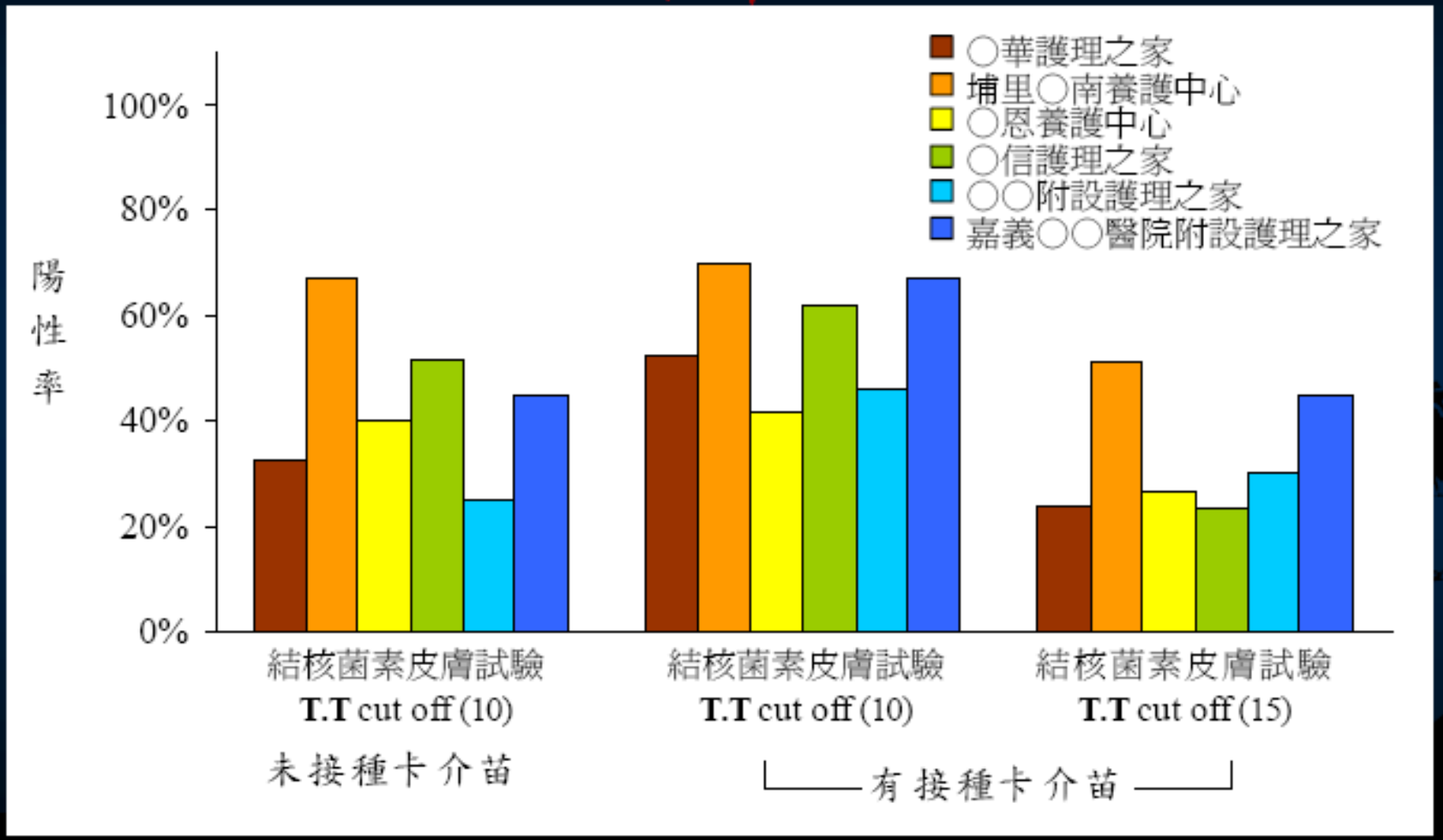
進行皮膚試驗

48-72小時之後進行判讀

研究樣本結核菌素皮膚試驗結果之陽性率

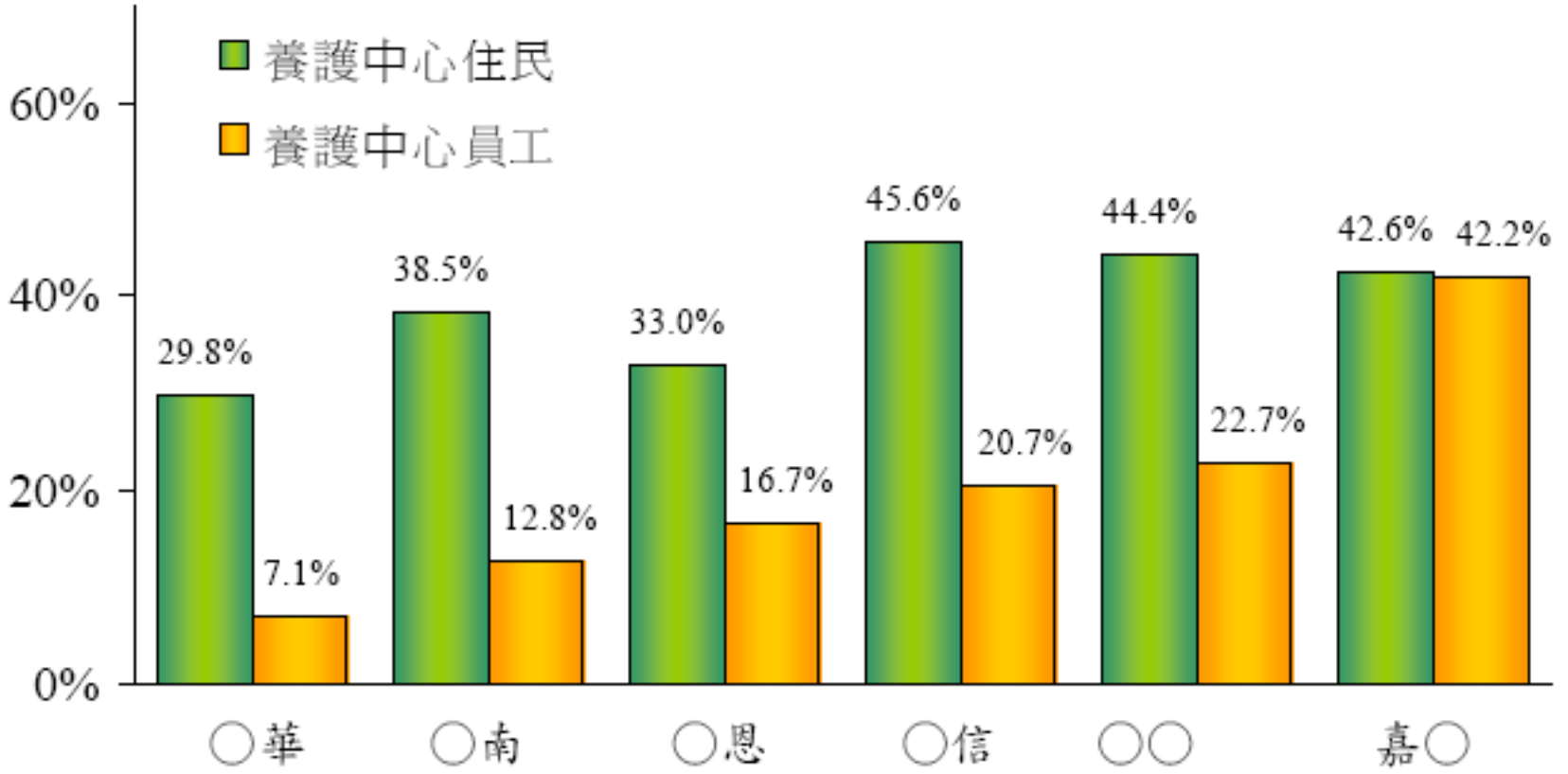


六家養護中心結核菌素皮膚試驗結果之陽性率



住民與員工抽血進行
QFT-G檢查

六家養護中心QuantiFERON-TB Gold試驗結果之陽性率



平均QFT-G的陽性率

QuantiFERON-TB Gold試驗: total 217位陽性

	QFT試驗結果				
身份別	陰性	陽性	陽性率	R.R	p值
養護中心住民	275	170	38.2%		
養護中心員工	168	47	21.9%		<0.001***

115/217=53%

研究樣本身份別與結核菌素皮膚（T.T）試驗結果的關係

		養護中心	T.T 試驗結果				
		身份別	陰性	陽性	陽性率	R.R	p值
未接種卡介苗	Cut off 10	住民	112	80	41.7%		
		員工	23	24	51.1%	1.23	0.317
有接種卡介苗	Cut off 10	住民	114	141	55.3%		
		員工	67	105	61.0%	1.10	0.280
	Cut off 15	住民	161	94	36.9%		
		員工	108	64	37.2%	1.01	1.000

QuantiFERON-TB Gold試驗與結核菌素皮膚試驗（T.T）結果之一致性

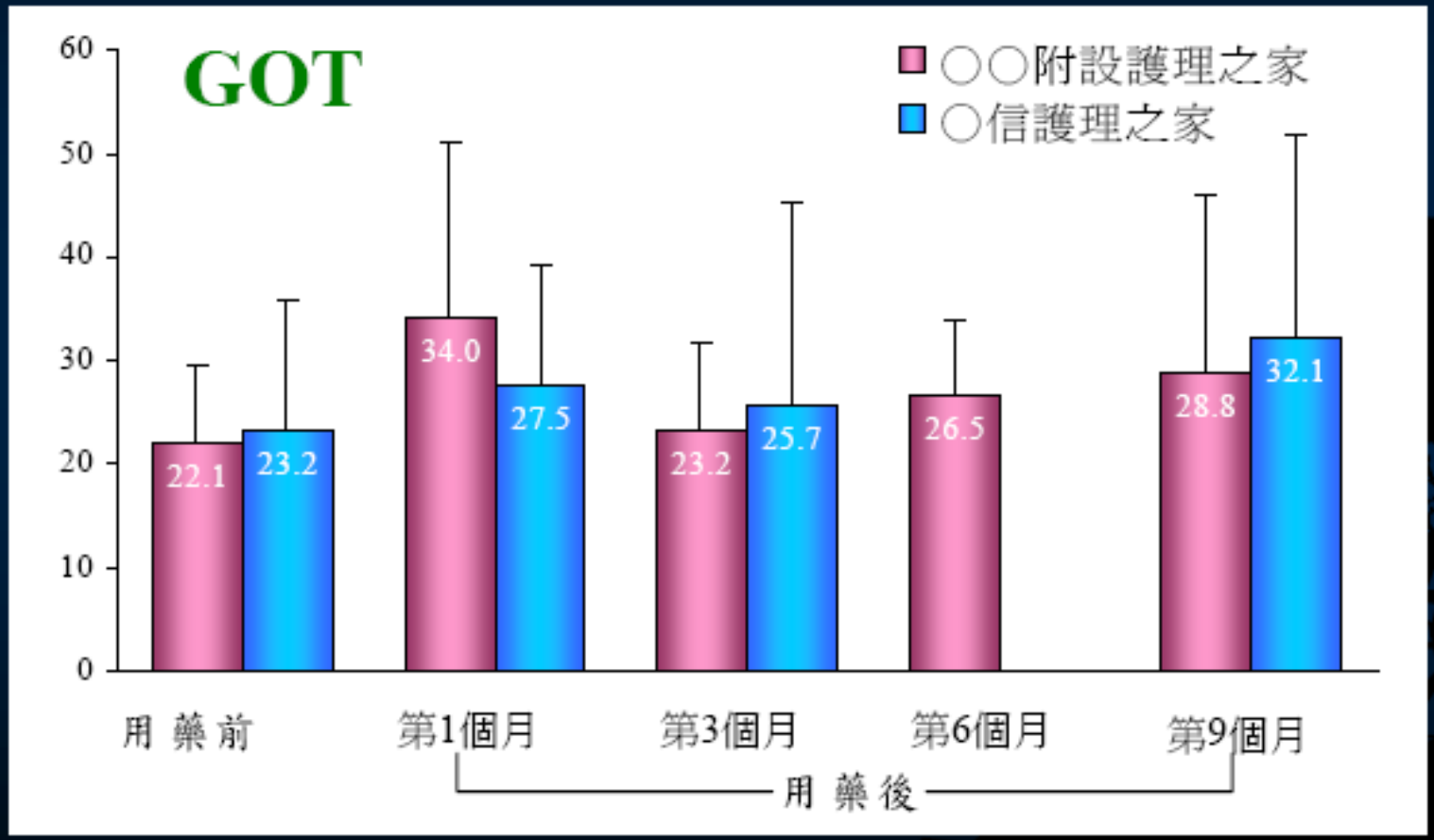
卡介苗	T.T Cut off	QFT 結果	結核菌素皮膚（T.T）試驗結果 陰性		陽性		Kappa	p值	Agreement 一致率
未接種	10	陰性	108	(80.6%)	30	(29.4%)	0.514	<0.001***	76.3%
		陽性	26	(19.4%)	72	(70.6%)			
有接種	10	陰性	154	(86.0%)	149	(61.6%)	0.224	<0.001***	58.7%
		陽性	25	(14.0%)	93	(38.4%)			
	15	陰性	217	(82.2%)	86	(54.8%)	0.329	<0.001***	68.4%
		陽性	47	(17.8%)	71	(45.2%)			

註： 表中 (%) 爲 row %

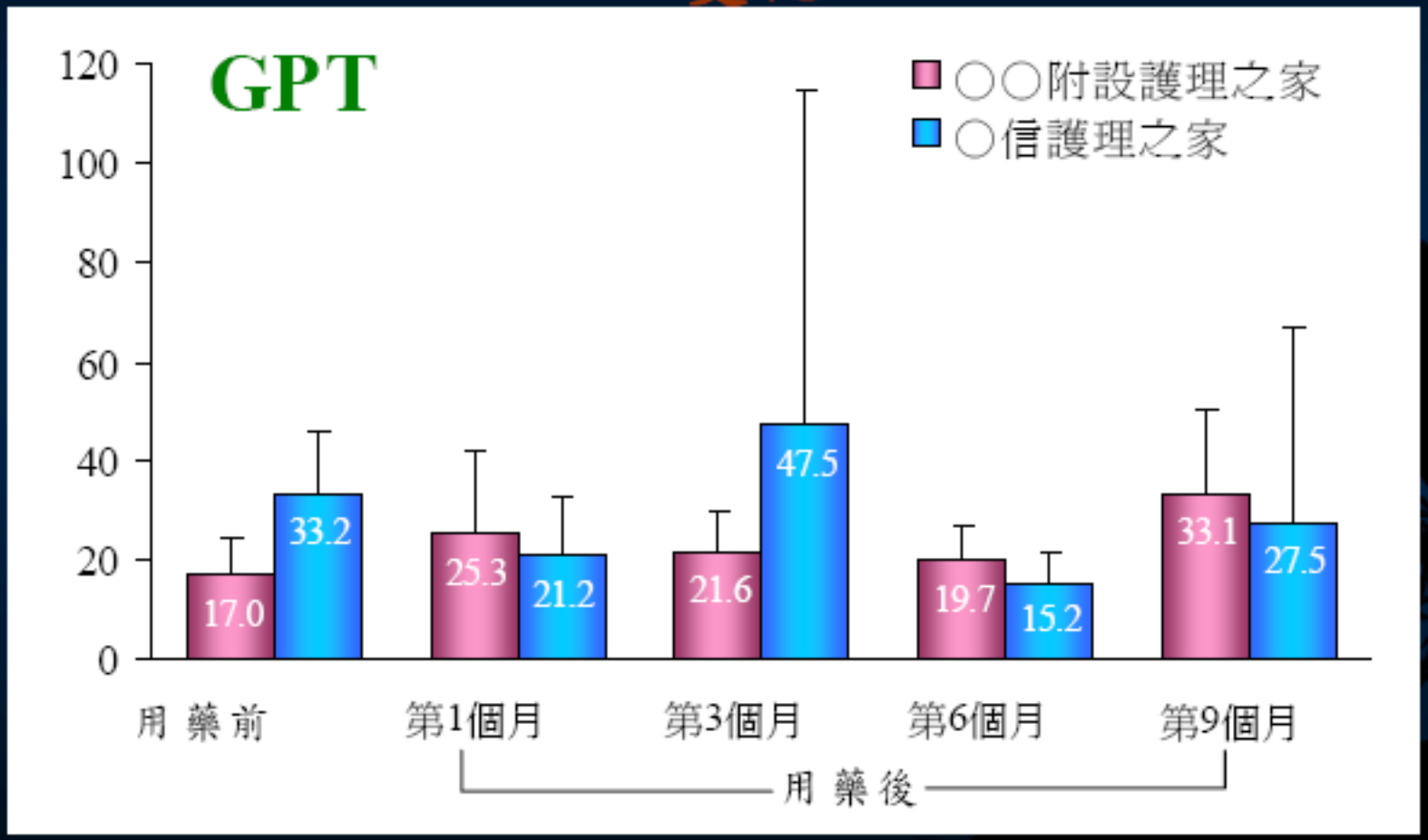
已有54位完成9個月LTBI治療

	彰化○○附設護理之家 (n=22)		彰化○信護理之家 (n=32)	
身份				
員工	4	(18.2%)	3	(9.4%)
住民	18	(81.8%)	29	(90.6%)
肝功能檢驗				
GOT				
服藥前	22	22.1±7.6 (11-35)	5	23.2±12.5 (11-39)
服藥後第1個月	4	34.0±17.0 (15-56)	24	27.5±11.6 (10-58)
服藥後第3個月	10	23.2±8.4 (13-35)	13	25.7±19.7 (9-82)
服藥後第6個月	4	26.5±7.2 (21-35)	0	
服藥後第9個月	11	28.8±17.0 (9-66)	22	32.1±19.7 (14-101)
GPT				
服藥前	22	17.0±10.0 (7-41)	5	33.2±12.4 (22-52)
服藥後第1個月	16	25.3±16.2 (10-47)	25	21.2±11.4 (5-47)
服藥後第3個月	20	21.6±16.1 (7-72)	4	47.5±67.4 (9-148)

本研究樣本INH用藥前後之肝功能GOT變化



本研究樣本INH用 藥前後之後之肝功能GPT變化



結果摘要

- 在長照機構中，由於住民與員工接觸相當密切，故我們發現未接種卡介苗的住民皮膚試驗陽性率為41.7%，有接種卡介苗的住民皮膚試驗陽性率為55.3%
- 未接種卡介苗的員工皮膚試驗陽性率為51.1%，有接種卡介苗的員工皮膚試驗陽性率為61.0%

- 養護中心的住民QFT-G陽性率為38.2%
- 養護中心的員工QFT-G陽性率為21.9%
- QFT-G陽性的受試者中，80%TST亦為陽性
- 若以QFT-G定義為LTBI，且須治療，住民約有38.2%，員工約有21.9%須接受治療

- 在已完成服藥的54位病患中
- 有兩位GOT或GPT大於120(3.7%)
- 有一位GOT或GPT大於200(GPT: 255)(1.9%)
- 其中有一位員工(GPT: 198)與一位住民(GPT: 255)並無任何症狀，且在服藥第9個月後才發現
- 沒有一位病患在服藥期間因肝功能異常而停藥

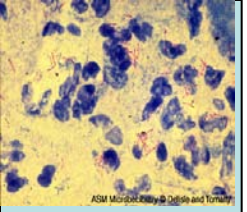
LTBI 治療的成效

- 針對有群聚疑慮的長照機構進行接觸者監測，可發現其潛伏感染的機率很高
- 針對已完成INH都治9個月的兩家長照機構而言，已成功將其通報數由8→ 10→ 0→1; 1→2→3→0，其他長照機構陸續治療中

檢討與建議

- 住民的服藥配合度較佳，反而醫療照護人員服藥配合度較差
- 為了推廣方便
  - 若有QFT-G 可測，則參考QFT-G
- 若沒有QFT-G 可測，則可僅運用TST
  - 沒有打卡介苗者，以10 mm作為cutoff作為服用LTBI的參考
  - 有打卡介苗者，以15 mm作為cutoff作為服用LTBI的參考
- 希望能儘早進行疑似群聚長照機構LTBI的治療以解決每年病患的發生

- 長照機構潛隱性結核的治療成效，除了看新增個案數的減少之外
- 還希望看到新增潛隱性結核也能減少，此一部份，必須隔半年或一年之後，再進行皮膚試驗或QFT-G的檢查，評估有多少比率為新增的潛隱性結核(TST由陰轉陽或QFT-G由陰轉陽)



Thanks for your attention!

抗結核　動起來 ！！