

The comorbidities may be one of the predictors of smoking cessation in Taiwan

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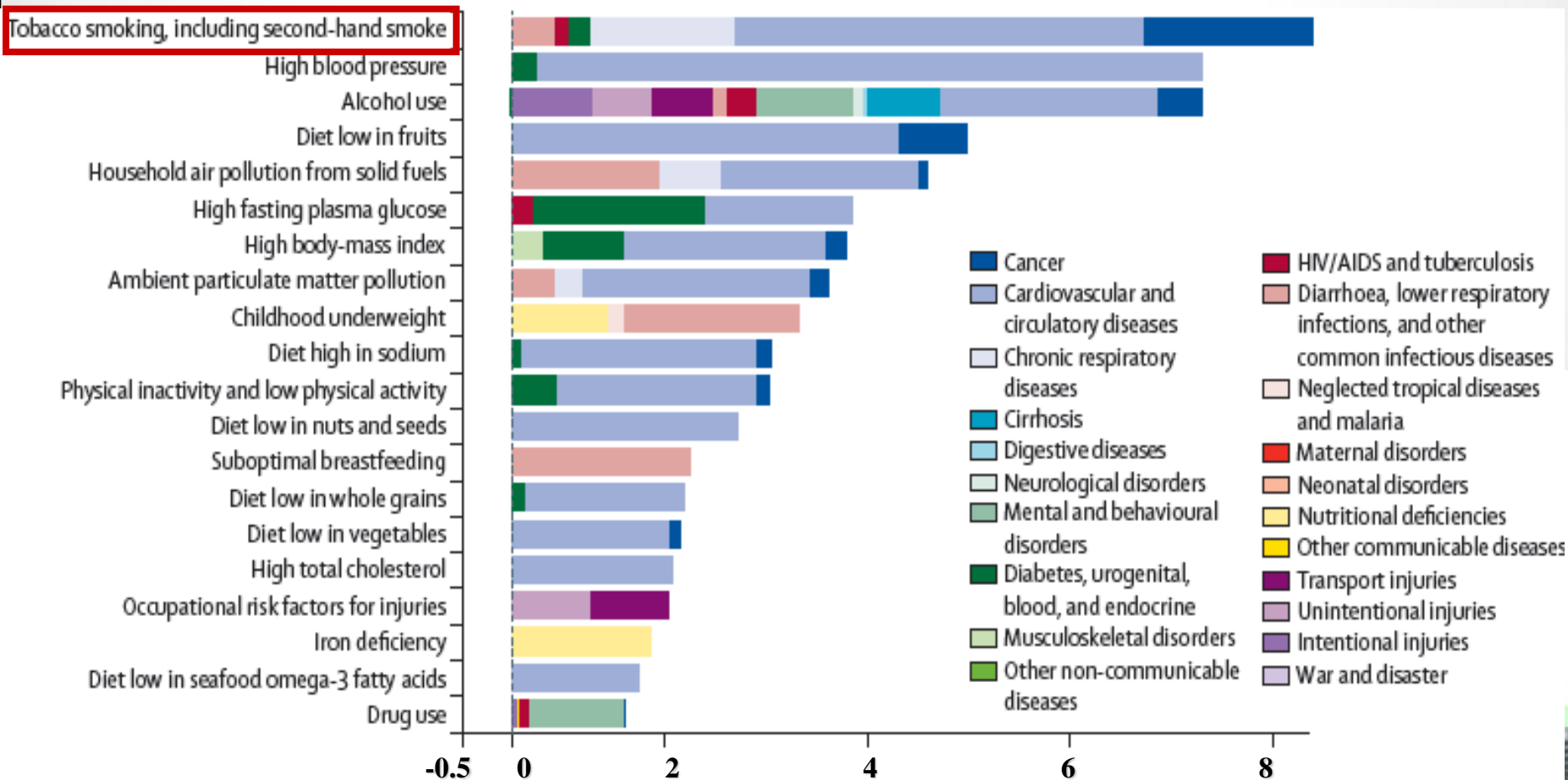
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2010年可歸因於20大主要危險因子之疾病負擔²

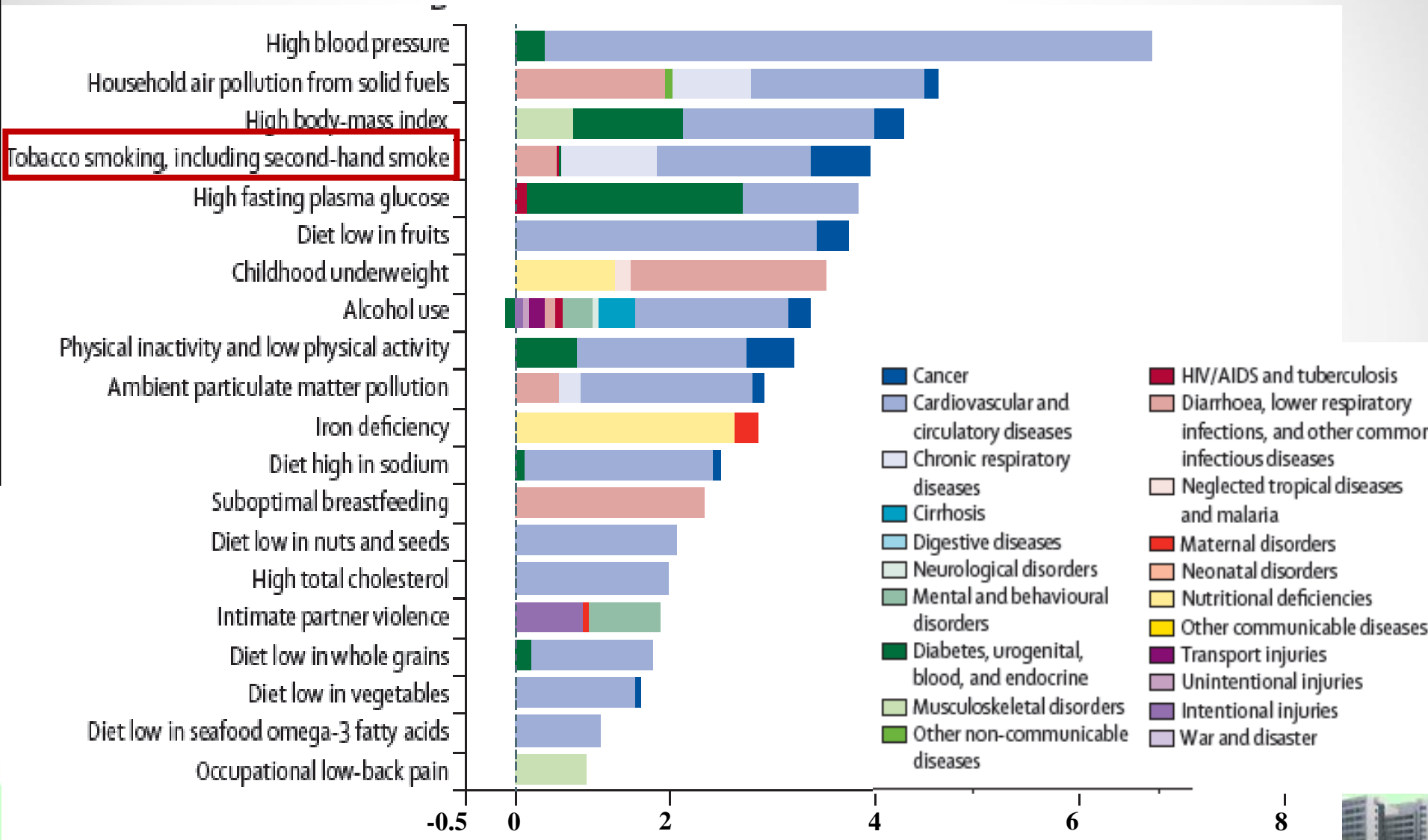
— 男性失能調整存活人年(DALY)(%)

依2012年Lancet期刊研究指出，導致全球死亡的前20種健康風險因子中，分析各因子之失能調整損失人年(DALY)顯示，居首位者為菸害，約占8.5%，表示菸害造成過早死亡，「折壽」最多，其中菸害所造成的人年損失中，又以**心血管疾病**死亡年數所占最多，約超過一半。



2010年可歸因於20大主要危險因子之疾病負擔³

— 女性失能調整存活人年(DALY)(%)



十大死因長期趨勢：菸害相關疾病持續威脅國人

- 十大死因皆與吸菸有關：**6個直接相關**、**4個間接相關**。
- (癌症、心臟病、腦血管疾病、糖尿病、肺炎、慢性阻塞性疾病)
- 99年約20,024人死於菸害，每25分鐘即有1人死於菸害。

單位：每十萬人口死亡人數

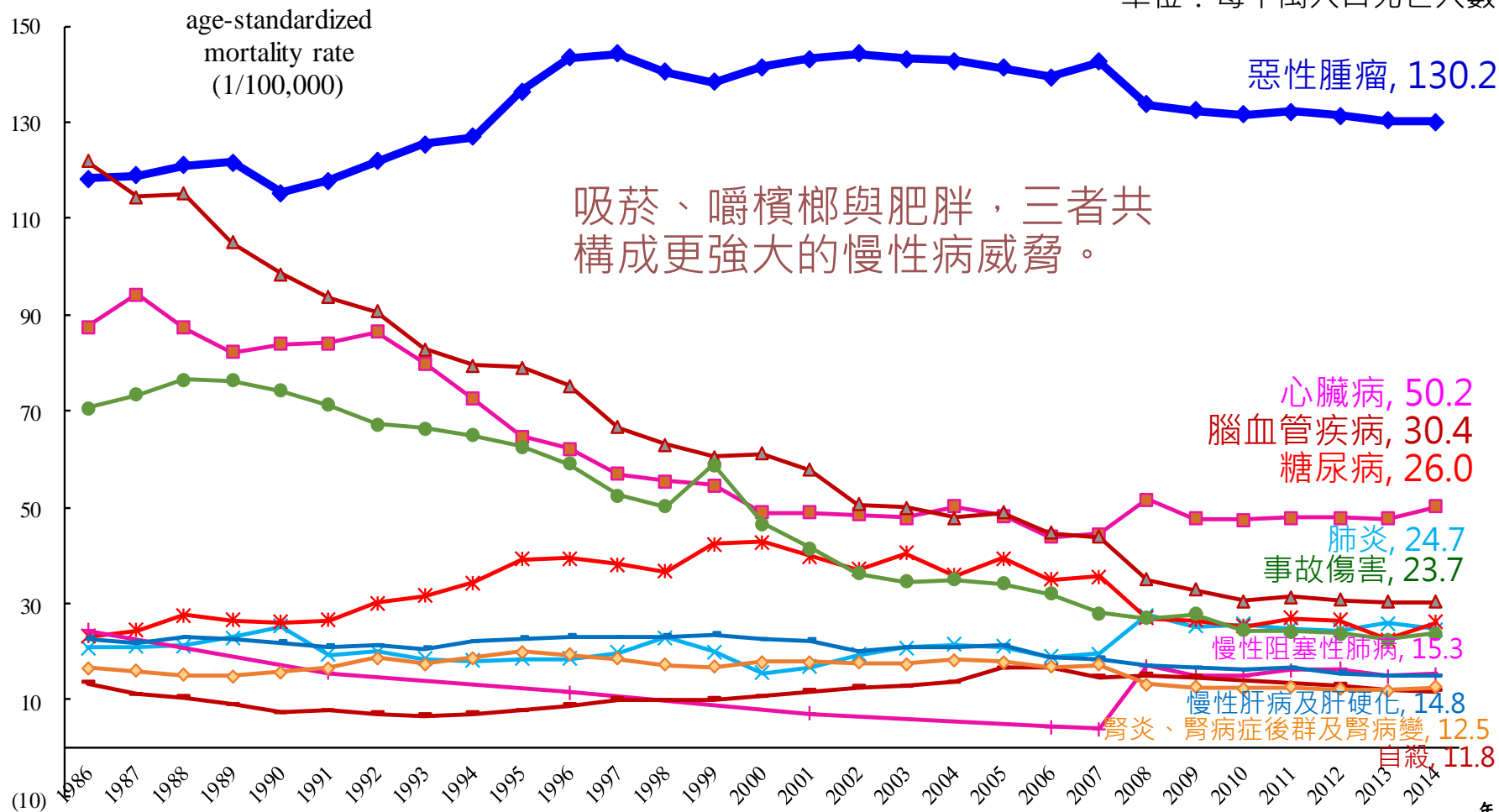
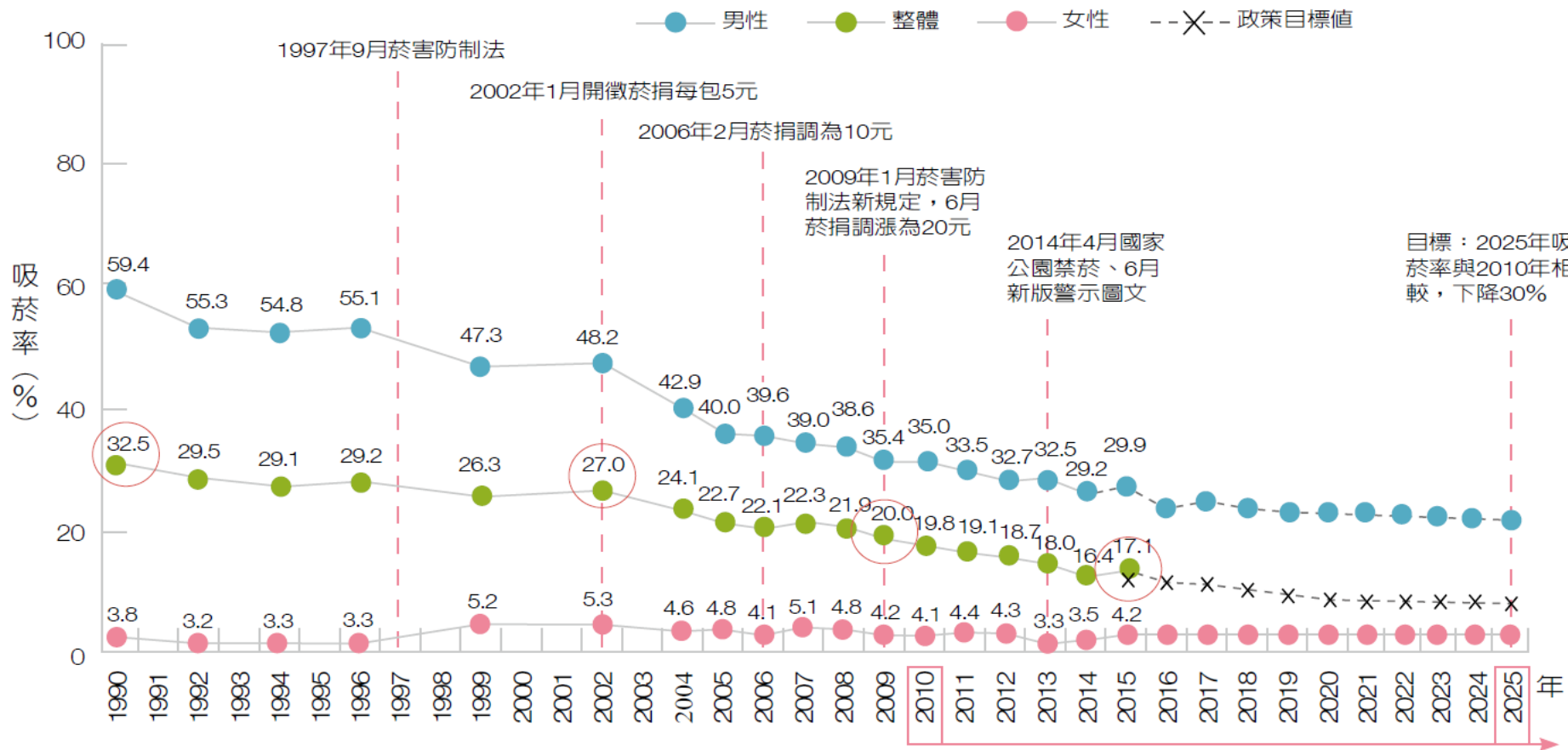


圖3-1 臺灣歷年18歲以上成人吸菸率及未來目標



資料來源：

1. 1990~1996年資料來源為菸酒公賣局調查資料
2. 1999年資料來源為李蘭教授調查資料
3. 2002年資料來源為國民健康署「臺灣地區2002年國民健康促進知識、態度與行為調查」
4. 2004~2015年資料來源為國民健康署「國人吸菸行為電話調查」
5. 1999~2015年吸菸者定義，係指以前到現在吸菸超過100支（5包），且最近30天內曾使用菸品者。

下降30%

目標：2025年吸菸率與2010年相較，下降30%

菸害與各疾病死亡之相對危險性(Relative Risk; RR值)

| 一手菸 | RR值 | |
|-----------------|------|------|
| | 男性 | 女性 |
| 死因 | | |
| 癌症 | | |
| 氣管、肺、支氣管癌 | 23.3 | 12.7 |
| 喉癌 | 14.6 | 13.0 |
| 唇、口腔及咽部癌症 | 10.9 | 5.1 |
| 食道癌 | 6.8 | 7.8 |
| 膀胱癌 | 3.3 | 2.2 |
| 腎臟及腎盂癌症 | 2.7 | 1.3 |
| 胰臟癌 | 2.3 | 2.3 |
| 心血管疾病 | | |
| 主動脈瘤 | 6.2 | 7.1 |
| 腦血管疾病(35-64歲) | 3.3 | 4.0 |
| 冠狀動脈心臟病(35-64歲) | 2.8 | 3.1 |
| 粥狀動脈硬化 | 2.4 | 1.8 |
| 呼吸道疾病 | | |
| 支氣管炎、肺氣腫 | 17.1 | 12.0 |
| 慢性呼吸道阻塞 | 10.6 | 13.1 |

| 二手菸 | RR值 | |
|-----------------|-----|-----|
| | 男性 | 女性 |
| 死因 | | |
| 暴露家庭二手菸者 | | |
| 肺癌 | 1.2 | 1.2 |
| 冠狀動脈心臟病 | 1.3 | 1.3 |
| 腦血管疾病 | 1.7 | 1.7 |
| 暴露職場二手菸者 | | |
| 肺癌 | 1.2 | 1.2 |
| 冠狀動脈心臟病 | 1.2 | 1.2 |
| 腦血管疾病 | 1.7 | 1.7 |

二手菸之其他危害：

低體重兒、嬰兒猝死症、中耳炎、
氣喘發作、肺炎、白血病.....等

資料來源：美國疾病管制署(CDC)可歸因於吸菸死亡、
罹病及經濟成本評估
SAMMEC (Smoking-Attributable Mortality, Morbidity,
and Economic Costs, CPS-II 1982-1988)



Introduction

- Cigarette smoking causes more than 480,000 deaths each year in the United States. This is about one in five deaths.
- Smoking causes about 90% (or 9 out of 10) of all lung cancer deaths in men and women.
- About 80% (or 8 out of 10) of all deaths from chronic obstructive pulmonary disease (COPD) are caused by smoking.
- Smoking can cause cancer almost anywhere in your body. Cigarette smoking increases risk for death from all causes in men and women.



- In Taiwan, in all 3.5 million of adult cigarette smokers, more than 40% smokers had made at least one attempt to quit during their smoking careers.
- However, only about 8.6% of self-quitters were still abstinent 6 months later.
- Therefore, it is very important to know why so many smoking had attempts to quit but there was only few of success.



- A series of review studies had submitted some predictors of smoking cessation.
- For example, the longest previous quit attempt and not having any other smokers in the household is a strong predictor of success.
- Smokers with recurrent major depressive disorder or those who were treated for depression were significantly less likely to be abstinent of smoking.
- Two indicators of nicotine dependence (smoking within 30 min of waking up and higher cotinine levels) reduced the odds of quitting was noted.
- Alcoholism is a negative prognostic factor for successful smoking cessation.



- Other studies showed that only measures of nicotine dependence are consistently predictive of success of those attempts.
- Gender, age and marital status and educational level are not related consistently to quit attempts or quit success across countries.
- In addition, the affluence of income, education, or employment status were not found to be predictive.



- On the other hand, there was also studies compared with sustained quitters and relapses.
- The relapses were more likely to report symptoms of emotional distress (anxiety($P=0.014$), depression($P=0.003$) and insomnia($P<0.001$)) and higher levels of nicotine dependence($P<0.001$), to drink more alcohol (drinking amounts larger than 15 grams per day ($P<0.001$)), and to report more medical conditions, such as myocardial infarction ($P=.02$) and higher rates of back ($P<0.01$) and joint pain ($P=.02$).



Predictor

| Predictor | Relation | Ref |
|--|-------------|---|
| longest previous quit and not having any other smokers in the household attempt | positive | <i>Pasquale Caponnetto, Riccardo Polosa, 2008.</i> |
| recurrent major depressive disorder or those who were treated for depression | negative | <i>Pasquale Caponnetto, Riccardo Polosa, 2008.</i> |
| nicotine dependence (smoking within 30 min of waking up and higher cotinine levels) | negative | <i>Pasquale Caponnetto, Riccardo Polosa, 2008.</i> U.S. Department of Health and Human Services, 2014. |
| Alcoholism | negative | <i>Pasquale Caponnetto, Riccardo Polosa, 2008.</i> |
| Gender, age, marital status, educational level, affluence of income, education, and employment status | not related | U.S. Department of Health and Human Services, 2014. |

- Therefore, only when we know more about the predictors of smoking cessation, the more we can do to help the smokers to quit.
- There was also other comorbidities may influence smoking cessation.
- However less studies had analyzed.



Hypothesis

- Co morbidity is a predictor of smoking cessation successful rate.



Study Aim

- This study examined not only demographic variables but also the relationships between comorbidities and smoking cessation.
- We wanted to know whether the common comorbidities to influence smoking cessation successful rate.
- If we understand that there was other comorbidities influence smoking cessation successful rate, we had better chance to help the smokers.



Method

- The retrospective study enrolled 1182 Taiwanese smokers included who went far-east hospital Family Medicine department for smoking cessation with counseling or drugs between 2014/07 to 2015/03.
- After medication or counseling was given, we had followed up their smoking status 6months later by telephone or coming back to our department.



Inclusion and exclusion criteria

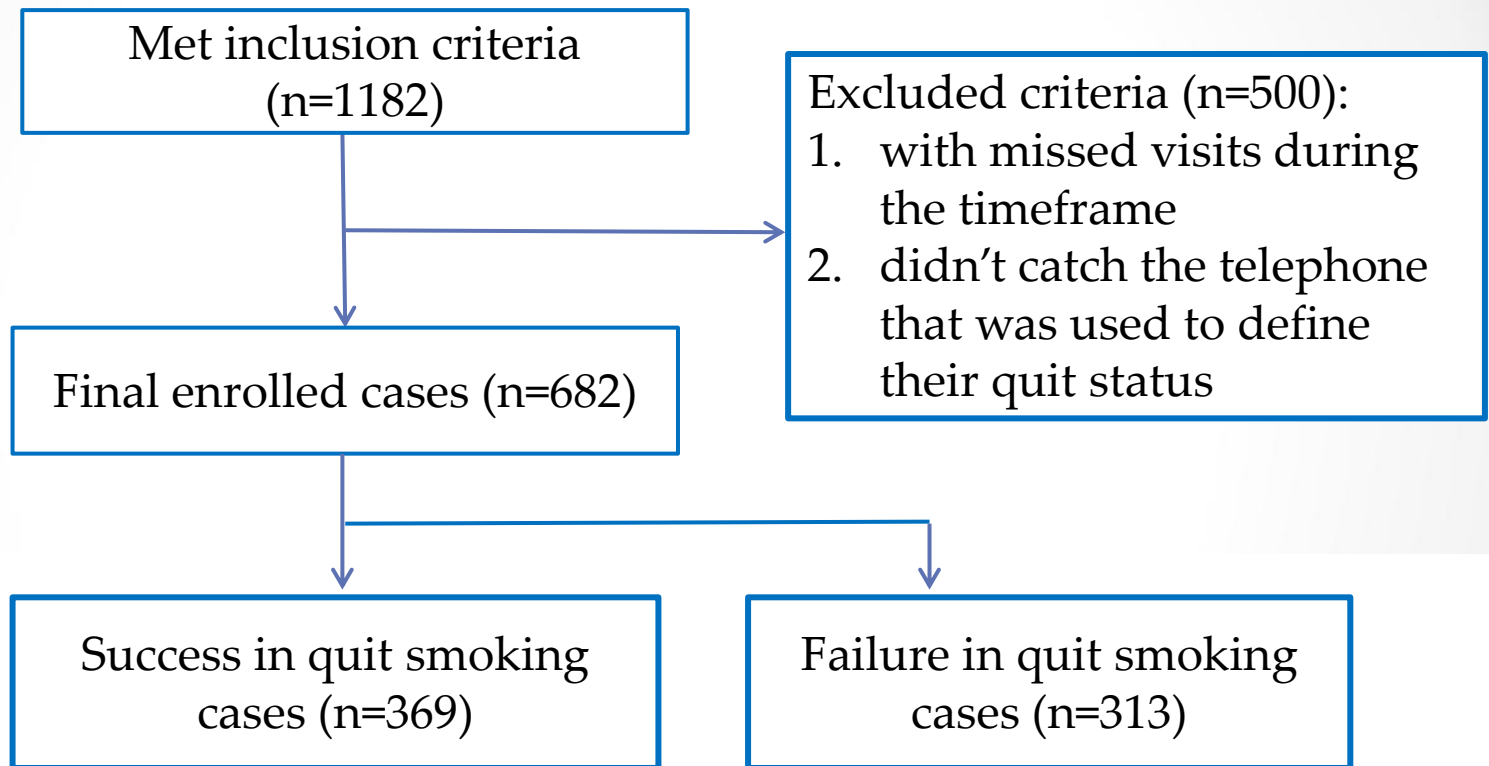
- At baseline in our study, all individuals in our outpatient department smoked at least 10 cigarettes per day or Fagerstrom Test for Nicotine Dependence (FTND) > 4 points.
- All individuals selected for our samples were exposed to the key behavior of having made quit attempt and decided to quit.



- We **excluded** men with **missed** visits during the timeframe or didn't catch the telephone that was used to define their quit status.
- Individuals who were expired during the trial were also excluded from our sample.
- After exclusion, we enrolled 682 participants in this study. 594 male and 88 female was noted.



Case collection flowchart



Outcome measures

- primary outcome: 7 day point prevalence quit rate at 6 months. (it means no smoking during the previous 7 days at the 6 month follow up)
- Secondary outcome: demographic variables influence successful rate, compare with the previous series of studies.

Do point prevalence and prolonged abstinence measures produce similar results in smoking cessation studies? A systematic review
John R. Hughes, M.D, *Nicotine Tob Res.* 2010 Jul; 12(7): 756-762.

Independent Variables

- demographic variables
gender, age, marital status and education
- smoking history
total cigarettes per day at baseline, pack years, years smoked and FTND and CO value
- alcohol use
Y/N
- chronic medical condition
DM, HTN, COPD, CAD, AMI, peptic ulcer, GAD



the chronic medical conditions

- We also recorded the chronic medical conditions by diagnosis code(ICD code) of participants who went to hospital during 2014/07-2015/03 with their agreement.
- The common comorbidities may influence the quitting attempt : diabetes mellitus, hypertension, cardiovascular disease, myocardial infarction, peptic ulcer, chronic obstructive pulmonary disease and general anxiety disorders



Outcome-1

- Our primary outcome showed that the 7 day point prevalence quit rate at 6 month follow up was about 53.9%(369/682).
- The more higher of nicotine dependence level (FTND and CO level), the more likely to fail smoking succession.
- Those who were married or suffered from AMI had higher rates of smoking cessation.



Outcome-2

- After adjusting other independent variables that smoking cessation was significantly predicted by marital status (OR:1.66 , CI: 1.11-2.47, p=0.01), moderate and severe FTND score (OR: 0.4, CI: 0.24-0.65 p=<0.001; OR: 0.25, CI: 0.16-0.41 p=<0.001), and comorbid AMI (OR: 1.95, CI: 1.06-3.59, p=0.03).
- CO level was not included due to 242 missing data.





Table 1 The associated factors of smoking cessation

| variable | Failure in quit smoking case (n=313) | Success in quit smoking case (n=369) | Total case (n=682) | p-value |
|-------------------------------|---|---|---------------------------|----------|
| | Mean ± SD(range)/ n(%) | Mean ± SD(range)/ n(%) | Mean ± SD(range)/ n(%) | |
| Age | 46.9±11.97 | 48.12±12.54 | | 0.19 |
| Gender | | | | 0.54 |
| Male | 270(86.3) | 324(87.8) | 594(87.1) | |
| Female | 43(13.7) | 45(12.2) | 88(12.9) | |
| Marital status | | | | 0.04* |
| Married | 233(74.4) | 302(81.8) | 535(78.4) | |
| Single | 73(23.3) | 58(15.7) | 131(19.2) | |
| Other | 7(2.2) | 9(2.4) | 16(2.3) | |
| Education | | | | 0.68 |
| Junior school and below | 98(31.3) | 107(29) | 205(30.1) | |
| Vocational and high school | 123(39.3) | 143(38.8) | 266(39) | |
| Above college | 92(29.4) | 119(32.2) | 211(30.9) | |
| FTND | | | | 0.000*** |
| Mild(0-3) | 29(9.3) | 90(24.4) | 119(17.4) | |
| Moderate(4-6) | 111(35.5) | 139(37.7) | 250(36.7) | |
| Severe(above 7) | 173(55.3) | 140(37.9) | 313(45.9) | |
| CO | | | | 0.000*** |
| Normal(0-6) | 37(17.1) | 81(36.3) | 118(26.8) | |
| Mild(7-10) | 58(26.7) | 55(24.7) | 113(25.7) | |
| Severe(above 11) | 122(56.2) | 87(39) | 209(47.5) | |
| Missing value | 96(--) | 146(--) | 242(--) | |





Table 1 The associated factors of smoking cessation (continued)

| variable | Failure in quit smoking | Success in quit | Total case | p-value |
|-------------|---------------------------|---------------------------|---------------------------|--------------|
| | case (n=313) | smoking case (n=369) | (n=682) | |
| | Mean ± SD(range)/ n(%) | Mean ± SD(range)/ n(%) | Mean ± SD(range)/ n(%) | |
| Alcohol | | | | 0.75 |
| No | 264(84.3) | 308(83.5) | 572(83.9) | |
| Yes | 49(15.7) | 61(16.5) | 110(16.1) | |
| Betelnut | | | | 0.57 |
| No | 291(93) | 347(94) | 638(93.5) | |
| YES | 22(7) | 22(6) | 44(6.5) | |
| Comorbidity | | | | |
| DM | 46(14.7) | 70(19) | 116(17) | 0.13 |
| HTN | 72(23) | 96(26) | 168(24.6) | 0.36 |
| AMI | 17(5.4) | 37(10) | 54(7.9) | 0.02* |
| CAD | 32(10.2) | 54(14.6) | 86(12.6) | 0.08 |
| COPD | 11(3.5) | 16(4.3) | 27(4) | 0.58 |
| PUD | 26(8.3) | 28(7.6) | 54(7.9) | 0.72 |
| GAD | 40(12.8) | 35(9.5) | 75(11) | 0.17 |

* p < 0.05; ** p < 0.01; *** p < 0.001

Abbreviations: FTND, Fagerstrom Test for Nicotine Dependence; CO, Carbon monoxide; DM, Diabetes Mellitus; HTN, Hypertension; AMI, Acute Myocardial Infarction; CAD, Coronary Artery Disease; COPD, Chronic Obstructive Pulmonary Disease; PUD, Peptic Ulcer Disease; GAD, General Anxiety Disorder.



Table 2 Logistic regression analysis of whether the success in quit smoking

| Variables | Odds ratio | 95%CI | P value |
|-----------------------|------------|-----------|---------|
| Marital status | | | |
| Single | reference | | |
| Married | 1.66 | 1.11-2.47 | 0.01 |
| Other | 1.93 | 0.67-5.58 | 0.22 |
| FTND | | | |
| Mild(0-3) | reference | | |
| Moderate(4-6) | 0.4 | 0.24-0.65 | <0.001 |
| Severe(above 7) | 0.25 | 0.16-0.41 | <0.001 |
| AMI | | | |
| No | reference | | |
| Yes | 1.95 | 1.06-3.59 | 0.03 |

Adjusted Marital status, FTND , AMI

Abbreviations: FTND, Fagerstrom Test for Nicotine Dependence; AMI, Acute Myocardial Infarction.



Conclusion

- The outcome showed that comorbid AMI, marital status and moderate and severe FTND score affect the smoking cessation successful rate.
- The result can be apply to specific groups to increase smoking cessation successful rate when the recourses were limited. The further study should be continuous for more cost-effective smoking cessation model.



Limitations

- The comorbidities was not clarified into 2 group: acute or chronic medical condition. And it may causes the bias of predicting smoking cessation. AMI patients had higher rate of smoking cessation may due to its emergent condition.
- Smoking status was depends on the follow-up call visit question: “Have you ever smoke during the past 7 days?” instead of asking whether the participants had not smoked at all (6 full months of not smoking) or had stopped at some time during the interval (<6 months of not smoking).



Thanks for attention

