# 糖尿病疾病資料庫應用舉隅-子資料庫在研究上的應用

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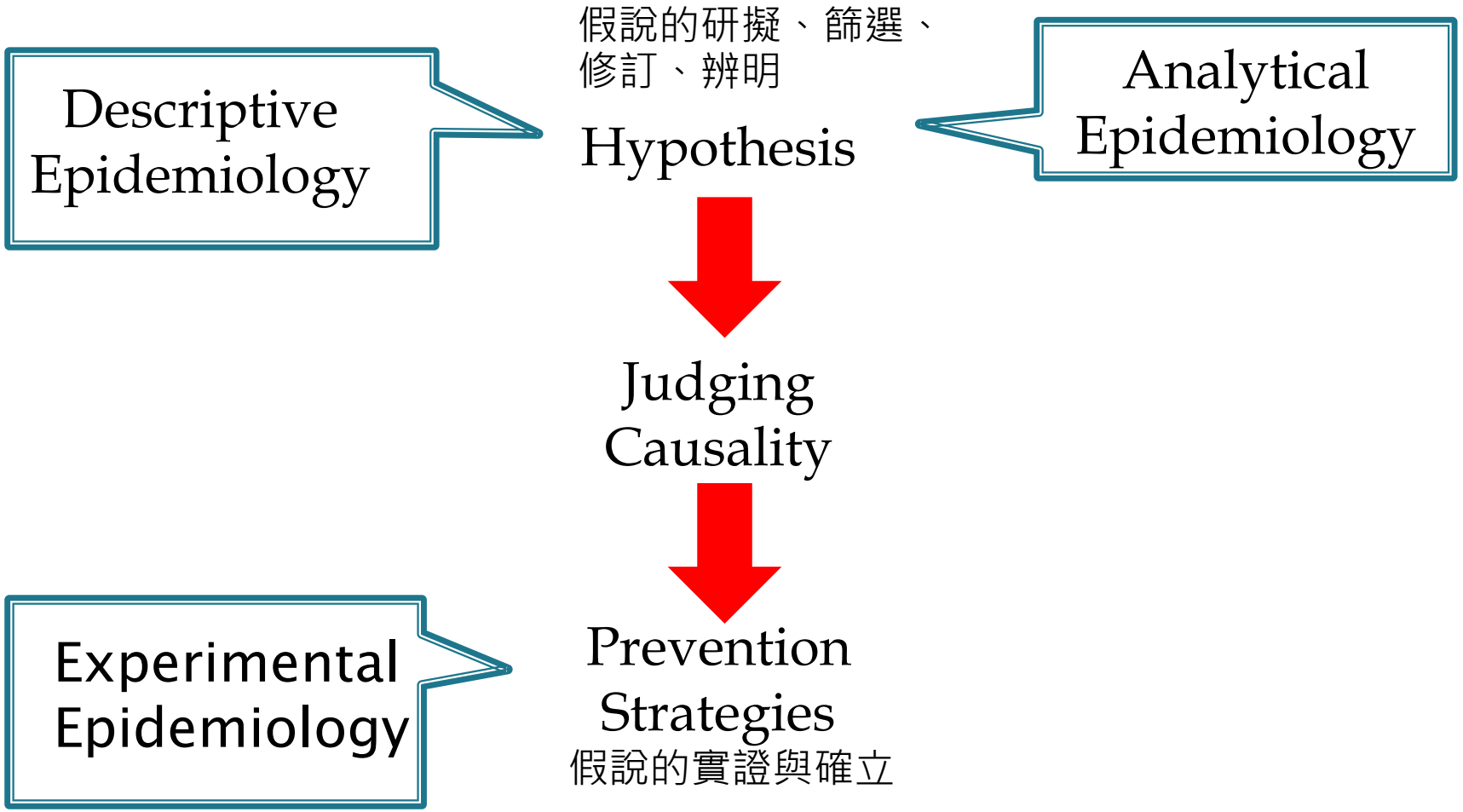
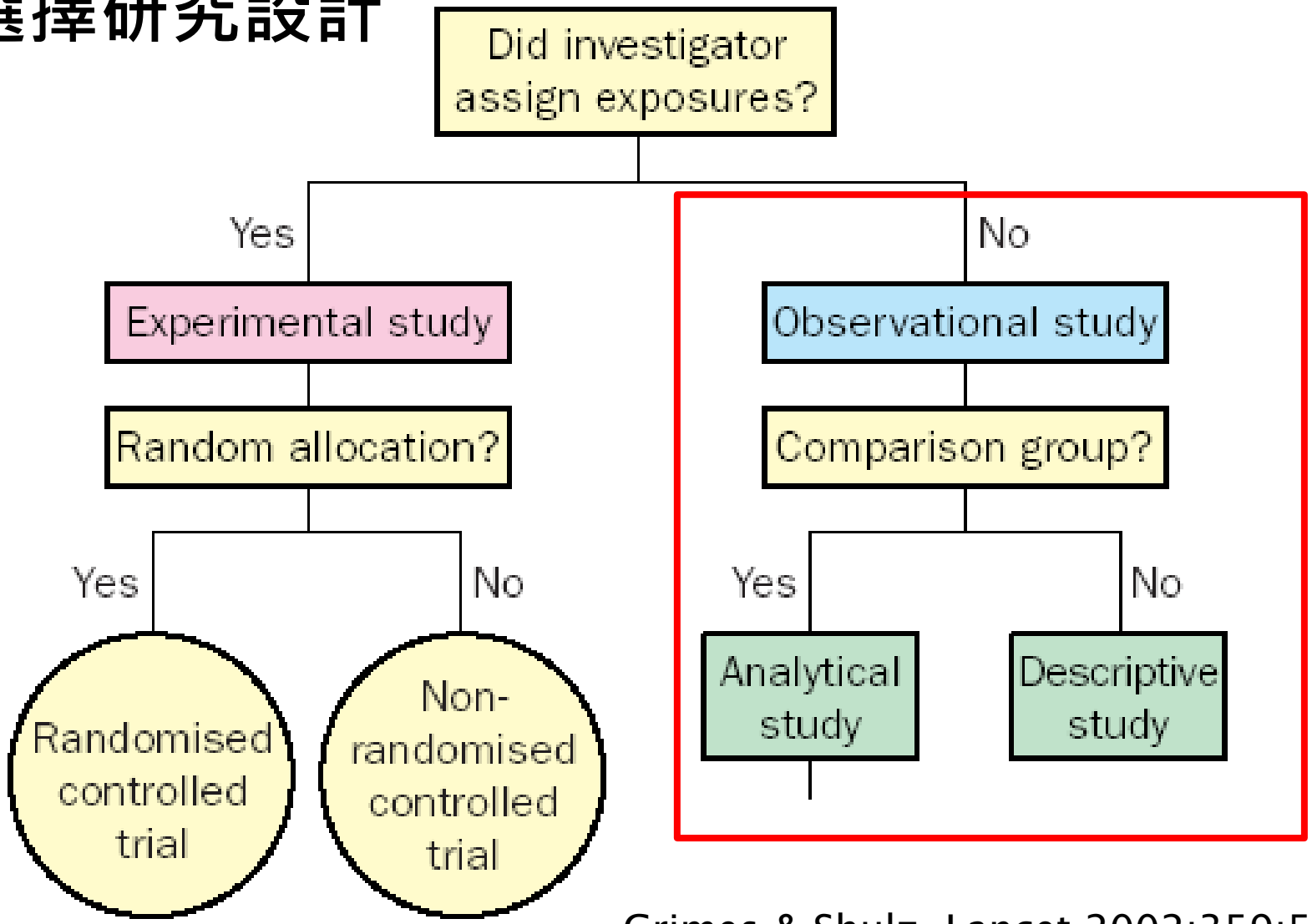
# 討論健康主題

- 描述性醫學研究
  - 研究各種人時地的健康狀態（生理、疾病、傷害、殘障、死亡）或健康相關議題（治療方式、醫療利用、醫療成本）
  - 分布情形是指什麼人(who)、在何時(when)、在何地(where)、罹患什麼疾病或發生何種健康問題(what)
- 分析性醫學研究
  - 為何(why)發生某健康問題
  - 如何(how)防治疾病、傷害、殘障和死亡的發生
- 實驗性醫學研究（臨床試驗）
  - 操弄病因暴露或治療手段來改變疾病病程或結果

# Concept Map of study design



# 選擇研究設計



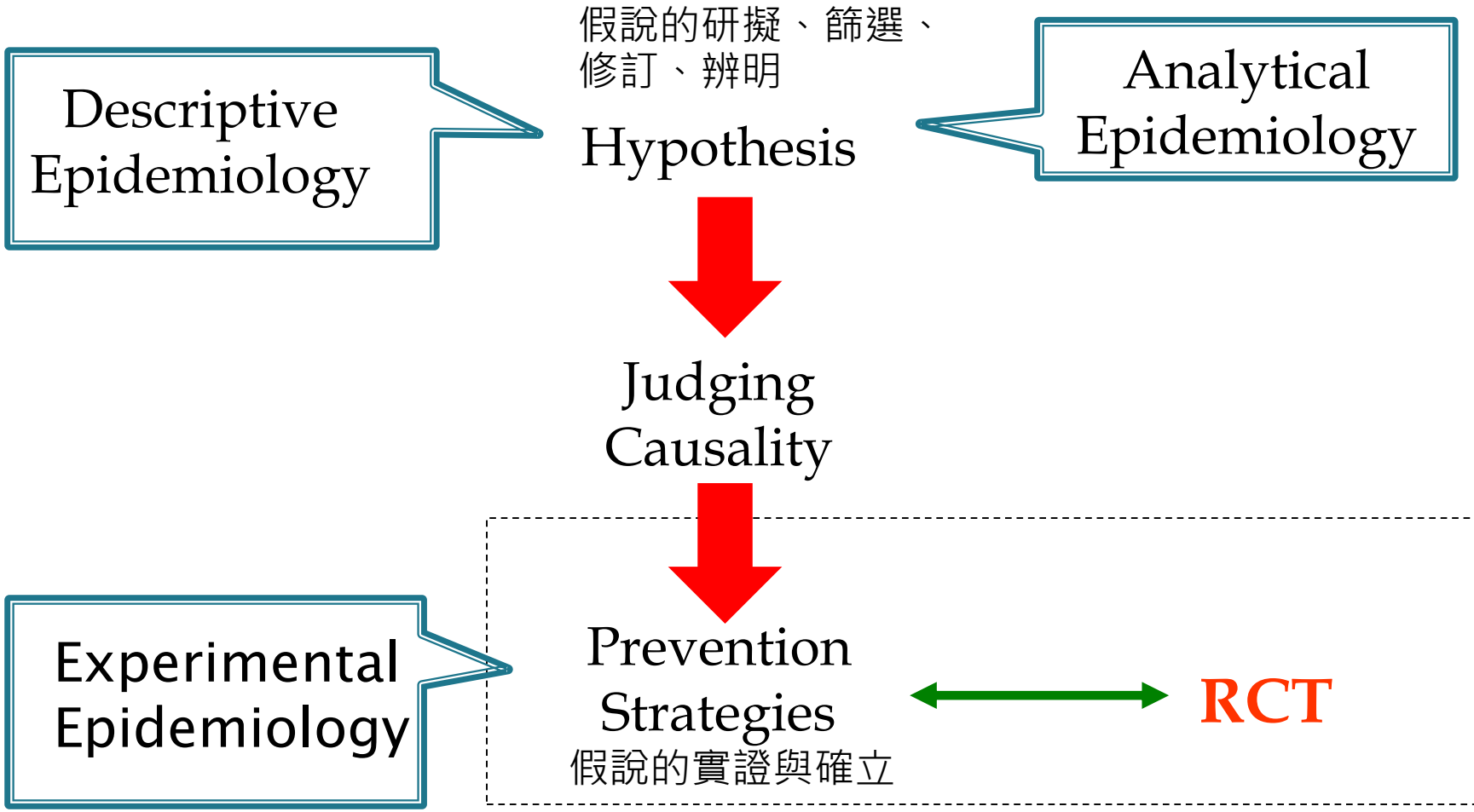

Grimes & Shulz, Lancet 2002;359:57-61

# 研究設計類型

- 依研究之基本單位
  - 團體性資料研究(Ecological Study)
  - 個人性資料研究(Individual Study)

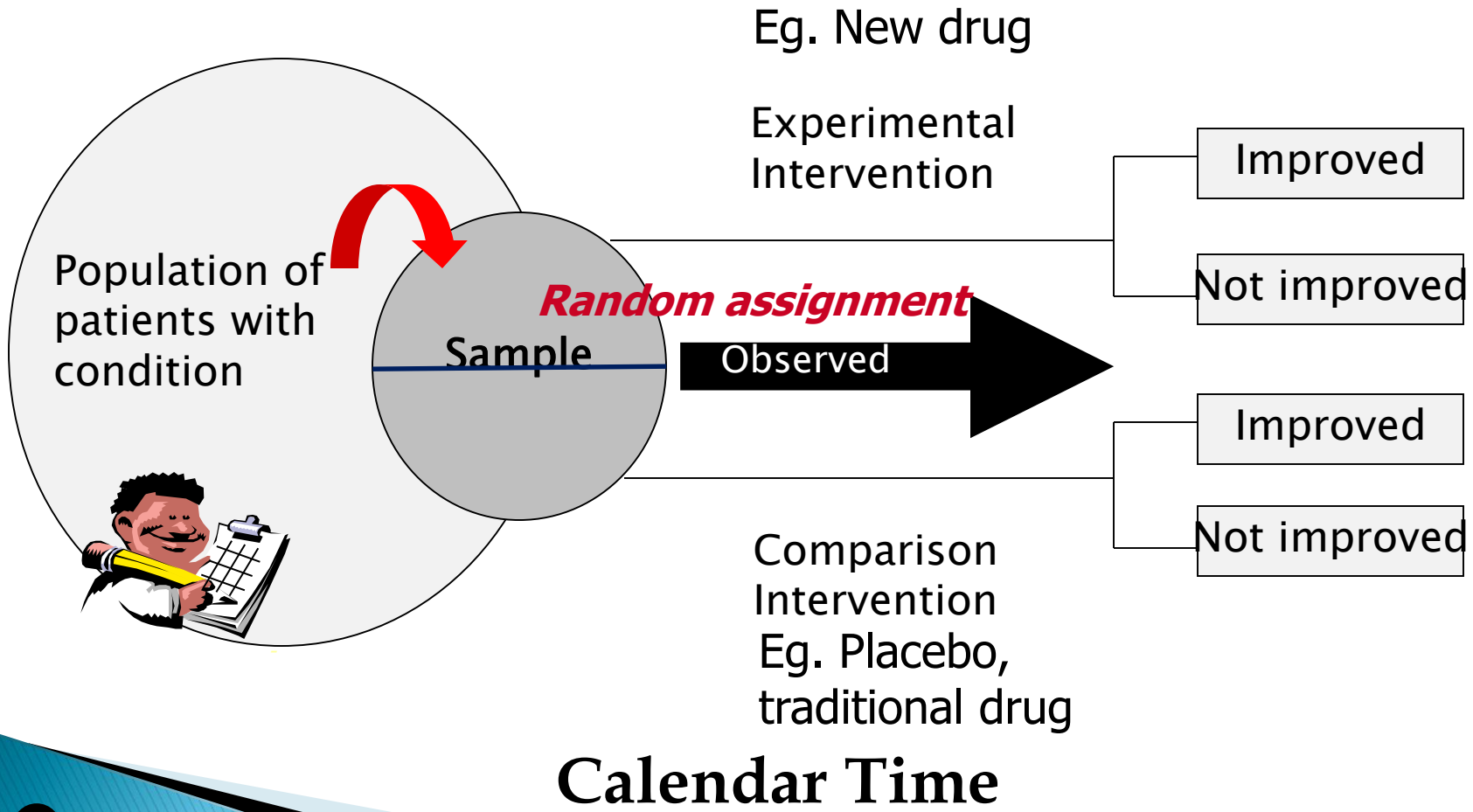
- 依時序而分
  - 縱斷法(Longitudinal Study)：
    - 回溯法(Retrospective Study)：outcome➔exposure
    - 追蹤法(Prospective Study )：exposure➔outcome
  - 橫斷法(Cross-sectional Study)：
    - 在一時間點上之抽樣調查或普查

# Concept Map of study design

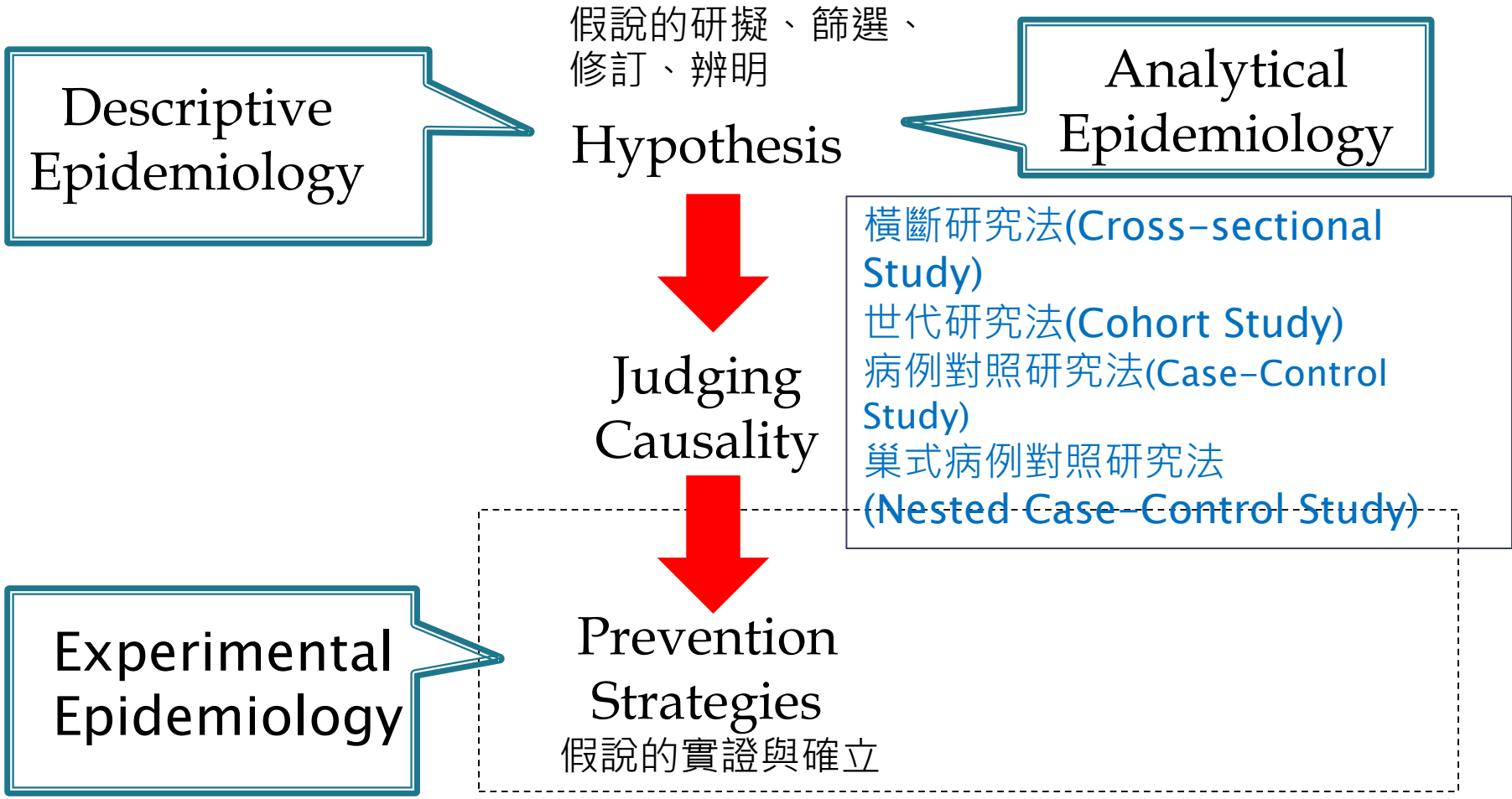



實驗室研究(Laboratory)
臨床試驗(Clinical Trial)
社區介入試驗(Community Intervention)

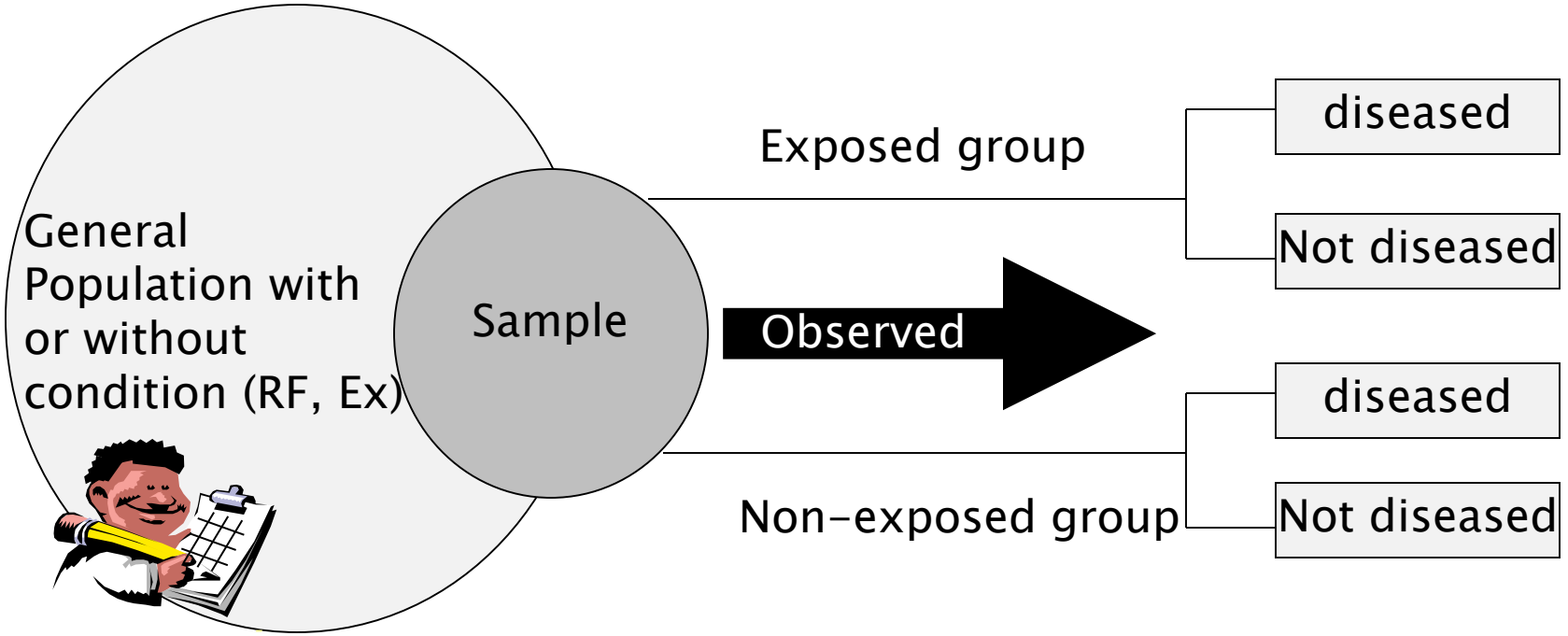
# Design Structure –
## Randomized clinical trial, *RCT*



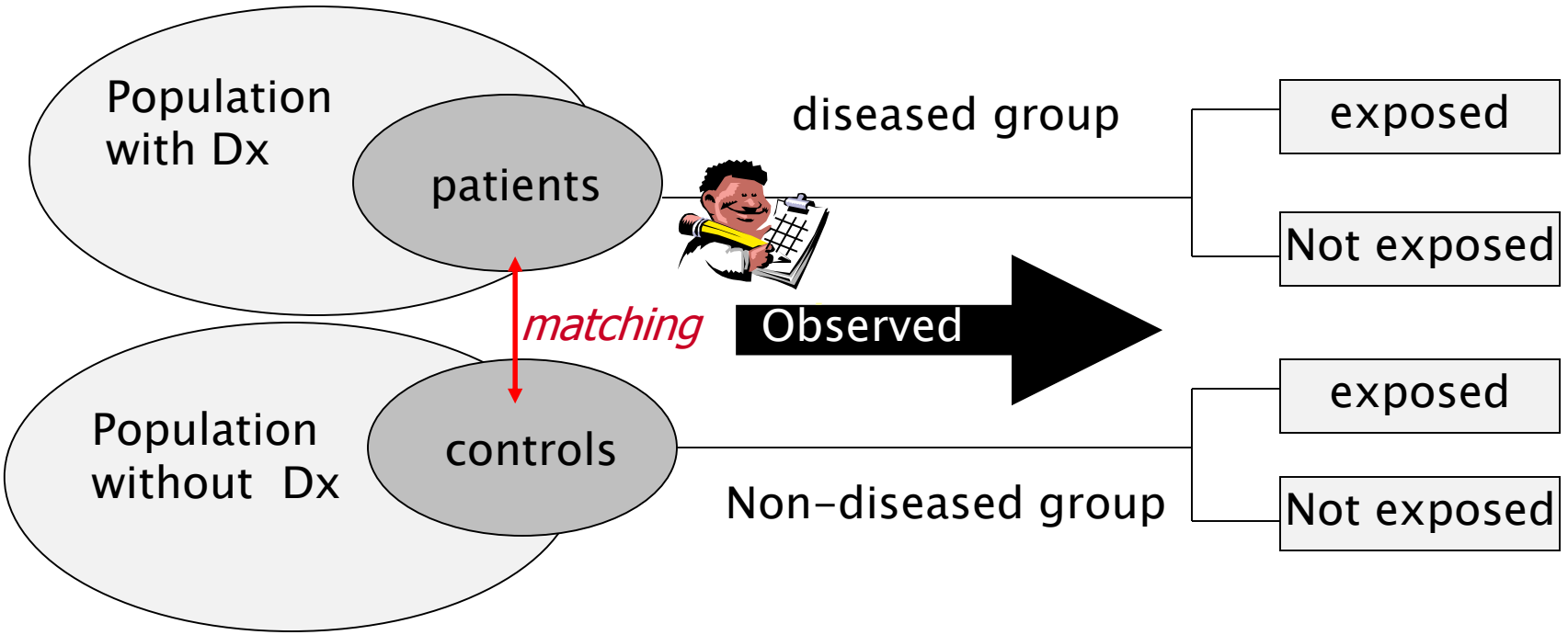
# Concept Map of study design



# Design Structure –
## Prospective Cohort 追蹤世代研究

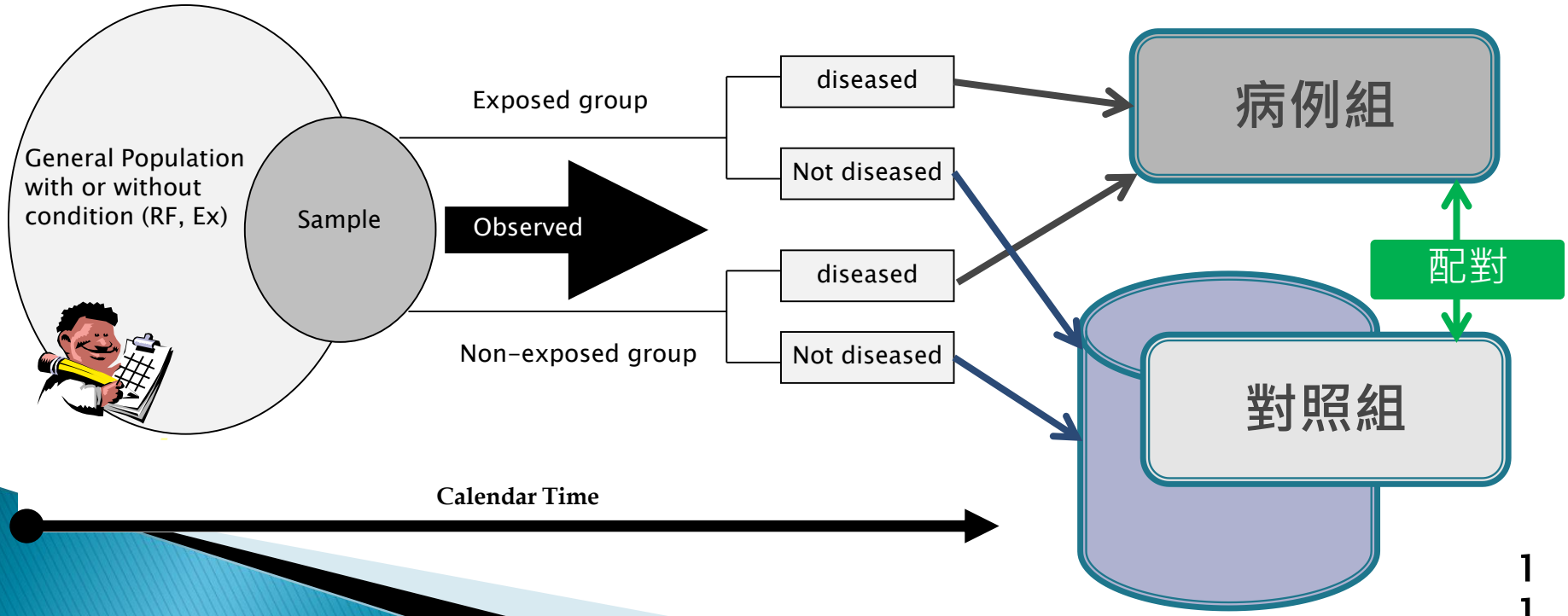


# Design Structure –
## Case Control Design病例對照研究



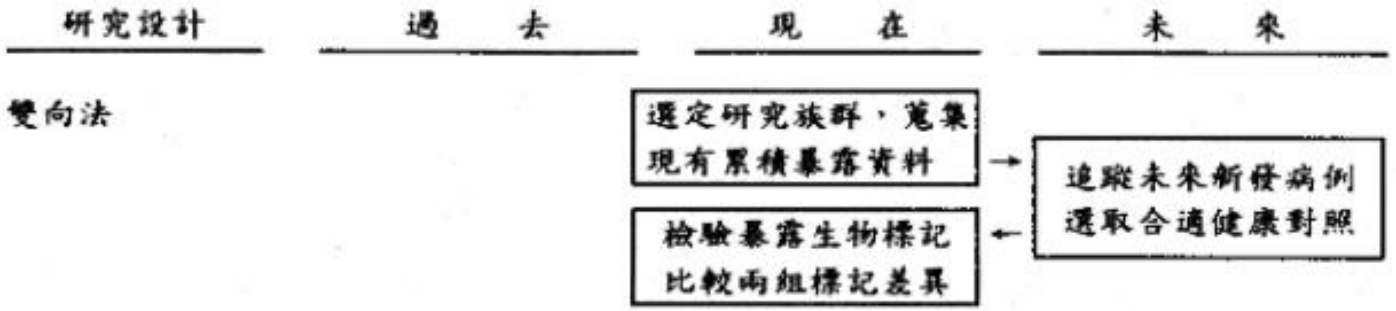
# Design Structure – Nested Case-Control Study巢式病例對照研究法

- 整合“世代研究法”與“病例對照研究法”，又稱為“雙向研究法”
  - 保留優點，改善缺點

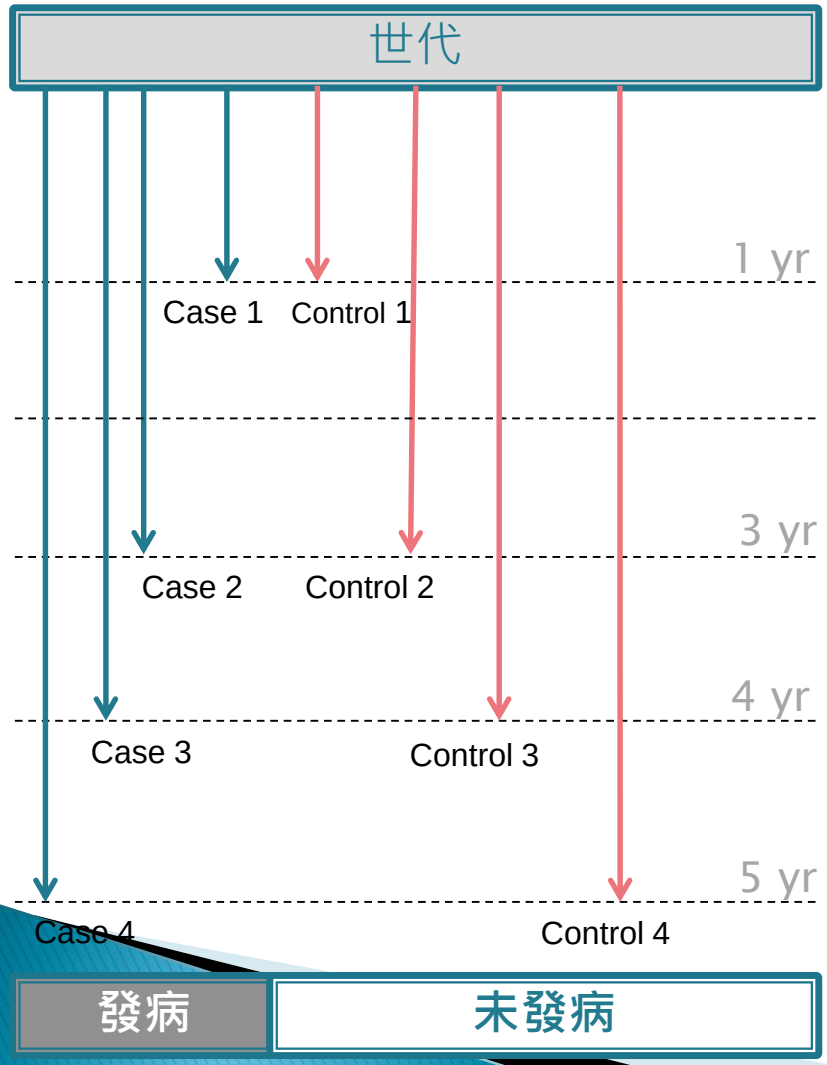


# 重疊病例對照研究 nested case control study

- 係指將世代研究中追蹤到的健康事件作為病例，在世代內的個案中選取對照的一種研究法
  - 可視為一個世代研究內的病例對照研究
- 優點
  - 暴露資料來自世代，沒有回憶誤差
  - 與世代研究相同，可以估計疾病率
  - 時間、人力、成本與病例對照研究相同
- 限制：必須依附於世代研究，難以使用世代研究未保存的資料/檢體



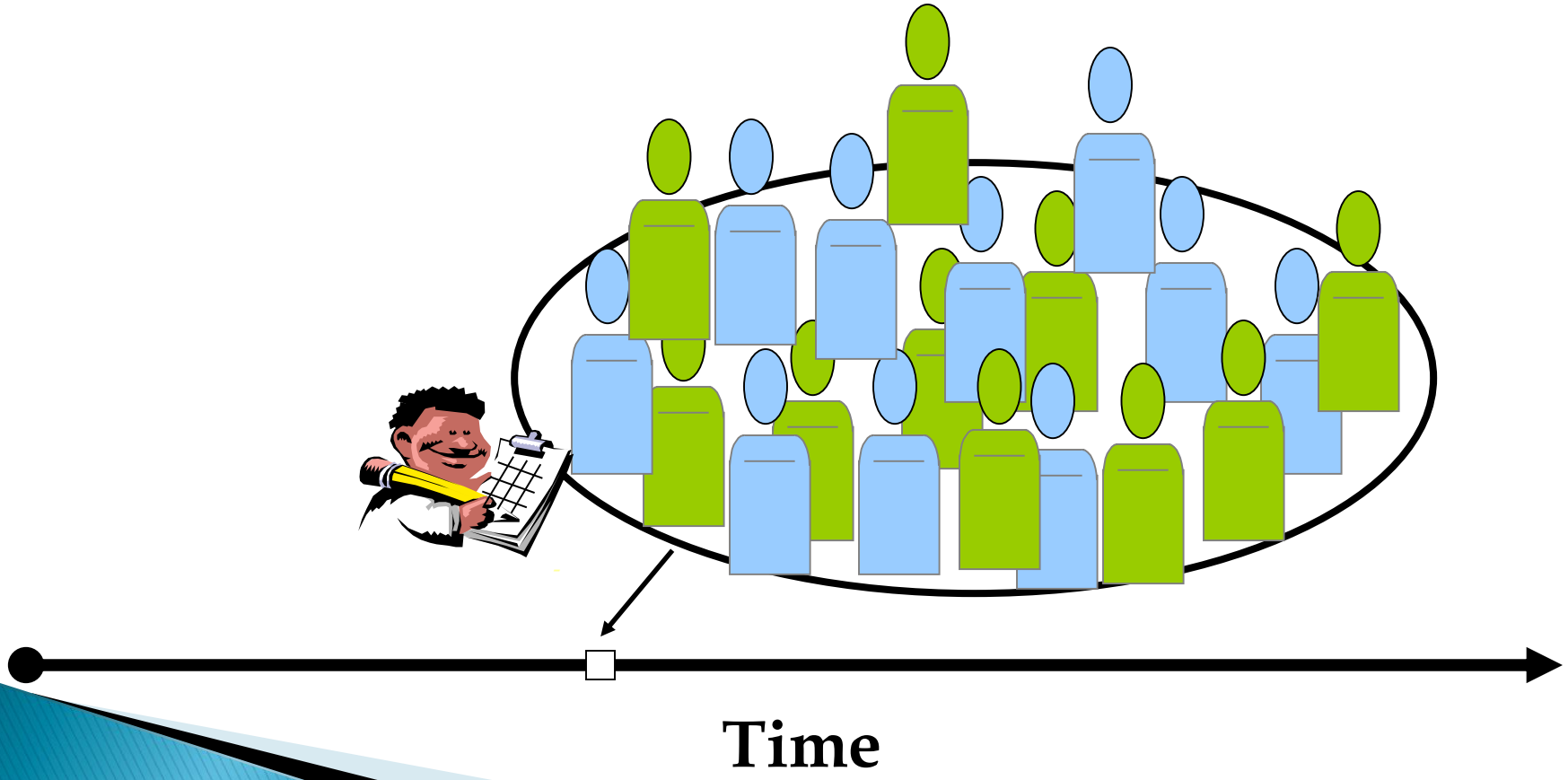
# 重疊病例對照研究 執行概念



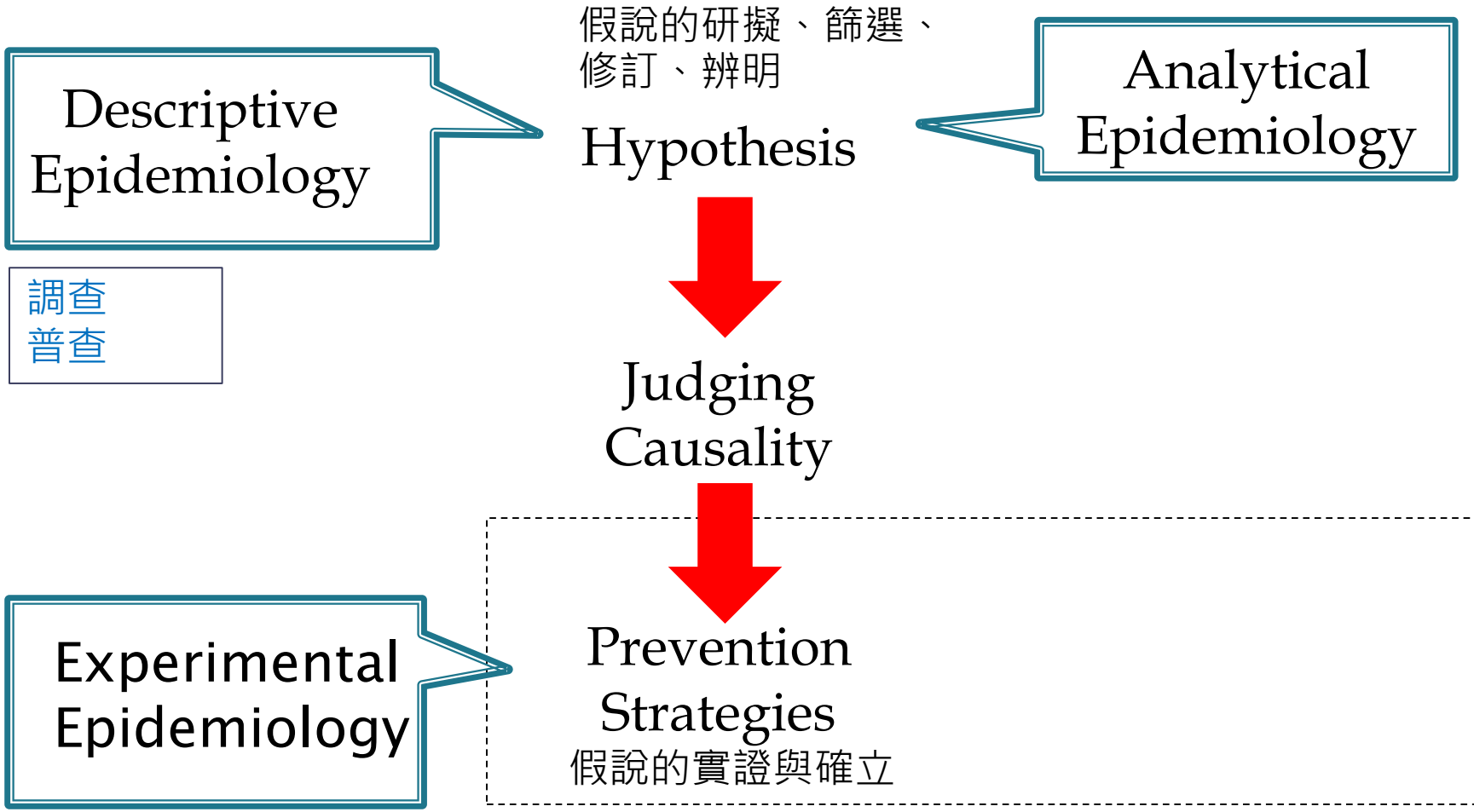

- 定義/建立世代
- 依據病例的發生時間進行密度抽樣/配對，收取對應之對照
- 回溯性使用過去的暴露資料
- 估計危險對比值（OR）

執行步驟

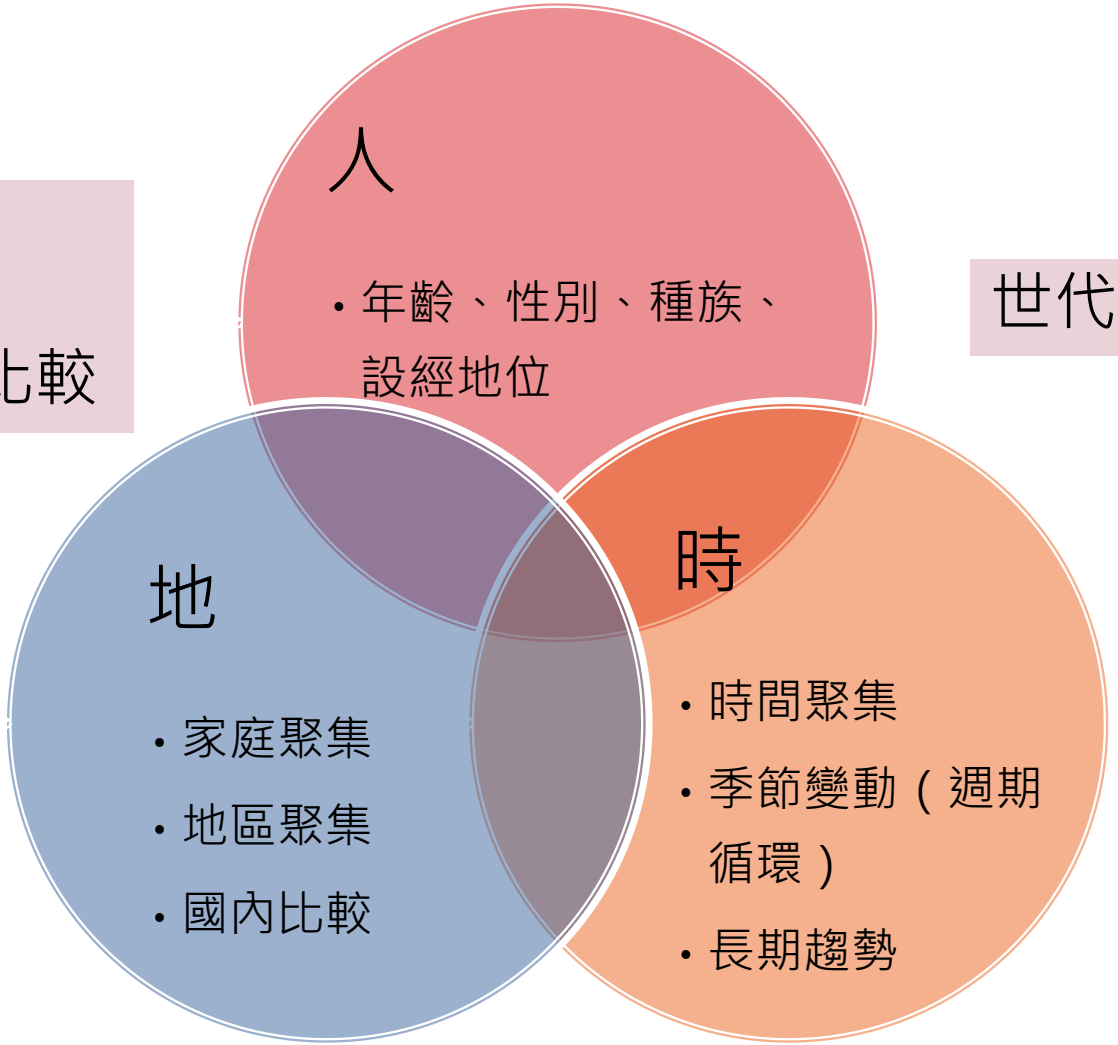
# Design Structure –
## Cross Sectional Design 橫斷性研究



# Concept Map of study design



移民研究
生態研究
地域、國際比較




世代效應

時地聚集

# 選擇研究族群（糖尿病族群）

Diabetes diagnosis

- By ADA 1991
  - fasting plasma glucose level ≥ 126 mg/dL (7.0 mmol/l). – FPG criterion
  - plasma glucose ≥ 200 mg/dL (11.1 mmol/l) two hours after a 75 g oral glucose load as in a glucose tolerance test. - OGTT criterion
  - random plasma glucose ≥ 200 mg/dL (11.1 mmol/l). – RPG criterion
- By ADA 2010
  - Hemoglobin A1c level ≥6.5% - HbA1c criterion

# Diagnosis of diabetes, ADA 2010

**Table 2—*Criteria for the diagnosis of diabetes***

| | |
|---|---|
| 1. | A1C ≥6.5%. The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.* |
| | OR |
| 2. | FPG ≥126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h.* |
| | OR |
| 3. | Two-hour plasma glucose ≥200 mg/dl (11.1 mmol/l) during an OGTT. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.* |
| | OR |
| 4. | In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dl (11.1 mmol/l). |

*In the absence of unequivocal hyperglycemia, criteria 1–3 should be confirmed by repeat testing.

# 納入排除標準

- 資料庫沒有lab data，通常沿用病因診斷
  - International Classification of Diseases, Ninth Revision, Clinical Modification, ICD 9 CM
  - Incidence case or prevalence case
  - 主診斷碼及次診斷碼
  - 一次門診? 一次住院? 兩次門診或一次住院？
- 依據研究設計調整納入排除標準
  - Cohort study：乾淨的基線資料
  - Case control study：明確的病例及對照定義

# 研究族群的分析單位

- Patients
- Physician
- Hospital
- Regional or year

# 結果指標

- Mortality：
  - 透過勾稽死亡資料
- Morbidity：
  - 透過疾病登錄、就醫資料
  - 再入院、入急診、感染、其他疾病就診
- Medical process：
  - 透過醫令資料
  - 特定藥物、醫療處置、醫療檢查的使用
- Cost：
  - 透過申報費用資料
  - 總費用、各細項費用

# 設立自變項

- 比較臨床狀態
  - HTN vs nonHTN
  - Stage III+ vs stage I II in cancer
- 比較疾病介入
  - drugs
  - Surgery  or operating type
  - Medical processs
- 比較醫師機構特性
  - 就醫科別、醫師別
  - 醫院規模、級別、地域別、分局別

# 定義干擾因素

- Review and list, etc
  - literatures, papers, books, medline,
  - 
- Summary the comorbidity
  - Carlson's comorbidity index
  - Propensity scores
- Dele the confounding effect
  - Matching
  - Restriction
  - stratification
  - Modeling adjustment

# 適當的統計方法

- 依據資料特性
- 依據研究設計
- 依據研究者想展現的推論形式

# 連續性獨立資料分析範例

- 平均數的比較
  - 單一樣本：Z檢定、t檢定
  - 兩組樣本：2 sample t test、
  - sign test (無母數) 、Willcoxon rank sum test(無母數)
  - 兩組以上樣本：ANOVA、 Kruskal-Wallis H Test (無母數)
  - 男女生身高、體重比較
- 相關分析
  - 連續性變數(Y) vs. 連續性變數(X)
  - 血壓與血糖的相關強度
- 迴歸分析
  - 連續性應變數(Y) vs. 自變數(X)
  - 身高與體重、身高與種族

**無母數分析**
指資料不符合統計假設（例如常態分析）或是不使用統計假設的分析方法

# 類別性獨立資料分析範例

- 卡方分析(Chi-Squares)
  - 類別應變數(Y) vs. 類別自變數(X)
  - B型肝炎帶原與肝硬化
- 邏輯斯迴歸分析(LOGISTIC)
  - 類別 (二分)應變數(Y) vs. 自變數(X)
  - 肺癌與抽菸習慣
- 存活分析(Survival analysis)
  - 應變數(Y)是觀察時間及事件發生（二分）vs 自變數(X)
  - 肺癌5年存活率與抽菸習慣

# 相依資料分析範例

- 相依資料：
  - 指**配對**或**同一個人**的具有相關性的資料，如左右手、左右眼、治療前後等
- 連續性資料
  - Pair t test
  - 左右手疼痛分數比較
- 類別資料
  - McNemar test、conditional logistic regression
  - 治療前後嚴重程度的比較

# 健康保險資料庫可以做哪些研究？

以糖尿病族群為例

# 383 articles were found in *PubMed* by 'diabetes' AND 'Taiwan National Health Insurance Database' AND '2010~2015'

# Socioeconomic disparities in preventable hospitalization among adults with diabetes in Taiwan: a multilevel modelling approach.

Int J Equity Health. 2015 Mar 21;14(1):31.

## Aims

- Literature shows socioeconomic disparities are related to various aspects of diabetes care. However, few studies have explored the relationship between socioeconomics and healthcare outcomes, particularly with regard to preventable hospitalization.
- This cohort study employed hierarchical modelling to evaluate the role of socioeconomics at both the individual and regional levels in order to examine disparities associated with the preventable hospitalization of diabetes patients in Taiwan.

# Socioeconomic disparities in preventable hospitalization among adults with diabetes in Taiwan: a multilevel modelling approach.

Int J Equity Health. 2015 Mar 21;14(1):31.

- **Design**: cohort study
- **DataBase**: Longitudinal Health Insurance Database LHID 2010
- **Population**: All diabetes patients aged 18 and older who received regular care in 2010 were included.

- **Exposure**: Socioeconomic status at the individual level was measured according to income and at the regional level according to level of urbanization and the proportion of residents who had completed college education.

# Socioeconomic disparities in preventable hospitalization among adults with diabetes in Taiwan: a multilevel modelling approach.

Int J Equity Health. 2015 Mar 21;14(1):31.

- **Confounders**: Control variables included age, gender, comorbidities, time of diabetes diagnosis, participated in the pay-for-performance program status, and the characteristics of regular sources of care, including the level of the facility (i.e., medical centre, regional hospital, local hospital, outpatient clinic) and ownership.

- **Statistical analysis** was performed using generalized linear mixed models.

**Table 3 Multilevel logistic regressions of preventable hospitalization among diabetes patients aged 18 years or older in 2010**

| Variables | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | | OR | 95% CI | |
| *Individual level* | | | | | | |
| Gender | | | | | | |
| Male | 1.027 | 0.905 | 1.166 | 1.038 | 0.903 | 1.194 |
| Female | 1.000 | | | 1.000 | | |
| Age | | | | | | |
| <55 | 0.966 | 0.806 | 1.158 | 1.036 | 0.847 | 1.267 |
| 55-65 | 0.602‡ | 0.501 | 0.723 | 0.657‡ | 0.536 | 0.805 |
| 65-75 | 0.721‡ | 0.609 | 0.854 | 0.754† | 0.624 | 0.911 |
| ≥75 | 1.000 | | | 1.000 | | |
| Income | | | | | | |
| Dependents | 2.657‡ | 2.021 | 3.493 | 2.475‡ | 1.854 | 3.303 |
| Low | 2.892‡ | 2.186 | 3.827 | 2.443‡ | 1.812 | 3.295 |
| Middle | 2.092‡ | 1.598 | 2.738 | 2.079‡ | 1.568 | 2.758 |
| High | 1.000 | | | 1.000 | | |

## CONCLUSIONS:

Our results demonstrate that the socioeconomic effects of higher education at the regional level as well as income at the individual level are important factors which affect disparities in diabetes-related preventable hospitalization.

# Changes in prevalence of diabetic complications and associated healthcare costs during a 10-year follow-up period among a nationwide diabetic cohort.

J Diabetes Complications. 2015 May-Jun;29(4):523-8.

- Long-term health and economic consequences of diabetes mellitus are of significant importance to health policy makers to identify the most efficient interventions for disease managements. However, existing data are mainly from simulation models instead of "real-world" data.

**OBJECTIVE:**

- to longitudinally evaluate the changes of prevalence of diabetic complications and associated healthcare costs in a nationally-representative diabetic cohort.

# Changes in prevalence of diabetic complications and associated healthcare costs during a 10-year follow-up period among a nationwide diabetic cohort.

J Diabetes Complications. 2015 May-Jun;29(4):523-8.

- **Design**: a population-based cohort study
- **DataBase**: **LHID 2010**
- **Population**: type 2 diabetes patients
- **Exposures**: Diabetic complications of each patient were calculated annually after the cohort entry by the adapted Diabetes Complications Severity Index (aDCSI) score (sum of diabetic complication with severity levels, range 0-13) using diagnostic codes recorded in the LHID.
- **Outcome**: Healthcare utilizations (including outpatient and inpatient visits) as well as direct medical costs.

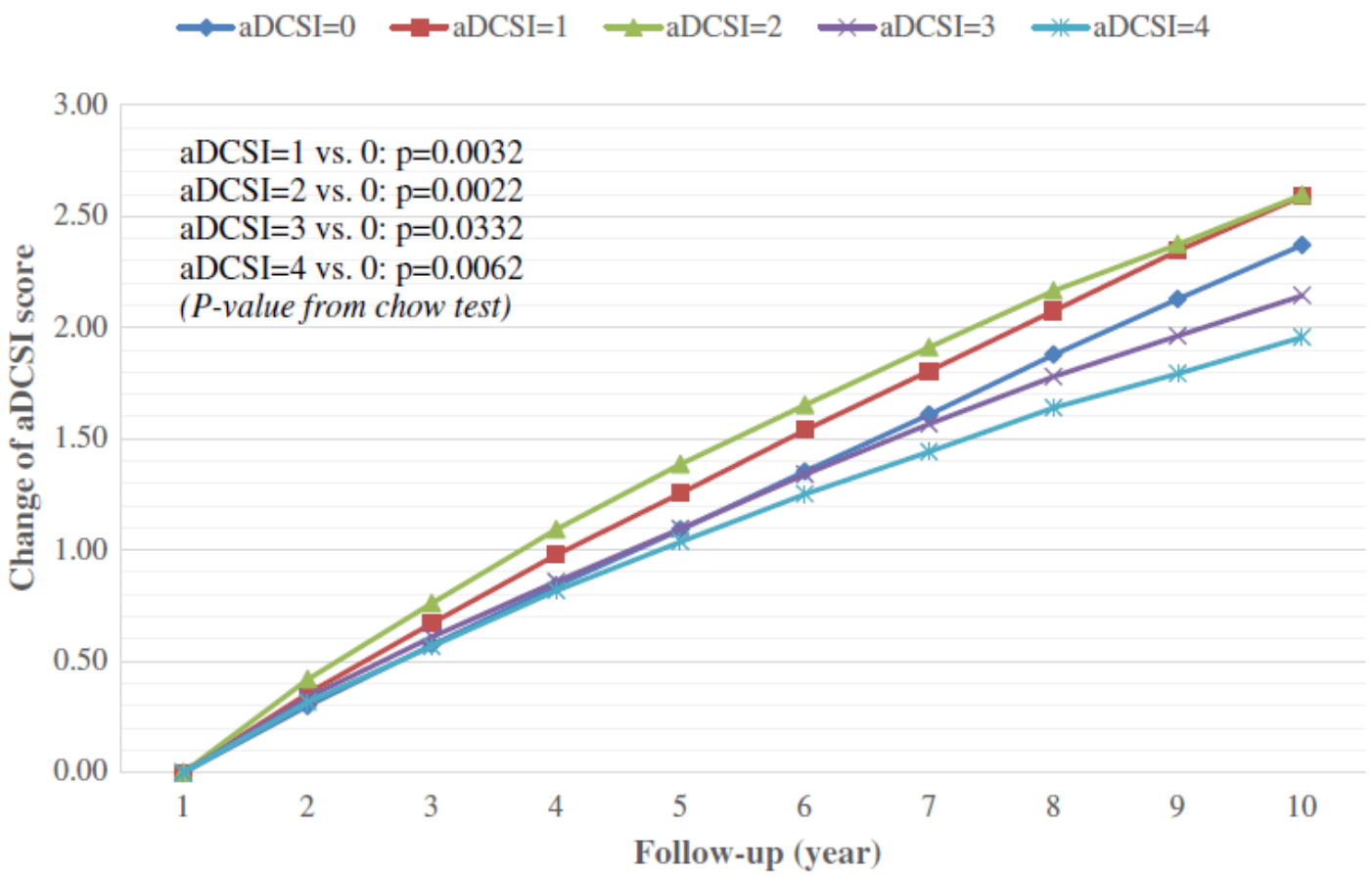



**Fig. 1.** Change of aDCSI score by different aDCSI score groups (at cohort entry; aDCSI = 0, 1, 2, 3, and 4) over a 10-year follow-up period.

the severity of diabetic complications increased over time, especially for patients with aDCSI score of 2 and above at cohort entry (at 10years of follow-up: aDCSI=0 (cohort entry), 2.37; aDCSI=1, 3.59; aDCSI=2, 4.60; aDCSI=3, 5.14; aDCSI=4, 5.96).

# Changes in prevalence of diabetic complications and associated healthcare costs during a 10-year follow-up period among a nationwide diabetic cohort.

**RESULTS:**

- We found the severity of diabetic complications increased over time, especially for patients with aDCSI score of 2 and above at cohort entry (at 10years of follow-up: aDCSI=0 (cohort entry), 2.37; aDCSI=1, 3.59; aDCSI=2, 4.60; aDCSI=3, 5.14; aDCSI=4, 5.96).
- There were significant differences in healthcare utilizations and associated medical costs among patients stratified by aDCSI score (e.g. at 1year after cohort entry, mean counts of inpatient visits: 0.14 vs. 1.81 for aDCSI=0 vs.5+).
- Relatively high healthcare utilizations and associated medical costs in the first year of cohort entry were observed for patients with aDCSI score of 4 and above at cohort entry.

# Changes in prevalence of diabetic complications and associated healthcare costs during a 10-year follow-up period among a nationwide diabetic cohort.

**CONCLUSIONS:**

- We provided the important empirical data for patient-level longitudinal changes in diabetic complications and associated healthcare utilization and medical costs among patients with diabetes.

# Separate and joint effects of diabetes mellitus and chronic kidney disease on the risk of acute coronary syndrome: a population-based cohort study.

Medicine (Baltimore). 2014 Dec;93(28):e261.

**Aims**

- Patient with diabetes (DM) and chronic kidney disease (CKD) are at a higher risk of developing acute coronary syndrome (ACS). However, only a few studies have investigated the separate and joint effects of DM and CKD on the risk of ACS, especially population-based studies under age-, sex- and various cardiovascular risk factor-stratifications.

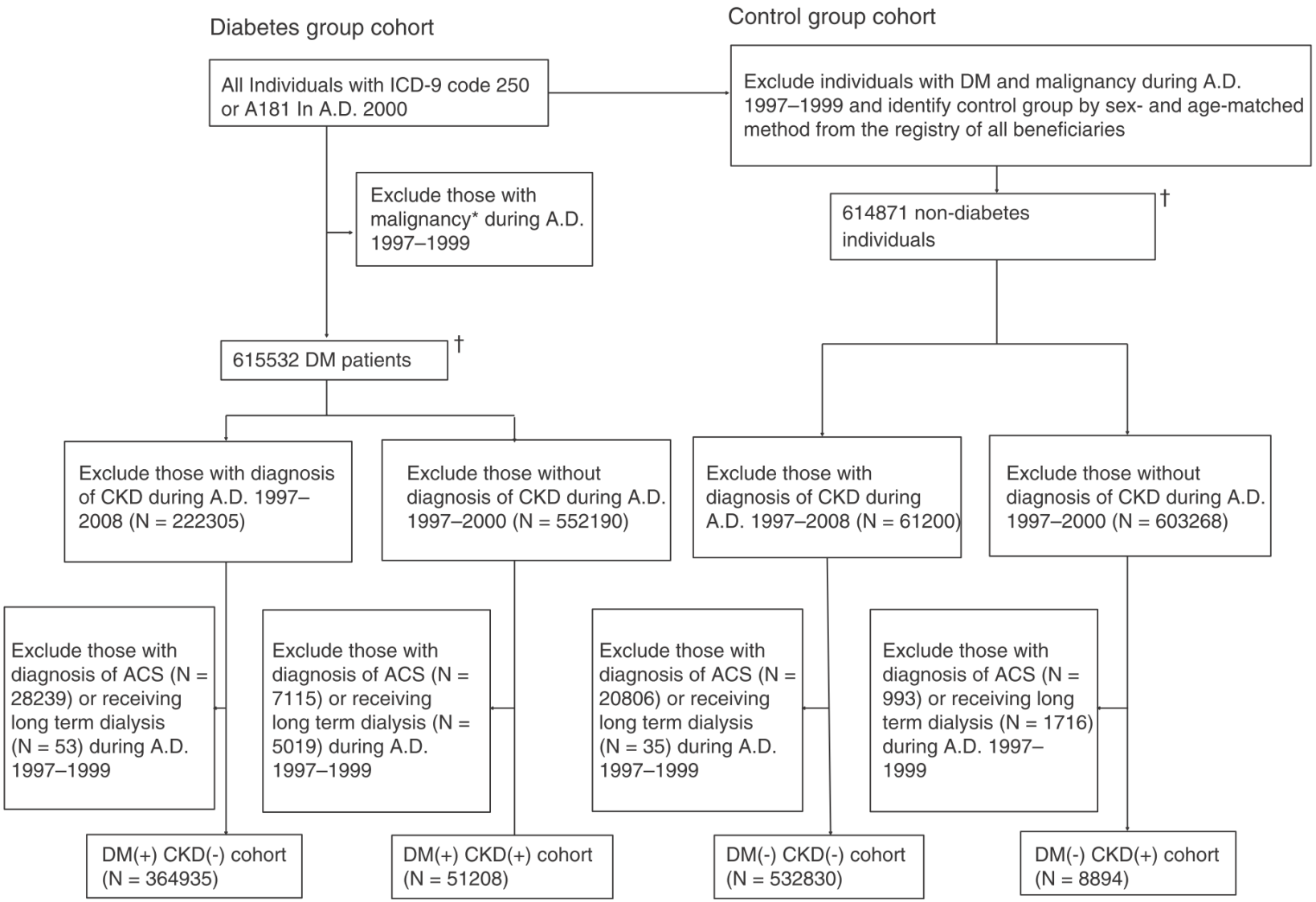



**FIGURE 1.** The flow diagram of individuals selection in our cohort study. ∗Malignancy: (ICD-9: 140–208). †The inconsistent number between diabetes and control cohort was due to the missing information in diabetes group (N = 661).

**TABLE 3.** Selected Clinical Risk Factor(s)-Specific Relative Hazards of Acute Coronary Syndrome in Relation to Diabetes (DM) and Chronic Kidney Disease (CKD)

| | Acute coronary syndrome | | |
|---|---|---|---|
| | No | Yes | AHR* (95% CI) |
| Non-DM/non-CKD subjects without clinical risk factors | 182,838 | 9863 | 1.00 (reference) |
| DM/non-CKD su | 25,363 | 2464 | 2.46† (2.35–2.57) |
| Non-DM/CKD su | | | 1.67† (1.34–2.08) |
| DM/CKD subjec | | | 3.39† (2.94–3.92) |
| Non-DM/non-CK | | | 1.00 (reference) |
| DM/non-CKD su | | | 1.70† (1.61–1.78) |
| Non-DM/CKD su | | | 1.30 (0.96–1.77) |
| DM/CKD subjec | | | 2.58† (2.33–2.86) |
| Non-DM/non-CK | | | 1.00 (reference) |
| DM/non-CKD su | | | 1.53† (1.49–1.58) |
| Non-DM/CKD su | | | 1.44† (1.28–1.63) |
| DM/CKD subjec | | | 2.01† (1.89–2.14) |
| Non-DM/non-CK | | | 1.00 (reference) |
| DM/non-CKD su | | | 1.58† (1.43–1.75) |
| Non-DM/CKD subjects with past-history of CHD only | 105 | 23 | 1.39 (0.91–2.12) |
| DM/CKD subjects with past-history of CHD only | 201 | 42 | 1.61† (1.19–2.19) |

Design: cohort study
DataBase: LHID 2010
Exposure: DM / CKD
Outcomes: incident ACS
Statistics: Cox proportion hazard model

# Mortality of patients with type 2 diabetes in Taiwan: a 10-year nationwide follow-up study.

Diabetes Res Clin Pract. 2015 Jan;107(1):178-86.

**Aims**

- This study aims to investigate the distribution of underlying-causes-of-death (UCOD) among deceased patients with type 2 diabetes mellitus (DM) in Taiwan and assess the influence of socio-demographic characteristics on mortality in type 2 DM patients.

- **design: cohort**
- **DataBase: DM pt (2000~2008) + Mortality Registry (2000~2009)**

# Mortality of patients with type 2 diabetes in Taiwan: a 10-year nationwide follow-up study.

Diabetes Res Clin Pract. 2015 Jan;107(1):178-86.

- **METHODS:**
- A cohort study on patients who sought medical care for type 2 DM from 2000 to 2008 was conducted on 65,599 type 2 DM patients retrieved from the 1-million beneficiaries randomly selected from Taiwan's National Health Insurance Database.
- The study cohort was then linked to Taiwan's Mortality Registry to ascertain the patients who died between 2000 and 2009.
- We examined the distribution of UCOD in the deceased subjects.
- The hazard ratios of mortality in relation to socio-demographic characteristics were estimated from Cox proportional hazard model.

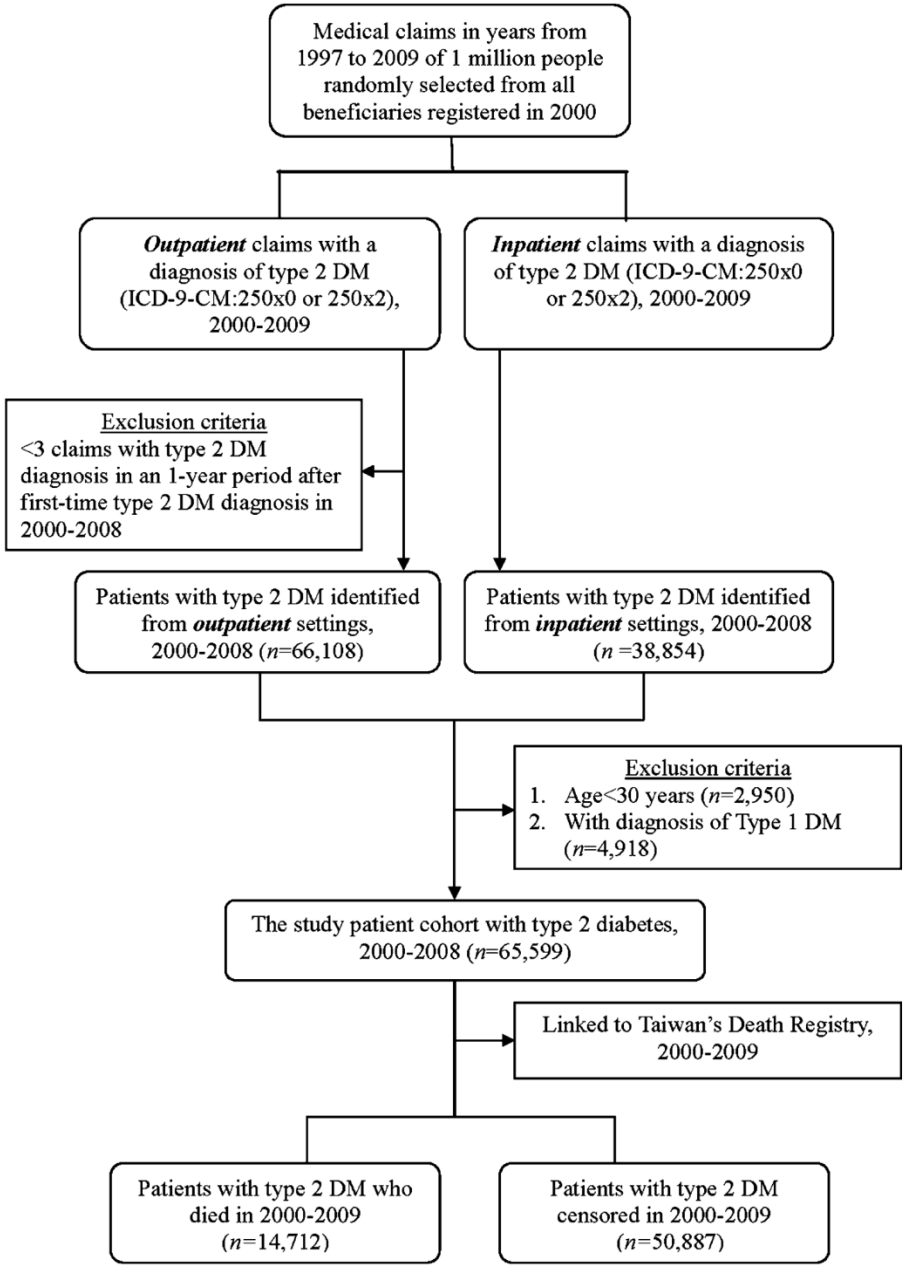



**Fig. 1 – Flow chart of identification and follow-up of study subjects.**

**Table 2 – The underlying causes of death among the deceased study subjects.**

| Underlying causes of death | *n* | % |
|---|---|---|
| Diseases of the circulation system (ICD-9: 390–459, ICD-10: I00–I99) | 3084 | 21.46 |
| Ischemic heart disease (ICD-9: 410–414, ICD–10: I20–I25) | 836 | 5.82 |
| Cerebrovascular disease (ICD-9: 430–438, ICD-10: I60–I69) | 1394 | 9.70 |
| Other disease of the circulation system | 854 | 5.94 |
| Endocrine, nutritional and metabolic diseases, and immunity disorders (ICD-9: 240–279, ICD-10: E00–E90) | 2987 | 20.78 |
| Diabetes mellitus (ICD-9: 250, ICD-10: E10–E14) | 2948 | 20.51 |
| Malignant neoplasm (ICD-9: 140–208, ICD-10: C00–C97) | 3260 | 22.68 |
| Liver and intrahepatic bile ducts (ICD-9: 155, ICD-10: C22) | 740 | 5.15 |
| Trachea, bronchus, and lung (ICD-9: 162, ICD-10: C349) | 620 | 4.31 |
| Colon and rectum (ICD-9: 153–154, ICD-10: C18–C20) | 352 | 2.45 |
| Pancreas (ICD-9: 157, ICD-10: C259) | 190 | 1.32 |
| Stomach (ICD-9: 151, ICD-10: C169) | 177 | 1.23 |
| Breast (ICD-9: 174–175, ICD-10: C50) | 93 | 0.65 |
| Prostate (ICD-9: 185, ICD-10: C61) | 88 | 0.61 |
| Other malignant neoplasm | 1000 | 6.96 |
| Diseases of the respiratory system (ICD-9: 460–519, ICD-10: J00–J99) | 1331 | 9.26 |
| Diseases of the digestive system (ICD-9: 520–579, ICD-10: K00–K93) | 1200 | 8.35 |
| Nephritis, nephrotic syndrome, and nephrosis (ICD-9: 580–589, ICD-10: N00–N07, N17–N19, N25–N27) | 647 | 4.50 |
| Diseases of the nervous system and sense organs (ICD-9: 320–389, ICD-10: G00–G99) | 136 | 0.95 |
| Infectious and parasitic diseases (ICD-9: 001–139, ICD-10: A00–B99) | 363 | 2.53 |
| Injury and poisoning (ICD-9: 800–999, ICD-10: V0l-Y98) | 536 | 3.73 |
| Other causes | 828 | 5.76 |

# Mortality of patients with type 2 diabetes in Taiwan: a 10-year nationwide follow-up study.

Diabetes Res Clin Pract. 2015 Jan;107(1):178-86.

- **RESULTS:**
- The leading causes of death in type 2 DM included neoplasm (22.68%), cardiovascular diseases (21.46%), and endocrine diseases (20.78%).
- Male gender and older ages were associated with significantly increased risk of mortality.
- In addition, lower urbanization and greater co-morbidity score were also significantly associated with an increased risk of mortality with a dose-gradient pattern.

# Mortality of patients with type 2 diabetes in Taiwan: a 10-year nationwide follow-up study.

Diabetes Res Clin Pract. 2015 Jan;107(1):178-86.

**CONCLUSIONS:**

- Neoplasm accounts for the largest portion (22.68%) of deaths in type 2 DM patients closely followed by with cardiovascular diseases (21.46%).
- An increased risk of mortality in type 2 DM patients in lower urbanized areas may reflect poor diabetes care in these areas.

# Association between antidiabetic drugs and psoriasis risk in diabetic patients: results from a nationwide nested case-control study in Taiwan.

J Am Acad Dermatol. 2015 Jan;72(1):123-30.

## Aims

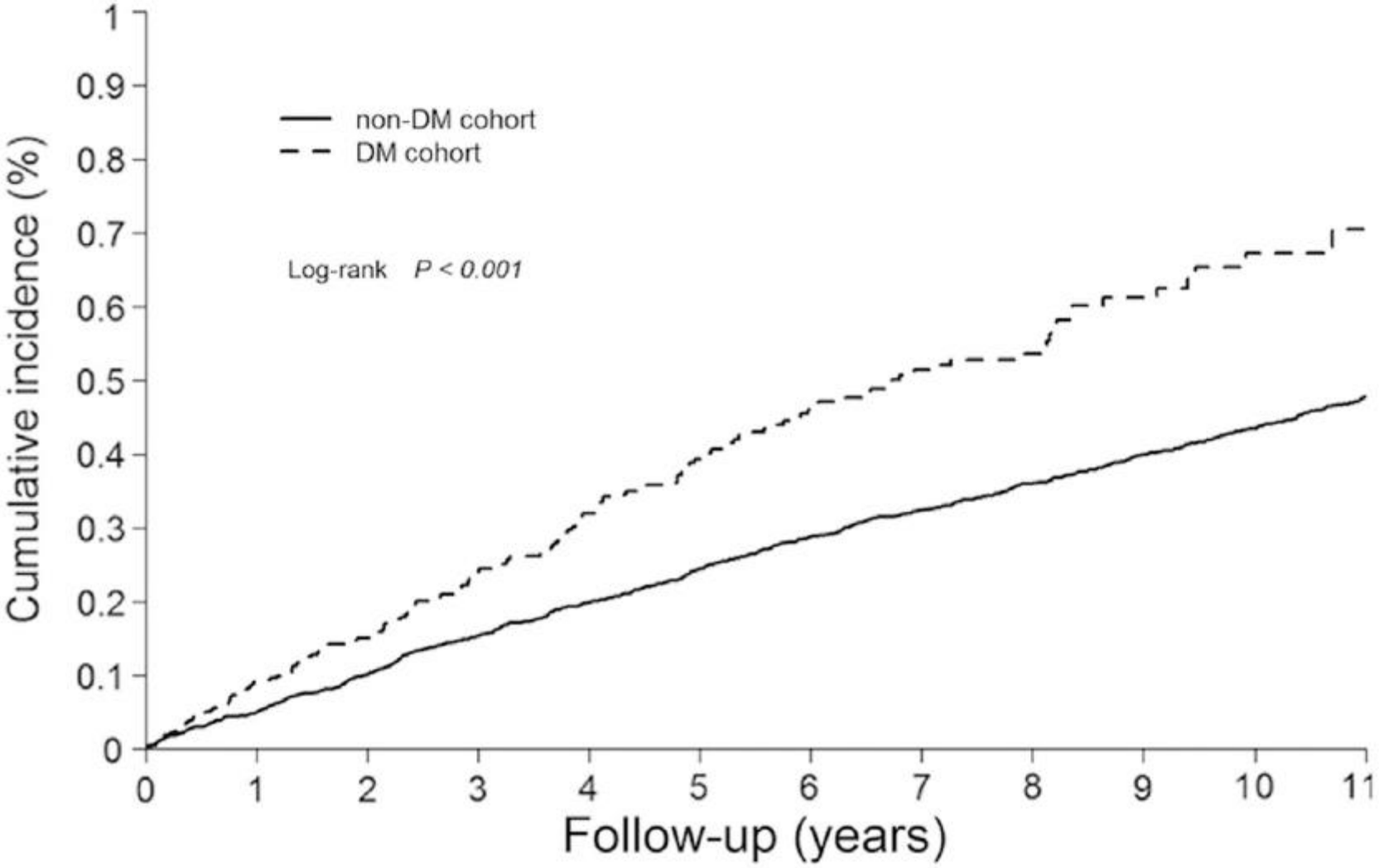
- We sought to investigate the association between antidiabetic therapies and psoriasis.

**DataBase: 全檔（1997~2011)**

**Method** (1)

**Design: cohort study**

**Population**: The incidence of psoriasis was compared between a representative diabetic cohort and a matched nondiabetic cohort. We next conducted a nationwide cohort study with 1,659,727 diabetic patients using the National Health Insurance Research Database of Taiwan 1997 through 2011.


non-DM cohort
DM cohort
Log-rank P < 0.001
Cumulative incidence (%)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
10
11
Follow-up (years)

# Association between antidiabetic drugs and psoriasis risk in diabetic patients: results from a nationwide nested case-control study in Taiwan.

J Am Acad Dermatol. 2015 Jan;72(1):123-30.

## Method(2)

**Design: nested case control study**

**Case: psoriasis patients**

- Patients were classified as having first-time diagnosis of psoriasis or psoriatic arthritis if they had been hospitalized in or received 3 consecutive diagnoses from a department of dermatology or rheumatology for one of these conditions after the index date.
- Those who had received a diagnostic code for psoriasis before the date of cohort entry were excluded.

**Control:**

- Four control subjectswere randomly selected from the diabetic cohort for each case of psoriasis after matching age, gender, date of diagnosis of diabetes, duration of follow-up, and propensity score.

**Table II.** Frequent versus infrequent users of prescriptions and the risk of psoriasis among case and control groups within 3 years before the index date

| Prescription before the index date | Case (N = 9243) | Control (N = 36,972) | Unadjusted OR (95% CI) | Adjusted OR* (95% CI) | *P* value† |
|---|---|---|---|---|---|
| Metformin | | | | | |
| Nonuser | 2099 | 8580 | 1 | 1 | .01 |
| Infrequent user‡ | 2557 | 9986 | 1.05 (0.98-1.12) | 1.05 (0.98-1.12) | |
| Frequent user‡ | 4587 | 18,406 | 1.02 (0.96-1.08) | 0.94 (0.88-0.99) | |
| Insulin | | | | | |
| Nonuser | 6474 | 27,397 | 1 | 1 | <.001 |
| Infrequent user‡ | 2087 | 7423 | 1.19 (1.13-1.26) | 1.13 (1.06-1.19) | |
| Frequent user‡ | 682 | 2152 | 1.34 (1.23-1.47) | 1.29 (1.18-1.42) | |
| TZD | | | | | |
| Nonuser | 7937 | 31,662 | 1 | 1 | .09 |
| Infrequent user‡ | 704 | 2631 | 1.07 (0.98-1.16) | 1.04 (0.95-1.13) | |
| Frequent user‡ | 602 | 2679 | 0.90 (0.82-0.98) | 0.89 (0.81-0.98) | |
| Sulfonylurea and others§ | | | | | |
| Nonuser | 1130 | 4673 | 1 | 1 | .02 |
| Infrequent user‡ | 2235 | 9037 | 1.02 (0.94-1.11) | 1.07 (0.98-1.16) | |
| Frequent user‡ | 5878 | 23,262 | 1.05 (0.97-1.12) | 0.96 (0.89-1.03) | |

*CI*, Confidence interval; *OR*, odds ratio; *TZD*, thiazolidinedione.

*Adjusted for age; gender; comorbidities including hyperlipidemia, hypertension, cirrhosis, chronic renal failure or hemodialysis, acute coronary syndrome, cerebrovascular accidents, HIV infection, and malignancies; Charlson score except diseases mentioned above; use of antidiabetic drugs listed above; hospital visits; and disease duration.

†*P* value of trend test based on Cochran-Armitage trend test.

‡Infrequent users, <90 days of prescriptions per year; frequent users, ≥90 days of prescriptions per year.

§Others = oral hypoglycemic agents other than metformin and TZD.

# Association between antidiabetic drugs and psoriasis risk in diabetic patients: results from a nationwide nested case-control study in Taiwan.

J Am Acad Dermatol. 2015 Jan;72(1):123-30.

- **CONCLUSION:**
- Among diabetic patients, regular insulin use is associated with psoriasis development. Frequent use of thiazolidinedione may be associated with modest reduction in psoriasis risk.

# Optimal duration of anti-TB treatment in patients with diabetes: nine or six months?

Chest. 2015 Feb;147(2):520-8.

**AIMS:**

- Diabetes mellitus (DM) increases the risk of TB recurrence.
- This study investigated whether 9-month anti-TB treatment is associated with a lower risk of TB recurrence within 2 years after complete treatment than 6-month treatment in patients with DM with an emphasis on the impact of directly observed therapy, short course (DOTs).

# Optimal duration of anti-TB treatment in patients with diabetes: nine or six months?

Chest. 2015 Feb;147(2):520-8.

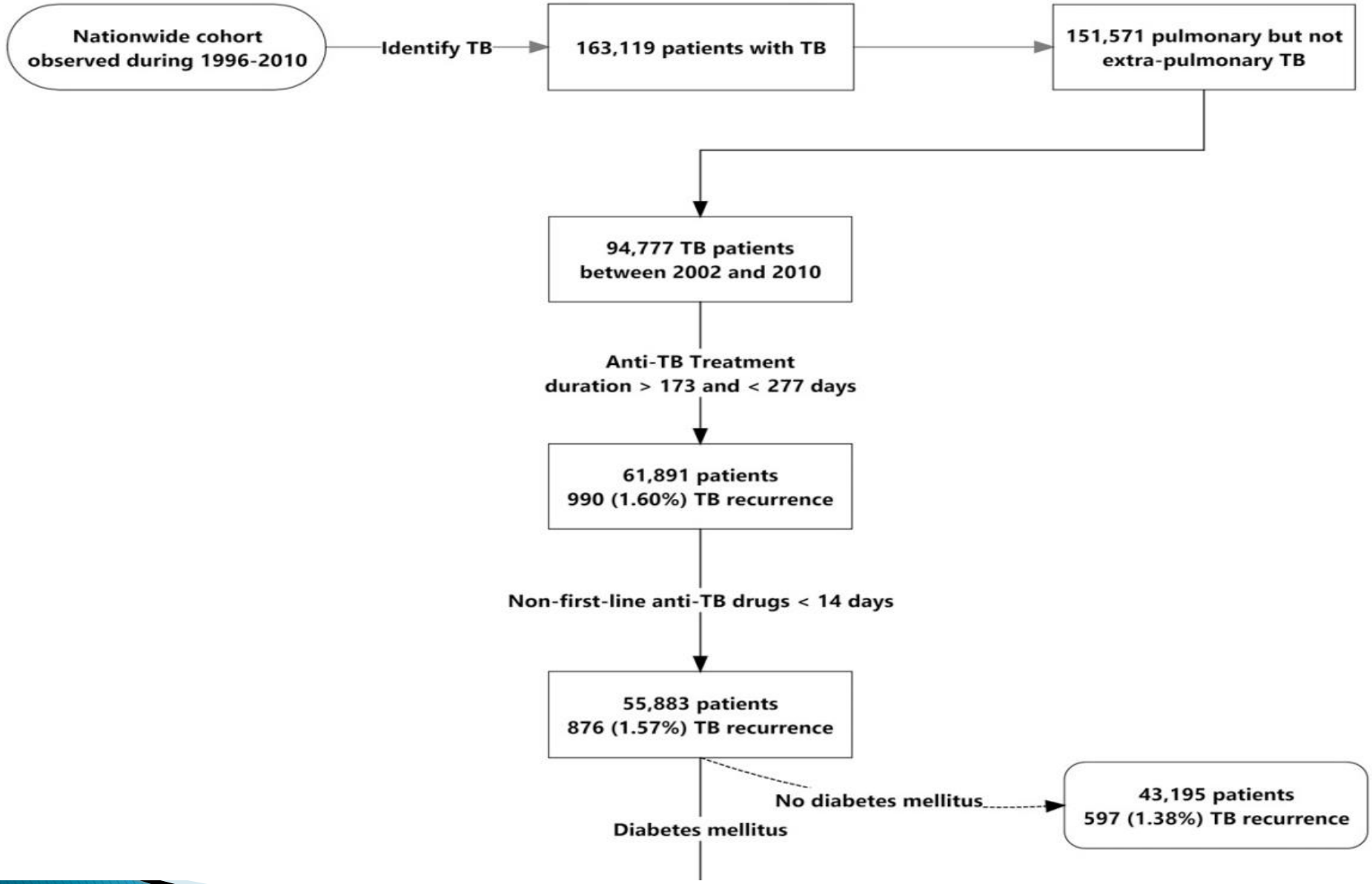
## METHODS:

## Design:

1. 描述性研究 2002~2010
2. Cohort study

## Population:

- Patients with pulmonary but not extrapulmonary TB receiving treatment of 173 to 277 days between 2002 and 2010 were identified from the National Health Insurance Research Database of Taiwan.
- Patients with DM were then selected and classified into two groups based on anti-TB treatment duration (9 months vs 6 months). Factors predicting 2-year TB recurrence were explored using Cox regression analysis.


Nationwide cohort observed during 1996-2010
Identify TB
163,119 patients with TB
151,571 pulmonary but not extra-pulmonary TB
94,777 TB patients between 2002 and 2010
Anti-TB Treatment duration > 173 and < 277 days
61,891 patients
990 (1.60%) TB recurrence
Non-first-line anti-TB drugs < 14 days
55,883 patients
876 (1.57%) TB recurrence
No diabetes mellitus
43,195 patients
597 (1.38%) TB recurrence
Diabetes mellitus

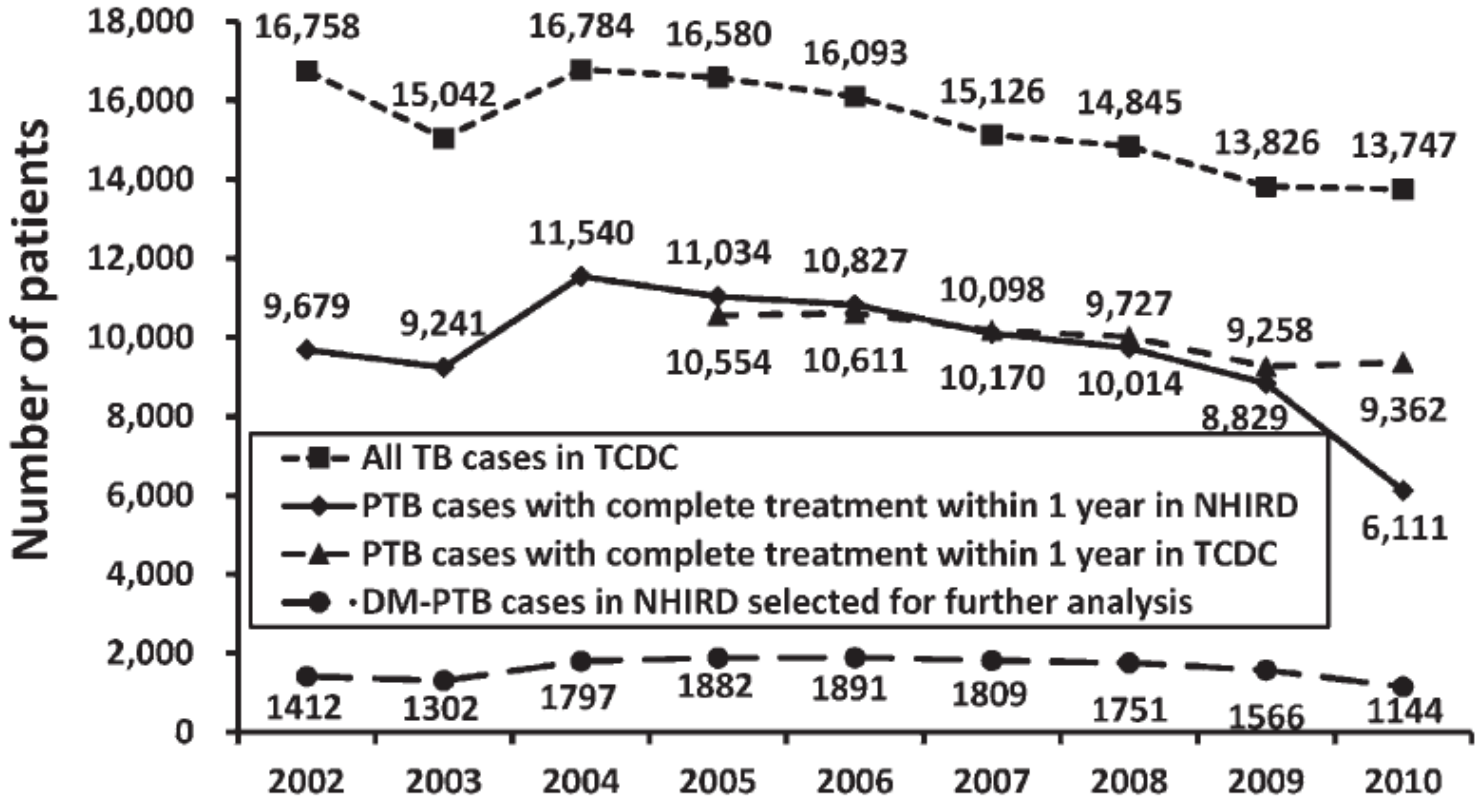



Figure 2 – *Numbers of TB and PTB cases reported by the TCDC and in the NHIRD as well as number of DM-pulmonary patients with TB selected from NHIRD for further analysis in this study. DM = diabetes mellitus; NHIRD = National Health Insurance Research Database; PTB = pulmonary TB; TCDC = Taiwan Centers for Disease Control.*

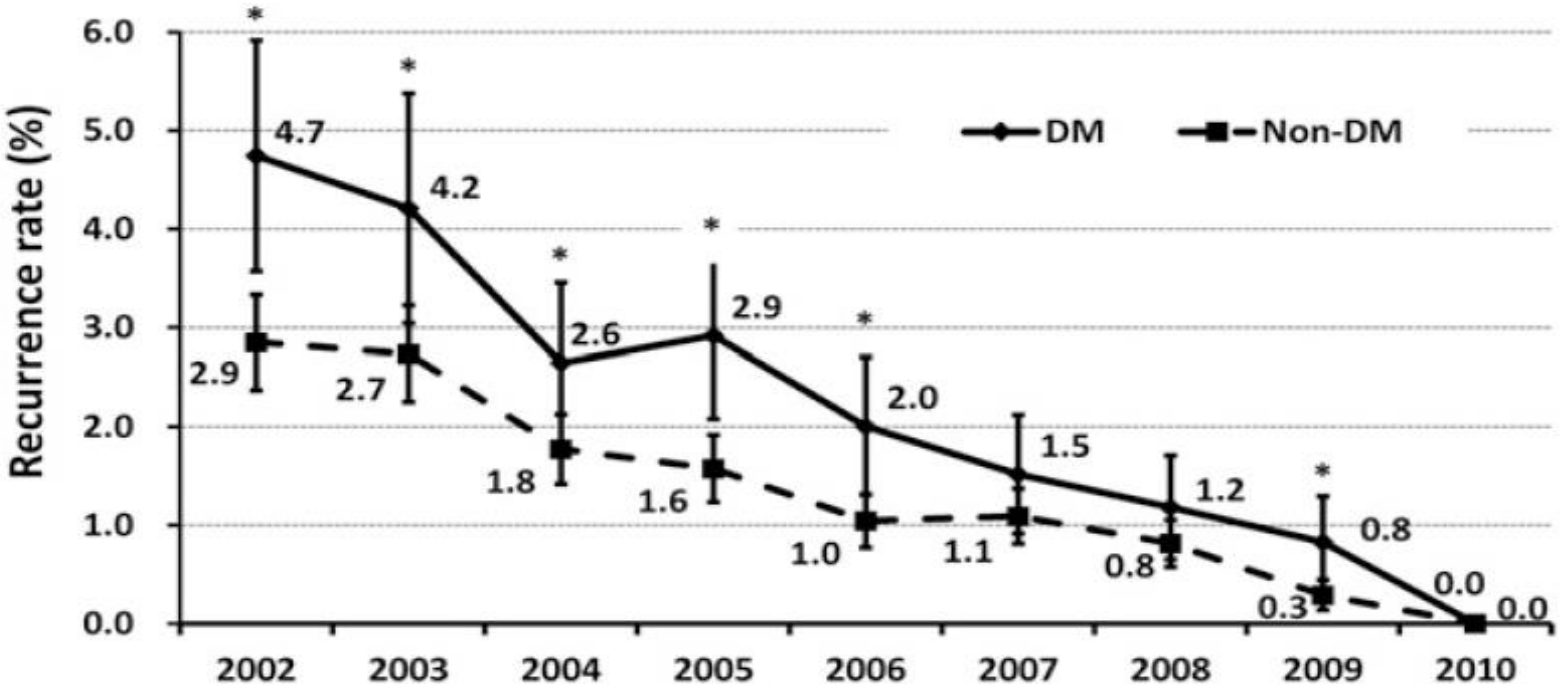



Figure 3 – *The 2-y TB recurrence rate and its 95% CI in patients with and without DM receiving anti-TB treatment of pulmonary TB between 6 and 9 mo during which the duration of non-first-line anti-TB drugs was ≤ 14 d in the National Health Insurance Research Database of Taiwan.*

Among 12,688 patients with DM and 43,195 patients without DM, the 2-year TB recurrence rate was 2.20% and 1.38%, respectively ($P < .001$). Of the patients with DM, recurrence rate decreased from 3.54% to 1.19% after implementation of DOTs ($P < .001$).

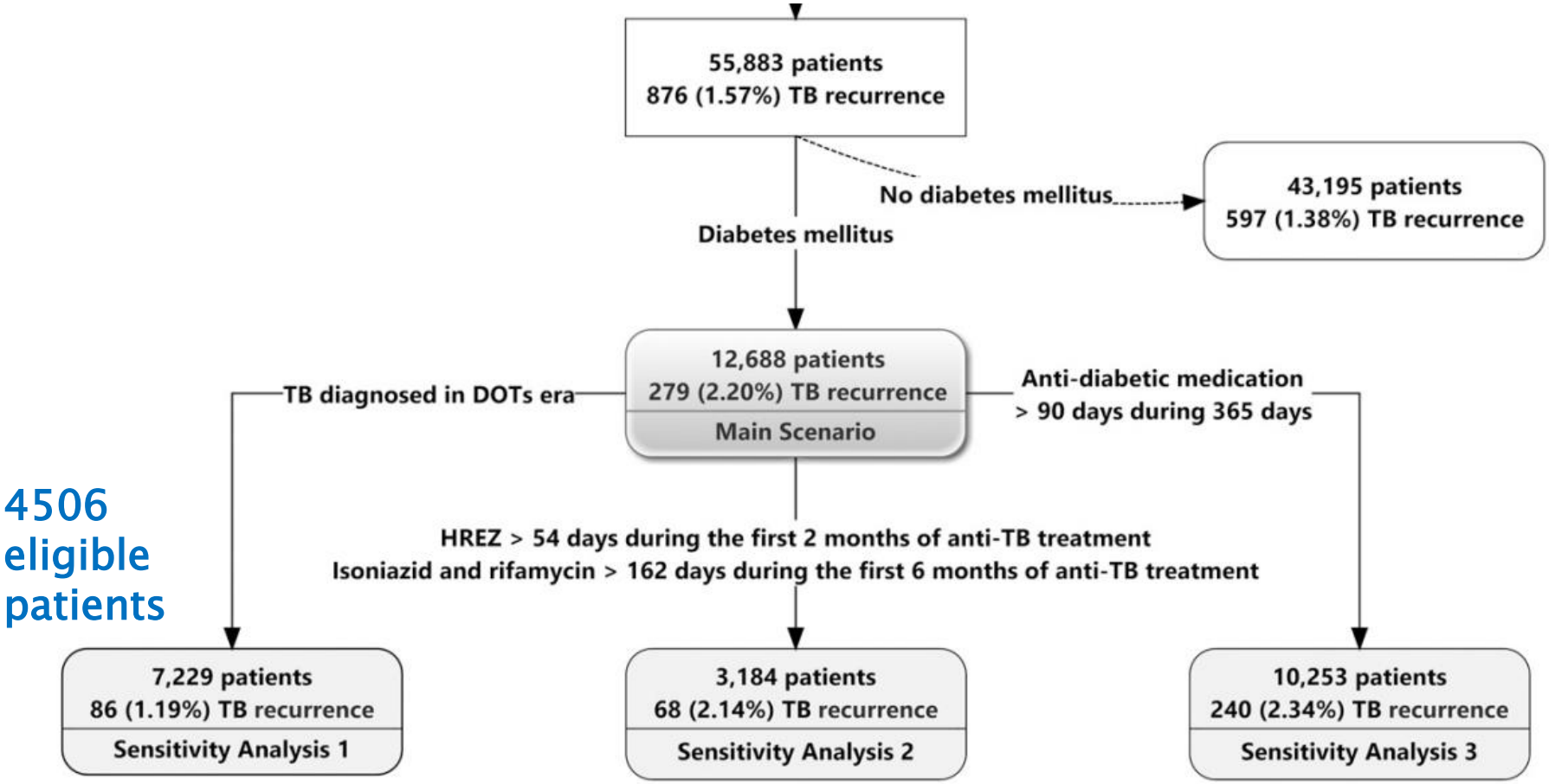



Figure 1 – *Flowchart of case selection from the National Health Insurance Research Database of Taiwan. DOTs = directly observed therapy, short course. HREZ = isoniazid, rifamycin, ethambutol, and pyrazinamide.*

TABLE 2 ] Independent Risk Factors for TB Recurrence Within 2 y After Completion of Anti-TB Treatment Among the 12,688 Patients With Diabetes, by Cox Proportional Hazards Regression Analysis

| Risk Factor | *P* Value | Adjusted HR | 95% CI | |
|---|---|---|---|---|
| | | | Lower | Upper |
| Age, per-y increment | <.001 | 0.97 | 0.96 | 0.98 |
| Sex, male vs female | .022 | 1.40 | 1.05 | 1.87 |
| Later TB diagnostic y, per-y increment | <.001 | 0.81 | 0.77 | 0.86 |
| Malignancy, yes vs no | .039 | 1.64 | 1.03 | 2.63 |
| Culture positivity after 2-mo anti-TB treatment, yes vs no | <.001 | 1.96 | 1.36 | 2.83 |
| 80% Consistency with standard anti-TB treatment, yes vs no | .010 | 0.72 | 0.56 | 0.93 |
| Duration of anti-TB treatment, 9 mo vs 6 mo | .030 | 0.76 | 0.59 | 0.97 |

HR = hazard ratio.

## CONCLUSIONS:

The 2-year TB recurrence rate is higher in a diabetic population in Taiwan and can be reduced by treatment supervision. Extending the anti-TB treatment by 3 months may also decrease the recurrence rate when treatment is not supervised.

# 使用資料庫研究要注意

- 熟悉資料庫的資料來源、內容、結構
- 可以多思考各種研究主題
- 審慎評估研究主題的可行性
  - 過去
  - 現在
- 要系統性的進行研究設計和規劃
- 與有經驗的研究者合作（**資料庫分析最重要的就是研究設計**）

# 感謝聆聽