



- Using Mind map as a communication tool in a vaccination data quality improvement project -

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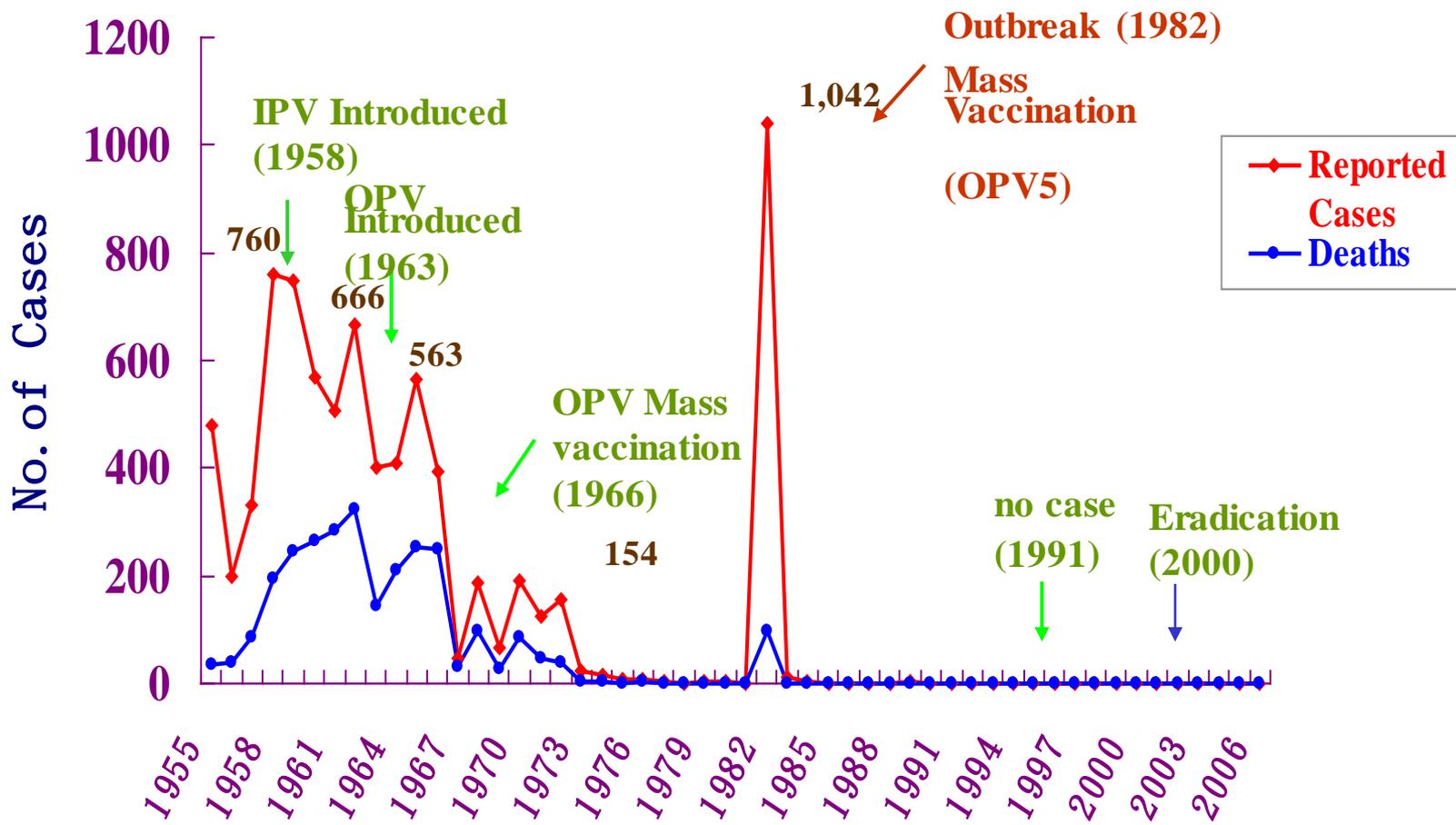
September 19, 2012



# Overview

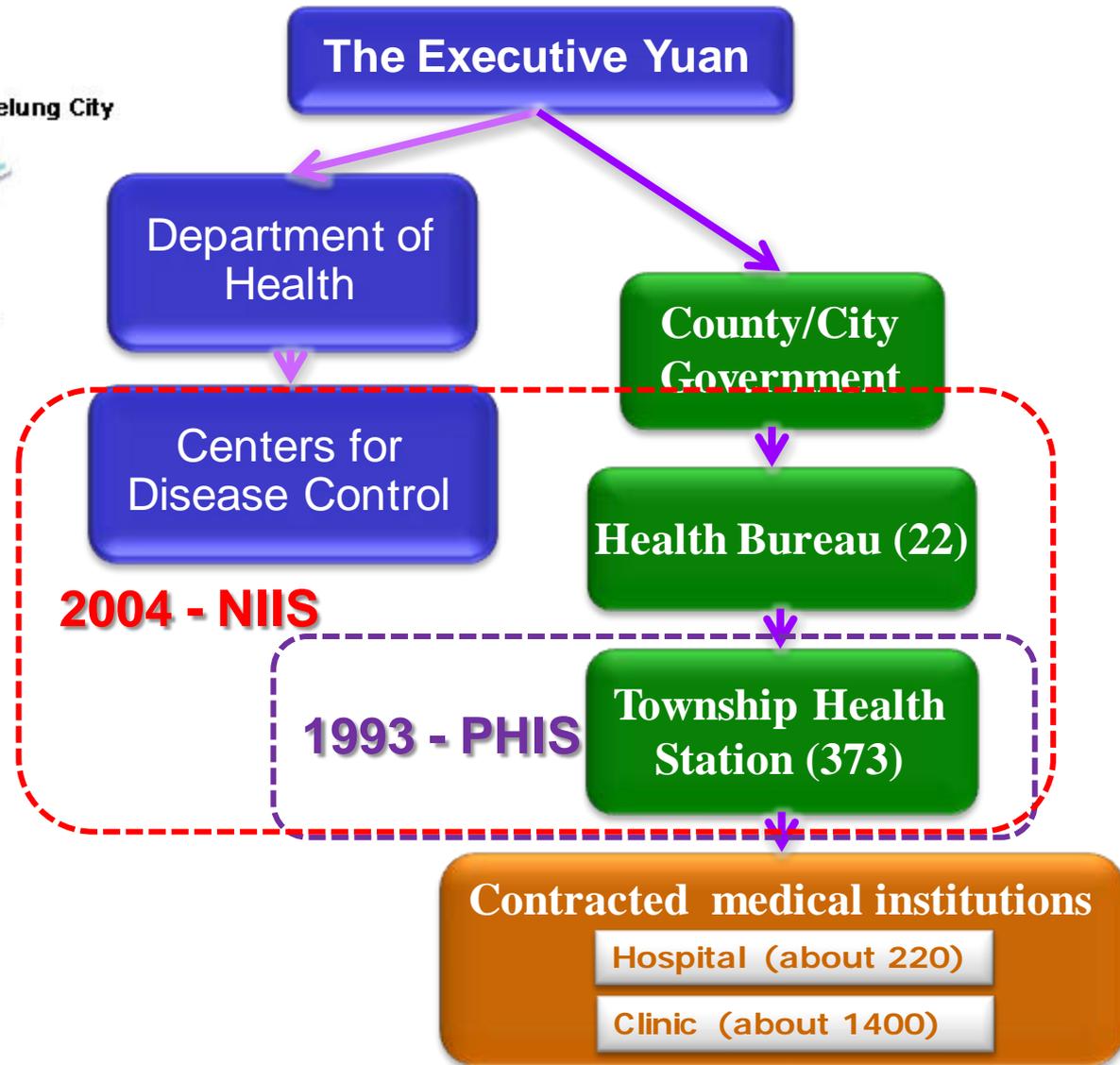
- **National Immunization Information System (NIIS) history introduction**
- **Data quality improvement project**
- **Using mind map as a communication tool**
- **Conclusion**

# Poliomyelitis in Taiwan

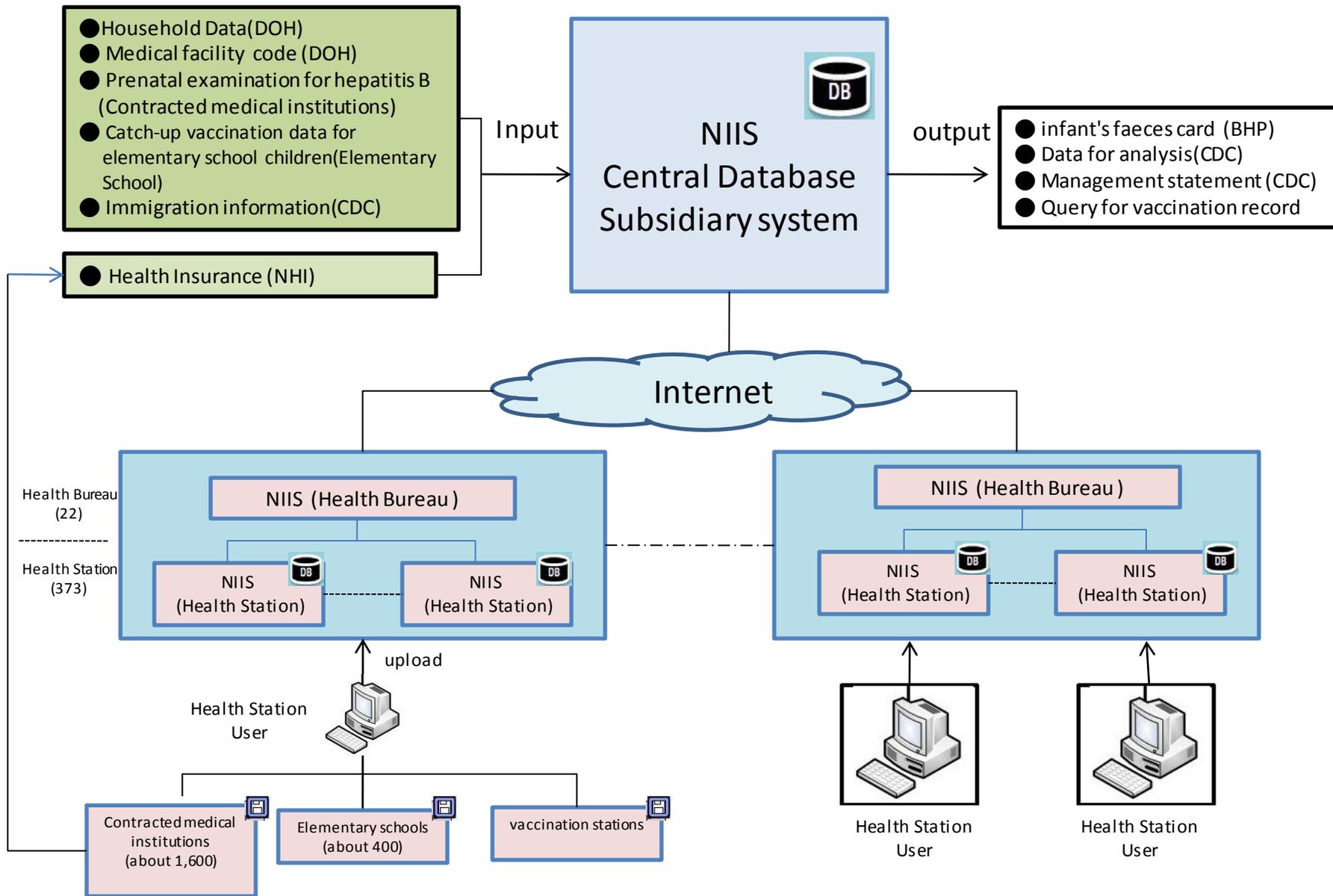




# Health Organization in Taiwan



# National Immunization Information System (NIIS)





# Why System Renew is needed

- **Technical environment was changed**
- **Business rules were changed**
- **Old system structure is hard to fulfill current business need**



# The first step – data quality improvement

- Data is separated and duplicated between different counties
- Single centralized DB will be used in new NIIS
- A chance to review current system limitation from insight



# Data quality improvement project

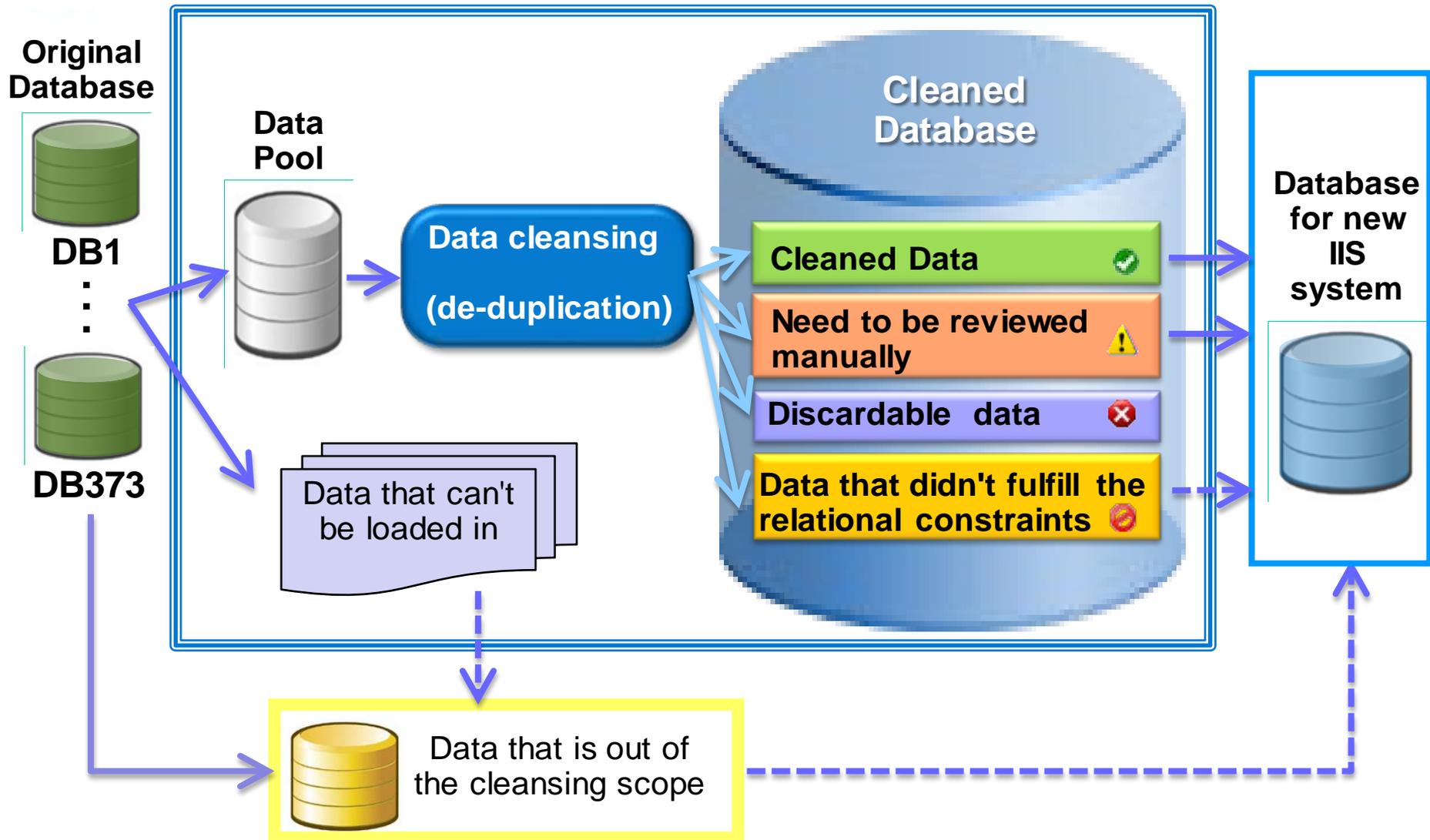
## ■ Time period

- Nov. 29, 2011 ~ June 30, 2012

## ■ Project goals

- Data De-duplication
- Mark the records that need to be reviewed manually
- The result will be the data migration source for new IIS
- Construct the architecture for new IIS

# The concept of data cleansing workflow





# Data quality improvement project(cont.)

## ■ Challenge

- Time is limited
- The data cleansing rule is complicated and required business decision
- The vender didn't familiar the public health domain language
- The communication between vender and business unit is frustrating



# Data quality improvement project(cont.)

## ■ Solution

- Mind map methodology is used

## ■ Why mind map

- Mind maps work the way the brain works.
- Mind maps allow associations and links to be recorded and reinforced.
- Visual quality of mind maps allows us to make key points to stand out easily.

Cite from: <http://www.peterrussell.com/MindMaps/Advantages.php>



# A part of data cleansing rules

資料擷取日期：2011年8月4日

- (編號) 處理中
- (編號) 檢何不過但仍為選取資料
- (編號) 同群組最後取得的唯一資料
- (編號) 同群組中註記結束資料
- (編號) 同群組暫時取得的唯一資料
- (編號)

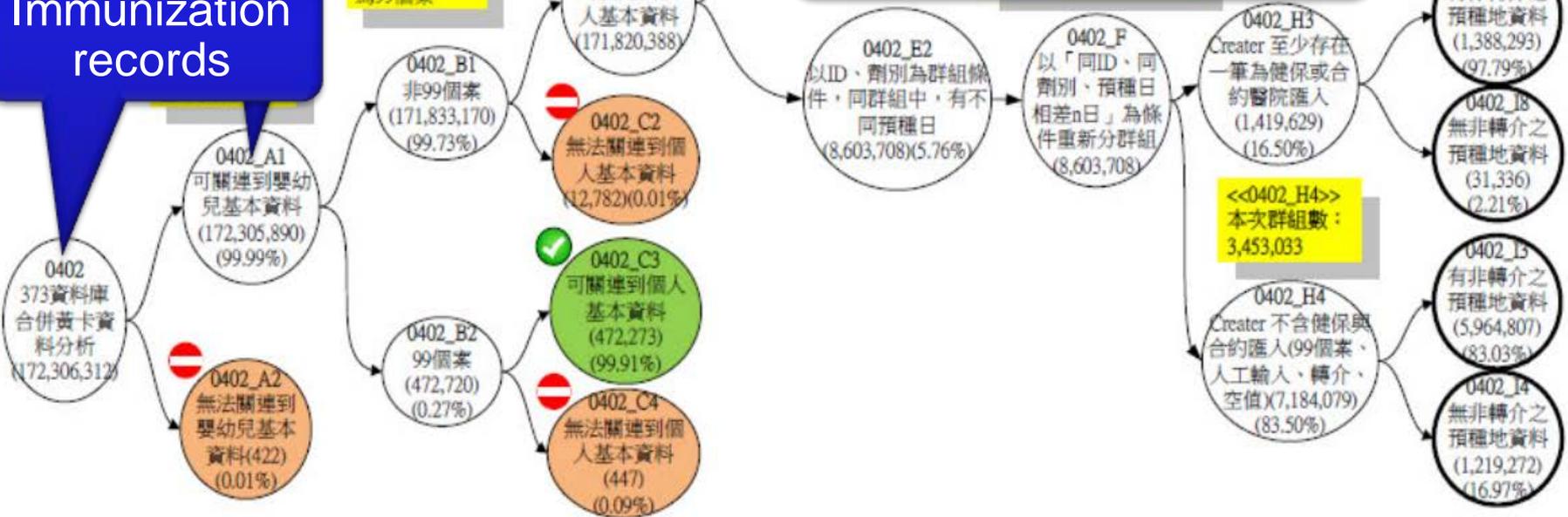
With the same ID and dose, the immunization date are also the same

Can reference to personal record

Can Reference to child record

Immunization records

There is at least one record that came from contracted hospital



# Result Validation

指標項目	指標目的說明
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指標項目說明：

前五項資料驗證指標

其它資料驗證指標

資料驗證指標

**Personal records**

**Baby records**

**Immunization records**

**Prenatal checkup for Hepatitis B**

**population statistics**

**gender statistics**

**age distribution**

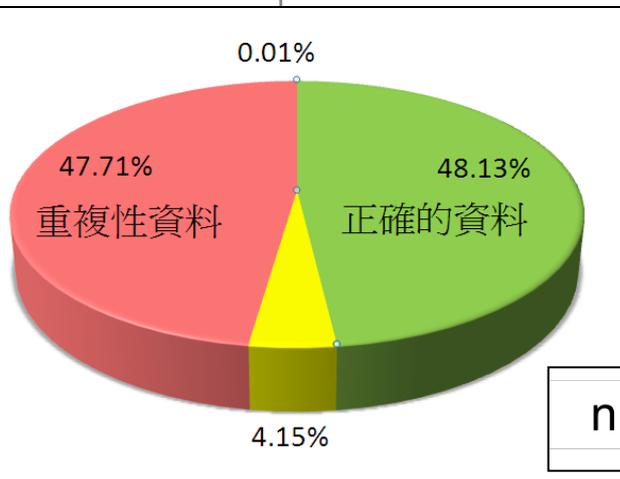
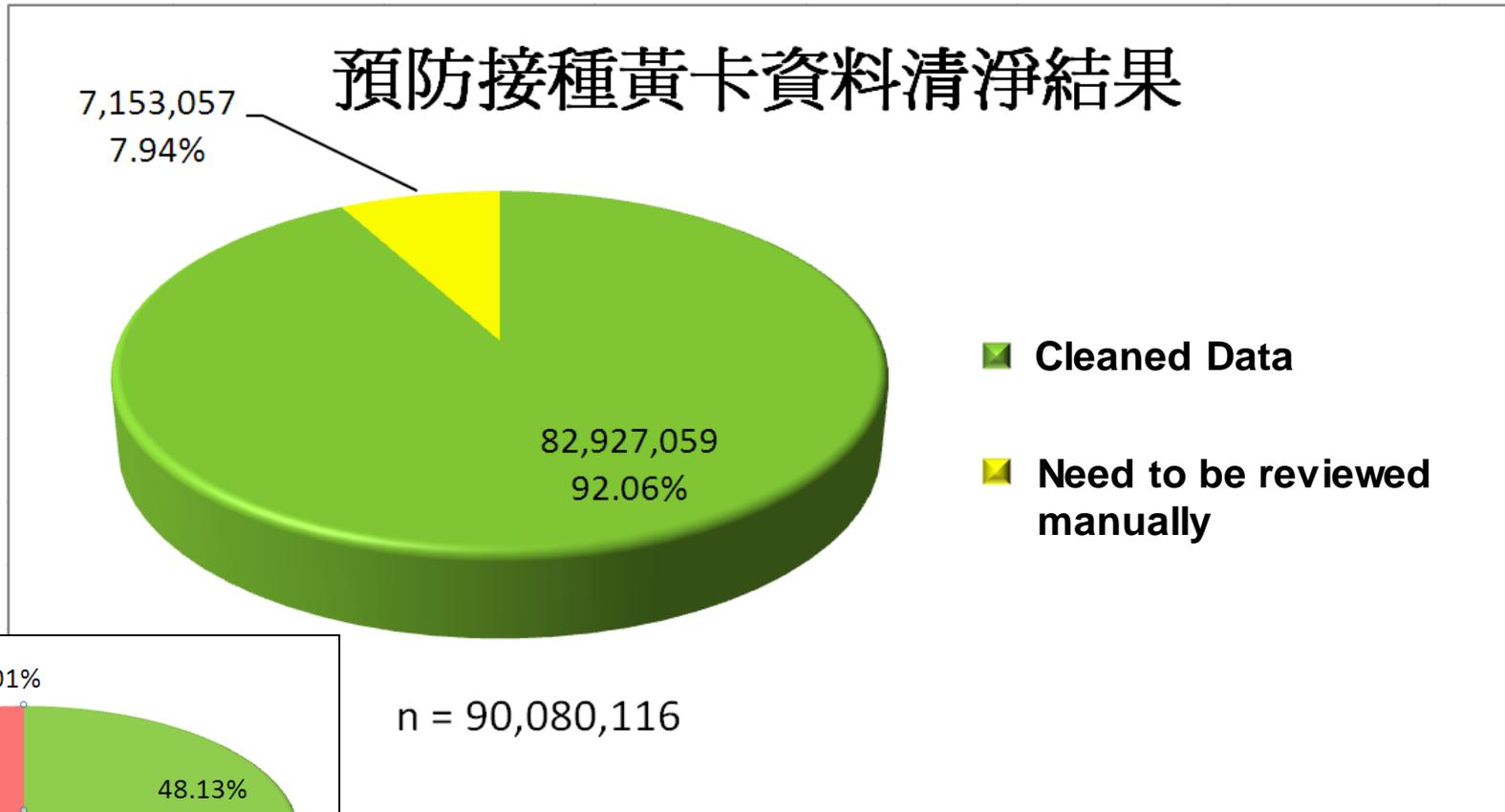
**vaccination rate**

**prenatal checkup rate**

**statistics of pregnant women**

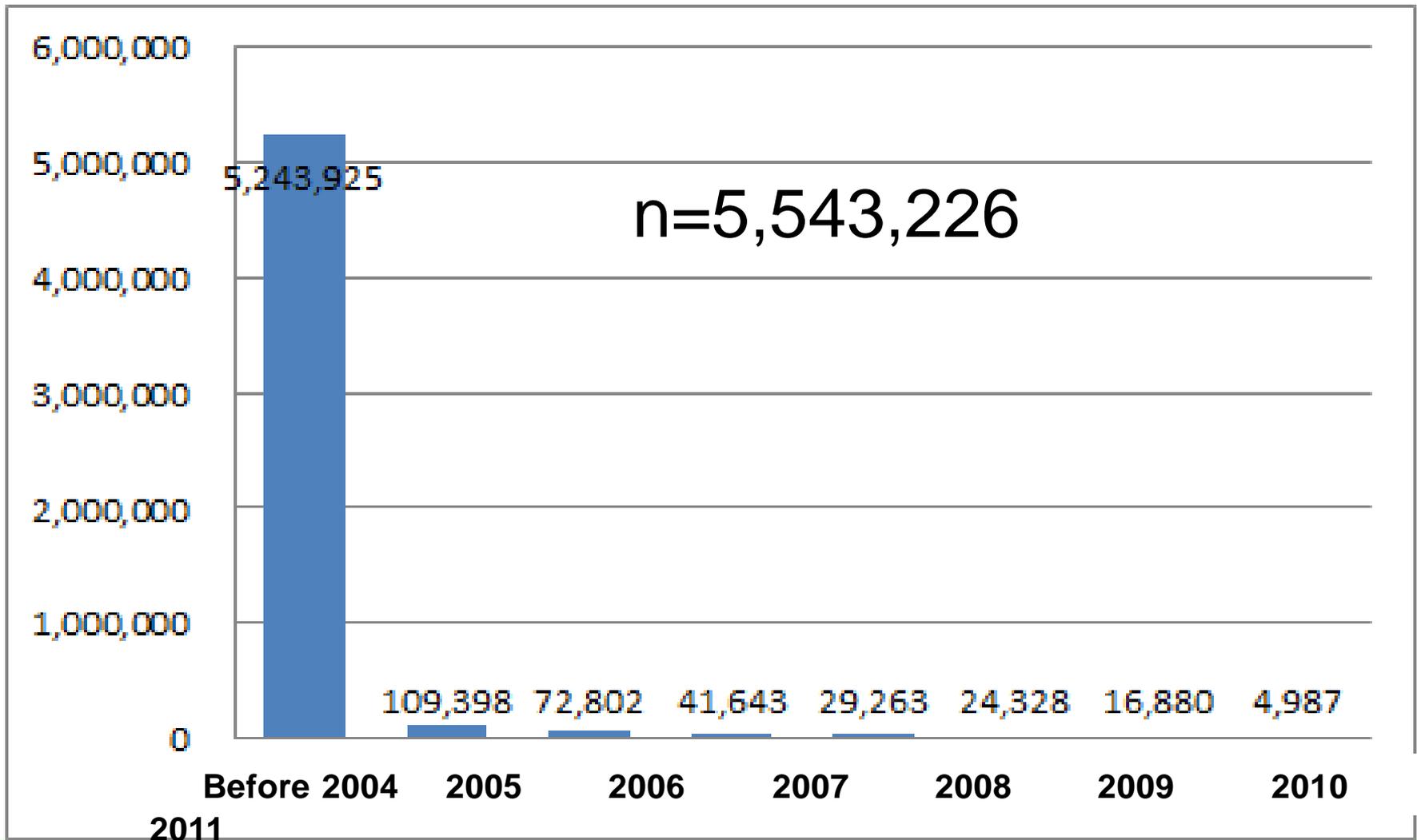
1.總人數(人)	「資料」經過與中央戶政資料前後總人數的一致性。
2.性別數(人)	資料校正，其指標可以驗證
3.人口數年齡組(人)	「資料清淨前後人數的一致性」。
4.總人數(人)	「出生日期資料，經過與中央戶政資料的校正，其指標可以
5.性別數(人)	資料的完整性」。
6.父親統號數(人)	校正，其指標可以驗證
7.母親統號數(人)	「性別資料」經過與中央戶政資料校正，其指標可以驗證
8.BCG預種人數(人)	「資料清淨前後人數的一致性」。
9.HBIG預種人數(人)	中央戶政資料的校正，其指
10.清淨前後的筆數	「提升資料的完整性」。
11.地=來源地比率	資料清淨後會捨棄「重複性、關連性檢查錯誤、組間比較重
12.轉介之率值	複性」之資料，其BCG與HBIG預種人數的指標，可以驗證經過
13.批號有值比率	資料清淨後「預種人數會趨向於合理化」。
14.接種護士有值比率	一化，其指標可以驗證
15.疫苗BCG接種率	「資料」。
16.疫苗HBIG接種率	資料清淨後會捨棄「重複性、關連性檢查錯誤、組間比較重
17.母親人數(人)、採檢人	複性」之資料，其BCG與HBIG接種率的指標，可以驗證經過
18.孕婦受檢率	資料清淨後「接種率會趨向於合理化」。
19.HBsAg(+)率	資料清淨後會排除重複性資料並唯一化，其指標可以驗證
20.HBeAg(+)率	「資料清淨前後的排除資料與唯一化資料」。
21.HBIG接種率	「關連性檢查錯誤」之資料，其
22.率/孕婦生產年齡	資料清淨後「孕婦B肝產檢資料會
23.HBeAg(+)率/孕婦生產年齡組(人)	

# The Data cleansing result





# Need to be reviewed manually (by generation)





# Conclusion

## ■ Through this project

- We knew the data defect pattern and how to prevent it in new system.
- We knew the data structure limitation and how to refine it.
- We knew the volume of data that need to be corrected manually.
- And we knew the potential of mind map as communication tool.



# Conclusion(cont.)

## ■ Benefits of using mind map

- It provides the project participants the whole picture of the project.
- Doing so we wouldn't lose our way in noncritical detail and can create consensus easily.
- It helps the participants to focus on specific issue and clarify the associations between different issues.

Thanks for your attention !!



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