出國報告（出國類別：開會）

赴越南進行健保暨醫療資訊交流

服務機關：衛生福利部中央健康保險署
姓名職稱：蔡淑鈴 副署長
張鈺旋 組長
吳淑慧 參議
陳孜瑜 副研究員
賴秋伶 視察
高以琳 助理研究員
派赴國家/地區：越南
出國期間：108 年 6 月 16 日至 19 日
報告日期：108 年 8 月 23 日

目次

一、目的

二、行程安排

三、臺灣全民健保工作坊 (Taiwan’s National Health Insurance Workshop)

四、機構參訪

五、心得與建議

六、附錄：簡報資料及活動照片

一、目的：

為配合政府新南向五大旗艦計畫，將藉由我國醫療衛生軟實力，推動與新南向國家之醫衛合作，而臺灣全民健康保險制度自 1995 年開辦至今，已邁入第 24 年，並以「普及、方便、經濟、滿意度高」的成就，在全球建立聲望，不僅獲得許多國際上之讚揚，也成為各國建立或改革健保制度的研究對象，每年吸引多國外賓慕名而訪。為能與更多新南向國家人員分享台灣全民健保制度之相關建置經驗，本署赴新南向國家辦理健保會議，近距離與新南向國家人員交流，拓展國際人脈，以期建立互助互惠合作契機。

考量越南各界參訪團曾對台灣全民健保制度及醫療資訊建置經驗表達濃厚興趣及熱忱，在我國駐越南代表處石瑞琦大使及越南駐臺北辦事處大力支持及協助下，本署人員於 108 年 6 月 16 日赴越南，並於 108 年 6 月 17 日假越南河內市舉辦「台灣全民健保暨醫療資訊交流工作坊」(Taiwan's National Health Insurance Workshop)，與越南各界分享台灣健保制度與健保醫療資訊雲端查詢系統之成功經驗。

另為加強與越方之瞭解及互動，本署也至衛生相關單位及醫院進行參訪及會談，以期促雙方間之交流與合作。

二、行程安排

日期	行程內容
6 月 16 日(星期日)	去程 臺北-河內 工作坊之準備，場佈確認、設備測試等事宜。
6 月 17 日(星期一)	上午 參訪越德醫院及白梅醫院 下午 辦理「台灣全民健保暨醫療資訊交流工作坊」
6 月 18 日(星期二)	上午 參訪越南社會安全局 中午 拜會駐越南臺北經濟文化辦事處 下午 參訪越南衛生部、越南勞動榮軍及社會部
6 月 19 日(星期三)	返台

三、臺灣全民健保暨醫療資訊交流工作坊(Taiwan's National Health Insurance Workshop)

(1) 本署於 108 年 6 月 17 日假越南河內泛太平洋酒店舉辦「臺灣全民健保暨醫療資訊交流工作坊」，參與者來自越南產官學界，從中央到地方，包括越南衛生部、越南社會保險局、越南勞動榮軍及社會部、廣寧省衛生廳、白梅醫院、越德醫院及河內公共衛生大學等多家醫院、大學及衛生相關單位，相當踴躍，顯示越方對於我國健保制度及醫療資訊之應用感到高度興趣。

(2) 工作坊由蔡淑鈴副署長及越南衛生部健康保險司副司長 Dr. Dang Hong Nam 開場，另邀請駐越南代表處石瑞琦大使致詞。工作坊內容主要由健保署人員介紹分享臺灣全民健康保險制度、健保資訊系統、健保醫療資訊雲端查詢系統之建置，以及衛生資訊科技於醫院之運用等四個主題，並邀請越南衛生部社會保險司分享越南衛生政策及健康保險現況(議程如后)，而為了讓與會者充分理解台灣健保醫療相關資訊，亦聘請中越傳譯擔任全場翻譯，使雙方交流討論更加順利。

(3) 工作坊綜合討論時段由蔡副署長及越南衛生部健康保險司司長 Dr. Le Van Kham 擔任主持人，與演講者共同回應現場與會者之提問(詳如附件四照片剪影)。現場與會者反應熱烈，提問重點如下：

- 臺灣的檢驗統計數據，包括 20 種通用的檢驗，可節省五萬四千美金，請問這是一年的統計數據或是某段時間?
- 越南的病人正在醫療診所住院治療，但他同時可以使用保險卡在別間診所就診跟治療，可是越南這裡沒辦法查出來，因為需等病人出院後，資料才會上傳系統，等到病人下次看診，才知道病人上一次就診資料，臺灣是否有這種情況? 是否有每天更新醫療機構的資料?
- 臺灣醫療院所沒有分層，如何分辨醫療機構的品質與方法?
- 傳統醫學單位，有關醫療服務的審核，臺灣是哪個單位負責? 審核與保險支付?
- 門診治療時，臨床及病情資料上傳雲端系統，資訊的保密如何處理?

- 中藥的品質、編碼、使用、規定，如何進行健保支付跟查詢?
- 關於傳統藥物，膠囊跟藥丸，越南有些中藥可列入健保，臺灣是否有招標? 招標基礎? 如何管理藥物品質?
- 有關傳統醫學跟藥品，價格的基礎，如何計算? 基於何種基礎來鑑定跟規定價格?

(4) 另外與會者也表示對於我國健保卡、資訊系統以及醫療資訊雲端查詢系統(MediCloud System)之應用管理等，印象深刻，認為非常值得學習，並希望未來能在資訊系統建置，電子化的醫療管理，電子醫療及費用審查等資訊管理部分等領域與本署進行交流，以期建置適合越南社會現況之資訊制度。

(5) **臺灣全民健保暨醫療資訊交流工作坊議程**

Taiwan's National Health Insurance Workshop	
Time	**Agenda**
14:00-14:30	Registration
14:30-14:40	Opening and Remarks
14:40-15:00	Taiwan’s NHI System and Perspectives
15:00-15:20	Overview of Health Insurance and Medical Services Reimbursement in Vietnam
15:20-15:40	NHI Medical Information & Data Warehouse System
15:40-15:55	Break
15:55–16:15	NHI MediCloud System
16:15-16:35	Health Information Technology applied in the Hospital
16:35-17:20	Overall Discussion (Q&A)
17:20-17:30	Closing

四、機構參訪

(一)參訪越德醫院 (Viet Duc Hospital)

會議摘要：

(1) 由國際事務處國際長 Dr. Nguyen Duc Chinh 全程接待。越德醫院為河內醫科大學之教學醫院，為 Special Hospital 等級，也是越南最著名的手術中心，設有 52 間開刀房，並與河內醫科大學合作，進行 9 項任務，分別為緊急情況和診所之病患服務、教育訓練、科學研究、保健活動和培訓的方向、中藥預防、國際合作、財經管理、醫院認證及醫院管理。越德醫院於 2019 年 5 月底剛與臺北榮總醫院簽署合作備忘錄。

(2) 越德醫院擁有 400 多名教授及醫生，近年來進行了約 60,000 例手術。於 2007 年完成第一例肝移植，現在更多達 61 例，肺移植在 2018 年有第一個成功案例，是與臺大醫院合作，而心臟移植完成 20 例，腎移植完成 700 例。移植手術只有部份有健保給付，目前肝移植無健保給付。

(3) 越德醫院在越南政府支持鼓勵下亦建設第二分院 Viet Duc II Surgical Hospital，越德醫院第二分院距離本院約 45 公里。主要負責門診病人，並新增幹細胞中心，之後會安排病人於第一院區開完刀後，待情況穩定轉至第二院區進行後續照護。第二分院除了門診服務外，將增加 1,000 張病床及至少 40 個手術室。

(4) 醫院的收入來源有 42%為健保給付、25%為病患自付、33%為依需要提供之服務。越南國民健康保險的醫療程序是根據醫院、衛生部健康保險司及政策而制定，而對於低收入民眾的醫療費用則向政府申請補助，來減輕貧窮民眾看病的醫療費負擔。

(二)參訪白梅醫院 (Bach Mai Hospital)

會議摘要：

(1) 由白梅醫院國際合作部主任 Do Van Thanh 全程接待，白梅醫院屬於 Special Hospital 等級，是越南醫療國家管理人員的最重要培訓中心

與負責指導下級單位之最高層級醫院，也是北越最大規模的醫院。

(2) 越南病患習慣集中當地大型醫院就醫，2015 年病床利用率高達 196.62%，直至今年，仍是平均二個病患使用一張病床，因此病床利用率是白梅醫院急需解決的問題。

(3) 白梅醫院亦在越南扮演領導地位，是全球各國爭相合作的最重要醫院之一，臺大醫院和成大醫院、台北醫學大學附設醫院、臺北榮總醫院等醫院也已和白梅醫院展開合作交流、進行人才管理代訓。

(4) 越南的醫療制度，是鼓勵病患先至診所看病，再由診所評估是否轉診，病患至診所就診之健保給付比例為 80%，但如果病患直接到醫院就診，則健保給付比例將減少為 40%，越南的轉診順序為診所、區域、省立至中央醫院,所有病患皆可接受相同的檢查與治療方式，唯高級檢查由病患自費支付，病患的檢查及治療報告可由電子系統上傳，但某些有問題的報告仍需以紙本繳交。而關於健保費之撥付方式，需等病患支付完醫療費，政府才會撥款給醫院。

(5) Do Van Thanh 主任期待未來能與台灣不論在健保制度、醫療資訊等能有更多層面之合作。

(三)參訪越南社會安全局 (Vietnam Social Security)

會議摘要：

(1) 由副總局長 Dao Viet Anh 代表接待。

(2) 1992 年 8 月 15 日越南政府第一次頒布相關法令規定健康保險相關之內容，2001 年越南健康保險體系併入越南社會保險系統，越南的健康保險法從 2007 年開始生效，之後選定每年 7 月 1 日是健康保險日，而副總局長也說明越南目前正準備慶祝健康保險法 10 周年。

(3) 健康保險的政策對於越南的改革開放很重要，雖然在 1992 年開始實施時困難重重，但在這將近 30 年的執行，逐步看到一些成果，也朝向全民納保的方向努力，目前越南健保覆蓋率也達到 89%，即越南總人口的 8 千 4 百多萬人有參加健保。

(4) 副總局長表示該局也到很多國家考察過，包括台灣、日本等，吸取很多國家經驗，目前也刻正規劃建立電子化健保制度及審核機制，希望對所有越南民眾的醫療資料數據做管理整合，也努力於今、明年制定發行 IC 健保卡。副總局長對台灣的科技發展印象深刻，也想學習整合治療管理費用的部份，特別是越南也面臨人口老化，因此對於老人健保、保險支付如何調整，也是越南社會安全局思考的重點，也希望未來能就健保政策、醫療保險的審核及藥物測試和管理等與本署持續交流。

(5) 蔡副署長回應說明臺灣健保成功的經驗在於我們健保開辦就進行電子化申報作業，而且臺灣健保資安工作也是台灣政府機關是做得最好的，這些是我們健保工作有效率的重要關鍵因素。

(6) 臺越雙方未來還有很多可以針對資訊科技交流深化的機會，歡迎再度來訪臺灣。

(四) 參訪越南衛生部

會議摘要：

(1) 由健康保險司司長 Dr. Le Van Kham 接見，司長提到 6/17 舉辦的台灣全民健保研討會，讓我們能對臺灣制度有更多的瞭解，因時間有限，未來若再有臺灣健保研討會議，希望能夠再參加，並且到台灣實地參訪。

(2) 司長表示在越南，健保是熱門的政策議題，面臨國民期待繳費少品質高的挑戰，我們希望透過資訊系統來改善，但目前因為資訊系統缺乏配套，完整性不足，軟體程式不易使用，導致目前醫院採用電子申報仍有許多困難。而越南衛生部目標在 2025 年建立個人電子健康記錄，希望能學習臺灣經驗，與臺灣健保署就資訊系統建置，電子化的醫療管理，電子醫療及費用審查等資訊管理部分合作，發展適合越南經濟現況的制度。

(3) 蔡副署長則回應說明臺灣醫療資訊系統建置，其成功要素在於公私協力的成果，包括人才、硬體、頻寬等配套，並當面邀請司長

來台參加本署於 108 年 8 月 8 日及 9 日辦理的「APEC 醫療資訊分享國際研討會」，也非常歡迎司長及其同仁來臺參訪，本署可協助安排參訪醫院及臺灣民間產業，讓他們能分享與健保合作執行之經驗，提供越方參考。

（五）參訪越南勞動榮軍及社會部

會議摘要：

(1) 由社會保險司副司長陳海南(Tran Hai Nam)全程接待。

(2) 陳副司長首先說明目前越南社會保險與面臨之挑戰：越南社會保險經過 1995 年、2003 年、2008 年、2014 年及 2018 年的正式條例、修改與納保政策、範圍等之調整，已逐步完整，而在執行過程中，也遇到許多問題，包括雇主問題、相關人員法律的規定遵守問題等，大部分的越南勞工希望一次性的領取補貼金額，因此越南勞動榮軍及社會部會需要慢慢去勸說與調整，如何讓勞工可以執行及享受退休金的補助。

(3) 2018 年，越南已經擬定一個有關社會保險政策整體評估的報告，重要的單位已經頒布相關議定書，說明將對越南社會保險制度進行適當改革，希望再修改及調整相關制度，讓越南的保險制度更加完善、健全與滿足社會的需求。

(4) 越南目前也面臨人口老化的問題，這樣的情況對社會福利政策也造成一定程度壓力，目前政府也在尋找適當的方式來做改變及調整，期望借助資訊通訊技術，來簡化行政的手續，妥當的去解決及處理一些制度性的需求。

(5) 陳副司長提到希望臺越雙方關係能更加密切，在社會保險與醫療保險也有合作的空間，同時也提到，對於在台灣健康保險工作坊介紹的醫療雲端技術印象深刻，也非常有興趣，但也表示越方目前環境還可能需要很大的努力才有可能建立類似的系統。

(6) 蔡副署長回應說明健保開辦時的背景，於 1995 年將各保險之健康保險集中，並納入那些沒有工作的人，而外籍勞工亦納保，與

國人權益相同，並分享臺灣沒有固定雇主的農漁民及勞工，透過工會(農會)參加健保及勞保的制度；而臺灣健保之資訊系統扮演重要的角色，可以進行有效率的管理。醫療保障和社會保障，是國家進步的指標，雙方可以互相學習。

五、心得與建議

(1) 本次為本署首次在國外辦理全民健保工作坊，在國外辦理工作坊面臨非常多的不確定性，從與會者的邀請、聯繫、會議的安排及不同的國情文化，較難全權掌握。本次在越南的工作坊能順利及成功的辦理，真的非常感謝我國駐越南代表處及越南駐臺北辦事處的大力協助。

(2) 透過本次工作坊有效促進臺越雙方政府單位、專家學者，以及醫療衛生領域人員對彼此健保制度和醫療資訊系統之瞭解，而本署同仁也能赴越南衛生相關單位實地參訪，瞭解醫院、健康及保險單位之運作，強化雙方醫療衛生領域之交流與互動。

(3) 全民健保為單一保險人制度，民眾就醫資料所累積之巨量資料庫，成為台灣發展智慧醫療之最大優勢，國際上許多國家對於臺灣在智慧醫療領域的發展均相當有興趣，希望能與本署交流相關經驗，建議未來本署可持續規劃赴新南向國家辦理健保工作坊，展現我國醫療衛生軟實力，促進醫療衛生領域之實質交流。

(4) 越南健康保險覆蓋率雖已達 89%，但是在醫療資訊、數據方面朝電子化邁進的過程中，仍然面臨很多挑戰及限制，包括法律的制定、政策的調整及人民的接受度等，同時在軟體及硬體技術方面，也急需提升，而因個人健康資料電子化及一致化是越南政府刻正規劃的方向及努力的目標，建議未來可從此議題研擬相關交流及合作。

六、附錄：活動照片及簡報資料

【台灣健康保險工作坊全體人員合影】

【台灣健康保險工作坊綜合討論】

【與石大使於工作坊開始前合影】

【與越德醫院國際事務處國際長 Nguyen Duc Chinh(右八)合照】

【與白梅醫院國際合作部主任 Do Van Thanh 及醫院同仁合照】

【與越南衛生部健康保險司司長 Le Van Kham 會談】

【與陳錦玲公使(左五)於越南衛生部門口合影】

【越南社會安全局副總局長 Dao Viet Anh 及越南社會安全局同仁合影】

【與越南勞動榮軍副司長及同仁合照】

Taiwan's NHI System & Perspectives

CHANG, YU-HSUAN, Ph.D.

National Health Insurance Administration,
Ministry of Health and Welfare
TAIWAN

2019.06.17

CHANG, YU-HSUAN

Current Affiliation

- Director ,Planning Division , National Health Insurance Administration, Ministry of Health and Welfare

Professional Experience

- Director, NHIA
- Deputy Director, NHIA
- Senior Executive Officer, NHIA
- Deputy Manager, BNHI
- Senior Executive Officer, BNHI
- Senior Specialist, BNHI
- Section Chief ,BNHI
- Senior Secretary, BNHI

Education Background

- Ph.D. in Political Science, National Taiwan Normal University
- EMHA in National Taiwan University
- MA in Political Science, National Taiwan University,
- BA in Law, National Taiwan University

2

Outline

- A Snapshot of Taiwan's Health Insurance System
- Core Value & Achievements
- Challenges
- Reform & Innovations
- Looking into the Future

3

Taiwan

Population (2017)	23.57 million
Land area	36,197km^2
Ageing (over 65)	13.86%
GDP per capita (2017)	US$ 24,331 (nominal) US$ 49,800 (PPP by CIA)
Crude birth rate (2017) Crude death rate (2017)	8.23 ‰ 7.27‰
Infant mortality (2016) Maternal mortality (2016)	3.9 ‰ 11.6 0/0000
CHE to GDP (2017)	6.1%
Life expectancy(2016)	83.4 (F) / 76.8(M)

4

3H= Help + Health + Happy

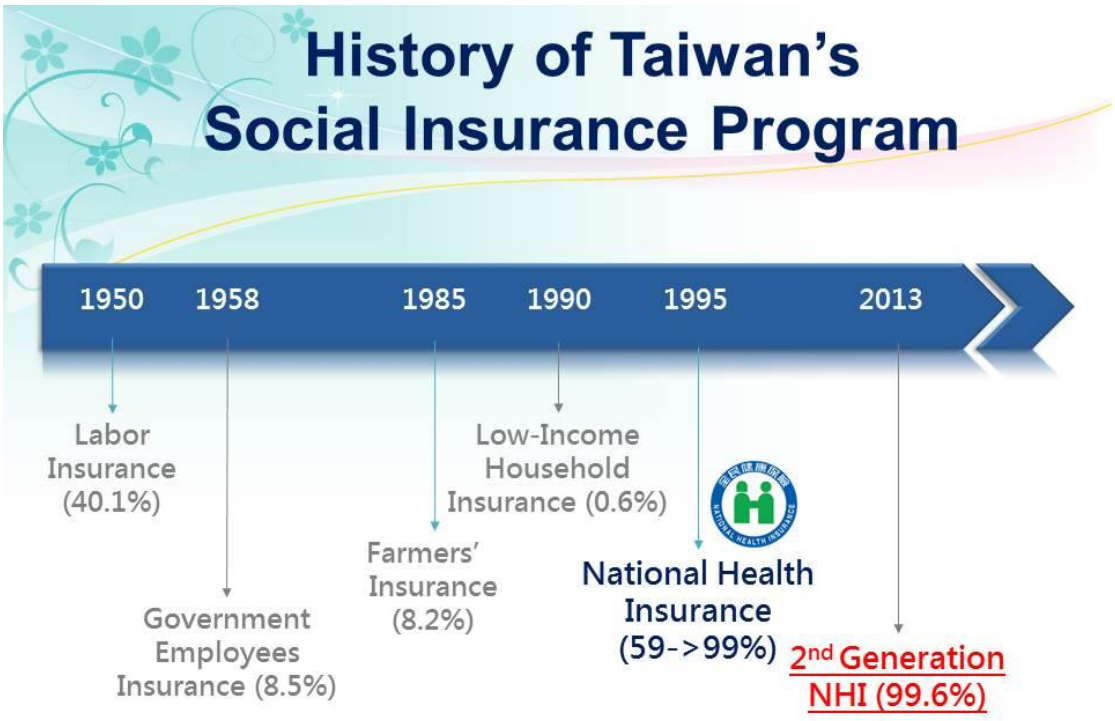
5

NHIA Organization

6

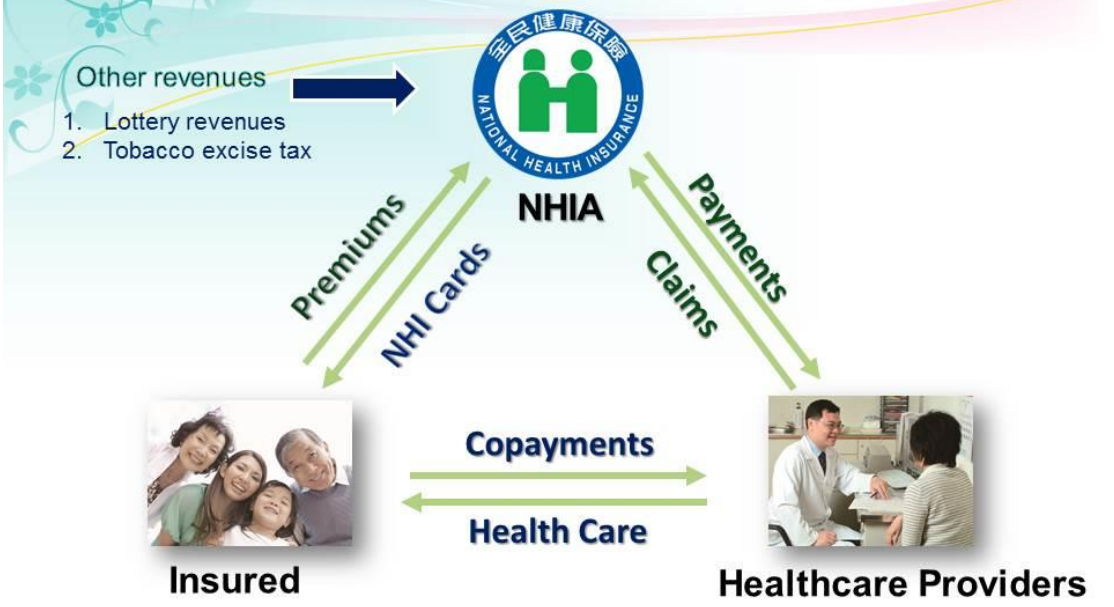
A Snapshot of Taiwan's
Health Insurance System

7


History of Taiwan's
Social Insurance Program
1950
1958
1985
1990
1995
2013
Labor Insurance (40.1%)
Government Employees Insurance (8.5%)
Farmers' Insurance (8.2%)
Low-Income Household Insurance (0.6%)
National Health Insurance (59->99%)
2nd Generation NHI (99.6%)

8

NHI Framework

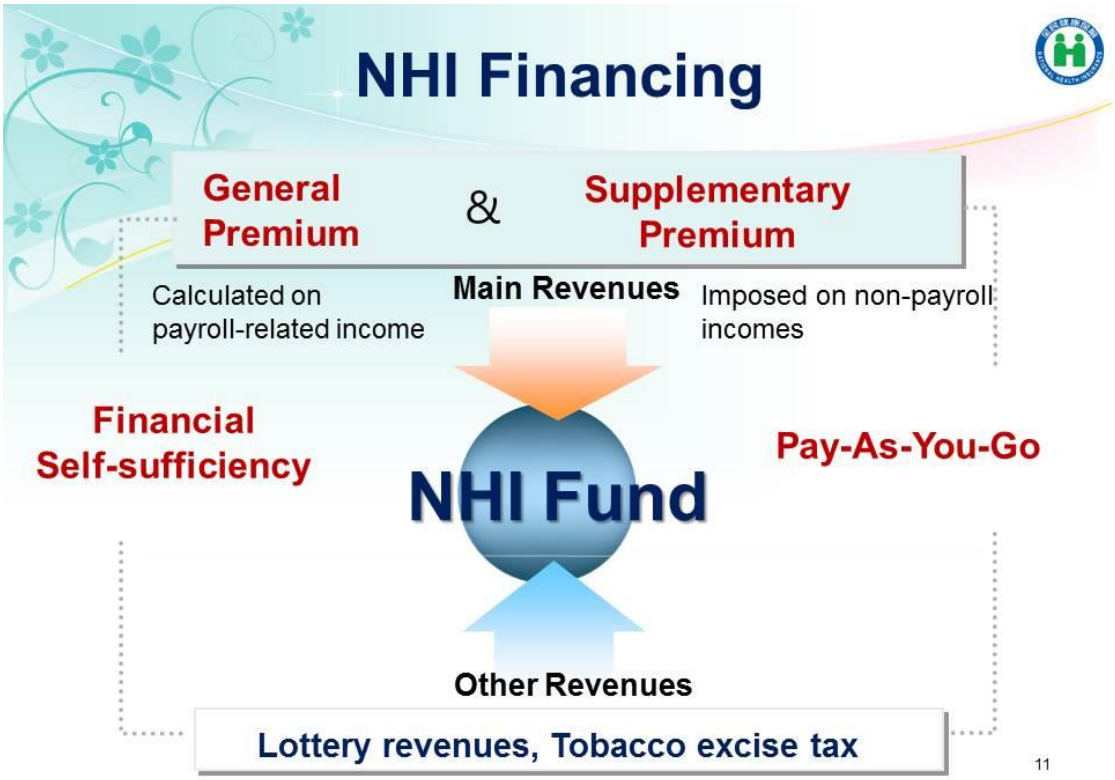


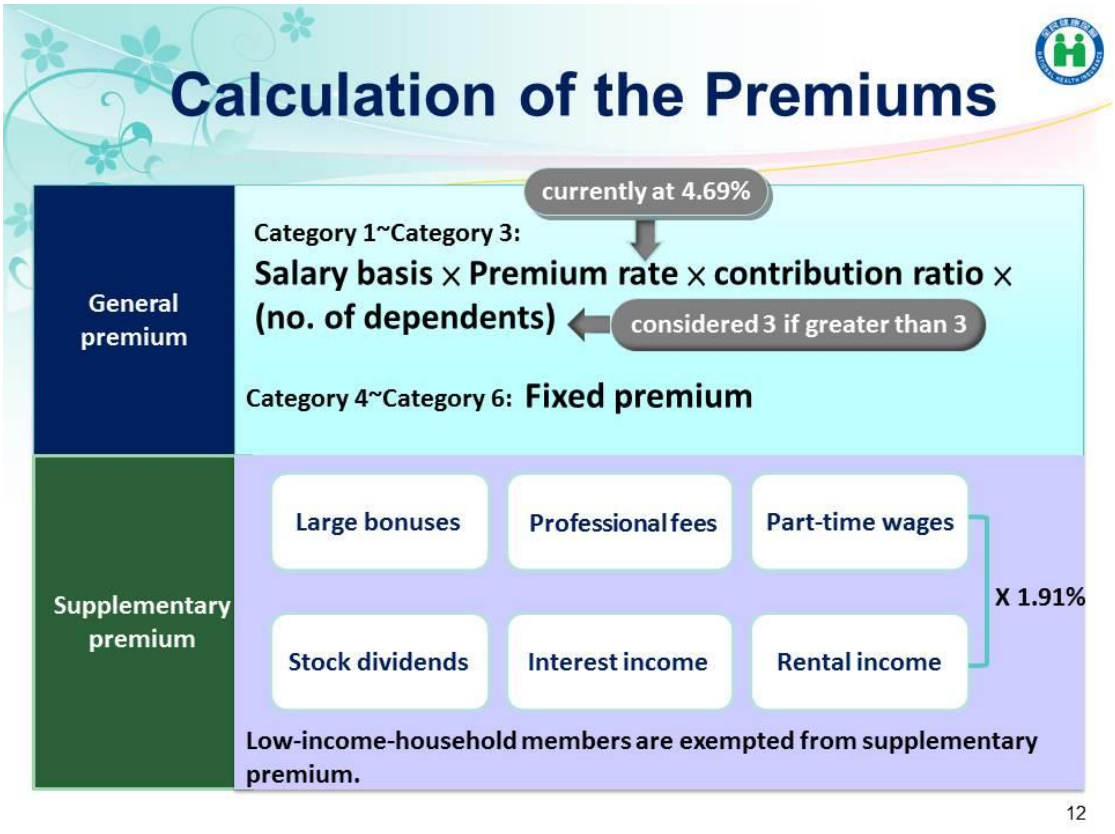
9

NHI Key Features

Coverage	Compulsory enrollment for all citizens and legal residents (99.9% of the population is covered by the NHI)
Administration	Single-payer system run by the government
Financing	Premiums
Benefits	Uniform package, copayment required
Providers	Contract-based 93.03% of healthcare providers contracted with NHI
Payment	Plural payment programs under the global budget payment systems
Privileges	Premium subsidies and copayment waivers for the disadvantaged

10


NHI Financing
General Premium
&
Supplementary Premium
Calculated on payroll-related income
Main Revenues
Imposed on non-payroll incomes
Financial Self-sufficiency
NHI Fund
Pay-As-You-Go
Other Revenues
Lottery revenues, Tobacco excise tax
11


Calculation of the Premiums
General premium
currently at 4.69%
Category 1~Category 3:
Salary basis × Premium rate × contribution ratio × (no. of dependents)
considered 3 if greater than 3
Category 4~Category 6: Fixed premium
Supplementary premium
Large bonuses
Professional fees
Part-time wages
Stock dividends
Interest income
Rental income
X 1.91%
Low-income-household members are exempted from supplementary premium.
12

Foreigners' Enrollment Regulation

- **In consideration of human rights and fairness, foreign workers, new immigrant residents, foreign students are also covered under NHI.**

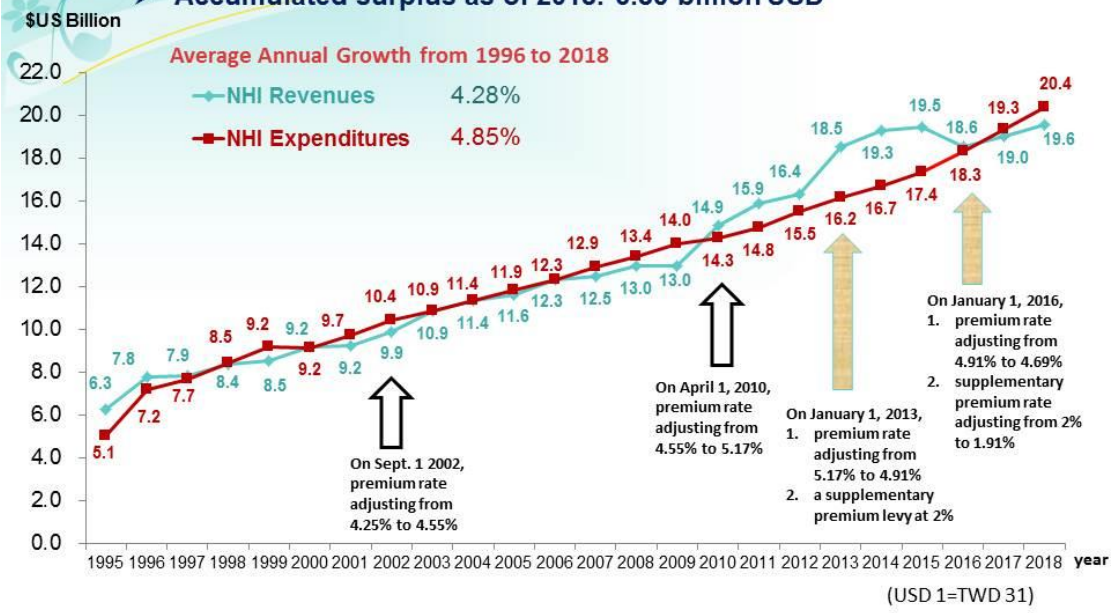
For foreigners with the alien resident certificate (ARC):
They have to reside in Taiwan for over 6 months to be qualified as the insured.

- For infants born in Taiwan and the employed with work permit:
  They shall enroll in the NHI from the date of birth and the date of employed.

13

Trend of NHI Financial Status

- **Global budget expenditures in 2019 : 23 billion USD**
- **Accumulated surplus as of 2018: 6.85 billion USD**



(USD 1=TWD 31)

Taiwan's Healthcare Delivery System

- Dominated by the private sector
- A closed-staff medical structure for hospitals
- No gate-keeper system
- High volume of hospital OPD services
- No waiting list as defined in western countries

Data:2017 NHIA Statistics, Taiwan

15

Benefits

Disease | **Injury** | **Maternity care**

- Inpatient care
- Outpatient care
- Prescription drugs
- Dental services
- Traditional Chinese medicine
- Day care for the mentally ill
- Home health care

16

NHI Copayment

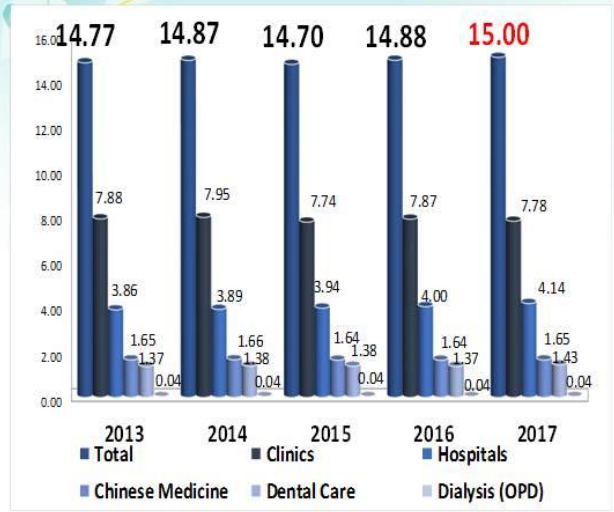
Unit: USD *(1 USD = 30 NTD)*

	With Referral	Direct Visit	Exemptions/Ceiling
Outpatient Care	1.7 ~ 5.7	2.7 ~ 14	• Catastrophic diseases and child delivery. • Medical services offered in mountain areas or on offshore islands. • Low-income households, veterans, and children under the age of 3. • Insured in areas with inadequate medical resources.
Inpatient Care	Within 30 days: 10% 31 ~ 60 days: 20% Above 61 days: 30%		• 1,300 per stay for the same disease. • A total of 2,167 accumulated in the entire calendar year. (2019)
Emergency Care	5 ~ 18.3		
Dental Care/ Chinese Medicine	1.7		
Pharmaceuticals	0 ~ 6.7		

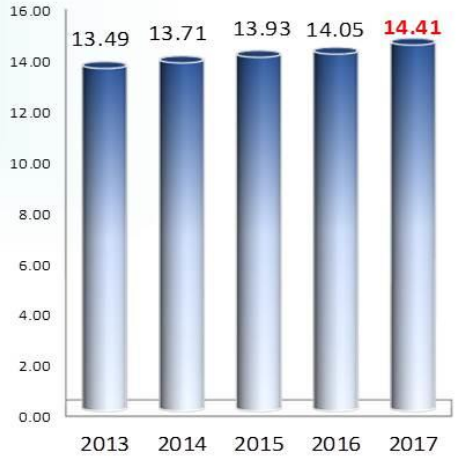
17

NHI Medical Utilization

Outpatient visits per person from 2013 to 2017



No. of hospital admissions per 100 persons



18

NHI Payment Reform

1995	1998~2002	2001	2010	2011
FFS + Case Payment	Global Budget	P4P	Tw-DRGs	Capitation Pilot Programs

- Dental care (1998)
- Chinese Medicine (1999)
- Clinics (2001)
- Hospitals (2002)
- OPD Dialysis (2003)

- Diabetes, Asthma, Breast cancer(2001)
- Hypertension (2006)
- Schizophrenia, Hepatitis B carriers and Hepatitis C infectious (2010)
- Chronic Kidney Diseases (2011)
- Pilot Project of Post Acute Care(2014)
- Integrated Services for House Calls(2016)

→ RBRVS(2004)

19

NHI Cards

- Daily update of medical visit data
- Heavy-user detection & management
- Infectious disease tracing & monitoring
- Simplification of management process

1. Last Six Medical Visits
2. Drug Prescriptions, Drug Allergies
3. Catastrophic Diseases
4. Organ Donation Consent
5. Palliative Care

20

21

Assistance for the Disadvantaged

2016 Full unlocking of NHI card Policy

Statutory premium subsidies

- Low-income households
- Disabled persons
- The elderly
- The temporarily unemployed

Financial assistance for the near poor

- Interest-free Loans
- Payment by installments
- Referrals to charity organizations

Medical assistance for the disadvantaged

- Guaranteed emergency services
- Copayment subsidies and exemptions

22

Alleviating Financial Burdens

Patients with catastrophic diseases represent 3.99% of population, who used 27.33% of NHI health expenditures.

Type of User	Medical Expenses (2017)	Equivalency
Per capita	US$941	1 .0
Per catastrophic disease	US$6,352	6.7
Per cancer patient	US$5,183	5.5
Per rare diseases patient	US$21,196	22.5
Per dialysis patient	US$18,979	20.2
Per patient on respirator	US$23,041	24.5
Per hemophilia patient	US$94,164	100.1

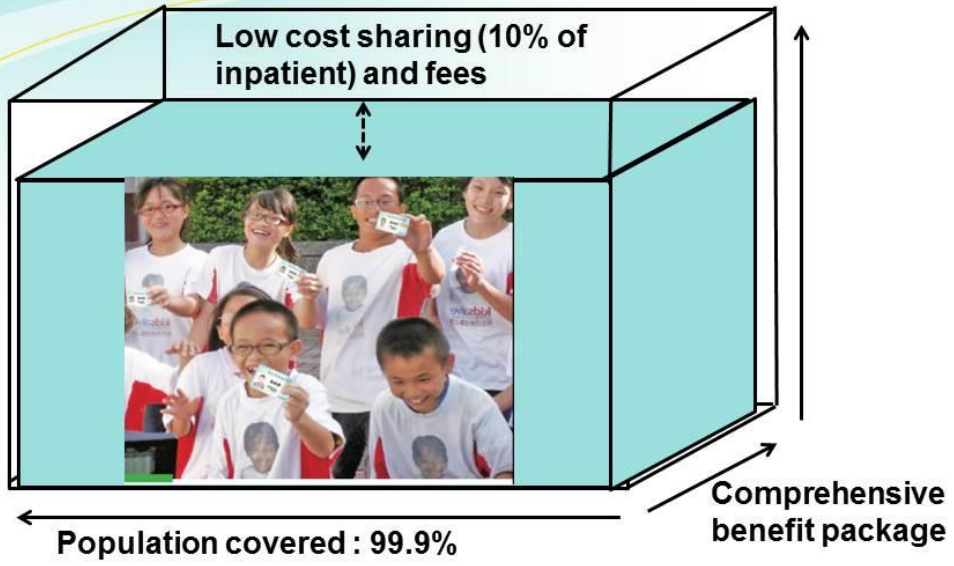
23

NHI Established a Secured Health Care Network

- **Ensure heath care reaches out to every corner**
- **50 IDS plans to improve services in remote mountainous areas and offshore islands**
- **Telemedicine & helicopter service in virtually every islet**

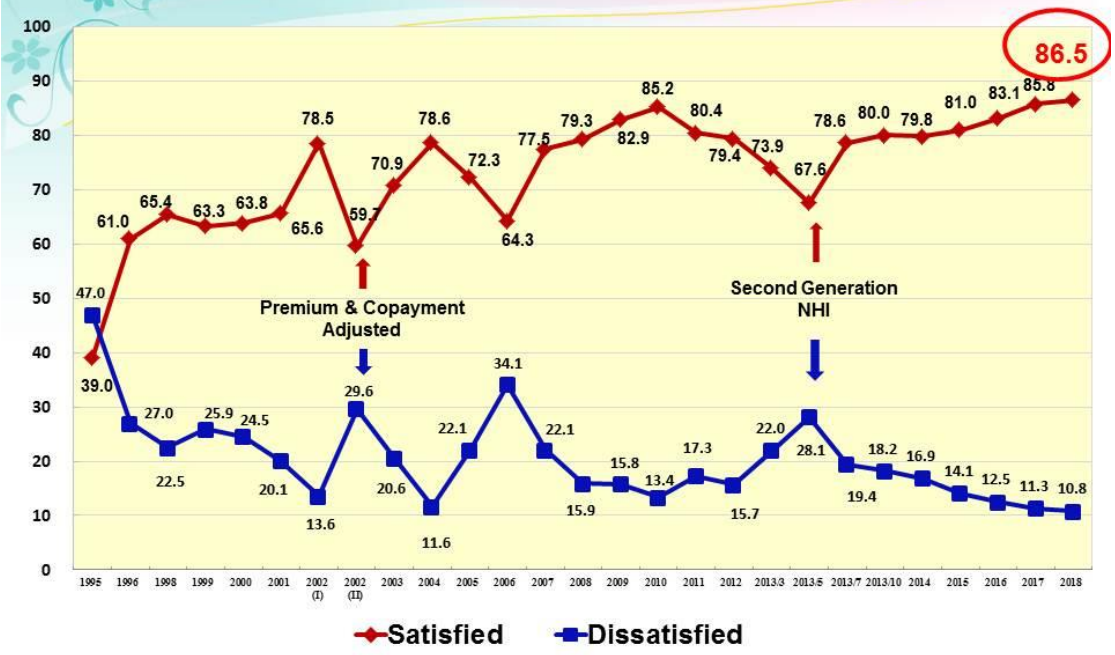
24

3 Dimensions to Consider When Moving Towards UHC – Taiwan's Status Quo



25

High Public Satisfaction

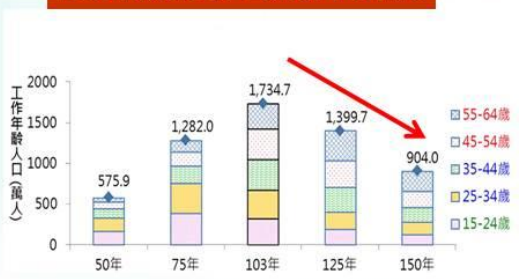


27

Social Environmental Change and Prediction

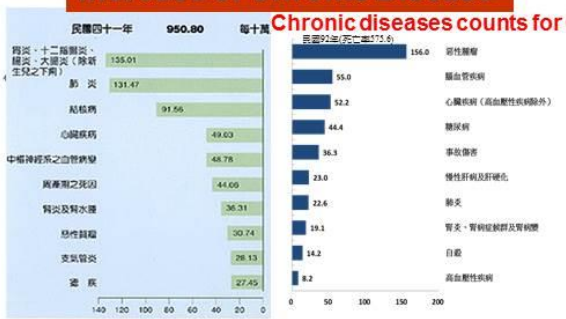
Low Birth Rate

Decrease of Labor Force



Increase of Chronic Disease

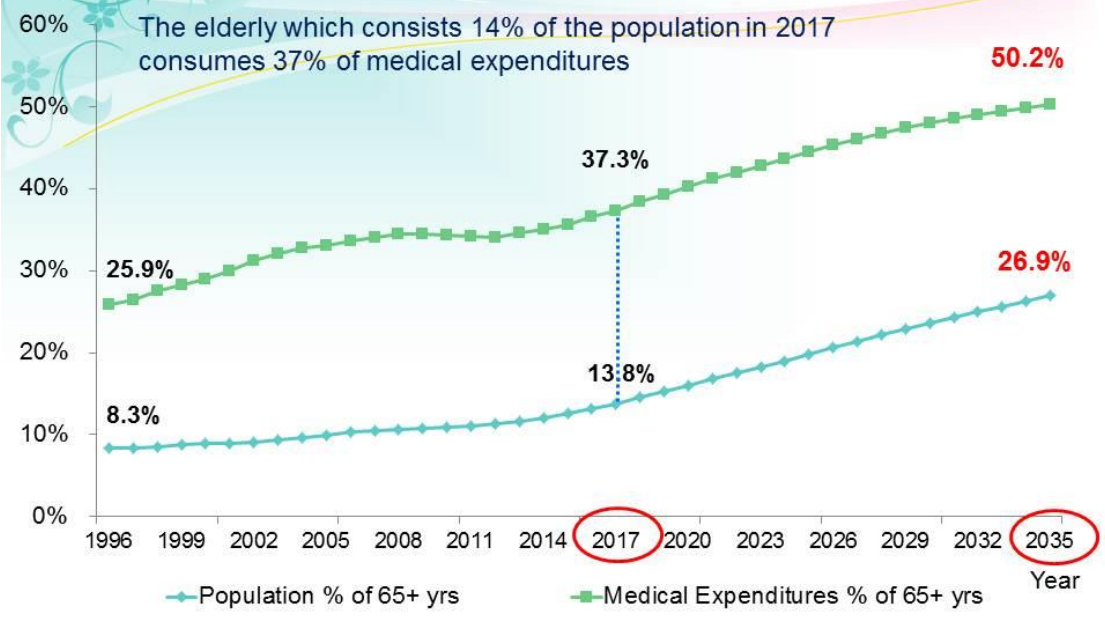
Chronic diseases counts for 64%



Aging Society

28

Impact of Aging on Medical Expenditure



29

Inclusion of New Technology and New Drugs

Sovaldi

30

31

Reform & Innovation Strategies

CHALLENGES

1. Aging population with multiple chronic diseases
2. new medical technology and drugs
3. limited health budget and resources
4. Lack of personal health awareness and responsibility
5. Fragmented health care system

Setback to NHI system

1. Abuse medical resources
2. Soaring medical expenditure

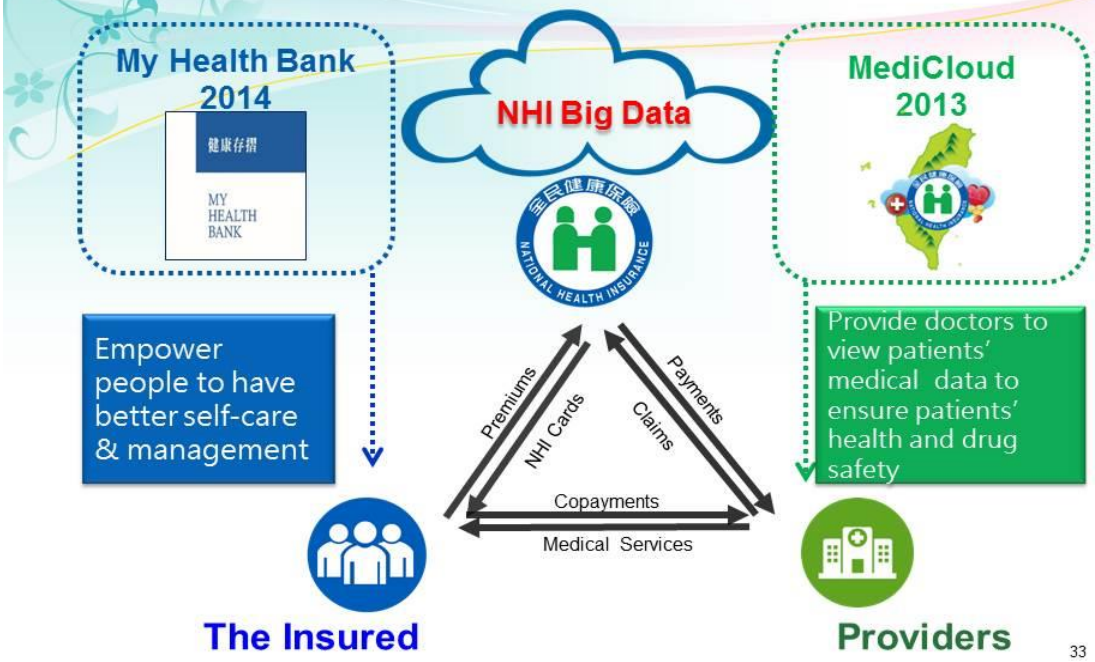
PATIENT-CENTERED

1. My Health Bank
2. Medi-Cloud system
3. Other health care system reform

ICT+AI

32

Applications of NHI Big Data



33

My Health Bank

My Data, My Decision

健康存摺
MY HEALTH BANK

Established in 2014 and added new functions in 2016

- Better self-care and healthier lifestyle
- 3 Years of medical data (healthcare providers' names, dates of visits, diagnoses, medical orders etc.)
- Health information is displayed in the form of diagrams to enhance readability
- Provide educational guidelines
- Simpler access
- Certain disease prognosis and evaluation

34

Contents of My Health Bank

Individual's medical records of 3-year

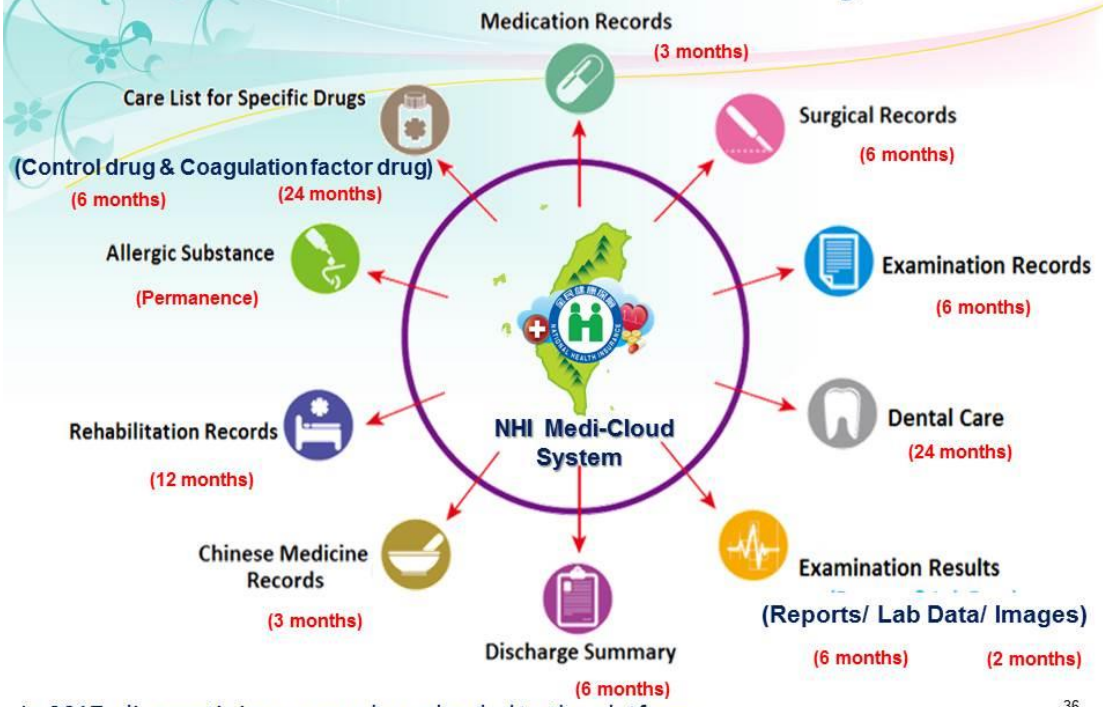
CKD evaluation with examination results

Dental services with visualized illustration

Hyperlinks of health education sites

35

Contents of NHI Medi-Cloud System



In 2017, diagnostic images can be uploaded to the platform

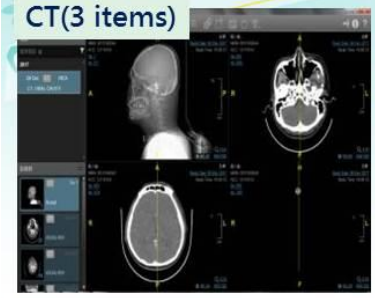
36

Enhancing Medical Information Sharing

36 Medical Images for Access in 2018

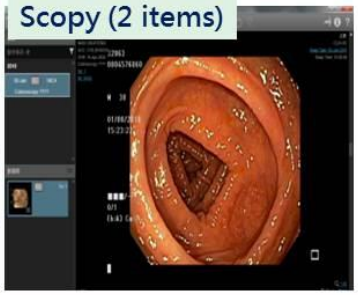
In 2018, the Medi-Cloud system allowed healthcare providers to upload medical images

CT(3 items)



MRI(2 items)

Scopy (2 items)



X-Ray (3 items)

Ultrasound(25 items)

X-Ray for Dentist (1 item)

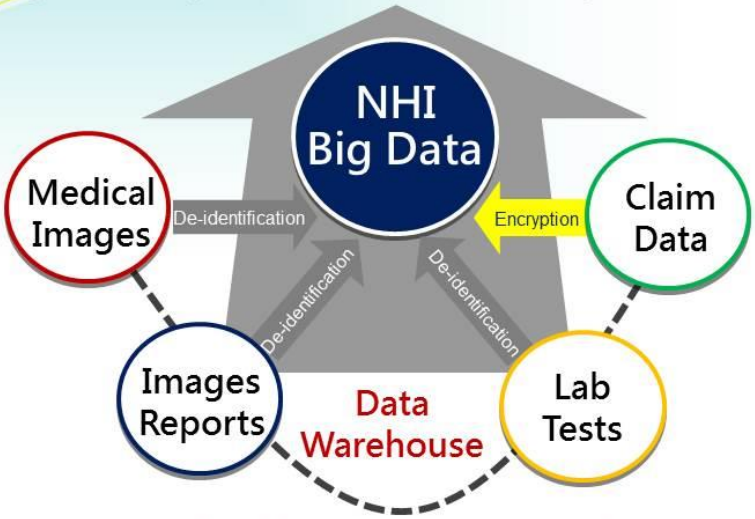
37

38

NHI * AI

Apply AI to NHI big data

Development of precision medicine and precise claim review



All the data was de-identified to protect personal privacy for application

39

NHI * AI (2018)

3 Important Things

Cultivating AI skilled manpower

Cultivating AI application skilled manpower in health field.

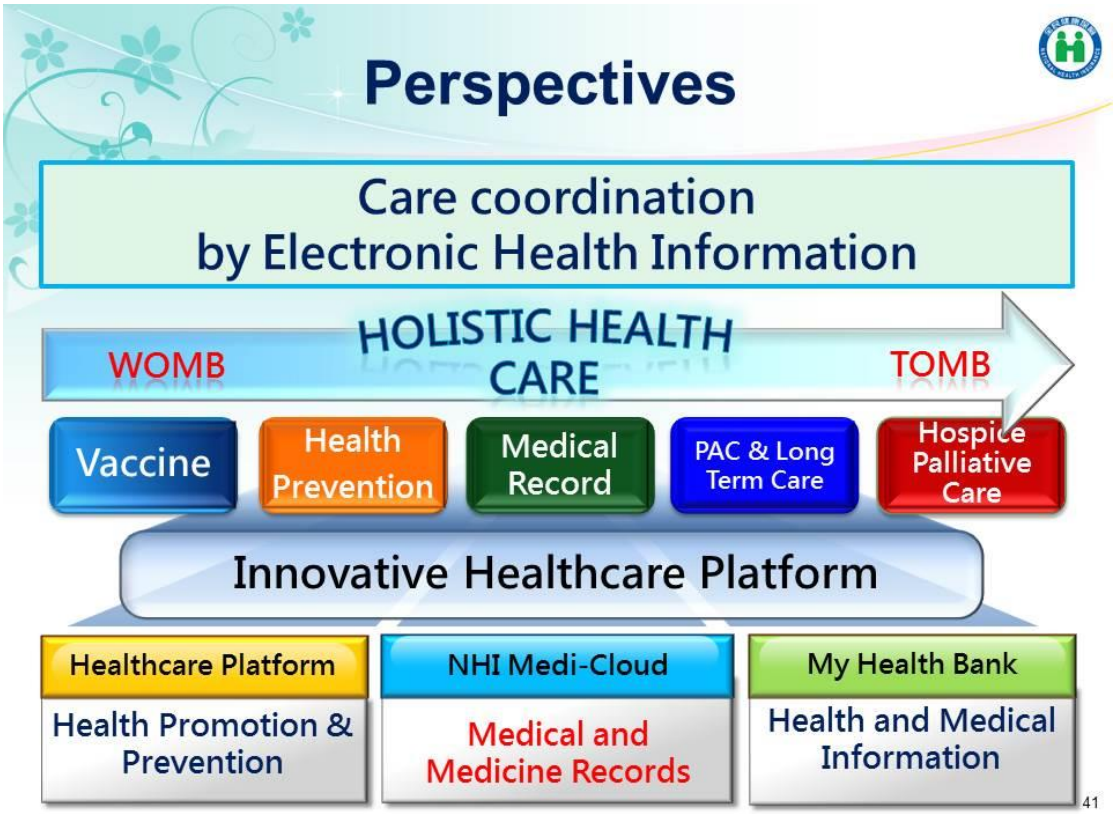
Initiating AI projects

1. To establish **Taiwan's clinical practice knowledge warehouse.**
2. To establish a de-identified **medical imaging data warehouse** for AI application.

EU GDPR

NHI regulations would be modified in the near future to cope with the EU GDPR.

40


Perspectives
Care coordination
by Electronic Health Information
WOMB
HOLISTIC HEALTH CARE
TOMB
Vaccine
Health Prevention
Medical Record
PAC & Long Term Care
Hospice Palliative Care
Innovative Healthcare Platform
Healthcare Platform
Health Promotion & Prevention
NHI Medi-Cloud
Medical and Medicine Records
My Health Bank
Health and Medical Information
41

Conclusion
Continuous reform is the key of NHI's success.
In my presentation, two key innovative strategies are proposed to reform Taiwan's NHI.
NHIA hopes to provide all the people a smart healthy life.
42

Thank you
for your kind attention!

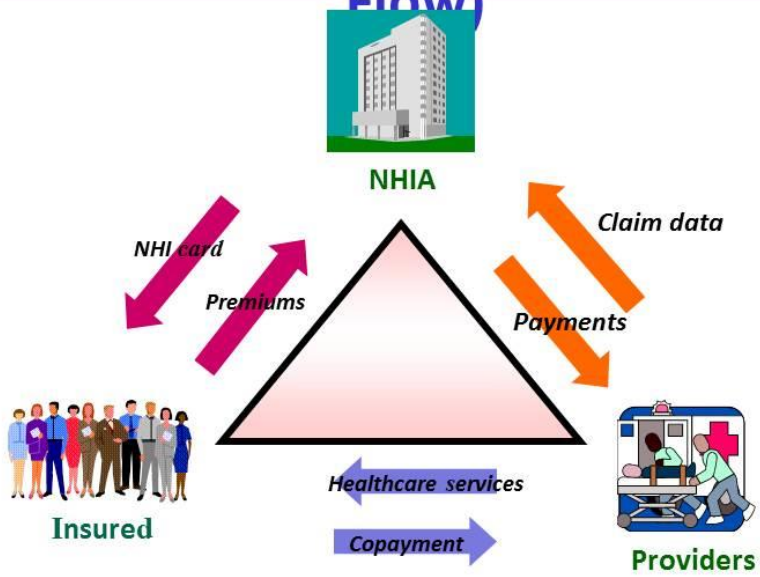
National Health Insurance Medical Information & Data Warehouse System

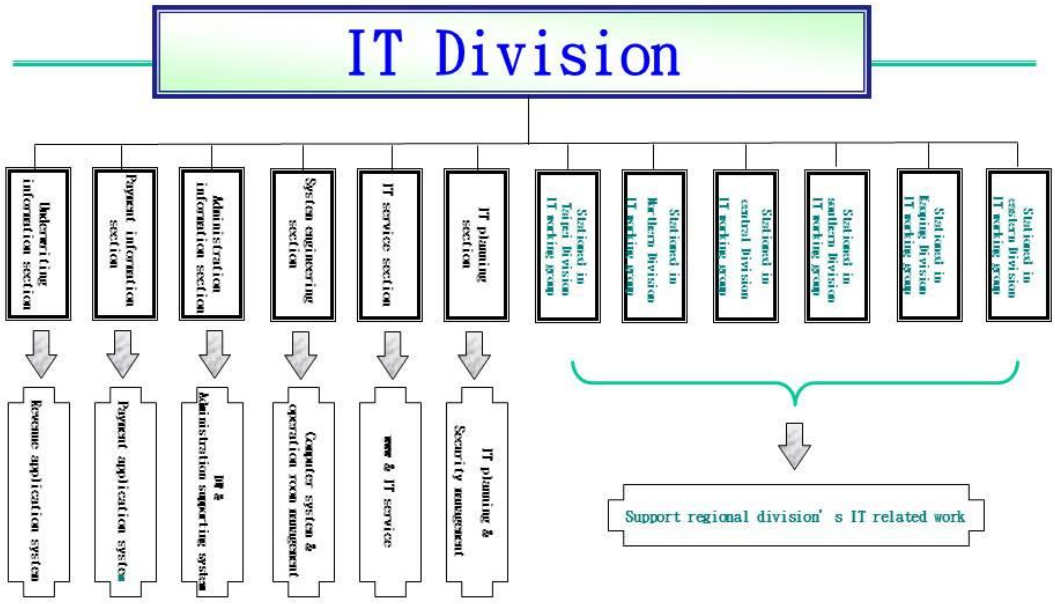
Shwu-Huey Wu

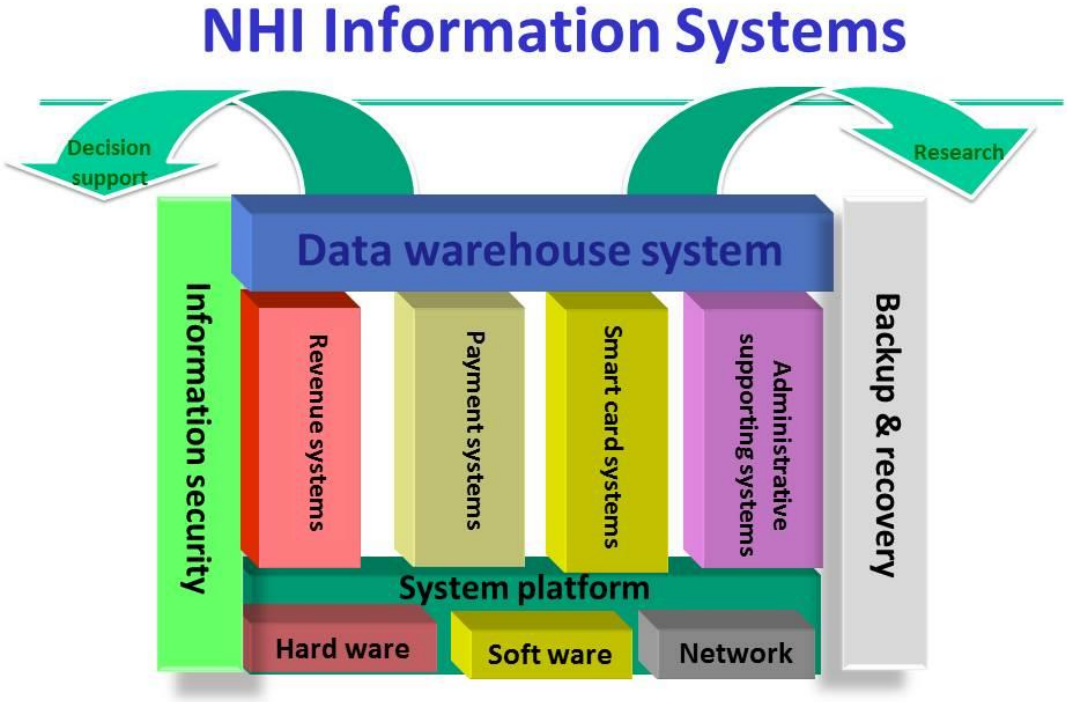
Senior Executive Officer

National Health Insurance Administration, MOHW, Taiwan

NHI System Framework (Data Flow)



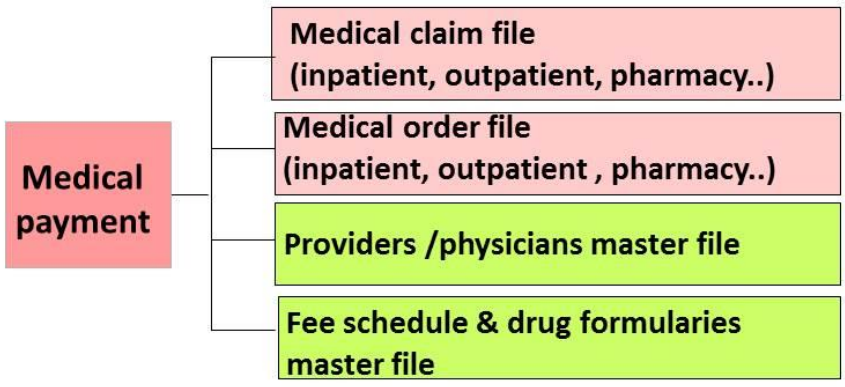

IT Division
Underwriting information section
Payment information section
Administration information section
System engineering section
IT service section
IT planning section
Stationed in Taipei Division IT working group
Stationed in Northern Division IT working group
Stationed in central Division IT working group
Stationed in southern Division IT working group
Stationed in Kaoping Division IT working group
Stationed in eastern Division IT working group
Revenue application system
Payment application system
Administration supporting system
Computer system & operation room management
www & IT service
IT planning & Security management
Support regional division's IT related work


NHI Information Systems
Decision support
Research
Data warehouse system
Information security
Revenue systems
Payment systems
Smart card systems
Administrative supporting systems
Backup & recovery
System platform
Hard ware
Soft ware
Network

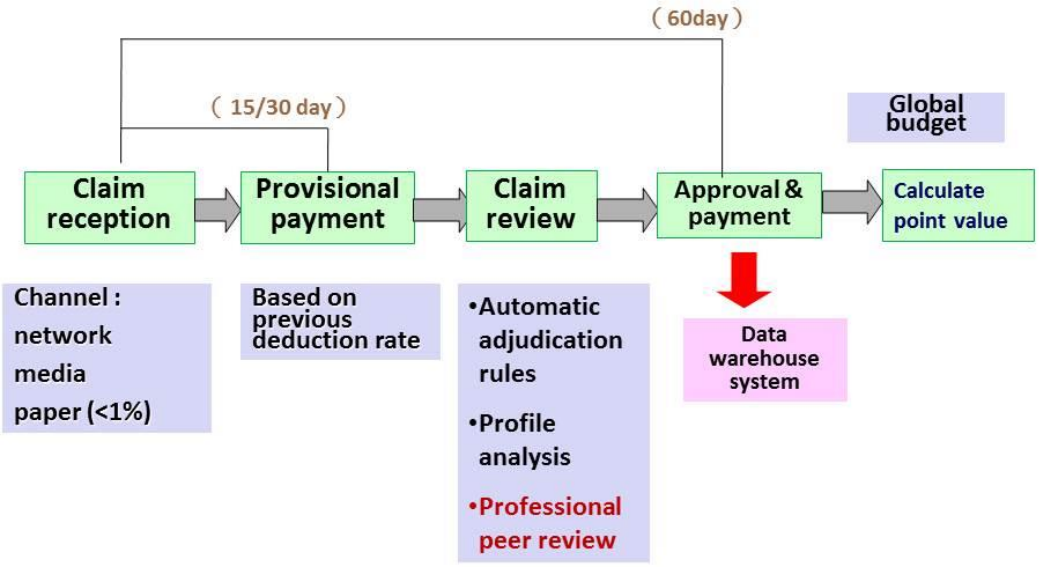
Data Profile

- THE NUMBER OF GROUP INSURANCE APPLICANTS：800,000
- THE NUMBER OF BENEFICIARIES：23 million
  the rate of enrollment switching per month：8%-10%
- THE NUMBER OF HEALTHCARE PROVIDERS：28,000
- THE NUMBER OF CLAIMS FOR OUTPATIENT VISITS PER MONTH：32 million
  - ✓ the number of medical orders per month ： 119 million
- THE NUMBER OF CLAIMS FOR INPATIENT CARE PER MONTH：320,000
  - ✓ the number of medical orders per month ： 22 million
- THE NUMBER OF MEDICAL IMAGE FILES PER MONTH：2 million (Data size: 30TB)

Medical Information System Database



Claim Data Flow



Key Factor：Standard

- Single-payer payment system
- Unified claim form (data format)
- National standard coding table
  - Diagnosis Code(ICD-9-CM) -> change to ICD-10-CM in 2016
  - Hospital No.
  - Treatment code, Procedure code, Drug Code, etc.
- Set time table for hospitals to move to electronic claim

Fast payment remittance for electronic claim

- Provisional Payment Rate ：
  - Electronic claim: up to 95%(Before Global Budget 100%)
  - Paper claim: at most 85% (Before Global Budget 90%)
- Provisional Payment Pay Date：
  - Electronic claim: within 15 days
  - Paper claim: within 30 days
- Paper Claim Data Processing Fee:

  (A minus fee item listed in the fee schedule)
  - 5~10 points for each outpatient claim
  - 50 points for each inpatient claim

Provide Incentives to Promote Clinics Computerization

- Offer free & simple outpatient medical claim computer software
- Provide various data exchange e-services
  - Offer table down load function（ code table, drug approval price… ）
  - Provide NHIA internal claim processing status information

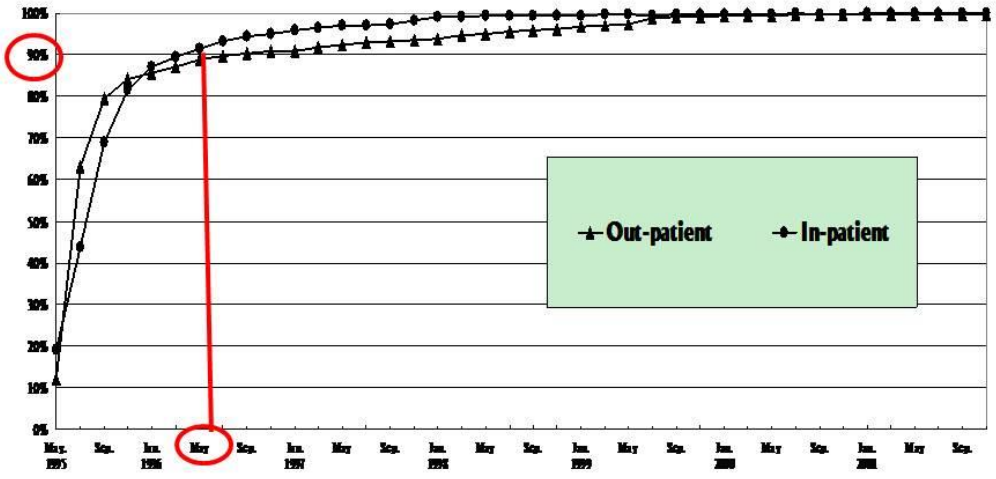
✓ the rate of electronic medical claims is over 99.9% after 2001

Methods to improve claim data quality

- Provide data pre-check services
  - Early error reported, providers can re-check and modify data before claim submission.
  - Help hospital information system to detect possible system malfunction.
- Phased-in policy to **accept only 100% correct** claim data to proceed the following payment procedure

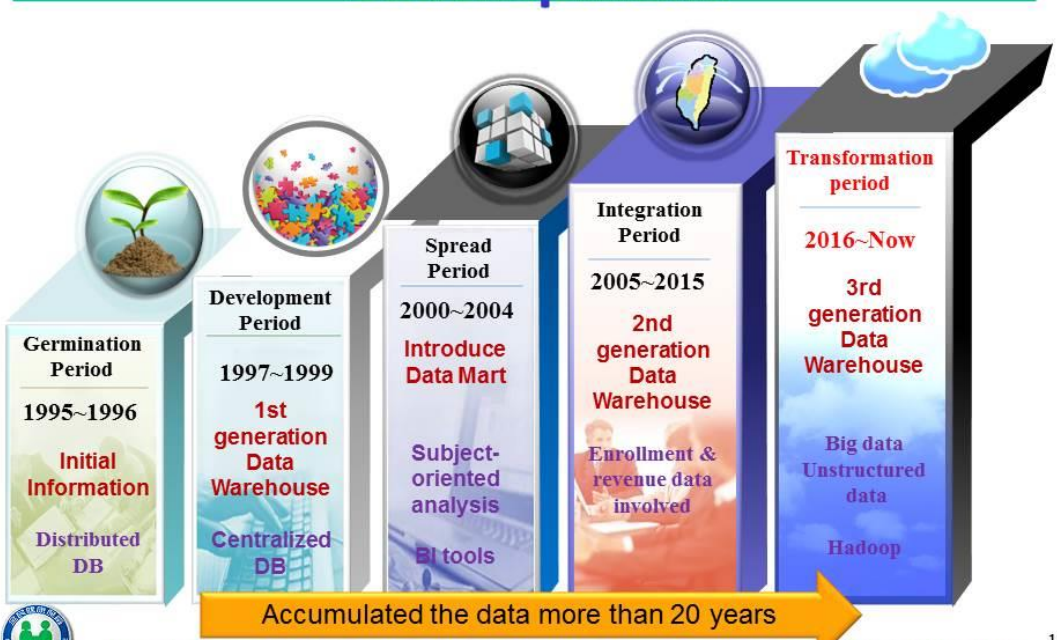
Electronic Medical Claims

The rates of electronic claims submission

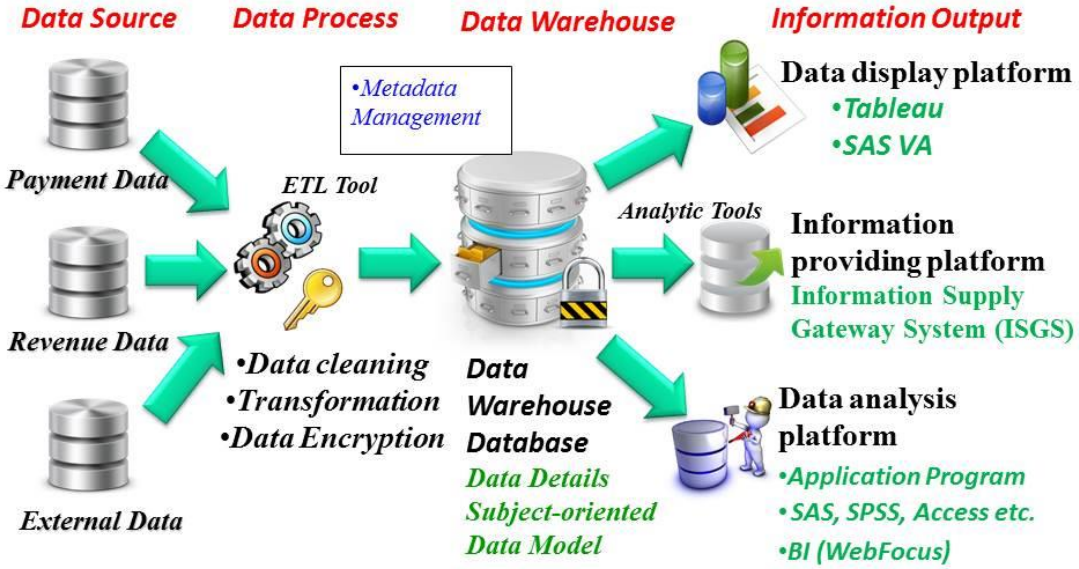


Data Warehouse System

Data Warehouse System Development



Data warehouse system overview



Features

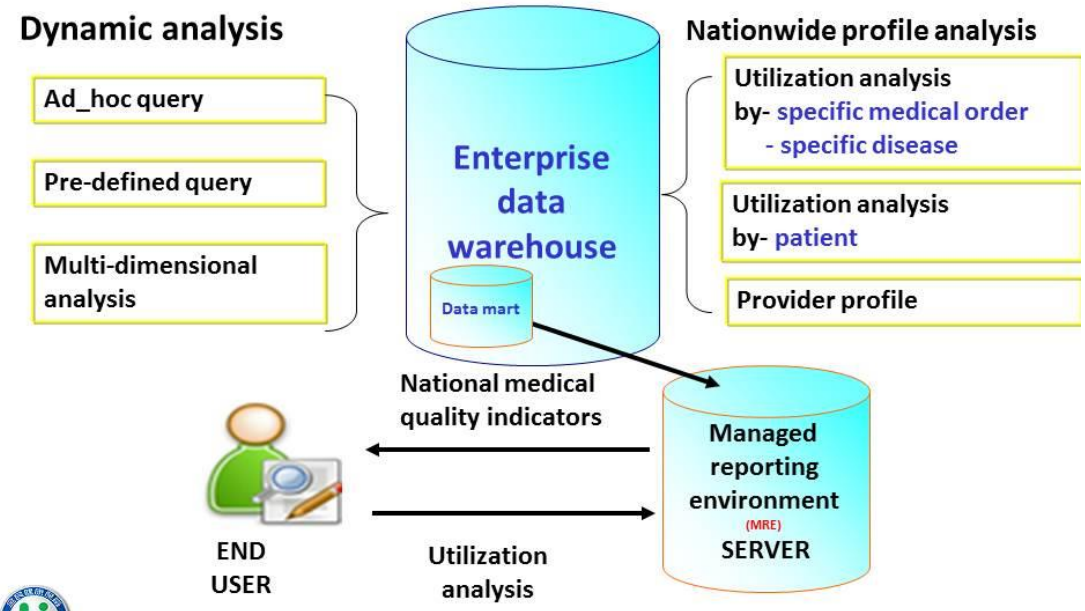
Capacity
- Phases: payment, revenue, and external data
- Duration: 30 years
- Data size: 24 TB (Structured data)

Flexibility
- Parallel processing and high expansion
- Hadoop structure: store unstructured data (image)

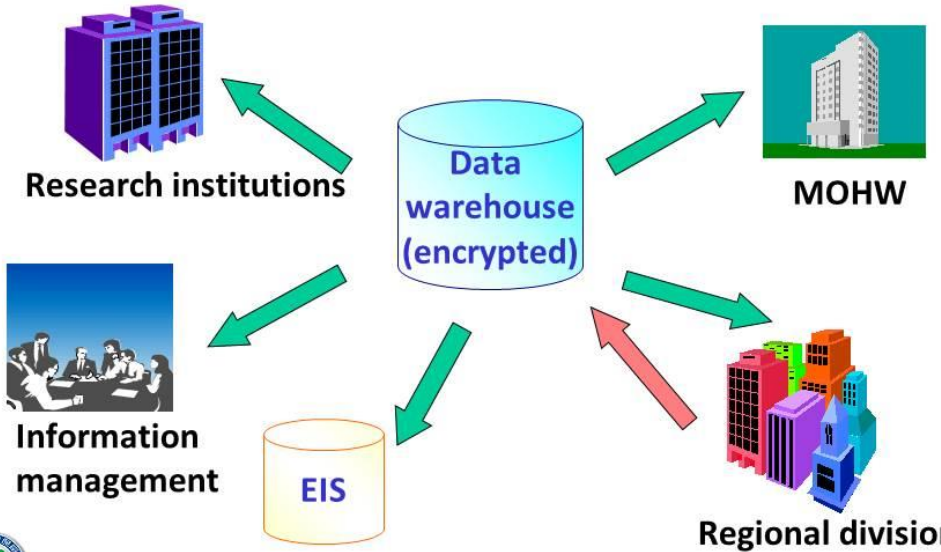
Security
- Raw data are all encrypted and keys are under strong protection.
- All usage records are stored in LOG file.

Management
- Great metadata management system
- Various analysis tools
- Intelligent monitor

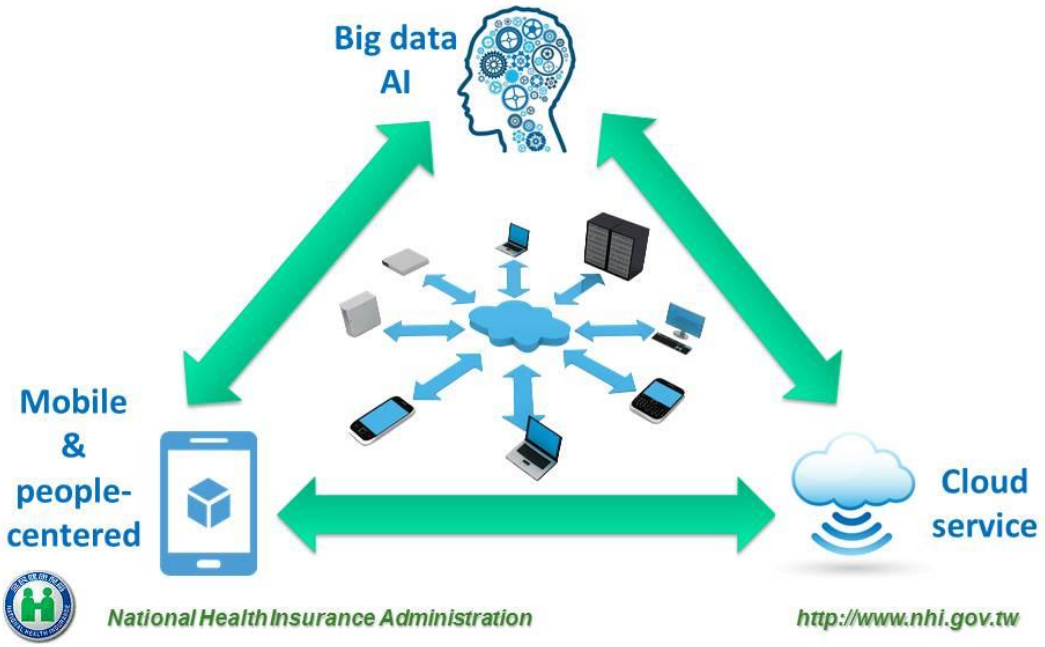
Information Delivery



Provide Consistent Information



Future Perspectives



NHI MediCloud System

Tzu-Yu Chen
Associate Researcher
Information Management Division
National Health Insurance Administration
Ministry of Health and Welfare, Taiwan

Agenda

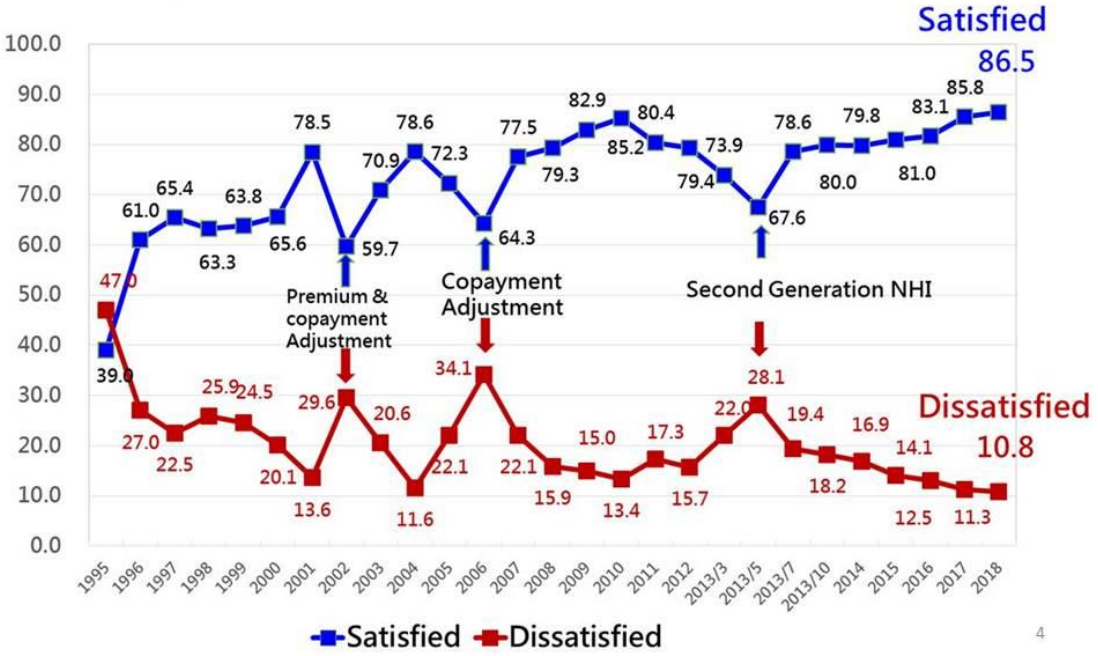
- Background
- Development Stage
- Achievement
- Feedback
- Challenge

Agenda

- ***Background***
- Development Stage
- Achievement
- Feedback
- Challenge

3

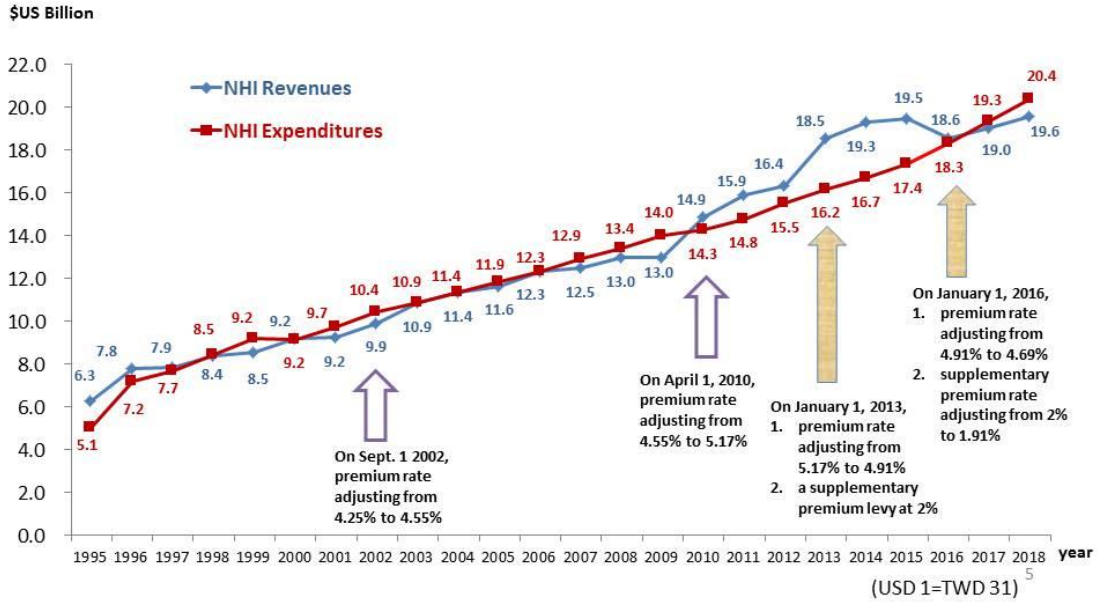
High Public Satisfaction



4

Trend of NHI Financial Status

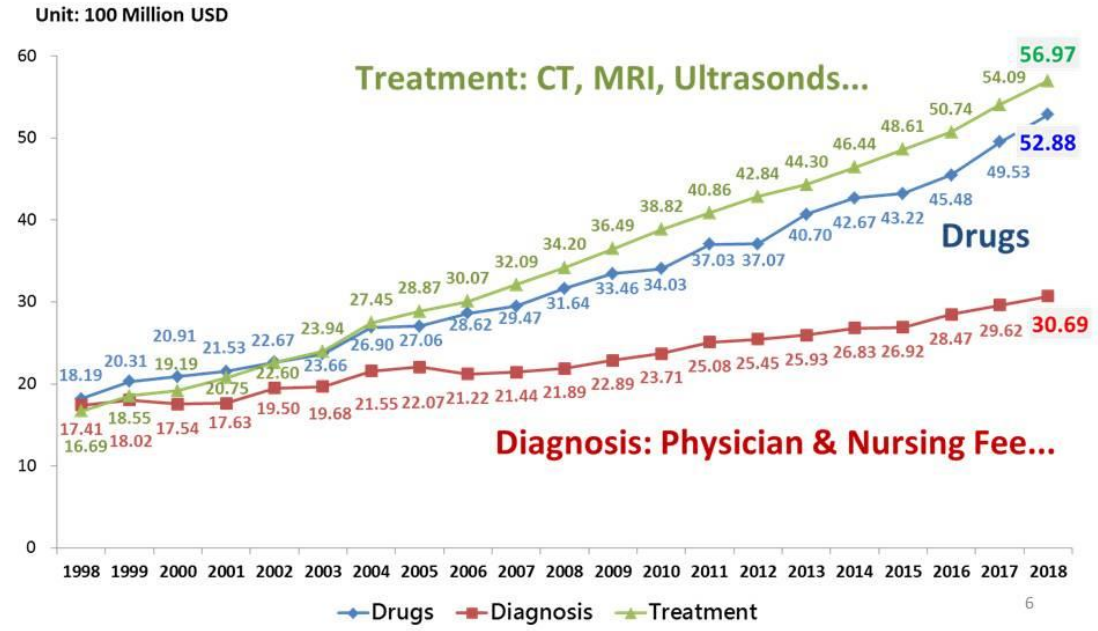
◎Accumulated surplus as of 2018: USD 6.85bn



(USD 1=TWD 31)

5

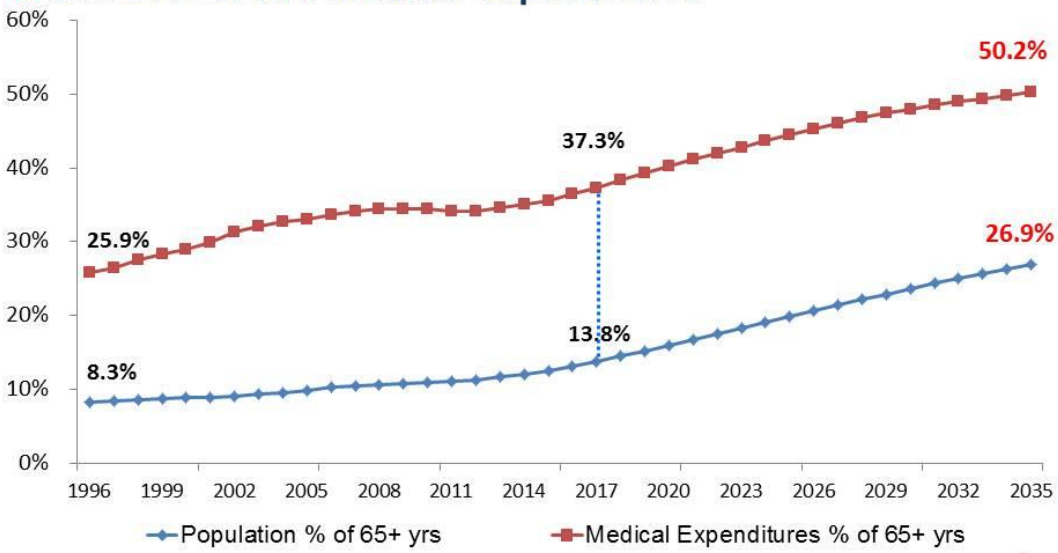
Breakdown of Outpatient Expenditures



6

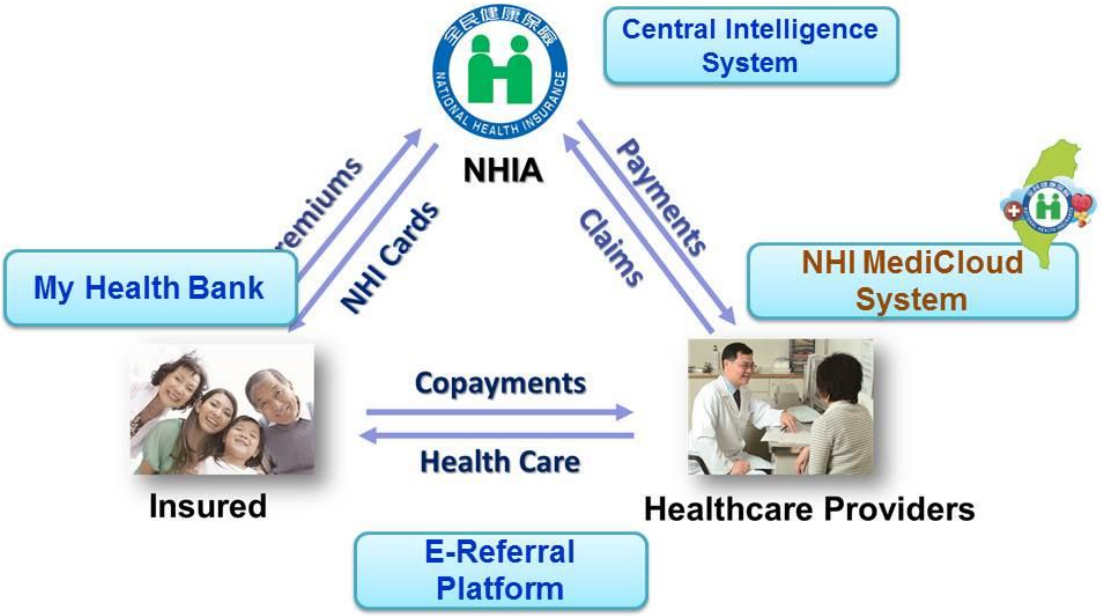
Ageing Trends and Impact to Healthcare

- Take up about 14% of the population
- Use 37% of NHI medical expenditures



7

Healthcare Innovation



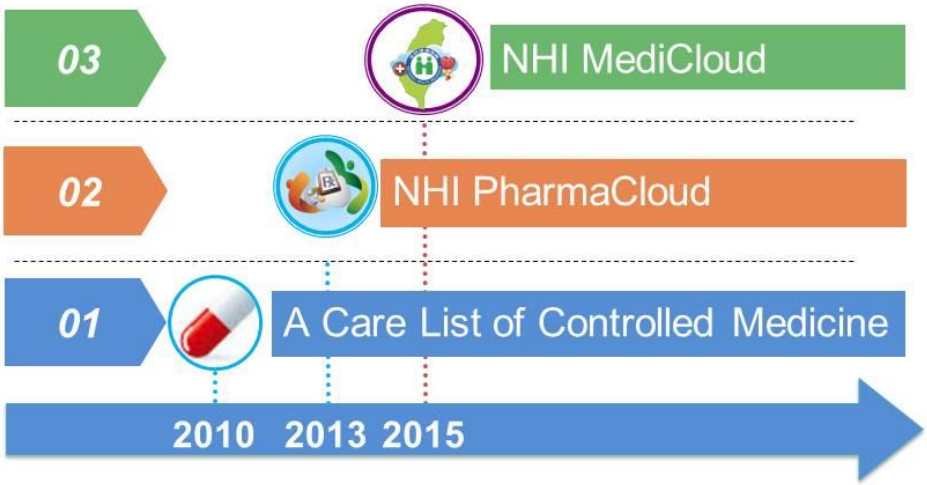
8

Agenda

- Background
- ***Development Stage***
- Achievement
- Feedback
- Challenge

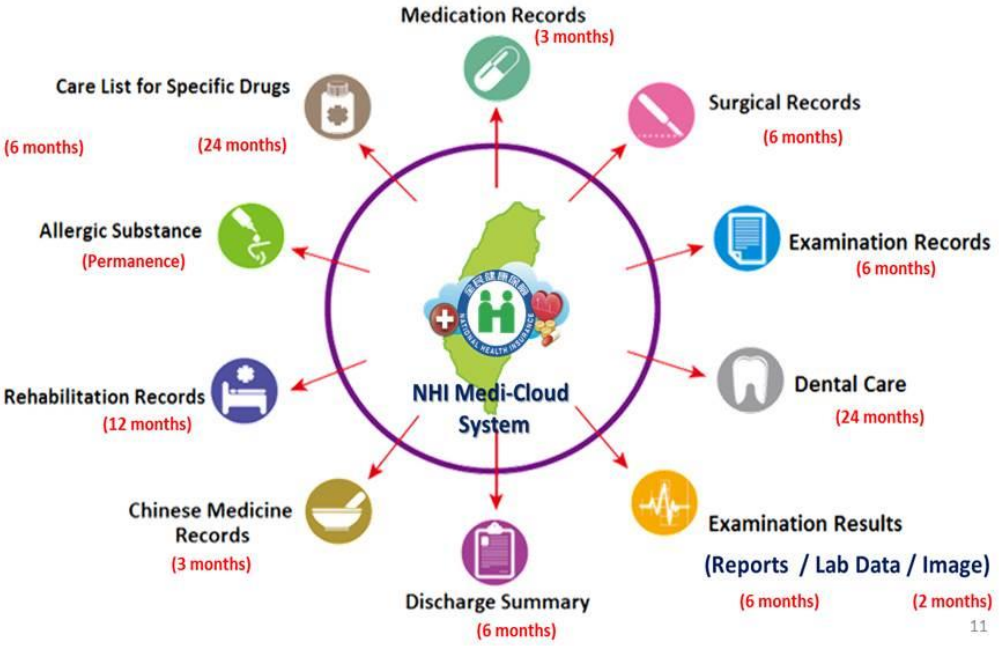
9

Development of NHI MediCloud System



10

Contents of NHI MediCloud



11

Features of NHI MediCloud System

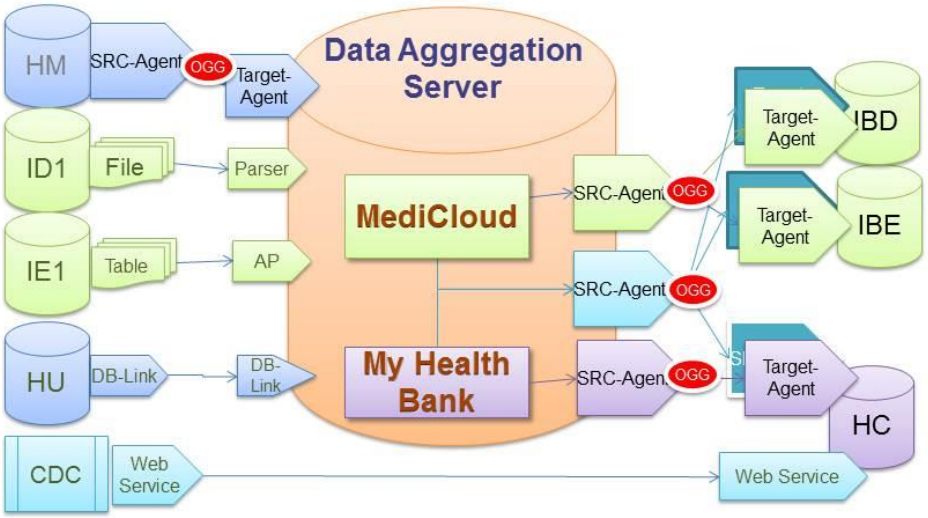
Capacity
- Update the information on daily basis
- Process huge volume data
- Dual data centers

Efficiency
- Response time
- Interaction with HIS (Hospital Information System)
- Drug-Drug Interaction (DDI)

Security
- Three card authentications: sim card (hospital or clinic) physician's card, patient's IC card
- Defense Mechanism

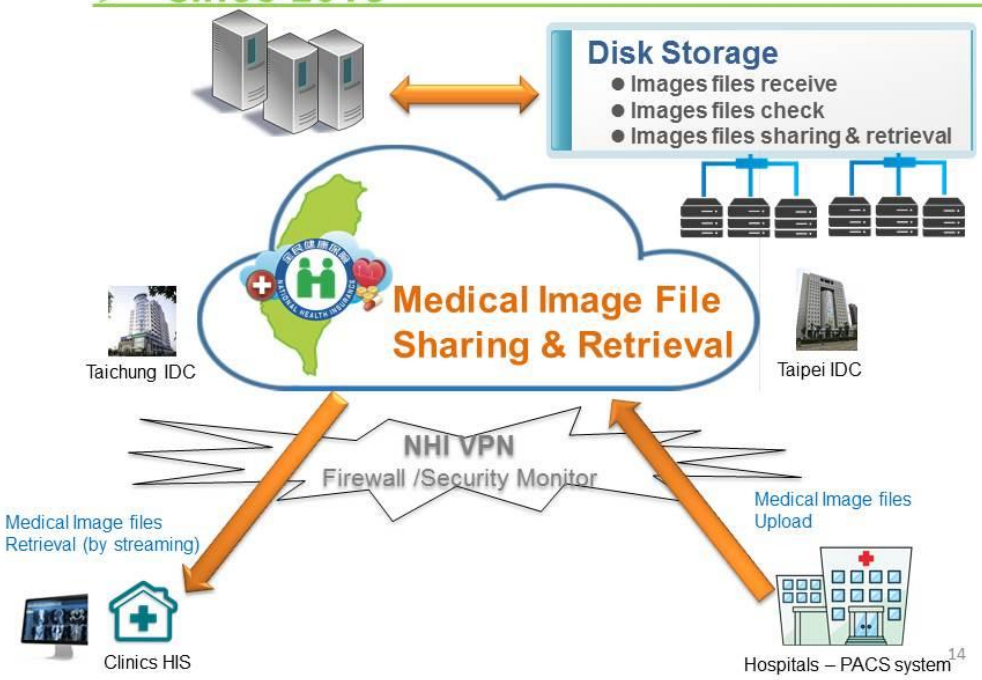
Management
- Keep log files to track and evaluate the outcomes
- Yearly progress plans

Data Aggregation



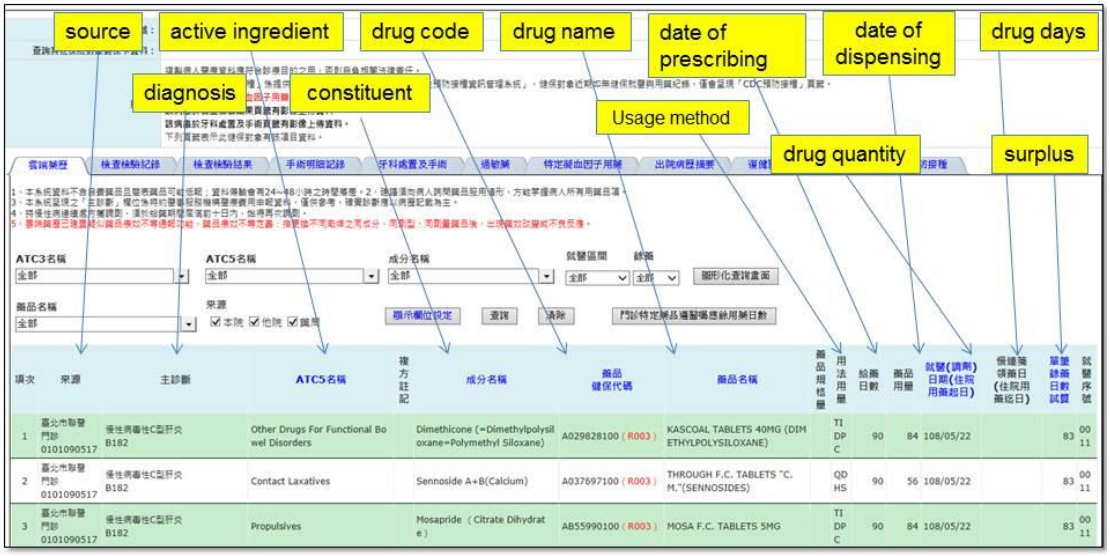
13

Overall Architecture Diagram of Medical Image Sharing and Retrieval Subsystem *since 2018*

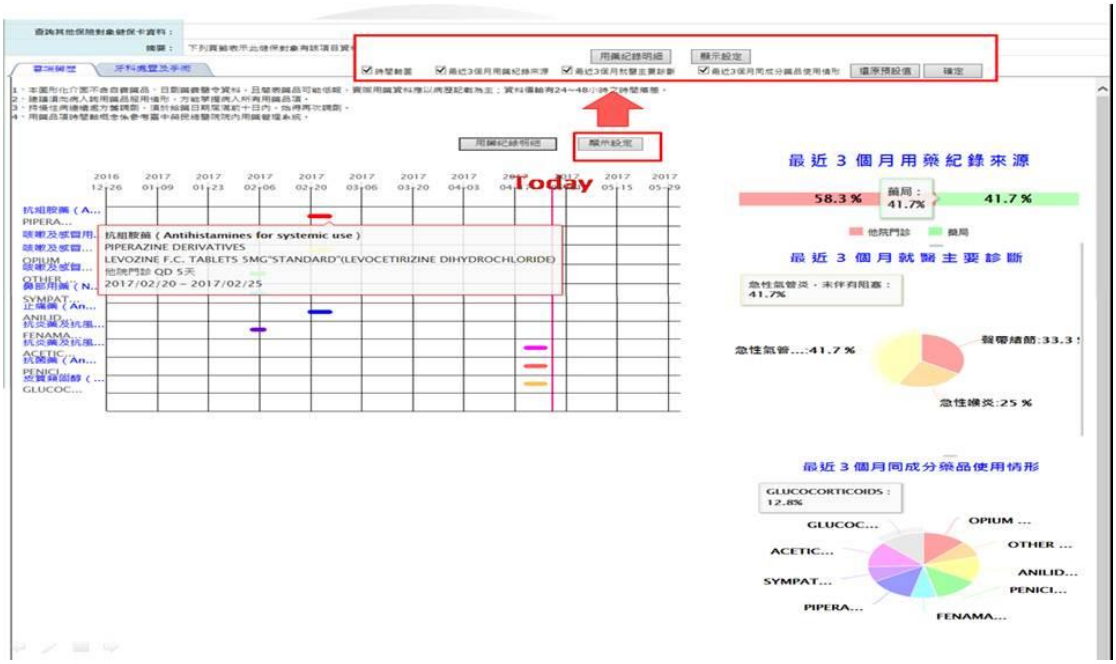


14

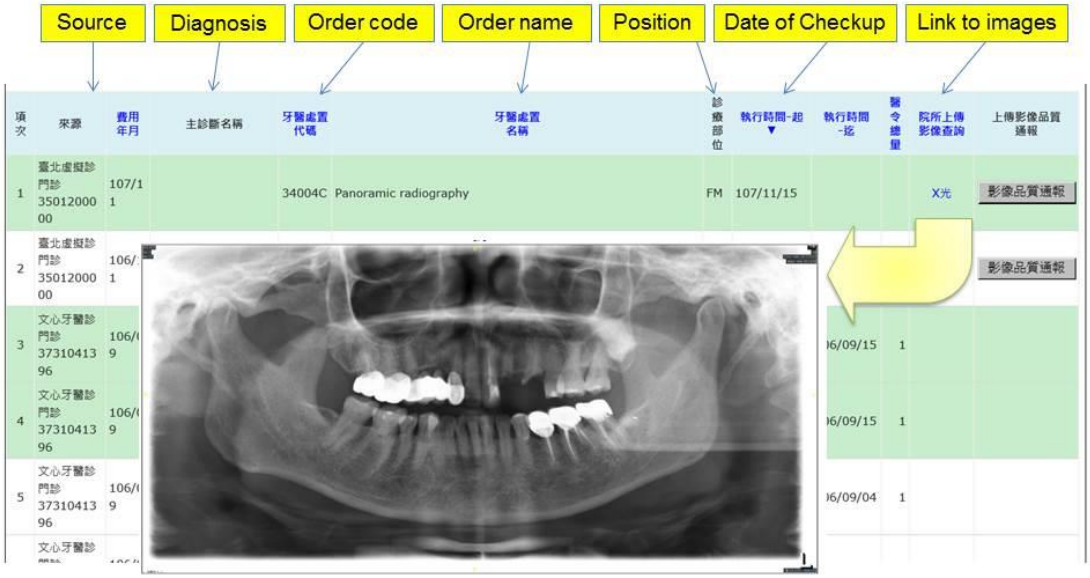
Medication Record Query



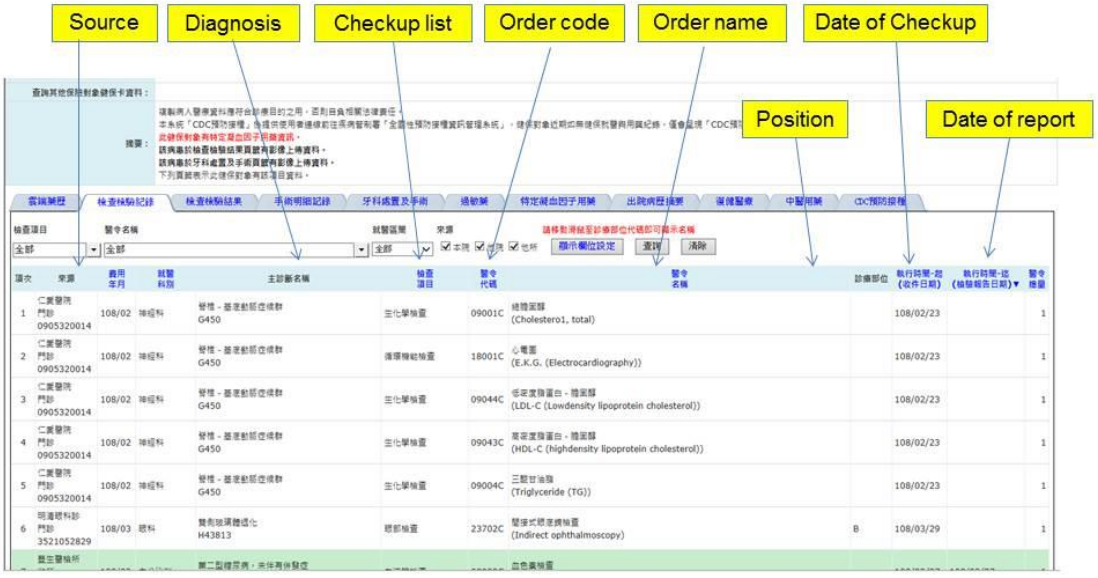
Time-Line Graph & Summary of Medication Usage



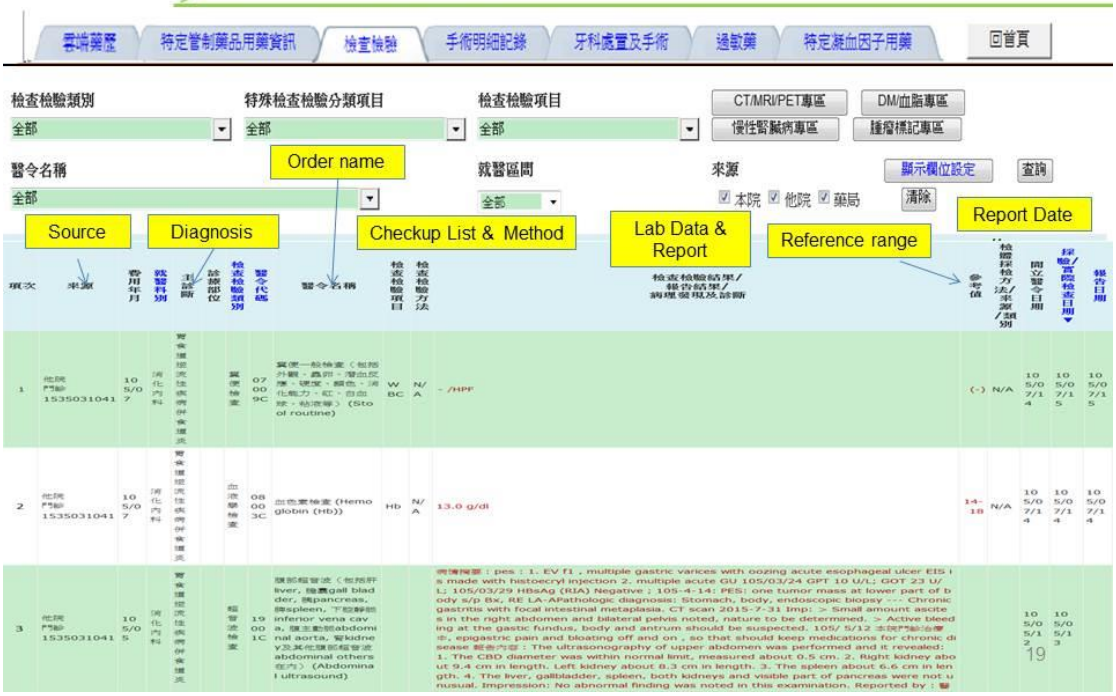
Dental Care



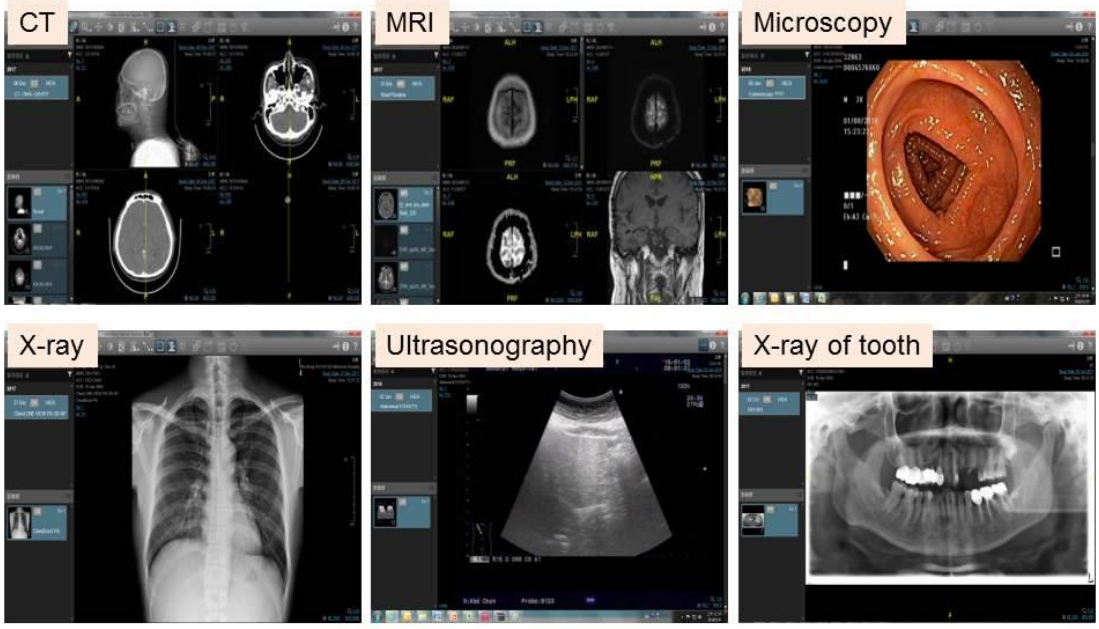
Medical Examination Record



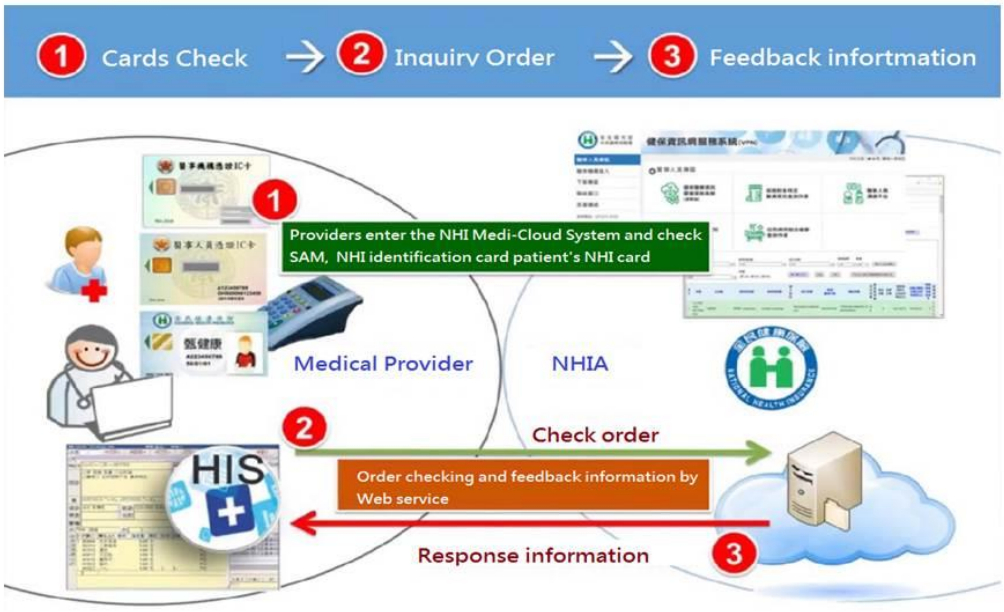
Medical Examination Results Since 2015



Screenshots of Sharing Medical Images



Providing In-Time Notice through Web Services



21

Agenda

- Background
- Development Stage
- ***Achievement***
- Feedback
- Challenge

22

System Benefit

Resource sharing

- The images and reports of examination can be shared across hospitals and clinics

Ensure patient safety

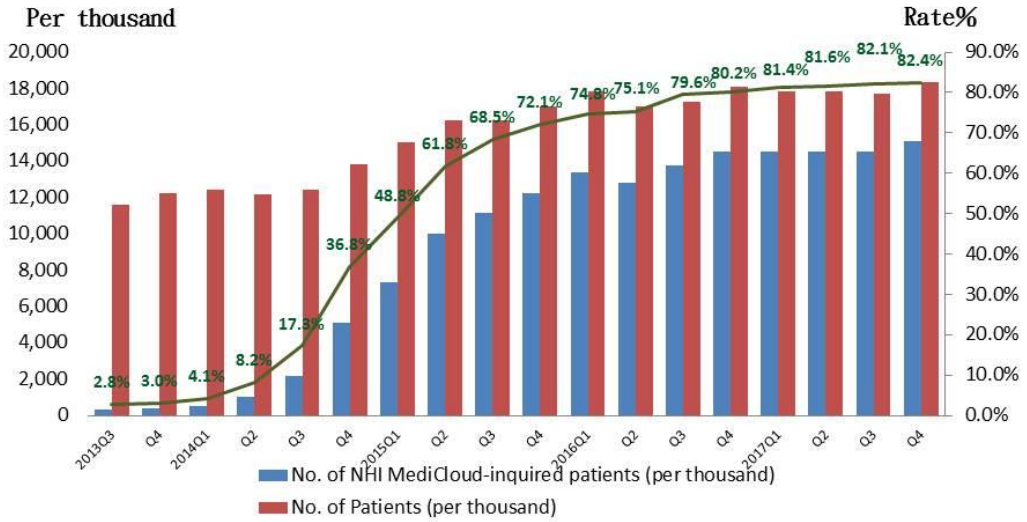
- Avoid duplication of medication and examination
- Physician can provide continuous care

Cost saving

- Tremendous saving of medical expenditure

23

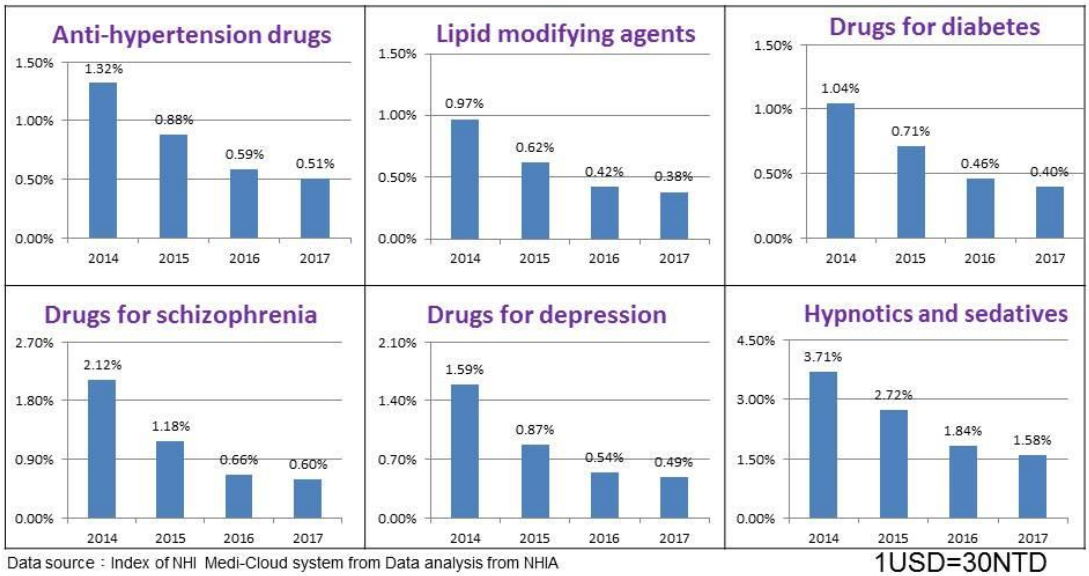
The Upward Trend of NHI MediCloud System Inquiry rate



24

Effectiveness of Medication

◎Percentages in overlapping days of six chronic diseases
◎Reducing 10 million USD medication expenditure

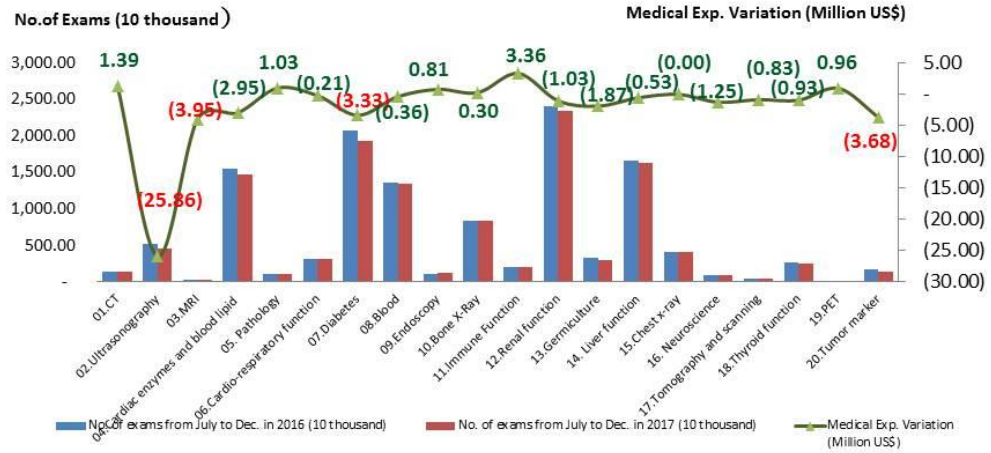


Data source：Index of NHI Medi-Cloud system from Data analysis from NHIA

1USD=30NTD

Influence of Examination

◎Top 20 Paid Lab Tests in 2016
◎Savings 40 million USD from Information Sharing



Data source：Data Analysis from NHIA

Top 3 Paid Examinations

Rate of re-examinations in 30 days

ITEM	Jul-Dec/2016		Jul-Dec/2017		Variation	
	No. of re-exams in 30 days	% of re-exams in 30 days	No. of re-exams in 30 days	% of re-exams in 30 days	No. of re-exams in 30 days	% of re-exams in 30 days
CT	85,722	9.32%	83,771	8.94%	-1,951	-0.38%
MRI	9,519	2.79%	8,858	2.64%	-661	-0.15%
Abdominal ultrasonography	48,371	3.76%	39,225	3.24%	-9,146	-0.52%

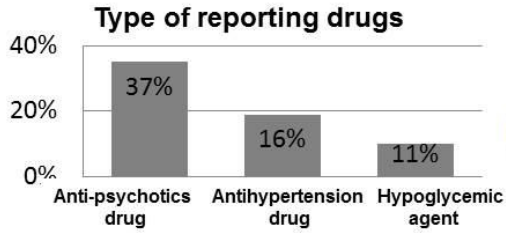
27

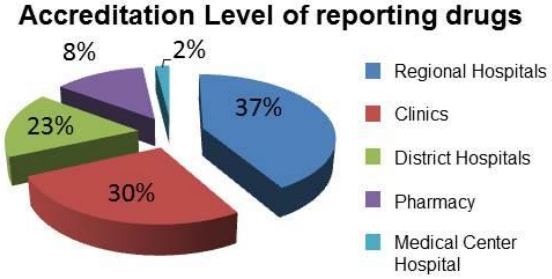
Agenda

- Background
- Development Stage
- Achievement
- ***Feedback***
- Challenge

28

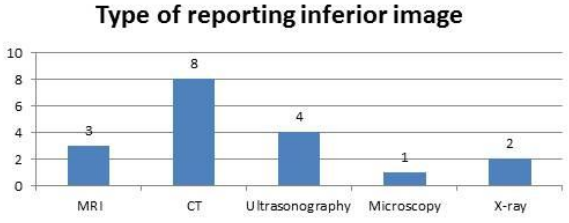
Reporting function for Therapeutic inequivalence of medicine

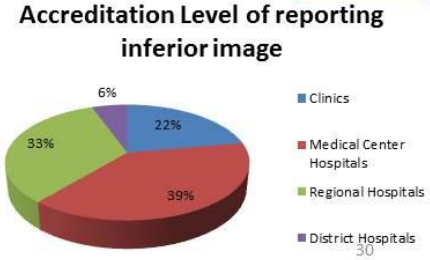




*Data range：2018.05.17-2018.06.30

Reporting function for Inferior quality of medical image





*Data range：2018.07.31-2018.08.05

NHI MediCloud System User Experience Sharing

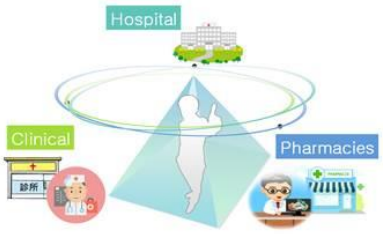
31

Healthcare IT Vendor Seminar

32

Agenda

- Background
- Development Stage
- Achievement
- Feedback
- ***Challenge***



33

Challenges

- **Great Medical Service v.s. Cost Growth Management**
- **Increase Revenue v.s. Reduce Unnecessary Expenditure**
- **NHIA Policy v.s. Digital Transformation**

34

Thank you
for your kind attention!

Health Information Technology applied in the Hospital

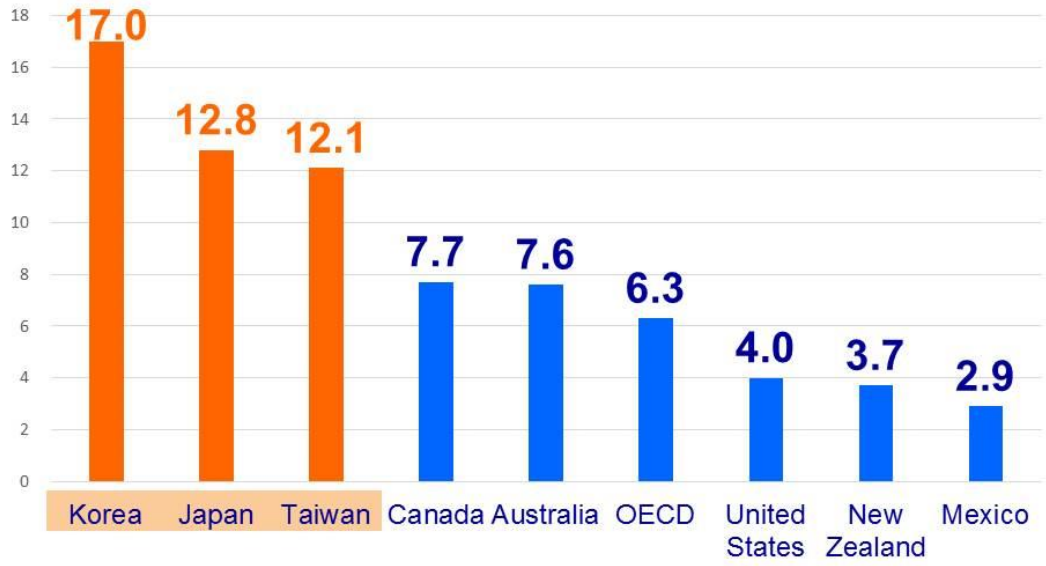
Chiu-Ling Lai

Medical Review and Pharmaceutical Benefits Division,
National Health Insurance Administration,
Ministry of Health and Welfare, Taiwan

2019.06.17

1

Doctor Consultations by Selected Countries (year 2016)



Source: OECD Health Statistics 2018, Taiwan's Ministry of Health and Welfare.

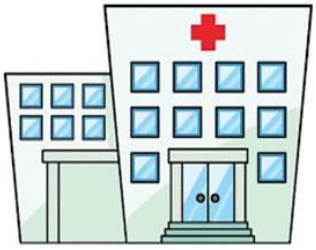
2

In Taiwan, on average a person consulted 3.4 specialties, 5.2 physicians, and 3.9 healthcare facilities in a year.

3.4 specialties

5.2 physicians

3.9 healthcare facilities



Source: Hsu MH, Yeh YT, Chen CY, Liu CH, Liu CT. Online detection of potential duplicate medications and changes of physician behavior for outpatients visiting multiple hospitals using national health insurance smart cards in Taiwan. Int J Med Inform. 2011 Mar;80(3):181-9. doi: 10.1016/j.ijmedinf.2010.11.003. Epub 2010 Dec 22.
Chen TJ, Chou LF, Hwang SJ. Patterns of ambulatory care utilization in Taiwan. BMC Health Serv Res. 2006 May 4;6:54.
OECD Health Statistics 2018, Taiwan's Ministry of Health and Welfare.

Outline

- MediCloud Value-Added Application
- Vertical Integration and MediCloud
- Future Perspectives

MediCloud

Value-Added Application

Reduce Duplication on Medication(1)

(Chi Mei Medical Center)

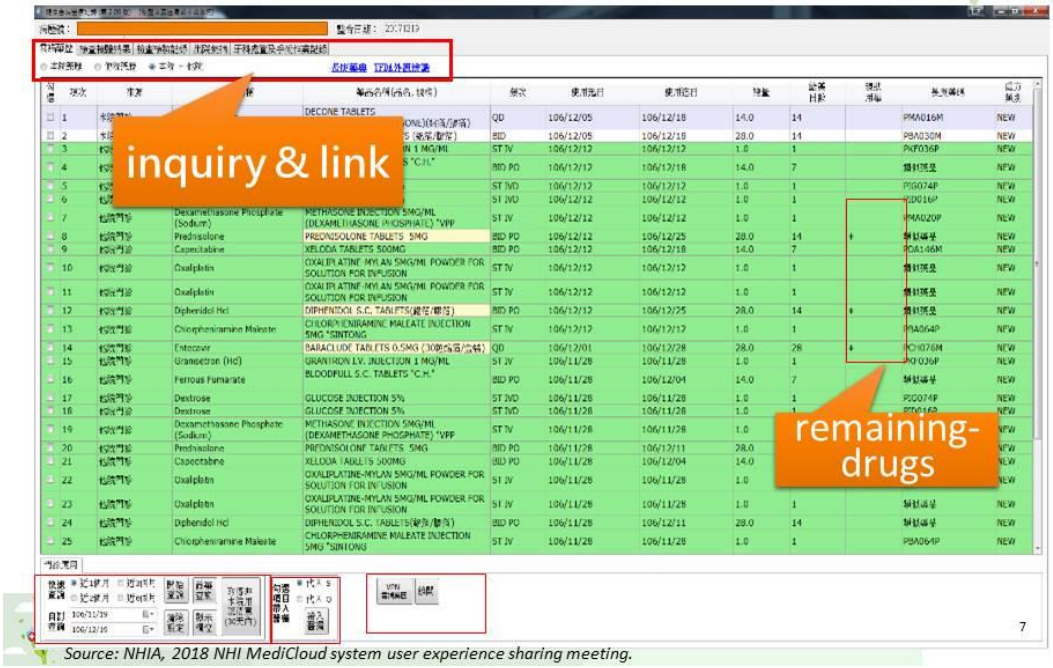
medical records from NHI Medicloud system

hospital information system

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

Reduce Duplication on Medication(2)

(Linkou Chung Gung Memorial Hospital)

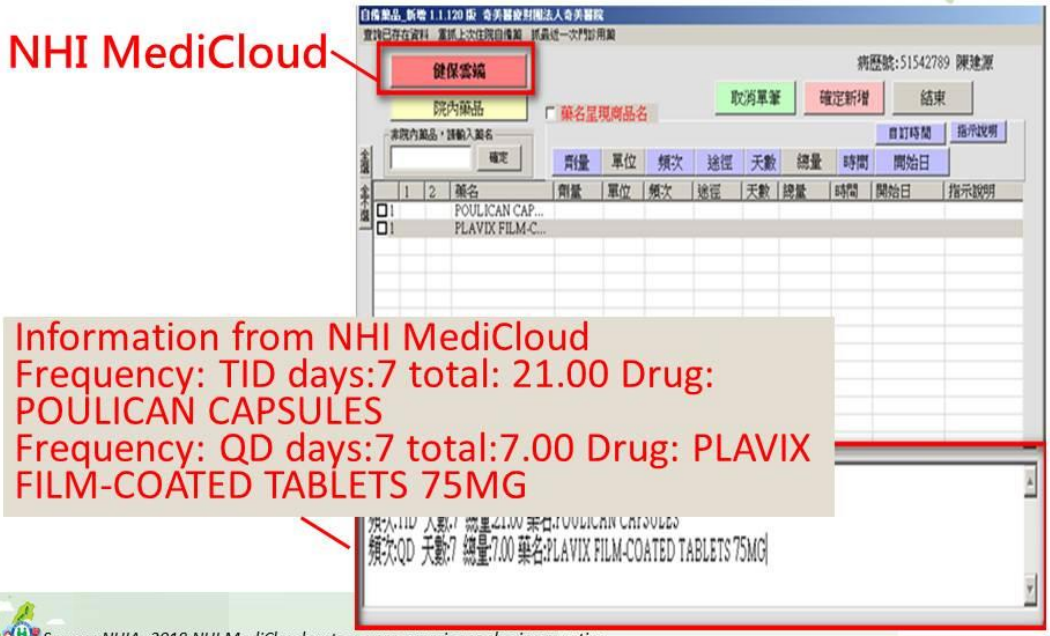


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

7

Patients Own Medicines in Hospital

(Chi Mei Medical Center)

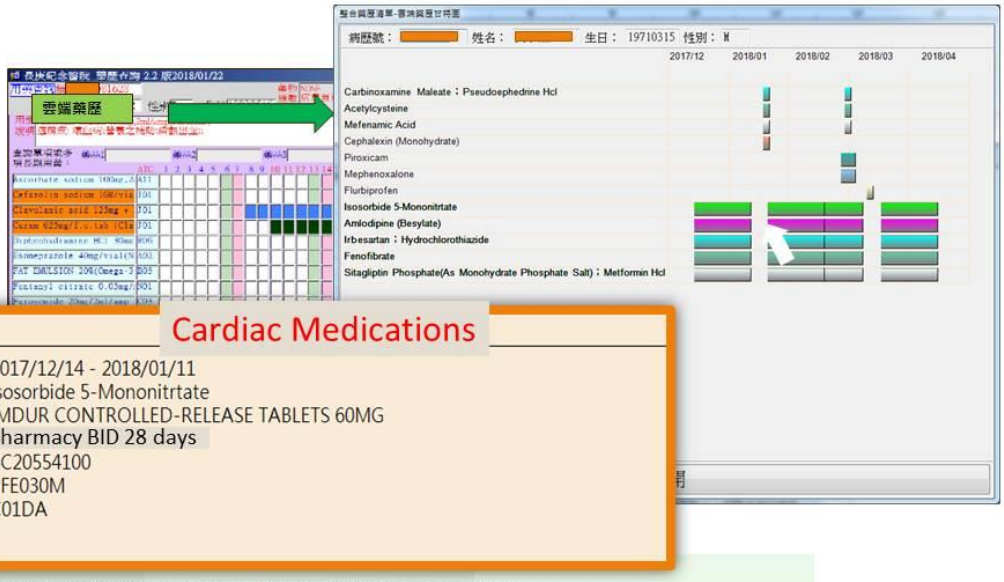


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

8

Medication Record: Gantt Chart

(Linkou Chung Gung Memorial Hospital)

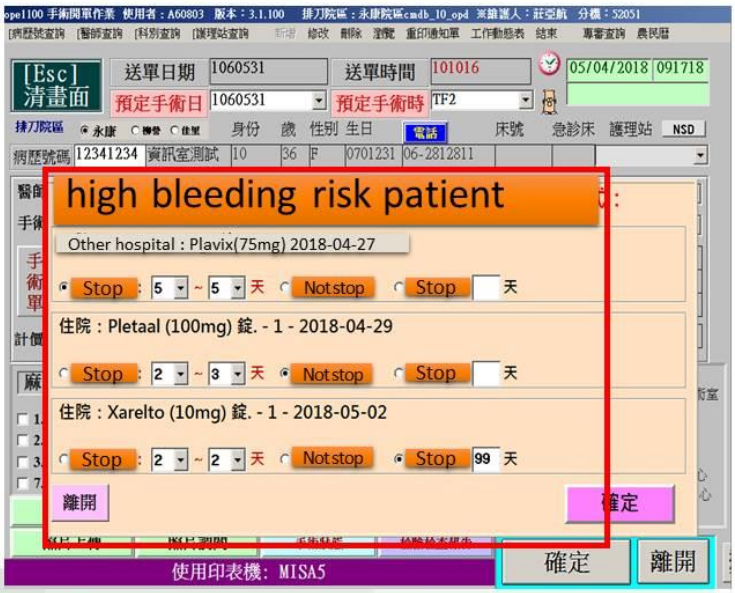


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

9

Surgical Patient with Anticoagulation

(Chi Mei Medical Center)

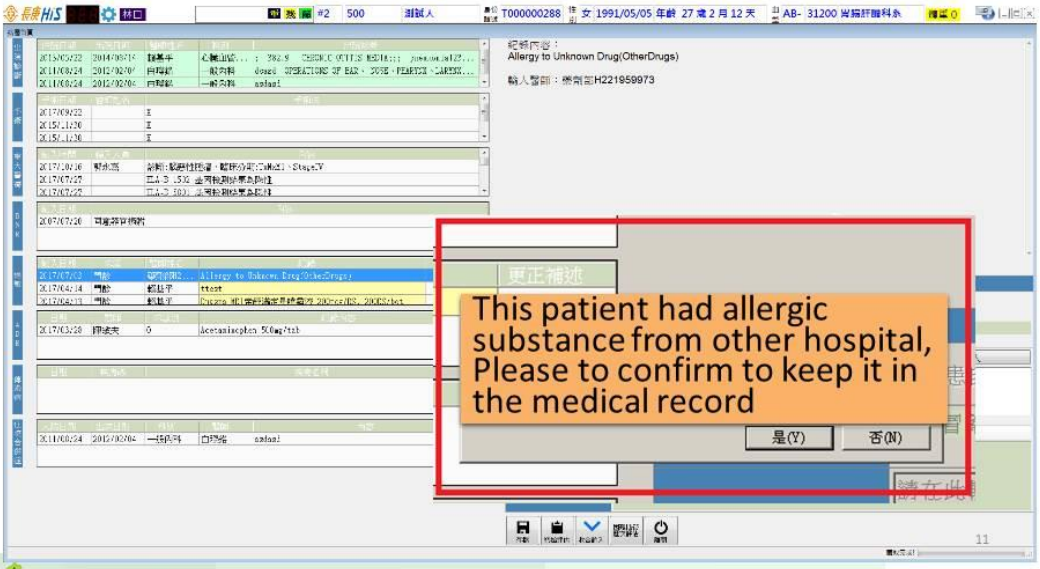


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

10

Allergic Substance

(Linkou Chung Gung Memorial Hospital)

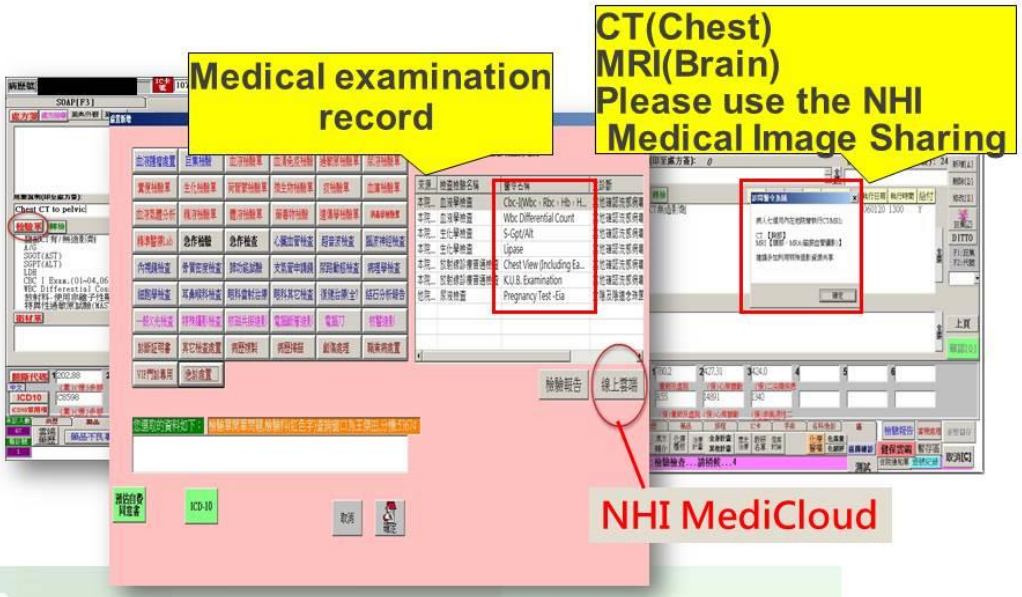


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

11

Reduce Duplication on Medical Testings

(Chi Mei Medical Center)

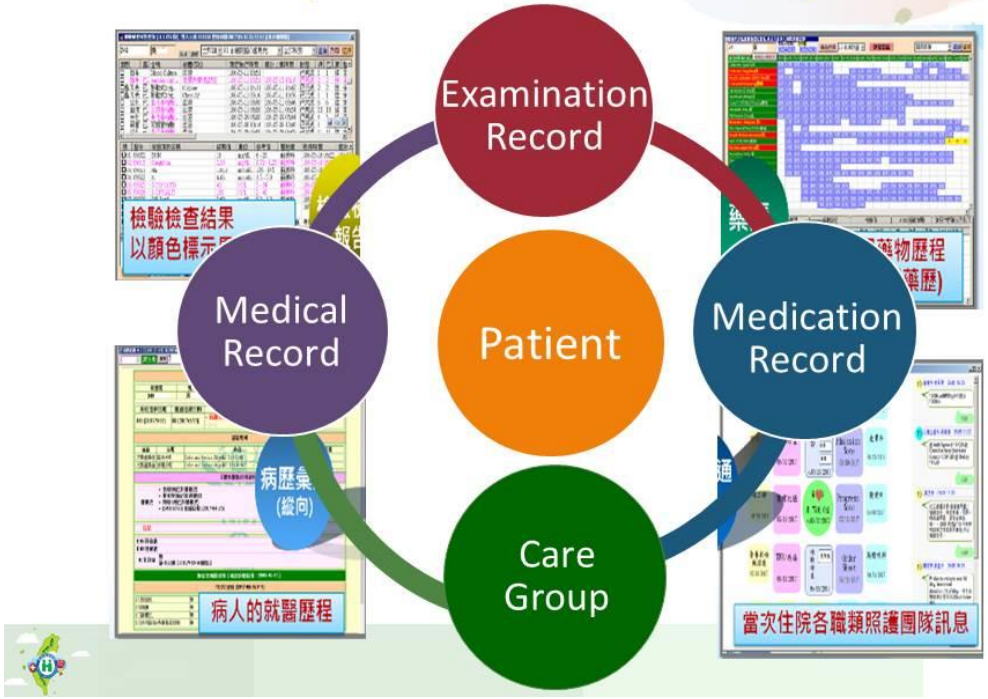


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

12

Continuity of Care Record

(Chi Mei Medical Center)



13

Vertical Integration and MediCloud

14

Flying Geese Paradigm

By flying in a V-formation, the whole flock achieves a 70% greater flying range than if each bird flew alone.
All the other geese learned from following the example of lead goose.
In order to reinforce NHI medical referral system. We Imitate the flying geese paradigm.
By identifying the medical center or region hospital to take the lead for the vertical integration.

15

Hierarchically Integrated Health System Policy

16

Flying Geese Medical Care Group

- More than 500 hospitals, clinics, nursing home and home care in this group.

Linkou Chung Gung

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

17

Communication APP：LINE

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

18

Case Manager: to facilitate effective teamwork

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

19

Patient Health Management: APP

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

20

Medical Utilization Inquiry

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

21

Medication Management

Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

22

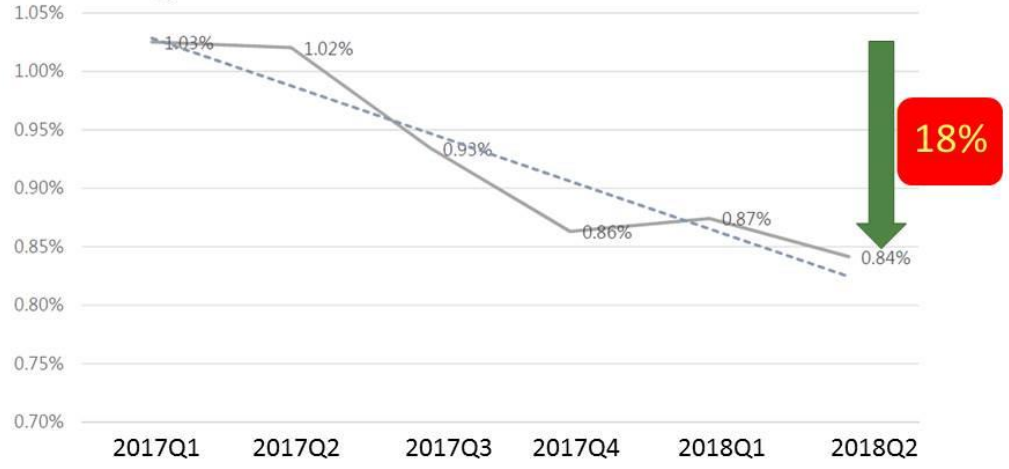
Drug Inquiry and Education

23

Impact of Vertical Integration(1)

The percentage of overlapping days of six selected groups of drug usage declined from 1.03% in 2017Q1 to 0.84% in 2018Q2.

The declining rate was 18%.

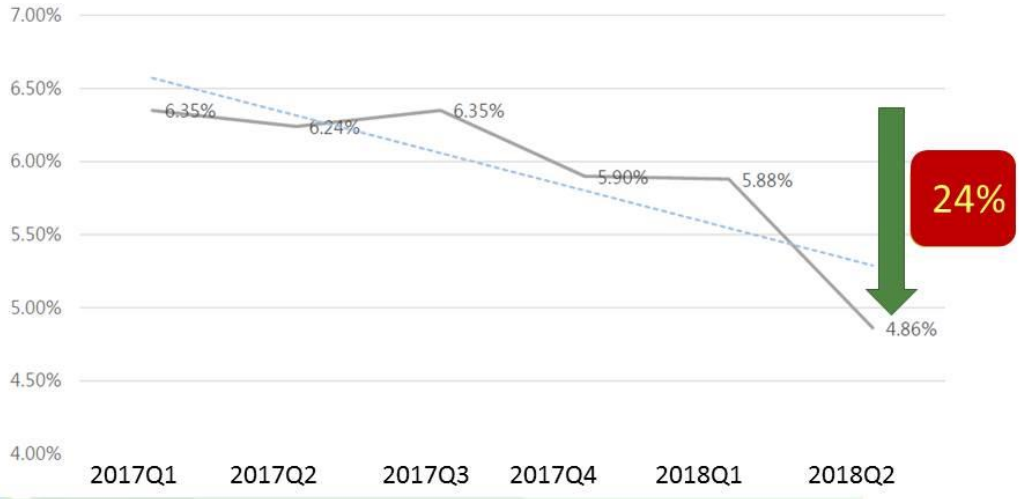


Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

24

Impact of Vertical Integration(2)

The duplicate rate of ten selected items of medical tests within 28 days declined from 6.35% in 2017Q1 to 4.86% in 2018Q2. The declining rate was 24%.



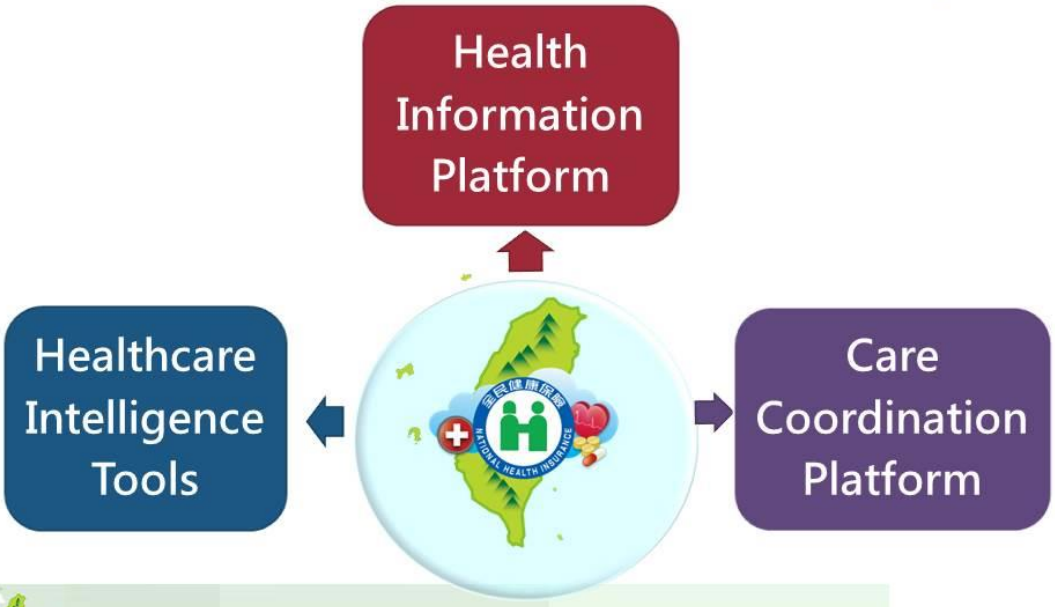
Source: NHIA, 2018 NHI MediCloud system user experience sharing meeting.

25

Future Perspectives

26

Future Perspectives



27

Taichung Veterans General Hospital opens treatment center for Taiwanese in Vietnam

2018/07/30 20:05:45

Photo courtesy of Taichung Veterans General Hospital

28

Thank you
for your attention!