Exploring Global Health Care Cost Drivers: Hong Kong and Taiwan

Sponsored by the International Actuarial Association Health Section (IAAHS) and the Academy's Health Practice International Committee (HPIC)

August 25, 2016

Presenters

- Alex Leung, MAAA, FSA, Member of the International Actuarial Association Health Section Committee (Taiwan)
- Lawrence Tsui, FIAAust, Member of the Actuarial Society of Hong Kong and the International Actuarial Association (Hong Kong)
- **Moderator**: Susan Mateja, MAAA, FSA, Chairperson, Academy Health Practice International Committee (United States)

Exploring Global Health Care Cost Drivers
2015 Webinars Highlighted Various Health Care Systems

Professor Tuvia Horev (Israel)

Rian de Jonge (The Netherlands)

Emile Stipp (South Africa)

Tom Wildsmith (U.S.)

Alvin Fung (Singapore)

Candice Ming (Australia)

Stuart Rodger (Australia)

John Have (Canada)

Jonathan Callund (Chile)

April Choi (IAAHS moderator)

Susan Mateja (Academy's HPIC moderator)

Exploring Global Health Care Cost Drivers: Hong Kong and Taiwan

We continue this series with 2 presentations in 2016:

- **August 25 (Taiwan & Hong Kong)**
- October 5 (U.K. & France)

We are holding a conversation that will explore the following:

- General characteristics
- Financing system
- Cost drivers
- Methods of coping with the cost drivers
- Measurement metrics
- Insights, successes, hurdles
- Future trends

Exploring Global Health Care Cost Drivers Taiwan

Alex T. Leung

About Taiwan

Population: 23.4 million

Land Area: 36,191 km^2

Per Capita GDP (2014):

- US$ 22,629 or
- US$ 46,096 (ppp)

Per Capita NHE (2014):

- US$ 1,324 or
- US$ 2,697 (ppp)

Life Expectancy (2014):

- 76.7 male / 83.2 female

Source: Directorate-General of Budget, Accounting and Statistics; Ministry of Health and Welfare

Comparison of Health Care Spending

Source: OECD Health Data 2015; Ministry of Health and Welfare

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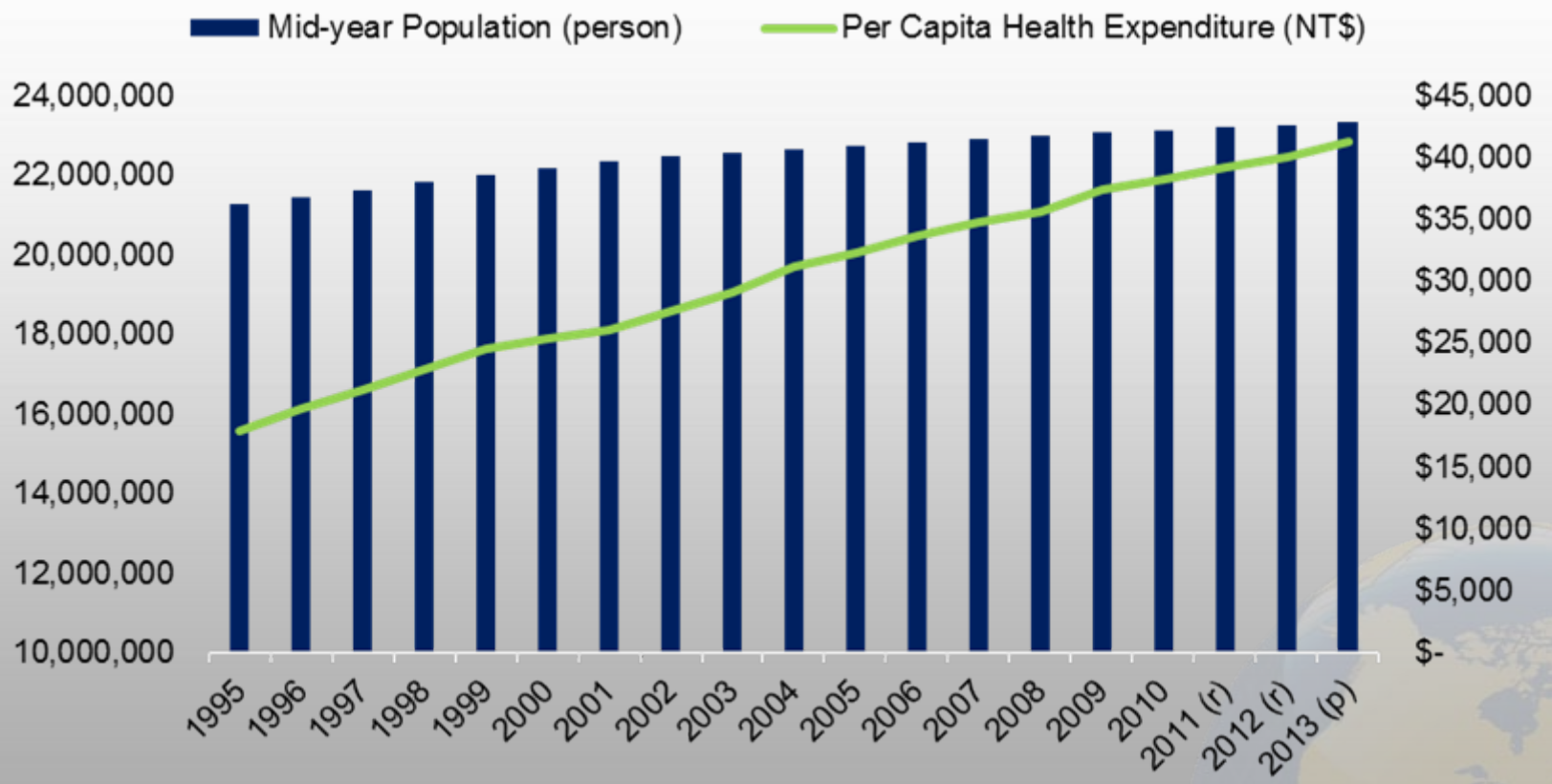
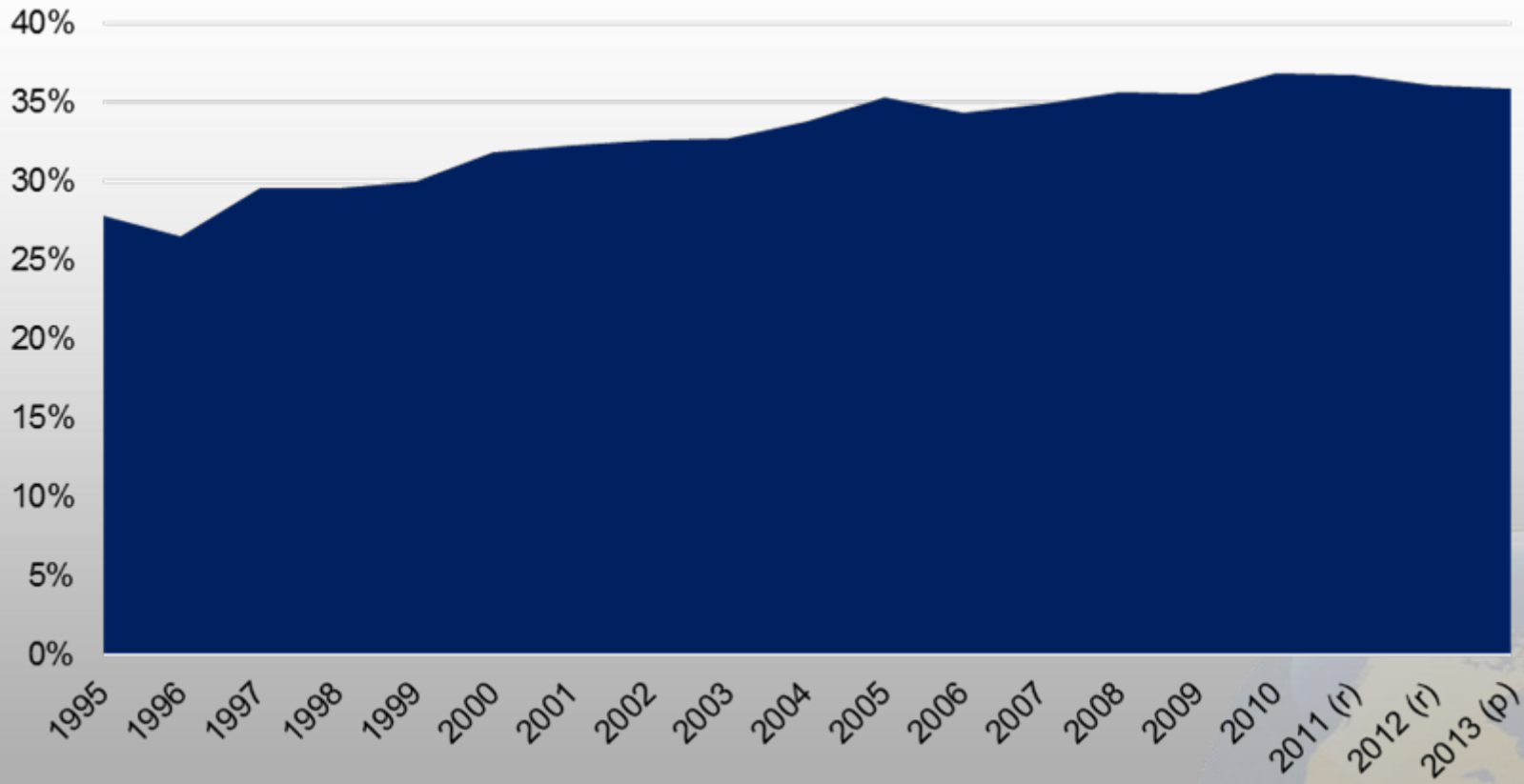
Population & Health Expenditure Growth



Source: Ministry of Health and Welfare
Remark: (r) preliminary, (p) projected

OOP Costs as % of Health Expenditure



Source: Ministry of Health and Welfare
Remark: (r) preliminary, (p) projected

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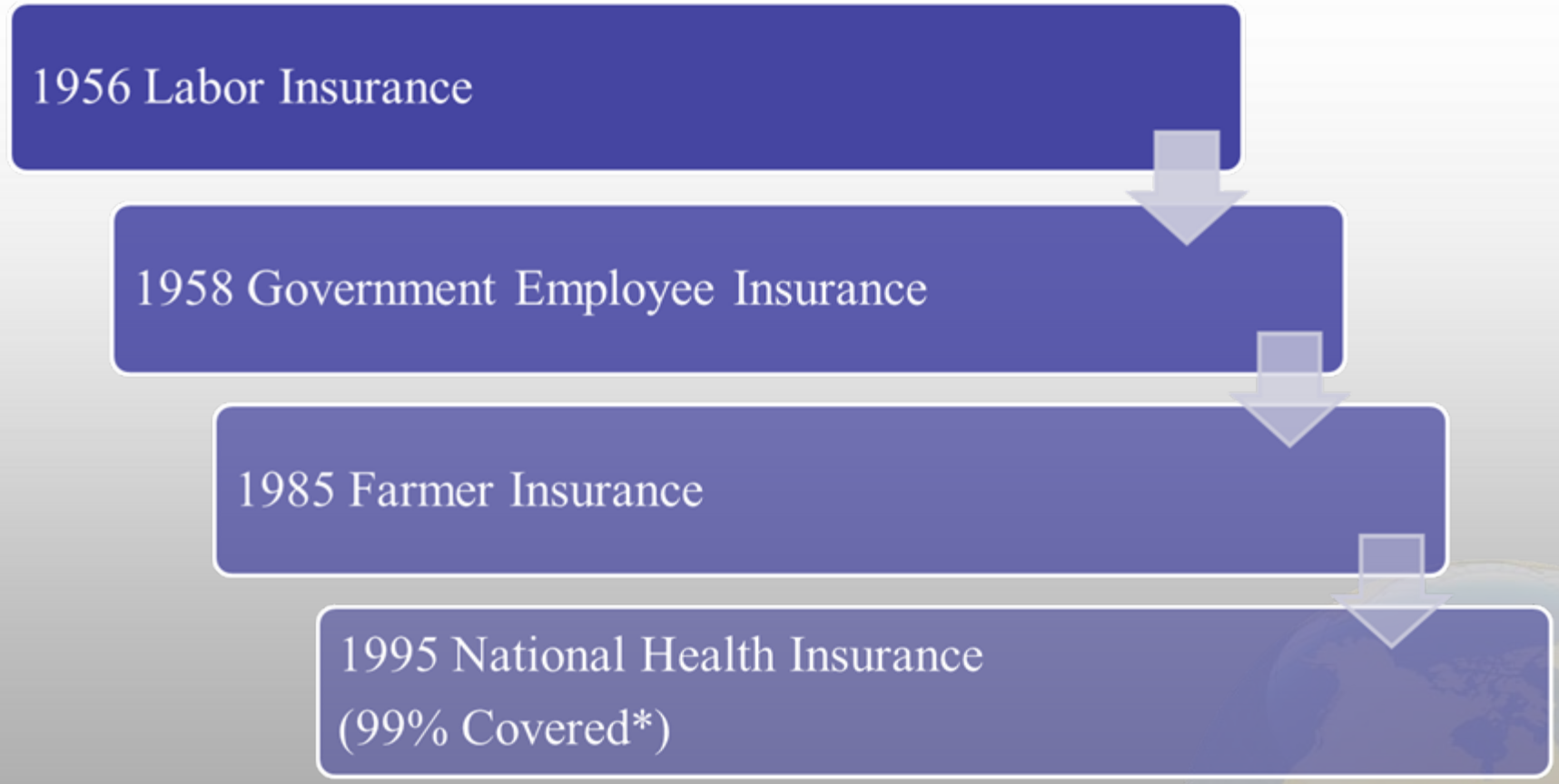
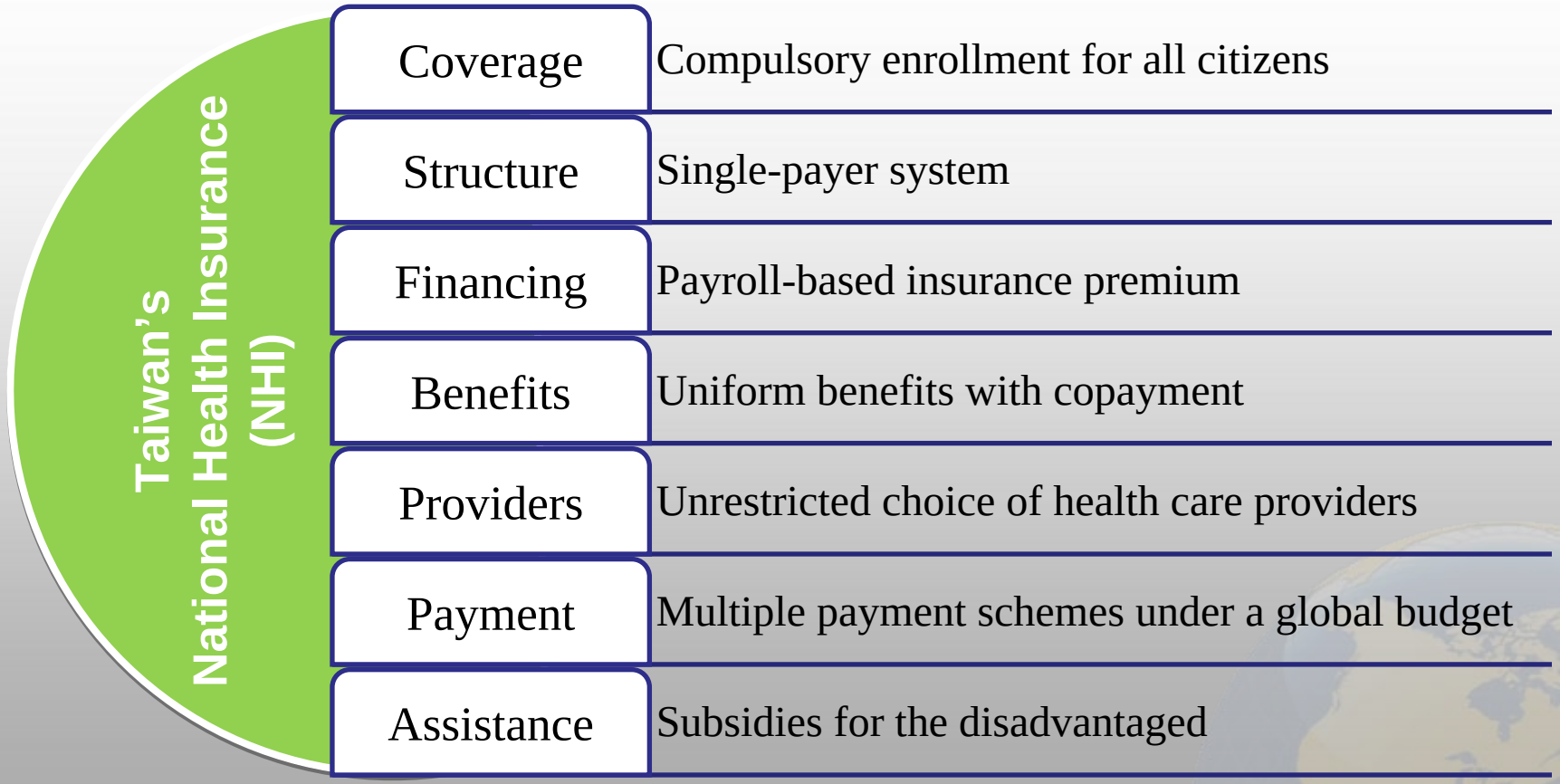
Road to National Health Insurance



** Health insurance coverage rate before 1995 was 58%*

National Health Insurance Overview

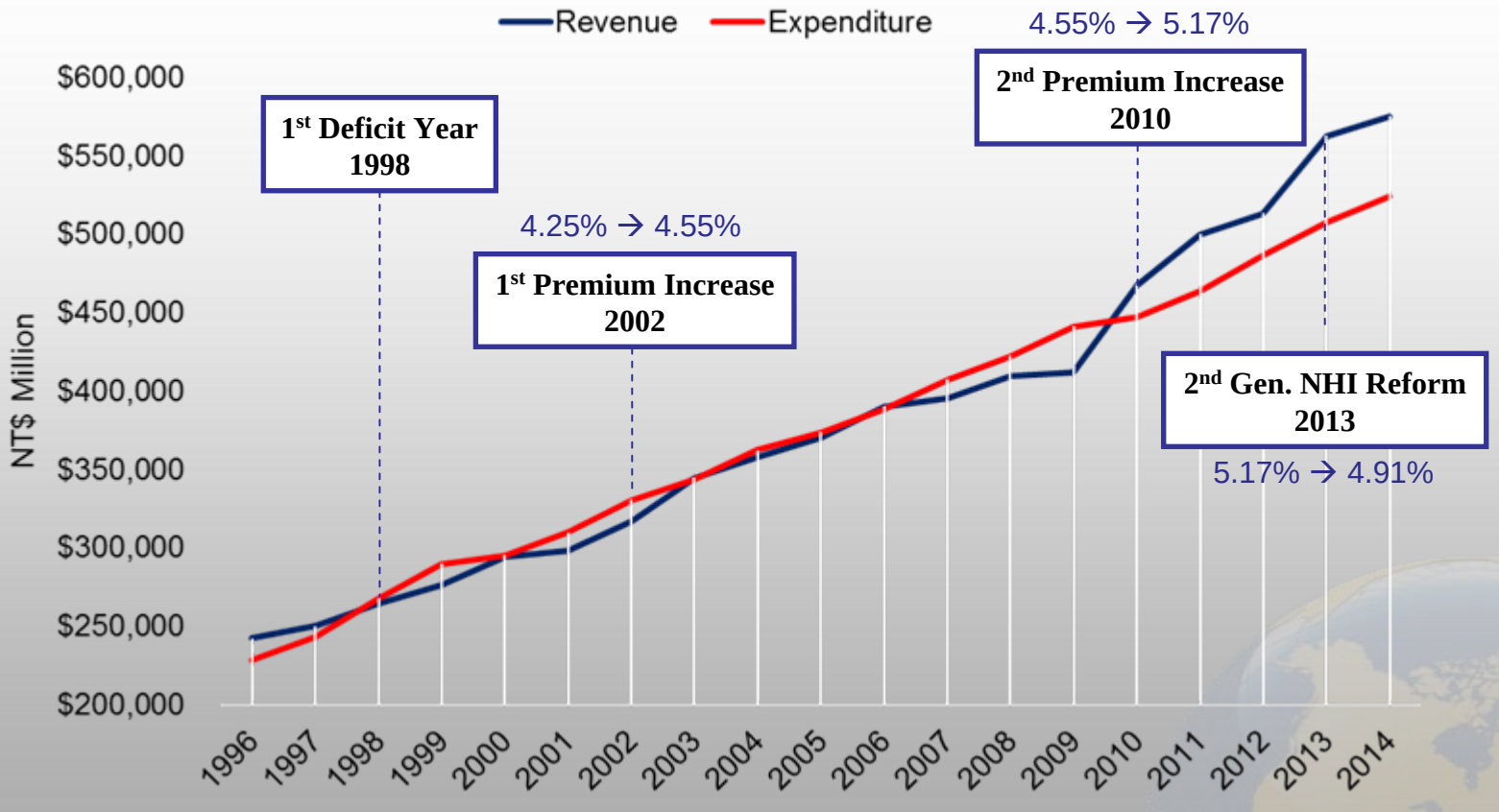


Basic and Health Indicators

	Pre-NHI		Post-NHI		
	1980	1990	2000	2010	
Basic Indicators					
Population (millions)	17.8	20.2	22.2	23.2	
Infant mortality (1/1,000)	9.8	5.3	5.8	4.2	↓
Life expectancy (years)					
Male	69.6	71.3	72.6	76.2	↑
Female	74.5	76.8	78.3	82.7	↑
% of population age 65+	4.3	6.2	8.6	10.7	
Healthcare Resources					
Physicians per 1,000 persons	0.7	1.0	1.3	1.7	↑
Hospital beds per 1,000 persons	3.2	4.1	5.1	6.9	↑
Healthcare Financing					
% of population insured	16.0	47.3	96.5	99.6	↑
Health spending as % of GDP	3.3	4.2	5.5	6.6	

Source: Routledge Handbook of Global Public Health in Asia; Health care financing in Taiwan, T.L. Chiang

NHI Revenues and Costs



Source: National Health Insurance Administration

NHI Challenges and Changes

Challenges of 1st Generation NHI

- Cumulative financial deficits
- Insufficient revenue source
- Lack of cost containment capabilities
- Ineffective check and balance

Highlights of 2nd Generation NHI

- Supplementary premium
- Linkage between revenues and expenditures
- Public oversight committees
- Better provider reporting and program transparency

NHI Administration

National Health Insurance Administration
Ministry of Health and Welfare

Headquarter	Regional Divisions	Committees
• Enrollment • Financial Analysis • Medical Affairs • Planning • Medical Review and Pharmaceutical Benefits • Information Management • Secretariat • Personnel Office • Accounting and Statistics • Civil Services Ethics	• Taipei Division • Northern Division • Central Division • Southern Division • Kaoping Division • Eastern Division	• National Health Insurance Committee • National Health Insurance Dispute Mediation Committee

NHI Integrated Circuit Smart Card

- The IC Card is used for accessing care under the NHI
- It has demonstrated a number of benefits: lower admin costs, improved convenience & better record keeping
- Data that can be stored on the IC Card:

Personal	NHI-related
• Name • Gender • Date of birth • ID number	• Remark for special status • Visits and admissions data • Premium records • Accumulated medical expenses • Amount of cost-sharing

Medical Service	Health Administration
• Current prescriptions • Certain medical treatments • Drug allergy information	• Immunization record • Organ donation designation • Do no resuscitate (DNR) instruction

Other NHI Technology

- **Electronic Claims System** (rolled-out in 1995)
  - Provides the infrastructure for auto-adjudication of claims and shortens the time it takes to approve or deny reimbursement; nearly all contracted providers file their claims electronically
- **Multiple Authentication Platform** (rolled-out in 2006)
  - Allows employers and individuals to file or update enrollment information and check premium payments online
- **PharmaCloud** (rolled-out in 2013)
  - Enables clinicians to check a patient's medication records for the last three months, improving patient safety and reducing waste
- **MyHealthBank** (rolled-out in 2014)
  - Enrollees can obtain their electronic medical records and view their insurance status online in real time

NHI Premium Formula

Standard Premium	Salary Basis x Premium Rate x Contribution Ratio x (1 + Number of Dependents)*
Supplementary Premium	[High Bonus; Part-time Wages; Professional Fees; Stock Dividends; Interest Income; Rental Income] x 2%

* Capped at a maximum of three

Note: The standard premiums have been fairly predictable while the supplementary premiums may have large variances.

NHI Premium Contribution Ratios

Insured Category	Insured	IROs	Government
1. Employees of publicly or privately owned enterprises or institutions	30%	60%	10%
Government employees	30%	70%	0%
Private school teachers	30%	35%	35%
Self-employed	100%	0%	0%
2. Occupation union members	60%	0%	40%
3. Farmers, fishermen & irrgation association members	30%	0%	70%
4. Military personnel & inmates	0%	0%	100%
5. Low-income households	0%	0%	100%
6. Veterans	0%	0%	100%
Dependents of veterans	30%	0%	70%
Community population	60%	0%	40%

Source: National Health Insurance Administration

NHI Benefits Coverage

The NHI offers comprehensive benefits package covering:

- Inpatient Care
- Outpatient Care
- Prescription Drugs
- Preventive Care
- Labs & Diagnostic Imaging
- Chinese Medicine
- Dental Services
- Vision Services

Patient OOP Costs

Copayments

- All patients (excl. certain disadvantaged groups) must pay a copay for medical service and prescription drug
- The outpatient copay ranges from 50-450 TWD (or 2-15 USD)
- If a patient has been hospitalized, the patient pay a coinsurance that ranges from 5%-30%

Medical Registration Fees

- It is common for providers to collect a registration fee in addition to the required copay under the NHI
- The registration fee is an administrative fee; the fee amount is set by each provider within the limits approved by the local public health departments
- The registration fee ranges from 0-150 TWD (or 0-5 USD) for office visit and 0-300 TWD or (0-10 USD) for emergency care

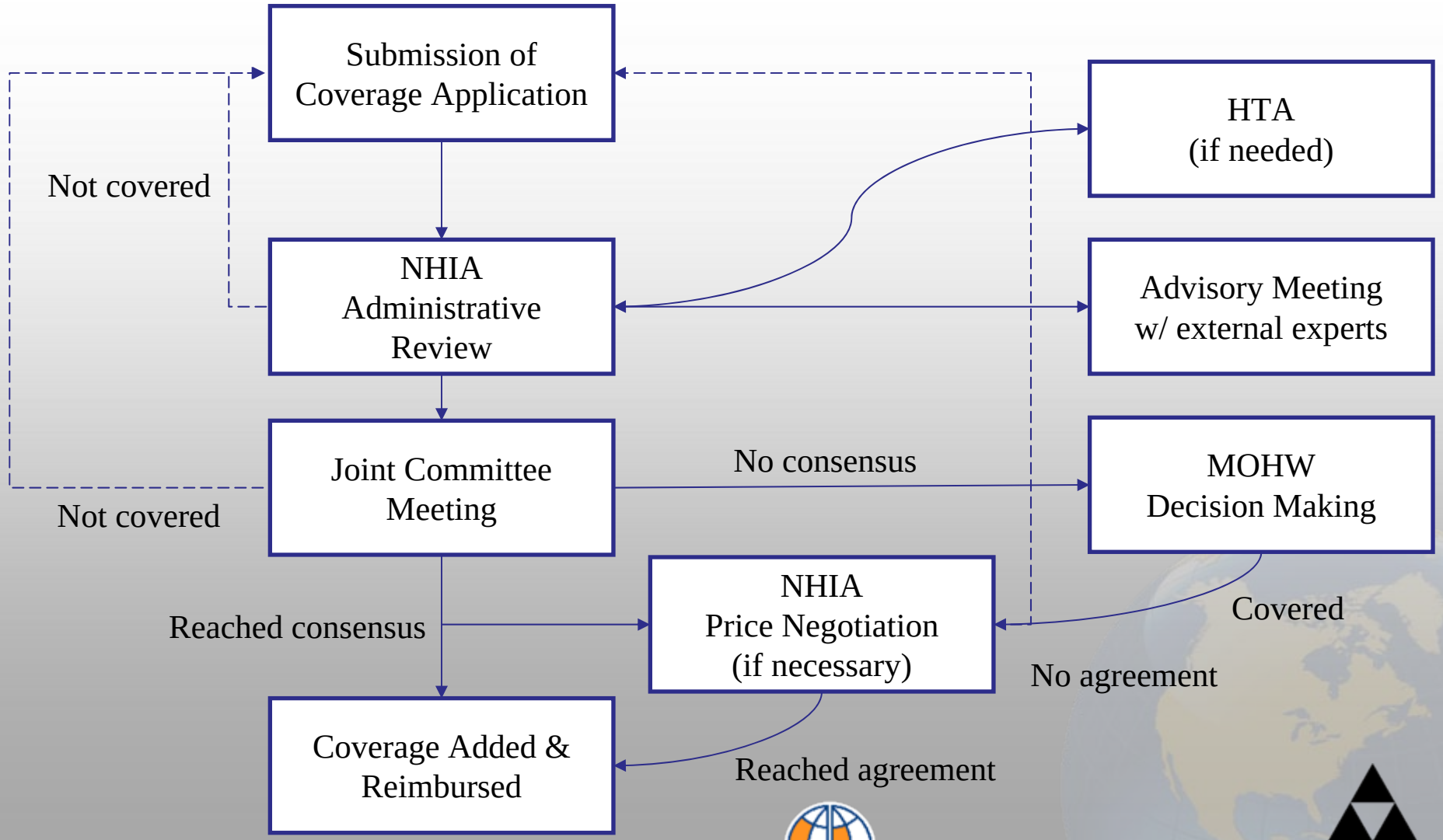
Partially Covered Devices

- The NHI provides partial coverage to certain high cost medical devices to give patients more choice in their treatment
- The partial coverage provides the same level of reimbursement as their conventional equivalents
- The partially covered devices include drug-eluting stents, artificial hip, joints, lenses, and bio-prosthetic heart valves

Not Covered Services

- While the NHI offers a comprehensive benefit package, it only covers services that are deemed medically necessary by NHI
- Whenever a physician recommends a course of treatment that is not covered by the NHI, the patient must provide consent and choose to pay for the elective services out-of-pocket

NHI Benefits Decision Process



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American Academy of Actuaries

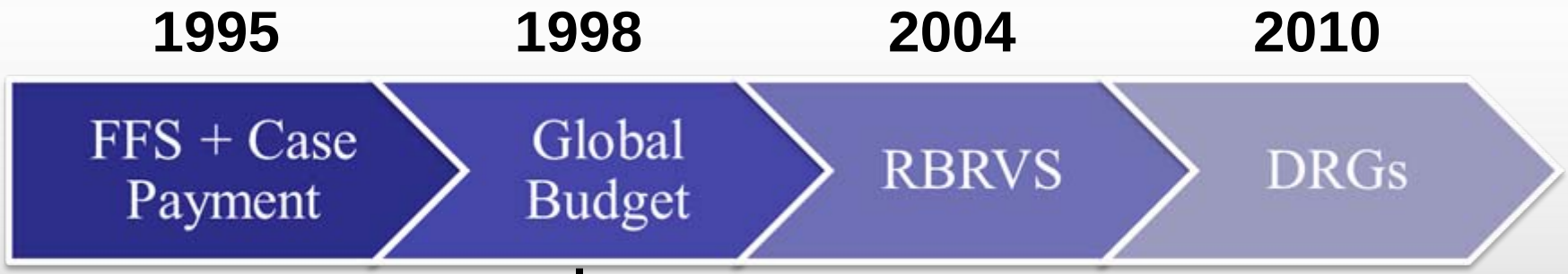
NHI Provider Contracting

Unit: Number of Institutions

2015	Total	Hospitals	Clinics	Chinese Medicine Hospitals	Chinese Medicine Clinics	Dental Clinics
Total Health Care Institutions	22,124	479	11,319	12	3,664	6,650
Contracted Health Care Institutions	20,620	479	10,186	10	3,421	6,524
% Contracted	93.2%	100.0%	90.0%	83.3%	93.4%	98.1%

Source: National Health Insurance Administration

NHI Provider Payment Schemes



Four Sectoral Budgets:

- 1998 Dental Care
- 2000 Traditional Chinese Medicine
- 2001 Clinics
- 2002 Hospitals

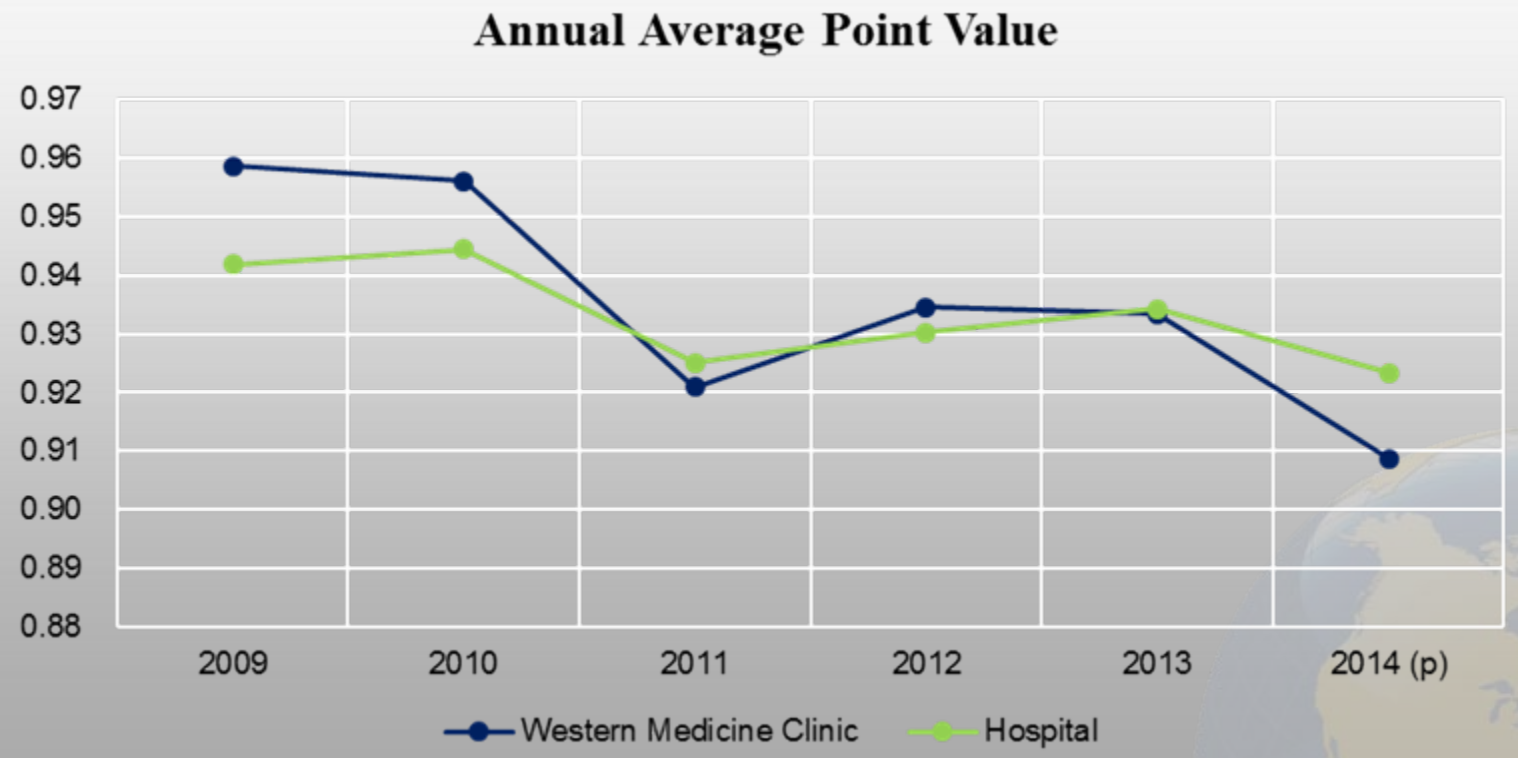
Annual NHI Global Budget Growth

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Growth	4.5%	4.5%	4.7%	3.9%	3.3%	2.9%	4.3%	4.4%	3.3%

Source: National Health Insurance Administration

Deflating NHI Payment Point Value

$$\textbf{Point Value} = \frac{\text{Total Global Budget \$}}{\text{Total Relative Value Unit of Services}}$$

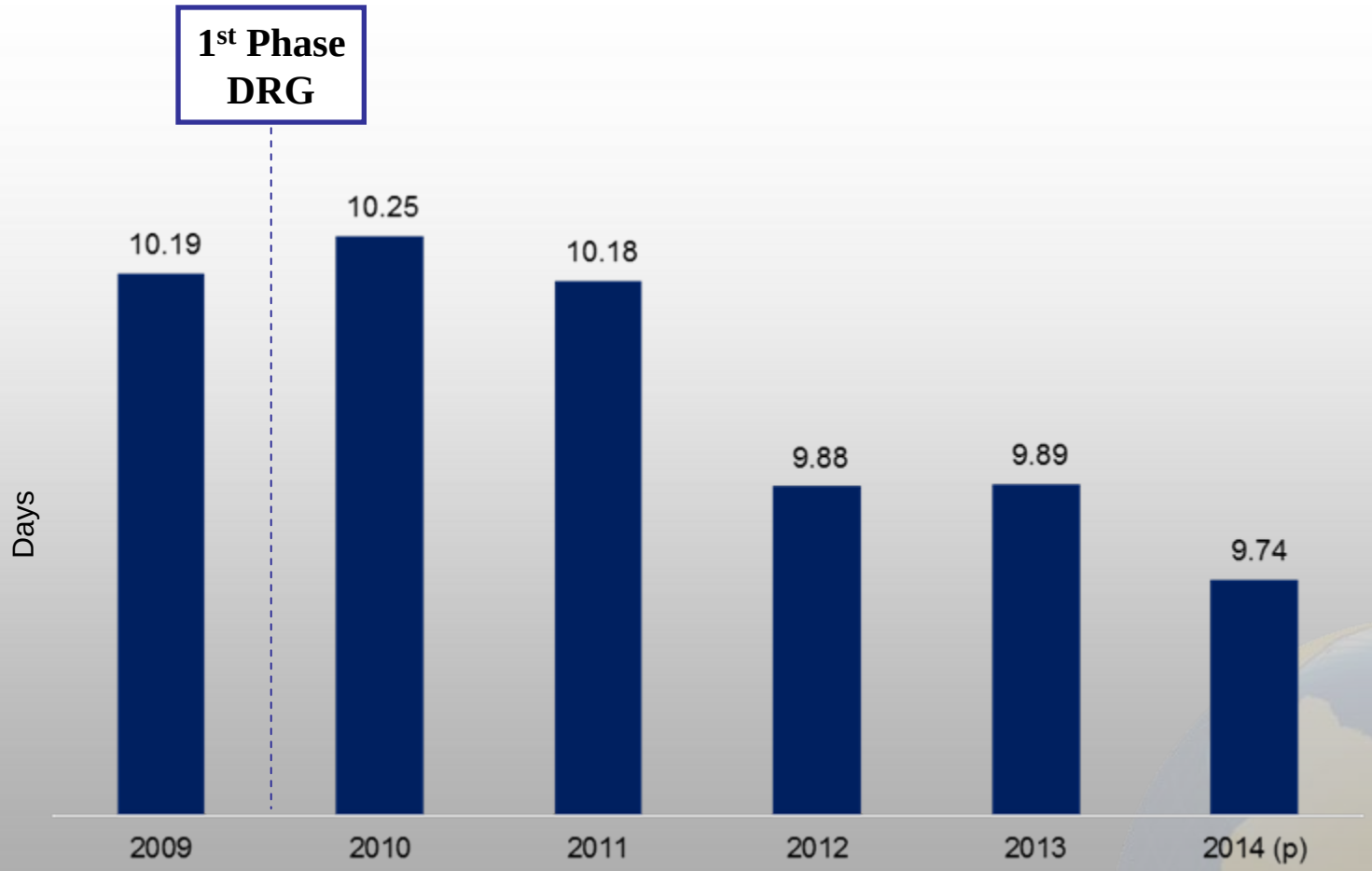


Source: National Health Insurance Administration
Remark: (p) projected

Tw-DRGs

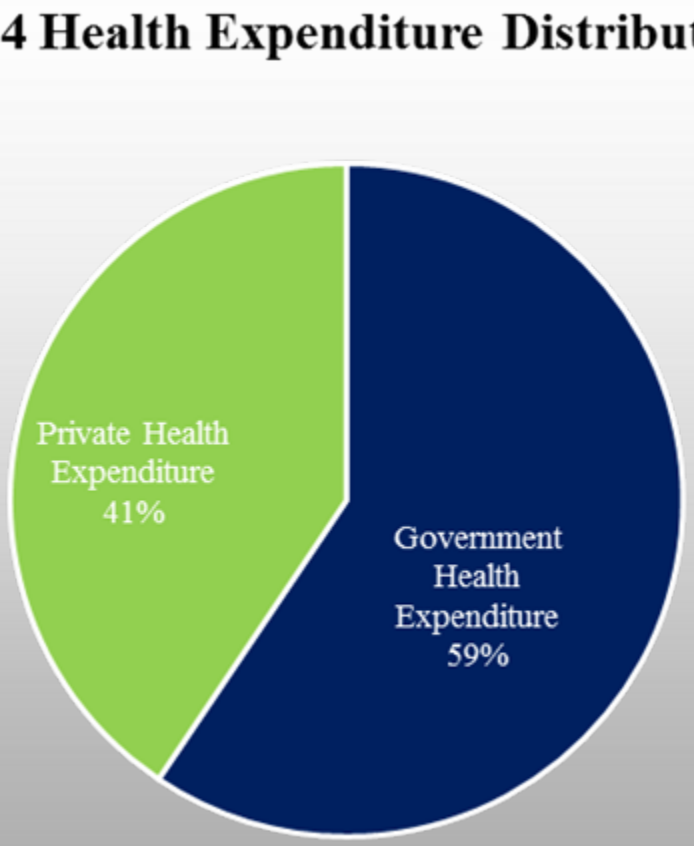
- Taiwan's version of diagnosis related groups (Tw-DRGs) were first launched in July 2010 to further promote efficiency and better care quality
  - 2010: 164 DRGs were introduced for paying inpatient services
  - 2014: additional 254 DRGs were added
  - Additional DRGs pending, however, provider resistance has continued to delay the full roll-out
- The system design was based on the 18th version of the U.S. Medicare DRGs, with adjustments to reflect the specific health care needs in Taiwan

Inpatient, Average Length of Stay



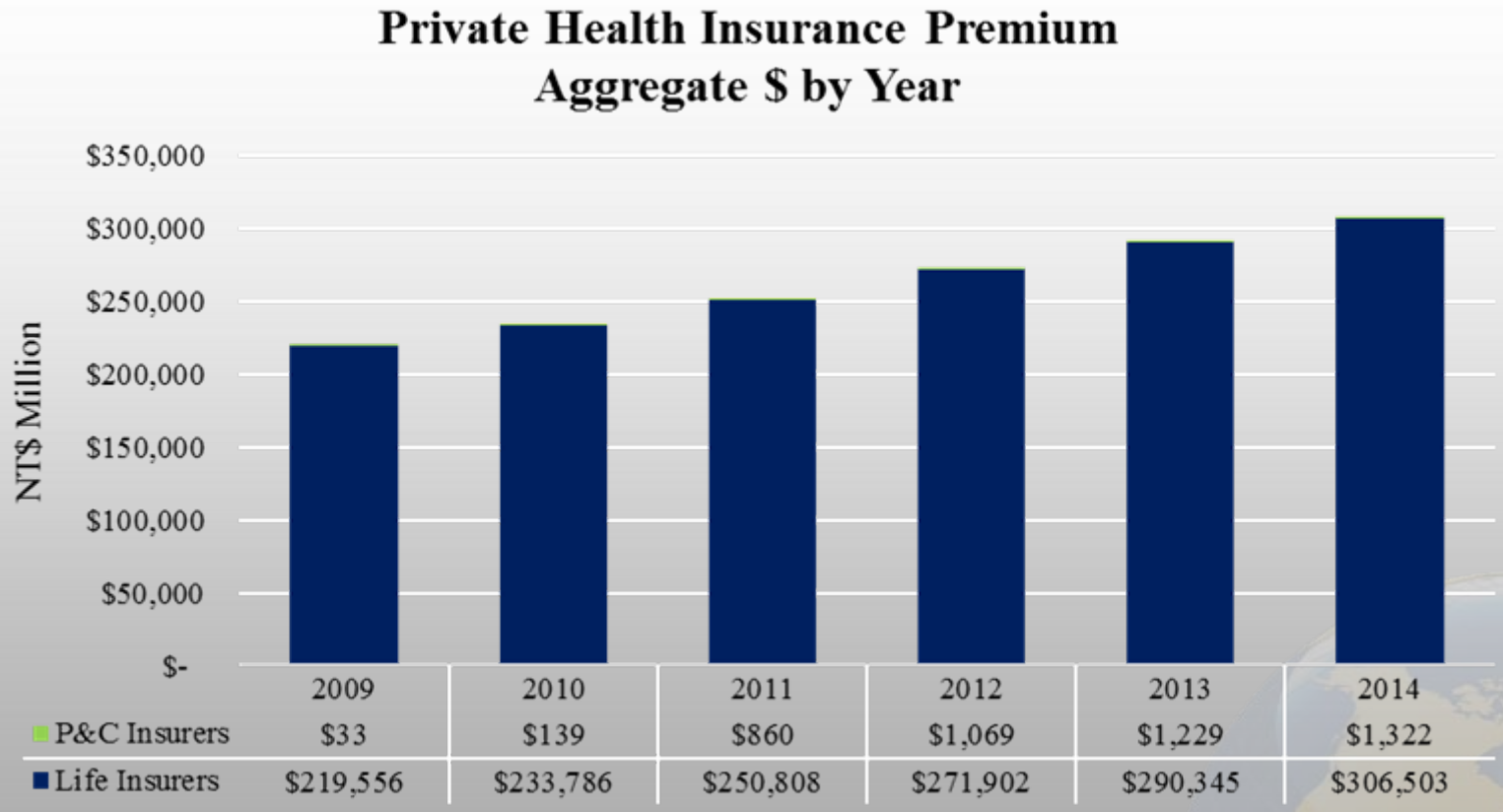
Source: National Health Insurance Administration
Remark: (p) projected

Government / Private Expenditure



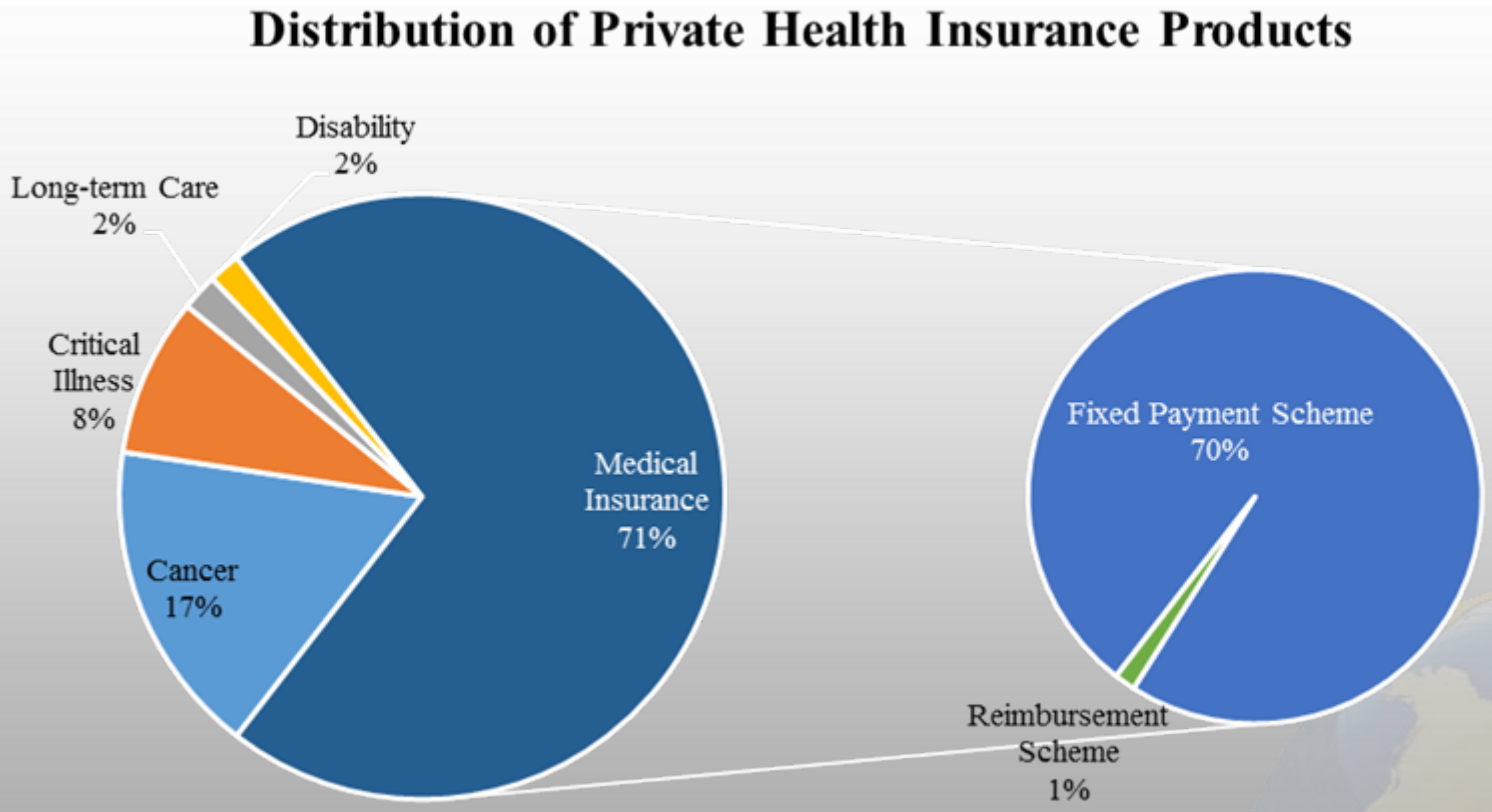
Source: Ministry of Health and Welfare

Private Health Insurance Premiums



Source: Taiwan Insurance Institute

Private Health Insurance Products



Source: Taiwan Insurance Institute, Insurance Product Filings Accessed on 03-12-2015

Role of the Actuary

National Health Insurance:

- Limited involvement; actuaries serve on the project oversight committee responsible for the review of the actuarial study conducted every five years

Private Health Insurance:

- Actuaries lead and support various product development, pricing, and valuation work related to supplemental health insurance at private insurers and reinsurers

Lessons from Taiwan

- The single-payer approach not only has its administrative advantage with the uniform systems, but it can also offer equitable access to quality health care
- Upfront investment in technology systems and infrastructure can increase the efficiency and effectiveness of the insurer's administrative processes
- The insurer should have autonomy to adjust premiums, set budgets, and allocate funds to ensure long-term sustainability
- While a single-payer can regulate prices under a FFS payment scheme, it cannot manage the growth of health care expenditure without global budgets

Thank you

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Exploring Global Health Care Cost Drivers Hong Kong

Lawrence Tsui

About Hong Kong

Population: 7.2 million

Land Area: 2,755 km^2

Per Capita GDP (2015):

- US$ 42,437
- US$ 56,428 (ppp)

Per Capita Total Health Exp:

- US$ 2,009 (2012/13) or US$ 2,672 (ppp)
- 5.4% of GDP (2013)

Life Expectancy (2014):

- 81.2 male / 86.9 female

Sources: Wikipedia, HK Food & Health Bureau

Health Statistics and Outcomes

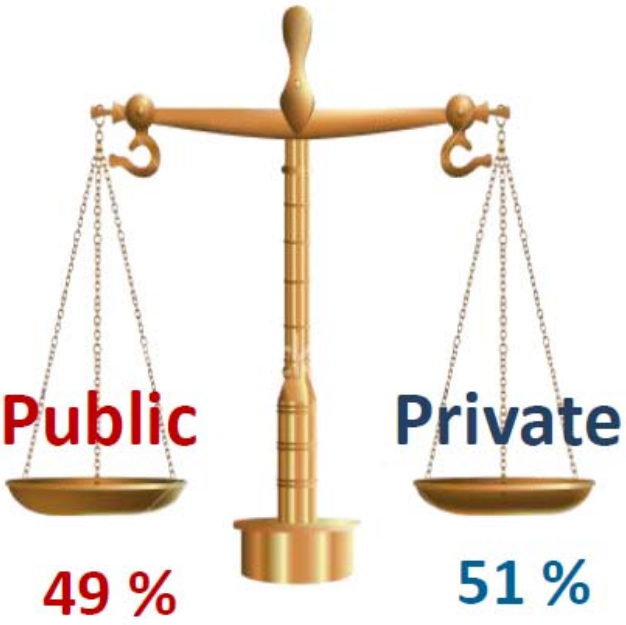
	HK 2004	HK 2009	HK 2014	US 2013
Total Health Expenditure (% of GDP)	5.5	5.0	5.4 (2013)	17.1
% of Public Expenditure	57.7	49.3	47.6 (2013)	47.1
% of Private Expenditure	42.3	50.7	52.4 (2013)	52.9
Licensed Doctors per 1,000 of popn	1.7	1.8	1.9	3.3
Licensed Nurses per 1,000 of popn	6.5	5.5	6.6	11.1
Hospital Beds per 1,000 of popn	4.3	4.0	4.0	2.9 (2012)
% of Population > 65	12.1	12.9	14.7	14.5 (2014)
Total Fertility Rate (per female 15-49)	0.92	1.06	1.23	1.86 (2014)
Crude Birth Rate per 1,000 of popn	7.3	11.8	8.6	12.5 (2014)
Crude Death Rate per 1,000 of popn	5.4	5.9	6.2	8.2
Infant Mortality per 1,000 live births	2.7	1.7	1.7	6.0 (2012)
Life Expectancy (M/F)	79.0/84.8	79.8/85.9	81.2/86.9	76.4/81.2

Hong Kong and Capitalism

- #1 in Index of Economic Freedom 2008-2016
  (2016 U.S. #11, Taiwan #14)
  Source: Heritage Foundation
  - HK Government Expenditure (2016-17 Budget Estimate)
    21.2% of GDP (vs 38.1% U.S. 2014)
  - HK Government Healthcare Budget
    15.9% of Total Government Expenditure (vs 24% U.S. 2014)

Hong Kong "Dual Track" Healthcare Public vs Private Imbalance

Health Expenditure



Public 90% Private 10%

Inpatient Service (bed days)

Public 30% Private 70%

Outpatient Service (attendance)

Source: Hong Kong Food & Health Bureau

Price vs Cost of Public Healthcare Services (2013)

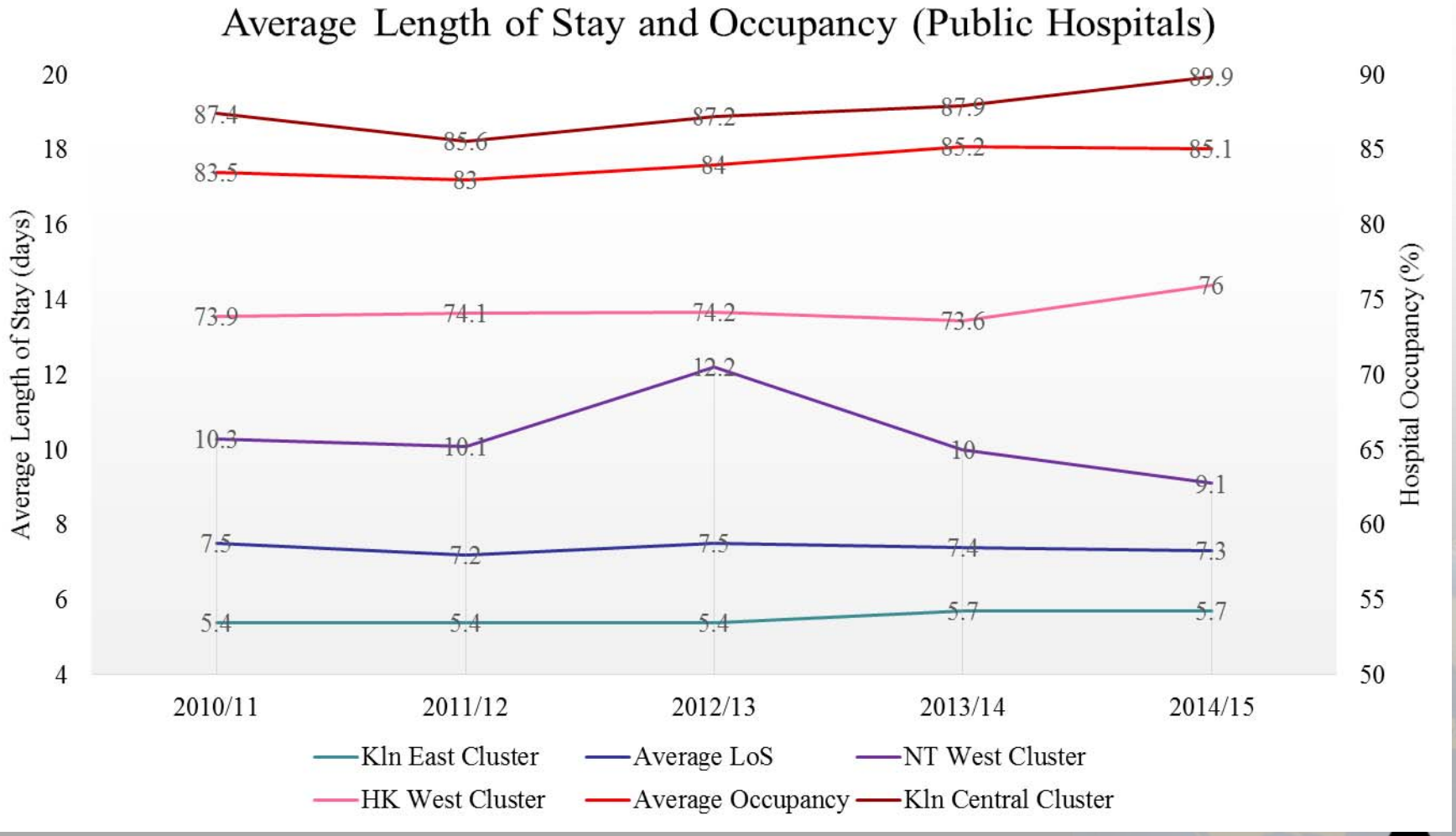
Service	Fees	Cost	Subsidized Rate
Accident & Emergency	US$13 $100 per attendance	US$90 $700	86%
In-patient (general acute beds)	US$13 $100 per day	US$489 $3,790	97%
In-patient (convalescent, rehabilitation, infirmary & psychiatric beds)	US$9 $68 per day	US$188 $1,460	95%
Specialist out-patient	US$13 / $8 $100 (1st attendance) $60 (subsequent attendance)	US$68 $530	81%-89%
Specialist out-patient (drug)	US$1.30 $10 per drug item	US$15 $120	92%
General out-patient	US$6 $45 per attendance	US$32 $250	82%

Source: Hong Kong Food & Health Bureau

Public Healthcare Facilities

- Public Healthcare Facilities (end 2015)
  - 7 clusters (by geographical region)
  - 42 public hospitals and institutions
    - 27,895 Hospital Beds (Top 8: 71%; Top 16: 93% of Discharges)
    - 2,225,486 A&E attendances in 2015
  - 47 specialist outpatient clinics
    - 9,824,666 specialist outpatient attendances in 2015
  - 73 general outpatient clinics
    - 5,985,630 general outpatient attendances in 2015
- Private Healthcare Facilities (end 2015)
  - 11 private hospitals
    - 4,014 Hospital Beds

Public Hospital Performance



Source: Hong Kong Hospital Authority

Public vs Private Hospitals

- Public Hospitals
  - Provide vast majority of emergency and acute care
  - Hong Kong residents pay a very heavily subsidised fee, with subsidies funded from general tax revenue
  - Subject to long waiting lists for non-emergency treatment
- Private Hospitals
  - Focus on elective / non-emergency treatment
  - No regulation of charges and little transparency, with charges for almost all services differing by level of accommodation (Private, Semi-Private, General Ward)

Private Health Insurance

- Private health insurance purely voluntary (~40% of population) and primarily covers
  - treatment in private hospitals and avoidance of waiting lists
  - outpatient consultations and treatment (mostly group cover)
- Group and individual private health insurance
  - Group cover for employees (and families) not subject to underwriting (larger schemes), but subject to employee "actively-at-work" – pre-existing conditions sometimes waived for larger schemes
  - Individual cover typically fully underwritten and risk-rated with both general pre-existing conditions exclusions and specific exclusions for disclosed impairments

Private Health Insurance Products

- Medical Reimbursement (mostly YRT/Attained Age)
  - Mass-Market Plans with many inner limits
    - R&B, Physician Visits, Specialist Visits
    - Surgeon/Anaesthetist/Op Theatre Fees
    - Miscellaneous Charges, Diagnostic Tests, Prescribed Medicines
    - Day Surgery, Outpatient Cancer, Pre-/Post-Hospitalisation, TCM, etc.
    - May have Annual / Lifetime limits, some Deductibles
  - "High-End" Plans
    - Envisage Private / Semi-Private Accommodation
    - Annual Limits
- Other Health Insurance Products (Level Prem or YRT)
  - Critical Illness, Cancer, Hospital Cash, etc.

Private Healthcare Services Group Insurance (2014)

Summary of Total Billed Amount and Average Cost – Group Policies

Description	Total Billed Amount: Amount (HK$000's)	Total Billed Amount: %	Number of Cases: Number	Number of Cases: %	Average Cost Per Claim (HK$)	
2014						
In-Patient	3,333,550	49%	189,148	2%	17,624	US$2,272
Out-Patient	3,479,103	51%	9,110,903	98%	382	US$49
Total	6,812,654	100%	9,300,051	100%	733	

Average Billed and Paid Amounts by Level of Accommodation – Group Policies

Level of Accommodation		Billed (HK$)	Relativity Factor	Paid (HK$)	Relativity Factor	Reimbursement %
2014						
Private	US$10,339	80,204	237%	40,900	169%	51%
Semi-Private	US$5,488	42,573	126%	31,375	130%	74%
Ward	US$4,361	33,828	100%	24,154	100%	71%
Day Case	US$709	5,500	16%	4,547	19%	83%

Source: Hong Kong Federation of Insurers

Private Healthcare Services Individual Insurance (2014)

Summary of Total Billed Amount and Average Cost – Individual Policies

Description	Total Billed Amount (HK$000's)	%	Number of Cases Number	%	Average Cost Per Claim (HK$)	
2014						
In-Patient	4,652,300	98%	166,971	61%	27,863	US$3,592
Out-Patient	83,891	2%	104,856	39%	800	US$103
Total	4,736,191	100%	271,827	100%	17,424	

Average Billed and Paid Amounts by Level of Accommodation – Individual Policies

Level of Accommodation		Billed (HK$)	Relativity Factor	Paid (HK$)	Relativity Factor	Reimbursement %
2014						
Private	US$10,430	80,905	247%	63,882	232%	79%
Semi-Private	US$5,140	39,874	122%	31,670	115%	79%
Ward	US$4,227	32,792	100%	27,493	100%	84%
Day Case	US$1,130	8,763	27%	7,429	27%	85%

Source: Hong Kong Federation of Insurers

Major Cost Drivers

- Total Health Expenditure forecast to increase from 5.4% of GDP in 2013 to 9%+ of GDP by 2033
- Ageing
  - Elderly Dependency Ratio (65+ vs 15-64) expected to increase from ~20% in 2016 to ~50% by 2041
  - Elderly population aged > 65 uses ~6x more in-patient care (bed days) than population aged < 65
- New medical technology / drugs
  - Very “light touch” regulation on introduction of new treatments in private sector (more or less following FDA)
  - More rigorous cost-benefit analysis for public sector

Coping with Cost Drivers

- Extremely limited political will / ability to increase charges in the public sector
- Public sector cost control mostly by rationing supply
  - Long waiting lists (Hospital Authority as at 30 June 2016)
    - Cataract Surgery — 8-30 months (varies by region)
    - Joint Replacement Surgery — 11-74 months (varies by region)
    - Speciality Outpatient Consult (varies by region and specialty)
      - Urgent Case — 1-2 weeks (90th percentile)
      - Semi-Urgent Case — 3-8 weeks (90th percentile)
      - Stable Case — 17-164 weeks (90th percentile)
- Drug formulary reviewed by Advisory Committee
  - General, Special, Self-Financed (with/without safety net)

Coping with Cost Drivers

- Pilot programs for Public-Private Partnership
  - Cataract Surgeries Program
    - one-off HK$5,000 / US$645 subsidy to undergo surgery in the private sector (additional charges capped at HK$8,000 / US$1,031)
  - Elderly Healthcare Voucher Pilot System
    - All Elderly age > 70 given 5 x HK$50 (US$6.50) voucher for Private Primary Care Providers
  - Tin Shui Wai Primary Care Partnership Project
    - Eligible patients may enrol with a private medical practitioner and receive up to 10 consultations at HK$45 (US$6) each
  - Other PPP Projects to use spare capacity in private sector to compensate for capacity shortages in public sector

Healthcare Reform

- Enhanced role of Private Health Insurance
  - Provide more choices with better protection to those who are able and willing to pay for private health insurance and private healthcare services
  - Relieve public queues by enabling more people to choose private services and focus public healthcare on target service areas and population groups
  - Better enable people with health insurance to stay insured and make premium payment at older age and meet their healthcare needs through private services
  - Enhance transparency, competition, value-for-money and consumer protection in private health insurance and private healthcare services

Three Decades of Public Consultation on Healthcare Reform (but little action)

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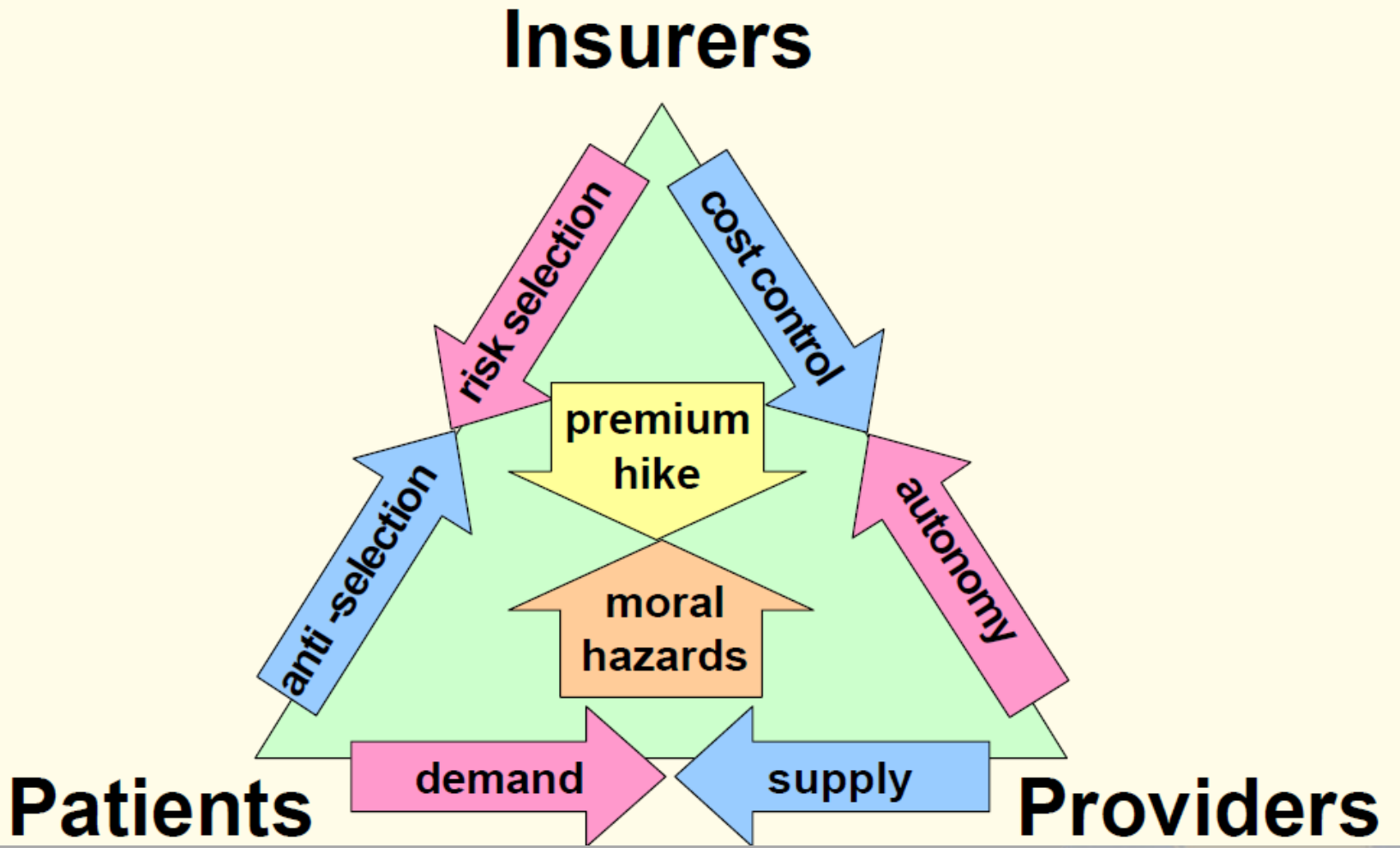
Healthcare Reform Proposals 2014-15

- Guaranteed renewability for life, no lifetime limits, with portability between insurers
- Standardised basic coverage (subject to minimum coverage requirements), policy terms and conditions
- Limits on cost-sharing by policyholders
- Transparent pricing information for customers
- Guaranteed acceptance with coverage of pre-existing conditions subject to waiting periods, premium loadings (capped at +200%), partly funded by government high-risk pool
- Informed financial consent (written quotations from providers) and package pricing requirements for some procedures

Challenges



Source: Hong Kong Food & Health Bureau

Challenges

- Ageing population and increasing healthcare costs
- Inability to increase charges for Public Healthcare
- Significant barriers to access to Private Health Insurance for chronically ill and elderly
- Multiple stalled attempts at getting insurers and providers on-board with Healthcare Reform
- Restricted supply of doctors
- No regulation of private healthcare provider charges and very limited price transparency
- Lack of reliable, credible, standardised data

Role of Actuaries

- Historically limited role in Health Insurance but has grown significantly in recent years
  - Private Insurers - General and Life Insurance
  - Consultants
  - Reinsurers
  - Government / Food & Health Bureau
- Actuarial Society of Hong Kong Statistics
  - As at July 2016, 1,060 members (incl 688 Fellows)
  - 11 members list Health Insurance as Primary Practice Area (but 17 with “Health” in their job title)

Lessons from Hong Kong

- Favourable health outcomes are possible with relatively low levels of health expenditure
- But subject to heavy constraints on supply (waiting lists), low comfort levels in public healthcare facilities
- Pure reliance on “market solutions” results in service failure for lower income groups, elderly and chronically ill
- Lack of coordination between healthcare authorities, providers and insurance companies leads to poor data quality for actuaries
- Power of inertia in healthcare systems –
  Healthcare “reform” is very difficult!

Thank you

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Question and Answer

Question and Answer Session

Next Webinar

Exploring Global Health Care Cost Drivers: France and the UK

October 5