Healthcare Landscape in Asia – Use of Health Economics in Community Health

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Outline

- Transition of “Evidence-based” to “Value-based” medicine
- Value-based assessment
- What is “Value” and how it is measured?
- Value-based research studies at community level
- Summary and take home messages

Background

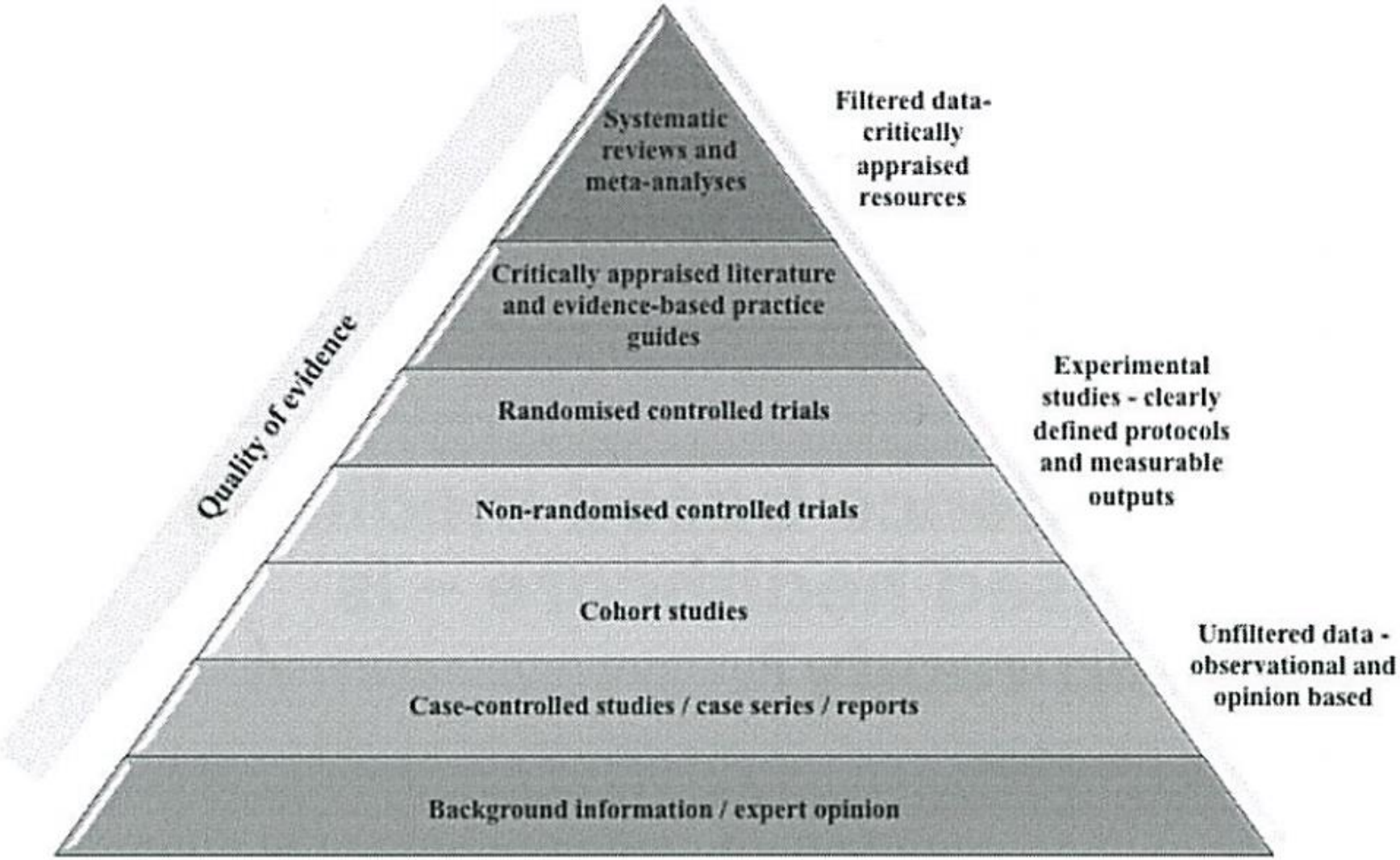
Economics of health care

- “Supply and demand”: if the price of a commodity is too high, consumer demand will decrease and supply will therefore consequently decrease too and vice versa
- Theory of “Elasticity”
- Healthcare spending by individuals is “inelastic”: does not follow the normal “supply and demand” rule e.g. no matter how expensive insulin syringes are, diabetic patients would need to purchase it or find way to do so
- Demand is always on the rise, yet prices are also increasing, sometimes even faster than inflation rate
- Somehow some approaches will need to be in place to ensure demand is met (accessibility), patient still afford to purchase (affordability), and the system can continue (sustainability)
- Potential solution: to establish the **“VALUE”** of new medicines

Transition from Evidence-based to Value-based Medicine

Evidence-based medicine (EBM)

- Core of clinical decision making in late 1990s
- Decision was based on best available research information rather than solely on a clinician's expertise, so as to minimize the uncertainties of clinical examinations (Bae 2013, 2014)
- Quality of evidence : 7-level system



(http://s3-ap-southeast-2.amazonaws.com/crcaustralia/wp-content/uploads/2017/04/11055225/figure1_bis.jpg)

Adapted from an evidence based medicine pyramid generated by Dartmouth College (6) and Central Michigan University (7).

Evidence-based Medicine

Concerns:

- Patient's preference not taken into decision-making process
- Efficacy from clinical trials vs clinical effectiveness
- As healthcare cost increases, questions arise:
  - are we paying the right cost for the service
  - are we able to maximize the benefits with our spending
  - is the level of spending sustainable

Value-based medicine (VBM)

- “VBM” was introduced in early 2000s
- Definition: The practice of medicine incorporating the highest level of evidence-based data with the patient-perceived value conferred by healthcare interventions for the resources expended (Brown 2005)
- 3 components of VBM
  - use of best research evidence available
  - Patient’s “values” are converted into measurable parameters called “utilities”
  - cost-utility analysis (CUA) forms the basis for decision-making

Fig. 1. The value-based medicine pyramid.

Source: Brown 2003

What is “Value” and how it is measured

Cost vs Value

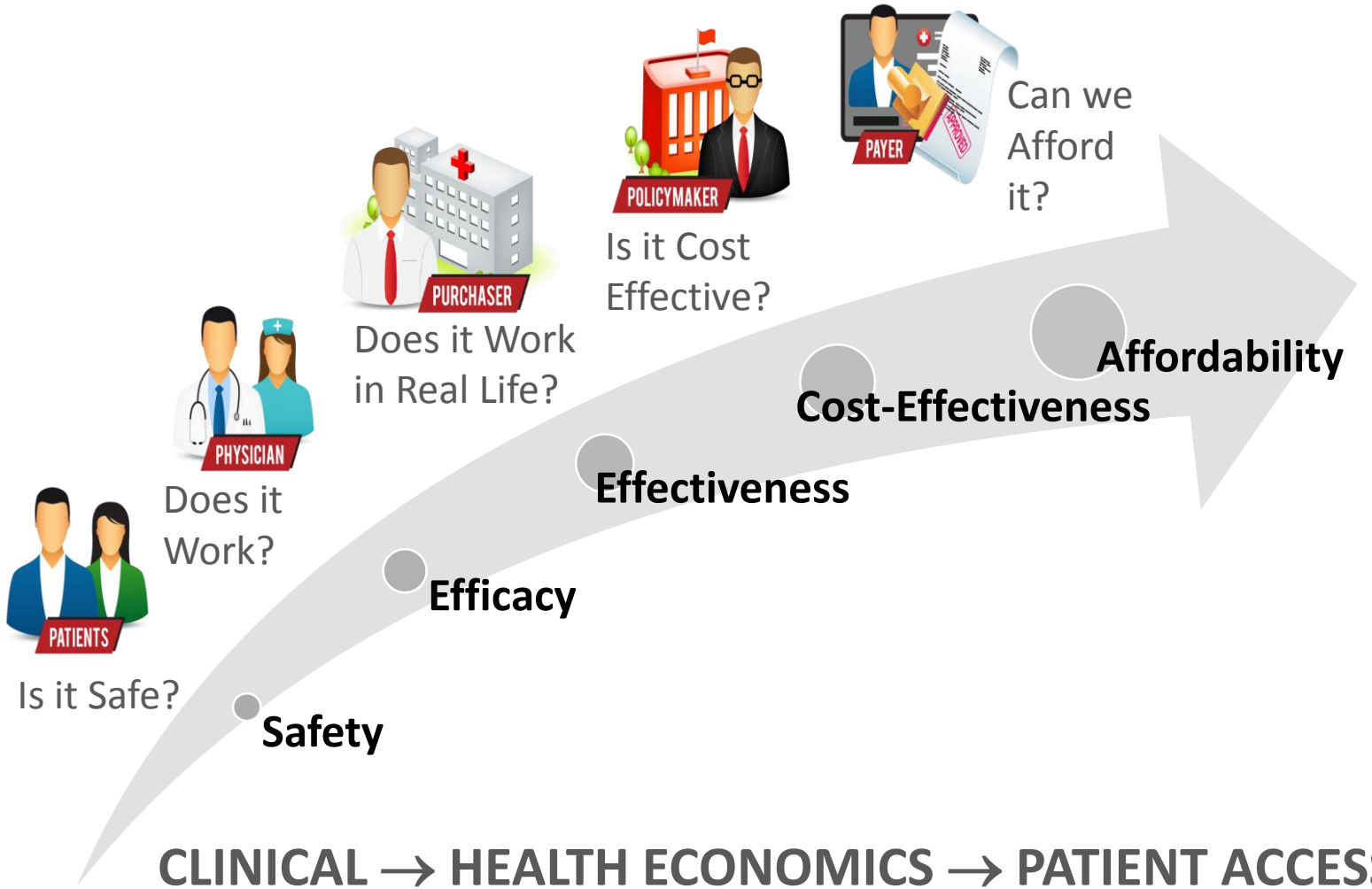
Cost

- Fixed
- Easy to count
- visible

Value

- Uncertainties exist
- Difficult to estimate
- Difficult to demonstrate
- Humanistic consideration included
- Examples: quality-of-life, overall effect on the society, impact on the management guideline etc

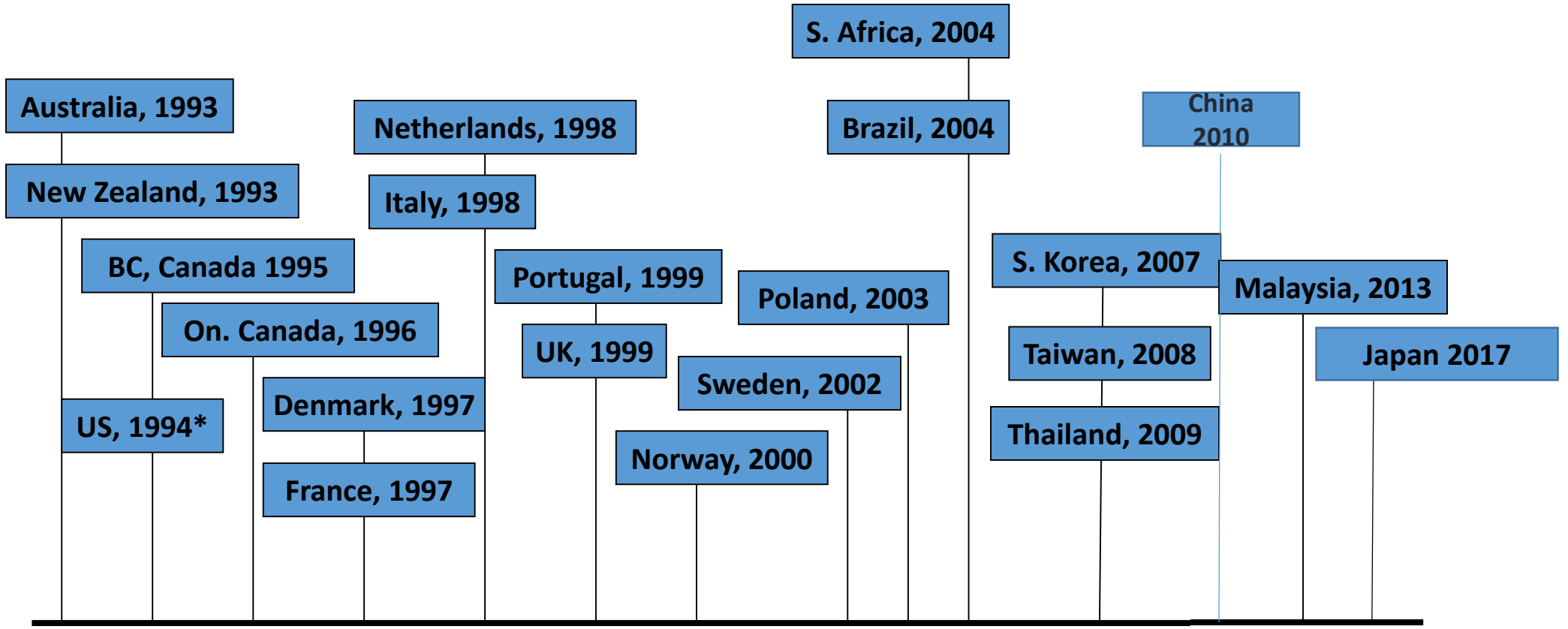
Steps to establish “value” of a medicine



How is “value” measured?

- Concept of Quality-adjusted life-year (QALY) introduced in 1968 by Klarman et al for renal disease managements
- Reason: difficult to compare costs and benefits of treating different conditions by traditional bio-indicators e.g. benefits in treating cancer vs mental illnesses
- QALY: able to compare cost effectiveness between different conditions
- Through Health Technology Assessment (HTA)
- Applications: registration, formulary listing, price-setting, disease management guidelines, new patient access schemes
- Analytical tool: Cost Utility Analysis (CUA)
- Incremental cost effectiveness ratio (ICER): Increase in cost/Increase in QALY

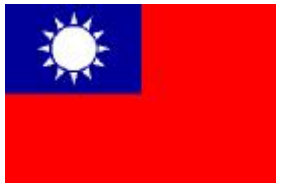
Formal use of Health Technology Assessment (HTA) for new pharmaceuticals around the world



S. Korea

- HTA introduced in April 2007 as a component of health care reform
- Aims to assess the safety and effectiveness of new health technology
- To encourage the development of high technology in health care sector
- Organizations involved: National Health Insurance Corporation (NHIC) and Health Insurance Review Agency (HIRA)

Taiwan



- Division of HTA was established in late 2007 under the Centre for Drug Evaluation (CDE), a non-profit-making NGO funded by the DoH of Taiwan
- The division became operational in early 2008
- Major function: to provide evidence report to Bureau of National Health Insurance (BNHI) for every new drug submitted for reimbursement

Recent study to compare health care technology assessment in Singapore, Malaysia and Indonesia

	Singapore	Malaysia	Indonesia
Demographics			
Population	5,888,926 (July 2017 est.) country comparison to the world: 113	31,381,992 (July 2017 est.) country comparison to the world: 41	260,580,739 (July 2017 est.) country comparison to the world: 4
Population by age	65 years and over: 9.63% Median age:: 34.6 years Country comparison to the world: 84	65 years and over: 6.1% Median age: 28.5 years Country comparison to the world: 129	65 years and over: 7.01% Median age: 30.2
Literacy (Adult)	97.2 (2017)	93.12 (2010)	95.22 (2010)
Absolute GDP per capita (USD)	$90,500 (2017 est.) country comparison to the world: 7	$28,900 (2017 est.) country comparison to the world: 69	$12,400 (2017 est.) $country comparison to the world: 127
Health care spending			
As % of GDP per capita	4.9% of GDP (2014)	4.53% of GDP (2016)	2.8% of GDP (2014)

	Singapore	Malaysia	Indonesia
Philosophy of health care (shared vs governmen t alone)	**"Shared responsibility"** approach. To keep healthcare costs affordable and sustainable for all Singaporeans. Patients pay for part of their treatment. The remaining funds come from government subsidies.	Universal healthcare system that offers public health services to the entire population at **heavily subsidized rates.** The public healthcare system co-exists with a private healthcare sector, where patients pay out-of-pocket or through private health insurance schemes	**National health insurance** (JKN) introduced in 2014. Implementation of JKN is driving the rest of the country's health sector as a new model of supply and demand emerges. Government prefers more cost-saving mechanisms such as use of generics.
Health insurance (diffusion as %)	100% diffusion under MediSave (compulsory 8-10.5% monthly salary), MediShield, ElderShield, Medifund, and CHAS	In 2017 government proposed to introduce a voluntary national health insurance system in 2018. Current diffusion rate: about 25%	National health insurance programme (JKN) in 2014 as part of the National Social Security system in the country. JKN aims to achieve universal health coverage for the entire population by 2019. Another objective of JKN is to protect the insured from the financial burden of healthcare costs by reducing OOP health care payments.

Health outcomes	Singapore	Malaysia	Indonesia
Life expectancy at birth	total population: 85.2 years country comparison to the world: 3	total population: 75.2 years country comparison to the world: 109	total population: 73 years country comparison to the world: 143
Infant mortality rate (as deaths per 1,000 live births)	total: 2.4 deaths/1,000 live births Country comparison to the world: 4th (CIA 2018)	total: 12.5 deaths/1,000 live births Country comparison to the world: 118th (CIA 2018)	total: 22.7 deaths/1,000 live births Country comparison to the world: 152nd (CIA 2018)
World ranking in health	1 (Asia), 4 (World) Bloomberg index 2017 WHO Health system Performance ranking: 6	WHO Health system Performance ranking: 49	WHO Health system Performance ranking: 92

Evaluation of new drugs	Singapore	Malaysia	Indonesia
Use of HTA	Y (1995)	Y (2016)	Y (2014)
HTA authority	Agency for Care Effectiveness (ACE) MoH	Malaysian Health Technology Assessment Section (MaHTAS) and Pharmaceutical Division MoH	
Guideline for HTA	Y	Y	Y
Innovative access scheme	Y	Y	N
Capacity building	Y	Y	Y
Incremental Cost-effectiveness Ratio (ICER) Threshold	Nil	1 GDP	

Results from preliminary analysis

- Singapore has the most efficient system among the 3 systems studied
- Reasons for success
  - Strong government with heavy involvement in regulating prices, supply of health care professionals and access to new medicines
  - Government-funded agency to conduct HTA to inform policy-making since 1995 thus improving access to new innovative drugs
  - Hybrid health care financing model poses a smaller burden on government compared to other state-funded systems
  - Concept of “shared responsibility” in maintaining health is well established among Singaporeans
  - Relatively small population but healthier than most other countries
  - Higher adult literacy, hence health knowledge is high
  - Formidable reserves allowing tough decisions to invest in health care

Health care research at community level

Outcome measurements due to interventions:

- Change in health indicators
- Change in quality of life (measured as Quality-adjusted life-year (QALY)) with increased spending
- Long term cost-effectiveness
- Long term cost savings

Tele-monitoring and team-based management of glycemic control on patients with type 2 Diabetes Mellitus: A cluster randomized controlled trial

Lee S, Lee J et al *Primary Care Diabetes* (In print)

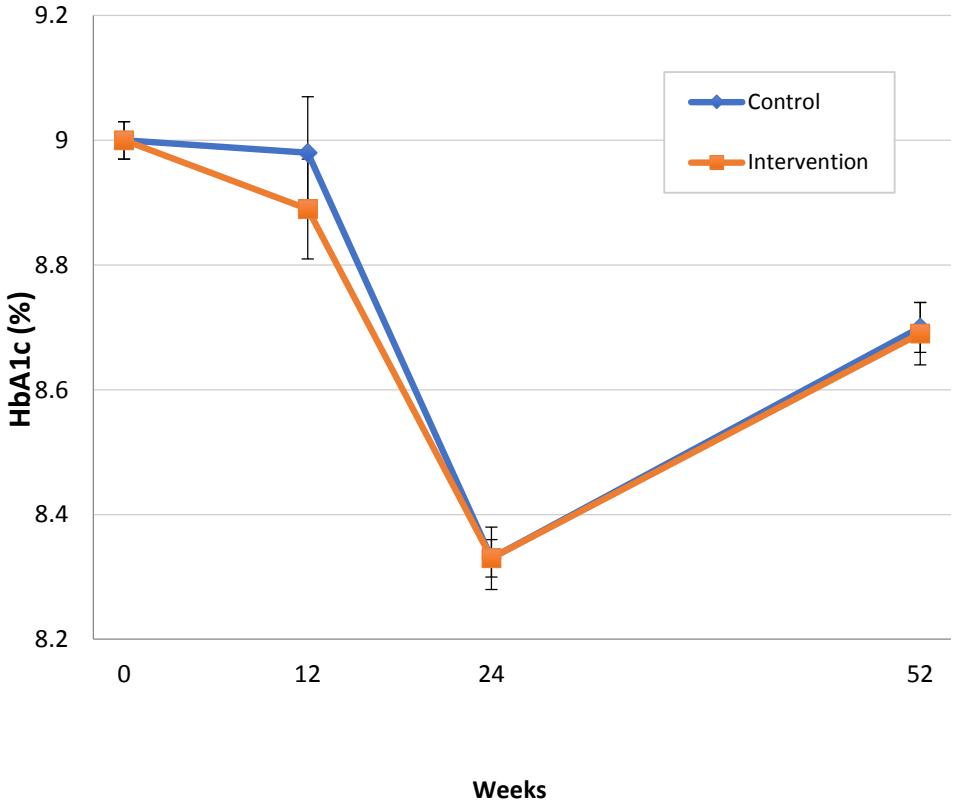
Objective: To evaluate the effects of remote tele-monitoring with team-based management on patients with poorly controlled type 2 diabetes

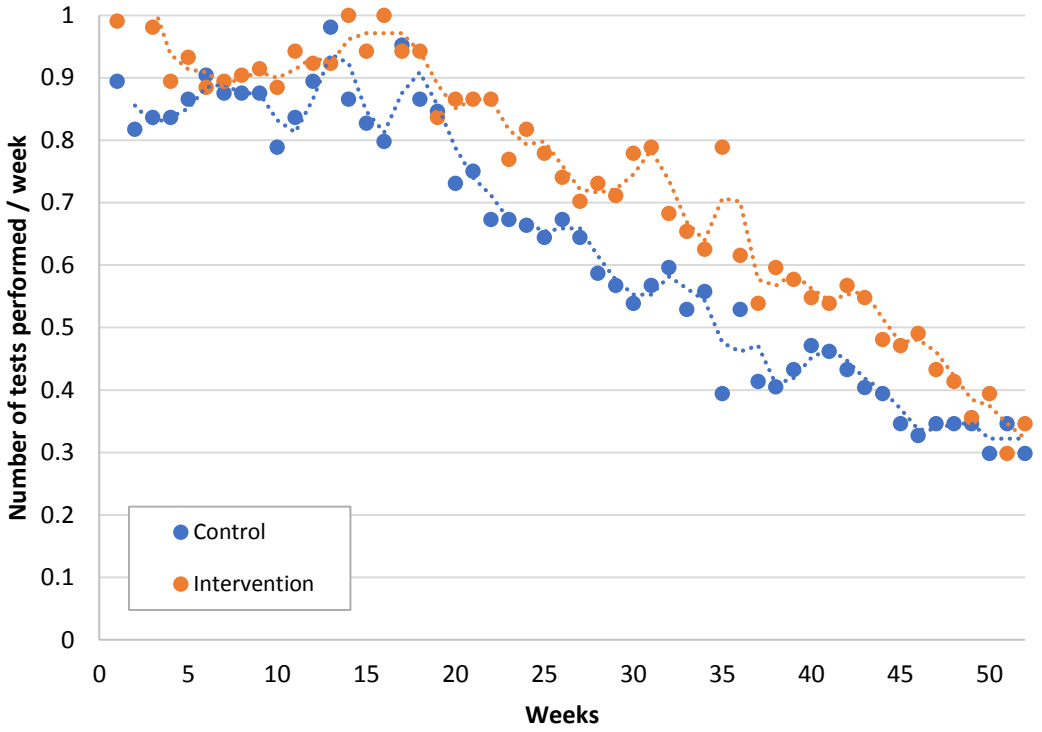
Research Design and Methods:

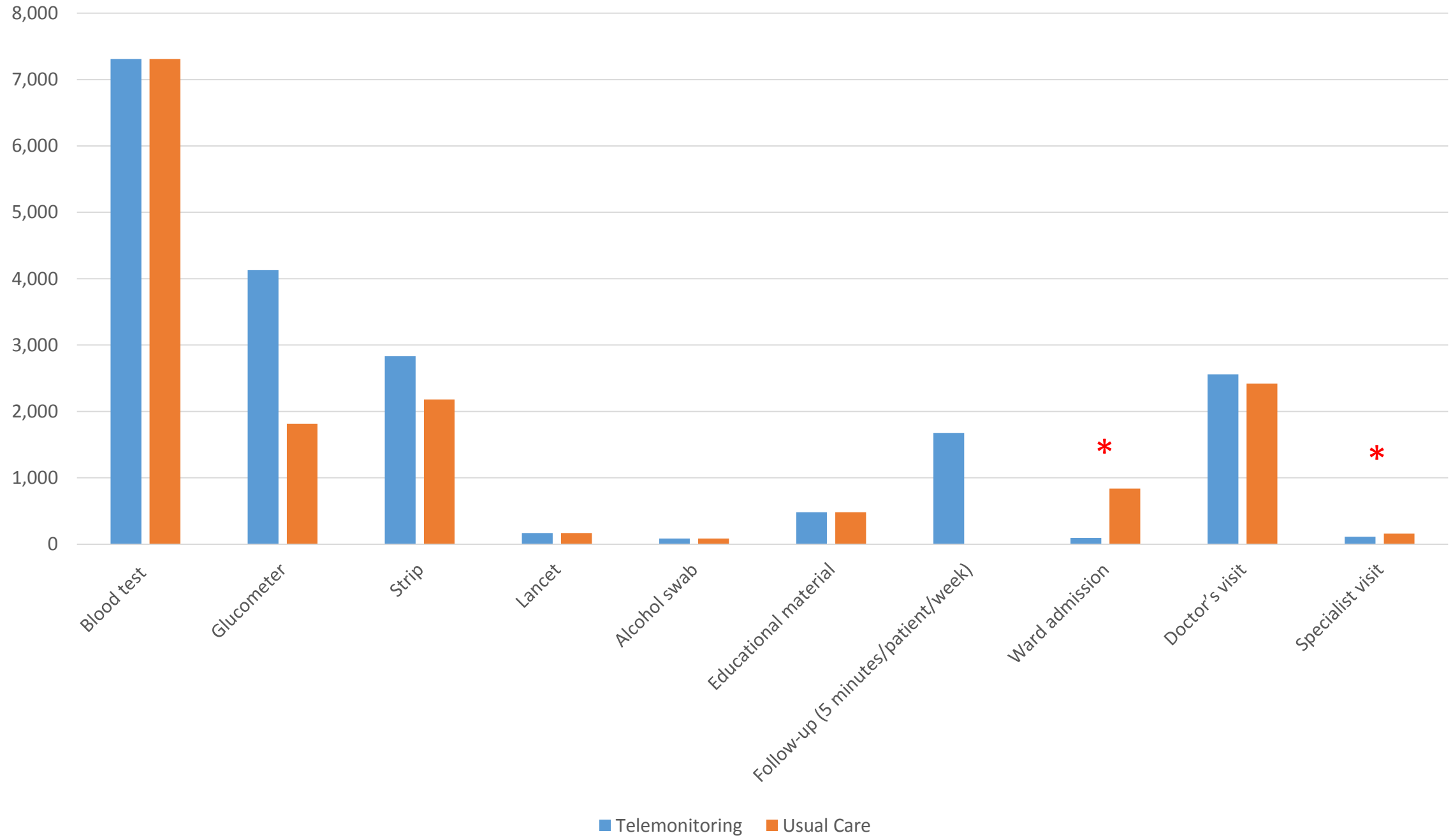
- This was a pragmatic 52-week cluster-randomized controlled study among 11 public primary care institutions in Malaysia.
- Intervention group received home gluco-telemonitors and transmitted glucose data to a care team
- The team also facilitated self-management by supporting participants to improve medication adherence, encourage healthier lifestyle and use of resources to reduce risk factors. Usual care group received routine health care service only.
- Primary outcome was the change in HbA1c at 24 weeks.

Results

- A total of 240 participants were recruited in this study. There were no clinical and statistical significance in improving glycemic control between both groups at the end of study (Week 24: -0.26; 95% CI: -0.66 to 0.15, p=0.223) or at follow-up (Week 52: -0.10; -0.59 to 0.37, p=0.663).
- No notable group differences in the other outcomes, including adverse events and health related quality of life.
- Analysis showed that telemonitoring for diabetes management cost a total of USD$19,443.24/patient compared to conventional diabetes management which cost USD$15,450.51/patient
- The increase in cost was due to the follow-up cost by the research team, higher cost of purchasing a web-based glucometer and its strips
- However, the use of a telemonitoring strategy reduced the cost of ward admissions by USD$744.66 pre patient at the end of the study compared to usual care.


9.2
9
8.8
8.6
8.4
8.2
HbA1c (%)
0
12
24
52
Weeks
Control
Intervention


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Number of tests performed / week
0
5
10
15
20
25
30
35
40
45
50
Weeks
Control
Intervention


8,000
7,000
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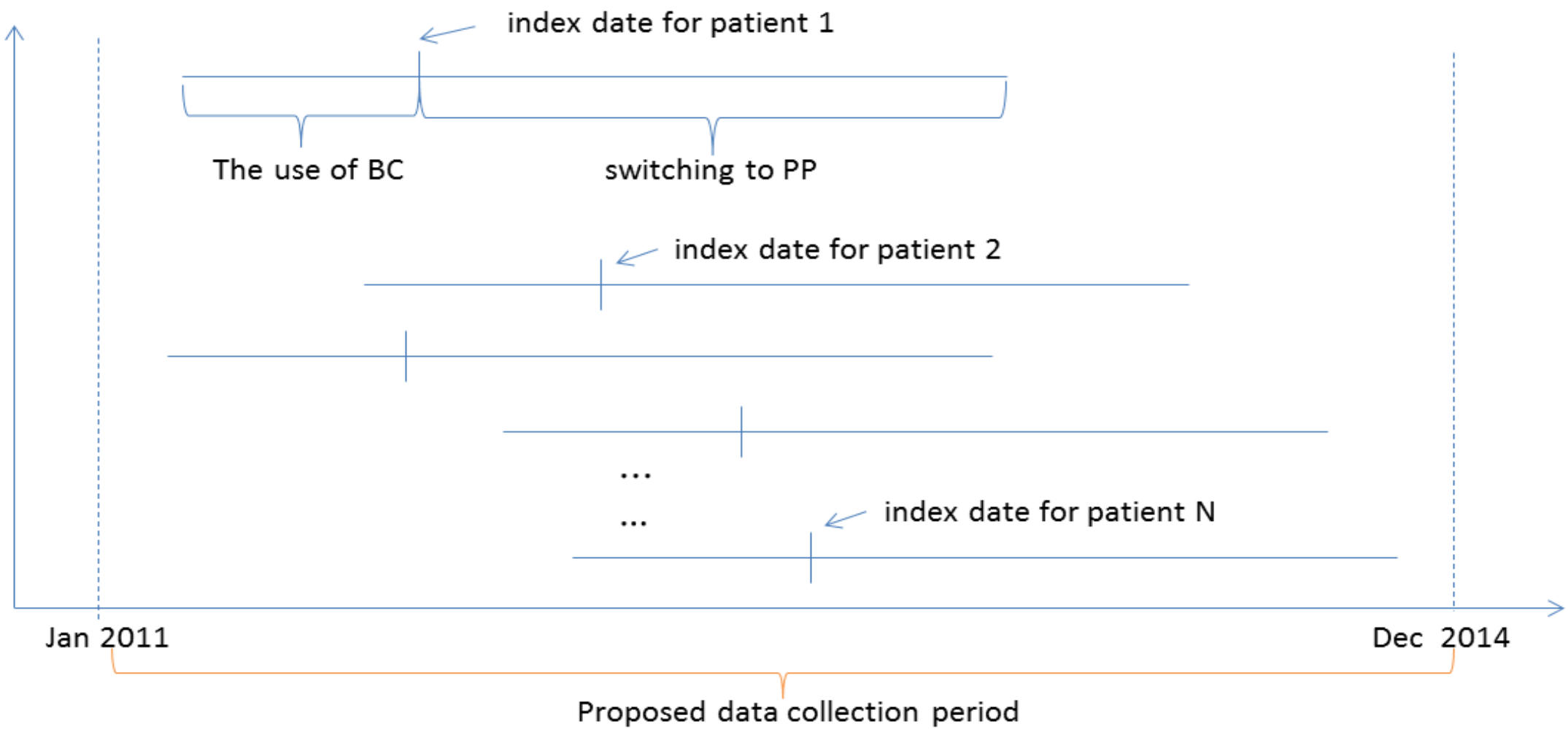
5,000
4,000
3,000
2,000
1,000
0
Blood test
Glucometer
Strip
Lancet
Alcohol swab
Educational material
Follow-up (5 minutes/patient/week)
Ward admission
Doctor´s visit
Specialist visit
*
*
Telemonitoring
Usual Care

A cost analysis of health care resource utilization of paliperidone palmitate in the treatment of schizophrenia in the public health care sector of Hong Kong

Choon WY, Lee KC, Wu D et al *J Medical Economics (In print)*

Objective: To compare the health care resources utilization and associated cost of schizophrenic patients from 3 regional public hospitals before and after the initiation of paliperidone palmitate long acting injection (PP1M) treatment of a patient cohort of about 400 patients

Study design



Method

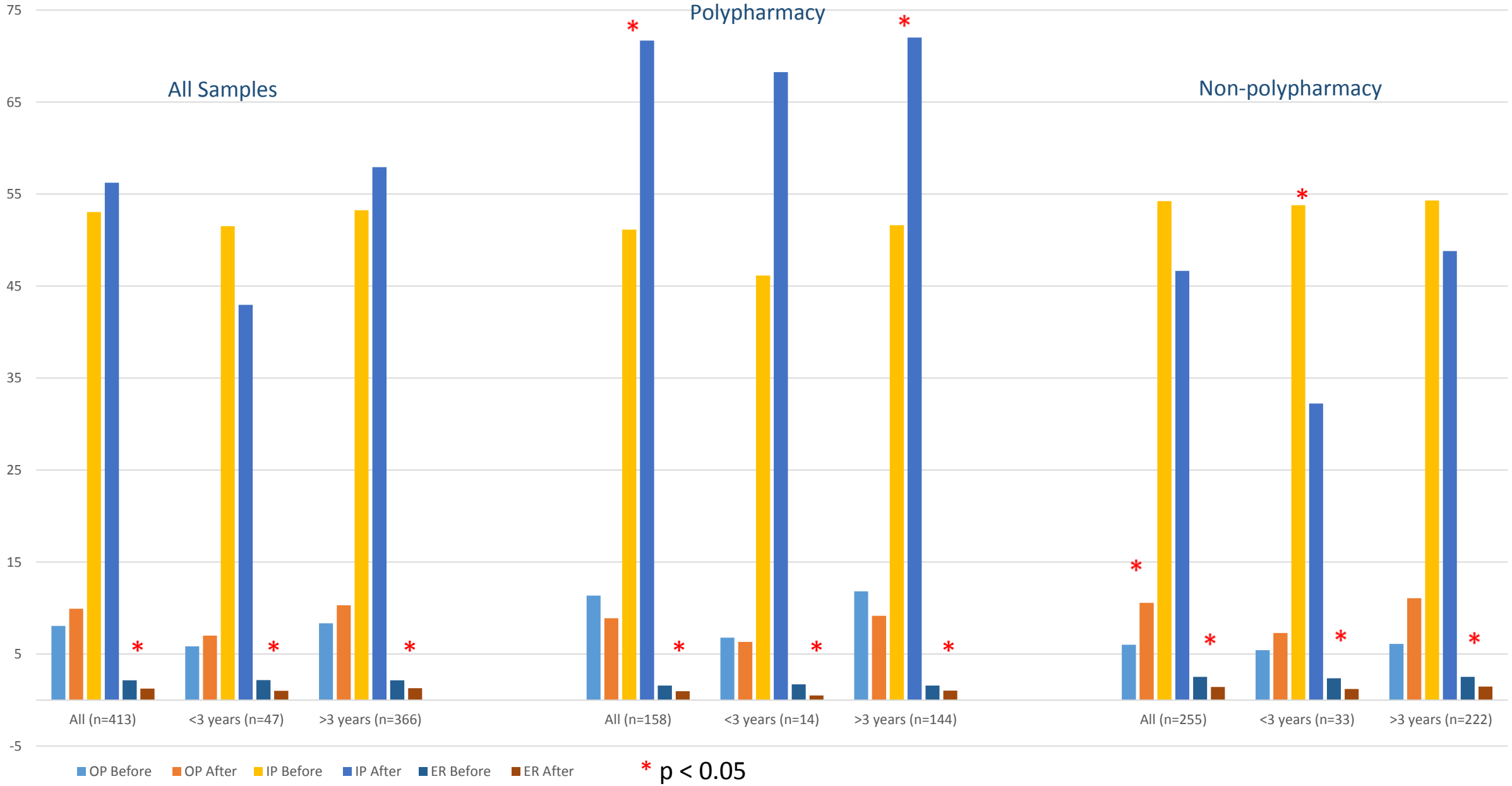
- Retrospective patient data analysis
- Health care utilization and associated costs of pre and post PPIM treatment in 413 patients with schizophrenia or schizoaffective disorder recruited from 3 major public hospitals providing psychiatric services in Hong Kong studied
- Patients were categorized into early treatment (<=3yrs since diagnosis) and chronic (>3yrs) groups, and also whether they were receiving multiple drug therapy (polypharmacy)

Cost data

	Cost ($HK)
Specialist outpatient clinic visit	1,110/visit (including prescriptions)
In-patient charge for psychiatric hospitals (public ward)	1,940/day (including prescriptions within the scale provided at hospitals)
Psychiatric day hospital	1,150/day
Accident and Emergency Department	990/visit
Community nurse	1,380/visit
Outpatient visit for injection	100/visit

Source: HK Government Gazette 2013 (for patients non-eligible for government-subsidized healthcare)

Comparison of resource utilization before and after the use of PP1M



Conclusion

- Both polypharmacy and treatment time seem to affect the final outcomes in hospital stay and emergency room utilization
- Polypharmacy due to chronicity seems to have an effect on overall cost impact
- Early treatment appears to result in better outcomes in terms of hospital stay
- Cost of hospitalization is the major cost driver

Case manager

- Role: contributing to community mental health by providing support to discharged patients at the community level
- Research question: cost of such service can be offset by reduction in hospitalization
- Before : After = 62.3% : 42%
- Assuming one visit per month: HKD16,560/year/patient
- Per 100 patients: HKD1,031,688 vs HKD695,520
- Awaiting final confirmation of results

Cost-effectiveness of point-of-care testing for influenza at community pharmacy setting in Hong Kong

You J, Tam LP *Pharmacotherapy* Vol 36 (12),2016

Objective: Health care cost implication is significant due to influenza and its associated hospitalization, this study was to evaluate the potential cost-effectiveness aiming for early detection and hence leading to cost avoidance

Method: A decision-analytic model was used to simulate the outcomes between early and no testing. Parameters measured included direct cost, mortality rate and QALY.

Results

- Base case analysis, point-of-care (POC) testing group showed sig lower mortality rate, less loss of QALY, and higher direct cost per individual compared to control group
- Incremental cost/QALY saved by POC = USD 647/QALY
- One-way sensitivity analysis: robust
- Threshold of willingness-to-pay of HK : 1 GDP per capita (USD 40,594 in 2015)
- POC testing the preferred option

Conclusion

- POC testing appears to be cost-effective in reducing mortality and saving QALYs at community level

Is “value-based” approach the final answer? What are the challenges?

Concerns of VBM

- Definition of “value” varies
- Whose “value” are we measuring? Quantitatively, “value” varies among different stakeholders e.g. patient populations, service provider, payer, insurance provider, hence potential conflicts among stakeholders
- “Value” changes over time
- Comparisons between countries difficult due to difference in health care system and economic structures
- Availability of interventional options with high value not always guaranteed
- Universal database of utility values not available
- Healthcare budget does have a limit

Summary and conclusion

- Value-based approach will be replacing evidence-based approach as the global standard for assessment of new health technologies
- Most western countries and some Asian countries have adopted VB approach
- New theories and ideas will continue to emerge making HTA more reliable and adaptable
- Before embarking on VBM, one must ensure all the infra-structures e.g. data resources, registries are in place
- Beware of fake values e.g. false savings from cost shifting and restricted services
- Capacity building is imminent
- Wider society must be involved in discussion