Yong Loo Lin School of Medicine
Centre for Biomedical Ethics

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The Unbearable Lightness of Equity: Big Data and Risk Sharing in Access to Healthcare

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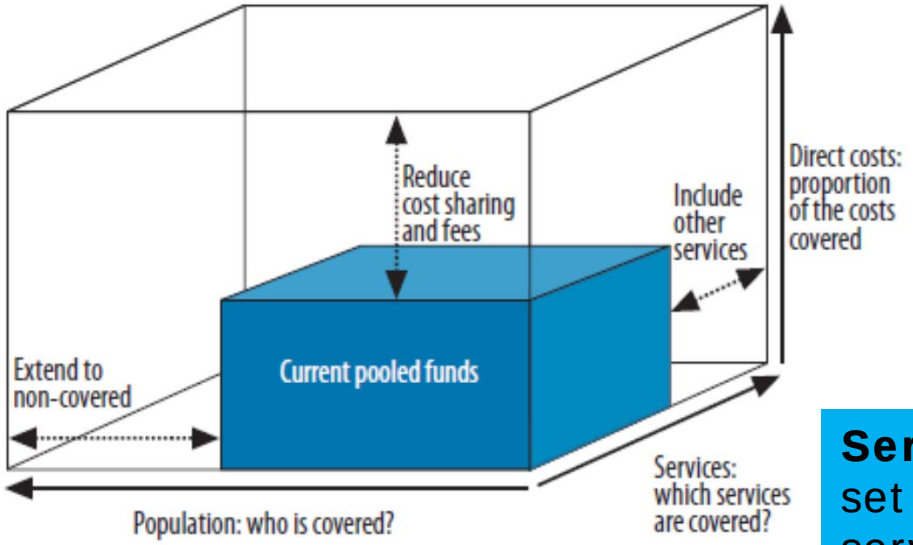
Overview

- Equity in Universal Health Coverage
  - Exiting the Eternal Recurrence
- Big Data is unlikely to be the promised cure
  - Increase inequities across social and income classes
  - Data Infrastructure likely to remain fragmented, particularly in LMICs; Problem of Scalability
- System-perspective and Legal Trend
- MeDIC Asia Study (Harvard-NUS-WPRO-SEARO) – Key Insurance Scheme in Indonesia
- Challenges: Interoperability, Coordination, Large Upfront Capital Investment, unclear RoI
- Participation and trust will remain challenging

Universal Health Coverage



Financial Protection: Protect populations against impoverishment due to illnesses since most of health care is paid for out-of-pocket

Service Coverage: Define a set of essential health care services based on the priority health needs for each country

Population Coverage: Expand coverage to allow equal access for all persons

Trade-offs: Given resource constraints, each country has to prioritise between increasing share of population covered, enhancing the level of financial protection, or to expand the range of health services

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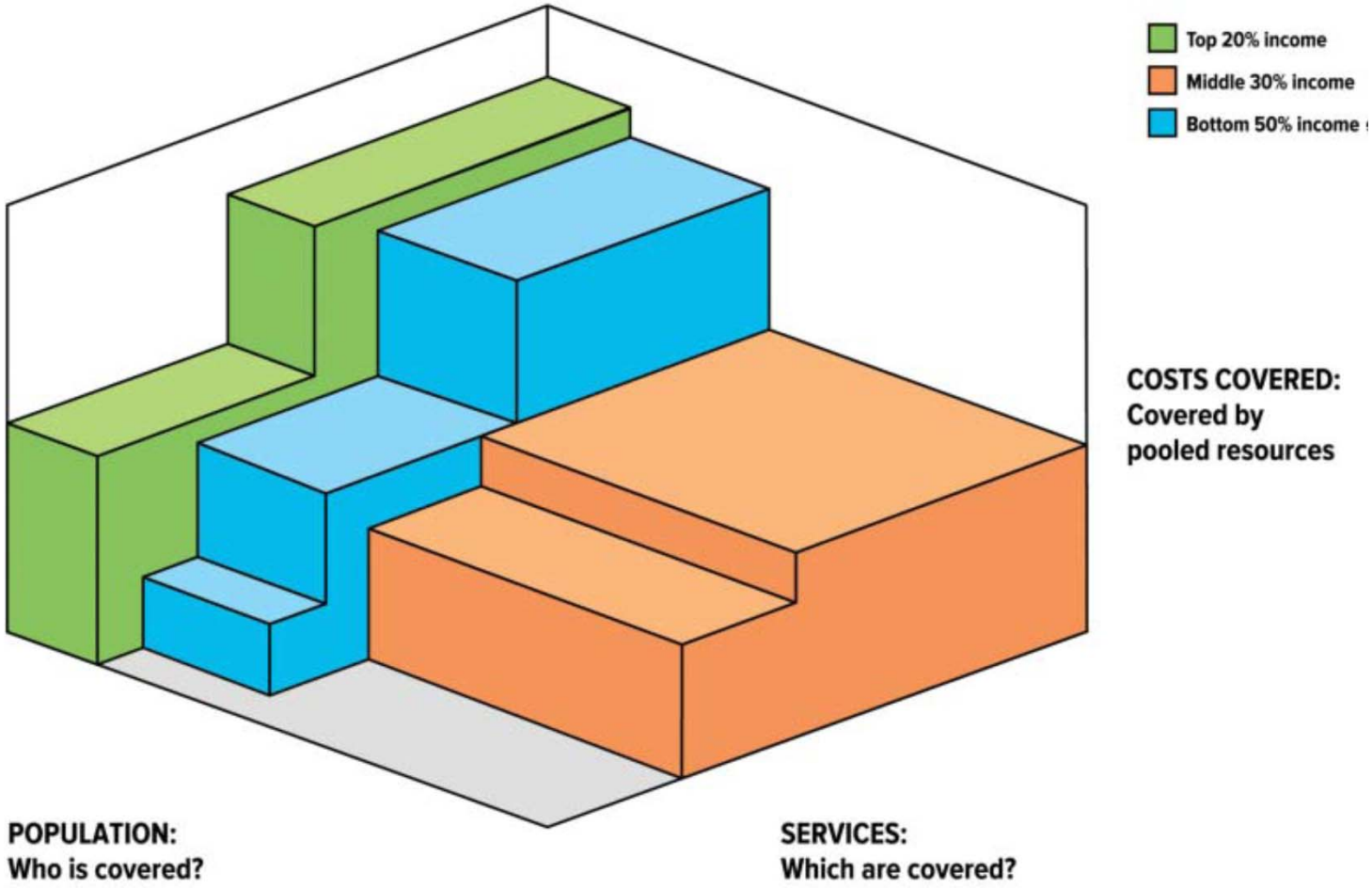

Source: Marc J. Roberts, William C. Hsiao & Michael R. Reich (2015) Disaggregating the Universal Coverage Cube: Putting Equity in the Picture. *Health Systems & Reform* 1:1,22-27

National Health Insurance System

- What basic data infrastructure is needed?
  - Actuaries as first data scientists; Aggregate information to make informed decisions about risk.
  - Extent of coverage, composition of benefits package, budget impact and affordability.
- How to scale up data infrastructure (e.g data sharing)? What is currently feasible?
- How does it support policy goals? What values?
  - National health insurance schemes may not be able to exclude certain conditions.
  - How to link them to target populations?
  - What measures?
- What is the return on investment?

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Big Data (as a Tool) in Insurance

- Risk Assessment
  - Pricing, underwriting, risk selection, loss control, claims management
- Fraud Detection
  - Match variables in every claim against the profiles of past fraudulent claims (predictive modelling)
- Beneficiary (or Insured) Profile
  - Comprehensive understanding of a beneficiary's behaviours, habits and needs from various sources
- Service Delivery
  - Relates to person-centred care

Big Data in Insurance (Cont'd)

- Personalising Benefits Package
  - Mainly private sector providers.
  - Utilize apps' and wearables' data to track and enable beneficiaries to manage their health conditions or chronic diseases. E.g. Cigna has partnered with BodyMedia to use their armband tracker for diabetes prevention and management, integrated with the insured's insurance plan.
- Predictive analytics
  - compliance checks, data entry, reconciliation, risk assessment, claims verification, fraud detection

Big Data (Cont'd)

- Real-time analysis
  - Potential to make daily adjustments to premium rates, premium strategies and underwriting limits by combining internal data (policy, regulations) with external data (social media, press, analyst comments) in order to optimise finances and instant payouts.
  - Data mining techniques used to cluster and score claims in order to prioritise and assign them to the most appropriate staff based on their experience on claim complexity.

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Social insurance fund (Jamsostek; 14% coverage)

- PT Jamsostek, the state owned company designated to manage social insurance fund for the private sector, provides health insurance for formal sector workers.
- Formal sector workers made up about one-third of the workforce, or around 34 million workers in 2010. Jamsostek provided four programs i.e. employment injury insurance, life insurance, old age savings and health insurance. The first three schemes were mandatory and provided in one package for all private sector enterprises in the formal economy.

- Employment injury insurance covered accident at work, occupational disease arising out of employment, and travel accidents that occur while travelling to work following the usual route. This insurance was managed by PT Jamsostek, and was available in 5 different levels of protection. Employees did not contribute to the insurance while employers contributed 0.24 to 1.74% of wages, depending on the level of protection.
- Despite its mandatory nature, participation in the Jamsostek employment injury insurance, life insurance, old age savings programs was considerably low. In 2010, of around 34 million informal sector workers in Indonesia, only 9,337,423 are active members of these programs.

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Civil service fund (Askes; 7% coverage)

- Active and retired civil servants, retired military and police personnel, veterans and national patriots, and their dependents were covered by a compulsory health insurance scheme managed by PT Askes. Members obtained benefits through a structured health services mechanism, which was available throughout Indonesia.
- Contributions to the fund were shared between civil servants and the government in its role of employer. Civil servants contributed 2% of their salaries and the government matched the contributions.
- In 2009, the total premium amounted to IDR 7.9 trillion. Active military and police personnel were provided with in-house health care through special military hospitals.

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Health insurance targeting the poor (Jamkesmas; 32% coverage)

- Operated from 2005.
- It succeeded the health card program under the Social Safety Net (1998-2001) and the fuel price compensation scheme (2001-2005) which reallocated fuel subsidy budget to health and other social assistance programmes. Prior to 2008 the program was known as Askeskin.
- The scheme provided beneficiaries with free health services in Community Health Centers (Puskesmas) and 3rd class (basic level) wards in government hospitals and some designated private hospitals.

- Jamkesmas was not based on actuarial calculation and did not have clear benefits package/limitation. The ministry of health attempted to improve beneficiary and utilisation database, as well as benefits packages.
- It did not have targeting accuracy. An assessment by the World Bank (2011) showed that 52% of the poorest 30% of the population were without health insurance while 28% of the middle deciles and 11.8% of the top 3 deciles were covered by Jamkesmas.
- Coverage among households in the bottom three income deciles according to expenditures increased from 16.5% in 2004 to > 43% in 2010. However, even after accounting for the other 4.4% of households in this population group covered by other insurance schemes, 52.6% of the poor population remains without health insurance. On the other hand, 28% of households from the middle deciles and 11.8% of households in the top three deciles were covered.

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Jaminan Kesehatan Nasional (JKN)

- Effective 1 January 2014, the new Mandatory Health Insurance Scheme (JKN) managed by Badan Penyelenggara Jaminan Sosial (BPJS).
- About 130 million Indonesians are registered at BPJS.
- By 2018, all Indonesian citizens and residents are required to participate.
- No “opt out” for employers who provide premium health insurance benefits to their employees.
- Insurance companies can sign an individualised Coordination of Benefits (CoB) agreement with BPJS.

Some Incentives …

- A growing middle class in a country with a population of over 260 million and a low insurance penetration of less than 2% will have a positive effect on the growth of health insurance.
- Growing recognition of need to invest in private insurance.
- BUT …
  - BPJS procedures inflexible and inconvenient.
  - Scheme and entitlements complex.
  - Coordination of benefits (CoB) to developing complementary products complex and costly.
  - No established formal guidelines that apply to all insurers – each CoB has to be individually negotiated.

Challenges

- Retro-fitting interoperability failed.
- Economic incentives unlikely to be strong enough to generate market demand and behavioural change.
- Policymakers have a strong interest in promoting interoperability and must ensure robust, cross-vendor interoperability. In the US (Adler-Milstein et al. 2015. *Health Affairs (Millwood)* 34(12):2174-80):
  - In the US, Health Information Technology for Economic and Clinical Health (HITECH) legislation
  - Large gains in adoption, with 75% of US hospitals now having adopted at least a basic EHR system—up from 59% in 2013. However, small and rural hospitals continue to lag behind.
  - Challenges: Up-front and ongoing costs, physician cooperation, and complexity of meeting meaningful-use criteria as challenges.

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How to bring values in? How to encourage participation?

- "Accountability for reasonableness" (A4R)
- Ethical framework to guide decision-makers in implementing fair priority setting
- Emphasizes democratic deliberation and is a priority-setting process
- Four basic conditions encompassed: relevance, publicity, revision and appeal, enforcement

Efforts to Implement A4R

- **UK** – National Institute for Health and Clinical Excellence: Citizen's council to provide input on relevant social values (e.g. age) for use as a criterion in setting limits
- **Mexico** – *Seguro Popular*: Process developed to consider inputs from clinical, economic, ethical and social working groups, with disclosure of full rationale behind decisions
- **Tanzania** – Response to Accountable Priority-Setting for Trust in Health Systems
- **South Korea** – Health Insurance Review and Assessment: Citizen participation (2 days of discussion and deliberation) to broaden values underlying benefits decision process

Elusive Equity

- Keeping true to the UHC Ideal – Equity as empowerment
- Distribution of benefits and burdens of health services should be allocated based on a set of criteria that is fair
- Reasonable disagree over how criteria should be applied and which values to emphasize
  - Risk Classification vs. Need; individual responsibility vs. solidarity
- Complicated by factors including:
  - Clinical uncertainty
  - Competing goals of patients, programs and systems
  - Multiple stakeholder interests

Nietzsche's Eternal Recurrence

- A system whose dynamics are resource-preserving and which is confined to a finite data volume will, after a sufficiently long time, return to an arbitrarily small neighborhood of its initial state.
- "A sufficiently long time" could be much longer than the predicted lifetime of the observable universe.
- Big Data has the potential to aggravate inequity if confined to limited data volume (fragmentation) OR it could be break free of the eternal recurrence of inequity.

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Key Issues

- What basic data infrastructure is needed?
  - Need to be realistic about retrofitting interoperability.
- How to scale up data infrastructure? What is currently feasible?
- How to promote sharing and appropriate control (read privacy)?
- How does it support policy goals?
- How does equity relate to other values?
- What is the return on investment (beyond economic conception)?
- Why enable broader stakeholders participation and how?

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