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Walking in the shoes of a healthcare actuary

ACA Presentation

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Agenda

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02 The language of healthcare systems and stakeholders

03 Why are healthcare systems inefficient?

04 Incentives & why they matter

05 Managing healthcare systems

06 Actuarial issues in healthcare

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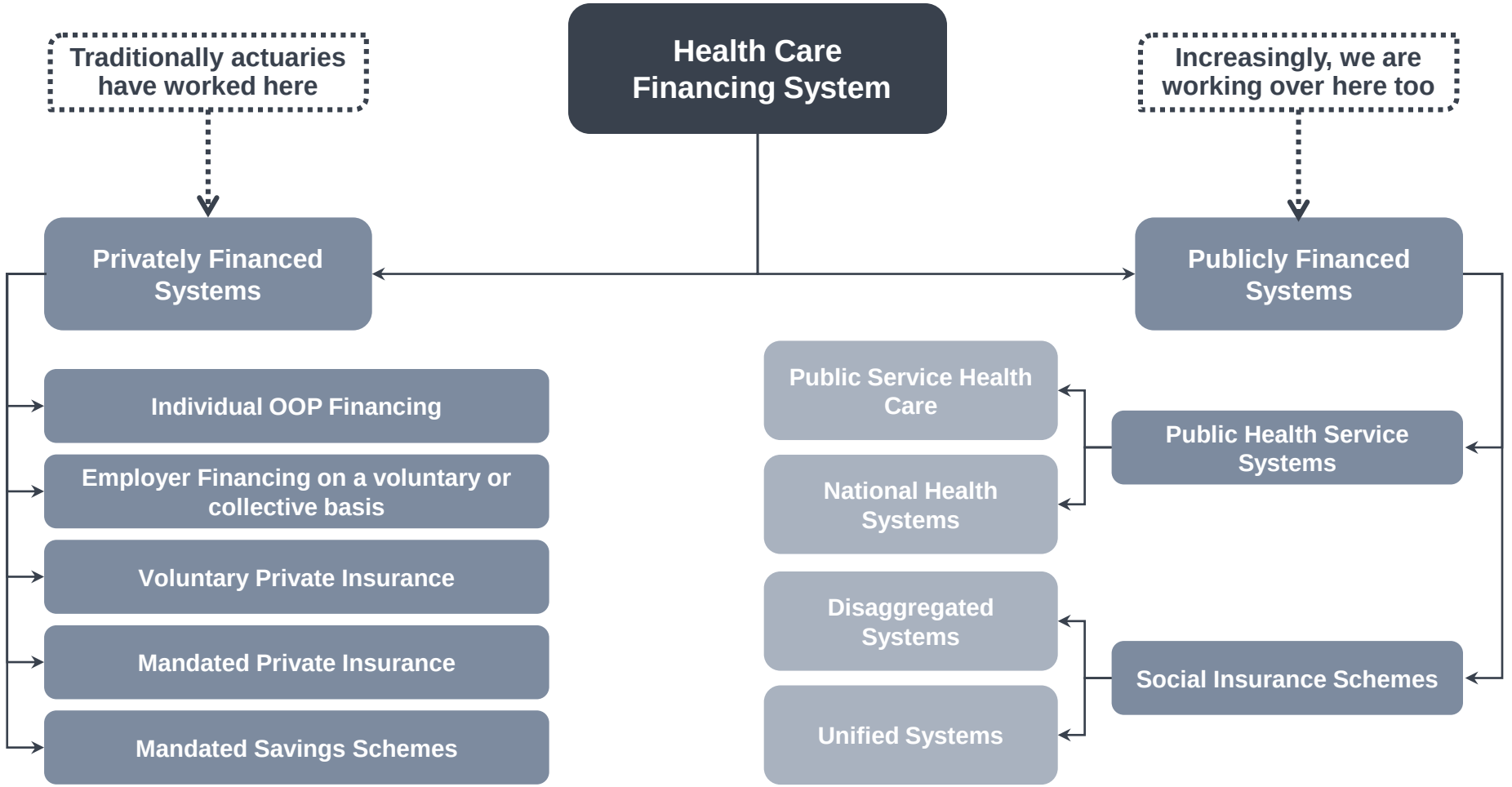
Types of healthcare systems



Who are the stakeholders & what do they want?

What questions do health actuaries ask to understand the context of their modelling?

- How is the health system funded? Tax payers directly, tax payers via commercial entities, payroll taxes, premiums, out of pocket payments by patients?
- How are those funds distributed throughout the system? Regional bodies with block grants? How are population characteristics accounted for? Retrospective or prospective? Experience adjustments?
- How are doctors paid? Salaries, fee for service, capitation, capitation with risk adjustment?
- How are hospitals paid? Block grants, activity rates by inpatient day, activity rates by hospital admission/discharge, episode costing?. Activity or quality? Pay for Performance?
- How are drugs paid for? Risk sharing agreements, fee per prescription, block purchasing?
- Is there a risk equalisation system operating? Pre or post? How sophisticated is it? What incentives does it create for payers and hospitals?

Standard technical market efficiency assumptions are null and void in healthcare markets, which results in disconnects between supply and demand

Patients rarely pay directly or full cost, so don't make choices based on allocation of income for health gain.

Asymmetric information – patients (and payers) find it hard to judge quality.

Little price transparency.

Agency problems – doctors make decisions in "best interests of patients".

Providers compete on "quality", which is interpreted as new treatments. They do not compete on price, which leads to an arms race of equipment and supplier-induced demand, rather than lower prices

Why do inefficient healthcare markets matter?

- Monopolies of supply (by hospitals and doctors) => higher prices for payers.
- Lack of price and quality information makes it hard to judge productivity and compare to alternative use of resources.
- Poor investment in IT and infrastructure.
- Misaligned incentives for doctors, patients and payers.
- BUT: Do we really want efficient markets? Efficiency does not necessarily imply equity.
  - Governments usually concerned with health inequalities.

What incentives are created by different reimbursement mechanisms?

Doctors

- Fee for Service: paid for every service performed:
  - Payer bears all the risk (financially).
  - Patient bears risk of over treatment, but likely to get all possible treatments (with side effects).
- Capitation: set sum for every patient per year:
  - Provider bears risk of very sick/unhealthy population.
  - Patient likely to be under-treated?
- Can get increasingly sophisticated hybrid systems with quality measure to overcome conflicting incentives, e.g. capitation with quality/outcome bonuses, pay for performance

Hospitals

- Fee for service: paid for every service performed separately:
  - Payer bears all the risk (financially).
  - Patient bears risk of over treatment, but likely to get all possible treatments (with side effects).
- Per diem payment: paid for each day in hospital:
  - Reduces incentive to provide extra tests, but incentive to keep people in for long time.
- Case rate payments: set sum for per admission depending on diagnosis (HRG / DRG systems):
  - Provider bears risk of complications and long length of stay.
  - Patient likely to be under-treated and sent home very quickly

ERM for healthcare

- Aligning incentives between stakeholders.
- Managing quality, which should also manage cost (at the margin higher quality may mean higher cost, but not usually).
- Long term planning with scenario testing and understanding key dependencies:
  - Population changes.
  - Changing expectations of consumers.
  - Managing new treatments and ensuring they demonstrate value.
- IT investment and infrastructure.
- Educating (empowering?) patients. Clinical risk management

The tools/methodologies used by health actuaries tend to be borrowed from GI and/or Life, as well as statisticians and health economists

- Traditional actuarial tasks:
  - Reserving models and methodologies (but monthly, rather than quarterly or annually). Sometimes stochastic methods.
  - Long term multiple decrement models, with morbidity rather than mortality rates.
  - Deterministic/stochastic projection models to profit test/price/financial forecasts/capital/solvency modelling.
- Less “traditional” actuarial tasks:
  - Markov models:
    - Look at progression of disease and associated costs.
    - Often useful to work out when a specific intervention may change costs and benefits.
  - Decision Tree Models:
    - Looking at costs of treatment under different scenarios where patients can take a number of pathways.

Skills of the healthcare actuary – very much part of a multidisciplinary team

- Working as a multidisciplinary team to understand clinical and other issues to work out best modelling approach.
- Understand the key clinical and financial assumptions to create a robust, yet simple model.
- Describing clearly the desired outputs and input.
- Finding the right kinds of data for the inputs.
- Understanding the model perspective:
  - What should and should not be included?

Methodology versus data

METHODOLOGY

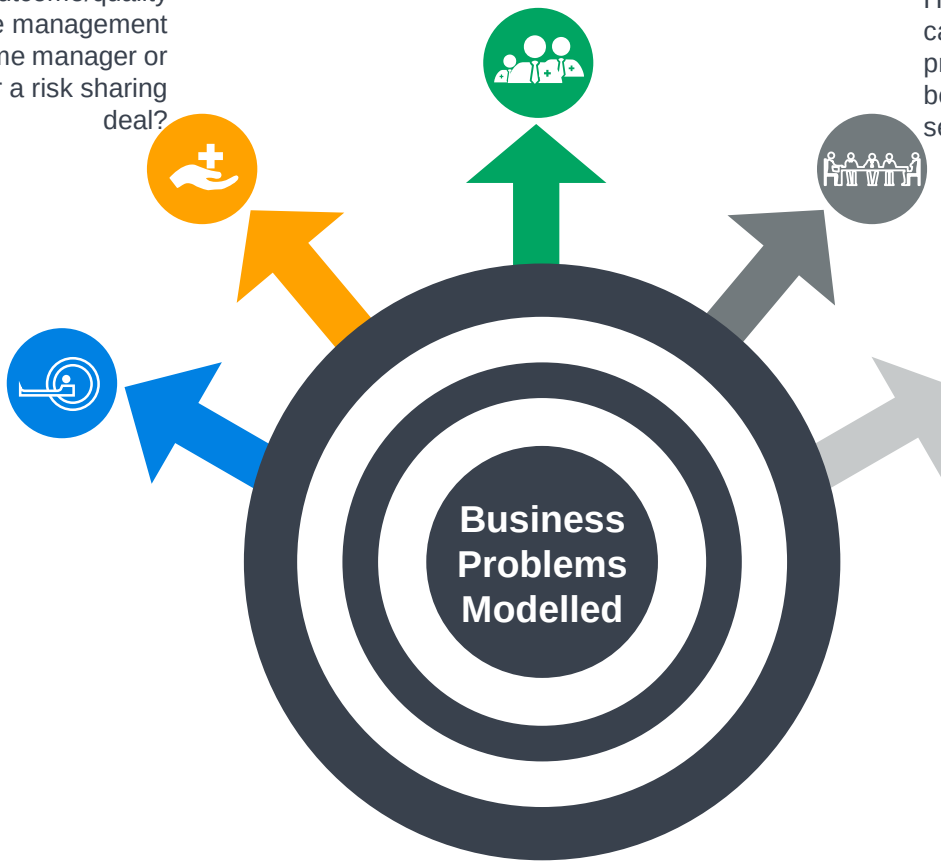
- One often drives the other:
  - Data is rarely available in the right format.
- Usually iterative process:
  - Determine ideal methodology and data.
  - Determine available data and quality of data.
  - Modifies ideal methodology based on availability of useful data.
  - Tries to strike a balance between theoretical “correctness” and use-ability.

Business problems modelled by health actuaries

Healthcare Professionals
What is the cost-benefit impact of introducing regulation for certain healthcare professionals? What is the financial impact of changing they way they are reimbursed?

Disease Management Program
What is the financial and care outcome/quality impact of introducing a disease management program?. How can a programme manager or pharmaceutical company enter a risk sharing deal?

Management Program
How should an insurance company charge for a case management or disease management program?. For large groups, who reaps the benefit? What kind of risk sharing makes sense?

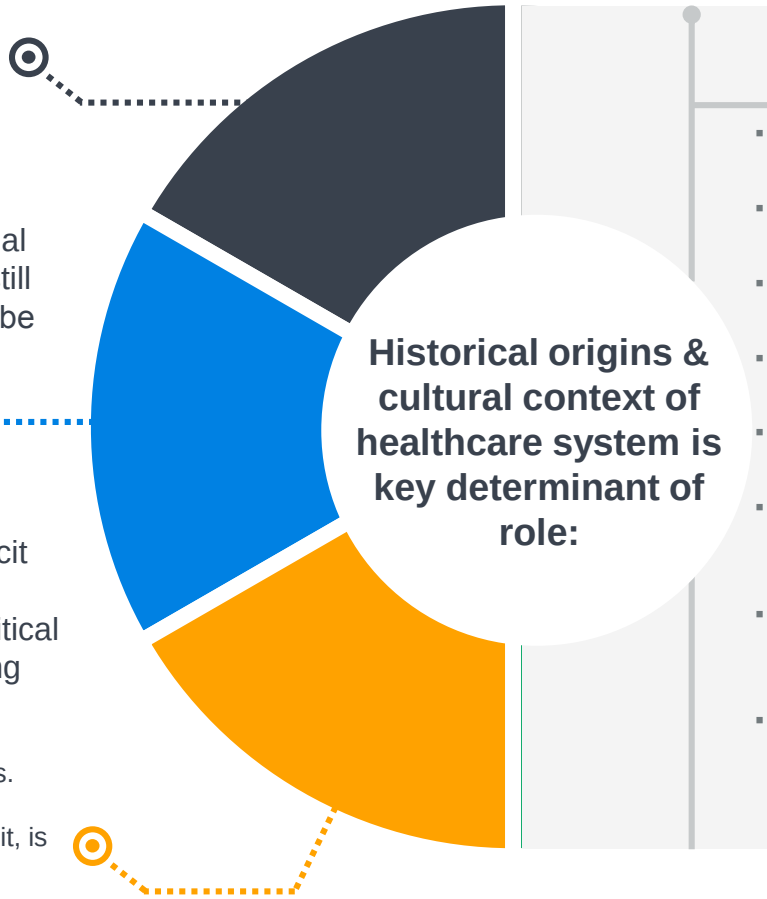


Screening Program For Cancer
What is the financing impact of introducing a screening program for cancer?

Global medical benefits
How can they be priced and what benefit design packages make sense to fit in with local regulations? What mitigates against anti-selection?

Current and future role of the healthcare actuary

- Lots of private sector involvement – actuarial have a natural (and often reserved) place.
- Newly involved private sector– actuarial skills becoming more important, but still a legacy of “assuming not possible to be left to sink”.
- Socialised systems tend to have explicit statements of social policy and these encourage health economists and political decisions, rather than actuaries making business decisions:
  - But recognition of useful skills of actuaries.
  - Risk and uncertainty and how to manage it, is becoming increasingly important.

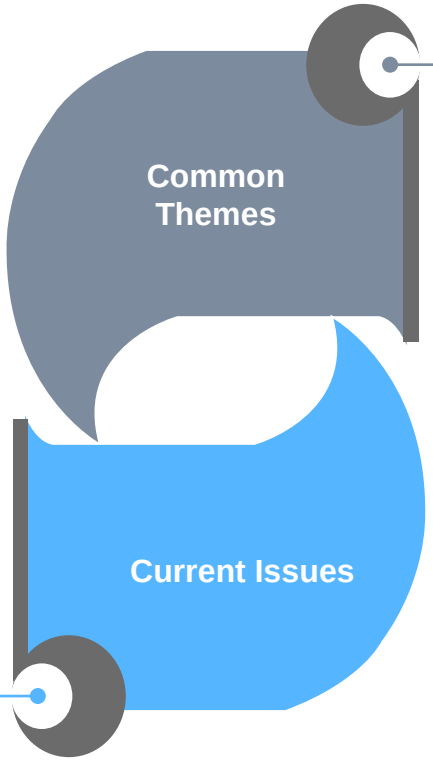


Areas where healthcare actuaries can add value

- Understanding of impact of demographic changes.
- Understanding of impact of healthcare reforms (RES etc.).
- Understanding and quantifying operational risks.
- Benchmarking health systems performance on a risk-adjusted basis.
- Quantifying impact of new contracting methods.
- Building models to show allocation of risk to stakeholders to ensure all parties understand the risk they are assuming.
- Isolating the impact of risk factors on healthcare trends and modelling future utilisation.
- Modelling the financial impact of wellness, disease management and preventive care over the medium/long term.

While the local context is important, there are more similarities than differences across health systems

- Investment in preventive care and social care to keep older people out of hospital.
- Using private providers and/or integrators.
- Encouraging quality and better outcomes through contracting re-design, particularly hospitals, but also pharma companies:
  - Value based pricing.
  - Capitation contracting for providers, to shift utilisation risk.
- Reducing variation in healthcare utilisation using evidence-based medicine and pathways.



- The big issues are the same in most systems, with regional and cultural nuances:
  - All pivot on individual responses to the same market imperfections/inefficiencies.
  - Similar stakeholders with similar issues.
  - Cost, quality (outcomes) and access.

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Q&A Session

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