Every nation that provides health care faces the same dilemma.

How can scarce resources be allocated fairly across plans and other risk bearing entities?

Risk adjustment is one tool of redistributing payments to risk-bearing entities, to accurately align these payments with the level and risk of services provided to their members.
“Risk Adjustment in Health Care Funding”, Contingencies Jan./Feb. 2011

Sponsored by the Academy’s Health Practice International Task Force (HPITF)

Lead: Susan Mateja, FSA, MAAA

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United Kingdom: Martin Bardsley, PHD

Israel: Yair Babad, Fellow of the Israeli Actuarial Association

South Africa: Barry Childes, FIA, FASSA

The Netherlands: Carl Ghiselli, FSA, MAAA
Actuarial Exam

1. What is risk adjustment? (5 points)

2. Name 5 risk adjusters. (10 points)

3. List the goal and successes of risk adjustment. (15 points)

Designation: CWWRAA
Risk Adjustment – A Global Perspective

Agenda

1. Define risk adjustment

2. State the goals of risk adjustment

3. Examine 5 countries:
   United Kingdom, Israel, The Netherlands, Chile and South Africa

4. Determine the extent to which they are meeting their particular goals
Working Definition for Risk Adjustment

Tool used to adjust payments to plans to accurately reflect the health status of their members

– Relies on risk assessment ➔
Review the risk adjusters for each country

– Relies on available data ➔
Universal, consistent, current, verifiable, feasible to collect and confidential
Goals of Risk Adjustment

1. Enhance solidarity
   - Protect open enrollment & community rating
   - Respond to consumers’ preferences

2. Prevent antiselection
   - Create a level playing field

3. Improve efficiency
   - Encourages fair competition

4. Ensure quality and appropriateness of care

5. Establish a sustainable health care system
   - Market stability
# Risk Adjustment – A Global Perspective

<table>
<thead>
<tr>
<th>Health Financing System</th>
<th>UK</th>
<th>Israel</th>
<th>Netherlands</th>
<th>Chile</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Mandatory</td>
<td>Mandatory</td>
<td>Voluntary</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Health Insurers</td>
<td>Primary Care Trusts (PCTs)</td>
<td>Non - Profit Sick Funds</td>
<td>For - Profit Sick Funds</td>
<td>For - Profit Isapre (Instituciones de Salud Previsional)</td>
<td>Non - Profit Medical Schemes</td>
</tr>
<tr>
<td># of Insurers</td>
<td>152</td>
<td>4</td>
<td>~20</td>
<td>13</td>
<td>~120</td>
</tr>
<tr>
<td>Models</td>
<td>Budgets</td>
<td>Prospective</td>
<td>Prospective / Retrospective</td>
<td>Prospective</td>
<td>Prospective</td>
</tr>
<tr>
<td>Special Features</td>
<td>Person-Based Resource Allocation model for General Practitioners</td>
<td>3-Tiered System</td>
<td>In 2006, moved to mandatory private health care</td>
<td>Explicit Health Guarantees</td>
<td>Risk Equalization Fund is Transparent</td>
</tr>
</tbody>
</table>
Mandatory health care was introduced in 1948.
- In England, 152 PCTs deliver health care to distinct regions.
- Typically a few PCTs will fail to stay within their allotted budget, and the government will bail them out.
- Person-Based Resource Allocation (PBRA) model predicts the General Practitioner (GP) practice budgets.
Risk Adjustment – UK

Person-Based Resource Allocation (PBRA)

- National predictive model, introduced in 2009, that links physician, hospital and social care information to predict future costs of care. Mental health, maternity and community based services are excluded.

- PBRA was able to predict the next year practice level expenditure within 10% for about 2/3rd of the practices.

- PBRA determines the next year’s budget on the patients registered with that GP. At the end of the year there is a reconciliation between the amount of hospital care used by that GP and predicted budget. The idea is that GPs will want to reduce unnecessary hospital care. Presently, they are only used for benchmarking, with the PCT picking up the slack. The PCTs will be replaced by a GP consortia, who will assume more risk for their members.
PBRA Risk Adjusters – UK

**Age / Gender - 18 age bands**

**152 Morbidity Markers**
- Consists of contiguous ICD-10 codes, which are comparable to the US’s 70 Hierarchical Condition Codes (HCC)

**Local Neighborhood Health Indicators**
- Residents in public housing
- Disability
- Residents between 16 & 74 lacking education qualifications
- Residents who sought private medical care in last 2 years
- Students
Risk Adjustment – UK

Conclusions:

Historically, allocations have not aligned well with population health.
- Big differences in the amount of health care spending per head are seen in different parts of the country. London tends to get the a bigger share of resources than the North, but the North has a less healthy population.

Efficiency and delivering appropriate care are the PBRA’s focus.
+ The PBRA model was able to accurately medical costs for about two-thirds of the general practices.
+ A distinct advantage of developing a person-level formula within a publicly funded system is access to person-level data.
- Budgets remain largely notional, so the financial incentives for groups to examine quality and efficiency of the care are still weak. The GP consortia will place more power with the family doctor and increase reliance on risk adjustment methods.
Israel’s 4 Sick Funds have been delivering health care since the mid-1950s.

- The Israel National Health Insurance Act (INHIA) was established in 1995.
- Sick funds receive a prospective payment (for the basic/universal coverage) that accounts for over 95% of compensation, with the remaining coming from a retrospective payment.
Israel has a 3-tier health care structure, which leads to a complex risk adjustment environment

<table>
<thead>
<tr>
<th>Tier 1 Basic Coverage</th>
<th>Tier 2 Supplemental Health Care Services (SHCS)</th>
<th>Tier 3 Commercial Insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Care</td>
<td>More Choices-Selection of surgeon</td>
<td>Dreaded Diseases</td>
</tr>
<tr>
<td>Physician Services</td>
<td>Limit Increases-Additional IVF trials</td>
<td>Disability</td>
</tr>
<tr>
<td>Prescription Drugs</td>
<td>Services Not Covered-Orthodontic</td>
<td>Long Term Care</td>
</tr>
<tr>
<td>Home Health Care</td>
<td>Other out-of-network</td>
<td>Extension –RX</td>
</tr>
<tr>
<td>Psychiatric Care</td>
<td></td>
<td>Fixed compensation for medical treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Workmen’s compensation</td>
</tr>
</tbody>
</table>
Risk Adjusters - Israel

**Basic Tier**
- Age (11 age bands) accounts for 93% of allocation
- Severe diseases accounts for 6% of allocation
  - Renal failure requiring dialysis
  - Gauche
  - Talasemia
  - Hemophilia
  - AIDS
- *Recently age and distance from medical services was added*

**SHCS’s only risk adjuster is age**
- An individual can only join the SHCS that is offered by his sick fund
- Uses waiting periods to mitigate risk
- About 75% do purchase SHCS

**Commercial Insurance uses underwriting techniques**
- Pre-existing
- Medical history
- Waiting periods
- Exclusions
The INHIA, to achieve fairness in allocating resources, requires that capitation use weighted number of members with weights related to age/gender and distance from medical services, with a lump payment for 5 chronic diseases. In actuality, age is the driver of the fund allocation.

- Some argue that children are overvalued
- Data is based on inpatient services and visits to outpatient clinics
Conclusions:

Are sick funds responding to consumers’ preferences?
+ Only 1.5% of Israelis switch funds annually.
+ The premium for basic benefits is $0.
  – They do compete through copays, quality and service.
  – Supplemental benefits may attract the young and healthy.

Financial responsibility is high for the sick funds.
+ 95% of there payment is prospective.
+ Age is the dominate risk adjuster.
  – State must cover health care deficits.
The Netherlands has seen significant reform over the past 20 years.

- In the 1990s they had a mix of social health insurance (65%) and private insurance (35%). They changed to a mandatory system in 2006.
- About 20 private insurance companies must accept any applicant for basic care.
- Employers pay 7.2% of employee's salary (capped)
- 2/3rd receive subsidies for the flat premium
Risk Adjusters – The Netherlands

- **Age / Gender – 18 age bands** (1991)
- **Urbanization** (1996)
  - 10 regional clusters based on non-Western immigrants, average income, % of single people, death probability, proximity of hospitals & doctors, number of nursing homes
- **Pharmacy-based cost groups (PCGs)** (2002)
  - Out-patient drugs
  - Not an incidental user (6 months usage)
  - Linked to about 20 chronic conditions
- **Diagnostic cost groups (DCGs)** (2004)
  - Based on diagnosis when discharged from hospital
- **Source of income (special for ages 0-14 & over 65)** (2007+)
  - Disability
  - Receiving income support
  - Unemployment
  - Self-employed
  - Employed
### Risk Adjustment – The Netherlands

<table>
<thead>
<tr>
<th>Risk Adjuster</th>
<th>Woman Age 67, Rural, Thyroid disorder</th>
<th>Man Age 19, City, Student No chronic disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/Gender</td>
<td>970</td>
<td>389</td>
</tr>
<tr>
<td>Urbanization</td>
<td>-31</td>
<td>36</td>
</tr>
<tr>
<td>PCG</td>
<td>174</td>
<td>-109</td>
</tr>
<tr>
<td>DCG</td>
<td>-97</td>
<td>-97</td>
</tr>
<tr>
<td>Source of Income</td>
<td>0</td>
<td>-20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,016</strong></td>
<td><strong>199</strong></td>
</tr>
</tbody>
</table>

The sick fund receives the monthly amount (in EURs) minus the policyholder’s flat rate premium. Final payments are adjusted retrospectively. Privacy is maintained by assigning each insured a Pseudo-identity number.

“Risk Adjustment under the Health Insurance Act in the Netherlands”, Ministry of Health, Wellness and Sport
Conclusions:

Risk adjustment is needed to prevent cherry picking. Is it working?

+ Risk adjustment system is robust.
  – Funds can now offer a rebate to certain groups (up to 10%).
± Funds can not reject for basic coverage, but may reject for supplemental benefits.
± Sick funds are for-profit.

Is efficiency is improving?

+ Retrospective risk payments (currently 40%) continue to decrease.
+ Some insurers have developed programs for diabetes patients.
+ Model does account for health characteristics (PCGs & DCGs).
± Sick funds are for-profit.
Isapres, Instituciones de Salud Previsional, are 13 private insurers created in 1990.
- Enrollment covers employee and dependents.
- In 2006, $1M transferred from 6 Isapres.

FONASA, Fondo Nacional de Salud, is the state insurance fund.
Risk Adjustment – Chile

The Fund for Solidarity Compensation, created in 2005, attempts to equalize health risks among Isapres beneficiaries as relates to explicit health care guarantees.

<table>
<thead>
<tr>
<th>Year</th>
<th># of Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>25</td>
</tr>
<tr>
<td>2007</td>
<td>56</td>
</tr>
<tr>
<td>Current</td>
<td>69</td>
</tr>
</tbody>
</table>

Example - A patient with a heart attack has the below guarantees:
- Within 30 minutes from arriving at health care center – EKG diagnostic and treatment with thrombolytic medication if indicated
- After discharge – secondary prevention visit within 30 days of discharge, monthly visits thereafter

Acceso Universal con Garantías Explicitas en Salud (AUGE)
Universal Access with Explicit Guarantees in Health
Risk Adjustment – Chile

Conclusions:

This system establishes solidarity between people with different health risks.

± Redistribution is modest as indicated by less than $1M changing hands.
± FONASA does not participate in the solidarity fund, but payments are adjusted for geography and income level.
  – They need to incorporate socio-economic variables.

Is this system delivering high quality appropriate care?

+ The explicit health guarantees are increasing.
  – The effect of the fund is still very limited.
Medical Schemes consists of about 120 non-profit private insurers. They must cover the Prescribed Minimum Benefits (PMBs), but are allowed to include supplemental benefits.

- Risk Equalization Fund (REF) was created in 2004, but is still not implemented.
The REF is responsible for collecting and redistributing funds only for the prescribed minimum benefits (PMBs). These are defined using ICD-10 codes, with the goal of ensuring that all medical scheme members have access to certain minimum health services, regardless of the benefit option they have selected.

Medical Schemes must cover the costs of:
- Emergency conditions
- Set of 270 medical conditions defined as Diagnosis Treatment Pairs (DTPs)

<table>
<thead>
<tr>
<th>DTP Code</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>109A</td>
<td>Vertebral dislocation/fractures with injury to spinal cord</td>
<td>Repair/reconstruction; medical management; inpatient rehabilitation up to 2 months</td>
</tr>
</tbody>
</table>

- Chronic Disease List (CDL)
- HIV/AIDS
Risk Adjusters – South Africa

Age – 19 age bands

Chronic diseases & number of chronic diseases

- 25 chronic diseases
- HIV/AIDS on ARV therapy

Maternity cases – counted separately
# Risk Adjustment – South Africa

70 yr old female with diabetes (DBI) and coronary heart failure (CHF)

Maximum of (3745, 1791) + 246 = 3,992

<table>
<thead>
<tr>
<th>Age Bands</th>
<th>No CDL Diseases NON</th>
<th>Chronic Disease List (CDL) Conditions</th>
<th>ADS</th>
<th>CHF</th>
<th>CMY</th>
<th>DBI</th>
<th>DM1</th>
<th>DM2</th>
<th>DYS</th>
<th>EPL</th>
<th>HAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 1</td>
<td>669</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-4</td>
<td>115</td>
<td></td>
<td>294</td>
<td>3,066</td>
<td>1,632</td>
<td>1,112</td>
<td>1,893</td>
<td>665</td>
<td>868</td>
<td>1,004</td>
<td>13,132</td>
</tr>
<tr>
<td>40-44</td>
<td>218</td>
<td></td>
<td>397</td>
<td>3,169</td>
<td>1,735</td>
<td>1,214</td>
<td>1,995</td>
<td>767</td>
<td>970</td>
<td>1,106</td>
<td>13,234</td>
</tr>
<tr>
<td>70-74</td>
<td>794</td>
<td></td>
<td>973</td>
<td>3,745</td>
<td>2,311</td>
<td>1,791</td>
<td>2,572</td>
<td>1,344</td>
<td>1,547</td>
<td>1,683</td>
<td>13,811</td>
</tr>
<tr>
<td>85+</td>
<td>706</td>
<td></td>
<td>884</td>
<td>3,657</td>
<td>2,223</td>
<td>1,702</td>
<td>2,483</td>
<td>1,255</td>
<td>1,458</td>
<td>1,594</td>
<td>13,722</td>
</tr>
</tbody>
</table>

## Combined Female and Male table for use in Shadow Year 2010

### Chronic Disease List (CDL) Conditions

<table>
<thead>
<tr>
<th>Age Bands</th>
<th>No CDL Diseases NON</th>
<th>Chronic Disease List (CDL) Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Modifier for number of chronic conditions

<table>
<thead>
<tr>
<th>Number</th>
<th>2</th>
<th>3</th>
<th>4 or more</th>
<th>MAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC2</td>
<td>CC3</td>
<td>CC4</td>
<td></td>
</tr>
<tr>
<td>All Ages</td>
<td>246</td>
<td>673</td>
<td>1,373</td>
<td>23,192</td>
</tr>
<tr>
<td></td>
<td>246</td>
<td>673</td>
<td>1,373</td>
<td>23,192</td>
</tr>
<tr>
<td></td>
<td>246</td>
<td>673</td>
<td>1,373</td>
<td>23,192</td>
</tr>
</tbody>
</table>

Source: South Africa, REF Contribution Table 2010
Risk Adjustment – South Africa

Conclusions:

Risk adjustment is needed to prevent cherry picking. Is it working?
– Age profile differs considerably between the schemes, pointing to a large distortion in risk exposure.
– Beneficiaries can leave a scheme without prior notice.
+ Chronic disease list is reviewed every year.
+ Data is becoming more standardized with less variations.

Risk adjustment is needed to maintain market stability.
– Discrepancies between the private and public system exist.
– Range of services are different between the public & private sectors.
– The cost per capita in the private market is about 7 times higher than in the public sector.
± The number of medical schemes are increasing.
+ The contribution table is transparent.
## Risk Adjustment – A Global Perspective

<table>
<thead>
<tr>
<th>Risk Adjusters</th>
<th>UK</th>
<th>Israel</th>
<th>Netherlands</th>
<th>Chile</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic</td>
<td>Age (18 bands) Gender</td>
<td>Age (11 bands) Recently Gender</td>
<td>Age (18 bands) Gender</td>
<td>Age (18 bands) Gender</td>
<td>Age (19 bands)</td>
</tr>
<tr>
<td>Health Status</td>
<td>Morbidity Markers</td>
<td>5 Severe Diseases</td>
<td>PCGs / DCGs</td>
<td></td>
<td>Chronic Diseases</td>
</tr>
<tr>
<td>Socio-Economic</td>
<td>Neighborhood Health Indicators</td>
<td>Source of Income</td>
<td></td>
<td></td>
<td># of Chronic Diseases</td>
</tr>
<tr>
<td>Geography</td>
<td>Distance from services (recent)</td>
<td>Urbanization</td>
<td></td>
<td></td>
<td>Maternity</td>
</tr>
</tbody>
</table>

## Achieving Goals

- **Improve efficiency**
- **Ensure quality & appropriate care**
- **Enhance solidarity**
- **Sustainable system**
- **Prevent antiselection**
- **Improve efficiency**
- **Ensure quality & appropriate care**
- **Sustainable system**
- **Prevent antiselection**
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Risk Adjustment – A Global Perspective

Resources:

“PBRA report v8.2”, by PBRA team, October 14, 2009.


Israel sick fund statistics - 2005 study to the Center for Research and Information of the Knesset (the Israeli Parliament) by Prof. D. Tchernichovski.


