Society of Actuaries in Ireland

Healthcare Seminar on Risk Equalisation & Regulation in Private Health Insurance

26th September 2018

Disclaimer

The views expressed in these presentations are those of the presenter(s) and not necessarily of the Society of Actuaries in Ireland

Agenda

Time	Title	Speakers
9.00am – 9.10am	Welcome & Opening Remarks	Maurice Whyms
9.10am – 9.20am	Official Opening	Colm O'Reardon
9.20am – 10.00am	Risk Equalisation: The Case of Ireland Overview & Future Challenges	John Armstrong
10.00am – 10.45am	Health-Based Risk Adjustment/Equalisation: International Experiences & Lessons Learned	Richard van Kleef
10.45am – 11.15am	Coffee Break	
11.15am -12.00pm	Risk Sharing in Plan Payments in Individual Health Insurance Markets & The Problem of Very High Costs Cases	Thomas McGuire
12.00pm – 12.45pm	Panel Discussion: *"The Future of Risk Equalisation in Ireland"*	Fiona Kiernan, James O 'Donoghue & Eoin Dornan Moderator: Cathy Herbert
12.45pm	Seminar Close	Brendan McCarthy

Welcome & Opening Remarks

Maurice Whyms

Society of Actuaries in Ireland

Official Opening

Colm O'Reardon

Risk Equalization and Risk Sharing in Regulated Health Insurance Markets

John Armstrong   -   Thomas McGuire   -
Richard van Kleef

Erasmus School of
Health Policy
& Management

HARVARD
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Society of Actuaries in Ireland Seminar,

September 26, 2018, Dublin

Risk Equalization and Risk Sharing in Regulated Health Insurance Markets

The Case of Ireland

John Armstrong

Erasmus School of
Health Policy
& Management

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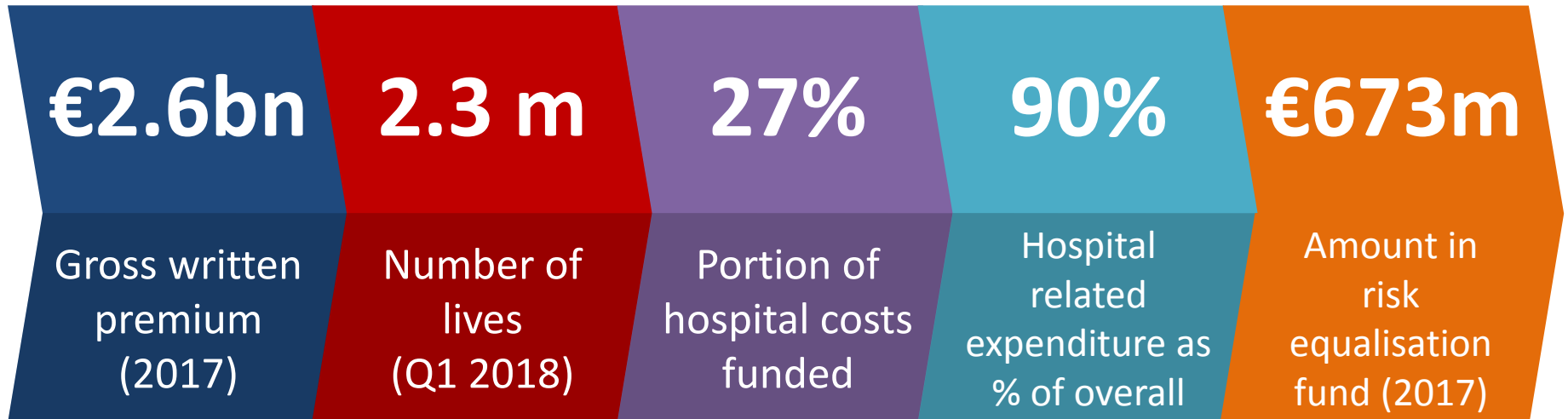
AGENDA

OVERVIEW

01

TERMINOLOGY

- Important to understand key terminology differences from that readily used in Ireland

Examples:

1. Risk equalization and risk adjustment

2. Premium regulation and community rating

3. Health plan payment

4. Risk adjuster

HIGHLIGHTS OF MARKET

1. *Voluntary market* of circa. with over 45% of population insured
2. Role within wider health system
3. Duplicative / supplementary
4. Covers public/voluntary and private hospitals
5. Competitive market
6. Detailed regulatory requirements underpinning market

€2.6bn	2.3 m	27%	90%	€673m
Gross written premium (2017)	Number of lives (Q1 2018)	Portion of hospital costs funded	Hospital related expenditure as % of overall	Amount in risk equalisation fund (2017)

Sources: Various HIA Reports (2017, 2018), CSO (2018)

WHY REGULATE HEALTH INSURANCE?

02

WHY REGULATE HEALTH INSURANCE?

1. Health insurance markets are often premised on basis of regulated competition

2. Based upon aims of equitable access, fairness in financing, efficiency in delivery combined with providing quality in terms of service delivery

3. Often these aims are conflicting and not always met in the extreme versions of competition (i.e. no competition versus perfectly competitive model)

4. Public/single insurer markets often tend to prioritise equity over efficiency / innovation

5. Conversely, pure competition markets tend to favour innovation, cost containment but not equity

Regulated competition model attempts to meet a pre-defined level of equity while retaining efficiency to an acceptable level

DIMENSIONS OF COMPETITION

| **Price** | **Quality** | **Benefits** |

Consumers can have free choice of insurer with choice influenced by:

1. Price offered explicitly or otherwise to consumers

2. Quality of service delivery both by insurer and providers within the network

3. Range & scope of benefits provided

CONSEQUENCES OF IMPERFECT REGULATION

1. Pure risk rating will undermine affordability for high-risk people

2. Risk selection will undermine affordability and efficiency

Example of outlier costs that could lead to adverse consequences

Cost of TAVI (valve-replacement heart procedure) close to EUR 50,000

COUNTRIES WITH ELEMENTS OF REGULATED COMPETITION HEALTH INSURANCE
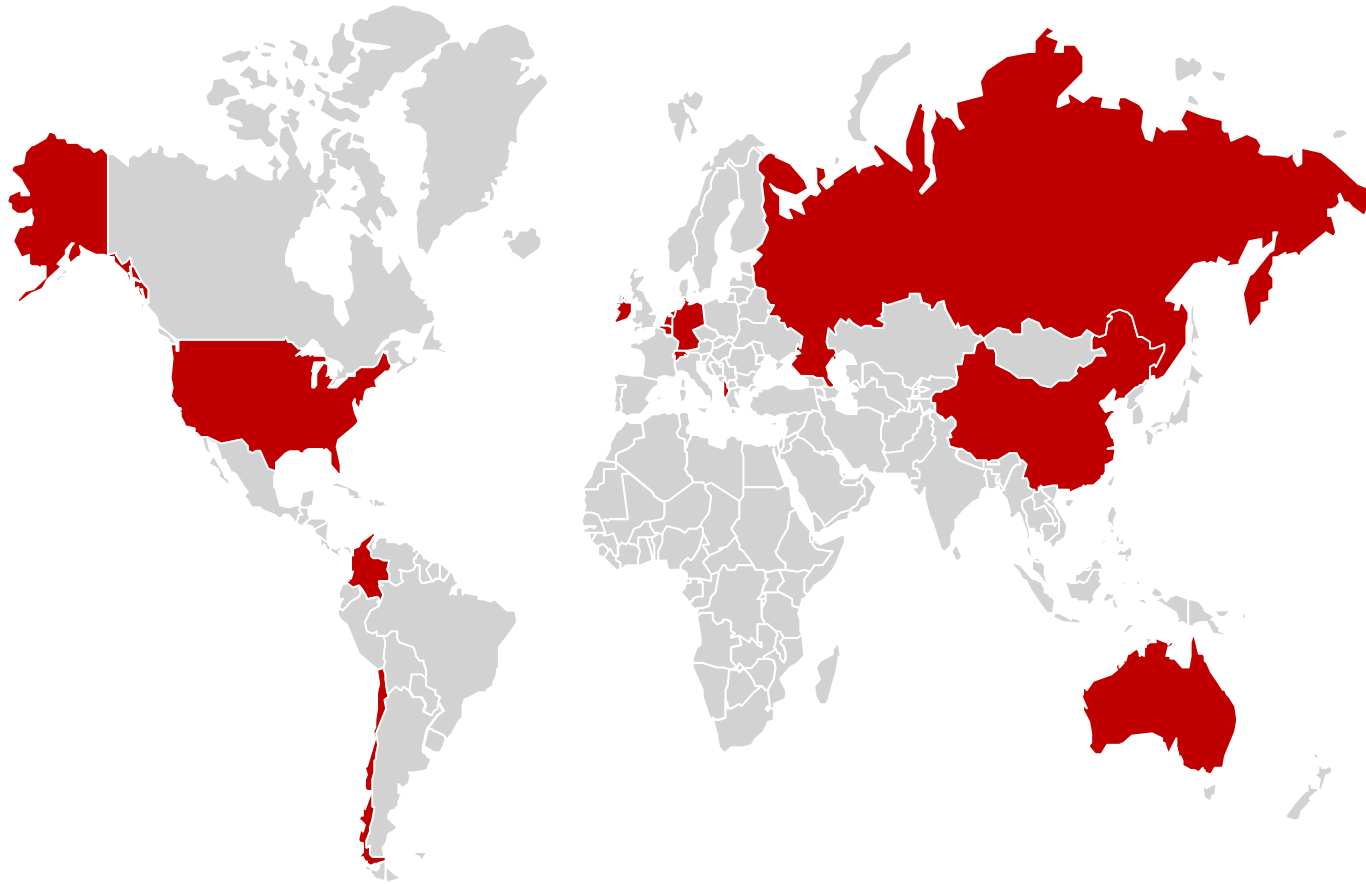
Europe
1. Belgium
2. Germany
3. Ireland
4. Netherlands
5. Russia Federation
6. Switzerland

North & South America
1. Chile
2. Columbia
3. United States

Rest of World
1. Australia
2. China
3. Israel

WHY REGULATE IN IRELAND

1. Long-standing view that health insurance is part of social policy

2. Indicated by various features of the market

   1. Need for Vhi to balance revenues & cost (Vhi Act 1957)
   2. Vhi exemption from Insurance Acts
   3. Behaviour of Vhi before 1994 when chose to apply a flat premium (informal form of community rating)
   4. Nonetheless, not legislative basis until 1994

3. Purpose of market has been articulated as one of equity to make health insurance affordable to everyone regardless of risk profile

4. Basis under which operates continues until this day

5. Enshrined in legislation since Health Insurance Act (1994) and various amendments thereafter

6. Slaintecare is silent on the topic so unclear as to future role into future

TOOLS FOR REGULATION

03

TOOLS FOR REGULATION

Regulator's Tools for Structuring and Managing Individual Health Insurance Markets		
General tools	**Example of specific regulation**	**Examples in Ireland**
Regulation of coverage	1. Standardisation of benefits 2. Standardisation of consumer cost-sharing 3. Network requirements	Minimum benefits apply though have never been updated thereby diluting their effectiveness
Regulation of enrollment	1. Insurance mandate 2. Open enrollment 3. Standardised contract length 4. Central entry point for enrollment	Open enrolment / Lifetime cover apply / 1-year contracts
Regulation of market entry	1. Screening of insurers 2. Screening of plans 3. Screening of provider networks	Prudential authorisation / HIA approval
Adapted from McGuire & van Kleef (2018)		

TOOLS FOR REGULATION

Regulator's Tools for Structuring and Managing Individual Health Insurance Markets		
General tools	**Example of specific regulation**	**Examples in Ireland**
Market support and surveillance	1. Promotion of transparency 2. Quality measurement 3. Antitrust supervision 4. Solvency requirements 5. Monitoring of risk selection	1. Competition Acts 2. HIA product notifications 3. Prudential regulation
Regulation of Health Plan Payment	1. Premium regulation 2. Risk equalization 3. Risk sharing 4. Subsidies	1. Community rating applies by product within insurer with limited exceptions 2. Lifetime community rating 3. Age/gender/level of cover risk equalisation 4. Hospital utilisation credit as risk sharing tool 5. Income tax subsidies

Adapted from McGuire & van Kleef (2018)

REGULATION OF HEALTH INSURANCE IN IRELAND

04

RECAP OF REGULATION

Many regulatory tools are present. These include:
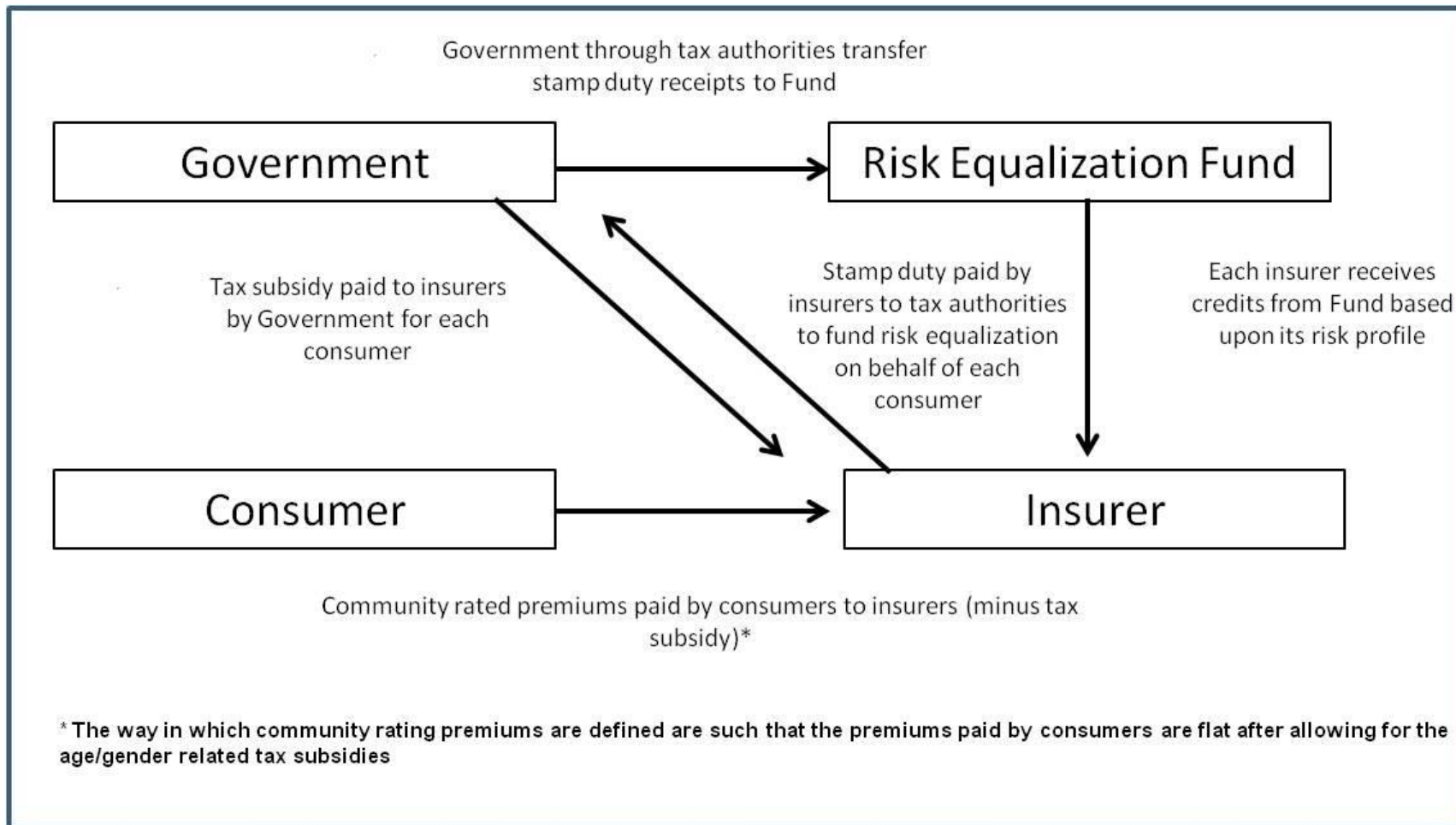
1. Premium regulation (Community rating)

2. Risk equalization (Age/gender/type of cover)

3. Risk sharing (HUC / Over-compensation mechanism)

All of these mechanisms have effects on affordability and efficiency within the market

PREMIUM REGULATION IN IRELAND

1. Community rating long regarded as the cornerstone of the market

2. Applies to all cover, even higher levels of cover

MODALITY OF RISK EQUALIZATION

Government through tax authorities transfer stamp duty receipts to Fund

| Government | → | Risk Equalization Fund |

Tax subsidy paid to insurers by Government for each consumer

Stamp duty paid by insurers to tax authorities to fund risk equalization on behalf of each consumer

Each insurer receives credits from Fund based upon its risk profile

| Consumer | → | Insurer |

Community rated premiums paid by consumers to insurers (minus tax subsidy)*

* The way in which community rating premiums are defined are such that the premiums paid by consumers are flat after allowing for the age/gender related tax subsidies

Taken from Armstrong (2018)

Risk adjusters used are age, gender, level of cover

RISK SHARING IN IRELAND

1. Not explicitly said but current system has element of risk sharing

2. Actual costs are retrospectively shared between insurers based upon hospital utilization credit

3. Furthermore, an over-compensation mechanism is in place under which, theoretically at least, risk equalization credits can be capped
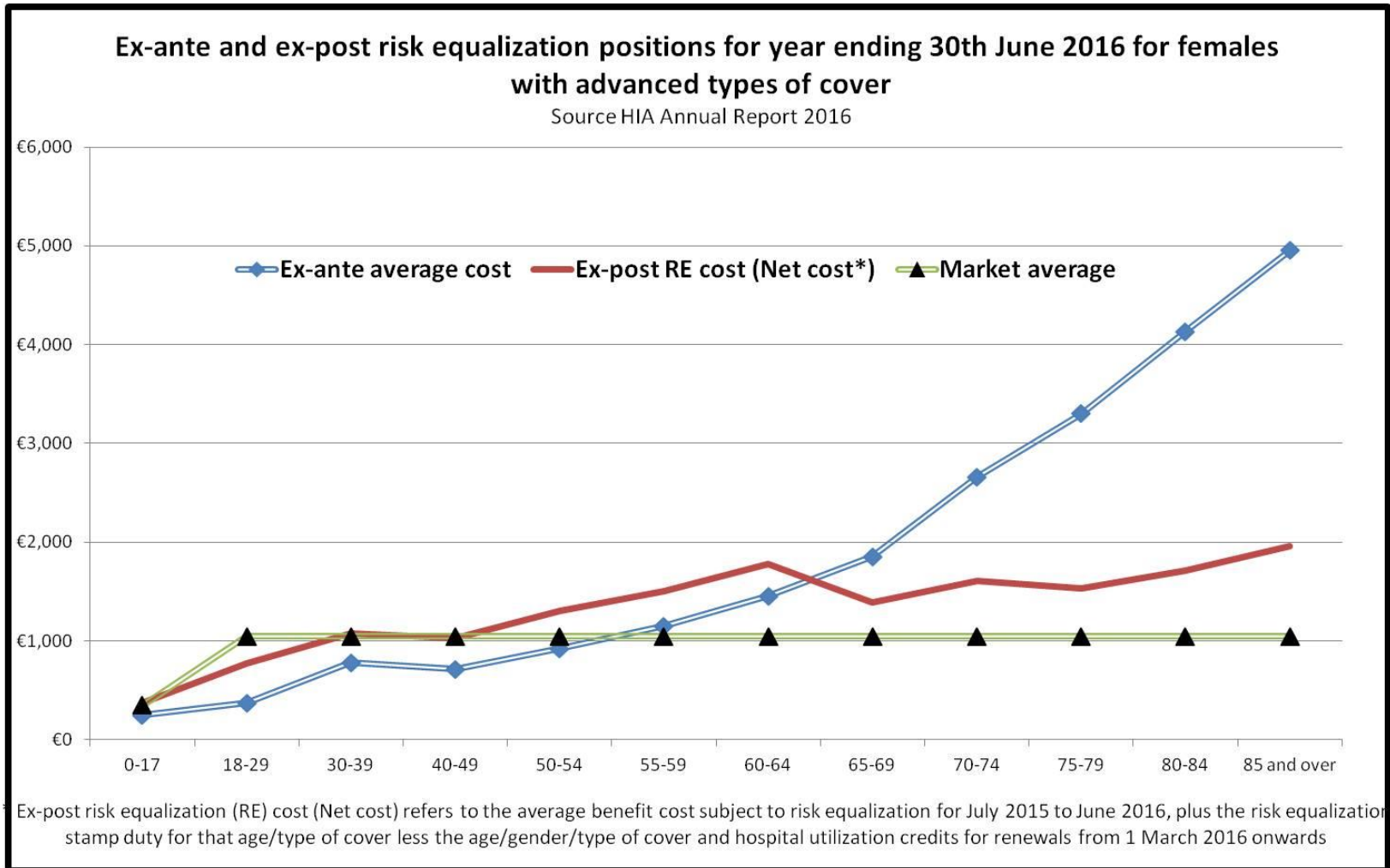
IMPROVING RISK EQUALIZATION IN IRELAND

05

HOW EFFECTIVE IS RISK EQUALIZATION IN IRELAND?

1. Limited official data available to measure effectiveness using international commonly used statistical measures e.g. R-squared statistics using regression (individual or aggregated); measures of fit for key groups

2. Nonetheless, work by myself (and consistent with others) suggests current age/gender/type of cover risk adjusters give a low R-squared

3. However, it is clear that having risk equalization in place has partially changed insurer responses (e.g. insurer / product choice)

4. There is no evidence of changed consumer responses as of yet

Overall, it is clear that risk equalization have been someway effective in enhancing competition but there is much further work to be done

HOW EFFECTIVE IS RISK EQUALIZATION IN IRELAND?

Ex-ante and ex-post risk equalization positions for year ending 30th June 2016 for females with advanced types of cover
Source HIA Annual Report 2016

*Ex-post risk equalization (RE) cost (Net cost) refers to the average benefit cost subject to risk equalization for July 2015 to June 2016, plus the risk equalization stamp duty for that age/type of cover less the age/gender/type of cover and hospital utilization credits for renewals from 1 March 2016 onwards

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ROADMAP FOR FUTURE CHANGES

1. A key part of reform must be to reduce opportunities for risk selection and to encourage efficiency

2. Many reforms could be put in place to do this including:

    1. Revisions to community rating

    2. Better transparency for consumers

    3. Product regulation

    4. Changes to both the risk equalisation and risk sharing mechanisms

3. For purposes of this presentation we consider implementation issues for introduction of Health status risk adjustment (i.e. A DRG system)

KEY STEPS FOR HEALTH STATUS DRG INTRODUCTION

Clinical coding	Data collection	RE Credits	RE payments

- **Medical providers record all patient through-put**
- **Covers all providers – both public / private**

- **Governance**
- **How will it operate?**
- **Coding standards**
- **Regularity timeliness**
- **Data exchange with insurers / regulator**
- **Quality**
- **Cost issues**

- **Person level data**
- **Choice of diagnoses to use**
- **Statistical modelling to determine credits**
- **Projecting into future**
- **Regularly updated**

- **Modality of payments**
- **How it interacts with risk sharing arrangements**

FRAMEWORK FOR DATA COLLECTION FOR HEALTH STATUS

06

DATA COLLECTION FOR DRG HEALTH STATUS

1. Overall, data gaps have slowed down significantly ability of Irish risk equalization system to develop in line with best practice

2. Thus, has compromised our ability to facilitate competition based on efficiency rather than risk selection and is, therefore, not in consumer interest

3. We must improve data collection mechanisms as a crucial first step to enhancing the risk equalization system

4. This is true both for public/voluntary hospitals where data needs to be provided to insurers and for private hospitals

5. An useful case study for the private hospital sector on how to do this comes from Australia

POSSIBLE FRAMEWORK FOR DRG RISK EQUALISATION

Consumer contract with insurers

Consumer have patient episodes

Consumer

Insurers

Private Hospitals

Public / Voluntary Hospitals

Episodic data shared With insurers by hospitals

Coding Agency

National Standards – Health Pricing Office

Regulator - HIA

Central agency codes data on behalf of hospitals including DRG Grouping

Coding standards set by HPO

Credits determined & existing modality of risk equalization applies

Underpinned by legislative basis

CASE STUDY: AUSTRALIA

1. Australia long seen importance of data collection for system design, financing & accountability

2. Multiple collection mechanisms from private hospitals

3. Private hospitals have long supported measures to collect data

4. Much of framework set out in legislation

   1. Dates back to 1905 Census & Statistics Act

   2. Most important is *Private Health Insurance Act* 2007

5. Establishes Private Hospital Data Bureau and establishes obligation on private hospitals to report monthly to insurers

POTENTIAL ISSUES FOR PRIVATE HOSPITAL COLLECTION

1. Definition of private care – Nothing set out in legislation
2. Regularity of reporting
3. Lack of expertise to code / Individual size of hospitals
4. Ensuring anonymity for consumers, hospitals & insurers
5. Quality monitoring
6. Integration with existing public hospital data collection system
7. Commercial considerations (examples):
   1. Who pays for it?
   2. Data may damage commercial / negotiating position of hospitals
   3. No business case for private hospitals to invest in feeder systems

MOVING AHEAD FOR THE FUTURE

07

7 **SOME CONCUDING THOUGHTS**

1. Changes to regulatory environment important to ensure affordability and equity for consumers

2. They could have significant impacts on premium increases

3. Changes must be balanced with wider competition concerns

4. Risk equalization and other measures help equity within market and, therefore, consistent with principles of Slaintecare

5. There are significant challenges ahead on the next phase of the journey but experience from other countries would indicate it is a worthwhile journey

Risk Equalization and Risk Sharing
in Regulated Health Insurance Markets

John Armstrong   -   Thomas McGuire   -   Richard van Kleef

Society of Actuaries in Ireland – September 26, 2018, Dublin

Forthcoming:

- A volume that covers theory and practice of health plan payment in regulated health insurance markets

- Theory: 5 conceptual chapters

- Practice: 14 country/sector chapters

- Much of what we talk about today comes from the book!

Risk Adjustment, Risk Sharing and Premium Regulation in Health Insurance Markets
Theory and Practice

Edited by Thomas G. McGuire and Richard C. van Kleef
Foreword by Alain Enthoven

Health-based risk equalization:

International experiences and lessons learned
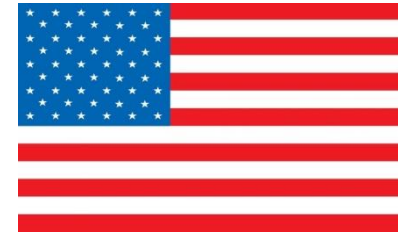
Richard van Kleef

Outline

1. What does health-based risk equalization look like?
   → Quick visit to Germany, the Netherlands and the U.S. Marketplaces

2. What is needed to make it work?
   → Principles and requirements

3. How do health-based risk equalization models perform?
   → Empirical illustration from the Netherlands

Health-based risk equalization (RE):

paying insurers on the basis of (health) characteristics of their population

What do these characteristics (i.e. the risk adjusters) look like?

A quick flavor: risk adjusters in three sophisticated RE models (I)

	Germany	Netherlands	U.S. Marketplaces
Demographic and socioeconomic characteristics	• Age • Sex • Reduced earning capacity	• Age • Sex • Regional factors • Socioeconomic status • Source of income • Household composition • Yes/no institutionalized • Level of education	• Age • Sex • Geography

A quick flavor: risk adjusters in three sophisticated RE models (II)

	Germany	Netherlands	U.S. Marketplaces
Disease indicators	201 hierarchical morbidity groups (HMG) based on: • prescribed drugs • in- and outpatient diagnoses	Indicators based on: • prescribed drugs • hospital diagnoses • physiotherapy diagnoses • durable medical equipment • multiple-year high/low cost • one-year cost of home care	100 Hierarchical Condition Categories (HCCs) based on: • all encounter diagnoses
Timing of disease indicators	prospective	prospective	concurrent

Some observations

- Current health-based RE models are the product of >30 years of research

- Data is crucial --> but start from what you have!

- Health-based risk equalization is not 'only' about *prediction*

- Health-based risk equalization is also about *incentives* → e.g. see next slide

From Chapter 3 of the volume (Ellis et al.):

BOX 3.2 Principles guiding HCC model development

1. Diagnostic categories should be clinically meaningful.
2. Diagnostic categories should be predictive.
3. Diagnostic categories that will affect payments should have adequate sample sizes to permit accurate and stable estimates of expenditures.
4. Hierarchies should be used to characterize the person's illness level within each disease process, while the effects of unrelated disease processes accumulate.
5. The diagnostic classification should encourage specific coding.
6. The diagnostic classification should not reward coding proliferation.
7. Providers should not be penalized for recording additional diagnoses (monotonicity).
8. The classification system should be internally consistent (transitive) with regard to costs.
9. The diagnostic classification should assign all ICD-9-CM codes (i.e., be exhaustive).
10. Discretionary diagnostic categories should be excluded from payment models.
11. *Designers should anticipate induced changes in coding and treatment.*
12. *Designers should optimize given likely selection effects induced by payment system.*

    Note: The first 10 principles are from Pope et al. (2004).

Principles can be pretty restrictive

In the Netherlands for example:

- >65% of the population uses drugs in a given year
  → <20% is flagged by health indicators based on prior use of pharmaceutical care

- >40% of the population is treated in a hospital in a given year
  → <12% is flagged by health indicators based on prior hospital treatments

- >10% of the population uses medical equipment in a given year
  → <4% is flagged by health indicators based on prior use of medical equipment

Interesting question:

Can risk equalization sufficiently compensate for predictable variation in medical spending *given these principles?*

How do sophisticated health-based risk equalization models perform?

Some empirical results from the Netherlands

The Dutch RE model for somatic care (2018)

- Age/gender (1993)
- Region (1995)
- Source of income (1995/1999)
- Pharmacy-based cost groups (PCGs; 2002)
- Diagnoses-based cost groups (DCGs; 2004)
- Socioeconomic status (2008)
- Multiple-year high cost (2012; extended with multiple-year low cost in 2018)
- Medical equipment cost groups (2014)
- Level of education (2014/2016)
- Home care spending in prior year (2016)
- Household composition / being institutionalized (2017)
- Physiotherapy-diagnoses groups (2017)

Why did it take so long?

R-squared

?

R-squared

.32

Predictiveness per risk adjuster: R-squared (I)

	No other risk adjusters	Conditional on all other risk adjusters 2018
Pharmacy-based cost groups	.16	.03
Diagnoses-based cost groups (hospital)	.16	.03
Medical Equipment cost groups	.05	.00
Physiotherapy diagnoses groups	.02	.00

→ Diagnoses from drug prescriptions and hospital treatments are important

→ Substantial overlap between disease indicators

Predictiveness per risk adjuster: R-squared (II)

	No other risk adjusters	Conditional on all other risk adjusters 2018
Age/gender	.05	.00
Region Source of income Socioeconomic status Level of education Household composition Being institutionalized	.06	.00

→ Demographics and socioeconomic information doesn't add much to the predictiveness given the presence of (an extensive set of) health indicators

Predictiveness per risk adjuster: R-squared (III)

	No other risk adjusters	Conditional on all other risk adjusters 2018
Multiple-prior-year high cost	.18	.02
Home care cost prior year	.10	.03

→ Prior costs have high predictiveness

→ Prior costs can improve predictiveness of health-based models

Group-level Payment Fit

Self-reported health is good or very good (77%)

1,139

194

-3,143

Self-reported health is fair, poor or very poor (23%)

-398

□ No risk adjustment   ■ Risk adjustment model 2016
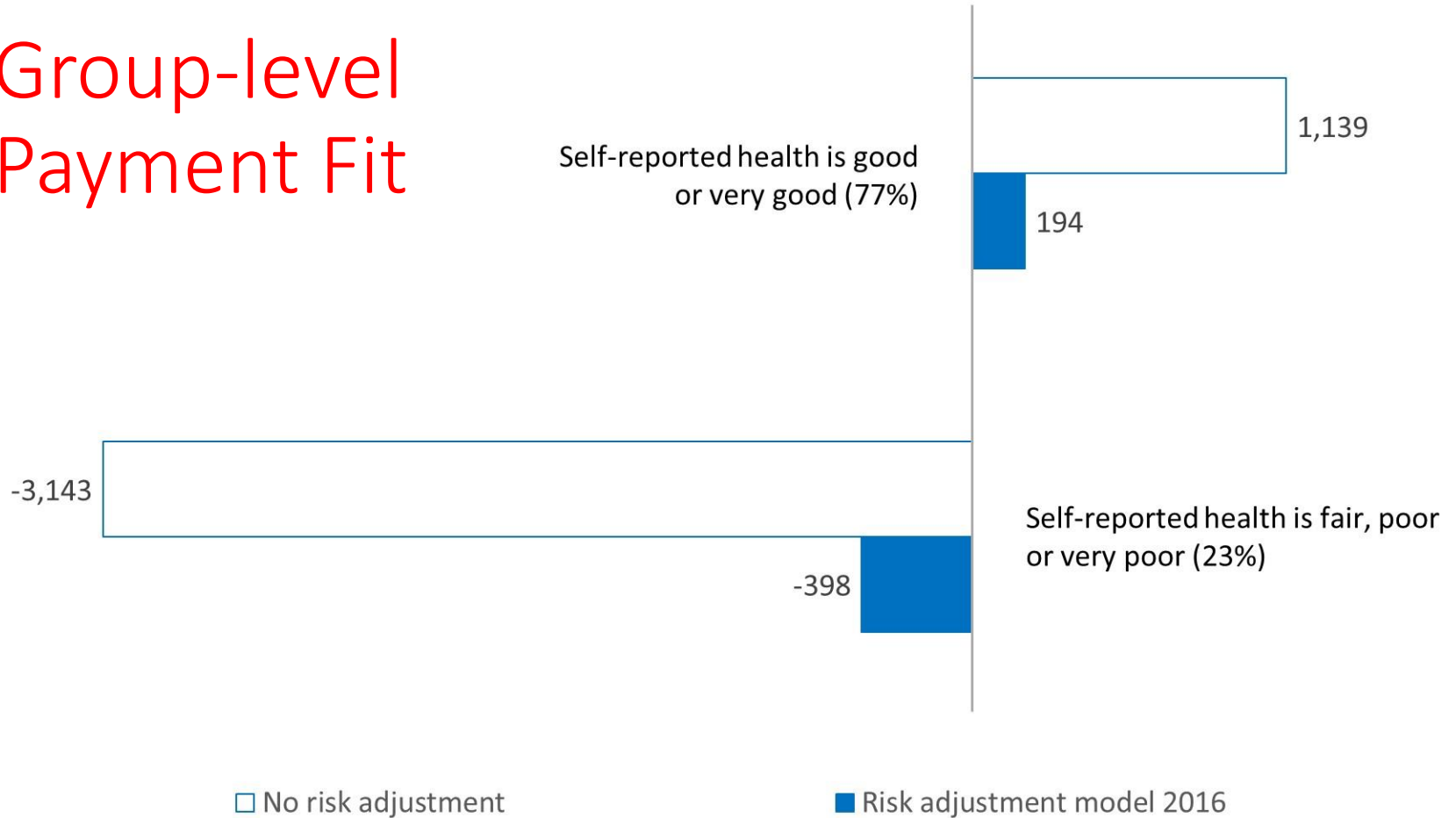
Ongoing discussion

Are remaining predictable profits and losses a problem?

If the answer is yes, then…

… how to reduce remaining predictable profits and losses?

- Improving risk equalization?

- Risk rating of premiums?

- Risk sharing?

Summary

- Decades of research led to sophisticated RE models

- RE is about more than 'just' prediction; it's also about incentives

- Information on diagnoses and drug prescriptions are crucial

- (Careful use of) risk adjusters based on prior cost can help

- Health-based risk equalization is still work in progress

- Additional measures – such as risk sharing – might be useful

Risk Equalization and Risk Sharing
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COFFEE BREAK

Risk Sharing in Plan Payments in Individual Health Insurance Markets and the Problem of Very High Cost Cases
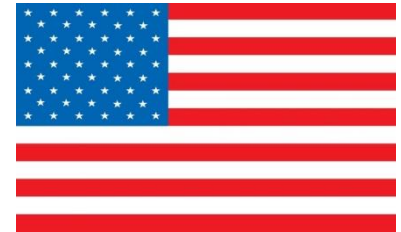
Thomas McGuire

Chapter 4: Risk Sharing
Thomas G. McGuire and Richard C. van Kleef

Chapter 11: Health Plan Payment in Ireland
John Armstrong

Two-Sided Reinsurance and Risk Adjustment in Individual Health Insurance: Germany, The Netherlands and the U.S. Marketplaces
TGM, Sonja Schillo, RvK

Risk Adjustment, Risk Sharing and Premium Regulation in Health Insurance Markets
Theory and Practice

Edited by Thomas G. McGuire and Richard C. van Kleef
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Health Plans Share Risk with Consumers and Reinsurers/Regulators
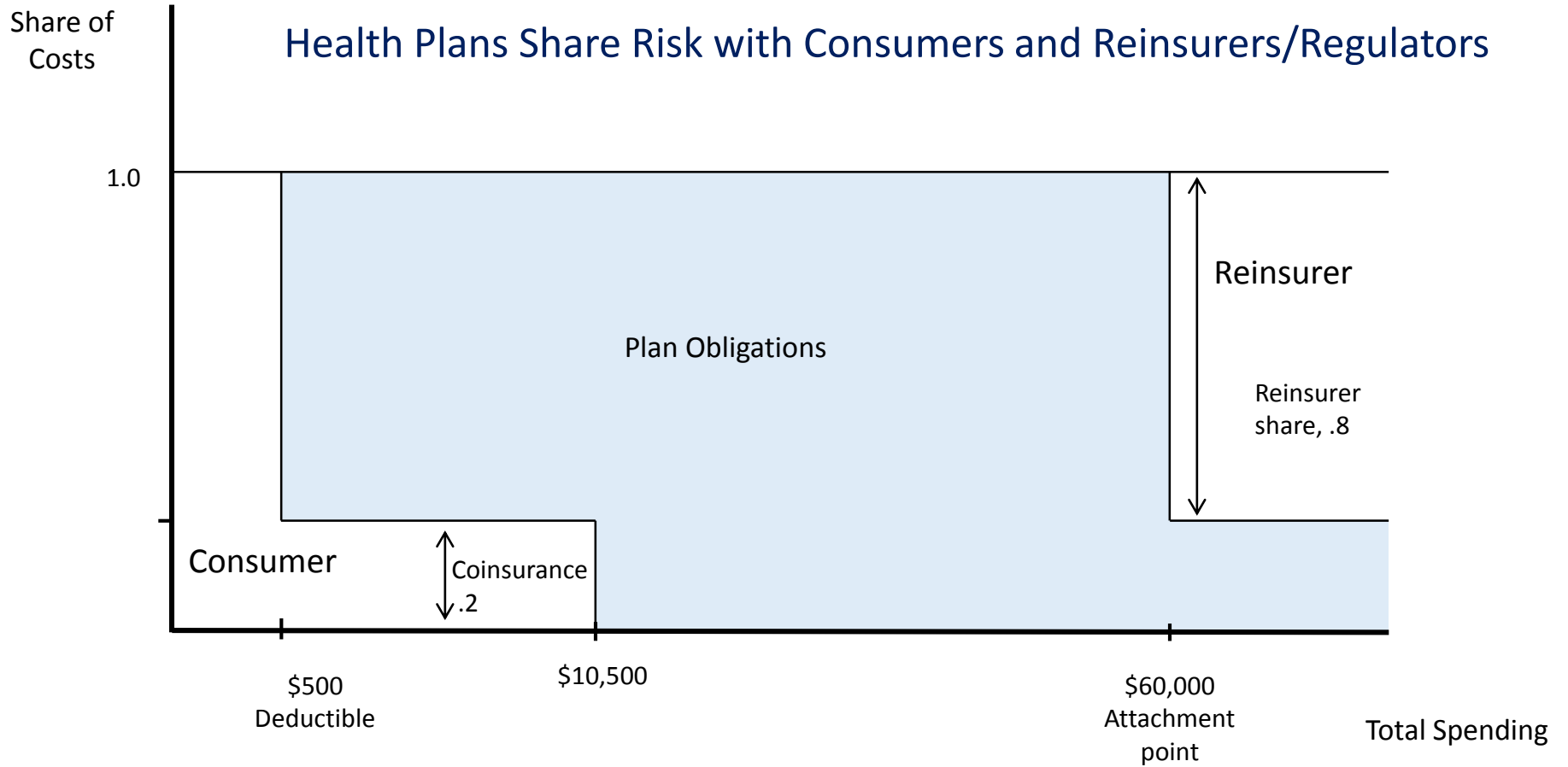
Risk Sharing Takes a Number of Forms

- Consumer-side deductibles, coinsurance, copayments, limits

- Reinsurance, risk corridors, shared risk contracts, feed back of costs to payments from rate-setting rules

- Payments link to costs in other ways: experience rating, regulatory feedback, utilization-based risk adjustment

- Does Ireland have risk sharing?

- Hospital utilization credit (≈ 15% of costs); Overcompensation adjustment (one-sided risk corridor); Past experience of one insurer affects national average => feedback through HIA rate setting

Very High-Cost Cases in Three Graphs

- Health care costs are very skewed

- Risk-adjustment pays more for consumers predicted to be high cost, but still leaves a very large right tail of losses <u>after</u> risk-adjusted payment

- The very high-costs cases account for a high share of spending and a really high share of unexplained variance

Distribution of Health Care Spending

# Distribution of Residuals from Risk Adjustment Model

Frequency
In population

hundreds of
thousands

0

multiple
millions
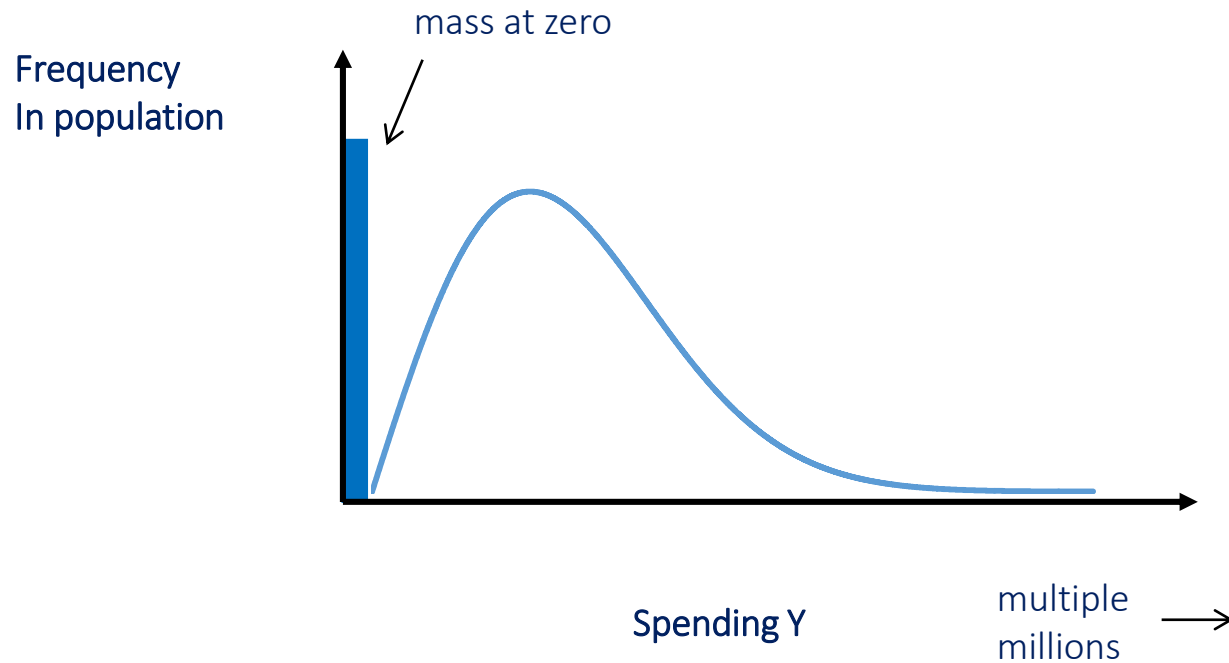
Residuals
$Y-\sum X\beta$
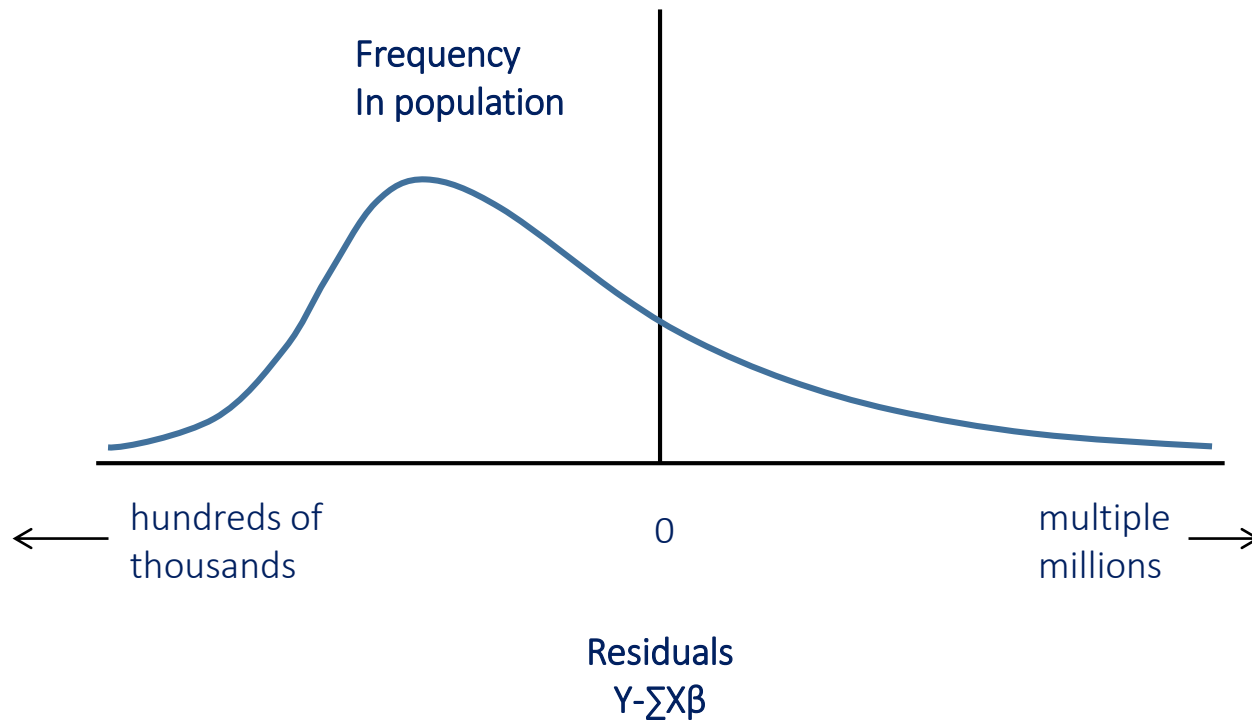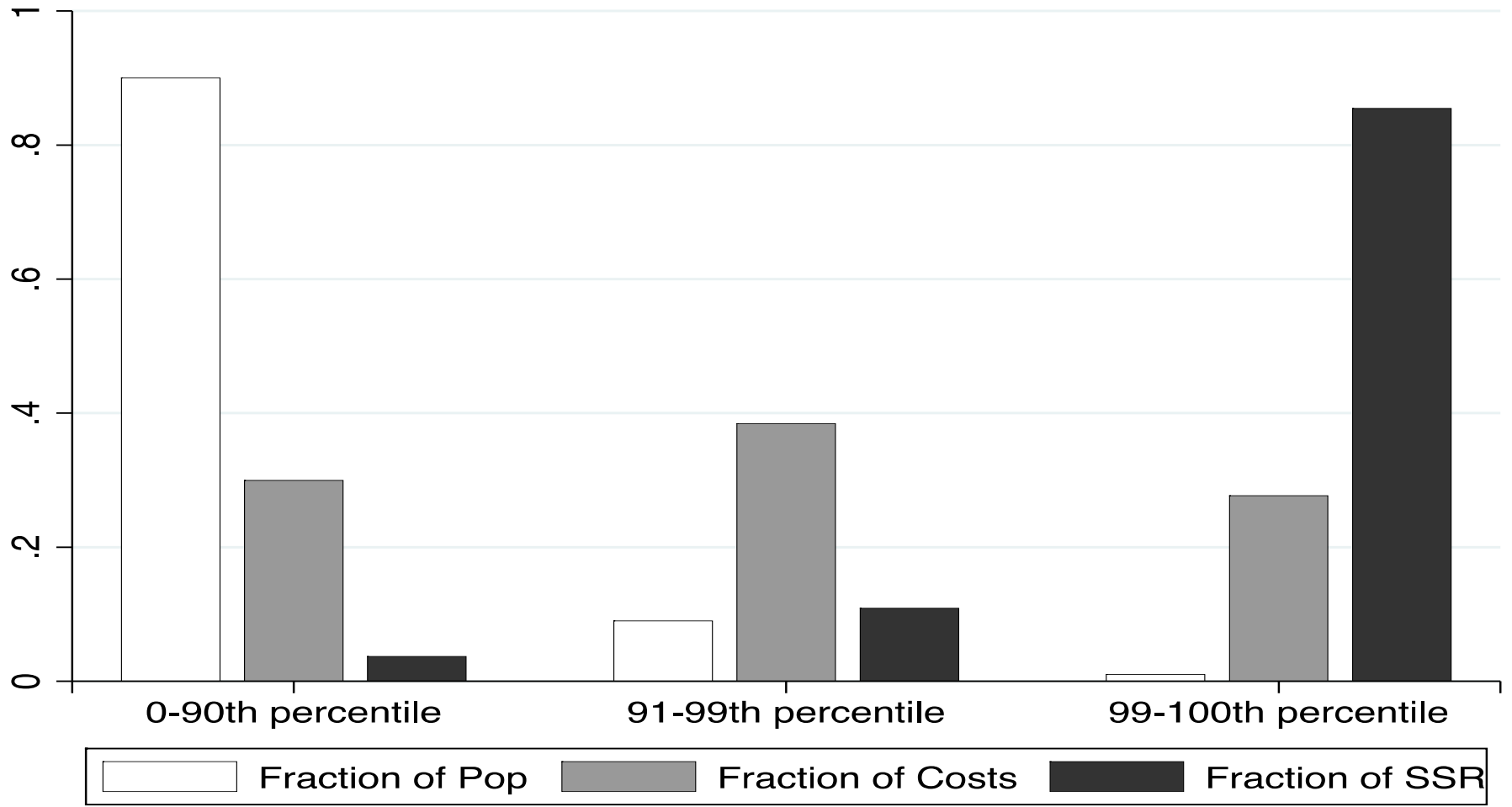
US Marketplace and German Research on High-Cost Cases

Layton and McGuire, "Marketplace Plan Payment Options for Dealing with High-Cost Enrollees," *American Journal of Health Economics*, 2017

Schillo, Lux, Wasem & Buchner, "High-Cost Pool or High-Cost Groups? How to Handle the High(est) Cost Cases in a Risk Adjustment Mechanism," *Health Policy, 2016*

Conventional Reinsurance Defined in Terms of Spending
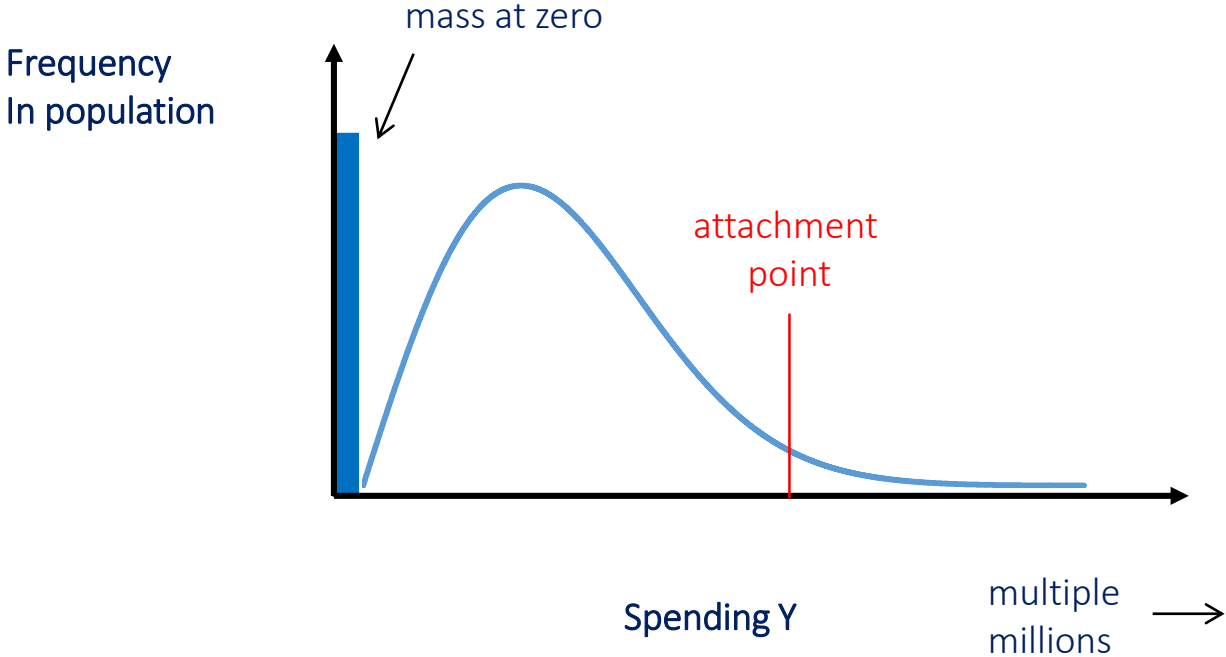
Risk Adjustment and Risk Sharing Should Work as a Team

- Risk adjustment weights and risk sharing parameters are generally set independently – not ideal

- Weights should be based on plan spending obligations (e.g., role of deductible in NETH)

- Risk sharing not needed for costs already captured by risk adjustment

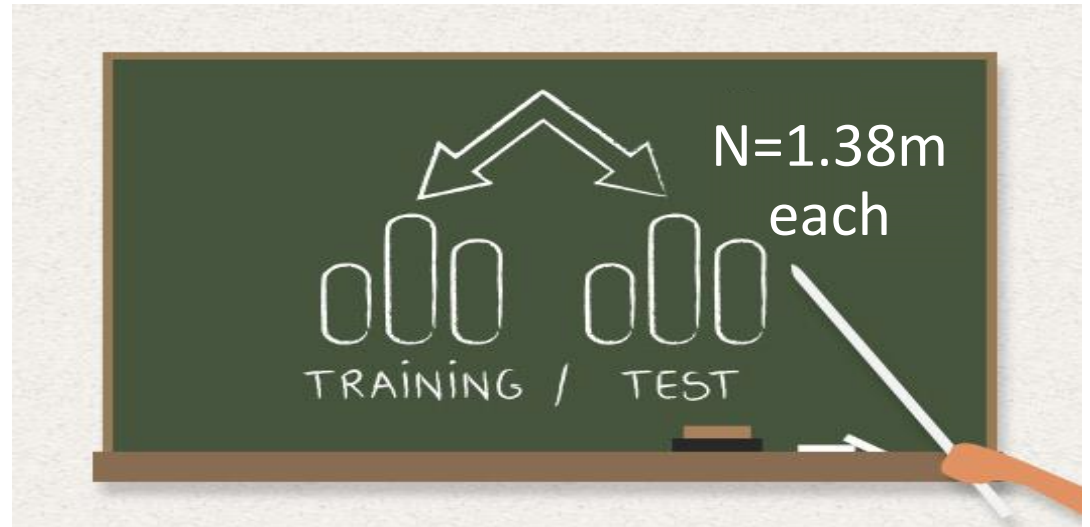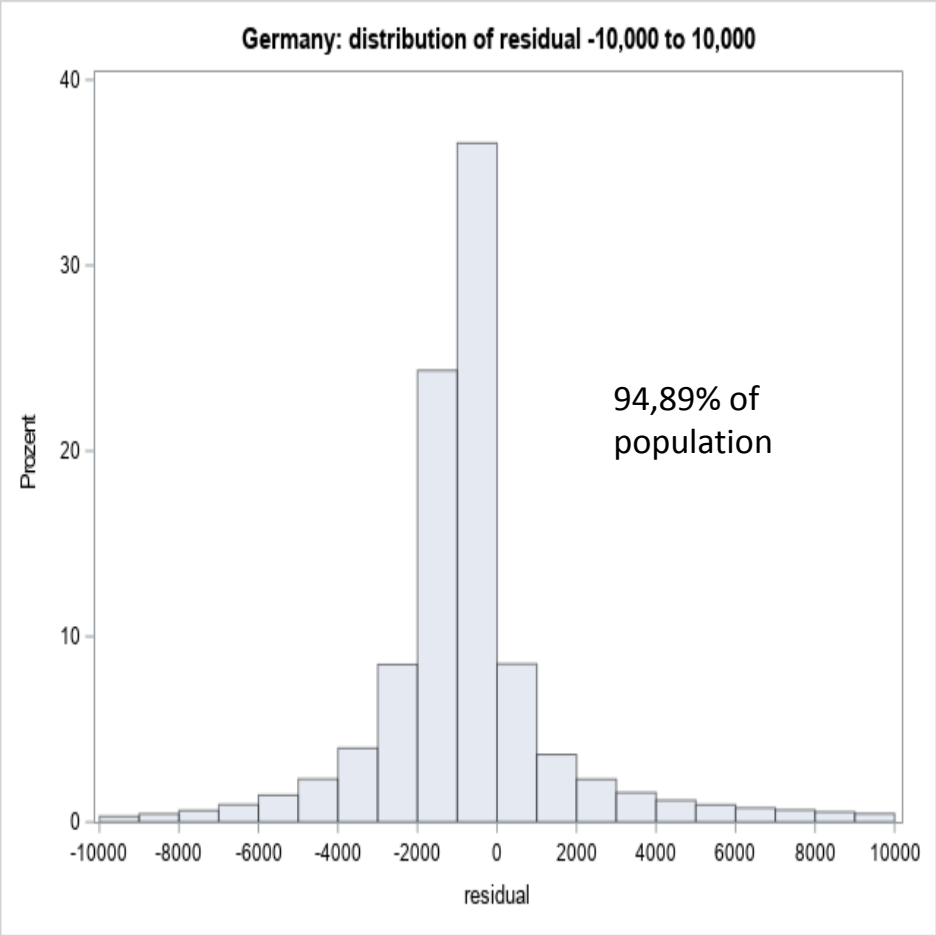# Reinsurance Defined in Terms of Residuals from Risk Adjustment Model

Frequency
In population

positive
threshold T$^+$

reinsurance

hundreds of
thousands

0

multiple
millions
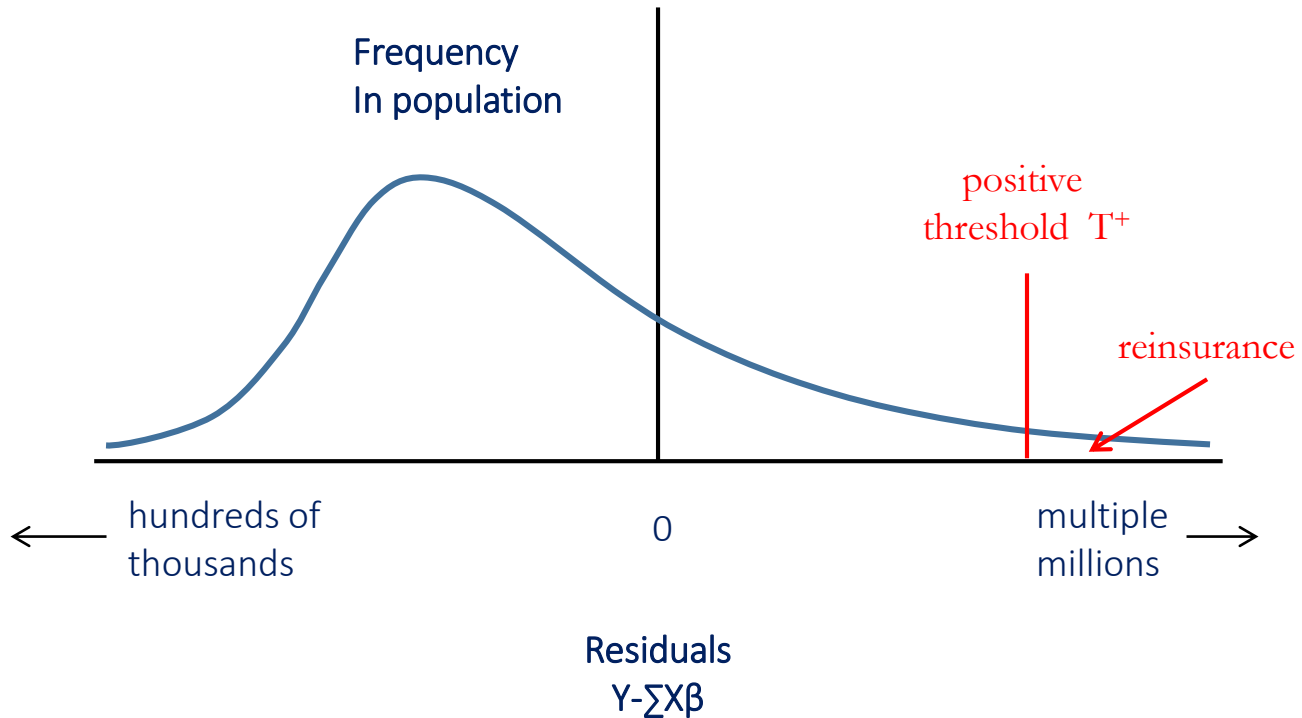
Residuals
Y-∑Xβ

Two-Sided Reinsurance Defined in Terms of Residuals from Risk Adjustment Model
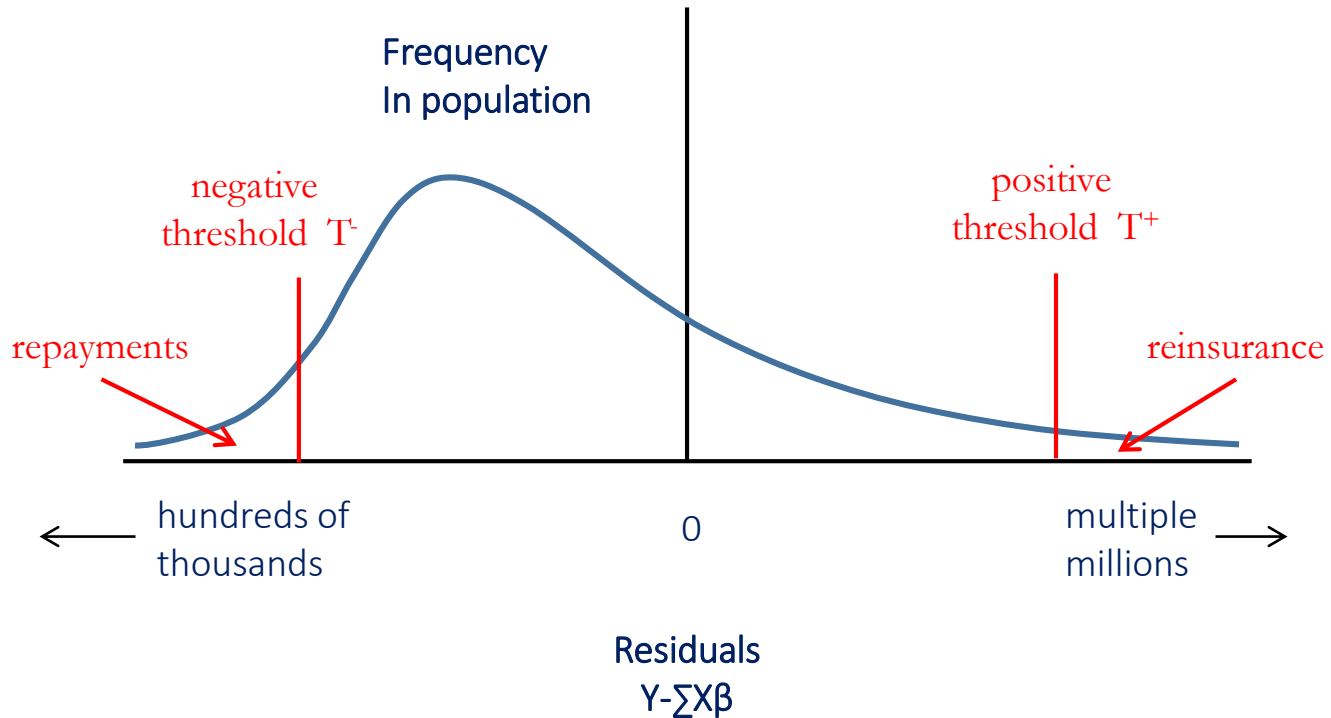
Data

Administrative from a nationwide sickness fund in Germany

N=1.38m each

TRAINING / TEST

Germany: distribution of residual -10,000 to 10,000
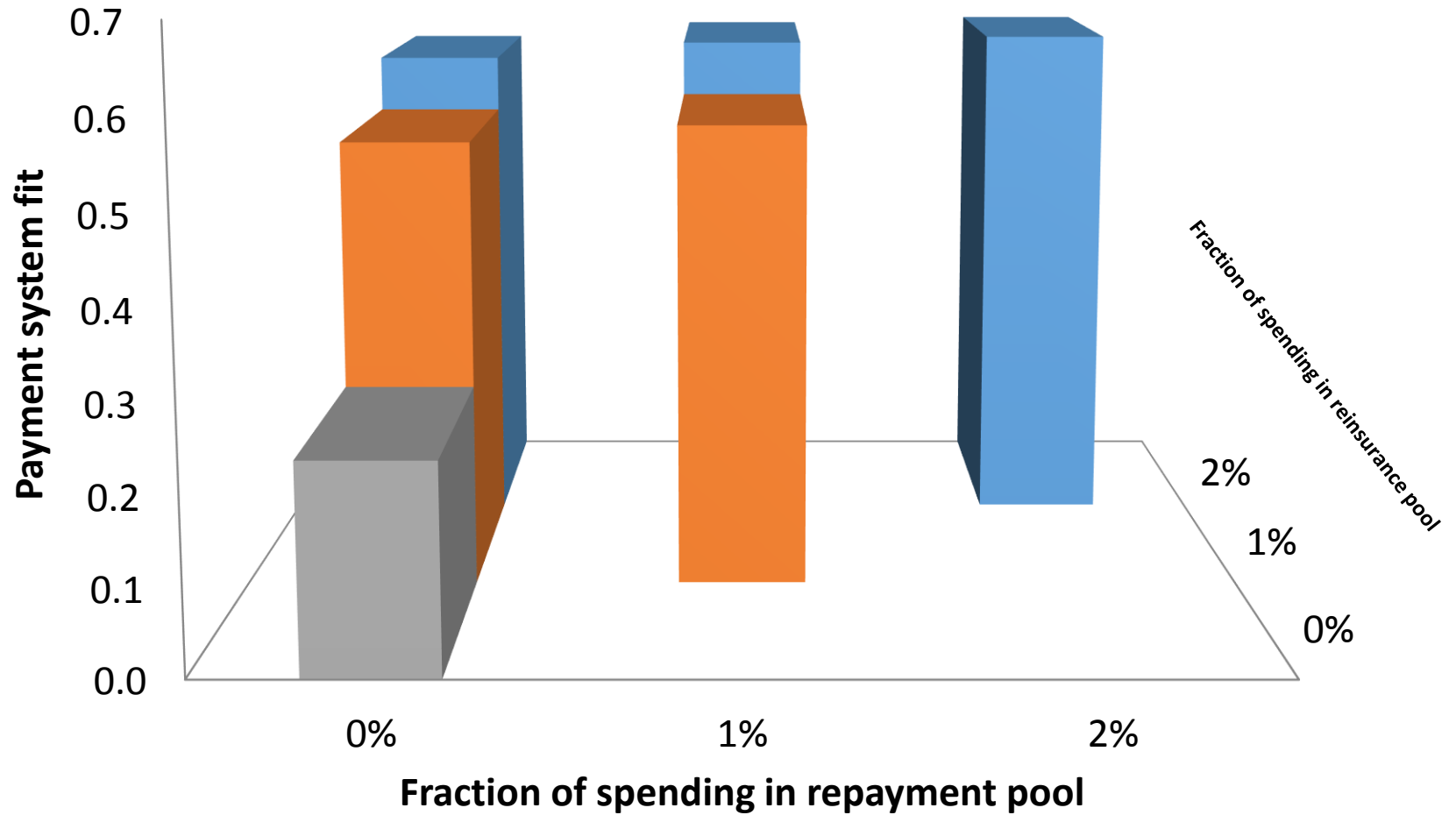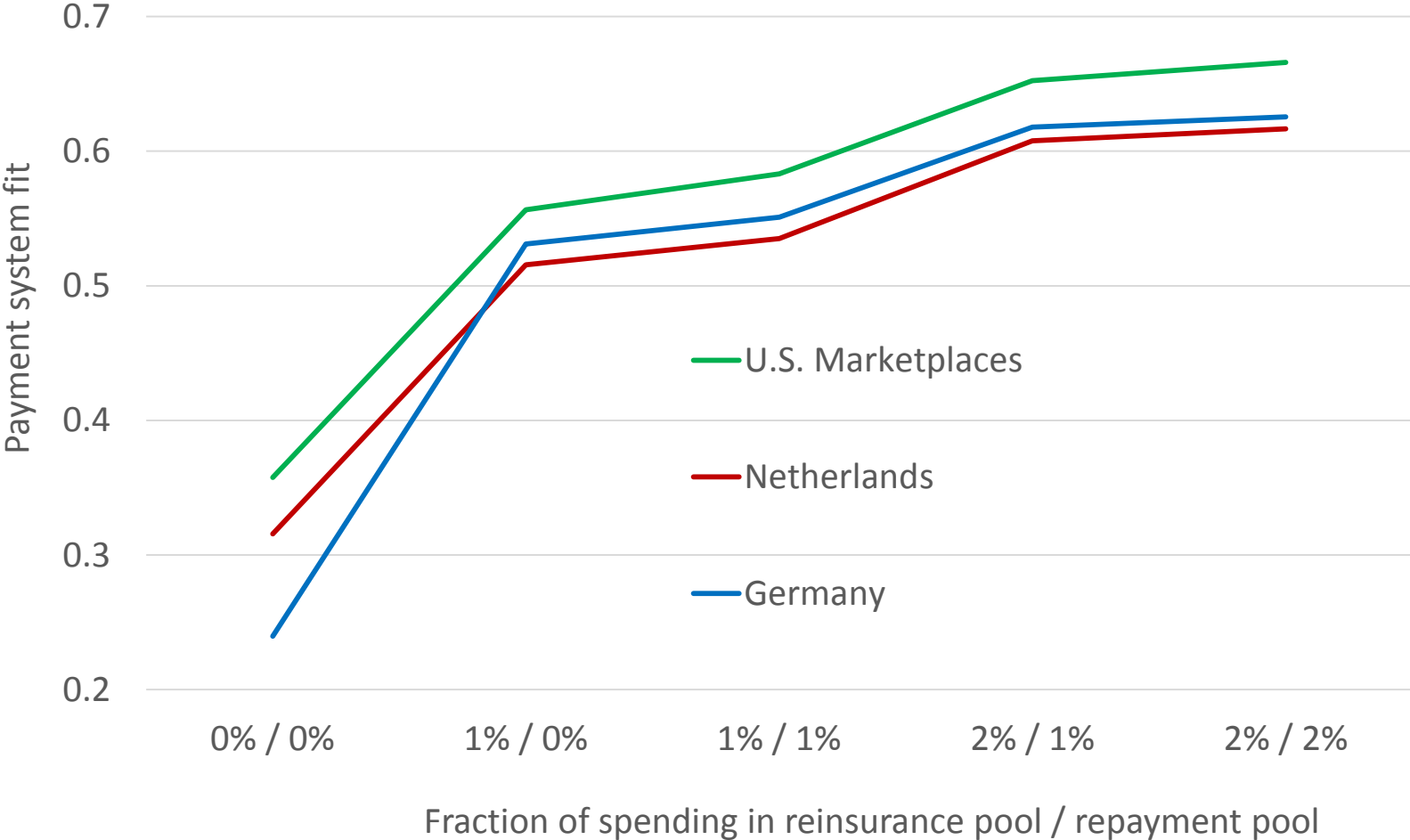
94,89% of population

Germany: distribution of residual >10,000
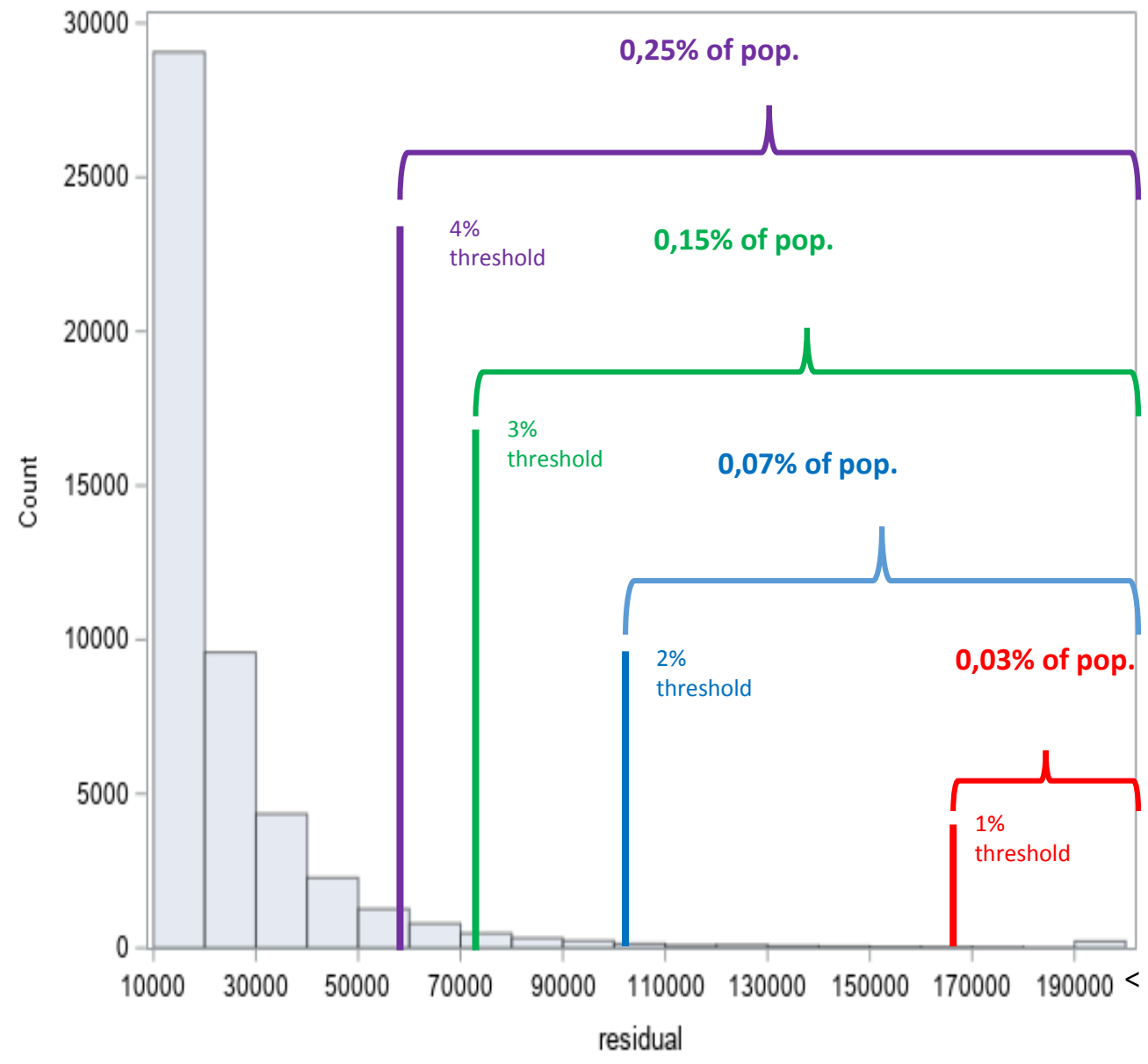
Germany: residual-based reinsurance and repayments

Residual-based reinsurance / repayments: Country comparison

Final Comments

- Reisurance/repayment yields very large improvements in fit with a small sacrifice in incentives

- Targeting residuals strictly dominates policies targeting spending levels

- Teamwork will improve when we optimize weights for the presence of risk sharing

- Country-specific research necessary to evaluate payment alternatives more comprehensively – ongoing in all three countries

- "Who are these guys?" The extreme outliers plus/minus need to be understood better

Questions and Discussion

Society of Actuaries in Ireland

Panel Discussion
The Future of Risk Equalisation in Ireland

Panel: Fiona Kiernan, James O'Donoghue, Eoin Dornan

Moderator: Cathy Herbert

Cathy Herbert: Moderator

Cathy Herbert

Cathy Herbert has worked as Head of Communications and Public Policy for Aviva Ireland over the last 6 years. She was appointed Special Advisor by the late Brian Lenihan in 2006 and worked with him until the general election in 2011. She had previously worked as a journalist in the newsroom in RTE.

Society of Actuaries in Ireland

Panel Discussion
The Future of Risk Equalisation in Ireland

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Society of Actuaries in Ireland

Closing remarks