



**Actuaries
Institute**

Insights – Group Life IBNR

How Good is your Crystal Ball?

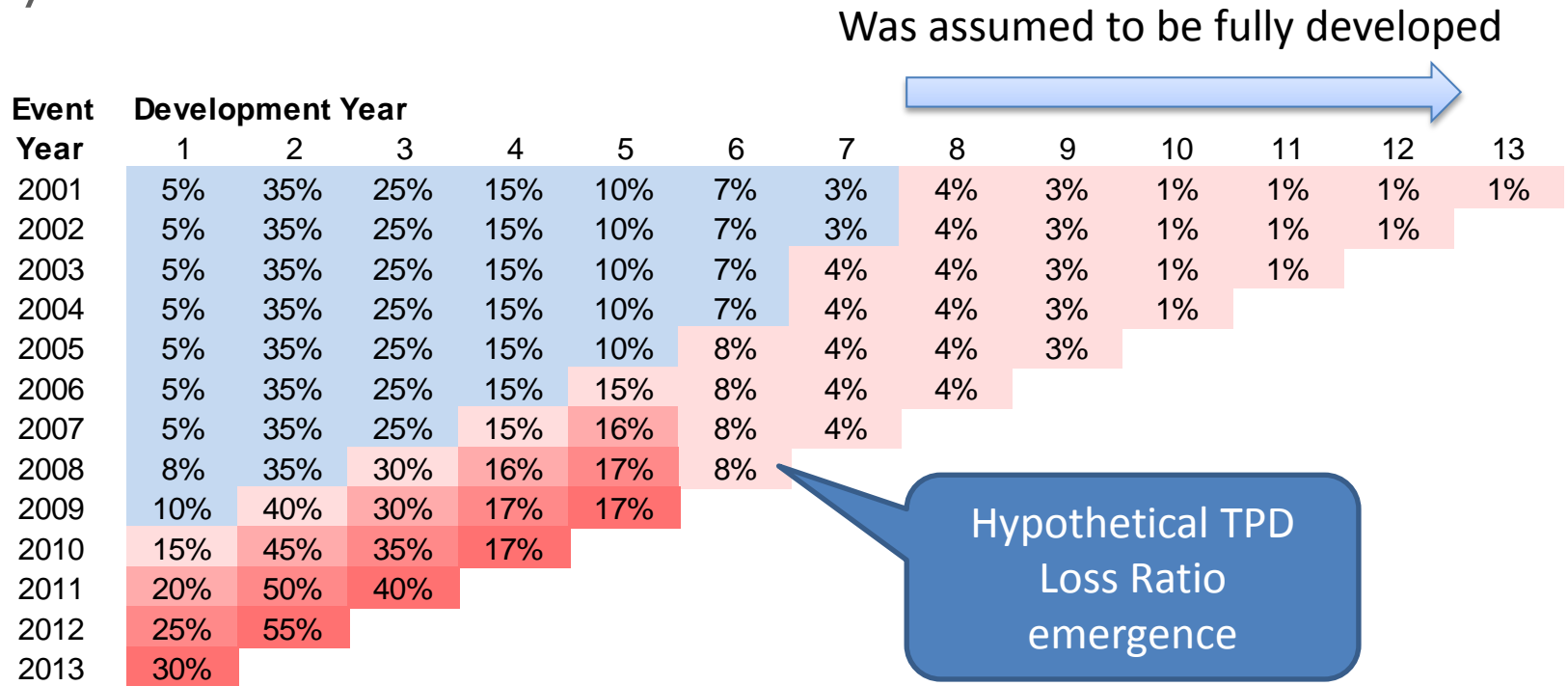
Geoff Atkins and Stephen Lee – 25 June 2014

Introduction

- Take as read Hinton & Yee (FSF14), McDonnell, Palmer & Sun (FSF14)
- Focus on actuarial analysis; alternatives

The basic paradigm

- Event year, development year, calendar year



The chain ladder model is flawed

- Calendar period impacts get leveraged onto claim year impacts and the projection is too high

Event Year	Development Year													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
2001	5%	35%	25%	15%	10%	7%	3%	4%	3%	1%	1%	1%	1%	111%
2002	5%	35%	25%	15%	10%	7%	3%	4%	3%	1%	1%	1%	1%	111%
2003	5%	35%	25%	15%	10%	7%	4%	4%	3%	1%	1%	1%	1%	112%
2004	5%	35%	25%	15%	10%	7%	4%	4%	3%	1%	1%	1%	1%	112%
2005	5%	35%	25%	15%	10%	7%	4%	4%	3%	1%	1%	1%	1%	113%
2006	5%	35%	25%	15%	15%	8%	4%	4%	3%	1%	1%	1%	1%	118%
2007	5%	35%	25%	15%	16%	8%	4%	4%	3%	1%	1%	1%	1%	120%
2008	8%	35%	30%	16%	17%	8%	5%	5%	3%	1%	1%	1%	1%	131%
2009	10%	40%	30%	17%	17%	9%	5%	5%	3%	1%	1%	1%	1%	142%
2010	15%	45%	35%	17%	21%	11%	6%	6%	3%	1%	1%	1%	1%	166%
2011	20%	50%	40%	23%	25%	13%	7%	7%	6%	2%	2%	2%	2%	197%
2012	25%	55%	48%	27%	29%	15%	8%	8%	6%	2%	2%	2%	2%	230%
2013	30%	82%	68%	37%	41%	21%	11%	11%	9%	3%	3%	3%	3%	321%
ICD Factors		3.72	1.61	1.21	1.19	1.08	1.04	1.04	1.03	1.01	1.01	1.01	1.01	

ICD Factors based on recent experience

Projections are highly leveraged

Faster reporting or more claims?

- Will more claims reported now from an event year mean that there will be proportionately more reported in future?
 - Maybe, maybe not
- Will more claims reported now from an event year mean that there are less to be reported in future?
 - Sadly, that is very, very rare
- An example...

Do the trends continue?

- Usually the upward trend has natural limits
- A key call is when (past or future) the trend levels out


Case Study: NSW Workers Compensation (mid 1980s)

Assuming a Steady Tail would require price increases of 29%.

Assuming a Growing Tail would require price increases of 60%.

Current Challenges for TPD

- Challenges that can be modelled:
 - Changes to benefits
 - Shifts in demographics
- Challenges that are difficult to model
 - Member awareness
 - Adviser influences (union, lawyer, trustee)
 - Courts and tribunals
 - Impact of insurer initiatives



Informed
judgement is
needed here

The goal right now

- Nobody wants to be badly under or over, but nobody knows
- The choice of standard actuarial techniques will not get you towards this goal
- Key thing is to get onto a control cycle so we can track and adapt, as well as explain

What and how to model?

- Need an exposure measure for each event year – is premium a good measure? Would lives insured be more suitable?
- Claims paid is an output, not a key parameter, so what are the alternatives:
 - Claims cost in dollars – paid or incurred
 - Claims accepted (frequency) and average size (\$)
 - Claims reported (frequency), admittance rate (%) and average size (\$)?
- Is there an earlier indicator? A 'notification'?

Exposure measures in GI

Workers Compensation

Hours Worked; FTE;
Wages

CTP

Number of vehicles

Frequency and Size Model Proposal

Claim Frequency

Claims frequency (per 1,000 insured lives)

Event	Development Year													Ultimate
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	
2001	0.100	0.300	0.300	0.200	0.100	0.050	0.020	0.030	0.020	0.010	0.005	0.005	0.005	1.145
2002	0.100	0.300	0.300	0.200	0.100	0.050	0.020	0.030	0.020	0.010	0.005	0.005	0.005	1.145
2003	0.100	0.300	0.300	0.200	0.100	0.050	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.165
2004	0.100	0.300	0.300	0.200	0.100	0.050	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.165
2005	0.100	0.300	0.300	0.200	0.100	0.055	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.170
2006	0.100	0.300	0.300	0.200	0.100	0.055	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.190
2007	0.100	0.300	0.300	0.200	0.120	0.060	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.245
2008	0.100	0.300	0.350	0.200	0.120	0.060	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.295
2009	0.100	0.350	0.400	0.300	0.140	0.070	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.475
2010	0.150	0.400	0.400	0.300	0.160	0.070	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.595
2011	0.250	0.500	0.400	0.350	0.160	0.070	0.040	0.030	0.020	0.010	0.005	0.005	0.005	1.845
2012	0.300	0.600	0.450	0.350	0.160	0.070	0.040	0.030	0.020	0.010	0.005	0.005	0.005	2.045
2013	0.350	0.650	0.450	0.350	0.160	0.070	0.040	0.030	0.020	0.010	0.005	0.005	0.005	2.145

Starting point may be to expect some further escalation

Assume claim reports continue at the same frequency as historical experience

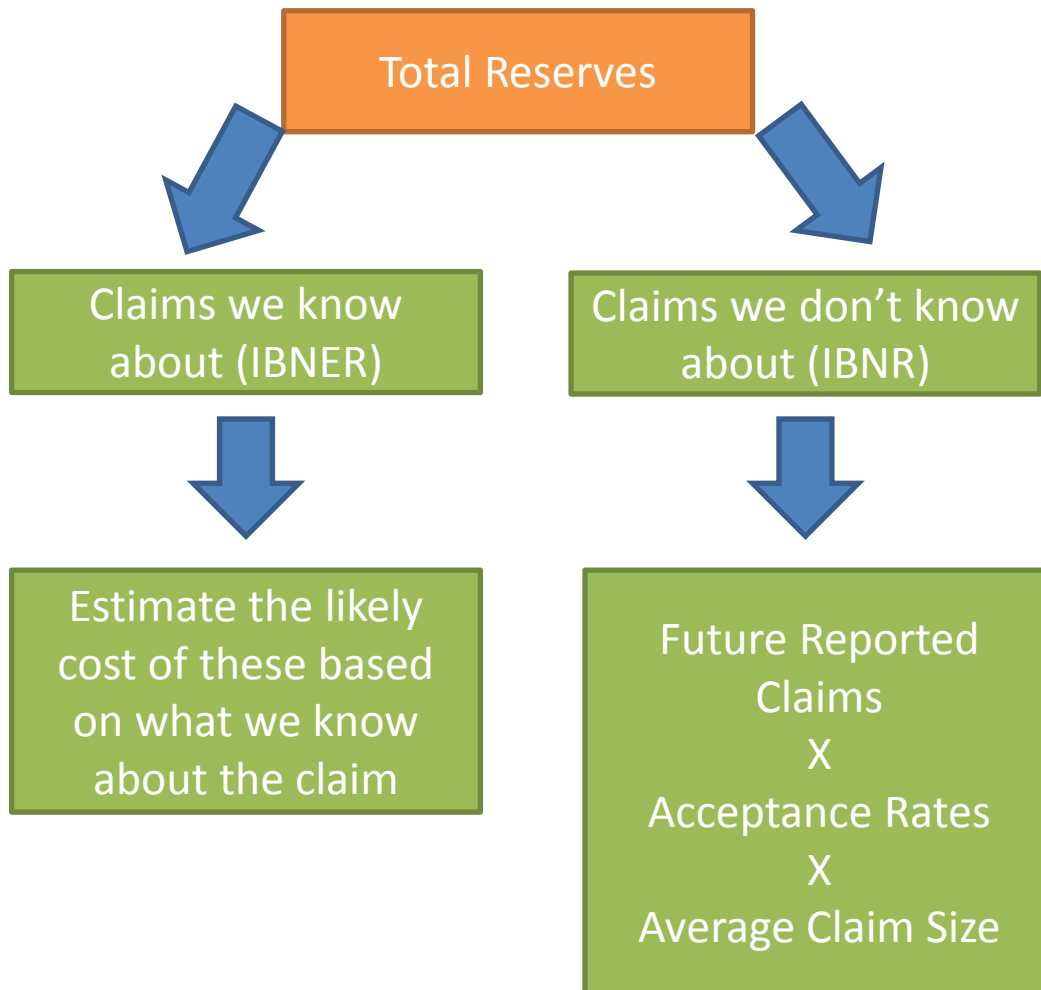


Claim Size

$$f(\text{Claim Year}, \text{Development Year})$$

Control Cycle metrics on Size*Frequency models can be very informative

Example: Builders Warranty

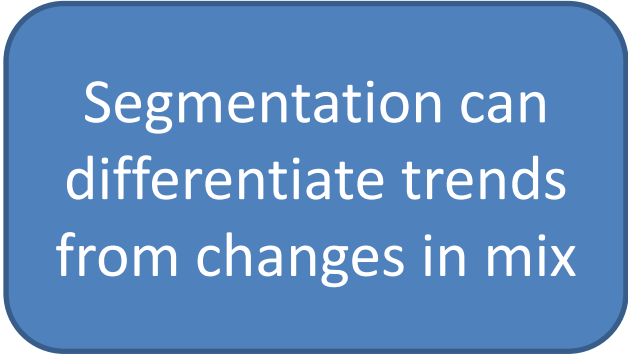


Diagnostics

- Builder failures and open exposures
- Building type
- Builder size
- State

Diagnostics vs Model Parameters

- Keep the model fairly simple, but reflect the ‘claims process’
- Use diagnostics to inform the parameters
 - Legal representation
 - Age
 - Occupation
 - Employer
 - Law firm
 - State
 - Benefits
 - Cause of disablement
- Don’t be scared of ‘selections’



Segmentation can
differentiate trends
from changes in mix

Taking the 'temperature'

- Observing the external environment:
 - Media
 - Lawyer activity/advertising
 - Decisions and appeals
 - State by state
 - Workers compensation scheme changes
- Informing the judgements about the future



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Colin Yellowlees – 25 June 2014



Issues

Market Issues

- Member Awareness
- Weakened Definitions/Eligibility
- Increased Benefits
- Lawyer Involvement
- Economic Environment
- Poor Data



Pricing Issue

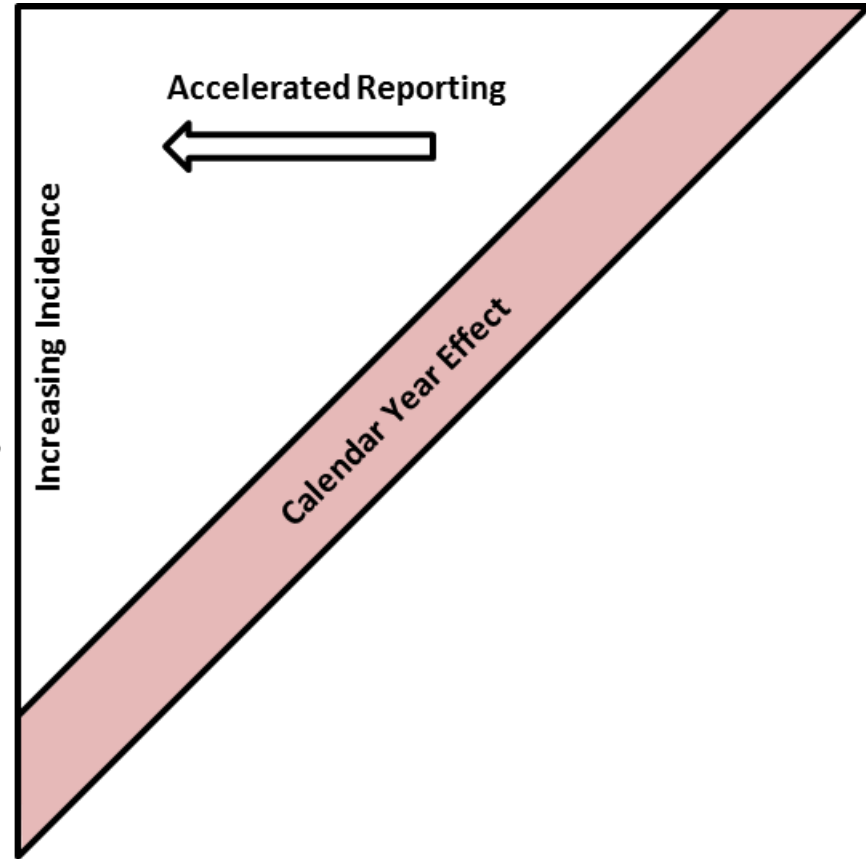
- Accelerated Claim Reporting
- Increasing/changing Incidence
- Delayed Claim Reporting
- Changing Insurer
- Poor data



Issues

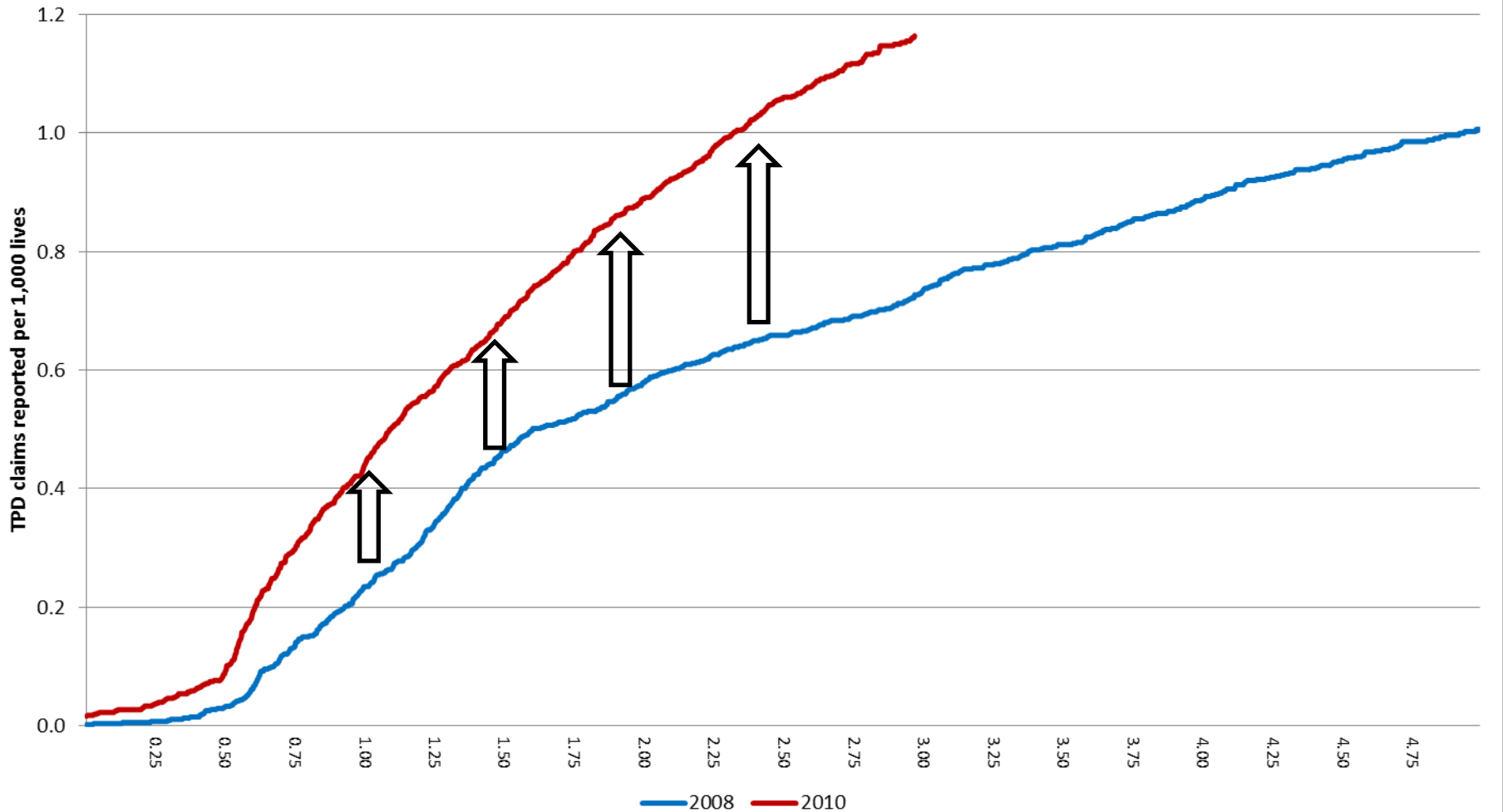
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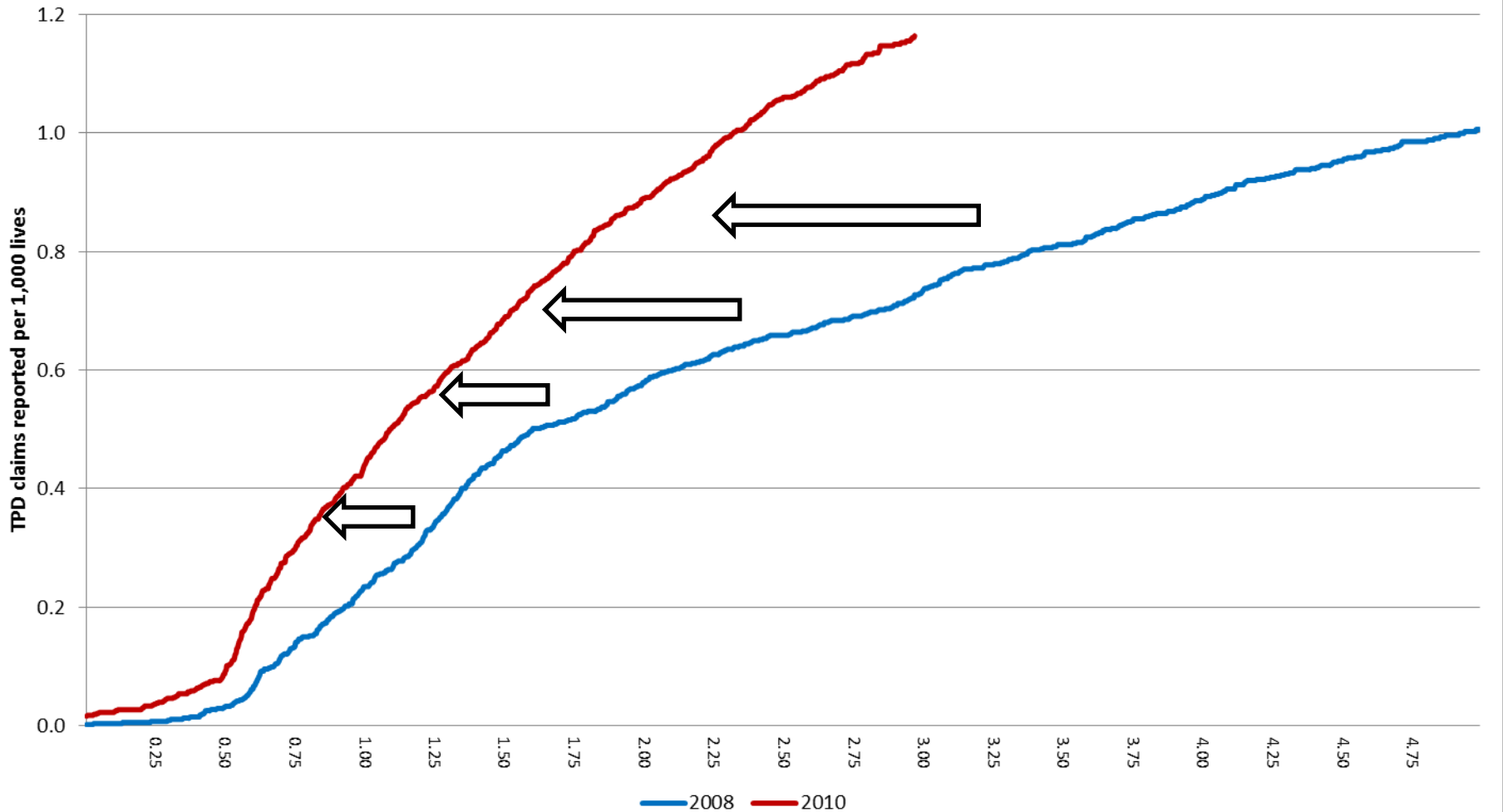
Increasing Incidence

Observed TPD Claim Rate by Event Year



Accelerated Reporting

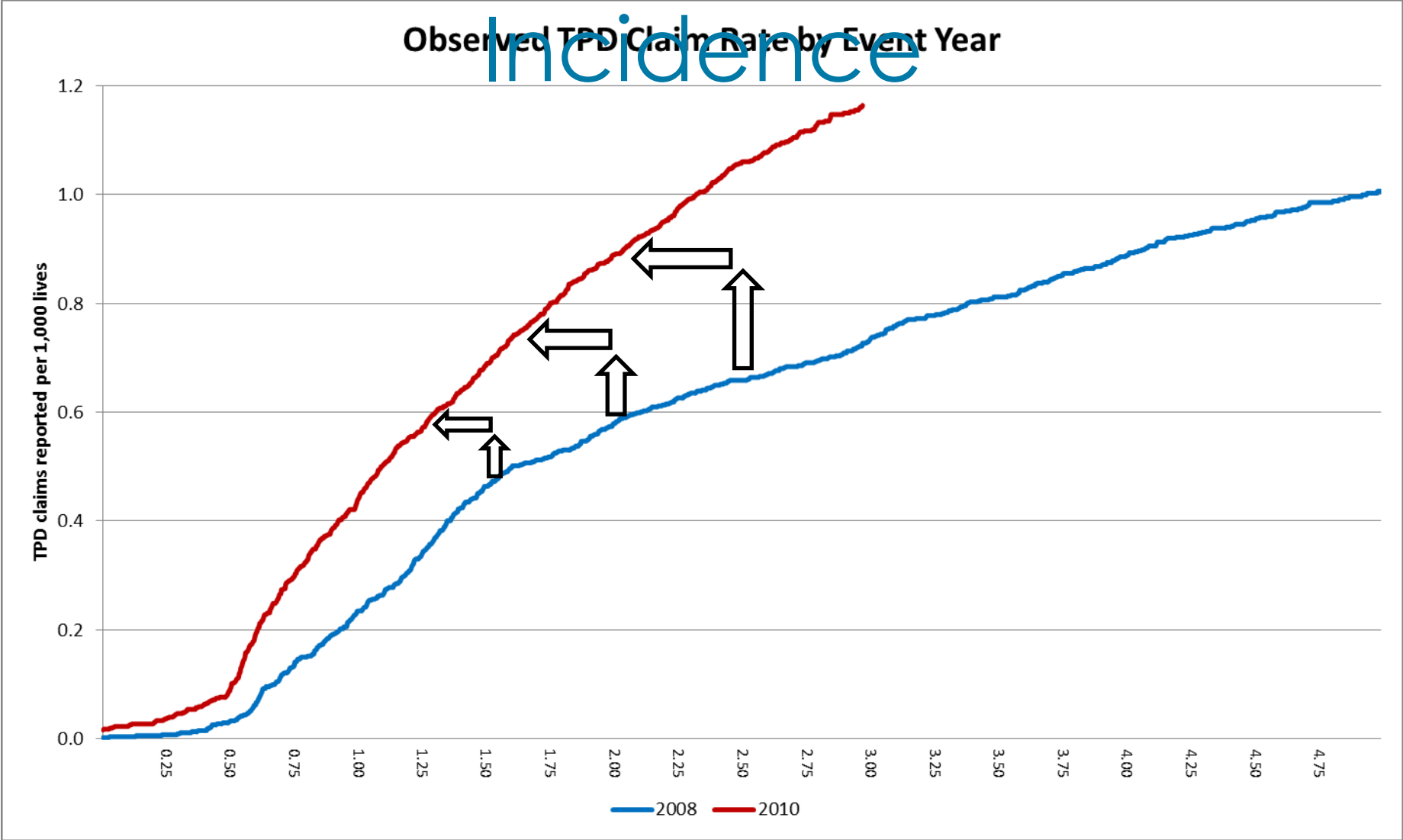
Observed TPD Claim Rate by Event Year



Acceleration & Increased Incidence

Observed TPD Claim Rate by Event Year

Incidence





Trends

Australia ▾ All categories ▾ Web Search ▾



Hot Searches

▸ Top Charts

Explore

Subscriptions

Compare

Search terms

Locations

Time ranges

tpd

Search term

Jan 2010 - Jul 2014

+ Add time range

Interest over time ?

News headlines Forecast ?



Note

Jan 2011

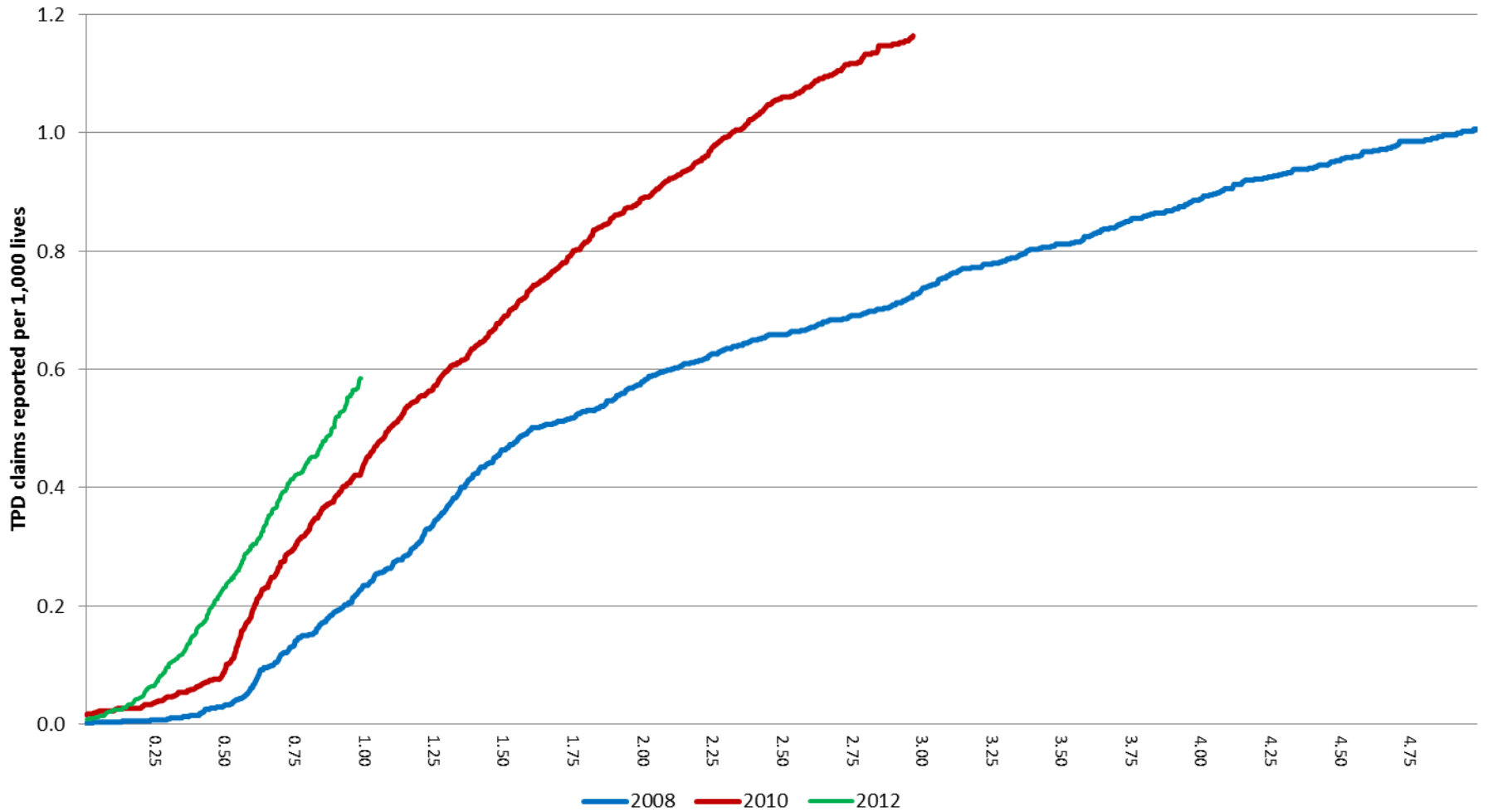
Jan 2012

Jan 2013

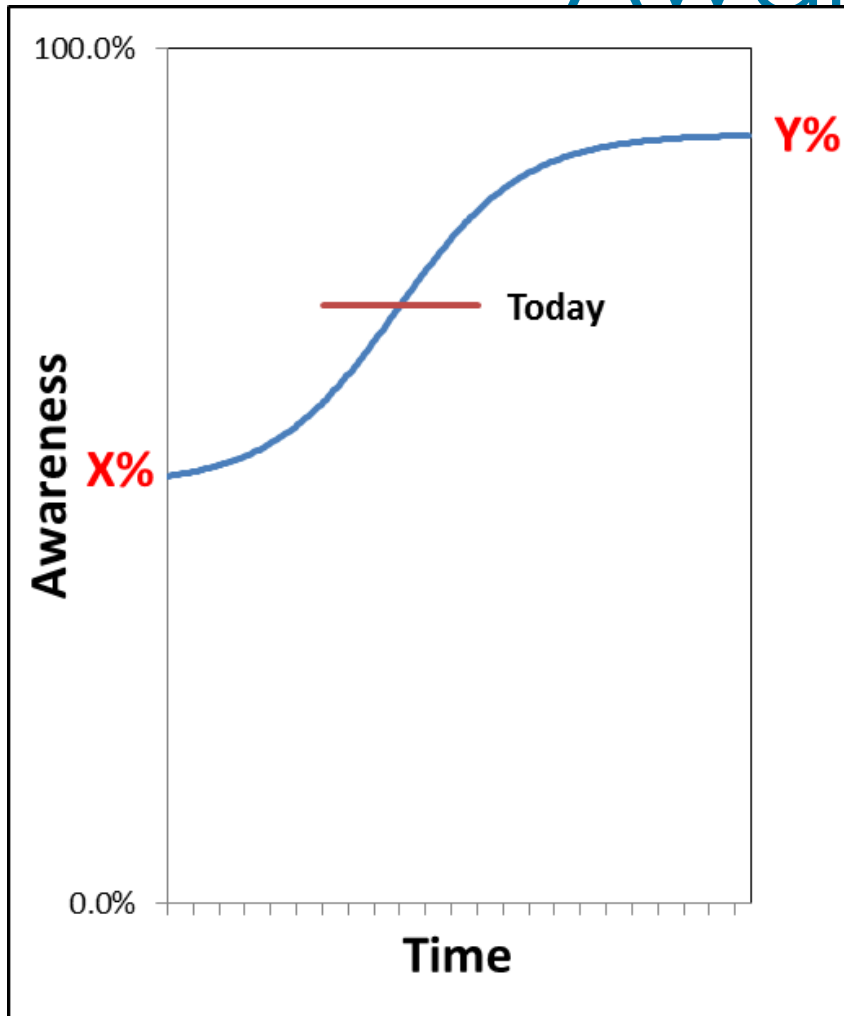
Jan 2014

Trends

Observed TPD Claim Rate by Event Year



Awareness



- Varies by fund
- Where is base
- Where is ultimate

Challenges

- Understanding the business better
- Communicating uncertainty

