



International Actuarial Association Health Section
2007 Colloquium

13th - 16th May 2007 Cape Town, South Africa

A Critical Table – *Pricing Critical Illness in the UK on a new Insured Lives Table*

Paul Brett and Johann DuToit

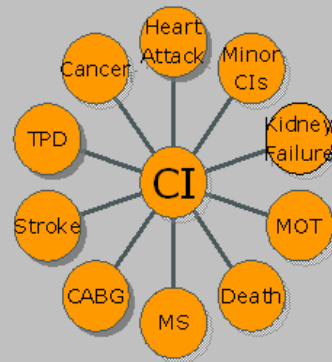
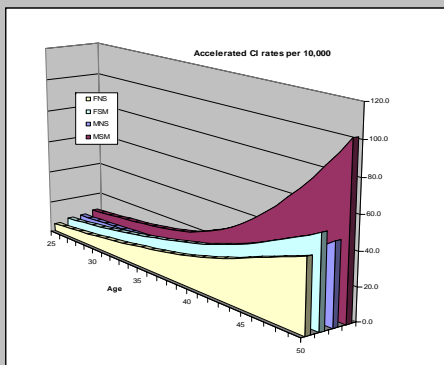
IAAHS 2007

IAA Health Section Colloquium

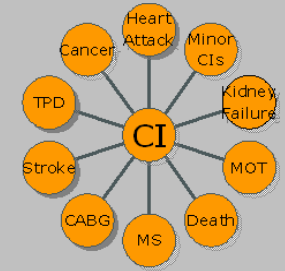
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CTICC

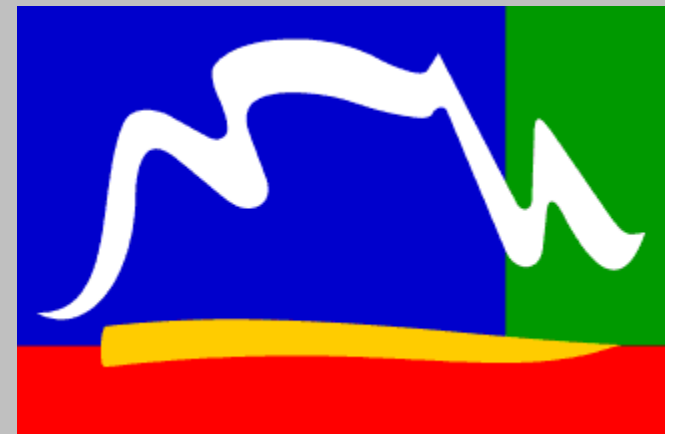
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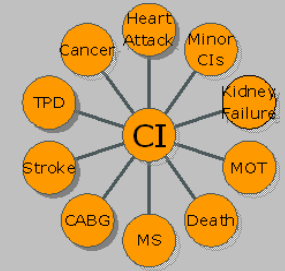
Agenda



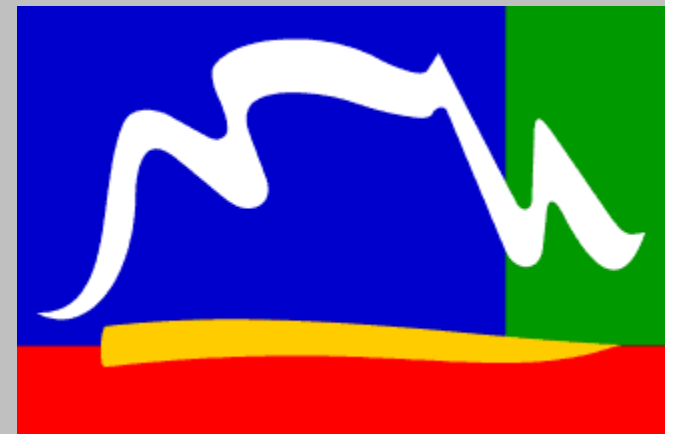
- Introduction
- Basic Methodology & Issues
- Headline Results
- International Aspects
- Questions



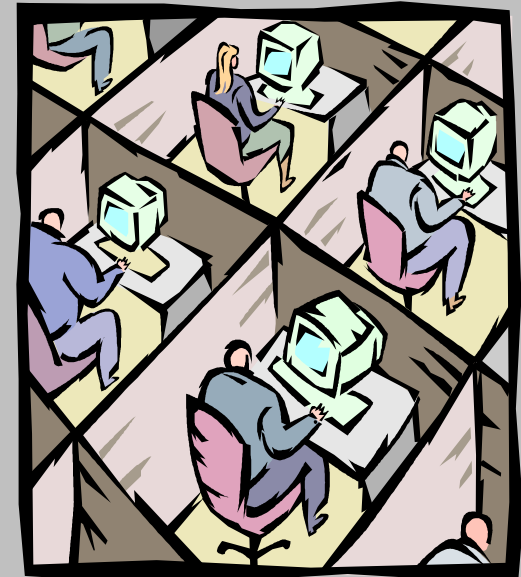
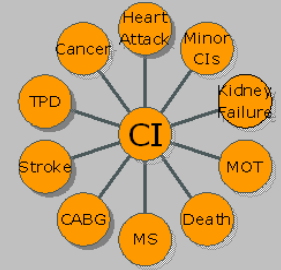
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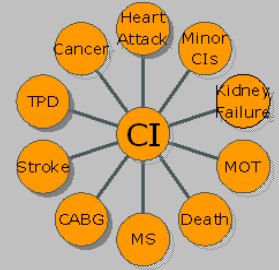
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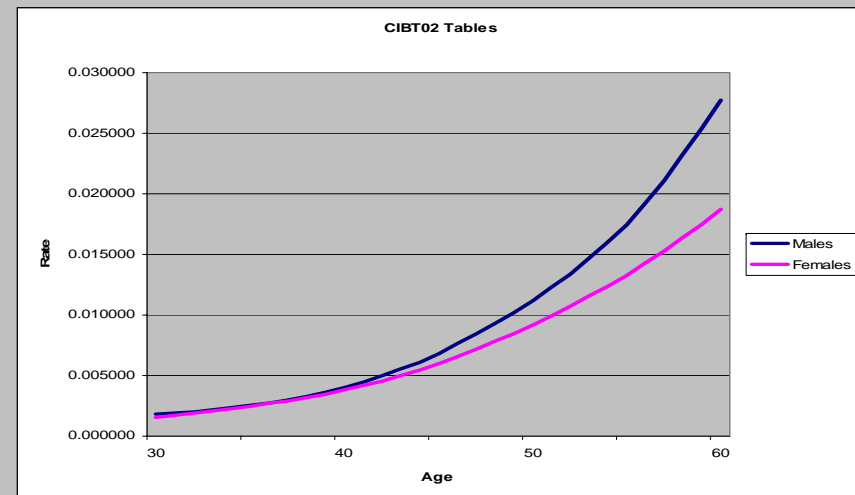
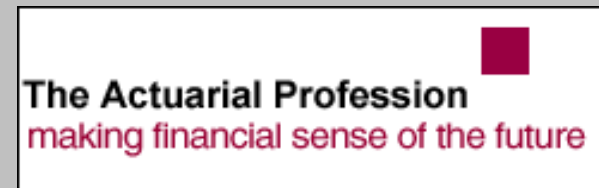
Design of Paper



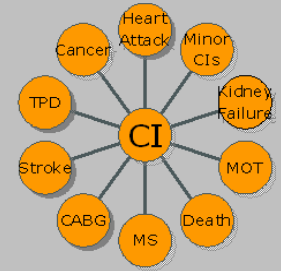
Why Produce the Paper?



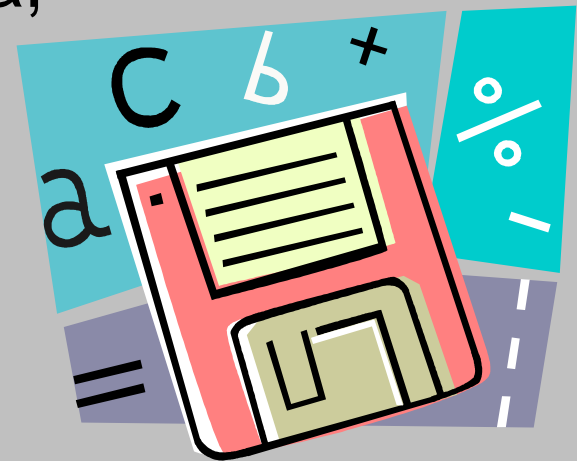
- The Actuarial Profession - CMI
- Available tables;
 - Theoretical
 - Population
 - Aggregate



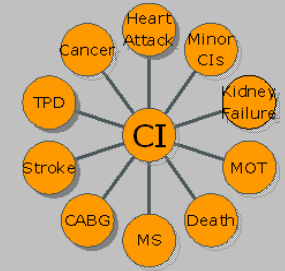
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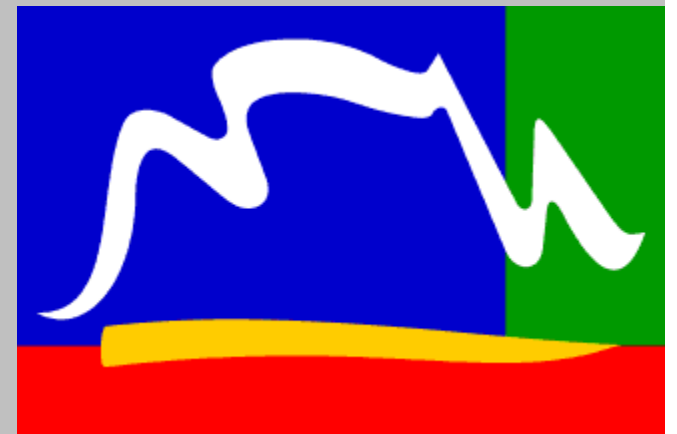
- Issues with the insured lives data;
 - Immature
 - Limited age range
 - Estimates of date of diagnosis
 - Data needs grossing-up
- Regulations;
 - Realistic balance sheet
 - Gender Directive



Agenda

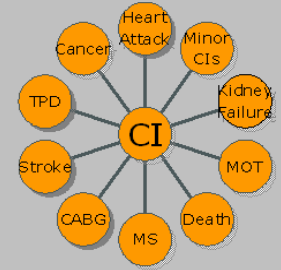
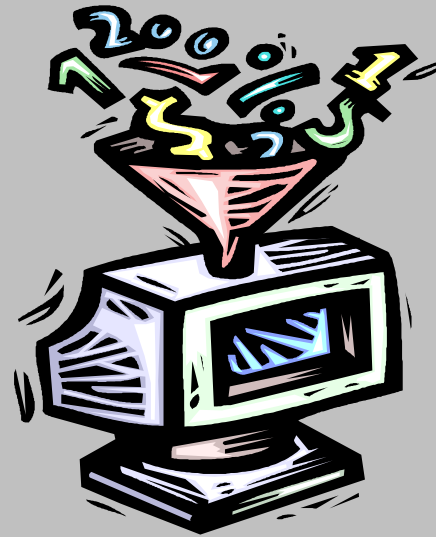


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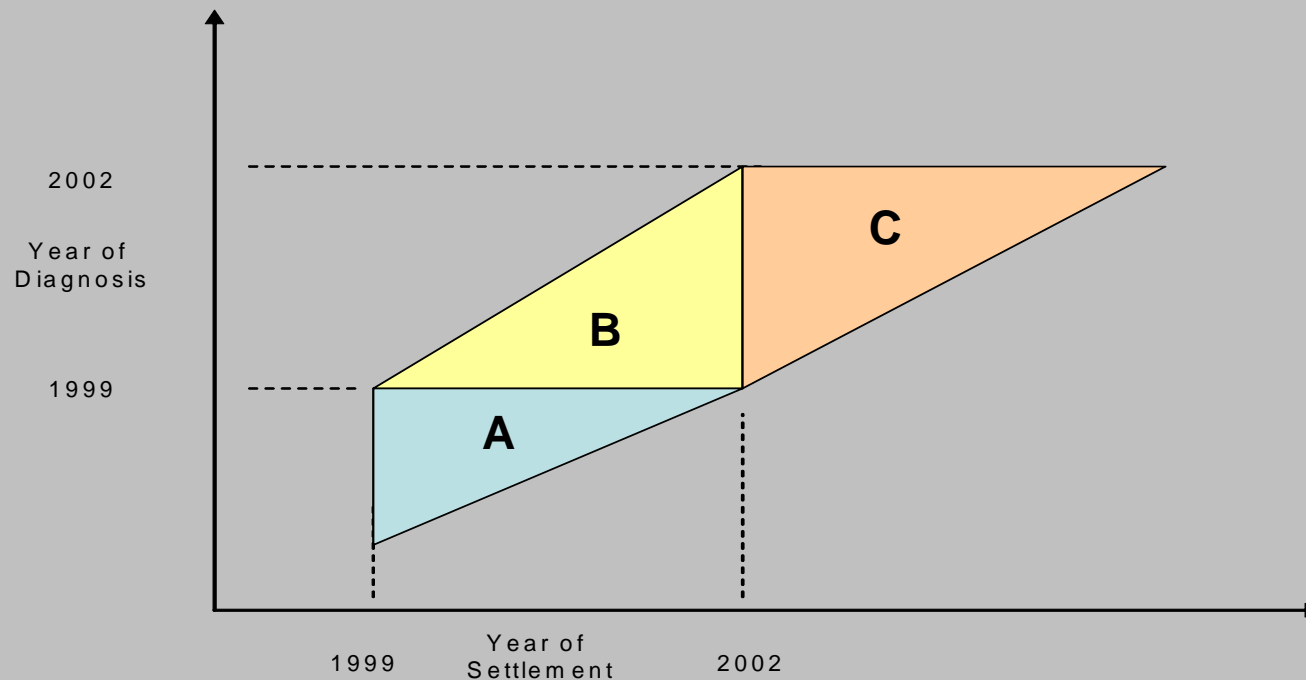
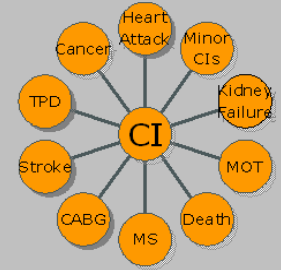


CMI Data

- 1999 – 2002 data
 - 16 offices
 - 7.4 million life years
 - 11,803 claims
 - 90% ACI and 10 % SCI
- Date of diagnosis
 - 44% no date recorded
 - No uniform definition
 - Estimated Date of Diagnosis

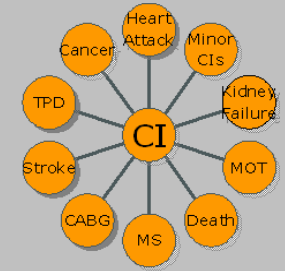


Settled to Diagnosed Adjustments



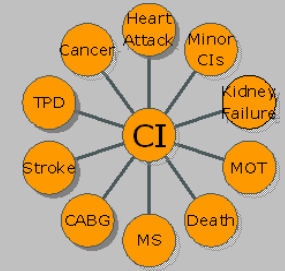
- $SDA = (B + C) / (A + B) > 1$ if $C > A$
- Distinguish by:
 - Condition (long settlement delays have bigger SDAs)
 - Duration since Inception (more scrutiny on early duration claims)

Causes of Claim



- Conditions;
 - 21 standardised CI conditions
 - Death, TPD and Angioplasty
- Rates by condition
- Further adjustments
 - Smoker status unknown
 - Unknown claims cause
 - Under representation
 - Removal of other claims

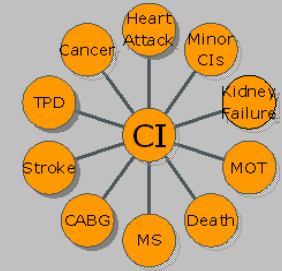
Adjusted Data



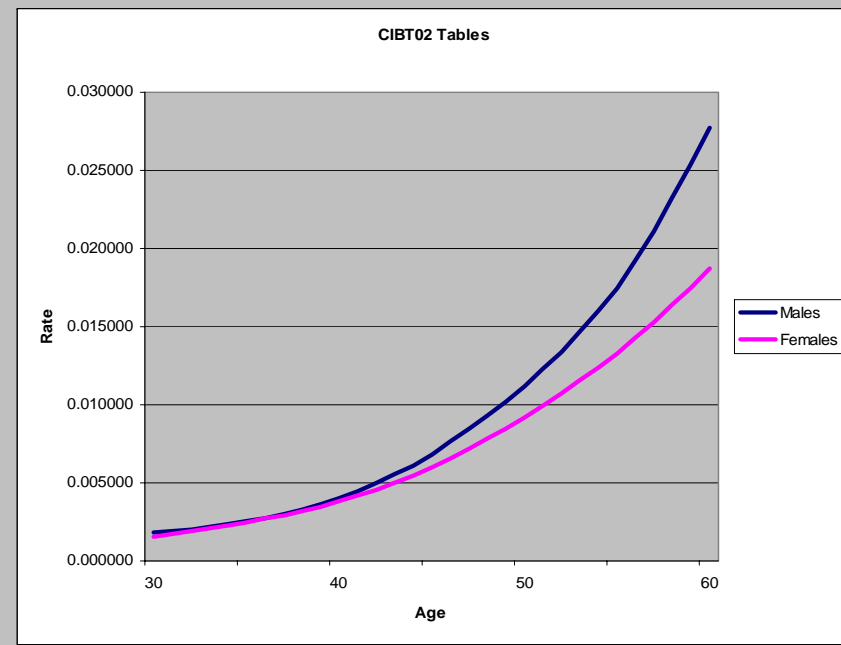
- Exposure
 - Raw 7.397 million
 - Modified 7.351 million
- Claims
 - Raw 11,803
 - Modified 13,452



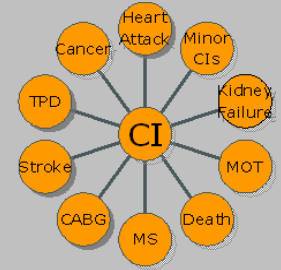
CIBT02



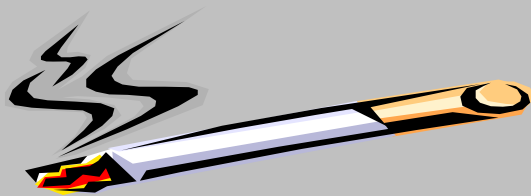
- CIBT93
- CI Healthcare Study Group
- Theoretical population table
 - First ever event
 - Overlap between conditions
- Rates by condition



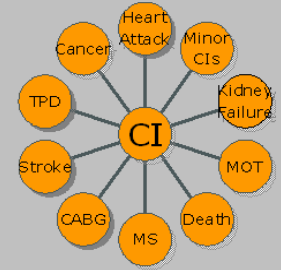
Insured Lives Rates



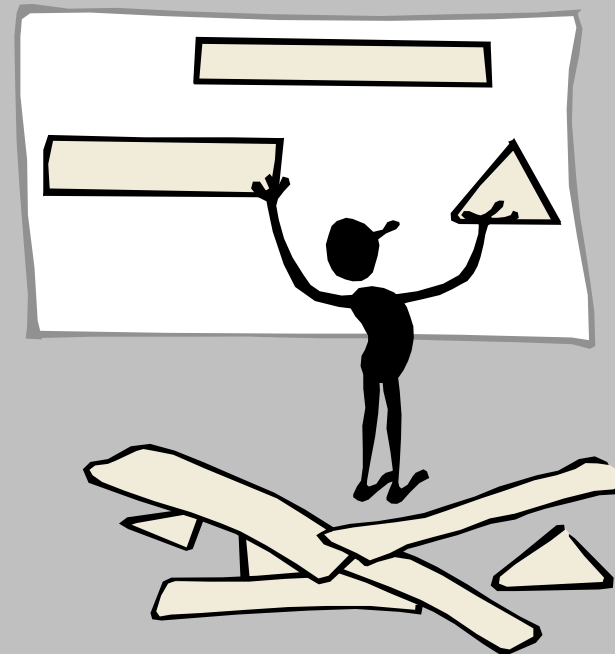
- Insured lives rate for given condition =
CIBT02 rate for given condition
x A / E for given condition
- Insured / Population (I/P) adjustment
 - Effect of underwriting
 - Socio economic
 - Smoking status



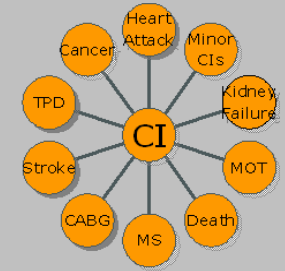
Further Adjustments



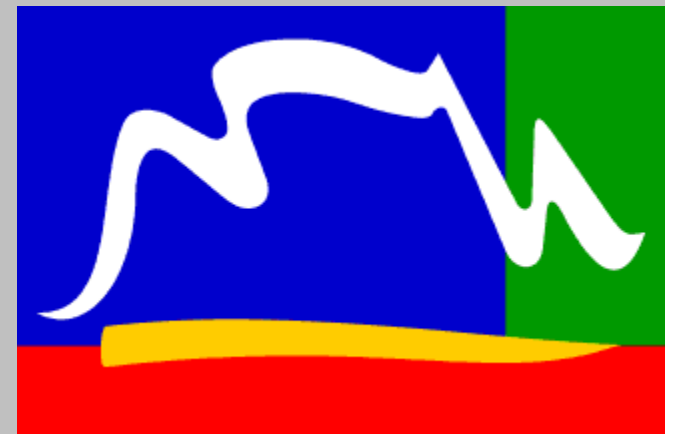
- Select rates
 - Differ by condition
- ACI different to SCI



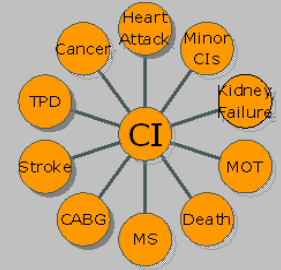
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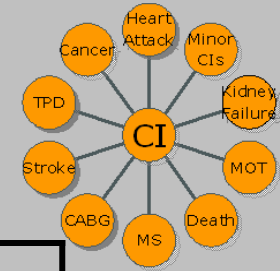


ACI Results



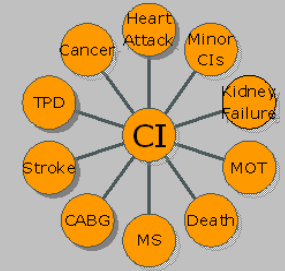
- CI Table fits “All ACI Claims” 100%
- Do Individual Rates fit CMI Individual Claims data?
- We followed a “Grouped Illness” approach

ACI Grouped Conditions

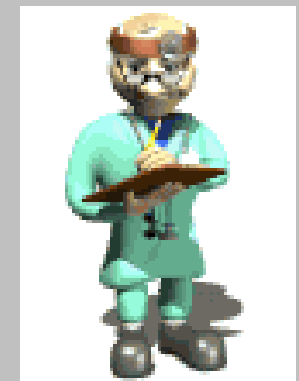


Groups	Conditions
Cancer-type	<ul style="list-style-type: none"> •Benign Brain •Tumour Cancer •Loss of Speech (e.g. throat cancer)
Cardiovascular -type	<ul style="list-style-type: none"> •Heart Attack •Stroke •Coronary Artery By-pass •Heart Valve Replacement •Angioplasty •Aorta Graft Surgery
Neurological-type	<ul style="list-style-type: none"> •Multiple Sclerosis •Motor Neurone Disease •Parkinson's Disease •Alzheimer's Disease
Accident-type	<ul style="list-style-type: none"> •Coma •Paralysis •Blindness •Loss of Limbs •Third Degree Burns •Loss of Hearing
Organ Failure-type	<ul style="list-style-type: none"> •Kidney Failure •Major Organ Transplant
Total & Permanent Disability	
Deaths & Terminal Illness	

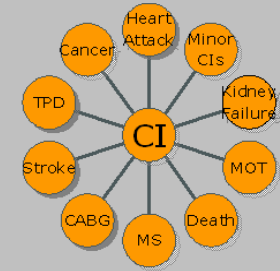
I / P Adjustments



Group	I/P Adjustment
Deaths	47%
TPD	16%
Organ Failure-types	20%
Cardiovascular-types	38%
Neurological-types	63%
Cancer-types	71%
Accident-types	19%



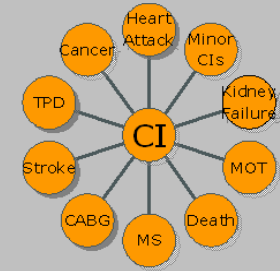
Select Pattern



- Effect of Underwriting in Descending order:

Condition	Select Period	Select Discounts			
TPD	3 years	-77.9%	-47.7%	-15.8%	Ult
Death (MNS)	3 years	-23.0%	-18.4%	-15.4%	Ult
Organ Failure	3 years	-45.0%	-42.1%	-7.7%	Ult
Cardiovascular	2 years		-22.4%	-4.5%	Ult
Neurological	1 year			-48.9%	Ult
Cancer (MNS)	1 year			-17.2%	Ult
Accident	None				Ult

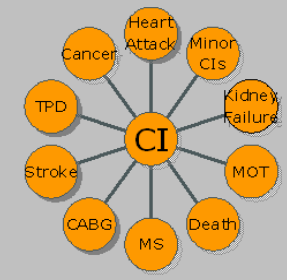
Increase by Age



Age Band	MNS	MSM	FNS	FSM
20-30	3.9%	4.7%	10.0%	8.3%
30-40	6.8%	9.9%	9.4%	8.6%
40-50	10.7%	12.5%	8.5%	8.4%
50-60	10.4%	9.5%	6.3%	7.4%
60-70	9.1%	9.4%	8.5%	9.1%

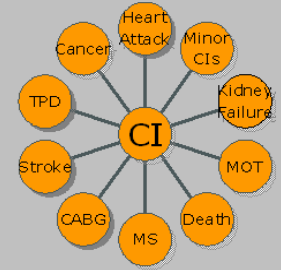
- Female Cancer increases by 15% p.a. from young ages
- UK Insured Life only Mortality rates increase in a similar fashion but slightly faster.

Smoker differentials



Sex	Age	Smoker differential	% Cancer	% HA
MNS	25	25%	38%	1%
	45	114%	33%	21%
	65	91%	39%	18%
FNS	25	46%	55%	1%
	45	23%	65%	4%
	65	44%	53%	8%

Experience by Benefit Size

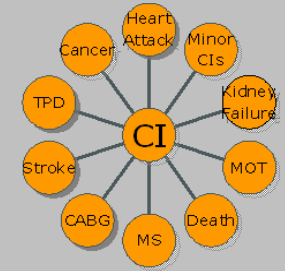


ACI	SA: <= £10K	SA: £11K-£150K	SA: >£150K	All	SA: >£10K
A/E	1194%	89%	1082%	100%	90%
Claims	1,227	10,280	231	11,739	10,511

- The Benefit curve is U-shaped
- Consistent poor experience at high Sums Assured in the UK
- Correct level is around 90%

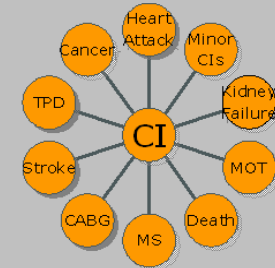


90% of Insured Table



Client Offices	A/E on Insured Table
IFA Office A	84.2%
IFA Office B	87.3%
Bancassurance Office C	90.4%
Bancassurance Office D	95.1%

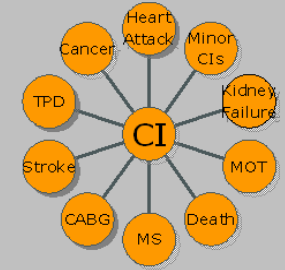
Experience by Channel



Channel	Published Claims	SA: £11K- £150K	Revised for Channel Error	Relative to IFA	Average SA
IFA	2,625	83%	83%	100%	£58,076
Bancassurer	4,072	92%	89%	107%	£50,159
Direct Sales	3,033	92%	99%	119%	£45,646



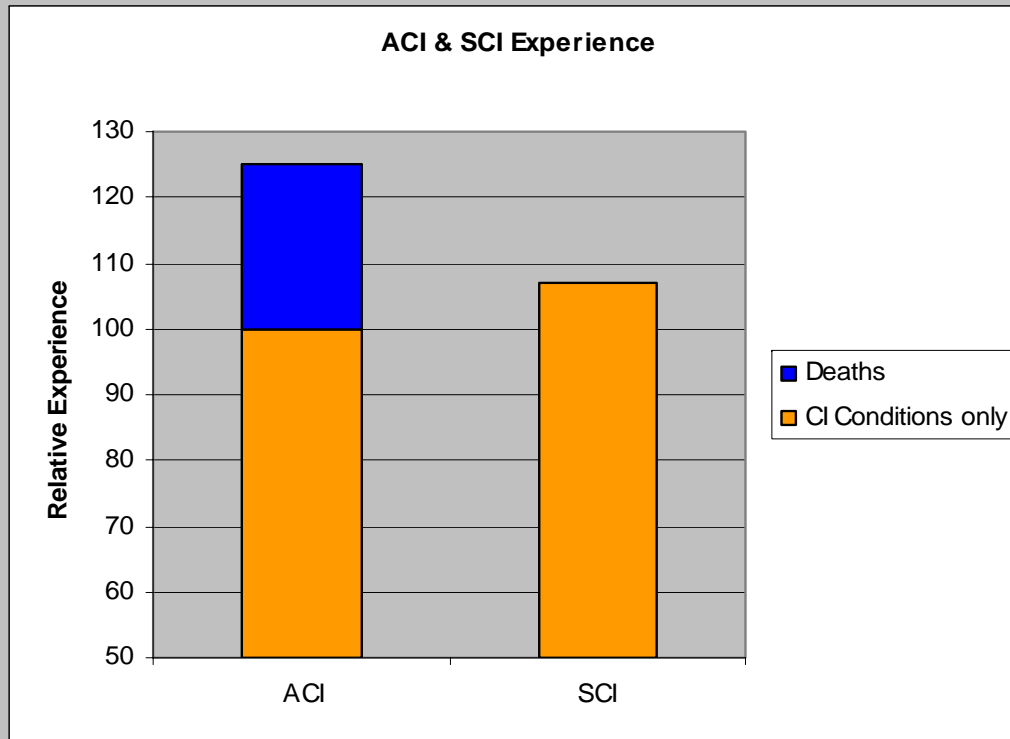
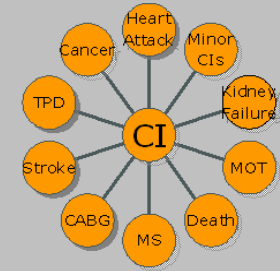
1999-2002 v 2003-2004



Duration	0	1	2	3	4	5+	All
MNS: 99-02	84%	84%	91%	85%	76%	84%	84%
MNS: 03-04	83%	73%	66%	68%	65%	78%	74%
MSM: 99-02	95%	85%	87%	94%	74%	71%	84%
MSM: 03-04	80%	71%	66%	73%	64%	69%	71%
FNS: 99-02	85%	86%	87%	83%	81%	74%	82%
FNS: 03-04	84%	82%	68%	71%	78%	79%	78%
FSM: 99-02	74%	85%	81%	74%	74%	88%	80%
FSM: 03-04	90%	83%	64%	89%	71%	82%	80%

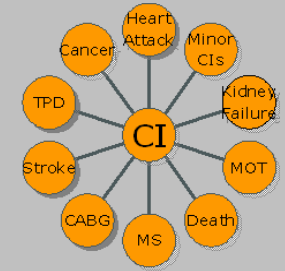
- Based on “Raw claims” excl. any adjustments
- Red > Blue
- SDA for 1999-2002 > SDA for 2003-2004

Standalone Experience

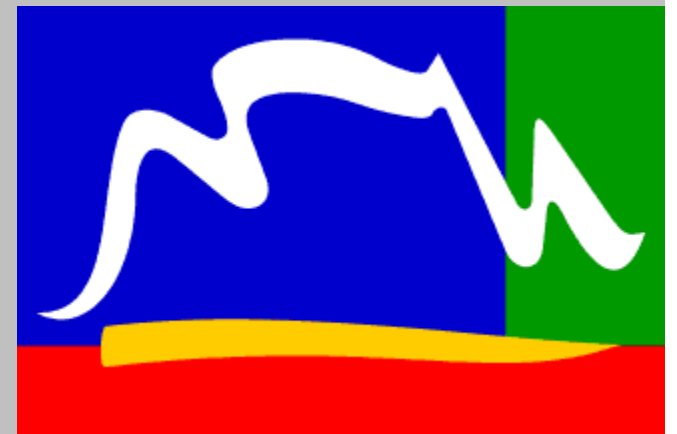


- Deaths after 28 days (survival period):
 - Under SCI it is paid as a critical illness
 - Under ACI it may be paid as a death claim
- SCI experience is at 107% v 125% for ACI

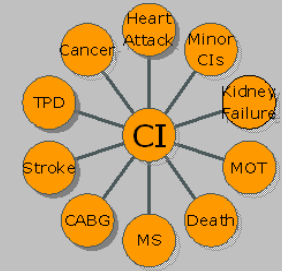
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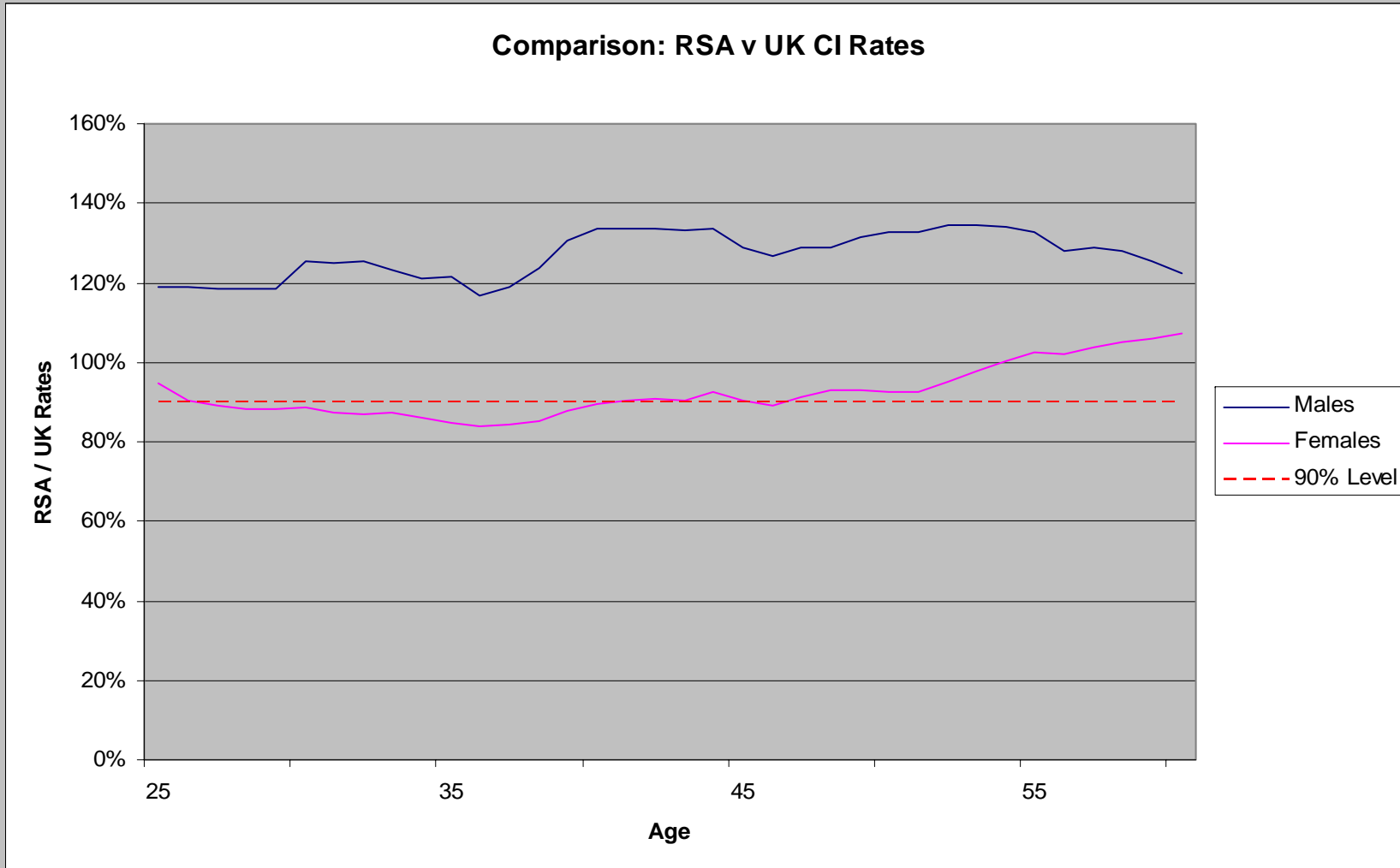
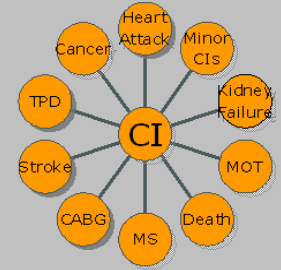
International Aspects



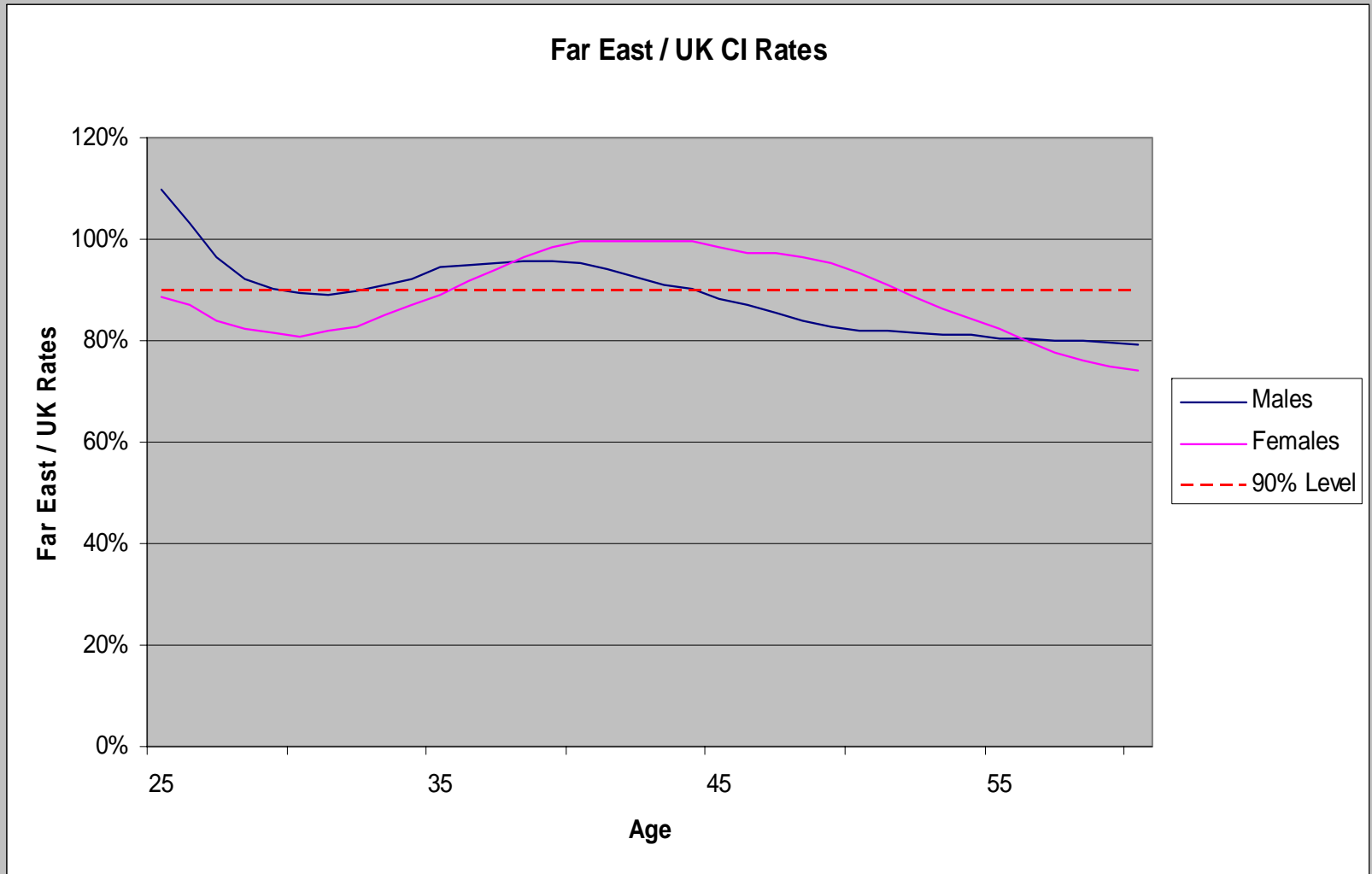
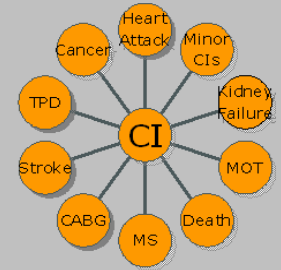
- Problems with large cases
- Grouping of conditions
- Rates by condition
- Date of diagnosis
- SCI > ACI



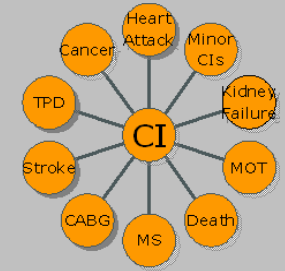
Comparison: RSA v UK



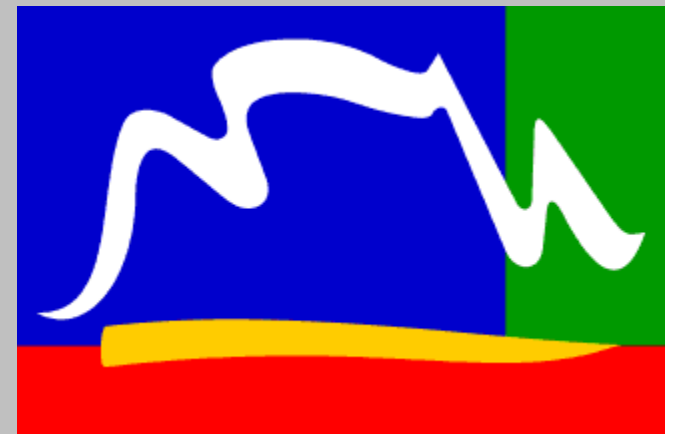
Comparison: Far East v UK



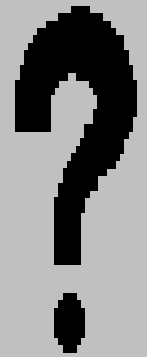
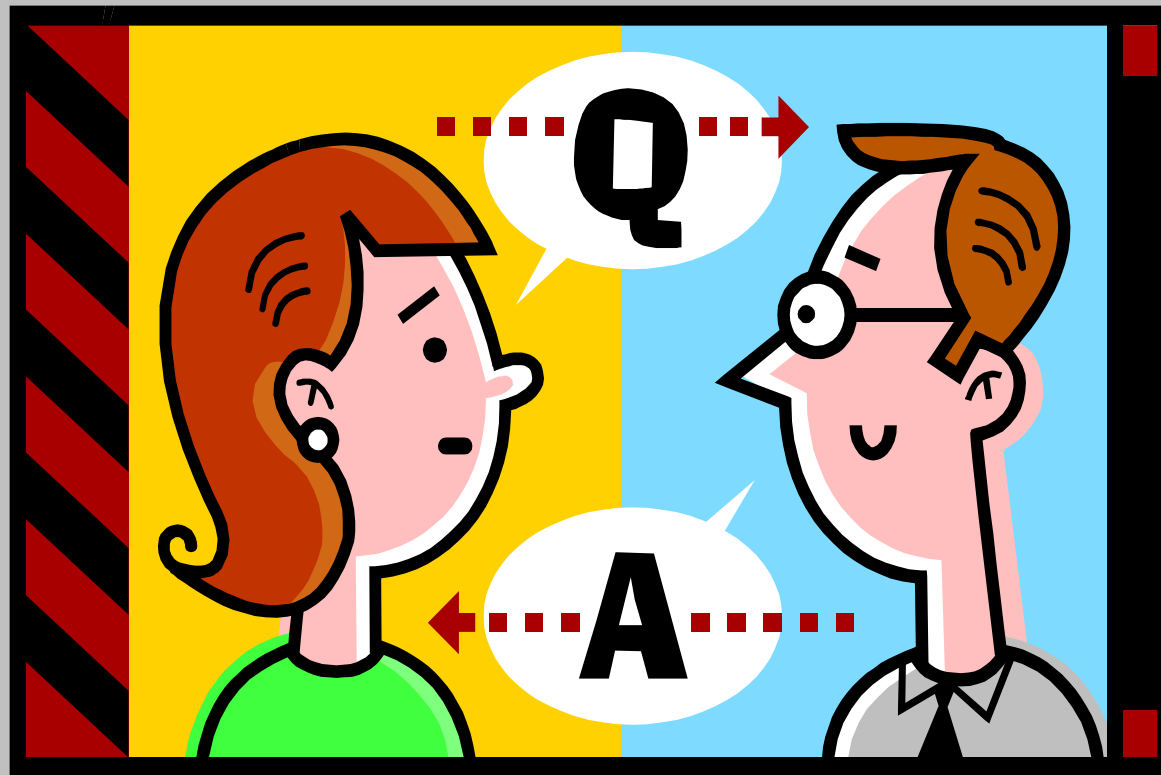
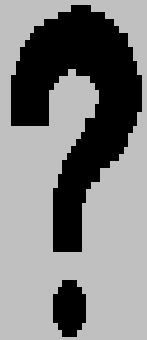
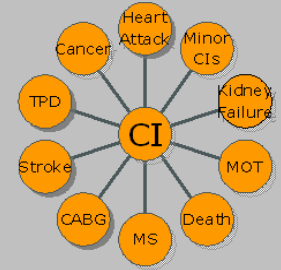
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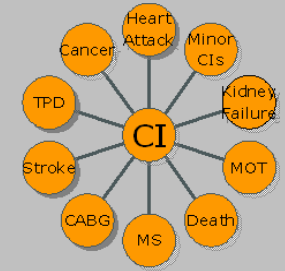
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Questions



Updates & Queries



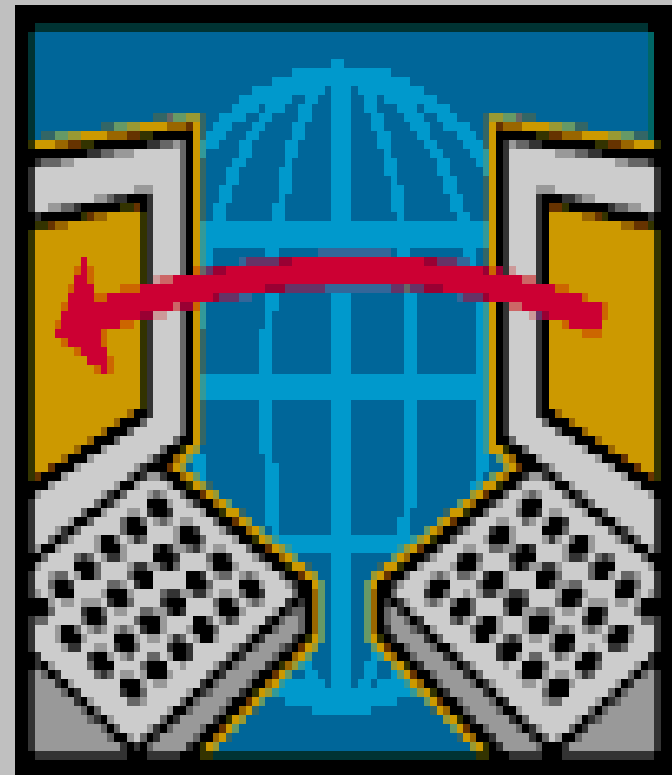
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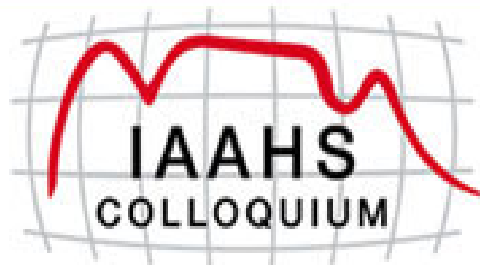
www.genrelifehealth.com/uk

- Contact details

paul_brett@genre.com

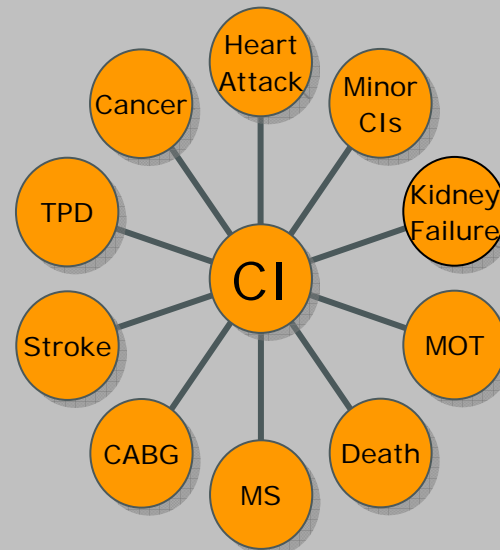
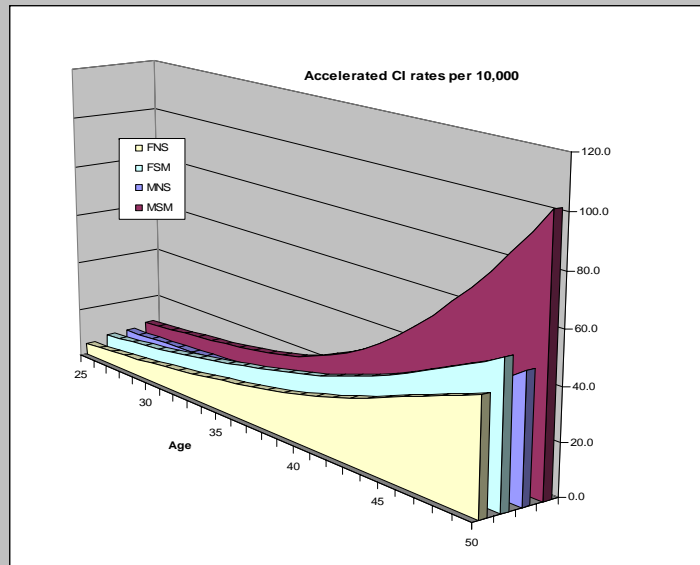
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