I See Dead People

Group Life Claims Experience

1.1.94 – 31.12.99

- James Collier

IAAust BIENNIAL CONVENTION 2003

Institute of Actuaries of Australia

Outline

- Previous Studies & Papers
- Study Scope & Details
- Results
  - Crude & Smoothed Rates
  - Death Only Scheme Loadings
  - Occupation Loadings
  - Comparisons v Retail Experience
  - Trends
- Profiting from Death – Other Issues

Previous Studies & Papers

- Source: 6 Monthly Consultants Study
- Previous IAA convention papers:
- (2001), (1995), (1991)
- Relevant IAA Mortality Reports
  - IA 95-97
  - Industry Funds
  - TPD Experience by Occupation & Gender

2003 Study Scope

- Group Life: Mortality & TPD
- Industry Funds excluded

- Analysis Period (1.1.94 – 31.12.99)
  - Longer v Previous
  - Constraints at either end &
  - Broadly comparable v IA 95-97
- Recent Trends to 30.6.01

Study Size

	Exposure ('000)				Claims		
	M	F	Total	% F	M	F	Total
Mortality - D.O. Schemes	295	274	569	48%	343	80	423
Mortality - D&TPD Schemes	3,056	1,582	4,637	34%	3,130	732	3,862
TPD	3,142	1,628	4,770	34%	5,649	1,452	7,101
Dermody (2001) Exposure			2,589				2,435
Comparative % of this Study			56%				63%
IA 95-97 (Duration 2+)	2,953	1,167	4,120	28%	16,850	2,445	19,295
Comparative % of this Study	97%	74%	89%		538%	334%	500%

Study Data - Claims

- No. Claims Admitted (Paid) v Incurred
- Data obtained by Age, Type (Death v TPD)
  - Usually by Sex, Scheme Type (D.O. v D&TPD)
  - Some by Occupation (White v Blue Collar)
  - None by TPD definition
- Issues
  - Speed v Accuracy
  - Change in Contributors

Study Data - Exposure

- Potential Mismatch v Claims
  - Underestimate claims rates if growing exposure
  - Overestimate claims rates if shrinking exposure
  -

Year	'93	'94	'95	'96	'97	'98	'99
TPD Exposure ('000)	799	790	748	822	905	849	847
Year on Year Change		-1%	-5%	10%	10%	-6%	0%

- Unit Rated data (~35% of total) is respread

Study Data - Underlying Mix

- Changing Contributors
  - 10 - 14 Companies
  - 80% - 100% Market
  - Effect? 48 Month Intercompany Variation:

TPD Results as % Expected	No. of Companies
20 - 40%	2
40 - 55%	1
55 - 70%	2
70 - 85%	1
85 - 100%	0
100 - 115%	2
115 - 130%	3

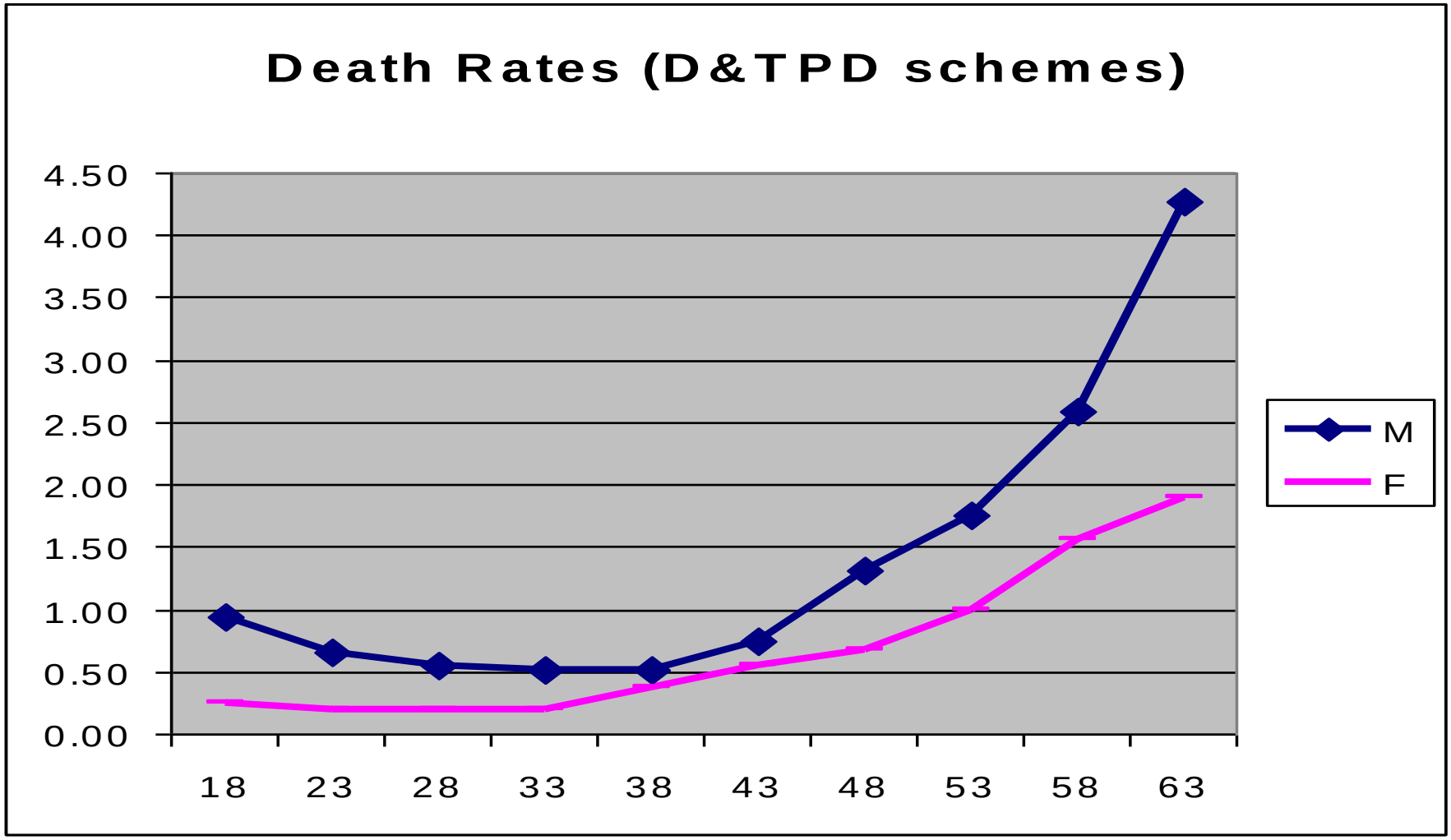
Study Data - Underlying Mix

- Occupation Mix / Contributors (and their target market)
- Claims Reporting Speeds
- Claims Payment Speeds
- Terms & Conditions
  - Exclusions, AAL's, coverage – P/T & casual, No. hrs for TPD eligibility, Spouse cover
- Data Errors & Corrections

Data – Death (D&TPD Funds)

AGE (ANB)	MALES EXPOSURE	MALES CLAIMS	MALES RATES (per '000)	FEMALES EXPOSURE	FEMALES CLAIMS	FEMALES RATES (per '000)
16 - 20	47,928	45	0.94	31,761	8	0.25
21 - 25	263,622	171	0.65	211,521	43	0.20
26 - 30	405,942	222	0.55	285,647	58	0.20
31 - 35	474,560	241	0.51	241,262	46	0.19
36 - 40	477,414	246	0.52	207,356	78	0.38
41 - 45	418,228	308	0.74	202,050	111	0.55
46 - 50	392,588	512	1.30	194,040	131	0.68
51 - 55	296,664	519	1.75	128,608	127	0.99
56 - 60	193,264	501	2.59	61,897	97	1.57
61 - 65	85,344	365	4.28	17,468	33	1.89
	3,055,554	3,130	1.02	1,581,610	732	0.46

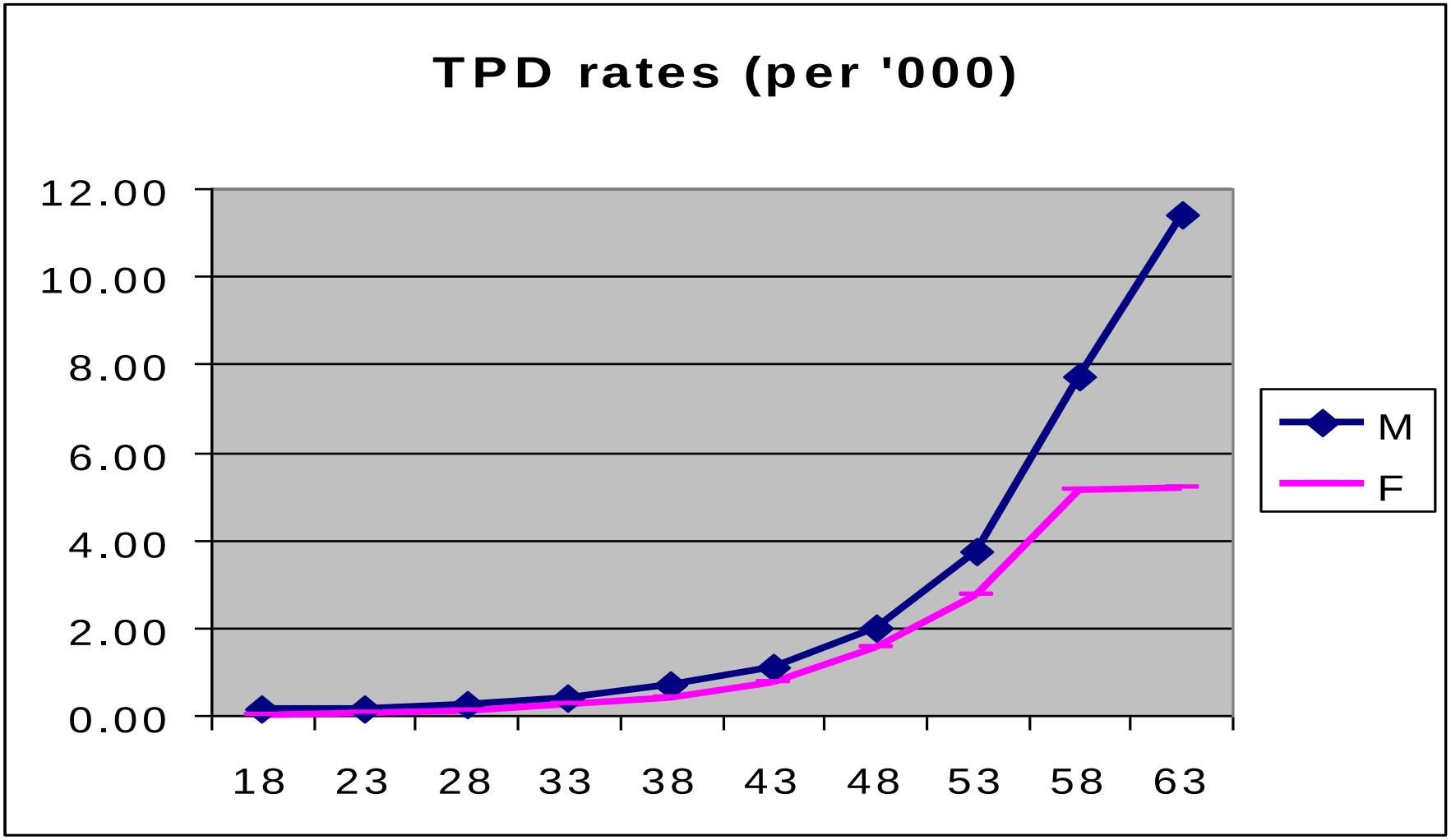
Results - Crude Death Rates



Data – TPD

AGE (ANB)	MALES EXPOSURE	MALES CLAIMS	MALES RATES (per '000)	FEMALES EXPOSURE	FEMALES CLAIMS	FEMALES RATES (per '000)
16 - 20	49,145	7	0.14	32,659	0	0.00
21 - 25	270,778	40	0.15	217,690	11	0.05
26 - 30	417,156	113	0.27	294,173	36	0.12
31 - 35	488,337	197	0.40	248,411	64	0.26
36 - 40	490,343	340	0.69	213,199	90	0.42
41 - 45	430,195	465	1.08	208,100	155	0.74
46 - 50	403,798	810	2.01	199,783	309	1.55
51 - 55	304,847	1,136	3.73	132,260	365	2.76
56 - 60	198,807	1,535	7.72	63,734	328	5.15
61 - 65	88,392	1,006	11.38	18,092	94	5.20
	3,141,798	5,649	1.80	1,628,101	1,452	0.89

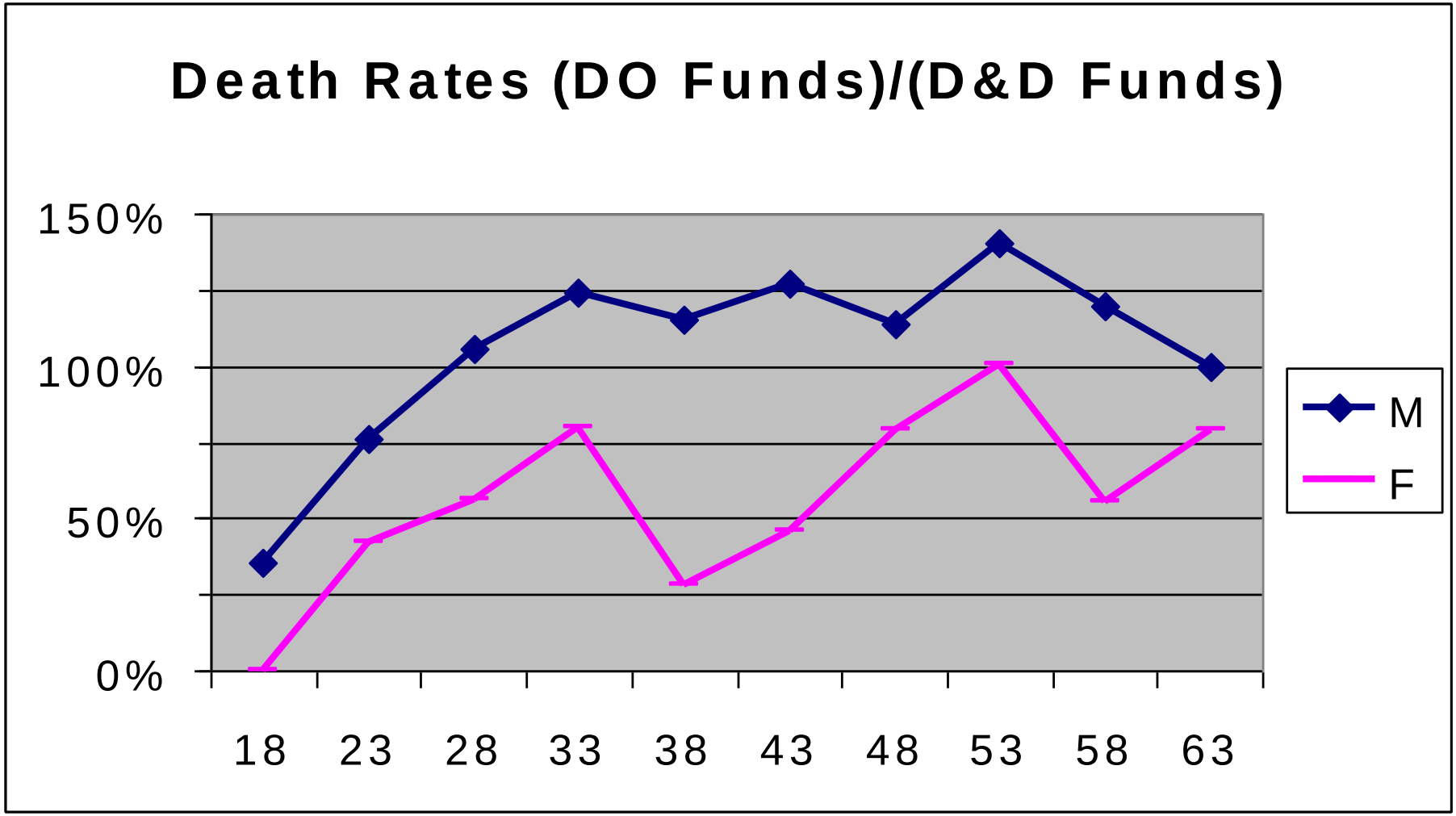
Results - Crude TPD Rates



Data – Death Only Funds

AGE (ANB)	MALES EXPOSURE	MALES CLAIMS	MALES RATES (per '000)	FEMALES EXPOSURE	FEMALES CLAIMS	FEMALES RATES (per '000)
16 - 20	10,458	3	0.29	7,400	0	0.00
21 - 25	32,530	16	0.49	34,825	3	0.09
26 - 30	39,921	23	0.58	43,678	5	0.11
31 - 35	42,946	27	0.63	39,885	7	0.18
36 - 40	43,644	26	0.60	41,104	4	0.10
41 - 45	38,366	36	0.94	39,164	9	0.23
46 - 50	33,513	48	1.43	33,719	18	0.53
51 - 55	25,807	66	2.56	20,156	20	0.99
56 - 60	16,109	50	3.10	10,282	8	0.78
61 - 65	11,268	48	4.26	3,885	6	1.54
	294,562	343	1.16	274,098	80	0.29

Results - Death Only Loadings

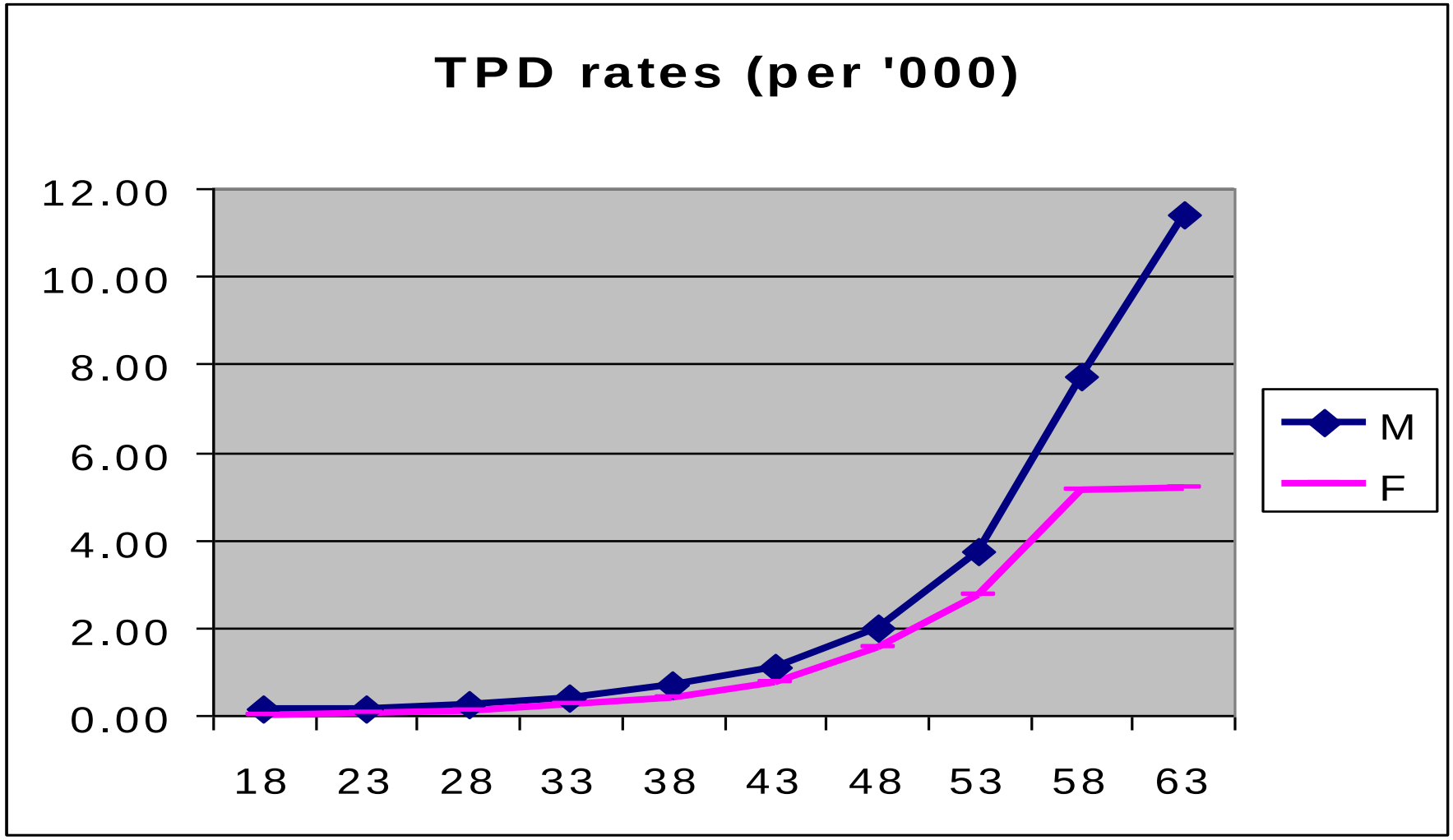


Results - Death Only Loadings

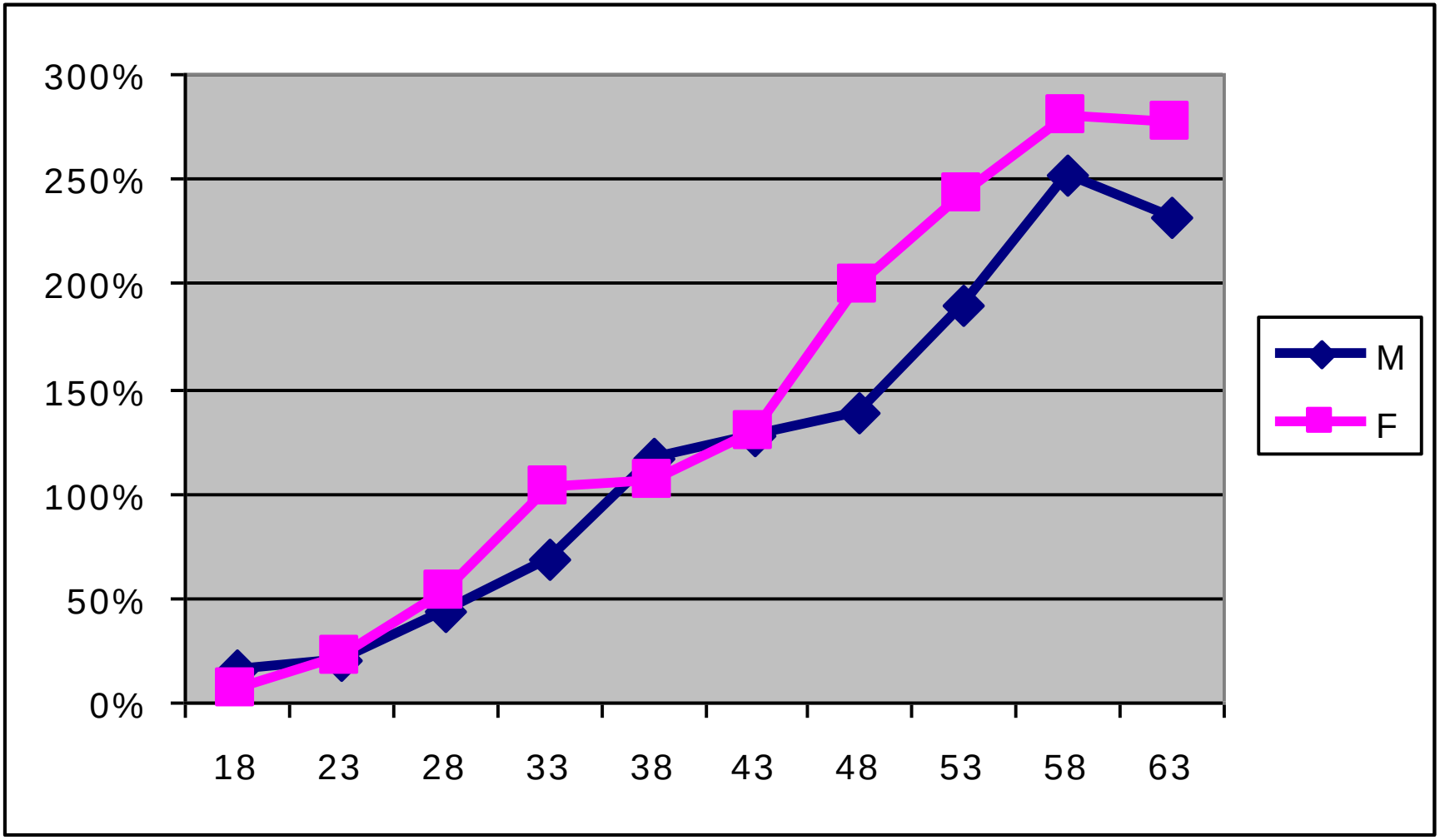
- **Interpretation of Results:**
  - **Expect > 100% as no TPD acceleration effect**
  - **However,**
    - **Volatile results from small sample size**
    - **Different occupation mix? One Mastertrust:**

	MALES		FEMALES	
	Death Only	D&D	Death Only	D&D
WC	65%	66%	92%	87%
BC	16%	11%	2%	5%
HBC	19%	23%	5%	8%
~ No. Mbrs	1,500	3,500	1,000	2,500

Checks - TPD Acceleration



Checks – TPD / Death Ratios



Results – Occupation Rates

- **48 Months to 31.12.99 BC/WC:**
  -

	M	F	Weighted
Death	181%	207%	190%
TPD	290%	294%	291%

Based on assumption:
M 50% WC
F 75% WC

- **Reasonableness of 50% & 75% assumptions?**
  - **ABS: M=44%, F=75%**
  - **Mastertrust percentages from earlier**
  - **Nb. Importance on results**
- **Reasonableness of Results**
  - **v Industry Fund studies**

Results – Occupation Loads

- **Produces possible Class Loadings:**

	Death	TPD	D&D	Occ split	Assumed	Required
Professional	-10%	-15%	-12.50%	18.0%		
Clerical	-	-	-	38.5%	56.50%	58%
Light Blue Collar	40%	90%	75%	20.0%		
Heavy Blue Collar	90%	180%	150%	15.5%	43.50%	42%
Hazardous/ Unskilled	150%	450%	350%	8.0%		
						weighted 50%M WC 75%F WC
Implied BC/WC	184%	303%				
Required	190%	291%				

- **Checks - Translation to life expectancy**

  +90%: 40 y.o. on IA95-97 38yrs→32 (+150%→ 29yrs)

Trends – Measurement Base

- Need base table for results comparison
- Use “KPMGACT” tables v IA retail mortality tables, as shape matches group experience. Change in claims or portfolio composition then doesn’t effect results
- KPMGACT tables adjust IA table by age related factors to produce mortality curve ~ group experience.
- Mortality level not important just shape.

Trends – Base Table

- IA 85-90 (Ultimate) adjusted by;

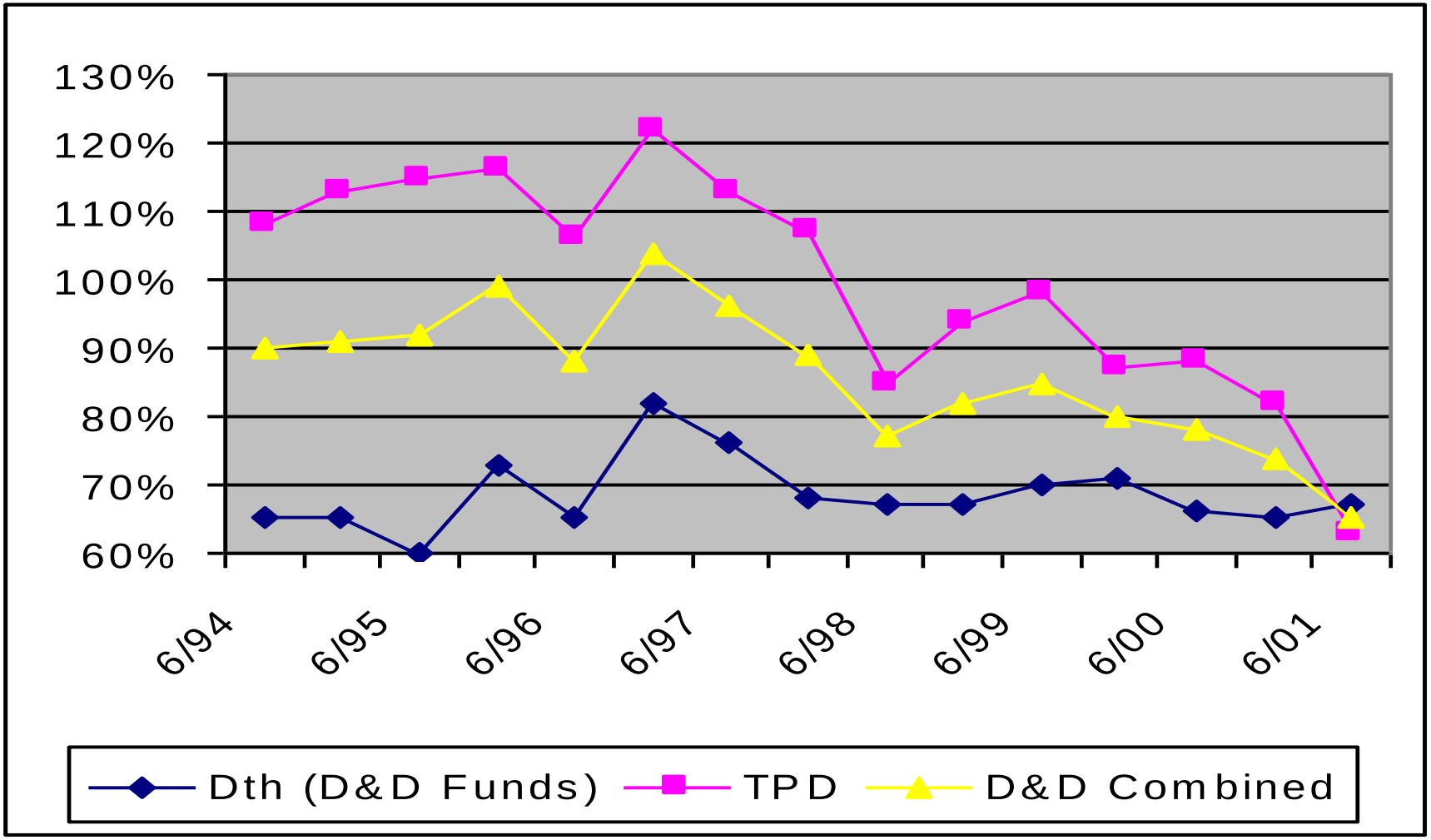
  Death

  - 100% for age (X) < 25 (M&F)
  - 100% - 1.4% * (X-25) (M)
  - 100% - 2.0% * (X-25) for 25<X<50 (F)
  - 50% for X > 50 (F)

  TPD

  - Min [100%, 2.5% * (X–14)] (M&F)

Results – Latest Trends to 6/01



Results – Latest Trends to 6/01

	6 mths ending	Dth (D&D Funds) A v E on KPMGACT	TPD A v E on KPMGACT	D&D A v E on KPMGACT
Analysis Period	6/94	65%	108%	90%
	12/94	65%	113%	91%
	6/95	60%	115%	92%
	12/95	73%	116%	99%
	6/96	65%	106%	88%
	12/96	82%	122%	104%
	6/97	76%	113%	96%
	12/97	68%	107%	89%
	6/98	67%	85%	77%
	12/98	67%	94%	82%
	6/99	70%	98%	85%
	12/99	71%	87%	80%
	6/00	66%	88%	78%
	12/00	65%	82%	74%
	6/01	67%	63%	65%
	6 Yr average underlying Analysis (ignoring exposure weighting)			
		69%	105%	89%

Results – Comment on Trends

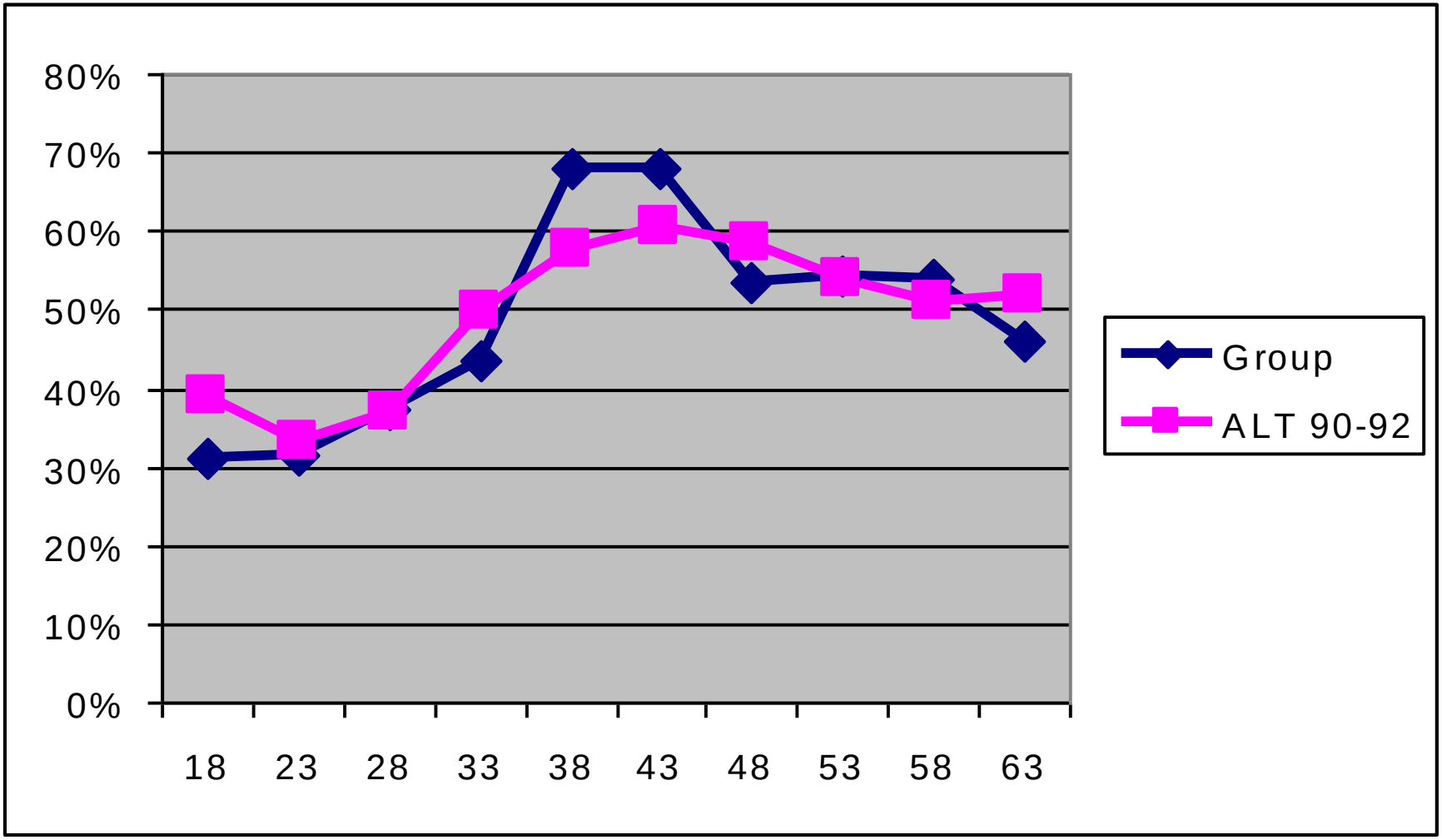
- Recent Experience
  - Death similar
    - v Population mortality Improvements?
  - TPD lower
    - (c.f. last few periods v 6 yr average of 105%)
    - Adjust downward for trend (say x 87%)
- Effect of change in contributors
  - (nb. mirrored effects in Death v TPD)
- Recent economic environment
- Extrapolating
  - Impact of the SCT on old age TPD claims
  - Own Occupation Definitions

Results – Adjusted Claim Rates

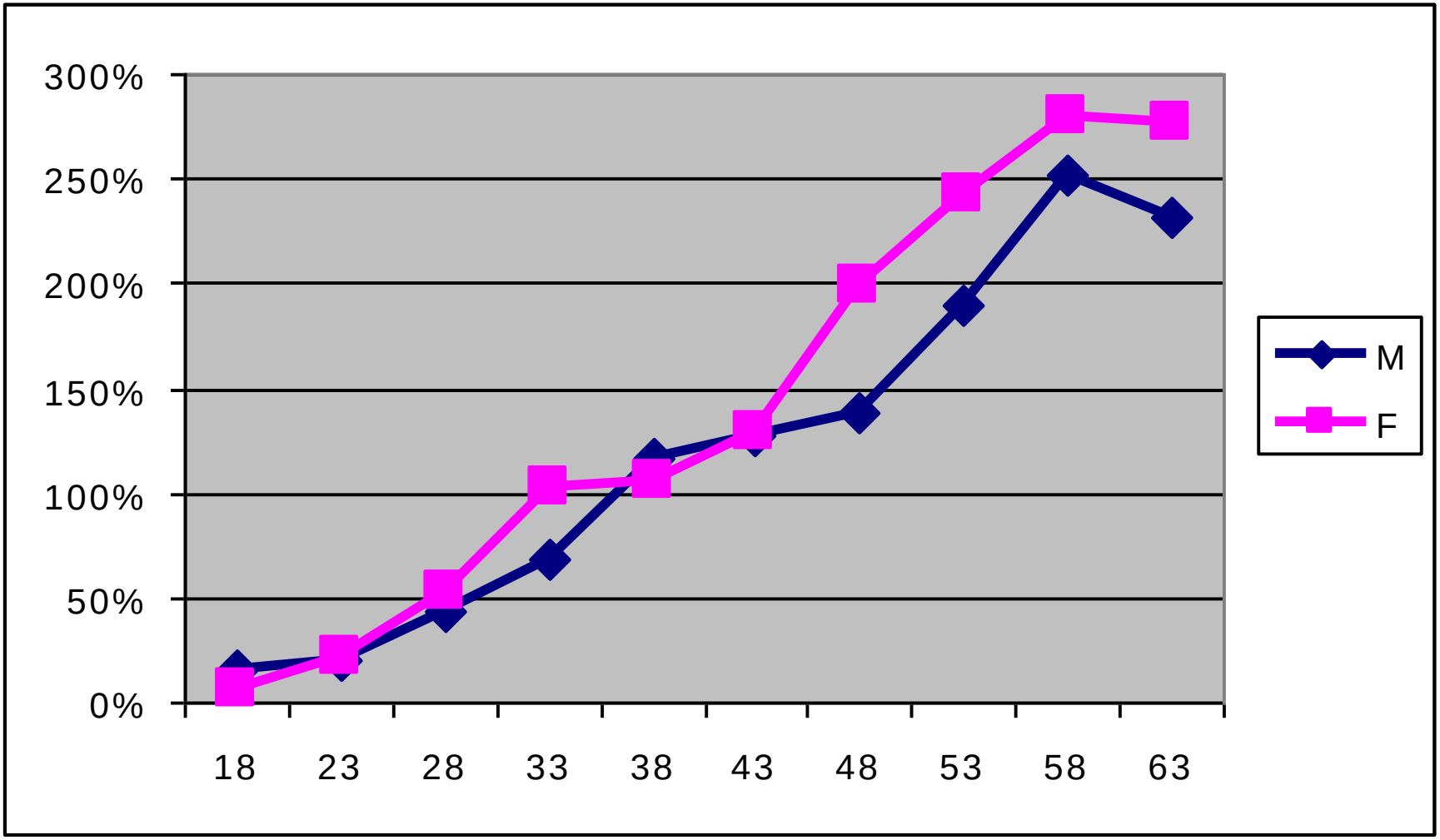
- **After smoothing & trend factor allowance:**
  -

AGE (ANB)	MALES Death (D&D Funds) (per '000)	MALES TPD (per '000)	FEMALES Death (D&D Funds) (per '000)	FEMALES TPD (per '000)
16 - 20	0.81	0.12	0.25	0.02
21 - 25	0.65	0.13	0.20	0.04
26 - 30	0.55	0.24	0.20	0.11
31 - 35	0.51	0.35	0.22	0.22
36 - 40	0.52	0.60	0.35	0.37
41 - 45	0.74	0.94	0.50	0.65
46 - 50	1.26	1.75	0.68	1.35
51 - 55	1.82	3.45	0.99	2.40
56 - 60	2.59	6.53	1.40	3.92
61 - 65	4.28	9.90	1.96	5.44

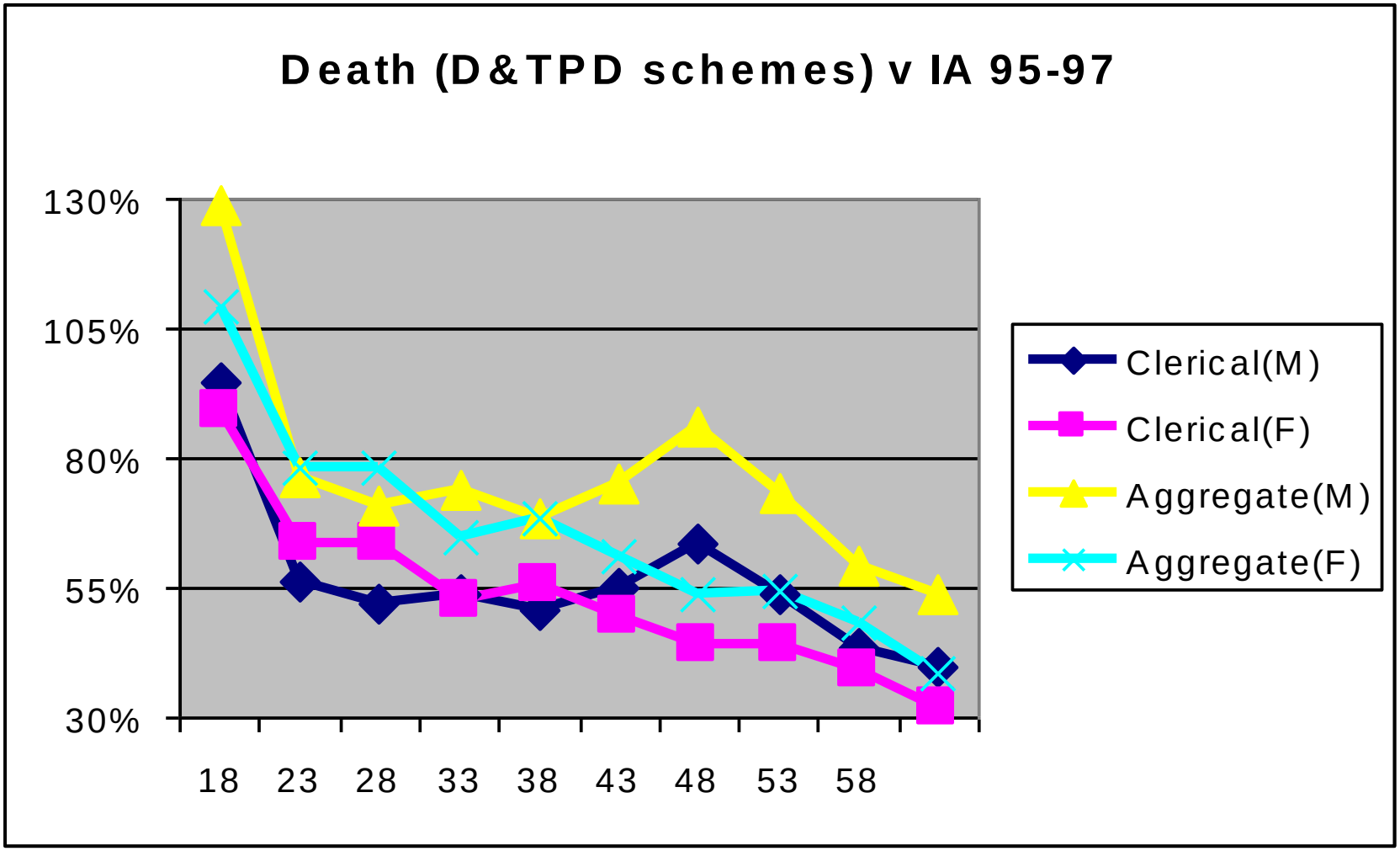
Checks – F / M ratios



Checks – TPD / Death ratios



Results - v IA95-97 Retail table



Results – v IA Retail table

- Clerical rates 73%(M) & 81%(F) of Aggregate Levels
- In examining variations across ages:
  - Assumption: Occ proportion unchanged
    - Workforce Entry & Retirement
  - Assumption: Occ loads unchanged
- Downward sloping graph
  - TPD acceleration effect

Results – Cautions

- Use of these Rates
  - Reliances & Limitations of study
    - Numbers v Amounts, Paid v Incurred
  - Interpretation of trends
  - Allowance for more recent results
  - Likely future experience (eg impact of the SCT)
  - Intercompany adjustments (TPD repudiation rates)
  - Differing TPD Occupation definitions & loadings
  - Portfolio premium achieved
  - Other claims loadings (I.e. Continuation options)

Other – Profiting from Death

- Experience Rating
  - Anti-selective claims information (incl/excl, period)
  - Credibility weighting formulae
  - IBNR allowance in Actual results
- Profit share loadings
  - Sufficient loadings
  - Unknown mean & moving
  - Self experience formulae
- Mastertrusts - Personal Sections
- Member choice – Anti-selection