Projecting mortality

Harder than expected?

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The actuarial projection

- The year is 1800. A Swedish actuary wants to project the difference in life expectancy between males and females as of year 2030.
- Let us see how he and later actuaries succeed
Study statistics from 1750
Difference in life expectancy females - males, per calendar year

Source: Human Mortality Data Base
The 1800 actuary makes this projection
Projected value at 2030: 3.0

Value at 2010: 3.00

Source: Human Mortality Data Base
1850, the next generation of actuaries looks at the projection
Not that good!!!
The 1850 generation of actuaries makes a new projection
Projected value at 2030: 11.5

Source: Human Mortality Data Base
1900, the next generation of actuaries looks at the projection. Not that good!!!
The 1900 generation of actuaries makes a new projection
Projected value at 2030: -2.5

Source: Human Mortality Data Base
1950, the next generation of actuaries looks at the projection. Not that good!!!
The 1950 generation of actuaries makes a new projection. Projected value at 2030: 2.5
1975, the next generation of actuaries looks at the projection
Not that good!!!
The 1975 generation of actuaries makes a new projection
Projected value at 2030: 12

Source: Human Mortality Data Base
2010, the next generation of actuaries looks at the projection
Not that good!!!
The 2010 generation of actuaries makes a new projection
Projected value: 2.1
But

Change of trend the last three years??

Source: Human Mortality Data Base
A possible projection
Projected value: 4.1

Source: Human Mortality Data Base
Another possible projection
Projected value: 4.0

Source: Human Mortality Data Base
Another possible projection
Projected value: 3.2 (the long term average)

Source: Human Mortality Data Base
1751-2010
Trend patterns

Source: Human Mortality Data Base
1751-2010
The total of projections

Source: Human Mortality Data Base
Conclusions

- Trends shift
- Long term projections from short term data is dangerous
- We have a reversion to the mean
- We should not expect the difference in longevity to reach zero
- The gender problem will not disappear by itself
The end