

Descriptive epidemiology of drug-treated T2DM in the Nordic Countries

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AZ / Arlanda,
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<http://BendixCarstensen.com/SDC/daf>

(currently) Available data

- ▶ Prevalence data — absent

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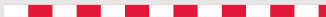
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Denmark



Finland



Norway



Sweden



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- ▶ Age-specific prevalences at 1 Jan 2008, 2012, 2016

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- ▶ classified by country / sex: 24 curves

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- ▶ classified by country / sex: 24 curves
- ▶ Average trends in prevalence over the period (2008–2016)

Incidence of dDM

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Incidence of dDM

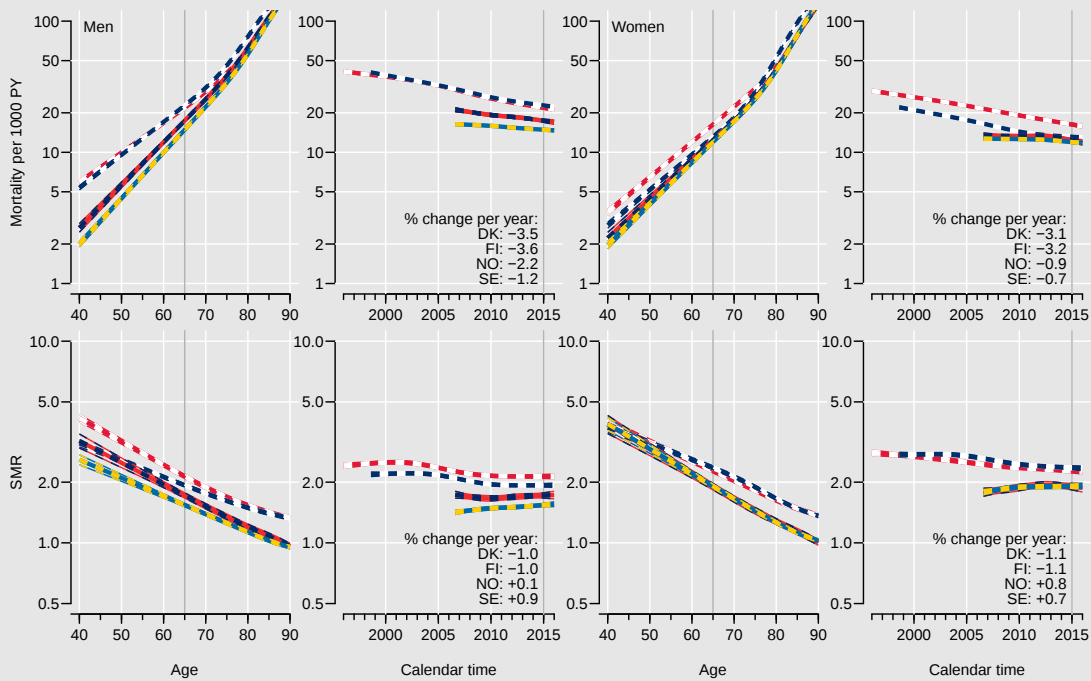
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- ▶ (top row of figure)



Mortality

Statistical models for mortality of dDM patients (μ_{DM}) by age (a) and date (p):

$$\mu_{\text{DM}}(a, p) = f(a) \times g(p)$$

$$\mu_{\text{DM}}(a, p) = f(a) \times (1 + \beta)^{p-2005}$$

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Statistical model for mortality of the general population by age (a) and date (p):

$$\mu_{\text{pop}}(a, p) = f(a)_{\text{pop}} \times g_{\text{pop}}(p)$$

SMR

Statistical models for mortality of dDM patients
by age (a) and date (p) relative to general population:

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Statistical models for SMR

(ρ — hazard ratio between dDM and population)
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First model reported by $f(a) \times g(2015)$, and $f(65) \times g(p)$, respectively.

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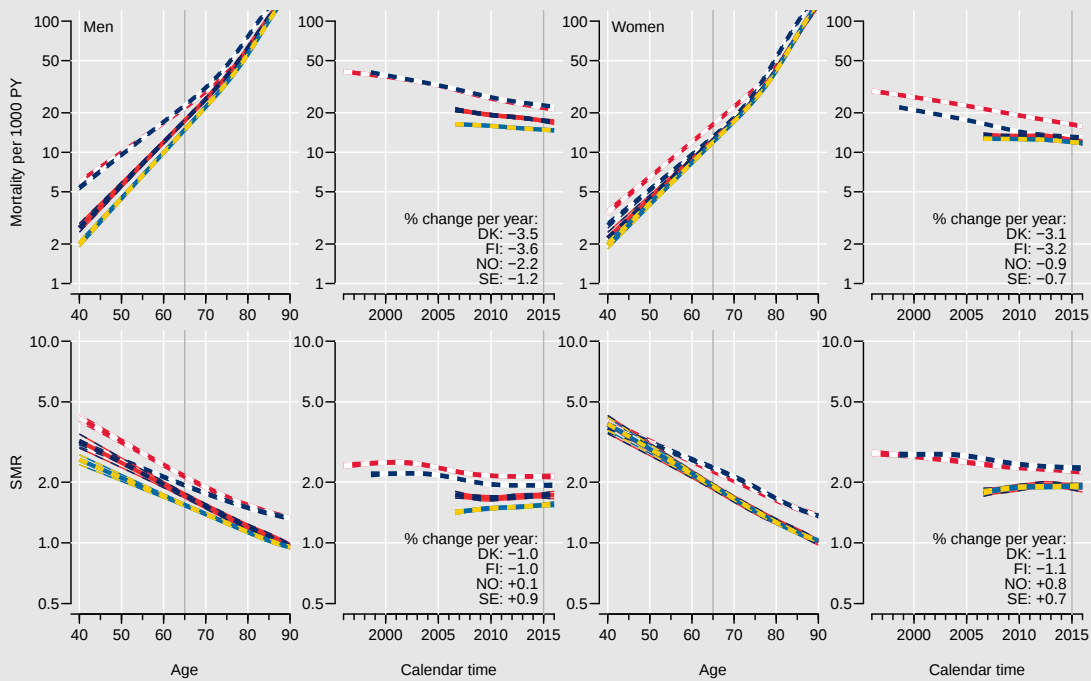
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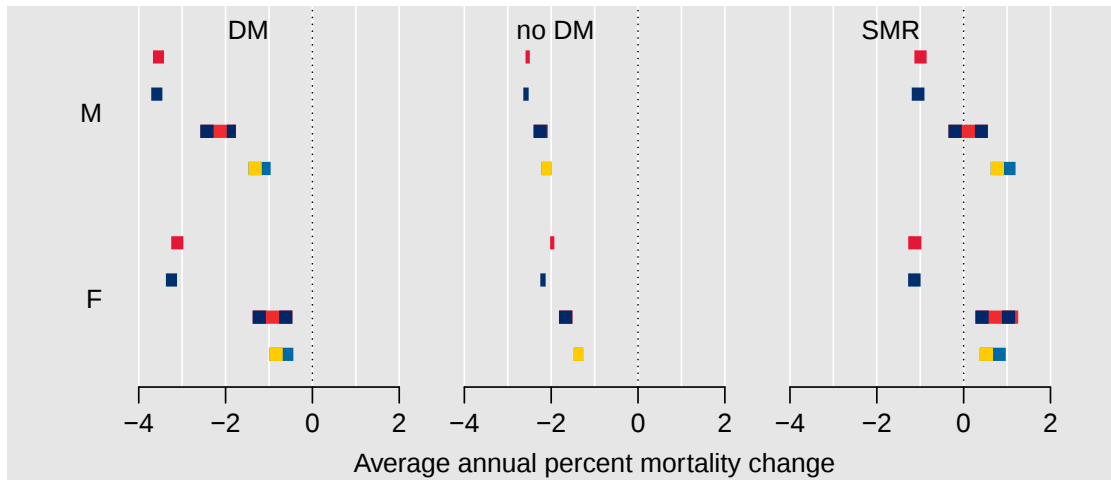
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Estimates of γ printed on the plot

If $\gamma = -2\%$, say, then every year the SMR (ρ) changes by a factor $(1 - 0.02) = 0.98$.



Summary of mortality / SMR changes



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- ▶ SMR in dDM vs. population is higher in DK and FI compared to NO and SE
- ▶ Mortality decreasing:
3.5%/year in DK & FI, 2%/year in NO, 1%/year in SE.
- ▶ SMR decreasing 3%/year in DK & FI, **increasing** 1%/year in NO & SE.

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Years of life lost

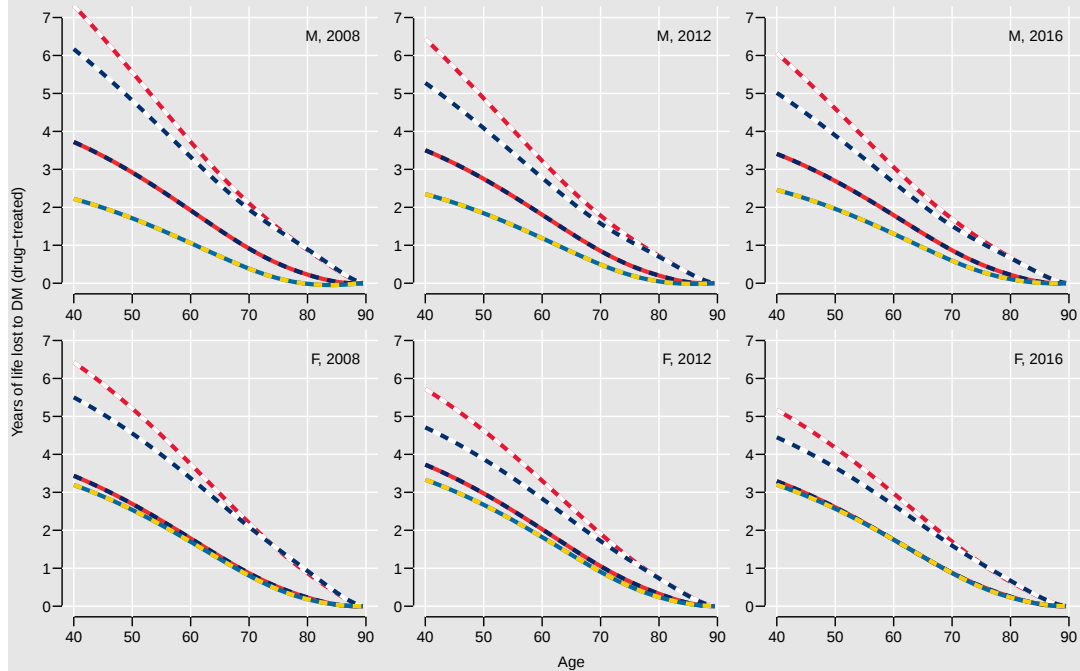
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- ▶ ... **and** a date for evaluation of the mortality rates

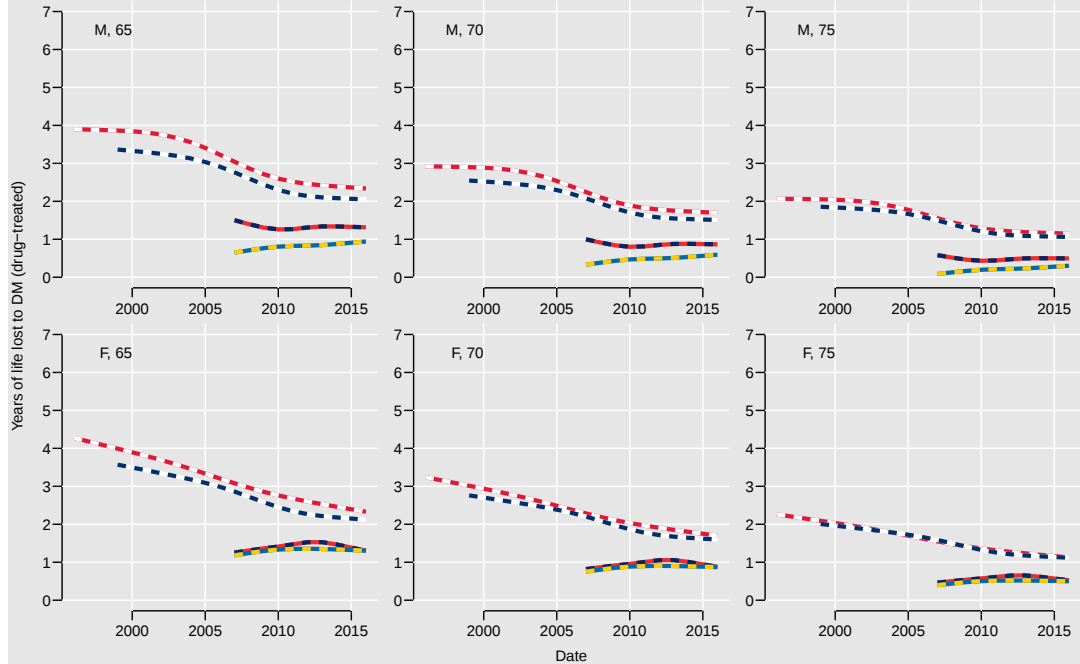
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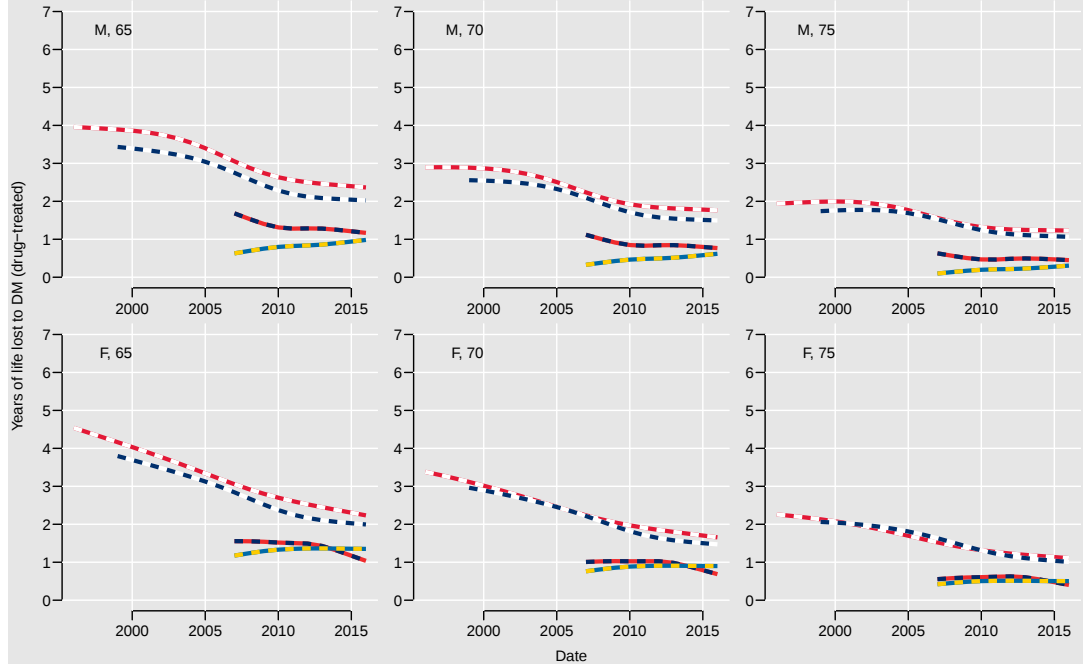
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- ▶ Depends on age and date. . .

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- ▶ ... or:
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- ▶ ... **and** a date for evaluation of the mortality rates
- ▶ Depends on age and date...
- ▶ ...so what should be the major time scale?







Conclusion for YLL to diabetes

- ▶ Highest in DK & FI

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- ▶ Decreasing in DK, FI, not in NO, SE

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Conclusion for YLL to diabetes

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- ▶ Decreasing in DK, FI, not in NO, SE
- ▶ Slightly higher for women
- ▶ Current levels of YLL for 65 year old:
2 y in DK & FI, 1 y in NO & SE

Complications SMR of between dDM and non-dDM

Statistical models for SMR (ρ) by age (a) and date (p):

$$\rho_{\text{DM}}(a, p) = f(a) \times g(p)$$

$$\rho_{\text{DM}}(a, p) = f(a) \times (1 + \gamma)^{p-2005}$$

$$\rho_{\text{DM}}(a, p) = g_0(p)$$

$$\rho_{\text{DM}}(a, p) = \alpha \times (1 + \gamma_0)^{p-2005}$$

First model reported by $f(a) \times g(2015)$, and $f(65) \times g(p)$, respectively.

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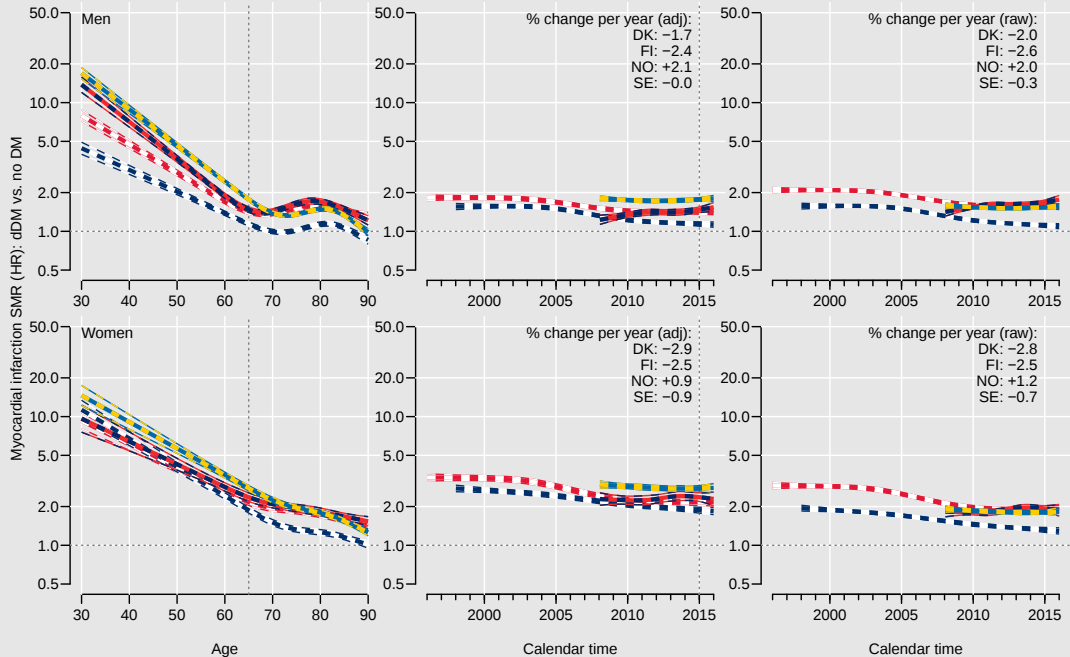
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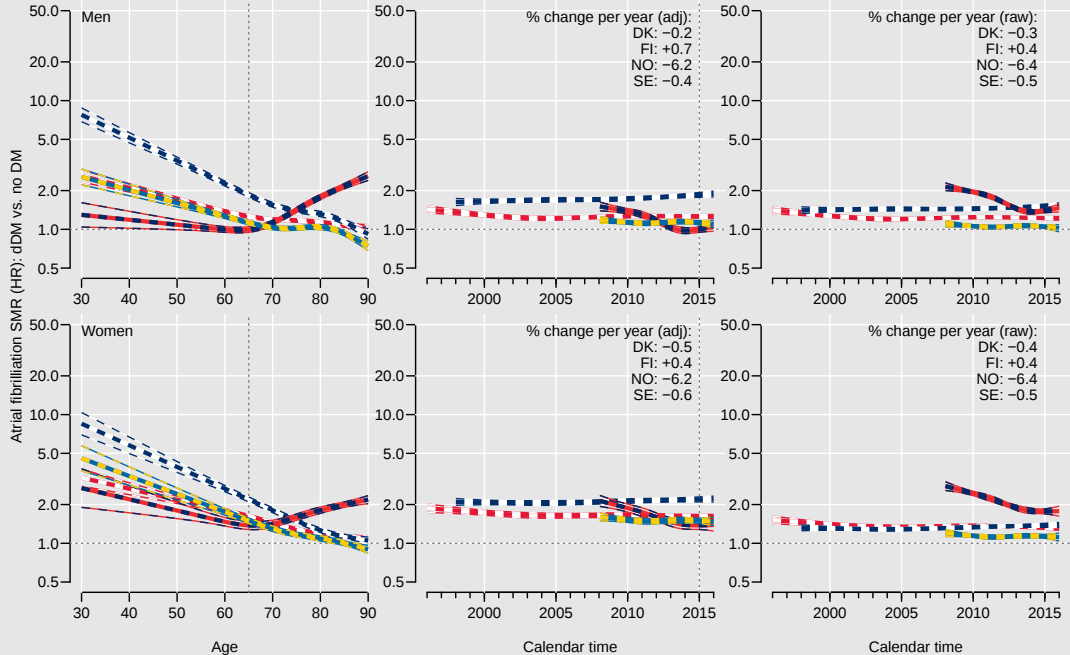
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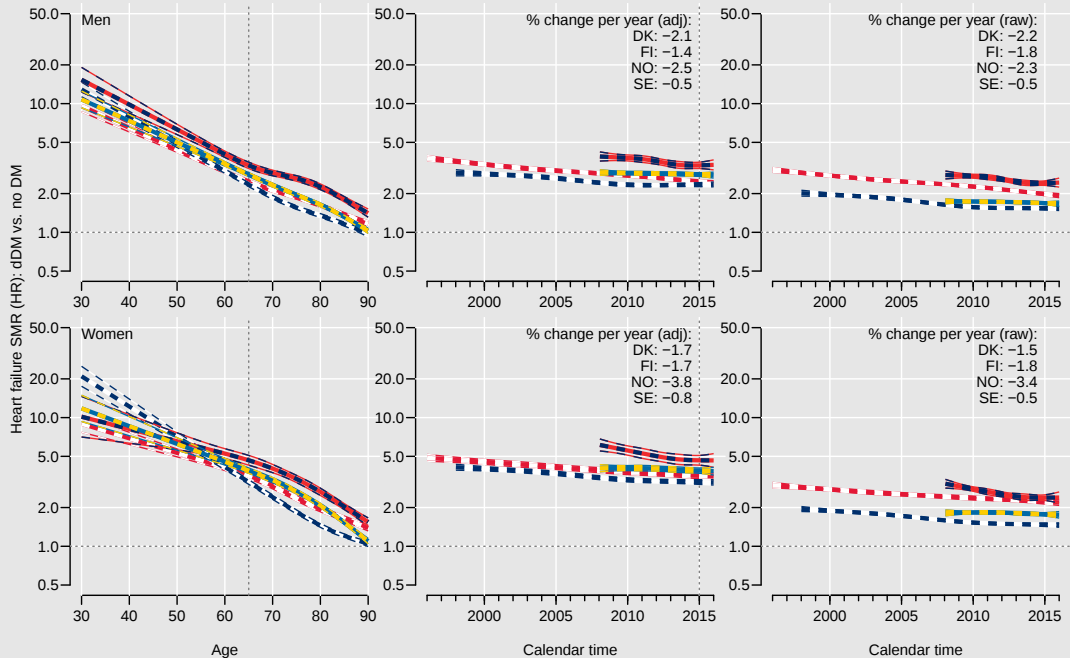
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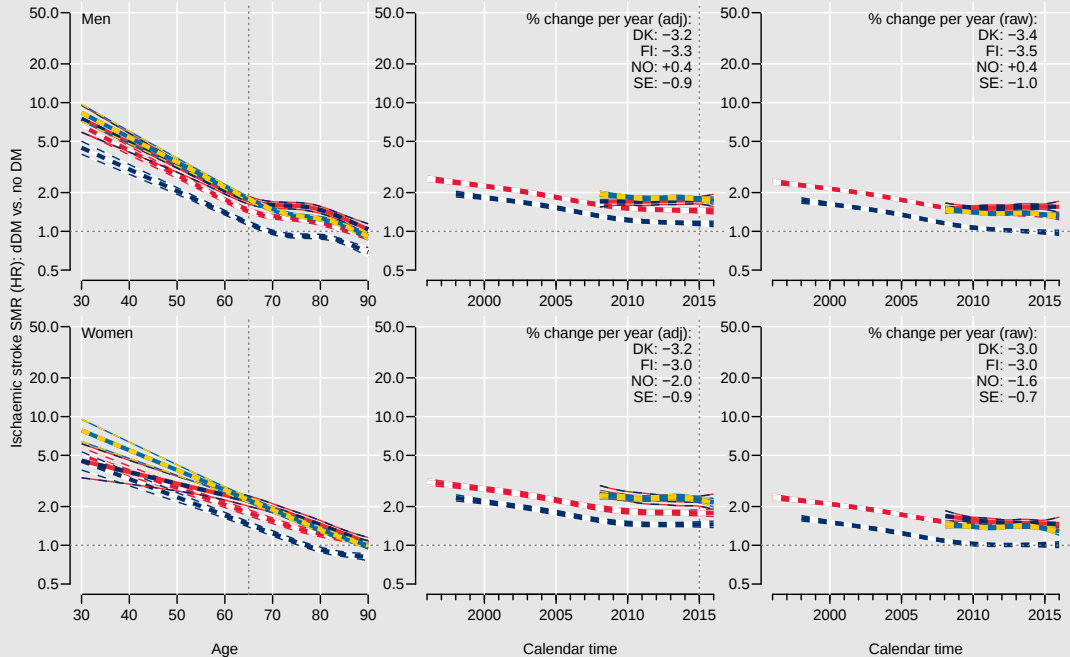
$$\rho_{\text{DM}}(a, p) = \alpha \times (1 + \gamma_0)^{p-2005}$$

The latter two models asserts that SMR does not depend on age — simpler interpretation, no need for reference age — but clearly a wrong model. $g_0(p)$ given in rightmost plot, with estimates of γ_0









Conclusion for complications

What do we want more

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- ▶ Incidence rates of dDM, by age & date
- ▶ Requires just incidence data with:
 - ▶ no new cases of dDM
 - ▶ no of these with each complication