# What have we learned from Scandinavian Diabetes Registers?

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Diabetes Kongess 2015, Berlin

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http://BendixCarstensen.com/DMreg

steno
diabetes center

# Disclosure

- Employee at Steno Diabetes Center,
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- Own shares in NovoNordisk,
  worth approx. half my annual salary.

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    2015: 350,000 ptt $\approx$ 88% of all

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   - Not complete w.r.t. cases of DM
   - Clinical information is collected regularly (*e.g.* annually)
     HbA1c, HDL, BMI, ...

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    - Distribution of and changes in clinical parameters:
      HbA1c, Blood pressure, Cholesterol ...

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- ▶ ...by web or by automated data transfer

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- Examples of results from both registers

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Swedish law no. 787 (1996):

§**31** The quality of health care should be developed and assured systematically and continually.

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- Protected with same standards as medical records regarding confidentiality and data handling

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# Swedish NDR: Registered items

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| | | |
|---|---|---|
| Date of registration | Caregiver code | Person id |
| Year of diabetes diagnosis | HbA1c | Micro- & macro albuminuria |
| Type of diabetes | Diabetes treatment | S-creatinine |
| Height & weight | Blood pressure | IHD (date) |
| Waist circumference | Anti-hypertensive treatment | Stroke (date) |
| Smoking habits | Blood lipid level | Retinal image (date) |
| Physical activity | Lipid-lowering treatment | Visual impairment |
| Severe hypoglycaemia | Aspirin treatment | Foot examination |
| | | Amputation |

# SE-NDR: Trends in HbA1c

**Figur 21.** Medelvärde för HbA1c (mmol/mol).
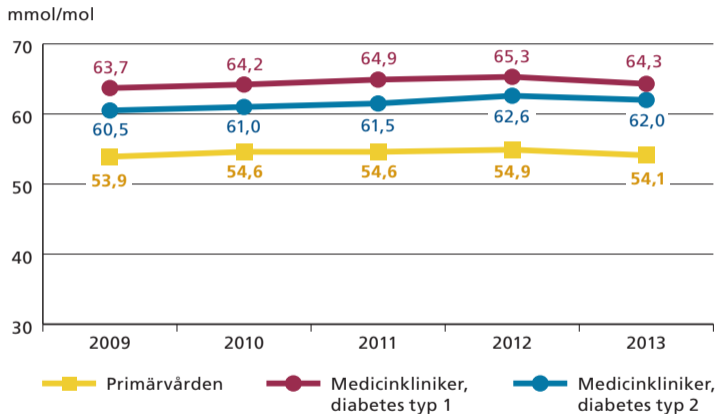


mmol/mol

Yellow: Primary care    Blue: Clinics, T2    Brown: Clinics, T1

# SE-NDR: Trends in HbA1c T1D by age

**Figur 25.** Medelvärde för HbA1c (mmol/mol) i olika åldersgrupper. Typ 1 diabetes vid medicinkliniker.



mmol/mol

Medicinkliniker, diabetes typ 1, ålder 18–21 år
Medicinkliniker, diabetes typ 1, ålder 22–30 år
Medicinkliniker, diabetes typ 1, ålder > 30 år
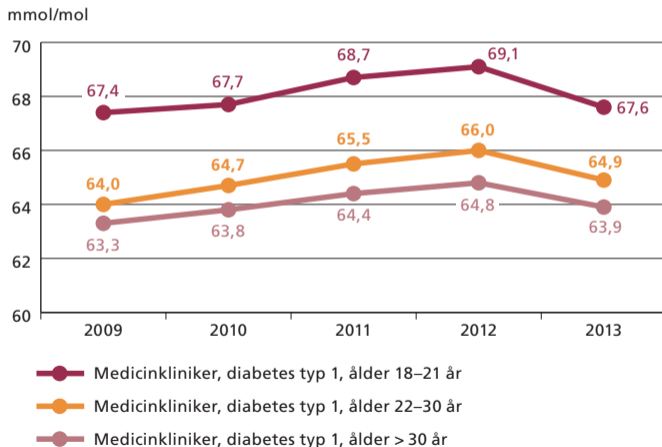
# SE-NDR: Trends in pharmacological treatment of T2D
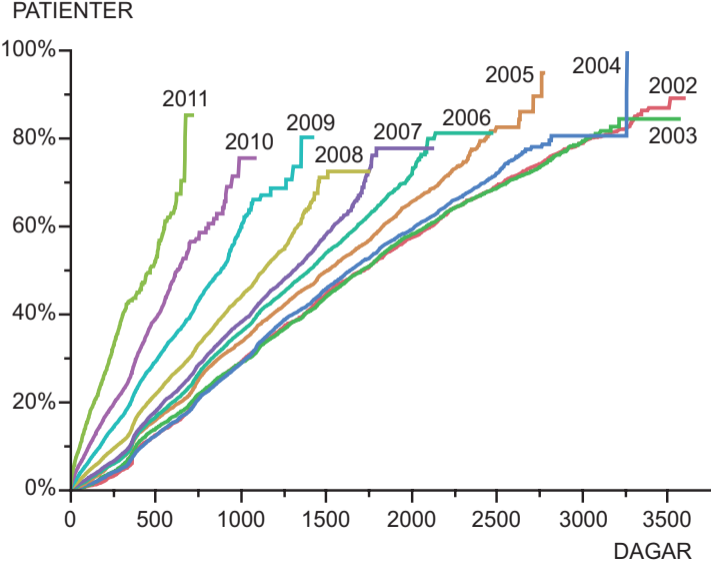
# DK-NDR: Changes in prevalence 1995–2012
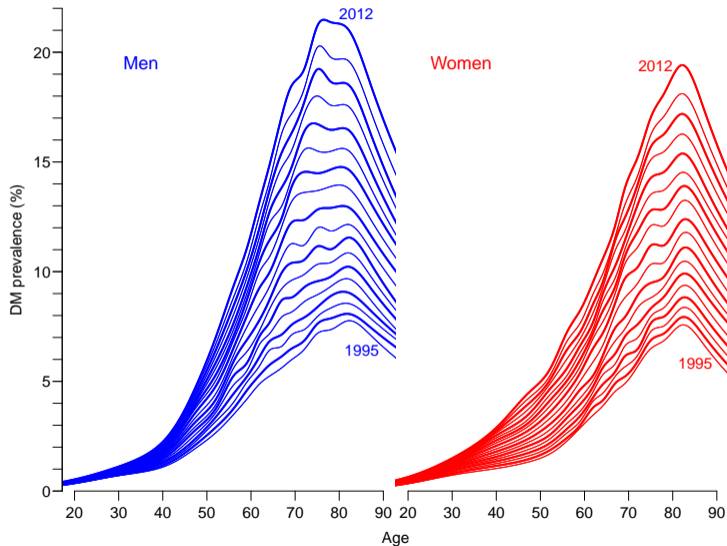
# What drives the increasing prevalence in DK?

- Changing **rates** in period 1995–2012:

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| Diabetes incidence | **3.5%**/year |
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- There is not balance between incidence and mortality in 1995
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- Which is the more important force?
- Use rates from the register and predict using different scenarios.
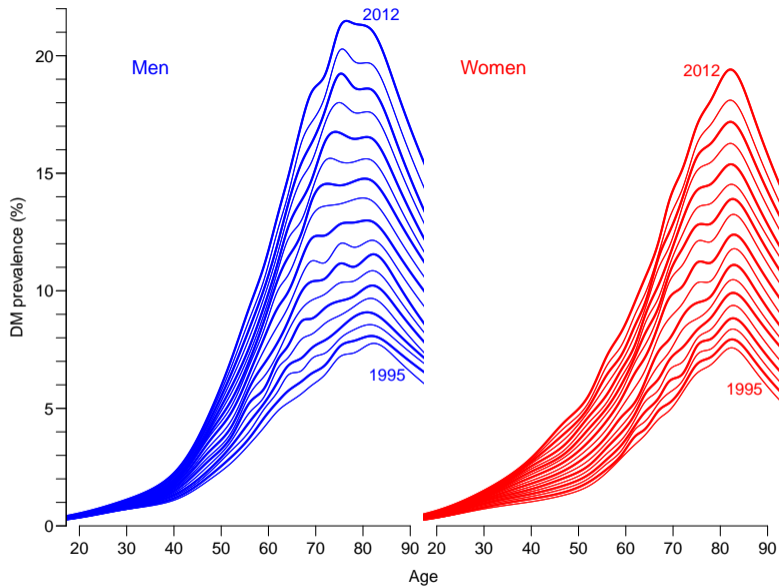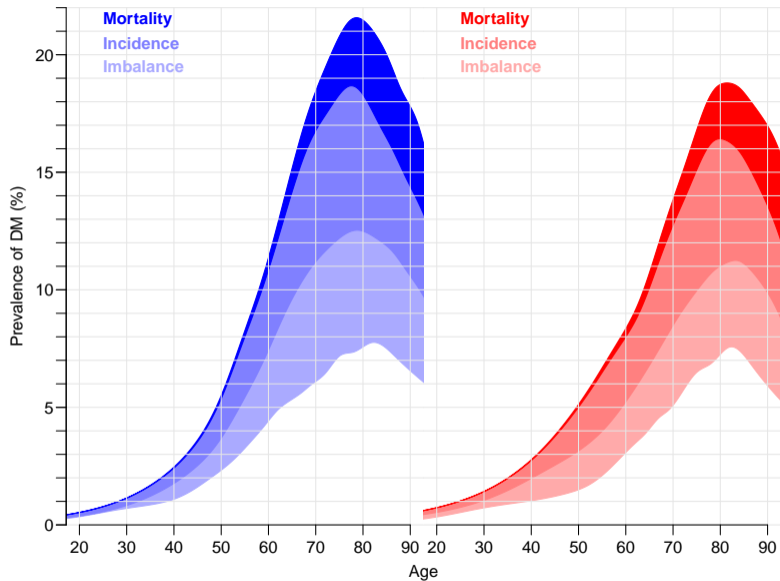
**2012**

160,352   N   150,309
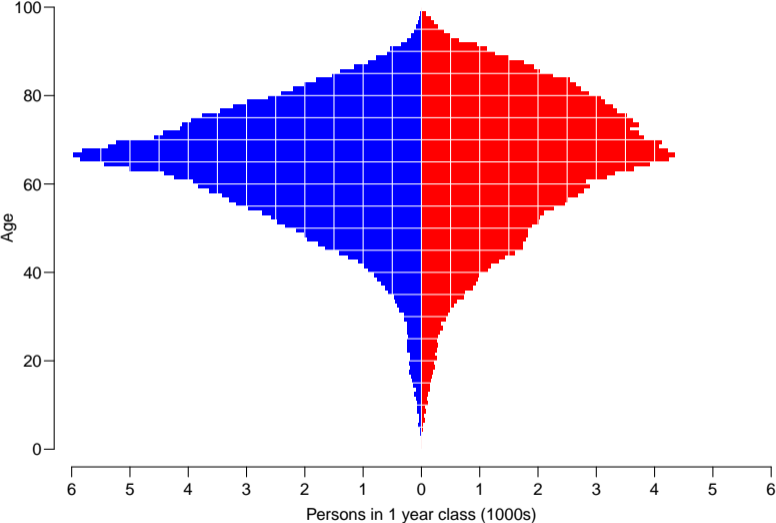
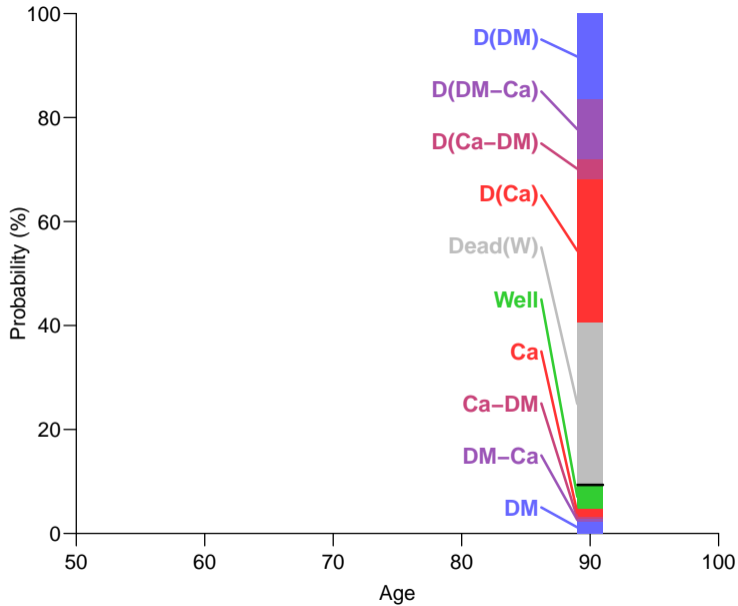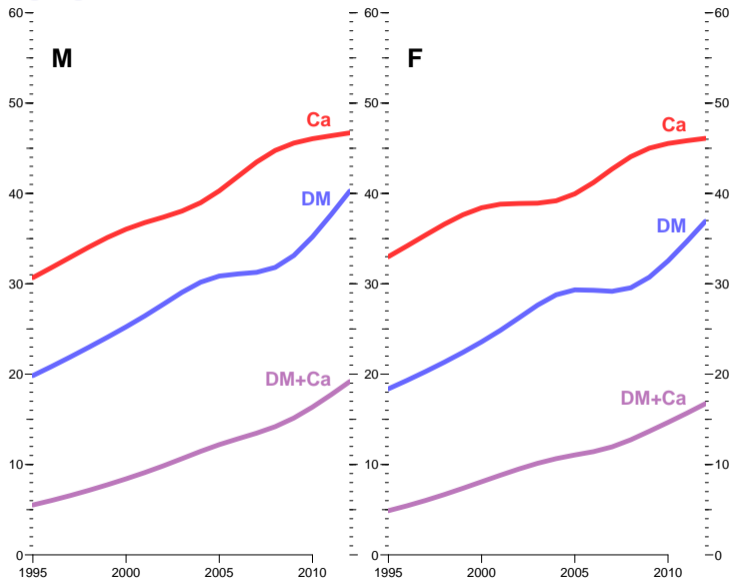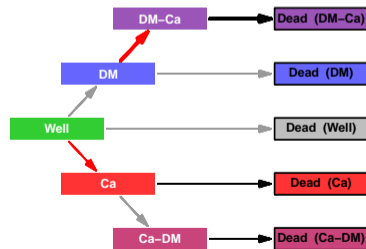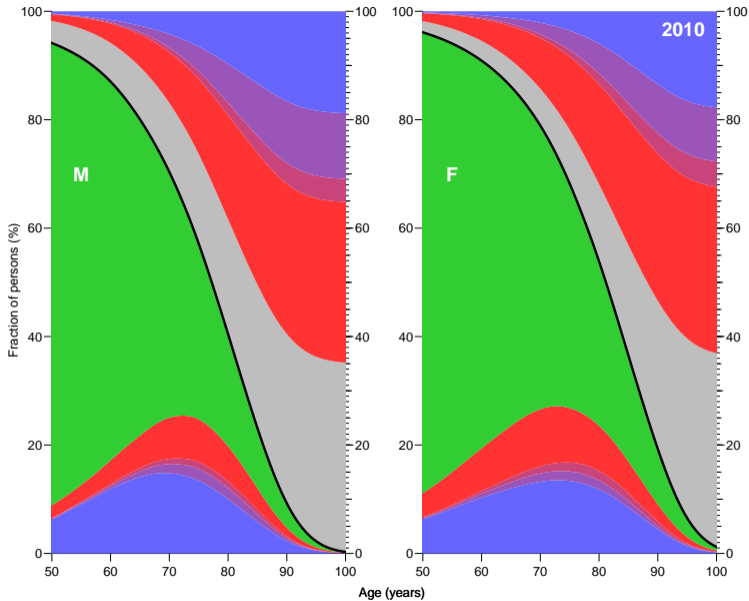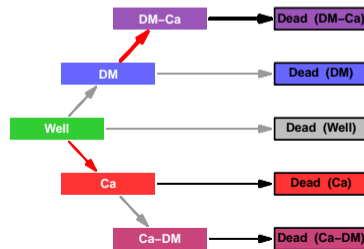| 2012 | Mort | Inc | Imbal | Org | All | | All | Org | Imbal | Inc | Mort |
|------|------|-----|-------|-----|-----|---|-----|-----|-------|-----|------|
| | 12,273 | 47,282 | 40,568 | 61,510 | 161,632 | N | 152,001 | 55,939 | 38,232 | 46,486 | 11,344 |
| | 7.6 | 29.3 | 25.1 | 38.1 | | % | | 36.8 | 25.2 | 30.6 | 7.5 |
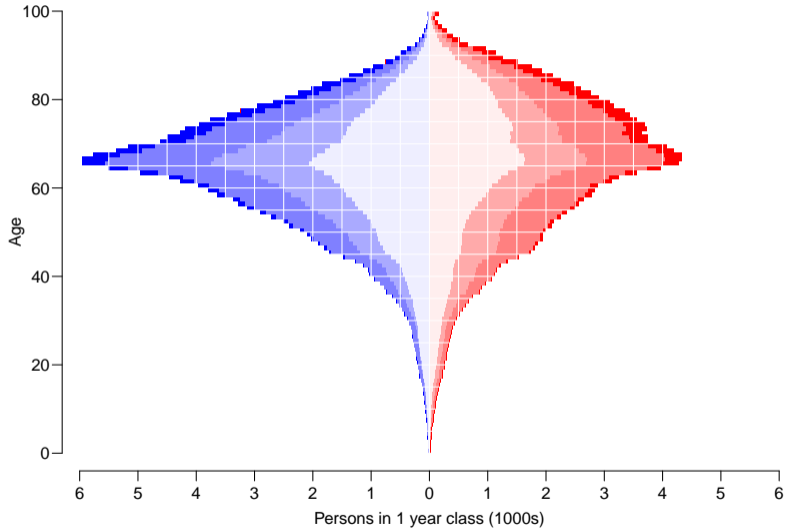
# DK-NDR: Lifetime risk of diabetes and cancer
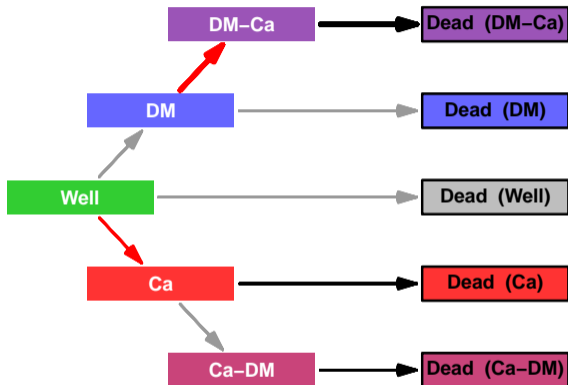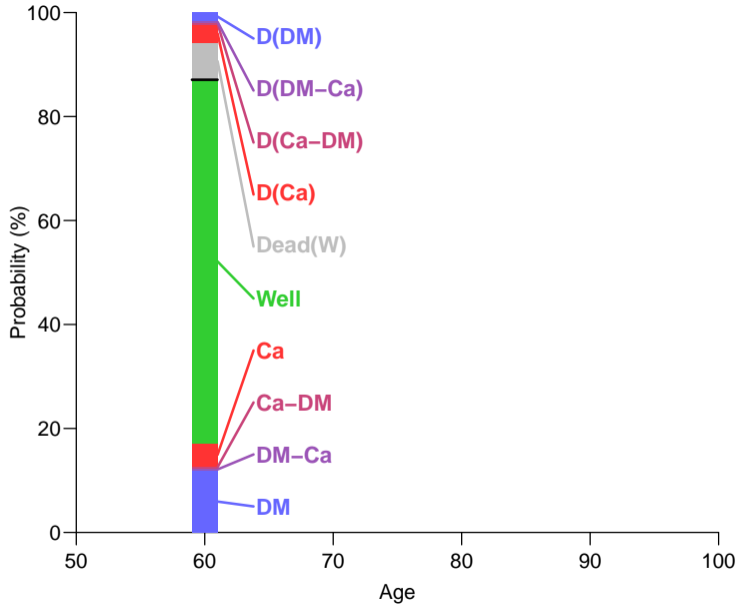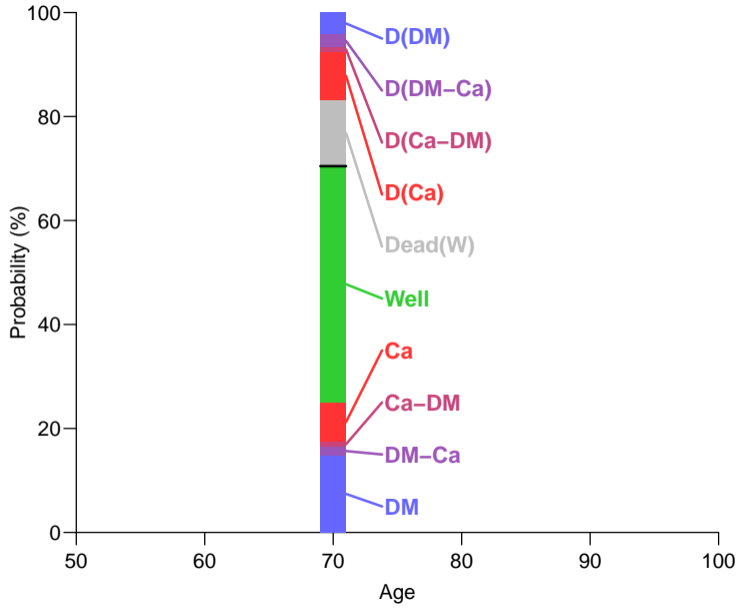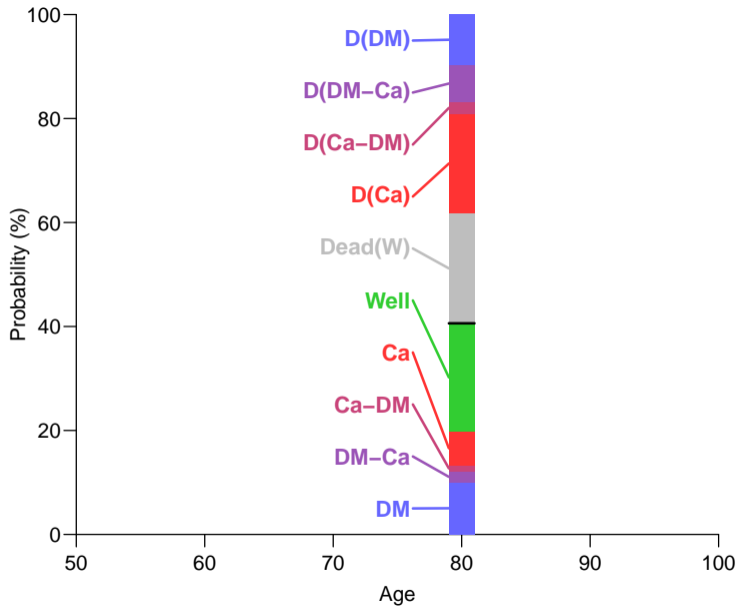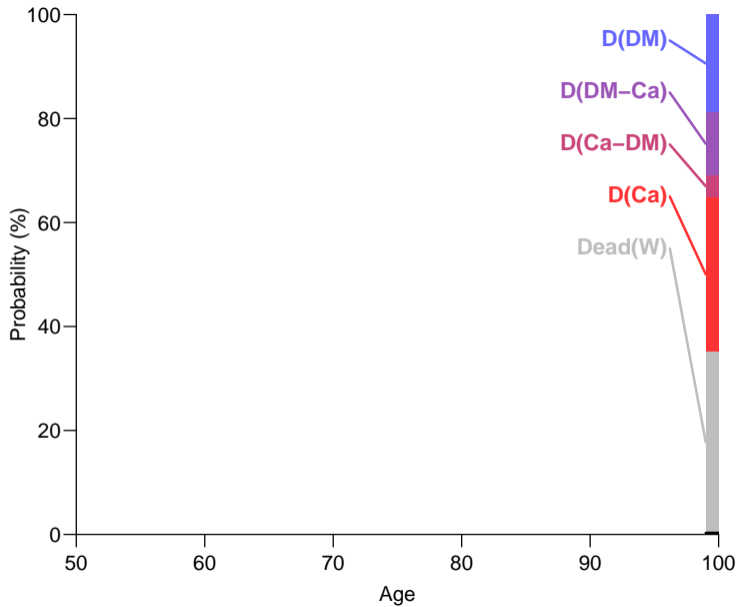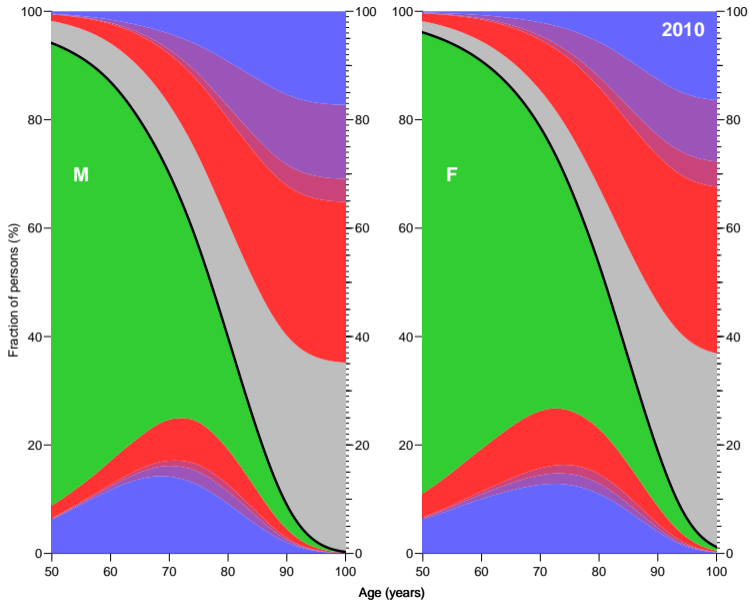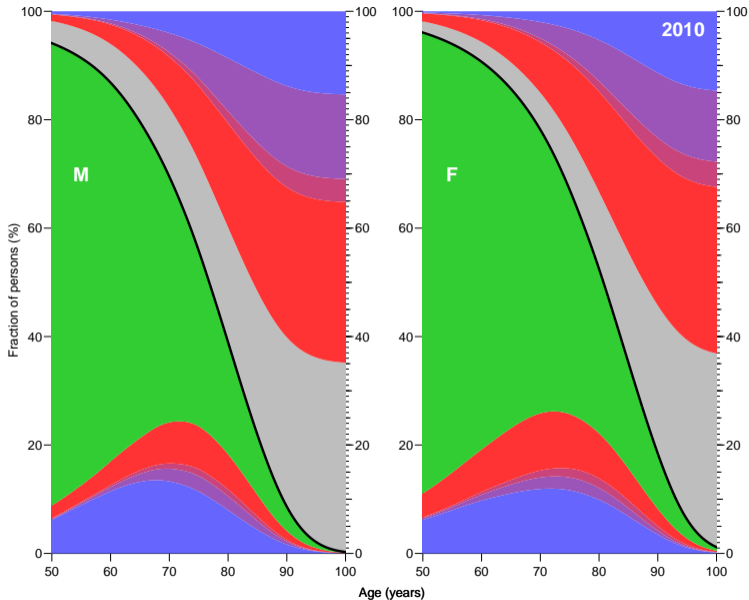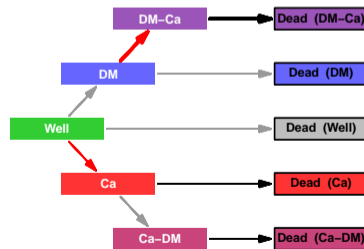
# Lifetime risks



Date of rate evaluation

Cancer rates among DM-ptt inflated 20%

Cancer rates among DM-ptt inflated          50%

# Demographic changes in DM & Cancer 1995–2012

- Changing **rates** in period 1995–2012:

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- Changing **life-time risk** 1995–2012:

| | | +20% Ca \| DM | +50% Ca \| DM |
|---|---|---|---|
| Diabetes | **19%** to **38%** | 19% to 38% | 19% to 38% |
| Cancer | **32%** to **46%** | 33% to 48% | 34% to 50% |
| DM + Ca | **6%** to **18%** | 6% to 20% | 7% to 22% |

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# Thanks for your attention