

Changes in Diabetes prevalence: Decreasing mortality or Increasing incidence?

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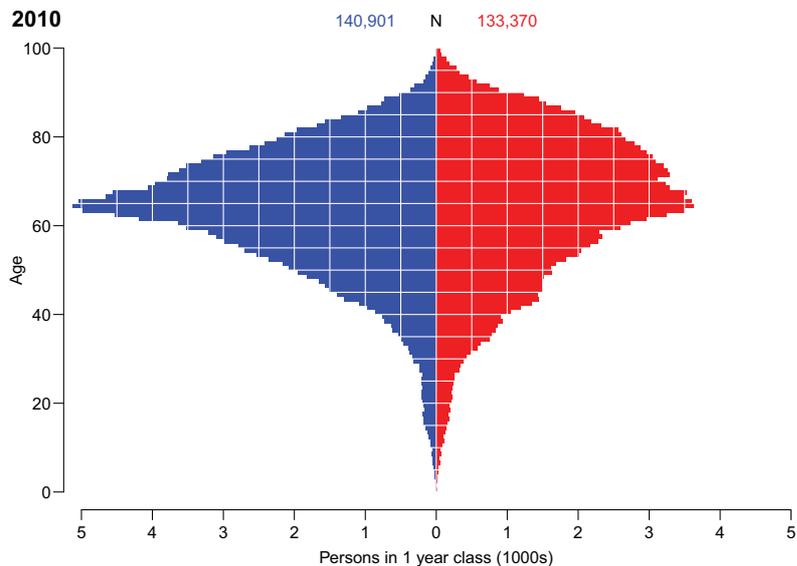
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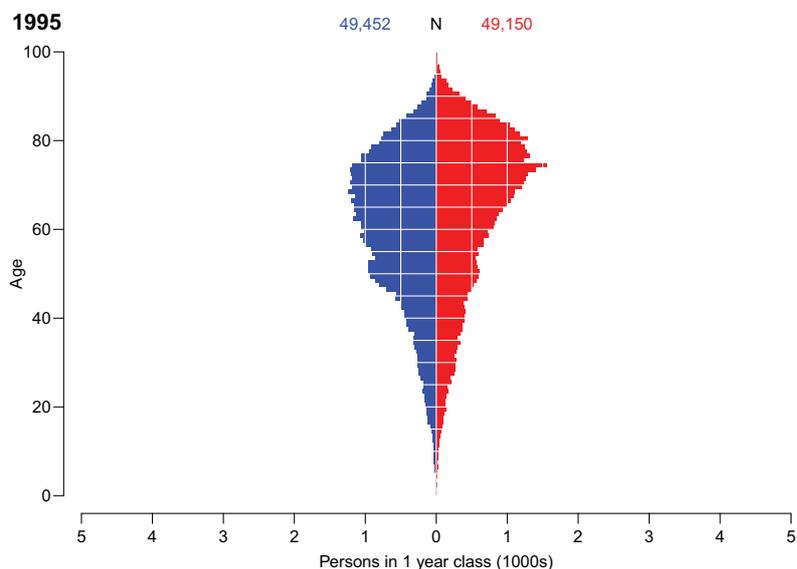
<http://BendixCarstensen.com/DMreg/Prevalence>

DM patients in Denmark, 2010



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Prevalence of DM in Denmark.



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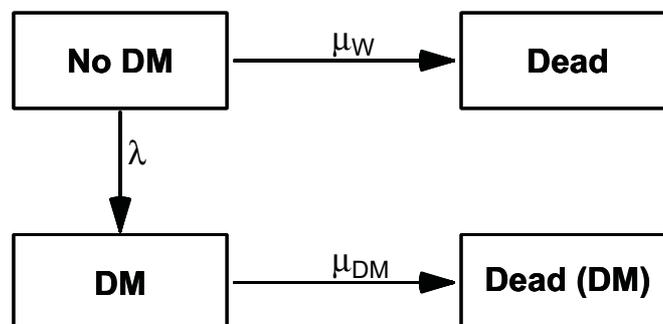
Where do the changes come from?

The period 1995–2010 for **men** resp. **women**:

- ▶ Increasing diabetes incidence:
3.8%, 3.9% per year
- ▶ Decreasing mortality:
non-DM: 2.5%, 1.8% per year
DM-ptt: 3.8%, 3.4% per year
- ▶ Aim:
How much can each factor explain?
- ▶ Look at age-specific **prevalences**,
not the **numbers** of DM-patients.

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DM prevalence prediction

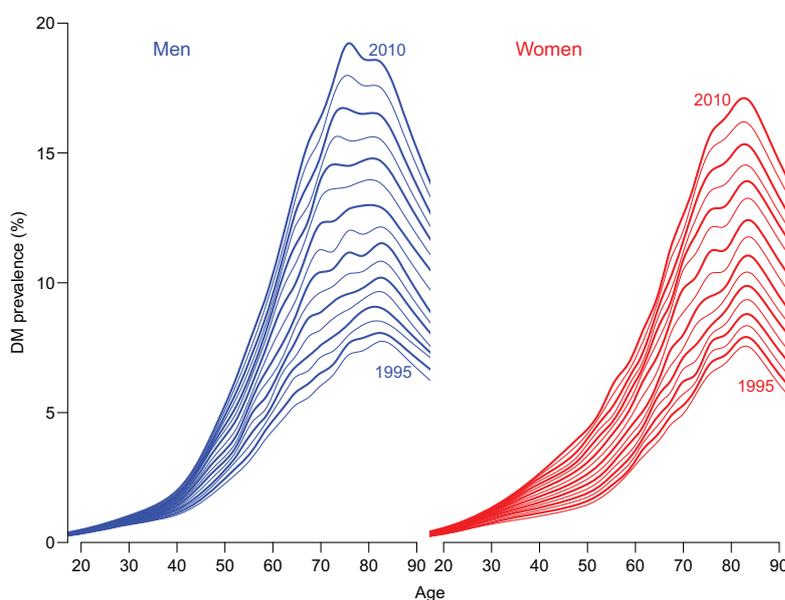


If we know

- ▶ prevalence of DM in 1995
 - ▶ the rates in the period 1995-2010
- then we can predict prevalence in 2010

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Age-specific prevalences 1995–2010:



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Updating age-specific prevalences:

- ▶ Use prevalences at 1.1.1995 as starting point
- ▶ Use incidence and mortality rates for 1995 to predict age-specific prevalences at 1.1.1996
- ▶ Use these prevalences and incidence and mortality rates for 1996 to predict age-specific prevalences at 1.1.1997
- ▶ ... etc.

Each step has as input (year y):

- ▶ Prevalences at 1 Jan
- ▶ Mortality rates for the year
- ▶ Incidence rates for the year

Outputs age-specific prevalences 1 Jan year $y + 1$

Actual updating interval used: 1/10 year

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Incidence and mortality rates

The mortality and incidence rates depend on:

Sex

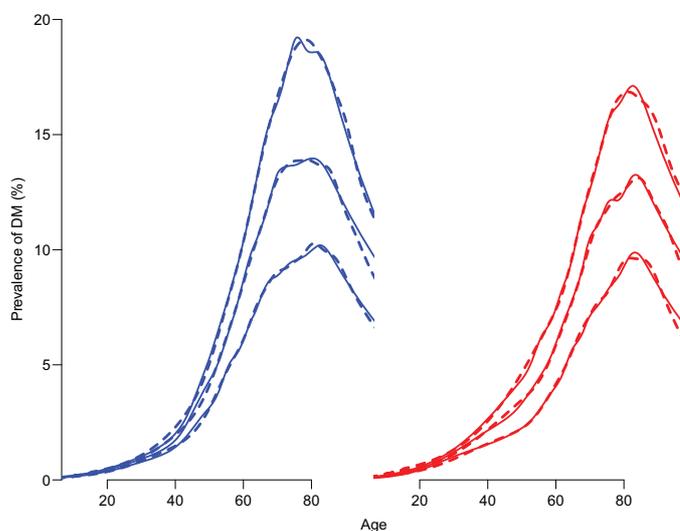
Age

Date of observation (Period)

Date–Age = Date of birth (Cohort)

Estimated as Age-Period-Cohort models, separately for men and women.

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Full: Obs. prevalence 2000, 2005, 2010

Broken: APC-model

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DM prevalence components

- ▶ Four scenarios:
 - ▶ Rates develop as observed
 - ▶ Mortality rates fixed at 1995 level
 - ▶ Incidence rates fixed at 1995 level
 - ▶ Both mortality and incidence rates fixed at 1995 level
- ▶ Differences between these can be transformed to 4 **components** of prevalence:

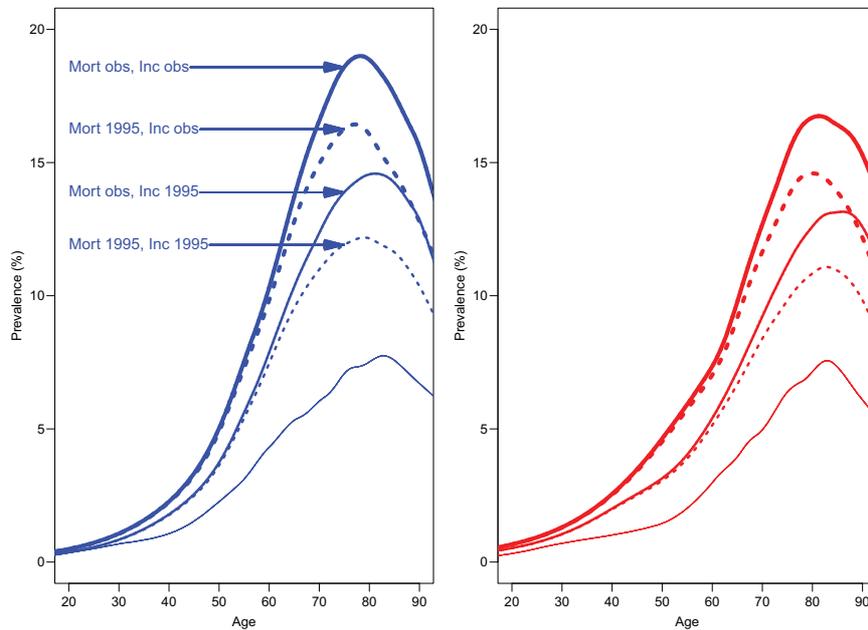
Mort: DM-ptt. alive because of declining mortality

Inc: DM-ptt. because of increasing incidence

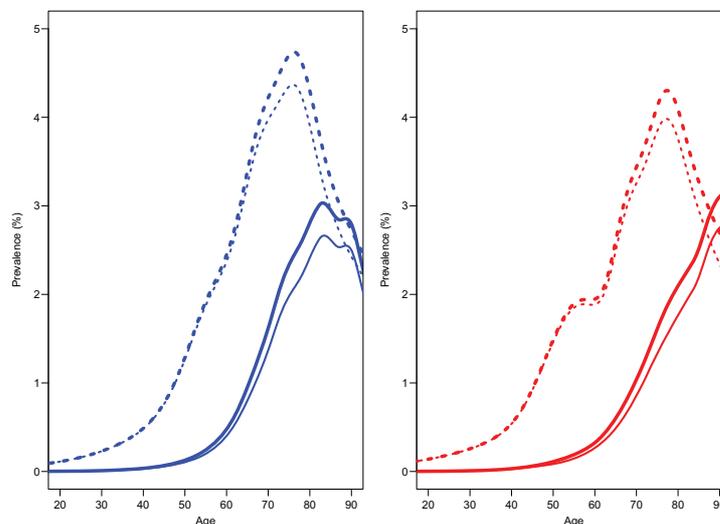
Const: DM-ppt. attributable to non-equilibrium in 1995

Org: DM-ptt. corresponding to 1995 age-specific prevalences

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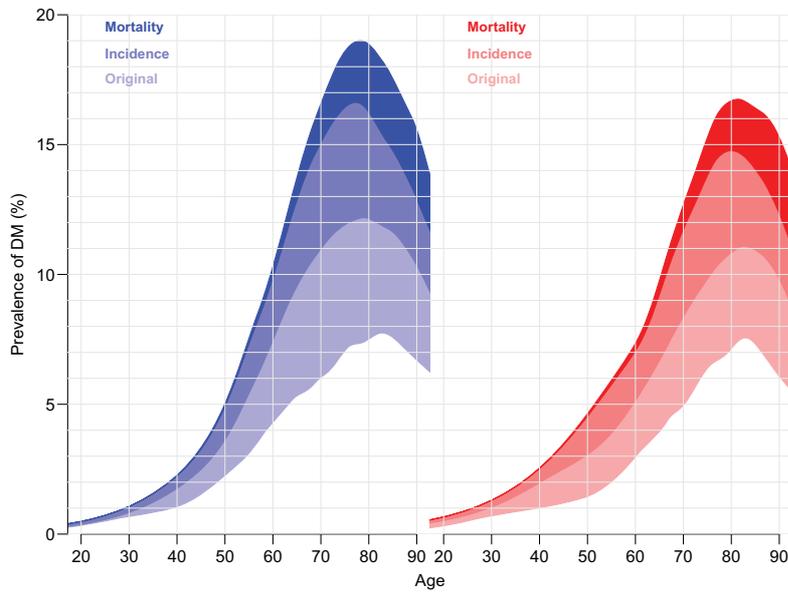
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Attributable parts of prevalence:
Full: Mortality; Broken: Incidence.

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Age-specific prevalences, 2010:



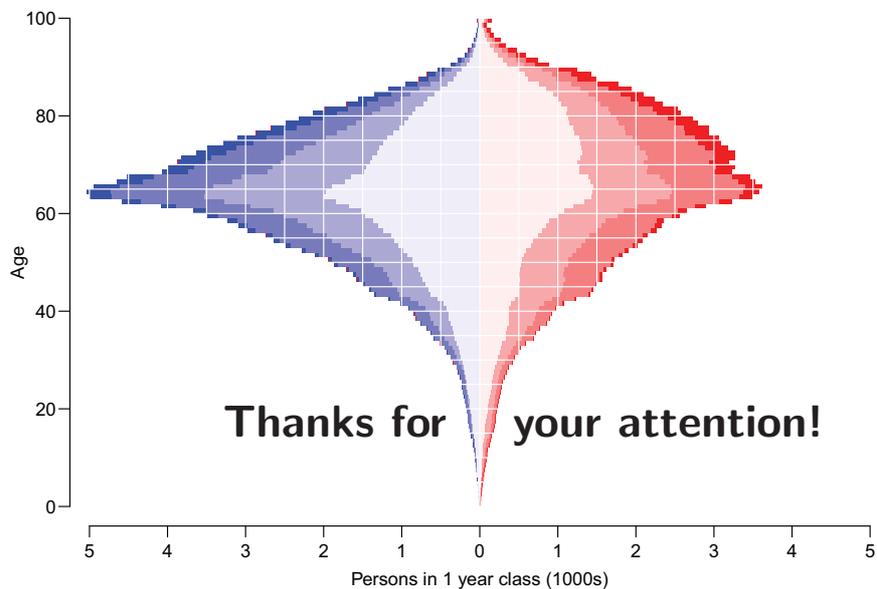
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How many patients?

Recover the **number** of patients in each group by multiplying by the corresponding population size. This is now done for each year 1996–2010

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2010	Mort	Inc	Const	Org	All	N	All	Org	Const	Inc	Mort
	9,850	33,365	39,304	58,487	141,007		134,079	53,655	37,189	33,825	9,410
	7.0	23.7	27.9	41.5		%	40.0	27.7	25.2	7.0	



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