Incidence, mortality and drug initiation in Danish T2 diabetes patients

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Contents

Chapter 1

Overview and data structure

1.1 Aims

The aim of this study is to assess the occurrence of T2 diabetes (T2D), as well as the mortality of T2D patients, with a particular view to the occurrence and effect of medication of patients as observed at population level.

Specifically we shall use register data to assess

- incidence of T2D in Denmark:
  - non-pharmacologically treated
  - pharmacologically treated
- incidence of pharmacological treatment
- mortality of diabetes patients
- (for comparison) mortality of non-diabetic persons

Once these quantities have been described as functions of sex, (attained) age, calendar time, date of birth and — where relevant — duration of diabetes and treatment, we shall compute derived measures:

- prevalence of T2 diabetes
- life-time lost to diabetes
- expected life-time spent with diabetes without pharmacological treatment
- expected life-time spent with diabetes with pharmacological treatment

These quantities will be quantified as functions of age and calendar time of diagnosis of diabetes. Also, the time-trends in these quantities will be described.

1.2 Concepts

In order to formalize and illustrate the quantities we are concerned with, we show the transitions between the states of disease and death as defined above:

```
> library(Epi)
> TM <- matrix(NA,4,4)
> rownames(TM) <- colnames(TM) <- c("Well","DM-none","DM-drug","Dead")
> TM[   "Well","DM-none"] <-
+ TM[   "Well","DM-drug"] <-
+ TM[   "Well","Dead"   ] <-
+ TM["DM-none","DM-drug"] <-
+ TM["DM-none","Dead"   ] <-
+ TM["DM-drug","Dead"   ] <- 1
> wh <- list( x=c(10,85,85,60), y=c(50,90,10,50) )
> boxes( TM, boxpos=wh, hmult=3, wmult=1.5, col.bg=gray(c(1,1,1,0.8)) )
```

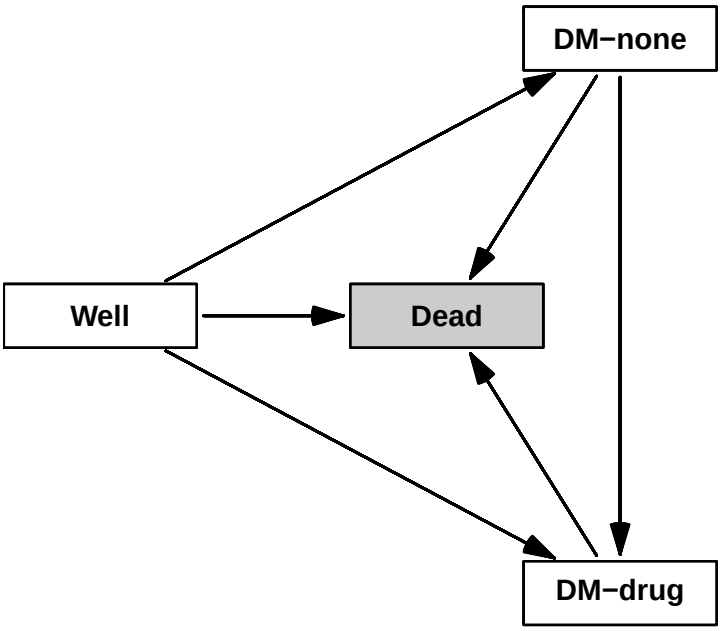

Figure 1.1: *Incidence and mortality transitions in the description of rates in diabetes occurrence. "DM-none" refers to patients diagnosed with diabetes but not on any antidiabetic drug, and "DM-drug" to patients that have filled at least one prescription for an antidiabetic drug.*

It is not necessarily of interest to model the incidence rates of "DM-none" and "DM-drug" separately, the *sum* of the rates (total incidence of T2 diabetes) and the rate-ratio (essentially the odds of starting on pharmacological treatment given diagnosis) are more likely of interest. Incidentally, modeling of the two rates by age-period-cohort models [1] immediately yields age-period-cohort models for the sum and the ratio too. We shall return to this in more detail in the modeling chapter.

Mortality rates can in the same vein be modeled separately or jointly for the two diabetes states, and again the sum or the ratio of the rates can be derived from the separate models. Likewise with the ratio relative to the mortality rates of the non-diabetic part of the population ("Well").

1.2.1 Complications

We will analyse the occurrence of complications and the influence of these on the mortality. We shall consider the following complications (mostly defined by codes from the NPR):

- Macrovascular
  - Ischeamic heart disease
  - Stroke
  - Heart failure
  - Amputation
- Microvascular
  - End stage renal disease
  - Retinopathy (photocoagulation?)
  - Neuropathy (first filling of a prescription of . . .)
  - Erectile dysfunction (first filling of a prescription of viagra or . . .)
- Hypoglycaemia
- Diabetic ketoacidosis

We will show rates of complications and the influence of these on the mortality rates as illustrated in figure 1.2.

For each type of complication (and possibly the union of macro- resp. micro-vascular complications), we will show the age-specific complication rates and the time-trends in these as well as the trends in HR of death between patients with and without complications.

Analyses will be done separately for each type of complication.

It might be argued that the scenario is over-simplified because it disregards the possibility of complications *prior* to diabetes diagnosis, which would imply an extra two arrows:

The problem with the set-up in figure 1.3 is that the rates of complication for persons *without* diabetes is not known, so we do no have any information on the arrows to or from the "Comp" state. But it illustrates that we in the analysis of complications will have some persons that start in the complications states, and that the analysis of complication rates will be based on those that at the start are free of complications.

Since we start follow-up in 1995 (1996?) where also the prescription register is initiated, it may not be feasible

1.2.2 What to show

The following is a list of possible graphs that could be included in a paper on the Danish data. Some of the graphs may be of lesser importance in a publication.

- Prevalence:
  - Age-specific prevalences of any diabetes diabetes by sex; one curve for each year

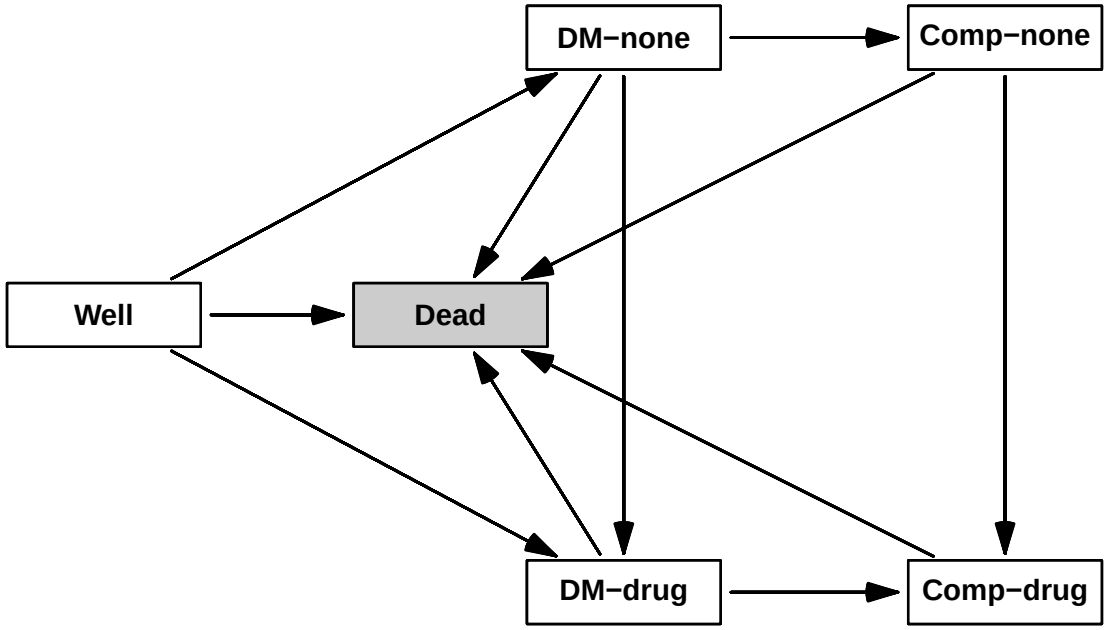

Figure 1.2: *Incidence, mortality and complications transitions in the description of rates in diabetes occurrence. "DM-none" refers to patients diagnosed with diabetes but not on any antidiabetic drug, and "DM-drug" to patients that have filled at least one prescription for an antidiabetic drug. "Comp-none" refers to patients with complications not on any drug, and "Comp-dug" to patients with complication on drugs.*

  - Age-specific prevalences of drug-treated diabetes by sex; one curve for each year
  - The ratio of these — that is the fraction of all diabetes patients on drugs
  - (optional) Average annual change in prevalence for each age

- Incidence:

  - Age-specific incidence rates and the RR by calendar year; separately by sex. The average trend over time will be estimated as a separate quantity separately for men and women.

- Complications:
  The following will be shown for each of the (10?) complications separately (figure 1.2, the two horizontal transitions):

  - Incidence rates of complication by time since DM for a reference age at diagnosis (60, say), and reference date (2006, say). RR by age at diagnosis and date of diagnosis.
  - This can be done separately for persons with and without drug treatment
  - Possibly we may include a variable indicating a preexisting complication of a specific type (or group).

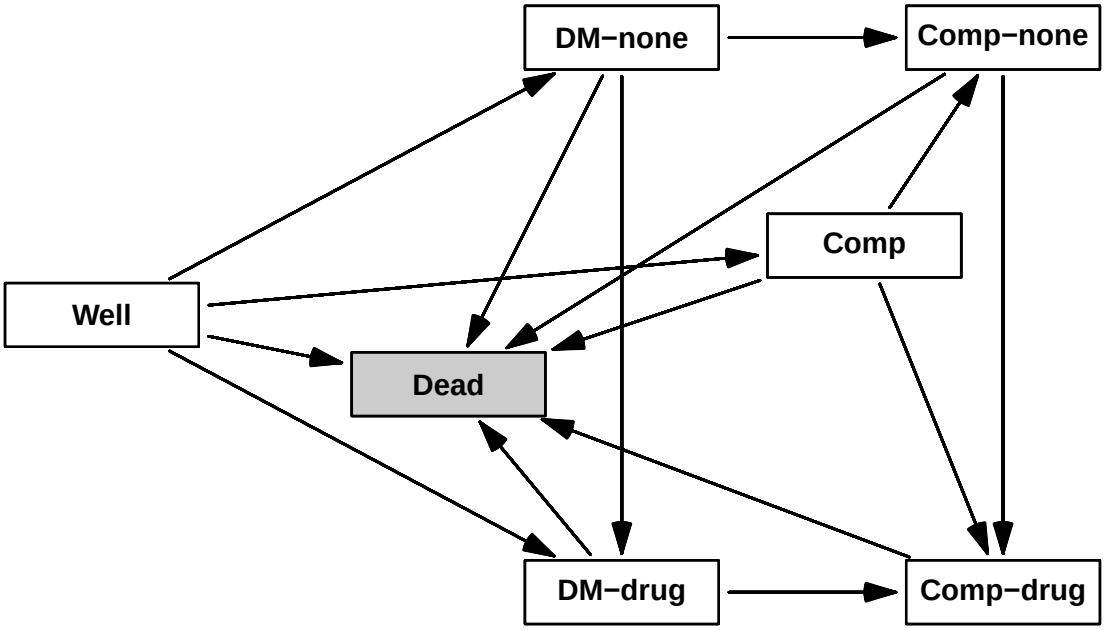

Figure 1.3: *Incidence, mortality and complications transitions in the description of rates in diabetes occurrence. "DM-none" refers to patients diagnosed with diabetes but not on any antidiabetic drug, and "DM-drug" to patients that have filled at least one prescription for an antidiabetic drug. "Comp-none" refers to patients with complications not on any drug, and "Comp-drug" to patients with complication on drugs, and "Comp" to persons with the complication in question but* without *diabetes.*

- Mortality:
  - Age-specific mortality rates for diabetes patients, subdivided by age at diagnosis for a given reference year (2006, say). This display will have one curve for persons diagnosed at age 50, (starting at 50), one for persons diagnosed at age 60, (starting at 60), etc. RR relative to 2006.
  - The same display for SMR — *i.e.* mortality among DM patients relative to the general population.
- Years lost to diabetes:
  - Based on the mortality rates among DM patients and among persons without DM we show the years of life lost for different ages and dates, based on cross-sectional mortality rates. The models for these mortality rates will ignore duration, because the calculations of years lost requires knowledge of mortality to the very end of the age-range (essentially 100 years)
  - The years of life lost will be computed both compared to a hypothetical population immune to DM and to a reference population susceptible to DM.
  - Years spent with complications should be possible to compute; it will be a fraction of the residual lifetime for diabetes patients. Thus it will be relevant to

show both the expected residual life time for a person with diabetes at a given age (assuming no complications) as well as how much of this will be spent with the complication in question.

1.3 Data structure and construction

The structure of the analysis data sets is basically one table of person years and types of events for each of the three transient states (the white boxes in figure 1.1). The tables have different classifying sets; the "Well" dataset is classified by sex, age and calendar time; the "DM-none" by sex, age, calendar time and duration of DM and the "DM-drug" dataset by sex, age, calendar time, duration of DM and duration of drug treatment.

Data is constructed by tabulating events of DM and death, and the person-years spent in each state. The person-years in the "Well" state is obtained by taking the person-years in the entire Danish population and subtracting the person-years among those in the two DM states.

In the tabulations, age and calendar time is grouped in 1-year intervals, and time since diagnosis of DM, respectively drug initiation in 6-month intervals, the latter giving up to 40 different classes; table 1.1 gives an overview of the classifiers and outcome variables in the data sets. The data sets also including information on complications are outlined in table 1.2.

Table 1.1: *Classifiers and outcome counters in the analysis data sets*

		Dataset (transient state)			
		Well	DM-none	DM-drug	Levels
Events:	DM-none	•			
	DM-drug	•	•		
	Dead	•	•	•	
Classifiers:	sex	•	•	•	2
	age	•	•	•	100
	cal.time	•	•	•	20
	DM dur.		•	•	40
	drug dur.			•	40
No. cells(1000s)		4	160	≈ 3000	

For the analysis of rates out of "Well" we will have $2 \times 100 \times 20 = 4,000$ entries, for the analysis of rates out of "DM-none" we will have $2 \times 100 \times 20 \times 40 = 160,000$ entries and for the analysis of rates out of "DM-drug" we will have (at most)
$2 \times 100 \times 20 \times 40 \times 40 = 6,400,000$. The latter is a gross exaggeration, since we will not have all $40 \times 40 = 1600$ possible combinations of DM duration and drug duration in the dataset, notably the latter is never larger than the former, so we will certainly have less than 3,200,000 records in that dataset.

Analysis of the rates is straight-forward using the number of events as response in Poisson-models with the log-person-years as offset and the effects of the time-scales as smooth parametric curves (natural splines).

Table 1.2: *Classifiers and outcome counters in the analysis data sets including one type of complication*

		Dataset (transient state)					
		Well	DM-none	DM-drug	Comp-none	Comp-drug	Levels
Events:	DM-none	•					
	DM-drug	•	•				
	Comp-none		•				
	Comp-drug			•	•		
	Dead	•	•	•	•	•	
Classifiers:	sex	•	•	•	•	•	2
	age	•	•	•	•	•	100
	cal.time	•	•	•	•	•	20
	DM dur.		•	•	•	•	40
	drug dur.			•	•	•	40
	comp dur.				•	•	40
No. cells(1000s)		4	160	≈ 3000	a lot	a lot	

1.4 SAS code enumerating follow-up

Here we devise the SAS-code to create for the three outlined datsets for analysis of incidence and mortality.

Note that we start by renaming the variables from the mother dataset to names more mnemonically pertinent to the task at hand, and then make the Lexis split of data, followed by the relevant tabulation.

```
NOTE: Copyright (c) 2002-2012 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software 9.4 (TS1M3)
      Licensed to FORSKNING 2, Site 50800723.
NOTE: This session is executing on the X64_ES08R2  platform.



NOTE: Updated analytical products:

      SAS/STAT 14.1

NOTE: Additional host information:

 X64_ES08R2 WIN 6.1.7601 Service Pack 1 Server

NOTE: SAS initialization used:
      real time           15.38 seconds
      cpu time            1.76 seconds

1    libname her "../data" ;
NOTE: Libref HER was successfully assigned as follows:
      Engine:        V9
      Physical Name: E:\workdata\705093\BXC\data
2    options nosource2 ;
3    %inc "../../sas/Lexis.sas" ;
160
```

```
161  data her.base ;
162    set her.personbase_bxc ( rename = ( DOBirth = doBth
163                                        DoDeath = doDth
164                                  DoEndStudykorr = doEnd
165                                           DoRMPS = doMed
166                                   first_DM_korr = doDM ) ) ;
167    doIni = "01JAN1995"d ; * Convenience constant ;
168    format doEnd doMed doDM ddmmyy10. ;
169  run ;

NOTE: There were 420488 observations read from the data set HER.PERSONBASE_BXC.
NOTE: The data set HER.BASE has 420488 observations and 8 variables.
NOTE: DATA statement used (Total process time):
      real time           1.04 seconds
      cpu time            0.35 seconds


170
171  ********************************************************************
172  * Note that the Lexis macro uses the variables entry, exit and fail
173  * if they are not specified in the call of the macro. enttry and exit
174  * are date variables and fail the event indicator, 0 being the
175  * censoring code by default ;
176
177  ********************************************************************
178  * Set up data for enumerating PY and events of different types from
179  * the DMnone state - fishy data displayed and fixed ;
180  data DMnone ;
181    set her.base ;
182    if ( doDM > .z and ( doDM < doMed or doMed le .z ) ) ;
183    entry = max( doIni, doDM  ) ;
184     exit = min( doEnd, doMed, doDth ) ;
185   * fail is 2 if the exit is to medication, and 1 if it is to death ;
186     fail = ( doMed > .z and doMed = exit ) * 2 +
187            ( doDth > .z and doDth = exit ) ;
188    if fail gt 2 then do ;
189       put "What:" fail= dodm= doMed= doEnd= doDth= ;
190       fail = 1 ;
191       end ;
192  run ;

What:fail=3 doDM=11/04/2003 doMed=24/04/2003 doEnd=24/04/2003 doDth=24/04/2003
What:fail=3 doDM=17/05/2010 doMed=05/07/2010 doEnd=05/07/2010 doDth=05/07/2010
What:fail=3 doDM=11/02/2013 doMed=21/02/2013 doEnd=21/02/2013 doDth=21/02/2013
What:fail=3 doDM=26/04/1978 doMed=14/02/1995 doEnd=14/02/1995 doDth=14/02/1995
What:fail=3 doDM=06/02/2002 doMed=25/03/2010 doEnd=25/03/2010 doDth=25/03/2010
What:fail=3 doDM=13/02/2008 doMed=06/03/2008 doEnd=06/03/2008 doDth=06/03/2008
What:fail=3 doDM=12/04/2006 doMed=20/04/2006 doEnd=20/04/2006 doDth=20/04/2006
What:fail=3 doDM=27/09/2005 doMed=24/10/2005 doEnd=24/10/2005 doDth=24/10/2005
NOTE: There were 420488 observations read from the data set HER.BASE.
NOTE: The data set WORK.DMNONE has 216298 observations and 11 variables.
NOTE: DATA statement used (Total process time):
      real time           0.79 seconds
      cpu time            0.29 seconds


193
194  %Lexis( data = DMnone,
195          out = byP,
196       breaks = 0 to 125 by 1,
197       origin = '01JAN1900'd,
198        scale = 365.25,
```

```
199          left = P ) ;

NOTE: There were 216298 observations read from the data set WORK.DMNONE.
NOTE: The data set WORK.DISCRD has 0 observations and 14 variables.
NOTE: The data set WORK.BYP has 811158 observations and 14 variables.
NOTE: DATA statement used (Total process time):
      real time           2.62 seconds
      cpu time            2.62 seconds


200
201  data byP ; set byP ; P = P+1900 ; run ;

NOTE: There were 811158 observations read from the data set WORK.BYP.
NOTE: The data set WORK.BYP has 811158 observations and 14 variables.
NOTE: DATA statement used (Total process time):
      real time           0.60 seconds
      cpu time            0.60 seconds


202
203  %Lexis( data = byP,
204           out = byAP,
205        breaks = 0 to 125 by 1,
206        origin = doBth,
207         scale = 365.25,
208          left = A ) ;

NOTE: There were 811158 observations read from the data set WORK.BYP.
NOTE: The data set WORK.DISCRD has 0 observations and 15 variables.
NOTE: The data set WORK.BYAP has 1354864 observations and 15 variables.
NOTE: DATA statement used (Total process time):
      real time           9.11 seconds
      cpu time            9.11 seconds


209
210  %Lexis( data = byAP,
211           out = byAPD,
212        breaks = 0 to 125 by 0.5,
213        origin = doDM,
214         scale = 365.25,
215          left = dur,
216          risk = Y ) ;

NOTE: There were 1354864 observations read from the data set WORK.BYAP.
NOTE: The data set WORK.DISCRD has 0 observations and 17 variables.
NOTE: The data set WORK.BYAPD has 2387227 observations and 17 variables.
NOTE: DATA statement used (Total process time):
      real time           27.12 seconds
      cpu time            27.12 seconds


217
218  data byAPD ;
219    set byAPD ;
220    DMd = ( fail = 2 ) ;
221    Dth = ( fail = 1 ) ;
222  run ;

NOTE: There were 2387227 observations read from the data set WORK.BYAPD.
NOTE: The data set WORK.BYAPD has 2387227 observations and 19 variables.
```

```
NOTE: DATA statement used (Total process time):
      real time           2.30 seconds
      cpu time            2.30 seconds


223
224  proc summary  data=byAPD  nway ;
225    class sex A P dur ;
226    var Y DMd Dth ;
227    output out = DMnone ( keep = sex A P dur Y DMd Dth )
228           sum = ;
229  run ;

NOTE: There were 2387227 observations read from the data set WORK.BYAPD.
NOTE: The data set WORK.DMNONE has 107501 observations and 7 variables.
NOTE: PROCEDURE SUMMARY used (Total process time):
      real time           3.04 seconds
      cpu time            6.72 seconds


230
231  data her.DMnone ;
232    set DMnone ;
233    label A="Age" P="Date" dur="DM duration" ;
234  run ;

NOTE: There were 107501 observations read from the data set WORK.DMNONE.
NOTE: The data set HER.DMNONE has 107501 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.21 seconds
      cpu time            0.07 seconds


235
236  ************************************************************************
237  * Set up data for enumerating PY and events of different types from
238  * the DMdrug state ;
239  data DMdrug ;
240    set her.base ;
241    if ( doMed > .z ) ;
242    entry = doMed ;
243     exit = min( doEnd, doDth ) ;
244     fail = ( doDth > .z and doDth = exit ) ;
245  run ;

NOTE: There were 420488 observations read from the data set HER.BASE.
NOTE: The data set WORK.DMDRUG has 363570 observations and 11 variables.
NOTE: DATA statement used (Total process time):
      real time           0.81 seconds
      cpu time            0.29 seconds


246
247  %Lexis( data = DMdrug,
248            out = byP,
249         breaks = 0 to 125 by 1,
250         origin = "01JAN1900"d,
251          scale = 365.25,
252           left = P ) ;

NOTE: There were 363570 observations read from the data set WORK.DMDRUG.
NOTE: The data set WORK.DISCRD has 0 observations and 14 variables.
```

```
NOTE: The data set WORK.BYP has 2769658 observations and 14 variables.
NOTE: DATA statement used (Total process time):
      real time           4.86 seconds
      cpu time            4.86 seconds


253
254  data byP ; set byP ; P = P+1900 ; run ;

NOTE: There were 2769658 observations read from the data set WORK.BYP.
NOTE: The data set WORK.BYP has 2769658 observations and 14 variables.
NOTE: DATA statement used (Total process time):
      real time           2.18 seconds
      cpu time            2.18 seconds


255
256  %Lexis( data = byP,
257           out = byAP,
258        breaks = 0 to 125 by 1,
259        origin = doBth,
260         scale = 365.25,
261          left = A ) ;

NOTE: There were 2769658 observations read from the data set WORK.BYP.
NOTE: The data set WORK.DISCRD has 0 observations and 15 variables.
NOTE: The data set WORK.BYAP has 5305662 observations and 15 variables.
NOTE: DATA statement used (Total process time):
      real time           23.32 seconds
      cpu time            23.30 seconds


262
263  %Lexis( data = byAP,
264           out = byAPD,
265        breaks = 0 to 125 by 0.5,
266        origin = doDM,
267         scale = 365.25,
268          left = dur ) ;

NOTE: There were 5305662 observations read from the data set WORK.BYAP.
NOTE: The data set WORK.DISCRD has 0 observations and 16 variables.
NOTE: The data set WORK.BYAPD has 10268718 observations and 16 variables.
NOTE: DATA statement used (Total process time):
      real time           1:16.88
      cpu time            1:16.70


269
270  %Lexis( data = byAPD,
271           out = byAPDd,
272        breaks = 0 to 125 by 0.5,
273        origin = doMed,
274         scale = 365.25,
275          left = ddur,
276          risk = Y ) ;

NOTE: There were 10268718 observations read from the data set WORK.BYAPD.
NOTE: The data set WORK.DISCRD has 0 observations and 18 variables.
NOTE: The data set WORK.BYAPDD has 12778047 observations and 18 variables.
NOTE: DATA statement used (Total process time):
      real time           2:40.72
```

```
      cpu time            2:40.07


277
278  proc summary  data = byAPDd ( rename = ( fail=Dth ) )  nway ;
279    class sex A P dur ddur ;
280    var Y Dth ;
281    output out = DMdrug ( keep = sex A P dur ddur Y Dth )
282           sum = ;
283  run ;

NOTE: There were 12778047 observations read from the data set WORK.BYAPDD.
NOTE: The data set WORK.DMDRUG has 1023047 observations and 7 variables.
NOTE: PROCEDURE SUMMARY used (Total process time):
      real time           13.18 seconds
      cpu time            31.85 seconds


284
285  data her.DMdrug ;
286    set DMdrug ;
287    label A="Age" P="Date" dur="DM duration" ddur="Drug duration" ;
288  run ;

NOTE: There were 1023047 observations read from the data set WORK.DMDRUG.
NOTE: The data set HER.DMDRUG has 1023047 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           1.32 seconds
      cpu time            0.59 seconds


289
290  ************************************************************************
291  * Enumerate the total deaths and risk time in DMnone and DMdrug for
292  * subtraction from the total Danish population data ;
293  data FU ;
294    set her.DMnone ( keep = sex A P Y Dth )
295        her.DMdrug ( keep = sex A P Y Dth ) ;
296  run ;

NOTE: There were 107501 observations read from the data set HER.DMNONE.
NOTE: There were 1023047 observations read from the data set HER.DMDRUG.
NOTE: The data set WORK.FU has 1130548 observations and 5 variables.
NOTE: DATA statement used (Total process time):
      real time           2.27 seconds
      cpu time            0.31 seconds


297
298  proc summary  data = FU  nway ;
299    class sex A P ;
300    var Y Dth ;
301    output out = YDth ( keep = sex A P Y Dth )
302           sum = ;
303  run ;

NOTE: There were 1130548 observations read from the data set WORK.FU.
NOTE: The data set WORK.YDTH has 3152 observations and 5 variables.
NOTE: PROCEDURE SUMMARY used (Total process time):
      real time           0.90 seconds
      cpu time            1.81 seconds
```

```
304
305  ************************************************************************
306  * Set up data for enumerating events of different types from
307  * the Well state ;
308  data well ;
309    set her.base ;
310    DM  = ( doDM  > doIni & doDM < doMed ) ;
311    DMd = ( doMed > doIni & doDM = doMed ) ;
312      A = floor( ( doDM - doBth ) / 365.25 ) ;
313      P = floor( ( doDM         ) / 365.25 ) + 1960 ;
314  run ;

NOTE: There were 420488 observations read from the data set HER.BASE.
NOTE: The data set WORK.WELL has 420488 observations and 12 variables.
NOTE: DATA statement used (Total process time):
      real time           1.10 seconds
      cpu time            0.40 seconds


315
316  proc summary  data = well  nway ;
317    class sex A P ;
318    var DM DMd ;
319    output out = DMnd ( keep = sex A P DM DMd )
320           sum = ;
321  run ;

NOTE: There were 420488 observations read from the data set WORK.WELL.
NOTE: The data set WORK.DMND has 5153 observations and 5 variables.
NOTE: PROCEDURE SUMMARY used (Total process time):
      real time           0.38 seconds
      cpu time            0.84 seconds


322
323  ************************************************************************
324  * Merge the follow-up events in Well and the person-years and deaths and
325  * PY in the two DM states for subsequent subtraction from total
326  * population Y and D ;
327  data her.Well ;
328    merge YDth /* variables  Y and Dth */
329          DMnd /* variables DM and DMd */ ;
330    by sex A P ;
331  run ;

NOTE: There were 3152 observations read from the data set WORK.YDTH.
NOTE: There were 5153 observations read from the data set WORK.DMND.
NOTE: The data set HER.WELL has 5365 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.21 seconds
      cpu time            0.03 seconds


332
333  ************************************************************************
334  * Convert the relevant datasets to Xport datasets ;
335  libname xDMn xport "..\data\DMnone.xpt" ;
NOTE: Libref XDMN was successfully assigned as follows:
      Engine:        XPORT
      Physical Name: E:\workdata\705093\BXC\data\DMnone.xpt
336  libname xDMd xport "..\data\DMdrug.xpt" ;
```

```
NOTE: Libref XDMD was successfully assigned as follows:
      Engine:        XPORT
      Physical Name: E:\workdata\705093\BXC\data\DMdrug.xpt
337  libname xWll xport "..\data\Well.xpt"   ;
NOTE: Libref XWLL was successfully assigned as follows:
      Engine:        XPORT
      Physical Name: E:\workdata\705093\BXC\data\Well.xpt
338  proc copy in=her out=xDMn memtype=data ; select DMnone ; run ;

NOTE: Copying HER.DMNONE to XDMN.DMNONE (memtype=DATA).
NOTE: There were 107501 observations read from the data set HER.DMNONE.
NOTE: The data set XDMN.DMNONE has 107501 observations and 7 variables.
NOTE: PROCEDURE COPY used (Total process time):
      real time           0.43 seconds
      cpu time            0.15 seconds


339  proc copy in=her out=xDMd memtype=data ; select DMdrug ; run ;

NOTE: Copying HER.DMDRUG to XDMD.DMDRUG (memtype=DATA).
NOTE: There were 1023047 observations read from the data set HER.DMDRUG.
NOTE: The data set XDMD.DMDRUG has 1023047 observations and 7 variables.
NOTE: PROCEDURE COPY used (Total process time):
      real time           2.44 seconds
      cpu time            1.23 seconds


340  proc copy in=her out=xWll memtype=data ; select Well   ; run ;

NOTE: Copying HER.WELL to XWLL.WELL (memtype=DATA).
NOTE: There were 5365 observations read from the data set HER.WELL.
NOTE: The data set XWLL.WELL has 5365 observations and 7 variables.
NOTE: PROCEDURE COPY used (Total process time):
      real time           0.04 seconds
      cpu time            0.01 seconds
```

References

[1] B Carstensen. Age-Period-Cohort models for the Lexis diagram. *Statistics in Medicine*, 26(15):3018–3045, July 2007.