

A Danish Diabetes Register

SDCC
June 2020

Draft version 3

Compiled Friday 3rd July, 2020, 13:03
from: V:\SDC\469DRIVE\DMreg\tex/reg2018.tex

Bendix Carstensen Senior statistician, Clinical Epidemiology
Steno Diabetes Center Copenhagen, Gentofte, Denmark
& Department of Biostatistics, University of Copenhagen
bcar0029@regionh.dk b@bxc.dk
<http://BendixCarstensen.com>

Marit Eika Jørgensen Head, Clinical Epidemiology
Steno Diabetes Center Copenhagen, Gentofte, Denmark
marit.eika.joergensen@regionh.dk

Contents

1	Background and definitions	1
1.1	National Diabetes Register, NDR	1
1.2	RUKS	2
1.3	A new register	3
1.3.1	Type of diabetes	3
1.3.2	Gestational Diabetes (GDM)	4
1.3.3	Polycystic Ovarian Syndrome (PCOS)	4
1.3.4	Summary	4
1.3.5	Differences to RUKS	4
2	Data acquisition	6
2.1	Diabetes patients	6
2.2	Population data	6
2.2.1	Place of residence	6
2.2.2	Education	6
2.2.3	Income	7
2.3	Follow-up	7
2.3.1	Analysis dataset for incidence, mortality and SMR	7
2.4	Prevalence	7
3	R-versions of the register and adjacent files	8
3.1	Reading the R-version of the DMreg	8
3.1.1	Things to note:	9
3.2	Tabular overview of the DMreg	9
3.2.1	Readable tables that can be sent	10
3.2.2	Sources of diabetes type	11
3.3	Reading and grooming the DMreg	12
3.4	Reading the R-version of the DMreg	13
3.4.1	Things to note:	14
3.5	Tabular overview of the DMreg	14
3.5.1	Readable tables that can be sent	15
3.5.2	Sources of diabetes type	16
3.6	The LABKA database	17
3.6.1	SAS splitting of the LABKA data.	17
3.6.2	Converting to .Rda	17
3.7	The complications files	20
3.7.1	SAS generation of complications data.	20

3.7.2	Converting to .Rda	21
	Complication names	21
	Grooming the data frames	22
4	SAS programs	24
4.1	Rationale and overview	24
4.2	Program execution	26
4.3	Program documentation	26
4.3.1	optslibs.sas	26
4.3.2	xgdm.sas	27
4.4	00-base	27
4.4.1	00-base.lst	31
4.5	01-npr	40
4.5.1	01-npr.lst	48
4.6	02-dvdd	63
4.6.1	02-dvdd.lst	67
4.7	03-nhsr	78
4.7.1	03-nhsr.lst	80
4.8	04-rmps	82
4.8.1	04-rmps.lst	87
4.9	05-diab	89
4.9.1	05-diab.lst	91
4.10	06-define	92
4.10.1	06-define.lst	96
4.11	06d-define	109
4.11.1	06d-define.lst	110
4.12	10-labcompl	111
4.12.1	10-labcompl.lst	112
4.13	10-compl	112
4.13.1	10-compl.lst	119
4.14	00-fmts.log	128

Chapter 1

Background and definitions

The maintenance of the National Diabetes Register (NDR) has been discontinued by the Health Data Authority (Sundhedsdatastyrelsen). It is being replaced by the Register of Selected Chronic Diseases (RUKS—Register for Udvalgte Kroniske Sygdomme) which however does not encompass precisely the same persons.

1.1 National Diabetes Register, NDR

The “old” NDR, established 2006, covering the period 1995–2012 (in terms of incidence) was based on the following criteria [?]:

lpr: recording of diabetes as diagnosis in the NPR

fodt: use of the service “foot-therapy for diabetes patients” in the National Health Services Register (NHSR).

b15i1: the date of the 5th blood glucose measurement within a period of one year in the NHSR.

b12i5: two measurements of blood glucose per year in 5 consecutive years. The date is defined as the 2nd blood glucose measurement within the 5th period of one year.

oad: date of 2nd purchase of OAD as recorded in the Register of Medicines Products Statistics (RMPS) – the prescription register.

ins: date of 2nd purchase of insulin as recorded in the RMPS.

The inclusion date was the earliest of the dates where any of these 6 criteria were met, except:

- PCOS — if metformin were the only dispensation of antidiabetic drugs between ages 20 and 35, these were not counted as it was assumed that they were dispensations for treatment of PCOS.
- GDM — if a woman has a record of GDM in the NPR, any criterion met in a 1-year period after the GDM date was disregarded.

It has been pointed out that the two blood-glucose (purely *procedural*) criteria included many persons that were unlikely to be diabetic patients, notably women only being *tested* for gestational diabetes (GDM) [?].

Because of this, the comparison between NDR, RUKS and the reconstructed register is based on a modified version of the NDR, where the two blood glucose criteria are disregarded.

1.2 RUKS

The alleged replacement of the NDR is the Register of Selected Chronic Diseases (Register over Udvalgte Kroniske Sygdomme, RUKS). Among the 8 diseases selected for the register are T1 diabetes and T2 diabetes.

The only available data from RUKS are the tabular counts of incident cases for the years 2000 – 2015 and prevalent cases for 1 January each of the years 2000–2015 (why not 2016 — end of 2015?)

- Type 2 DM:
 - Persons recorded with ICD10 code E11 in NPR, as the latest diagnosis.
Persons are not included on the basis of a single NPR contact with code E11, at least one more contact (E10 or E11?) or purchase of OAD or insulin is required.
 - Persons who have purchased OADs (A10B from the RMPS), and at least two purchases of either A10A (insulins) or A10B (other antidiabetic drugs).
Persons are not included on the basis of a single OAD purchase, at least one more purchase of OAD or insulin is required or contact to NDR is required.
 - Women who have a diagnosis of PCOS or have only purchased metformin (and no other OADs or insulin) and have purchased either clomifen (G03GB02) or estrogen (G03HB) are *excluded*.
 - Persons who have had no diabetes recordings in NPR or RMPS during the last 10 years are *excluded*.
 - The term “latest” for the NPR criterion and the exclusion referring to “last 10 years” seems to indicate that the register is defined relative to a particular creation date for the register, although this is not explicitly stated.
- Type 1 diabetes:
 - Persons recorded with ICD10 code E10 in NPR, as the latest diagnosis.
Persons are not included on the basis of NPR contacts with code E11, at least one purchase of insulins is required
 - Persons who have purchased insulins (A10A from the RMPS), and at least two purchases of A10 (either A10A (insulins) or A10B (OADs)).
 - Persons already classified as T2 above are *excluded*.
 - Women with a diagnosis of GDM (ICD10 024.4) and only have purchased anti diabetic medication in a window from 280 days before the first till 280 days after the last recording of GDM are excluded.

1.3 A new register

The following is an attempt to reconstruct / improve the NDR, using (almost) the same criteria as in the original NDR, with an additional effort to define persons as either T1 or T2.

The basic content of the register is one record per person with sex, type of diabetes and dates of birth, DM and death. Additionally, the register will have the dates for meeting each of the defining criteria (name of the date in the register):

doNPR Date of the first recorded contact date with a diagnosis of diabetes in the NPR.

doPod Earliest date of billing for podiatry in the NHSR.

doOAD Date of first recorded purchase of OAD (A10B).

doIns Date of first recorded purchase of insulin (A10A).

doDVD Earliest recorded date of diagnosis in the Danish adult diabetes register (DADD). If none recorded, the date of reporting is used.

doDiab First recorded date of eye-screening in the Danish eye-screening database for diabetes patients.

In order to have a possible comparison with the old NDR and RUKS, we have also defined variables **doOAD2** and **doIns2** with the dates of the *second* purchase of OAD resp. insulin, as the summary variable **doDM2** with date of inclusion based on using these two instead of dates of first purchases.

As for RUKS we do not include persons on one drug purchase or one record in NPR—two of one of these is required for inclusion; and epidemiologically we make the date of the second of these the criterion date.

1.3.1 Type of diabetes

The classification of patients as T1 or T2 based on register date only is not accurate, and the approach chosen here is to identify persons with T1D with reasonably high specificity, and classify the rest as T2D. Thus T2D will be equivalent to “cannot be classified as T1D with reasonable certainty”, and hence the classification should be used cautiously; the persons recorded as T1D are likely to be T1D, but there is some under-reporting. Consequently, some T1D patients are erroneously classified as T2D, but the precise size of this problem is unknown.

The practical implementation of the type classification is:

- use the DADD recordings of diabetes type (T1,T2,Other,Unkn) and classify persons as T1 resp. T2 if more than half of the recordings are T1 resp. T2. The rest are left unclassified.
- use the NPR to classify persons as T1 resp. T2 if more than half of the recordings are T1 (E10) resp. T2 (E11). The other codes (E12-E13) are ignored, and thus some persons are left unclassified.
- The classification from DADD as T1 is always used. If a person is not classified or does not appear in DADD, the classification as T1 from NPR is used, however not if the person is classified as T2 in DVDD.

- Finally, persons that have purchased OAD before age 15 or insulin before age 30 are classified as T1 (except if classified as T2 in DADD); all other are classified as T2.

The reason that we cannot entirely dispose with the NDR in classification of diabetes is that the DADD was not established till 2005 and onwards, so the classification of patients dead before 2005 is very sparse in the DADD.

1.3.2 Gestational Diabetes (GDM)

GDM diagnoses that are less than 200 days from the previous one are disregarded; so from the earliest GDM for a given person, no GDM diagnosis in the next 200 days is counted, from the next after this, another window of 200 days is used etc.

If a person is recorded with a diagnosis of GDM in the NPR, the person cannot enter the register on any criterion during the next 365 days. To account for registration delays the window starts 30 days prior to the recorded date of GDM.

1.3.3 Polycystic Ovarian Syndrome (PCOS)

If a person is recorded with PCOS in the NPR, this person cannot be included on the basis of metformin purchase in the period from the earliest PCOS diagnosis until the person's 40th birthday.

Moreover, if a person's only drug dispensations are metformin between age 20 and 40, the person is considered a possible PCOS case and these dispensations are not counted. Dispensations after age 40 for women with a PCOS diagnosis are considered as diabetes medication and lead to inclusion in the register at the first date of purchase after the 40th birthday.

1.3.4 Summary

The register we attempt to build is a register where persons are captured by a set of criteria and then kept in the register with this inclusion date.

1.3.5 Differences to RUKS

The proposed approach differs from RUKS in the following points:

- Persons may be included in our register even if only one purchase of OAD/Insulin is recorded.
- Only NPR diagnosis of PCOS is used, and women deemed to suffer from PCOS can actually be included at a time after age 40 based on metformin purchase alone.

It is not entirely clear whether persons who meet the criteria for PCOS before age 40 and meet other criteria after age 40 are included in RUKS with a date of inclusion equal to the first purchase of metformin, or whether these women are not included at all. After all, PCOS is a known risk factor for diabetes, so these women may contract diabetes later.

-
- RUKS maintains a window of no inclusion of 280 days *before* date of GDM till 280 days after. Our approach only use a window of 30 days before (to account for registration delays) and of 365 days after the date of GDM. Moreover repeat GDM diagnoses closer than 200 days are regarded as being from the same pregnancy in our approach, and only the first one is used in defining the window.
 - The RUKS approach to definition T1/T2 is based on recordings in the NPR and classify persons as T1/T2 according to the most recent occurrence of E10 and E11, whereas our approach only classify persons if more than half of the recordings are E10 resp E11, also taking other codes into account. It seems that RUKS do not include the codes E12–E14 as diabetes.
 - In principle we might use the health registers to define an exit date as well (for example 10 years). However it would be more viable to define a dates of last meeting each criterion, enabling reserchers to explore the nature of “false” positives in the register according to different criteria.

Chapter 2

Data acquisition

2.1 Diabetes patients

We have reconstructed a Danish Diabetes Register based on information from the National Patient Register, the Prescription Register (officially: Register of Medicines Products Statistics), the National Health Services Register (NHSR), the Danish Adult Diabetes Database (DADD) and the eye examination database (Diabase). The register contains id, date of birth, date of DM and date of death (among other things).

In the register we have defined T1 diabetes as those persons we are reasonably certain to be T1 patients namely those under 30 at first purchase of insulin, and those classified as T1 patients in the DADD or in NPR (the latter only used if no status from DADD is available). The algorithm is further detailed below.

2.2 Population data

We have had access to records for the entire Danish population containing date of birth, death, emigration and immigration. From this we constructed a dataset with one record per period spent in Denmark; a new record is started whenever a person enters the study population (by birth, immigration or crossing 1996-01-01 alive). The follow-up represented by this record is terminated by emigration death or the end of the study period, currently 2018-12-31.

2.2.1 Place of residence

From the population data we have persons's place of residence (by health care region) at the beginning of each year. We have classified the follow-up for the entire population by region — the classification of a persons's follow-up in any given year by the place of residence at 1 January in the year.

2.2.2 Education

We have the educational level as the highest attained education at the beginning of each year. However this is missing for persons who have completed their education before 1971 (??)

2.2.3 Income

Even if income is a personal feature the more relevant aspect is probably the family income which we have compiled for each person at the beginning of each year.

2.3 Follow-up

We used the Diabetes Register to subdivide the population records of follow-up by state of follow up in “noDM”, “T1” and “T2”. Also the register information was used to count the number of DM-events; that is diagnoses of T1 resp. T2 and deaths.

2.3.1 Analysis dataset for incidence, mortality and SMR

The constructed dataset of follow-up records was further subdivided by current age and calendar time in 1-year intervals, and the resulting dataset was tabulated by region of residence, sex, state, age and calendar time of follow-up and date of birth; the latter three in 1-year categories. Each entry in the tabulation contains the person-years at risk, the number of deaths and the number of diagnoses of T1 and T2, respectively. Obviously, the numbers of diagnoses of T1 and T2 in the states “T1” and “T2” are 0.

This dataset allows us to model incidence rates of T1 and T2 diabetes as well as mortality rates separately for the three states. The construction of the follow-up data from the register is documented in the SAS-program 08-mkFU.

2.4 Prevalence

Further when we make projections we shall also need the prevalence of DM at different dates (1 January each year 1996–2019). These numbers were also constructed from the follow-up dataset, by simply extracting those that were alive at the 1 January each year and classify these a being either “noDM”, “T1” or “T2”.

The construction of the prevalence data from the register is documented in the SAS-program 09-mkPr. Note that this way of constructing the prevalence data will allow us to have prevalences of T1 and T2 classified not only

Chapter 3

R-versions of the register and adjacent files

This chapter shows how the generated SAS-files can be read by R (slow), and how they are groomed and saved as R-files.

3.1 Reading the R-version of the DMreg

The R-code from this section is available as the file

E:\workdata\707655\DMreg\r\readDMreg.R — probably some of this is what you want at the top of your program.

We can load the register and the variable labels — note the `v=TRUE` argument to `load` that lists the objects you are loading, and the `v=0` argument to `str` that allows you to export the result from `DST` (suppresses the listing of data points):

```
> system.time(  
+ load( file="e:/workdata/707655/DMreg/data/DMreg.Rda", v=TRUE ) )
```

Loading objects:

```
DMreg  
vlabs  
  user  system elapsed  
  1.05   0.00   1.34
```

```
> str( DMreg, v=0 )
```

```
'data.frame':      486243 obs. of  21 variables:  
 $ pnr   : chr    ...  
 $ sex   : Factor w/ 2 levels "M","W": NULL ...  
 $ DMtp  : chr    ...  
 $ doBth : 'cal.yr' num  NULL ...  
 $ doDM  : 'cal.yr' num  NULL ...  
 $ doDth : 'cal.yr' num  NULL ...  
 $ inCr  : chr    ...  
 $ doNPR : 'cal.yr' num  NULL ...  
 $ doNPR2: 'cal.yr' num  NULL ...  
 $ doOAD : 'cal.yr' num  NULL ...  
 $ doOAD2: 'cal.yr' num  NULL ...  
 $ doIns : 'cal.yr' num  NULL ...  
 $ doIns2: 'cal.yr' num  NULL ...  
 $ do2nd : 'cal.yr' num  NULL ...  
 $ doPod : 'cal.yr' num  NULL ...
```

```

$ doDiaB: 'cal.yr' num NULL ...
$ doDVD : 'cal.yr' num NULL ...
$ only1 : Factor w/ 2 levels "N","Y": NULL ...
$ nprtyp: Factor w/ 3 levels "undef","T1","T2": NULL ...
$ dvdtyp: Factor w/ 3 levels "undef","T1","T2": NULL ...
$ hasdvd: Factor w/ 2 levels "N","Y": NULL ...

```

```
> cbind( vlabs )
```

```

      vlabs
pnr    "Personnummer"
sex    "sex"
DMtp   "Type of DM"
doBth  "Date of birth"
doDM   "Date of inclusion"
doDth  "Date of death"
inCr   "Incl. criterion"
doNPR  "Date of 1st NPR"
doNPR2 "Date of 2nd NPR"
doOAD  "Date of 1st OAD"
doOAD2 "Date of 2nd OAD"
doIns  "Date of 1st Ins"
doIns2 "Date of 2nd Ins"
do2nd  "Date of 2nd of Ins/OAD/NPR"
doPod  "Date of Podiatry"
doDiaB "Date of diaBase"
doDVD  "Date of DVDD"
only1  "Only one criterion"
nprtyp "Type from NPR"
dvdtyp "Type from DVDD"
hasdvd "has DVDD record"

```

3.1.1 Things to note:

- Do not put anything in the folder E:\workdata\707655\DMreg or any of its sub-folders.
- `pnr` id of class `character`. It must remain so, numerical values are inaccurate.
- Keep the factors that are defined.
- Do not rename the variables from the DMreg, that would be a prescription of confusion.

3.2 Tabular overview of the DMreg

We can get an overview of the number of cases in the register, by date of inclusion, sex and type of diabetes.

```

> with( DMreg, ftable( addmargins( table(floor(pmax(doDM,1995)),
+                                     sex,
+                                     DMtp,
+                                     exclude=NULL) ),
+                               row.vars=1 ) )

```

sex	M			W			Sum		
DMtp	T1	T2	Sum	T1	T2	Sum	T1	T2	Sum

1995	12422	30221	42643	9638	31024	40662	22060	61245	83305
1996	682	6165	6847	524	5286	5810	1206	11451	12657
1997	690	5859	6549	487	4888	5375	1177	10747	11924
1998	664	6535	7199	462	5256	5718	1126	11791	12917
1999	594	6725	7319	406	5664	6070	1000	12389	13389
2000	600	6586	7186	391	5534	5925	991	12120	13111
2001	590	6803	7393	420	5404	5824	1010	12207	13217
2002	608	8056	8664	395	7267	7662	1003	15323	16326
2003	550	9144	9694	394	7609	8003	944	16753	17697
2004	511	9289	9800	396	7734	8130	907	17023	17930
2005	519	8162	8681	380	6436	6816	899	14598	15497
2006	556	8161	8717	381	5893	6274	937	14054	14991
2007	563	8681	9244	389	6700	7089	952	15381	16333
2008	558	9869	10427	376	7574	7950	934	17443	18377
2009	576	10730	11306	368	7698	8066	944	18428	19372
2010	529	11847	12376	376	8672	9048	905	20519	21424
2011	515	15481	15996	365	13093	13458	880	28574	29454
2012	501	12794	13295	324	10092	10416	825	22886	23711
2013	490	10193	10683	365	8068	8433	855	18261	19116
2014	488	9876	10364	361	7406	7767	849	17282	18131
2015	500	10059	10559	393	7758	8151	893	17817	18710
2016	524	10694	11218	386	7961	8347	910	18655	19565
2017	513	10429	10942	370	8109	8479	883	18538	19421
2018	506	10779	11285	331	8052	8383	837	18831	19668
Sum	25249	243138	268387	18678	199178	217856	43927	442316	486243

And the prevalent cases as of 2019-1-1 by age, sex and type of diabetes

```
> with( subset( DMreg, doDM < 2019 & ( doDth > 2019 | is.na(doDth) ) ),
+       ftable( addmargins( table( cut(2019-doBth, breaks=seq(0,120,5), right=FALSE),
+                                   sex,
+                                   DMtp,
+                                   exclude=NULL) ),
+             row.vars=1 ) )
```

This table is not printed because it has small numbers in it.

3.2.1 Readable tables that can be sent

Readable tables with large numbers require position commas: this is provided by `fCtable` — an *ad hoc* function in the file `e:/workdata/707655/util/elapsed.R`.

Thin tables will benefit from having 0s perinted as “.”. This is also provided by `fCtable` (and `fC` for other objects).

If you want to send home table you must omit numbers smaller than 3, and they are replaced by “*” by `rCtable` (and `rCp`). SO this enavles us to look at the prevalences after loading the functions:

```
> source( "e:/workdata/707655/util/elapsed.R" )

> with( subset( DMreg, doDM < 2019 & ( doDth > 2019 | is.na(doDth) ) ),
+       rCtable( addmargins( table( cut(2019-doBth, breaks=seq(0,120,5), right=FALSE),
+                                   sex,
+                                   DMtp,
+                                   exclude=NULL) ),
+             row.vars=1, w=7 ) )
```


	dvdtyp	undef	T1	T2	NA	Sum
DMtp	nprtyp					
T1	undef	171	4,369	.	594	5,134
	T1	1,001	20,767	.	15,282	37,050
	T2	33	1,235	.	166	1,434
	NA	*	33	.	275	309
	Sum	1,206	26,404	.	16,317	43,927
T2	undef	1,590	23	17,769	17,260	36,642
	T1	20	32	4,013	1,573	5,638
	T2	1,973	30	85,468	61,451	148,922
	NA	199	40	92,862	158,013	251,114
	Sum	3,782	125	200,112	238,297	442,316
Sum	undef	1,761	4,392	17,769	17,854	41,776
	T1	1,021	20,799	4,013	16,855	42,688
	T2	2,006	1,265	85,468	61,617	150,356
	NA	200	73	92,862	158,288	251,423
	Sum	4,988	26,529	200,112	254,614	486,243

3.3 Reading and grooming the DMreg

We have created the DMreg as a SAS-file, the entire process is available in the document

```
> library( haven )
> library( Epi )

> system.time(
+ DMreg <- read_sas( "e:/workdata/707655/DMreg/data/DMreg.sas7bdat" ) )
  user  system elapsed
 5.55    0.31   11.81
```

The variable PNR should not be upper case

```
> names( DMreg )[grep("PNR", names(DMreg))] <- 'pnr'
```

We want the variable labels for convenience so get the variable labels

```
> vlabs <- sapply( DMreg, FUN = function(x) attr(x,"label") )
```

We want the dataset as a `dtat.frame` so we make a it dataframe and transform dates to years (do not use `devimal_date`):

```
> DMreg <- cal.yr( as.data.frame(DMreg) )
```

We remove labels and other single column attributes from DMreg

```
> for( v in names(vlabs) ) attr( DMreg[,v], "label" ) <- NULL
> attr( DMreg$pnr, "format.sas" ) <- NULL
> attr( DMreg, "label" ) <- NULL
```

Finally we define factors, as needed. Note that `dvdtyp` and `nprtyp` will have missing values — they are character variables and one value is "", which, when not mentioned in the `levels` argument, will become a missing value.


```
> DMreg <- transform( DMreg,
+                   sex = factor( sex, labels=c("M","W") ),
+                   only1 = factor( only1, labels=c("N","Y") ),
+                   hasdvd = factor( hasdvd, labels=c("N","Y") ),
+                   dvdtyp = factor( dvdtyp, levels=c("NA","T1","T2"),
+                   labels=c("undef","T1","T2") ),
+                   nprtyp = factor( nprtyp, levels=c("NA","T1","T2"),
+                   labels=c("undef","T1","T2") ) )
```

When listing the variable we need them in some sensible order:

```
> oo <- c(1,13,21,12,15,14,18,3,4,6:9,17,10,11,16,19,2,5,20)
> DMreg <- DMreg[oo]
> vlabs <- vlabs[oo]
```

Finally save the register *and* the variable labels in a file — note that it is a handy feature of `save`, that you can save several R-objects in one file, here `DMreg.Rda`

```
> system.time(
+ save( DMreg, vlabs, file="e:/workdata/707655/DMreg/data/DMreg.Rda" ) )
  user system elapsed
 3.80   0.11   4.52
```

3.4 Reading the R-version of the DMreg

The R-code from this section is available as the file

`E:\workdata\707655\DMreg\r\readDMreg.R` — probably some of this is what you want at the top of your program.

We can load the register and the variable labels — note the `v=TRUE` argument to `load` that lists the objects you are loading, and the `v=0` argument to `str` that allows you to export the result from `DST` (suppresses the listing of data points):

```
> system.time(
+ load( file="e:/workdata/707655/DMreg/data/DMreg.Rda", v=TRUE ) )
Loading objects:
  DMreg
  vlabs
  user system elapsed
 0.95   0.05   1.03
> str( DMreg, v=0 )
'data.frame':      486243 obs. of  21 variables:
 $ pnr   : chr    ...
 $ sex   : Factor w/ 2 levels "M","W": NULL ...
 $ DMtp  : chr    ...
 $ doBth : 'cal.yr' num  NULL ...
 $ doDM  : 'cal.yr' num  NULL ...
 $ doDth : 'cal.yr' num  NULL ...
 $ inCr  : chr    ...
 $ doNPR : 'cal.yr' num  NULL ...
 $ doNPR2: 'cal.yr' num  NULL ...
 $ doOAD : 'cal.yr' num  NULL ...
 $ doOAD2: 'cal.yr' num  NULL ...
 $ doIns : 'cal.yr' num  NULL ...
```

```

$ doIns2: 'cal.yr' num NULL ...
$ do2nd : 'cal.yr' num NULL ...
$ doPod : 'cal.yr' num NULL ...
$ doDiaB: 'cal.yr' num NULL ...
$ doDVD : 'cal.yr' num NULL ...
$ only1 : Factor w/ 2 levels "N","Y": NULL ...
$ nprtyp: Factor w/ 3 levels "undef","T1","T2": NULL ...
$ dvdtyp: Factor w/ 3 levels "undef","T1","T2": NULL ...
$ hasdvd: Factor w/ 2 levels "N","Y": NULL ...

```

```
> cbind( vlabs )
```

```

      vlabs
pnr    "Personnummer"
sex    "sex"
DMtp   "Type of DM"
doBth  "Date of birth"
doDM   "Date of inclusion"
doDth  "Date of death"
inCr   "Incl. criterion"
doNPR  "Date of 1st NPR"
doNPR2 "Date of 2nd NPR"
doOAD  "Date of 1st OAD"
doOAD2 "Date of 2nd OAD"
doIns  "Date of 1st Ins"
doIns2 "Date of 2nd Ins"
do2nd  "Date of 2nd of Ins/OAD/NPR"
doPod  "Date of Podiatry"
doDiaB "Date of diaBase"
doDVD  "Date of DVDD"
only1  "Only one criterion"
nprtyp "Type from NPR"
dvdtyp "Type from DVDD"
hasdvd "has DVDD record"

```

3.4.1 Things to note:

- Do not put anything in the folder E:\workdata\707655\DMreg or any of its sub-folders.
- `pnr` id of class `character`. It must remain so, numerical values are inaccurate.
- Keep the factors that are defined.
- Do not rename the variables from the DMreg, that would be a prescription of confusion.

3.5 Tabular overview of the DMreg

We can get an overview of the number of cases in the register, by date of inclusion, sex and type of diabetes.

```

> with( DMreg, ftable( addmargins( table(floor(pmax(doDM,1995)),
+                                     sex,
+                                     DMtp,
+                                     exclude=NULL) ),
+                 row.vars=1 ) )

```

	sex			M			W			
	DMtp	T1	T2	Sum	T1	T2	Sum	T1	T2	Sum
1995		12422	30221	42643	9638	31024	40662	22060	61245	83305
1996		682	6165	6847	524	5286	5810	1206	11451	12657
1997		690	5859	6549	487	4888	5375	1177	10747	11924
1998		664	6535	7199	462	5256	5718	1126	11791	12917
1999		594	6725	7319	406	5664	6070	1000	12389	13389
2000		600	6586	7186	391	5534	5925	991	12120	13111
2001		590	6803	7393	420	5404	5824	1010	12207	13217
2002		608	8056	8664	395	7267	7662	1003	15323	16326
2003		550	9144	9694	394	7609	8003	944	16753	17697
2004		511	9289	9800	396	7734	8130	907	17023	17930
2005		519	8162	8681	380	6436	6816	899	14598	15497
2006		556	8161	8717	381	5893	6274	937	14054	14991
2007		563	8681	9244	389	6700	7089	952	15381	16333
2008		558	9869	10427	376	7574	7950	934	17443	18377
2009		576	10730	11306	368	7698	8066	944	18428	19372
2010		529	11847	12376	376	8672	9048	905	20519	21424
2011		515	15481	15996	365	13093	13458	880	28574	29454
2012		501	12794	13295	324	10092	10416	825	22886	23711
2013		490	10193	10683	365	8068	8433	855	18261	19116
2014		488	9876	10364	361	7406	7767	849	17282	18131
2015		500	10059	10559	393	7758	8151	893	17817	18710
2016		524	10694	11218	386	7961	8347	910	18655	19565
2017		513	10429	10942	370	8109	8479	883	18538	19421
2018		506	10779	11285	331	8052	8383	837	18831	19668
Sum		25249	243138	268387	18678	199178	217856	43927	442316	486243

And the prevalent cases as of 2019-1-1 by age, sex and type of diabetes

```
> with( subset( DMreg, doDM < 2019 & ( doDth > 2019 | is.na(doDth) ) ),
+       ftable( addmargins( table( cut(2019-doBth, breaks=seq(0,120,5), right=FALSE),
+                                   sex,
+                                   DMtp,
+                                   exclude=NULL) ),
+             row.vars=1 ) )
```

This table is not printed because it has small numbers in it.

3.5.1 Readable tables that can be sent

Readable tables with large numbers require position commas: this is provided by `fCtable` — an *ad hoc* function in the file `e:/workdata/707655/util/elapsed.R`.

Thin tables will benefit from having 0s perinted as “.”. This is also provided by `fCtable` (and `fC` for other objects).

If you want to send home table you must omit numbers smaller than 3, and they are replaced by “*” by `rCtable` (and `rCp`). SO this enavles us to look at the prevalences after loading the functions:

```
> source( "e:/workdata/707655/util/elapsed.R" )
```

```
> with( subset( DMreg, doDM < 2019 & ( doDth > 2019 | is.na(doDth) ) ),
+       rCtable( addmargins( table( cut(2019-doBth, breaks=seq(0,120,5), right=FALSE),
+                                   sex,
```

```

+                                     DMtp,
+                                     exclude=NULL) ),
+                                     row.vars=1, w=7 ) )

```

	sex	M			W			Sum		
	DMtp	T1	T2	Sum	T1	T2	Sum	T1	T2	Sum
[0,5)		48	*	49	34	5	39	82	6	88
[5,10)		261	3	264	261	*	263	522	5	527
[10,15)		614	9	623	557	20	577	1,171	29	1,200
[15,20)		904	37	941	772	117	889	1,676	154	1,830
[20,25)		1,068	169	1,237	906	337	1,243	1,974	506	2,480
[25,30)		1,219	437	1,656	936	594	1,530	2,155	1,031	3,186
[30,35)		1,153	966	2,119	804	919	1,723	1,957	1,885	3,842
[35,40)		1,148	1,934	3,082	806	1,504	2,310	1,954	3,438	5,392
[40,45)		1,417	3,722	5,139	1,017	3,615	4,632	2,434	7,337	9,771
[45,50)		1,607	6,866	8,473	1,131	5,718	6,849	2,738	12,584	15,322
[50,55)		1,768	12,133	13,901	1,254	9,109	10,363	3,022	21,242	24,264
[55,60)		1,517	16,031	17,548	999	11,485	12,484	2,516	27,516	30,032
[60,65)		1,311	19,589	20,900	954	13,518	14,472	2,265	33,107	35,372
[65,70)		1,039	22,241	23,280	790	15,581	16,371	1,829	37,822	39,651
[70,75)		912	27,226	28,138	733	19,271	20,004	1,645	46,497	48,142
[75,80)		531	19,309	19,840	395	16,018	16,413	926	35,327	36,253
[80,85)		266	11,804	12,070	254	11,758	12,012	520	23,562	24,082
[85,90)		78	5,289	5,367	121	7,056	7,177	199	12,345	12,544
[90,95)		22	1,654	1,676	24	3,083	3,107	46	4,737	4,783
[95,100)		*	238	240	9	728	737	11	966	977
[100,105)		.	14	14	.	73	73	.	87	87
[105,110)		.	*	*	.	11	11	.	12	12
[110,115)		.	*	*	.	*	*	.	3	3
[115,120)	
Sum		16,885	149,675	166,560	12,757	120,523	133,280	29,642	270,198	299,840

The last argument `w=7` determines the width of the columns in the resulting table.

You will note that the 0s have been replaced by a “.” and numbers 1, 2 and 3 by a “*”.

3.5.2 Sources of diabetes type

Here is an overview of how many persons’ type of DM originate from DVDD and NPR, first without

```

> with( DMreg, rCtable( table(DMtp,
+                               nprtyp,
+                               dvdtyp,
+                               exclude=NULL),
+                               row.vars=1:2, w=7 ) )

```

DMtp	nprtyp	dvdtyp	undef	T1	T2	NA
T1	undef		171	4,369	.	594
	T1		1,001	20,767	.	15,282
	T2		33	1,235	.	166
	NA		*	33	.	275
T2	undef		1,590	23	17,769	17,260
	T1		20	32	4,013	1,573
	T2		1,973	30	85,468	61,451
	NA		199	40	92,862	158,013

```
> with( DMreg, rCtable( addmargins( table(DMtp,
+                                       nprtyp,
+                                       dvdtyp,
+                                       exclude=NULL) ),
+                                       row.vars=1:2, w=8 ) )
```

	dvdtyp	undef	T1	T2	NA	Sum
DMtp nprtyp						
T1 undef		171	4,369	.	594	5,134
T1		1,001	20,767	.	15,282	37,050
T2		33	1,235	.	166	1,434
NA		*	33	.	275	309
Sum		1,206	26,404	.	16,317	43,927
T2 undef		1,590	23	17,769	17,260	36,642
T1		20	32	4,013	1,573	5,638
T2		1,973	30	85,468	61,451	148,922
NA		199	40	92,862	158,013	251,114
Sum		3,782	125	200,112	238,297	442,316
Sum undef		1,761	4,392	17,769	17,854	41,776
T1		1,021	20,799	4,013	16,855	42,688
T2		2,006	1,265	85,468	61,617	150,356
NA		200	73	92,862	158,288	251,423
Sum		4,988	26,529	200,112	254,614	486,243

3.6 The LABKA database

```
> library( Epi )
> library( tidyverse )
> library( haven )
> source("E:/workdata/707655/util/elapsed.r")
> setwd("E:/workdata/707655/DMreg/r")
> start()
```

```
-----
Home: E:/workdata/707655/DMreg/r
Time: 2020-06-22 15:26:00
-----
```

LABKA measurements are in a very large file, 346 mil. records, 146 Gb, so we have read the file and created 26 sas-files with separate measurements in the folder
E:\workdata\707655\DMreg\data\labka.

3.6.1 SAS splitting of the LABKA data.

3.6.2 Converting to .Rda

The SAS program 00-labka contains the names and the labels of the files, so we read the SAS-code and extract the file names and the labels for use in the R-files:

```
> ll <- read.table( "../sas/00-labka.sas", sep="/" )[,1]
> ll <- read.table( "../sas/00-labka.log", sep="/" )[,1]
> ll <- grep( "label", ll, value=TRUE )
> dot <- sapply( strsplit(ll,""), function(x) which(x=="") )
> eql <- sapply( strsplit(ll,""), function(x) which(x=="") )
```

```

> rbr <- sapply( strsplit(ll,""), function(x) which(x=="") )
> nam <- gsub(" ", "", substr( ll, dot+1, dot+4 ) )
> lab <-          substr( ll, eql+2, rbr-2 )
> nam <- tolower( nam )
> names( lab ) <- nam
> cbind( lab )
      lab
hba1 "Hba1c"
gluc "Glukose"
glu0 "Glukose 0"
gl30 "Glukose 30"
gl120 "Glukose 120"
tchl "Total kolesterol"
ldl "LDL kolesterol"
hdl "HDL kolesterol"
vldl "VLDL kolesterol"
trig "Triglycerid"
plcr "Plasma Kreatinin"
uacr "Ualbcrea"
pota "Kalium"
sodi "Natrium"
tsh "TSH"
cpep "C-peptid/Proinsulin"
crp "CRP"
gad "GAD65"
egfr "eGFR"
gfr "GFR"
alat "ALAT"
alcp "Basisk fosfatase"
cobl "Cobalamin"
trmb "Trombocytter"
leuc "Leucocytter"
hmgb "Hæmoglobin"

```

We now have the filenames (without extension) — note all filenames are in lower case; they are in the `names` attribute of the `lab` vector of labels of the various types of measurements.

Then we read the SAS-files, coerce them to `data.frames`, strip the disturbing attributes of the variabls, assigns the proper label to the `label` attribute of the data frame. It is then assigned to a object with the proper name and subsequently saved in an R-file with the correct name.

```

> for( fn in names(lab) )
+ {
+   cat( fn, " start at", format( Sys.time(), "%T" ) )
+   xx <- read_sas( paste0("../data/labka/", fn, ".sas7bdat") )
+   xx <- as.data.frame( xx )
+   for( i in names(xx) ) attr( xx[,i], "format.sas" ) <- NULL
+   attr( xx$SAMPLINGTIME, "units" ) <- NULL
+   attr( xx, "label" ) <- lab[fn]
+   assign( fn, xx )
+   system.time(
+     save( list = fn,
+           file = paste0("e:/workdata/707655/DMreg/data/labka/", fn, ".Rda" ) ) )
+   cat( " end at", format( Sys.time(), "%T" ),
+         "dim=", paste( fCp(dim(xx)), collapse=" by" ), "\n" )
+   rm( list = fn )
+ }

```

```

hba1 start at 15:26:01 end at 15:37:31 dim= 21,261,038 by 7
gluc start at 15:37:31 end at 15:42:18 dim= 8,736,053 by 7
glu0 start at 15:42:18 end at 15:42:51 dim= 874,845 by 7
gl30 start at 15:42:51 end at 15:42:52 dim= 11,395 by 7
gl120 start at 15:42:52 end at 15:42:54 dim= 61,892 by 7
tchl start at 15:42:54 end at 15:49:05 dim= 10,463,522 by 7
ld1 start at 15:49:05 end at 15:54:52 dim= 9,875,421 by 7
hdl start at 15:54:52 end at 16:01:12 dim= 10,083,655 by 7
vld1 start at 16:01:12 end at 16:02:06 dim= 1,492,139 by 7
trig start at 16:02:06 end at 16:08:08 dim= 10,356,568 by 7
plcr start at 16:08:08 end at 16:25:24 dim= 31,617,208 by 7
uacr start at 16:25:24 end at 16:26:37 dim= 2,085,164 by 7
pota start at 16:26:37 end at 16:42:26 dim= 30,207,229 by 7
sodi start at 16:42:26 end at 16:57:45 dim= 30,186,282 by 7
tsh start at 16:57:45 end at 17:02:50 dim= 11,495,628 by 7
cpep start at 17:02:50 end at 17:02:56 dim= 164,936 by 7
crp start at 17:02:56 end at 17:11:33 dim= 20,723,651 by 7
gad start at 17:11:33 end at 17:11:35 dim= 28,416 by 7
egfr start at 17:11:35 end at 17:23:50 dim= 28,742,105 by 7
gfr start at 17:23:50 end at 17:23:52 dim= 2,409 by 7
alat start at 17:23:52 end at 17:32:22 dim= 20,540,099 by 7
alcp start at 17:32:22 end at 17:38:52 dim= 15,495,551 by 7
cobl start at 17:38:52 end at 17:41:04 dim= 5,324,860 by 7
trmb start at 17:41:04 end at 17:49:42 dim= 21,039,994 by 7
leuc start at 17:49:42 end at 18:00:17 dim= 25,630,130 by 7
hmgb start at 18:00:17 end at 18:12:44 dim= 30,419,252 by 7

```

Thus, for example if you need the cobalamin measurements you just do:

```

> system.time(
+ load( "e:/workdata/707655/DMreg/data/labka/cobl.Rda", v=T ) )
Loading objects:
  cobl
      user system elapsed
 8.53    0.06    8.77
> str( cobl, v=0 )
'data.frame':      5324860 obs. of  7 variables:
 $ pnr              : chr   ...
 $ SAMPLINGDATE     : Date, format: ...
 $ SAMPLINGTIME     : 'hms' num   ...
 $ ANALYSISCODE     : chr   ...
 $ LABORATORIUM_IDCODE: chr   ...
 $ VALUE            : chr   ...
 $ UNIT             : chr   ...
- attr(*, "label")= Named chr   ...
 ..- attr(*, "names")= chr   ...
> attr( cobl, "label" )
      cobl
"Cobalamin"
> fCp( object.size( cobl ) )
[1] 416,553,960

```

The last use of `attr` is necessary because `v=0` also cuts the the first (and only) element of the `label` attribute, so if you want a human readable label this is what to do.

```
-----
2020-06-22 at 18:12:56
Time elapsed: 02:46:55
-----
```

3.7 The complications files

First the paraphernalia:

```
> library( Epi )
> library( tidyverse )
> library( haven )
> source("E:/workdata/707655/util/elapsed.r")
> setwd("E:/workdata/707655/DMreg/r")
> start()
```

```
-----
Home: E:/workdata/707655/DMreg/r
Time: 2020-07-03 10:24:54
-----
```

Complications occurring in the entire population (*i.e.* not only the have been gathered in three SASE-files:

comp1: One record per first occurrence of each complication, key is (NPR, comp1), comp1 has 21 values; only variables are comp1Gr (a grouping of comp1 in 10 groups, of which 5 only have one element) and doC.

wcomp1: One record per person with at least one complication, key is pnr, and with 26 variables, namely the date of first occurrence of each of the complications.

rcomp1: One record per person and recurrent complication (HpoG, Keto), the key is (pnr, comp1, doC), and there are no other variables in the dataset.

3.7.1 SAS generation of complications data.

The code and output from SAS generation the the complications data are in the chapter with SAS-programs.

This first program, 10-labcomp defines complications based on the lab-measurements in LABKA and DVDD. Since some measurements may actually be the same we exclude any measurement that are less than 4 days after a previous one of the same kind.

We compute eGFR based on the plasma creatinine measurement and the sex and age of the persons at the date of measurement.

The diagnoses of moderate, severe and end stage kidney disease (ModL, SevL, ESRL) are defined as two measurements of eGFR below 60, 30, resp. 15 with at least 60 days interval. Correspondingly, diagnoses of micro- and macro-albuminuria (MicA, MacA) are defined as two measurements of albumin/creatinine ratio below 30 resp. 300 with at least 60 days interval. The date of the complication is defined as the date of the second measurement beyond the threshold.

The first of each of these dates are stored in a SAS-dataframe DMdat.micompl; key (pnr,comp1), variable doC, date of first occurrence of the complication.

The second program, 10-comp1 extracts complications from NPR, all types of records, and for each type of complication takes the first of these within each person.

3.7.2 Converting to .Rda

We can now read the SAS-datasets and convert them to R-datasets for easier access:

```
> system.time( fcompl <- read_sas( "../data/fcompl.sas7bdat" ) )
  user system elapsed
11.12  0.17  33.69

> system.time( wcompl <- read_sas( "../data/wcompl.sas7bdat" ) )
  user system elapsed
19.00  0.25  84.83

> system.time( rcompl <- read_sas( "../data/rcompl.sas7bdat" ) )
  user system elapsed
 0.25  0.00  0.38

> lls()
  name      mode      class          dim      size(Kb)
1 elapsed  function function          1         11.5
2 fC       function function          1          1.8
3 fcompl   list      tbl_df tbl data.frame 3736240 4      229,616.8
4 fCp      function function          1          3.2
5 fCtable  function function          1          3.2
6 ini.time numeric POSIXct POSIXt          1          0.3
7 rC       function function          1          3.7
8 rcompl   list      tbl_df tbl data.frame 159959 3      7,573.1
9 rCp      function function          1          3.2
10 rCtable function function          1          3.2
11 start   function function          1          7.2
12 wcompl  list      tbl_df tbl data.frame 1805684 27     493,757.7

> names(fcompl)
[1] "compl" "compGr" "PNR" "doC"

> names(wcompl)
[1] "PNR" "doCbVD" "doHypD" "doAFib" "doIHD" "doMicA" "doAtMD" "doModC"
[9] "doSevL" "doModL" "doESRD" "doHF" "doHpoG" "doESRL" "doMajA" "doMedA"
[17] "doMinA" "doReti" "doNeur" "doKeto" "doMacA" "doSevC" "doCVD" "doDNef"
[25] "doNefL" "doNefr" "doAmp"

> names(rcompl)
[1] "compl" "PNR" "doC"
```

Complication names

We read the format base for the grouping of complications which contain the long form of the complications labels:

```
> cnam <- read.csv( "../fmts/compfmt.csv", header=TRUE )
> cnam <- subset( cnam, FMTNAME=="$abb2txt" )
> compl.names <- as.character( cnam$LABEL )
> names( compl.names ) <- cnam$START
> cbind( compl.names )
```

```

      compl.names
AtMD "Atherosclerotic macrovascular disease"
AFib "Atrial fibrillation"
CbVD "Cerebrovascular disease"
HF   "Heart failure"
HypD "Hypertensive Disease"
HpoG "Hypoglyceamia"
IHD  "Ischeamic heart disease"
Keto "Ketoacidosis"
MajA "Major amputation"
MedA "Medium amputation"
MinA "Minor amputation"
Neur "Neuropathy"
Reti "Retinopathy"
ModC "Moderate CKD"
SevC "Severe CKD"
ESRD "End-stage CKD"
ModL "Moderate CKD (lab)"
SevL "Severe CKD (lab)"
ESRL "End-stage CKD (lab)"
Amp  "Amputation"
CVD  "Cardiovascular Disease"
Nefr "Nephropathy"
NefL "Nephropathy (lab)"
DNef "Diabetic nephropathy"
MicA "Macro-abuminuria"
MacA "Macro-abuminuria"

```

Now `compl.names` is a character vector with the long names of the complications. The *names* attribute of the vector is the abbreviations of the complications used in `fcompl` and `wcompl`; we see that they are all there:

```

> sort( match( paste0("do",names(compl.names)), names( wcompl ) ) )
 [1]  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
[26] 27

```

The point of using the abbreviations as *names* attributes of the `compl.names` is that you can get the official long text by indexing with the abbreviation:

```

> compl.names["CbVD"]
           CbVD
"Cerebrovascular disease"

```

...which is useful when labeling tables and graphs.

Grooming the data frames

We want to store the datasets as `data.frames`, we remove the `label` and the `format.sas` attributes of the `pnr` variable:

```

> fcompl <- data.frame(rename(fcompl, pnr=PNR))
> wcompl <- data.frame(rename(wcompl, pnr=PNR))
> rcompl <- data.frame(rename(rcompl, pnr=PNR))
> attr(fcompl$pnr, "label") <- NULL
> attr(wcompl$pnr, "label") <- NULL
> attr(rcompl$pnr, "label") <- NULL

```

```
> attr(fcompl$pnr, "format.sas") <- NULL
> attr(wcompl$pnr, "format.sas") <- NULL
> attr(rcmpl$pnr, "format.sas") <- NULL
```

Finally we convert the date variables in data frames to class `cal.yr`:

```
> fcompl <- cal.yr(fcompl)
> wcompl <- cal.yr(wcompl)
> rcmpl <- cal.yr(rcmpl)
```

We save these as R-datasets and document how long it takes to read them back in—note that we save the names vector with each of the files, too.

```
> save(fcompl, compl.names, file = "../data/fcompl.Rda")
> system.time( load(file = "../data/fcompl.Rda", v=T) )
```

Loading objects:

```
fcompl
compl.names
  user system elapsed
 4.08   0.03   4.11
```

```
> save(wcompl, compl.names, file = "../data/wcompl.Rda")
> system.time( load(file = "../data/wcompl.Rda", v=T) )
```

Loading objects:

```
wcompl
compl.names
  user system elapsed
 3.84   0.02   3.86
```

```
> save(fcompl, compl.names, file = "../data/rcmpl.Rda")
> system.time( load(file = "../data/rcmpl.Rda", v=T) )
```

Loading objects:

```
fcompl
compl.names
  user system elapsed
 3.89   0.04   4.37
```

Thus these data sets provide for a reading time which is a factor 5–10 smaller than reading from the SAS files.

```
-----
2020-07-03 at 10:27:35
Time elapsed: 00:02:42
-----
```

Chapter 4

SAS programs

4.1 Rationale and overview

The following documented programs sequentially construct data sets with dates of diagnosis of DM according to different criteria, then merge these to pick the earliest. All computing is done at the server of Statistics Denmark.

All created data will be in the data folder as SAS-datasets, and the SAS log and `lst` files will be printed here verbatim for documentation (the latter after removal of numbers less than 4).

We have the following programs:

`00-fmts` Definition of formats for grouping and labeling.

`00-base` Collects the base information on all persons in Denmark, that is sex, date of birth and date of death, and stores it in the dataset `bef`.

`00d-base` Collects causes of death.

`00r-base` Collects place of residence information for all persons and extrapolates to all years 1993–2016, for use with the construction of the follow-up and prevalence data.

`00-labka` Reads the (very large) file of LABKA-measurements and subdivides it to smaller files with one type of lab-measurement in each.

`01-npr` Uses the national patient register (NPR) to generate three data sets, all with `pnr` as key:

- a dataset `npr` with the earliest date of DM diagnosis in the NPR, `doNPR`, as well as a variable `nprtyp` with values T1 (ICD10: E10) or T2 (ICD10: E11) or NA (anything else), based on whether E10 or E11 or neither is recorded on more than half of the person's NPR entries. Thus formally some of the follow-up will be based on type-information from future recording.
- a dataset `pcos` with the earliest date of registered PCOS, `doPCOS`
- a dataset `gdm` with recorded dates of GDM that are at least 200 days apart, `doGDM1`, `doGDM2`, ...

- 02-dvdd** Uses the DADD to identify persons from outpatient clinics (and in due course from GPs) and to seek out persons deemed to be T1D patients. It creates a dataset, DVDD with key `pnr` and a variable for type of diabetes `dvdtyp`, based on whether T1 resp. T2 is recorded on more than half of the available clinical records. Thus formally some of the follow-up will be based on type-information from future recording.
- 03-nhsr** Uses the NHSR to get the date of the first podiatry (foot-therapy) service for diabetes patients. Creates the dataset `Foot` with the data variable `doPod`.
- 04-rmps** Generates a dataset with `pnr` as key with one record per person, with dates of first dispensation of each of a number of drugs, `donlMet`, `danyMet` etc. as well as `doOAD` and `doIns`, which are the two criteria dates that are carried on to the register. Note that this is at variance with the original NDR that used the *second* dispensation date, so the program also creates the two variables `doOAD2` and `doIns2` with dates of second purchase of OAD resp. insulin.
- 05-diab** Extracts data from the DiaBase, excludes records with examination date in the GDM grace interval, and selects the earliest record for each person and defines the date in the variable `doDiaB`.
- 06-define** Collects data from the previously created data sets and defines date of diagnosis and type of diabetes (T1/T2), and thus generates a DM-register with sex, date of birth, date of death, date of inclusion, the latter being the smaller of date of OAD, date of insulin, date of DADD recording and date of NPR recording.
- However, some 85% of the dates of diagnosis in the DVDD are either 1st January or 15th June; both of which we interpret as “sometime during the year”. The consequence of this is that if a person meets another criterion during the same calendar year as the one defined in DVDD, the date from DVDD will be ignored and the person will be included at the date of the other criterion.
- For persons with a record from DADD with type of diabetes defined, this is used. If different types are given in different records, the most frequent type is used, but only if present in more than half of the records.
- The program also defines a type variable that uses the typing from the NDR, based on the diagnosis code (E10:T1 or E11:T2); if one of these codes occur in more than half of the NPR records. Note that codes E12, E13 and E14 also define diabetes, and such records are counted in this calculation, hence some patients will have an indeterminate type from NPR.
- For persons with no classification from DADD, we use a similar algorithm for classification based on diagnoseis codes from NPR.
- Finally, a person is classified as T1 if insulin has been taken out before age 30 (unless classified as T2 in DADD), otherwise as T2.
- 08-mkFU** Splits the follow-up of the register population by type, sex, age, calendar time and duration of diabetes in 1-year intervals, and produces a tabular dataset for analysis of incidence and mortality rates, classified by region of residence. Deaths are classified in 4 classes: CVD, Cancer, Resiratory and Other.

- 09-mkPr Compiles prevalences in 1-year age-classes by sex, region of residence and diabetes type for each of the dates 1 January 1996–2017.
- 10-labcomp1 Extracts measurements from LABKA and DVDD and defines dates of severe, moderate and end stage kidney disease, as well as dates of micro- and macro-albuminuria. This is done for the *entire* population.
- 10-comp1 Defines complication dates based on NPR-records and appends the lab-defined complications This is done for the *entire* population.

4.2 Program execution

All data analyses are run on the servers at Statistics Denmark. In order to have a thorough documentation of the data processing all SAS-programs have been run in sequence as batch jobs from the command prompt (`cmd`), where the program in the file `xxx.sas`, say, is run and produces the files `xxx.log` and `xxx.lst`. Since the code from `xxx.sas` is contained in `xxx.log`, it suffices to show the files `xxx.log` and `xxx.lst` to provide full documentation of the data acquisition process.

The practical execution of the SAS-programs is done using the `cmd`-script `sj.bat` which reads:

The running of the program `xxx.sas` is started by issuing “`sj xxx`” at the command prompt.

The script `sj.bat` just starts a new process which in turn runs the script `sjx.bat`, which reads:

The second last line in the script simply copies the two result-files from SAS into one for convenience of inspection. It is the two result files that are transferred from DST to a local computer for inclusion in a documentation report.

Note that all programs are preceded by execution of `optslibs.sas` via the `-autoexec` argument to SAS, as seen from the script `sjx.bat`.

This way there is a reasonable documentation that the results are actually produced by the listed code (in the `.log` file). Hopefully the program code is reasonably human-readable.

4.3 Program documentation

The following is a listing of the SAS-programs and -results (that is the `.log` and `.lst` files) used to generate the base data sets. Each one is preceded by a very brief description; main technical points are included as comments in the program code, found in the `.log` files.

Note that according to rules of DST, all table entries of 3 or less in `.lst` file are masked as a “*”. This is done in an automated process, so also entries not strictly necessary to mask have been masked.

4.3.1 `optslibs.sas`

This is common set of declarative commands that defines a couple of options, the location of the raw and the derived data sets and some global macro variables used for handling GDM and PCOS and definition of T1D. It is included as `autoexec` file in all runs, note the `options nonotes` for brevity of output:

4.3.2 xgdm.sas

Note that the `optslibs.sas` also contains the definition of the `xgdm` macro: For each of the criteria it is necessary to exclude dates of meeting the criterion which fall within a grace period after a diagnosis of GDM. This is what the macro `xgdm` is for; it relies on the structure of the GDM dataset constructed in the `01-npr` program, which has the GDM dates in the wide form for person with at least one date of GDM. It iterates up to 12 in order to produce a note from the SAS system, that documents that only 11 GDM dates are needed.

4.4 00-base

Reads the files with all person ids (`pnr`), for each calendar year of data, and forms a total roster of all `pnr` with demographic information (`sex`, `date of birth`, `date of death`).

Also reads all migration records, and forms a dataset of time spent *outside* of Denmark, which is used by the program `08-mkFU` to count only events and person-years among persons actually present in Denmark.

```
1                                "Program: 00-base.sas"    14:53 Saturday, April 18, 2020
```

```
NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.
```

```
NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)
      Licensed to FORSKNING 2, Site 50800723.
```

```
NOTE: This session is executing on the X64_SR12R2 platform.
```

```
NOTE: Updated analytical products:
```

```
      SAS/STAT 14.3
```

```
NOTE: Additional host information:
```

```
      X64_SR12R2 WIN 6.3.9600 Server
```

```
NOTE: SAS initialization used:
```

```
      real time          0.08 seconds
      cpu time           0.12 seconds
```

```
NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.
```

```
NOTE: AUTOEXEC processing completed.
```

```
1          * The base populations (entire Danish population 1995-2015) ;
2          %macro getpop ;
3          data pop ;
4              merge %do i = &yrf.-1 %to &yrl. ;
5                  grund.bef&i.12 ( keep = pnr koen foed_dag opr_land )
6                  %end ; ;
7              by pnr ;
8              * some of the files contain multiple blank pnr - causing a note ;
9              if pnr ne ' ' ;
10         run;
11         %mend ;
12         %getpop ;
```

```
NOTE: MERGE statement has more than one data set with repeats of BY values.
```

```
NOTE: There were 5245145 observations read from the data set GRUND.BEF199512.
```

```
NOTE: There were 5268824 observations read from the data set GRUND.BEF199612.
```

```
NOTE: There were 5288549 observations read from the data set GRUND.BEF199712.
```

```
NOTE: There were 5308437 observations read from the data set GRUND.BEF199812.
```

```

NOTE: There were 5324533 observations read from the data set GRUND.BEF199912.
NOTE: There were 5344497 observations read from the data set GRUND.BEF200012.
NOTE: There were 5363038 observations read from the data set GRUND.BEF200112.
NOTE: There were 5378304 observations read from the data set GRUND.BEF200212.
NOTE: There were 5391890 observations read from the data set GRUND.BEF200312.
NOTE: There were 5406633 observations read from the data set GRUND.BEF200412.
NOTE: There were 5423347 observations read from the data set GRUND.BEF200512.
NOTE: There were 5447126 observations read from the data set GRUND.BEF200612.
NOTE: There were 5475791 observations read from the data set GRUND.BEF200712.
NOTE: There were 5511451 observations read from the data set GRUND.BEF200812.
NOTE: There were 5534738 observations read from the data set GRUND.BEF200912.
NOTE: There were 5560628 observations read from the data set GRUND.BEF201012.
NOTE: There were 5580516 observations read from the data set GRUND.BEF201112.
NOTE: There were 5602628 observations read from the data set GRUND.BEF201212.
NOTE: There were 5627235 observations read from the data set GRUND.BEF201312.
NOTE: There were 5659715 observations read from the data set GRUND.BEF201412.
NOTE: There were 5707251 observations read from the data set GRUND.BEF201512.
NOTE: There were 5748769 observations read from the data set GRUND.BEF201612.
NOTE: There were 5781190 observations read from the data set GRUND.BEF201712.
NOTE: There were 5806081 observations read from the data set GRUND.BEF201812.
NOTE: The data set WORK.POP has 7632150 observations and 4 variables.
NOTE: DATA statement used (Total process time):
      real time           1:43.65
      cpu time            29.50 seconds

```

```

13
14      * merge population with death records and remove persons not observed
15      between ini and end ;
16      data DMdat.pop ( keep = pnr sex doBth whBth doDth dSrc
17                    label = 'Total population 1996-2018 incl.' ) ;
18          label pnr = 'person id'
19          doBth = 'date of birth'
20          sex = 'sex'
21          whBth = 'place of birth DK/We/nW'
22          doDth = 'date of death'
23          dSrc = 'source of doDth' ;
24      merge pop ( in = pop )
25                grund.dodsaars2001 /* d_dodsdto */
26                grund.dodsaasg2017 /* d_dodsdato */
27                grund.dod2018 ;    /* doddato */
28      by pnr ;
29      * must be in base population ;
30      if pop ;
31      * variable names ;
32          sex = koen ;
33          doBth = foed_dag ;
34
35      * place of birth - Denmark (DK), Western (West), non-Western (non-W) ;
36      whB = input( substr( put( opr_land, OPR_LAND_VESTLIG_SB. ), 1, 2 ), 2. ) ;
37      if whB eq 3 then whBth = 'non-W' ;
38      if whB eq 2 then whBth = 'West' ;
39      if whB eq 1 then whBth = 'DK' ;
40
41      * date of death from cause of death register(s) or CPR ;
42      if( doDth le .z ) then do ; doDth = d_statdato ; dSrc = "cod17" ; end ;
43      if( doDth le .z ) then do ; doDth = d_dodsdto ; dSrc = "cod01" ; end ;
44      if( doDth le .z ) then do ; doDth = doddato ; dSrc = "cpr" ; end ;
45      if( doDth le .z ) then do ; doDth = doddato ; dSrc = "none" ;
46      * born after end date: late Born ;
47      lBrn = ( doBth >= &end. ) ;
48      * dead before start date: early Death ;
49      eDth = ( .z < doDth < &ini. ) ;
50      * collect only persons contributing risk 1996-2018 ;
51      if ~lBrn and ~eDth then output DMdat.pop ;
52      run ;

```

WARNING: Multiple lengths were specified for the variable C_DODSMAADE by input data set(s). This can cause truncation of data.

NOTE: There were 7632150 observations read from the data set WORK.POP.

NOTE: There were 1444199 observations read from the data set GRUND.DODSAARS2001.
 NOTE: There were 860599 observations read from the data set GRUND.DODSAASG2017.
 NOTE: There were 2367205 observations read from the data set GRUND.DOD2018.
 NOTE: The data set DMDAT.POP has 7631979 observations and 6 variables.
 NOTE: DATA statement used (Total process time):
 real time 5.67 seconds
 cpu time 4.88 seconds

```
53
54      * Dmdat.pop now has all persons contributing between (end) and (ini) ;
55      title1 "The total population contributing between &ini. and &end." ;
56      proc contents data = DMDat.pop varnum ; run ;
```

NOTE: PROCEDURE CONTENTS used (Total process time):
 real time 0.03 seconds
 cpu time 0.03 seconds

NOTE: The PROCEDURE CONTENTS printed page 1.

```
57      proc tabulate data = DMDat.pop noseps missing ;
58          class whBth doBth doDth dSrc ;
59          table all doBth doDth, dSrc * f=comma10. / rts = 15 ;
60          table all doBth doDth, whBth * f=comma10. / rts = 15 ;
61          format doBth doDth year4. ;
62          title1 ;
63
64          * Here comes the migrations ;
```

NOTE: There were 7631979 observations read from the data set DMDAT.POP.
 NOTE: The PROCEDURE TABULATE printed pages 2-3.
 NOTE: PROCEDURE TABULATE used (Total process time):
 real time 1.89 seconds
 cpu time 4.43 seconds

```
65      proc sort data = grund.vnds2018 out = migr ;
66          by pnr haend_dato ;
67      run ;
```

NOTE: There were 3687670 observations read from the data set GRUND.VNDS2018.
 NOTE: The data set WORK.MIGR has 3687670 observations and 4 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 2.24 seconds
 cpu time 1.26 seconds

```
68
69      * if multiple records with same type of movement, only take the first ;
70      data migr ups ;
71          set migr ;
72          by pnr ;
73          if first.pnr or
74             indud_kode ne lag1(indud_kode) then output migr ;
75          else output ups ;
76      run ;
```

NOTE: There were 3687670 observations read from the data set WORK.MIGR.
 NOTE: The data set WORK.MIGR has 3673682 observations and 4 variables.
 NOTE: The data set WORK.UPS has 13988 observations and 4 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.70 seconds
 cpu time 0.70 seconds

```
77
78      * How many persons have fishy data ;
79      proc sort data = ups nodupkey ; by pnr ; run ;
```

NOTE: There were 13988 observations read from the data set WORK.UPS.

NOTE: 1158 observations with duplicate key values were deleted.
 NOTE: The data set WORK.UPS has 12830 observations and 4 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.00 seconds
 cpu time 0.01 seconds

```

80
81      * We keep track of period OUTSIDE of DK in the period ;
82      * so in each records doEm < doIm ;
83      data DMdat.xDK ( keep = pnr doIm doEm
84                    label = 'Periods spent outside DK: doEm < doIm' ) ;
85          merge migr ( in = mig )
86                  DMdat.pop ( in = pop ) ;
87      by pnr ;
88      if mig and pop ;
89      retain doEm ;
90      if first.pnr then doEm = . ;
91      if ( indud_kode eq "U" ) then doEm = haend_dato ;
92      if ( indud_kode eq "I" ) then doIm = haend_dato ;
93      * Not relevant if entered back in before start ;
94      if ( .z < doIm < &ini. ) then delete ;
95      if ( .z < doIm < doEm ) then put "This should never print!" ;
96      if ( indud_kode eq "I" or last.pnr ) then output ;
97      format doEM doIm dmmmyy10. ;
98      run ;

```

NOTE: There were 3673682 observations read from the data set WORK.MIGR.
 NOTE: There were 7631979 observations read from the data set DMDAT.POP.
 NOTE: The data set DMDAT.XDK has 1912979 observations and 3 variables.
 NOTE: DATA statement used (Total process time):
 real time 2.27 seconds
 cpu time 2.07 seconds

```

99
100      title1 'Person-time spent outside of DK: doEM < doIm' ;
101      proc contents data = DMdat.xDK ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):
 real time 0.00 seconds
 cpu time 0.01 seconds

NOTE: The PROCEDURE CONTENTS printed page 4.

```

102      proc tabulate data = DMdat.xDK noseps missing ;
103          class doEm doIm ;
104          table all doEm,
105                all * f=comma9.
106                doIm * f=comma7.
107                / rts = 7 ;
108          format doEm doIm year4. ;
109          title1 ;

```

NOTE: There were 1912979 observations read from the data set DMDAT.XDK.
 NOTE: The PROCEDURE TABULATE printed pages 5-7.
 NOTE: PROCEDURE TABULATE used (Total process time):
 real time 0.39 seconds
 cpu time 1.00 seconds

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414
 NOTE: The SAS System used:
 real time 1:57.08
 cpu time 44.06 seconds

4.4.1 00-base.lst

The total population contributing between '01JAN1996'd and '31DEC2018'd 1
 14:53 Saturday, April 18, 2020

The CONTENTS Procedure

Data Set Name	DMDAT.POP	Observations	7631979
Member Type	DATA	Variables	6
Engine	V9	Indexes	0
Created	18/04/2020 14:54:57	Observation Length	48
Last Modified	18/04/2020 14:54:57	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Total population 1996-2018 incl.		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	5608
First Data Page	*
Max Obs per Page	1361
Obs in First Data Page	1325
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\pop.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	351MB
File Size (bytes)	367591424

Variables in Creation Order

#	Variable	Type	Len	Format	Informat	Label
1	pnr	Char	12	\$12.	\$10.	person id
2	doBth	Num	8			date of birth
3	sex	Num	8			sex
4	whBth	Char	5			place of birth DK/We/nW
5	doDth	Num	8			date of death
6	dSrc	Char	5			source of doDth

14:53 Saturday, April 18, 2020 2

source of doDth				
	cod01	cod17	cpr	none
	N	N	N	N

All	350,593	860,412	62,498	6,358,476
date of birth				
1884	*	.	.	.
1888	*	.	.	.
1889	5	.	.	.
1890	16	.	.	.
1891	13	.	.	.
1892	30	.	.	.
1893	60	*	.	.
1894	99	*	.	.
1895	192	6	*	.
1896	303	10	.	.

1897	454	29	*	.
1898	683	39	*	*
1899	1,011	79	*	.
1900	1,496	109	.	.
1901	2,079	275	*	*
1902	2,820	415	*	.
1903	3,469	636	8	*
1904	4,511	1,007	11	*
1905	5,305	1,429	10	6
1906	6,424	2,028	23	*
1907	7,376	2,741	28	6
1908	8,475	4,012	25	13
1909	9,686	5,124	29	13
1910	10,305	6,578	32	31
1911	10,791	8,043	46	15
1912	11,504	9,907	54	49
1913	11,844	11,628	63	54
1914	11,817	13,375	86	96
1915	11,384	14,421	126	140
1916	11,355	16,399	176	222
1917	11,313	17,859	223	306
1918	11,428	20,179	311	510
1919	10,682	20,871	443	828
1920	11,917	25,852	647	1,297
1921	11,238	26,297	820	1,829
1922	10,220	25,809	855	2,294
1923	10,134	27,036	1,121	3,309
1924	9,470	27,769	1,291	4,461
1925	8,589	27,362	1,436	5,668
1926	8,296	26,822	1,634	7,105
1927	7,589	25,951	1,742	8,381
1928	7,219	26,093	1,905	10,263
1929	6,621	24,572	1,913	11,711
1930	6,383	24,511	1,928	13,683
1931	5,898	23,105	1,966	15,519
1932	5,497	22,201	1,923	17,847
1933	4,967	20,658	1,922	20,117
1934	4,772	20,585	1,908	22,916
1935	4,345	19,452	1,981	25,520
1936	4,090	18,666	1,881	28,908
1937	3,807	17,509	1,894	32,353
1938	3,512	16,935	1,772	35,271
1939	3,302	15,574	1,656	37,569
1940	3,025	15,043	1,707	41,083
1941	2,914	14,521	1,628	43,728
1942	3,057	15,019	1,686	50,799
1943	2,914	14,897	1,746	55,461
1944	2,936	15,176	1,691	61,705
1945	2,824	14,594	1,636	66,604
1946	2,437	13,754	1,463	70,665
1947	2,240	12,047	1,420	69,891
1948	1,979	10,527	1,232	66,857
1949	1,712	9,484	1,130	64,411
1950	1,583	8,834	1,036	65,788
1951	1,389	8,060	937	64,629
1952	1,382	7,609	902	66,470
1953	1,289	7,243	817	68,563
1954	1,180	6,593	755	68,212
1955	1,043	6,128	737	70,332
1956	899	5,602	667	72,163
1957	855	4,980	584	72,465
1958	787	4,453	583	73,748
1959	677	4,205	537	73,998
1960	620	3,836	486	77,979
1961	591	3,399	429	78,648
1962	525	3,066	410	81,720
1963	546	2,973	426	87,082
1964	478	2,682	327	89,710
1965	465	2,488	318	92,428
1966	433	2,319	304	96,216

1967	393	1,931	264	90,909
1968	302	1,612	242	86,301
1969	296	1,419	175	84,050
1970	277	1,237	208	85,132
1971	253	1,238	161	89,090
1972	274	1,032	133	91,292
1973	262	951	142	88,521
1974	252	846	120	89,485
1975	202	840	112	91,318
1976	204	673	100	85,722
1977	203	646	106	84,170
1978	211	625	94	85,506
1979	183	564	84	84,796
1980	176	482	63	84,545
1981	137	437	69	81,226
1982	131	434	58	82,384
1983	72	404	60	81,778
1984	79	421	65	83,641
1985	60	411	61	86,434
1986	71	368	54	88,779
1987	47	337	48	89,423
1988	45	350	47	92,442
1989	47	321	48	93,727
1990	42	329	44	95,123
1991	50	300	33	93,842
1992	66	242	41	94,888
1993	57	217	33	92,142
1994	83	210	23	93,031
1995	143	174	30	90,301
1996	119	150	19	84,978
1997	92	121	30	82,216
1998	68	117	28	77,933
1999	72	125	31	75,228
2000	45	129	19	74,448
2001	.	158	23	71,913
2002	.	127	18	70,448
2003	.	118	10	70,638
2004	.	85	7	70,630
2005	.	111	*	70,474
2006	.	90	4	71,449
2007	.	91	5	70,566
2008	.	76	6	71,557
2009	.	59	10	69,085
2010	.	78	8	69,314
2011	.	50	5	64,431
2012	.	48	5	63,060
2013	.	33	4	60,433
2014	.	40	*	60,827
2015	.	37	7	61,196
2016	.	25	13	63,784
2017	.	.	29	62,621
2018	.	.	.	61,573
date of death	.	.	.	6,358,476
1996	60,658	.	9	.
1997	59,531	.	10	.
1998	57,763	.	386	.
1999	58,442	.	445	.
2000	56,873	.	774	.
2001	57,326	.	692	.
2002	.	58,050	303	.
2003	.	57,055	297	.
2004	.	55,314	332	.
2005	.	54,388	329	.
2006	.	54,949	324	.
2007	.	55,018	335	.
2008	.	54,003	342	.
2009	.	54,324	349	.
2010	.	53,804	348	.
2011	.	51,997	313	.

2012	.	51,801	325	.
2013	.	51,981	291	.
2014	.	50,758	338	.
2015	.	51,993	319	.
2016	.	52,278	323	.
2017	.	52,699	310	.
2018	.	.	55,004	.

14:53 Saturday, April 18, 2020 3

place of birth DK/We/nW			
	DK	West	non-W
	N	N	N

All	6,367,307	585,098	679,574
date of birth			
1884	*	.	.
1888	*	.	.
1889	4	*	.
1890	15	*	.
1891	13	.	.
1892	30	.	.
1893	60	*	.
1894	100	*	.
1895	189	10	.
1896	301	8	4
1897	462	21	*
1898	696	27	*
1899	1,062	28	*
1900	1,551	47	7
1901	2,294	56	9
1902	3,147	83	7
1903	3,993	111	11
1904	5,376	141	15
1905	6,513	215	22
1906	8,196	244	38
1907	9,809	304	38
1908	12,159	325	41
1909	14,403	395	54
1910	16,420	447	79
1911	18,308	525	62
1912	20,838	583	93
1913	22,857	643	89
1914	24,637	622	115
1915	25,344	598	129
1916	27,457	562	133
1917	28,988	596	117
1918	31,642	660	126
1919	31,920	735	169
1920	38,572	863	278
1921	39,039	890	255
1922	37,968	907	303
1923	40,287	980	333
1924	41,590	992	409
1925	41,601	971	483
1926	42,349	1,023	485
1927	42,042	1,026	595
1928	43,741	1,159	580
1929	43,015	1,129	673
1930	44,536	1,123	846
1931	44,598	1,129	761
1932	45,450	1,158	860
1933	45,609	1,204	851
1934	47,999	1,317	865
1935	48,934	1,400	964
1936	51,059	1,520	966

1937	52,833	1,661	1,069
1938	54,577	1,804	1,109
1939	54,983	1,863	1,255
1940	57,453	1,984	1,421
1941	59,199	2,252	1,340
1942	66,784	2,323	1,454
1943	70,968	2,506	1,544
1944	76,928	2,905	1,675
1945	81,162	2,625	1,871
1946	83,549	2,826	1,944
1947	80,446	2,938	2,214
1948	75,262	3,030	2,303
1949	71,321	3,057	2,359
1950	71,474	3,110	2,657
1951	69,309	3,202	2,504
1952	70,068	3,263	3,032
1953	71,431	3,309	3,172
1954	69,920	3,289	3,531
1955	70,792	3,453	3,995
1956	71,302	3,653	4,376
1957	70,651	3,865	4,368
1958	70,633	4,004	4,934
1959	70,005	4,192	5,220
1960	72,220	4,411	6,290
1961	72,455	4,591	6,021
1962	74,012	4,816	6,893
1963	78,533	5,311	7,183
1964	79,795	5,593	7,809
1965	81,915	5,886	7,898
1966	84,995	6,247	8,030
1967	78,790	6,672	8,035
1968	72,452	7,056	8,949
1969	69,705	7,330	8,905
1970	69,630	7,628	9,596
1971	74,029	8,161	8,552
1972	74,441	8,777	9,513
1973	70,714	9,251	9,911
1974	70,356	9,848	10,499
1975	71,412	10,346	10,714
1976	64,854	10,750	11,095
1977	61,566	11,834	11,725
1978	61,511	12,212	12,713
1979	58,954	13,311	13,362
1980	56,901	13,747	14,618
1981	52,761	14,090	15,018
1982	52,579	14,541	15,887
1983	50,759	15,217	16,338
1984	51,616	15,917	16,673
1985	53,623	16,455	16,888
1986	54,852	17,508	16,912
1987	55,257	17,455	17,143
1988	57,940	17,953	16,991
1989	60,224	17,790	16,129
1990	62,256	17,914	15,368
1991	62,679	17,065	14,481
1992	65,606	15,873	13,758
1993	65,087	14,737	12,625
1994	67,395	13,504	12,448
1995	67,131	12,030	11,487
1996	64,549	9,929	10,788
1997	63,901	8,197	10,361
1998	62,640	6,015	9,491
1999	62,218	4,179	9,059
2000	62,772	2,818	9,051
2001	60,974	2,571	8,549
2002	59,891	2,452	8,250
2003	60,411	2,373	7,982
2004	60,680	2,338	7,704
2005	60,711	2,357	7,519
2006	61,569	2,489	7,485

2007	60,628	2,506	7,528
2008	61,355	2,694	7,590
2009	59,009	2,732	7,413
2010	59,027	2,790	7,583
2011	54,411	2,765	7,310
2012	53,056	2,854	7,203
2013	50,601	2,801	7,068
2014	50,825	2,921	7,123
2015	51,514	2,920	6,806
2016	53,766	3,056	7,000
2017	53,005	2,866	6,779
2018	52,563	2,753	6,257
date of death			
.	5,140,878	554,749	662,849
1996	58,913	1,285	469
1997	57,740	1,343	458
1998	56,285	1,382	482
1999	56,949	1,369	569
2000	55,735	1,367	545
2001	56,044	1,338	636
2002	56,468	1,297	588
2003	55,393	1,277	682
2004	53,725	1,237	684
2005	52,793	1,246	678
2006	53,264	1,278	731
2007	53,375	1,281	697
2008	52,367	1,272	706
2009	52,577	1,317	779
2010	52,136	1,261	755
2011	50,267	1,256	787
2012	50,006	1,311	809
2013	50,147	1,278	847
2014	48,924	1,293	879
2015	50,060	1,355	897
2016	50,220	1,392	989
2017	50,631	1,412	966
2018	52,410	1,502	1,092

Person-time spent outside of DK: doEM < doIm

14:53 Saturday, April 18, 2020 4

The CONTENTS Procedure

Data Set Name	DMDAT.XDK	Observations	1912979
Member Type	DATA	Variables	*
Engine	V9	Indexes	0
Created	18/04/2020 14:55:08	Observation Length	32
Last Modified	18/04/2020 14:55:08	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Periods spent outside DK: doEm < doIm		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	939
First Data Page	*
Max Obs per Page	2039
Obs in First Data Page	1996
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\xdk.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	59MB
File Size (bytes)	61603840

(Continued)

14:53 Saturday, April 18, 2020 7

	doIm				
	2014	2015	2016	2017	2018
	N	N	N	N	N
All	79,399	91,028	85,472	80,450	75,939
doEm	55,690	66,807	61,369	56,265	52,386
.
1969	.	.	.	.	.
1970	.	.	.	.	.
1971	.	.	.	.	.
1972	.	*	.	*	*
1973	9	14	10	9	10
1974	19	15	15	16	15
1975	23	15	11	19	21
1976	10	10	11	10	16
1977	11	15	13	15	7
1978	14	19	20	11	9
1979	25	19	20	9	11
1980	25	35	22	19	14
1981	28	11	35	27	21
1982	28	15	14	19	25
1983	25	27	21	31	25
1984	34	23	26	18	33
1985	30	28	38	37	27
1986	16	18	29	30	18
1987	27	26	28	29	21
1988	38	30	21	30	24
1989	42	43	23	18	33
1990	35	31	27	18	31
1991	42	30	37	23	30
1992	40	42	29	34	42
1993	53	34	39	37	38
1994	71	58	53	51	44
1995	63	67	52	55	51
1996	81	109	78	56	53
1997	117	81	94	83	73
1998	117	113	111	100	82
1999	134	122	132	115	110
2000	171	168	132	129	132
2001	201	191	161	161	133
2002	239	217	197	158	163
2003	258	230	191	207	193
2004	333	326	248	255	202
2005	397	382	351	270	265
2006	511	491	419	337	273
2007	637	505	503	431	336
2008	757	648	459	437	335
2009	984	741	565	556	324
2010	1,281	954	738	537	475
2011	2,030	1,340	987	711	564
2012	3,405	1,988	1,344	924	700
2013	7,756	3,383	2,039	1,346	908
2014	3,592	7,950	3,126	1,953	1,301
2015	.	3,656	8,039	3,180	2,014
2016	.	.	3,595	8,021	3,202
2017	.	.	.	3,652	7,776
2018	.	.	.	.	3,372

4.5 01-npr

Processes the records from the NPR, and produces records with GDM diagnoses and PCOS diagnoses.

Persons cannot enter on any criterion in a 365 days grace period after each GDM diagnosis. GDM diagnoses occurring within 200 days of another one is not counted, though. Thus all GDM diagnoses in the same person are at least 200 days apart.

Outputs the earliest NPR diagnosis clear of GDM and PCOS, and derives a tentative T1/T2 classification in the variable `nprtyp`.

```
1                                     "Program: 01-npr.sas"          14:23 Friday, April 17, 2020
```

```
NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.
```

```
NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)  
      Licensed to FORSKNING 2, Site 50800723.
```

```
NOTE: This session is executing on the X64_SR12R2 platform.
```

```
NOTE: Updated analytical products:
```

```
      SAS/STAT 14.3
```

```
NOTE: Additional host information:
```

```
      X64_SR12R2 WIN 6.3.9600 Server
```

```
NOTE: SAS initialization used:
```

```
      real time      0.08 seconds  
      cpu time       0.12 seconds
```

```
NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.
```

```
NOTE: AUTOEXEC processing completed.
```

```
1      * read the NPR datasets in the two different formats and combine them ;  
2      %macro mold ;  
3      data all_npr1977_93 ;  
4          set %do i = 1977 %to 1993 ;  
5              grund.lpr_adm&i. (keep = pnr recnum c_adiag d_inddto )  
6              %end ; ;  
7      * the ICD-8 codes incl. GDM / PCOS ;  
8      if c_adiag in('24900','24901','24902','24903','24904',  
9                  '24905','24906','24907','24908','24909',  
10                 '25000','25001','25002','25003','25004',  
11                 '25005','25006','25007','25008','25009',  
12                 '63474','Y6449','61520','61521') ;  
13      if substr(c_adiag,1,3) eq '249' then nprtyp = 'T1' ;  
14      if substr(c_adiag,1,3) eq '250' then nprtyp = 'T2' ;  
15      run ;  
16      %mend ;  
17      %mold ;
```

```
NOTE: There were 805332 observations read from the data set GRUND.LPR_ADM1977.
```

```
NOTE: There were 867531 observations read from the data set GRUND.LPR_ADM1978.
```

```
NOTE: There were 882896 observations read from the data set GRUND.LPR_ADM1979.
```

```
NOTE: There were 889120 observations read from the data set GRUND.LPR_ADM1980.
```

```
NOTE: There were 883805 observations read from the data set GRUND.LPR_ADM1981.
```

```
NOTE: There were 910878 observations read from the data set GRUND.LPR_ADM1982.
```

```
NOTE: There were 938875 observations read from the data set GRUND.LPR_ADM1983.
```

```
NOTE: There were 953048 observations read from the data set GRUND.LPR_ADM1984.
```

```
NOTE: There were 971292 observations read from the data set GRUND.LPR_ADM1985.
```

```
NOTE: There were 992916 observations read from the data set GRUND.LPR_ADM1986.
```

```
NOTE: There were 1007181 observations read from the data set GRUND.LPR_ADM1987.
```

```
NOTE: There were 1032422 observations read from the data set GRUND.LPR_ADM1988.
NOTE: There were 1042588 observations read from the data set GRUND.LPR_ADM1989.
NOTE: There were 1049307 observations read from the data set GRUND.LPR_ADM1990.
NOTE: There were 1044150 observations read from the data set GRUND.LPR_ADM1991.
NOTE: There were 1064970 observations read from the data set GRUND.LPR_ADM1992.
NOTE: There were 1078440 observations read from the data set GRUND.LPR_ADM1993.
NOTE: The data set WORK.ALL_NPR1977_93 has 238421 observations and 5 variables.
NOTE: DATA statement used (Total process time):
      real time          14.27 seconds
      cpu time           1.70 seconds
```

```
18
19      %macro mnew ;
20      data all_npr1994_18 ;
21          set %do i = 1994 %to 2018 ;
22              grund.lpr_adm&i. (keep = pnr recnum c_adiag d_inddto )
23          %end ;
24          grund.uaf_adm2018 ;
25          * the ICD-10 codes incl GDM / PCOS ;
26          if substr(c_adiag,2,3) in ('E10','E11','E12','E13','E14','024') or
27              substr(c_adiag,2,4) in ('H360','E282') ;
28          if substr(c_adiag,2,3) eq 'E10' then nprtyp = 'T1' ;
29          if substr(c_adiag,2,3) eq 'E11' then nprtyp = 'T2' ;
30      run ;
31      %mend ;
32      %mnew ;
```

```
NOTE: There were 2259996 observations read from the data set GRUND.LPR_ADM1994.
NOTE: There were 3099974 observations read from the data set GRUND.LPR_ADM1995.
NOTE: There were 3292287 observations read from the data set GRUND.LPR_ADM1996.
NOTE: There were 3381783 observations read from the data set GRUND.LPR_ADM1997.
NOTE: There were 3465660 observations read from the data set GRUND.LPR_ADM1998.
NOTE: There were 3573247 observations read from the data set GRUND.LPR_ADM1999.
NOTE: There were 3617984 observations read from the data set GRUND.LPR_ADM2000.
NOTE: There were 3908224 observations read from the data set GRUND.LPR_ADM2001.
NOTE: There were 4593785 observations read from the data set GRUND.LPR_ADM2002.
NOTE: There were 4630303 observations read from the data set GRUND.LPR_ADM2003.
NOTE: There were 4770380 observations read from the data set GRUND.LPR_ADM2004.
NOTE: There were 4970849 observations read from the data set GRUND.LPR_ADM2005.
NOTE: There were 5148038 observations read from the data set GRUND.LPR_ADM2006.
NOTE: There were 5176587 observations read from the data set GRUND.LPR_ADM2007.
NOTE: There were 5467668 observations read from the data set GRUND.LPR_ADM2008.
NOTE: There were 5892674 observations read from the data set GRUND.LPR_ADM2009.
NOTE: There were 5906779 observations read from the data set GRUND.LPR_ADM2010.
NOTE: There were 6204786 observations read from the data set GRUND.LPR_ADM2011.
NOTE: There were 6127472 observations read from the data set GRUND.LPR_ADM2012.
NOTE: There were 6329051 observations read from the data set GRUND.LPR_ADM2013.
NOTE: There were 6495594 observations read from the data set GRUND.LPR_ADM2014.
NOTE: There were 6927895 observations read from the data set GRUND.LPR_ADM2015.
NOTE: There were 6852448 observations read from the data set GRUND.LPR_ADM2016.
NOTE: There were 6857872 observations read from the data set GRUND.LPR_ADM2017.
NOTE: There were 6707411 observations read from the data set GRUND.LPR_ADM2018.
NOTE: There were 1977489 observations read from the data set GRUND.UAF_ADM2018.
NOTE: The data set WORK.ALL_NPR1994_18 has 1145705 observations and 13 variables.
NOTE: DATA statement used (Total process time):
      real time          2:13.13
      cpu time           16.92 seconds
```

```
33
34      * c_adiag has length 6 in the old data (1977-93) but length 10
35      in the new data (1994-18), so the data set with the longer
36      variable length must be mentioned first in order to avoid
37      truncation ;
38      data all_npr ;
39          set all_npr1994_18
40              all_npr1977_93 ;
41      run ;
```

NOTE: There were 1145705 observations read from the data set WORK.ALL_NPR1994_18.
 NOTE: There were 238421 observations read from the data set WORK.ALL_NPR1977_93.
 NOTE: The data set WORK.ALL_NPR has 1384126 observations and 13 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.33 seconds
 cpu time 0.29 seconds

```
42           proc sort data = all_npr ; by pnr d_inddto ; run ;
```

NOTE: There were 1384126 observations read from the data set WORK.ALL_NPR.
 NOTE: The data set WORK.ALL_NPR has 1384126 observations and 13 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.54 seconds
 cpu time 0.84 seconds

```
43
44           *-----;
45           * only records from persons in the base population -
46           GDM & PCOS diagnoses are put in separate files ;
47           data DM
48            gdm
49            pcos ;
50            merge all_npr   ( in = npr )
51            DMdat.pop   ( in = pop ) ;
52            by pnr ;
53            length diaggr $ 4 ;
54            if npr and pop ;
55            * GDM / PCOS (excluding men) ;
56            if substr(c_adiag,2,4) in('0244','0249') or
57            c_adiag            in('63474','Y6449')
58            then do ;
59            if sex eq 2 then diaggr = 'GDM' ; else delete ;
60            end ;
61            else
62            if substr(c_adiag,2,4) in('E282'               ) or
63            c_adiag            in('61520','61521')
64            then do ;
65            if sex eq 2 then diaggr = 'PCOS' ; else delete ;
66            end ;
67            else
68            diaggr = 'DM' ;
69            if diaggr eq 'DM' then output DM ;
70            if diaggr eq 'GDM' then output gdm ;
71            if diaggr eq 'PCOS' then output pcos ;
72            run ;
```

NOTE: There were 1384126 observations read from the data set WORK.ALL_NPR.
 NOTE: There were 7632139 observations read from the data set DMDAT.POP.
 NOTE: The data set WORK.DM has 1184249 observations and 19 variables.
 NOTE: The data set WORK.GDM has 42219 observations and 19 variables.
 NOTE: The data set WORK.PCOS has 31162 observations and 19 variables.
 NOTE: DATA statement used (Total process time):
 real time 7.57 seconds
 cpu time 1.79 seconds

```
73
74           *-----;
75           title1 'PCOS: id and first date of PCOS' ;
76           proc sort data = pcos ; by pnr d_inddto ; run ;
```

NOTE: There were 31162 observations read from the data set WORK.PCOS.
 NOTE: The data set WORK.PCOS has 31162 observations and 19 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.02 seconds
 cpu time 0.00 seconds

```

77      data DMdat.pcos ( keep = pnr doPCOS c_adiag ) ;
78          set pcos ;
79          by pnr d_inddto ;
80          if first.pnr ;
81          doPCOS = d_inddto ;
82      run ;

```

NOTE: There were 31162 observations read from the data set WORK.PCOS.
NOTE: The data set DMDAT.PCOS has 22842 observations and 3 variables.
NOTE: DATA statement used (Total process time):

real time	0.14 seconds
cpu time	0.00 seconds

```

83
84      proc contents data = DMdat.pcos ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):

real time	0.03 seconds
cpu time	0.04 seconds

NOTE: The PROCEDURE CONTENTS printed page 1.

```

85      proc tabulate data = DMdat.pcos missing noseps ;
86          class doPCOS c_adiag ;
87          table c_adiag, n * f=comma9.
88              / rts = 80 ;
89          table doPCOS, n * f=comma9.
90              / rts = 8 ;
91          format doPCOS year4.
92              c_adiag $icdAll_L1L1_KT. ;
93      run ;

```

NOTE: There were 22842 observations read from the data set DMDAT.PCOS.
NOTE: The PROCEDURE TABULATE printed pages 2-3.
NOTE: PROCEDURE TABULATE used (Total process time):

real time	0.57 seconds
cpu time	0.09 seconds

```

94
95      title1 'First date of PCOS > 2015' ;
96      proc tabulate data = DMdat.pcos missing noseps ;
97          where doPCOS ge '01JAN2015'd ;
98          class doPCOS ;
99          table doPCOS, n * f=comma10.
100             / rts = 10 ;
101          format doPCOS yymms8. ;
102      run ;

```

NOTE: There were 2779 observations read from the data set DMDAT.PCOS.
WHERE doPCOS>='01JAN2015'D;
NOTE: The PROCEDURE TABULATE printed page 4.
NOTE: PROCEDURE TABULATE used (Total process time):

real time	0.01 seconds
cpu time	0.01 seconds

```

103
104      *-----;
105      title1 'GDM records - id and any date of GDM' ;
106      proc tabulate data = gdm (rename = (d_inddto=doGDM)) missing noseps ;
107          class doGDM c_adiag ;
108          table c_adiag, n * f=comma9.
109              / rts = 80 ;
110          table doGDM, n * f=comma9.
111              / rts = 8 ;
112          format doGDM year4.
113              c_adiag $icdAll_L1L1_KT. ;
114      run ;

```

NOTE: There were 42219 observations read from the data set WORK.GDM.
 NOTE: The PROCEDURE TABULATE printed pages 5-6.
 NOTE: PROCEDURE TABULATE used (Total process time):
 real time 0.07 seconds
 cpu time 0.09 seconds

```
115
116     title1 'GDM records - id and any date of GDM except if too close' ;
117     proc sort data = gdm ; by pnr d_inddto ; run ;
```

NOTE: There were 42219 observations read from the data set WORK.GDM.
 NOTE: The data set WORK.GDM has 42219 observations and 19 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.03 seconds
 cpu time 0.01 seconds

```
118     data gdm ( keep = pnr doGDM dno c_adiag ) ;
119     set gdm ( rename = ( d_inddto = doGDM ) ) ;
120     by pnr doGDM ;
121     retain prevGDM ;
122     if first.pnr then do ;
123         dno = 1 ;
124         prevGDM = doGDM ;
125         output ;
126     end ;
127     if ^first.pnr and ( doGDM - prevGDM ) gt &gdmint. then do ;
128         dno + 1 ;
129         output ;
130         prevGDM = doGDM ;
131     end ;
132     run ;
```

NOTE: There were 42219 observations read from the data set WORK.GDM.
 NOTE: The data set WORK.GDM has 27128 observations and 4 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.02 seconds
 cpu time 0.01 seconds

```
133
134     proc transpose data = gdm
135         out = DMdat.gdm ( drop = _NAME_ _LABEL_ )
136         prefix = doGDM ;
137     by pnr ;
138     var doGDM ;
139     id dno ;
140     run ;
```

NOTE: There were 27128 observations read from the data set WORK.GDM.
 NOTE: The data set DMDAT.GDM has 22391 observations and 12 variables.
 NOTE: PROCEDURE TRANSPOSE used (Total process time):
 real time 0.08 seconds
 cpu time 0.04 seconds

```
141
142     %let doGDMn = doGDM2 doGDM3 doGDM4 doGDM5 doGDM6 doGDM7 doGDM8 doGDM9 doGDM10
142     ! doGDM11 ;
143     title 'The recorded dates of Gestational diabetes' ;
144     proc contents data = DMdat.gdm ; run ;
```

NOTE: PROCEDURE CONTENTS used (Total process time):
 real time 0.00 seconds
 cpu time 0.01 seconds

NOTE: The PROCEDURE CONTENTS printed page 7.


```

145     proc tabulate data = DMdat.gdm missing noseps ;
146         class doGDM1 ;
147         var &doGDMn. ;
148         table doGDM1 all &doGDMn.,
149             n * f=comma10. / rts=9 ;
150         format doGDM1 year4. ;
151     run ;

```

NOTE: There were 22391 observations read from the data set DMDAT.GDM.

NOTE: The PROCEDURE TABULATE printed page 8.

NOTE: PROCEDURE TABULATE used (Total process time):

```

real time      0.03 seconds
cpu time       0.01 seconds

```

```

152
153     title1 'First date of GDM > 2015' ;
154     proc tabulate data = DMdat.gdm missing noseps ;
155         where doGDM1 ge '01JAN2015'd ;
156         class doGDM1 ;
157         var &doGDMn. ;
158         table doGDM1 all &doGDMn.,
159             n * f=comma10. / rts=9 ;
160         format doGDM1 yymms7. ;
161     run ;

```

NOTE: There were 5387 observations read from the data set DMDAT.GDM.

WHERE doGDM1>='01JAN2015'D;

NOTE: The PROCEDURE TABULATE printed page 9.

NOTE: PROCEDURE TABULATE used (Total process time):

```

real time      0.02 seconds
cpu time       0.01 seconds

```

```

162     title1 ;
163
164     *-----;
165     title1 'DM diagnoses from NPR (no. of records)' ;
166     proc tabulate data = DM missing noseps ;
167         class c_adiag nprtyp d_inddto ;
168         table all c_adiag, nprtyp * f=comma7.
169             / rts = 65 ;
170         table all d_inddto, nprtyp * ( n * f=comma9.
171             pctn<nprtyp> * f=5.1 )
172             / rts = 10 ;
173         format c_adiag $icdAll_L1L1_KT.
174             d_inddto year4. ;
175     run ;

```

NOTE: There were 1184249 observations read from the data set WORK.DM.

NOTE: The PROCEDURE TABULATE printed pages 10-11.

NOTE: PROCEDURE TABULATE used (Total process time):

```

real time      0.36 seconds
cpu time       0.64 seconds

```

```

176     title1 ;
177
178     *-----;
179     * Excluding NPR-records in the GDM windows ;
180     options mprint ;
181     data npr ( keep = pnr sex d_inddto nprtyp c_adiag ) ;
182         merge DM ( in = DM )
183             DMdat.gdm ;
184     by pnr ;
185     if DM ;
186     * Do not count NPR diagnoses in window around GDM ;
187     %xgdm( d_inddto ) ;
MPRINT(XGDM):   if ( doGDM1 - 30 ) < d_inddto < ( doGDM1 + 365 ) then delete ;
MPRINT(XGDM):   if ( doGDM2 - 30 ) < d_inddto < ( doGDM2 + 365 ) then delete ;

```

```

MPRINT(XGDM):  if ( doGDM3 - 30 ) < d_inddto < ( doGDM3 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM4 - 30 ) < d_inddto < ( doGDM4 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM5 - 30 ) < d_inddto < ( doGDM5 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM6 - 30 ) < d_inddto < ( doGDM6 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM7 - 30 ) < d_inddto < ( doGDM7 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM8 - 30 ) < d_inddto < ( doGDM8 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM9 - 30 ) < d_inddto < ( doGDM9 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM10 - 30 ) < d_inddto < ( doGDM10 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM11 - 30 ) < d_inddto < ( doGDM11 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM12 - 30 ) < d_inddto < ( doGDM12 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM13 - 30 ) < d_inddto < ( doGDM13 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM14 - 30 ) < d_inddto < ( doGDM14 + 365 ) then delete ;
MPRINT(XGDM):  if ( doGDM15 - 30 ) < d_inddto < ( doGDM15 + 365 ) then delete ;
188      run ;

```

NOTE: Variable doGDM12 is uninitialized.

NOTE: Variable doGDM13 is uninitialized.

NOTE: Variable doGDM14 is uninitialized.

NOTE: Variable doGDM15 is uninitialized.

NOTE: Missing values were generated as a result of performing an operation on missing values.

Each place is given by: (Number of times) at (Line):(Column).

```

1156358 at 187:18  1156358 at 187:54  1175527 at 187:20  1175527 at 187:56
1179482 at 187:20  1179482 at 187:56  1180219 at 187:20  1180219 at 187:56
1180327 at 187:20  1180327 at 187:56  1180381 at 187:20  1180381 at 187:56
1180400 at 187:20  1180400 at 187:56  1180400 at 187:20  1180400 at 187:56
1180405 at 187:20  1180405 at 187:56  1180405 at 187:20  1180405 at 187:56
1180405 at 187:20  1180405 at 187:56  1180407 at 187:20  1180407 at 187:56
1180407 at 187:20  1180407 at 187:56  1180407 at 187:20  1180407 at 187:56
1180407 at 187:20  1180407 at 187:56

```

NOTE: There were 1184249 observations read from the data set WORK.DM.

NOTE: There were 22391 observations read from the data set DMDAT.GDM.

NOTE: The data set WORK.NPR has 1180407 observations and 5 variables.

NOTE: DATA statement used (Total process time):

```

real time      4.26 seconds
cpu time       4.07 seconds

```

```

189      options nomprint ;
190
191      * NPR dates of first and second contact ;
192      data npr1 ( keep = pnr doNPR )
193          npr2 ( keep = pnr doNPR
194              rename = ( doNPR = doNPR2 ) ) ;
195      set npr ( keep = pnr d_inddto
196             rename = ( d_inddto = doNPR ) ) ;
197      by pnr ;
198      if first.pnr then nprN = 0 ;
199      nprN + 1 ;
200      if first.pnr then output npr1 ;
201      if nprN eq 2 then output npr2 ;
202      run ;

```

NOTE: There were 1180407 observations read from the data set WORK.NPR.

NOTE: The data set WORK.NPR1 has 243939 observations and 2 variables.

NOTE: The data set WORK.NPR2 has 173127 observations and 2 variables.

NOTE: DATA statement used (Total process time):

```

real time      0.20 seconds
cpu time       0.12 seconds

```

```

203
204      * Classifiy persons according to the most frequently occurring type ;
205      data DMdat.npr ;
206      merge npr npr1 npr2 ;
207      by pnr ;
208      retain nT1 nT2 nRc ;
209      if first.pnr then do ;
210          nT1 = 0 ;
211          nT2 = 0 ;

```

```

212         nRc = 0 ;
213         end ;
214         nT1 + ( nprtyp eq 'T1' ) ;
215         nT2 + ( nprtyp eq 'T2' ) ;
216         nRc + 1 ;
217         * If more than half of records agree on one type ;
218         if last.pnr then do ;
219             if nRc < (nT1+nT2) then put "This should never print" ;
220             nprtyp = 'NA' ;
221             if nT1 > nRc/2 then nprtyp = 'T1' ;
222             if nT2 > nRc/2 then nprtyp = 'T2' ;
223             output ;
224         end ;
225         label doNPR = ' '
226             doNPR2 = ' ' ;
227         format doNPR doNPR2 year4. ;
228     run ;

```

NOTE: There were 1180407 observations read from the data set WORK.NPR.
NOTE: There were 243939 observations read from the data set WORK.NPR1.
NOTE: There were 173127 observations read from the data set WORK.NPR2.
NOTE: The data set DMDAT.NPR has 243939 observations and 10 variables.
NOTE: DATA statement used (Total process time):
real time 0.39 seconds
cpu time 0.26 seconds

```

229
230         title1 'Diagnoses of DM accepted from NPR - persons' ;
231         proc contents data = DMdat.npr ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):
real time 0.00 seconds
cpu time 0.00 seconds

NOTE: The PROCEDURE CONTENTS printed page 12.

```

232
233         * Truncate at 12 records from npr ;
234         data xnpr ;
235         set DMdat.npr ;
236         nT1 = min( nT1, 12 ) ;
237         nT2 = min( nT2, 12 ) ;
238     run ;

```

NOTE: There were 243939 observations read from the data set DMDAT.NPR.
NOTE: The data set WORK.XNPR has 243939 observations and 10 variables.
NOTE: DATA statement used (Total process time):
real time 0.09 seconds
cpu time 0.06 seconds

```

239         proc tabulate data = xnpr missing noseps ;
240             class doNPR doNPR2 nprtyp sex nT1 nT2 ;
241             var nRc ;
242             table nT1 * nT2,
243                 nRc * ( min p25 p50 p75 max ) * f=4.
244                 ( all nprtyp ) * f=comma7.
245                 / rts = 7 ;
246             table all doNPR doNPR2,
247                 ( all sex nprtyp ) * f=comma10.
248                 / rts = 8 ;
249             format doNPR doNPR2 year4.
250                 sex koen_t. ;
251     run ;

```

NOTE: There were 243939 observations read from the data set WORK.XNPR.
NOTE: The PROCEDURE TABULATE printed pages 13-14.
NOTE: PROCEDURE TABULATE used (Total process time):
real time 0.18 seconds

cpu time 0.45 seconds

```

252
253     title2 '- only from 1 January 2015 - checking seasonality' ;
254     proc tabulate data = DMdat.npr missing noseps ;
255         where doNPR ge '01JAN2015'd ;
256         class doNPR nprtyp sex ;
257         table all doNPR,
258             ( all sex nprtyp ) * f=comma10.
259         / rts = 10 ;
260         format doNPR yymms8.
261             sex koen_t. ;
262     run ;

```

NOTE: There were 32418 observations read from the data set DMDAT.NPR.
 WHERE doNPR>='01JAN2015'D;
 NOTE: The PROCEDURE TABULATE printed page 15.
 NOTE: PROCEDURE TABULATE used (Total process time):
 real time 0.03 seconds
 cpu time 0.03 seconds

263 title1 ;

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414
 NOTE: The SAS System used:
 real time 2:42.78
 cpu time 27.81 seconds

4.5.1 01-npr.lst

PCOS: id and first date of PCOS

14:23 Friday, April 17, 2020 1

The CONTENTS Procedure

Data Set Name	DMDAT.PCOS	Observations	22842
Member Type	DATA	Variables	*
Engine	V9	Indexes	0
Created	17/04/2020 14:26:27	Observation Length	32
Last Modified	17/04/2020 14:26:27	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	12
First Data Page	*
Max Obs per Page	2039
Obs in First Data Page	1997
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\pcos.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	832KB
File Size (bytes)	851968

D0244D	Graviditet med gestationel diabetes	18,805
D0244E	Graviditet med insulinbehandlet gestationel diabetes	2,943
D0249	Graviditet, fødsel eller barsel med diabetes UNS	3,538
D0249A	Graviditet med diabetes UNS	51
D0249B	Fødsel med diabetes UNS	*
D0249C	Barsel med diabetes UNS	9
Y6449	DIABETES MELLITUS(GESTATIONS-)ANTEA	31

GDM records - id and any date of GDM

14:23 Friday, April 17, 2020 6

```

-----
N
-----
D_IND-
DT0
1987      60
1988     117
1989     130
1990     157
1991     128
1992     127
1993     207
1994     713
1995     686
1996    1,010
1997     839
1998     970
1999     780
2000     865
2001    1,097
2002    1,038
2003    1,265
2004    1,492
2005    1,602
2006    1,663
2007    1,894
2008    2,192
2009    2,400
2010    2,160
2011    2,132
2012    1,931
2013    2,467
2014    2,579
2015    3,006
2016    2,624
2017    1,845
2018    2,043
-----

```

The recorded dates of Gestational diabetes

14:23 Friday, April 17, 2020 7

The CONTENTS Procedure

Data Set Name	DMDAT.GDM	Observations	22391
Member Type	DATA	Variables	12
Engine	V9	Indexes	0
Created	17/04/2020 14:26:28	Observation Length	104
Last Modified	17/04/2020 14:26:28	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	36

```

First Data Page          *
Max Obs per Page        629
Obs in First Data Page  607
Number of Data Set Repairs 0
ExtendObsCounter        YES
Filename                 E:\workdata\707655\DMreg\data\gdm.sas7bdat
Release Created          9.0401M5
Host Created             X64_SR12R2
Owner Name               DSTFSE\FDIY7655
File Size                2MB
File Size (bytes)       2424832

```

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
*	PNR	Char	12	\$12.	\$10.	Personnummer
*	doGDM1	Num	8	DATE9.		
*	doGDM2	Num	8	DATE9.		
4	doGDM3	Num	8	DATE9.		
5	doGDM4	Num	8	DATE9.		
6	doGDM5	Num	8	DATE9.		
7	doGDM6	Num	8	DATE9.		
8	doGDM7	Num	8	DATE9.		
9	doGDM8	Num	8	DATE9.		
10	doGDM9	Num	8	DATE9.		
11	doGDM10	Num	8	DATE9.		
12	doGDM11	Num	8	DATE9.		

The recorded dates of Gestational diabetes

14:23 Friday, April 17, 2020 8

```

-----
              N
-----
doGDM1
1987          50
1988          81
1989         108
1990          94
1991          84
1992          87
1993         147
1994         377
1995         365
1996         550
1997         504
1998         532
1999         435
2000         464
2001         482
2002         490
2003         667
2004         821
2005         895
2006         921
2007         973
2008        1,093
2009        1,182
2010        1,058
2011        1,089
2012          968
2013        1,197
2014        1,290
2015        1,520
2016        1,340
2017        1,238
2018        1,289
All          22,391
doGDM2        3,932

```



```

doGDM3      622
doGDM4      122
doGDM5       34
doGDM6       15
doGDM7        6
doGDM8        *
doGDM9        *
doGDM10       *
doGDM11       *
-----

```

First date of GDM > 2015

14:23 Friday, April 17, 2020 9

```

-----
                N
-----
doGDM1
2015/01      142
2015/02      116
2015/03      117
2015/04       96
2015/05     109
2015/06     134
2015/07     127
2015/08     132
2015/09     112
2015/10     119
2015/11     188
2015/12     128
2016/01     155
2016/02     122
2016/03     117
2016/04     137
2016/05     157
2016/06     137
2016/07       99
2016/08       93
2016/09       83
2016/10       68
2016/11       86
2016/12       86
2017/01       94
2017/02       83
2017/03      124
2017/04       81
2017/05       97
2017/06      145
2017/07      106
2017/08      134
2017/09      104
2017/10       97
2017/11      104
2017/12       69
2018/01      102
2018/02       82
2018/03       95
2018/04       99
2018/05      118
2018/06      130
2018/07      120
2018/08      140
2018/09      108
2018/10      106
2018/11       96
2018/12       93
All          5,387
doGDM2       308
doGDM3        14
doGDM4         0
doGDM5         0

```

```

doGDM6      0
doGDM7      0
doGDM8      0
doGDM9      0
doGDM10     0
doGDM11     0
-----

```

DM diagnoses from NPR (no. of records)

14:23 Friday, April 17, 2020 10

	nprtyp		
	T1		T2
	N	N	N
All	193,372	409,057	581,820
C_ADIAG			
24900 DIABETES MELLITUS,INSULINO DEPENDENTE,SINE COMPLICATIONE	.	5,666	.
24901 CATARACTA,RETINOPATHIA DIABETICA INSULINO DEPENDENTE	.	2,064	.
24902 NEPHROPATHIA DIABETICA,SYNDR. KIMMELSTIEL- WILSON,INSUL.DEPEN.	.	308	.
24903 NEUROPATHIA,POLYNEURITIS DIABETICA,INSULINO DEPENDENTE	.	194	.
24904 ANGIOPATHIA DIABETICA EXTREMITATUM,INSULINO DEPENDENTE	.	78	.
24905 GANGRAENA DIABETICA, INSULINO DEPENDENTE	.	593	.
24906 COMA DIABETICUM SINE KETONURIA,INSULINO DEPENDENTE	.	65	.
24907 COMA(INCL.PRAECOMA)DIABETICUM,INSULINO DEPENDENTE	.	1,250	.
24908 DIABETES MELLITUS,INSULINO DEPENDENTE,CUM COMPL.ALIA DEFIN.	.	2,301	.
24909 DIABETES MELLITUS,INSULINO DEPENDENTE	.	19,728	.
25000 DIABETES MELLITUS,INSULINO INDEPENDENTE,SINE COMPLICATIONE	.	.	18,620
25001 CATARACTA,RETINOPATHIA DIABETICA,INSULINO INDEPENDENTE	.	.	3,674
25002 NEPHROPATHIA DIAB.,SYNDR.KIMMELSTIEL-WILSON,INSULINO INDEP	.	.	270
25003 NEUROPATHIA,POLYNEURITIS DIABETICA,INSULINO INDEPENDENTE	.	.	577
25004 ANGIOPATHIA DIABETICA EXTREMITATUM,INSULINO INDEPENDENTE	.	.	72
25005 GANGRAENA DIABETICA,INSULINO INDEPENDENTE	.	.	690
25006 COMA DIABETICUM SINE KETONURIA,INSULINO INDEPENDENTE	.	.	102
25007 COMA(INCL.PRAECOMA)DIABETICUM, INSULINO INDEPENDENTE	.	.	1,777
25008 DIABETES MELLITUS,INSULINO INDEPENDENTE,CUM COMPL.ALIA DEFI	.	.	4,364
25009 DIABETES MELLITUS, INSULINO INDEPENDENTE	.	.	43,306
DE10 Type 1-diabetes	.	1,313	.
DE100 Type 1-diabetes med koma	.	3,689	.
DE100A Coma diabeticum, hyperosmolær ved IDDM	.	23	.
DE100B Coma diabeticum ved IDDM med ketoacidose	.	391	.
DE100C Coma diabeticum ved IDDM uden ketoacidose	.	34	.
DE100D Coma diabeticum, hyperglykæmisk ved IDDM	.	85	.
DE100E Coma diabeticum, hypoglykæmisk ved IDDM	.	497	.
DE100F Diabetes mellitus insulino dependente med coma diabeticum	.	211	.
DE101 Type 1-diabetes med ketoacidose	.	23,435	.
DE102 Type 1-diabetes med nyrekomplikation	.	13,616	.
DE103 Type 1-diabetes med øjenkomplikation	.	21,980	.
DE104 Type 1-diabetes med neurologisk komplikation	.	7,788	.
DE105 Type 1-diabetes med komplikationer i perifere karsystem	.	14,181	.
DE105A Type 1-diabetes med perifer angiopati	.	275	.
DE105B Type 1-diabetes med fodsår	.	4,769	.
DE105C Type 1-diabetes med gangræn	.	1,355	.
DE105D Type 1-diabetes med mikroangiopati	.	61	.
DE106 Type 1-diabetes med anden komplikation	.	3,418	.
DE107 Type 1-diabetes med multiple komplikationer	.	33,078	.
DE108 Type 1-diabetes med komplikation UNS	.	35,863	.
DE109	.	*	.
DE109 Type 1-diabetes uden komplikationer	.	198,290	.
DE109A Type 1-diabetes UNS	.	12,457	.
DE11 Type 2-diabetes	.	.	825

DE110	Type 2-diabetes med koma	.	.	2,761
DE110A	Coma diabeticum ved NIDDM uden ketoacidose	.	.	21
DE110B	Coma diabeticum, hypoglykæmisk ved NIDDM	.	.	166
DE110C	Coma diabeticum, hyperosmolær ved NIDDM	.	.	54
DE110D	Coma diabeticum, hyperglykæmisk ved NIDDM	.	.	40
DE110E	Coma diabeticum ved NIDDM med ketoacidose	.	.	44
DE111	Type 2-diabetes med ketoacidose	.	.	2,191
DE112	Type 2-diabetes med nyrekomplikation	.	.	30,661
DE113	Type 2-diabetes med øjenkomplikation	.	.	12,407
DE114	Type 2-diabetes med neurologisk komplikation	.	.	18,842
DE115	Type 2-diabetes med komplikationer i perifere karsystem	.	.	19,347
DE115A	Type 2-diabetes med perifer angiopati	.	.	535
DE115B	Type 2-diabetes med fodsår	.	.	16,151
DE115C	Type 2-diabetes med gangræn	.	.	1,976
DE115D	Type 2-diabetes med mikroangiopati	.	.	132
DE116	Type 2-diabetes med anden komplikation	.	.	6,291
DE117	Type 2-diabetes med multiple komplikationer	.	.	39,372
DE118	Type 2-diabetes med komplikation UNS	.	.	57,685
DE119	Type 2-diabetes uden komplikationer	.	.	*
DE119A	Type 2-diabetes UNS	.	.	273,299
DE12	Diabetes forårsaget af underernæring	8	.	.
DE120	Diabetes forårsaget af underernæring med koma	220	.	.
DE120A	Coma diabeticum, hyperglykæmisk ved diab mell malnutritioni	10	.	.
DE120B	Coma diabeticum, hypoglykæmisk ved diab mell malnutritionis	10	.	.
DE120C	Coma diabeticum ved diab mell malnutrit med ketoacidose	*	.	.
DE121	Diabetes forårsaget af underernæring med ketoacidose	153	.	.
DE122	Diabetes forårsaget af underernæring med nyrekomplikation	102	.	.
DE123	Diabetes forårsaget af underernæring med øjenkomplikation	72	.	.
DE124	Diabetes f.a. underernæring med neurologisk komplikation	74	.	.
DE125	Diabetes f.a. underernæring med kompl. i perifere karsystem	385	.	.
DE125A	Diabetes forårsaget af underernæring med perifer angiopati	*	.	.
DE125B	Diabetes forårsaget af underernæring med fodsår	40	.	.
DE125C	Diabetes forårsaget af underernæring med gangræn	42	.	.
DE126	Diabetes forårsaget af underernæring med anden komplikation	37	.	.
DE127	Diabetes f.a. underernæring med multiple komplikationer	85	.	.
DE128	Diabetes forårsaget af underernæring med komplikation UNS	131	.	.
DE129	Diabetes forårsaget af underernæring uden komplikationer	263	.	.
DE13	Andre former for diabetes	46	.	.
DE130	Anden diabetes med koma	76	.	.
DE131	Anden diabetes med ketoacidose	669	.	.
DE132	Anden diabetes med nyrekomplikation	333	.	.
DE133	Anden diabetes med øjenkomplikationer	1,684	.	.
DE134	Anden diabetes med neurologisk komplikation	314	.	.
DE135	Anden diabetes med komplikationer i perifere karsystem	209	.	.
DE135A	Anden diabetes med perifer angiopati	7	.	.
DE135B	Anden diabetes med fodsår	307	.	.
DE135C	Anden diabetes med gangræn	70	.	.
DE135D	Anden diabetes med mikroangiopati	9	.	.
DE136	Anden diabetes med anden komplikation	227	.	.
DE137	Anden diabetes med multiple komplikationer	479	.	.
DE138	Anden diabetes med komplikation UNS	833	.	.
DE139	Anden diabetes uden komplikationer	5,986	.	.
DE14	Ikke spec. diabetes	377	.	.
DE140	Diabetes UNS med koma	724	.	.
DE140A	Coma diabeticum ved diabetes mellitus uden specifikation	55	.	.
DE140B	Coma diabeticum, hyperglykæmisk ved diab mell uden specifik	11	.	.
DE140C	Coma diabeticum, hyperosmolær ved diab mell uden specifik	19	.	.

DE140D	Coma diabeticum, hypoglykæmisk ved diab mell uden specifik	20	.	.
DE141	Diabetes UNS med ketoacidose	3,197	.	.
DE142	Diabetes UNS med nyrekomplikation	915	.	.
DE143	Diabetes UNS med øjenkomplikation	1,954	.	.
DE144	Diabetes UNS med neurologisk komplikation	3,916	.	.
DE145	Diabetes UNS med komplikationer i perifere karsystem	6,022	.	.
DE145A	Diabetes UNS med perifer angiopati	35	.	.
DE145B	Diabetes UNS med fodsår	4,321	.	.
DE145C	Diabetes UNS med gangræn	776	.	.
DE145D	Diabetes UNS med mikroangiopati	31	.	.
DE146	Diabetes UNS med anden komplikation	642	.	.
DE147	Diabetes UNS med multiple komplikationer	1,561	.	.
DE148	Diabetes UNS med komplikation UNS	6,324	.	.
DE149	Diabetes UNS uden komplikationer	36,378	.	.
DH360				
		*	.	.
DH360	Diabetisk retinopati UNS	78,642	.	.
DH360A	Retinopathia simplex IDDM	975	.	.
DH360B	Retinopathia proliferativa IDDM	2,242	.	.
DH360C	Retinopathia simplex NIDDM	1,193	.	.
DH360D	Retinopathia proliferativa NIDDM	1,160	.	.
DH360E	Maculopathia diabetica IDDM	965	.	.
DH360F	Maculopathia diabetica NIDDM	1,978	.	.
DH360H	Simpel diabetisk retinopati	3,079	.	.
DH360J	Proliferativ diabetisk retinopati	4,081	.	.
DH360K	Diabetisk makulopati	6,027	.	.
D024	Diabetes under graviditet, fødsel og barsel	*	.	.
D0240	Graviditet, fødsel el. barsel m. forud best. type 1-diabetes	4,961	.	.
D0240A	Graviditet med forud bestående type 1-diabetes	3,790	.	.
D0240B	Fødsel med forud bestående type 1-diabetes	30	.	.
D0240C	Barsel med forud bestående type 1-diabetes	18	.	.
D0241	Graviditet, fødsel el. barsel m. forud best. type 2-diabetes	759	.	.
D0241A	Graviditet med forud bestående type 2-diabetes	1,677	.	.
D0241B	Fødsel med forud bestående type 2-diabetes	*	.	.
D0241C	Barsel med forud bestående type 2-diabetes	*	.	.
D0242	Gravid., fødsel eller barsel med diabetes f.a. underernæring	32	.	.
D0242A	Graviditet med forud bestående diabetes f.a. underernæring	*	.	.
D0243	Gravid., fødsel el. barsel med forud bestående diabetes UNS	1,534	.	.
D0243A	Graviditet med forud bestående diabetes UNS	31	.	.
D0243C	Barsel med forud bestående diabetes UNS	4	.	.
D0245	Nyopdaget manifest diabetes i graviditeten	20	.	.

DM diagnoses from NPR (no. of records)

14:23 Friday, April 17, 2020 11

nprtyp						

T1						
T2						

	N	PctN	N	PctN	N	PctN

All	193,372	16.3	409,057	34.5	581,820	49.1
D_INDDTO						
1941	.	.	* 100.0	.	.	.
1968	.	.	* 100.0	.	.	.
1970	.	.	* 100.0	.	.	.
1971	.	.	* 100.0	.	.	.
1972	.	.	8 100.0	.	.	.
1973	.	.	17 89.5	*	10.5	.
1974	.	.	17 94.4	*	5.6	.
1975	.	.	15 93.8	*	6.3	.
1976	.	.	19 29.7		45 70.3	.
1977	.	.	10 0.3		3,073 99.7	.

1978	.	.	20	0.5	3,840	99.5
1979	.	.	25	0.6	4,172	99.4
1980	*	0.0	28	0.6	4,440	99.3
1981	.	.	28	0.6	4,775	99.4
1982	.	.	24	0.5	5,284	99.5
1983	*	0.0	54	1.0	5,223	99.0
1984	4	0.1	45	0.7	5,968	99.2
1985	5	0.1	65	0.9	7,011	99.0
1986	6	0.1	215	2.9	7,307	97.1
1987	4	0.1	4,082	55.2	3,303	44.7
1988	60	0.7	4,805	59.6	3,195	39.6
1989	67	0.8	5,261	61.9	3,167	37.3
1990	57	0.7	5,263	62.6	3,085	36.7
1991	61	0.6	6,017	62.7	3,519	36.7
1992	107	1.0	6,363	61.8	3,823	37.1
1993	618	3.0	13,058	63.4	6,906	33.6
1994	2,587	10.9	12,248	51.6	8,915	37.5
1995	3,778	13.6	13,413	48.4	10,540	38.0
1996	4,369	13.9	14,010	44.6	13,045	41.5
1997	5,014	14.7	15,149	44.5	13,913	40.8
1998	6,466	17.3	15,019	40.2	15,842	42.4
1999	6,633	15.8	17,110	40.8	18,180	43.4
2000	5,533	14.3	14,896	38.6	18,194	47.1
2001	5,951	14.9	15,222	38.2	18,687	46.9
2002	6,297	16.1	14,523	37.2	18,267	46.7
2003	7,856	17.9	15,026	34.3	20,914	47.8
2004	8,159	19.5	14,646	34.9	19,102	45.6
2005	8,907	19.4	16,568	36.0	20,542	44.6
2006	8,540	18.8	14,731	32.4	22,242	48.9
2007	9,788	24.6	11,781	29.6	18,224	45.8
2008	10,484	20.4	16,837	32.7	24,183	47.0
2009	9,461	19.7	15,101	31.5	23,369	48.8
2010	8,395	21.6	11,840	30.5	18,589	47.9
2011	9,235	20.5	14,520	32.2	21,378	47.4
2012	9,631	22.4	12,470	28.9	20,982	48.7
2013	9,546	16.9	16,326	29.0	30,459	54.1
2014	8,375	22.5	10,109	27.1	18,817	50.4
2015	9,207	15.7	17,954	30.5	31,613	53.8
2016	11,370	24.6	11,328	24.5	23,520	50.9
2017	9,960	16.6	19,151	32.0	30,819	51.4
2018	6,838	15.6	13,632	31.1	23,344	53.3

Diagnoses of DM accepted from NPR - persons

14:23 Friday, April 17, 2020 12

The CONTENTS Procedure

Data Set Name	DMDAT.NPR	Observations	243939
Member Type	DATA	Variables	10
Engine	V9	Indexes	0
Created	17/04/2020 14:26:33	Observation Length	80
Last Modified	17/04/2020 14:26:33	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	299
First Data Page	*
Max Obs per Page	817
Obs in First Data Page	792
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\npr.sas7bd
Release Created	9.0401M5

Host Created X64_SR12R2
 Owner Name DSTFSE\FDIY7655
 File Size 19MB
 File Size (bytes) 19660800

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
*	C_ADIAG	Char	10	\$10.	\$10.	C_ADIAG
*	D_INDDTO	Num	8	DATE9.	DATE9.	D_INDDTO
*	PNR	Char	12	\$12.	\$10.	Personnummer
6	doNPR	Num	8	YEAR4.	DATE9.	
7	doNPR2	Num	8	YEAR4.	DATE9.	
10	nRc	Num	8			
8	nT1	Num	8			
9	nT2	Num	8			
4	nprtyp	Char	*			
5	sex	Num	8			sex

Diagnoses of DM accepted from NPR - persons

14:23 Friday, April 17, 2020 13

						nprtyp			
						All	NA	T1	T2
nRc						N	N	N	N
Min	P25	P50	P75	Max					
n-	n-								
T1	T2								
0	0	*	*	*	25	13,537	13,537	.	.
*	*	*	*	*	16	63,760	7,999	.	55,761
*	*	*	*	*	30	34,087	2,556	.	31,531
*	*	*	*	*	27	19,801	986	.	18,815
4	4	4	4	5	22	12,046	441	.	11,605
5	5	5	5	6	24	7,816	221	.	7,595
6	6	6	6	7	30	4,836	111	.	4,725
7	7	7	7	8	21	2,987	50	.	2,937
8	8	8	8	10	24	1,948	40	.	1,908
9	9	9	9	11	26	1,255	15	.	1,240
10	10	10	11	12	22	775	7	.	768
11	11	11	12	13	22	501	*	.	500
12	12	13	15	17	60	1,033	7	.	1,026
*	0	*	*	*	18	7,269	1,256	6,013	.
*	*	*	*	*	18	3,792	3,792	.	.
*	*	*	*	4	23	2,973	934	.	2,039
*	4	4	4	5	19	2,312	426	.	1,886
4	5	5	5	6	20	1,695	223	.	1,472
5	6	6	6	7	28	1,297	105	.	1,192
6	7	7	7	9	20	962	65	.	897
7	8	8	8	10	20	711	37	.	674
8	9	9	10	11	24	496	23	.	473
9	10	10	11	12	25	351	9	.	342
10	11	11	12	14	25	260	6	.	254
11	12	12	13	14	31	178	*	.	175
12	13	15	17	20	41	496	6	.	490
*	0	*	*	*	19	3,895	469	3,426	.
*	*	*	*	4	16	1,864	600	1,264	.
*	4	4	4	5	22	1,522	1,522	.	.
*	5	5	5	6	22	1,099	455	.	644
4	6	6	6	8	22	878	241	.	637
5	7	7	7	9	18	650	118	.	532
6	8	8	9	10	18	471	56	.	415
7	9	9	10	11	22	351	33	.	318
8	10	10	11	12	24	294	24	.	270
9	11	11	12	14	22	202	10	.	192
10	12	12	13	16	23	133	4	.	129
11	13	13	14	17	32	95	4	.	91

	12	14	17	19	23	46	309	4	.	305
*	0	*	*	*	4	20	3,089	250	2,839	.
	*	4	4	4	5	26	1,241	295	946	.
	*	5	5	5	7	27	952	439	513	.
	*	6	6	6	8	19	703	703	.	.
	4	7	7	7	9	22	527	258	.	269
	5	8	8	9	10	31	399	120	.	279
	6	9	9	9	11	23	267	50	.	217
	7	10	10	11	12	23	203	26	.	177
	8	11	11	12	14	23	169	17	.	152
	9	12	12	13	15	24	126	13	.	113
	10	13	13	14	15	27	93	6	.	87
	11	14	15	16	18	30	62	*	.	59
	12	15	17	20	23	42	209	6	.	203
4	0	4	4	4	5	32	2,728	196	2,532	.
	*	5	5	5	7	35	999	174	825	.
	*	6	6	6	8	37	736	204	532	.
	*	7	7	8	9	24	476	243	233	.
	4	8	8	9	10	24	392	392	.	.
	5	9	9	10	11	31	286	154	.	132
	6	10	10	11	12	24	180	68	.	112
	7	11	11	12	14	41	158	45	.	113
	8	12	12	13	15	30	121	22	.	99
	9	13	13	15	16	21	83	9	.	74
	10	14	14	16	18	25	58	10	.	48
	11	15	15	16	18	23	56	*	.	55
	12	16	18	21	25	55	170	6	.	164
5	0	5	5	5	7	30	2,391	126	2,265	.
	*	6	6	6	8	23	826	111	715	.
	*	7	7	8	10	21	592	155	437	.
	*	8	8	9	10	26	393	136	257	.
	4	9	9	10	12	23	294	173	121	.
	5	10	10	11	13	25	225	225	.	.
	6	11	11	12	14	25	164	105	.	59
	7	12	12	13	15	32	129	58	.	71
	8	13	13	14	16	27	82	28	.	54
	9	14	14	15	17	28	61	14	.	47
	10	15	15	17	19	42	65	9	.	56
	11	16	16	18	19	35	46	6	.	40
	12	17	19	22	25	45	124	4	.	120
6	0	6	6	6	8	34	2,092	103	1,989	.
	*	7	7	8	9	22	643	71	572	.
	*	8	8	9	11	23	482	97	385	.
	*	9	9	10	12	27	350	96	254	.
	4	10	10	11	12	28	252	94	158	.
	5	11	11	12	14	25	160	99	61	.
	6	12	12	13	15	21	126	126	.	.
	7	13	13	14	16	25	84	51	.	33
	8	14	14	15	18	29	70	34	.	36
	9	15	15	17	18	22	32	11	.	21
	10	16	17	18	20	26	37	10	.	27
	11	17	17	18	20	31	32	*	.	29
	12	18	21	24	27	42	100	13	.	87
7	0	7	7	7	9	38	1,814	63	1,751	.
	*	8	8	9	11	19	548	43	505	.
	*	9	9	10	12	24	388	49	339	.
	*	10	10	11	13	24	296	61	235	.
	4	11	11	12	14	26	189	54	135	.
	5	12	12	13	15	31	144	69	75	.
	6	13	13	15	16	26	97	70	27	.
	7	14	14	16	17	24	78	78	.	.
	8	15	15	17	19	35	67	47	.	20
	9	16	16	17	19	43	33	13	.	20
	10	17	18	20	22	26	36	20	.	16
	11	18	18	19	20	27	24	*	.	21
	12	19	22	25	29	46	100	12	.	88
8	0	8	8	9	10	36	1,468	45	1,423	.
	*	9	9	10	12	37	436	23	413	.
	*	10	10	11	13	26	316	25	291	.
	*	11	11	12	14	24	227	27	200	.

	4	12	12	14	16	30	150	40	110	.
	5	13	13	15	17	37	98	30	68	.
	6	14	14	16	17	31	72	37	35	.
	7	15	16	17	19	27	54	43	11	.
	8	16	17	18	22	27	38	38	.	.
	9	17	18	19	20	29	37	28	.	9
	10	18	19	21	23	30	16	10	.	6
	11	19	20	22	23	28	17	10	.	7
	12	20	24	27	31	40	59	6	.	53
9	0	9	9	10	11	33	1,146	40	1,106	.
	*	10	10	11	13	26	409	11	398	.
	*	11	11	12	14	26	271	24	247	.
	*	12	12	13	15	28	199	23	176	.
	4	13	13	15	16	26	141	23	118	.
	5	14	14	15	17	22	87	19	68	.
	6	15	16	17	19	35	59	27	32	.
	7	16	16	17	19	28	38	16	22	.
	8	17	18	19	22	26	34	26	8	.
	9	18	18	19	21	26	17	17	.	.
	10	19	19	20	22	26	20	14	.	6
	11	20	21	21	24	35	14	5	.	9
	12	21	24	27	33	55	64	19	.	45
10	0	10	10	11	12	36	883	22	861	.
	*	11	11	13	14	30	266	10	256	.
	*	12	12	13	15	29	253	16	237	.
	*	13	13	15	17	26	150	17	133	.
	4	14	14	15	17	29	116	11	105	.
	5	15	15	17	19	29	82	15	67	.
	6	16	16	18	20	28	65	19	46	.
	7	17	18	19	21	28	50	21	29	.
	8	18	19	20	21	31	37	24	13	.
	9	19	20	21	22	26	21	17	4	.
	10	20	20	22	23	39	18	18	.	.
	11	21	22	23	26	30	8	6	.	*
	12	23	25	29	33	49	48	14	.	34
11	0	11	11	12	14	43	765	23	742	.
	*	12	12	13	15	25	235	4	231	.
	*	13	13	14	17	27	176	9	167	.
	*	14	14	16	18	29	128	12	116	.
	4	15	15	16	18	33	97	10	87	.
	5	16	16	17	19	31	56	6	50	.
	6	17	18	19	21	34	52	12	40	.
	7	18	18	19	21	32	34	8	26	.
	8	19	19	20	23	44	38	12	26	.
	9	20	20	23	25	38	22	14	8	.
	10	21	22	24	25	37	18	16	*	.
	11	22	22	22	27	29	9	9	.	.
	12	23	26	29	33	108	38	8	.	30
12	0	12	15	17	22	158	2,738	32	2,706	.
	*	13	16	19	25	149	1,060	9	1,051	.
	*	14	17	21	26	190	850	26	824	.
	*	15	18	22	28	103	606	18	588	.
	4	16	19	23	29	334	505	16	489	.
	5	17	21	25	32	81	401	26	375	.
	6	18	22	26	32	172	330	25	305	.
	7	19	24	29	35	106	251	33	218	.
	8	20	24	28	36	131	193	23	170	.
	9	21	25	29	37	85	142	26	116	.
	10	22	27	32	40	81	119	18	101	.
	11	23	28	32	41	208	90	31	59	.
	12	24	34	42	56	277	416	140	198	78

Diagnoses of DM accepted from NPR - persons

14:23 Friday, April 17, 2020 14

		sex		nprtyp	
All	Mand	Kvinde	NA	T1	T2

	N	N	N	N	N	N
All	243,939	139,580	104,359	44,048	44,576	155,315
doNPR						
1941	*	.	*	.	*	.
1968	*	*	.	.	*	.
1970	*	*	*	*	*	.
1971	*	.	*	*	*	.
1972	8	*	6	5	*	.
1973	19	12	7	6	10	*
1974	18	9	9	6	10	*
1975	16	10	6	10	5	*
1976	64	31	33	17	36	11
1977	2,296	1,115	1,181	574	1,042	680
1978	2,142	1,077	1,065	548	964	630
1979	1,956	995	961	446	887	623
1980	1,862	982	880	436	793	633
1981	1,737	934	803	386	709	642
1982	1,896	1,018	878	376	751	769
1983	1,761	901	860	360	672	729
1984	1,929	924	1,005	365	760	804
1985	2,029	1,066	963	389	753	887
1986	2,104	1,143	961	381	857	866
1987	2,139	1,128	1,011	300	907	932
1988	2,239	1,238	1,001	328	957	954
1989	2,414	1,275	1,139	330	1,009	1,075
1990	2,526	1,390	1,136	358	970	1,198
1991	2,836	1,530	1,306	386	1,074	1,376
1992	3,003	1,604	1,399	434	1,038	1,531
1993	4,826	2,772	2,054	792	1,620	2,414
1994	5,526	3,035	2,491	943	1,401	3,182
1995	6,072	3,400	2,672	1,072	1,373	3,627
1996	6,758	3,816	2,942	1,117	1,376	4,265
1997	7,035	3,912	3,123	1,172	1,355	4,508
1998	7,919	4,401	3,518	1,345	1,418	5,156
1999	8,030	4,443	3,587	1,396	1,302	5,332
2000	8,097	4,511	3,586	1,293	1,288	5,516
2001	8,203	4,646	3,557	1,418	1,262	5,523
2002	8,463	4,811	3,652	1,592	1,213	5,658
2003	9,414	5,385	4,029	1,750	1,194	6,470
2004	9,182	5,277	3,905	1,777	1,237	6,168
2005	8,953	5,045	3,908	1,654	1,176	6,123
2006	9,294	5,369	3,925	1,848	1,200	6,246
2007	9,158	5,281	3,877	1,729	1,168	6,261
2008	8,725	5,134	3,591	1,595	1,139	5,991
2009	8,553	5,113	3,440	1,591	1,111	5,851
2010	8,599	5,166	3,433	1,468	1,112	6,019
2011	8,744	5,209	3,535	1,497	1,091	6,156
2012	8,406	4,904	3,502	1,488	909	6,009
2013	8,413	5,006	3,407	1,542	922	5,949
2014	8,149	4,849	3,300	1,575	904	5,670
2015	8,369	5,001	3,368	1,505	906	5,958
2016	8,763	5,237	3,526	1,664	956	6,143
2017	8,337	5,079	3,258	1,490	892	5,955
2018	6,949	4,391	2,558	1,292	838	4,819
doNPR2						
.	70,812	38,641	32,171	9,038	6,013	55,761
1977	556	263	293	153	207	196
1978	885	413	472	259	382	244
1979	928	423	505	268	418	242
1980	1,024	493	531	286	497	241
1981	1,070	520	550	274	500	296
1982	1,033	556	477	257	491	285
1983	996	543	453	241	482	273
1984	1,159	582	577	262	589	308
1985	1,342	692	650	327	673	342
1986	1,381	745	636	350	672	359
1987	1,261	689	572	193	718	350
1988	1,433	811	622	203	834	396
1989	1,527	836	691	225	876	426

1990	1,608	872	736	243	864	501
1991	1,806	1,014	792	271	981	554
1992	1,917	1,009	908	295	957	665
1993	4,542	2,678	1,864	775	2,284	1,483
1994	4,644	2,559	2,085	838	1,656	2,150
1995	4,885	2,778	2,107	861	1,462	2,562
1996	5,327	3,062	2,265	946	1,370	3,011
1997	5,472	3,108	2,364	936	1,405	3,131
1998	6,032	3,404	2,628	1,124	1,348	3,560
1999	6,307	3,568	2,739	1,157	1,343	3,807
2000	5,734	3,265	2,469	954	1,152	3,628
2001	5,930	3,448	2,482	1,058	1,156	3,716
2002	5,785	3,347	2,438	1,133	1,036	3,616
2003	6,635	3,839	2,796	1,460	1,039	4,136
2004	6,119	3,549	2,570	1,430	1,020	3,669
2005	6,311	3,642	2,669	1,375	1,120	3,816
2006	6,608	3,910	2,698	1,404	986	4,218
2007	5,644	3,350	2,294	1,356	916	3,372
2008	7,056	4,230	2,826	1,462	969	4,625
2009	6,801	4,151	2,650	1,449	971	4,381
2010	5,275	3,224	2,051	1,182	891	3,202
2011	5,873	3,493	2,380	1,238	886	3,749
2012	5,449	3,271	2,178	1,132	735	3,582
2013	7,355	4,500	2,855	1,324	904	5,127
2014	4,880	2,978	1,902	1,162	698	3,020
2015	6,645	4,039	2,606	1,299	812	4,534
2016	6,183	3,795	2,388	1,477	782	3,924
2017	6,759	4,168	2,591	1,255	807	4,697
2018	4,950	3,122	1,828	1,116	674	3,160

Diagnoses of DM accepted from NPR - persons
 - only from * January 2015 - checking seasonality

14:23 Friday, April 17, 2020 15

	sex			nprtyp		
	All	Mand	Kvinde	NA	T1	T2
	N	N	N	N	N	N
All	32,418	19,708	12,710	5,951	3,592	22,875
doNPR						
2015/01	745	479	266	97	81	567
2015/02	697	431	266	128	84	485
2015/03	785	468	317	146	78	561
2015/04	630	390	240	110	69	451
2015/05	705	411	294	116	85	504
2015/06	733	424	309	130	70	533
2015/07	531	304	227	97	61	373
2015/08	624	344	280	129	59	436
2015/09	811	493	318	138	79	594
2015/10	740	444	296	161	87	492
2015/11	770	453	317	155	76	539
2015/12	598	360	238	98	77	423
2016/01	780	486	294	148	96	536
2016/02	708	425	283	122	75	511
2016/03	708	428	280	127	103	478
2016/04	715	434	281	137	77	501
2016/05	780	460	320	136	68	576
2016/06	798	457	341	149	83	566
2016/07	509	292	217	105	67	337
2016/08	689	405	284	136	97	456
2016/09	791	470	321	168	72	551
2016/10	746	429	317	142	69	535
2016/11	864	522	342	172	76	616
2016/12	675	429	246	122	73	480
2017/01	814	482	332	160	82	572
2017/02	643	381	262	117	70	456
2017/03	920	600	320	163	88	669

2017/04	544	337	207	82	61	401
2017/05	842	504	338	155	91	596
2017/06	724	449	275	130	65	529
2017/07	504	299	205	97	66	341
2017/08	664	390	274	112	81	471
2017/09	673	412	261	109	72	492
2017/10	693	403	290	112	67	514
2017/11	790	489	301	165	91	534
2017/12	526	333	193	88	58	380
2018/01	682	419	263	122	61	499
2018/02	621	394	227	96	69	456
2018/03	647	394	253	115	77	455
2018/04	594	378	216	109	69	416
2018/05	611	400	211	102	63	446
2018/06	606	410	196	111	68	427
2018/07	465	280	185	91	53	321
2018/08	549	357	192	100	76	373
2018/09	568	356	212	105	66	397
2018/10	554	341	213	110	71	373
2018/11	574	356	218	122	87	365
2018/12	478	306	172	109	78	291

4.6 02-dvdd

The DVDD contains annual records for diabetes patients, mostly from out-patient clinics, but (eventually) also from GPs. These records contain type and date of diagnosis. The program chooses the earliest reported date of diagnosis and the type of diabetes reported more than half of the times (in the variable `dvdtyp`).

Uses the GDM dates to exclude possible inclusion dates in GDM grace periods.

```
1                                "Program: 02-dvdd.sas"           14:32 Friday, April 17, 2020
```

```
NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.
```

```
NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)
```

```
      Licensed to FORSKNING 2, Site 50800723.
```

```
NOTE: This session is executing on the X64_SR12R2 platform.
```

```
NOTE: Updated analytical products:
```

```
      SAS/STAT 14.3
```

```
NOTE: Additional host information:
```

```
      X64_SR12R2 WIN 6.3.9600 Server
```

```
NOTE: SAS initialization used:
```

```
      real time           0.10 seconds
```

```
      cpu time           0.10 seconds
```

```
NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.
```

```
NOTE: AUTOEXEC processing completed.
```

```
1      proc sort  data = ekstn.ny_dvdd_7_feb20
2              out = dvdd ( keep = pnr status_dato diag_dato diag_type ) ;
3              by pnr status_dato diag_dato diag_type ;
4      run ;
```

```
NOTE: There were 868972 observations read from the data set EKSTN.NY_DVDD_7_FEB20.
```

```
NOTE: The data set WORK.DVDD has 868972 observations and 4 variables.
```

NOTE: PROCEDURE SORT used (Total process time):
 real time 12.25 seconds
 cpu time 2.17 seconds

```
5
6      * check number of *persons* in the data set ;
7      proc sort data = dvdd out = pers nodupkey ;
8          by pnr ;
9      run ;
```

NOTE: There were 868972 observations read from the data set WORK.DVDD.
 NOTE: 620174 observations with duplicate key values were deleted.
 NOTE: The data set WORK.PERS has 248798 observations and 4 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.12 seconds
 cpu time 0.29 seconds

```
10
11     * only persons in base and included before 1.1.2016 ;
12     data dvdd ;
13     merge dvdd ( in = dvdd )
14           DMdat.pop ( in = pop ) ;
15     by pnr ;
16     if pop and dvdd ;
17     * remove status records after the cut date ;
18     if status_dato > &end. then delete ;
19     run ;
```

NOTE: There were 868972 observations read from the data set WORK.DVDD.
 NOTE: There were 7632139 observations read from the data set DMDAT.POP.
 NOTE: The data set WORK.DVDD has 809235 observations and 9 variables.
 NOTE: DATA statement used (Total process time):
 real time 4.78 seconds
 cpu time 1.43 seconds

```
20
21     * clean out multiple status dates and return a date of diagnosis ;
22     data dvdd /* All records */
23         dvdd_fix ( keep = pnr doDVDD ) ; /* one per pnr with revised date of DM
24     ! diagnosis */
25     set dvdd ( keep = pnr status_dato diag_dato diag_type doBth doDth ) ;
26     by pnr status_dato diag_dato diag_type ;
27     retain doDVDD ;
28     * use only the first among identical status dates within each person ;
29     * set the revised DM date to the earlier of diag_dato and status dates ;
30     if first.pnr then doDVDD = min( diag_dato, status_dato ) ;
31     else doDVDD = min( doDVDD, diag_dato, status_dato ) ;
32     output dvdd ;
33     if last.pnr then output dvdd_fix ;
34     run ;
```

NOTE: There were 809235 observations read from the data set WORK.DVDD.
 NOTE: The data set WORK.DVDD has 803286 observations and 7 variables.
 NOTE: The data set WORK.DVDD_FIX has 231741 observations and 2 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.24 seconds
 cpu time 0.25 seconds

```
35
36     * add the computed doDVDD date to the status records ;
37     data dvdd ;
38     merge dvdd
39           dvdd_fix ;
40     by pnr ;
41     run ;
```

NOTE: There were 803286 observations read from the data set WORK.DVDD.
 NOTE: There were 231741 observations read from the data set WORK.DVDD_FIX.
 NOTE: The data set WORK.DVDD has 803286 observations and 7 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.20 seconds
 cpu time 0.18 seconds

```
42
43     * DVDD will provide classification of follow-up as T1 / *not* T1 (=T2) ;
44     * tabulation of the sequences of type classifications occurring ;
45     proc sort  data = dvdd  out = dvdd_type ;
46         by pnr status_dato ;
47     run ;
```

NOTE: There were 803286 observations read from the data set WORK.DVDD.
 NOTE: The data set WORK.DVDD_TYPE has 803286 observations and 7 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.14 seconds
 cpu time 0.37 seconds

```
48
49     data dvdd_type ( keep = pnr doDVDD status_dato typ )
50         dvdd_hist ( keep = pnr hist ) ;
51     set dvdd_type ;
52     by pnr ;
53     length typ $ 4 hist $ 80 ;
54     retain hist ;
55     typ = substr( diag_type, 1, 2 ) ;
56     if typ eq "Ty" then typ = "T" || substr( diag_type, 6, 1 ) ;
57     if first.pnr then hist = typ ;
58     if ^first.pnr and ( diag_type ne lag(diag_type) )
59         then hist = trim(hist) || " " || typ ;
60     output dvdd_type ;
61     if last.pnr then output dvdd_hist ;
62     run ;
```

NOTE: There were 803286 observations read from the data set WORK.DVDD_TYPE.
 NOTE: The data set WORK.DVDD_TYPE has 803286 observations and 4 variables.
 NOTE: The data set WORK.DVDD_HIST has 233323 observations and 2 variables.
 NOTE: DATA statement used (Total process time):
 real time 0.25 seconds
 cpu time 0.25 seconds

```
63
64     * classification rule: if more than half of registrations T1 then T1 ;
65     *                         if more than half of registrations T2 then T2 ;
66     data dvdd ( keep = pnr doDVDD dvdtyp nT1 nT2 nRc ) ;
67     set dvdd_type ;
68     by pnr status_dato ;
69     retain nT1 nT2 ;
70     if first.pnr then do ;
71         nT1 = 0 ;
72         nT2 = 0 ;
73         nRc = 0 ;
74     end ;
75     nT1 + ( typ eq "T1" ) ;
76     nT2 + ( typ eq "T2" ) ;
77     nRc + 1 ;
78     * If more than half of records agree on one type ;
79     if last.pnr then do ;
80         if nRc < (nT1+nT2) then put "This should never print" ;
81         dvdtyp = 'NA' ;
82         if nT1 > nRc/2 then dvdtyp = 'T1' ;
83         if nT2 > nRc/2 then dvdtyp = 'T2' ;
84     output ;
85     end ;
```

```
86          run ;
```

NOTE: There were 803286 observations read from the data set WORK.DVDD_TYPE.

NOTE: The data set WORK.DVDD has 233323 observations and 6 variables.

NOTE: DATA statement used (Total process time):

```
real time      0.16 seconds
cpu time       0.15 seconds
```

```
87
```

```
88          data DMdat.dvdd ( label = 'Persons from the DVDD, first recorded date' );
```

```
89          merge dvdd
```

```
90          dvdd_hist ( keep = pnr hist ) ;
```

```
91          by pnr ;
```

```
92          run ;
```

NOTE: There were 233323 observations read from the data set WORK.DVDD.

NOTE: There were 233323 observations read from the data set WORK.DVDD_HIST.

NOTE: The data set DMDAT.DVDD has 233323 observations and 7 variables.

NOTE: DATA statement used (Total process time):

```
real time      0.20 seconds
cpu time       0.09 seconds
```

```
93
```

```
94          title1 'Dates and types from DVDD' ;
```

```
95          proc contents data = DMdat.dvdd ; run ;
```

NOTE: PROCEDURE CONTENTS used (Total process time):

```
real time      0.03 seconds
cpu time       0.01 seconds
```

NOTE: The PROCEDURE CONTENTS printed page 1.

```
96          title2 'Classification based on most frequent type recorded in DVDD - persons'
```

```
96          ! ;
```

```
97          proc tabulate data = DMdat.dvdd missing noseps ;
```

```
98          class dvdtyp doDVDD nT1 nT2 NRc ;
```

```
99          table all doDVDD,
100          ( all dvdtyp ) * f=comma9.
```

```
101          / rts = 8 ;
```

```
102          table nRc * nT1,
```

```
103          nT2 * f=5.
```

```
104          / rts = 5 indent = 1 ;
```

```
105          format doDVDD year4. ;
```

```
106          run ;
```

NOTE: There were 233323 observations read from the data set DMDAT.DVDD.

NOTE: The PROCEDURE TABULATE printed pages 2-4.

NOTE: PROCEDURE TABULATE used (Total process time):

```
real time      0.13 seconds
cpu time       0.15 seconds
```

```
107
```

```
108          proc tabulate data = DMdat.dvdd missing noseps order = freq ;
```

```
109          class dvdtyp hist ;
```

```
110          table all hist="sequence of different types",
```

```
111          ( all dvdtyp ) * f=comma7.
```

```
112          / rts = 30 ;
```

```
113          run ;
```

NOTE: There were 233323 observations read from the data set DMDAT.DVDD.

NOTE: The PROCEDURE TABULATE printed page 5.

NOTE: PROCEDURE TABULATE used (Total process time):

```
real time      0.04 seconds
cpu time       0.07 seconds
```

```
114          title1 ;
```

```

115
116     title1 'Seasonality of DVDD dates' ;
117     data dvdd ;
118         set DMdat.dvdd ;
119         moDVDD = put( doDVDD, month. ) ;
120         yo = max( 1991, input( put( doDVDD, year4. ), 4. ) ) ;
121     run ;

```

NOTE: There were 233323 observations read from the data set DMDAT.DVDD.

NOTE: The data set WORK.DVDD has 233323 observations and 9 variables.

NOTE: DATA statement used (Total process time):

```

real time      0.09 seconds
cpu time       0.09 seconds

```

```

122
123     proc tabulate data = dvdd missing noseps order=fmt ;
124         class moDVDD doDVDD ;
125         table all doDVDD="Date",
126             all * f=comma7.
127             moDVDD * f=5.
128             / rts=6 ;
129         table all doDVDD="Date",
130             all * pctn<all doDVDD>* f=5.1
131             moDVDD * pctn<all doDVDD*moDVDD>* f=5.2
132             / rts=6 ;
133         format doDVDD day. ;
134     run ;

```

NOTE: There were 233323 observations read from the data set WORK.DVDD.

NOTE: At least one W.D format was too small for the number to be printed. The decimal may be shifted by the "BEST" format.

NOTE: The PROCEDURE TABULATE printed pages 6-7.

NOTE: PROCEDURE TABULATE used (Total process time):

```

real time      0.03 seconds
cpu time       0.09 seconds

```

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

```

real time      18.97 seconds
cpu time       5.78 seconds

```

4.6.1 02-dvdd.lst

Dates and types from DVDD

14:32 Friday, April 17, 2020 1

The CONTENTS Procedure

Data Set Name	DMDAT.DVDD	Observations	233323
Member Type	DATA	Variables	7
Engine	V9	Indexes	0
Created	17/04/2020 14:33:01	Observation Length	128
Last Modified	17/04/2020 14:33:01	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Persons from the DVDD, first recorded date		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size 65536

```

Number of Data Set Pages    457
First Data Page            *
Max Obs per Page           511
Obs in First Data Page     497
Number of Data Set Repairs 0
ExtendObsCounter           YES
Filename                    E:\workdata\707655\DMreg\data\dvdd.sas7bdat
Release Created             9.0401M5
Host Created                X64_SR12R2
Owner Name                  DSTFSE\FDIY7655
File Size                   29MB
File Size (bytes)          30015488

```

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
2	doDVDD	Num	8			
6	dvdtyp	Char	*			
7	hist	Char	80			
5	nRc	Num	8			
3	nT1	Num	8			
4	nT2	Num	8			
1	pnr	Char	12	\$12.	\$10.	Personnummer

Dates and types from DVDD 14:32 Friday, April 17, 2020 2
Classification based on most frequent type recorded in DVDD - persons

	dvdtyp			
	All	NA	T1	T2
	N	N	N	N
All	233,323	5,035	26,546	201,742
doDVDD				
1890	*	.	.	*
1899	*	.	.	*
1900	62	.	11	51
1901	*	*	.	*
1903	*	.	.	*
1905	*	.	.	*
1907	*	.	.	*
1909	*	*	.	.
1910	*	.	.	*
1920	10	.	4	6
1922	*	.	.	*
1923	*	.	.	*
1927	*	.	*	*
1931	*	.	.	*
1933	*	.	*	.
1934	*	.	*	*
1936	*	*	*	.
1937	*	.	*	*
1938	*	.	*	.
1939	6	.	5	*
1940	9	.	6	*
1941	6	.	4	*
1942	8	.	7	*
1943	4	.	*	*
1944	11	.	10	*
1945	20	.	16	4
1946	15	.	13	*
1947	25	*	22	*
1948	30	*	27	*
1949	28	.	26	*
1950	46	.	35	11
1951	39	.	36	*

1952	42	.	33	9
1953	45	*	40	4
1954	58	*	49	6
1955	89	*	72	15
1956	129	*	123	5
1957	95	*	87	6
1958	124	4	106	14
1959	110	*	99	8
1960	207	*	171	33
1961	175	6	163	6
1962	201	6	174	21
1963	201	*	184	16
1964	202	4	169	29
1965	226	4	179	43
1966	226	4	183	39
1967	236	4	198	34
1968	224	*	191	31
1969	268	*	215	51
1970	445	10	298	137
1971	325	*	268	54
1972	438	8	318	112
1973	384	8	288	88
1974	422	10	324	88
1975	528	9	322	197
1976	484	7	347	130
1977	514	18	345	151
1978	654	11	420	223
1979	591	10	403	178
1980	1,162	33	481	648
1981	671	13	414	244
1982	859	23	413	423
1983	845	18	424	403
1984	907	14	432	461
1985	1,429	35	431	963
1986	1,168	23	489	656
1987	1,275	27	482	766
1988	1,411	36	475	900
1989	1,390	36	496	858
1990	3,109	54	625	2,430
1991	1,772	41	549	1,182
1992	2,508	38	551	1,919
1993	2,364	44	513	1,807
1994	2,711	51	615	2,045
1995	4,524	72	603	3,849
1996	3,587	58	609	2,920
1997	3,805	61	660	3,084
1998	5,090	61	651	4,378
1999	4,832	72	583	4,177
2000	9,109	121	689	8,299
2001	6,350	88	720	5,542
2002	7,033	103	614	6,316
2003	7,861	109	602	7,150
2004	8,883	147	622	8,114
2005	9,996	139	615	9,242
2006	10,168	204	669	9,295
2007	10,925	200	638	10,087
2008	12,823	229	683	11,911
2009	12,786	250	594	11,942
2010	14,566	263	586	13,717
2011	14,877	273	493	14,111
2012	12,059	290	488	11,281
2013	9,548	314	436	8,798
2014	6,124	311	419	5,394
2015	3,673	296	411	2,966
2016	3,869	330	348	3,191
2017	3,057	292	222	2,543
2018	16,208	115	199	15,894

13	7	173	.	.	.	.	.	.	.	.	.	.	.	.
14	89	.	.	.	.	.	.	.	.	.	.	.	.	.
15														
0	.	*	.	.	.	.	.	.	*	.	.	.	*	.
*	.	.	*
4	.	.	.	.	.	.	.	.	.	.	.	*	.	.
7	.	.	.	.	.	.	.	.	*	.	.	.	.	.
8	.	.	.	.	.	.	.	*	.	.	.	.	.	.
9	.	.	.	.	.	.	*	.	.	.	.	.	.	.
10	.	.	.	.	*	*	.	.	.	.	.	.	.	.
11	.	.	.	.	*	.	.	.	.	.	.	.	.	.
12	.	.	.	7	.	.	.	.	.	.	.	.	.	.
13	.	4	41	.	.	.	.	.	.	.	.	.	.	.
14	.	30	.	.	.	.	.	.	.	.	.	.	.	.
15	*	.	.	.	.	.	.	.	.	.	.	.	.	.
16														
0	.	.	.	.	.	*	.	.	.	.	.	.	.	.
*
6	.	.	.	.	.	.	.	.	.	.	*	.	.	.
12	.	.	.	.	*	.	.	.	.	.	.	.	.	.
13	.	.	.	*	.	.	.	.	.	.	.	.	.	.
14	.	.	17	.	.	.	.	.	.	.	.	.	.	.
15	.	*	.	.	.	.	.	.	.	.	.	.	.	.
17														
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.
*
15	.	.	*	.	.	.	.	.	.	.	.	.	.	.
18														
16	.	.	*	.	.	.	.	.	.	.	.	.	.	.

(Continued)

Dates and types from DVDD 14:32 Friday, April 17, 2020 4
 Classification based on most frequent type recorded in DVDD - persons

nT2				

	14	15	16	17

	N	N	N	N

*				
0
*
*				
0
*
*
*
4				
0
*
*
*
4
5				
0
*
*
*
4
5
6				
0

```
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
8
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
8      .      .      .      .
9
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
8      .      .      .      .
9      .      .      .      .
10
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
8      .      .      .      .
9      .      .      .      .
10     .      .      .      .
11
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
8      .      .      .      .
9      .      .      .      .
10     .      .      .      .
11     .      .      .      .
12
0      .      .      .      .
*      .      .      .      .
*      .      .      .      .
*      .      .      .      .
4      .      .      .      .
5      .      .      .      .
6      .      .      .      .
7      .      .      .      .
```

8	.	.	.	.
9	.	.	.	.
10	.	.	.	.
11	.	.	.	.
12	.	.	.	.
13	.	.	.	.
0	.	.	.	.
*
*
4	.	.	.	.
5	.	.	.	.
6	.	.	.	.
7	.	.	.	.
8	.	.	.	.
9	.	.	.	.
10	.	.	.	.
11	.	.	.	.
12	.	.	.	.
13	.	.	.	.
14	.	.	.	.
0	224	.	.	.
*
*
*
4	.	.	.	.
5	.	.	.	.
6	.	.	.	.
7	.	.	.	.
8	.	.	.	.
9	.	.	.	.
10	.	.	.	.
11	.	.	.	.
12	.	.	.	.
13	.	.	.	.
14	.	.	.	.
15	.	.	.	.
0	*	52	.	.
*
4	.	.	.	.
7	.	.	.	.
8	.	.	.	.
9	.	.	.	.
10	.	.	.	.
11	.	.	.	.
12	.	.	.	.
13	.	.	.	.
14	.	.	.	.
15	.	.	.	.
16	.	.	.	.
0	.	.	12	.
*	.	*	.	.
6	.	.	.	.
12	.	.	.	.
13	.	.	.	.
14	.	.	.	.
15	.	.	.	.
17	.	.	.	.
0	.	.	.	*
*	.	.	*	.
15	.	.	.	.
18	.	.	.	.
16	.	.	.	.

Dates and types from DVDD

14:32 Friday, April 17, 2020 5

Classification based on most frequent type recorded in DVDD - persons

dvdtyp

	All	T2	T1	NA
	N	N	N	N
All	233,323	201,742	26,546	5,035
sequence of different types				
T2	197,785	197,785	.	.
T1	17,969	.	17,969	.
T1 T2 T1	4,789	52	4,705	32
T2 T1	2,639	861	1,356	422
An	2,314	.	.	2,314
T1 T2	1,575	735	562	278
An T2	1,144	646	.	498
T1 T2 T1 T2 T1	944	*	937	5
T2 An	879	330	.	549
T2 T1 T2	569	537	20	12
T2 An T2	481	449	.	32
T2 T1 T2 T1	381	58	285	38
An T1	250	.	140	110
An T2 An	175	8	.	167
T1 An	172	.	94	78
T1 T2 T1 T2	136	40	78	18
T1 An T1	83	.	73	10
T2 T1 T2 T1 T2 T1	57	7	44	6
T2 An T1	56	8	14	34
T2 T1 T2 T1 T2	52	44	5	*
T2 An T2 An	47	10	.	37
An T2 An T2	46	25	.	21
T2 T1 An	45	8	9	28
An T1 T2 T1	41	.	36	5
-I T2	40	33	.	7
T1 T2 An	37	5	7	25
An T2 T1	35	7	7	21
T1 T2 T1 An	27	*	20	5
An T1 An	25	.	*	23
T1 T2 T1 T2 T1 T2 T1	25	.	25	.
An T2 An T2 An	24	.	.	24
An T1 T2	20	7	*	11
-I	20	.	.	20
T1 An T2	18	6	*	11
-I An	18	.	.	18
-I T1	17	.	16	*
T1 T2 T1 T2 T1 T2	17	*	14	*
T1 T2 An T1	16	.	12	4
T2 -I T2	13	13	.	.
T2 An T2 An T2	13	10	.	*
An T2 An T1	13	.	*	12
T1 T2 T1 An T1	12	.	9	*
T1 An T2 An	12	.	*	9
T2 T1 T2 An	11	6	*	4
T2 An T2 T1	11	6	*	*
-I An T2	10	*	.	8
T1 T2 An T2	10	4	.	6
T1 -I T1	10	.	10	.
An T2 T1 An	9	*	*	6
An T2 T1 T2 T1	9	*	4	4
T2 T1 An T1	9	.	7	*
T1 An T1 An	9	.	7	*
T1 An T1 T2 T1	8	.	8	.
An T1 T2 T1 T2 T1	7	.	6	*
T1 An T2 T1	7	*	5	*
T2 T1 T2 An T2	7	7	.	.
-I T2 T1	7	*	*	*
T2 An T1 An	6	.	.	6
An T2 An T2 An T2	6	.	.	6
T2 T1 T2 T1 An	5	*	*	*
T1 An T2 An T2 An	5	.	.	5
An T2 T1 T2	4	*	.	*
T1 An T1 An T1	4	.	4	.

T2 T1 T2 T1 T2 T1 T2 T1	4	*	*	.
An T2 An T1 An	*	.	.	*
An T1 T2 An	*	*	.	*
-I An T2 An	*	.	.	*
T2 -I	*	*	.	*
T2 An T2 An T2 An	*	.	.	*
-I T2 T1 T2 T1	*	.	*	*
T1 T2 T1 T2 An	*	*	*	*
An T1 T2 T1 An	*	.	*	*
T2 T1 An T2	*	*	.	*
An T1 An T2	*	.	.	*
T2 An T1 T2	*	*	.	*
-I T1 T2 T1	*	.	*	.
An T1 An T1	*	.	*	*
An T1 T2 T1 T2	*	*	*	.
T1 An T2 T1 T2	*	.	.	*
T1 T2 An T2 An	*	.	.	*
T2 An T2 An T1	*	.	.	*
T1 An T2 T1 T2 T1	*	.	*	.
T2 T1 An T1 T2 T1	*	.	*	.
T2 An T1 T2 T1	*	.	*	*
T1 T2 An T1 An	*	*	.	*
An T1 An T1 An	*	.	*	*
T1 An T1 T2 T1 T2 T1	*	.	*	*
T1 T2 T1 T2 T1 T2 T1 T2 T1	*	.	*	.
-I An T1 T2 T1	*	.	*	*
T2 T1 T2 T1 T2 T1 An	*	.	*	.
T2 T1 An T2 T1	*	.	.	*
T1 An T2 An T1	*	.	.	*
T1 T2 T1 T2 T1 An	*	.	*	*
-I T1 T2	*	*	*	.
T1 An T2 T1 An	*	.	.	*
T2 -I T1 T2 T1	*	.	.	*
-I T1 T2 T1 T2	*	.	*	.
T2 T1 T2 T1 T2 An	*	.	.	*
T2 T1 T2 An T2 An T2 T1 An	*	.	.	*
An T1 An T2 T1 T2 T1 An	*	.	.	*
T1 An T1 An T2 An T1 An T1	*	.	.	*
An	*	.	.	*
T2 T1 T2 T1 T2 An T2	*	*	.	.
T1 T2 T1 T2 T1 T2 T1 T2	*	*	.	.
An T2 T1 T2 An	*	.	.	*
T1 T2 T1 T2 T1 T2 An	*	.	.	*
T2 T1 T2 An T1 T2	*	*	.	.
T1 -I An T1 T2 T1	*	.	.	*
T2 T1 T2 An T1	*	.	.	*
T1 T2 T1 An T2	*	.	*	.
T2 T1 T2 T1 T2 T1 T2	*	.	*	.
T2 An T1 T2 T1 An T1	*	.	*	.
-I T1 T2 T1 T2 T1	*	.	*	.
T1 An T1 An T1 T2 T1 An	*	.	.	*
T1 An T1 T2	*	.	.	*
T1 T2 An T1 T2	*	.	*	.
T2 An T2 T1 T2	*	*	.	.
An T2 An T2 An T2 An T1	*	.	.	*
An -I An T2 An T2 An	*	.	.	*
T1 -I An	*	.	.	*
T1 -I T2 T1	*	.	*	.
An -I An T2 An	*	.	.	*
T1 T2 An T2 An T2 T1 T2 An	*	.	.	*
An T2 An T1 T2 T1	*	.	*	.
T2 T1 T2 T1 An T1	*	.	*	.
T1 -I An T2	*	.	.	*
T2 T1 An T2 An	*	*	.	.
-I An T1	*	.	.	*
-I An T1 An T2	*	.	.	*
T1 An T1 T2 An T2 An	*	.	.	*
T2 -I An T2 An T2 T1 An	*	.	.	*
An -I An T2 An T1	*	.	.	*
An T2 An T2 An T2 An	*	.	.	*


```

T2 An T2 An T2 T1      *      .      .      *
T2 T1 T2 An T2 T1      *      .      .      *
An T2 T1 T2 T1 An      *      .      .      *
T1 An T2 An T2 An T1   *      .      .      *
An -I An                *      .      .      *
T2 An T1 An T1 An      *      .      .      *
An T2 An T1 T2         *      .      .      *
-I An -I An T2         *      *      .      .
An T2 An T1 T2 T1 An   *      .      .      *
T1 T2 An T1 T2 T1 T2 T1 *      .      .      *
-I T2 An                *      .      .      *
An T1 An T1 T2         *      .      .      *
T2 T1 An T2 An T1 An   *      *      .      .
An T1 T2 T1 T2 T1 T2 T1 *      .      *      .
T1 T2 An T2 T1         *      .      *      .
T2 An T1 T2 T1 T2 T1 An T2 *      *      .      .
An T2 An T2 T1         *      .      .      *
T2 An T2 An T1 An      *      .      .      *
-I T2 T1 T2 T1 T2      *      .      *      .
-----

```

Seasonality of DVDD dates

14:32 Friday, April 17, 2020 6

```

-----
                                moDVDD
-----
      All      *      *      *      4      5      6      7      8      9      10      11      12
      N      N      N      N      N      N      N      N      N      N      N      N      N
-----
All 233,323 61015 5466 6235 5615 6191 128E3 3554 3649 4371 4080 2983 2507
Date
*   69,935 57072  834  922  713  975  5694  730  526  511  717  612  629
*   1,427   84  164  173   94  201  163  100  49  41  168  89  101
*   1,424   68  104  122  173  205  172  121  50  159  118  64  68
4   1,474   78  102  117  228  126  275  103  40  149  130  56  70
5   1,333   97  150  219  144  101   80  86  34  167  116  72  67
6   1,575  113  195  222  112  110  315  86  53  144  71  76  78
7   1,502   90  173  217   90  219  257  42  57  123  76  76  82
8   1,524   89  167  192  129  193  253  38  87  64  145  92  75
9   1,499  112  164  141  177  202  169  69  82  85  157  78  63
10  1,568  121  106  142  195  105  202  78  75  176  213  74  81
11  1,526   99   95  130  239  119  283  76  49  155  146  67  68
12  1,573   90  138  202  192  109  288  81  45  164  116  78  70
13  1,627  128  141  229  161  117  297  79  102  163  44  80  86
14  1,538   99  140  228  115  205  286  53  117  123  47  62  63
15  121,381 526  594  627  437  542 116E3 1068 272 249 273 234 275
16  1,362  133  107  158  207  184  107  57  130  55  84  73  67
17  1,378  110  103  108  175  181  112  57  112  181  98  62  79
18  1,462  128  117  150  194  160  207  67  59  161  79  77  63
19  1,571  134  162  238  233  107  206  49  52  169  67  78  76
20  1,580  101  156  230  160   91  243  47  172  163  66  90  61
21  1,427  111  167  235   63  109  214  33  157  134  44  94  66
22  1,589  114  188  197   80  249  214  29  178  63  129  87  61
23  1,409  119  121  143  197  224  110  42  138  61  133  84  37
24  1,366  152  117   70  196  167  105  45  136  167  139  68   4
25  1,424  151  131  103  184  155  212  55  53  185  141  53   *
26  1,522  147  234  160  184  101  222  45  65  160  110  92   *
27  1,411  128  205  150  102  112  184  43  155  178  58  74  22
28  1,507  131  290  122  100  177  221  24  166  103  52  89  32
29  1,257  137  101   71  118  203  163  34  144  62  124  71  29
30  1,330  166   .   91  223  228  119  47  177  56  114  81  28
31   822  187   .  126   .  214   .   70  117   .  105   .   *
-----

```

Seasonality of DVDD dates

14:32 Friday, April 17, 2020 7

```

-----
                                moDVDD
-----

```

	All	1	2	3	4	5	6	7	8	9	10	11	12
	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN	PctN
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Date													
1	100.0	24.46	0.36	0.40	0.31	0.42	2.44	0.31	0.23	0.22	0.31	0.26	0.27
2	100.0	0.04	0.07	0.07	0.04	0.09	0.07	0.04	0.02	0.02	0.07	0.04	0.04
3	100.0	0.03	0.04	0.05	0.07	0.09	0.07	0.05	0.02	0.07	0.05	0.03	0.03
4	100.0	0.03	0.04	0.05	0.10	0.05	0.12	0.04	0.02	0.06	0.06	0.02	0.03
5	100.0	0.04	0.06	0.09	0.06	0.04	0.03	0.04	0.01	0.07	0.05	0.03	0.03
6	100.0	0.05	0.08	0.10	0.05	0.05	0.14	0.04	0.02	0.06	0.03	0.03	0.03
7	100.0	0.04	0.07	0.09	0.04	0.09	0.11	0.02	0.02	0.05	0.03	0.03	0.04
8	100.0	0.04	0.07	0.08	0.06	0.08	0.11	0.02	0.04	0.03	0.06	0.04	0.03
9	100.0	0.05	0.07	0.06	0.08	0.09	0.07	0.03	0.04	0.04	0.07	0.03	0.03
10	100.0	0.05	0.05	0.06	0.08	0.05	0.09	0.03	0.03	0.08	0.09	0.03	0.03
11	100.0	0.04	0.04	0.06	0.10	0.05	0.12	0.03	0.02	0.07	0.06	0.03	0.03
12	100.0	0.04	0.06	0.09	0.08	0.05	0.12	0.03	0.02	0.07	0.05	0.03	0.03
13	100.0	0.05	0.06	0.10	0.07	0.05	0.13	0.03	0.04	0.07	0.02	0.03	0.04
14	100.0	0.04	0.06	0.10	0.05	0.09	0.12	0.02	0.05	0.05	0.02	0.03	0.03
15	100.0	0.23	0.25	0.27	0.19	0.23	49.84	0.46	0.12	0.11	0.12	0.10	0.12
16	100.0	0.06	0.05	0.07	0.09	0.08	0.05	0.02	0.06	0.02	0.04	0.03	0.03
17	100.0	0.05	0.04	0.05	0.08	0.08	0.05	0.02	0.05	0.08	0.04	0.03	0.03
18	100.0	0.05	0.05	0.06	0.08	0.07	0.09	0.03	0.03	0.07	0.03	0.03	0.03
19	100.0	0.06	0.07	0.10	0.10	0.05	0.09	0.02	0.02	0.07	0.03	0.03	0.03
20	100.0	0.04	0.07	0.10	0.07	0.04	0.10	0.02	0.07	0.07	0.03	0.04	0.03
21	100.0	0.05	0.07	0.10	0.03	0.05	0.09	0.01	0.07	0.06	0.02	0.04	0.03
22	100.0	0.05	0.08	0.08	0.03	0.11	0.09	0.01	0.08	0.03	0.06	0.04	0.03
23	100.0	0.05	0.05	0.06	0.08	0.10	0.05	0.02	0.06	0.03	0.06	0.04	0.02
24	100.0	0.07	0.05	0.03	0.08	0.07	0.05	0.02	0.06	0.07	0.06	0.03	0.00
25	100.0	0.06	0.06	0.04	0.08	0.07	0.09	0.02	0.02	0.08	0.06	0.02	0.00
26	100.0	0.06	0.10	0.07	0.08	0.04	0.10	0.02	0.03	0.07	0.05	0.04	0.00
27	100.0	0.05	0.09	0.06	0.04	0.05	0.08	0.02	0.07	0.08	0.02	0.03	0.01
28	100.0	0.06	0.12	0.05	0.04	0.08	0.09	0.01	0.07	0.04	0.02	0.04	0.01
29	100.0	0.06	0.04	0.03	0.05	0.09	0.07	0.01	0.06	0.03	0.05	0.03	0.01
30	100.0	0.07	.	0.04	0.10	0.10	0.05	0.02	0.08	0.02	0.05	0.03	0.01
31	100.0	0.08	.	0.05	.	0.09	.	0.03	0.05	.	0.05	.	0.00

4.7 03-nhsr

Extracts dates of foot therapy from the National Health Services Register.

Uses the GDM dates to exclude possible inclusion dates in GDM grace periods.

1 "Program: 03-nhsr.sas" 15:42 Friday, April 17, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)

Licensed to FORSKNING 2, Site 50800723.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.08 seconds

cpu time 0.12 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      /*
2      proc contents data = grund.sysi2005 ; run ;
3      proc contents data = grund.sssy2005 ; run ;
4      proc print data = grund.sysi2005 (obs=10) ; run ;
5      proc print data = grund.sssy2005 (obs=10) ; run ;
6      */
7
8      %macro getssy ;
9      data foot ( keep = pnr doPod speciale ) ;
10     set %do i = 1990 %to 2005 ;
11         grund.sysi&i. ( keep = pnr speciale honuge )
12     %end ;
13     %do i = 2005 %to 2018 ;
14         grund.sssy&i. ( keep = pnr speciale honuge )
15     %end ; ;
16     if substr( speciale, 1, 2 ) eq '54' ;
17     yr = input( substr( honuge, 1, 2 ), 2. ) ;
18     wk = input( substr( honuge, 3, 2 ), 2. ) ;
19     doPod = ( 1900 + yr + 100 * (yr<50) - 1960 ) * 365.25 + wk * 7 ;
20 run ;
21 %mend ;
22
23 %getssy ;

```

NOTE: There were 133344 observations read from the data set GRUND.SYSI1990.
NOTE: There were 145830 observations read from the data set GRUND.SYSI1991.
NOTE: There were 162331 observations read from the data set GRUND.SYSI1992.
NOTE: There were 175648 observations read from the data set GRUND.SYSI1993.
NOTE: There were 193396 observations read from the data set GRUND.SYSI1994.
NOTE: There were 219430 observations read from the data set GRUND.SYSI1995.
NOTE: There were 239616 observations read from the data set GRUND.SYSI1996.
NOTE: There were 263392 observations read from the data set GRUND.SYSI1997.
NOTE: There were 289082 observations read from the data set GRUND.SYSI1998.
NOTE: There were 318830 observations read from the data set GRUND.SYSI1999.
NOTE: There were 278443 observations read from the data set GRUND.SYSI2000.
NOTE: There were 157321 observations read from the data set GRUND.SYSI2001.
NOTE: There were 361516 observations read from the data set GRUND.SYSI2002.
NOTE: There were 486671 observations read from the data set GRUND.SYSI2003.
NOTE: There were 537483 observations read from the data set GRUND.SYSI2004.
NOTE: There were 279213 observations read from the data set GRUND.SYSI2005.
NOTE: There were 279214 observations read from the data set GRUND.SSSY2005.
NOTE: There were 69820 observations read from the data set GRUND.SSSY2006.
NOTE: There were 72665 observations read from the data set GRUND.SSSY2007.
NOTE: There were 76200 observations read from the data set GRUND.SSSY2008.
NOTE: There were 82601 observations read from the data set GRUND.SSSY2009.
NOTE: There were 94862 observations read from the data set GRUND.SSSY2010.
NOTE: There were 370234 observations read from the data set GRUND.SSSY2011.
NOTE: There were 554060 observations read from the data set GRUND.SSSY2012.
NOTE: There were 618790 observations read from the data set GRUND.SSSY2013.
NOTE: There were 654018 observations read from the data set GRUND.SSSY2014.
NOTE: There were 683659 observations read from the data set GRUND.SSSY2015.
NOTE: There were 719677 observations read from the data set GRUND.SSSY2016.
NOTE: There were 749265 observations read from the data set GRUND.SSSY2017.
NOTE: There were 764464 observations read from the data set GRUND.SSSY2018.
NOTE: The data set WORK.FOOT has 9437442 observations and 3 variables.
NOTE: DATA statement used (Total process time):
real time 4.55 seconds
cpu time 1.76 seconds

```

24
25     title1 'Date of any podiatry' ;
26     proc tabulate data = foot noseps missing ;
27         class doPod ;
28         table all doPod, n * f=comma10. / rts = 10 ;

```

```
29         format doPod  year4. ;
30         run ;
```

NOTE: There were 9437442 observations read from the data set WORK.FOOT.

NOTE: The PROCEDURE TABULATE printed page 1.

NOTE: PROCEDURE TABULATE used (Total process time):

```
real time      1.99 seconds
cpu time       2.36 seconds
```

```
31
32         proc sort  data = foot ; by pnr doPod ; run ;
```

NOTE: There were 9437442 observations read from the data set WORK.FOOT.

NOTE: The data set WORK.FOOT has 9437442 observations and 3 variables.

NOTE: PROCEDURE SORT used (Total process time):

```
real time      1.59 seconds
cpu time       3.57 seconds
```

```
33
34         data DMdat.foot ;
35         set foot ;
36         by pnr doPod ;
37         if first.pnr then output ;
38         run ;
```

NOTE: There were 9437442 observations read from the data set WORK.FOOT.

NOTE: The data set DMDAT.FOOT has 289190 observations and 3 variables.

NOTE: DATA statement used (Total process time):

```
real time      1.47 seconds
cpu time       1.10 seconds
```

```
39
40         title1 'Date of >>first<< podiatry' ;
41         proc tabulate data = DMdat.foot noseps missing ;
42         class doPod ;
43         table all doPod, n * f=comma10. / rts = 10 ;
44         format doPod  year4. ;
45         run ;
```

NOTE: There were 289190 observations read from the data set DMDAT.FOOT.

NOTE: The PROCEDURE TABULATE printed page 2.

NOTE: PROCEDURE TABULATE used (Total process time):

```
real time      0.07 seconds
cpu time       0.07 seconds
```

```
46
47
48
49
```

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

```
real time      9.89 seconds
cpu time       9.03 seconds
```

4.7.1 03-nhsr.lst

Date of any podiatry

15:42 Friday, April 17, 2020 1

```
-----
N
```

```

-----
All          9,437,442
doPod
1990         133,346
1991         145,828
1992         162,331
1993         175,653
1994         193,391
1995         219,430
1996         239,616
1997         264,042
1998         288,686
1999         318,576
2000         279,402
2001         156,661
2002         361,228
2003         486,737
2004         537,406
2005         558,428
2006          69,819
2007          72,665
2008          76,141
2009          76,069
2010          75,105
2011         337,745
2012         501,263
2013         552,201
2014         583,532
2015         605,770
2016         636,300
2017         659,900
2018         670,171
-----

```

Date of >>first<< podiatry

15:42 Friday, April 17, 2020 2

```

-----
N
-----
All          289,190
doPod
1990         19,124
1991          5,505
1992          5,706
1993          6,085
1994          6,764
1995          7,723
1996          7,919
1997          8,333
1998          8,997
1999          9,782
2000          8,008
2001          5,011
2002         16,093
2003         14,252
2004         14,352
2005          6,961
2006          1,458
2007          1,584
2008          1,600
2009          1,404
2010          1,881
2011         35,271
2012         18,509
2013         14,060
2014         12,454
2015         12,086
2016         12,558
2017         12,719
2018         12,991

```

4.8 04-rmps

Processes the records from the RMPS with other target medications and creates a file (pRMPS) with one record per person with at least one prescription of either OAD or insulin.

Uses the GDM dates to exclude possible inclusion dates in GDM grace periods.

1 "Program: 04-rmps.sas" 09:51 Saturday, April 18, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)

Licensed to FORSKNING 2, Site 50800723.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.08 seconds

cpu time 0.12 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      %macro getmed ;
2      data rmps
3          fert ( rename = ( eksd = doFb ) ) ;
4          set %do i = 1995 %to 2019 ;
5              grund.lmdb&i.          ( keep = pnr atc eksd
6                                      where = ( substr(atc,1,3) in ("A10","G03") ) )
7              grund.lmdb&i._brutto ( keep = pnr atc eksd
8                                      where = ( substr(atc,1,3) in ("A10","G03") ) )
9          %end ; ;
10         if substr( atc, 1, 4 ) in ("G03G","G03H") then output fert ;
11         if substr( atc, 1, 4 ) in ("A10A","A10B") then output rmps ;
12     run ;
13     %mend ;
14     %getmed ;

```

NOTE: There were 583837 observations read from the data set GRUND.LMDB1995.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 564309 observations read from the data set GRUND.LMDB1995_BRUTTO.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 646713 observations read from the data set GRUND.LMDB1996.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 628673 observations read from the data set GRUND.LMDB1996_BRUTTO.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 690515 observations read from the data set GRUND.LMDB1997.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 673272 observations read from the data set GRUND.LMDB1997_BRUTTO.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 751178 observations read from the data set GRUND.LMDB1998.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 734724 observations read from the data set GRUND.LMDB1998_BRUTTO.

WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 812675 observations read from the data set GRUND.LMDB1999.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 797198 observations read from the data set GRUND.LMDB1999_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 843479 observations read from the data set GRUND.LMDB2000.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 829201 observations read from the data set GRUND.LMDB2000_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 922459 observations read from the data set GRUND.LMDB2001.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 908987 observations read from the data set GRUND.LMDB2001_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1000624 observations read from the data set GRUND.LMDB2002.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 987387 observations read from the data set GRUND.LMDB2002_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1082273 observations read from the data set GRUND.LMDB2003.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1069550 observations read from the data set GRUND.LMDB2003_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1195096 observations read from the data set GRUND.LMDB2004.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1182980 observations read from the data set GRUND.LMDB2004_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1306429 observations read from the data set GRUND.LMDB2005.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1294466 observations read from the data set GRUND.LMDB2005_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1423247 observations read from the data set GRUND.LMDB2006.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1411671 observations read from the data set GRUND.LMDB2006_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1535243 observations read from the data set GRUND.LMDB2007.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1523697 observations read from the data set GRUND.LMDB2007_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1673701 observations read from the data set GRUND.LMDB2008.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1662816 observations read from the data set GRUND.LMDB2008_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1765353 observations read from the data set GRUND.LMDB2009.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1754160 observations read from the data set GRUND.LMDB2009_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1885400 observations read from the data set GRUND.LMDB2010.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1877610 observations read from the data set GRUND.LMDB2010_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2012463 observations read from the data set GRUND.LMDB2011.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2005300 observations read from the data set GRUND.LMDB2011_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2113066 observations read from the data set GRUND.LMDB2012.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2104230 observations read from the data set GRUND.LMDB2012_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2142429 observations read from the data set GRUND.LMDB2013.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2133412 observations read from the data set GRUND.LMDB2013_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2163345 observations read from the data set GRUND.LMDB2014.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2154513 observations read from the data set GRUND.LMDB2014_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2176058 observations read from the data set GRUND.LMDB2015.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2166529 observations read from the data set GRUND.LMDB2015_BRUTTO.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2263674 observations read from the data set GRUND.LMDB2016.
WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2254229 observations read from the data set GRUND.LMDB2016_BRUTTO.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2318789 observations read from the data set GRUND.LMDB2017.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2313898 observations read from the data set GRUND.LMDB2017_BRUTTO.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2369983 observations read from the data set GRUND.LMDB2018.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 2370544 observations read from the data set GRUND.LMDB2018_BRUTTO.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1224776 observations read from the data set GRUND.LMDB2019.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: There were 1225080 observations read from the data set GRUND.LMDB2019_BRUTTO.
 WHERE SUBSTR(atc, 1, 3) in ('A10', 'G03');

NOTE: The data set WORK.RMPS has 73129139 observations and 3 variables.
 NOTE: The data set WORK.FERT has 402102 observations and 3 variables.
 NOTE: DATA statement used (Total process time):
 real time 24:59.13
 cpu time 3:37.20

```
15
16 *-----;
17 * delete duplicates ;
18 proc sort data = rmps nodupkey ; by pnr eksd atc ; run ;
```

NOTE: There were 73129139 observations read from the data set WORK.RMPS.
 NOTE: 37348781 observations with duplicate key values were deleted.
 NOTE: The data set WORK.RMPS has 35780358 observations and 3 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 15.74 seconds
 cpu time 37.81 seconds

```
19 proc sort data = fert nodupkey ; by pnr doFb atc ; run ;
```

NOTE: There were 402102 observations read from the data set WORK.FERT.
 NOTE: 68542 observations with duplicate key values were deleted.
 NOTE: The data set WORK.FERT has 333560 observations and 3 variables.
 NOTE: PROCEDURE SORT used (Total process time):
 real time 0.08 seconds
 cpu time 0.21 seconds

```
20
21 *-----;
22 * we need sex as variable in alloAD and excluding ;
23 data alloAD
24 allIns ;
25 merge rmps ( in = r )
26 DMdat.pcos ( in = p )
27 DMdat.gdm
28 DMdat.pop ( in = b keep = pnr doBth sex ) ;
29 by pnr ;
30 if r and b ;
31 * exclude drug dispensation in the GDM-windows ;
32 %xgdm( eksd ) ;
33 * drop metformin in PCOSrange ;
34 inPCOSrg = ( doBth + 365.25*&pcoslo. )
35 < eksd <
36 ( doBth + 365.25*&pcoshi. ) ;
37 if inPCOSrg and
38 sex eq 2 and
39 atc eq "A10BA02" then delete ;
40 if substr( atc, 1, 4 ) eq "A10A" then output allIns ;
41 if substr( atc, 1, 4 ) eq "A10B" then output alloAD ;
42 run ;
```

NOTE: Variable doGDM12 is uninitialized.
 NOTE: Missing values were generated as a result of performing an operation on missing

values.

Each place is given by: (Number of times) at (Line):(Column).

```
35246689 at 32:18 35246689 at 32:54 35631607 at 32:20 35631607 at 32:56
35712942 at 32:20 35712942 at 32:56 35726694 at 32:20 35726694 at 32:56
35730260 at 32:20 35730260 at 32:56 35731155 at 32:20 35731155 at 32:56
35731385 at 32:20 35731385 at 32:56 35731385 at 32:20 35731385 at 32:56
35731554 at 32:20 35731554 at 32:56 35731554 at 32:20 35731554 at 32:56
35731554 at 32:20 35731554 at 32:56 35731554 at 32:20 35731554 at 32:56
```

NOTE: There were 35780358 observations read from the data set WORK.RMPS.

NOTE: There were 22842 observations read from the data set DMDAT.PCOS.

NOTE: There were 22391 observations read from the data set DMDAT.GDM.

NOTE: There were 7632139 observations read from the data set DMDAT.POP.

NOTE: The data set WORK.ALLOAD has 23458236 observations and 20 variables.

NOTE: The data set WORK.ALLINS has 11941514 observations and 20 variables.

NOTE: DATA statement used (Total process time):

```
real time      50.76 seconds
cpu time       50.06 seconds
```

```
43
44 *-----;
45 * generate data sets with second date of OAD / Ins ;
46 %macro second( tp ) ;
47 data &tp.2 ( keep = pnr do&tp.2 ) ;
48   set all&tp. ( rename = ( eksd = do&tp.2 ) ) ;
49   by pnr ;
50   if first.pnr then dno = 0 ;
51   dno + 1 ;
52   if dno eq 2 then output ;
53 run ;
54
55 data &tp. ( keep = pnr do&tp. ) ;
56   set all&tp. ( rename = ( eksd = do&tp. ) ) ;
57   by pnr ;
58   if first.pnr ;
59 run ;
60 %mend ;
61
62 options mprint ;
63 %second( OAD ) ;
MPRINT(SECOND): data OAD2 ( keep = pnr doOAD2 ) ;
MPRINT(SECOND): set allOAD ( rename = ( eksd = doOAD2 ) ) ;
MPRINT(SECOND): by pnr ;
MPRINT(SECOND): if first.pnr then dno = 0 ;
MPRINT(SECOND): dno + 1 ;
MPRINT(SECOND): if dno eq 2 then output ;
MPRINT(SECOND): run ;
```

NOTE: There were 23458236 observations read from the data set WORK.ALLOAD.

NOTE: The data set WORK.OAD2 has 394493 observations and 2 variables.

NOTE: DATA statement used (Total process time):

```
real time      3.39 seconds
cpu time       3.39 seconds
```

```
MPRINT(SECOND): data OAD ( keep = pnr doOAD ) ;
MPRINT(SECOND): set allOAD ( rename = ( eksd = doOAD ) ) ;
MPRINT(SECOND): by pnr ;
MPRINT(SECOND): if first.pnr ;
MPRINT(SECOND): run ;
```

NOTE: There were 23458236 observations read from the data set WORK.ALLOAD.

NOTE: The data set WORK.OAD has 417994 observations and 2 variables.

NOTE: DATA statement used (Total process time):

```
real time      3.42 seconds
cpu time       3.42 seconds
```

```
64 %second( Ins ) ;
MPRINT(SECOND): data Ins2 ( keep = pnr doIns2 ) ;
```

```

MPRINT(SECOND):  set allIns ( rename = ( eksd = doIns2 ) ) ;
MPRINT(SECOND):  by pnr ;
MPRINT(SECOND):  if first.pnr then dno = 0 ;
MPRINT(SECOND):  dno + 1 ;
MPRINT(SECOND):  if dno eq 2 then output ;
MPRINT(SECOND):  run ;

```

NOTE: There were 11941514 observations read from the data set WORK.ALLINS.

NOTE: The data set WORK.INS2 has 159980 observations and 2 variables.

NOTE: DATA statement used (Total process time):

```

real time      1.69 seconds
cpu time       1.70 seconds

```

```

MPRINT(SECOND):  data Ins ( keep = pnr doIns ) ;
MPRINT(SECOND):  set allIns ( rename = ( eksd = doIns ) ) ;
MPRINT(SECOND):  by pnr ;
MPRINT(SECOND):  if first.pnr ;
MPRINT(SECOND):  run ;

```

NOTE: There were 11941514 observations read from the data set WORK.ALLINS.

NOTE: The data set WORK.INS has 173220 observations and 2 variables.

NOTE: DATA statement used (Total process time):

```

real time      1.63 seconds
cpu time       1.64 seconds

```

```

65      options nomprint ;
66
67      data DMdat.rmps ( label = "Antidiabetic drug purchase DK 1995-2019" ) ;
68          merge OAD OAD2 Ins Ins2 ;
69          by pnr ;
70          label doOAD = 'Date of 1st OAD'
71              doOAD2 = 'Date of 2nd OAD'
72              doIns = 'Date of 1st Ins'
73              doIns2 = 'Date of 2nd Ins' ;
74          format doOAD doOAD2 doIns doIns2 ddmmyys10. ;
75          run ;

```

NOTE: There were 417994 observations read from the data set WORK.OAD.

NOTE: There were 394493 observations read from the data set WORK.OAD2.

NOTE: There were 173220 observations read from the data set WORK.INS.

NOTE: There were 159980 observations read from the data set WORK.INS2.

NOTE: The data set DMDAT.RMPS has 474318 observations and 5 variables.

NOTE: DATA statement used (Total process time):

```

real time      0.25 seconds
cpu time       0.20 seconds

```

```

76
77      proc contents data = DMdat.rmps ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):

```

real time      0.03 seconds
cpu time       0.04 seconds

```

NOTE: The PROCEDURE CONTENTS printed page 1.

```

78      proc tabulate data = DMdat.rmps noseps missing ;
79          class doINS doOAD ;
80          var doINS2 doOAD2 ;
81          table all doOAD="doOAD",
82              all * f=comma7.
83              doOAD2='N:OAD2' * n * f=comma7.
84              doIns2='N:Ins2' * n * f=comma7.
85              doIns="doIns" * f=comma7.
86          / rts = 7 ;
87          format doINS doOAD
88              doINS2 doOAD2 year4. ;
89          keylabel n = ' ' ;

```

90 run ;

NOTE: There were 474318 observations read from the data set DMDAT.RMPS.

NOTE: The PROCEDURE TABULATE printed pages 2-4.

NOTE: PROCEDURE TABULATE used (Total process time):

real time 0.12 seconds
cpu time 0.18 seconds

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

real time 26:16.59
cpu time 5:16.03

4.8.1 04-rmps.lst

!The SAS System 09:51 Saturday, April 18, 2020 1

The CONTENTS Procedure

Data Set Name	DMDAT.RMPS	Observations	474318
Member Type	DATA	Variables	5
Engine	V9	Indexes	0
Created	18/04/2020 10:18:07	Observation Length	28
Last Modified	18/04/2020 10:18:07	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Antidiabetic drug purchase DK 1995-2019		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	204
First Data Page	*
Max Obs per Page	2329
Obs in First Data Page	2270
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\rmps.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	13MB
File Size (bytes)	13434880

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
1	PNR	Char	12	\$12.	\$10.	Personnummer
4	doIns	Num	4	DDMMYYS10.		Date of 1st Ins
5	doIns2	Num	4	DDMMYYS10.		Date of 2nd Ins
2	doOAD	Num	4	DDMMYYS10.		Date of 1st OAD
3	doOAD2	Num	4	DDMMYYS10.		Date of 2nd OAD

The SAS System 09:51 Saturday, April 18, 2020 2

```
-----
doIns
-----
All N:OAD2 N:Ins2 . 1995 1996 1997 1998 1999 2000
```

	474,318	394,493	159,980	301,098	31,996	4,828	4,022	4,365	4,807	4,976
All										
do0AD										
.	56,324	0	52,151	.	25,810	2,009	1,207	1,133	1,120	1,145
1995	46,057	45,239	21,744	23,205	2,504	2,163	1,968	1,996	2,068	1,852
1996	10,877	10,170	4,862	5,766	372	289	259	280	317	363
1997	10,134	9,463	4,483	5,405	267	48	275	249	276	270
1998	11,152	10,507	5,059	5,814	278	29	63	328	303	302
1999	11,407	10,735	5,086	6,037	292	33	30	75	378	281
2000	11,527	10,928	4,960	6,271	271	28	25	36	64	402
2001	12,222	11,665	5,180	6,720	232	15	20	24	30	71
2002	12,093	11,517	4,874	6,875	213	24	19	18	37	39
2003	14,271	13,666	5,352	8,549	177	16	22	19	31	24
2004	14,667	13,950	4,908	9,377	124	18	9	18	22	25
2005	14,480	13,858	4,731	9,382	119	7	8	12	18	24
2006	15,009	14,336	4,423	10,238	99	11	13	18	18	16
2007	16,468	15,766	4,375	11,704	123	15	14	24	15	14
2008	18,221	17,438	4,157	13,645	112	14	9	11	14	23
2009	19,123	18,284	3,878	14,821	133	13	8	19	13	19
2010	21,338	20,387	3,674	17,244	120	7	11	15	14	11
2011	25,090	23,998	3,295	21,362	128	13	9	19	7	16
2012	21,998	20,856	2,704	18,893	132	15	6	15	10	16
2013	16,062	15,206	2,121	13,615	94	4	9	12	7	10
2014	14,946	14,173	1,857	12,791	64	18	8	7	5	6
2015	16,867	15,945	1,742	14,794	63	14	8	4	10	8
2016	18,278	17,213	1,453	16,541	77	5	6	7	11	8
2017	17,652	16,560	1,297	16,074	70	5	7	10	6	12
2018	18,005	16,504	1,105	16,630	62	12	6	8	8	11
2019	10,050	6,129	509	9,345	60	*	*	8	5	8

(Continued)

The SAS System

09:51 Saturday, April 18, 2020

3

doIns										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All	4,904	5,207	5,971	6,416	6,243	6,313	6,562	6,221	6,288	5,991
do0AD										
.	1,134	1,159	1,133	1,194	1,186	1,267	1,270	1,293	1,285	1,270
1995	1,414	1,418	1,406	1,204	931	773	627	439	365	313
1996	328	336	356	363	281	277	244	177	151	121
1997	337	308	376	347	321	266	233	190	141	140
1998	335	331	431	410	361	311	325	239	200	180
1999	284	321	406	418	349	339	339	279	233	186
2000	291	271	381	379	385	344	354	282	266	211
2001	454	301	372	392	399	361	410	330	303	260
2002	59	458	324	381	354	348	339	301	315	259
2003	35	62	478	405	404	413	436	372	371	299
2004	32	33	60	556	376	345	342	376	348	293
2005	25	34	21	64	599	357	369	321	344	310
2006	24	19	33	33	64	565	354	324	365	308
2007	18	22	17	38	47	66	611	327	329	288
2008	17	18	30	32	25	39	75	681	320	288
2009	13	17	21	33	21	35	39	70	716	305
2010	21	18	22	31	26	41	51	47	83	717
2011	17	19	26	26	26	34	31	36	35	79
2012	12	5	17	21	21	31	20	25	34	69
2013	9	13	12	14	12	23	12	21	21	21
2014	12	7	12	13	8	24	23	25	11	22
2015	5	10	6	21	13	13	20	17	9	11
2016	5	5	5	12	8	7	8	9	13	13
2017	9	7	12	16	9	10	10	18	9	9
2018	7	9	9	10	12	15	14	14	12	12
2019	7	6	5	*	5	9	6	8	9	7

(Continued)

The SAS System

09:51 Saturday, April 18, 2020 4

	doIns								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
All	6,292	6,337	6,638	6,686	7,026	7,238	7,444	7,004	3,445
do0AD									
.	1,216	1,166	1,372	1,339	1,328	1,398	1,532	1,525	833
1995	291	238	202	175	143	133	109	68	52
1996	114	92	82	77	69	44	56	53	10
1997	138	116	82	81	81	65	46	47	29
1998	170	149	145	93	91	90	84	67	23
1999	186	172	165	140	134	120	93	82	35
2000	220	197	161	171	165	119	114	79	40
2001	245	240	234	176	161	158	131	120	63
2002	257	229	228	225	204	178	195	142	72
2003	336	288	284	279	257	241	207	185	81
2004	343	301	319	273	278	285	239	194	81
2005	320	348	314	285	311	280	279	217	112
2006	329	325	302	303	299	309	303	214	123
2007	332	329	357	374	357	336	330	279	102
2008	275	339	354	357	376	362	377	282	146
2009	301	305	339	350	366	360	346	307	153
2010	319	279	279	311	385	402	386	342	156
2011	713	316	287	305	321	374	375	361	155
2012	60	722	288	267	264	296	314	315	130
2013	27	71	700	234	252	249	270	254	96
2014	21	23	61	711	255	244	232	233	110
2015	20	30	29	66	794	284	256	249	113
2016	16	20	17	42	66	785	250	229	113
2017	19	15	19	23	32	69	816	261	105
2018	15	17	9	20	29	40	76	823	125
2019	9	10	9	9	8	17	28	76	387

4.9 05-diab

Uses eye-screening dates from the national eye-screening database to supplement persons with diabetes and update dates of diabetes diagnosis. Uses the clinically recorded type of diabetes to define the status of the patients.

Uses the dataset with GDM dates to exclude examination dates in GDM grace periods.

1 "Program: 05-diab.sas" 11:05 Saturday, April 18, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)

Licensed to FORSKNING 2, Site 50800723.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.08 seconds

cpu time 0.12 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      options nofmterr ;
2
3      proc sort  data = ekstn.diabase_forskning
4                ( rename = (Report_EyeScreeningDate = doDiaB) )
5                out = diab ( keep = pnr doDiaB ) ;
6      by pnr doDiaB ;
7      run ;

```

NOTE: There were 723554 observations read from the data set EKSTN.DIABASE_FORSKNING.

NOTE: The data set WORK.DIAB has 723554 observations and 2 variables.

NOTE: PROCEDURE SORT used (Total process time):

real time 0.85 seconds
cpu time 0.50 seconds

```

8
9      data DMdat.DiaB ( drop = visit )
10     DiaB ;
11     set diab ;
12     by pnr ;
13     visit = 'Later' ;
14     if first.pnr then do ;
15         output DMdat.DiaB ;
16         visit = 'First' ;
17     end ;
18     output DiaB ;
19     format doDiaB ddmmyy10. ;
20     label doDiaB = 'EyeScr data' ;
21     run ;

```

NOTE: There were 723554 observations read from the data set WORK.DIAB.

NOTE: The data set DMDAT.DIAB has 221761 observations and 2 variables.

NOTE: The data set WORK.DIAB has 723554 observations and 3 variables.

NOTE: DATA statement used (Total process time):

real time 0.13 seconds
cpu time 0.12 seconds

```

22
23     proc tabulate data = DiaB missing noseps ;
24         class doDiaB visit ;
25         table all doDiaB,
26             ( visit all ) * f =comma9.
27             / rts = 10 ;
28         format doDiaB yyqs8. ;
29     run ;

```

NOTE: There were 723554 observations read from the data set WORK.DIAB.

NOTE: The PROCEDURE TABULATE printed page 1.

NOTE: PROCEDURE TABULATE used (Total process time):

real time 0.22 seconds
cpu time 0.34 seconds

```

30
31     proc contents data = DMdat.DiaB ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):

real time 0.01 seconds
cpu time 0.01 seconds

NOTE: The PROCEDURE CONTENTS printed page 2.

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

real time 1.36 seconds
cpu time 1.12 seconds

4.9.1 05-diab.lst

The SAS System

11:05 Saturday, April 18, 2020 1

```

-----
              visit
-----
      First      Later      All
-----
      N          N          N
-----
All          221,761    501,793    723,554
EyeScr
data
2009/1        1,730          *      1,733
2009/2        1,470           81     1,551
2009/3        1,345          243     1,588
2009/4        1,521          273     1,794
2010/1        2,011          746     2,757
2010/2        1,949          1,086   3,035
2010/3        3,127          1,395   4,522
2010/4        3,637          1,697   5,334
2011/1        4,271          2,421   6,692
2011/2        2,858          2,433   5,291
2011/3        2,218          2,741   4,959
2011/4        2,371          3,663   6,034
2012/1        2,213          4,094   6,307
2012/2        1,970          3,713   5,683
2012/3        1,205          3,123   4,328
2012/4        1,051          3,468   4,519
2013/1        3,302          3,930   7,232
2013/2        5,832          4,473  10,305
2013/3        4,665          4,038   8,703
2013/4        6,628          5,134  11,762
2014/1        9,925          7,294  17,219
2014/2       12,064          9,223  21,287
2014/3       12,034          8,089  20,123
2014/4       11,226          9,696  20,922
2015/1       12,712         13,410  26,122
2015/2       11,875         17,255  29,130
2015/3        7,627         16,144  23,771
2015/4       10,417         20,326  30,743
2016/1        7,198         22,164  29,362
2016/2        6,875         26,258  33,133
2016/3        4,788         18,859  23,647
2016/4        4,953         24,370  29,323
2017/1        5,343         23,622  28,965
2017/2        6,432         26,373  32,805
2017/3        5,249         19,906  25,155
2017/4        7,059         27,018  34,077
2018/1        6,866         25,969  32,835
2018/2        6,695         32,294  38,989
2018/3        4,544         23,286  27,830
2018/4        4,765         28,794  33,559
2019/1        4,414         25,983  30,397
2019/2        3,326         26,705  30,031
-----

```

The SAS System

11:05 Saturday, April 18, 2020 2

The CONTENTS Procedure

Data Set Name	DMDAT.DIAB	Observations	221761
Member Type	DATA	Variables	*
Engine	V9	Indexes	0
Created	18/04/2020 11:05:06	Observation Length	24
Last Modified	18/04/2020 11:05:06	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	82
First Data Page	*
Max Obs per Page	2715
Obs in First Data Page	2663
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\diab.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	5MB
File Size (bytes)	5439488

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
2	doDiaB	Num	8	DDMMYY10.	IS8601DA10.	EyeScr data
1	pnr	Char	12	\$12.	\$10.	Personnummer

4.10 06-define

Collects records from the processed registers and defines a diabetes register and the relevant dates in it.

The inclusion date will be the smaller of the earliest dates from NPR, RMPS, DADD, NHSR and DIAB, and the inclusion criterion will be the one that triggered the inclusion. This has been done both using 1st or 2nd NPR record and dispense of OAD and insulin.

Diabetes type is derived as described above.

Also derives a diabetes register exclusively based on drug information only.

1 "Program: 06-define.sas" 14:39 Saturday, April 18, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)
Licensed to FORSKNING 2, Site 50800723.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.07 seconds
cpu time 0.10 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      * Constants used ;
2      %put      ini = &ini.      end = &end.      t1ins = &t1ins. ;
ini = '01JAN1996'd      end = '31DEC2018'd      t1ins = 30
3
4      * A data set of all persons mentioned in any of the source registers ;
5      data DMreg ;
6          merge DMdat.npr      ( in = npr      keep = pnr doNPR doNPR2 nprtyp )
7                  DMdat.DVDD ( in = dvdd      keep = pnr doDVDD      dvdtype )
8                  DMdat.RMPS ( in = rmpr      keep = pnr doOAD doOAD2 doIns doIns2 )
9                  DMdat.FOOT ( in = foot      keep = pnr doPod )
10                 DMdat.DiaB ( in = diab      keep = pnr doDiaB )
11                 DMdat.pop ( in = pop ) ;
12     by pnr ;
13     format doBth doDth
14             doDM doNPR doDVDD doDiaB doPod doOAD doIns
15             doNPR2 doDVD      doOAD2 doIns2 do2nd
16             ddmmyy10. ;
17     * must be in the population and meet at least one criterion ;
18     if pop and ( npr or dvdd or rmpr or foot or diab ) ;
19
20     * date in DVDD only used if the person meets no other criterion
21     so we define doDVD as the doDVDD to be used. This will have the
22     effect of putting the date of inclusion later than if we used the
23     DVDD date proper. But the DVDD date is too uncertain to be used
24     except when no other criterion met ;
25     if nmiss( doNPR, doOAD, doIns, doPod, doDiaB ) eq 5 then doDVD = doDVDD ;
26
27     *-----;
28     * Date of diagnosis as 2nd date of EITHER dispense or NPR diag
29     - find the date of the 1st and 2nd criterion met
30     - record the criterion met at the earliest date ;
31     if doOAD eq min(doOAD ,doIns ,doNPR ) then do ;
32     do2nd = min(doOAD2,doIns ,doNPR ) ; fC = '0' ; end ;
33     if doIns eq min(doOAD ,doIns ,doNPR ) then do ;
34     do2nd = min(doOAD ,doIns2,doNPR ) ; fC = 'I' ; end ;
35     if doNPR eq min(doOAD ,doIns ,doNPR ) then do ;
36     do2nd = min(doOAD ,doIns ,doNPR2) ; fC = 'N' ; end ;
37     * compute the type of 2nd criterion between OAD, Ins and NPR ;
38     if do2nd eq doOAD or do2nd eq doOAD2 then inCr = fC||"-O" ;
39     if do2nd eq doIns or do2nd eq doIns2 then inCr = fC||"-I" ;
40     if do2nd eq doNPR or do2nd eq doNPR2 then inCr = fC||"-N" ;
41     * Date of inclusion using 2nd dispense OR 2nd NPR record ;
42     doDM = min( do2nd, doPod, doDiaB, doDVD ) ;
43     * Inclusion criterion based on 2nd purchase / 2nd NPR ;
44     if doDM le .z      then inCr = "---" ;
45     else do ;
46     if doDM eq doDiaB then inCr = "Dia" ;
47     if doDM eq doPod  then inCr = "Pod" ;
48     if doDM eq doDVD  then inCr = "DVD" ;
49     end ;
50
51     * indicator of a single criterion met
52     and whether the person has a DVDD record ;
53     only1 = nmiss( do2nd, doPod, doDiaB, doDVD ) eq 3 ;
54     hasdvd = ~missing( doDVDD ) ;
55
56     *-----;
57     * Type definition using also the T1 definition from NPR ;

```

```

58         if                      dvdtyp eq 'T1'      or
59         ( nprtyp eq 'T1' and dvdtyp ne 'T2' ) or
60         .z < (doIns - doBth) < ( 365.25 * &tins. ) then DMtp = 'T1' ;
61         else DMtp = 'T2' ;
62         * impossible to be T1 without insulin ;
63         if missing( doIns ) then DMtp = 'T2' ;
64         * finally, never override a DVDD verdict of T2 ;
65         if dvdtyp eq 'T2' then DMtp = 'T2' ;
66     run ;

```

NOTE: Missing values were generated as a result of performing an operation on missing values.

Each place is given by: (Number of times) at (Line):(Column).

33034 at 31:15 50965 at 32:15 33034 at 33:15 36376 at 34:15
33034 at 35:15 44801 at 36:15 27901 at 42:13 346630 at 60:18

NOTE: There were 243939 observations read from the data set DMDAT.NPR.
NOTE: There were 233323 observations read from the data set DMDAT.DVDD.
NOTE: There were 474318 observations read from the data set DMDAT.RMPS.
NOTE: There were 289190 observations read from the data set DMDAT.FOOT.
NOTE: There were 221761 observations read from the data set DMDAT.DIAB.
NOTE: There were 7632139 observations read from the data set DMDAT.POP.
NOTE: The data set WORK.DMREG has 523426 observations and 25 variables.
NOTE: DATA statement used (Total process time):
real time 5.44 seconds
cpu time 3.36 seconds

```

67
68     title1 'The reconstructed diabetes register' ;
69     data DMdat.DMreg ( label = 'Reconstructed DM register for Denmark'
70                     keep = pnr sex DMtp dvdtyp nprtyp
71                          inCr only1 hasdvd
72                          doBth doDth
73                          doDM doNPR doOAD doIns doPod doDiaB doDVD
74                          doNPR2 doOAD2 doIns2 do2nd ) ;
75     set DMreg ;
76     * only sane results accepted ;
77     if doDM gt doBth and
78     doDM le &end. ;
79     label doBth = 'Date of birth'
80           doDth = 'Date of death'
81           DMtp = 'Type of DM'
82           dvdtyp = 'Type from DVDD'
83           nprtyp = 'Type from NPR'
84           only1 = 'Only one criterion'
85           hasdvd = 'has DVDD record'
86           inCr = 'Incl. criterion'
87           doDM = 'Date of inclusion'
88           do2nd = 'Date of 2nd of Ins/OAD/NPR'
89           doNPR = 'Date of 1st NPR'
90           doNPR2 = 'Date of 2nd NPR'
91           doOAD = 'Date of 1st OAD'
92           doOAD2 = 'Date of 2nd OAD'
93           doIns = 'Date of 1st Ins'
94           doIns2 = 'Date of 2nd Ins'
95           doPod = 'Date of Podiatry'
96           doDiaB = 'Date of diaBase'
97           doDVD = 'Date of DVDD' ;
98     run ;

```

NOTE: There were 523426 observations read from the data set WORK.DMREG.
NOTE: The data set DMDAT.DMREG has 486243 observations and 21 variables.
NOTE: DATA statement used (Total process time):
real time 0.27 seconds
cpu time 0.14 seconds

```

99
100    * temporary variables for the tabulation ;
101    data a ;

```

```

102     set DMdat.DMreg ;
103     * age at diagnosis ;
104     ageDM = ( doDM - doBth ) / 365.25 ;
105     a1 = floor( ageDM ) ;
106     * date of diagnosis moved to end 1995 ;
107     doDM = max( doDM , &ini.-1 ) + doDM - doDM ;
108     o1 = only1 * 100 ;
109     run ;

```

NOTE: There were 486243 observations read from the data set DMDAT.DMREG.

NOTE: The data set WORK.A has 486243 observations and 24 variables.

NOTE: DATA statement used (Total process time):

```

real time      0.25 seconds
cpu time       0.12 seconds

```

```

110
111     proc format ;
112         value onlyone 0='>1 crit' 1=' only 1' ;
NOTE: Format ONLYONE has been output.
113         value hasdvd 0='no DVDD' 1='in DVDD' ;
NOTE: Format HASDVD has been output.
114     run ;

```

NOTE: PROCEDURE FORMAT used (Total process time):

```

real time      0.00 seconds
cpu time       0.01 seconds

```

```

115
116     title2 'Inclusion using 2nd OAD/Ins/NPR (the official version)' ;
117     proc tabulate data = a ( where = (doDM > .z) )
118         missing noseps formchar = ' - - - ' ;
119         class sex doDth doDM inCr a1 ageDM
120             only1 hasdvd dvdtyp nprtyp DMtp ;
121         var o1 doIns ;
122         keylabel n = ' '
123             mean = ' ' ;
124         table all DMtp * doDM,
125             dvdtyp * ( all nprtyp ) * f=comma7.
126             / rts = 6 indent = 0 ;
127         table ( all DMtp ) *
128             ( all only1 ) *
129             ( all hasdvd ),
130             ( all inCr ) * f=comma7.
131             / rts = 20 indent = 2 ;
132         table DMtp * ( all doDM ),
133             all * ( n='      N' * f=comma7. mean * o1='%w1' * f=4.1 )
134             inCr * ( n='      N' * f=comma7. mean * o1='%w1' * f=3.0 )
135             / rts = 6 indent = 0 ;
136         table all doDM,
137             all * f = comma7.
138             inCr * f = comma7.
139             / rts = 6 condense ;
140         table all doDM,
141             all * f = comma7.
142             inCr * pctn< inCr all > * f = 4.1
143             / rts = 6 condense ;
144         table sex all="M+F"
145             ( sex all="M+F" ) * a1="dAge",
146             all * f = comma7.
147             inCr * f = 5.
148             / rts = 6 indent=0 condense ;
149         format doDM year4.
150             ageDM agr.
151             sex sex.
152             only1 onlyone.
153             hasdvd hasdvd. ;
154     run ;

```

NOTE: There were 486243 observations read from the data set WORK.A.
 WHERE doDM>.Z;
 NOTE: At least one W.D format was too small for the number to be printed. The decimal may
 be shifted by the "BEST" format.
 NOTE: The PROCEDURE TABULATE printed pages 1-9.
 NOTE: PROCEDURE TABULATE used (Total process time):
 real time 0.67 seconds
 cpu time 0.90 seconds

155
 156 proc contents data = DMdat.DMreg ; run ;

NOTE: PROCEDURE CONTENTS used (Total process time):
 real time 0.00 seconds
 cpu time 0.01 seconds

NOTE: The PROCEDURE CONTENTS printed page 10.

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:
 real time 6.85 seconds
 cpu time 4.70 seconds

4.10.1 06-define.lst

The following is a tabular documentation of the most important features of the constructed register.

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 1
 Inclusion using 2nd OAD/Ins/NPR (the official version)

----- Type from DVDD ----- NA ----- Type from NPR -----										
	Type from NPR				Type from NPR					
	All	NA	T1	T2	All	NA	T1	T2		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
All	254,614	158,288	17,854	16,855	61,617	4,988	200	1,761	1,021	2,006
T1										
1995	8,165	76	95	7,938	56	299	.	35	258	6
1996	481	23	10	446	*	26	.	5	21	.
1997	430	12	8	408	*	35	.	4	30	*
1998	402	8	4	390	.	26	.	7	19	.
1999	328	13	6	304	5	32	.	7	24	*
2000	307	6	*	298	*	27	.	4	22	*
2001	284	4	8	269	*	25	.	4	19	*
2002	275	6	10	257	*	40	.	4	35	*
2003	252	5	7	236	4	40	.	7	32	*
2004	247	*	6	235	*	33	.	7	25	*
2005	238	7	15	214	*	36	.	6	29	*
2006	211	13	17	180	*	55	.	6	48	*
2007	241	8	13	218	*	37	.	6	30	*
2008	248	*	10	234	*	45	.	6	37	*
2009	285	8	23	249	5	47	.	9	36	*
2010	279	8	21	246	4	47	.	6	40	*
2011	303	6	24	269	4	55	.	7	46	*
2012	283	8	25	243	7	64	.	15	47	*
2013	347	6	39	301	*	55	.	8	45	*
2014	381	9	38	325	9	52	.	5	46	*
2015	406	6	29	364	7	46	.	*	43	.
2016	525	7	33	472	13	40	.	5	31	4
2017	665	12	55	587	11	33	*	4	28	.
2018	734	18	97	599	20	11	.	*	10	.

T2										
1995	46,338	18,122	6,395	465	21,356	326	*	186	.	138
1996	7,866	4,143	687	81	2,955	44	.	13	.	31
1997	6,981	3,766	614	51	2,550	64	.	28	.	36
1998	7,229	3,953	610	65	2,601	64	.	23	.	41
1999	7,458	4,230	632	64	2,532	73	*	35	.	36
2000	6,900	4,051	509	54	2,286	73	*	31	.	40
2001	6,641	3,957	497	55	2,132	82	*	37	*	43
2002	8,248	5,301	576	74	2,297	89	*	36	*	49
2003	8,570	5,659	596	85	2,230	111	4	49	*	56
2004	8,372	5,783	533	60	1,996	109	*	43	.	65
2005	6,565	4,582	451	56	1,476	122	*	61	*	58
2006	5,775	4,002	424	50	1,299	154	*	60	*	89
2007	6,218	4,452	394	48	1,324	145	6	53	*	84
2008	6,648	4,976	338	42	1,292	187	15	63	*	108
2009	6,662	5,110	354	33	1,165	186	9	70	.	107
2010	7,034	5,452	309	40	1,233	206	15	72	*	118
2011	9,677	7,973	325	57	1,322	242	13	97	*	130
2012	7,997	6,479	354	20	1,144	252	16	102	.	134
2013	6,883	5,545	314	17	1,007	270	18	118	*	133
2014	8,321	6,733	364	28	1,196	241	14	114	*	112
2015	11,406	9,490	437	30	1,449	240	16	97	4	123
2016	12,825	10,714	498	26	1,587	229	19	103	.	107
2017	13,425	11,299	493	36	1,597	195	23	74	*	97
2018	14,258	12,241	556	36	1,425	78	15	25	.	38

(Continued)

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 2
 Inclusion using 2nd OAD/Ins/NPR (the official version)

Type from DVDD										

	T1					T2				
	Type from NPR					Type from NPR				
	All	NA	T1	T2	All	NA	T1	T2		

All	26,529	73	4,392	20,799	1,265	200,112	92,862	17,769	4,013	85,468
T1										
1995	13,596	*	2,720	10,303	572	.	.	.	.	.
1996	699	.	70	589	40	.	.	.	.	.
1997	712	*	74	595	42	.	.	.	.	.
1998	698	*	82	583	30	.	.	.	.	.
1999	640	*	62	549	28	.	.	.	.	.
2000	657	*	62	563	31	.	.	.	.	.
2001	701	*	73	586	41	.	.	.	.	.
2002	687	.	83	560	44	.	.	.	.	.
2003	653	*	82	546	24	.	.	.	.	.
2004	627	*	67	519	39	.	.	.	.	.
2005	625	*	73	524	25	.	.	.	.	.
2006	671	.	75	563	33	.	.	.	.	.
2007	673	.	89	549	35	.	.	.	.	.
2008	642	.	91	525	26	.	.	.	.	.
2009	612	*	88	488	34	.	.	.	.	.
2010	579	*	78	472	27	.	.	.	.	.
2011	521	*	61	422	37	.	.	.	.	.
2012	479	*	69	385	24	.	.	.	.	.
2013	453	*	79	350	21	.	.	.	.	.
2014	415	.	75	320	20	.	.	.	.	.
2015	440	*	89	321	28	.	.	.	.	.
2016	347	*	61	264	21	.	.	.	.	.
2017	185	*	49	125	10	.	.	.	.	.
2018	92	6	17	66	*	.	.	.	.	.
T2										
1995	5	4	*	.	.	14,574	877	2,927	1,279	9,491
1996	.	.	.	.	.	3,543	424	508	134	2,477

1997	*	.	*	.	.	3,701	453	503	127	2,618
1998	.	.	.	.	.	4,496	639	595	188	3,074
1999	*	.	.	*	.	4,857	795	654	181	3,227
2000	6	.	*	*	*	5,143	958	629	156	3,400
2001	*	.	*	.	.	5,483	1,108	698	149	3,528
2002	*	*	.	.	*	6,971	1,820	768	151	4,232
2003	4	*	.	.	*	8,080	2,330	921	166	4,663
2004	6	.	*	*	*	8,536	2,954	859	164	4,559
2005	*	.	*	*	.	7,909	2,794	801	160	4,154
2006	*	.	.	.	*	8,112	2,969	825	160	4,158
2007	*	*	*	.	*	9,021	3,818	838	141	4,224
2008	7	*	*	*	*	10,606	5,107	888	137	4,474
2009	*	.	.	*	.	11,578	6,067	948	147	4,416
2010	4	*	*	*	.	13,267	7,781	865	150	4,471
2011	4	.	*	*	.	18,648	12,568	946	131	5,003
2012	7	*	*	*	*	14,641	10,189	715	90	3,647
2013	5	*	.	*	.	11,103	7,635	565	61	2,842
2014	13	*	*	4	5	8,706	5,964	469	54	2,219
2015	10	*	*	*	*	6,156	3,986	348	32	1,790
2016	10	*	*	5	*	5,597	3,881	269	20	1,427
2017	11	8	.	*	*	4,907	3,764	164	13	966
2018	18	12	.	*	*	4,477	3,981	66	22	408

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 3
 Inclusion using 2nd OAD/Ins/NPR (the official version)

	Incl. criterion							
	All	DVD	Dia	I-I	I-N	I-0	N-I	N-N
All								
All								
All	486,243	5,563	16,870	8,958	1,184	521	10,988	65,082
no DVDD	254,614	.	9,225	6,409	610	352	4,984	25,891
in DVDD	231,629	5,563	7,645	2,549	574	169	6,004	39,191
>1 crit								
All	328,303	.	10,384	3,935	696	265	7,715	51,268
no DVDD	133,870	.	5,104	1,750	224	128	2,307	15,023
in DVDD	194,433	.	5,280	2,185	472	137	5,408	36,245
only *								
All	157,940	5,563	6,486	5,023	488	256	3,273	13,814
no DVDD	120,744	.	4,121	4,659	386	224	2,677	10,868
in DVDD	37,196	5,563	2,365	364	102	32	596	2,946
T1								
All								
All	43,927	.	253	1,721	334	19	5,350	28,521
no DVDD	16,317	.	62	868	186	12	2,104	8,880
in DVDD	27,610	.	191	853	148	7	3,246	19,641
>1 crit								
All	36,182	.	253	1,086	193	11	4,019	23,743
no DVDD	9,748	.	62	315	61	5	957	4,870
in DVDD	26,434	.	191	771	132	6	3,062	18,873
only *								
All	7,745	.	.	635	141	8	1,331	4,778
no DVDD	6,569	.	.	553	125	7	1,147	4,010
in DVDD	1,176	.	.	82	16	*	184	768
T2								
All								
All	442,316	5,563	16,617	7,237	850	502	5,638	36,561
no DVDD	238,297	.	9,163	5,541	424	340	2,880	17,011
in DVDD	204,019	5,563	7,454	1,696	426	162	2,758	19,550
>1 crit								
All	292,121	.	10,131	2,849	503	254	3,696	27,525
no DVDD	124,122	.	5,042	1,435	163	123	1,350	10,153
in DVDD	167,999	.	5,089	1,414	340	131	2,346	17,372
only *								
All	150,195	5,563	6,486	4,388	347	248	1,942	9,036
no DVDD	114,175	.	4,121	4,106	261	217	1,530	6,858

in DVDD 36,020 5,563 2,365 282 86 31 412 2,178

(Continued)

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 4
 Inclusion using 2nd OAD/Ins/NPR (the official version)

	Incl. criterion				
	N-0	0-I	0-N	0-0	Pod
All					
All					
All	24,755	1,460	13,165	256,713	80,984
no DVDD	11,532	901	4,638	138,537	51,535
in DVDD	13,223	559	8,527	118,176	29,449
>1 crit					
All	17,845	784	10,235	164,737	60,439
no DVDD	6,330	328	2,740	66,847	33,089
in DVDD	11,515	456	7,495	97,890	27,350
only *					
All	6,910	676	2,930	91,976	20,545
no DVDD	5,202	573	1,898	71,690	18,446
in DVDD	1,708	103	1,032	20,286	2,099
T1					
All					
All	630	107	754	2,768	3,470
no DVDD	305	49	193	1,595	2,063
in DVDD	325	58	561	1,173	1,407
>1 crit					
All	489	82	643	2,193	3,470
no DVDD	190	29	117	1,079	2,063
in DVDD	299	53	526	1,114	1,407
only *					
All	141	25	111	575	.
no DVDD	115	20	76	516	.
in DVDD	26	5	35	59	.
T2					
All					
All	24,125	1,353	12,411	253,945	77,514
no DVDD	11,227	852	4,445	136,942	49,472
in DVDD	12,898	501	7,966	117,003	28,042
>1 crit					
All	17,356	702	9,592	162,544	56,969
no DVDD	6,140	299	2,623	65,768	31,026
in DVDD	11,216	403	6,969	96,776	25,943
only *					
All	6,769	651	2,819	91,401	20,545
no DVDD	5,087	553	1,822	71,174	18,446
in DVDD	1,682	98	997	20,227	2,099

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 5
 Inclusion using 2nd OAD/Ins/NPR (the official version)

	Incl. criterion												
	All		DVD		Dia		I-I		I-N		I-0		N-I
	N	%w1	N	%w1	N	%w1	N	%w1	N	%w1	N	%w1	N
T1													
All	43,927	17.6	.	.	253	0	1,721	37	334	42	19	42	5,350
1995	22,060	10.3	.	.	.	.	674	28	31	26	*	100	1,652
1996	1,206	17.7	.	.	.	.	98	42	10	40	*	0	265
1997	1,177	15.2	.	.	.	.	54	48	11	55	*	100	280
1998	1,126	15.8	.	.	.	.	57	49	12	25	.	.	247

1999	1,000	15.4	.	.	.	.	53	49	12	33	*	0	201
2000	991	17.4	.	.	.	.	48	33	12	58	*	100	199
2001	1,010	15.4	.	.	.	.	41	41	15	47	.	.	218
2002	1,002	14.0	.	.	.	.	44	45	19	53	.	.	195
2003	945	17.4	.	.	.	.	35	46	12	67	.	.	140
2004	907	15.2	.	.	.	.	36	33	15	27	*	0	181
2005	899	20.2	.	.	.	.	33	52	16	50	.	.	169
2006	937	22.0	.	.	.	.	39	62	8	50	.	.	153
2007	951	22.1	.	.	.	.	49	45	17	47	.	.	144
2008	935	24.8	.	.	.	.	46	35	17	47	*	50	162
2009	944	23.9	.	.	13	0	44	43	8	38	*	0	149
2010	905	21.8	.	.	17	0	41	34	14	50	*	0	127
2011	879	25.5	.	.	29	0	40	28	9	44	*	0	109
2012	826	24.3	.	.	27	0	42	48	9	0	*	100	88
2013	855	29.1	.	.	25	0	42	14	8	13	.	.	104
2014	848	33.7	.	.	28	0	39	31	13	15	.	.	100
2015	892	32.4	.	.	30	0	35	26	19	32	*	0	110
2016	912	42.9	.	.	25	0	50	38	14	57	*	0	88
2017	883	56.7	.	.	33	0	41	63	16	50	*	100	121
2018	837	68.6	.	.	26	0	40	78	17	76	*	100	148
T2													
All	442,316	34.0	5,563	100	16,617	39	7,237	61	850	41	502	49	5,638
1995	61,243	27.6	52	100	.	.	1,801	65	28	32	18	44	1,004
1996	11,453	34.3	11	100	.	.	252	64	14	43	5	40	151
1997	10,747	32.1	7	100	.	.	160	64	11	27	9	22	140
1998	11,789	30.3	15	100	.	.	138	52	19	37	12	50	131
1999	12,389	30.9	14	100	.	.	180	56	24	33	10	50	168
2000	12,122	31.4	58	100	.	.	169	60	22	32	11	55	187
2001	12,207	30.3	45	100	.	.	185	50	30	30	14	36	170
2002	15,311	31.1	54	100	.	.	174	45	26	15	13	38	207
2003	16,765	31.1	75	100	.	.	170	51	45	33	15	33	190
2004	17,023	32.0	96	100	.	.	186	52	40	45	17	53	238
2005	14,598	36.3	156	100	.	.	203	63	41	44	15	67	222
2006	14,043	36.2	202	100	.	.	249	67	47	40	19	37	209
2007	15,387	34.7	260	100	.	.	254	63	37	49	25	52	209
2008	17,448	33.9	451	100	.	.	292	63	39	46	37	38	235
2009	18,428	31.5	411	100	264	12	289	64	37	43	26	50	197
2010	20,511	30.2	581	100	344	10	254	59	42	36	29	38	204
2011	28,571	29.4	599	100	589	16	263	52	31	42	17	59	201
2012	22,897	29.9	501	100	298	12	249	59	34	26	34	35	199
2013	18,261	32.9	516	100	1,312	41	308	53	49	31	30	53	219
2014	17,281	35.7	268	100	3,077	44	281	60	34	41	26	65	265
2015	17,812	37.3	58	100	3,252	43	269	55	49	53	31	45	209
2016	18,661	40.3	103	100	2,416	34	277	54	45	51	27	67	216
2017	18,538	47.3	124	100	2,530	40	300	64	38	42	30	60	246
2018	18,831	61.8	906	100	2,535	45	334	76	68	60	32	69	221

(Continued)

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 6
 Inclusion using 2nd OAD/Ins/NPR (the official version)

----- Incl. criterion -----													
N-I		N-N		N-O		O-I		O-N		O-O		Pod	
%w1	N	%w1	N	%w1	N	%w1	N	%w1	N	%w1	N	%w1	N
T1													
All	25	28,521	17	630	22	107	23	754	15	2,768	21	3,470	0
1995	20	15,461	10	238	28	16	38	34	15	832	23	3,120	0
1996	16	513	12	30	23	9	22	32	16	203	25	45	0
1997	13	541	11	31	6	*	0	31	16	191	21	36	0
1998	18	544	11	35	20	5	20	34	18	159	17	33	0
1999	17	513	11	30	13	*	0	28	18	122	21	37	0
2000	22	520	13	18	17	*	33	27	15	134	20	29	0
2001	15	543	12	16	19	4	25	31	16	122	19	20	0
2002	14	559	11	18	22	4	25	38	5	95	16	30	0

2003	22	552	13	21	14	*	33	32	25	107	24	43	0
2004	17	499	12	17	12	4	0	41	22	93	24	20	0
2005	24	535	17	18	39	4	25	31	23	85	14	8	0
2006	29	592	17	15	20	*	100	44	9	80	28	4	0
2007	34	596	18	20	20	8	0	34	9	81	20	*	0
2008	35	568	22	14	7	4	0	39	23	82	17	*	0
2009	36	609	22	14	21	5	0	35	17	65	12	*	0
2010	28	615	20	13	8	*	0	22	5	52	29	*	0
2011	28	591	28	15	40	*	0	31	*	47	11	4	0
2012	34	557	26	12	17	4	25	25	0	56	7	5	0
2013	39	581	33	14	0	5	20	31	6	38	11	7	0
2014	39	591	37	11	18	6	33	22	14	32	16	6	0
2015	33	609	38	10	20	*	0	34	6	34	12	7	0
2016	47	665	47	9	22	*	50	31	10	23	9	*	0
2017	51	617	63	4	25	*	67	20	35	20	40	7	0
2018	78	550	71	7	71	5	40	27	33	15	27	*	0
T2													
All	34	36,561	25	24,125	28	1,353	48	12,411	23	253,945	36	77,514	27
1995	31	11,884	22	4,861	33	43	51	406	25	19,486	38	21,660	17
1996	26	1,148	25	952	31	14	64	334	25	6,331	36	2,241	35
1997	24	1,132	23	827	26	27	67	318	27	5,687	33	2,429	34
1998	22	1,300	22	870	23	23	61	406	23	6,280	32	2,595	33
1999	20	1,327	22	878	24	20	45	372	23	6,465	33	2,931	32
2000	27	1,315	22	862	27	24	46	446	26	6,485	32	2,543	34
2001	31	1,340	23	938	24	36	47	487	23	7,279	30	1,683	38
2002	20	1,250	22	840	23	36	33	507	19	7,154	30	5,050	37
2003	26	1,430	22	983	24	43	42	574	17	8,142	30	5,098	37
2004	33	1,233	24	921	26	49	41	605	19	8,607	33	5,031	32
2005	40	1,205	32	910	33	47	51	580	25	8,687	37	2,532	33
2006	41	1,413	30	953	28	56	55	573	26	9,805	36	517	36
2007	48	1,264	28	1,098	26	68	53	592	28	10,959	34	621	42
2008	44	1,346	26	1,070	26	80	53	617	22	12,631	32	650	46
2009	38	1,185	27	1,106	22	73	45	617	24	13,732	30	491	42
2010	39	1,024	24	1,168	22	90	40	671	18	15,545	29	559	39
2011	28	914	23	1,056	19	80	41	654	17	17,655	29	6,512	28
2012	32	768	25	776	26	62	48	641	17	15,855	30	3,480	20
2013	36	720	28	595	25	80	40	557	21	11,662	32	2,213	19
2014	37	656	22	540	26	71	49	502	20	9,862	36	1,699	17
2015	35	694	27	498	27	82	44	550	17	10,357	40	1,763	18
2016	41	693	30	505	39	74	49	543	24	11,867	46	1,895	17
2017	43	666	34	485	41	87	52	481	28	11,744	54	1,807	22
2018	58	654	47	433	58	88	59	378	47	11,668	68	1,514	28

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 7
 Inclusion using 2nd OAD/Ins/NPR (the official version)

	Incl. criterion									
	All	DVD	Dia	I-I	I-N	I-0	N-I	N-N	N-0	O-I
All	486,243	5,563	16,870	8,958	1,184	521	10,988	65,082	24,755	1,460
Date of inclusion										
1995	83,303	52	.	2,475	59	20	2,656	27,345	5,099	59
1996	12,659	11	.	350	24	6	416	1,661	982	23
1997	11,924	7	.	214	22	10	420	1,673	858	28
1998	12,915	15	.	195	31	12	378	1,844	905	28
1999	13,389	14	.	233	36	11	369	1,840	908	23
2000	13,113	58	.	217	34	12	386	1,835	880	27
2001	13,217	45	.	226	45	14	388	1,883	954	40
2002	16,313	54	.	218	45	13	402	1,809	858	40
2003	17,710	75	.	205	57	15	330	1,982	1,004	46
2004	17,930	96	.	222	55	18	419	1,732	938	53
2005	15,497	156	.	236	57	15	391	1,740	928	51
2006	14,980	202	.	288	55	19	362	2,005	968	58

1995	83,303	0.1	.	3.0	0.1	0.0	3.2	32.8	6.1	0.1	0.5	24.4	29.7
1996	12,659	0.1	.	2.8	0.2	0.0	3.3	13.1	7.8	0.2	2.9	51.6	18.1
1997	11,924	0.1	.	1.8	0.2	0.1	3.5	14.0	7.2	0.2	2.9	49.3	20.7
1998	12,915	0.1	.	1.5	0.2	0.1	2.9	14.3	7.0	0.2	3.4	49.9	20.3
1999	13,389	0.1	.	1.7	0.3	0.1	2.8	13.7	6.8	0.2	3.0	49.2	22.2
2000	13,113	0.4	.	1.7	0.3	0.1	2.9	14.0	6.7	0.2	3.6	50.5	19.6
2001	13,217	0.3	.	1.7	0.3	0.1	2.9	14.2	7.2	0.3	3.9	56.0	12.9
2002	16,313	0.3	.	1.3	0.3	0.1	2.5	11.1	5.3	0.2	3.3	44.4	31.1
2003	17,710	0.4	.	1.2	0.3	0.1	1.9	11.2	5.7	0.3	3.4	46.6	29.0
2004	17,930	0.5	.	1.2	0.3	0.1	2.3	9.7	5.2	0.3	3.6	48.5	28.2
2005	15,497	1.0	.	1.5	0.4	0.1	2.5	11.2	6.0	0.3	3.9	56.6	16.4
2006	14,980	1.3	.	1.9	0.4	0.1	2.4	13.4	6.5	0.4	4.1	66.0	3.5
2007	16,338	1.6	.	1.9	0.3	0.2	2.2	11.4	6.8	0.5	3.8	67.6	3.8
2008	18,383	2.5	.	1.8	0.3	0.2	2.2	10.4	5.9	0.5	3.6	69.2	3.5
2009	19,372	2.1	1.4	1.7	0.2	0.1	1.8	9.3	5.8	0.4	3.4	71.2	2.5
2010	21,416	2.7	1.7	1.4	0.3	0.1	1.5	7.7	5.5	0.4	3.2	72.8	2.6
2011	29,450	2.0	2.1	1.0	0.1	0.1	1.1	5.1	3.6	0.3	2.3	60.1	22.1
2012	23,723	2.1	1.4	1.2	0.2	0.1	1.2	5.6	3.3	0.3	2.8	67.1	14.7
2013	19,116	2.7	7.0	1.8	0.3	0.2	1.7	6.8	3.2	0.4	3.1	61.2	11.6
2014	18,129	1.5	17.1	1.8	0.3	0.1	2.0	6.9	3.0	0.4	2.9	54.6	9.4
2015	18,704	0.3	17.5	1.6	0.4	0.2	1.7	7.0	2.7	0.4	3.1	55.6	9.5
2016	19,573	0.5	12.5	1.7	0.3	0.1	1.6	6.9	2.6	0.4	2.9	60.7	9.7
2017	19,421	0.6	13.2	1.8	0.3	0.2	1.9	6.6	2.5	0.5	2.6	60.6	9.3
2018	19,668	4.6	13.0	1.9	0.4	0.2	1.9	6.1	2.2	0.5	2.1	59.4	7.7

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 9
 Inclusion using 2nd OAD/Ins/NPR (the official version)

	Incl. criterion												
	All	DVD	Dia	I-I	I-N	I-0	N-I	N-N	N-0	O-I	O-N	O-0	Pod
M	268,387	2966	8702	4573	697	272	6517	38347	14574	851	8145	148E3	35180
F	217,856	2597	8168	4385	487	249	4471	26735	10181	609	5020	109E3	45804
M+F	486,243	5563	16870	8958	1184	521	10988	65082	24755	1460	13165	257E3	80984
M													
0	32	.	.	*	.	.	4	24	.	.	.	*	.
*	140	.	.	*	.	.	17	120	.	.	.	.	*
*	170	.	.	*	.	.	23	145	.	.	.	.	.
*	189	.	.	*	.	.	23	164	.	.	.	.	*
4	239	.	.	*	*	.	26	209	.	.	.	*	*
5	224	.	.	*	.	.	29	192	.	.	.	.	*
6	250	.	.	*	*	.	28	219	.	.	.	.	*
7	277	.	.	*	.	.	32	241	.	.	.	*	*
8	315	.	.	*	.	.	31	281	*	.	.	.	.
9	382	.	.	*	.	.	39	335	*	.	.	*	*
10	402	.	.	4	.	.	48	345	*	.	.	*	*
11	436	.	.	7	.	.	50	373	.	.	.	*	5
12	546	.	.	*	*	.	73	459	*	.	.	4	*
13	588	*	*	5	*	.	59	507	*	.	*	*	9
14	607	.	*	5	*	.	65	508	4	.	*	7	13
15	524	.	.	9	.	.	44	445	*	.	*	5	16
16	432	*	.	8	*	.	41	346	4	.	4	4	23
17	473	*	.	8	*	.	38	384	4	.	9	9	19
18	440	.	8	8	*	.	52	338	7	.	6	4	16
19	454	*	*	12	*	.	29	361	9	.	8	19	11
20	478	4	5	17	*	.	41	357	11	.	8	18	14
21	446	*	4	13	*	.	46	321	13	.	4	33	10
22	543	*	7	17	5	.	48	377	13	.	13	42	19
23	587	*	15	14	*	.	47	388	22	*	10	64	20
24	558	*	8	21	*	*	43	374	19	.	15	47	27
25	652	4	10	17	*	.	53	399	25	.	26	83	32
26	687	*	10	26	6	.	47	421	32	*	22	99	22
27	721	*	7	24	4	.	63	421	27	*	20	122	30
28	799	*	7	32	4	.	43	457	40	*	40	145	27
29	850	*	6	33	4	.	48	440	44	*	48	191	33
30	913	4	15	32	*	*	64	429	51	*	45	230	39
31	989	*	15	27	5	*	70	450	55	.	49	265	49


```

102      *      .      .      *      .      .      .      .      .      .      .      *      .
103      *      .      .      .      .      .      .      .      .      .      .      *      .
F
0        33      .      .      *      *      .      *      26      .      .      .      .      *
*       131      .      .      *      .      .      .      16  111      .      .      .      *      .
*       134      .      .      .      .      .      .      17  117      .      .      .      .      .
*       165      *      .      *      .      .      .      13  148      .      .      .      .      *
4       200      *      .      *      .      .      .      27  171      .      .      .      .      .
5       252      .      .      *      .      .      .      27  222      .      .      .      .      *
6       244      .      .      *      .      .      .      30  212      .      .      .      .      .
7       314      .      .      .      *      .      .      44  266      *      .      .      *      .
8       308      .      .      *      *      .      .      40  260      *      .      .      *      *
9       411      *      .      *      *      .      .      69  335      .      .      .      *      *
10      401      *      .      5      .      .      .      52  335      .      .      .      5      *
11      490      .      .      6      *      .      .      64  408      *      .      .      5      4
12      519      .      .      4      *      .      .      49  444      *      .      .      11      6
13      438      *      .      7      *      .      .      41  364      *      .      .      10      11
14      424      *      .      *      .      .      .      51  319      9      .      *      33      7
15      458      .      .      9      *      .      .      27  322      8      .      *      80      8
16      442      .      *      7      .      .      .      33  278      7      .      5  100      11
17      475      .      5      5      *      .      .      34  265      10     .      5  131      17
18      320      *      9      9      .      .      .      26  245      *      .      *      7      17
19      352      *      8      7      *      .      .      37  262      5      .      *      11      13
20      375      4     10     22     .      .      .      29  262      11     .      *      15      20
21      410      7     20     16     *      *      .      27  275      12     .      4     24      21
22      461      *     12     27     *      .      .      41  303      9      .      5     32      27
23      456      *     20     17     6      .      .      48  286      11     *      6     24      35
24      519      *     33     27     9      .      .      36  319      10     .      *      45      36
25      503      9     21     27     4      .      .      42  274      16     .      *      53      54
26      609      12     22     51     *      .      .      47  342      21     *      9     57      45
27      602      12     38     36     8      .      .      38  326      10     *      7     60      66
28      577      7     39     46     4      .      .      35  280      17     .      8     79      62
29      681      10     45     50     *      .      .      41  319      25     4     10     88      87
30      709      12     46     54     6      *      .      49  318      26     .      12     90      95
31      784      14     52     72     5      *      .      50  324      30     *      19    103    113
32      818      11     55     75     10     .      .      54  345      23     *      23    120    101
33      828      8     71     69     5      *      .      57  309      31     *      10    131    134
34      975      20     78     90     7      .      .      52  340      40     .      20    173    155
35     1,006      14     68     88     5      .      .      48  338      38     *      25    207    174
36     1,038      16     71     79     7      *      .      52  340      59     5     21    210    177
37     1,138      12     98     87     4      *      .      49  387      56     *      23    217    202
38     1,213      12    104     86     12     *      .      52  326      78     7     31    263    240
39     1,389      5    125     88     *      *      .      61  398      81     8     35    310    274
40     3,650      17     65     99     *      9      .      38  320     312     *      69  2518    198
41     2,259      9     47     90     4      *      .      32  296     131     4     80  1329    235
42     2,217      19     47     66     7      *      .      27  326     139     5     84  1266    230
43     2,174      20     66     52     *      *      .      42  330     143     11     84  1128    296
44     2,312      19     63     63     5      *      .      44  369     141     4     87  1228    288
45     2,491      23     70     62     6      4      .      34  367     122     5     96  1391    311
46     2,533      22     64     58     10     *      .      51  357     129     9    105  1364    362
47     2,782      15     71     66     8      *      .      42  374     162     5    108  1529    400
48     2,932      21     90     70     *      *      .      60  345     182     11    101  1655    394
49     3,131      25     98     52     10     *      .      52  374     172     9    122  1740    474
50     3,413      26    111     59     7      6      .      51  363     203     13    121  1943    510
51     3,773      26    131     70     7      5      .      65  368     198     15    129  2159    600
52     3,867      21    123     57     12     5      .      67  408     243     12    138  2163    618
53     4,097      34    135     60     13     4      .      70  441     210     16    141  2294    679
54     4,134      41    140     48     6      *      .      52  437     260     11    140  2248    749
55     4,356      42    148     59     7      *      .      66  426     225     11    140  2428    801
56     4,442      36    165     50     7      8      .      51  413     240     10    134  2442    886
57     4,466      48    147     57     9      7      .      71  433     215     11    137  2470    861
58     4,680      44    149     55     4      4      .      62  423     258     16    127  2634    904
59     4,671      49    147     54     8      *      .      64  415     218     14    157  2577    967
60     4,987      68    201     57     9      *      .      74  403     268     13    120  2727  1044
61     5,061      65    185     64     8      5      .      67  429     244     12    140  2760  1082
62     5,220      67    204     56     8      6      .      74  422     246     13    142  2851  1131
63     5,237      60    193     66     12     6      .      61  438     252     13    128  2802  1206
64     5,431      82    185     75     9      4      .      67  379     242     17    133  3043  1195
65     5,530      55    202     74     13     *      .      75  380     266     12    127  3034  1289
66     5,519      78    211     87     9      5      .      79  375     226     12    135  2954  1348

```

67	5,500	68	248	79	12	*	80	385	227	18	119	2937	1324
68	5,484	77	241	60	13	5	65	383	217	10	128	2899	1386
69	5,429	89	269	77	10	4	70	338	233	12	115	2776	1436
70	5,359	89	258	73	9	11	83	342	196	17	90	2811	1380
71	5,245	76	260	56	11	7	61	308	218	16	98	2797	1337
72	5,334	75	246	85	9	7	72	317	201	19	102	2789	1412
73	5,151	73	226	80	5	6	67	296	222	16	88	2765	1307
74	4,931	78	224	81	5	5	68	280	207	9	96	2610	1268
75	4,768	73	189	72	9	7	73	246	201	9	76	2484	1329
76	4,543	64	192	61	14	*	52	272	191	14	80	2379	1222
77	4,183	52	161	49	5	7	63	223	174	19	67	2151	1212
78	4,068	68	156	64	9	7	59	206	158	21	76	2092	1152
79	3,894	58	125	61	7	6	72	159	159	9	55	2032	1151
80	3,600	54	143	68	5	11	56	164	144	12	43	1885	1015
81	3,473	55	140	71	*	6	53	152	154	8	42	1813	976
82	3,033	49	105	51	4	5	38	117	166	9	45	1583	861
83	2,845	60	83	71	5	6	43	115	130	8	30	1495	799
84	2,489	32	71	53	4	5	44	102	135	6	22	1274	741
85	2,227	22	74	41	*	5	41	92	113	8	25	1184	621
86	1,927	32	56	40	4	*	32	84	86	7	21	1027	536
87	1,644	26	48	33	*	5	23	60	78	5	24	909	431
88	1,345	20	37	33	*	*	27	41	65	6	17	713	380
89	1,094	23	31	24	.	*	19	39	60	7	9	567	313
90	859	12	24	19	*	*	17	16	42	4	16	473	234
91	717	9	15	23	*	.	13	17	27	*	6	376	227
92	499	5	6	9	*	*	4	18	18	5	4	286	140
93	397	6	7	14	*	*	12	9	19	*	4	215	106
94	318	7	14	5	*	*	7	7	15	*	*	169	87
95	179	*	5	8	*	*	*	4	5	*	.	103	43
96	135	5	4	5	*	*	*	5	5	*	*	66	38
97	84	.	.	*	.	.	4	*	5	.	.	51	21
98	56	*	*	*	*	.	*	*	4	*	.	25	17
99	36	*	.	*	.	.	*	*	*	.	.	17	9
100	24	.	.	.	.	.	.	*	*	*	.	11	10
101	11	.	.	.	.	.	.	.	*	*	.	5	*
102	4	.	.	.	.	.	.	.	.	.	.	*	*
103	*	.	.	.	.	.	.	.	.	.	.	*	.
104	*	.	.	.	.	.	.	.	.	.	.	*	*
105	*	.	.	.	.	.	.	.	.	.	.	*	.
M+F													
0	65	.	.	5	*	.	7	50	.	.	.	*	*
*	271	.	.	5	.	.	33	231	.	.	.	*	*
*	304	.	.	*	.	.	40	262	.	.	.	.	.
*	354	*	.	*	.	.	36	312	.	.	.	.	*
4	439	*	.	*	*	.	53	380	.	.	.	*	*
5	476	.	.	4	.	.	56	414	.	.	.	.	*
6	494	.	.	*	*	.	58	431	.	.	.	.	*
7	591	.	.	*	*	.	76	507	*	.	.	*	*
8	623	.	.	5	*	.	71	541	*	.	.	*	*
9	793	*	.	6	*	.	108	670	*	.	.	*	4
10	803	*	.	9	.	.	100	680	*	.	.	6	5
11	926	.	.	13	*	.	114	781	*	.	.	6	9
12	1,065	.	.	6	4	.	122	903	6	.	.	15	9
13	1,026	*	*	12	*	.	100	871	4	.	*	12	20
14	1,031	*	*	8	*	.	116	827	13	.	*	40	20
15	982	.	.	18	*	.	71	767	11	.	4	85	24
16	874	*	*	15	*	.	74	624	11	.	9	104	34
17	948	*	5	13	4	.	72	649	14	.	14	140	36
18	760	*	17	17	*	.	78	583	9	.	9	11	33
19	806	6	9	19	4	.	66	623	14	.	11	30	24
20	853	8	15	39	*	.	70	619	22	.	10	33	34
21	856	8	24	29	*	*	73	596	25	.	8	57	31
22	1,004	5	19	44	7	.	89	680	22	.	18	74	46
23	1,043	5	35	31	9	.	95	674	33	*	16	88	55
24	1,077	*	41	48	11	*	79	693	29	.	17	92	63
25	1,155	13	31	44	7	.	95	673	41	.	29	136	86
26	1,296	13	32	77	8	.	94	763	53	*	31	156	67
27	1,323	14	45	60	12	.	101	747	37	*	27	182	96
28	1,376	8	46	78	8	.	78	737	57	*	48	224	89
29	1,531	12	51	83	6	.	89	759	69	5	58	279	120

30	1,622	16	61	86	8	*	113	747	77	*	57	320	134
31	1,773	17	67	99	10	*	120	774	85	*	68	368	162
32	1,859	14	76	105	12	.	118	776	84	4	69	427	174
33	2,039	12	94	97	12	*	131	814	115	4	65	492	200
34	2,253	26	103	116	11	*	126	863	120	4	69	586	226
35	2,500	23	98	131	8	*	139	900	126	9	96	723	246
36	2,664	23	91	130	14	*	138	884	177	7	100	832	266
37	2,926	18	119	117	11	4	135	999	173	14	111	909	316
38	3,109	23	136	148	16	*	155	892	204	12	142	1036	343
39	3,542	15	165	147	14	*	154	987	222	14	167	1246	408
40	5,995	33	105	145	8	10	128	971	483	12	189	3571	340
41	4,886	25	96	155	20	*	119	976	299	14	208	2549	422
42	5,037	31	102	127	14	4	124	983	326	15	230	2635	446
43	5,278	38	122	120	9	*	146	982	352	20	246	2686	555
44	5,792	37	131	145	11	6	149	1088	377	17	253	3008	570
45	6,059	45	151	124	18	9	142	1033	358	15	286	3271	607
46	6,565	52	156	129	19	5	152	1087	387	23	282	3536	737
47	7,132	52	196	147	21	6	173	1069	445	15	285	3950	773
48	7,511	50	212	147	16	5	182	1061	498	24	292	4213	811
49	8,168	52	224	158	25	4	164	1129	533	34	335	4547	963
50	8,756	66	244	152	27	10	188	1083	559	32	322	5059	1014
51	9,471	71	286	153	20	8	187	1120	556	33	349	5541	1147
52	9,834	71	287	157	32	10	197	1162	640	30	369	5614	1265
53	10,175	86	291	153	29	10	178	1160	597	38	387	5912	1334
54	10,458	85	310	142	23	12	171	1212	633	33	380	6025	1432
55	10,862	103	321	149	19	10	188	1194	646	30	361	6302	1539
56	11,187	114	357	160	24	15	160	1168	645	26	363	6477	1678
57	11,382	132	327	149	25	12	188	1130	603	30	366	6707	1713
58	11,761	121	379	140	17	12	175	1111	694	36	382	6944	1750
59	11,765	118	353	150	27	8	185	1076	625	33	393	6952	1845
60	12,523	147	434	152	21	12	188	1074	682	37	364	7360	2052
61	12,648	148	416	172	31	10	175	1019	666	40	396	7531	2044
62	12,786	156	445	156	28	13	197	1033	642	36	352	7525	2203
63	12,785	154	468	174	31	15	188	1015	616	40	331	7485	2268
64	13,005	160	481	176	26	15	190	972	646	47	342	7635	2315
65	13,026	157	494	188	29	11	191	889	643	34	340	7662	2388
66	12,714	206	488	190	22	12	179	881	580	38	307	7277	2534
67	12,765	169	560	170	27	8	199	887	567	41	298	7267	2572
68	12,346	181	547	165	32	12	171	816	584	24	295	6955	2564
69	12,030	172	626	179	23	10	167	751	523	34	274	6669	2602
70	11,775	194	581	180	19	21	172	717	500	33	222	6688	2448
71	11,272	150	564	154	26	13	156	638	492	34	228	6399	2418
72	11,015	155	501	177	29	13	161	673	482	37	221	6116	2450
73	10,654	152	492	183	22	9	142	658	484	38	194	5964	2316
74	10,089	161	468	153	18	10	151	546	443	27	203	5696	2213
75	9,439	150	395	154	19	12	139	539	422	26	159	5201	2223
76	9,053	144	365	133	25	7	133	515	412	28	149	5070	2072
77	8,225	120	350	111	10	14	128	440	403	37	136	4490	1986
78	7,829	137	316	117	22	10	124	382	338	30	136	4304	1913
79	7,200	117	264	129	12	14	121	331	319	23	105	3979	1786
80	6,740	98	295	129	10	16	103	318	304	26	98	3710	1633
81	6,074	104	241	114	11	7	100	274	261	18	88	3364	1492
82	5,386	95	200	105	10	11	82	211	275	15	76	3012	1294
83	4,849	99	155	113	9	7	81	199	224	17	65	2708	1172
84	4,232	68	139	79	10	8	68	174	228	11	46	2282	1119
85	3,787	53	130	73	5	11	71	166	183	17	41	2103	934
86	3,158	56	104	70	7	4	55	129	165	12	31	1757	768
87	2,676	44	81	59	5	11	36	95	136	11	33	1524	641
88	2,172	33	64	59	*	5	42	78	105	10	33	1186	554
89	1,678	31	50	36	*	*	31	57	96	10	18	907	438
90	1,318	22	41	36	*	*	27	26	57	8	17	742	340
91	1,040	13	24	29	*	.	25	29	44	*	7	567	297
92	731	11	17	12	*	*	11	25	33	8	9	417	184
93	542	9	9	17	*	*	19	14	30	4	4	304	128
94	437	9	16	9	*	*	10	12	21	*	6	238	109
95	267	5	9	11	*	*	7	5	11	*	*	152	57
96	182	5	5	8	*	*	*	6	6	*	*	91	52
97	112	*	.	*	.	.	4	5	5	.	*	70	25
98	77	*	*	4	*	.	*	*	5	*	.	39	20
99	49	*	.	4	*	.	*	*	4	.	.	25	10

100	27	.	.	.	.	.	.	*	*	*	.	11	13
101	12	.	.	.	.	.	.	.	*	*	.	6	*
102	7	.	.	*	.	.	.	.	.	.	.	5	*
103	*	.	.	.	.	.	.	.	.	.	.	*	.
104	*	.	.	.	.	.	.	.	.	.	.	*	*
105	*	.	.	.	.	.	.	.	.	.	.	*	.

The reconstructed diabetes register 14:39 Saturday, April 18, 2020 10
 Inclusion using 2nd OAD/Ins/NPR (the official version)

The CONTENTS Procedure

Data Set Name	DMDAT.DMREG	Observations	486243
Member Type	DATA	Variables	21
Engine	V9	Indexes	0
Created	18/04/2020 14:39:42	Observation Length	136
Last Modified	18/04/2020 14:39:42	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Reconstructed DM register for Denmark		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	1011
First Data Page	*
Max Obs per Page	481
Obs in First Data Page	455
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\dmreg.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	63MB
File Size (bytes)	66322432

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
21	DMtp	Char	*			Type of DM
*	PNR	Char	12	\$12.	\$10.	Personnummer
17	do2nd	Num	8	DDMMYY10.		Date of 2nd of Ins/OAD/NPR
12	doBth	Num	8	DDMMYY10.		Date of birth
15	doDM	Num	8	DDMMYY10.		Date of inclusion
16	doDVD	Num	8	DDMMYY10.		Date of DVDD
11	doDiaB	Num	8	DDMMYY10.	IS8601DA10.	Date of diaBase
14	doDth	Num	8	DDMMYY10.		Date of death
8	doIns	Num	4	DDMMYY10.		Date of 1st Ins
9	doIns2	Num	4	DDMMYY10.		Date of 2nd Ins
*	doNPR	Num	8	DDMMYY10.	DATE9.	Date of 1st NPR
4	doNPR2	Num	8	DDMMYY10.	DATE9.	Date of 2nd NPR
6	doOAD	Num	4	DDMMYY10.		Date of 1st OAD
7	doOAD2	Num	4	DDMMYY10.		Date of 2nd OAD
10	doPod	Num	8	DDMMYY10.		Date of Podiatry
5	dvdtyp	Char	*			Type from DVDD
20	hasdvd	Num	8			has DVDD record
18	inCr	Char	*			Incl. criterion
*	nprrtyp	Char	*			Type from NPR
19	only1	Num	8			Only one criterion
13	sex	Num	8			sex

4.11 06d-define

Defines the diabetes *drug-register*, i.e. the register exclusively based on drug purchases.

1 "Program: 06d-define.sas" 14:41 Saturday, April 18, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)
Licensed to FORSKNING 2, Site 50800723.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.07 seconds
cpu time 0.09 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      title1 'The reconstructed diabetes *drug* register' ;
2      data DMdat.DMreg ( label = 'Reconstructed DM register, only persons on drugs'
2      ! ) ;
3          merge DMdat.RMPS ( in = rmps keep = pnr doOAD doIns )
4                  DMdat.pop ( in = pop )
5                  DMdat.DMreg ( in = dmr keep = pnr dmtp ) ;
6      by pnr ;
7      keep pnr sex DMtp inCr
8          doBth doDM doOAD doIns doDth ;
9      format doBth doDM doDth doOAD doIns ddmmyy10. ;
10     if pop and rmps and dmr ;
11     * Date of diagnosis - GDM and PCOS - taken care of in RMPS / DVDD ;
12     doDM = min( doOAD, doIns ) ;
13     if doDM le &end. ;
14     if doDM gt doBth ;
15     if doDM eq doOAD then inCr = "OAD" ;
16     if doDM eq doIns then inCr = "Ins" ;
17     label doBth = 'Date of birth'
18           doDth = 'Date of death'
19           DMtp = 'Type of DM'
20           inCr = 'Incl. criterion'
21           doDM = 'Date of inclusion'
22           doOAD = 'Date of 1st OAD'
23           doIns = 'Date of 1st Ins' ;
24     run ;

```

NOTE: There were 474318 observations read from the data set DMDAT.RMPS.

NOTE: There were 7632139 observations read from the data set DMDAT.POP.

NOTE: There were 486243 observations read from the data set DMDAT.DMREG.

NOTE: The data set DMDAT.DMDREG has 445724 observations and 9 variables.

NOTE: DATA statement used (Total process time):

real time 4.12 seconds
cpu time 1.78 seconds

25

```
26     proc tabulate data = DMdat.DMreg missing noseps ;
```

```
27     class sex doDM DMtp inCr ;
```

```

28      table all doDM,
29          ( all DMtp * ( all inCr ) ) * f = comma7.
30          ( DMtp * ( InCr * pctn<InCr> ) ) * f = 5.1
31      / rts = 6 ;
32      keylabel n = ' ' ;
33      format doDM year4.
34          sex koen_t. ;
35      run ;

```

NOTE: There were 445724 observations read from the data set DMDAT.DMDREG.
NOTE: The PROCEDURE TABULATE printed page 1.
NOTE: PROCEDURE TABULATE used (Total process time):
real time 0.19 seconds
cpu time 0.28 seconds

```

36      proc contents data = DMdat.DMreg ; run ;

```

NOTE: PROCEDURE CONTENTS used (Total process time):
real time 0.00 seconds
cpu time 0.01 seconds

NOTE: The PROCEDURE CONTENTS printed page 2.

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:
real time 4.52 seconds
cpu time 2.18 seconds

4.11.1 06d-define.lst

The reconstructed diabetes *drug* register 14:41 Saturday, April 18, 2020 1

		Type of DM									
		Type of DM				Type of DM					
		T1		T2		T1		T2			
		Incl. criterion		Incl. criterion		Incl. criterion		Incl. criterion			
		Ins		OAD		Ins		OAD			
		PctN		PctN		PctN		PctN			
All	445,724	43,886	38,045	5,841	401,838	30,338	371,500	86.7	13.3	7.5	92.5
Date of inclusion											
1995	74,970	21,074	19,159	1,915	53,896	10,713	43,183	90.9	9.1	19.9	80.1
1996	12,328	2,022	1,681	341	10,306	677	9,629	83.1	16.9	6.6	93.4
1997	10,816	1,220	925	295	9,596	577	9,019	75.8	24.2	6.0	94.0
1998	11,775	1,138	854	284	10,637	627	10,010	75.0	25.0	5.9	94.1
1999	11,911	1,014	786	228	10,897	707	10,190	77.5	22.5	6.5	93.5
2000	12,122	995	765	230	11,127	800	10,327	76.9	23.1	7.2	92.8
2001	12,858	1,010	785	225	11,848	768	11,080	77.7	22.3	6.5	93.5
2002	12,735	1,018	799	219	11,717	740	10,977	78.5	21.5	6.3	93.7
2003	14,886	937	722	215	13,949	802	13,147	77.1	22.9	5.7	94.3
2004	15,351	930	741	189	14,421	915	13,506	79.7	20.3	6.3	93.7
2005	15,158	900	728	172	14,258	903	13,355	80.9	19.1	6.3	93.7
2006	15,718	946	781	165	14,772	931	13,841	82.6	17.4	6.3	93.7
2007	17,037	964	797	167	16,073	898	15,175	82.7	17.3	5.6	94.4
2008	18,696	928	759	169	17,768	968	16,800	81.8	18.2	5.4	94.6

2009	19,512	944	800	144	18,568	927	17,641	84.7	15.3	5.0	95.0
2010	21,552	895	797	98	20,657	920	19,737	89.1	10.9	4.5	95.5
2011	25,120	883	752	131	24,237	859	23,378	85.2	14.8	3.5	96.5
2012	21,949	833	716	117	21,116	848	20,268	86.0	14.0	4.0	96.0
2013	16,467	854	740	114	15,613	950	14,663	86.7	13.3	6.1	93.9
2014	15,429	859	760	99	14,570	958	13,612	88.5	11.5	6.6	93.4
2015	17,221	890	780	110	16,331	932	15,399	87.6	12.4	5.7	94.3
2016	18,559	904	814	90	17,655	942	16,713	90.0	10.0	5.3	94.7
2017	17,873	893	827	66	16,980	990	15,990	92.6	7.4	5.8	94.2
2018	15,681	835	777	58	14,846	986	13,860	93.1	6.9	6.6	93.4

The reconstructed diabetes *drug* register

14:41 Saturday, April 18, 2020 2

The CONTENTS Procedure

Data Set Name	DMDAT.DMDREG	Observations	445724
Member Type	DATA	Variables	9
Engine	V9	Indexes	0
Created	18/04/2020 14:41:12	Observation Length	64
Last Modified	18/04/2020 14:41:12	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Reconstructed DM register, only persons on drugs		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	437
First Data Page	*
Max Obs per Page	1021
Obs in First Data Page	989
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\dmdreg.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	27MB
File Size (bytes)	28704768

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
7	DMtp	Char	*			Type of DM
1	PNR	Char	12	\$12.	\$10.	Personnummer
4	doBth	Num	8	DDMMYY10.		Date of birth
8	doDM	Num	8	DDMMYY10.		Date of inclusion
6	doDth	Num	8	DDMMYY10.		Date of death
3	doIns	Num	4	DDMMYY10.		Date of 1st Ins
2	doOAD	Num	4	DDMMYY10.		Date of 1st OAD
9	inCr	Char	*			Incl. criterion
5	sex	Num	8			sex

4.12 10-labcompl

Reads the files of urine albumin/creatinine from LABKA and the albumin/cceatinine ratio from DVDD and the GFR from the LABKA data base and plasma creatinine measurements from the DVDD. Measurements and dates of measurement are then combined to dates of severe, moderate and end stage kidney disease and to dates of micro- and macroalbuminuria in the

file DMdat.micompl

4.12.1 10-labcompl.lst

4.13 10-compl

Reads ICD10-codes from NPR for the period 1994–2018 and classifies these as belonging in 18 mutually exclusive groups of complications. The complications defined in 10-labcompl are appended. Some of the complication groups are combined in super-groups, and a total 26 different groups are formed.

1 "Program: 10-compl.sas" 16:45 Thursday, July 2, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)
Licensed to FORSKNING 1, Site 50800722.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.10 seconds
cpu time 0.09 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      *-----;
2      * Creates a data frame for the entire DK pop with complications dates:
3      *   for each complication the first date of the complication ;
4
5      *-----;
6      * ADMINISTRATIVE RECORDS from NPR:
7      *   Read the link between recno and pnr and keep the date of
8      *   hospitalization to be used as the date of complication ;
9      %MACRO mrec;
10     data recpnr ( keep = pnr recnum doC ) ;
11         set %do i = 1994 %to 2018 ; /* only relevant from 1994 */
12             grund.lpr_adm&i.
13         %end ;
14         grund.uaf_adm2018 ;
15         doC = d_inddto ;
16     run;
17     %MEND ;
18     %mrec ;

```

NOTE: There were 2259996 observations read from the data set GRUND.LPR_ADM1994.

NOTE: There were 3099974 observations read from the data set GRUND.LPR_ADM1995.

```

NOTE: There were 3292287 observations read from the data set GRUND.LPR_ADM1996.
NOTE: There were 3381783 observations read from the data set GRUND.LPR_ADM1997.
NOTE: There were 3465660 observations read from the data set GRUND.LPR_ADM1998.
NOTE: There were 3573247 observations read from the data set GRUND.LPR_ADM1999.
NOTE: There were 3617984 observations read from the data set GRUND.LPR_ADM2000.
NOTE: There were 3908224 observations read from the data set GRUND.LPR_ADM2001.
NOTE: There were 4593785 observations read from the data set GRUND.LPR_ADM2002.
NOTE: There were 4630303 observations read from the data set GRUND.LPR_ADM2003.
NOTE: There were 4770380 observations read from the data set GRUND.LPR_ADM2004.
NOTE: There were 4970849 observations read from the data set GRUND.LPR_ADM2005.
NOTE: There were 5148038 observations read from the data set GRUND.LPR_ADM2006.
NOTE: There were 5176587 observations read from the data set GRUND.LPR_ADM2007.
NOTE: There were 5467668 observations read from the data set GRUND.LPR_ADM2008.
NOTE: There were 5892674 observations read from the data set GRUND.LPR_ADM2009.
NOTE: There were 5906779 observations read from the data set GRUND.LPR_ADM2010.
NOTE: There were 6204786 observations read from the data set GRUND.LPR_ADM2011.
NOTE: There were 6127472 observations read from the data set GRUND.LPR_ADM2012.
NOTE: There were 6329051 observations read from the data set GRUND.LPR_ADM2013.
NOTE: There were 6495594 observations read from the data set GRUND.LPR_ADM2014.
NOTE: There were 6927895 observations read from the data set GRUND.LPR_ADM2015.
NOTE: There were 6852448 observations read from the data set GRUND.LPR_ADM2016.
NOTE: There were 6857872 observations read from the data set GRUND.LPR_ADM2017.
NOTE: There were 6707411 observations read from the data set GRUND.LPR_ADM2018.
NOTE: There were 1977489 observations read from the data set GRUND.UAF_ADM2018.
NOTE: The data set WORK.RECPNR has 127636236 observations and 3 variables.
NOTE: DATA statement used (Total process time):
      real time          3:05.94
      cpu time           17.42 seconds

```

```

19      * Sort so data can be merged on recnum with
20      diagnosis, surgery and procedures records ;
21      proc sort data = recpnr ; by recnum ; RUN ;

```

```

NOTE: There were 127636236 observations read from the data set WORK.RECPNR.
NOTE: The data set WORK.RECPNR has 127636236 observations and 3 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time          1:10.79
      cpu time           2:03.75

```

```

22
23      *-----;
24      * ICD10 diagnosis data (we should include pre 1994 using ICD8) ;
25      %MACRO mdiag ;
26      data diags ( keep = recnum diag compl ) ;
27      length c_diag $ 10 ; * has length 6 in the 1994 file ;
28      set %do i = 1994 %to 2018 ; /* only relevant from 1994 */
29      grund.lpr_diag&i.
30      %end ;
31      grund.uaf_diag2018 ;
32      * Retain only observations that are not referrals ;
33      if c_diagtype eq "H" then delete ;
34      * group the diagnoses, first by full code ;
35      compl = put( c_diag , $compsub.) ;
36      * ...then by the first 4 digits ;
37      if compl eq 'Other' then
38      compl = put(substr(c_diag, 2, 4), $cmp4sub.) ;
39      diag = c_diag ;
40      * only records with one of the specified complications ;
41      if compl ne 'Other' then output ;
42      run ;
43      %MEND ;
44      %mdiag ;

```

```

NOTE: There were 3061037 observations read from the data set GRUND.LPR_DIAG1994.
NOTE: There were 4417984 observations read from the data set GRUND.LPR_DIAG1995.
NOTE: There were 5114752 observations read from the data set GRUND.LPR_DIAG1996.
NOTE: There were 5526027 observations read from the data set GRUND.LPR_DIAG1997.
NOTE: There were 5979155 observations read from the data set GRUND.LPR_DIAG1998.

```

```

NOTE: There were 7331856 observations read from the data set GRUND.LPR_DIAG1999.
NOTE: There were 7904652 observations read from the data set GRUND.LPR_DIAG2000.
NOTE: There were 8505005 observations read from the data set GRUND.LPR_DIAG2001.
NOTE: There were 9702689 observations read from the data set GRUND.LPR_DIAG2002.
NOTE: There were 10113403 observations read from the data set GRUND.LPR_DIAG2003.
NOTE: There were 10928441 observations read from the data set GRUND.LPR_DIAG2004.
NOTE: There were 11483126 observations read from the data set GRUND.LPR_DIAG2005.
NOTE: There were 11957102 observations read from the data set GRUND.LPR_DIAG2006.
NOTE: There were 12147472 observations read from the data set GRUND.LPR_DIAG2007.
NOTE: There were 12766717 observations read from the data set GRUND.LPR_DIAG2008.
NOTE: There were 13482499 observations read from the data set GRUND.LPR_DIAG2009.
NOTE: There were 13660985 observations read from the data set GRUND.LPR_DIAG2010.
NOTE: There were 14347430 observations read from the data set GRUND.LPR_DIAG2011.
NOTE: There were 14357996 observations read from the data set GRUND.LPR_DIAG2012.
NOTE: There were 14676150 observations read from the data set GRUND.LPR_DIAG2013.
NOTE: There were 14832333 observations read from the data set GRUND.LPR_DIAG2014.
NOTE: There were 15650577 observations read from the data set GRUND.LPR_DIAG2015.
NOTE: There were 15131689 observations read from the data set GRUND.LPR_DIAG2016.
NOTE: There were 15628953 observations read from the data set GRUND.LPR_DIAG2017.
NOTE: There were 15356228 observations read from the data set GRUND.LPR_DIAG2018.
NOTE: There were 4613813 observations read from the data set GRUND.UAF_DIAG2018.
NOTE: The data set WORK.DIAGS has 10234905 observations and 3 variables.
NOTE: DATA statement used (Total process time):
      real time           3:03.61
      cpu time            1:03.68

```

```

45
46 *-----;
47 * Surgery data ;
48 %MACRO msurg ;
49 data surgs ( keep = recnum diag compl ) ;
50   set %do i = 1996 %to 2018 ; /* only exist from 1996 */
51     grund.lpr_sksopr&i.
52   %end ;
53   grund.uaf_sksopr2018
54   grund.uaf_opr1996 ; * must be last: C_diag has only length 6 ;
55   compl = put(      c_opr      , $compsub.) ;
56   if compl eq 'Other' then
57     compl = put(substr(c_opr, 2, 4), $cmp4sub.) ;
58   diag = c_opr ;
59   * only records with one of the complications ;
60   if compl ne 'Other' then output surgs ;
61 run ;
62 %MEND ;
63 %msurg ;

```

```

NOTE: There were 1005520 observations read from the data set GRUND.LPR_SKSOPR1996.
NOTE: There were 1068015 observations read from the data set GRUND.LPR_SKSOPR1997.
NOTE: There were 1172159 observations read from the data set GRUND.LPR_SKSOPR1998.
NOTE: There were 1202449 observations read from the data set GRUND.LPR_SKSOPR1999.
NOTE: There were 1355194 observations read from the data set GRUND.LPR_SKSOPR2000.
NOTE: There were 1566517 observations read from the data set GRUND.LPR_SKSOPR2001.
NOTE: There were 1601589 observations read from the data set GRUND.LPR_SKSOPR2002.
NOTE: There were 1726606 observations read from the data set GRUND.LPR_SKSOPR2003.
NOTE: There were 1865271 observations read from the data set GRUND.LPR_SKSOPR2004.
NOTE: There were 1968744 observations read from the data set GRUND.LPR_SKSOPR2005.
NOTE: There were 2029382 observations read from the data set GRUND.LPR_SKSOPR2006.
NOTE: There were 2037839 observations read from the data set GRUND.LPR_SKSOPR2007.
NOTE: There were 2112855 observations read from the data set GRUND.LPR_SKSOPR2008.
NOTE: There were 2202248 observations read from the data set GRUND.LPR_SKSOPR2009.
NOTE: There were 2248493 observations read from the data set GRUND.LPR_SKSOPR2010.
NOTE: There were 2467102 observations read from the data set GRUND.LPR_SKSOPR2011.
NOTE: There were 2451266 observations read from the data set GRUND.LPR_SKSOPR2012.
NOTE: There were 2608265 observations read from the data set GRUND.LPR_SKSOPR2013.
NOTE: There were 2647552 observations read from the data set GRUND.LPR_SKSOPR2014.
NOTE: There were 3159681 observations read from the data set GRUND.LPR_SKSOPR2015.
NOTE: There were 2881706 observations read from the data set GRUND.LPR_SKSOPR2016.
NOTE: There were 2942536 observations read from the data set GRUND.LPR_SKSOPR2017.
NOTE: There were 2741472 observations read from the data set GRUND.LPR_SKSOPR2018.

```

NOTE: There were 1721434 observations read from the data set GRUND.UAF_SKSOPR2018.
 NOTE: There were 18753 observations read from the data set GRUND.UAF_OPR1996.
 NOTE: The data set WORK.SURGS has 614870 observations and 3 variables.
 NOTE: DATA statement used (Total process time):
 real time 41.99 seconds
 cpu time 11.97 seconds

```

64
65      *-----;
66      * Examination and procedures data ;
67      %MACRO mexam ;
68      data exams ( keep = recnum diag compl ) ;
69          set %do i = 1999 %to 2018 ; /* only exist from 1999 */
70              grund.lpr_sksube&i.
71          %end ;
72          grund.uaf_sksube2018 ;
73          compl = put(          c_opr          , $compsub.) ;
74          if compl eq 'Other' then
75              compl = put(substr(c_opr, 2, 4), $cmp4sub.) ;
76          diag = c_opr ;
77          if compl ne 'Other' then output exams ;
78      run ;
79      %MEND ;
80      %mexam ;

```

NOTE: There were 790360 observations read from the data set GRUND.LPR_SKSUBE1999.
 NOTE: There were 1331778 observations read from the data set GRUND.LPR_SKSUBE2000.
 NOTE: There were 3549220 observations read from the data set GRUND.LPR_SKSUBE2001.
 NOTE: There were 8650787 observations read from the data set GRUND.LPR_SKSUBE2002.
 NOTE: There were 11008755 observations read from the data set GRUND.LPR_SKSUBE2003.
 NOTE: There were 15801484 observations read from the data set GRUND.LPR_SKSUBE2004.
 NOTE: There were 17662628 observations read from the data set GRUND.LPR_SKSUBE2005.
 NOTE: There were 20015620 observations read from the data set GRUND.LPR_SKSUBE2006.
 NOTE: There were 20400478 observations read from the data set GRUND.LPR_SKSUBE2007.
 NOTE: There were 24272485 observations read from the data set GRUND.LPR_SKSUBE2008.
 NOTE: There were 24827897 observations read from the data set GRUND.LPR_SKSUBE2009.
 NOTE: There were 25466350 observations read from the data set GRUND.LPR_SKSUBE2010.
 NOTE: There were 31485421 observations read from the data set GRUND.LPR_SKSUBE2011.
 NOTE: There were 37251165 observations read from the data set GRUND.LPR_SKSUBE2012.
 NOTE: There were 46899955 observations read from the data set GRUND.LPR_SKSUBE2013.
 NOTE: There were 47031584 observations read from the data set GRUND.LPR_SKSUBE2014.
 NOTE: There were 55087013 observations read from the data set GRUND.LPR_SKSUBE2015.
 NOTE: There were 54408611 observations read from the data set GRUND.LPR_SKSUBE2016.
 NOTE: There were 55661241 observations read from the data set GRUND.LPR_SKSUBE2017.
 NOTE: There were 50416994 observations read from the data set GRUND.LPR_SKSUBE2018.
 NOTE: There were 37387739 observations read from the data set GRUND.UAF_SKSUBE2018.
 NOTE: The data set WORK.EXAMS has 5811956 observations and 3 variables.
 NOTE: DATA statement used (Total process time):
 real time 7:49.56
 cpu time 2:19.59

```

81
82      *-----;
83      * Append diagnoses, surgery and procedures and groups complications ;
84      data compl ( keep = recnum diag compl compGr ) ;
85          set diags surgs exams ;
86          compGr = put( compl, $sub2grp. ) ;
87      run ;

```

NOTE: There were 10234905 observations read from the data set WORK.DIAGS.
 NOTE: There were 614870 observations read from the data set WORK.SURGS.
 NOTE: There were 5811956 observations read from the data set WORK.EXAMS.
 NOTE: The data set WORK.COMPL has 16661731 observations and 4 variables.
 NOTE: DATA statement used (Total process time):
 real time 3.43 seconds
 cpu time 2.93 seconds

```

88
89      *-----;
90      * Show the collected diagnoses, surgery and procedures and the
91      * classification of these - several records per person ;
92      proc tabulate data = compl noseps missing ;
93      class diag compl compGr ;
94      table all compGr * compl * diag, n*f=comma10.
95      / rts = 70 indent = 1 box = "No. of NPR records retrieved" ;
96      format diag $dob_l111_kt.
97      compGr compl $ab2abtx. ;
98      run ;

```

NOTE: There were 16661731 observations read from the data set WORK.COMPL.

NOTE: The PROCEDURE TABULATE printed page 1.

NOTE: PROCEDURE TABULATE used (Total process time):

```

real time      2.82 seconds
cpu time       4.75 seconds

```

```

99
100     *-----;
101     * Sort by recnum to merge with adm and obtain pnr ;
102     proc sort data = compl ; by recnum ; run ;

```

NOTE: There were 16661731 observations read from the data set WORK.COMPL.

NOTE: The data set WORK.COMPL has 16661731 observations and 4 variables.

NOTE: PROCEDURE SORT used (Total process time):

```

real time      3.04 seconds
cpu time       6.21 seconds

```

```

103     * Append the pnr and the dates to NPR diagnoses via recnum ;
104     data compl ;
105     merge compl (in = dg)
106     recpnr ;
107     by recnum ;
108     if dg ;
109     * recnum not needed any more ;
110     drop recnum ;
111     run ;

```

NOTE: There were 16661731 observations read from the data set WORK.COMPL.

NOTE: There were 127636236 observations read from the data set WORK.RECPNR.

NOTE: The data set WORK.COMPL has 16661731 observations and 5 variables.

NOTE: DATA statement used (Total process time):

```

real time      28.88 seconds
cpu time       23.04 seconds

```

```

112     * compl is now a dataset with all diagnoses assigned to a group from:
113     - lprdiag (diagnoses)
114     - lprsktop (surgery)
115     - lprsksub (procedures)
116     The sort order is not used ;
117
118     * append the labdata-based complications created by program 10-labcompl ;
119     data compl ;
120     set compl DMDat.micompl ;
121     run ;

```

NOTE: There were 16661731 observations read from the data set WORK.COMPL.

NOTE: There were 624962 observations read from the data set DMDAT.MICOMPL.

NOTE: The data set WORK.COMPL has 17286693 observations and 5 variables.

NOTE: DATA statement used (Total process time):

```

real time      3.37 seconds
cpu time       1.56 seconds

```

```

122
123     *-----;

```



```

124      * Construction of the datasets with complication dates
125      * sort by pnr, complication and date within complication ;
126      proc sort data = compl ; by pnr compl doC ; run ;

```

NOTE: There were 17286693 observations read from the data set WORK.COMPL.

NOTE: The data set WORK.COMPL has 17286693 observations and 5 variables.

NOTE: PROCEDURE SORT used (Total process time):

```

real time      6.32 seconds
cpu time       11.61 seconds

```

```

127
128      * Select the first complication of each type within each person ;
129      data DMdat.fcompl ( keep = pnr compl compGr doC
130                      label = 'Dates of first complication in long form for DKpop'
131      ! ) ;
131      set compl ;
132      by pnr compl ;
133      if first.compl ;
134      compGr = put( compl, $sub2grp. ) ;
135      format doC ddmmyy10. ;
136      run ;

```

NOTE: There were 17286693 observations read from the data set WORK.COMPL.

NOTE: The data set DMDAT.FCOMPL has 3736240 observations and 4 variables.

NOTE: DATA statement used (Total process time):

```

real time      3.71 seconds
cpu time       2.35 seconds

```

```

137
138      * Transpose to one record per person with compl-dates ;
139      proc transpose data = DMdat.fcompl ( drop = compGr )
140                      out = wcompl ( drop = _name_ )
141                      prefix = do ;
142      by pnr ;
143      id compl ;
144      var doC ;
145      run ;

```

NOTE: There were 3736240 observations read from the data set DMDAT.FCOMPL.

NOTE: The data set WORK.WCOMPL has 1805684 observations and 22 variables.

NOTE: PROCEDURE TRANSPOSE used (Total process time):

```

real time      4.36 seconds
cpu time       3.95 seconds

```

```

146
147      * The coarser grouping but same procedure ;
148      proc sort data = DMdat.fcompl out = cmpgr ; by pnr compGr doC ; run ;

```

NOTE: There were 3736240 observations read from the data set DMDAT.FCOMPL.

NOTE: The data set WORK.CMPGR has 3736240 observations and 4 variables.

NOTE: PROCEDURE SORT used (Total process time):

```

real time      0.48 seconds
cpu time       1.50 seconds

```

```

149      data cmpgr ;
150      set cmpgr ;
151      by pnr compGr ;
152      if first.compGr ;
153      run ;

```

NOTE: There were 3736240 observations read from the data set WORK.CMPGR.

NOTE: The data set WORK.CMPGR has 2966801 observations and 4 variables.

NOTE: DATA statement used (Total process time):

```

real time      0.83 seconds
cpu time       0.71 seconds

```

```

154      * Transpose to one record per person with compGr-dates ;
155      proc transpose data = cmpgr ( drop = compl )
156          out = wgrps ( drop = _name_ )
157          prefix = do ;
158          by pnr ;
159          id compGR ;
160          var doC ;
161      run ;

```

NOTE: There were 2966801 observations read from the data set WORK.CMPGR.
NOTE: The data set WORK.WGRPS has 1805684 observations and 11 variables.
NOTE: PROCEDURE TRANSPOSE used (Total process time):

real time	3.59 seconds
cpu time	3.25 seconds

```

162
163      * Merge side-by side ;
164      data DMdat.wcompl ( label = 'Dates of first complications for DKpop' ) ;
165          merge wcompl wgrps ;
166          by pnr ;
167      run ;

```

NOTE: There were 1805684 observations read from the data set WORK.WCOMPL.
NOTE: There were 1805684 observations read from the data set WORK.WGRPS.
NOTE: The data set DMDAT.WCOMPL has 1805684 observations and 27 variables.
NOTE: DATA statement used (Total process time):

real time	2.07 seconds
cpu time	0.84 seconds

```

168
169      *-----;
170      * For ketoacidosis and hypoglycaemia we also want all the recurring
170      ! complications ;
171      data DMdat.rcompl ( keep = pnr compl doC
172          label = 'Dates of *all* recurrent complications in long form
172      ! for DKpop' ) ;
173          set compl ;
174          if compl in ('Keto','HpoG') ;
175          format doC ddmmyy10. ;
176      run ;

```

NOTE: There were 17286693 observations read from the data set WORK.COMPL.
NOTE: The data set DMDAT.RCOMPL has 159959 observations and 3 variables.
NOTE: DATA statement used (Total process time):

real time	1.79 seconds
cpu time	1.25 seconds

```

177
178      *-----;
179      * Show the classification of complications groups ;
180      proc tabulate data = DMdat.fcompl missing nosepts ;
181          class compGr compl ;
182          table all compGr*compl,
183              n * f=comma9.
184              / rts = 12 indent=3 ;
185      run ;

```

NOTE: There were 3736240 observations read from the data set DMDAT.FCOMPL.
NOTE: The PROCEDURE TABULATE printed page 2.
NOTE: PROCEDURE TABULATE used (Total process time):

real time	0.20 seconds
cpu time	0.70 seconds

```

186
187      *-----;

```

```
188      * Check how many persons ;
189      proc sort  data = DMdat.fcompl  nodupkey  out = x ; by pnr ; run ;
```

```
NOTE: There were 3736240 observations read from the data set DMDAT.FCOMPL.
NOTE: 1930556 observations with duplicate key values were deleted.
NOTE: The data set WORK.X has 1805684 observations and 4 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time      0.42 seconds
      cpu time       1.12 seconds
```

```
190      proc sort  data = DMdat.wcompl  nodupkey  out = x ; by pnr ; run ;
```

```
NOTE: There were 1805684 observations read from the data set DMDAT.WCOMPL.
NOTE: 0 observations with duplicate key values were deleted.
NOTE: The data set WORK.X has 1805684 observations and 27 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time      2.15 seconds
      cpu time       1.06 seconds
```

```
191      proc sort  data = DMdat.rcompl  nodupkey  out = x ; by pnr ; run ;
```

```
NOTE: There were 159959 observations read from the data set DMDAT.RCOMPL.
NOTE: 98812 observations with duplicate key values were deleted.
NOTE: The data set WORK.X has 61147 observations and 3 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time      0.09 seconds
      cpu time       0.07 seconds
```

```
192
193      *-----;
194      * Show the contents of the datasets ;
195      proc contents data = DMdat.fcompl  varnum ; run ;
```

```
NOTE: PROCEDURE CONTENTS used (Total process time):
      real time      0.01 seconds
      cpu time       0.01 seconds
```

```
NOTE: The PROCEDURE CONTENTS printed page 3.
```

```
196      proc contents data = DMdat.wcompl  varnum ; run ;
```

```
NOTE: PROCEDURE CONTENTS used (Total process time):
      real time      0.00 seconds
      cpu time       0.00 seconds
```

```
NOTE: The PROCEDURE CONTENTS printed page 4.
```

```
197      proc contents data = DMdat.rcompl  varnum ; run ;
```

```
NOTE: PROCEDURE CONTENTS used (Total process time):
      real time      0.00 seconds
      cpu time       0.00 seconds
```

```
NOTE: The PROCEDURE CONTENTS printed page 5.
```

```
NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414
```

```
NOTE: The SAS System used:
      real time      17:00.18
      cpu time       7:03.53
```

4.13.1 10-compl.lst

The SAS System

16:45 Thursday, July 2, 2020 1

```

-----
No. of NPR records retrieved                                N
-----
All                                                         16,661,731
Amp: Amputation
MajA: Major amputation
  KNFQ09 Eksartikulation i hofteled                        1,038
  KNFQ19 Amputation på lårben                             41,449
  KNFQ99 Anden amputationsoperation på hofte/lår         447
MedA: Medium amputation
  KNGQ09 Eksartikulation i knæled                        6,006
  KNGQ19 Amputation på underben                          27,276
MinA: Minor amputation
  KNHQ00 Eksartikulation i talokruralled                 55
  KNHQ02 Intertarsal eksartikulation                    447
  KNHQ03 Tarsometatarsal eksartikulation                1,261
  KNHQ05 Metatarsofalangeal eksartikulation            5,460
  KNHQ07 Eksartikulation af tå i interfalangealled     2,360
  KNHQ11 Amputation i ankelled a.m. Syme                156
  KNHQ14 Transmetatarsal amputation                   21,598
  KNHQ17 Partiel amputation af tå                      12,899
  KNHQ99 An. amputations- el. eksartikulations-  
operation på ankel/fod                                817
CVD: Cardiovascular Disease
AFib: Atrial fibrillation
  DI480 Paroksysmatisk atrieflimren                    102,967
  DI481 Persisterende atrieflimren                    28,840
  DI482 Kronisk atrieflimren                          42,462
  DI483 Typisk atrieflagren                            10,988
  DI484 Atypisk atrieflagren                          3,634
  DI489 Atrieflagren eller atrieflimren UNS           1,363,420
  KFPD00 Labyrintoperation for atrieflimner           867
  KFPD96 Anden operation for atrieflimner             2,092
AtMD: Atherosclerotic macrovascular dis
  DI700 Aterosklerose i aorta                          7,591
  DI701 Aterosklerose i nyrearterie                   2,591
  DI702 Aterosklerose i arterie i underekstremitet    344,533
  DI702A Aterosklerotisk gangræn                      63,383
  DI702B Mönckebergs mediasklerose                     82
  DI708 Aterosklerose i anden arterie                  13,485
  DI708A Aterosklerotisk retinopati                    18
  DI709 Aterosklerose UNS                              53,697
  DI71 Aorta-aneurisme og aortadissektion             207
  DI710 Aortadissektion UNS                           8,662
  DI710A Aortadissektion, type A                       3,748
  DI710B Aortadissektion, type B                      3,574
  DI711 Rumperet torakalt aorta-aneurisme             2,099
  DI712 Torakalt aorta-aneurisme uden ruptur          14,039
  DI713 Rumperet abdominalt aorta-aneurisme           17,946
  DI714 Abdominalt aorta-aneurisme uden ruptur        96,369
  DI715 Rumperet torakoabdominalt aorta-aneurisme     1,130
  DI716 Torakoabdominalt aorta-aneurisme uden ruptur  6,250
  DI718 Rumperet aorta-aneurisme UNS                  1,471
  DI719 Aorta-aneurisme UNS uden ruptur               18,940
  DI719A Dilateret aorta                              6,626
  DI719B Hyalin nekrose i aorta                        6
  DI739A Claudicatio intermittens                     165,521
  DI739C Iskæmiske hvilesmerter i underekstremitet    60,497
CbVD: Cerebrovascular disease
  DG450 Vertebrobasilært syndrom                      2,568
  DG450A Arteria vertebralis-syndrom                   145
  DG450B Arteria basilaris-syndrom                    202
  DG451 Arteria carotis-syndrom                       5,219
  DG452 Insufficiens af fl. el. dobbeltsidige præcerebrale arterier 70
  DG452A Insufficiens af dobbeltsidige præcerebrale arterier 11
  DG453 Amaurosis fugax                               16,876
  DG454 Global forbigående amnesi                     11,073
  DG458 Anden transitorisk cerebral iskæmi eller beslægtet syndrom 5,692

```

DG459	Transitorisk anfald af cerebral iskæmi UNS	215,595
DG459A	Spasme i cerebral arterie	221
DI600	Subaraknoidalblødning fra karotissifonen eller bifurkaturen	3,433
DI601	Subaraknoidalblødning fra arteria cerebri media	5,305
DI602	Subaraknoidalblødning fra arteria communicans anterior	7,511
DI603	Subaraknoidalblødning fra arteria communicans posterior	1,828
DI604	Subaraknoidalblødning fra arteria basilaris	1,974
DI605	Subaraknoidalblødning fra arteria vertebralis	680
DI606	Subaraknoidalblødning fra anden intrakraniel arterie	1,407
DI606A	Subaraknoidalblødning fra arteria cerebri posterior	114
DI606B	Subaraknoidalblødning fra arteria cerebri anterior	257
DI606C	Subaraknoidalblødning fra flere intrakranielle arterier	48
DI607	Subaraknoidalblødning fra intrakraniel arterie UNS	5,032
DI607A	Bristet medfødt intrakranielt sakkulært aneurisme	19
DI608	Anden form for subaraknoidalblødning	2,753
DI609	Subaraknoidalblødning UNS	24,268
DI609A	Bristet (medfødt) intrakranielt aneurisme UNS	76
DI610	Subkortikal blødning i hjernehemisfære	8,224
DI610A	Dybtliggende blødning i hjernehemisfære	3,033
DI611	Kortikal blødning i hjernehemisfære	3,351
DI611A	Blødning i hjernens overflade	198
DI611B	Haemorrhagia lobi cerebri	669
DI612	Intracerebral blødning i hjernehemisfære UNS	19,821
DI613	Blødning i hjernestammen	2,993
DI614	Blødning i lillehjernen	4,883
DI615	Blødning i hjerneventrikel	3,118
DI616	Blødning flere steder i hjernen	1,564
DI618	Anden form for hjerneblødning	1,958
DI619	Hjerneblødning UNS	59,233
DI620	Akut ikke-traumatisk subdural blødning	5,621
DI621	Ikke-traumatisk epidural blødning	378
DI629	Ikke-traumatisk intrakraniel blødning UNS	2,071
DI630	Hjerneinfarkt forårsaget af trombose i præcerebral arterie	2,933
DI631	Hjerneinfarkt forårsaget af emboli i præcerebral arterie	1,417
DI632	Hjerneinfarkt f.a. tilluk./stenose i præcerebral arterie UNS	13,073
DI633	Hjerneinfarkt forårsaget af trombose i cerebral arterie	32,911
DI634	Hjerneinfarkt forårsaget af emboli i cerebral arterie	12,986
DI635	Hjerneinfarkt f.a. tillukning/stenose i cerebral arterie UNS	12,010
DI636	Hjerneinfarkt f.a. ikke-pyogen cerebral venøs trombose	565
DI638	Anden form for hjerneinfarkt	4,942
DI639	Hjerneinfarkt UNS	339,354
DI649	Apoplexia cerebri UNS	379,228
DI650	Okklusion/stenose af arteria vertebralis uden hjerneinfarkt	713
DI650A	Okklusion af arteria vertebralis uden hjerneinfarkt	64
DI650B	Stenose af arteria vertebralis uden hjerneinfarkt	84
DI651	Okklusion el. stenose af arteria basilaris u. hjerneinfarkt	600
DI651A	Okklusion af arteria basilaris uden hjerneinfarkt	42
DI651B	Stenose af arteria basilaris uden hjerneinfarkt	35
DI652	Okklusion el. stenose af arteria carotis uden hjerneinfarkt	28,885
DI652A	Okklusion af arteria carotis uden hjerneinfarkt	794
DI652B	Stenose af arteria carotis uden hjerneinfarkt	5,252
DI653	Okklusion/stenose af fl/bilat præcerebrale aa. u/infarkt	499
DI653A	Okklusion af bilaterale præcerebrale aa. u/infarkt	46
DI653B	Okklusion af flere præcerebrale arterier u/infarkt	26
DI653C	Stenose flere præcerebrale arterier u/infarkt	51
DI653D	Stenose af bilaterale præcerebrale arterier u/infarkt	41
DI658	Okklusion/stenose af an. præcerebral arterie u. hjerneinfar.	735
DI659	Okklusion/stenose af præcerebral arterie u. hjerneinfa. UNS	5,239
DI660	Okklus. el. stenose af arteria cerebri media u. hjerneinfa.	618
DI660A	Okklusion af arteria cerebri media u/infarkt	98
DI660B	Stenose af arteria cerebri media u/infarkt	184
DI661	Okklusion/stenose af arteria cerebri anterior u. hjerneinfa.	56
DI661A	Okklusion af arteria cerebri anterior u/infarkt	11
DI661B	Stenose af arteria cerebri anterior u/infarkt	7
DI662	Okklusion/steno. af arteria cerebri posterior u. hjerneinfa.	113

DI662A	Okklusion af arteria cerebri posterior u/infarkt	14
DI662B	Stenose af arteria cerebri posterior u/infarkt	14
DI663	Okklusion el. stenose af cerebellar arterie u. hjerneinfarkt	130
DI663A	Okklusion af cerebellar arterie uden hjerneinfarkt	5
DI663B	Stenose af cerebellar arterie uden hjerneinfarkt	*
DI664	Okklusion/stenose af fl/bilaterale cerebrale aa. u/infarkt	187
DI664A	Okklusion af bilaterale cerebrale arterier u/infarkt	4
DI664B	Okklusion af flere cerebrale arterier u/infarkt	13
DI664C	Stenose af bilaterale cerebrale arterier u/infarkt	6
DI664D	Stenose af flere cerebrale arterier u/infarkt	21
DI668	Okklusion/stenose af an. cerebrale arterier u. hjerneinfarkt	644
DI668A	Okklusion af en el fl. af aa. perforantes cerebri u/infarkt	7
DI669	Okklusion/stenose af cerebrale arterie UNS u. hjerneinfarkt	1,654
DI670	Dissektion af cerebral arterie uden ruptur	2,575
DI671	Cerebralt aneurisme uden ruptur	20,012
DI671A	Erhvervet cerebral arteriovenøs fistel	901
DI672	Cerebral aterosklerose	8,469
DI672A	Atheroma arteriae cerebri	25
DI673	Progressiv vaskulær leukoencefalopati	1,658
DI673A	Binswangers sygdom	134
DI674	Hypertensiv encefalopati	1,412
DI675	Moyamoya-sygdom	610
DI676	Ikke-pyogen intrakraniell venøs trombose	2,451
DI676A	Ikke-pyogen trombose i sinus venosi cerebri	739
DI677	Cerebral arteritis IKA	1,394
DI677A	Primær cerebral vaskulitis	411
DI678	Anden cerebrovaskulær sygdom	2,681
DI678A	Akut cerebrovaskulær insufficiens	172
DI678B	Cerebral (kronisk) iskæmi	768
DI679	Cerebrovaskulær sygdom UNS	3,867
DI680	Cerebral amyloid angiopati	1,196
DI681	Cerebral arteritis ved infektiøs eller parasitær sygdom KA	43
DI682	Cerebral arteritis ved anden sygdom klassificeret andetsteds	119
DI688	Anden karforandring i hjernen ved sygdom klas. andetsteds	245
DI690	Senfølge efter tidligere subaraknoidalblødning	7,983
DI691	Senfølge efter tidligere hjerneblødning	18,321
DI692	Senfølge eft. tidl. an. art ikke-traum. intrakran. blødning	1,829
DI693	Senfølge efter tidligere hjerneinfarkt	92,022
DI694	Senfølge efter tidligere apoplexia cerebri	344,214
DI698	Senfølge efter tidligere an/ikke spec. cerebrovaskulær sygdom	8,875
HF: Heart failure		
DI110	Hypertensiv hjertesygdom med inkomenseret hjertesvigt	23,844
DI130	Hypertensiv hjertesygdom og nyresygdom med hjertesvigt	1,589
DI132	Hypertensiv hjertesygdom og nyresygdom m. hjerte- og nyresvigt	1,282
DI500	Kronisk hjerteinsufficiens	194,556
DI500A	Højresidig hjerteinsufficiens	4,815
DI501	Venstresidig hjerteinsufficiens	99,005
DI501A	Asthma cardiale	413
DI501B	Kardiel lungeødem	8,129
DI501C	Kardiel lungestase	9,474
DI501D	Biventrikulær hjerteinsufficiens	1,183
DI509	Hjertesvigt UNS	659,476
IHD: Ischeamic heart disease		
DI200	Ustabil angina pectoris	143,874
DI200B	Klinisk vurderet ustabil angina pectoris	4,306
DI200C	Ustabil angina pectoris med dokumenteret iskæmi	1,955
DI201	Prinzmetals angina pectoris	15,984
DI208	Anden form for angina pectoris	51,666
DI208D	Mikrovaskulær angina	942
DI208E	Stabil angina pectoris	9,639
DI209	Angina pectoris UNS	805,705
DI210	Anteriort akut myokardieinfarkt med Q-taksudvikling	36,658
DI210A	Anteriort non-ST-elevations AMI med Q-taksudvikling	1,916
DI210B	Anteriort ST-elevations akut myokardieinfarkt med Q-taksudv.	9,466

DI211	Inferiort/posteriort akut myokardieinfarkt med Q-taksudv.	28,936
DI211A	Inferiort el posteriort non-ST-elevations AMI m Q-taksudvikl	1,663
DI211B	Inferiort el posteriort ST-elevations AMI m Q-taksudvikling	9,713
DI213	ST-elevations akut myokardieinfarkt uden Q-taksudvikling	57,262
DI214	Non-ST-elevations akut myokardieinfarkt uden Q-taksudvikling	191,400
DI219	Akut myokardieinfarkt UNS	229,536
DI230	Hæmoperikardium efter akut myokardieinfarkt	504
DI231	Atrieseptumruptur efter akut myokardieinfarkt	151
DI232	Ventrikelseptumruptur efter akut myokardieinfarkt	849
DI233	Ruptur i hjertevæg u hæmoperikardium eft AMI	128
DI234	Ruptur af chordae tendineae efter akut myokardieinfarkt	89
DI235	Papillærmuskeldruptur efter akut myokardieinfarkt	161
DI236	Trombose i atrie eller ventrikel efter akut myokardieinfarkt	544
DI236A	Trombose i atrieaurikel efter akut myokardieinfarkt	17
DI236B	Trombose i ventrikel akut myokardieinfarkt	80
DI238	An. akut kompl. i efterforløbet af AMI	782
DI238A	Perikardieansamling efter akut myokardieinfarkt	174
DI240	Koronartrombose uden infarkt	1,242
DI240A	Arteriel eller venøs koronaremboli uden infarkt	31
DI241	Postmyokardieinfarktsyndrom	1,350
DI248	Anden form for akut iskæmisk hjertesygdom	3,385
DI248A	Insufficiëntia coronaria	352
DI249	Akut iskæmisk hjertesygdom UNS	15,439
KFNA00	Anastom. mellem a. mamma interna og kor-a.	50,866
KFNA10	Sekventielle anastomoser mellem a. mamm. interna og kor-a.	3,029
KFNA20	Anastomoser mellem bilat. aa. mamm. internæ og kor-a.	2,950
KFNA96	An. anastomoseoperation mellem a. mamma interna og kor-a.	339
KFNB00	Anastom. mellem a. gastroepiploica og kor-a.	42
KFNB20	Sekventielle anastomoser mellem a. gastroepiploica og kor-a.	4
KFNB96	An. anastomoseoperation mellem a. gastroepiploica og kor.ea.	6
KFNC10	Aortokoronar byp. m. enkelt distal anastom.	17,585
KFNC20	Aortokoronar byp. m. to distale anastomoser	23,943
KFNC30	Aortokoronar byp. m. tre distale anastomoser	14,795
KFNC40	Aortokoronar byp. m. fire distale anastomoser	4,252
KFNC50	Aortokoronar byp. m. fem distale anastomoser	589
KFNC60	Aortokoronar byp. m. seks distale anastomoser	64
KFNC96	Anden aortokoronar bypass-operation	79
KFND10	Aortokoronar bypass med enkelt protese	53
KFND20	Aortokoronar bypass med to proteser	6
KFND96	Anden aortokoronar bypass-operation m. protese	*
KFNE00	Kor. byp. m. anv. af frit a.transpl. fra a. mamma interna	652
KFNE10	Kor. byp. m. anv. af frit a.transpl. fra a. gastroepiploica	35
KFNE20	Kor. byp. m. anv. af frit a.transpl. fra a. radialis	204
KFNE96	An. kor. byp. m. anv. af frit a.transpl.	4,599
KFNF00	Trombendarterektomi i høg. kor-a.	80
KFNF10	Trombendarterektomi i ramus desc. ant. fra høg. kor-a.	63
KFNF20	Trombendarterektomi i ramus circumflexus fra høg. kor-a.	19
KFNF30	Trombendarterektomi i ve. koronararteries hovedstamme	*
KFNF96	Anden koronar trombendarterektomi	41
KFNG00	Udvidelse af koronararterie	8,266
KFNG02	Perkut. translum. plastik på kor-a. (PTCA)	33,321
KFNG02A	Prim. perkut. translum. plastik på kor-a. (PTCA)	9,783
KFNG05	Perkut. translum. plastik på kor-a. (PTCA) m. stent	196,053
KFNG05A	Prim. perkut. translum. plastik på kor-a. (PTCA) m. stent	76,667
KFNG10	Embolektomi på koronararterie	84
KFNG12	Perkut. translum. embolektomi på kor-a.	217
KFNG20	Fjernelse af fremmedlegeme i kor-a.	11
KFNG30	Udvidelse af kor-a. m. anvendelse af patch	588
KFNG40	Laserbehandling af koronararterie	46
KFNG96	Anden udvidelse el. rekanalisering af kor-a.	3,737

HpoG: Hypoglycemia

HpoG: Hypoglycemia		
DE100	Type 1-diabetes med koma	6,572
DE110	Type 2-diabetes med koma	10,643
DE120	Diabetes forårsaget af underernæring med koma	518
DE130	Anden diabetes med koma	218
DE140	Diabetes UNS med koma	1,335
DE160	Hypoglykæmi uden koma forårsaget af lægemiddel	14,143
DE161	Anden form for hypoglykæmi	4,159
DE161B	Encefalopati efter hypoglykæmisk koma	97
DE162	Hypoglykæmi UNS	76,508
DT380	Forgift. m. hormon/synt-substitut/antagon. af kendt art IKA	3,136
DT383	Forgiftning med insulin eller andet antidiabetika	874
DT383A	Insulin-shock	198
DT389	Forgift.med hormon, syntetisk substitut el. antagonist UNS	783
HypD: Hypertensive Disease		
HypD: Hypertensive Disease		
DI109	Essentiel hypertension	2,452,408
DI119	Hypertensiv hjertesygdom uden inkomensation	24,602
DI119A	Hypertensiv hjertesygdom UNS	2,307
DI120	Hypertensiv nyresygdom med nyresvigt	14,195
DI129	Hypertensiv nyresygdom uden nyresvigt	8,438
DI129A	Hypertensiv nyresygdom UNS	598
DI131	Hypertensiv hjertesygdom og nyresygdom med nyresvigt	1,073
DI139	Hypertensiv hjertesygdom og nyresygdom UNS	1,342
DI150	Renovaskulær hypertension	11,945
DI151	Hypertension sekundært til anden nyresygdom	21,046
DI152	Hypertension sekundært til endokrin sygdom	3,085
DI158	Anden form for sekundær hypertension	4,066
DI159	Sekundær hypertension UNS	28,281
Keto: Ketoacidosis		
Keto: Ketoacidosis		
DE101	Type 1-diabetes med ketoacidose	28,801
DE111	Type 2-diabetes med ketoacidose	4,653
DE121	Diabetes forårsaget af underernæring med ketoacidose	224
DE131	Anden diabetes med ketoacidose	913
DE141	Diabetes UNS med ketoacidose	4,272
DE872A	Laktacidose	1,912
Nefr: Nephropathy		
ESRD: End-stage CKD		
BJFD0	Akut dialyse	2,943
BJFD00	Akut hæmodialyse	243,702
BJFD01	Akut peritonealdialyse	11,804
BJFD02	Kontinuerlig vene-vene-diahemofiltration (CVVDHF)	58,678
BJFD2	Dialyse ved kronisk nyresygdom	550
BJFD20	Hæmodialyse ved kronisk nyresygdom	5,147,898
BJFD21	Kontinuerlig ambulant peritonealdialyse, CAPD	111,225
BJFD22	Intermitterende peritonealdialyse, IPD	8,362
BJFD23	Natlig peritonealdialyse, NPD	565
BJFD24	Kontinuerlig cyklisk peritonealdialyse, CCPD	*
BJFD25	Daglig ambulant peritonealdialyse, DAPD	2,116
BJFD26	Hæmodiafiltration	150,777
BJFD27	Automatisk peritonealdialyse, APD	19,731
BJFZ	Delprocedurer ved dialysebehandling	142
BJFZ0	Tilslutning af dialyseapparat til patient	263
BJFZ00	Tilslutning af hæmodialyseapparat til patient	363
BJFZ01	Tilslutning af peritonealdialyseapparat til patient	572
BJFZ1	Fjernelse af dialyseapparat fra patient	267
BJFZ10	Fjernelse af hæmodialyseapparat fra patient	542
BJFZ11	Fjernelse af peritonealdialyseapparat fra patient	133
BJFZ4	Delprocedure vedrørende dialysekateter	1,632
BJFZ40	Anlæggelse af hæmodialysekateter	15,010
BJFZ40A	Anlæggelse af tunnelleret hæmodialysekateter	2,511
BJFZ41	Skift af hæmodialysekateter	894
BJFZ41A	Skiftning af tunnelleret hæmodialysekateter	29
BJFZ42	Skylning af hæmodialysekateter	3,258
BJFZ43	Fjernelse af hæmodialysekateter	1,716
BJFZ43A	Fjernelse af tunnelleret hæmodialysekateter	1,646
BJFZ44	Omlægning af hæmodialysekateter	58
BJFZ45	Anlæggelse af peritonealdialysekateter	2,916
BJFZ46	Skift af peritonealdialysekateter	154

BJFZ47	Skylning af peritonealdialysekateter	6,204
BJFZ48	Fjernelse af peritonealdialysekateter	2,835
BJFZ49	Omlægning af peritonealdialysekateter	290
BJFZ4A	Tætning af peritoneal dialysekateter uden omlægning	14
BJFZ6	Slangeskift ved dialysebehandling	163
BJFZ60	Slangeskift ved peritonealdialysekateter	5,816
BJFZ9	Tilpasning af dialyseapparat til patient	347
BJFZ90	Programmering af kort til individuel dialysebehandling	803
BJFZ91	Justering af individuel dialysebehandling	4,695
DN185	Kronisk nyreinsufficiens, terminalt stadium 5	48,351
KJAK10	Laparotomi m. indl. af kateter til peritonealdialyse	3,195
KJAK11	Laparoskopisk indl. af kateter til peritonealdialyse	1,264
KJAK13	Laparotomi m. omlejring af peritonealt dialysekateter	223
KJAK14	Laparoskopisk omlejring af peritonealt dialysekateter	476
KKAS00	Autolog nyretransplantation	50
KKAS10	Allogen nyretransplantation m. nyre fra kadaverdonor	3,602
KKAS20	Allogen nyretransplantation m. nyre fra levende donor	2,042
KKAS40	Excision af transplanteret nyre	815
KKAS41	Perkut. endoskopisk excision af transplanteret nyre	*
KKAS50	Pyelocystotomi på transplanteret nyre	11
KKAS60	Operation for lymfocele v. transplanteret nyre	67
KKAS61	Perkut. endoskop. op. for lymfocele v. transplanteret nyre	23
KKAS70	Uretertransposition til transplanteret urinleder/nyrebækken	65
KKAS96	Anden operation i forbindelse m. nyretransplantation	154
KKAS97	An. perkut. endoskop. op. i forb. m. nyretransplant.	*
KPBL10	Anlæggelse af av-fistel fra a. axillaris	61
KPBL10A	Anlæggelse af av-fistel fra a. axillaris m. protese	13
KPBL20	Anlæggelse af av-fistel fra a. brachialis	7,901
KPBL20A	Anlæggelse af av-fistel fra a. brachialis m. protese	513
KPBL30	Anlæggelse af av-fistel fra a. radialis el. a. ulnaris	16,413
KPBL30A	Anlæggelse af av-fistel fra a. radialis/ulnaris m. protese	505
KPBL99	Anlæggelse af av-fistel fra an. a. i overekstremitet.	180
ModC: Moderate CKD		
DN183	Kronisk nyreinsufficiens, stadium *	15,228
DN189	Kronisk nyreinsufficiens UNS	304,583
SevC: Severe CKD		
DN184	Kronisk nyreinsufficiens, stadium 4	13,363
Neur: Neuropathy		
Neur: Neuropathy		
DE104	Type 1-diabetes med neurologisk komplikation	27,574
DE114	Type 2-diabetes med neurologisk komplikation	52,206
DE124	Diabetes f.a. underernæring med neurologisk komplikation	186
DE134	Anden diabetes med neurologisk komplikation	799
DG590	Diabetisk mononeuropati	432
DG632	Diabetisk polyneuropati	8,508
DG990	Autonom neuropati ved endokrin eller metabolisk sygdom KA	269
Reti: Retinopathy		
Reti: Retinopathy		
DH350I	Retinopati UNS	1,500
DH360	Diabetisk retinopati UNS	120,821
DH360H	Simpel diabetisk retinopati	8,150
DH360J	Proliferativ diabetisk retinopati	12,194
DH360K	Diabetisk makulopati	14,347

The SAS System

16:45 Thursday, July 2, 2020 2

N	

All	3,736,240
Amp	
MajA	15,738
MedA	13,400
MinA	15,055
CVD	
AFib	383,588
AtMD	228,199

```

    CbVD      518,420
    HF        317,930
    IHD       482,975
DNeF
  MacA       28,855
  MicA       99,554
HpoG
  HpoG       50,594
HypD
  HypD       842,236
Keto
  Keto       16,074
NefL
  ESRL       17,916
  ModL       414,843
  SevL       63,794
Nefr
  ESRD       49,650
  ModC       83,475
  SevC        6,807
Neur
  Neur       37,547
Reti
  Reti       49,590
-----

```

The SAS System 16:45 Thursday, July 2, 2020 3

The CONTENTS Procedure

Data Set Name	DMDAT.FCOMPL	Observations	3736240
Member Type	DATA	Variables	4
Engine	V9	Indexes	0
Created	02/07/2020 17:02:23	Observation Length	32
Last Modified	02/07/2020 17:02:23	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Dates of first complication in long form for DKpop		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	1833
First Data Page	*
Max Obs per Page	2039
Obs in First Data Page	1993
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\fcompl.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	115MB
File Size (bytes)	120193024

Variables in Creation Order

#	Variable	Type	Len	Format	Informat	Label
1	compl	Char	5			
2	compGr	Char	5			
3	PNR	Char	12	\$12.	\$10.	Personnummer
4	doC	Num	8	DDMMYY10.		

The SAS System 16:45 Thursday, July 2, 2020 4

The CONTENTS Procedure

Data Set Name	DMDAT.WCOMPL	Observations	1805684
Member Type	DATA	Variables	27
Engine	V9	Indexes	0
Created	02/07/2020 17:02:35	Observation Length	224
Last Modified	02/07/2020 17:02:35	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Dates of first complications for DKpop		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	6184
First Data Page	*
Max Obs per Page	292
Obs in First Data Page	275
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\wcompl.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	387MB
File Size (bytes)	405340160

Variables in Creation Order

#	Variable	Type	Len	Format	Informat	Label
*	PNR	Char	12	\$12.	\$10.	Personnummer
*	doCbVD	Num	8	DDMMYY10.		
*	doHypD	Num	8	DDMMYY10.		
4	doAFib	Num	8	DDMMYY10.		
5	doIHD	Num	8	DDMMYY10.		
6	doMicA	Num	8	DDMMYY10.		
7	doAtMD	Num	8	DDMMYY10.		
8	doModC	Num	8	DDMMYY10.		
9	doSevL	Num	8	DDMMYY10.		
10	doModL	Num	8	DDMMYY10.		
11	doESRD	Num	8	DDMMYY10.		
12	doHF	Num	8	DDMMYY10.		
13	doHpoG	Num	8	DDMMYY10.		
14	doESRL	Num	8	DDMMYY10.		
15	doMajA	Num	8	DDMMYY10.		
16	doMedA	Num	8	DDMMYY10.		
17	doMinA	Num	8	DDMMYY10.		
18	doReti	Num	8	DDMMYY10.		
19	doNeur	Num	8	DDMMYY10.		
20	doKeto	Num	8	DDMMYY10.		
21	doMacA	Num	8	DDMMYY10.		
22	doSevC	Num	8	DDMMYY10.		
23	doCVD	Num	8	DDMMYY10.		
24	doDNef	Num	8	DDMMYY10.		
25	doNefL	Num	8	DDMMYY10.		
26	doNefr	Num	8	DDMMYY10.		
27	doAmp	Num	8	DDMMYY10.		

The SAS System

16:45 Thursday, July 2, 2020 5

The CONTENTS Procedure

Data Set Name	DMDAT.RCOMPL	Observations	159959
Member Type	DATA	Variables	*

Engine	V9	Indexes	0
Created	02/07/2020 17:02:38	Observation Length	32
Last Modified	02/07/2020 17:02:38	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label	Dates of *all* recurrent complications in long form for DKpop		
Data Representation	WINDOWS_64		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	65536
Number of Data Set Pages	79
First Data Page	*
Max Obs per Page	2039
Obs in First Data Page	1995
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	E:\workdata\707655\DMreg\data\rcompl.sas7bdat
Release Created	9.0401M5
Host Created	X64_SR12R2
Owner Name	DSTFSE\FDIY7655
File Size	5MB
File Size (bytes)	5242880

Variables in Creation Order

#	Variable	Type	Len	Format	Informat	Label
1	compl	Char	5			
2	PNR	Char	12	\$12.	\$10.	Personnummer
3	doC	Num	8	DDMMYY10.		

4.14 00-fmts.log

This is the log for the format definitions used in the project. The corresponding .lst file is not listed as it is *very* long and contains very little additional information relative to the .log file here.

1 "Program: 00-fmts.sas" 02:27 Tuesday, June 30, 2020

NOTE: Copyright (c) 2016 by SAS Institute Inc., Cary, NC, USA.

NOTE: SAS (r) Proprietary Software 9.4 (TS1M5)

Licensed to FORSKNING 1, Site 50800722.

NOTE: This session is executing on the X64_SR12R2 platform.

NOTE: Updated analytical products:

SAS/STAT 14.3

NOTE: Additional host information:

X64_SR12R2 WIN 6.3.9600 Server

NOTE: SAS initialization used:

real time 0.07 seconds

cpu time 0.07 seconds

NOTE: AUTOEXEC processing beginning; file is E:\workdata\707655\DMreg\sas\optslibs.sas.

NOTE: AUTOEXEC processing completed.

```

1      title1 'Complications groupings' ;
2      * Input of the classification of diagnosis / surgery / procedure codes
3      in form of a file used as input to proc format via cntlin=
4      The formats created are classifying diagnosis, surgery and procedure
5      codes:
6      compsub - codes translated to 16 complication groups (4 characters)
7      cmp4sub - same, uses only 4 first digits of codes - wildcarding
8      sub2grp - grouping of 16 groups to 8 (4 of which are the same)
9      abb2txt - translate group-codes (4 char) to human readable text ;
10     data compfmt ;
11         infile '..\fmts\compfmt.csv'
12             delimiter = ','
13             missover dsd lrecl=32767 firstobs=2 ;
14     informat fmtname $10. ;
15     informat start $9. ;
16     informat label $39. ;
17     informat hlo $3. ;
18     input fmtname $
19         start $
20         label $
21         hlo $ ;
22     run;

```

NOTE: The infile '..\fmts\compfmt.csv' is:
 Filename=E:\workdata\707655\DMreg\fmts\compfmt.csv,
 RECFM=V,LRECL=32767,File Size (bytes)=14832,
 Last Modified=30. juni 2020 02:20:41,
 Create Time=30. juni 2020 01:47:20

NOTE: 470 records were read from the infile '..\fmts\compfmt.csv'.
 The minimum record length was 25.
 The maximum record length was 67.

NOTE: The data set WORK.COMPfmt has 470 observations and 4 variables.

NOTE: DATA statement used (Total process time):
 real time 0.01 seconds
 cpu time 0.00 seconds

```

23
24     proc print data = compfmt ; run ;

```

NOTE: There were 470 observations read from the data set WORK.COMPfmt.

NOTE: The PROCEDURE PRINT printed page 1.

NOTE: PROCEDURE PRINT used (Total process time):
 real time 0.01 seconds
 cpu time 0.01 seconds

```

25     * create the formats ;
26     proc format library = DMfmt.DMreg
27         cntlin = compfmt ;
NOTE: Format $COMPSUB is already on the library DMFMT.DMREG.
NOTE: Format $COMPSUB has been written to DMFMT.DMREG.
NOTE: Format $CMP4SUB is already on the library DMFMT.DMREG.
NOTE: Format $CMP4SUB has been written to DMFMT.DMREG.
NOTE: Format $$SUB2GRP is already on the library DMFMT.DMREG.
NOTE: Format $$SUB2GRP has been written to DMFMT.DMREG.

```

NOTE: Format \$ABB2TXT is already on the library DMFMT.DMREG.

NOTE: Format \$ABB2TXT has been written to DMFMT.DMREG.

NOTE: Format \$AB2ABTX is already on the library DMFMT.DMREG.

NOTE: Format \$AB2ABTX has been written to DMFMT.DMREG.

```
28      run ;
```

NOTE: PROCEDURE FORMAT used (Total process time):

```
real time      0.10 seconds
```

```
cpu time       0.00 seconds
```

NOTE: There were 470 observations read from the data set WORK.COMPfmt.

```
29
```

```
30      title1 'Format with names of diagnoses, operations and behandlinger' ;
```

```
31      *-----;
```

```
32      * FORMATS used for grouping and labeling ;
```

```
33      * A collected format with Diagnoses (ICD 8 & 10, Handling and Operation) ;
```

```
34      proc format library = dsfmt.sundhed
```

```
35              cntlout = dob ( keep = fmtname start label type ) ;
```

```
36          select $ICD8_L1L1_KT
```

```
37                  $ICD10_L1L1_KT
```

```
38                  $OPR_L1L1_KT
```

```
39                  $BEH_L1L1_KT ;
```

```
40      run ;
```

NOTE: PROCEDURE FORMAT used (Total process time):

```
real time      0.51 seconds
```

```
cpu time       0.03 seconds
```

NOTE: The data set WORK.DOB has 50445 observations and 4 variables.

```
41
```

```
42      data dob ;
```

```
43          set dob ;
```

```
44          fmtname = 'dob_L1L1_KT' ;
```

```
45      run ;
```

NOTE: There were 50445 observations read from the data set WORK.DOB.

NOTE: The data set WORK.DOB has 50445 observations and 4 variables.

NOTE: DATA statement used (Total process time):

```
real time      0.01 seconds
```

```
cpu time       0.01 seconds
```

```
46
```

```
47      options source2 ;
```

```
48      proc format library = DMfmt.DMreg
```

```
49              cntlin = dob ;
```

NOTE: Format \$DOB_L1L1_KT is already on the library DMFMT.DMREG.

NOTE: Format \$DOB_L1L1_KT has been written to DMFMT.DMREG.

NOTE: A byte-order mark in the file "E:\workdata\707655\DMreg\fmts\NPUfmt.sas" (for fileref "#LN00066") indicates that the data is encoded in "utf-8". This encoding will be used to process the file.

```
49      ! * Diagnosis/Operation/Behandling ;
```

```
50      * Formats (NPUd / NPUE - Danish English) grouping lab-measurements ;
```

```
51      %inc '../fmts/NPUfmt.sas' ;
```

NOTE: %INCLUDE (level 1) file ../fmts/NPUfmt.sas is file

```
E:\workdata\707655\DMreg\fmts\NPUfmt.sas.
```

```
52      ** proc format ;
```

```
53      +
```

```
54      ** Defines two formats:
```

```
55      + one with Danish long texts ($NPUd) and
```

```
56      + one with English short texts ($NPUe) - max 4 characters ;
57      +
58      +value $NPUD
59      +
60      +'NPU27412',
61      +'NPU27300',
62      +'DNK35249',
63      +'NPU29296',
64      +'NPU03835',
65      +'NPU02307'='Hba1c'
66      +
67      +'NPU02187',
68      +'NPU04173',
69      +'NPU04177',
70      +'NPU08572',
71      +'NPU08571',
72      +'NPU02192',
73      +'NPU21531',
74      +'NPU22089'='Glukose'
75      +
76      +'DNK35842',
77      +'NPU10047',
78      +'NPU08503',
79      +'NPU22127',
80      +'NPU21532',
81      +'NPU02193',
82      +'NPU02195',
83      +'NPU08972',
84      +'NPU02188',
85      +'NPU22069'='Glukose 0'
86      +
87      +'NPU10048',
88      +'NPU08504',
89      +'NPU22129',
90      +'NPU04174'='Glukose 30'
91      +
92      +'NPU10051',
93      +'NPU08507',
94      +'NPU22134',
95      +'NPU21530'='Glukose 120'
96      +
97      +'NPU18412',
98      +'NPU01566',
99      +'NPU01549',
100     +'NPU17029',
101     +'NPU10033',
102     +'NPU18411'='Total kolesterol'
103     +
104     +'NPU10171',
105     +'NPU01568',
106     +'DNK35308'='LDL kolesterol'
107     +
108     +'NPU10157',
109     +'NPU01567',
110     +'NPU18107'='HDL kolesterol'
111     +
112     +'NPU09256',
113     +'NPU01569'='VLDL kolesterol'
114     +
115     +'NPU03620',
116     +'NPU04094',
117     +'NPU18413',
```

```
118      +'NPU18106'='Triglycerid'
119      +
120      +'NPU01807',
121      +'NPU04998',
122      +'NPU09101',
123      +'NPU18016'='Plasma Kreatinin'
124      +
125      +'NPU19661',
126      +'NPU28842',
127      +'DNK05289',
128      +'NPU03918'='Ualbcrea'
129      +
130      +'NPU03230'='Kalium'
131      +
132      +'NPU03429'='Natrium'
133      +
134      +'NPU03577',
135      +'NPU27547'='TSH'
136      +
137      +'NPU03246',
138      +'NPU03247',
139      +'NPU03248',
140      +'NPU04149',
141      +'NPU18004',
142      +'NPU18005',
143      +'NPU04154',
144      +'NPU04020',
145      +'NPU10390',
146      +'NPU18007',
147      +'NPU08978'='C-peptid/Proinsulin'
148      +
149      +'NPU01422',
150      +'DNK05027',
151      +'NPU19748',
152      +'NPU01423'='CRP'
153      +
154      +'NPU26737',
155      +'NPU14507',
156      +'NPU29550',
157      +'NPU12544',
158      +'NPU12546',
159      +'NPU28627',
160      +'NPU28628',
161      +'NPU54726',
162      +'NPU54727',
163      +'NPU28103'='GAD65'
164      +
165      +'DNK35131',
166      +'NPU28811',
167      +'DNK35301',
168      +'DNK35302',
169      +'DNK35303',
170      +'DNK35304'='eGFR'
171      +
172      +'NPU19597',
173      +'NPU28271',
174      +'NPU10295'='GFR'
175      +
176      +'NPU01121',
177      +'NPU19981',
178      +'NPU19651',
179      +'DNK05051'='ALAT'
```



```
180      +
181      +'DNK05098',
182      +'NPU27783',
183      +'DNK05431',
184      +'NPU57047',
185      +'DNK05050'='Basisk fosfatase'
186      +
187      +'NPU01700'='cobalamin'
188      +
189      +'NPU03568',
190      +'NPU26813'='Trombocytter'
191      +
192      +'NPU02593',
193      +'NPU04851',
194      +'NPU02596',
195      +'NPU17027',
196      +'NPU18245',
197      +'NPU18156',
198      +'NPU17580',
199      +'NPU04100'='Leucocytter'
200      +
201      +'NPU02319'='Hæmoglobin' ;
NOTE: Format $NPUD is already on the library DMFMT.DMREG.
NOTE: Format $NPUD has been written to DMFMT.DMREG.
202      +
203      +value $NPUE
204      +
205      +'NPU27412',
206      +'NPU27300',
207      +'DNK35249',
208      +'NPU29296',
209      +'NPU03835',
210      +'NPU02307'='HbA1'
211      +
212      +'NPU02187',
213      +'NPU04173',
214      +'NPU04177',
215      +'NPU08572',
216      +'NPU08571',
217      +'NPU02192',
218      +'NPU21531',
219      +'NPU22089'='Gluc'
220      +
221      +'DNK35842',
222      +'NPU10047',
223      +'NPU08503',
224      +'NPU22127',
225      +'NPU21532',
226      +'NPU02193',
227      +'NPU02195',
228      +'NPU08972',
229      +'NPU02188',
230      +'NPU22069'='Glu0'
231      +
232      +'NPU10048',
233      +'NPU08504',
234      +'NPU22129',
235      +'NPU04174'='G130'
236      +
237      +'NPU10051',
238      +'NPU08507',
239      +'NPU22134',
```

```
240      + 'NPU21530'='G120'
241      +
242      + 'NPU18412',
243      + 'NPU01566',
244      + 'NPU01549',
245      + 'NPU17029',
246      + 'NPU10033',
247      + 'NPU18411'='Tchl'
248      +
249      + 'NPU10171',
250      + 'NPU01568',
251      + 'DNK35308'='LDL'
252      +
253      + 'NPU10157',
254      + 'NPU01567',
255      + 'NPU18107'='HDL'
256      +
257      + 'NPU09256',
258      + 'NPU01569'='VLDL'
259      +
260      + 'NPU03620',
261      + 'NPU04094',
262      + 'NPU18413',
263      + 'NPU18106'='Trig'
264      +
265      + 'NPU01807',
266      + 'NPU04998',
267      + 'NPU09101',
268      + 'NPU18016'='PlCr'
269      +
270      + 'NPU19661',
271      + 'NPU28842',
272      + 'DNK05289',
273      + 'NPU03918'='Uacr'
274      +
275      + 'NPU03230'='Pota'
276      +
277      + 'NPU03429'='Sodi'
278      +
279      + 'NPU03577',
280      + 'NPU27547'='TSH'
281      +
282      + 'NPU03246',
283      + 'NPU03247',
284      + 'NPU03248',
285      + 'NPU04149',
286      + 'NPU18004',
287      + 'NPU18005',
288      + 'NPU04154',
289      + 'NPU04020',
290      + 'NPU10390',
291      + 'NPU18007',
292      + 'NPU08978'='Cpep'
293      +
294      + 'NPU01422',
295      + 'DNK05027',
296      + 'NPU19748',
297      + 'NPU01423'='CRP'
298      +
299      + 'NPU26737',
300      + 'NPU14507',
301      + 'NPU29550',
```

```

302     +'NPU12544',
303     +'NPU12546',
304     +'NPU28627',
305     +'NPU28628',
306     +'NPU54726',
307     +'NPU54727',
308     +'NPU28103'='GAD'
309     +
310     +'DNK35131',
311     +'NPU28811',
312     +'DNK35301',
313     +'DNK35302',
314     +'DNK35303',
315     +'DNK35304'='eGFR'
316     +
317     +'NPU19597',
318     +'NPU28271',
319     +'NPU10295'='GFR'
320     +
321     +'NPU01121',
322     +'NPU19981',
323     +'NPU19651',
324     +'DNK05051'='ALAT'
325     +
326     +'DNK05098',
327     +'NPU27783',
328     +'DNK05431',
329     +'NPU57047',
330     +'DNK05050'='alcP'
331     +
332     +'NPU01700'='Cobl'
333     +
334     +'NPU03568',
335     +'NPU26813'='Trmb'
336     +
337     +'NPU02593',
338     +'NPU04851',
339     +'NPU02596',
340     +'NPU17027',
341     +'NPU18245',
342     +'NPU18156',
343     +'NPU17580',
344     +'NPU04100'='Leuc'
345     +
346     +'NPU02319'='Hmgb' ;
NOTE: Format $NPUE is already on the library DMFMT.DMREG.
NOTE: Format $NPUE has been written to DMFMT.DMREG.
347     +
348     +* run ;
349     +
350     +
NOTE: %INCLUDE (level 1) ending.
351
352     /*
353     *-----;
354     * Formats for grouping of complications / comorbidities (Daffodil - history) ;
355     value $icd8gr
356     '41090'-'41099' = 'MI'
357     '41930'-'41939',
358     '41390'-'41399' = 'Angina'
359     '42599',
360     '42709'-'42719',

```

```

361     '42799',
362     '42899' = 'HF'
363     '42793',
364     '42794' = 'AtrFib'
365     '43000'-'43099',
366     '43100',
367     '43108'-'43190',
368     '43198'-'43199' = 'HmStr'
369     '43200'-'43299',
370     '43309'-'43399',
371     '43409'-'43499' = 'IscStr'
372     '43509'-'43599' = 'TIA'
373     '44020'-'44030' = 'PAD'
374     '78410'-'78419',
375     '78470'-'78479' = 'Bleed'
376     '58100'-'58209' = 'CKD'
377     '35500'-'35799' = 'Neuro'
378     '25001'-'25002',
379     '37400'-'37499',
380     '37700'-'37719',
381     '37790'-'37799',
382     '37890'-'37899',
383     '45690'-'45699' = 'DiaEye'
384     '25003'-'25099' = 'PeriAng'
385     '58300'-'58399' = 'DKD'
386     '25100'-'25199',
387     '96230'-'96239' = 'Hypo'
388     '14000'-'20449' = 'Cancer'
389     '49100'-'49200' = 'COPD'
390     other='Other' ;
391
392     value $icd10gr
393     'I210'-'I229' = 'MI'
394     'I200' = 'UnstAng'
395     'I201', 'I208', 'I209' = 'Angina'
396     'I500'-'I509' = 'HF'
397     'I480'-'I489' = 'AtrFib'
398     'I600'-'I629' = 'HmStr'
399     'I630'-'I649' = 'IscStr'
400     'G450'-'G459' = 'TIA'
401     'I700'-'I799' = 'PAD'
402     'D629', 'I850', 'K226', 'K250', 'K252', 'K254', 'K256', 'K260',
403     'K262', 'K264', 'K266', 'K270', 'K272', 'K274', 'K276', 'K280',
404     'K282', 'K284', 'K286', 'K290', 'K625', 'K920', 'K921', 'K922' = 'Bleed'
405     'N180'-'N189' = 'CKD'
406     'Z490'-'Z499' = 'Dial'
407     'G990', 'G590', 'G632', 'E104', 'E114', 'E124', 'E134', 'E144' = 'Neuro'
408     'H280', 'H358', 'H360', 'E103', 'E113', 'E123', 'E133', 'E143' = 'DiaEye'
409     'M142', 'M146', 'M908', 'L984' = 'DiaFoot'
410     'E105', 'E115', 'E125', 'E135', 'E145' = 'PeriAng'
411     'N083', 'E102', 'E112', 'E122', 'E132', 'E142' = 'DKD'
412     'E107', 'E117', 'E127', 'E137', 'E147', 'E108', 'E118', 'E128', 'E138', 'E148'
412     != 'DMcompl'
413     'E100', 'E110', 'E120', 'E130', 'E140', 'E116', 'E106', 'E136', 'E146',
413     != 'E160'-'E162' = 'Hypo'
414     'E101', 'E111', 'E121', 'E131', 'E141', 'E872' = 'Keto'
415     'C000'-'C999' = 'Cancer'
416     'J440'-'J449' = 'COPD'
417     other='Other' ;
418
419     value $icd5opr
420     'FNA00'-'FNE99' = 'CABG'

```

```

421     'FNG00'-'FNG99' = 'PCIsten'
422     'JDF10', 'JDF11', 'JDF20', 'JDF21' = 'Bari'
423     'JAK10', 'TJA20', 'TJA33', 'DJ008', 'DR015'-'DR024', 'QFO06' = 'Dial'
424     'CKC12', 'CKD65' = 'DiaEye'
425     'QDGX10' = 'DiaFoot'
426     'NGQ00'-'NGQ99', 'NHQ00'-'NHQ99' = 'Amp'
427     other='Other' ;
428
429     value $icd4opr
430     'BJFD' = 'Dial'
431     other='Other' ;
432
433     value $icd3opr
434     'FNA', 'FNB', 'FNC', 'FND', 'FNE' = 'CABG'
435     'FNG' = 'PCIsten'
436     'NGQ', 'NHQ' = 'Amp'
437     other='Other' ;
438
439     value $icdabbr
440         MI = 'Myocardial infarction'
441         CABG = 'CABG'
442     PCIsten = 'PCI with stent'
443     UnstAng = 'Unstable angina'
444         Angina = 'Angina pectoris'
445         HF = 'Heart failure'
446     AtrFib = 'Atrial fibrillation'
447     Stroke = 'Stroke'
448     HmStr = 'Hemorrhagic stroke'
449     IscStr = 'Ischemic stroke'
450         TIA = 'Transitory ischemic attack'
451         PAD = 'Peripheral artery disease'
452     Bleed = 'Major organ specific bleeding'
453     Bari = 'Bariatric surgery'
454     CKD = 'Chronic kidney disease'
455     Dial = 'Dialysis'
456     Neuro = 'Diabetic mono-/polyneuropathy'
457     DiaEye = 'Diabetic eye complications'
458     DiaFoot = 'Diabetic foot'
459     PeriAng = 'Peripheral angiopathy '
460         DKD = 'Diabetic kidney disease'
461     DMcompl = 'Diabetes with several-/unspecified complications'
462         Hypo = 'Severe hypoglycemia'
463         Keto = 'Keto-/lactate acidosis'
464     Cancer = 'Cancer'
465     COPD = 'COPD'
466     Amp = 'Lower limb amputations'
467     other = 'Other';
468 */
469
470     run ;

```

```

NOTE: PROCEDURE FORMAT used (Total process time):
      real time          0.28 seconds
      cpu time           0.14 seconds

```

NOTE: There were 50445 observations read from the data set WORK.DOB.

```

471
472     *-----;
473     * Formats used for the diabase and for grouping drugs and
474       socio-economic variables ;
475     proc format lib = DMfmt.DMreg

```

```
476      /*
477          cntlin = ekstn.s125_format ; * Formats for the diabase ;
478      exclude dwh_afdeling
479              dwh_hospital
480              $dwh_shak ; * Very long formats we are not using ;
481      */ ;
482
483      * For convenience ;
484      value yesno
485      0 = 'No'
486      1 = 'Yes'
487      ;
NOTE: Format YESNO is already on the library DMFMT.DMREG.
NOTE: Format YESNO has been written to DMFMT.DMREG.
488
489      * regions ;
490      value region
491      81 = "Nord"
492      82 = "Midt"
493      83 = "Syd"
494      84 = "Hov"
495      85 = "Sjll"
496      ;
NOTE: Format REGION is already on the library DMFMT.DMREG.
NOTE: Format REGION has been written to DMFMT.DMREG.
497
498      * income groups ;
499      value $indk
500      "< = 0,00" = "000"
501      "0,01 - 50.000,00" = "001"
502      "50.000,01 - 100.000,00" = "050"
503      "100.000,01 - 150.000,00" = "100"
504      "150.000,01 - 200.000,00" = "150"
505      "200.000,01 - 250.000,00" = "200"
506      "250.000,01 - 300.000,00" = "250"
507      "300.000,01 - 350.000,00" = "300"
508      "350.000,01 - 400.000,00" = "350"
509      "400.000,01 - 450.000,00" = "400"
510      "450.000,01 - 500.000,00" = "450"
511      "500.000,01 - 550.000,00" = "500"
512      "550.000,01 - 600.000,00" = "550"
513      "600.000,01 - 650.000,00" = "600"
514      " >= 650.000,01" = "650"
515      other = "oth"
516      ;
NOTE: Format $INDK is already on the library DMFMT.DMREG.
NOTE: Format $INDK has been written to DMFMT.DMREG.
517
518      value $indgr
519      "< = 0,00",
520      "0,01 - 50.000,00",
521      "50.000,01 - 100.000,00" = "000"
522      "100.000,01 - 150.000,00",
523      "150.000,01 - 200.000,00" = "100"
524      "200.000,01 - 250.000,00",
525      "250.000,01 - 300.000,00" = "200"
526      "300.000,01 - 350.000,00",
527      "350.000,01 - 400.000,00" = "300"
528      "400.000,01 - 450.000,00",
529      "450.000,01 - 500.000,00" = "400"
530      "500.000,01 - 550.000,00",
531      "550.000,01 - 600.000,00",
```

```

532         "600.000,01 - 650.000,00",
533         " >= 650.000,01"           = "500"
534         other                       = "oth"
535         ;
NOTE: Format $INDGR is already on the library DMFMT.DMREG.
NOTE: Format $INDGR has been written to DMFMT.DMREG.
536
537         * texts for socio_13
538         value $soclong
539         "100" = "Self-employed"
540         "200" = "Top manager"
541         "300" = "Wage-earner"
542         "400" = "Trainee"
543         "500" = "Unemployed 6mth+"
544         "600" = "Sick leave, mat leave, activation"
545         "700" = "Social welfare"
546         "800" = "Early pension"
547         "900" = "Retired"
548         "950" = "Other, children"
549         "999" = "Unknown"
550         ;
551         value $socshort
552         "100" = "s-Emp"
553         "200" = "TopMn"
554         "300" = "WageE"
555         "400" = "Train"
556         "500" = "Unemp"
557         "600" = "Leave"
558         "700" = "SWelf"
559         "800" = "e-Pen"
560         "900" = "Retir"
561         "950" = "Other"
562         "999" = "Unkn"
563         ;
NOTE: Format $$SOCSHORT is already on the library DMFMT.DMREG.
NOTE: Format $$SOCSHORT has been written to DMFMT.DMREG.
564         value $socshortlong
565         "s-Emp" = "Self-employed"
566         "TopMn" = "Top manager"
567         "WageE" = "Wage-earner"
568         "Train" = "Trainee"
569         "Unemp" = "Unemployed 6mth+"
570         "Leave" = "Sick leave, maternal leave, activation"
571         "SWelf" = "Social welfare"
572         "e-Pen" = "Early pension"
573         "Retir" = "Retired"
574         "Other" = "Other, children"
575         "Unkn" = "Unknown"
576         ;
NOTE: Format $$SOCSHORTLONG is already on the library DMFMT.DMREG.
NOTE: Format $$SOCSHORTLONG has been written to DMFMT.DMREG.
577
578         * Classifies from the variable 'afdeling' in DVDD to the 5 SDC,
579         based on reporting clinic ;
580         value $sdc
581         "1507010",
582         "1507019",
583         "150701R" = "SDCC"
584         "3800DOE",
585         "3800HOE",
586         "3800LOE",
587         "3800NOE",

```

```

588     "3800ROE",
589     "3800VOE",
590     "3800VOQ" = "SDCS"
591     "4202080",
592     "4202089" = "SDCO"
593     "6620076",
594     "6620079",
595     "7003079",
596     "7003279",
597     "7004069" = "SDCA"
598     "8001099" = "SDCN"
599         other = "notSDC"
600     ;

```

NOTE: Format \$SDC is already on the library DMFMT.DMREG.

NOTE: Format \$SDC has been written to DMFMT.DMREG.

```

601
602     * Classifies from the variable 'afdeling' in DVDD to ambl/prak ;
603     value $amb
604     "8001099", "800109", "8001329", "665033C", "665033B", "5003037",
605     "1330559", "1330550", "133032E", "1351309", "1309539", "663030C",
606     "663004C", "550155E", "700505B", "8003207", "200027E", "200076A",
607     "8001609", "8005039", "7005059", "200027B", "8003209", "8003201",
608     "200054A", "3800HOE", "3800HOQ", "1401297", "800159H", "800503H",
609     "1351110", "3800LOE", "3800LOD", "3800DOE", "3800DOD", "1401069",
610     "1516435", "130185F", "6501044", "6502066", "7003279", "7004069",
611     "6006049", "665033T", "1309699", "7003079", "6620076", "6620079",
612     "4212031", "6504020", "6007200", "2501059", "5002035", "4212039",
613     "4001039", "5004039", "6504029", "5001059", "1502069", "1351119",
614     "6007209", "6007059", "7601047", "7601049", "7002056", "1516339",
615     "1301719", "1501099", "3800NOE", "3800NOD", "3800P9D", "3800VOE",
616     "3800VOQ", "4202739", "4202080", "4202089", "3800C2D", "200027G",
617     "5000649", "5000409", "5000407", "5000637", "3800ROE", "600705E",
618     "6008056", "6008059", "550105E", "550145E", "150701R", "1507019",
619     "1507010", "7603049", "7603041"
620         = "Ambu"
621         other = "Prak"
622     ;

```

NOTE: Format \$AMB is already on the library DMFMT.DMREG.

NOTE: Format \$AMB has been written to DMFMT.DMREG.

```

623
624     * English sex ;
625     value sex
626         1 = 'M'
627         2 = 'F' ;

```

NOTE: Format SEX is already on the library DMFMT.DMREG.

NOTE: Format SEX has been written to DMFMT.DMREG.

```

628
629     * 5-year age-groups for tabulation ;
630     value agr ( fuzz=0)
631     0-<5 = ' 0 '
632     5-<10 = ' 5 '
633     10-<15 = '10 '
634     15-<20 = '15 '
635     20-<25 = '20 '
636     25-<30 = '25 '
637     30-<35 = '30 '
638     35-<40 = '35 '
639     40-<45 = '40 '
640     45-<50 = '45 '
641     50-<55 = '50 '
642     55-<60 = '55 '
643     60-<65 = '60 '

```



```

644         65-<70 = '65 '
645         70-<75 = '70 '
646         75-<80 = '75 '
647         80-<85 = '80 '
648         85-<90 = '85 '
649         90-<95 = '90 '
650         95-high= '95+' ;
NOTE: Format AGR is already on the library DMFMT.DMREG.
NOTE: Format AGR has been written to DMFMT.DMREG.
651
652         * formats to group ATC codes for diabetes drugs at different levels ;
653         value $atc4grp
654         'A10AB' = 'fastIns'
655         'A10AC' = 'intIns'
656         'A10AD' = 'mixIns'
657         'A10AE' = 'longIns'
658         'A10BA' = 11
659         'A10BB' = 12
660         'A10BG' = 13
661         'A10BH' = 14
662         'A10BF' = 18
663         'A10BC' = 'Other'
664         other   = 'Other'
665         ;
NOTE: Format $ATC4GRP is already on the library DMFMT.DMREG.
NOTE: Format $ATC4GRP has been written to DMFMT.DMREG.
666         value $atc5grp
667         'A10BD02' = 212
668         'A10BD03', 'A10BD05' = 213
669         'A10BD07', 'A10BD08', 'A10BD10', 'A10BD11', 'A10BD13' = 214
670         'A10BD17' = 218
671         'A10BD04', 'A10BD06' = 223
672         'A10BD09', 'A10BD12' = 234
673         'A10BD19', 'A10BD21' = 246
674         'A10BD15', 'A10BD16', 'A10BD20' = 216
675         'A10BX02', 'A10BX03' = 12
676         'A10BJ01', 'A10BJ02', 'A10BJ03', 'A10BJ04', 'A10BJ05' = 15
677         'A10BK01', 'A10BK02', 'A10BK03' = 16
678         'A10AE56' = 257
679         other = 'Other'
680         ;
NOTE: Format $ATC5GRP is already on the library DMFMT.DMREG.
NOTE: Format $ATC5GRP has been written to DMFMT.DMREG.
681
682         * Names of the groupings incl. combinations
683         - note there are no other groups here ;
684         value $druggr ( notsorted )
685         '11' = 'Metformin'
686         '12' = 'SU'
687         '13' = 'TZD'
688         '14' = 'DPP4'
689         '15' = 'GLP1'
690         '16' = 'SGLT2'
691         '17' = 'Insulin'
692         '18' = 'Acarbose'
693         '19' = 'Meglitinid'
694         '212' = 'MetxSU'
695         '213' = 'MetxTZD'
696         '214' = 'MetxDPP4'
697         '216' = 'MetxSGLT2'
698         '218' = 'MetxAcar'
699         '223' = 'SUxTZD'

```

```

700      '234' = 'TZDxDPP4'
701      '246' = 'DPP4xSGLT2'
702      '257' = 'InsxGLP1'
703      ;
NOTE: Format $DRUGGR is already on the library DMFMT.DMREG.
NOTE: Format $DRUGGR has been written to DMFMT.DMREG.
704
705      * A format that identifies usable dose-codes ;
706      value $dosogrp
707      '0000003'-'0000005','0000015'-'0000017','0000024'-'0000028',
708      '0000034','0000038'-'0000039','0000044'-'0000046','0000050',
709      '0000059'-'0000060','0000079'-'0000083','0000092'-'0000093',
710      '0000098'-'0000099','0000101','0000105'-'0000106','0000114',
711      '0000130','0000133','0000158','0000178','0000244','0000246',
712      '0000247','0000259'-'0000262','0000266','0000289'-'0000292',
713      '0000313','0000362','0000369','0000370','0000387','0000447',
714      '0000468'-'0000469','0000482','0000492','0000511','0000540',
715      '0000555','0000589','0000613','0000631','0000637',
716      '0000655'-'0000656','0000675','0000805','0000838'-'0000840',
717      '0000864'-'0000865','0000967','0000995'-'0000996','0001000',
718      '0001019','0001036','0001048','0001050','0001059','0001061',
719      '0001112','0001116','0001145' = '01'
720      other = '00';
NOTE: Format $DOSOGRP is already on the library DMFMT.DMREG.
NOTE: Format $DOSOGRP has been written to DMFMT.DMREG.
721
722      value $dosotxt ( notsorted )
723      '01' = 'Dose kn'
724      '00' = 'Unkn'
725      '99' = 'Blank/Tom'
726      ;
NOTE: Format $DOSOTXT is already on the library DMFMT.DMREG.
NOTE: Format $DOSOTXT has been written to DMFMT.DMREG.
727
728      * Values from WHO website: DDDs for combined products 2009 ;
729      * no. tablets for combos ;
730      value $DDDcombprod
731      'A10BD02' = 2 /* er rettet op fra 1 til 2 pr. 13.7.2010 */
732      'A10BD03' = 2
733      'A10BD04' = 1
734      'A10BD05' = 2
735      'A10BD06' = 1
736      'A10BD07' = 2
737      'A10BD08' = 2
738      'A10BD09' = 1
739      'A10BD11' = 2
740      'A10BD13' = 2
741      'A10BD15' = 2
742      ;
NOTE: Format $DDDCOMBPROD is already on the library DMFMT.DMREG.
NOTE: Format $DDDCOMBPROD has been written to DMFMT.DMREG.
743
744      *-----;
745      * Grouping of other (non OAD) drugs (Daffodil) ;
746      value $med3oth
747      'CO7' = 'BB1'
748      'HO2' = 'Ccs'
749      other = 'Other'
750      ;
NOTE: Format $MED3OTH is already on the library DMFMT.DMREG.
NOTE: Format $MED3OTH has been written to DMFMT.DMREG.
751      value $med4oth

```

```

752      'A08A' = 'WtL'
753      'C09A', 'C09B' = 'ACE'
754      'C09C', 'C09D' = 'ARB' /* (exclude C09DX04) */
755      'C08C' = 'DHP'
756      'C03A' = 'THZ'
757      'C08D' = 'NHP'
758      'C03C' = 'HCD'
759      other = 'Other'
760      ;
NOTE: Format $MED40TH is already on the library DMFMT.DMREG.
NOTE: Format $MED40TH has been written to DMFMT.DMREG.
761      value $med5oth
762      'B01AF' = 'DXI'
763      'C10AA' = 'Sta'
764      'C03DA' = 'AlA'
765      other = 'Other'
766      ;
NOTE: Format $MED50TH is already on the library DMFMT.DMREG.
NOTE: Format $MED50TH has been written to DMFMT.DMREG.
767      value $med7oth
768      'B01AC06' = 'Asp'
769      'B01AE07' = 'DTI'
770      'C09DX04' = 'NpI'
771      'C01AA04' = 'Dgt'
772      'C01AA05' = 'Dgo'
773      'C01BC04' = 'Fla'
774      'C01BD01' = 'Ami'
775      'B01AA03' = 'Wrf'
776      'B01AC04', 'B01AC22', 'B01AC24' = 'RPA'
777      'B01AC07', 'B01AC09', 'B01AC11',
778      'B01AC13', 'B01AC16', 'B01AC17', 'B01AC21' = 'AP1'
779      other = 'Other'
780      ;
NOTE: Format $MED70TH is already on the library DMFMT.DMREG.
NOTE: Format $MED70TH has been written to DMFMT.DMREG.
781      value $medgr
782      'BB1' = 'Beta blockers'
783      'Ccs' = 'Corticosteroids'
784      'WtL' = 'Weight loss drugs'
785      'ACE' = 'ACE inhibitors'
786      'ARB' = 'ARB'
787      'DHP' = 'Dihydropyridines (calcium channel blockers)'
788      'THZ' = 'Low ceiling diuretics (thiazides)'
789      'NHP' = 'Non-hydropyridines (calcium channel blockers)'
790      'HCD' = 'High ceiling diuretics (loop-diuretics)'
791      'DXI' = 'Direct factor Xa inhibitors'
792      'Sta' = 'Statins'
793      'AlA' = 'Aldosterone antagonists'
794      'Asp' = 'Low dose aspirin'
795      'DTI' = 'Direct thrombin inhibitor'
796      'NpI' = 'Nepriylsine inhibitor'
797      'Dgt' = 'Digitoxin'
798      'Dgo' = 'Digoxin'
799      'Fla' = 'Flekanide'
800      'Ami' = 'Amiodarone'
801      'Wrf' = 'Warfarin'
802      'RPA' = 'Receptor P2Y12 antagonists'
803      'AP1' = 'Other antiplatelets'
804      ;
NOTE: Format $MEDGR is already on the library DMFMT.DMREG.
NOTE: Format $MEDGR has been written to DMFMT.DMREG.

```

```

806
807     value $lmedgr
808     'BBl' = 'BBl: Beta blockers'
809     'Ccs' = 'Ccs: Corticosteroids'
810     'WtL' = 'WtL: Weight loss drugs'
811     'ACE' = 'ACE: ACE inhibitors'
812     'ARB' = 'ARB: ARB'
813     'DHP' = 'DHP: Dihydropyridines (calcium channel blockers)'
814     'THZ' = 'THZ: Low ceiling diuretics (thiazides)'
815     'NHP' = 'NHP: Non-hydropyridines (calcium channel blockers)'
816     'HCD' = 'HCD: High ceiling diuretics (loop-diuretics)'
817     'DXI' = 'DXI: Direct factor Xa inhibitors'
818     'Sta' = 'Sta: Statins'
819     'AlA' = 'AlA: Aldosterone antagonists'
820     'Asp' = 'Asp: Low dose aspirin'
821     'DTI' = 'DTI: Direct thrombin inhibitor'
822     'NpI' = 'NpI: Neprilysine inhibitor'
823     'Dgt' = 'Dgt: Digitoxin'
824     'Dgo' = 'Dgo: Digoxin'
825     'Fla' = 'Fla: Flekanide'
826     'Ami' = 'Ami: Amiodarone'
827     'Wrf' = 'Wrf: Warfarin'
828     'RPA' = 'RPA: Receptor P2Y12 antagonists'
829     'AP1' = 'AP1: Other antiplatelets'
830     ;

```

NOTE: Format \$LMEDGR is already on the library DMFMT.DMREG.

NOTE: Format \$LMEDGR has been written to DMFMT.DMREG.

```

831
832     run ;

```

NOTE: PROCEDURE FORMAT used (Total process time):

```

real time      0.01 seconds
cpu time       0.01 seconds

```

```

833     title1 ;
834
835     *-----:
836     * Now list all the formts in the catalogs ;
837     proc catalog  catalog = DMfmt.DMreg ;
838     contents catalog = DMfmt.DMreg ; run ;

```

839

NOTE: The PROCEDURE CATALOG printed page 2.

NOTE: PROCEDURE CATALOG used (Total process time):

```

real time      0.00 seconds
cpu time       0.00 seconds

```

```

840     proc format  fmtlib  library=DMfmt.DMreg ;
841     select $npu ;
842     run ;

```

NOTE: PROCEDURE FORMAT used (Total process time):

```

real time      0.00 seconds
cpu time       0.00 seconds

```

NOTE: The PROCEDURE FORMAT printed page 3.

NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414

NOTE: The SAS System used:

real time	1.20 seconds
cpu time	0.34 seconds