

FAHMM: Roche Data

2024-12-12

Summarise the model fit

This is a mrkdown for replicating new MS classification using Roche data

```
follow      = read.csv('/home/bergec/interim_tables/follow_FAhmm_Relapse_ALLC.csv')

yy          = as.matrix(follow[,c("V32","V33","V34","V35")])
yy          = scale(yy,center = FALSE,scale = TRUE)

follow <- follow %>%
  mutate(MONTHN = MONTH,
         MONTHN = ifelse(MONTHN == -1, 0, MONTHN)) %>%
  group_by(USUBJID) %>%
  arrange(MONTHN, .by_group = TRUE) %>%
  mutate(deltaM = -lag(MONTHN) + MONTHN) %>%
  ungroup() %>%
  mutate(deltaM = ifelse(is.na(deltaM), 0, deltaM))

Time      = follow$deltaM
ss        = follow%>%group_by(USUBJID)%>%summarise(s=length(USUBJID))
seq=ss$s

load('/home/bergec/interim_tables/hmm_s8_init_clara2_euc.RData')
hmm_CTDC = hmm_CTDC_clara2_euc
l = order(hmm_CTDC$mu[1,],decreasing = TRUE)
l=c(7,6,2,5,3,4,1,8)
hmm_CTDC$mu = hmm_CTDC$mu[,l]
hmm_CTDC$A  = hmm_CTDC$A[l,l]
hmm_CTDC$pi = hmm_CTDC$pi[l]
hmm_CTDC$sigma = hmm_CTDC$sigma[,l]

Z = ctdthmm_MultSubj_viterbi(hmm_CTDC,yy,seq,Time)
table(Z)

## Z
##      1      2      3      4      5      6      7      8
## 9981 10336 7219 1143 1513 7975 8334 3549

follow$Z=Z
follow$MS=NA
follow$MS[Z %in% c(1,2,3)]=1
follow$MS[Z %in% c(6,7,8)]=4
follow$MS[Z==4]=2
follow$MS[Z==5]=3
```

```
write.csv(follow, 'interim_tables/follow_FAhmm_Relapse_ALLC_MetaS.csv')
kk= follow%>%dplyr::select(c( "EDSS", "T25FWM", "HPT9M", "PASAT", "VOLT2", "NBV", "NUMGDT1", "RELAPSE"))
spl=split(kk,Z)
Emp_mu_S9 = sapply(spl,function(x){colMeans(x,na.rm = TRUE)})
Emp_mu_S9[6,]=Emp_mu_S9[6,]/1000
```

States

```
round(Emp_mu_S9,2)
```

##		1	2	3	4	5	6	7	8
##	EDSS	2.24	2.98	2.58	3.15	3.99	3.29	6.00	6.45
##	T25FWM	5.31	6.67	11.00	10.81	12.55	7.52	17.59	118.07
##	HPT9M	19.75	23.44	32.38	27.11	28.96	27.57	31.29	90.77
##	PASAT	52.99	48.08	47.42	42.61	45.73	39.55	46.10	41.81
##	VOLT2	1.20	1.97	1.26	2.24	1.93	2.82	2.06	2.32
##	NBV	1.55	1.48	1.51	1.50	1.49	1.39	1.44	1.37
##	NUMGDT1	0.00	0.00	0.00	4.00	1.20	0.04	0.00	0.08
##	RELAPSE	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00

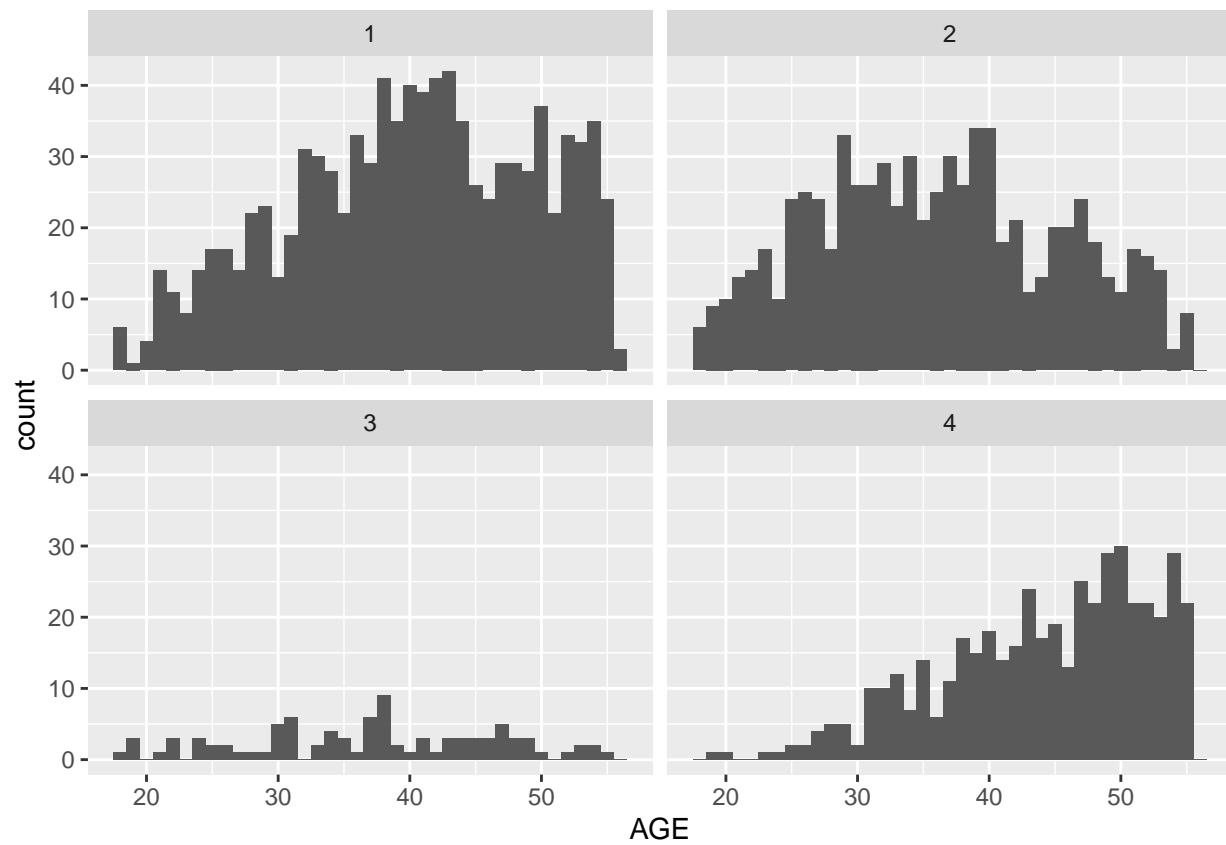
Transition probability

```
AD=hmm_CTDC$A
AD[AD<.005]=0
round(AD,4)
```

##		[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]
##	[1,]	0.9036	0.0000	0.0578	0.0074	0.0259	0.0000	0.0000	0.0000
##	[2,]	0.0000	0.9192	0.0225	0.0151	0.0242	0.0053	0.0096	0.0000
##	[3,]	0.0103	0.0000	0.9511	0.0000	0.0186	0.0000	0.0124	0.0000
##	[4,]	0.2152	0.3511	0.0237	0.0216	0.0147	0.2316	0.1037	0.0384
##	[5,]	0.1752	0.1431	0.0994	0.0191	0.3103	0.1382	0.0875	0.0271
##	[6,]	0.0000	0.0000	0.0000	0.0113	0.0263	0.9399	0.0157	0.0000
##	[7,]	0.0000	0.0000	0.0000	0.0000	0.0121	0.0000	0.9341	0.0396
##	[8,]	0.0000	0.0000	0.0000	0.0000	0.0098	0.0000	0.0440	0.9391

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.