

Model119 AIC

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Model119

jmb2.119.value.rate :

lme1 : $\mathbf{m}(time) = (fixed = lamh \sim time,$

random = time|id)

surv19 : $Surv(etime, event) \sim factor(bmi) + site + ethnic + smoke$
+ $\mathbf{m}(time) + \mathbf{m}'(time)$

#>

#> Call:

#> JMbays2::jm(Surv_object = surv19, Mixed_objects = lme1, time_var = "time",

#> functional_forms = list(lamh = ~value(lamh) + slope(lamh)),

#> control = jmcontrol)

#>

#> Data Descriptives:

#> Number of Groups: 600 Number of events: 600 (100%)

#> Number of Observations:

#> lamh: 3326

#>

#> DIC WAIC LPML

#> marginal 1905941.4 4.586033e+14 -1.968026e+09

#> conditional 12568.8 1.243650e+04 -7.035887e+03

#>

#> Random-effects covariance matrix:

#>

#> StdDev Corr

#> (Intr) 1.4336 (Intr)

#> time 0.0554 0.5626

#>

#> Survival Outcome:

#> Mean StDev 2.5% 97.5% P Rhat

#> as.factor(bmi_cat)2 -1.7656 0.9775 -3.8852 -0.0301 0.0466 1.0918

#> as.factor(bmi_cat)3 -4.1642 1.2017 -6.8023 -2.1759 0.0000 1.3139

#> ethnic_black -1.8188 0.9105 -3.8067 -0.2112 0.0271 1.1079

#> ethnic_chine -0.5626 1.4538 -3.5146 2.2502 0.6982 1.0194

#> ethnic_hispa -2.9564 3.0386 -9.2318 2.8109 0.3171 1.0240

#> ethnic_japan -0.0391 1.3533 -2.7040 2.6523 0.9678 1.0153

#> site_c 0.8296 1.1282 -1.3273 3.1707 0.4553 1.0207

#> site_m 1.4951 1.0775 -0.5124 3.7630 0.1416 1.0477

#> site_nj 3.1125 2.5798 -1.7043 8.5650 0.2085 1.0307

#> site_p 2.1466 1.2214 -0.0520 4.7868 0.0564 1.0730

```

#> site_ucd                0.2785  1.3502   -2.3686    3.0013  0.8398  1.0139
#> site_ucla                2.1205  1.4344   -0.5360    5.1019  0.1234  1.0678
#> smoke_current_smoker    1.9256  1.0416    0.0641    4.1478  0.0430  1.1089
#> smoke_past_only        -0.2001  0.7392   -1.6612    1.2898  0.7762  1.0201
#> value(lamh)            -1.5168  0.6705   -2.7469   -0.1891  0.0230  1.0633
#> slope(lamh)           -168.5497 35.9966 -249.5620 -108.9432 0.0000  1.5484
#>
#> Longitudinal Outcome: lamh (family = gaussian, link = identity)
#>           Mean StDev   2.5%  97.5% P   Rhat
#> (Intercept)  7.8516 0.0981  7.6631  8.0457 0 1.0476
#> time        -0.5953 0.0116 -0.6184 -0.5729 0 1.1204
#> sigma        1.3195 0.0179  1.2848  1.3552 0 1.0000
#>
#> MCMC summary:
#> chains: 5
#> iterations per chain: 7e+05
#> burn-in per chain: 2e+05
#> thinning: 100
#> time: 6.5 hours

```

Function for AUC CI

This is function modified from Dimitris Rizopoulos' `tvAUC.jm()` function. The function is used to calculate the AUC and its confidence interval. The function is modified to work with the `jm` object from the `JMbayes2` package.

The function is conditional on the `Tstart` and `Dt` arguments for each setup. After we set up the `Tstart` and `Dt`, the new dataset will be generated to include the individuals who have not experienced the event yet but having longitudinal outcomes before the `Tstart + Dt`. We pull out every single iteration of `mcmc` object from the `predict()` function and calculate the AUC for that iteration.

argument `iter` is the number of iterations to calculate the AUC.

Then we can calculate the quantiles of the re-sampling AUCs to get the confidence interval.

AUC CI

	Dt1	Dt2	Dt3	Dt4	Dt5
Tstart2	NA	0.4739	0.7701	0.7270	0.7272
Tstart3	0.7062	0.8250	0.7565	0.7925	0.7755
Tstart4	0.8227	0.7686	0.7975	0.7682	0.7576
Tstart5	0.7517	0.7693	0.7524	0.7580	0.8016
Tstart6	0.7840	0.8101	0.7918	0.8030	0.7935
Tstart8	0.7892	0.8028	0.7814	0.7746	0.8105

For the final table each column is different `Dt` time window for predicting in 1, 2, 3, 4, 5 years; each row is the `Tstart` time window for starting from the 2, 3, 4, 5, 6, 8-th years. each cell is the AUC with 95% CI in the parenthesis **median (95% CI)**.

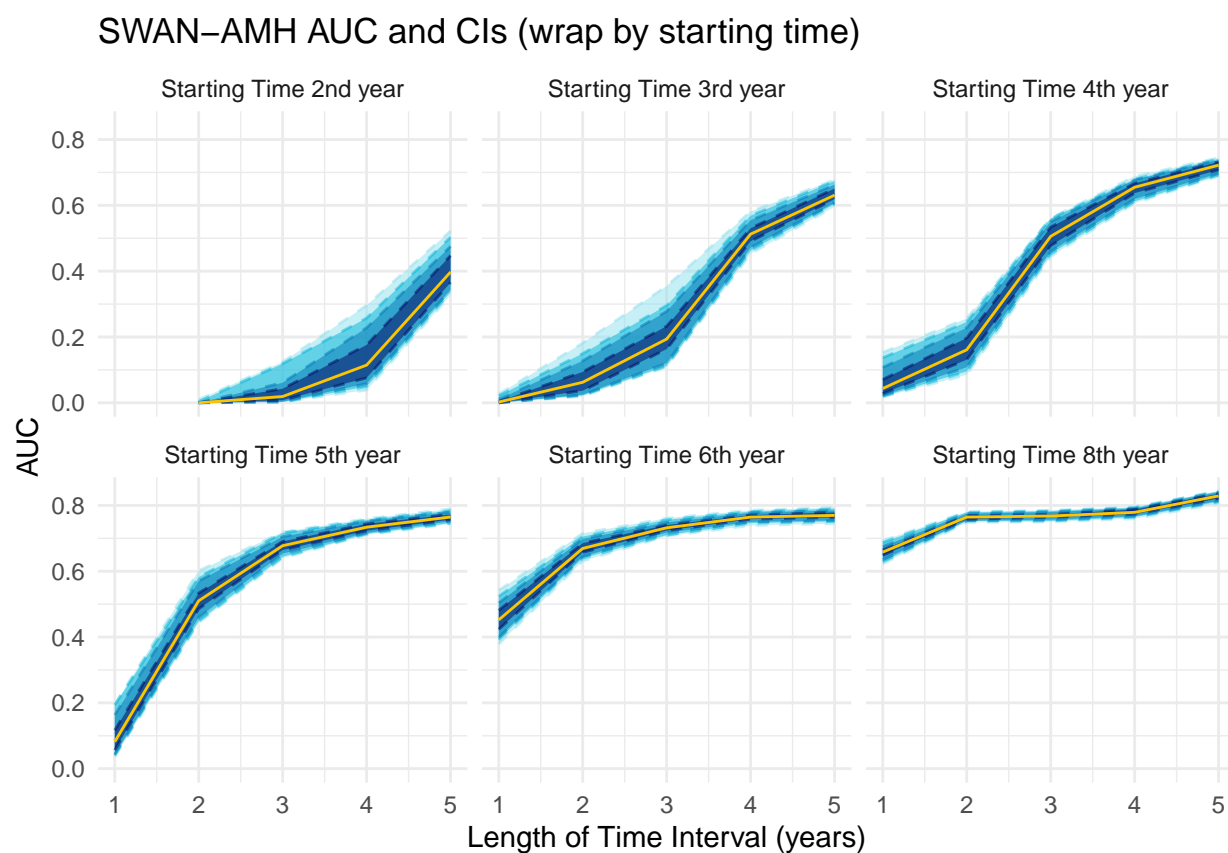
	Dt1	Dt2	Dt3	Dt4	Dt5
Tstart2	NA	0 (0 , 0.01)	0.019 (0.002 , 0.124)	0.115 (0.039 , 0.296)	0.397 (0.327 , 0.522)
Tstart3	0.002 (0 , 0.027)	0.062 (0.02 , 0.182)	0.194 (0.11 , 0.355)	0.513 (0.453 , 0.581)	0.631 (0.596 , 0.678)

Tstart4	0.043 (0.018 , 0.153)	0.161 (0.085 , 0.256)	0.506 (0.445 , 0.561)	0.655 (0.607 , 0.688)	0.722 (0.69 , 0.745)
Tstart5	0.082 (0.037 , 0.195)	0.51 (0.444 , 0.602)	0.678 (0.639 , 0.719)	0.734 (0.712 , 0.76)	0.765 (0.744 , 0.789)
Tstart6	0.452 (0.379 , 0.542)	0.669 (0.631 , 0.715)	0.732 (0.707 , 0.761)	0.765 (0.739 , 0.786)	0.77 (0.745 , 0.793)
Tstart8	0.658 (0.622 , 0.693)	0.765 (0.748 , 0.78)	0.768 (0.75 , 0.786)	0.779 (0.76 , 0.795)	0.829 (0.806 , 0.844)

☒ You are breathtaking!

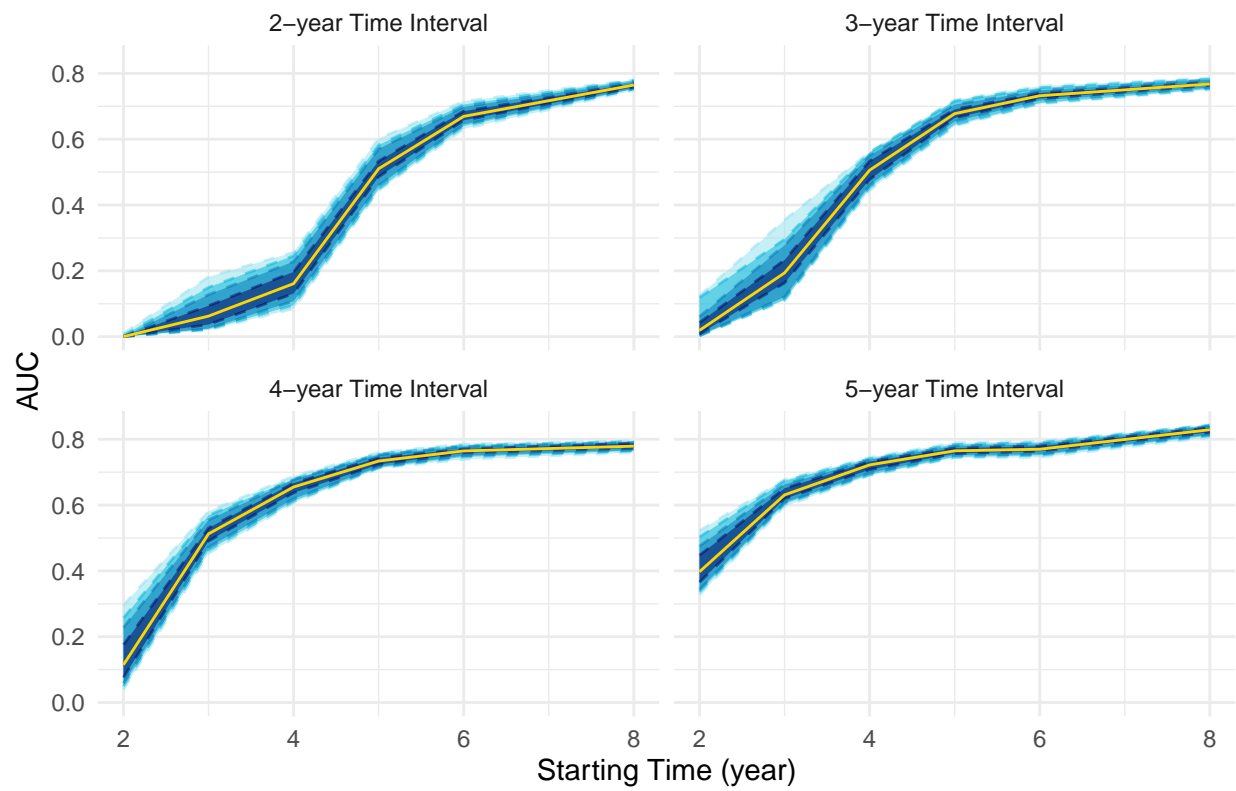
AUC plot

AUC and CI by Tstart



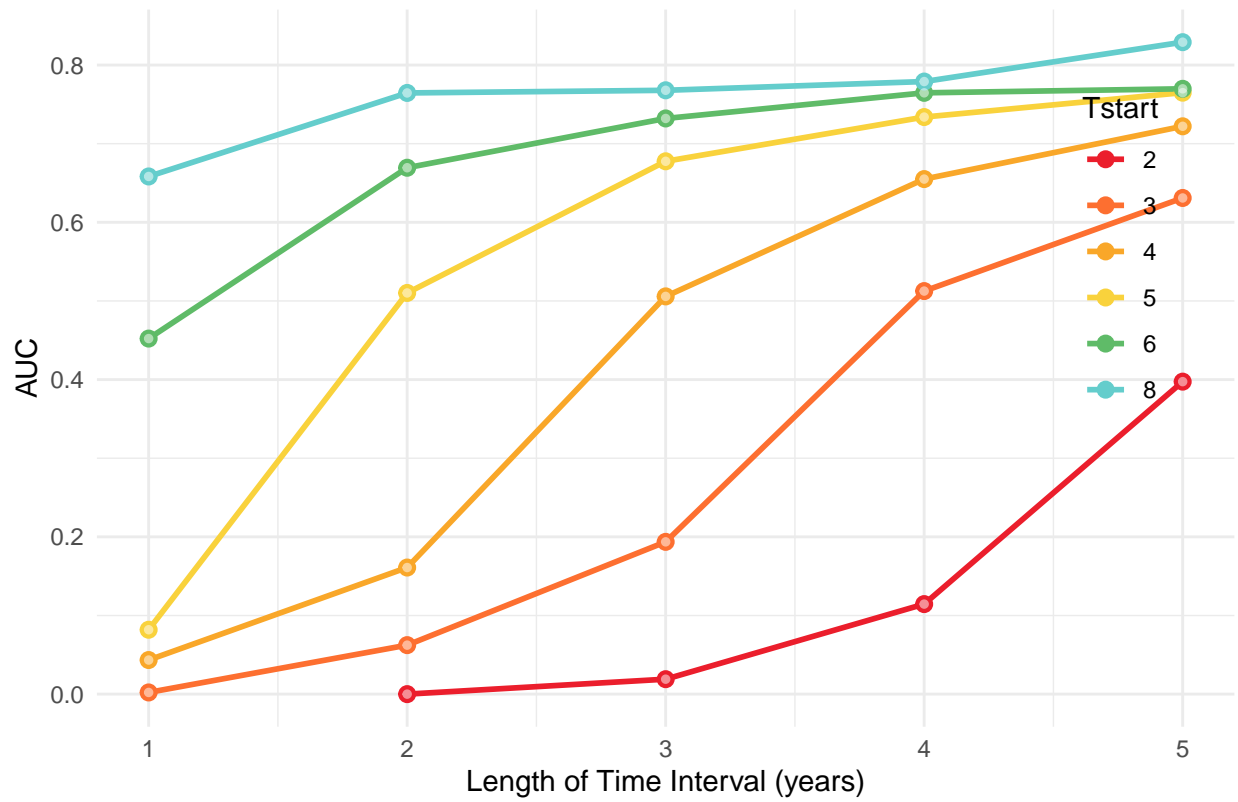
AUC and CI by Dt

SWAN-AMH AUC and CIs (wrap by time interval)

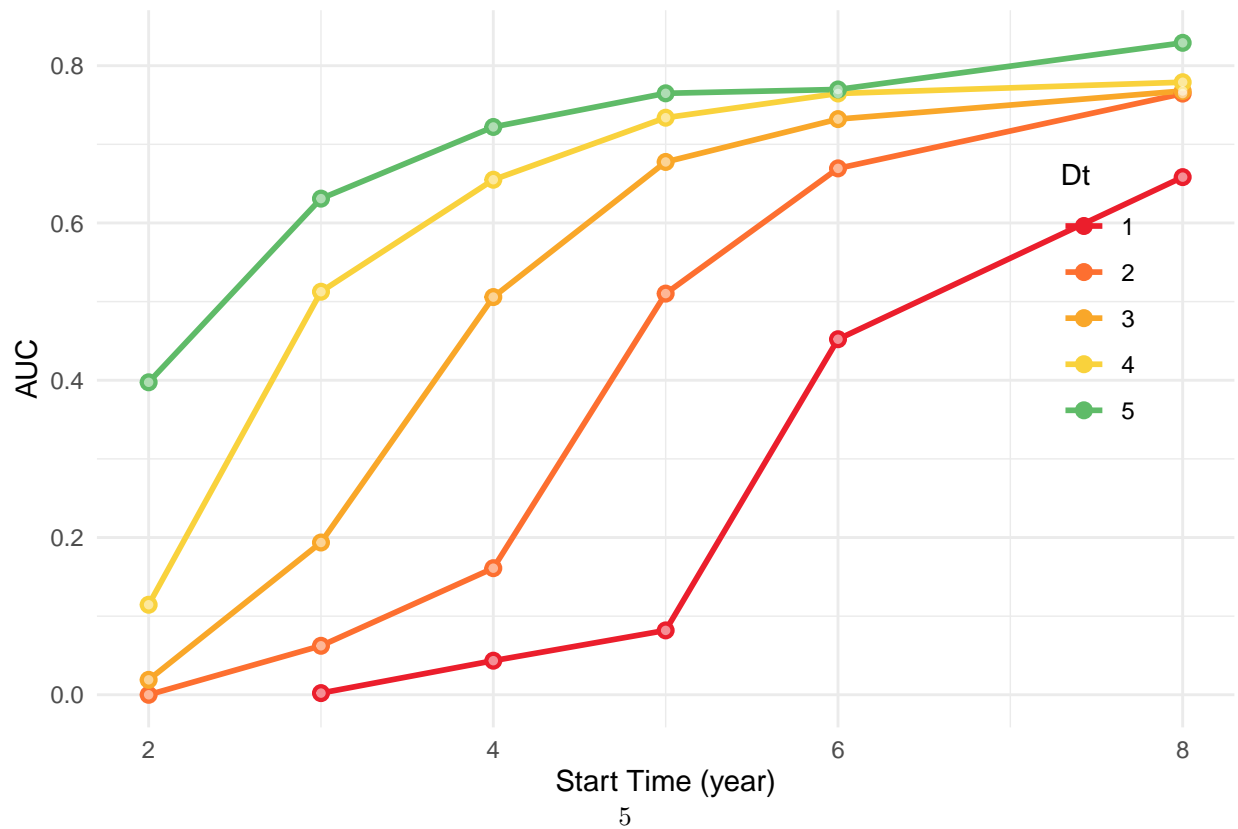


AUC only

SWAN-AMH AUC



SWAN-AMH AUC



Comparison for `jm117.value.rate` to `jm119.value.rate`