Table1 (for Publication)

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# To-do-list

* ☒ run table 1 for the total sample size as 1 group
  + ☒ Keeping table1 for one group (n = 600)
  + ☒ Baseline levels of AMH (untransformed)
  + ☒ also include the min and max of AMH
  + ☒ How many repeated measures per woman
* ☒ all the survival parameters summary
* ☒ all the longitudinal parameters summary
* ☒ joint model summary
  + ☒ with rate
  + ☒ without rate

# Table1: descriptive summaries

Here is the Table1 for publication.

| **Characteristics** | **N = 600**1 |
| --- | --- |
| ***Age (years)*** |  |
| Mean (SD) | 46.42 (2.41) |
| Median [Range] | 46.00 [42.00, 53.00] |
| ***Ethnicity / Race*** |  |
| CAUCA | 265 / 600 (44%) |
| BLACK | 170 / 600 (28%) |
| CHINE | 62 / 600 (10%) |
| HISPA | 18 / 600 (3.0%) |
| JAPAN | 85 / 600 (14%) |
| ***Marital Status*** |  |
| Not Married/Partnered | 191 / 600 (32%) |
| Married/Partnered | 409 / 600 (68%) |
| ***Alcohol Use*** |  |
| None | 308 / 600 (51%) |
| <1/wk | 71 / 600 (12%) |
| 1-7/wk | 161 / 600 (27%) |
| >7/wk | 60 / 600 (10%) |
| ***Smoking History*** |  |
| Never Smoked | 373 / 600 (62%) |
| Past Only | 149 / 600 (25%) |
| Current Smoker | 78 / 600 (13%) |
| ***Ever use of BC Pills*** |  |
| Never | 155 / 600 (26%) |
| Ever use BC pills | 445 / 600 (74%) |
| ***BMI*** |  |
| Mean (SD) | 28 (7) |
| Median [Range] | 26 [16, 56] |
| ***Overall Health*** |  |
| Excellent | 147 / 600 (25%) |
| Very Good | 233 / 600 (39%) |
| Good | 151 / 600 (25%) |
| Fair/Poor | 69 / 600 (12%) |
| ***Physical Activity Score*** |  |
| Mean (SD) | 7.75 (1.77) |
| Median [Range] | 7.60 [3.40, 12.80] |
| ***Baseline AMH*** |  |
| Mean (SD) | 540 (702) |
| Median [Range] | 273 [1, 4,652] |
| ***Number of Visits*** |  |
| Mean (SD) | 5.54 (2.14) |
| Median [Range] | 5.00 [3.00, 11.00] |
| ***Parity*** |  |
| None | 111 / 600 (19%) |
| One | 88 / 600 (15%) |
| Two | 210 / 600 (35%) |
| Three | 116 / 600 (19%) |
| More than three | 75 / 600 (13%) |
| ***Children*** |  |
| Mean (SD) | 1.98 (1.41) |
| Median [Range] | 2.00 [0.00, 12.00] |
| ***Employment Status*** |  |
| Unemployed | 104 / 600 (17%) |
| Employed | 496 / 600 (83%) |
| ***Educational Attainment*** |  |
| High School or Less | 125 / 600 (21%) |
| Some College | 190 / 600 (32%) |
| College degree or higher | 285 / 600 (48%) |
| ***Site*** |  |
| B | 96 / 600 (16%) |
| C | 76 / 600 (13%) |
| M | 103 / 600 (17%) |
| NJ | 27 / 600 (4.5%) |
| P | 74 / 600 (12%) |
| UCD | 102 / 600 (17%) |
| UCLA | 122 / 600 (20%) |
| 1n / N (%) | |

Here is the LaTeX code for the table1.

% latex table generated in R 4.2.2 by xtable 1.8-4 package  
% Tue Apr 9 11:44:18 2024  
\begin{table}[ht]  
\centering  
\begin{tabular}{rll}  
 \hline  
 & \*\*Characteristics\*\* & \*\*N = 600\*\* \\   
 \hline  
1 & \\_\\_\\_Age (years)\\_\\_\\_ & \\   
 2 & Mean (SD) & 46.42 (2.41) \\   
 3 & Median & 46.00 \\   
 4 & [Range] & [42.00, 53.00] \\   
 5 & \\_\\_\\_Ethnicity / Race\\_\\_\\_ & \\   
 6 & CAUCA & 265 / 600 (44\%) \\   
 7 & BLACK & 170 / 600 (28\%) \\   
 8 & CHINE & 62 / 600 (10\%) \\   
 9 & HISPA & 18 / 600 (3.0\%) \\   
 10 & JAPAN & 85 / 600 (14\%) \\   
 11 & \\_\\_\\_Marital Status\\_\\_\\_ & \\   
 12 & Not Married/Partnered & 191 / 600 (32\%) \\   
 13 & Married/Partnered & 409 / 600 (68\%) \\   
 14 & \\_\\_\\_Alcohol Use\\_\\_\\_ & \\   
 15 & None & 308 / 600 (51\%) \\   
 16 & $<$1/wk & 71 / 600 (12\%) \\   
 17 & 1-7/wk & 161 / 600 (27\%) \\   
 18 & $>$7/wk & 60 / 600 (10\%) \\   
 19 & \\_\\_\\_Smoking History\\_\\_\\_ & \\   
 20 & Never Smoked & 373 / 600 (62\%) \\   
 21 & Past Only & 149 / 600 (25\%) \\   
 22 & Current Smoker & 78 / 600 (13\%) \\   
 23 & \\_\\_\\_Ever use of BC Pills\\_\\_\\_ & \\   
 24 & Never & 155 / 600 (26\%) \\   
 25 & Ever use BC pills & 445 / 600 (74\%) \\   
 26 & \\_\\_\\_BMI\\_\\_\\_ & \\   
 27 & Mean (SD) & 28 (7) \\   
 28 & Median & 26 \\   
 29 & [Range] & [16, 56] \\   
 30 & \\_\\_\\_Overall Health\\_\\_\\_ & \\   
 31 & Excellent & 147 / 600 (25\%) \\   
 32 & Very Good & 233 / 600 (39\%) \\   
 33 & Good & 151 / 600 (25\%) \\   
 34 & Fair/Poor & 69 / 600 (12\%) \\   
 35 & \\_\\_\\_Physical Activity Score\\_\\_\\_ & \\   
 36 & Mean (SD) & 7.75 (1.77) \\   
 37 & Median & 7.60 \\   
 38 & [Range] & [3.40, 12.80] \\   
 39 & \\_\\_\\_Baseline AMH\\_\\_\\_ & \\   
 40 & Mean (SD) & 540 (702) \\   
 41 & Median & 273 \\   
 42 & [Range] & [1, 4,652] \\   
 43 & \\_\\_\\_Number of Visits\\_\\_\\_ & \\   
 44 & Mean (SD) & 5.54 (2.14) \\   
 45 & Median & 5.00 \\   
 46 & [Range] & [3.00, 11.00] \\   
 47 & \\_\\_\\_Parity\\_\\_\\_ & \\   
 48 & None & 111 / 600 (19\%) \\   
 49 & One & 88 / 600 (15\%) \\   
 50 & Two & 210 / 600 (35\%) \\   
 51 & Three & 116 / 600 (19\%) \\   
 52 & More than three & 75 / 600 (13\%) \\   
 53 & \\_\\_\\_Children\\_\\_\\_ & \\   
 54 & Mean (SD) & 1.98 (1.41) \\   
 55 & Median & 2.00 \\   
 56 & [Range] & [0.00, 12.00] \\   
 57 & \\_\\_\\_Employment Status\\_\\_\\_ & \\   
 58 & Unemployed & 104 / 600 (17\%) \\   
 59 & Employed & 496 / 600 (83\%) \\   
 60 & \\_\\_\\_Educational Attainment\\_\\_\\_ & \\   
 61 & High School or Less & 125 / 600 (21\%) \\   
 62 & Some College & 190 / 600 (32\%) \\   
 63 & College degree or higher & 285 / 600 (48\%) \\   
 64 & \\_\\_\\_Site\\_\\_\\_ & \\   
 65 & B & 96 / 600 (16\%) \\   
 66 & C & 76 / 600 (13\%) \\   
 67 & M & 103 / 600 (17\%) \\   
 68 & NJ & 27 / 600 (4.5\%) \\   
 69 & P & 74 / 600 (12\%) \\   
 70 & UCD & 102 / 600 (17\%) \\   
 71 & UCLA & 122 / 600 (20\%) \\   
 \hline  
\end{tabular}  
\end{table}

# Table2: summary for AMH and visits

| **Characteristics** | **N = 600** |
| --- | --- |
| ***Baseline AMH*** |  |
| Mean (SD) | 540 (702) |
| Median [IQR] | 273 [71, 672] |
| Median [5%, 95%] | 273 [1, 2,095] |
| Median [Range] | 273 [1, 4,652] |
| ***Minimum AMH*** |  |
| Mean (SD) | 28 (78) |
| Median [IQR] | 2 [1, 18] |
| Median [5%, 95%] | 2 [1, 133] |
| Median [Range] | 2 [1, 772] |
| ***Maximum AMH*** |  |
| Mean (SD) | 628 (730) |
| Median [IQR] | 341 [132, 836] |
| Median [5%, 95%] | 341 [23, 2,174] |
| Median [Range] | 341 [1, 4,681] |
| ***Number of Visits*** |  |
| Mean (SD) | 5.54 (2.14) |
| Median [IQR] | 5.00 [4.00, 7.00] |
| Median [5%, 95%] | 5.00 [3.00, 10.00] |
| Median [Range] | 5.00 [3.00, 11.00] |

Here is the latex code for Table2:

% latex table generated in R 4.2.2 by xtable 1.8-4 package  
% Tue Apr 9 14:00:42 2024  
\begin{table}[ht]  
\centering  
\begin{tabular}{rll}  
 \hline  
 & \*\*Characteristics\*\* & \*\*N = 600\*\* \\   
 \hline  
1 & \\_\\_\\_Baseline AMH\\_\\_\\_ & \\   
 2 & Mean (SD) & 540 (702) \\   
 3 & Median [IQR] & 273 [71, 672] \\   
 4 & Median [5\%, 95\%] & 273 [1, 2,095] \\   
 5 & Median [Range] & 273 [1, 4,652] \\   
 6 & \\_\\_\\_Minimum AMH\\_\\_\\_ & \\   
 7 & Mean (SD) & 28 (78) \\   
 8 & Median [IQR] & 2 [1, 18] \\   
 9 & Median [5\%, 95\%] & 2 [1, 133] \\   
 10 & Median [Range] & 2 [1, 772] \\   
 11 & \\_\\_\\_Maximum AMH\\_\\_\\_ & \\   
 12 & Mean (SD) & 628 (730) \\   
 13 & Median [IQR] & 341 [132, 836] \\   
 14 & Median [5\%, 95\%] & 341 [23, 2,174] \\   
 15 & Median [Range] & 341 [1, 4,681] \\   
 16 & \\_\\_\\_Number of Visits\\_\\_\\_ & \\   
 17 & Mean (SD) & 5.54 (2.14) \\   
 18 & Median [IQR] & 5.00 [4.00, 7.00] \\   
 19 & Median [5\%, 95\%] & 5.00 [3.00, 10.00] \\   
 20 & Median [Range] & 5.00 [3.00, 11.00] \\   
 \hline  
\end{tabular}  
\end{table}

# Longitudinal model

Here is the summary for longitudinal sub-model, based on model selection

Here is the table for the longitudinal model:

| effect | group | term | estimate | std.error | df | statistic | p.value |
| --- | --- | --- | --- | --- | --- | --- | --- |
| fixed | NA | (Intercept) | 7.5166321 | 0.1042432 | 2725 | 72.10669 | 0 |
| fixed | NA | time | -0.5304830 | 0.0116235 | 2725 | -45.63885 | 0 |
| ran\_pars | id | sd\_(Intercept) | 1.6842278 | NA | NA | NA | NA |
| ran\_pars | id | cor\_time.(Intercept) | -0.3595600 | NA | NA | NA | NA |
| ran\_pars | id | sd\_time | 0.1039758 | NA | NA | NA | NA |
| ran\_pars | Residual | sd\_Observation | 1.2991322 | NA | NA | NA | NA |

The full summary for the longitudinal model is as follows:

#> Linear mixed-effects model fit by REML  
#> Data: swan\_amh00   
#> AIC BIC logLik  
#> 12583.7 12620.36 -6285.852  
#>   
#> Random effects:  
#> Formula: ~time | id  
#> Structure: General positive-definite, Log-Cholesky parametrization  
#> StdDev Corr   
#> (Intercept) 1.6842278 (Intr)  
#> time 0.1039758 -0.36   
#> Residual 1.2991322   
#>   
#> Fixed effects: lamh ~ time   
#> Value Std.Error DF t-value p-value  
#> (Intercept) 7.516632 0.1042432 2725 72.10669 0  
#> time -0.530483 0.0116235 2725 -45.63885 0  
#> Correlation:   
#> (Intr)  
#> time -0.748  
#>   
#> Standardized Within-Group Residuals:  
#> Min Q1 Med Q3 Max   
#> -4.9581436 -0.4749003 0.1009506 0.5917255 2.8944856   
#>   
#> Number of Observations: 3326  
#> Number of Groups: 600

# Survival model

**Notes: is it necessary to include a model with observed AMH as covariate in survival model?**

Here is the table for survival model, based on model selection:

| term | estimate | std.error | statistic | p.value |
| --- | --- | --- | --- | --- |
| marriedMarried/Partnered | 0.2009837 | 0.0963057 | 2.0869349 | 0.0368940 |
| bc\_pillsEver use BC pills | -0.2237786 | 0.0993733 | -2.2518989 | 0.0243287 |
| bmi | -0.0035685 | 0.0067598 | -0.5279079 | 0.5975633 |
| site\_ethnic\_b\_black | 0.0058217 | 0.2136773 | 0.0272453 | 0.9782641 |
| site\_ethnic\_c\_black | -0.0224055 | 0.2183077 | -0.1026328 | 0.9182544 |
| site\_ethnic\_c\_cauca | 0.2142089 | 0.2217840 | 0.9658448 | 0.3341219 |
| site\_ethnic\_m\_black | 0.1646291 | 0.1995273 | 0.8250954 | 0.4093174 |
| site\_ethnic\_m\_cauca | 0.3423318 | 0.2155704 | 1.5880274 | 0.1122801 |
| site\_ethnic\_nj\_cauca | 0.2682986 | 0.3604395 | 0.7443652 | 0.4566556 |
| site\_ethnic\_nj\_hispa | 0.0658811 | 0.2772944 | 0.2375853 | 0.8122028 |
| site\_ethnic\_p\_black | 0.3511122 | 0.2466007 | 1.4238086 | 0.1545019 |
| site\_ethnic\_p\_cauca | 0.7013580 | 0.2008652 | 3.4916843 | 0.0004800 |
| site\_ethnic\_ucd\_cauca | 0.3055980 | 0.2124732 | 1.4382898 | 0.1503518 |
| site\_ethnic\_ucd\_chine | 0.2584626 | 0.1959062 | 1.3193179 | 0.1870628 |
| site\_ethnic\_ucla\_cauca | 0.3373483 | 0.2201958 | 1.5320374 | 0.1255132 |
| site\_ethnic\_ucla\_japan | 0.1564432 | 0.1787153 | 0.8753768 | 0.3813689 |
| smoke\_past\_only | 0.0755806 | 0.1047054 | 0.7218408 | 0.4703924 |
| smoke\_current\_smoker | 0.6000705 | 0.1365294 | 4.3951736 | 0.0000111 |

Here is the summary for the survival model

#> Call:  
#> coxph(formula = Surv(etime, event) ~ 0 + married + bc\_pills +   
#> bmi + site\_ethnic\_b\_black + site\_ethnic\_c\_black + site\_ethnic\_c\_cauca +   
#> site\_ethnic\_m\_black + site\_ethnic\_m\_cauca + site\_ethnic\_nj\_cauca +   
#> site\_ethnic\_nj\_hispa + site\_ethnic\_p\_black + site\_ethnic\_p\_cauca +   
#> site\_ethnic\_ucd\_cauca + site\_ethnic\_ucd\_chine + site\_ethnic\_ucla\_cauca +   
#> site\_ethnic\_ucla\_japan + smoke\_past\_only + smoke\_current\_smoker,   
#> data = swan\_amh12, model = TRUE, x = TRUE)  
#>   
#> n= 600, number of events= 600   
#>   
#> coef exp(coef) se(coef) z Pr(>|z|)   
#> marriedMarried/Partnered 0.200984 1.222605 0.096306 2.087 0.03689 \*   
#> bc\_pillsEver use BC pills -0.223779 0.799492 0.099373 -2.252 0.02433 \*   
#> bmi -0.003569 0.996438 0.006760 -0.528 0.59756   
#> site\_ethnic\_b\_black 0.005822 1.005839 0.213677 0.027 0.97826   
#> site\_ethnic\_c\_black -0.022406 0.977844 0.218308 -0.103 0.91825   
#> site\_ethnic\_c\_cauca 0.214209 1.238881 0.221784 0.966 0.33412   
#> site\_ethnic\_m\_black 0.164629 1.178956 0.199527 0.825 0.40932   
#> site\_ethnic\_m\_cauca 0.342332 1.408227 0.215570 1.588 0.11228   
#> site\_ethnic\_nj\_cauca 0.268299 1.307738 0.360439 0.744 0.45666   
#> site\_ethnic\_nj\_hispa 0.065881 1.068100 0.277294 0.238 0.81220   
#> site\_ethnic\_p\_black 0.351112 1.420647 0.246601 1.424 0.15450   
#> site\_ethnic\_p\_cauca 0.701358 2.016489 0.200865 3.492 0.00048 \*\*\*  
#> site\_ethnic\_ucd\_cauca 0.305598 1.357436 0.212473 1.438 0.15035   
#> site\_ethnic\_ucd\_chine 0.258463 1.294938 0.195906 1.319 0.18706   
#> site\_ethnic\_ucla\_cauca 0.337348 1.401227 0.220196 1.532 0.12551   
#> site\_ethnic\_ucla\_japan 0.156443 1.169344 0.178715 0.875 0.38137   
#> smoke\_past\_only 0.075581 1.078510 0.104705 0.722 0.47039   
#> smoke\_current\_smoker 0.600070 1.822247 0.136529 4.395 1.11e-05 \*\*\*  
#> ---  
#> Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
#>   
#> exp(coef) exp(-coef) lower .95 upper .95  
#> marriedMarried/Partnered 1.2226 0.8179 1.0123 1.4766  
#> bc\_pillsEver use BC pills 0.7995 1.2508 0.6580 0.9714  
#> bmi 0.9964 1.0036 0.9833 1.0097  
#> site\_ethnic\_b\_black 1.0058 0.9942 0.6617 1.5290  
#> site\_ethnic\_c\_black 0.9778 1.0227 0.6374 1.5000  
#> site\_ethnic\_c\_cauca 1.2389 0.8072 0.8021 1.9134  
#> site\_ethnic\_m\_black 1.1790 0.8482 0.7974 1.7432  
#> site\_ethnic\_m\_cauca 1.4082 0.7101 0.9230 2.1487  
#> site\_ethnic\_nj\_cauca 1.3077 0.7647 0.6452 2.6505  
#> site\_ethnic\_nj\_hispa 1.0681 0.9362 0.6203 1.8393  
#> site\_ethnic\_p\_black 1.4206 0.7039 0.8762 2.3035  
#> site\_ethnic\_p\_cauca 2.0165 0.4959 1.3603 2.9893  
#> site\_ethnic\_ucd\_cauca 1.3574 0.7367 0.8951 2.0586  
#> site\_ethnic\_ucd\_chine 1.2949 0.7722 0.8820 1.9011  
#> site\_ethnic\_ucla\_cauca 1.4012 0.7137 0.9101 2.1574  
#> site\_ethnic\_ucla\_japan 1.1693 0.8552 0.8238 1.6598  
#> smoke\_past\_only 1.0785 0.9272 0.8784 1.3242  
#> smoke\_current\_smoker 1.8222 0.5488 1.3944 2.3813  
#>   
#> Concordance= 0.589 (se = 0.014 )  
#> Likelihood ratio test= 48.39 on 18 df, p=1e-04  
#> Wald test = 51.8 on 18 df, p=4e-05  
#> Score (logrank) test = 52.77 on 18 df, p=3e-05

# Joint model without Rate (only value term of longitudinal submodel)

## Longitudinal submodel

Here is the summary for longitudinal submodel:

|  | Mean | StDev | 2.5% | 97.5% | P |
| --- | --- | --- | --- | --- | --- |
| (Intercept) | 7.9150045 | 0.1167373 | 7.6776408 | 8.1358265 | 0 |
| time | -0.5959353 | 0.0140724 | -0.6213314 | -0.5676174 | 0 |
| sigma | 1.3069148 | 0.0194243 | 1.2706265 | 1.3462695 | 0 |

## Survival submodel

Here is the summary for survival submodel:

|  | Mean | StDev | 2.5% | 97.5% | P |
| --- | --- | --- | --- | --- | --- |
| marriedMarried/Partnered | 0.1230590 | 0.1477155 | -0.1906037 | 0.4031406 | 0.4120 |
| bc\_pillsEver use BC pills | -0.0036234 | 0.1326284 | -0.2647300 | 0.2585364 | 0.9980 |
| bmi | -0.0482207 | 0.0086565 | -0.0647940 | -0.0318024 | 0.0000 |
| site\_ethnic\_b\_black | -0.0986269 | 0.2891925 | -0.6935329 | 0.4537392 | 0.7355 |
| site\_ethnic\_c\_black | -0.1950361 | 0.2906667 | -0.7415467 | 0.4028777 | 0.5255 |
| site\_ethnic\_c\_cauca | 0.5810621 | 0.2760849 | 0.0379913 | 1.1042824 | 0.0335 |
| site\_ethnic\_m\_black | 0.0391006 | 0.2629483 | -0.4670179 | 0.5915743 | 0.8955 |
| site\_ethnic\_m\_cauca | 0.4916273 | 0.2811987 | -0.0499484 | 1.0285136 | 0.0755 |
| site\_ethnic\_nj\_cauca | 0.8146601 | 0.4858047 | -0.1865071 | 1.7537388 | 0.1010 |
| site\_ethnic\_nj\_hispa | 0.2268313 | 0.3938292 | -0.5491844 | 0.9797106 | 0.5680 |
| site\_ethnic\_p\_black | 0.4207852 | 0.3254313 | -0.2412357 | 1.0394935 | 0.2050 |
| site\_ethnic\_p\_cauca | 0.5639798 | 0.2603183 | 0.0745456 | 1.0690264 | 0.0235 |
| site\_ethnic\_ucd\_cauca | 0.2741064 | 0.2712475 | -0.2325808 | 0.8399108 | 0.3015 |
| site\_ethnic\_ucd\_chine | 0.0442592 | 0.2599432 | -0.4668763 | 0.5731107 | 0.8865 |
| site\_ethnic\_ucla\_cauca | 0.5793384 | 0.2698834 | 0.0789994 | 1.1293692 | 0.0230 |
| site\_ethnic\_ucla\_japan | 0.5281033 | 0.2249767 | 0.0973573 | 0.9701987 | 0.0095 |
| smoke\_past\_only | -0.0616137 | 0.1362120 | -0.3183663 | 0.2200914 | 0.6120 |
| smoke\_current\_smoker | 0.2021982 | 0.1794691 | -0.1540481 | 0.5404030 | 0.2485 |
| value(lamh) | -1.0162608 | 0.0650950 | -1.1742875 | -0.9079182 | 0.0000 |

## Joint model

Here are the full summary for the joint model without rate:

#>   
#> Call:  
#> JMbayes2::jm(Surv\_object = surv.fit16, Mixed\_objects = lme.fit1,   
#> time\_var = "time", control = jmcontrol)  
#>   
#> Data Descriptives:  
#> Number of Groups: 600 Number of events: 600 (100%)  
#> Number of Observations:  
#> lamh: 3326  
#>   
#> DIC WAIC LPML  
#> marginal 14962.45 14972.47 -7499.795  
#> conditional 15739.73 15419.67 -8085.768  
#>   
#> Random-effects covariance matrix:  
#>   
#> StdDev Corr   
#> (Intr) 1.6798 (Intr)   
#> time 0.1070 -0.2562  
#>   
#> Survival Outcome:  
#> Mean StDev 2.5% 97.5% P  
#> marriedMarried/Partnered 0.1231 0.1477 -0.1906 0.4031 0.4120  
#> bc\_pillsEver use BC pills -0.0036 0.1326 -0.2647 0.2585 0.9980  
#> bmi -0.0482 0.0087 -0.0648 -0.0318 0.0000  
#> site\_ethnic\_b\_black -0.0986 0.2892 -0.6935 0.4537 0.7355  
#> site\_ethnic\_c\_black -0.1950 0.2907 -0.7415 0.4029 0.5255  
#> site\_ethnic\_c\_cauca 0.5811 0.2761 0.0380 1.1043 0.0335  
#> site\_ethnic\_m\_black 0.0391 0.2629 -0.4670 0.5916 0.8955  
#> site\_ethnic\_m\_cauca 0.4916 0.2812 -0.0499 1.0285 0.0755  
#> site\_ethnic\_nj\_cauca 0.8147 0.4858 -0.1865 1.7537 0.1010  
#> site\_ethnic\_nj\_hispa 0.2268 0.3938 -0.5492 0.9797 0.5680  
#> site\_ethnic\_p\_black 0.4208 0.3254 -0.2412 1.0395 0.2050  
#> site\_ethnic\_p\_cauca 0.5640 0.2603 0.0745 1.0690 0.0235  
#> site\_ethnic\_ucd\_cauca 0.2741 0.2712 -0.2326 0.8399 0.3015  
#> site\_ethnic\_ucd\_chine 0.0443 0.2599 -0.4669 0.5731 0.8865  
#> site\_ethnic\_ucla\_cauca 0.5793 0.2699 0.0790 1.1294 0.0230  
#> site\_ethnic\_ucla\_japan 0.5281 0.2250 0.0974 0.9702 0.0095  
#> smoke\_past\_only -0.0616 0.1362 -0.3184 0.2201 0.6120  
#> smoke\_current\_smoker 0.2022 0.1795 -0.1540 0.5404 0.2485  
#> value(lamh) -1.0163 0.0651 -1.1743 -0.9079 0.0000  
#>   
#> Longitudinal Outcome: lamh (family = gaussian, link = identity)  
#> Mean StDev 2.5% 97.5% P  
#> (Intercept) 7.9150 0.1167 7.6776 8.1358 0  
#> time -0.5959 0.0141 -0.6213 -0.5676 0  
#> sigma 1.3069 0.0194 1.2706 1.3463 0  
#>   
#> MCMC summary:  
#> chains: 1   
#> iterations per chain: 5000   
#> burn-in per chain: 1000   
#> thinning: 1   
#> time: 27 sec

# Joint model with rate (value and rate terms of longitudinal submodel)

## Longitudinal submodel

Here is the summary for longitudinal submodel:

|  | Mean | StDev | 2.5% | 97.5% | P |
| --- | --- | --- | --- | --- | --- |
| (Intercept) | 7.8009991 | 0.0856675 | 7.6390793 | 7.9778063 | 0 |
| time | -0.5831007 | 0.0078334 | -0.6016161 | -0.5718443 | 0 |
| sigma | 1.3158656 | 0.0183958 | 1.2788111 | 1.3525139 | 0 |

## Survival submodel

Here is the summary for survival submodel:

|  | Mean | StDev | 2.5% | 97.5% | P |
| --- | --- | --- | --- | --- | --- |
| marriedMarried/Partnered | 0.2417305 | 0.2101977 | -0.1655492 | 0.6652135 | 0.2330 |
| bc\_pillsEver use BC pills | -0.0394215 | 0.2006604 | -0.4541247 | 0.3595743 | 0.8500 |
| bmi | -0.0607746 | 0.0156032 | -0.0932495 | -0.0334083 | 0.0000 |
| site\_ethnic\_b\_black | -0.1296034 | 0.4137167 | -0.8825379 | 0.7732577 | 0.7025 |
| site\_ethnic\_c\_black | -0.4345540 | 0.3957967 | -1.2237136 | 0.4189339 | 0.2310 |
| site\_ethnic\_c\_cauca | 0.6873707 | 0.4119251 | -0.1019593 | 1.4818400 | 0.0905 |
| site\_ethnic\_m\_black | 0.0418710 | 0.3230775 | -0.5470842 | 0.7552422 | 0.9190 |
| site\_ethnic\_m\_cauca | 0.6366866 | 0.3826280 | -0.0415340 | 1.4331901 | 0.0560 |
| site\_ethnic\_nj\_cauca | 1.0990258 | 0.7955822 | -0.2368824 | 2.7695308 | 0.1305 |
| site\_ethnic\_nj\_hispa | 0.1942595 | 0.5524206 | -1.0104444 | 1.2960723 | 0.6885 |
| site\_ethnic\_p\_black | 0.4803200 | 0.4891255 | -0.4177802 | 1.4976000 | 0.3180 |
| site\_ethnic\_p\_cauca | 0.7271998 | 0.4069664 | 0.0146010 | 1.6170665 | 0.0440 |
| site\_ethnic\_ucd\_cauca | 0.2539384 | 0.4054615 | -0.5534879 | 1.0510744 | 0.5115 |
| site\_ethnic\_ucd\_chine | 0.0126214 | 0.3259992 | -0.5450049 | 0.7250946 | 0.9860 |
| site\_ethnic\_ucla\_cauca | 0.7145777 | 0.4227695 | -0.0328034 | 1.5574396 | 0.0615 |
| site\_ethnic\_ucla\_japan | 0.6833081 | 0.3408692 | 0.0293766 | 1.3331523 | 0.0370 |
| smoke\_past\_only | -0.0991718 | 0.2126347 | -0.5532838 | 0.2985079 | 0.6515 |
| smoke\_current\_smoker | 0.4043501 | 0.2890467 | -0.1059751 | 1.0048318 | 0.1635 |
| value(lamh) | -1.1322009 | 0.1265345 | -1.3717799 | -0.8975461 | 0.0000 |
| slope(lamh) | -24.5107006 | 15.6472310 | -50.3095234 | -0.2016081 | 0.0445 |

## Joint model

Here are the full summary for the joint model with rate:

#>   
#> Call:  
#> JMbayes2::jm(Surv\_object = surv.fit16, Mixed\_objects = lme.fit1,   
#> time\_var = "time", functional\_forms = list(lamh = ~value(lamh) +   
#> slope(lamh)), control = jmcontrol, seed = 55555)  
#>   
#> Data Descriptives:  
#> Number of Groups: 600 Number of events: 600 (100%)  
#> Number of Observations:  
#> lamh: 3326  
#>   
#> DIC WAIC LPML  
#> marginal 14827.79 14888.48 -7504.700  
#> conditional 14538.29 14379.46 -7573.724  
#>   
#> Random-effects covariance matrix:  
#>   
#> StdDev Corr  
#> (Intr) 1.5620 (Intr)  
#> time 0.0605 0.1060  
#>   
#> Survival Outcome:  
#> Mean StDev 2.5% 97.5% P  
#> marriedMarried/Partnered 0.2417 0.2102 -0.1655 0.6652 0.2330  
#> bc\_pillsEver use BC pills -0.0394 0.2007 -0.4541 0.3596 0.8500  
#> bmi -0.0608 0.0156 -0.0932 -0.0334 0.0000  
#> site\_ethnic\_b\_black -0.1296 0.4137 -0.8825 0.7733 0.7025  
#> site\_ethnic\_c\_black -0.4346 0.3958 -1.2237 0.4189 0.2310  
#> site\_ethnic\_c\_cauca 0.6874 0.4119 -0.1020 1.4818 0.0905  
#> site\_ethnic\_m\_black 0.0419 0.3231 -0.5471 0.7552 0.9190  
#> site\_ethnic\_m\_cauca 0.6367 0.3826 -0.0415 1.4332 0.0560  
#> site\_ethnic\_nj\_cauca 1.0990 0.7956 -0.2369 2.7695 0.1305  
#> site\_ethnic\_nj\_hispa 0.1943 0.5524 -1.0104 1.2961 0.6885  
#> site\_ethnic\_p\_black 0.4803 0.4891 -0.4178 1.4976 0.3180  
#> site\_ethnic\_p\_cauca 0.7272 0.4070 0.0146 1.6171 0.0440  
#> site\_ethnic\_ucd\_cauca 0.2539 0.4055 -0.5535 1.0511 0.5115  
#> site\_ethnic\_ucd\_chine 0.0126 0.3260 -0.5450 0.7251 0.9860  
#> site\_ethnic\_ucla\_cauca 0.7146 0.4228 -0.0328 1.5574 0.0615  
#> site\_ethnic\_ucla\_japan 0.6833 0.3409 0.0294 1.3332 0.0370  
#> smoke\_past\_only -0.0992 0.2126 -0.5533 0.2985 0.6515  
#> smoke\_current\_smoker 0.4044 0.2890 -0.1060 1.0048 0.1635  
#> value(lamh) -1.1322 0.1265 -1.3718 -0.8975 0.0000  
#> slope(lamh) -24.5107 15.6472 -50.3095 -0.2016 0.0445  
#>   
#> Longitudinal Outcome: lamh (family = gaussian, link = identity)  
#> Mean StDev 2.5% 97.5% P  
#> (Intercept) 7.8010 0.0857 7.6391 7.9778 0  
#> time -0.5831 0.0078 -0.6016 -0.5718 0  
#> sigma 1.3159 0.0184 1.2788 1.3525 0  
#>   
#> MCMC summary:  
#> chains: 1   
#> iterations per chain: 5000   
#> burn-in per chain: 1000   
#> thinning: 1   
#> time: 33 sec

# Comparison for model with and without rate

#>   
#> DIC WAIC LPML  
#> jmbayes2.fit116.d 14827.79 14888.48 -7504.700  
#> jmbayes2.fit116 14962.45 14972.47 -7499.795  
#>   
#> The criteria are calculated based on the marginal log-likelihood.