

## Joint Modeling of Longitudinal and Time-to-Event Data in R

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## Code 1

```

1 install.packages("JMbayer")
2 install.packages("rjags")
3 library(JMbayer)
4 library(rjags)

```

## Code 2

```

1 summary(jointFit.mlsc1)
2
3 Call:
4 jointModelBayes(lmeObject = lmeFit.mlsc2.1, survObject = Coxfit_fem,
5   timeVar = "Age_50", n.iter = 30000)
6
7 Data Descriptives:
8 Longitudinal Process Event Process
9 Number of Observations: 5517 Number of Events: 1858 (66.8%)
10 Number of subjects: 2780
11
12 Joint Model Summary:
13 Longitudinal Process: Linear mixed-effects model
14 Event Process: Relative risk model with penalized-spline-approximated
15 baseline risk function
16 Parameterization: Time-dependent value
17
18      LPML      DIC      pD
19 -26425.21 51793.14 5199.108
20
21 Variance Components:
22           StdDev      Corr
23 (Intercept) 5.6169 (Intr)
24 Age_50      0.2801 -0.2035
25 Residual    0.9464
26
27 Coefficients:
28 Longitudinal Process
29           Value Std.Err Std.Dev   2.5%   97.5%      P
30 (Intercept)  8.8057  0.1290  1.1708  6.5061 11.0604 <0.001
31 Age_50       0.1922  0.0040  0.0574  0.0786  0.3024  0.001
32 AgeStart    -0.0542  0.0023  0.0189 -0.0899 -0.0176  0.002
33 I(Age_50^2) -0.0066  0.0000  0.0002 -0.0069 -0.0063 <0.001
34 Age_50:AgeStart -0.0048  0.0001  0.0009 -0.0065 -0.0030 <0.001
35
36 Event Process
37           Value Std.Err Std.Dev   2.5%   97.5%      P

```

```

38 SmokerTRUE 0.4449 0.0077 0.0567 0.3280 0.5549 <0.001
39 AgeStart -0.0480 0.0010 0.0044 -0.0552 -0.0380 <0.001
40 Assoct -0.0259 0.0003 0.0031 -0.0321 -0.0199 <0.001
41 tauBs 12.1863 1.2287 5.4554 4.6427 25.5413 NA
42
43 MCMC summary:
44 iterations: 30000
45 adapt: 3000
46 burn-in: 3000
47 thinning: 15
48 time: 17.6 min

```

### Code 3

```

1 BIC(m2,m2.1,m2.2)

```

### Code 4

```

1 jointFit.mlsc1 <- jointModelBayes(lmeFit.mlsc2.1, Coxfit_fem,
2 timeVar = "Age_50",n.iter = 30000)
3
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5
6 Call:
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```

lmeFit.mlsc2.1 is the longitudinal submodel, Coxfit\_fem is the survival Cox submodel and timeVar = "Age\_50" means that the temporal variable is Age\_50.