

**Supplement to:
Empirically Derived Trajectories to Dementia Over 15 Years of Follow-Up
Identified Using Mixed Membership Models**

Web Table 1: Characteristics of Subjects Excluded Due to Death Prior to 1998/99

	Alive 1998/99	Dead 1998/99	Effect Size ¹
N	755	168	
Age 1992/94	74.2 (4.4)	77.8 (5.9)	.33*
Education (%N Beyond HS)	53.3 (386)	49.7 (98)	.807
Sex (%N Female)	60.8 (440)	40.6 (80)	.441*
Race (%N White)	76.5 (554)	75.1 (148)	.927
Hypertension ²	50.3 (364)	40.1 (79)	.662*
Diabetes ²	15.1 (109)	22.3 (44)	1.62*
Heart Disease ²	26.2 (190)	32.5 (64)	1.35
3MSE 1992/94	92.1 (6.8)	88.3 (9.4)	.67*
APOE*4 ²	19.9 (144)	5.0 (46)	1.23
Dementia ²	16.2 (117)	28.9 (67)	2.11*

¹ Odds Ratio or Cohen's d

² % present

* p-value < 0.05

Web Table 2: Characteristics of Subjects Excluded as a Function of Missing APOE Genotype

	APOE Genotype	no APOE Genotype	Effect Size ¹
N	652	103	
Age 1992/94	74.9 (4.99)	75.0 (5.0)	.02
Education (%N Beyond HS)	53.1 (346)	55.3 (57)	1.09
Sex (%N Female)	56.2 (366)	56.3 (58)	1.00
Race (%N White)	75.9 (494)	72.8 (75)	.85
Hypertension ²	46.1 (300)	61.2 (63)	1.84*
Diabetes ²	16.3 (106)	20.4 (21)	1.32
Heart Disease ²	29.5 (192)	29.1 (30)	.98
3MSE 1992/94	91.4 (7.3)	90.8 (9.1)	.05
Dementia ²	18.4 (120)	15.5 (16)	.062

¹ Odds Ratio or Cohen's d

² % present

* p-value < 0.05

Web Table 3: Full model with 7 time invariant predictors; posterior means and standard deviations for the parameters defining the 3 canonical trajectories.

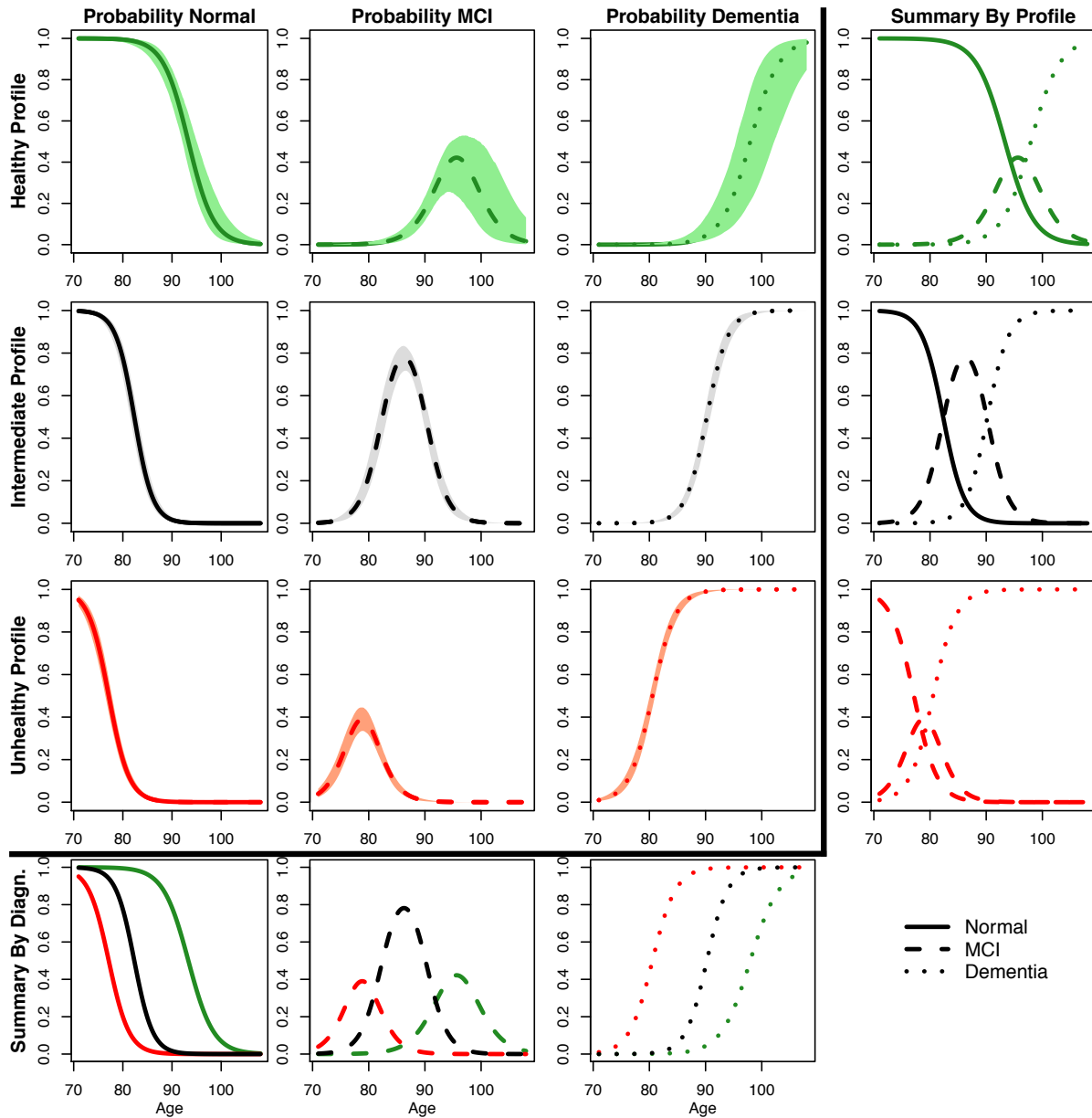
	parameter	k=1 (healthy)	k=2 (intermediate)	k=3 (unhealthy)
Intercept	β_{0k}	36.636 (0.631)	45.838 (0.155)	38.521 (0.176)
Effect of Age	β_{1k}	-0.363 (0.080)	-0.508 (0.028)	-0.478 (0.028)
MCI/Dem. treshold	c_k	3.755 (0.240)	3.755 (0.155)	1.636 (0.216)

Web Table 4: Full model with 7 time invariant predictors; posterior means and standard deviations for the parameters defining the 3 canonical survival trajectories.

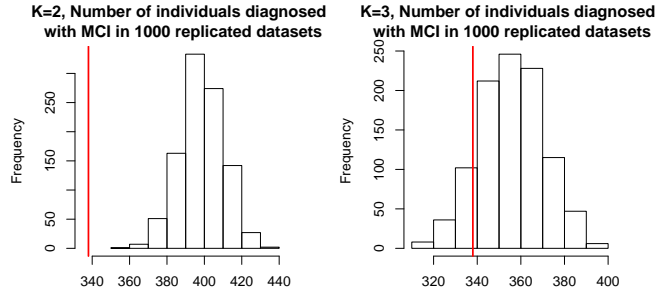
	Weibull parameter	k=1 (healthy)	k=2 (intermediate)	k=3 (unhealthy)
Scale	θ_k	4.046 (0.446)	5.080 (0.610)	4.040 (0.256)
Shape	δ_k	29.101 (0.074)	29.759 (0.709)	25.186 (0.511)

Web Table 5: Full model with 7 time invariant predictors; posterior means and 95% credible intervals for the parameters representing the effects of time-invariant predictors on the closeness of individual trajectories to the typical profiles.

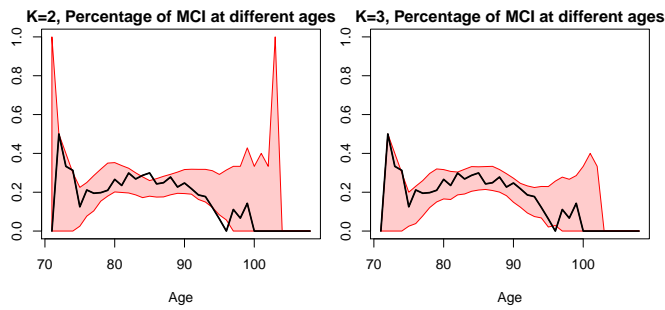
Effect of		parameter	Estimate [95% CI]
Race	Healthy Vs Intermediate	$a_{11} - a_{12}$	0.04 [-0.45, 0.66]
	Healthy Vs Unhealthy	$a_{11} - a_{13}$	0.98 [0.47, 1.43]
	Intermediate Vs Unhealthy	$a_{12} - a_{13}$	0.94 [0.47, 1.41]
Education	Healthy Vs Intermediate	$a_{21} - a_{22}$	0.36 [-0.15, 0.75]
	Healthy Vs Unhealthy	$a_{21} - a_{23}$	0.52 [0.03, 0.90]
	Intermediate Vs Unhealthy	$a_{22} - a_{23}$	0.16 [-0.27, 0.50]
Hypertension	Healthy Vs Intermediate	$a_{31} - a_{32}$	0.26 [-0.13, 0.69]
	Healthy Vs Unhealthy	$a_{31} - a_{33}$	-0.14 [-0.57, 0.40]
	Intermediate Vs Unhealthy	$a_{32} - a_{33}$	-0.40 [-0.73, -0.10]
ApoE4	Healthy Vs Intermediate	$a_{41} - a_{42}$	0.03 [-0.75, 0.52]
	Healthy Vs Unhealthy	$a_{41} - a_{43}$	-0.70 [-1.20, -0.25]
	Intermediate Vs Unhealthy	$a_{42} - a_{43}$	-0.73 [-1.18, -0.22]
Gender	Healthy Vs Intermediate	$a_{51} - a_{52}$	-0.26 [-0.76, 0.17]
	Healthy Vs Unhealthy	$a_{51} - a_{53}$	-0.32 [-0.68, 0.07]
	Intermediate Vs Unhealthy	$a_{52} - a_{53}$	-0.06 [-0.57, 0.31]
Diabetes	Healthy Vs Intermediate	$a_{61} - a_{62}$	-0.67 [-1.54, 0.08]
	Healthy Vs Unhealthy	$a_{61} - a_{63}$	-0.68 [-1.50, 0.09]
	Intermediate Vs Unhealthy	$a_{62} - a_{63}$	-0.01 [-0.56, 0.55]
HeartDisease	Healthy Vs Intermediate	$a_{71} - a_{72}$	-0.51 [-1.05, 0.04]
	Healthy Vs Unhealthy	$a_{71} - a_{73}$	-0.30 [-0.76, 0.27]
	Intermediate Vs Unhealthy	$a_{72} - a_{73}$	0.21 [-0.33, 0.71]



Web Figure 1: The probability of being cognitively normal, MCI, or dementia (as columns) for each of the three profiles, healthy, intermediate, and unhealthy (as rows). The right hand most column summarizes the probabilities as a function of profile, and the bottom row summarizes the probabilities as a function of diagnosis/classification. The lines colored green are for the healthy profile, the lines colored black for the intermediate profile, and the red lines for the unhealthy profile. The solid lines represent the probability of being normal, the dashed lines the probability of MCI, and the dotted lines the probability of dementia. The bands around each of the probability curves are the pointwise posterior 95% credible bands, and described the uncertainty of the estimation of the trajectories.



Web Figure 2: Posterior predictive check: histogram of the number of individuals diagnosed with MCI in 1000 replicated datasets. The vertical lines indicate the number (338) of individuals in the original dataset that have been diagnosed with MCI at least once.



Web Figure 3: Posterior predictive check: proportions of individuals affected by MCI at different ages. The black lines represent the true proportions found in the original dataset, while the pink confidence bands represent pointwise 95% credible bands for 1000 replicated datasets from the posterior predictive analysis.