

UAW-GM Cohort Study

Predicting survival to 1985

July 9, 2020

Population

- ▶ Restricted to those:
 - ▶ Still alive in 1941
 - ▶ Hired in or after 1938, but no later than 1982
 - ▶ Missing no more than half of their work record
- ▶ Individuals contributed person-time from three years after hire or 1941 (whichever came first) to death or loss to follow-up
- ▶ Individuals were considered lost to follow-up upon reaching the oldest observed age at death (106.56 years)
- ▶ $N = 36\,549$, (698 394 person-years)
- ▶ Deaths due to natural causes by end of 1984: 4 405 (11.4%)

ICD codes for natural causes of death

- ▶ ICD-9: all codes codes in [001, 799]
 - ▶ Excludes the categories labeled as “Injury and poisoning” and “external causes of injury and supplemental classification.”
- ▶ ICD-10: all codes, except those with prefix S, T, V, W, X, or Y.

Covariates

- ▶ Years since hire
- ▶ Age
- ▶ Plant
- ▶ Race
- ▶ Sex
- ▶ Proportion of year spent in assembly, machining (includes grinding), and off
- ▶ Cumulative time spent off
- ▶ Year of hire
- ▶ Cumulative exposure to straight, soluble, and synthetic MWFs
- ▶ Employment status

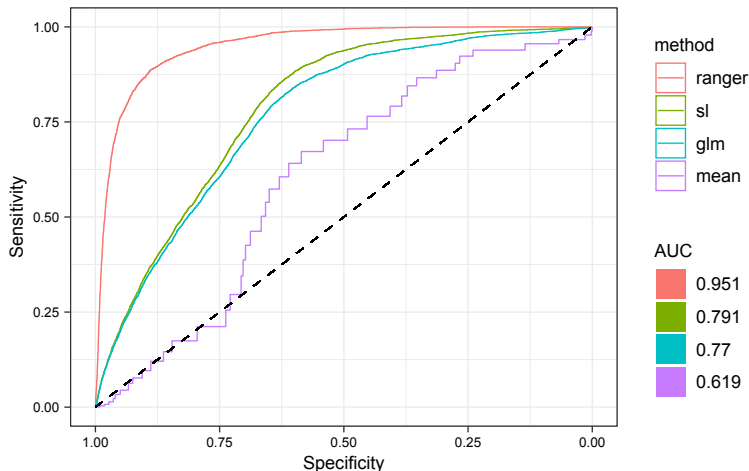
Average survival probabilities by age group among those still alive in 1985

Age	sl	mean	glm	ranger
[16.24, 44.71]	0.99	0.94	0.99	0.99
(44.71, 50.71]	0.97	0.89	0.97	0.98
(50.71, 54.64]	0.94	0.87	0.94	0.95
(54.64, 57.76]	0.90	0.85	0.90	0.92
(57.76, 60.97]	0.87	0.84	0.87	0.90
(60.97, 64.04]	0.83	0.83	0.83	0.88
(64.04, 67.27]	0.79	0.83	0.79	0.85
(67.27, 70.73]	0.74	0.82	0.73	0.80
(70.73, 76.08]	0.66	0.82	0.65	0.73
(76.08, 106.6]	0.44	0.81	0.43	0.56

Average survival probabilities by employment status among those still alive in 1985

Employment status	sl	mean	glm	ranger
At work	0.98	0.93	0.98	0.99
Left work	0.83	0.85	0.83	0.87

ROC Curve



Outcome: Natural cause mortality status in 1984

An individual's probability of not dying due to natural causes was calculated as: $\prod_t (1 - \hat{p}_t)$ where \hat{p}_t is the predicted probability of death due to natural causes for the t^{th} year of follow-up.

ROC Thresholds

method	min	Q2	med	Q3	max
sl	0.0004	0.0093	0.0280	0.1365	0.9482
mean	0.0094	0.0731	0.1327	0.1884	0.2406
glm	0.0002	0.0072	0.0243	0.1345	0.9584
ranger	0.0000	0.0024	0.0186	0.1369	0.8415