

# Figures and Tables: Development and Validation of the Other-Cause Comorbidity-Adjusted Mortality (OCCAM) Model for Clinical Use in Men with Prostate Cancer

Figure 1: STROBE diagram to construct National Health and Nutrition Examination Survey (NHANES) training data and Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO) validation data.

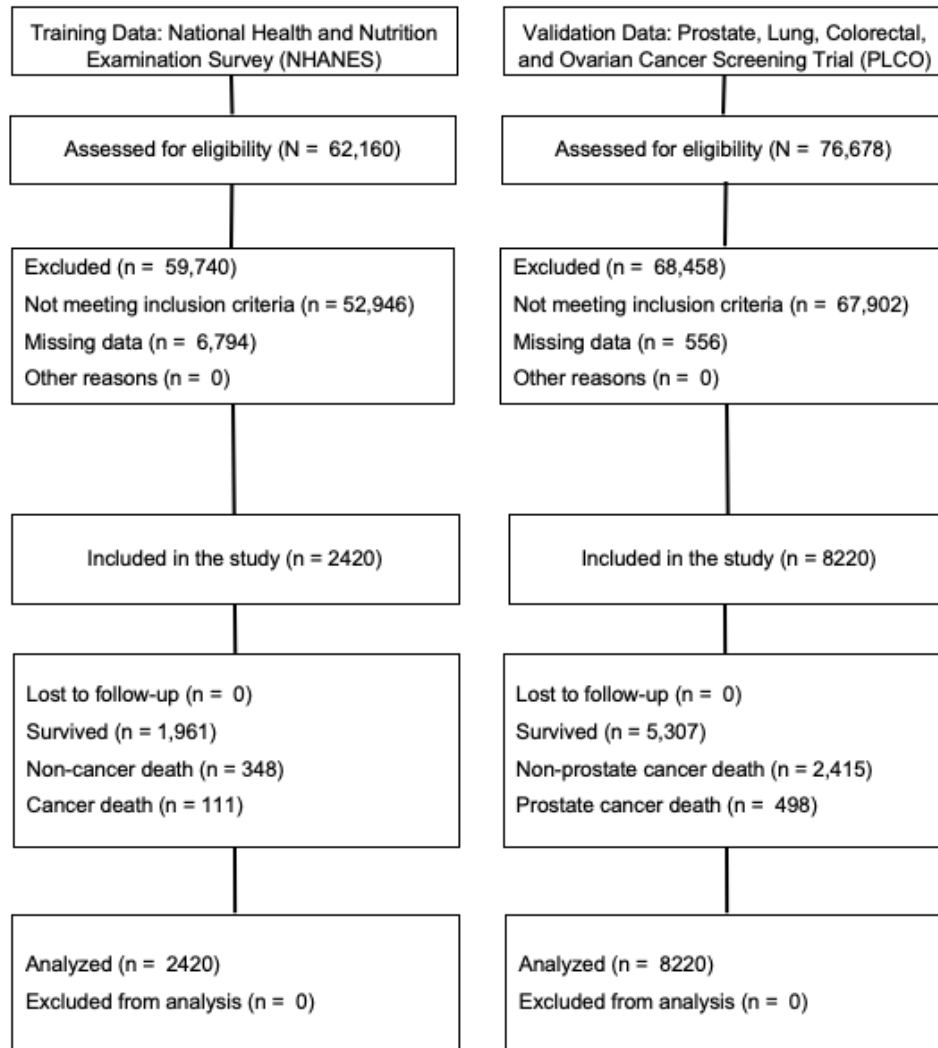


Table 1: Baseline characteristics of National Health and Nutrition Examination Survey (NHANES) training data and Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO) validation data.

|   | Training           | Validation         | p      | test |
|---|--------------------|--------------------|--------|------|
| n   | 2420               | 8220               |        |      |
| Age (years) (mean (SD))                                 | 59.4 (12.1)        | 69.5 (5.9)         | <0.001 |      |
| Race (%)  |                    |                    | <0.001 |      |
| Non-Hispanic black                                      | 411 (17.0)         | 475 ( 5.8)         |        |      |
| Non-Hispanic white                                      | 1362 (56.3)        | 7312 ( 89.0)       |        |      |
| Other race  | 647 (26.7)         | 433 ( 5.3)         |        |      |
| Education (%)   |                    |                    | <0.001 |      |
| Less than 9th grade                                     | 305 (12.6)         | 90 ( 1.1)          |        |      |
| 9th-11th grade  | 295 (12.2)         | 520 ( 6.3)         |        |      |
| HS graduate   | 591 (24.4)         | 1512 ( 18.4)       |        |      |
| Some college  | 607 (25.1)         | 2605 ( 31.7)       |        |      |
| College graduate  | 622 (25.7)         | 3493 ( 42.5)       |        |      |
| Marital status (%)                                      |                    |                    | <0.001 |      |
| Married   | 1813 (74.9)        | 7055 ( 85.8)       |        |      |
| Separated   | 466 (19.3)         | 945 ( 11.5)        |        |      |
| Single  | 141 ( 5.8)         | 220 ( 2.7)         |        |      |
| Smoking status (%)                                      |                    |                    | <0.001 |      |
| Never   | 905 (37.4)         | 3368 ( 41.0)       |        |      |
| Current   | 538 (22.2)         | 736 ( 9.0)         |        |      |
| Former  | 977 (40.4)         | 4116 ( 50.1)       |        |      |
| Arthritis = Yes (%)                                     | 813 (33.6)         | 2471 ( 30.1)       | 0.001  |      |
| Chronic bronchitis = Yes (%)                            | 111 ( 4.6)         | 240 ( 2.9)         | <0.001 |      |
| Diabetes = Yes (%)                                      | 453 (18.7)         | 527 ( 6.4)         | <0.001 |      |
| Emphysema = Yes (%)                                     | 75 ( 3.1)          | 183 ( 2.2)         | 0.017  |      |
| Hypertension = Yes (%)                                  | 1169 (48.3)        | 2742 ( 33.4)       | <0.001 |      |
| Previous heart attack, coronary heart disease = Yes (%) | 281 (11.6)         | 979 ( 11.9)        | 0.716  |      |
| Liver disease = Yes (%)                                 | 113 ( 4.7)         | 314 ( 3.8)         | 0.070  |      |
| Previous stroke = Yes (%)                               | 95 ( 3.9)          | 181 ( 2.2)         | <0.001 |      |
| Body mass index (BMI) (%)                               |                    |                    | <0.001 |      |
| BMI < 18.5  | 21 ( 0.9)          | 21 ( 0.3)          |        |      |
| BMI 18.5-25   | 506 (20.9)         | 2326 ( 28.3)       |        |      |
| BMI 25-40   | 1801 (74.4)        | 5809 ( 70.7)       |        |      |
| BMI 40+   | 92 ( 3.8)          | 64 ( 0.8)          |        |      |
| Prostate cancer = Yes (%)                               | 127 ( 5.2)         | 8220 (100.0)       | <0.001 |      |
| Outcome = Deceased (%)                                  | 459 (19.0)         | 2415 ( 29.4)       | <0.001 |      |
| Follow-up (months) (median [range])                     | 109.0 [0.0, 180.0] | 151.0 [0.0, 267.0] |        |      |

Figure 2: Forest plot of predictors for other-cause comorbidity-adjusted mortality (OCCAM) model fit in the National Health and Nutrition Examination Survey (NHANES) training cohort of 7,369 men. The OCCAM model also includes interactions between age and diabetes, education, hypertension, and stroke.

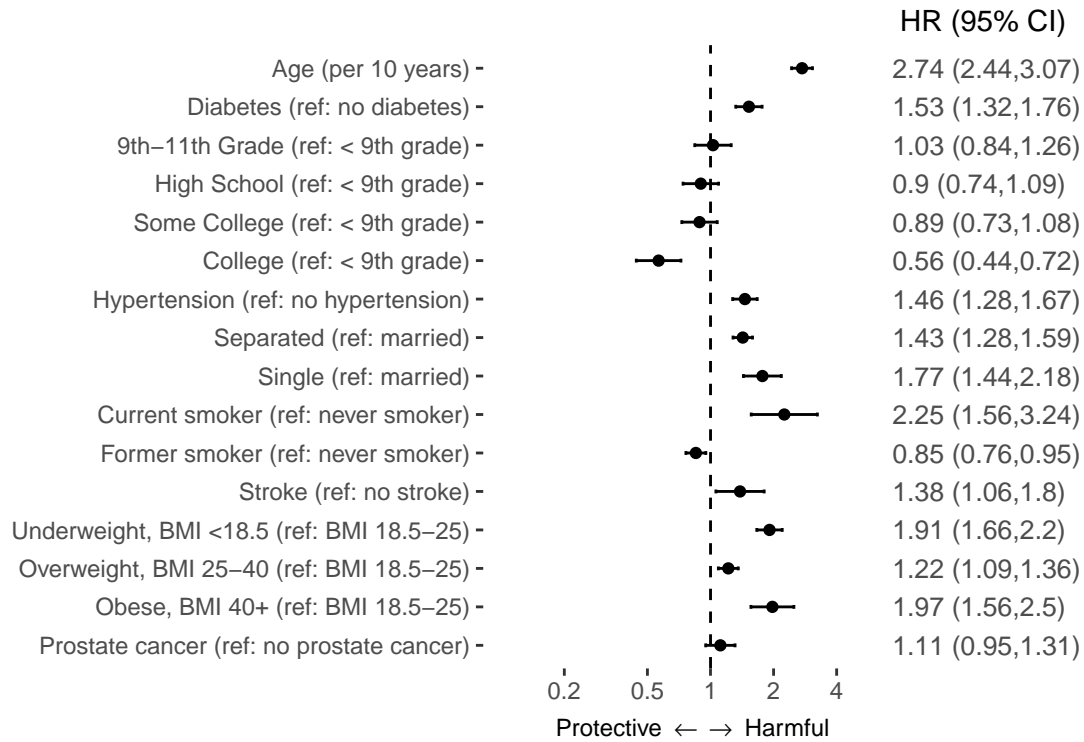


Figure 3: Externally validated time-dependent area-under-the-curves (AUCs) at 5, 10, and 15 years of our other-cause comorbidity-adjusted mortality (OCCAM) model, the Social Security Administration 2001 actuarial life table predictions (SSA), and the National Vital Statistics System's 2001 life expectancy predictions (NVSS). Models were validated in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO) cohort of 8,220 men with prostate cancer.

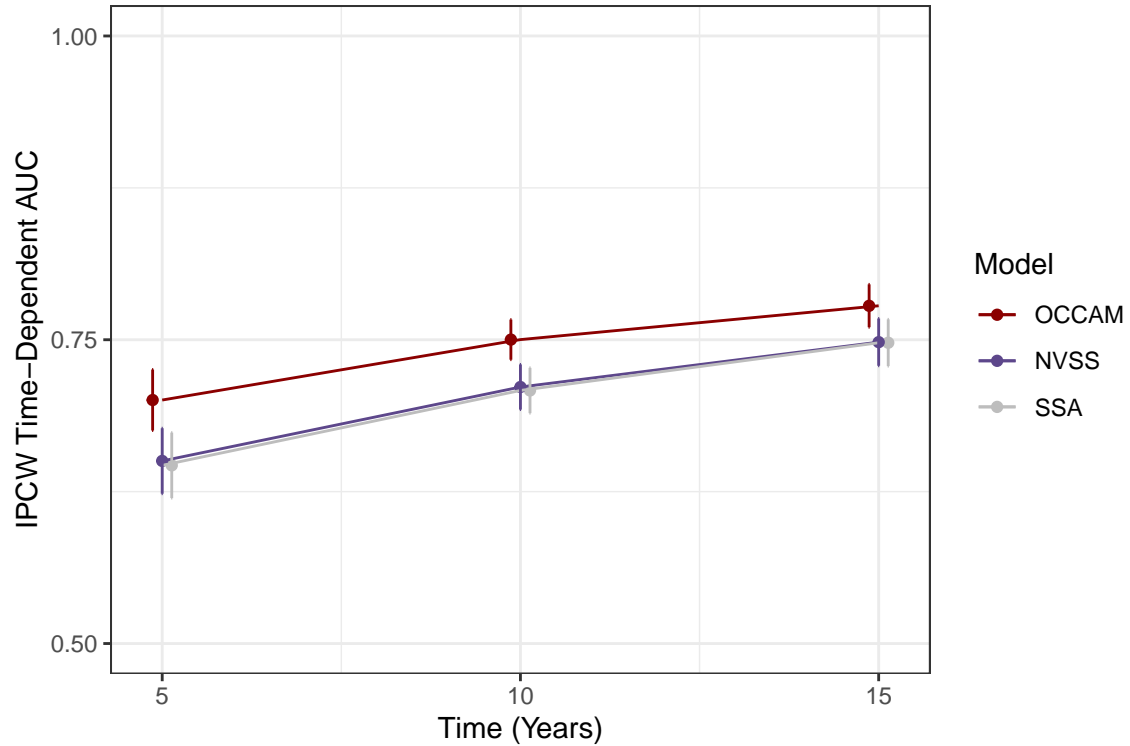


Figure 4: Calibration performance of other-cause comorbidity-adjusted mortality (OCCAM) model and the Social Security Administration's 2001 actuarial life table predictions (SSA) in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO) cohort of 8,220 men with prostate cancer.

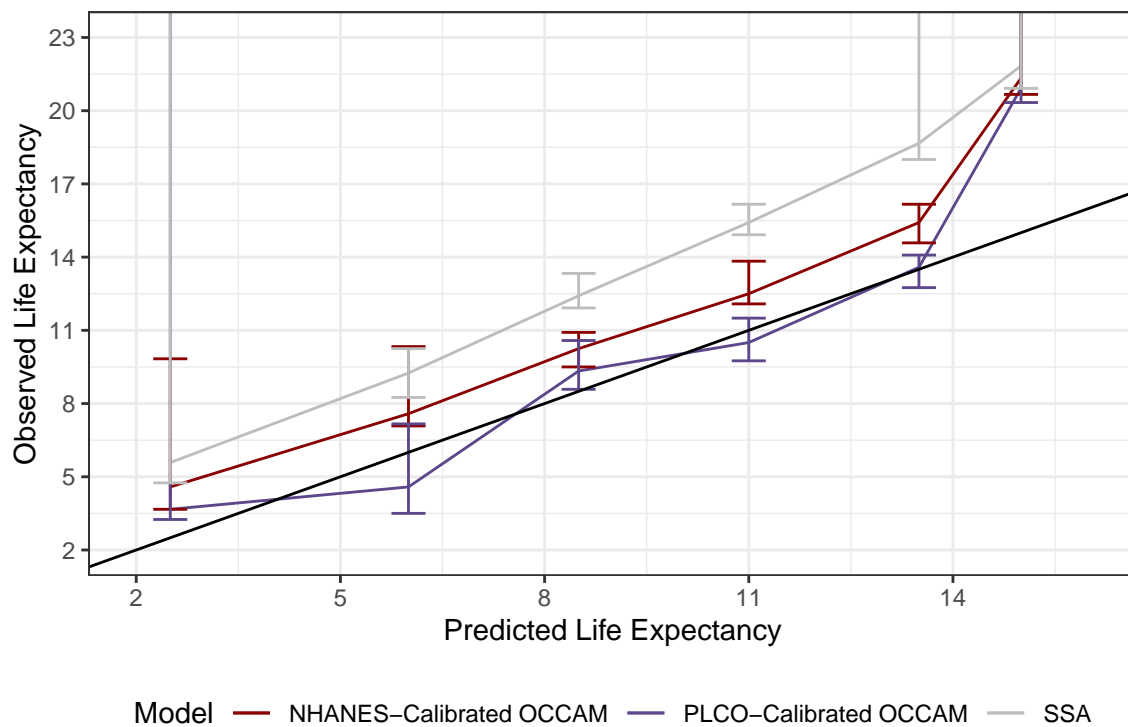


Table 2: Percent of men with OCCAM-predicted median survival of 0-5, 5-10, 10-15, and 15+ years, grouped by age, in a cohort of 8,220 men with prostate cancer from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO). Although older men generally have reduced life expectancy predictions, we see that a substantial proportion of older men also have long life expectancy predictions, which cannot be captured by predictions that rely on age alone.

| Age   | Number of Men | 0-5 Years | 5-10 Years | 10-15 Years | 15+ Years |
|-------|---------------|-----------|------------|-------------|-----------|
| 55-64 | 1717          | 0%        | 0.1%       | 3%          | 96.9%     |
| 65-74 | 4802          | 0%        | 4.1%       | 31.3%       | 64.6%     |
| 75-84 | 1668          | 1%        | 40.9%      | 55.9%       | 2.2%      |
| 85+   | 33            | 21.2%     | 78.8%      | 0%          | 0%        |

Figure 5: Number of men receiving a particular treatment in a cohort of 7,596 men in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO), grouped by NCCN prostate cancer risk group and predicted OCCAM life expectancy.

