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.

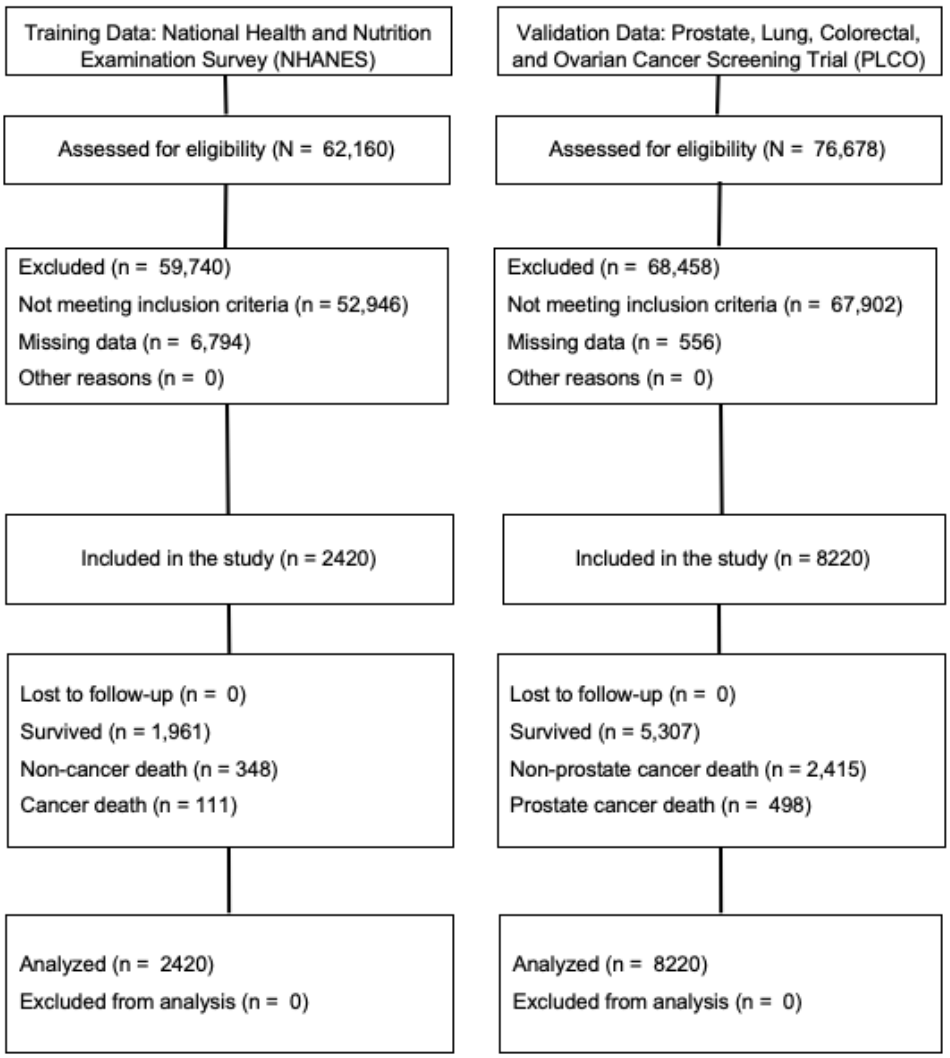

Table 1: Baseline characteristics of National Health and Nutrition Examination Survey (NHANES) training data and Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO) validation data.

	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.

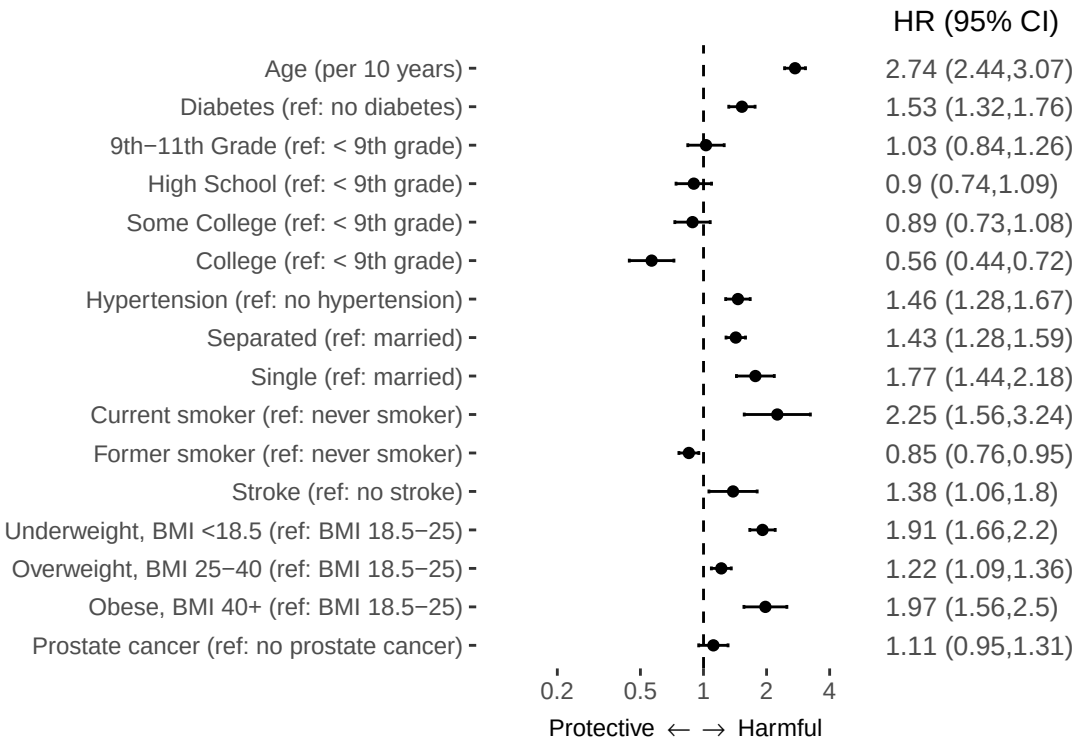

Figure 3: Externally validated time-dependent area-under-the-curves (AUCs) at 5, 10, and 15 years of our other-cause comorbidity-adjusted mortality (OCCAM) model, the Social Security Administration 2001 actuarial life table predictions (SSA), and the National Vital Statistics System's 2001 life expectancy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

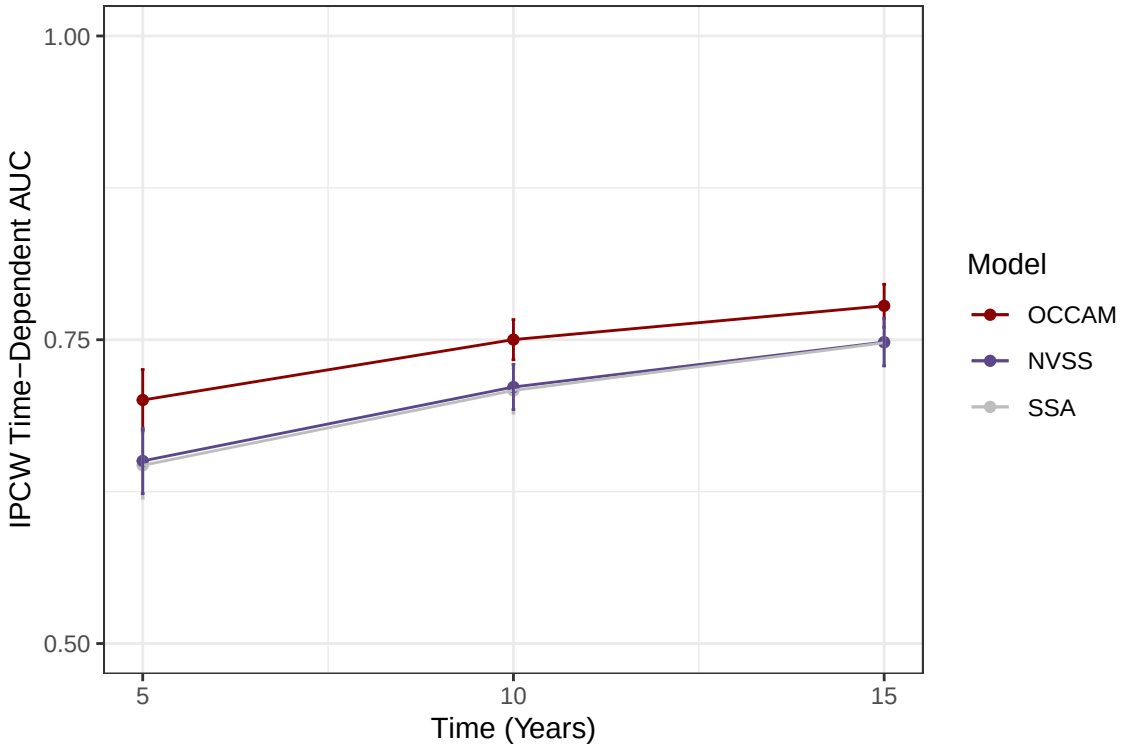

Figure 4: Calibration performance of other-cause comorbidity-adjusted mortality (OCCAM) model and the Social Security Administration's 2001 actuarial life table predictions (SSA) in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO) cohort of 8,220 men with prostate cancer.

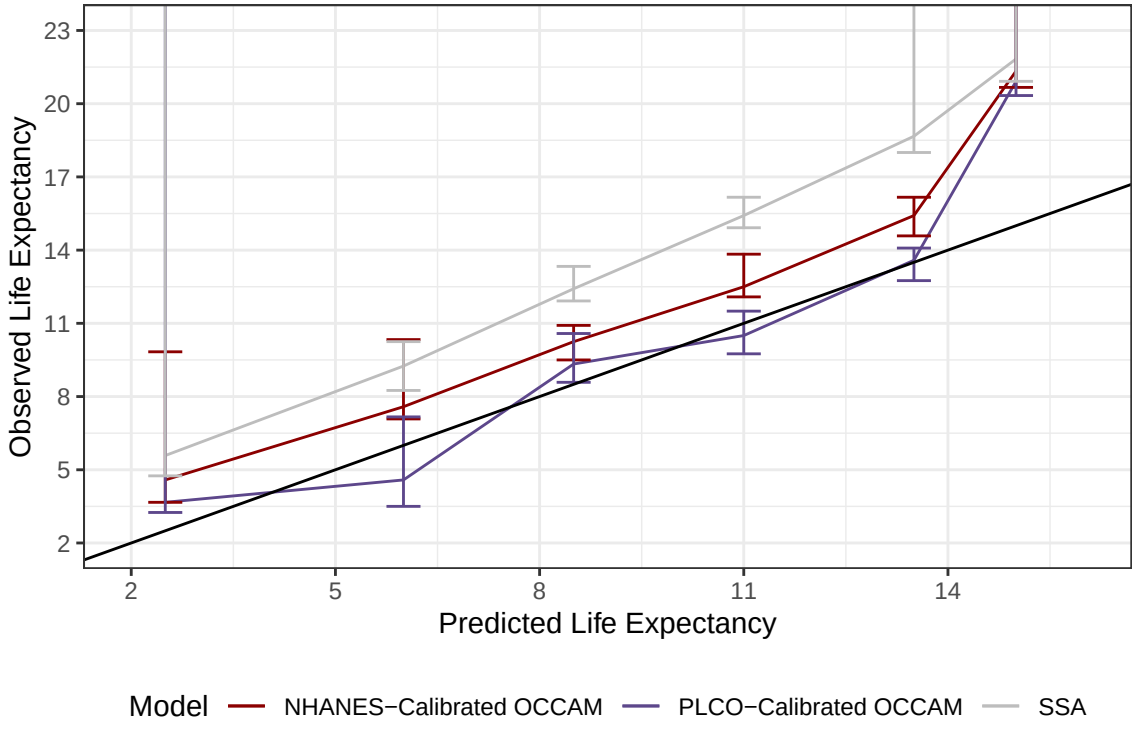

Table 2: Percent of men with OCCAM-predicted median survival of 0-5, 5-10, 10-15, and 15+ years, grouped by age, in a cohort of 8,220 men with prostate cancer from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO). Although older men generally have reduced life expectancy predictions, 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: Proportion 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 median survival prediction.