Supplement

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Variable Definitions

We constructed some of our variables from other NHANES variables. In particular:

1. We defined a patient as having hypertension if they reported a previous diagnosis of hypertension or if their blood pressure reading was hypertensive (we followed standard NHANES guidelines on constructing the blood pressure reading).

2. We defined a patient as having diabetes if they reported a previous diagnosis of diabetes or if their blood glucose met clinical criteria for diabetes.

3. We defined a patient as having high cholesterol if they reported high cholesterol, or if their blood work met clinical criteria for high cholesterol.

4. We defined patients as current smokers if they had smoked 100 cigarettes in their lifetime and reported smoking cigarettes every day or some days at present; we defined patients as former smokers if they had smoked 100 cigarettes in their lifetime and reported smoking not at all at present; we defined patients as never smokers if they had not smoked 100 cigarettes in their lifetime.

5. We defined being overweight as having BMI greater than or equal to 25 and less than 40 and being obese as having BMI greater than or equal to 40.

6. We collapsed marital status into three categories: married if the patient was currently married or living with a partner, separated if the patient was widowed, divorced, or separated from their partner, and single if the patient had never married.

7. We collapsed race into non-Hispanic white, non-Hispanic black, and all other races.

For all other variables, we used unmodified results from the NHANES questionnaires about demographics, health insurance, health care access, mental health, and medical history. For more information on variable definition and construction, please see the repository posted at: https://github.com/elizabethchase/ PCOtherCause.

Supplementary Findings

Supplementary Table 1: Cause-specific and competing-risks time-dependent AUCs of our final OC mortality model in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO) validation cohort of 8,220 men.
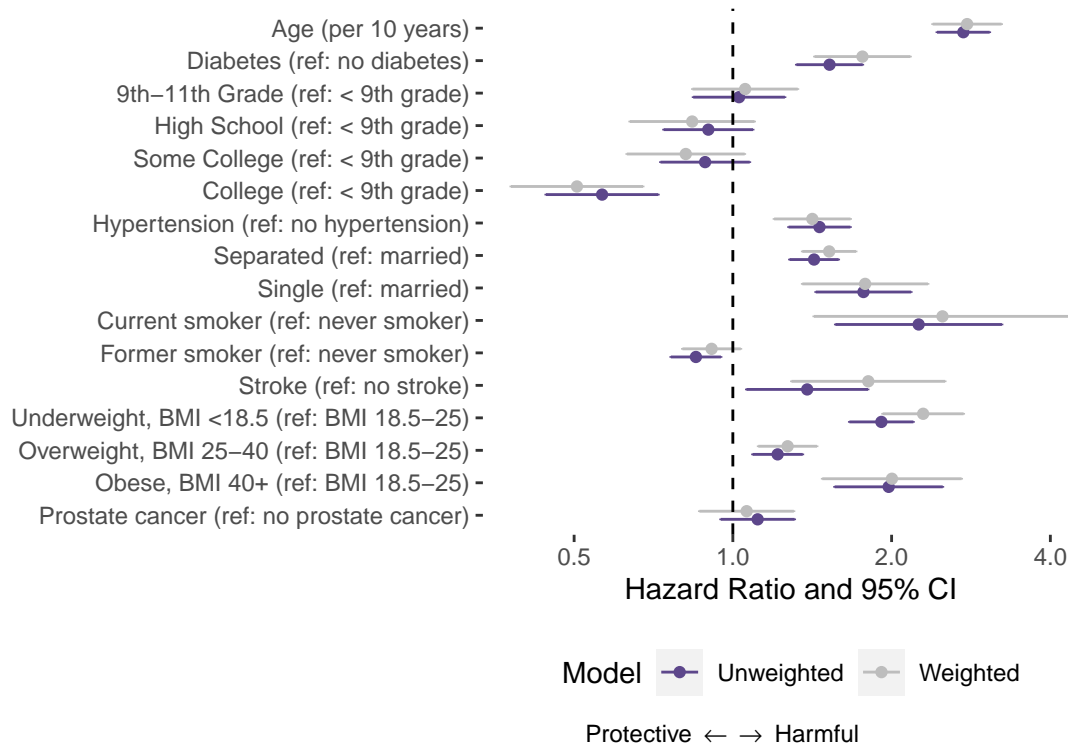
Metric	5 Years	10 Years	15 Years
Cause-Specific AUC	0.7	0.75	0.78
Competing-Risks AUC	0.7	0.74	0.73

Supplementary Table 2: Time-dependent AUC of our final OC mortality model in the three main treatment groups in the Prostate, Lung, Colon, and Ovarian Cancer Screening Trial (PLCO) validation cohort of 8,220 men.

Treatment	Cause-Specific AUC			Competing-Risks AUC		
	5 Years	10 Years	15 Years	5 Years	10 Years	15 Years
Prostatectomy	0.68	0.69	0.72	0.68	0.69	0.71
Radiation alone	0.65	0.71	0.75	0.65	0.70	0.72
Radiation + hormone	0.63	0.71	0.73	0.63	0.70	0.67

Supplementary Figure 1: Forest plot comparing the effect sizes of predictors from the unweighted and survey weighted versions of our final OC mortality prediction model fit in the NHANES training cohort of 7,369 men. The model also includes interactions between age and diabetes, education, hypertension, and stroke.

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## Stratified 1 - level Cluster Sampling design (with replacement)
## With (180) clusters.
## subset(nhanes_svy, inmodel4 == 1)
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Supplementary Table 3: Characteristics of a cohort of 7,596 men from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial, grouped by predicted median survival time from our OC mortality model.

	15+	10-15	5-10	< 5	p	test
n	3458	2799	1307	32		
Age (years) (mean (SD))	65.1 (4.0)	71.4 (3.9)	76.4 (4.3)	80.8 (3.8)	<0.001	
Race (%)					<0.001	
NHB	165 (4.8)	175 (6.3)	97 (7.4)	3 (9.4)		
NHW	3143 (90.9)	2468 (88.2)	1114 (85.2)	26 (81.2)		
Other	150 (4.3)	156 (5.6)	96 (7.3)	3 (9.4)		
Education (%)					<0.001	
Less than 9th grade	31 (0.9)	38 (1.4)	13 (1.0)	3 (9.4)		
9th-11th grade	127 (3.7)	248 (8.9)	106 (8.1)	2 (6.2)		
HS graduate	849 (24.6)	426 (15.2)	115 (8.8)	2 (6.2)		
Some college	675 (19.5)	1041 (37.2)	666 (51.0)	15 (46.9)		
College graduate	1776 (51.4)	1046 (37.4)	407 (31.1)	10 (31.2)		
Marital status (%)					<0.001	
Married	3173 (91.8)	2379 (85.0)	947 (72.5)	11 (34.4)		
Separated	234 (6.8)	350 (12.5)	273 (20.9)	17 (53.1)		
Single	51 (1.5)	70 (2.5)	87 (6.7)	4 (12.5)		
Smoking status (%)					<0.001	
Current	175 (5.1)	262 (9.4)	226 (17.3)	16 (50.0)		
Former	1565 (45.3)	1510 (53.9)	736 (56.3)	12 (37.5)		
Never	1718 (49.7)	1027 (36.7)	345 (26.4)	4 (12.5)		
Diabetes = Yes (%)	101 (2.9)	224 (8.0)	149 (11.4)	3 (9.4)	<0.001	
Hypertension = Yes (%)	846 (24.5)	1112 (39.7)	571 (43.7)	11 (34.4)	<0.001	
Previous stroke = Yes (%)	8 (0.2)	58 (2.1)	101 (7.7)	5 (15.6)	<0.001	
BMI category (%)					<0.001	
Underweight (BMI < 18.5)	2 (0.1)	8 (0.3)	6 (0.5)	4 (12.5)		
Normal weight (BMI 18.5-25)	802 (23.2)	811 (29.0)	517 (39.6)	17 (53.1)		
Overweight (BMI 25-40)	2636 (76.2)	1963 (70.1)	761 (58.2)	9 (28.1)		
Obese (BMI 40+)	18 (0.5)	17 (0.6)	23 (1.8)	2 (6.2)		
N Stage (%)					<0.001	
N0	3067 (88.7)	2389 (85.4)	1099 (84.1)	23 (71.9)		
N1	47 (1.4)	32 (1.1)	15 (1.1)	1 (3.1)		
N2	9 (0.3)	2 (0.1)	0 (0.0)	0 (0.0)		
NX	335 (9.7)	376 (13.4)	193 (14.8)	8 (25.0)		

Supplementary Table 3, cont.: Characteristics of a cohort of 7,596 men from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial, grouped by predicted median survival time from our OC mortality model.

	15+	10-15	5-10	< 5	p	test
n	3458	2799	1307	32		
T Stage (%)					<0.001	
T0	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		
T1-T2a	1619 (46.8)	1813 (64.8)	963 (73.7)	25 (78.1)		
T2b-T2c	1390 (40.2)	727 (26.0)	270 (20.7)	7 (21.9)		
T3a-T4	446 (12.9)	258 (9.2)	73 (5.6)	0 (0.0)		
TX	2 (0.1)	1 (0.0)	1 (0.1)	0 (0.0)		
Gleason (%)					<0.001	
<= 6	2028 (58.6)	1524 (54.4)	604 (46.2)	12 (37.5)		
7	1134 (32.8)	893 (31.9)	451 (34.5)	9 (28.1)		
8	166 (4.8)	223 (8.0)	141 (10.8)	6 (18.8)		
9	116 (3.4)	147 (5.3)	90 (6.9)	4 (12.5)		
10	14 (0.4)	12 (0.4)	21 (1.6)	1 (3.1)		
PSA at diagnosis (mean (SD))	10.7 (88.7)	11.6 (42.5)	17.0 (64.8)	48.2 (133.6)	0.015	
Prostate cancer risk group (%)					<0.001	
Low	906 (26.2)	809 (28.9)	326 (24.9)	3 (9.4)		
Intermediate	794 (23.0)	622 (22.2)	327 (25.0)	5 (15.6)		
High	613 (17.7)	550 (19.6)	296 (22.6)	12 (37.5)		
Regional	56 (1.6)	34 (1.2)	15 (1.1)	1 (3.1)		
NA	1089 (31.5)	784 (28.0)	343 (26.2)	11 (34.4)		
Treatment (%)					<0.001	
Active surveillance	219 (6.3)	352 (12.6)	279 (21.3)	15 (46.9)		
Other ablative treatment	41 (1.2)	73 (2.6)	52 (4.0)	1 (3.1)		
Hormone alone	99 (2.9)	215 (7.7)	224 (17.1)	10 (31.2)		
Radiation alone	627 (18.1)	690 (24.7)	297 (22.7)	2 (6.2)		
Prostatectomy	1973 (57.1)	759 (27.1)	112 (8.6)	0 (0.0)		
Radiation + hormone	499 (14.4)	710 (25.4)	343 (26.2)	4 (12.5)		
Outcome (%)					<0.001	
Alive	2636 (76.2)	1714 (61.2)	619 (47.4)	8 (25.0)		
Died of OC	665 (19.2)	903 (32.3)	592 (45.3)	21 (65.6)		
Died of PC	157 (4.5)	182 (6.5)	96 (7.3)	3 (9.4)		

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