

King, Yoon, Bredl et al.

VACO Index prediction of short-term COVID-19 mortality

**Supplement 4. Characteristics of Patients in VA, YNHH, and Medicare Cohorts**

All	Cohort								
	VA			YNHH			Medicare		
	All	Development	Validation	All	Early	Later	All	Early	Later
Testing dates	2/3/2020 to 19/7/2020	2/3/2020 to 15/4/2020	16/4/2020 to 19/7/2020	2/3/2020 to 19/7/2020	2/3/2020 to 15/4/2020	16/4/2020 to 19/7/2020	2/3/2020 to 19/7/2020	2/3/2020 to 15/4/2020	16/4/2020 to 19/7/2020
N	13,323	3,681	9,642	1,307	625	682	427,224	80,619	346,605
30-day Deaths, N (%)	1,136 (8.5)	480 (13.0)	656 (6.8)	229 (17.5)	104 (16.6)	125 (18.3)	68,493 (16.0)	25,283 (31.4)	43,210 (12.5)
Age, median (IQR)	63.1 (50.0 to 72.8)	64.8 (53.7 to 73.4)	62.3 (48.8 to 72.5)	65 (53 to 79)	66 (54 to 79)	65 (52 to 79)	77.5 (70.9 to 85.7)	77.7 (71.1 to 85.5)	77.5 (70.9 to 85.8)
Categories, N (%)									
20-49	3,326 (25.0)	717 (19.5)	2,609 (27.1)	277 (21.2)	118 (18.9)	159 (23.3)	-	-	-
50-54	1,072 (8.1)	279 (7.6)	793 (8.2)	81 (6.2)	41 (6.6)	40 (5.9)	-	-	-
55-59	1,292 (9.7)	375 (10.2)	917 (9.5)	132 (10.1)	66 (10.6)	66 (9.7)	-	-	-
60-64	1,598 (12.0)	481 (13.1)	1,117 (11.6)	131 (10.0)	65 (10.4)	66 (9.7)	-	-	-
65-69	1,472 (11.1)	433 (11.8)	1,039 (10.8)	128 (9.8)	70 (11.2)	58 (8.5)	89,793 (21.0)	16,517 (20.5)	73,276 (21.1)
70-74	2,119 (15.9)	654 (17.8)	1,465 (15.2)	137 (10.5)	62 (9.9)	75 (11.0)	86,791 (20.3)	16,364 (20.3)	70,427 (20.3)
75-79	1,004 (7.5)	293 (8.0)	711 (7.4)	112 (8.6)	56 (9.0)	56 (8.2)	72,092 (16.9)	13,969 (17.3)	58,123 (16.8)
80-84*	552 (4.1)	171 (5.7)	381 (4.0)	102 (7.8)	49 (7.8)	53 (7.8)	63,053 (14.8)	12,534 (15.6)	50,519 (14.6)
85-89*	491 (3.7)	155 (4.2)	336 (3.5)	104 (8.0)	53 (8.5)	51 (7.5)	44,380 (10.4)	10,521 (13.1)	44,369 (12.8)
90-94*	274 (2.1)	84 (2.3)	190 (2.0)	79 (6.0)	34 (5.4)	45 (6.6)	40,760 (9.5)	7,422 (9.2)	33,338 (9.6)
95-99*	109 (0.8)	367 (1.0)	73 (0.8)	19 (1.5)	10 (1.6)	9 (1.3)	16,879 (4.0)	2,842 (3.5)	14,037 (4.1)
>100*	14 (0.1)	3 (0.1)	11 (0.1)	5 (0.4)	1 (0.2)	4 (0.6)	2,966 (0.7)	450 (0.6)	2,516 (0.7)

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	All	Development	Validation	All	Early	Later	All	Early	Later
Race/Ethnicity†									
Non-Hispanic White	5,148 (38.6)	1,194 (32.4)	3,954 (41.0)	576 (44.1)	276 (44.2)	300 (44.0)	319,652 (74.8)	55,445 (68.8)	264,207 (76.2)
Non-Hispanic Black	5,589 (42.0)	1,896 (51.5)	3,693 (38.3)	406 (31.1)	197 (31.5)	209 (30.7)	61,572 (14.4)	16,293 (20.2)	45,279 (13.1)
Hispanic	1,734 (13.0)	405 (11.0)	1,329 (13.8)	271 (20.7)	126 (20.2)	145 (21.3)	16,132 (3.8)	2,844 (3.5)	13,288 (3.8)
Asian	-	-	-	-	-	-	10,563 (2.5)	2,210 (2.7)	8,353 (2.4)
North Amer. Native	-	-	-	-	-	-	2,836 (0.7)	346 (0.4)	2,490 (0.7)
Other	852 (6.4)	186 (5.1)	666 (6.9)	54 (4.1)	26 (4.2)	28 (4.1)	8,219 (1.9)	1,759 (2.2)	6,460 (1.9)
Male sex	12,114 (90.9)	3,410 (92.6)	8,704 (90.3)	628 (48.1)	319 (51.0)	309 (45.3)	180,907 (42.3)	38,165 (47.3)	142,742 (41.2)
BMI†, kg/m <sup>2</sup> , median (IQR)	30.1 (26.3 to 34.4)	30.0 (26.3 to 34.7)	30.1 (26.3 to 34.4)	29.5 (25.7 to 35.9)	29.6 (26.0 to 36.2)	29.2 (25.3 to 35.3)	-	-	-
Charlson Comorbidities									
AIDS	223 (1.7)	76 (2.1)	147 (1.5)	15 (1.2)	12 (1.9)	3 (0.4)	1,704 (0.4)	446 (0.6)	1,258 (0.4)
Cancer	1,585 (11.9)	505 (13.7)	1,080 (11.2)	118 (9.0)	71 (11.4)	47 (6.9)	61,237 (14.3)	12,819 (15.9)	48,418 (14.0)
Cancer, metastatic	228 (1.6)	73 (2.0)	155 (1.6)	17 (1.3)	11 (1.8)	6 (0.9)	9,058 (2.1)	2,130 (2.6)	6,928 (2.0)
Cerebrovascular accident	1,578 (11.8)	484 (13.1)	1,094 (11.3)	102 (7.8)	46 (7.4)	56 (8.2)	108,306 (25.7)	21,006 (26.1)	87,300 (25.2)
Chronic pulmonary disease	3,022 (22.7)	956 (26.0)	2,066 (21.4)	183 (14.0)	89 (14.2)	94 (13.8)	125,520 (29.4)	25,248 (31.3)	100,272 (34.8)
Congestive heart failure	1,857 (13.9)	587 (15.9)	1,270 (13.2)	165 (12.6)	73 (11.7)	92 (13.5)	109,818 (25.7)	22,891 (33.7)	86,927 (30.2)
Diabetes	4,900 (36.8)	1,485 (40.3)	3,415 (35.4)	253 (19.4)	121 (19.4)	132 (19.4)	173,064 (40.5)	35,810 (44.4)	137,254 (39.6)

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Diabetes with complications	2,813 (21.1)	884 (24.0)	1,929 (20.0)	139 (10.6)	63 (10.1)	76 (11.1)	99,013 (23.2)	20,989 (26.0)	78,024 (22.5)
Dementia	1,337 (10.0)	434 (11.8)	903 (9.4)	133 (10.2)	58 (9.3)	75 (11.0)	133,911 (31.3)	23,918 (29.7)	109,993 (31.7)
Liver disease, mild	1,387 (10.4)	429 (11.7)	958 (9.9)	48 (3.7)	24 (3.8)	24 (3.5)	31,244 (7.3)	6,390 (7.9)	24,854 (7.2)
Liver disease, moderate/severe	140 (1.1)	36 (1.0)	104 (1.1)	5 (0.4)	5 (0.8)	0 (0.0)	3,434 (0.8)	703 (0.9)	2,731 (0.8)
Myocardial infarction	742 (5.6)	219 (5.9)	523 (5.4)	181 (13.9)	81 (13.0)	100 (14.7)	36,938 (8.6)	7,990 (9.9)	28,948 (8.4)
Peptic ulcer disease	218 (1.6)	64 (1.7)	154 (1.6)	22 (1.7)	12 (1.9)	10 (1.5)	10,881 (2.5)	2,055 (2.5)	8,826 (2.5)
Peripheral vascular disease	1,800 (13.5)	572 (15.5)	1,228 (12.7)	87 (6.7)	44 (7.0)	43 (6.3)	166,850 (39.1)	32,660 (40.5)	134,190 (38.7)
Plegia	276 (2.1)	69 (1.9)	207 (2.1)	16 (1.2)	7 (1.1)	9 (1.3)	18,671 (4.4)	3,574 (4.4)	15,097 (4.4)
Renal disease	2,365 (17.8)	770 (20.9)	1,595 (16.5)	162 (12.4)	81 (13.0)	81 (11.9)	111,707 (26.1)	23,488 (29.1)	88,219 (25.5)
Rheumatologic disease	243 (1.8)	79 (2.1)	164 (1.7)	15 (1.2)	12 (1.9)	3 (0.4)	24,187 (5.7)	4,509 (5.6)	19,678 (5.7)
Charlson Comorbidity Index									
0	4,321 (32.4)	970 (26.4)	3,351 (34.8)	618 (47.3)	293 (46.9)	325 (47.7)	70,998 (16.6)	12,615 (15.7)	58,383 (16.8)
1	2,426 (18.2)	693 (18.8)	1,73 (18.0)	214 (16.4)	92 (14.7)	122 (17.9)	54,310 (12.7)	9,303 (11.5)	45,007 (13.0)
2	1,935 (14.5)	557 (15.1)	1,378 (14.3)	151 (11.6)	78 (12.5)	73 (10.7)	58,270 (13.6)	10,030 (12.4)	48,240 (13.9)
3	1,160 (8.7)	347 (9.4)	813 (8.4)	82 (6.3)	35 (5.6)	47 (6.9)	52,981 (12.4)	9,718 (12.1)	43,263 (12.5)
4	980 (7.4)	289 (7.9)	691 (7.2)	86 (6.6)	42 (6.7)	44 (6.5)	44,791 (10.5)	8,263 (10.3)	36,528 (10.5)

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5	681 (5.1)	228 (6.2)	453 (4.7)	50 (3.8)	25 (4.0)	25 (3.7)	37,694 (8.8)	7,318 (9.1)	30,376 (8.8)
6	580 (4.4)	184 (5.0)	396 (4.1)	33 (2.5)	19 (3.0)	14 (2.1)	29,489 (6.9)	5,871 (7.3)	23,618 (6.8)
7	492 (3.7)	164 (4.5)	328 (3.4)	36 (2.8)	18 (2.9)	18 (2.6)	23,724 (5.6)	5,023 (6.2)	18,701 (5.4)
8	304 (2.3)	94 (2.6)	210 (2.2)	16 (1.2)	10 (1.6)	6 (0.9)	18,413 (4.3)	3,966 (4.9)	14,447 (4.2)
9	186 (1.4)	60 (1.6)	126 (1.3)	10 (0.8)	6 (1.0)	4 (0.6)	13,433 (3.1)	3,026 (3.8)	10,407 (3.0)
≥10	258 (1.9)	95 (2.6)	163 (1.7)	11 (0.8)	7 (1.1)	4 (0.6)	23,121 (5.4)	5,486 (6.8)	17,635 (5.1)

\* More granular age categories than in original VACO Index

† Not included in original VACO Index

Abbreviations: IQR = interquartile range, AIDS = acquired immunodeficiency syndrome, VA = Veterans Health Administration, YNHH = Yale New Haven Hospital