

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eMethods: Search strategy

In PubMed, we searched for studies on the effect/association between the selected risk factors and ADRD risk using the following keywords or their synonyms (“physical inactivity”, “smoking”, “depression”, “low education”, “diabetes”, “obesity”, and “hypertension”) AND (“Alzheimer”, “dementia”, “cognitive decline”).

eTable 1: Variables, questions and values in the 2018 BRFSS

Variables	Question	Value
Older-than-65-year	<i>Calculated age group from self-reported age in years</i>	1= greater or equal to 65, 0=less than 65
Male sex	<i>"What is your sex? or What was your sex at birth?"</i>	1=Male, 0=Female
Race/ethnicity	Calculated variable from respondent's reported race as well as their reported ethnicity	Non-Hispanic White =1, Non-Hispanic Black =2, Non-Hispanic Asian=3, Non-Hispanic Native American/Alaska Native =4, Hispanic=5, Other=6
Physical inactivity	<i>"During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"</i>	1=physically active 0= physically inactive
Depression	<i>"Has a doctor, nurse, or other health professional ever told you that you had depressive disorder (including depression, major depression, dysthymia, or minor depression) "</i>	1=Yes 0=No
Current smoking	Calculated variable using two questions "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?". Respondents who reported having smoked at least 100 cigarettes in their lifetime and now smoke every day were classified as currently smoking (Yes) otherwise they were classified as not currently smoking (No)	1=Yes 0=No
Midlife obesity	Calculated variable in age 40-64 using body mass index (BMI) ≥ 30 based on reported weight and height, (weight in kg / height in m ²)	1=Yes 0=No
Low educational attainment	<i>"What is the highest grade or year of school you completed?"</i> Respondent who reported never attended school or only kindergarten, attended only grades 1 through 8 or attended grade 9 through 11 were classified as "did not graduate high	1 = did not graduate high school and 0 = otherwise

	school” (Yes) otherwise they were classified as graduated from high school (No)	
Diabetes	“Has a doctor, nurse, or other health professional ever told you that you had diabetes (excluding Type I diabetes and diabetes during pregnancy)”	1=Yes 0=No
Hearing loss	“Are you deaf or do you have serious difficulty hearing?”	1=Yes 0=No
Midlife hypertension	Assessed in age 40-64 using the question “Have you ever been told by a doctor, nurse or other health professional that you have high blood pressure (excluding told only during pregnancy)?”	1=Yes 0=No

eTable 2: Sex- and race/ethnicity-specific uniqueness for each modifiable risk factor using the 2018 BRFSS, U.S.

Risk factor	Over- all	Females	Males	Asians	Blacks	Hispanics	Native Americans/ Alaska Natives	Whites
Midlife hypertension*	22.1%	22.7%	21.4%	18.8%	21.0%	18.1%	19.9%	21.9%
Diabetes	43.2%	42.4%	44.4%	30.6%	43.1%	37.7%	37.2%	45.7%
Current smoking	46.9%	39.2%	53.0%	41.2%	49.5%	42.5%	43.2%	44.7%
Midlife obesity	66.2%	48.6%	64.9%	51.1%	58.4%	66.2%	48.1%	46.0%
Physical inactivity	67.5%	68.0%	65.4%	56.4%	82.5%	41.0%	42.0%	65.1%
Low education	70.8%	44.8%	63.5%	36.9%	64.1%	40.6%	72.5%	51.2%
Depression	74.1%	41.8%	80.7%	41.6%	71.7%	48.3%	64.5%	49.9%
Hearing loss	86.7%	66.4%	84.5%	23.8%	83.6%	80.4%	33.9%	44.8%

*Midlife hypertension correlation data with other risk factors was obtained from imputing midlife hypertension within the 2018 BRFSS.

eTable 3: Unadjusted and combined Population Attributable Risk (PAR) for 8 Modifiable dementia risk factors by sex, 2018, U.S.

Risk factor	Population Attributable Risk % (95% CI)	
	Females	Males
Hearing loss	1.8% (1.7,1.9)	2.8% (2.7,2.9)
Current smoking	5.3% (5.2,5.5)	6.8% (6.6,6.9)
Midlife hypertension	8.0% (7.9,8.1)	9.6% (9.5,9.8)
Diabetes	7.1% (6.9,7.2)	7.5% (7.3,7.7)
Depression	10.5% (10.4,10.7)	6.4% (6.2,6.5)
Low education	11.2% (10.9,11.5)	12.3% (11.9,12.6)
Physical inactivity	12.8% (12.7,13.0)	10.7% (10.5,10.9)
Midlife obesity	17.5% (17.2,17.8)	18.0% (17.7,18.2)
Combined PAR	30.1% (29.6,30.6)	35.9% (35.3,36.5)

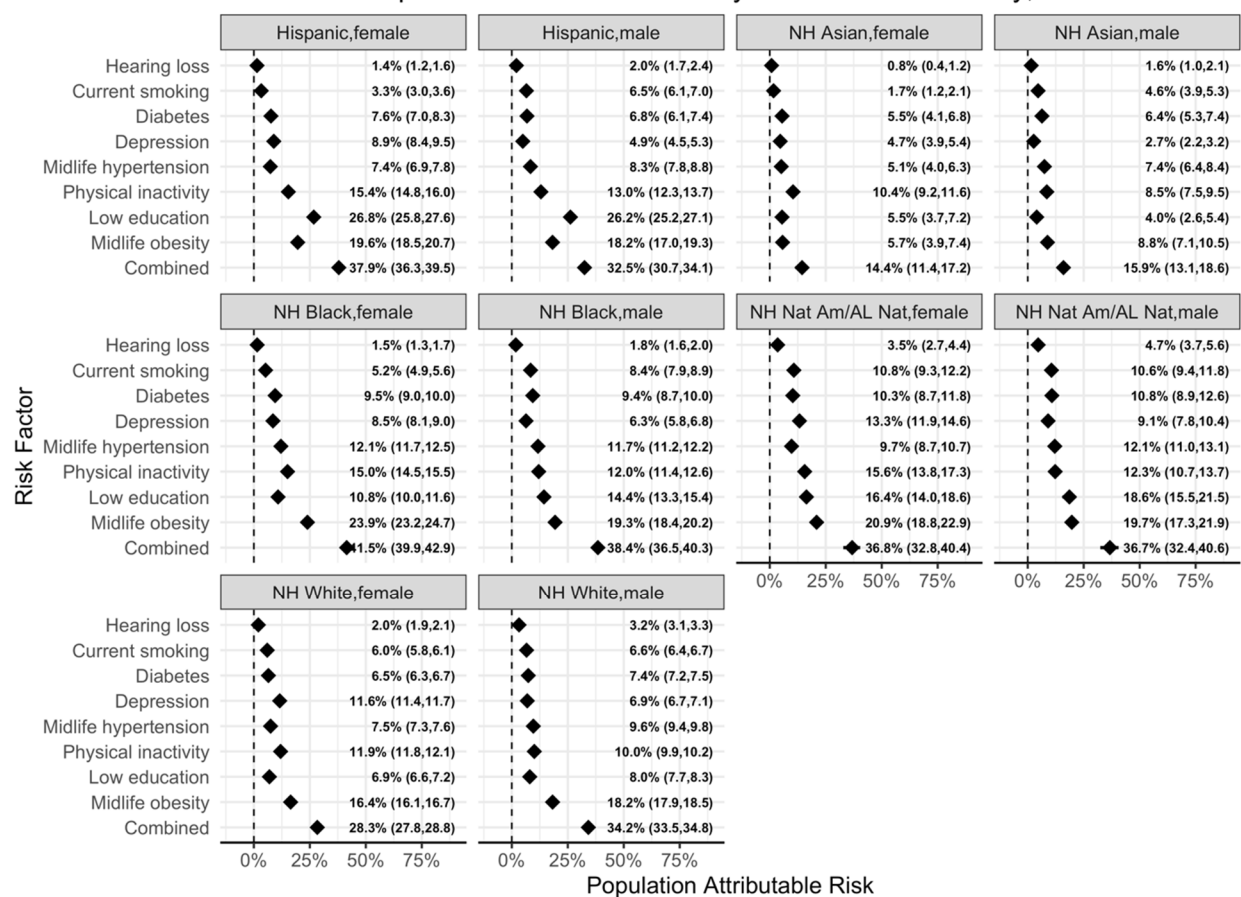
PAR: Population Attributable Risk

eTable 4: Unadjusted and combined Population Attributable Risk (PAR) for 8 Modifiable dementia risk factors by race/ethnicity, 2018, U.S.

Risk factor	Population Attributable Risk % (95% CI)				
	Asians	Blacks	Hispanics	Native Americans/ Alaska Natives	Whites
Hearing loss	1.2% (0.8,1.5)	1.6% (1.5,1.8)	1.7% (1.5,1.9)	4.1% (3.5,4.7)	2.6% (2.5,2.7)
Current smoking	3.2% (2.7,3.6)	6.7% (6.4,7.0)	4.9% (4.6,5.2)	10.7% (9.7,11.6)	6.3% (6.2,6.4)
Midlife hypertension	6.3% (5.5,7.1)	11.9% (11.6, 12.2)	7.8% (7.5,8.2)	11.0% (10.2,11.7)	8.5% (8.4,8.6)
Diabetes	5.9% (5.1,6.8)	9.4% (9.0,9.8)	7.2% (6.7,7.7)	10.5% (9.3,11.7)	6.9% (6.8,7.0)
Depression	3.7% (3.2,4.1)	7.5% (7.2,7.9)	6.9% (6.6,7.3)	11.3% (10.3,12.2)	9.3% (9.2,9.5)
Low education	4.7% (3.6,5.8)	12.5% (11.8,13.1)	26.5% (25.8,27.1)	17.5% (15.6,19.3)	7.5% (7.3,7.7)
Physical inactivity	9.5% (8.7,10.3)	13.7% (13.3,14.1)	14.2% (13.8,14.7)	14.0% (12.8,15.1)	11.0% (10.9,11.2)
Midlife obesity	7.4% (6.1,8.6)	21.7% (21.1,22.3)	18.8% (18.0,19.6)	20.3% (18.7,21.8)	17.3% (17.1,17.5)
Combined PAR	15.8% (13.8,17.8)	39.8% (38.6,41.0)	34.2% (33.0,35.3)	39.2% (36.1,42.0)	28.5% (28.1,28.9)

PAR: Population Attributable Risk

Population Attributable Risk by sex and race/ethnicity, U.S.



eFigure 1: Unadjusted and combined Population Attributable Risk (PAR) for 8 Modifiable dementia risk factors by sex and race/ethnicity, 2018, U.S.

NH: Non-Hispanic; Nat Am: Native Americans; AL Nat: Alaska Natives