Online Appendix

Development of the ARPS

The Alcohol-Related Problems Survey (ARPS) and its scoring algorithm informed the estimation of alcohol-related health risk in the study sample. To develop the algorithm, Fink and colleagues (1) convened experts to identify alcohol consumption patterns that would be Healthwise (non-hazardous or even beneficial), Hazardous, and Harmful (i.e., already showing some adverse effect on an older adult's health by virtue of the presence of a particular diagnosis, symptom, or functional problem). Agreeing that risk appraisal requires information on individual health characteristics, not just consumption quantity, and following the RAND/UCLA Appropriateness Method,(2) panelists used the best available evidence and expert judgment to classify the level of risk posed by different patterns of alcohol consumption in the context of specific medical problems, symptoms, medications, functional limitations, and combinations of these – currently a total of 63 factors. The Appropriateness Method is designed to avoid clinically conservative judgments and over-emphasis on unusual circumstances. For each pattern, panelists were instructed to consider a 'typical' patient.

Individuals identified as having, or being at risk for, an alcohol use disorder using tools, such as the Alcohol Use Disorders Identification Test (AUDIT) (3-5) and Cut down, Annoyed, Guilty, Eye-opener (CAGE),(6) are identified by the ARPS, but the ARPS additionally identifies patients whose alcohol use poses a risk to their health but who are not identified by other instruments.

The ARPS has been updated several times as scientific evidence and medication use have changed. The present study is based on the most recent (2011) ARPS update, which considers

63 factors in determining the individual's risk classification. In addition, the ARPS has been modified and used extensively by other research groups.(7-11)

Psychometric properties and concurrent validation of the ARPS classification

ARPS vs. Physician Classification

A body of evidence exists on the psychometric properties of the ARPS risk classification.(12-15) The ARPS has been validated against physician classification of the same patients' risk, when the physician was provided with comprehensive information about their medical history and current physical examination results. (12, 13) In 22 non-abstinent adults aged ≥ 65 years, the ARPS was compared with risk classification by two physicians who were informed regarding the effects of alcohol in older adults and who had, for each patient, the results of a structured review of the patient's medical record, a timeline follow-back of their alcohol consumption, and responses to an interview with a collateral informant about the individual's alcohol consumption. The physician personally conducted (or observed the other physician conduct) a structured medical history and a comprehensive physical examination.(13) Physician agreement on risk classification was strong (wtd. kappa=0.79). The ARPS' sensitivity (82%, 95% CI: 65-99%) and specificity (82%, 95% CI: 65-99%) for detecting risky alcohol use, as determined by the criterion physician classification, were both high.

In a second study, risk classifications of 166 older adults were compared with risk classification by one physician (with a review and consensus process for disagreements).(12) ARPS' sensitivity and specificity against that criterion were 93% (95% CI: 88-98%) and 66% (95% CI: 56-77%), respectively – lower than with two physician raters but comparable to other alcohol abuse screening measures.(16, 17) In addition, in a sub-sample of 32 participants re-administered the ARPS an average of 5.5 days later, the agreement was 91%.(12).

ARPS vs. Alcohol Use Disorder screening instruments

ARPS risk classification was also compared with positive findings on the AUDIT and CAGE screening instruments. In a study in 574 older current drinkers,(14,18) the ARPS correctly classified as Hazardous/ Harmful drinkers, 100% of those who screened positive on AUDIT and 91% who scored positive on CAGE. Importantly, the majority of older drinkers identified as Hazardous/Harmful drinkers did *not* screen positive on AUDIT or CAGE.

In 667 participants in a controlled trial of an ARPs screening and intervention trial in three large medical group practices in Santa Monica, CA.,(14,18) baseline alcohol use was Hazardous in 16.2% and Harmful in 29.1% of those who drank alcohol. The percentage who drank in excess of NIAAA-recommended limits for males and females ≥65 years, however, was only 3.9%. Physician acceptance of the risk reports on their patients in the Santa Monica study was very high, suggesting that the risk classification had strong face validity. Comparable acceptance has been observed wherever the ARPS and its risk reports have been used in the US, France, and Australia.

Predictive validity

Strong evidence exists that alcohol consumption, in the context of the specific conditions incorporated in the risk algorithm, leads to adverse events and poor outcomes. However, no study has yet been undertaken to determine the predictive relation between the ARPS' overall risk classification and future health status.

Application of the ARPS risk classification algorithm to NHANES data

The vast majority of information extracted from NHANES came from the household and medical examination questionnaires (**Appendix Table 1**). Additionally, we used NHANES laboratory data to establish whether an individual had a history of hepatitis – one of the 63

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factors in the ARPS scoring algorithm. NHANES collected blood samples for laboratory testing, which arguably provides a more valid and reliable means of establishing an individual's status with regard to hepatitis virus infection than does patient recall on the ARPS questionnaire. In this analysis, positivity on any serum hepatitis B, C, or D core anti-body test was interpreted as having had hepatitis, which indicates a condition in which alcohol use constitutes a health risk. Information on the presence of hepatitis A anti-body in serum (available for the 2005-2006 but not the 2007-2008 cycle), was not used in the present study because the ARPS does not consider hepatitis A status in its risk classification.

As noted in the manuscript, NHANES 2005-2006 lacked questions on the existence of a doctor diagnosis of five medical conditions about which respondents are queried on the ARPS. As a result of the addition of a question on gout, NHANES 2007-2008 lacked questions on only four of these conditions. However, NHANES has data on all current prescription medications the individual is using, and for the conditions in question, the classes of medication used are sufficiently specific to these conditions that it is appropriate to use a prescription of the medication as a proxy for the condition or diagnosis (e.g., a prescription of cholinesterase inhibitors or miscellaneous CNS agents in the case of memory or dementing illnesses, or anti-gout agents as a proxy for gout).

All of these decisions regarding the 14 NHANES items that were similar, but not identical, to the ARPS items and all five instances in which the existence of a medical problem was inferred from medication use, were reviewed by the chair of the original ARPS expert panel (JCB), who confirmed that the inferences were appropriate and that any differences between the NHANES information and the information provided by the ARPS were not clinically important as a basis for assessing alcohol-related health risk.

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Sensitivity analyses

Clinical information on 16 diagnoses, symptoms and functional limitations that were considered in the ARPS classification of alcohol-related health risk was not available in NHANES 2005-2008, either directly or by proxy. The ARPS is designed to identify factors that, depending on the pattern of alcohol consumption, may increase the potential risk of adverse health events. Consequently, the absence of information on ARPS factors would be expected to lead to an overestimate of the prevalence of Healthwise drinking and an underestimate of the prevalence of more risky drinking, but the extent of these effects would be dependent on the nature of the factors – their population prevalence and how sensitive the risk classification on each factor – is to the quantity and frequency of alcohol consumption, as well as the extent to which risk on an unavailable factor was associated with risk on a factor available in NHANES.

To estimate the extent of the potential misclassification, we conducted a sensitivity analysis using baseline data from Fink et al.'s 2000 Santa Monica trial in 667 primary care patients who reported currently consuming alcohol.(1) At the time of the trial, the ARPS algorithm consisted of 59 factors and did not collect information on four factors currently collected as part of the current 63-factor algorithm - history of colorectal cancer, and current use of muscle relaxants, statins or medications for bladder control problems. For our sensitivity analyses, therefore, we compared the proportions of Healthwise, Hazardous, and Harmful drinkers estimated from the 59-factor algorithm, to proportions generated from a 43-item algorithm used in the NHANES analysis (the 47-factor algorithm minus information on 4 factors).

The 59-item algorithm classified the drinking of 49.6%, 19.3%, and 31.0% of trial participants as Healthwise, Hazardous, and Harmful, respectively. The 43-item algorithm (for

which information is available for participants in both the Santa Monica trial and in NHANES 2005-2008), yielded proportions of 52.5%, 20.7%, and 26.8%, respectively in the Santa Monica sample (**Appendix Figure 1A**). Having information on the 16 additional items resulted in a 2.9 percentage point <u>decrease</u> in the estimated proportion of Healthwise drinkers, a 1.4 percentage point <u>decrease</u> in the proportions of Hazardous drinkers, and a 4.2 percentage point <u>increase</u> in the proportion of the patients with Harmful drinking (Appendix **Figure 1A**) – relatively small changes and in the expected directions.

When the NHANES 47-factor estimates presented in this report are proportionally adjusted for the impact of the 16 factors missing from NHANES, based on the observed differences between the 43-factor and 59-factor results in the Santa Monica sample, the adjusted estimated rates of Healthwise, Hazardous, and Harmful alcohol use of 46.7%, 15.9%, and 37.4%, respectively, become 44.1%, 14.8%, and 43.3%, respectively (**Appendix Figure 1B**). The adjustments decrease the estimated prevalence of Healthwise and Hazardous drinking (by 2.6 and 1.1 percentage points, respectively), and increase the estimated prevalence of Harmful drinking by 5.9 percentage points. These adjusted estimates consider the effects of all 63 factors (43 + 4 + 16) included in the most recent (63-factor) ARPS algorithm.

Note: The NHANES 63-factor estimates in **Appendix Figure 1B** also include the effects of the four most recently added factors (47-factor algorithm). Prevalence estimate for the NHANES sample based on the 47-factor algorithm did not differ appreciably from estimates based only on the earlier 43 factors (data not shown).

Alcohol consumption patterns associated with the most prevalent ARPS factors among at-risk older drinkers

Thirteen ARPS factors were prevalent in at least 10% of the older adult drinkers classified as having either Hazardous or Harmful alcohol consumption. For each of those factors, the 13 tables in **Appendix Figure 2** show the range of alcohol consumption the ARPS expert panel deemed to constitute *healthwise, hazardous, and harmful* consumption. It is evident that the ARPS algorithm considers the effects of a given quantity and frequency of alcohol use to be quite different in relation to different diagnoses, medications, symptoms, functional limitations, and other health risk behaviors.

Sub-group differences in prevalence

Overall, male drinkers had more than twice the adjusted odds of having Hazardous/Harmful alcohol consumption compared to female drinkers (**Appendix Figure 3A**).

Black drinkers had 1.5 times the odds of white drinkers of having Hazardous/harmful alcohol consumption compared to white drinkers (**Appendix Figure 3A**), and among those with Hazardous/Harmful consumption, black drinkers had 1.83 times the adjusted odds of having Harmful consumption **(Appendix Figure 3B**).

The pattern of Hazardous and Harmful consumption was similar across age groups (**Appendix Figure 4**), and there were no significant age group differences in the odds of either Hazardous/Harmful or Harmful consumption (**Appendix Figures 3A-3B)**.

<u>**Race-sex sub-group differences**</u>. The proportion classified as having Hazardous/Harmful alcohol consumption ranged from 44.0% among white female drinkers to 69.3% among black male drinkers (**Appendix Figure 5**). Among those classified as having

Hazardous/Harmful consumption, no race-sex subgroup had significantly increased odds of

having Harmful consumption, relative to white male drinkers (**Appendix Figure 6**).

Appendix Table 1. Availability of factors considered by ARPS in the 2005-2008 NHANES.

	Health status indicators considered by ARPS	Availability in NHANES 2005-2008
1	History of hypertension	Yes
2	History of congestive heart failure	Yes
3	History of diabetes	Yes
4	History of osteoporosis	Yes
5	History of cirrhosis or another liver condition	Yes
6	History of cancer of the mouth or throat	Yes
7	History of breast cancer	Yes
8	History of gout*	Yes
9	History of colorectal cancer	Yes
11	Sedatives or sleeping medication use - At Least Once a Week	Yes
12	Tranquilizer or anti-anxiety medication use - At Least Once a Week	Yes
13	Narcotics use - At Least Once a Week	Yes
14	Muscle relaxant use - At Least Once a Week	Yes
10	Aspirin use – Daily or Almost Everyday use	Yes
15	Ulcer and stomach medications use– Daily or Almost Everyday	Yes
16	Arthritis and pain medication use – Daily or Almost Everyday	Yes
17	Diabetes medication use – Daily or Almost Everyday	Yes
18	Blood pressure medication use – Daily or Almost Everyday	Yes
19	Nitrates use – Daily or Almost Everyday	Yes
20	Other cardiac medication use – Daily or Almost Everyday	Yes
21	Coumadin (warfarin) use – Daily or Almost Everyday	Yes
22	Seizure medication use – Daily or Almost Everyday	Yes
23	Anti-Depressant use – Daily or Almost Everyday	Yes
24	Non-sedating/drowsy antihistamine use – Daily or Almost Everyday	Yes
25	Sedating, sleep-inducing antihistamine use – Daily or Almost Everyday	Yes
26	Cholesterol lowering medication use – Daily or Almost Everyday	Yes
27	Bladder control problem medication use– Daily or Almost Everyday	Yes
28	Frequency of alcohol consumption in the past year	Yes
28	Number of alcoholic drinks on days you drank in past year	Yes
29	Physical limitation in climbing one flight of stairs	Yes
30	Current tobacco use and hypertension	Yes
31	Current tobacco use and mouth/throat cancer	Yes
32	Problems sleeping in past year	Yes
33	Vomiting in past year	Yes
34	Diarrhea in past year	Yes
35	Memory problems in past year	Yes
36	Feeling depressed in past year	Yes
37	Problems with bladder control in past year	Yes
38	Number of different medications taken Daily or Almost daily	Yes

	Health status indicators considered by ARPS	Availability in NHANES 2005-2008
39	Females: How often consumed ≥3 alcoholic drinks at a sitting in past year	Yes
40	Males: How often consumed ≥4 alcoholic drinks at a sitting in past year	Yes
41	Physical limitation in walking one block	Yes
42	Physical limitation in bathing or dressing yourself	Yes
43	Hepatitis in past year	Yes
44	Current tobacco use	Yes
45	History of memory disorder or dementing illness	Yes
45	GI ulcer in the past year	Yes
46	Depression, anxiety or another mental health problem in past year	Yes
47	Current tobacco use and GI ulcer	Yes
48	Failure to do something you were supposed to do because of your alcohol use in the past year	No
49	Unable to stop drinking once you started in past year	No
50	Felt guilty or sorry because of alcohol use in past year	No
51	Number of days driving within 2 hours of having 3+ drinks in past year	No
52	Drinking, driving, and medication use in the past year	No
53	Concerned about your drinking in past year	No
54	Gastritis in past year (and presence of GI symptoms)	No
55	Pancreatitis in past year	No
56	Current tobacco use and gastritis symptoms	No
57	Current tobacco use and pancreatitis	No
58	Stomach pains in past year	No
59	Heartburn in past year	No
60	Nausea in past year	No
61	Nervousness in past year	No
62	Tripping or bumping into things in past year	No
63	Falling in past year	No

|	
Yes	Identical or essentially identical information available
Yes	Similarly‡ worded information available
Yes	Proxy† information available
No	No information in NHANES

*Identifying people with gout: the 2005-2006 NHANES did not ask participants if they had ever

been told they had gout so taking an anti-gout medication was used as proxy. The 2007-2008

NHANES did ask patients explicitly about their gout history. In that cycle, we included both

those who reported having been told they had gout and those who were taking an anti-gout medication.

† "Proxy" means no question was asked that paralleled an ARPS question about a specific medical diagnosis, in which case taking a relevant class of prescription medications was used to infer a diagnosis. This was only done in instances where the medications were not used (e.g., off-label) for conditions other than for the diagnosis in question.

‡ **"Similarly"** worded means that a question was asked that paralleled an ARPS question, but that it used a different reference point – i.e., walking 1 block vs. walking ¼ mile; climbing a flight of stairs vs. climbing 10 steps.

Appendix Figure 1A. Proportion of individuals with Healthwise, Hazardous, and Harmful alcohol consumption in the ARPS Santa Monica clinical trial sample (n=667 adults aged 65 and older, who drank alcohol) based upon a 43-factor algorithm that excludes those factors not available in NHANES 2005-2008 and upon the 59-factor ARPS algorithm.
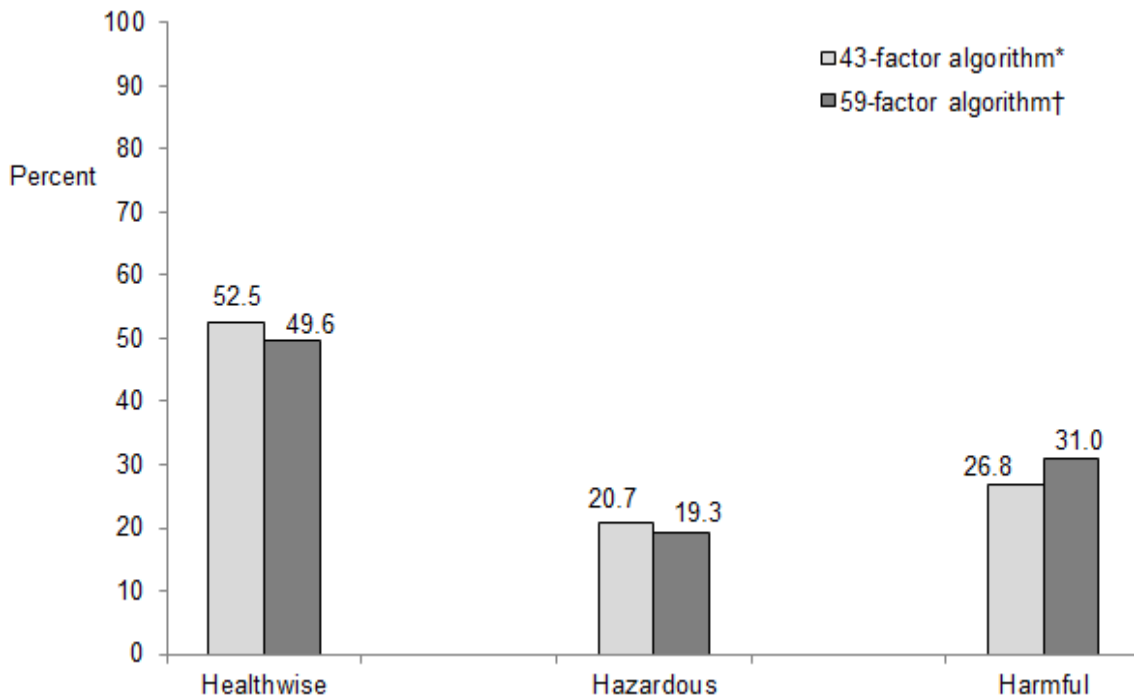
[*] The 43-factor algorithm does not include the 16 factors not available in NHANES (see **Appendix Table 1**) nor does it include the four factors missing from the algorithm used in the Santa Monica trial that were subsequently added (history of colorectal cancer, current use of muscle relaxants, of statins, and of bladder control medications).
[†]The 59-factor algorithm used in the Santa Monica trial does not include information about the four subsequently added factors.

Appendix Figure 1B. Estimated prevalence of Healthwise, Hazardous, and Harmful alcohol consumption in the 2005-2008 US population 65 years and older, using the 47-factor algorithm with information available in NHANES 2005-2008, and the adjusted proportion of Healthwise, Hazardous, and Harmful alcohol consumption to reflect results from a 63-factor algorithm, among adults aged 65 and older who drink alcohol (N=16,771,716), based on NHANES 2005-2008.*
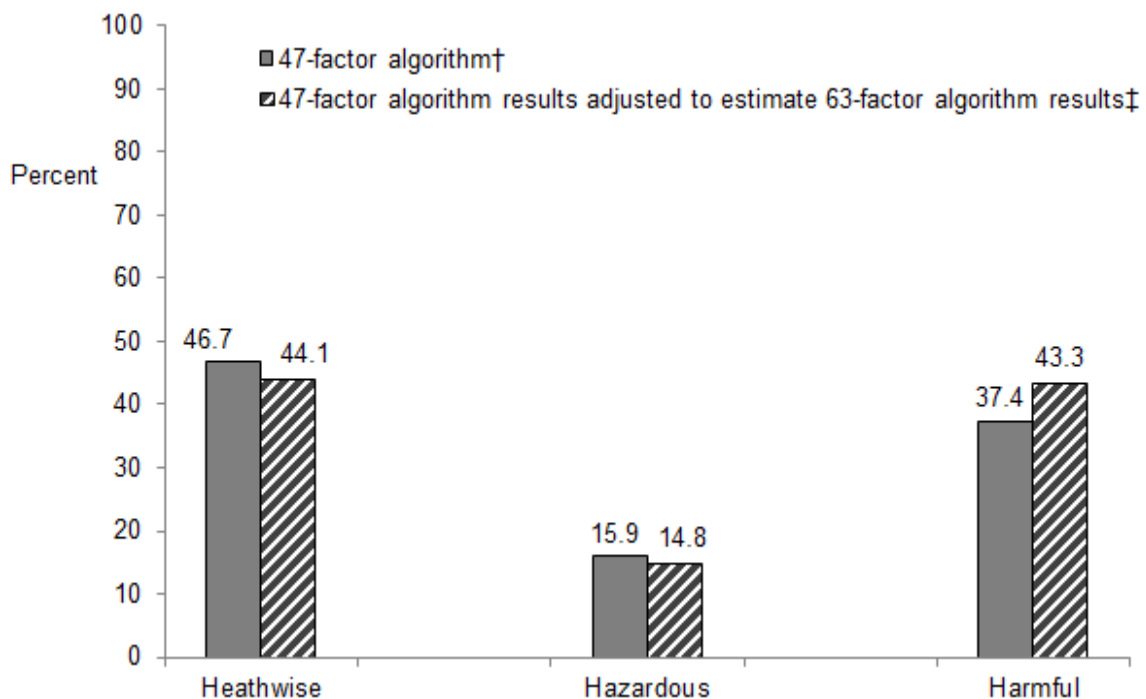
*Based on NHANES 2005-2008 unweighted sample size of n=1083 adults ≥65 years old who drink alcohol.

†The 47-factor algorithm includes 43 factors in common between NHANES and the Santa Monica trial and also four items added after the Santa Monica study (history of colorectal cancer, and current use of muscle relaxants, of statins, and of bladder control medications – items for which information is available in NHANES;

‡ The 63-factor algorithm prevalence estimates shown are based on the estimates obtained using the 47-factor algorithm adjusted to reflect the current 63-factor ARPS algorithm. The adjustment

was done by multiplying these values by the proportional changes in prevalence observed in the Santa Monica trial sample going from a 43-factor algorithm to a 59-factor algorithm (i.e. after adding the additional 16 items not included in NHANES 2005-2008). For example, the adjusted estimate of the % of Harmful drinkers = 37.4% * (31.0%/26.8%)=43.3%. In other words, had information in NHANES been available for the missing 16 factors, the estimated proportion of older drinkers with Harmful drinking (43.3%) would be approximately four percentage points higher than the proportion observed using the 47-factor algorithm (37.4%).

Appendix Figure 2. Alcohol consumption patterns that define *healthwise, hazardous, and harmful* consumption on those ARPS factors most prevalent among older drinkers whose consumption was classified, overall, as Hazardous/Harmful. (Percentages in parentheses indicate the factor's prevalence among those with Hazardous/Harmful consumption.)

LEGEND

harmful - **BLACK**
hazardous - **TAN**
healthwise - **WHITE**

1. Use of prescription anti-hypertensive medication (51.1%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				TAN	TAN	TAN
Two to four times per month			TAN	TAN	TAN	TAN
Two to three times per week			TAN	TAN	TAN	TAN
Four or more times per week		TAN	TAN	TAN	TAN	TAN
Daily or almost daily		TAN	TAN	TAN	TAN	TAN

2. Recent feelings of depression and anxiety (25.7%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				TAN	TAN	TAN
Two to four times per month			TAN	TAN	TAN	TAN
Two to three times per week	TAN	TAN	BLACK	BLACK	BLACK	BLACK
Four or more times per week	TAN	TAN	BLACK	BLACK	BLACK	BLACK
Daily or almost daily	TAN	TAN	BLACK	BLACK	BLACK	BLACK

3. Being physically limited to varying degrees in dressing/bathing him/herself (25.5%*)

3a. Being physically limited A LITTLE in dressing/bathing him/herself

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				▨	▨	▨
Two to four times per month			▨	▨	▨	▨
Two to three times per week		▨	▨	▨	█	█
Four or more times per week	▨	▨	▨	█	█	█
Daily or almost daily	▨	▨	▨	█	█	█

3b. Being physically limited A LOT in dressing/bathing him/herself

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month			▨	█	█	█
Two to four times per month	▨	▨	█	█	█	█
Two to three times per week	▨	█	█	█	█	█
Four or more times per week	█	█	█	█	█	█
Daily or almost daily	█	█	█	█	█	█

4. Quantity and frequency of alcohol consumption (25.1%*)

4a. Quantity and frequency of alcohol consumption for males

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month						▨
Two to four times per month					▨	▨
Two to three times per week				▨	▨	▨
Four or more times per week				▨	▨	▨
Daily or almost daily				▨	▨	▨

4b. Quantity and frequency of alcohol consumption for females

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month					░	░
Two to four times per month				░	░	░
Two to three times per week				░	░	░
Four or more times per week			░	░	░	░
Daily or almost daily			░	░	░	░

5. Hypertension (22.9%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month					░	░
Two to four times per month				░	░	░
Two to three times per week				░	█	█
Four or more times per week			░	█	█	█
Daily or almost daily			░	█	█	█

6. Current prescription statin use (21.6%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				░	░	░
Two to four times per month				░	░	░
Two to three times per week			░	░	░	░
Four or more times per week			░	░	░	░
Daily or almost daily			░	░	░	░

7. Currently using ≥6 prescription medications (21%*)

7a. Currently using 6 or 7 prescription medications

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				░	░	░
Two to four times per month			░	░	░	░
Two to three times per week		░	░	░	░	░
Four or more times per week		░	░	░	░	░
Daily or almost daily		░	░	░	░	░

7b. Currently using ≥ 8 prescription medications

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				▨	▨	▨
Two to four times per month			▨	▨	▨	▨
Two to three times per week	▨	▨	▨	▨	▨	▨
Four or more times per week	▨	▨	▨	▨	▨	▨
Daily or almost daily	▨	▨	▨	▨	▨	▨

8. Recent problems sleeping (16.7%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month					▨	▨
Two to four times per month				▨	▨	▨
Two to three times per week			▨	▨	■	■
Four or more times per week			▨	■	■	■
Daily or almost daily			▨	■	■	■

9. Current use of other heart medications like Coumadin (16%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				▨	▨	▨
Two to four times per month			▨	▨	▨	▨
Two to three times per week			▨	▨	▨	▨
Four or more times per week		▨	▨	▨	▨	▨
Daily or almost daily		▨	▨	▨	▨	▨

10. Current tobacco use in any form (14.7%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				▨	▨	▨
Two to four times per month			▨	▨	▨	▨
Two to three times per week			▨	▨	▨	▨
Four or more times per week		▨	▨	▨	▨	▨
Daily or almost daily		▨	▨	▨	▨	▨

11. Limited A LOT in climbing 10 steps (13.5%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				�	▒	▒
Two to four times per month			▒	▒	▒	▒
Two to three times per week		▒	▒	▒	█	█
Four or more times per week	▒	▒	▒	█	█	█
Daily or almost daily	▒	▒	▒	█	█	█

12. Current tobacco use in any form and history of hypertension (10.7%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month			▒	▒	▒	▒
Two to four times per month	▒	▒	▒	▒	▒	▒
Two to three times per week	▒	▒	▒	█	█	█
Four or more times per week	▒	▒	▒	█	█	█
Daily or almost daily	▒	▒	█	█	█	█

13. History of depression (10%*)

	Number of Drinks					
Frequency of Drinking	<1	1	2	3	4	5+
Less than or equal to once per month				▒	▒	▒
Two to four times per month			▒	▒	▒	▒
Two to three times per week	▒	▒	▒	▒	█	█
Four or more times per week	▒	▒	▒	█	█	█
Daily or almost daily	▒	▒	▒	█	█	█

* Percentages represent the proportion of older adult drinkers with Hazardous/Harmful consumption for all of the ARPS factors prevalent in at least 10% of those adults. For example, 51.1% of older adult drinkers with Hazardous/Harmful consumption overall had a *hazardous* or *harmful* classification for the ARPS factor – use of prescription anti-hypertensive medication.

Appendix Figure 3A. Adjusted odds ratios[*][†] (OR) and 95% CI for having Hazardous/Harmful alcohol consumption, among adults aged 65 and older who drink, by sex,[‡] race/ethnicity,[§] and age,[#] NHANES 2005-2008.[**]
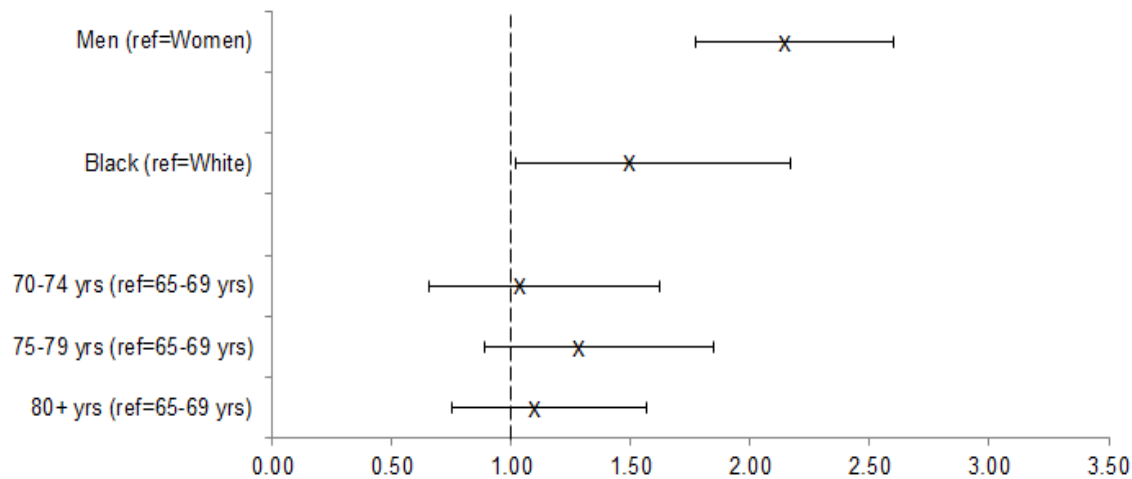
[*] The multivariate logistic regression model controlled for sex, race/ethnicity, and age.

[†]The reference groups are women, non-Hispanic whites, and persons 65-69 years of age, respectively.

[‡]Adjusted OR_{Men}= 2.14 (95% CI: 1.77, 2.60)

[§]Adjusted $OR_{Non-Hispanic\ blacks}$= 1.5 (95% CI: 1.02, 2.17)

[#]Adjusted $OR_{70-74\ year\ olds}$=1.03 (95% CI: 0.66, 1.62)

  Adjusted $OR_{75-79\ year\ olds}$=1.28 (95% CI: 0.89, 1.85)

  Adjusted $OR_{80+\ year\ olds}$=1.09 (0.75, 1.57)

[**] Unweighted sample size of n=1083 adults ≥65 year old who consume alcohol, including n=643 men, n=440 women, n=776 non-Hispanic blacks, n=141 non-Hispanic whites, n=333 65-69 year olds, n=292 70-74 year olds, n=201 75-79 year olds, and n=257 ≥80 years old.

Appendix Figure 3B. Adjusted odds ratios[*][†] (OR) and 95% CI for having Harmful alcohol consumption, among drinkers aged 65 and older who have Hazardous/Harmful alcohol consumption (N=8,946,997), by sex[‡], race/ethnicity[§], and age[#], NHANES 2005-2008.[**]
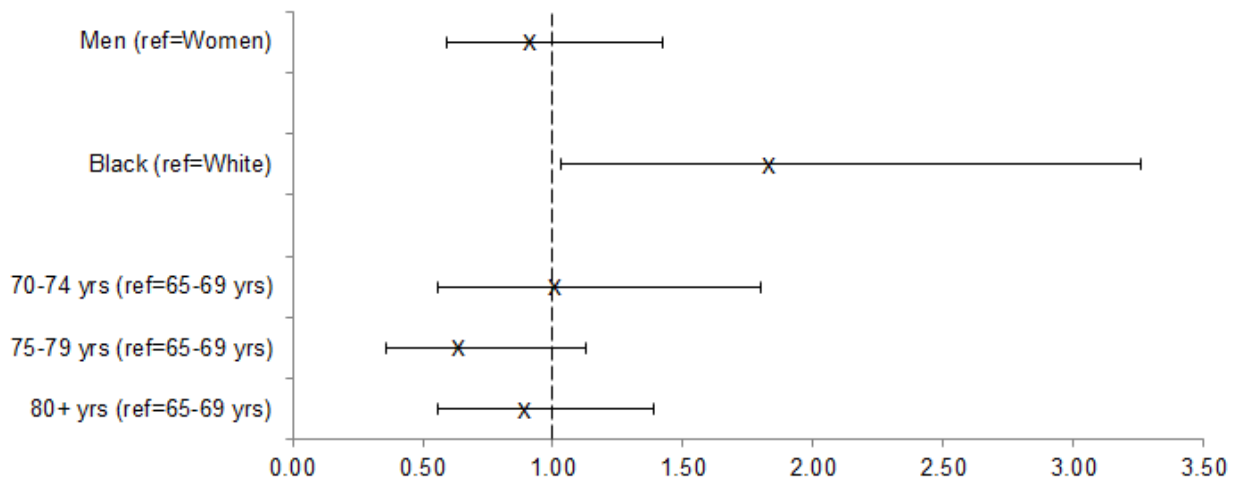
[*] The multivariate logistic regression model controlled for sex, race/ethnicity, and age.

†The reference groups are women, non-Hispanic whites, and adult drinkers 65-69 years old, respectively.

‡Adjusted OR_{Men}= 0.91 (95% CI: 0.59, 1.42)

§Adjusted $OR_{Non\text{-}Hispanic\ blacks}$= 1.83 (95% CI: 1.03, 3.26)

#Adjusted $OR_{70\text{-}74\ year\ olds}$= 1.00 (95% CI: 0.56, 1.80)

  Adjusted $OR_{75\text{-}79\ year\ olds}$= 0.64 (95% CI: 0.36, 1.13)

  Adjusted $OR_{80+\ year\ olds}$= 0.89 (95% CI: 0.56, 1.39)

** Unweighted sample size of n=599 adults ≥65 years old who have Hazardous or Harmful alcohol consumption, including n=410 men, n=189 women, n=86 non-Hispanic blacks, n=422 non-Hispanic whites, n=180 65-69 year olds, n=161 70-74 year olds, n=113 75-79 year olds, and n=145 ≥80 years old.

Appendix Figure 4. Prevalence (95% CI) of Healthwise, Hazardous, and Harmful alcohol consumption, among adults aged 65 and older who drink alcohol, N=16,771,716, by age group, NHANES, 2005-2008.*
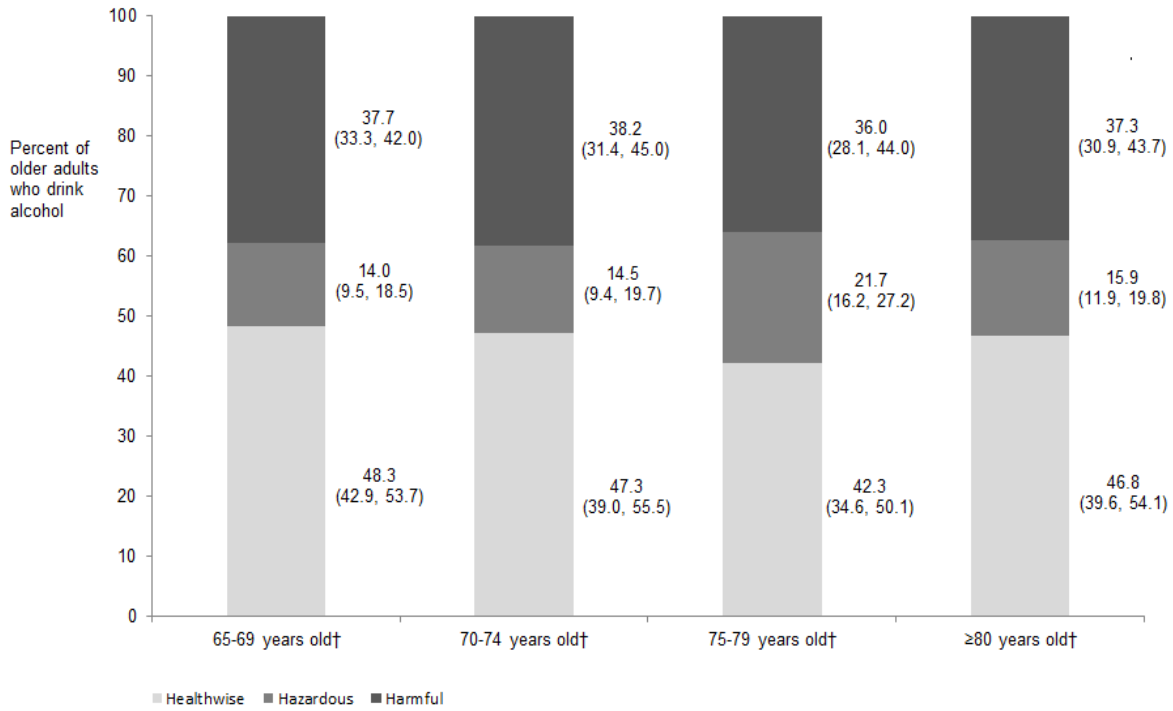
*Unweighted total sample size of n=1083 individuals ≥65 years old who drink alcohol, including n=333 65-69 year olds, n=292 70-74 year olds, n=201 75-79 year olds, and n=257 of those ≥80 years old.

†Weighted sample sizes: N=6,064,557 65-69 year olds; N=4,436,396 70-74 year olds; N=3,093,314 75-79 year olds; and N=3,117,449 of those ≥80 years old.

Appendix Figure 5. Prevalence (95% CI) of Healthwise, Hazardous, and Harmful alcohol consumption among adults aged 65 and older who drink alcohol, by race-sex sub-group[*], NHANES 2005-2008.[†]
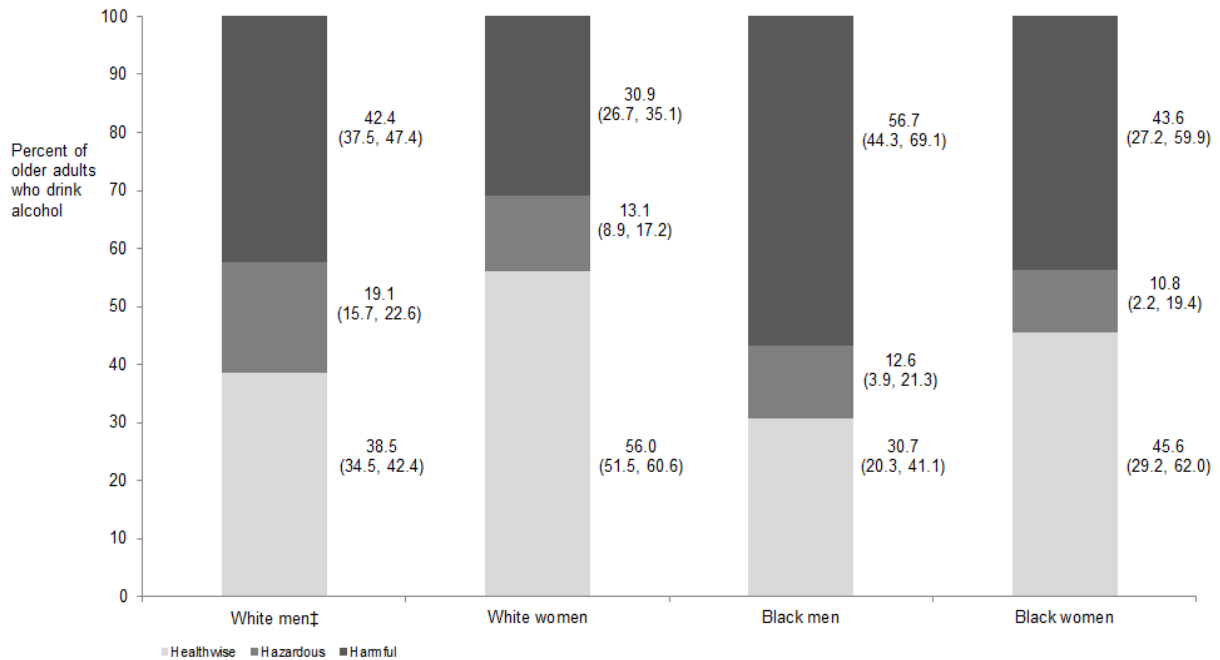

* Overall p-value < 0.0001; white men vs. white women: Rao-Scott Chi-Square p-value<0.0001; white men vs. black men: Rao-Scott Chi-Square p-value=0.0489; white women vs. black men: Rao-Scott Chi-Square p-value=0.0002.

† Individuals of other races and Hispanic ethnicity were excluded due to small numbers and/or differences in the sampling methodologies used by NHANES in the 2005-2006 and 2007-2008 cycles. Unweighted sample size of n=917 adults ≥65 years old who consume alcohol, including n=450 white men, n=88 black men, n=326 white women, and n=53 black women.

‡ Weighted sample sizes: N=7,468,635 white men; N=7,423,640 white women; N=448,429 black men; N=392,239 black women.

Appendix Figure 6. Adjusted odds ratios* (OR) and 95% CI for having Harmful alcohol consumption, among drinkers aged 65 and older whose alcohol consumption is Hazardous or Harmful (N=8,946,997), by race-sex sub-group (reference=White men), NHANES 2005-2008.[†]
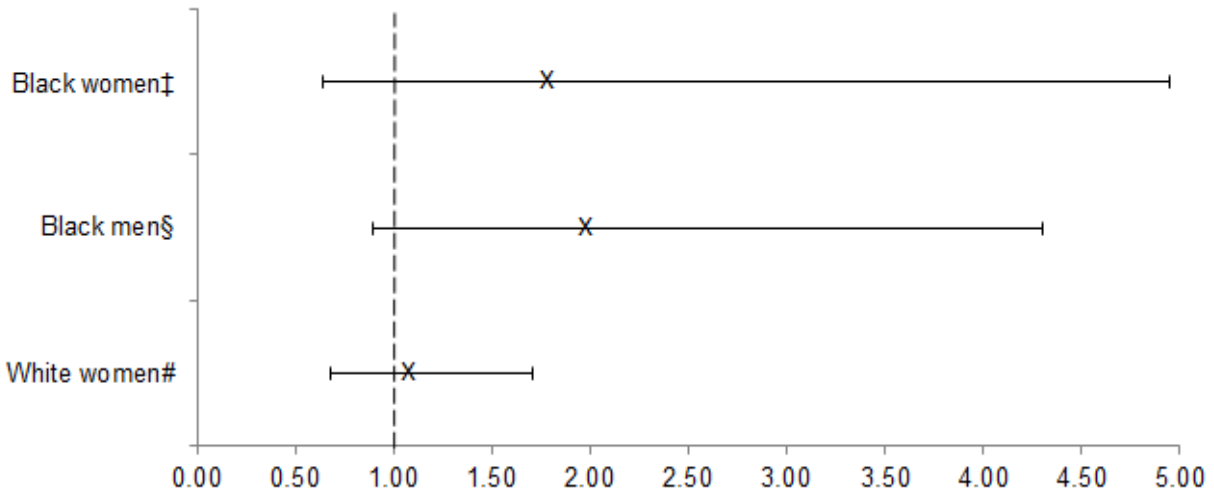
*Multivariable logistic regression model adjusted for sex, race/ethnicity, and age.

†Based on unweighted sample size of n=599 adults ≥ 65 years old whose alcohol consumption was Hazardous or Harmful, including n=28 black women, n=58 black men, n=141 white women, and n=281 white men.

‡ $OR_{Black\ women}$(OR)=1.78 (95% CI: 0.64, 4.95)

§ $OR_{Black\ men}$=1.87 (95% CI: 0.90, 4.31)

$OR_{White\ women}$=1.07 (95% CI: 0.68, 1.70)

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