Risk Drinking: At Risk for What?

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General outline of topics

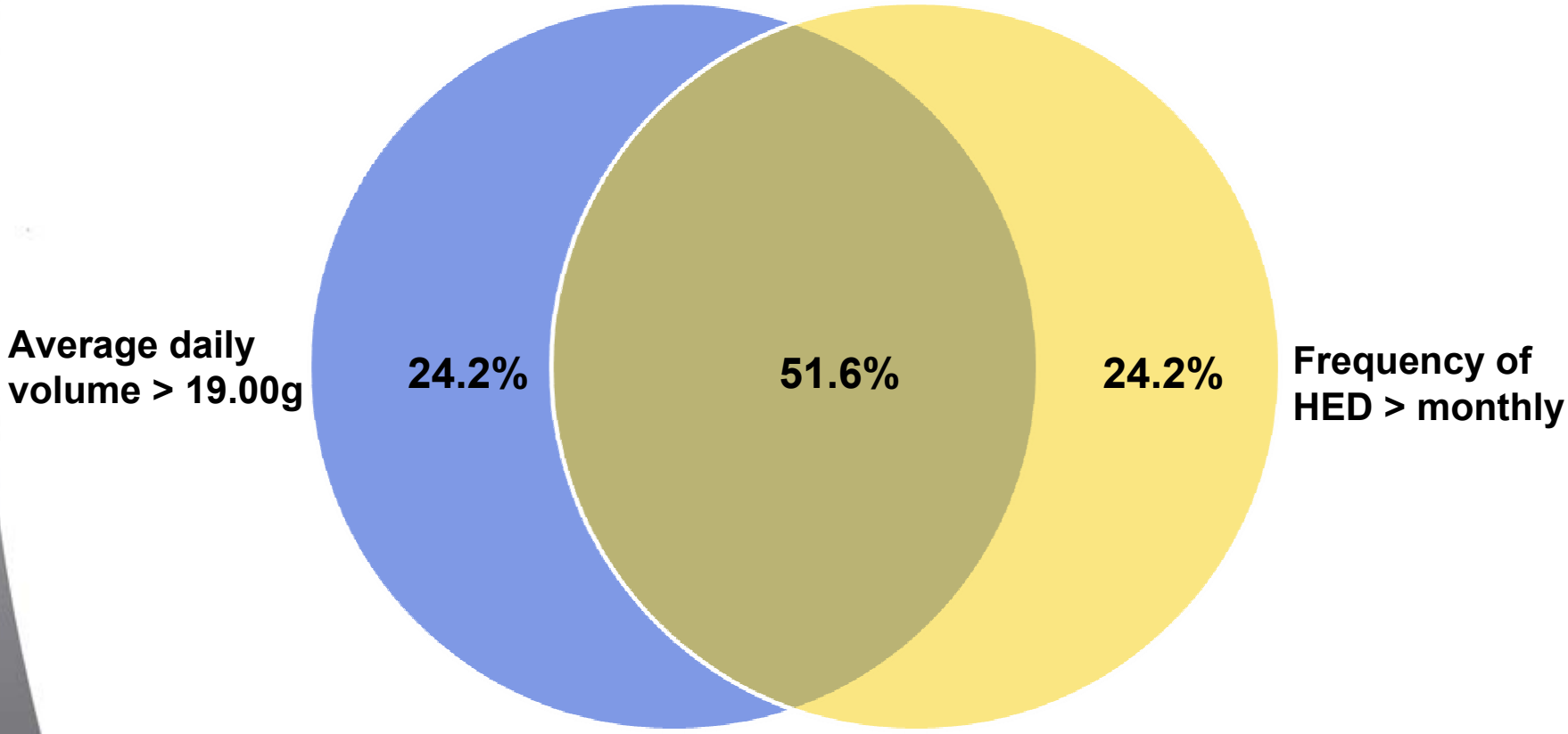
- Conceptual and practical issues in defining risk drinking
- Evidence from risk curves
- Low-risk drinking guidelines
  - ***International variation***
  - ***A comparison of Canadian and Australian guidelines***
  - ***A comparison of low-risk and moderate drinking guidelines, and gray area in between***
  - ***An approach to validating guidelines***
- Screening for risk drinking and AUD

Conceptual and Practical Issues

Conceptual issues

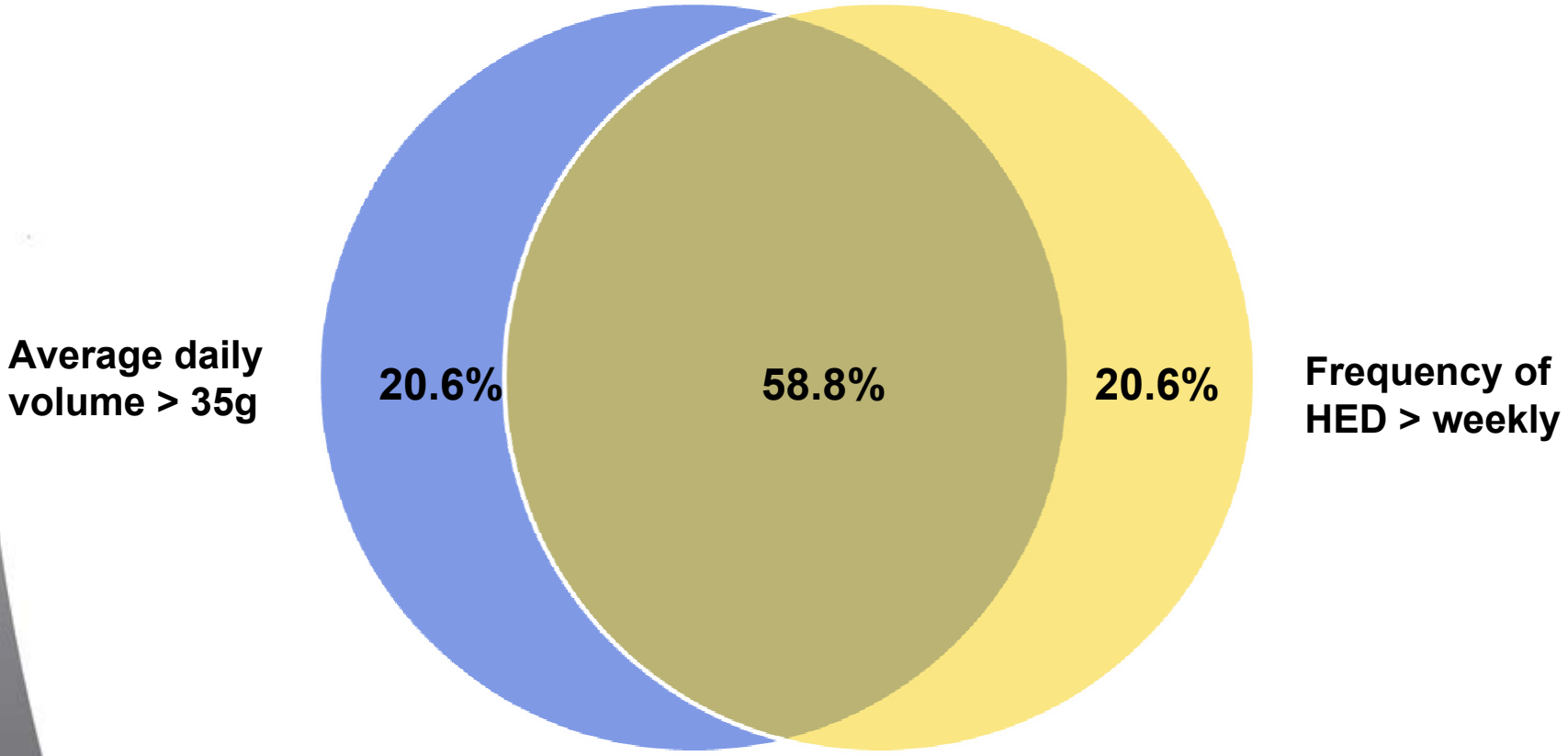
- What aspects of consumption should be considered?
  - ***Volume vs. heavy episodic drinking (HED)***
  - ***Volume better captures overall exposure to alcohol and is more stable over time, but a moderate volume may reflect either frequent consumption of low quantities or infrequent consumption of high quantities***
  - ***HED provides more information about drinking at levels that may increase the risk of acute alcohol-related harm, but not very stable or informative unless frequency is known***

Relationship of volume to frequency of HED: Top 20% of drinkers



Source: Wave 1 NESARC unpublished data

Relationship of volume to frequency of HED: Top 10% of drinkers



Source: Wave 1 NESARC unpublished data

Conceptual issues

- What types of harm should be considered?
  - ***Alcohol use disorders***
  - ***Mortality, morbidity, accidents and injury, social harm, harm to others***
  - ***Most severe harms***
  - ***Most prevalent harms***
  - ***Harms most strongly attributable to alcohol***
  - ***Harms for which data are available that can be linked with drinking at individual level***

Conceptual issues

- What types of studies are most appropriate for assessing associations?
  - ***Cross-sectional studies***
    - ***Used to assess the associations of current drinking levels with existing harm***
    - ***ED studies for evaluating in the event risk of various drinking levels***
    - ***Screening studies of AUD***
  - ***Prospective studies***
    - ***Used to assess the future risk of harm associated with a baseline level of drinking***
    - ***Generally used for evaluating risks of mortality and chronic disease***

Conceptual issues

- How do we determine the appropriate threshold for risk drinking?
  - ***Relative versus absolute risk***
  - ***Choice of referent group: lifetime abstainers versus lowest-risk drinkers***
  - ***How to handle linear risk curves***
  - ***How to handle different thresholds for different types of harm***
  - ***Net zero approach – balancing benefits and risks associated with moderate drinking***

Practical issues

- How should we account for the quality of the data?
- Consideration of data available for monitoring levels of risk drinking and adherence to drinking guidelines
- Enough vs. too much information?
  - ***Weekly vs. daily limits vs. both***
  - ***Gender-specific limits (5+ vs. 5+/4+)***
  - ***Different limits for other subpopulations***
  - ***Context-specific limits***

Evidence from Risk Curves

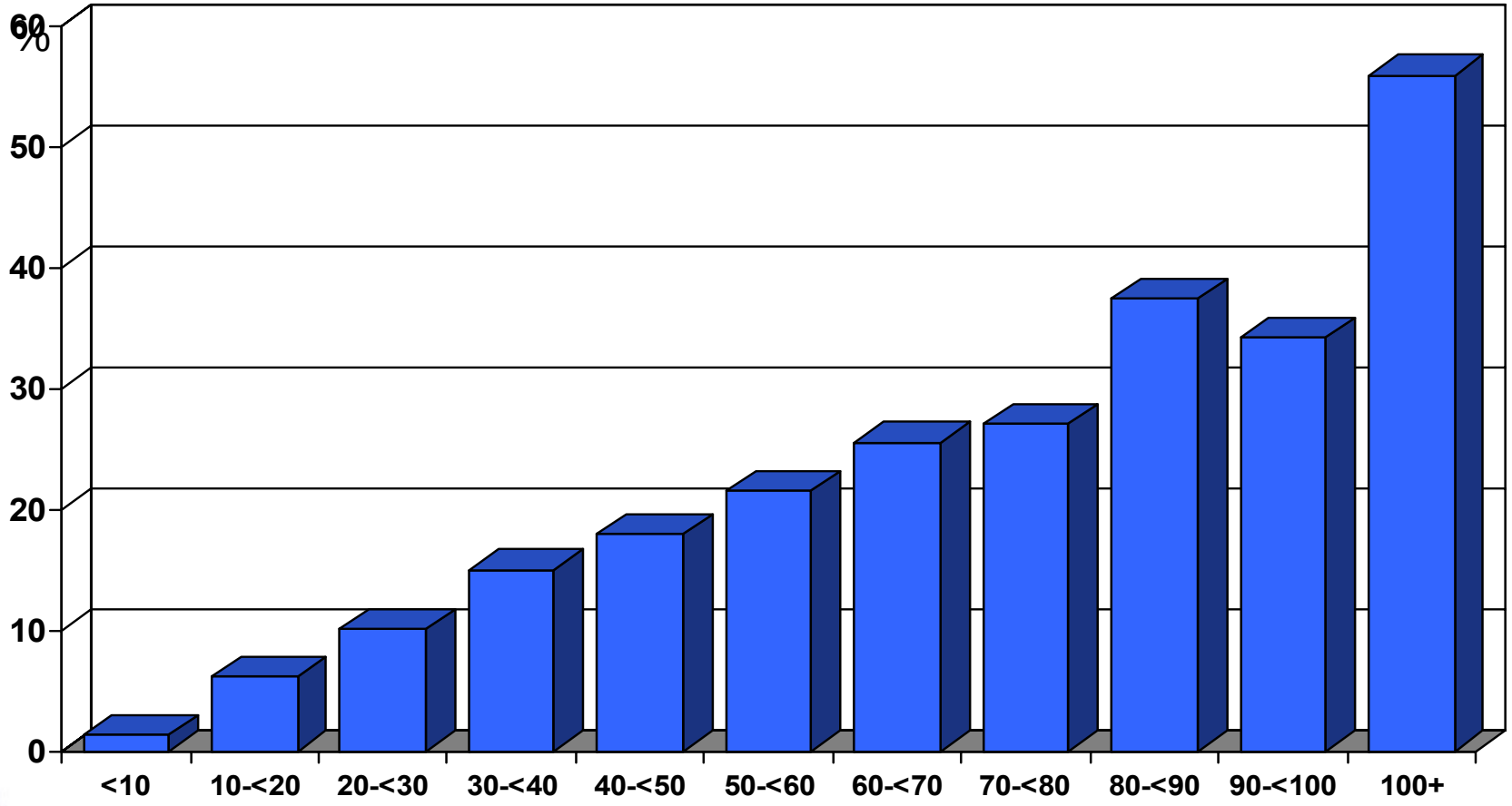
Data sources

- National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)
  - ***Nationally representative sample of US adults, interviewed in 2001-2002 and re-interviewed in 2004-2005***
  - ***Wave 1: n=43,093, (response rate = 81%)***
  - ***Wave 2: n=34,653 (response rate=87%)***
  - ***Represented adults 18+ living in households and selected group quarters***
  - ***Oversampled African Americans, Hispanics and young adults 18-24***
  - ***Queried alcohol use, AUD, and a host of comorbid psychiatric and medical conditions***

Data sources

- Meta-analysis of injury/collision data from various ED, roadside testing, and case-control and case-crossover studies
- Meta-analysis of ED studies from 10 countries
- Meta-analyses of all-cause and cause-specific mortality and morbidity
- Australian low-risk drinking guidelines

Prevalence of past-year DSM-IV alcohol dependence, by ADV* of ethanol intake

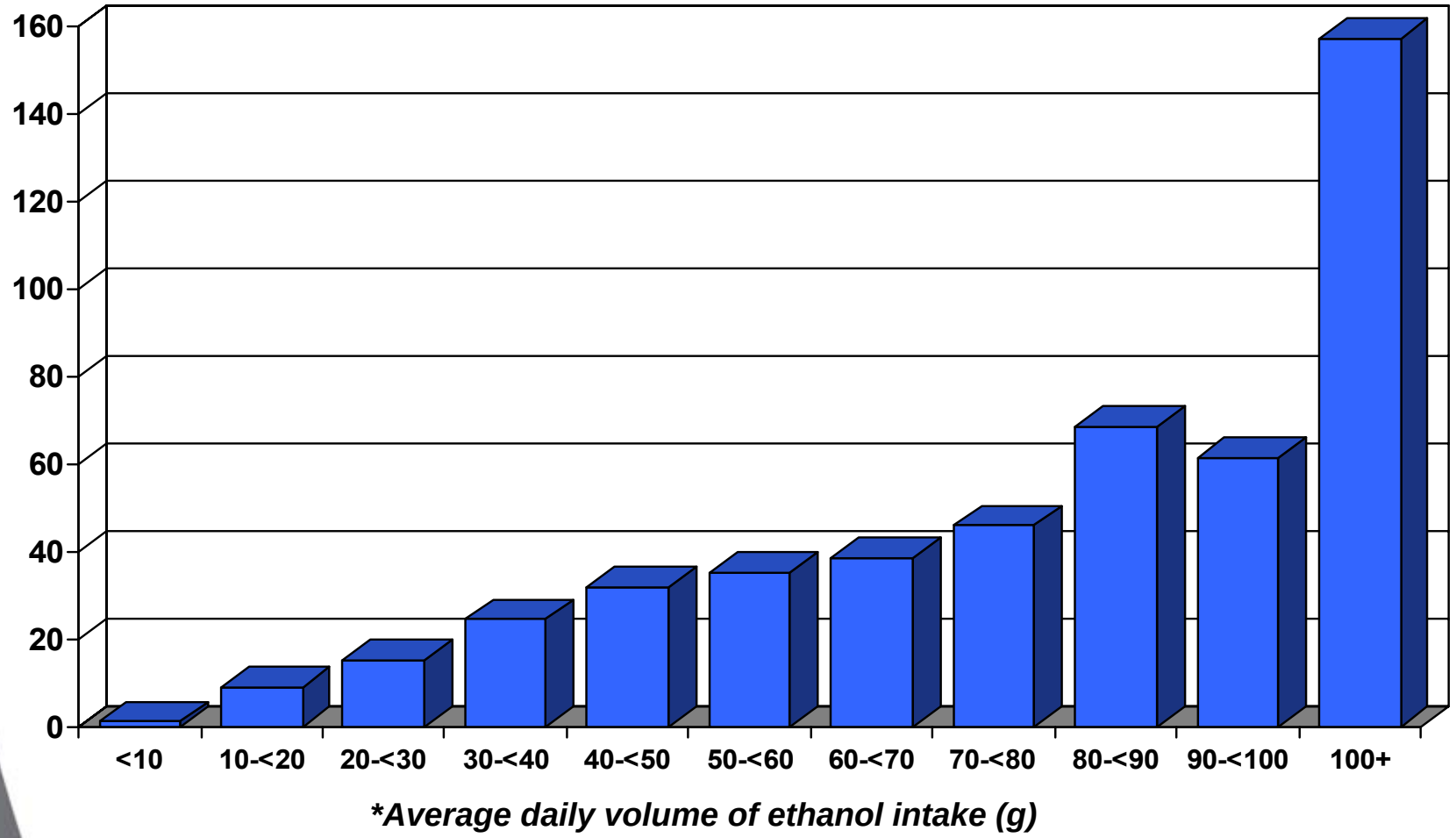


Average daily volume of ethanol intake (g)

Source: Wave 1 NESARC unpublished data

Adjusted OR for past-year DSM-IV alcohol dependence, by ADV* of ethanol intake

(No adjustment for frequency of HED)



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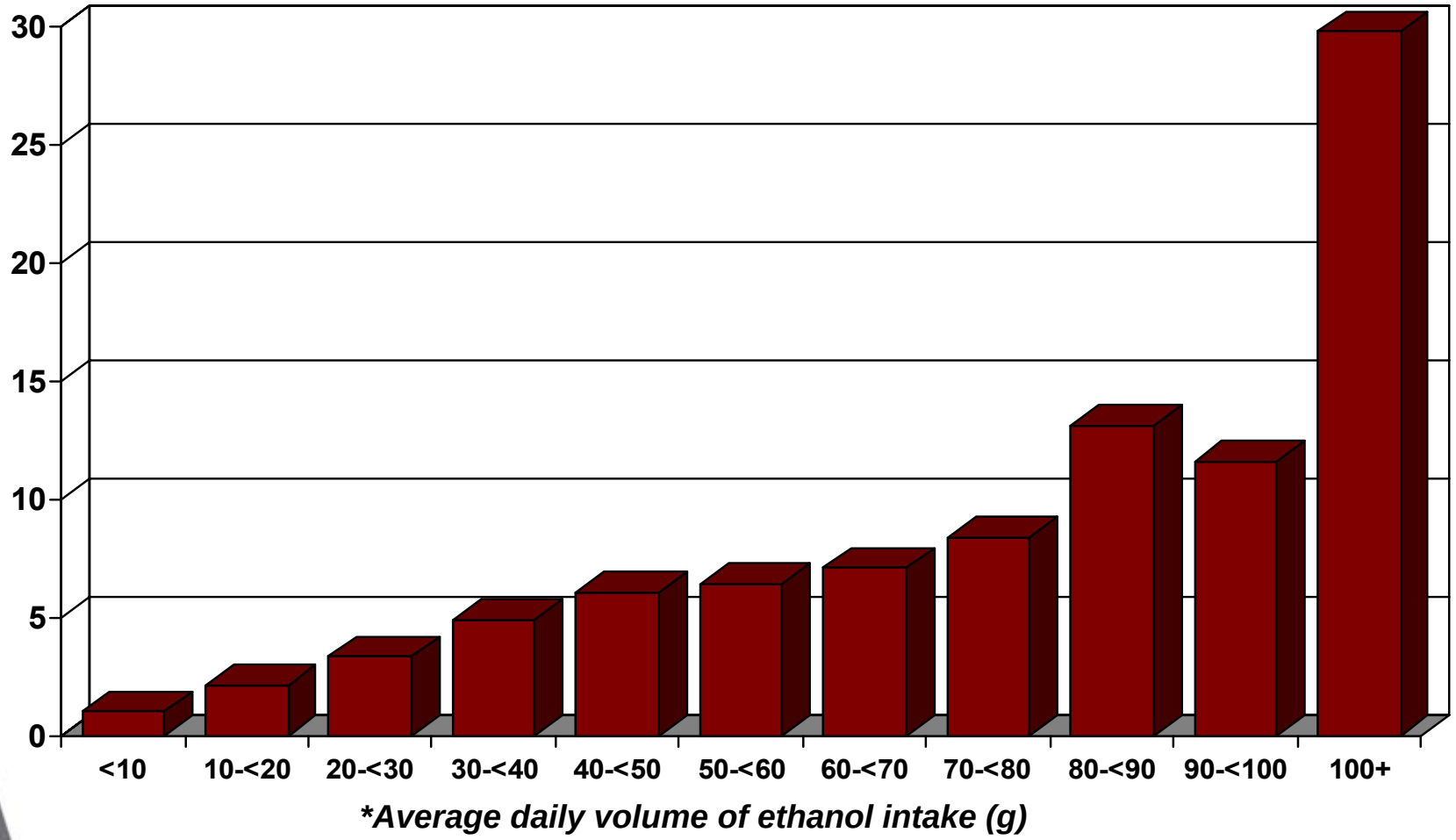
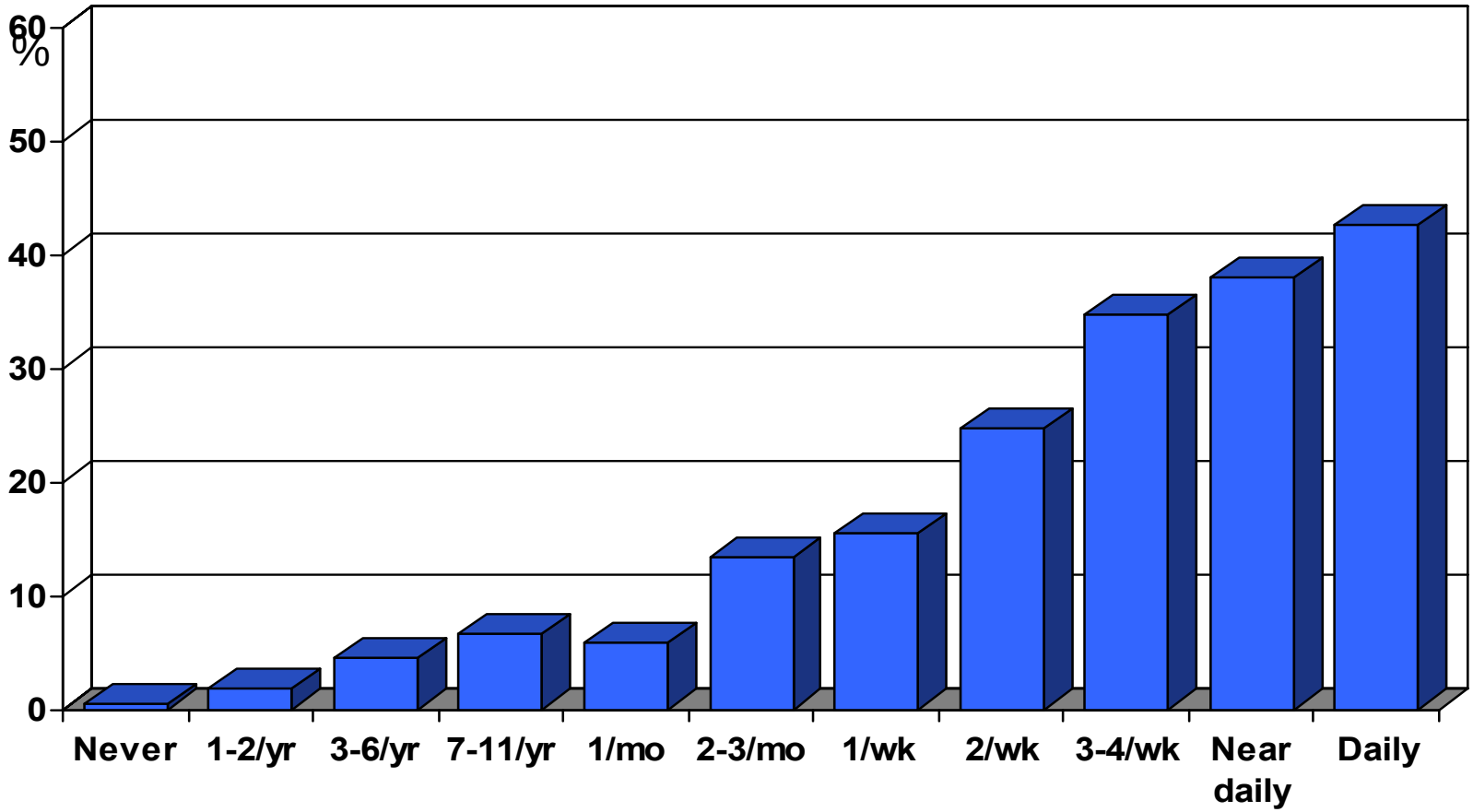


Source: Wave 1 NESARC unpublished data

Prevalence of past-year DSM-IV alcohol dependence, by frequency of HED

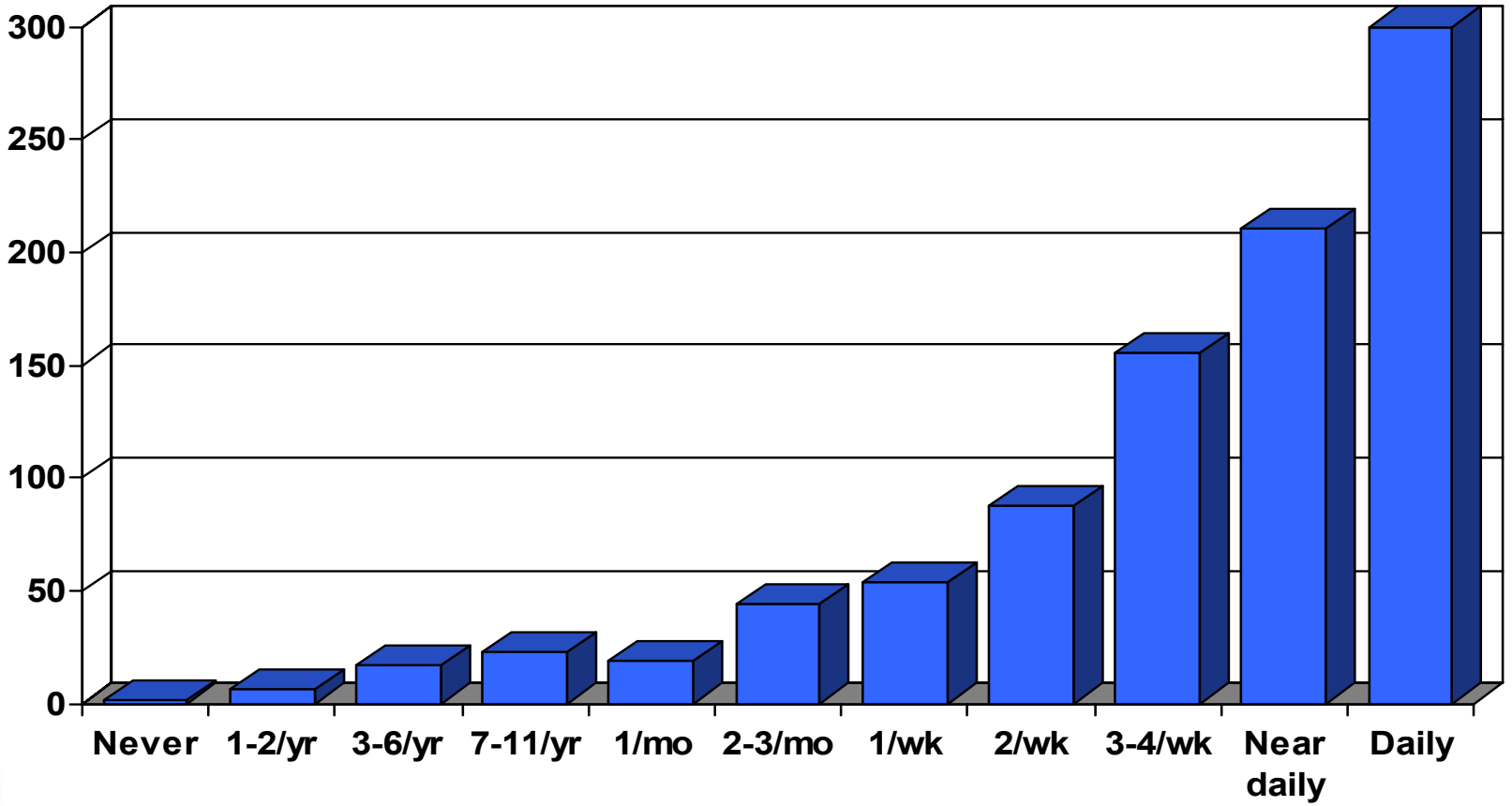


Frequency of HED (5+ standard drinks for men, 4+ standard drinks for women)

Source: Wave 1 NESARC unpublished data

Adjusted OR for past-year DSM-IV alcohol dependence, by frequency of HED

(Not adjusted for ADV of ethanol intake)



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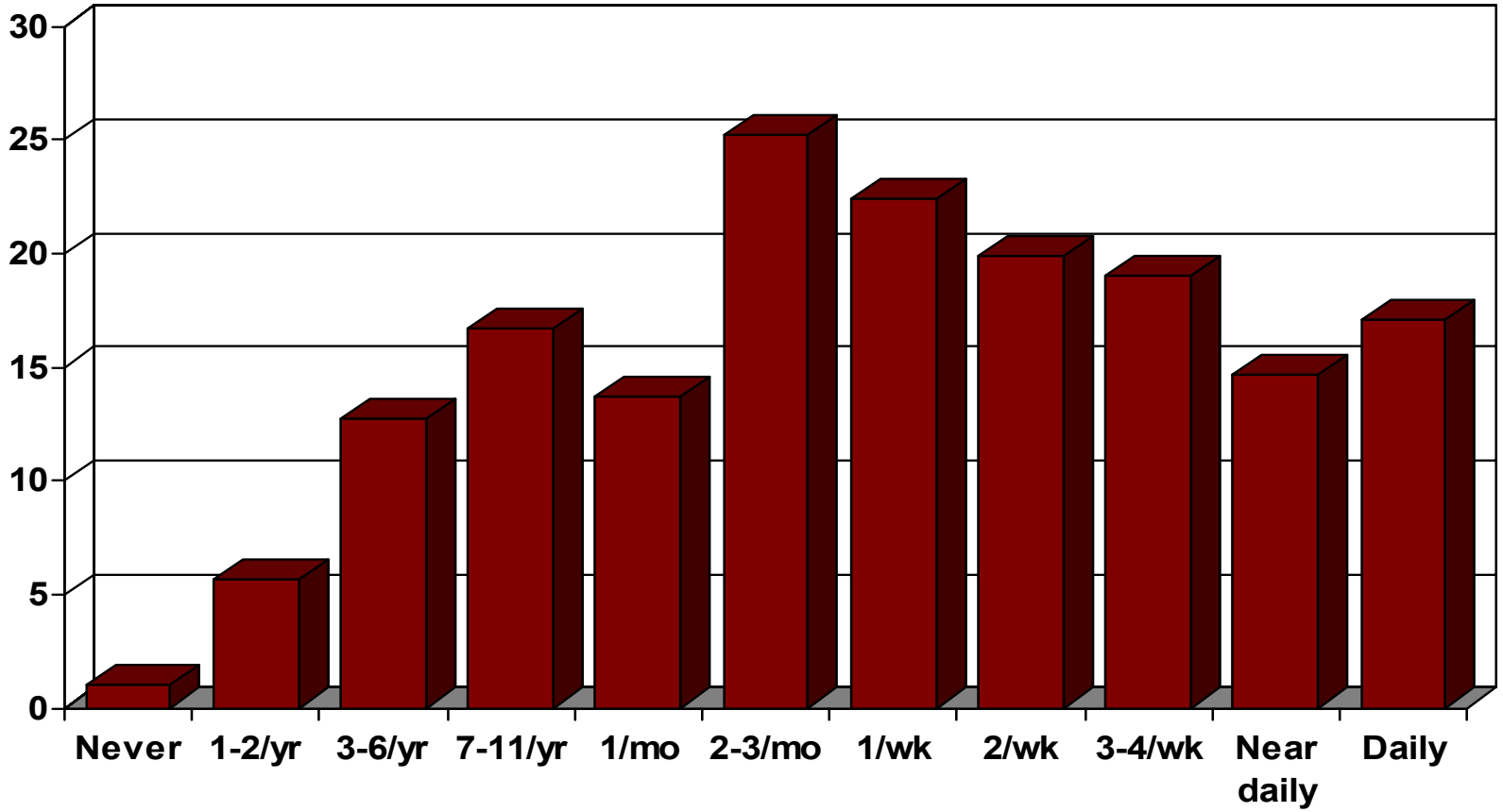


Frequency of HED (5+ standard drinks for men, 4+ standard drinks for women)

Source: Wave 1 NESARC unpublished data

Adjusted OR for various types of injury in association with a 10g increase in alcohol consumption prior to the event

Type of injury	*OR*
Intentional injuries	1.38
Falls	1.25
Motor vehicle crashes	1.24
Other unintentional injuries	1.32

Source: Meta-analysis of 31 ED, roadside testing, case-crossover and other population based studies (Taylor et al., 2010)

Adjusted OR for various types of injury in association with any drinking in 6 hours prior to the event

Type of injury	*OR*
Intentionally inflicted by someone else	20.7
Intentionally self-inflicted	23.1
Traffic accident	3.9
Blunt force trauma	8.2
Stabbed, cut, bitten, shot	3.7
Fell, tripped	3.3
Other unintentional injuries	7.4

Source: Meta-analysis of 10 ED case-crossover studies based on WHO collaborative study on alcohol and injuries (Borges et al., 2006)

Adjusted OR for any type of injury in association with various numbers of drinks in 6 hours prior to the event

Number of drinks	*OR*
None	1.0
1	3.3
2-3	3.9
4-5	6.5
6 or more	10.1

Source: Meta-analysis of 10 ED case-crossover studies based on WHO collaborative study on alcohol and injuries (Borges et al., 2006)

Average daily volume of consumption at which adjusted relative risk of all-cause mortality was significantly increased

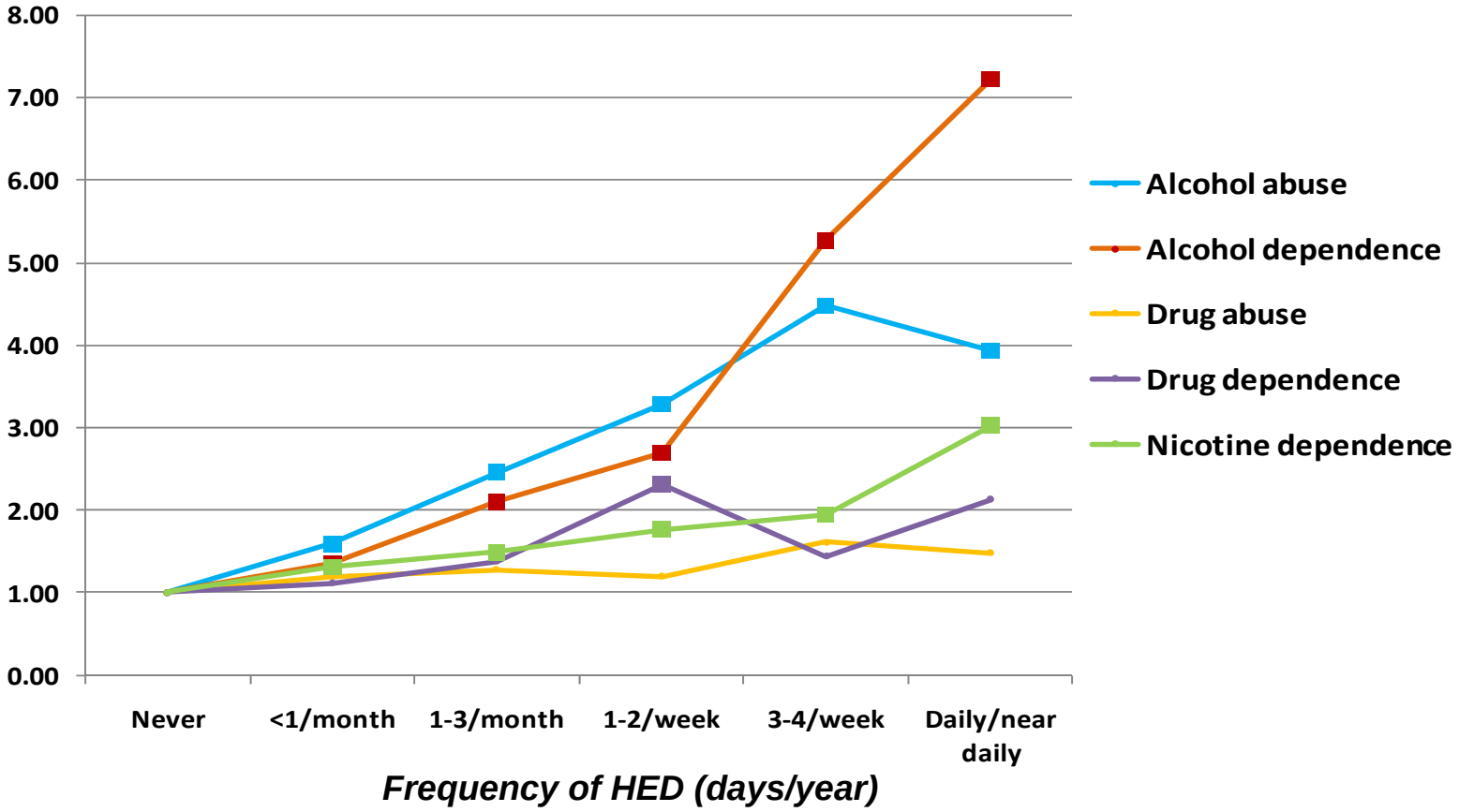
Study	*Referent*	*Total*	*Men*	*Women*
Castelnuovo et al. 2006: Meta-analysis of 34 studies conducted prior to 2005	Nondrinkers	≈38g	≈45g	≈35g
Gmel et al., 2003: Meta-analysis of all-cause mortality studies conducted prior to 2000	Lifetime abstainers 45 and older	---	40-70g	30-50g
Stockwell et al., under review: Meta-analysis of 8 studies free of serious design flaws	Long-term abstainers 40 and older	Threshold for men slightly lower than those shown above, similar threshold for women (unpublished data)		

Adjusted relative risks of chronic health outcomes by volume of ethanol intake

Outcome	Relative risk of outcome, by average daily volume (g) of ethanol intake									
	10	20	30	40	50	60	70	80	90	100
Lip, oral, pharyngeal cancers	1.31 1.33	1.67 1.72	2.08 2.18	2.53 2.69	3.02 3.26	3.53 3.88	4.06 4.52	4.59 5.19	5.09 5.85	5.57 6.51
Esophageal cancer	1.17	1.37	1.61	1.88	2.19	2.55	2.95	3.42	3.94	4.52
Liver cancer	1.08	1.15	1.23	1.31	1.40	1.48	1.56	1.65	1.73	1.81
Breast cancer	1.08	1.17	1.26	1.36	1.47	1.58	1.71	1.85	1.99	2.15
Hypertension	1.15	1.33	1.53	1.77	2.04	2.35	2.71	3.12	3.60	4.15
Ischemic heart disease	≤1	≤1	≤1	≤1	≤1	≤1	≤1	1.01	1.03	1.13
Ischemic stroke	≤1	≤1	≤1	1.12	1.40	1.73	2.04	2.21	2.12	1.72
Hemorrhagic stroke	1.16	1.35	1.57	1.82	2.12	2.46	2.86	3.32	3.86	4.48
Liver cirrhosis	1.21 1.32	1.45 1.73	1.72 2.25	2.02 2.89	2.35 3.68	2.71 4.64	3.10 5.80	3.51 7.17	3.94 8.80	4.38 10.69

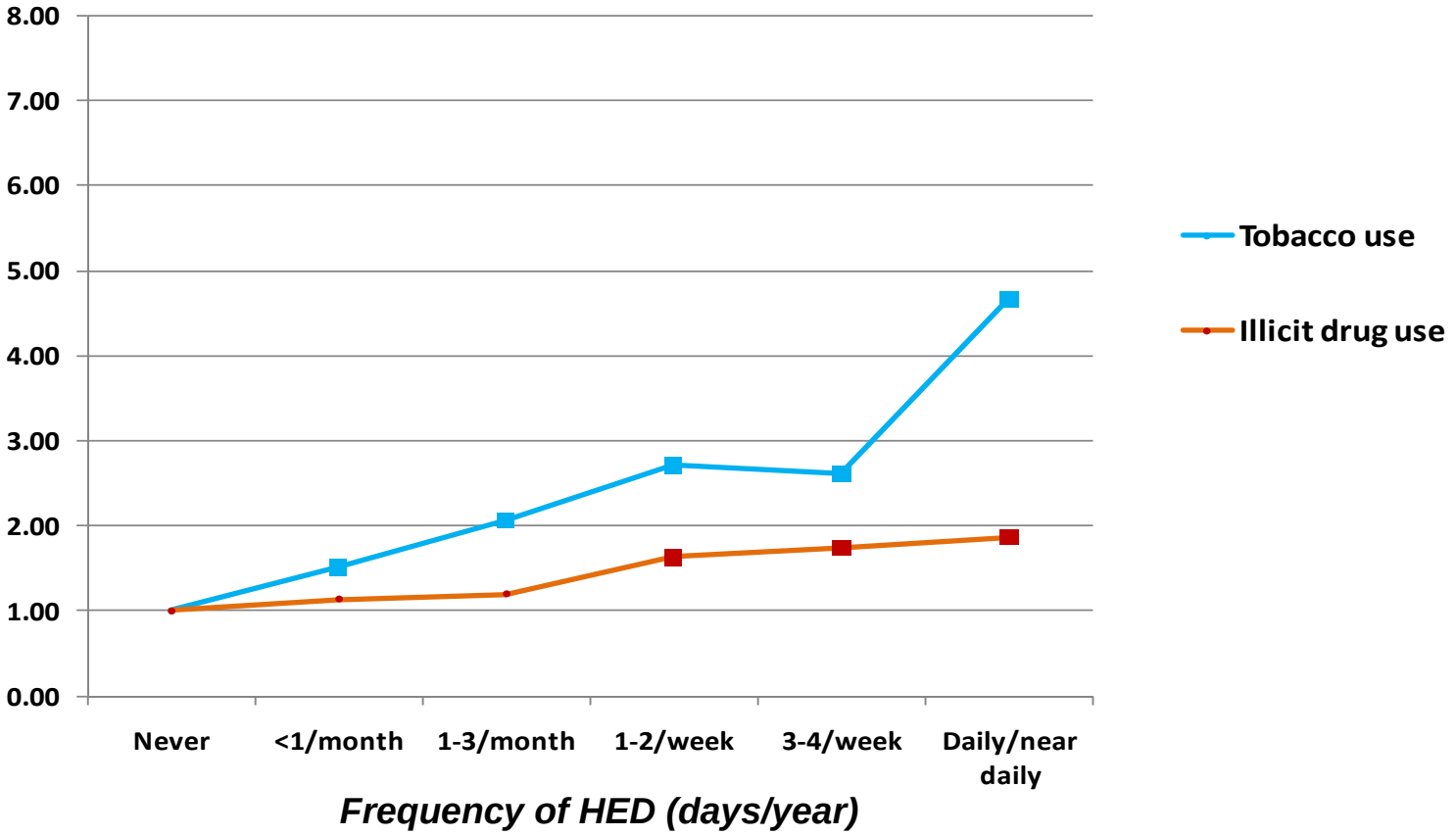
Source: Australian Guidelines, 2009

Adjusted ORs for association between frequency of HED and 3-year incidence of substance use disorders



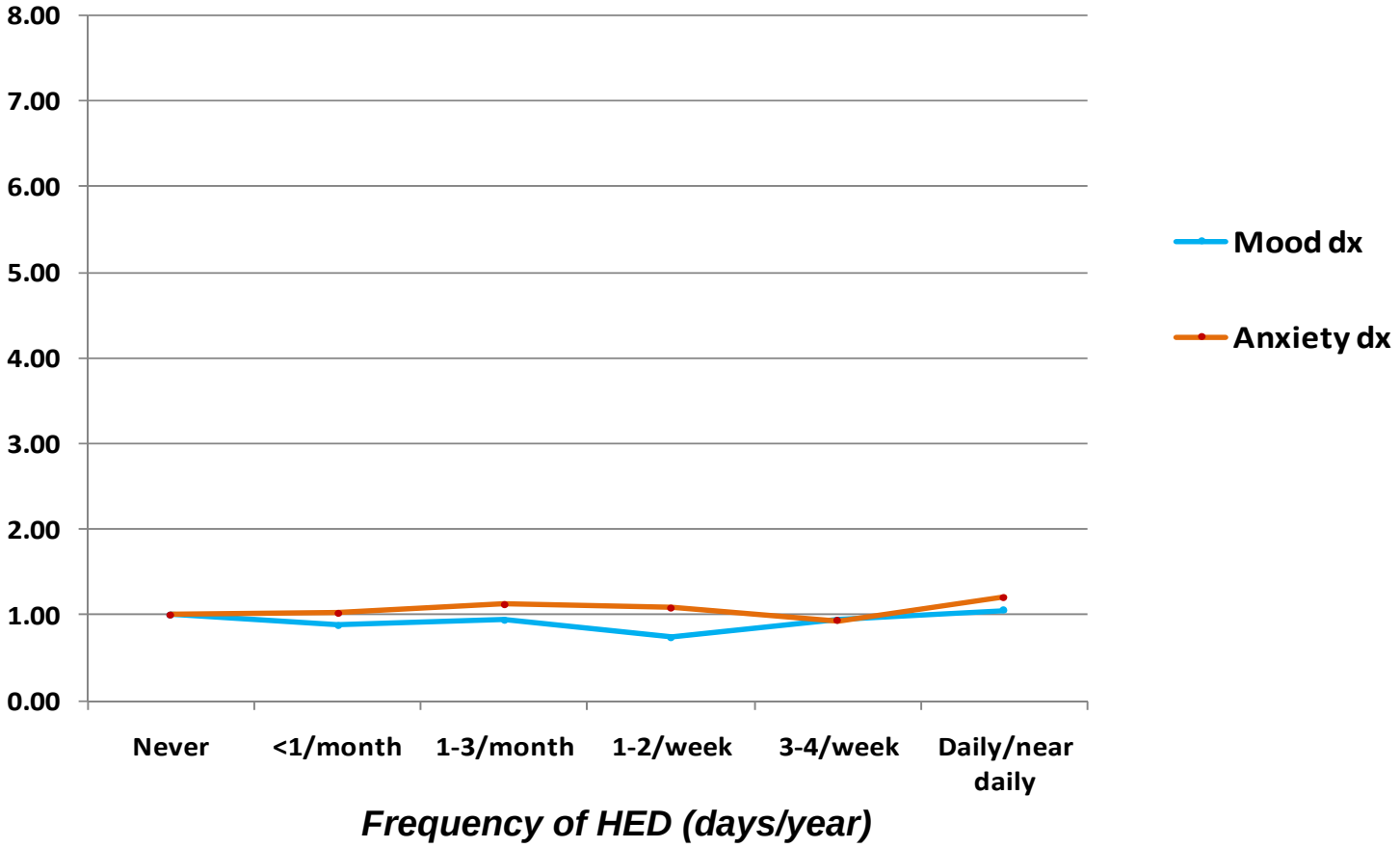
Source: Dawson et al., 2008

Adjusted ORs for association between frequency of HED and 3-year initiation of substance use



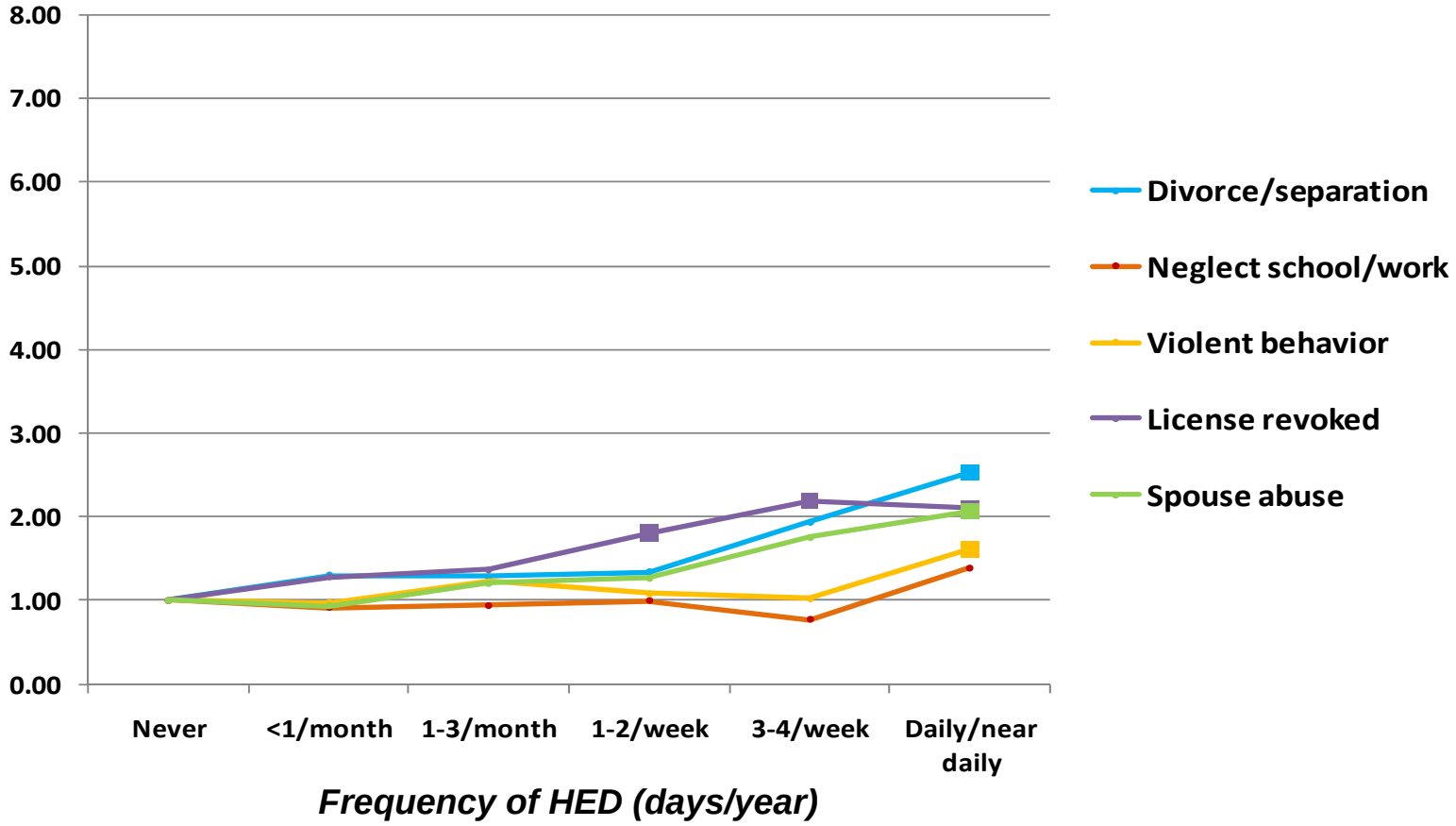
Source: Dawson et al., 2008

Adjusted ORs for association between frequency of HED and 3-year incidence of mood and anxiety disorders



Source: Dawson et al., 2008

Adjusted ORs for association between frequency of HED and 3-year occurrence of social harm



Source: Dawson et al., 2008

Low-Risk Drinking Guidelines

International drinking guidelines

- Daily limits only:
  - ***Austria, Czech Republic, France, Italy, Netherlands, Portugal, Singapore, Spain, Sweden, Switzerland, Scotland, US Dietary Guidelines***
    - ***Vary from 20 - 70g (M and W)***
- Weekly limits only:
  - ***Denmark, Finland, Ireland, South Africa***
    - ***Vary from 140 – 252g (M) and from 70 – 168g (W)***
- Weekly and daily limits:
  - ***Australia, Canada, New Zealand, Poland, Slovenia, United Kingdom, US NIAAA***
    - ***Weekly limits vary from 100 – 204g (M) and from 70 – 140g (W)***
    - ***Daily limits vary from 20 – 56 (M) and from 10 – 42 (W)***

**Gender invariant*

Source: ICAP website

A comparison of recently revised Australian and Canadian guidelines

Australia		*Canada*	
Gender invariant weekly limits		**Gender-specific weekly limits**	
Men 140g	**Women 140g**	**Men 204g**	**Women 136g**
Gender invariant daily limits		**Gender-specific daily limits**	
Men 40g	**Women 40g**	**Men 54.4g**	**Women 41.0g**

Sources: Room, 2010; Stockwell et al., 2010

A comparison of recently revised Australian and Canadian guidelines

Australia	*Canada*
Based on absolute risk of alcohol-related death of >1 in 100 people	Based on relative risk of all-cause mortality
Disregarded any possible health benefits of drinking	Net zero approach considered net effects of drinking
Proposed age-specific limits (lower limits for those 65+ and 18-29)	Age-specific limits not highlighted but involve one less drink for men and women 60+

Sources: Room, 2010; Stockwell et al., 2010

A comparison of two sets of U.S. drinking guidelines

NIAAA	*Old Dietary Guidelines*	*Proposed New Dietary Guidelines*
Exceeding limits represents high risk drinking	**Limits represent moderate drinking**	**Limits represent moderate drinking**
Based primarily on risks of AUD	**Based primarily on chronic disease, mortality risks**	**Based primarily on chronic disease, mortality risks**
Men 14 drinks/wk and 4 on any day; Women 7drinks/wk and 3 on any day	**Men 2 drinks on any day; Women 1 drink on any day**	**Men 2 drinks/day *on average* and 4 on any day; Women 1 drink/day *on average* and 3 on any day**

Sources: NIAAA, 2010; USDA 2005 and 2010

Gray area between moderate and risk drinking

- Consumption that exceeds the Old Dietary Guidelines but lies within the limits of the proposed new Dietary Guidelines
  - ***Men who do not exceed the limits of 14 drinks/week or 4 drinks on any day but who do exceed old 2-drink limit on some days***
  - ***Women who do not exceed the limits of 7 drinks/week or 3 drinks on any day but who do exceed old 1-drink limit on some days***
- Are they at increased risk compared to men who never drink more than 2 drinks on any day or women who never drink more than 1 drink on any day?

Validating Drinking Guidelines

Slides not available because paper currently being prepared for publication

Screening for Risk Drinking and AUD

Commonly used screeners

- Screeners based on alcohol problems
  - ***CAGE, RAPS4***
  - ***TWEAK, T-ACE***
  - ***MAST, SMAST, BMAST***
- Screeners based on alcohol problems and consumption
  - ***AUDIT***
  - ***RAPS4-QF***
- Screeners based solely on consumption
  - ***AUDIT-C (three AUDIT consumption items)***
- Single-item screeners
  - ***Frequency of drinking 5+/4+ drinks***
  - ***Maximum drinks consumed***

Performance of selected consumption-based screeners in screening for AUD

Screener and Cutpoint	Sens.	Spec.	Sens. + Spec.
AUDIT-C score of ≥3	92.5	73.6	166.1
AUDIT-C score of ≥4	83.7	83.1	166.8
Past-year frequency of 5+/4+ drinks ≥once/yr.	86.7	82.1	168.8
Maximum quantity of past-year drinks ≥4	90.4	78.8	169.2
Maximum quantity of past-year drinks ≥5	82.7	85.2	167.9

Source: Dawson et al., 2005, 2010

Optimal cutpoints of single-item screeners for any AUD or risk drinking

Subpopulation	Frequency 5+/4+	Maximum drinks
All adults 18+	≥1/year (87.5, 100.0)	≥4 (90.2, 96.3)
Men	≥1/year (89.6, 100.0)	≥5 (89.5, 100.0)
Women	≥1/year (84.3, 100.0)	≥4 (84.2, 100.0)
Ages 18-34	≥1/year (94.6, 100.0)	≥4 (95.9, 95.6)
Ages 35-64	≥1/year (85.0, 100.0)	≥4 (88.2, 95.7)
Ages 65+	≥1/year (64.3, 100.0)	≥2 (97.2, 82.0)
White	≥1/year (87.6, 100.0)	≥4 (90.2, 96.0)
African American	≥1/year (77.5, 100.0)	≥3 (92.7, 88.8)
Native American	≥1/year (91.2, 100.0)	≥4 (92.3, 97.3)
Asian	≥1/year (89.3, 100.0)	≥4 (90.5, 96.9)
Hispanic	≥1/year (92.6, 100.0)	≥4 (93.8, 96.4)

(Sensitivity and specificity in parentheses)

Source: Dawson et al., 2010

Summary and Conclusions

Summary

- Defining risk drinking is difficult, because the thresholds vary by type of harm and whether associations are determined prospectively or cross-sectionally
- Risk curve data are open to a range of interpretations, as exemplified by the variation in drinking guidelines across and within countries
- Our ability to assess the relationship between alcohol consumption and harm is strongly affected by the type of consumption data that are available

Conclusions

- As better data become available, we need to constantly re-examine our definitions of risk drinking
- We need to include a broader range of consumption measures in future surveys to permit testing different thresholds for harm
- As definitions of AUD evolve under DSM-V, we need to check that our screeners still perform as well as they did for DSM-IV diagnoses

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