Alcohol Related Harms

PEI Alcohol Policy Forum

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Presentation outline

1) Impacts of Alcohol Use on Health

2) Alcohol Use

3) Impact of Alcohol Use on the Burden of Disease

4) Other Impacts of Alcohol Use

5) What Can be Done to Reduce the Alcohol-Attributable Burden of Disease

Impacts of Alcohol Use on Health

Impact of alcohol use on health





Rush et al., 2019

Cause 2015	GHE	2015	caus	e category	ICD-10 coding	
10	Ι.	Com	munio	cable, maternal,	A00–B99, D50–53,	
		perin	atal a	ind nutritional	D64.9, E00–02,	
		cond	itions		E40-46, E50-64,	
					G00–04, G14, H65–66,	
					J00–22, N70–73,	
					000–99, P00–96, U04	
20		Α.	Infec	tious and parasitic	A00–B99, G00–04,	
			disea	ases	G14, N70–73, P37.3,	
					P37.4	
30			1	Tuberculosis*	A15–19, B90	
40			2	Sexually transmitted	A50-A64	
				infections excluding HIV		
100			3	HIV/AIDS	B20–24	
380		В.	Resp	piratory infections	H65–66, J00–22, P23, U04	
390			1	Lower respiratory infections*	J09–22, P23, U04	

Cause	GHE 201	5 cau	se category	ICD-10 coding
2015				
610	Α.	Mali	gnant neoplasms	C00–97
620		1	Mouth and	C00–14
			oropharynx cancers	
621			a. Lip and oral	C00–08
			cavity	
623			c. other pharyngea	ll C09–10, C12–14
			cancers	
630		2	Oesophagus cancer	C15
650		4	Colon and rectum	C18–21
			cancers	
660		5	Liver cancer	C22
700		9	Breast cancer	C50
710		10	Cervix uteri cancer	C53
753		19	Larynx cancer	C32

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Cause 2015	GHE 2015	5 cause	ecategory	ICD-10 coding
800	C.	Diabe	tes mellitus	E10–14 (minus E10.2– 10.29, E11.2–11.29, E12.2, E13.2–13.29, E14.2)
820	E.	Menta disord	I and substance use lers	F04–99, G72.1, Q86.0, X41–42, X44, X45
860		4	Alcohol use disorders	F10, G72.1, Q86.0, X45
940	F.	Neuro	logical conditions	F01–03, G06–98 (minus G14, G72.1)
970		3	Epilepsy	G40–41

Cause	GHE 201	5 caus	se cat	egory	ICD-10 coding
2013					
1100	Н.	Carc	liovas	scular diseases	100–99
1120		2	Hyp dise	ertensive heart ase	110–15
1130		3	lsch dise	aemic heart ase*	120–25
1140		4	Stro	ke	160–69
1141			a.	lschaemic stroke*	G45–46.8, 163–63.9, 165–66.9, 167.2–67.848, 169.3–69.4
1142			b.	Haemorrhagic stroke*	160–62.9, 167.0–67.1, 169.0–69.298
1150		5	Cardiomyopathy, myocarditis, endocarditis		130–33, 138, 140, 142
1210	J.	Dige	stive	diseases	K20–92
1230		2	Cirrł	nosis of the liver*	K70, K74
1248		8	Pan	creatitis*	K85–86

Cause	GHE 201	5 cau	ise category	ICD-10 coding
2015				
1520	A.	Unintentional injuries		V01–X40, X43, X46–59, Y40–86, Y88, Y89
1530		1	Road injury	V01–04, V06, V09–80, V87, V89, V99*
1540		2	Poisonings	X40, X43, X46–48, X49
1550		3	Falls	W00–19
1560		4	Fire, heat and hot substances	X00–19
1570		5	Drowning	W65–74
1575		6	Exposure to mechanical forces	W20–38, W40–43, W45, W46, W49–52, W75, W76
1590		8	Other unintentional injuries	Rest of V, W39, W44, W53–64, W77–99, X20– 29, X50–59, Y40–86, Y88, Y89

Cause 2015	GHE 201	5 cau	se category	ICD-10 coding
1600	В.	Inter	ntional injuries	X60–Y09, Y35–36, Y870, Y871
1610		1	Self-harm	X60–84, Y870
1620		2	Interpersonal violence	X85–Y09, Y871

What does this mean for policy?



Source: WHO

Alcohol use

Alcohol Use in Canada

Figure 7: Per capita consumption of alcohol by Canadian jurisdiction (2017–2018)



Source: Statistics Canada, 2019, Table 10-10-0010-0122



Figure 3: Prevalence of self-reported past-year alcohol use among grades 7–12 in Canada (2017)

Source: YSS 2012–2013,¹⁸ CSTADS 2014–2015,¹⁹ CSTADS 2016–2017¹⁷ Note: For survey cycles preceding 2014–2015, CSTADS was called the Youth Smoking Survey (YSS).

Alcohol use and COVID-19 – Canadian Example

			Total			Men			Women	
Independen	nt variable	Ordered OR*	(95% CI)	p value	Ordered OR*	(95% CI)	p value	Ordered OR*	(95% CI)	p value
Anxiety (GAD-7	Low (0 to 4)	REF	-	-	REF	-	-	REF	-	-
score)	Mild to moderate (5 to 14)	1.23	(1.07, 1.42)	<0.01	1.16	(0.94, 1.42)	0.16	1.30	(1.07, 1.59)	<0.01
	Severe (15 or greater)	1.49	(1.15, 1.93)	<0.01	1.48	(1.00, 2.19)	0.05	1.54	(1.09, 2.18)	0.01
Number of	None	REF	-	-	REF	-	-	REF	-	-
days	1 to 2	1.36	(1.17, 1.58)	<0.01	1.43	(1.15, 1.78)	<0.01	1.29	(1.05, 1.59)	0.02
feeling	3 to 4	1.48	(1.20, 1.83)	<0.01	1.42	(1.03, 1.94)	0.03	1.52	(1.14, 2.03)	<0.01
aepressea	5 to 7	1.42	(1.04, 1.94)	0.03	1.89	(1.16, 3.06)	<0.01	1.06	(0.70, 1.61)	0.78
Number of	None	REF	-	-	REF	-	-	REF	-	-
days	1 to 2	1.07	(0.93, 1.23)	0.32	1.16	(0.95, 1.42)	0.15	1.01	(0.83, 1.23)	0.89
feeling	3 to 4	1.24	(1.02, 1.50)	0.03	1.35	(1.02, 1.80)	0.04	1.14	(0.87, 1.49)	0.34
lonely	5 to 7	1.51	(1.16, 1.96)	<0.01	1.37	(0.92, 2.06)	0.13	1.51	(1.06, 2.15)	0.02
Number of	None	0.85	(0.71, 1.01)	0.06	0.84	(0.66, 1.06)	0.15	0.90	(0.70, 1.16)	0.40
days	1 to 2	0.96	(0.81, 1.13)	0.63	0.89	(0.70, 1.12)	0.32	1.09	(0.86, 1.38)	0.49
teeling hopeful	3 to 4	0.91	(0.78, 1.07)	0.26	0.89	(0.71, 1.11)	0.30	0.95	(0.75, 1.21)	0.69
about the future	5 to 7	REF	-	-	REF	-	-	REF	-	-

	HED at least once in the	Cannabis use at least once a week	Change in alcohol use	Change in cannabis use
Gender groups	past week			
Transgender and gender-diverse	1.65	3.89***	2.12**	4.61***
individuals				
	(0.69 - 3.93)	(1.95 - 7.75)	(1.07 - 4.19)	(2.15 - 9.92)
Cisgender individuals (women and				
men)	Ref	Ref	Ref	Ref
Transgender and gender-diverse	1.61	4.47***	2.16**	4.72***
individuals				
	(0.68 - 3.84)	(2.24 - 8.95)	(1.09 - 4.28)	(2.19 - 10.19)
Cisgender men	0.94	1.34***	1.05	1.05
	(0.84 - 1.06)	(1.15 - 1.57)	(0.94 - 1.16)	(0.89 - 1.25)
Cisgender women	Ref	Ref	Ref	Ref
Transgender and gender-diverse	1.71	3.34***	2.07**	4.49***
individuals				
	(0.72 - 4.07)	(1.67 - 6.69)	(1.04 - 4.09)	(2.08 - 9.71)
Cisgender women	1.06	0.75***	0.96	0.95
-	(0.95 - 1.19)	(0.64 - 0.87)	(0.86 - 1.07)	(0.80 - 1.13)
Cisgender men	Ref	Ref	Ref	Ref

Legend: *** and ** Odds ratios are significant at the 1% and 5% significance level, respectively. 95% confidence intervals in parentheses. Ref: reference category. Changes in alcohol use and changes in cannabis use variables are categorical with five categories: 1 (much less), 2 (slightly less), 3 (no change), 4 (slightly more), and 5 (much more). For these variables, proportional odds ratios were reported. Heavy episodic drinking and use of cannabis at least once a week are binary variables.

Note: Odds ratios and 95% confidence intervals are adjusted for age, marital status, education, ethnoracial background, living area, household income, the presence of children, other people in the household, worrying about getting COVID-19, and survey wave indicator variables.

Global benchmarks

Results: Total Adult APC 2019



Results – Change in Adult APC 2019 to 2020



Changes in Global APC 2019: 5.4 litres/ 2020: 5.0 litres/ 7.5% decrease

Impact of alcohol use on the burden of disease



Figure 10: Number of hospitalizations entirely caused by alcohol by Canadian jurisdiction (2017)

Source: Canadian Institute for Health Information, 2019, Health indicators interactive tool: Hospitalizations entirely caused by alcohol³⁹

Hospitalizations in 2014

Table 4. Hospital stays in Canada (not including Quebec) attributable to substance use in 2014 by type of substance

Substance	Number of Hospitalizations	Percentage of Hospitalizations
Alcohol	87,911	34.4%
Tobacco	145,801	57.0%
Cannabis	3,836	1.5%
Opioids	6,982	2.7%
Other CNS depressants	5,534	2.2%
Cocaine	1,572	0.6%
Other CNS stimulants	2,275	0.9%
Other drugs	1,660	0.6%
Total	255,571	

Deaths due to substance use and abuse in 2014

Table 6. Number of deaths, average age at death and potential years of life lost due to substanceuse-attributable premature mortality, 2014

Substance	Deaths	Average Age at Death	Potential Years of Life Lost due to Premature Mortality
Alcohol	14,827	65.3	244,144
Tobacco	47,562	75.4	326,870
Cannabis	851	61.8	18,301
Opioids	2,396	45.5	87,782
Other CNS Depressants	796	46.4	28,792
Cocaine	297	38,0	13,015
Other CNS stimulants	487	38.8	21,038
Other drugs	299	44.3	11,427
Total	67,515	71.0	751,369



Rush et al., 2019

Alcohol consumption per week

Drinking alcohol has negative consequences. The more alcohol you drink per week, the more the consequences add up.





Table. Prevalence of Canadian adults in 2018 drinking within each of the risk categories listed in Canada's 2023 Guidance on Alcohol and Health

Drinking category		Canada's 2023 —	Current drinkers			Total adult population (abstention included)		
		Guidance on Alcohol and Health risk categories	Total	Men	Women	Total	Men	Women
Abstainers		No risk				22.1%	23.3%	20.9%
	615							
	1 to 2 drinks per week*	Low risk	27.5%	19.9%	34.7%	21.5%	13.3%	29.1%
	3 to 6 drinks per week*	Moderate risk	23.8%	21.0%	26.6%	18.5%	16.6%	20.4%
	7 or more drinks per week*	Increasingly high risk	48.7%	59.2%	38.7%	37.9%	46.8%	29.7%

Alcohol consumption and cancer

A causal relationship between alcohol and the following cancers has been confirmed:

Oral cavity and pharyngeal (excluding nasopharyngeal) Oesophageal squamous cell carcinoma Colorectal Liver Laryngeal Breast (female)

Biological pathways:

Ethanol metabolism

Inhibition of the one carbon metabolism pathway

Modification of hormone levels and associated signaling pathways





0.7 Million Cancer Cases

4.1% of New Cancer Cases

Figure 3: Population attributable fraction and age-standardised incidence rate of alcohol-attributable cancer cases in females in 2020, by country



Figure 1: Population attributable fractions, by alcohol consumption category, sex, and world region

Attributable cancers by site



Alcohol Harms and Socioeconomic Status



Probst et al., 2021

How does alcohol compare to tobacco?

A Drink Equals How Many Cigarettes? Equating Mortality Risks From Alcohol and Tobacco Use



Figure 1. Lifetime deaths per 1,000 males and 1,000 females attributable to alcohol use and cigarette smoking

Other Impacts of Alcohol Use

Harms to people other than the drinker (second-hand harms)

- Motor vehicle injuries
- Violence
- Fetal alcohol spectrum disorder



Healthcare



Lost Productivity



Criminal Justice

Costs/Harm	Data Sources
Research and prevention	Health Canada; Canadian Institute for Health Research; Heart and Stroke Foundation; Canadian Cancer Society; Canadian Partnership Against Cancer; Canadian Council for Tobacco Control; Traffic Injury Research Foundation; Treasury Board of Canada Secretariat: Tobacco Control Strategy 2006/07–2017/18
Fire damage	Provincial/territorial fire marshal and fire commissioners reports 2015–2017; personal communications with provincial/territorial fire marshals and fire commissioners
Damage to motor vehicles	National Collision Database (Transport Canada, 2017) (counts); General Insurance Statistical Agency (2017) (costs)
Workplace drug-testing programs	Recent Alcohol and Drug Workplace Policies in Canada: Considerations for the Nuclear Industry (Barbara Butler & Associates Inc., 2012) (counts and costs)
Employee-assistance programs	Labour Force Survey 2007–2014 (Statistics Canada, 2017s); The Prevalence and Characteristics of Employee Assistance, Health Promotion and Drug Testing Programs in Ontario (Macdonald & Wells, 1995) (counts); personal communications with Morneau Shepell (costs)
Workers' compensation administrative costs	Provincial/territorial workers' compensation boards annual reports 2007–2017



Figure 12: Costs associated with hospitalizations due to use of alcohol versus all other substances (excluding tobacco)

Source: Canadian Centre on Substance Use and Addiction, Canadian Substance Use Costs and Harms, 2018³

	Net reven	ues (fiscal yea	ar 2014/15), \$	million		Total not				
Jurisdiction	Net income from liquor authorities	Federal excise tax	Sales tax ^a and other revenue	Total net revenue	Health care	Economic loss of production	Criminal justice	Other direct	Total net cost	surplus/deficit, \$ million
Newfoundland and Labrador	160.7	30.1	57.9	248.7	(86.8)	(119.5)	(48.9)	(20.8)	(276.0)	(27.3)
Prince Edward Island	19.7	6.7	30.3	56.7	(26.2)	(19.7)	(15.0)	(6.0)	(66.9)	(10.2)
Nova Scotia	228.0	41.9	102.9	372.7	(144.8)	(168.1)	(89.0)	(24.8)	(426.7)	(54.0)
New Brunswick	166.1	27.4	54.3	247.8	(102.5)	(120.5)	(76.3)	(27.1)	(326.4)	(78.6)
Quebec ^b	1 032.7	331.8	1 080.9	2 445.3	(598.9)	(983.3)	(708.5)	(298.2)	(2 588.9)	(143.6)
Ontario	1 817.4	549.2	1 552.0	3 918.6	(1 473.6)	(2 118.0)	(1 258.0)	(494.7)	(5 344.3)	(1 425.7)
Manitoba	281.6	56.4	93.6	431.5	(186.2)	(224.2)	(105.3)	(61.8)	(577.5)	(146.0)
Saskatchewan	244.2	53.8	93.4	391.4	(179.8)	(235.6)	(107.3)	(40.2)	(562.9)	(171.5)
Alberta	765.8	218.4	127.0	1 111.2	(709.3)	(1 109.6)	(387.2)	(189.7)	(2 395.8)	(1 284.6)
British Columbia	935.2	222.2	463.9	1 621.3	(673.2)	(744.3)	(349.0)	(169.0)	(1 935.5)	(314.2)
Yukon	9.2	2.7	6.1	17.9	(15.2)	(20.3)	(3.3)	(1.9)	(40.7)	(22.8)
Northwest Territories	25.0	3.1	2.4	30.5	(17.6)	(30.6)	(3.6)	(4.0)	(55.8)	(25.3)
Nunavut	1.2	0.3	0.3	1.7	(16.1)	(22.5)	(2.7)	(2.0)	(43.3)	(41.6)
Canada	5 686.9	1 543.9	3 664.8	10 895.5	(4 230.2)	(5 916.4)	(3 154.2)	(1 340.3)	(14 641.1)	(3 745.6)

TABLE 1Government alcohol net revenue, net costs and net deficit, by jurisdiction and Canada, 2014

Note: Numbers in parentheses are negative.

^a Provincial sales tax (PST), harmonized sales tax (HST) or goods and services tax (GST).

^b According to *Canadian Substance Use Costs and Harms*: 2007–2014,³ health care costs in Quebec are not fully enumerated due to data access issues; these costs are therefore underestimates.

What Can be Done to Reduce the Alcohol-Attributable Burden of Disease

Alcohol policies

WHO Best Buys:

- Increases in Taxation/Price
- Reductions in Availability
- **Reductions** in Advertising/Marketing

There is a need for additional alcohol policies to address:

- Effective **warning labels** on alcoholic beverages
- Decreasing the percentage of alcohol contained in alcoholic beverages



Country	Increasing currer 20%	nt excise duties by	Increasing current 50%	excise duties by	Increasing current e 100%	xcise duties by
	% alcohol-	% cancers	% alcohol-	% cancers	% alcohol-	% cancers
	attributable	averted/all	attributable	averted/all	attributable	averted/all
	cancers averted	cancers ^a	cancers averted	cancers ^a	cancers averted	cancers ^a
Germany	0.60 (0.50-0.72)	0.08 (0.07-0.10)	1.52 (1.26–1.81)	0.21 (0.17–0.25)	3.06 (2.55–3.67)	0.42 (0.35-0.51)
Italy	0.95 (0.81-1.10)	0.07 (0.06-0.09)	2.38 (2.04–2.76)	0.19 (0.16–0.22)	4.80 (4.10–5.56)	0.37 (0.32-0.43)
Kazakhstan	0.70 (0.56-0.91)	0.10 (0.08-0.14)	1.76 (1.42–2.29)	0.26 (0.21–0.34)	3.57 (2.87–4.67)	0.53 (0.43-0.70)
Sweden	1.38 (1.18-1.65)	0.12 (0.10-0.14)	3.48 (2.97–4.16)	0.29 (0.25–0.35)	7.03 (6.00–8.44)	0.60 (0.51-0.71)

Values given in parentheses are 95% confidence intervals. ^a The proportion here denotes the cases averted of all cancers from the following categories: lip and oral cavity, oropharynx, oesophagus, colon and rectum, liver, female breast, and larynx cancers.

Digital Interventions (Sohi et al., In Preparation)



	Treatment				Contro	bl		Mean diff.		Weight
Study	N Mean		ו SD	N	Mear	n SD		with 95% CI		(%)
> 3 to 6 months										
Baumgartner 2021	234	-34.4	35.6	234	-22.8	64.4		-11.60 [-21.03,	-2.17]	0.91
Bendtsen 2022	1,063	-14.6	17.6	1,066	-8.6	18.5		-6.00 [-7.53,	-4.47]	1.88
Berman 2019	262	-2.3	6.9	400	-2.1	7.5		-0.20 [-1.33,	0.93]	1.90
Bertholet 2015	367	12.1	11.9	370	13.1	12.6		-1.00 [-2.77,	0.77]	1.86
Bertholet 2019	461	-20.6	36.3	516	-14.8	33.5	-	-5.80 [-10.18,	-1.42]	1.56
Boß 2018 - Guided CWT	142	-15.4	24.5	144	-7.8	20.9		-7.60 [-12.88,	-2.32]	1.43
Boß 2018 - Unguided CWT	146	-19.4	22.9	144	-7.8	20.9		-11.60 [-16.65,	-6.55]	1.46
Brendryen 2013	125	26.4	23.3	119	30.7	26.9		-4.30 [-10.61,	2.01]	1.29
Carey 2017	160	-4.2	14.2	166	-3.6	15.8		-0.60 [-3.86,	2.66]	1.71
Cunningham 2009	92	21.6	17.3	93	22.3	20		-0.70 [-6.09,	4.69]	1.42
Ekman 2011	80	14.3	10.9	78	15.5	10.9		-1.20 [-4.60,	2.20]	1.69
Hamamura 2022	98	-10.6	21	80	-7.3	21.1		-3.30 [-9.52,	2.92]	1.30
Hansen 2012	450	-2.1	39	454	0	.1		-2.10 [-5.69,	1.49]	1.67
Kypri 2009	1,251	16.4	13.8	1,184	18.6	14.8		-2.20 [-3.34,	-1.06]	1.90
Kypri 2013	733	10	10.6	682	11.4	10.6		-1.40 [-2.51,	-0.29]	1.91
Kypri 2014	1,437	8.6	8.5	1,413	10	8.5		-1.40 [-2.02,	-0.78]	1.93
Lewis 2007b	64	15.9	13.3	78	22	13.4		-6.10[-10.51,	-1.69]	1.55
Lewis 2014	119	15.8	17	121	18.6	16.8	-	-2.80 [-7.08,	1.48]	1.57
Riper 2008	130	41	36	131	58	36		-17.00 [-25.74,	-8.26]	0.99
Rose 2017	854	9	21.1	851	-1.7	21		0.80 [-1.20,	2.80]	1.84
Schaub 2021	687	-39	50.9	713	-22	54		-17.00 [-22.50,	-11.50]	1.40
Schulz 2013	113	-5.6	14.2	84	6	27.9		-5.00 [-10.97,	0.97]	1.34
Voogt 2013a	318	17.4	21.6	291	16.7	20		0.70 [-2.62,	4.02]	1.70
Voogt 2013b	456	30.7	29.4	451	32	29.3		-1.30 [-5.12,	2.52]	1.63
Walters 2009	54	24.1	24.6	61	25.8	28.3		-1.70 [-11.45,	8.05]	0.88
Zill 2019	306	-27.2	49.1	302	-8.2	35.9		-19.00 [-25.84,	-12.16]	1.22
Heterogeneity: $\tau^2 = 19.58$, $I^2 = 94.2$	28%, H² = 17 .	49						-4.31 [-6.23,	-2.39]	
Test of $\theta_i = \theta_j$: Q(25) = 146.67, p =	0.00						•			
Test of $\theta = 0$: $z = -4.41$, $p = 0.00$										

Random-effects REML model

Figure. The effect of a digital intervention versus no or minimal intervention on drinking (grams/day)

-60 -40 -20 0 20

	Treatment			Control				Mean diff.	Weight
Study	N	Mean	SD	Ν	Mean	SD		with 95% CI	(%)
3 months									
Dulin 2022 - App	55	-2.6	6.3	45	-1	6.5	_	-1.60 [-4.12, 0.92]	6.65
Dulin 2022 - Bot	50	-1.5	6.1	45	-1	6.5		-0.50 [-3.03, 2.03]	6.60
Sunami 2022	50	-2.7	5.7	50	-1.2	5.4		-1.50 [-3.68, 0.68]	7.95
Sundstrom 2020 - High Intensity CBT	72	-7.9	6.1	23	-3.5	5.2		-4.40 [-7.17, -1.63]	5.86
Sundstrom 2020 - Low Intensity CBT	72	-7.4	6.7	23	-3.5	5.2		-3.90 [-6.89, -0.91]	5.25
Heterogeneity: $\tau^2 = 0.79$, $I^2 = 31.45\%$, H	1 ² = 1.4	46					•	-2.23 [-3.61, -0.84]	
Test of $\theta_i = \theta_i$: Q(4) = 6.00, p = 0.20									
Test of $\theta = 0$: z = -3.14, p = 0.00									
6 months									
Augsburger 2022	303	-7	6.4	286	-4.1	6.9		-2.90 [-3.97, -1.83]	14.09
Baumgartner 2021	234	-6.2	6	234	-1.7	6.5		-4.50 [-5.63, -3.37]	13.70
Schaub 2021	687	-7.3	8.2	713	-3.3	8.7	-	-4.00 [-4.89, -3.11]	15.30
Heterogeneity: τ² = 0.33, I² = 54.53%, Η	H ² = 2.2	20					•	-3.80 [-4.68, -2.92]	
Test of $\theta_i = \theta_i$: Q(2) = 4.36, p = 0.11									
Test of θ = 0: z = -8.47, p = 0.00									
One year									
Mujcic 2022	53	-4.5	6	50	-2.9	5.3		-1.60 [-3.79, 0.59]	7.89
Heterogeneity: $\tau^2 = 0.00$, $I^2 = .\%$, $H^2 = .$								-1.60 [-3.79, 0.59]	
Test of $\theta_i = \theta_j$: Q(0) = 0.00, p = .									
Test of θ = 0: z = -1.43, p = 0.15									
Overall							•	-3.04 [-3.85, -2.23]	
Heterogeneity: $\tau^2 = 0.91$, $I^2 = 55.76\%$, H	H ² = 2.2	26							
Test of $\theta_i = \theta_j$: Q(10) = 21.24, p = 0.02									
Test of $\theta = 0$: z = -7.38, p = 0.00									
Test of group differences: $Q_b(4) = 7.73$,	p = 0.	10							
						-10	-5 0	5	

Random-effects REML model

Figure. The effect of a digital intervention versus no or minimal intervention on AUDIT scores

Take Home Points

- Alcohol is causally associated with over 200 three-digit ICD-10 codes
- Alcohol leads to >200 hospitalizations per 100,000 people in PEI per year
- Alcohol leads to over > 14,000 deaths each year in Canada
- 5 in 10 Canadian adults exceed the guidelines (7 in 10 Canadian drinkers)
- Alcohol policies such as taxation, reductions in availability and restrictions in marketing reduce alcohol-attributable harms
- Experimental policies such as labelling also may be able to reduce alcoholattributable harms

Thank You

