



**AN ALCOHOL TAXATION METHOD THAT
CAN PREVENT DRINKING INITIATION
AND REDUCE ALCOHOL CONSUMPTION
AND ITS RELATED HARMS: EMPIRICAL
EVIDENCE FROM THAILAND**

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Presentation outline

Background and motivation

Objectives

Methods

Findings

Discussion

1. The public health importance of preventing alcohol-related problems in low- and middle-income countries

The prevalence of lifetime abstainers in low- and middle-income countries: (LMIC) 60-90%; High-income countries (HIC) 20-30%

Long-term prevention of harms (25 years)

Alcohol control policies

Prevent drinking initiation among young people 15 – 24 years of age

Prevent regular drinking among adults

Prevent alcohol-attributable harms among adults

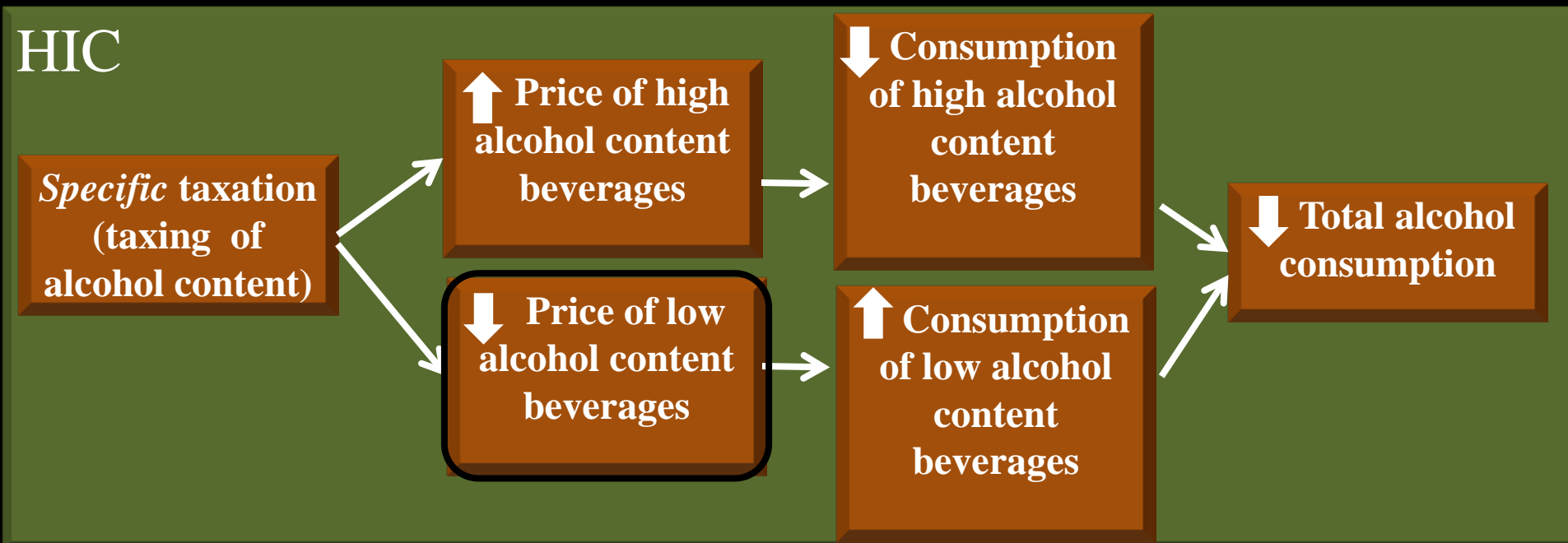
Reduce drinking among drinkers

Prevent alcohol-attributable harms

Short-term prevention of harms

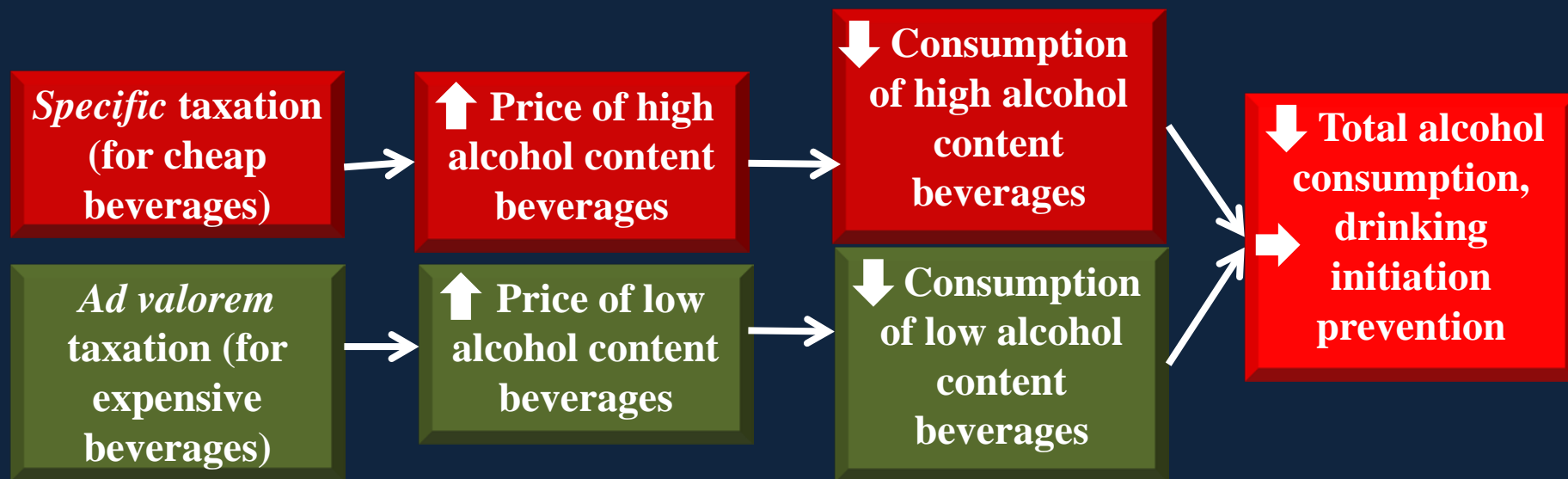
2. The common alcohol taxation method, successful in reducing alcohol-related problems in HIC, may face some challenges of applying the method in LMIC.

Alcohol taxation is one of the most effective alcohol control measures (*WHO 2010, 2012; Babor et al., 2010*)



3. Thailand's unique alcohol excise taxation system and its potential to simultaneously reduce alcohol consumption and its related harms and prevent drinking initiation

Thailand's unique alcohol excise taxation (Two-Chosen-One)



Two objectives of the study

1. To examine if changes in the rates of Thailand's alcohol excise taxation are associated with changes in alcohol consumption and alcohol-related harms.

2. To examine if changes in the rates of Thailand's alcohol excise taxation are associated with changes in rates of drinking initiation.

1. The association between taxation increases and changes in alcohol consumption and traffic fatalities in Thailand

Methods

- **Design:** A quasi-experimental interrupted time-series study
- **Measurements:**
 - **The dependent measures:**
 - A series of monthly data on *per capita* consumption of alcohol (using alcohol production data as a surrogate measure)
 - A series of monthly rates of traffic fatalities
 - **The independent measure:**
 - The average tax rate of eight alcoholic beverage categories.
- **Setting:** Thailand, October 2004 to September 2009

Findings

1. Thailand's alcohol taxation increase in 2009 was found to reduce alcohol consumption (22.9%).

tax rate increase	Alcohol consumption ^a (liters of pure alcohol per capita per month)			Resulting percentage change of alcohol consumption (%)	
	Estimated size of effect	95% Confidence Interval	P-value	Estimated size of effect	95% Confidence Interval
First (2005)	-0.035	-0.088 0.018	0.198	-7.6%	-19.1% 3.9%
Second (2007)	-0.058	-0.117 0.001	0.055	-12.9%	-26.0% 0.2%
Third (2009)	-0.110*	-0.207 -0.013	0.027	-22.9%*	-43.1% -2.7%

^aARIMA model for alcohol consumption = (0,0,1)(0,0,1,12); * P-value < 0.05

Findings

2. Thailand's alcohol taxation increases in 2005, 2007, and 2009 were found to reduce rates of traffic fatalities (7.1%, 19.2%, and 22.4% respectively).

tax rate increase	Traffic accident death rate (deaths per 100,000 population per month)			Resulting percentage change in fatal traffic accident rate (%)	
	Estimated size of effect	95% CI	P-value	Estimated size of effect	95% CI
First (2005)	-0.116*	-0.227 -0.005	0.040	-7.1%*	-13.9% -0.3%
Second (2007)	-0.286*	-0.443 -0.130	0.000	-19.2%*	-29.7% -8.7%
Third (2009)	-0.374*	-0.593 -0.156	0.001	-22.4%*	-35.5% -9.3%

^a ARIMA model for the total fatal traffic accident rate = (1,0,0)(1,0,0,12), * P-value < 0.05

Findings

3. The percentage of taxed coverage of the alcohol market was associated with the percentage change in traffic fatalities and in alcohol consumption with $r < -0.9$.

	First tax rate increase (2005)	Second tax rate increase (2007)	Third tax rate increase (2009)
The percentage of taxed coverage	14.9%	55.9%	95.3%
The percentage change of alcohol consumption	-7.6%	-12.9%	-22.9%
The percentage change of total traffic fatalities	-7.1%	-19.2%	-22.4%
The percentage change of male traffic fatalities	-5.6%	-19.5%	-23.4%
The percentage change of female traffic fatalities	-12.5%	-15.6%	-18.3%

2. The impact of alcohol taxation on drinking initiation in adolescents and young adults: the first evidence from a middle-income country

Methods

- **Design:** A quasi-experimental design
- **Population:** Thai people 15-24 years of age
- **Sample:** Four large-scale national surveys of alcohol consumption behaviours performed in Thailand in 2001, 2004, 2007, and 2011 (n=87,176)
- **Setting:** Thailand
- **Measurement:**
 - **Independent measures:** percentage increases in the alcohol taxation rate (as compared to the tax rate in 2001), and a number of socio-demographic variables
 - **Dependent measure:** the odds of lifetime drinking
- **Analysis:** Logistic regression

Findings

- 1. Thailand's taxation system was able to prevent drinking initiation among young people 15 – 24 years of age during 2001-2011 (10% increase in tax rate was associated with 5% reduction in the odds of lifetime drinking, 95%CI: 1% - 9%, P-value = 0.019).**

Findings

2. The effect on drinking initiation prevention was stronger for young adults (20 – 24 years of age) than for adolescents (15 – 19 years of age) and greater for males than for females.

		15 – 17 years old	18 – 19 years old	20 – 24 years old
Male	OR	1.12	1.01	0.90***
	95% CI	(0.94 – 1.33)	(0.90 – 1.13)	(0.84 – 0.97)
	P-value	0.192	0.830	0.004
Female	OR	0.91	0.81	0.99
	95% CI	(0.56 – 1.47)	(0.65 – 1.01)	(0.88 – 1.12)
	P-value	0.691	0.067	0.911

* P-value < 0.05, ** P-value < 0.017, *** P-value < 0.008

Discussion

- **The first study examining the effects of alcohol taxation on traffic fatalities and on drinking initiation for LMIC**

Discussion

- **Thailand's alcohol excise taxation was able to reduce alcohol consumption and traffic fatalities and to prevent drinking initiation in Thailand.**
 - **This kind of taxation may be transferable to other LMIC.**

	2001	2010	2011	Relative difference
GDP	\$5,195	\$9,221	\$9,600	+ 77% (9 yr) + 85% (10 yr)
Prevalence of lifetime drinkers	19.3%		21.0%	+ 9% (10 yr)
Recorded adult per capita alcohol consumption	6.05	6.16		+ 2% (9 yr)

Source: Index Mundi (2012), WHO (2012)

Limitations

1. Limitations related to time series data:

- **The absence of a measurement for monthly unrecorded alcohol consumption and no monthly data available for imported alcohol**
- **The small number of observations before the first taxation increase and after the third taxation increase**

2. Limitations of the survey data:

- **residual confounding**
- **exclusion bias and response bias, hard to establish a temporal effect**

3. The absence of behavioural variables:

- **inability to test behavioural theory**

4. A limitation of quasi-experimental studies:

- **the absence of a control country , cannot measure counterfactual**

Conclusions

- **Alcohol taxation is an effective alcohol control policy to reduce alcohol consumption and its related harms both for LMIC and HIC.**
- **Governments in LMIC that need to achieve both short- and long-term prevention of alcohol-related problems may consider an alcohol taxation method that can prevent drinking initiation among young people.**
- **To maximize the effects of taxation rate increases, governments should increase taxation across the majority of the alcoholic beverage market to prevent substitution.**
- **Moreover, governments also should apply additional, complementary, age-specific alcohol accessibility control measures in order to prevent drinking initiation.**

Conclusions

- **Future research opportunities include**
 - Examining the effects of alcohol taxation on alcohol-related harms and on drinking initiation in other LMIC
 - Producing studies to evaluate the effect of Thailand's alcohol taxation compared to other methods of taxation on alcohol consumption and its related harms and on drinking initiation
 - Examining the effects of alcohol taxation on drinking initiation in HIC.

Take home message

- **Taxation that increases price of alcoholic beverages preferred by heavy drinkers and young drinkers will be able to simultaneously reduce alcohol consumption and prevent drinking initiation.**
- **This taxation approach is especially important for low- and middle-income countries which are the countries that have high rate of abstainers.**

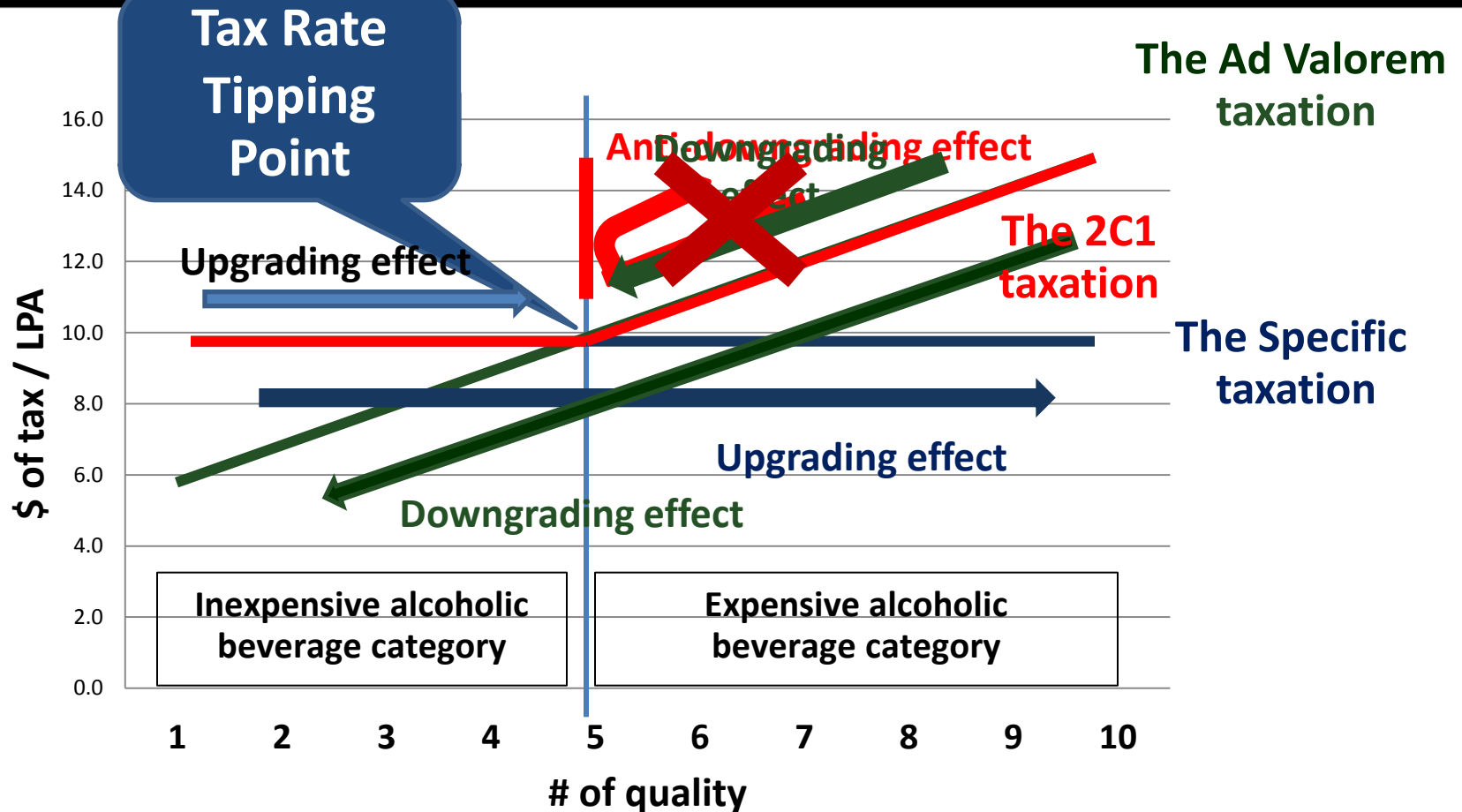
Question Time



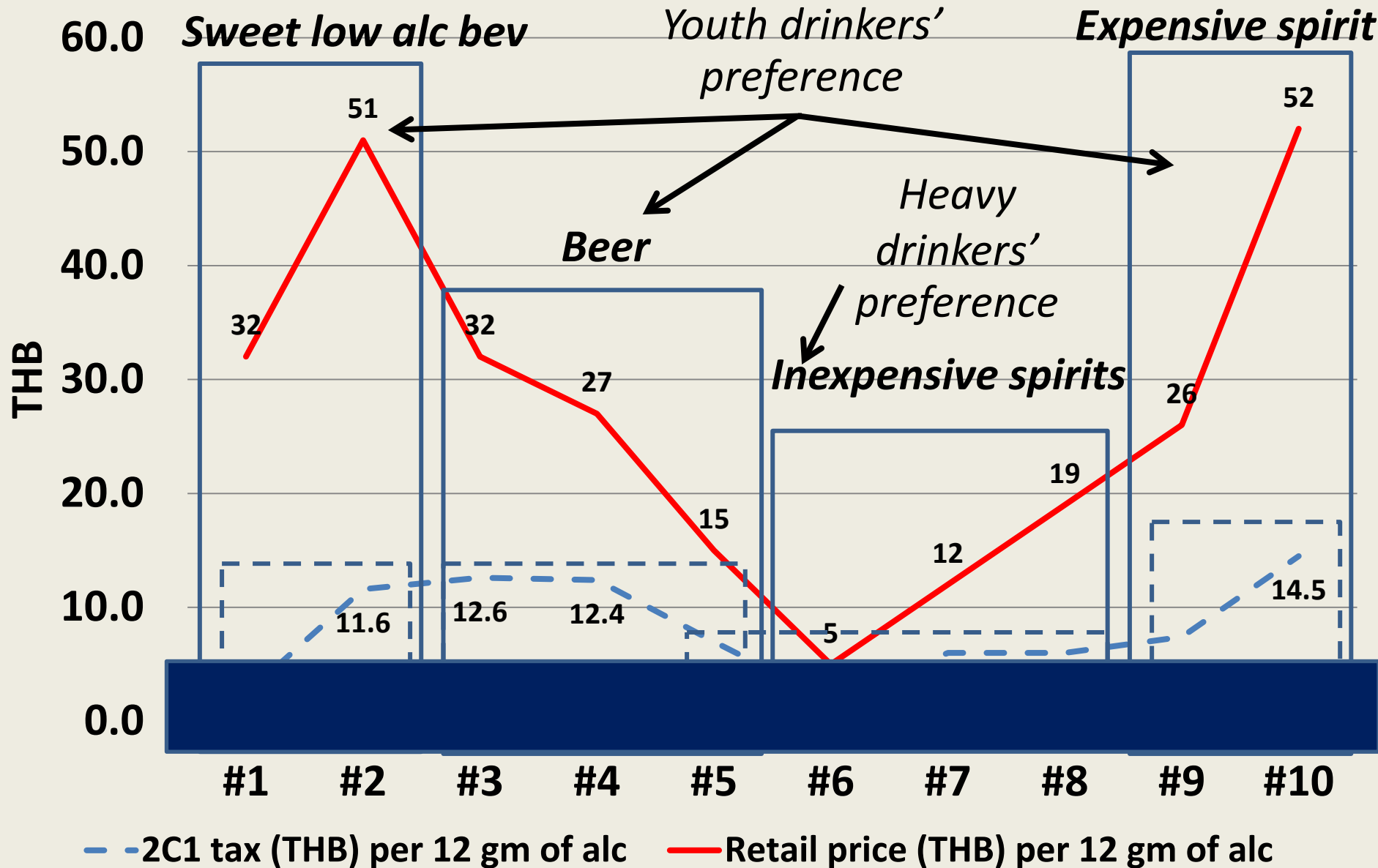
Thank you

Result of theoretical evaluation

Anti-downgrading effect



2C1's actual tax rates and retail prices per 12 gm of alcohol



Findings

1

There is no published literature examining the effects of alcohol taxation on alcohol-related harms and drinking initiation in LMIC.

2

The estimates of elasticity of demand in LMIC were found to be similar to those published for HIC as reported by Wagenaar et al. (2009) and Elder et al. (2010)

	HIC	LMIC
Beer	-0.46 (<i>Wagenaar et al., 2009</i>)	-0.5 (-0.78 to -0.21)
Wine	-0.69 (<i>Wagenaar et al., 2009</i>)	-0.79 (-1.09 to -0.49)
Spirit	-0.80 (<i>Wagenaar et al., 2009</i>)	
Total	-0.77 (<i>Elder et al., 2010</i>)	-0.64 (-0.80 to -0.48)



(Shield et al., 2011)

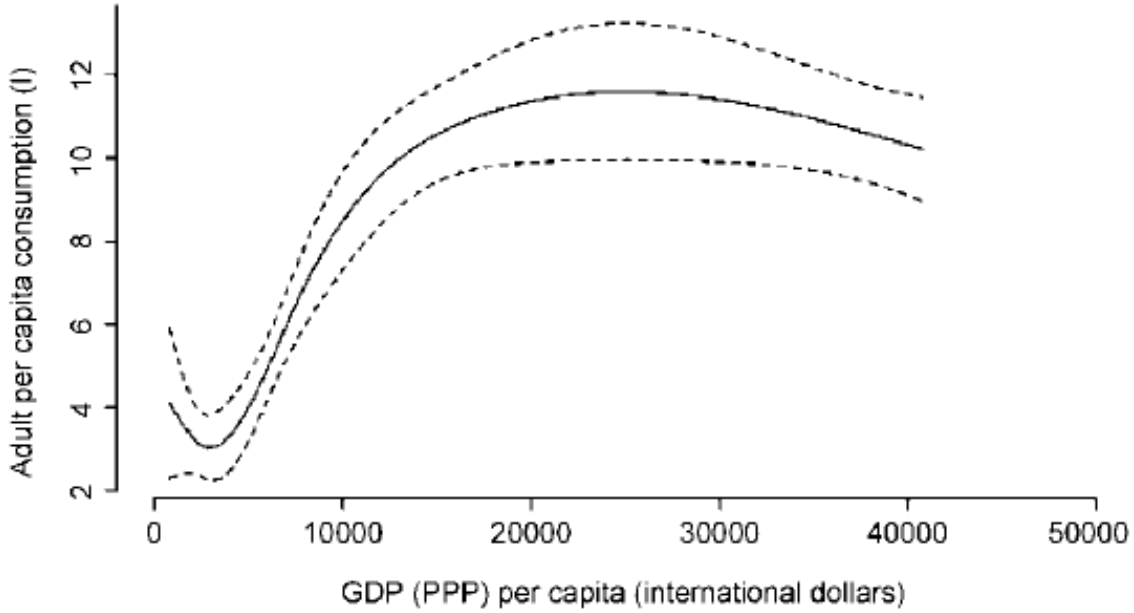
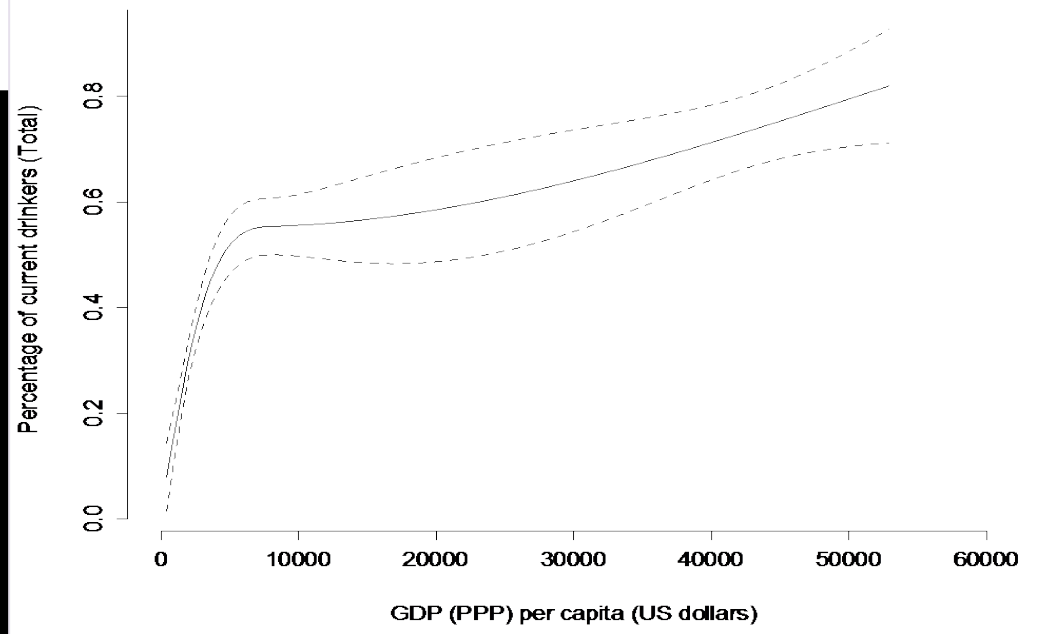


Figure 1. Relationship between total adult consumption per capita and Gross Domestic Product (PPP) per capita.

(Sornpaisarn et al., 2011)



Prevalence of alcohol abstinence by WHO region, 2004

WHO region	Lifetime abstainer (%)
AFR	57.3
AMR	21.5
EMR	87.8
EUR	18.9
SEAR	80.4
WPR	29.4
World	45.0

Challenging question

