Rapid Response

How can excise taxation be utilized to improve health outcomes in Lebanon?

A K2P Rapid Response responds to urgent requests from policymakers and stakeholders by summarizing research evidence drawn from systematic reviews and from single research studies. K2P Rapid Response services provide access to optimally packaged, relevant and high-quality research evidence for decision-making over short periods of time ranging between 3, 10 and 30-days.

Rapid Response

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K2P Rapid Response

How can excise taxation be utilized to improve health outcomes in Lebanon?

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Funding
IDRC provided initial funding to initiate the K2P Center.

Merit Review
The K2P Rapid Response undergoes a merit review process. Reviewers assess the summary based on merit review guidelines.

Citation
This K2P Rapid Response should be cited as
Hilal N, Fadlallah R, Jamal D, El-Jardali F. K2P Rapid Response: How can excise taxation be utilized to improve health outcomes in Lebanon? Knowledge to Policy (K2P) Center. Beirut, Lebanon; March 2017.*

Contents

Key Messages

Key Messages

- Products such as tobacco, alcohol, and certain food constitute major health modifiers as they are directly associated with numerous adverse health outcomes, such as cancer, cardiovascular disease, and stroke. Thus, the rationale behind applying taxation or subsidies on these health-related products is to gauge their consumption, alleviate adverse health outcomes, and produce economic benefits and savings that can be reinvested in health. In some cases, revenues from these taxes are earmarked for universal health coverage.
- In Lebanon, taxable products such as alcohol and tobacco have contributed to increased morbidity and mortality among the Lebanese population. At the same time, the current health financing arrangements do not secure universal coverage of health services or public financial protection, leading to high out of pocket expenditure and suboptimal and inequitable access to healthcare services.
- Impact of taxation and subsidies:
  - **Taxation on tobacco** was found to be the most effective price-based policy measure for reducing consumption of tobacco and achieving healthcare savings. Special populations such as youth, young adults, and those with low socioeconomic status were more price-responsive in terms of participation and consumption than the general population.
  - **Taxation on alcohol** decreased demand and was associated with a reduction in numerous adverse health outcomes such as alcohol dependence, sexually transmitted diseases, self-reported impaired driving, and traffic and non-traffic related mortality.
  - **Taxation on various food products** was associated with a lower demand for sugar sweetened beverages, fast food, sugar, and salt. Simultaneously, an increased demand was noted for alternative beverages such as fruit juice and milk. Evidence was mixed concerning association between soft drink tax and obesity.
  - **Subsidies** increased the intake of healthy foods such as fruits and vegetables, and led to adequate maternal weight gain, reduction in antibiotic prescriptions, increase in mean fetal hemoglobin levels, and increase in fetal height for age ratio. Subsidies were not associated with changes in body mass index, fetal birth weight, or fetal survival.

- **Price interventions** that combined taxes and subsidies were most effective in the promotion of healthy eating in groups with lower socioeconomic position.

- Several success stories across different contexts are found about tobacco and alcohol taxations which resulted in cut down on consumption and improvement in health and the economy.
- Excise taxes need to be imposed in a scientific, fair and realistic manner, and adapted to the Lebanese context, if they are to yield the expected health and economic gains at the individual and government levels.
- Public support for increased taxation increases substantially when economic benefits derived from taxation are reinvested in health sector development through funding of primary health care, universal health coverage, public hospitals, or any other project with proven public health benefit.
- Increased prices need to be accompanied by strategies or programs to assist individuals who could not reduce consumption in response to increased taxes, especially those of low socio-economic status to help address potential equity concerns.
- Successful taxation necessitates transparent and trust-based engagement among various stakeholders. This should be coupled with mindful understanding of the role that taxation and subsidies can play in promoting and protecting health and the economy, particularly when coupled with other evidence-based interventions.

الرسائل الأساسية

- إنّ المنتجات كالتبغ والكحول وبعض الأطعمة تؤثر بشكل كبير على الصحة، حيث أنّها ترتبط بعدد من الحالات المرضية، كالسرطان، وأمراض القلب والشرايين، والسكتة الدماغية. لذلك، فإن فرض ضرائب إضافية على التبغ والكحول أو اعتماد محفّزات وإعفاءات ضريبية على المواد الغذائية كالفاكهة والخضار، هي وسائل ترشد خيارات المستهلكين الغذائية، بما يساهم في الحدّ من المشاكل الصحية، ويحقّق فوائدَ ووفرةً اقتصادية يمكن إعادة استثمارها في تعزيز الصحة. وفي بعض الحالات، يتمّ تخصيص عائدات هذه الضرائب للتغطية الصحية الشاملة.
- إنّ ترتيبات تمويل النظام الصحي في لبنان لا تضمن **التغطية الشاملة** لخدمات الصحة الأساسية أو التغطية المالية للجميع، مما يؤدي إلى ارتفاع فاتورة الإنفاق الصحي لدى المواطنين وإلى وجود تفاوت في قدرة الأفراد على الحصول علىخدمات الرعاية الصحية اللّازمة.
- تأثير الضرائب والمحفزات الضريبية:
  - إنّ استحداث أو إضافة **ضرائب على التبغ** هي من الإجراءات التسعيرية الأكثر فعاليّة في مجال السياسات العامة للحدّ من استهلاك التبغ وتحقيق وفرة في تكلفة الرعاية الصحية. إنّ بعض الأفراد مثل المراهقين والشباب، وذوي الوضع الإجتماعي والإقتصادي المتدني هم أكثر استجابة في ما يتعلّق برفع الأسعار من حيث المشاركة والإستهلاك من الأفراد الآخرين.
  - إنّ استحداث أو إضافة **ضرائب على الكحول** يساهم في تخفيف الطّلب كما أثبتت الأبحاث والتجارب، ترافق معه الحدّ من العديد من المشاكل الصحية العديدة للمشروبات الكحولية مثل إدمان الكحول، والأمراض المنقولة جنسياً، والقيادة غير السليمة، والوفيات المرتبطة بحوادث السير وغيرها.
  - إنّ استحداث أو إضافة **ضرائب على منتجات غذائية معينة** مثل المشروبات التي تحتوي على كميات عالية من السكر والأطعمة السريعة، والخضار والفاكهة والسكر والملح، يؤدي إلى انخفاض الطلب على هذه المواد. وهذا يترافق عادة مع ارتفاع الطلب على منتجات أخرى مفيدة للصّحة مثل العصائر والحليب. أمّا بخصوص العلاقة بين الضرائب على المشروبات الغازية ومعدّلات السمنة، فتتفاوت الأدلة المتوفرة في الأبحاث بهذا الشأن، لذلك لا يمكن الجزم بها.
  - بالمقابل، إنّ **المحفزات الضريبية والإعفاءات** ساهمت في: ترشيد الإستهلاك الغذائي تجاه أغذية صحية كالخضار والفاكهة، ممّا أدى الى تحسين صحة الحوامل والجنين من خلال اكتساب ما يكفي من زيادة الوزن خلال الحمل، وتخفيض وصفات عدد أدوية المضادات الحيوية، وارتفاع معدل الحديد في الدم لدى

المواليد الجدد، وكذلك ارتفاع معدل الطول نسبة إلى العمر لدى المواليد الجدد. إلا أنّه لم يثبت أي ارتباط بين هذه المحفزات الضريبية ومتغيرات معدل مؤشر كتلة الجسم BMI ووزن المواليد الجدد عند الولادة، ومعدلات البقاء على قيد الحياة لدى الأجنّة.

- إنّ **التدخلات التسعيرية** التي تجمع بين الضرائب والمحفزات الضريبية هي من أكثر التدخلات الفعّالة في ترشيد الاستهلاك الغذائي نحو الأغذية الصحية، خاصة في أوساط الفئات ذات الدخل المنخفض.
- إنّ العديد من قصص النجاح عبر سياقات مختلفة عن فرض الضرائب على التبغ والكحول أدّت إلى خفض الاستهلاك وتحسين الصحة والاقتصاد.
- إنّ الضرائب غير المباشرة يجب أن تُفرَض بطريقة علمية، عادلة وواقعية، ويجب أن تحاكي السياق اللبناني، إذا كان الهدف منها أن تُسفرَ عن مكاسب صحية وإقتصادية على مستوى الفرد والحكومة.
- إنّ الدعم الشعبي لزيادة الضرائب يرتفع بشكل كبير عندما يتمّ استثمار الفوائد الإقتصادية المتأتية من الضرائب في تطوير القطاع الصحي من خلال تمويل الرعاية الصحية الأولية، والتغطية الصحية الشاملة والمستشفيات العامة، أو أي مشروع آخر مفيد للصحة العامة.
- إنّ زيادة الأسعار يجب أن تترافق مع استراتيجيات أو برامج لمساعدة الأفراد الذين لا يمكن أن يقلّلوا من استهلاكاتهم مع زيادة الضرائب، لا سيّما الأفراد ذوي الظروف الاجتماعية والاقتصادية المتدنية وذلك لتبديد مخاوف تتعلّق بالمساواة.
- إنّ تجارب الدّول التي اعتمدت استحداث أو رفع الضّرائب على التبغ أو الكحول أظهرت تأثيرًا إيجابيًا في خفض معدلات الاستهلاك و تحسين الصحة و الاقتصاد.
- إن نجاح السياسات الضريبية في ترشيد أنماط الاستهلاك الغذائي الصحي يتطلب مشاركة جميع المعنيين ضمن عملية تركزّ على الشفافية والثقة بين جميع الأطراف. كما أنها تتطلب فهمًا واضحًا لأهمية السياسات الضريبية ودورها في تحسين الصحة العامة والاقتصاد، وخاصة عندما تترافق مع تدخلات أخرى مبنية على البراهين والبيّنات العلمية.

Content

This Rapid Response document is structured as follows

1) Current Issue and Question
2) Background and Lebanese Context
3) Synthesis of the Evidence
4) What Other Countries are Doing
5) Implementation Consideration
6) Insights for Action
7) Next Steps

Current Issue and Question

In the past few weeks, the issues of government budget and taxation have become the center of ongoing political and public debates in Lebanon. A key point that stood out related to propositions to impose tax increases on certain products to generate additional funds. Uncertainties and lack of transparency surrounding the approach and how revenues generated will be re-invested remain at the center of the debate. This is further exacerbated by the absence of a public health perspective from the taxation equation.

The aim of this K2P Rapid Response is to inform ongoing deliberations by utilizing the best available evidence. Specifically, it attempts to inform the following question: How can excise taxation be utilized to improve health outcomes in Lebanon? This document will uncover the health and economic consequences of applying taxation (and subsidies, where applicable) on a variety of products (namely tobacco, alcohol, and some food products) as well as draw on lessons learned from other countries to help inform the Lebanese context. The intention is not to advocate specific option or close off discussion. Further actions can flow from the deliberations that the rapid response is intended to inform.

Background to K2P Rapid Response

A K2P Rapid Response responds to urgent requests from policymakers and stakeholders by summarizing research evidence drawn from systematic reviews and from single research studies. A systematic review is an overview of primary research on a particular question that relies on systematic and explicit methods to identify, select, appraise and synthesize research evidence relevant to that question.

K2P Rapid Response services provide access to optimally packaged, relevant and high-quality research evidence over short periods of time ranging between 3, 10, and 30-day timeframe.

This rapid response was prepared in a 10-day timeframe and involved the following steps:

1) Formulating a clear review question on a high priority topic requested by policymakers and stakeholders from K2P Center.

2) Establishing what is to be done in what timelines.

3) Identifying, selecting, appraising and synthesizing relevant research evidence about the question

4) Drafting the K2P Rapid Response in such a way that the research evidence is present concisely and in accessible language.

5) Submitting K2P Rapid Response for Peer/Merit Review.

6) Finalizing the K2P Rapid Response based on the input of the peer/merit reviewers.

7) Final Submission, translation into Arabic, validation, and dissemination of K2P Rapid Response

The quality of evidence is assessed using the AMSTAR rating which stands for A Measurement Tool to Assess Systematic Reviews. This is a reliable and valid measurement tool to assess the methodological quality of systematic reviews using 11 items. AMSTAR characterizes quality of evidence at three levels:

8 to 11= high quality

4 to 7 =medium quality

0 to 3 = low quality

Background and Lebanese Context

Overview

In Lebanon, six out of the top ten causes of death are directly related to smoking and dietary habits. These include ischemic heart disease, stroke, diabetes mellitus, lung cancer, breast cancer, and hypertensive heart disease. Such morbidities account for 31.1%, 9.4%, 3.7%, 3.6%, 2.6%, and 2.6% of total deaths respectively (WHO, 2015c). As for alcohol, road injury ranked third in the top ten causes of death in Lebanon, with up to 8% of cases directly attributed to alcohol intake. Moreover, alcoholism is responsible for up to 20% of cases of liver cirrhosis (WHO, 2015c). Thus, taxable products such as alcohol and tobacco are associated with adverse health outcomes and have contributed to increased morbidity and mortality among the Lebanese population (WHO, 2015c).

At the same time, the expenses of the Lebanese health system are covered by insufficient and disorganized funds, manifesting as high out of pocket expenditure and resulting in suboptimal and inequitable access to healthcare services.

Financing the Lebanese Health System

In Lebanon, the health expenditure share of the gross domestic product is estimated at 7.2%, compared to the global average of 10%. The governmental spending on health constitutes 10.7% of its total budget (WHO, 2013). Despite acceptable health financial shares, comparable to that in developed countries (WHO, 2013), the financial arrangement of the Lebanese healthcare system faces several challenges:

- The financing system is fragmented, reducing the possibility for pooling of both funds and risks. This fragmentation in financing results in limited access to health services and high out-of-pocket expenditure. Fragmented pooling of risks, on the other hand, can reduce the allocation of funds based on risk, thus reducing equity of access and efficiency.
- There is little emphasis on preventive care coupled with disorganized and insufficient financial arrangements of ambulatory and primary care services. As a result, escalating health bills are incurred due to the increased need of and demand on curative and specialized care.
- The households' share of health expenses is substantial. The household expenditure is estimated to be 53% of total health expenditure. It comprises out-of-pocket expenditures and contributions, which

contribute 37.3% and 15.6% of total health expenditures respectively. Out-of-pocket contributions are considered particularly high when compared with the global average of 18.6 % (WHO, 2013).

- The Ministry of Public Health, further burdened by the need to respond to the emerging challenges of the Syrian crisis, already has the burdensome obligation to cover the 53% of the uninsured Lebanese public (WHO, 2010).

Such challenges have led to difficulties in achieving the three pillars of universal health coverage, namely: health service coverage, financial risk protection, and equity of coverage for the entire population (WHO, 2015a).

Taxation for health

As for taxation, disbursement of tax sources through various public agencies comes as follows: Ministry of Public Health 47.6%, National Social Security Fund 15.2%, Army 15.8%, Civil Servants Cooperative 9.7%, Security Forces 8.8%, and mutual funds 2.9%. The schemes related to the arms of security apparatus are funded by general tax revenues and cover all ambulatory and hospitalization services for staff members and their dependents, though at different rates (WHO, 2006).

Excise taxes are applied for some products. Excise taxation on tobacco differs by formulation. It constitutes 108% on cigarettes and 30% on waterpipe tobacco. For alcohol, excise taxes are negligible and range from 200L.L. to 400L.L. No excise taxes are applied on food products such as soda or cocoa derivatives (Lebanese Customs, 2016). The local health impact of taxation on consumables is still not explored.

Product Consumption

Tobacco: The estimated prevalence of current tobacco smokers among Lebanese adults is 37%. As for youth (ages 13-15), up to 11% are current cigarette smokers and 36% are tobacco smokers (WHO, 2015b).

Alcohol: The per capita adult alcohol consumption in Lebanon is 2.4 litres, compared to 0.7 in the Eastern Mediterranean Region. Prevalence of heavy episodic drinking is 0.1% for whole population and 0.7% for drinkers; whereas the prevalence of alcohol use disorders and alcohol dependence is 0.8% and 0.3% respectively compared to 0.3% and 0.2% in the Eastern Mediterranean Region (WHO, 2014a). Particularly among the youth, one study conducted in 2011 found that one in four middle school students reported having had at least one alcoholic drink in the preceding month (Ghandour et al, 2015).

Food: A cross-sectional food consumption survey conducted in Beirut found that fat contributed 38.9% to the average daily energy intake, higher than the

20-35% recommended internationally (AHA, 2016). Average consumption of fruits and vegetables was approximately 367 g day, and 45.3% of subjects consumed less than the recommended 400 g daily. Younger people (25-34 years) significantly consumed more meat, sugar, alcoholic beverages and soft drinks, and less cooked vegetables and legumes, than older ones (Nasreddine et al, 2006).

Thus, based on the Lebanese context, this rapid response intends to uncover the evidence behind adopting taxation on tobacco and alcohol and to hint on the possible advantages of taxation and subsidies on food. The rationale behind applying taxation or subsidies on these health-related products is to gauge their consumption, alleviate adverse health outcomes, and produce economic benefits and savings that can be reinvested in health.

Synthesis of Evidence

The following section presents the findings from systematic reviews linking taxation on tobacco and alcohol, as well as taxation and subsidies on food to outcomes related to health, consumption, and the economy.

Taxation on Tobacco

Four systematic reviews addressed the impact of tobacco taxation. Results lacked any study directly linking tobacco taxation to health outcomes. Tobacco taxation was found to be the most effective strategy for reducing consumption, with a more pronounced impact on the youth population. Taxation on tobacco was also associated with substantial healthcare savings and productivity gains.

Results of the four systematic reviews on tobacco taxation are summarized below (for more details, please check annex, table 2a).

Impact on Consumption	Impact on Economy
⇢ Increase in tobacco taxes was the most effective price-based policy measure for reducing the consumption of tobacco, where a 10% tax-induced cigarette price increase reduced smoking prevalence by 4%-8% (Ekpu and Brown, 2015). ⇢ Net public benefits from tobacco tax remained positive only when tax rates	⇢ Estimates of yearly per person healthcare cost savings from a 20% price increase reached $86.72, though these benefits were non-existent in some cases. After including other benefits such as productivity gains, the total estimated net savings reached $90.98 (Contreary et al, 2015). ⇢ Cost of applying tobacco taxation is assumed rather than observed, and valued at 0.005% to 0.020% of gross

Impact on Consumption	Impact on Economy
were between 42.9% and 91.1% (Ekpu and Brown, 2015).	national product (Contreary et al, 2015).
⇢ Special populations such as youth, young adults, and those with low socioeconomic status were more price-responsive in terms of participation and consumption than the general population (Bader et al, 2011; Hoffman and Tan, 2015). The impact of price on smoking initiation among youth and young adults is less clear (Bader et al, 2011; Hoffman and Tan, 2015).	⇢ As for cost-effectiveness, ratio was estimated as $3,233 per quality-adjusted life-year and ranged between $116 and $3,884 per disability-adjusted life year (Contreary et al, 2015).
⇢ Increased price had a significant effect on smoking participation for those with drug or mental disorders, but not for those with alcohol dependence (Bader et al, 2011).	
⇢ For heavy or long term smokers, of three tobacco policies investigated (taxation, clean air restrictions, and media/comprehensive campaigns), higher prices had the greatest association with making a quit attempt in the past year, but price was not related to the likelihood of remaining abstinent for three or more months (Bader et al, 2011).	

Taxation on Alcohol

Seven systematic reviews addressed the impact of alcohol taxation. Results lacked any study directly linking alcohol taxation to economic outcomes. Increasing alcohol price was associated with decreased consumption, a relationship that held across all beverage types and extended to involve the youth population. Imposing taxation on alcohol also resulted in favourable health effects through reductions in alcohol dependence, impaired driving, and traffic-related mortality.

Results of the seven systematic reviews on alcohol taxation are summarized subsequently.

Impact on Consumption	Impact on Health
⇢ Consistently across beverage types, almost all studies reported negative price elasticities (Anderson et al, 2009; Elder et al, 2010; Wagenaar et al, 2009).	⇢ Increasing taxes and setting minimum prices reduced prevalence of alcohol dependence (Wagenaar, 2010), acute and chronic alcohol-related harms (Anderson et al, 2009), traffic-related mortality (Wagenaar, 2010), and non-

Impact on Consumption	Impact on Health
⇢ Higher prices or taxes were consistently associated with a lower prevalence of youth drinking (Elder et al, 2010; Nelson, 2014). ⇢ Mixed results were found on the relationship between alcohol prices or taxes and heavy drinking. In one systematic review, price or tax affected heavy drinking significantly, but the magnitude of effect was smaller than effects on overall drinking (Wagenaar et al, 2009). In another review, there was little or no price response by heavy-drinking adults or young adults (Nelson, 2014). ⇢ Increased alcohol taxes or prices are unlikely to be effective as a means to reduce binge drinking, regardless of gender or age group (Nelson, 2015).	traffic related mortality (Elder et al, 2010; Wagenaar, 2010). ⇢ Effects of alcohol price or taxes on motor-vehicle crashes were significant and of comparable magnitude to the relationship between alcohol prices or taxes and alcohol consumption (Elder et al, 2010). ⇢ Self-reported alcohol-impaired driving was inversely proportional to the price of alcoholic beverages (Elder et al, 2010). ⇢ Mixed results were found concerning the impact of alcohol taxation and violence. Three systematic reviews found that higher alcohol taxes were associated with decreased violence (Elder et al, 2010; Wagenaar, 2010) and crime (Wagenaar, 2010); whereas one systematic review found weak or no evidence for the influence of alcohol price changes on intimate partner violence (Wilson et al, 2014). ⇢ Increasing alcohol prices reduced occurrences of sexually transmitted diseases (Wagenaar, 2010), particularly gonorrhea and syphilis (Elder et al, 2010).

Taxation and Subsidies on Food

Ten systematic reviews addressed the impact of food taxation and/or subsidies. Results lacked any study directly linking food taxation or subsidies to economic outcomes. Taxation on sugar-sweetened beverages resulted in decreased consumption and increased demand for healthier foods such as fruit juice and milk. There was mixed evidence regarding the association between soft drink tax and obesity. Food subsidies, on the other hand, encouraged consumption of fruits and vegetables and led to better outcomes related to feto-maternal health and antibiotics use. Coupling food taxation with subsidies can potentially reduce inequalities through the promotion of healthy eating in groups with lower socioeconomic position.

Results of the ten systematic reviews on food taxation and/or subsidies are summarized below (for more details, please check annex, table 2c).

Taxation

Impact on Consumption	Impact on Health
⇢ Higher prices were associated with a lower demand for sugar-sweetened beverages (Escobar, 2013; Eyles et al, 2012; Maniadakis et al, 2013; Powell et al, 2013; Thow et al, 2014), fat (Eyles et al, 2012; Thow et al, 2014), fast food (Powell et al, 2013), sugar, and salt (Thow et al, 2014). ⇢ Higher prices for sugar-sweetened beverages were associated with an increased demand for alternative beverages such as fruit juice and milk and a reduced demand for diet drinks (Escobar et al, 2013). ⇢ Among children and adolescents, there were mixed results concerning association between soft drink taxation and consumption (Alagiyawanna et al, 2015). ⇢ There was a reported increase in consumption of soft drinks due to tax reduction (Alagiyawanna et al, 2015).	⇢ Evidence was mixed regarding the association between soft drink tax and obesity, with one systematic review identifying a significant correlation (Escobar et al, 2013), two systematic reviews reporting minimal association (Maniadakis et al, 2013; Powell et al, 2013), one review reporting no correlation (Trivedi et al, 2012), and one review reporting mixed results (Alagiyawanna et al, 2015).

Subsidies

Impact on Consumption	Impact on Health
⇢ Statistically significant associations were reported between subsidies and healthy food intake such as fruits and vegetables (Alagiyawanna et al, 2015; Elyes et al, 2012). ⇢ Subsidies on healthy foods that ranged from 1.8% to 50% resulted in an increase in consumption of targeted foods of at least half the magnitude of the tax applied (Thow et al, 2014).	⇢ Statistically significant associations were reported between subsidies on healthy foods and adequate maternal weight gain, reduction in antibiotic prescriptions, increase in fetal mean hemoglobin levels, and increase in fetal height for age ratio (Alagiyawanna et al, 2015). ⇢ Subsidies were not associated with changes in body mass index, fetal birth weight, or fetal survival (Alagiyawanna et al, 2015).

Combined taxation and subsidies

Impact on Consumption	Impact on Health
⇢ Price interventions that combined taxes and subsidies were most effective in promoting healthy eating in groups with lower socioeconomic position, and may therefore appear likely to reduce inequalities (McGill et al, 2015) ⇢ There is evidence of effectiveness for taxation and subsidies at increasing the consumption of healthier foods and lowering purchases of food high in fat, sodium, and sugar (Niebylski, 2015; Thow et al, 2010). ⇢ For a subsidy or tax on food to be effective, a minimum of 10–15% should be applied (Niebylski, 2015; Thow et al, 2010).	⇢ One systematic review identified improved health outcomes such as blood pressure and body mass index with taxation and subsidies (Niebylski, 2015)

What Other Countries are Doing

Success stories from countries that have adopted tobacco or alcohol taxation policies are presented below.

Experiences of Countries that Adopted Tobacco Taxation

Egypt changed the tobacco tax regime in 2010 from a tiered-specific excise system that is based on the retail prices of cigarettes to a mixed excise system, thus introducing a uniform specific and ad valorem excise on retail prices. In parallel, taxes on other tobacco products were increased dramatically (tax on shisha increased by 100%). Egypt further increased the ad valorem component of their excise to 50% of the retail price in 2012. As a result, Egypt's increased tax in 2010 led to a decrease in sales by 14% in 2 years (WHO, 2014b). Moreover an earmark tax of 10 piastres per pack of 20 cigarettes, which was implemented in 1992, was able to raise a fund of 52 million dollars in 2013-2014. Such fund was used to cover a substantial part of students' health insurance which included both preventive and curative care (Abou-Youssef, 2004).

Jordan In early 2013, tobacco prices went down by around 20%, paving the way for increased consumption and a heavier health burden on the population. In January 2014, Jordan raised the uniform specific component of the mixed excise

system by 41%. In one study, the total price elasticity of cigarette demand in Jordan was estimated to be -0.6, with higher effects noted for men (elasticity -0.81) as compared to women (elasticity -0.01). This study concluded that significant increases in tobacco taxes are likely to be effective in reducing smoking in Jordan, particularly among men (Sweis and Chaloupka, 2013).

Turkey increased tobacco tax rates and consequently its revenues significantly since 2009, and introduced a mixed excise system with a minimum specific floor in 2013. The specific and minimum floor rates were also increased markedly in 2014. Excise taxes have been steadily increasing, alongside the implementation of other policies, such as smoking and tobacco advertising bans. This led to a reduction in tobacco sales by 12% between 2008 and 2012 and a reduction in the proportion of tobacco smokers in the adult population from 31.2% to 27.1%, during the same period (WHO, 2014b).

France dramatically and regularly increased its taxes between the early 1990s and 2005, thereby tripling its cigarette prices. Such increase resulted in a reduction in sales by more than 50%. Few years later, a 50% reduction in lung cancer death rates for young men was noted (Jha & Peto, 2014; Hill, 2013).

Gambia changed the base for its excise on cigarettes from weight to volume in 2012. As a result, cigarette imports decreased significantly, from 1048.94 in 2012 to 597.94 thousand kg in 2013, suggesting a decrease in tobacco consumption. In 2013, Gambia also raised the excise on all tobacco products to the same rate of 52%, thus preventing consumers from switching to cheaper tobacco products. Excise collection on cigarettes almost doubled from GMD 88.62 million in 2012 to GMD166.91 million by the end of 2013 (Nargis et al, 2016).

Experiences of Countries that Adopted Alcohol Taxation

Thailand increased its alcohol tax by 10% between years 2001 and 2011. This was associated with a decrease in alcohol consumption particularly among the youth population, among which there was a 4.3% reduction in the prevalence of lifetime drinking (Sornpaisarn et al, 2015).

The **United States** (Illinois), under the 2009 Illinois Act, increased its alcohol excise tax on beer to $0.231 per gallon, on wine to $1.39 per gallon, and on distilled spirits to $8.55 per gallon. This resulted in a 26% reduction in fatal alcohol-related motor vehicle crashes. Drivers younger than 30 years showed larger declines (-37%) than those aged 30 years and older (-23%). Thus, alcohol excise taxation was able to save lives by reducing alcohol-impaired driving (Wagenaar et al, 2015).

Estonia increased it alcohol taxation rate ten times between the years 1998-2013. A particularly dramatic tax surge of 30% was applied in 2008. Such strategy resulted in a significant reduction in alcohol-related traffic accidents. As an estimate, a 1-unit increase in the tax rate was associated with a 1.6% decrease in the level of accidents per 100,000 population involving drunk motor vehicle drivers (Saar, 2015).

Taiwan increased its alcohol excise tax from $0.73 per liter of alcoholic beverage to approximately $5 in 2002. Within few months after implementation, this intervention resulted in an abrupt 14% decline in hospital inpatient charges due to alcohol-attributable diseases, which translated into equivalent net savings of around 1.3 million US dollars (Lin & Liao, 2014).

Russia raised the alcohol excise taxes to 33% in 2013, with an additional 25% in 2014. This was coupled by a downward trend in the population drinking. In parallel, during the past few years, Russia experienced a steep decline in overall mortality, which was due mainly to a decrease in mortality from cardiovascular diseases and alcohol-related deaths (Razvodovsky, 2014).

Implementation Considerations

- Public support for increased taxation increases substantially when tax revenues are specifically directed to fund public health programs instead of being used as an unrestricted source of general revenue (Elder et al, 2010).
- Increased price needs to be accompanied by policies or measures to assist individuals who continue to smoke or drink or who could not reduce consumption in response to increased taxes, especially those of low socio-economic status (Bader et al., 2011). This could help address potential equity concerns.
- Taxation policies need to be accompanied by law enforcement mechanism in order to reduce problem of smuggling and tax evasion (Ekpu et al, 2015; Jamison et al, 2013).
- Tax design needs to consider the range of relevant products and the changes in consumption that consumers might make if a tax is imposed in only one area (Jamison et al, 2013).
- Taxes and price increases need to be substantial to achieve the desired changes in consumption with periodic adjustments for inflation (Jamison et al, 2013).

Key Influencers of Excise Taxation

There are many forces that drive the decision to adopt a taxation strategy or impact its effective implementation. These influencers include the public consumers, the industrial sector, the trade market, the health organizations and

system, the political system, the tax collection system, international agencies, and regional or global agendas.

These influencers can be broadly classified into facilitators and barriers to implementation of a taxation system.

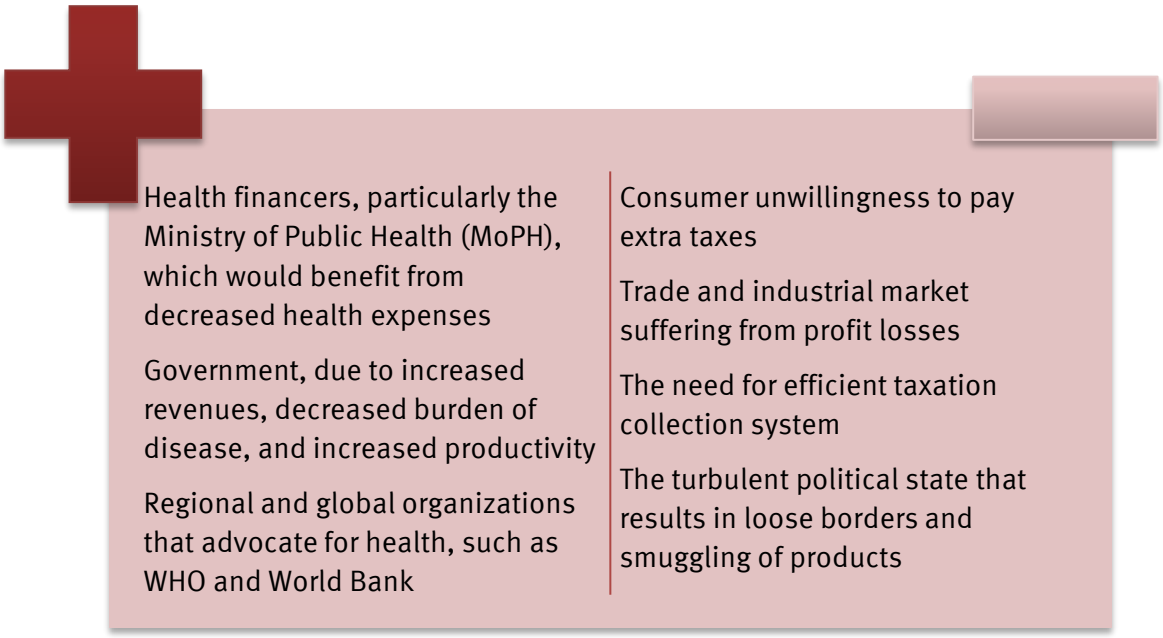

Figure 1 facilitators and barriers to implementation of a taxation system

Insights for Action

- Engage a wider range of stakeholders through conducting policy dialogues and deliberating on the role of taxation and subsidies in promoting and protecting health and the economy.
- Consider coupling taxation with other evidence-based effective interventions, including subsidies where applicable, aiming at decreasing consumption, delaying initiation, and reducing harm. For more information on interventions addressing alcohol consumption among the youth, please refer to K2P Center Policy Brief, Alcohol Drinking among Lebanese Youth: Delaying Initiation and Reducing Harm.
- Consider a stepwise application of taxation paralleled with close surveillance of outcomes and impact.
- Address potential concerns about the disproportionate impact of tax increases on the poor by using a portion of the revenues generated in a way that provides greater benefits to the poor. In this sense, excise taxation could become a pro-poor policy.
- Reinvest the economic benefits and savings derived from excise taxation in improving the financial arrangements of primary health care, securing universal health coverage, raising the financial ceiling for hospitals, enhancing the quality and availability of health services, or funding any other project with proven public health benefit, particularly for the poor. Future opportunities on earmarked taxes include supporting health-related Sustainable Development Goals (SDGs).

References

References

Abou-Youssef, H. (2004). The Egyptian experience with tobacco earmarking. World Health Organization: Geneva.

Alagiyawanna, A. M. A. A. P., Townsend, N., Mytton, O., Scarborough, P., Roberts, N., & Rayner, M. (2015). Studying the consumption and health outcomes of fiscal interventions (taxes and subsidies) on food and beverages in countries of different income classifications; a systematic review. BMC public health, 15(1), 1.

American Heart Association (2016). Know Your Fats.

Anderson, P., Chisholm, D., & Fuhr, D. C. (2009). Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. The Lancet, 373(9682), 2234-2246.

Bader, P., Boisclair, D., & Ferrence, R. (2011). Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. International journal of environmental research and public health, 8(11), 4118-4139.

Balbach, E. D., & Campbell, R. B. (2009). Union women, the tobacco industry, and excise taxes: a lesson in unintended consequences. American journal of preventive medicine, 37(2), S121-S125.

Contreary, K. A., Chattopadhyay, S. K., Hopkins, D. P., Chaloupka, F. J., Forster, J. L., Grimshaw, V., ... & Community Preventive Services Task Force. (2015). Economic Impact of Tobacco Price Increases Through Taxation: A Community Guide Systematic Review. American journal of preventive medicine, 49(5), 800-808.

Ekpu, V. U., & Brown, A. K. (2015). The economic Impact of smoking and of reducing smoking prevalence: Review of evidence. Tobacco use insights, 8, 1.

Elder, R. W., Lawrence, B., Ferguson, A., Naimi, T. S., Brewer, R. D., Chattopadhyay, S. K., ... & Task Force on Community Preventive Services. (2010). The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms. American journal of preventive medicine, 38(2), 217-229.

Escobar, M. A. C., Veerman, J. L., Tollman, S. M., Bertram, M. Y., & Hofman, K. J. (2013). Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis. BMC Public Health, 13(1), 1.

Eyles, H., Mhurchu, C. N., Nghiem, N., & Blakely, T. (2012). Food pricing strategies, population diets, and non-communicable disease: a systematic review of simulation studies. PLoS Med, 9(12), e1001353.

Ghandour, L., Afifi, R., Fares, S., El Salibi, N., & Rady, A. (2015). Time trends and policy gaps: the case of alcohol misuse among adolescents in Lebanon. Substance use & misuse, 50(14), 1826-1839.

Ghandour L, Nakkash R, Afifi R, Anouti S, Saleh R, Mogharbel S, Jamal D, El-Jardali F. (2017). K2P Policy Brief: Alcohol Drinking among Lebanese Youth: Delaying Initiation and Reducing Harm.

Hoffman, S. J., & Tan, C. (2015). Overview of systematic reviews on the health-related effects of government tobacco control policies. BMC public health, 15(1), 1.

Jamison, D. T., Summers, L. H., Alleyne, G., Arrow, K. J., Berkley, S., Binagwaho, A., ... & Ghosh, G. (2013). Global health 2035: a world converging within a generation. The Lancet, 382(9908), 1898-1955.

Jha, P., & Peto, R. (2014). Global effects of smoking, of quitting, and of taxing tobacco. New England Journal of Medicine, 370(1), 60-68.

Lebanese customs (2016). National Tariff. Accessed at: http://www.customs.gov.lb/customs/tariffs/national/tariff1.asp

Li, Q., Babor, T. F., Zeigler, D., Xuan, Z., Morisky, D., Hovell, M. F., ... & Li, B. (2015). Health promotion interventions and policies addressing excessive alcohol use: a systematic review of national and global evidence as a guide to health-care reform in China. Addiction (Abingdon, England), 110(0 1), 68-78.

Lin, C. M., & Liao, C. M. (2014). Inpatient expenditures on alcohol-attributed diseases and alcohol tax policy: a nationwide analysis in Taiwan from 1996 to 2010. Public health, 128(11), 977-984.

Maniadakis, N., Kapaki, V., Damianidi, L., & Kourlaba, G. (2013). A systematic review of the effectiveness of taxes on nonalcoholic beverages and high-in-fat foods as a means to prevent obesity trends. Clinicoecon Outcomes Res, 5, 519-543.

McGill, R., Anwar, E., Orton, L., Bromley, H., Lloyd-Williams, F., O'Flaherty, M., ... & Allen, K. (2015). Are interventions to promote healthy eating equally effective for all? Systematic review of socioeconomic inequalities in impact. BMC public health, 15(1), 1.

Ministry of Public Health, Lebanon (2012). National Health Accounts Summary Table, 2012. Available at http://www.moph.gov.lb/Statistics/Pages/NHA2012.aspx

Nargis, N., Manneh, Y., Krubally, B., Jobe, B., Ouma, A. E. O., Tcha-Kondor, N., & Blecher, E. H. (2016). How effective has tobacco tax increase been in the Gambia? A case study of tobacco control. BMJ open, 6(8), e010413.

Nasreddine, L., Hwalla, N., Sibai, A., Hamzé, M., & Parent-Massin, D. (2006). Food consumption patterns in an adult urban population in Beirut, Lebanon. Public health nutrition, 9(02), 194-203.

Nelson, J. P. (2015). Binge drinking and alcohol prices: a systematic review of age-related results from econometric studies, natural experiments and field studies. Health economics review, 5(1), 1-13.

Nelson, J. P. (2014). Gender differences in alcohol demand: a systematic review of the role of prices and taxes. Health economics, 23(10), 1260-1280.

Niebylski, M. L., Redburn, K. A., Duhaney, T., & Campbell, N. R. (2015). Healthy food subsidies and unhealthy food taxation: A systematic review of the evidence. Nutrition, 31(6), 787-795.

Powell, L. M., Chriqui, J. F., Khan, T., Wada, R., & Chaloupka, F. J. (2013). Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: a systematic review of prices, demand and body weight outcomes. Obesity reviews, 14(2), 110-128.

Razvodovsky, Y. E. (2014). Was the mortality decline in Russia attributable t o alcohol control policy. Journal of Socialomics, 3(2), 1-2.

Saar, I. (2015). Do alcohol excise taxes affect traffic accidents? Evidence from Estonia. Traffic injury prevention, 16(3), 213-218.

Sornpaisarn, B., Shield, K. D., Cohen, J. E., Schwartz, R., & Rehm, J. (2015). Can pricing deter adolescents and young adults from starting to drink: an analysis of the effect of alcohol taxation on drinking initiation among Thai adolescents and young adults. Journal of epidemiology and global health, 5(4), S45-S57.

Sweis, N. J., & Chaloupka, F. J. (2013). The economics of tobacco Use in Jordan. nicotine & tobacco research, ntt058.

Thow, A. M., Downs, S., & Jan, S. (2014). A systematic review of the effectiveness of food taxes and subsidies to improve diets: Understanding the recent evidence. Nutrition reviews, 72(9), 551-565.

Thow, A. M., Jan, S., Leeder, S., & Swinburn, B. (2010). The effect of fiscal policy on diet, obesity and chronic disease: a systematic review. Bulletin of the World Health Organization, 88(8), 609-614.

Trivedi, N., Fields, J., Mechanick, C., Klein, M., & Mechanick, J. (2012). Lack of correlation between antiobesity policy and obesity growth rates: review and analysis. Endocrine Practice, 18(5), 737-744.

Wagenaar, A. C., Livingston, M. D., & Staras, S. S. (2015). Effects of a 2009 Illinois alcohol tax increase on fatal motor vehicle crashes. American journal of public health, 105(9), 1880-1885.

Wagenaar, A. C., Salois, M. J., & Komro, K. A. (2009). Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. Addiction, 104(2), 179-190.

Wagenaar, A. C., Tobler, A. L., & Komro, K. A. (2010). Effects of alcohol tax and price policies on morbidity and mortality: a systematic review. American Journal of Public Health, 100(11), 2270-2278.

Wilson, I. M., Graham, K., & Taft, A. (2014). Alcohol interventions, alcohol policy and intimate partner violence: a systematic review. BMC public health, 14(1), 1.

World Health Organization (n .d.) The political economy of tobacco taxation
http://www.who.int/tobacco/publications/en_tfi_tob_tax_chapter4.pdf

World Health Organization (2006). Health System Profile Lebanon.

World Health Organization (2010). Country Cooperation Strategy for WHO and Lebanon 2010-2015

World Health Organization (2013). Health Financing. Available at: http://gamapserver.who.int/gho/interactive_charts/health_financing/atlas.html?indicator=i2&date=2011

World Health Organization (2014a). Alcohol consumption (country profile).

World Health Organization. (2014b). WHO engagement with Member States on tobacco taxation.

World Health Organization (2015a). Universal Health Coverage. Fact sheet number 395 updated December 2015. Available at: http://www.who.int/mediacentre/factsheets/fs395/en/

World Health Organization (2015b). WHO Report on the Global Tobacco Epidemic

World Health Organization (2015c). WHO statistical profile, updated January 2015

World Health Organization. (2016). Earmarked tobacco taxes: lessons learnt from nine countries. World Health Organization.

Annexes

Annexes

Annex 1: Glossary of terms

Ad volarem	A tax whose amount is based on the value of a transaction or of property
Elasticity	Measure used in economics to show the responsiveness of the quantity demanded of a good or service to a change in its price, holding constant all other determinants
Excise tax	Special taxes levied on specific kinds of goods, typically alcoholic beverages, tobacco and fuels; they may be imposed at any stage of production or distribution and are usually assessed by reference to the weight or strength or quantity of the product. Also called 'excise duty'.
Subsidy	Economic benefit (such as a tax allowance or duty rebate) or financial aid (such as a cash grant or soft loan) provided by a government to support a desirable activity, keep prices of staples low, maintain the income of the producers of critical or strategic products, maintain employment levels, or induce investment to reduce unemployment.
Tax	Compulsory monetary contribution to the state's revenue, assessed and imposed by a government on the activities, enjoyment, expenditure, income, occupation, privilege, or property of individuals and organizations.

Annex 2: Systematic reviews used for evidence synthesis

Annex 2a: Systematic reviews addressing tobacco taxation

Systematic Review	Countries (Number of studies)	Outcome	Impact
Effects of Tobacco Taxation and Pricing on Smoking Behavior in High Risk Populations: A Knowledge Synthesis (Bader et al, 2011)	US, Canada, Australia, France, Ireland, Spain, Sweden, UK, New Zealand, China, Russia, Mexico (67)	Smoking behaviour	<u>Youth (<19 years):</u> Studies examining the effects of increased price found that youth are 2-3 times more price-responsive than the general population. The impact of increased price on smoking initiation is less clear. <u>Young Adults (18–24 years):</u> The majority of studies found that price is inversely related to smoking consumption. The impact of price on smoking initiation is less clear. <u>Low Socio-Economic Status:</u> Twelve studies found that persons of low socioeconomic status are more responsive to price than the general population, whereas five studies indicated that low socio-economic status groups have the same responsiveness to price as the general population. <u>Dual diagnosis (mental health):</u> -Three studies revealed that increased price had a significant effect on smoking participation for those with drug or mental disorders, but not for those with

Systematic Review	Countries (Number of studies)	Outcome	Impact
			alcohol dependence. -One study found that both smokers with mental disorders and those without were similarly price-responsive. Another study found that adolescent (grades 7–12) smokers with emotional or behavioral problems were at least as responsive to price as those without such problems. <u>Heavy and/or Long-Term Smokers:</u> Of three tobacco policies investigated: taxation, clean air restrictions, and media/comprehensive campaigns, higher prices had the greatest association with making a quit attempt in the past year, but price was not related to the likelihood of remaining abstinent for three or more months. <u>Aboriginal people:</u> Findings indicate that price alone is not effective in reducing smoking, whereby a 10% price increase decreases overall smoking by only 0.73% in the aboriginal communities examined.
Economic Impact of Tobacco Price Increases Through Taxation: A Community Guide Systematic Review (Contreary et al, 2015)	UK, US, Netherland (8)	Economic benefits, costs, and cost effectiveness	Economic Benefits: Estimates of healthcare cost savings from a 20% price increase ranged from –$0.13 to $86.72 per patient per year. After including other benefits such as productivity gains, the total estimated net savings ranged from –$0.13 to $90.98. Cost: Cost was assumed rather than observed, and were valued at 0.005% to 0.020% of gross national product. Cost-effectiveness: -One study estimated a cost-effectiveness ratio between $116 and $3,884 per disability-adjusted life year. -Another study estimated a cost-effectiveness ratio of $3,233 per quality-adjusted life year.
The Economic Impact of Smoking and of Reducing Smoking Prevalence: Review of Evidence (Ekpu and Brown, 2015)	US, China, Australia, Hong Kong, Korea, Thailand, Taiwan, Sweden, France, Belgium, Denmark, India, Turkey, Netherland, Canada (151)	Smoking prevalenc e	-Increase in tobacco taxes was the most effective price-based policy measure for reducing the consumption of tobacco. -A 10% tax-induced cigarette price increase reduced smoking prevalence by 4%-8%. -Net public benefits from tobacco tax remain positive only when tax rates are between 42.9% and 91.1%.
Overview of systematic reviews	NA 45 (6 reviews on taxation)	Tobacco control	-All but one of the reviews found that increasing the price of tobacco decreased cigarette consumption and

Systematic Review	Countries (Number of studies)	Outcome	Impact
on the health-related effects of government tobacco control policies (Hoffman and Tan, 2015)			smoking prevalence and increased smoking cessation. -Price increases appeared to be most effective among adolescents, young adults, and persons of low socioeconomic status

Annex 2b: Systematic reviews addressing alcohol taxation

Systematic Review	Countries (Number of studies)	Outcome	Impact
Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol (Anderson et al, 2009)	NA (NA)	Harm reduction	-A meta analysis of 132 studies noted a median price elasticity for all beverage types of –0.52 in the short term and –0.82 in the long term, with elasticities being lower for beer than for wine or spirits. -A meta analysis of 112 studies noted mean price elasticities of –0.46 for beer, –0.69 for wine, and –0.80 for spirits. -Increasing taxes and setting minimum prices reduced acute and chronic alcohol-related harms.
The Effectiveness of Tax Policy Interventions for Reducing Excessive Alcohol Consumption and Related Harms (Elder et al, 2010)	NA (72)	Alcohol consumption and related harms	-Consistently across beverage types, almost all studies reported negative price elasticities, with median elasticities ranging from -0.50 for beer to –0.79 for spirits -Six studies found that higher prices or taxes were consistently associated with a lower prevalence of youth drinking. -Eleven studies that evaluated the effects of alcohol price or taxes on motor-vehicle crashes found that the relationship was generally significant and of a comparable magnitude to the relationship between alcohol prices or taxes and alcohol consumption. -Three studies consistently found that alcohol-impaired driving was inversely related to the price of alcoholic beverages. -Six studies found that higher alcohol prices were associated with decreased mortality, despite substantial variability in their individual effect estimates -Three additional studies found that higher alcohol taxes are associated with decreased violence. -Two studies evaluated the association between alcohol prices and two other health-related outcomes: alcohol dependence and sexually transmitted diseases. The first estimated an alcohol price elasticity for alcohol dependence of –1.49 while the second found robust effects on rates of both gonorrhea and syphilis.

Systematic Review	Countries (Number of studies)	Outcome	Impact
Health promotion interventions and policies addressing excessive alcohol use: A systematic review of national and global evidence as a guide to health-care reform in China (Li et al, 2015)	China 10 (4 on taxation)	Alcohol consumption	-One study found that a cigarette taxation policy was not only effective in smoking control, but also reduced alcohol consumption. -Two studies concluded that an alcohol tax reduction was associated with an increase in cardiovascular disease-related mortality and increased alcohol use. -Three studies found a significant reduction of alcohol-attributed disease mortality in the Death Registry, a reduction of alcohol-attributed diseases among the general population, and a clustered reduced mortality rates
Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies (Wagenaar et al, 2009)	NA (112)	Alcohol sales or self-reported drinking	-Simple means of reported elasticities were -0.46 for beer, -0.69 for wine and -0.80 for spirits. -Results documented the highly significant relationships between alcohol tax or price measures and indices of sales or consumption of alcohol. -Price or tax also affected heavy drinking significantly, but the magnitude of effect was smaller than effects on overall drinking.
Effects of alcohol tax and price policies on morbidity and mortality: a systematic review (Wagenaar et al, 2010)	Canada, US, Finland, Spain, UK, Denmark, Switzerland (50)	Measures of risky behavior or morbidity and mortality	Doubling the alcohol tax reduced alcohol-related mortality by an average of 35%, traffic crash deaths by 11%, sexually transmitted disease by 6%, violence by 2%, and crime by 1.4%.
Alcohol interventions, alcohol policy and intimate partner violence: a systematic review (Wilson et al, b)	US, Brazil, Australia (11)	Association with intimate partner violence	Population-level pricing and taxation studies found weak evidence for alcohol price changes influencing intimate partner violence.
Binge drinking and alcohol prices: a systematic review of age-related results from econometric studies, natural experiments and field studies (Nelson, 2015)	Australia, Iceland, UK Australia, Finland, Hong Kong, Sweden, Switzerland, US (56)	Association with binge drinking	Increased alcohol taxes or prices are unlikely to be effective as a means to reduce binge drinking, regardless of gender or age group.
Gender differences in alcohol demand: a	USA, Canada, China, Russia, Italy, Ukraine (15)	Alcohol demand	-Adult men have less elastic demands compared with women. -There was little or no price response by heavy-

Systematic Review	Countries (Number of studies)	Outcome	Impact
systematic review of the role of prices and taxes (Nelson, 2014)			drinking adults, regardless of gender. -Price might be important for drinking participation by young adults.

Annex 2c: Systematic reviews addressing food taxation/subsidies

Systematic Review	Countries (Number of studies)	Outcome	Impact
Studying the consumption and health outcomes of fiscal interventions (taxes and subsidies) on food and beverages in countries of different income classifications; a systematic review (Alagiyawanna et al, 2015)	High and middle income countries (18)	-Anthropometric measurements: BMI, waist circumference, height for age -Nutrient intake -Health outcomes related to diet e.g., mortality, morbidity, hospital attendance/admissions -Pregnancy-related outcomes, e.g., low birth weight.	Subsidies: -Statistically significant associations were reported between subsidies and food and vegetables intake, maternal weight gain, reduction in antibiotic prescriptions, and increase in mean hemoglobin levels. -Subsidies were also found to be associated with better consumption of healthy foods and an increase in height for age in upper middle-income countries. -Subsidies were not associated with body mass index (BMI) level, low birth weight, or fetal survival. -The low middle-income country study reported that a subsidy program pushed people towards obesity. Taxes: -All studies on the impact of taxes came from high-income countries. -Mixed results were found concerning the association between soft drink taxation and consumption, where one study demonstrated decreased consumption by children and adolescents, and two studies denying any association. -One study reported an increase in consumption of soft drinks due to tax reduction. -One study reported that soft drink tax could influence BMI. Two other studies reported that high tax rates could impact the BMI of heavier children and females. On the other hand, one study found a weakly negative association between soda tax and BMI among teens at risk of overweight; and six other studies found no impact on obesity or BMI.
Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis (Escobar et al, 2013)	US, Mexico, Brazil, France (9)	Obesity rate	-Higher prices were associated with a lower demand for sugar sweetened beverages with a pooled price-elasticity of -1.299 -Four articles reported cross-price elasticities, where higher prices for sugar sweetened beverages were associated with an increased demand for alternative beverages such as fruit juice and milk and a reduced demand for diet drinks.

Systematic Review	Countries (Number of studies)	Outcome	Impact
			-Six articles showed that a higher price could also lead to a decrease in BMI, overweight and obesity prevalence.
Food Pricing Strategies, Population Diets, and Non-Communicable Disease: A Systematic Review of Simulation Studies (Eyles et al, 2012)	NA (32)	Food consumption and prevalence of non-communicable diseases	-The own-price elasticity for carbonated soft drinks was 20.93, and the resulting modeled reduction in energy consumption was 20.02% for each 1% increase in price. -The own-price elasticity for subsidies on fruits and vegetables was 20.35. -Higher quality studies estimated that dairy and saturated fat taxes may increase mortality from cerebrovascular disease and coronary heart disease and less healthy or junk food taxes may increase overall mortality and mortality from stroke and cerebrovascular disease. -Relative impacts may also be greater for lower income groups, and thus food taxes and subsidies have the potential to be pro-equity.
A systematic review of the effectiveness of taxes on nonalcoholic beverages and high-in-fat foods as a means to prevent obesity trends (Maniadakis et al, 2013)	USA, UK, Norway, Italy, Denmark, Germany, France, Netherlands, Mexico, Brazil, Taiwan, Singapore, Australia (55)	Consumption, caloric intake, or weight outcomes.	-Results of studies indicated that the price elasticity for beverages is in the range of □0.5 to □1.6 depending on the beverage considered, with most of them falling below 1.0. -Eleven studies indicated that there is a very small impact of prices and taxes on energy intake and weight outcomes. -Six cross-sectional studies examined the association between prices and energy outcomes, while two other studies examined the association between prices and weight outcomes. The majority of the studies concluded that taxes are having trivial or modest effects on weight outcomes.
Are interventions to promote healthy eating equally effective for all? Systematic review of socioeconomic inequalities in impact (McGill et al, 2015)	US, Australia, France, Canada, Holland, Denmark, New Zealand, Switzerland, Ireland, Belgium, Norway, Germany 36 (18 on price)	Differential effect according to socioeconomic position	Price interventions that combined taxes and subsidies were most effective in groups with lower socioeconomic position, and may therefore appear likely to reduce inequalities.
Lack of Correlation Between Antiobesity Policy and Obesity Growth Rates: Review and Analysis (Trivedi et al, 2012)	NA (NA)	Obesity growth rates	Anti-obesity policies in three categories: taxation of sugared beverages and snacks, physical education and physical activity in schools, and funding for bicycle trail, were found to have no significant immediate correlation with the change in obesity growth rates.

Systematic Review	Countries (Number of studies)	Outcome	Impact
Healthy food subsidies and unhealthy food taxation: A systematic review of the evidence (Niebylski, 2015)	Western Europe, Canada, United States, Australia, New Zealand (78)	Change in dietary behaviour	-The majority of studies showed evidence of effectiveness at increasing the consumption of healthier foods and lowering purchases of food high in fat, sodium, and sugar. -An added benefit is the revenue generated by taxation that may be used to fund and better target non-communicable diseases' prevention interventions. -Some interventions that included a health parameter such as blood pressure and BMI found that healthy food uptake led to improvements in such health outcomes. -Cumulative evidence of moderate strength stated that for a subsidy or tax to be effective, a minimum of 10–15% should be applied.
Assessing the Potential Effectiveness of Food and Beverage Taxes and Subsidies for Improving Public Health: A Systematic Review of Prices, Demand and Body Weight Outcomes (Powell et al, 2013)	US (14)	Prices, demand, and body weight	-The price elasticity of demand for sugar sweetened beverages, fast food, fruits and vegetables was estimated to be –1.21, –0.52, –0.49 and –0.48, respectively. -Studies that linked soda taxes to weight outcomes showed minimal impacts on weight; however, sales taxes were relatively low. -Higher fast-food prices were associated with lower weight outcomes particularly among adolescents. -Lower fruit and vegetable prices were found to be associated with lower body weight outcomes among both low-income children and adults.
A systematic review of the effectiveness of food taxes and subsidies to improve diets: Understanding the recent evidence (Thow et al, 2014)	New Zealand, US, France, Brazil, Norway, Finland, Sweden, UK, Australia, Netherlands (43)	Consumption	-Subsidies on healthy foods that ranged from 1.8% to 50% resulted in an increase in consumption of targeted foods of at least half the magnitude of the tax applied. -Sugar sweetened beverages taxes that ranged from 5% to 30% resulted in a reduction in consumption of these beverages, ranging from 5% to 48%, demonstrating an overall response that was proportional to the taxes applied -Taxes on fat, sugar, and salt ranging from 5% to 40% reduced consumption of the targeted nutrient by 0–8%. -Taxes on foods deemed unhealthy on the basis of nutrient profiling ranged from 10 to 50%, and all but one study found reductions in purchase and consumption of target foods that ranged from 6.5% to 30%. -Taxes and subsidies are likely to be effective interventions for improving consumption patterns associated with obesity and chronic disease.

Systematic Review	Countries (Number of studies)	Outcome	Impact
The effect of fiscal policy on diet, obesity and chronic disease: a systematic review (Thow et al, 2010)	Ireland, Denmark, Scotland, US, UK, Norway, Egypt, Sweden, France (24)	Dietary habits, body weight and health	-Studies showed that taxes and subsidies on food have the potential to influence consumption considerably and improve health, particularly when they are large. -Studies that focused on a single target food or nutrient may have overestimated the impact of taxes by failing to take into account shifts in consumption to other foods.

Knowledge to Policy Center draws on an unparalleled breadth of synthesized evidence and context-specific knowledge to impact policy agendas and action. K2P does not restrict itself to research evidence but draws on and integrates multiple types and levels of knowledge to inform policy including grey literature, opinions and expertise of stakeholders.

Knowledge to Policy (K2P) Center
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