Why Thailand should have the Pictorial Warning Label on Alcoholic Beverage Packages?

A Technical Report

By

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June 2010
Executive Summary

- Concerning on its related social and health negative impact, alcohol must not be regarded as an ordinary commodity in any circumstance.
- The global health burden from alcohol has increased overtime. Alarmingly, special concern should be placed on the increase in alcohol consumption and harms among youth and female population worldwide, in particularly in the global regions with conventionally low consumption.
- Thailand is a lucid clear example of ‘Alcohol Emerging Market’, with marked growth in drinker prevalence, consumption volume, drinking frequency, product variety and exposure to direct and indirect alcohol marketing. Inevitably, the increase in alcohol consumption led to the increase in alcohol-related problem Thai society has to face with. The cost of alcohol consumption to Thai society is much higher than collective benefit from alcohol, and alcohol consumption closely relates to social inequity, taking into concern the negative impact on vulnerable sub-populations in Thailand.
- Alcohol-related problems are any of the range of adverse accompaniments of drinking alcohol, and imply to those consequences with alcohol as either direct cause or a contributing factors.
- There is no risk-free drinking. Although evidence suggests about the possibility of alcohol-attributable health benefit to drinkers with certain characteristics, there is no such benefit at aggregated level in low and middle income countries. Enjoying coronary heart disease protective benefit does not mean that the beneficiaries are safe from harms. People do not lose any benefit from being abstainer and from refraining from alcohol; they instead could gain health and other benefits. Therefore, to recommend patients and customers to drink is considerably inappropriate by professional ethic and social obligation.
- Evidence shows that warning messages on the package of commodity with potential harms is an effective mechanism to educate and warn users and general population about risks associated with the use of the item. It can raise knowledge and awareness among consumers and at the collective level. Pictorial warning label on alcoholic beverage packages would be a direct education tool to current and future drinkers. It highly focuses on high-risk users. Regular and heavy drinkers are among those customers with high exposure to the warning messages. Drawing experience from tobacco control, pictorial warning label on tobacco package can yield higher desirable impact in this regard, compared to the text-only messages.
- Through another conceptual framework, recent research in Thailand shows that the pictorial warning label could be another effective mechanism to prevent youth from consumption and thus control underage drinking and drinker prevalence as well as alcohol-related harms among youth.
• All six warning messages, in Thai legislative regulation, have high context relevancy to Thai society and are strongly supported by international and domestic scientific evidence.
• Evidence shows the ineffectiveness of education campaigns in changing drinking behaviours, and thus controlling alcohol-related harms. Apart from its ineffectiveness, the drinking guideline intervention could even lead to unexpected adversaries in public health perspective.
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1. Alcohol is the Non-ordinary Commodity

Most trade agreements, wrongly and dangerously, regard alcohol like other ordinary consumable products. Thinking about a product that kills 2.6 million global population a year, a product that causes million birth defects and disabilities and a product that causes massive tragedy to global population, particularly those youth and deprived populations and those who did not consume it; thinking about alcohol and thinking about how unreasonable this drugs has been treated as an ordinary commodity.

Level of alcohol consumption, drinking pattern as well as magnitude and severity of alcohol-related problems in Thailand require immediate attention from policy makers at all levels. Alcohol consumption has become more common in Thai society. The proportion of regular users, particularly daily drinkers, has increased, while the share of infrequent drinkers has gone in the opposite direction. The percentage of regular drinkers increased from 37.14 in 1996 to 40.67% in 2007 [1]. Alcohol consumption among Thai adult continuously escalated over time. Adult per-capita consumption rose from 7.28 in 1997 to 7.71 litres of pure alcohol in 2007. This is particular for Western-style beverage including whisky and beer. Beer consumption per capita had a 12 times growth during 1987 and 2003 [2]. The most worrisome fact is the rising number of new drinkers, mostly the youth, of around 0.26 million each year. Drinker proportion among minors such as female and youth, which were conventionally low, had constantly increased, owing to the high availability of, and accessibility to alcoholic beverages, and exposure to direct and indirect alcohol advertisement.

Figure 1: Thai adult commercial per capita consumption by beverage types

Source: [2]
Drinking patterns among Thai drinkers could be considered as more harmful compared to those of high income countries. This is particularly when taking the high drinking intensity into concern. Thai male drinkers averagely consumed 85.72 grams of pure alcohol per drinking day, and 51.99 grams for female drinkers. Among teenagers (12-19 years old), male drinkers averagely consumed as high as 118.35 grams per drinking day, and 61.95 grams for female [3]. All of these figures are considered as binge drinking.

Alcohol consumption leads to many negative consequences on all dimensions of health; physical, mental, social and spiritual. Alcohol consumption has been identified as an important risk factor to more than 60 different acute and chronic diagnoses under the 10th International Classification of Diseases (ICD 10). The detrimental effects of alcohol lead to an estimated of 3.8% of all global deaths and 4.6% of global Disability-adjusted Life Years (DALYs) [4]. In Thailand, alcohol consumption is the second greatest risk factor, accounting for 8.1% of overall total burden of diseases, which is roughly two times higher than global figure [5]. Percentage of all DALYs attributable to alcohol for Thai men and women were 12.1 and 2.5 respectively [4].

The extent of alcohol-related harm does not confine only to drinkers. Their family, surrounding people, community and society as a whole all together bear great burdens derived from the drinkers. Alcohol is associated to a wide range of social problems, for instance increased burden of health care cost, property damage and loss of productivity. Among youth who are national future, a study asserted that alcohol consumption was a gateway to other problems and undesirable behaviors such as tobacco use, illicit drug abuse, suicide, unsafe sex and crime [3]. Alcohol can undermine social assets in the long run, and therefore impedes social and economic development of the country. In 2006, the cost of alcohol-related problems was approximately USD 4,800, equivalent to almost 2% of the Gross Domestic Product (GDP), whereas state revenue generated from alcohol excise tax was USD 2,300, less than 1% of GDP [6]. Obviously, the cost incurred from alcohol consumption was much higher than public benefits.

The information on current alcohol consumption situation and negative consequences collected from a great deal of researches insists that alcohol is no ordinary commodity and control over it is necessary. Alcohol-related problems are fundamentally avoidable and preventable with effective alcohol policy and strong implementation.
1.1 Structuring alcohol-related consequences

To comprehend the legitimacy of warning messages, one has to understand the concept of causal relationship between alcohol consumption and its related consequences. The role of alcohol in the development of related consequence is complicated and different by each consequence. To standardize this diversity, epidemiologists use Alcohol Attributable Fraction (AAF) to identify extent of alcohol’s contribution. In short, the AAF is the proportion of cases assumed to be caused by alcohol consumption.

For few consequences, alcohol plays 100% contribution to their pathology pathway, which means the outcome would not exist without the existence of alcohol. The AAF in such consequences is 1.0. These adversaries include for examples; alcohol use disorder, fetal alcohol spectrum disorder and alcohol dependence.

For most of consequences, particularly social problems, alcohol is one of many factors for their etiology or so-called contributory role. And in these conditions, Alcohol Attributable Fraction is in the range of 0.0-0.99. This means that taking alcohol out of the scenario can cut down only a certain percentage of consequences. These consequences include, but not limited to, many types of cancer, sexual impotence, domestic violence, suicide, crime, road traffic accidents, reduced ability to foster children, and overall mortality. The role of alcohol consumption to such conditions is complicated, ranging from being a reinforcing factor, severity hampering factor, to being a gateway drug to many risky conditions.

Taking this diversity into account, the common term used to defined consequences of alcohol consumption is not the alcohol-caused problems, but rather the alcohol-related problems (or harms/ consequences). The definition of alcohol-related problem under the World Health Organization (WHO) system is 'any of the range of adverse accompaniments of drinking alcohol and it is important to note that "related" does not necessarily imply causality' [7].

Therefore, the causality inference for most alcohol-related consequences is neither direct nor sufficient causality, but a probabilistic causality. The difference between the association and causation is very important in this junction. The relationship from alcohol consumption to alcohol-related problems, mentioned in the warning messages, should be beyond the association level, for example the biological etiology must be explainable. And because the warning label is an alcohol policy intervention at population level, considering on the legitimacy of each message must be based on alcohol-related consequences at aggregated level.
1.2 Alcohol health benefit: no benefit in developing countries

The benefit of alcohol on protecting coronary heart disease is well supported by many studies in high income countries. Referring to this health benefit to aggregated population level, however, must be conducted with extremely careful. Taking all diseases and injuries at global level into account, the negative health impact of alcohol consumption is 31.6 times higher than benefit, in terms of DALYs [4].

At individual level, drinking to attain this benefit is not easy. Moreover, not everyone can enjoy this benefit. Beneficiary population groups are those male over 40 years old and post-menopause female population [8, 9] who consume with very limited quantity (i.e. 0.5-1 drink) every day or almost every day-without heavy use. Such regular light drinkers are rare [10], particularly in the developing world [11]. Most daily users drink in high quantity, and one might assume that most drinkers do not drink for cardio-protective benefit [12]. Furthermore, 78.7 % of death averted from alcohol attributable benefit occur after 70 years of life [13], which is not the major population segment for drinking.

At macro level, the cardio-protective benefit is found only in geographical area with high incidence of coronary heart disease [14], or namely high income countries [15]. And even in the high income settings, to be more specific, the benefit seems to be outstanding in only among White population, not other races [16]. Meanwhile, there is no such benefit at aggregated level in other global regions [17] In other words, alcohol consumption has positive relationship with the incidence of coronary heart disease, ’more drink-more disease’ in the global areas with low coronary heart disease incidence [8], such as in the developing world.

Most important, those who may obtain the benefit from light regular alcohol consumption on one hand, also obtain the risk for many diseases and conditions in the other hand. There is no such the ‘Risk-Free Drinking’, there is no ‘Safe Drinking’, but rather it is low and high risk drinking. The extent of risk depends on both volume and pattern of drinking, and it largely varies across societies.

It is clear that those abstainers, as well as those who quit drinking, do not lose any health benefit in their life, and many of them could gain health and other benefits from stop drinking. Professional councils [18] and institutions [19] in UK clearly say that drinkers should not drink for health benefit. And the recommendation to patient to drink in order to gain cardio-protective effect is considered as inappropriate practice among physicians [20].
In sum, the net relationship between alcohol and coronary heart disease is negative, which means the extent of heart protection benefit is washed out and surpassed by the burden of coronary disease attributable by alcohol [21].

At macro level, Rehm et al [4] estimate the positive and negative health impact of alcohol consumption in 10 countries (Brazil, China, Germany, India, Japan, Nigeria, Russia, South Africa, Thailand and United States of America). Interestingly, the health benefit from alcohol consumption if found only in Germany, Japan and USA, meanwhile there is no health benefit reported in other 7 countries, all from developing countries including Thailand (depicted in Table 1). This finding is in the line with finding from other studies (i.e. [22] [23]). This evidence leads to the conclusion that there is no alcohol-attributable benefit at population level in Thailand.

Table 1: Alcohol-attributable burden of disease in 1,000 DALYs by sex and cause in ten selected countries 2004

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Brazil</th>
<th>China</th>
<th>Germany</th>
<th>India</th>
<th>Japan</th>
<th>Nigeria</th>
<th>Russia</th>
<th>South Africa</th>
<th>Thailand</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>W</td>
<td>M</td>
<td>W</td>
<td>M</td>
<td>W</td>
<td>M</td>
<td>W</td>
<td>M</td>
<td>W</td>
</tr>
<tr>
<td>Neoplastic disorders</td>
<td>1,061</td>
<td>6,702</td>
<td>36</td>
<td>30</td>
<td>19</td>
<td>66</td>
<td>58</td>
<td>1,664</td>
<td>2,461</td>
<td>42</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>295</td>
<td>1,148</td>
<td>94</td>
<td>36</td>
<td>16</td>
<td>62</td>
<td>90</td>
<td>2,344</td>
<td>2,837</td>
<td>42</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>251</td>
<td>913</td>
<td>40</td>
<td>141</td>
<td>57</td>
<td>204</td>
<td>26</td>
<td>114</td>
<td>25</td>
<td>63</td>
</tr>
<tr>
<td>Unintentional and intentional injuries</td>
<td>1,632</td>
<td>2,414</td>
<td>110</td>
<td>113</td>
<td>30</td>
<td>2,044</td>
<td>49</td>
<td>390</td>
<td>125</td>
<td>3,579</td>
</tr>
<tr>
<td>All cause DALYs caused by alcohol</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total detrimental effects attributable to alcohol</td>
<td>3,932</td>
<td>499</td>
<td>13,696</td>
<td>1,532</td>
<td>738</td>
<td>254</td>
<td>7,343</td>
<td>7,191</td>
<td>2,565</td>
<td>1,781</td>
</tr>
<tr>
<td>Total beneficial effects attributable to alcohol</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-444</td>
<td>-271</td>
<td>0</td>
<td>-94</td>
<td>-29</td>
<td>0</td>
</tr>
<tr>
<td>All alcohol-attributable net DALYs</td>
<td>3,932</td>
<td>499</td>
<td>13,696</td>
<td>1,532</td>
<td>794</td>
<td>127</td>
<td>7,343</td>
<td>7,191</td>
<td>2,565</td>
<td>1,532</td>
</tr>
<tr>
<td>Percentage of all DALYs attributable to alcohol</td>
<td>17.1%</td>
<td>3.6%</td>
<td>12.9%</td>
<td>1.8%</td>
<td>12.8%</td>
<td>-0.4%</td>
<td>4.9%</td>
<td>0.5%</td>
<td>6.7%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

M – men, W – women
* Numbers are rounded to the nearest thousand. Zero (0) indicates fewer than 500 alcohol-attributable DALYs in the disease category.

Source: [4]
2. Effectiveness of Pictorial warning messages

From the public health perspective, alcoholic beverage packages are educational opportunity, which can directly communicate to drinkers as well as general population. The use of pictorial images enhances the impact of the public health messages at critical junctures; the point of purchase and the time of drinking. And because the distribution of alcohol consumption is highly distorted, the pictorial warning label would disproportionately focus on high-risk users. Regular and heavy drinkers are the subpopulation groups with high exposure to the warning messages.

From the consumer protection perspective, pictorial warning label is an opportunity to warn the users about risks associated with the use of the item. The legislative regulation on warning label prohibits businesses from knowingly exposing individuals to commodity with risks without providing a clear and reasonable warning. In this regard, it is the right of current and future customer to be informed about possible risks.

The evidence of pictorial warning on alcoholic beverage package is scarce, therefore this section explores the effectiveness of such initiation through three analytical frameworks; lesson learned from tobacco pictorial warning, text-only warning messages on alcoholic beverage packages, and potential impact of pictorial warning on Thai youth.

2.1 Experience from the pictorial warning messages on tobacco packages

Pictorial or graphic warning on tobacco products demonstrates the strongest evidence that it could raise awareness among smokers, which in turn can lead to behaviour change [24-26]. The graphic warning makes smokers to smoke less, think more about health risks and increase motivation to quit smoking. The tobacco experience suggests that vivid, large, full colour pictures or graphics positioning on the front of packs with direct unambiguous message can increase the likelihood recognition among smokers [24, 27]. Benefits of the pictorial warning labels are also pointed out as follows:

- The best source of health risk information: The warning labels can inform or educate consumers on negative consequences. Consumers generally have limited knowledge on and/or undermine health risks and harms associated with their consumption of hazardous commodity. The warning label is one of the few prominent resources of information of potential harms frequently seen by the consumers, particularly in poor resource settings such as in the low and middle
income countries. Therefore, impacts of the pictorial warning in these counties may be stronger than that of developed ones.

- **Cost effective public health intervention:** Pictorial warning is the most cost effective public campaigning health education intervention when compared to other prevention efforts such as paid mass media and education campaigns. Smokers including the young report tremendous reach and frequent exposure to the warning labels except [28].

Effective health risk communication tool: The package and label of alcohol beverages have been exploited by alcohol business as one of the communication channels to create positive images associated with their products. Pictorial or graphic warning is an essential tool for communicating health risk message. Appropriate warning labels can be easily noticed and easily remembered. They can help counteract with positive pro-drinking messages by replacing with health messages related to negative health impacts and other consequences [29, 30].

### 2.2 Impact of warning messages on drinkers

It is very likely that pictorial warnings on tobacco and alcohol packages would have close impacts. In contrast to the tobacco case, alcoholic beverages in many countries are free from any warning. However, it seems to have an increasing popularity, and is in the formulation process in many countries. French motif warning women during pregnancy not to drink alcohol even in small amounts as it can seriously harms maternal and child health seems to be the only and the most advance alcohol warning label [31, 32].

A policy evaluation conducted in the United States reveals that the awareness of the warning labels and recall of the warning messages were high, however with limited impact on behavior at gross population level [33]. In summary, the studies provide the following conclusions:

- Alcohol warning labels increase knowledge, impact attention or awareness including judgment about potential dangers or health risks. The impact is stronger among high-risk drinkers, particularly young people, pregnant women and heavy drinkers. They are more likely to recall the warning messages.
- There is no strong indication for positive behavioural change. However, the study rather suggests an impact on cognitive stage necessary for behavioural change, such as more conversations about alcohol risks and motive to reduce drinking.
- Those heavy and regular drinkers would expose more on the warning messages, so it is disproportionately direct communication to those problematic drinkers.
• Warning label on alcohol beverages is supportive to other prevention strategies and interventions. Warning labels can play an important role in raising public awareness to potential health threats and related problems resulting in overall reduction of alcohol consumption.
• The cost to implement this strategy is low and no negative consequences have been demonstrated. 

(Note: Summarized from [31, 32, 34, 35])

There are three significant observations on the conclusions here.

First, it has to be kept in mind that the research evidence mentioned above is based solely on the text-only warning label. Pictorial warning messages are not currently practiced.

Second, results of some studies might reflect the nature of the warning messages that are minuscule and placed on difficult-to-find location where is virtually unnoticeable in nature. This setting may overthrow the purpose of the law. Another survey confirms this assumption as respondents thought that the warning was too small, often illegible and hidden and most of them also reflected that the warning was not designed to intentionally inform consumers [34].

Third, the potential to influence drinking behavior relies on the design, the content, the placement of the messages and how well the messages are targeted at their intended audience. Researchers comment that if the alcohol warning label is enhanced, it will be more noticeable and impactful. This is probably why the introduction of large and prominent graphic or pictorial warnings on alcohol beverages is necessary [27, 35]. If pictorial warning could be displayed on alcohol package, the outcome could be similar.

2.3 Preventing new drinkers as the mechanism to prevent alcohol-related harms

In order to control alcohol-related harms in Thailand, the National Alcohol Policy Strategy defines four policy mechanisms; controlling of aggregated consumption, preventing new drinkers, making consumption safer, and rehabilitate those experiencing alcohol problem [36].

Preventing new drinkers, in order to control drinker prevalence, is particularly crucial for countries with low drinker prevalence, including Thailand with only 30% of adult drink. The new drinker prevention approaches mainly focus on youth, can be done through many means, including warning messages on alcoholic beverage products.
This is although the main stream of alcohol research in focuses on the effect of warning message intervention on current drinkers.

The Center for Alcohol Studies, Thailand recently conducted the survey among 1,512 primary school student nationwide (Grade 4-6, age between 10-12 years old) on the potential benefit of pictorial warning messages on alcoholic beverage products. This research particularly focuses on impact of such messages in preventing these youth to start drinking.

Major findings include:
- Among Thai youth who have seen the beverage packages with mandatory text-only warning messages, only 63.68 % aware about it and 22.80 % can recall the key messages.
- In comparison, 77.72 % of Thai youth who have seen the cigarette packages with pictorial warning, and 26.69% can recall the key messages.
- Therefore, comparing between warning on tobacco and alcoholic beverage packages, the pictorial warning can increase awareness by 22.05% and recall by 17.1%.
- 23.5 % of Thai primary students think that the current packing of alcoholic beverages is beautiful, easy to commemorate, and has high appeal to them.
- Comparing between pictorial and text-only messages, 92.1- 95.5 % of Thai youth think that the pictorial warning messages have higher influence to deter them from drinking initiation. The highest percentage is found on road traffic accident (Message#2), the lowest on sex-related impact (Message #4)
- 80.1 % of youth think that the six pictorial warning messages can create higher awareness and knowledge on alcohol-related consequences, compared with text-only warning.
- 81.0 % of youth think that pictorial warning label can limit the appeal of alcoholic beverage package to youth.
- And 90.5 % of youth support for the adoption of the mandatory pictorial warning message labeling regulation.
Figure 2: Percentages of Thai primary school students by perception of higher impact (effect in alcohol deterrence and in creating awareness) between pictorial and text-only warning among, 2010

Source: Center for Alcohol Studies, Thailand 2010 (forthcoming report)

All of these findings lead to the conclusion that the pictorial warning messages can have potential impact in preventing Thai youth to be new drinker.

3. Technical evidence for warning messages

Warning messages is an alcohol policy intervention aimed to control alcohol-related harms at the aggregated level. Hence, each message should be supported by scientific finding at population-level. However, the relationship between alcohol consumption and harms in the warning messages may vary across countries. Analyzing the legitimacy of these warning messages, then, has to take the context relevancy into account.
3.1 Alcohol consumption could lead to liver cirrhosis

Liver cirrhosis attributable to alcohol caused 373,000 global death and 6,945,000 healthy years of life in 2004 [4]. Alcohol can harm liver and alter its function through three major pathological steps from almost no symptom to full blown disease; alcoholic fatty liver, alcoholic hepatitis and liver cirrhosis (or liver fibrosis). Many pathologies of liver attributable to alcohol are related to each other, and can lead to the condition of liver cirrhosis. Overall AAF is 1.0 for alcoholic liver cirrhosis, and 0.43-0.54 for unspecified cirrhosis [37]

The correlation between alcohol consumption at aggregated level and liver diseases is well known. Therefore, the incidence of liver cirrhosis is commonly selected as a representative for overall alcohol-related problems. This is particularly in the settings with high reliability of health information.

Although the causes of liver cirrhosis in developing countries might have higher diversity compared to in Western countries. These causes include viral hepatitis and diseases of bile duct, such as cholangio-carcinoma in South-East Asia. Yet the liver cirrhosis attributable to alcohol still has a substantial share to total burden. Between 1971 and 2001, the mortality rate from liver disease in Thailand has a positive association with per capita alcohol consumption [38]. This means when consumption goes up, death from liver diseases goes up in response. This is in the line with the finding in many high income countries, with between 1-5 years time lag.

Figure 2: Adult per capita consumption (litre of ethanol) and liver mortality rate (per 100,000 populations) in Thailand 1977-2001

Source: [38]
Warning message on liver cirrhosis is particular important due to its chronic nature. Most of drinkers have ‘myopia’ underestimating the risk of cirrhosis from their consumption. Furthermore, the etiology, symptoms and suffering from liver cirrhosis and its health complications are difficult to understand among general population, let alone to make the linkage between alcohol consumption and this disease condition. Therefore the pictorial and text warning messages should be able to raise awareness and help drinkers and general population to understand this health burden.

3.2 Driving under the influence of alcohol could lead to disability and mortality

The evidence on the relationship between alcohol and lowered vehicle driving ability is well established worldwide. Alcohol alters the ability to drive safely through many mechanisms, including reducing visual acuity and response time through neuro-chemical effect of ethanol. Furthermore, study in Thailand shows that alcohol can further hinder the use of safe equipments, such as safety helmet and seatbelt [39]. The AAF for road traffic injuries is 0.18-0.43 in with a significant gender variation, road traffic injury among male is more likely to be attributable to alcohol than female [37].

An important nature of the road traffic injury risk is that there is no threshold for safe level of drinking and the risk increase with increased blood alcohol concentration, in linear pattern. The WHO report clearly states that blood alcohol concentration at 0.0 mg% is the only safest consumption level [40]. Furthermore, the drink driving produces clear externalities to others and the whole society, such as impact to passengers and pedestrians and material damage. The cost of property loss due to road traffic crashes under the influence of alcohol in 2004 was 779 million Baht (approximately 22.3 million USD) [6]. Of course, this cost is not solely shouldered by drinkers, but everyone in the society.

In Thailand, road traffic accident is a major preventable mass tragedy. Each year, road traffic accident averagely causes 12,000 acute death tolls (with in 24 hours after accident) [41] and another 12,000 as sub-acute (between 24 hour to 28 days) [6]. Unfortunately young population shares a disproportionally high proportion in this tragedy.

Drink driving and motorcycle use are two most common risks for road traffic mortality. This is particularly for long weekends. 70% of road traffic mortality in 2007 are riders and passengers of motorcycles [42]. The 2004 national survey reports that drinking driving practice is evident for 36.6% of current drinkers [43].
Particularly for long weekends, the drinking times, the death tolls increase over two times, from the average 35 deaths in normal period to 84-87 deaths for international and Thai New Year periods in 2001-2004 [39]. This increase went in the line with increase in alcohol consumption and prevalence of drink driving. Around two fifth of drivers during the 2003 Thai New Year period drove under the influence of alcohol [44].

At macro level, Thai road traffic accident morbidity and mortality rates during 1984-2001 have positive association with adult per capita consumption [45]. Another study shows the correlation between traffic mortality and alcohol outlet density [46].

Figure 3: Road traffic injury and mortality rate (per 100,000 populations) and adult per capita consumption (litre of ethanol) in Thailand 1984-2001

In sum, the warning on drink driving is justifiable and well supported by evidence, taking into account the health and societal burden from such unacceptable practice—particularly on the externalities to others. The picture, in addition, well reflects the most common scenario of road traffic accident in Thailand, such as the relationship between alcohol and motorcycle in young male adult.
3.3 Alcohol consumption could alter consciousness and lead to mortality

(Note: ‘Consciousnesses’ in Thai language may also mean ‘awakening’ or ‘realization’, particularly in religion-related usage)

This warning literally has two parts, one on effect of alcohol in altering consciousness, another one on mortality. Therefore, this can be interpreted in either separated or integrated way. In the bundled version, this message means that alcohol can alter consciousness and the altered consciousness can lead to death.

First part, alcohol consumption can alter the central nervous system (CNS), and thus the consciousness, in a number of ways including the effect of alcohol derivatives and other correspondences. Most important, the CNS effect of alcohol can occur at very low consumption level, particularly among youth and occasional drinkers [47], for example at blood alcohol concentration 10-30 milligram% [48] or the level than can obtain by only one standard drink for most of Thai consumers. In another word, there is no quantity threshold for the CNS effect.

Like elsewhere, many Thai drinkers stick themselves in the myth that drinking to some extent does not affect their consciousness and/or they still hold ability to control themselves after drinking. These myths are partly enhanced by the activities of the alcohol industry through the promotion of the policy discourses like ‘responsible drinking’ and ‘sensible drinking’. 43.8% of Thai youths still believe that the binge drinking (over 50 grams of ethanol) is still within safe limit [49]. Consumption in that quantity certainly affects CNS and limited consciousness. Such beliefs may be a major drive for the very harmful drinking practices among Thai youth drinkers, such as the average consumption per drinking day at 118.4 gm of ethanol for male and 61.9 grams for female [3].

Taking into account the high consumption per occasion, mentioned above, it is likely that drinking-to-death or acute fatal alcohol intoxication would not be a rare case among Thai drinkers. This case has been reported in mass media occasionally. This is although Thai health system still needs scientific information (postmortem blood alcohol concentration) to confirm. And therefore, bundling consciousness altering and mortality together can be also interpreted in this way.

In the realm of religion, the consciousness is very important to Buddhism. It is symbolized together with ethic as the two pillars for Buddhism [50], and is crucial for mental development. For Buddhism, alcohol consumption is defined as one of the ‘Six Ways of Deterioration’ and prohibited under the ‘Precinct 5’, together with killing, stealing, adultery, and telling a lie. The word ‘Precinct’ literally means the normal or usual way of life for the collective happiness. Interpreted in this way, alcohol use is not a normal way of life to Buddhism followers (roughly 95% of Thai
population), as well as of course Islamic population (approximately 4%). A common belief is that alcohol consumption is regarded as the most important Precinct, as it can lead to the breaching of other four Precincts [51]. The rationale for this is that alcohol consumption can certainly befuddle consciousness [52]. And with limited consciousness committing other sins is not so difficult. One out of six negative alcohol impacts from the Lord Buddha is that alcohol can damage ‘wisdom’ or alcohol can cloud the inherent clarity of the mind. The Buddhist scripture even says *those who drink alcohol regularly will not be able to think rationally, about cause and effect* [51].

Two other important issues in considering the legitimacy of the warning on the consciousness are that alcohol can limit drinkers’ ability to control their next drink(s) and the theory that the use of alcohol reinforces the next use. Alcohol is the only responsibility-limiting commodity that the producers are promoting ‘please consume with responsibility’. This is of course against the hard fact that it is alcohol that limits the ability of drinkers to be responsible. Having said that, the warning messages on consciousness would be the last stop to warn drinkers, as well as send a clear communication to those drinker-to-be, about the fact that altered consciousness could lead to many other risks, including alcohol-related mortality.

The second part of this warning message is about alcohol and mortality. Alcohol causes 2.64 million global death in 2004 [22], approximately equivalent to one death in every 12 second. In Thailand, the estimated death attributable to alcohol is around 26,026 in 2004 [53], or approximately equivalent to 416.24 per 100,000 population. The Thai alcohol-attributable mortality rate is much higher than global average.

Death from alcohol consumption has two interesting natures. Firstly, it does not confine to only drinkers themselves. Harms to other or externalities are much evident for alcohol-relate consequences. Secondly and perhaps most important, death attributable to alcohol is not proportionately distributed over life span. This means that alcohol causes more harm on young adult population, the productive batch and the future of society, than older batches.

Therefore, the warning on mortality attributable to alcohol is unquestionably not an exaggerated claim.
3.4 Alcohol consumption could lead to inferior sexual performance
(Literally ‘Alcohol consumption could damage sex’)

The sex-related effect of alcohol is a complicated domain, whereby social norms, personal expectations and several myths play significant role. In Thai context, the availability of medicinal alcoholic beverages and the local practice using alcohol as solvent to traditional herbs largely create the myth that alcohol could promote the sexual performance. Expectation on sex-related effect of alcohol is crucial for drinkers. Silverberg (2006) reports that placebo drinkers (who did not recognize that their drink is non-alcohol) report the same sex-related effect particularly sexual arousal, with no difference to alcohol drinkers [54].

Alcohol can hamper reproductive health in two major pathways, through the alteration of sex hormones and directly through the toxicity of alcohol to most of body parts, including sex-related. Alcohol can interfere male reproductive system (hypothalamus, anterior pituitary gland, and testes) by alter the function of each of these components, thereby causing impotence, infertility, and reduced male secondary sexual characteristics [55]. Research shows that even after a few drinks sexual response is reduced; and drinking in large amount will lead to a reduction in sexual arousal, men may have difficulty getting erections, and both men and women may have difficulty experiencing orgasm [56].

The long term effect of alcohol on reproductive health is particularly clear. Regular drinkers have limited ability in searching for intimate partners and have higher risk for marital problems [54]. Male alcohol dependences have higher risk for erectile dysfunction, lower libido, and reproductive ability [57]. 54% of male dependence have problem of erectile dysfunction and 31-58% have lower sexual desire [58]. These sex-related problems tend to have long term effect, if not permanent. The recovery period to gain sexual ability seems to be long after quitting from alcohol, unfortunately almost half of patients lost the ability permanently. Female dependences have higher chance for decrease sexual desire and sex-related happiness [59].

Apart from sex-related effect mentioned above, alcohol could lead to many sex-related risk behaviours, including unsafe sex [60], sex-related violence [61], multi partners, unexpected pregnancy [62], abortion [63] and premature sexual intercourse [64]. Survey among Thai youths show that youth drinkers have 3.75 higher likelihood for abortion and 2.92 times for pregnancy or making others pregnant [3].
Therefore, the warning message on sex-related effect attributable to alcohol would be an effective mechanism to raise awareness among drinkers and general population on these effects. This is particularly to prevent the overestimation or misconception on alcohol-related sex effect.

3.5 Alcohol consumption could harm yourself, children and family

This message consists of three inter-related components; harms to drinker themselves, family and children.

With no doubt, alcohol causes more harm to drinkers than others, including health and non-health consequences. Among 60 diseases and injuries bearing by drinkers, alcohol consumption also clearly associates with intentional self injury and suicide. The AAF of intentional self harm among UK adults is between 0.34-0.36 [65]. According to the WHO study, the AAF for suicide is between 0.2-0.4 [37]. Researches show the dose responsive characteristic of suicide on consumption level at individual level [66] and collective level (per capita consumption) [67]. In another word, the higher drinking volume, the higher risk of suicide. Interestingly, Dawson (1997) shows the evidence busting the myth that moderate drinking can prevent suicide, instead it increases the risk [66].

There is clear association between work problems and alcohol use [68]. These include unemployment, absenteeism, poor productivity, work accident, problem with others in workplace for examples. A study in 2006 shows the likely dose response relationship between decrease in work productivity (in the forms of both absenteeism and presenteeism) and volume of alcohol consumption among Thai employees [6].

Unlike in Western countries, the distribution of drinker by socioeconomic status in Thailand shows that most drinkers disproportionately concentrate in deprived subpopulation group. In 2004, for example, 66.7% of Thai drinkers had less than 5,000 Baht (125 USD) monthly income, compared to the national average at 8,537 Baht (approximately 213 USD). Furthermore, 48.9% of female drinkers earned less than 2,500 Baht a month (less than 2 USD a day) [43]. Although to conclude about cause and effect between alcohol consumption and poverty is not easy, one could easily conclude that the use of alcohol certainly hamper the ability of Thai drinkers and their families to escape from the poverty.

Alcohol consumption has direct and indirect impacts on spouses and children, in psychological and physical trauma as well as educational, social and financial handicaps. This is particularly for the lower socioeconomic stratifies. The household survey reports that Thai poorest family quintile spent on alcohol more than their
better-off counterparts, in terms of the proportion to total income and/or total expenditure [69]. Comparing on time series basis, the average expenditure for alcoholic beverage among Thai family increased by 96% within 6 years, from 370 Baht in 2002 [69] to 602 Baht in 2008 [70]. With this figure, Thai family averagely spent for health damaging commodities (alcohol and tobacco) seven folds higher than expense for medical care [69]. In terms of food security, a recent survey in Thailand found that families with drinker(s) have 5% lower food expense for the whole family [71].

To intimate partners, evidence shows that alcohol use associate with physical and sexual violence, particularly toward female partners, as well as marital problems. A study shows that divorce rate increase with increased per capita consumption [72]. More than half of alcohol dependent in-patients in a Northern Province of Thailand have marital problems and/or working difficulties [73]. A recent research in Thailand reports that families which both husband and wife drink alcohol have 8.55 times higher risk for domestic violence, compared to abstainer family [74].

<table>
<thead>
<tr>
<th>Drinker status</th>
<th>Adjusted relative probability (Odd Ratio)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both abstainers</td>
<td>1.00</td>
</tr>
<tr>
<td>Wife as drinker</td>
<td>1.25</td>
</tr>
<tr>
<td>Husband as drinker</td>
<td>4.27*</td>
</tr>
<tr>
<td>Both drinkers</td>
<td>8.55*</td>
</tr>
</tbody>
</table>

Note: *= difference with statistic significance
Source: [74]

Alcohol is a significant factor for harms to children, physically and mentally. Many studies confirms that families with drinking caretakers, particularly heavy user and dependence, have higher risk for child abuse [75]. According to the WHO report, the general AAF for child abuse is 0.16 [37]. Parental drinking contributes to many mental illnesses of their children, some of these are coincident with physical child abuse. In Thailand, Teenage children of fathers with alcohol dependence have an 11.5 times greater risk of psychological disorders [Sakulthong 1988 referenced in [76]]

Alcohol use during pregnancy is another clear mechanism for harm to children and youth. These burden groups can manifest in many forms; ranging from abortion, low birth weight to permanent damages like Fetal Alcohol Spectrum Disorder. According to the 2007 survey by the National Statistic Office [1], it can be estimated that 79.8% of drinking women in reproductive age group continues their drinking during pregnancy, and 78.4% for lactation period. Although the belief about the use of alcohol as solvent for traditional herbs may take a part, this high figures still
largely reflect the underestimation among Thai women about the alcohol effects on their fetuses, infants and young children.

According to the recent survey in 2009, many alcohol-related parental norms and behaviours can significantly increase the likelihood of youth drinking. These factors include living with drinking parents, parental drinking and/or being intoxicated in the presence of kids, requesting kid to purchase alcohol to parents [77].

Moreover, providing best care to their family and independents should be the moral and social obligations, and therefore this warning message is well supported in both scientific and ethical dimensions.

3.6 Alcohol consumption is an improper model for children and youth

This warning message is very specific to social context, particularly on social desirability on and legal aspect of alcohol consumption among youth. To well comprehend the effect of this warning message, one has to explore the potential positive impact at multiple levels. Youths' refraining from alcohol certainly benefits themselves, their family and the whole society. The role model effect of drinker to children and youth within family was addressed in the previous section (Message#5), within this the most important is that children with drinking parents have 2.04 times higher to be under age drinker [77].

In a society, each individual contribute to social norms at different extent, and in turn it is the social norm that influences the practice of individual. In recent decades, the normalization of alcohol consumption is prominent in the global region with traditionally low drinking prevalence, including Thailand. The marketing strategies used by the alcohol industry played a major role for this change. As the result, alcohol consumption has become more and more common in Thailand. Inevitably, children and youth are victims to this change, absorbing the effect of drinking normalization without awareness.

Youth drinking, commonly known as underage drinking, is particularly important in terms of the higher comparative risks, and the fact that the quality of youth determines the quality of future society. Evidence confirms that the age of first drinking is crucial for the risk of problems in their later stage of life [33]. Therefore preventing youth drinking is one of the most effective approaches in the long run. Minimum purchasing age is one of effective intervention, but it is certainly inadequate to address alcohol-related problems.
Youth within settings where alcohol consumption is more acceptable has higher chance to drink. Among Thai 76 provinces, the prevalence of youth drinkers (under 20 years-legal minimum purchasing age in Thailand) well reflects the prevalence of adult drinkers [78]. This means that in the settings where adults drink more, youths also drink more. From other studies, youths who study [46] and reside [46] in higher alcohol outlet density have higher likelihood to be drinkers.

Table 3: The likelihood of underage drinking by parental drinking status and permissiveness

<table>
<thead>
<tr>
<th>Parents drinking status</th>
<th>The probability of underage drinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Both are drinkers</td>
<td>2.04*</td>
</tr>
<tr>
<td>• Father or mother is drinker</td>
<td>1.78*</td>
</tr>
<tr>
<td>• Both are abstainers</td>
<td>1.0</td>
</tr>
<tr>
<td>Parents permissiveness</td>
<td></td>
</tr>
<tr>
<td>• Allow</td>
<td>5.02*</td>
</tr>
<tr>
<td>• Not allow</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Note: * difference with statistic significance
Source: [77]

Therefore, this warning message would be the last resort to remind those adult consumers on potential unintentional impacts to youths, both adjacent or far off them.

4. Why not other interventions?

This section synthesizes on the benefit of the pictorial warning messages compared with the alcohol policy interventions in the same category; text-only warning messages, general educational public campaign and the promotion of drinking guideline.

4.1 Why not text only?

The tobacco experience suggests that effective warning labels are possible and pictorial warning delivers greater success in influencing consumer behaviour, particularly motivation to cut down smoking. From extensive evidence on pictorial warning label on cigarette package combined with research results of the text-only
warning label on alcohol beverages, pictorial warning is more effective due to the following reasons:

- It is more likely to be recognized, well perceived, and easily remembered.
- Pictorial warning are more effective in educating consumers for increasing thoughts about health risks and potential damages, which are associated with increased motivation to reduce or quit smoking.
- Pictorial warnings are more effective than text-only warnings, likely because they can draw more attention.
- Pictorial warnings sustain their effects longer as it has “wear out” phenomenon in health communication or retain their salience over time.
- Imposing pictorial warning on alcohol beverages instead of text-only warning can have a long-term social utility in establishing understanding in the society that alcohol is no ordinary commodity.
- Pictorial warning may be particularly important in communicating health message to population in a country like Thailand where literacy rate is not very high like in developed countries. This is especially among lower socioeconomic stratifies who face more alcohol-related problems and would have limited capacity to cope with alcohol-related harms.

(Note: Summarized from [25, 28, 29, 79])

4.2 Why not education program and drinking guideline?

Alcohol policy is a domain where knowledge and behaviour do not always go in the same line. Education and persuasion intervention is one of the least effective and cost effective approaches to address alcohol-related problems [33, 80]. Some well-designed education programs might be able to increase knowledge and awareness, but are unlikely to change behaviour [81], particularly among high risk drinkers.

Particularly for education campaigns and/or warning messages promoting drinking guideline, there is no evidence on their efficacy in reducing alcohol-related harms [33, 82]. Drinking guideline programs fail to change drinking behaviour especially in curbing consumption volume of those who drink beyond the benchmark [83].

Apart from this failure, some campaigns, initiated and/or supported by the alcohol industry, can even lead to undesirable spill over effect. Such campaigns are easily defined as another marketing tool by the industry [84], some called these campaigns as the ‘educational marketing’. The adversaries of such campaigns include the impact on youth, drinker-to-be, abstainers and the whole society, creating the social norm conducive for drinking. This is particularly when the campaigners using the positive discourses about alcohol consumption, such as sensible drinking, safe drinking and responsible drinking. These messages confuse a substantial proportion of population; whether or not they should increase or
decrease their consumption [85]. In particular, they can create the wrong social perception that alcohol is harmless, or even useful.

Providing information about alcohol and related harms is appropriate, but it should not be regarded as an alternative to other more effective policy interventions. Taking the evidence of effectiveness and cost-effectiveness into account, therefore, education campaign and drinking guideline should be listed in the lowest alcohol policy priority and with high concern on their adversaries.
References


39. Thanaboriboon, Y., Risk factors of road traffic accident Thailand Health Situation [In Thai], 2006. 2(10).


