Aligning executive incentives with global public health goals

Pearce J.M. [1*], Denkenberger D.C.[2]

1. Michigan Technological University, Houghton MI, 49931, USA
2. Global Catastrophic Risk Institute, Durango, CO 81301, USA

ABSTRACT

Introduction: The World Health Organization (WHO) estimates that together tobacco and alcohol kill about 9 million people annually despite aggressive and widespread public health controls. These legal industries persist because of the demand for their products and their substantial economic influence, which is magnified by the concentration of wealth in the executives of leading corporations that profit from increased legal drug sales.
Materials and methods: This preliminary study quantifies the link between global premature deaths from these legal addictive drugs as a function of executive compensation in order to provide the necessary data to make more effective policy recommendations for preventing legal drug-related deaths.
Results: The results indicate a need to incentivize chief executive officers (CEOs), such that they have a constant marginal utility per life saved.
Conclusions: An executive compensation incentive that moves to eliminate tobacco use is achieved by a pay structure that increases exponentially with the number of lives saved.
Key words: tobacco control; alcohol control; global public health; executive compensation

*Corresponding author:
Joshua M. Pearce, Michigan Technological University
1400 Townsend Drive, Houghton, MI 49931-1295, USA
Tel.: 906-487-1466, e-mail: pearce@mtu.edu

INTRODUCTION

Multi-criteria decision analysis has repeatedly found that the legal drugs of tobacco and alcohol cause significant harm to both individuals and society [1,2]. In particular, the health-related dangers for tobacco [3-8] and alcohol [6,9-14] are well known to the medical community and the World Health Organization (WHO) estimates that together these two drugs kill about 9 million people annually. These deaths are premature deaths, which occur before a person would otherwise be expected to die of age and are thus considered preventable. Despite substantial effort by public health officials to institute control policies [15-19] such as the WHO's Global Treaty on Tobacco Control, which places broad restrictions on the sale, advertising, sponsorship, promotion, shipment, and taxation of tobacco products [20], the number of smokers has increased steadily worldwide and is now nearly a billion users [21]. Similarly, despite 61.7% of the global population (>15 years) avoiding alcohol consumption, there is a worldwide increase in recorded alcohol per capita [22].

These legal industries persist because of the demand for their products and their substantial economic influence: tobacco generated US$722 billion in 2013 and alcohol over US$1.4 trillion in revenue [23]. This economic influence is magnified by the concentration of wealth in the executives of these leading corporations that profit from increased drug sales. The evidence that the wealthy and thus politically powerful have frequently worked together to create or perpetuate privilege, often at the expense of the national interest (e.g. in this case public health) and usually at the expense of the middle and lower classes is well established [24].

The aim of this preliminary study is to quantify the link between global premature deaths from two legal addictive drugs as a function of executive compensation in order to provide the necessary data to make more effective policy recommendations for preventing legal drug-related deaths. The results are analyzed and policy recommendations are made to decouple this link for the benefit of the public health goals of increased quality of life and longevity globally.

MATERIALS AND METHODS

The global earnings per death or death ratio, $r_{g(i)}$, is the annual chief executive officer (CEO) compensation for company i per avoidable death in year (t) given by:

$$r_{g(i)}(t) = \frac{c_i(t)}{d_i(t)} \quad \text{[US\$/avoidable death/year]} \quad (1)$$

where d_i is the global total deaths caused by the company i per year and c_i is the summation of annual CEO compensation for company i consisting of base salary, bonuses and stock options, benefits and other forms of remuneration. The total deaths for a given year statistically attributed to any specific company can be approximated by:

$$d_i(t) = D(t)\, m_i(t) \quad \text{[avoidable deaths/year]} \quad (2)$$

where D is the total deaths attributed to a specific industry in year t and $m_i(t)$ is the market share (as percent of revenue) of a specific company in the industry. Similar calculations for the death ratio for a specific country and innocents (e.g. second hand smokers or drunk driver victims) can be calculated substituting D_{inn} for D, and using the appropriate m.

The market share, m, in 2013 for the top eight companies in tobacco and top ten in alcohol was determined from Euromonitor International's gateway Passport (www.portal.euromonitor.com). Inputs for c were determined for each individual CEO from Bloomberg Businessweek (http://www.bloomberg.com/). All monetary units were converted to US$ using Dec. 31, 2014 exchange rates published on xe.com. D was determined from the WHO, which reports that the tobacco industry is annually responsible for more than five million direct-deaths from tobacco and an additional 600,000 are the result of non-smokers being exposed to second-hand smoke [4]. Similarly, WHO estimates about 3.3 million deaths due to alcohol consumption [12]. For the purposes of a first order approximation the errors associated with all of the inputs are acceptable.

RESULTS

The inputs are summarized in Tables 1 and 2 for the tobacco and alcohol industries, respectively. The tables show the company, market share (m) of the company, CEO of the company and the annual compensation (c) for that CEO.

It is clear from Table 1 and 2 that both industries are largely controlled by only a few companies. The tobacco industry is particularly concentrated with only eight companies making up >88% of sales. The largest is China National Tobacco Corporation (CNTC), which is a special case as it is a Chinese state-owned manufacturer with nearly a complete monopoly of the Chinese cigarette market.

Table 1. The tobacco industry market share for the top eight companies, CEO and CEO compensation for 2013

Company	m [%]	CEO	c [US$]
China National Tobacco Corp (CNTC)	43.2%	Jiang Chengkang	N/A
Philip Morris International Inc	14.3%	André Calantzopoulos	$10 906 612
British American Tobacco Plc	11.6%	Nicandro Durante	$10 108 434
Japan Tobacco Inc	9.4%	Mitsuomi Koizumi	$1 102 570
Imperial Tobacco Group Plc	4.9%	Alison Cooper	$4 112 217
Altria Group Inc	2.3%	Martin J. Barrington	$20 139 967
ITC Ltd	1.4%	Yogesh Chander Deveshwar	$112 849 000
Reynolds American Inc	1.3%	Daniel M. Delen	$10 452 206

Table 2. The alcohol industry market share for the top ten companies, CEO and CEO compensation for 2013

Company	m[%]	CEO	c [US$]
Anheuser-Busch InBev NV	15.5%	Carlos Brito	$7 411 606
SABMiller Plc	7.6%	Alan Clark	$10 063 279
Heineken NV	7.4%	Jean-François van Boxmeer	$8 258 114
Carlsberg A/S	4.9%	Jørgen Buhl Rasmussen	$3 158 148
China Resources Enterprise Ltd	4.8%	Jie Hong	$3 260 000
Tsingtao Brewery Co Ltd	3.4%	Ke Xing Huang	$250 497
Molson Coors Brewing Co	2.5%	Peter S Swinburn	$8 406 628
Beijing Yanjing Brewery Co Ltd	2.2%	Fucheng Li	N/A
Kirin Holdings Co Ltd	2.0%	Senji Miyake	$1 100 880
Diageo Plc	1.4%	Ivan Menezes	$12 095 242

As the CNTC is under the jurisdiction of China's State Tobacco Monopoly Administration it does not function under the rules of the market that other companies must follow, nor is CEO compensation made public so it will be excluded from further analysis here.

The remaining seven tobacco companies make up 45% of the global market. Likewise the top ten alcohol companies make up 51.7% of their market. The results of substituting the solutions of equ. 2 into equ. 1 are shown in Figures 1 and 2 for the tobacco and alcohol industries, respectively.
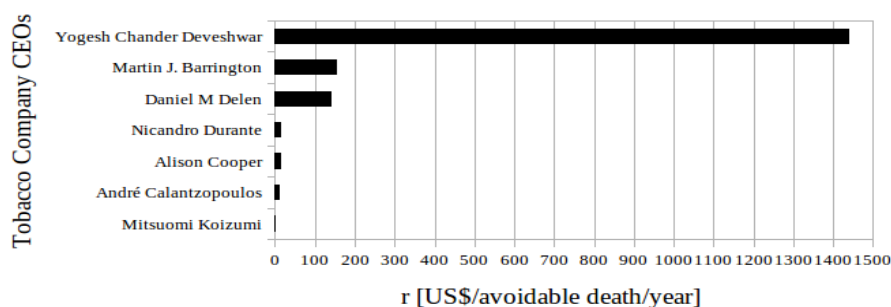

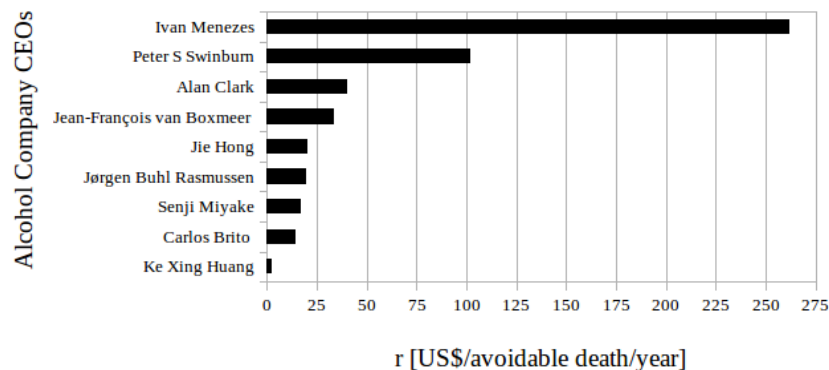**Figure 1.** The tobacco executive compensation per avoidable death for 2013

Figure 2. The alcohol executive compensation per avoidable death for 2013

DISCUSSION

In the tobacco industry the most striking result is how little some of top executives are compensated per avoidable death, when it is well known that approximately 50% of their customers die as a direct result of using their product [12]. Overall, as can be seen in Figure 1, the death rates in the tobacco industry range from a little over $2 of CEO compensation per attributable death for Mr. Koizumi of Japan Tobacco to over $1,400 per death for Mr. Deveshwar of ITC. Likewise, as can be seen in Figure 2, in the alcohol industry the death rate ranges from $2.23 for Mr. Huang of Tsingtao Brewery up to $261.80 for Mr. Menezes of Diageo. If it is assumed that all of the CEOs analyzed are attempting to maximize their income in order to give to charities to save lives [25], these low r values become even clearer. Give Well, an organization devoted to calculating the effectiveness of charities, found that one of the most effective charities is the Against Malaria Foundation, where it costs approximately $3,400 to save a human life [26]. What this means practically is that even if their entire compensation was directed at saving lives, the CEOs do not earn enough money to make up for the lives lost from selling their companies' products. To make this possible, r must be increased, which by following the equations can be done by: 1) increasing executive compensation or 2) decreasing the mortality rates of the products sold by their companies.

Thus, restructuring the incentive for CEOs could provide a solution to a large public health sector paradox: how is it that both alcohol and tobacco consumption are increasing globally – becoming what some are calling a "crisis" or "epidemic" [3,4,15,19]– while there have been enormous efforts to develop and implement control policies worldwide?

Calculating the executive compensation per avoidable death from legal drugs provides some clarity on this paradox. The answer is all of the control policies tried previously, from labeling laws to public use bans to taxes, would all act to decrease the revenue of the company, the value r and in turn decrease CEO compensation, c. So even the most ethical CEO living a deprived personal life from nearly 100% charitable donation would be a net destroyer of human life. In a free market economy all actors are expected to want to increase and even maximize the compensation for their work and would be expected to fight bitterly if it is threatened or reduced. In this way, all of the previous control policies have acted against the best long-term economic interests of the CEOs of legal drug companies, with unfortunate results for global health. These CEOs have considerable problem solving ability both because of the enormous scale of the multi-billion dollar companies they lead, but also from their own extremely valuable business acumen. For example, consider that Mr. Calantzopoulos is compensated over US$10 million for his work, indicating that the board of Philip Morris International consider his yearly effort more valuable to the company than over 150 highly-trained and experienced chemical engineers. Thus, it is clear for a more effective public health outcome, it would be best if the interests of these elite business people are aligned with health goals of lower mortality and morbidity. To reach this goal it is necessary to attempt to increase r and thus c if deaths are reduced. To do that, the rules of executive compensation need to be altered.

Currently, executive compensation limits are avoided under the assumption that competition for higher compensation will lead to more optimal outcomes for the economy and thus the overall society. As the simple analysis presented here shows, some products (e.g. tobacco and alcohol) have such large negative effects on the global scale, they warrant a re-evaluation of this assumption. The trans-industry damage for tobacco and alcohol are so great (for example in the U.S. tobacco causes 443,000 deaths annually [27] and alcohol causes ~88,000 deaths annually [28,29] both of which are orders of magnitude above threats such as terrorism for which substantial

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resources are mobilized to combat) that a small intervention may be justified on ethical grounds. In particular the upper limit on compensation of executives (c_l) of companies whose products result in substantial death from the use of their products can be governed by a formula like:

$$c_l(t) = S_1(t)\exp\left[\frac{d_0 - d(t)}{S_2(t)}\right] \text{ [US\$] (3)}$$

where S_1 is the base salary (including all forms of compensation), d_0 is the initial number of deaths per year, S_2 scales the saved lives, and $d(t)$ is defined above. S_1 and S_2 can be altered to account for inflation and other factors and could be set by legislatures in each area. S_1 should be enough that the executive can live normally, but modestly. The utility from the salary roughly goes with the logarithm of the salary. Therefore, equ. 1 has the salary increasing exponentially with the number of lives saved. This means that the CEO has a constant utility incentive per life saved. Thus the executive compensation would be incentivized for more ethical practices. One complication is that the sales of drugs often cause death much later, so in order to provide immediate feedback to the CEO, it may be necessary to predict the eventual number of deaths based on sales of different products. Within this compensation limit, the boards can vary the salaries based on performance or other company objectives.

The effects of such a policy change, which would only affect the work compensation for a very small number of individuals would be expected to create rapid change. CEOs would immediately have the choice between staying at their existing companies for a much lower compensation that they are earning now in the short term or moving elsewhere in the economy. Two outcomes are possible, both of which will result in improvements in global public health. First, it can be assumed that the CEOs currently running the top companies in the tobacco and alcohol industries are the most qualified and best at their jobs. If some or all choose to leave, their less-qualified replacements would be bound by the same rules and have the same incentives to reduce $d(t)$ (and in aggregate $D(t)$). All of the CEOs analyzed (and their likely replacements) have already have amassed great wealth and could be expected to be able to tolerate even very low S_1 values in the short term. For these CEOs unafraid of a challenge to fundamentally change their companies, they would be expected to use their considerable resources and business skills to aggressively reduce $d(t)$ in order to raise their compensation limits. They can do this by various means such as technically reducing the mortality of

their products (e.g. shifting to electronic cigarettes), changing advertising practices to reduce the number of problem drug users, etc. Some interventions could work even if only some companies are regulated, such as those headquartered in the regulating country. For instance, these companies could lobby for laws to ban smoking in public spaces like restaurants, which would affect all companies selling the product in that country. However, shifting to electronic cigarettes by domestic companies could be met with foreign companies ramping up sales of conventional cigarettes and would need to be enforced with trade deals/sanctions/import tariffs as is common in ensuring appropriate corporate behaviour in other industries. Most likely, however, the CEOs would try to diversify their businesses following the example of ITC's CEO, who had the largest r in this study by a wide margin (Figure 1). ITC is an Indian conglomerate and includes diversified businesses in consumer goods, agri-business, hotels, paperboards and packaging, and information technology. Mr. Deveshwar's full compensation ranges between more than five times to orders of magnitude higher than his competitors in the tobacco industry. This demonstrates that diversification in the long-term can be both profitable for existing legal drug companies, but also financially lucrative for CEOs following this model (Table 1). Speculation on how the CEOs would reduce d in order to raise r and c_l is unnecessary as their methods are immaterial to the resultant improved global public health outcomes. As the companies take on new markets they will invest less in the legal drug portion of the business and reduce sales in that area. What is important is that by making minor rule changes similar to equ. 3 for executive compensation for a small group of companies, CEO motivation will be aligned directly with optimal public health outcomes. This is in contrast to past interventional policies, such as bans on tobacco advertising, promotion and sponsorship, which reduced drug use in one region/country, but tended to shift it into other markets with poorer, less educated and more vulnerable citizens. The expected superior results of incentivizing CEOs to reduce deaths would come at negligible cost to the tax payers of nations, avoid having to outlaw these drugs and the concomitant problems associated with enforcement [30], and still enable choice for the consumers to use these legal drugs. It would be expected that fewer consumers would choose addictive and dangerous drugs if these industries simply reduced their efforts to sell them, which would be a result of a properly incentivized CEO shifting resources during diversification. For example, in the U.S. in 2011 the tobacco industry spent \$8.4 billion on cigarette advertising and promotional expenses with about \$7.0 billion of this expenditure on

price discounts to encourage addiction to their products [31]. As the health effects of tobacco use is well known, the ethics of this practice are at best questionable. With CEOs being unwilling to invest resources in such efforts that would reduce their income, no laws managing advertising, sponsorship or promotion would be necessary.

There is a history of intervening in CEO compensation. For example, a U.S. court ruling in 1930 found that a tobacco CEO bonus was wasteful [32]. In 1993, the U.S. eliminated tax-deductibility to the company of CEO pay over $1 million [33]. Also, regulated companies like electric utilities have lower CEO pay, and this correlates with lower CEO educational attainment [34]. Restricting CEO pay for economic reasons can have unintended consequences.

There are several risks with this approach. First, as the large legal drug companies began to diversify away from drugs, there is a risk that smaller companies could come in to fill the demand. If the CEO payment limitation were constant across all companies, smaller companies would be less affected because their CEOs make less to start with (however, the equation could be adjusted based on company size). There is likely a reason that the market is so concentrated in large companies, so smaller companies would likely be less effective. At the same time, the smaller companies would not have the resources (e.g. billions for ads) necessary to continue to expand the market, so the effect would at best only be to slow the contraction of the legal drug market. This, however, is necessary as shown by many studies covering tobacco and alcohol control and extrapolating globally from those done on a country with, for example, a smoke free goal [35-37]. There is also a risk that legal drug companies would dispense with the CEO and lead with the VPs. To counteract this, all executives of the companies responsible for significant negative health impacts would need to be held to a system of remuneration similar to equ. 3, but perhaps with different S factors. There is also the risk that employees or shareholders could try to compensate the CEO for profit-maximizing deadly behavior, so there would need to be a rigorous enforcement mechanism. Finally, it should be noted that because of the revenue of the legal drug industry, there is significant influence on the states' budgets, as its contribution to the overall tax system is considerable and cannot be neglected. In the same vein, the legal drug industry also causes secondary economic activity – e.g. increased revenue in the medical industry to care for dying addicts. Future work is needed to quantify this effect and compare this cost to the benefits of improved longevity, health and productivity of the workforce. In addition, a comparison should be made for the direct government costs of this approach (with low direct costs) to more traditional health promotion programs [e.g. 8]. Finally, it should be pointed out that although improving the rules for executive compensation in legal drug companies would be expected to improve public health, a holistic public health program is still necessary.

CONCLUSIONS

The results of calculating CEO compensation per avoidable death indicated a need to target CEO pay regulation to potentially save millions of lives. The solution proposed here is to incentivize legal drug company CEOs, such that they have a constant marginal utility per life saved, which is achieved by a pay structure that increases exponentially with lives saved. Gaming of the system can be minimized by global action in order to realize the enormous public health benefits of minimizing tobacco and alcohol use.

CONFLICTS OF INTEREST

None.

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