

# The Impact of Tobacco to Human Development Index

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## Abstract

Global tobacco epidemy that existed today's reflects that there is a difference tobacco consumption pattern between low and medium and high income countries. Low and medium income countries experiencing an increase consumption of tobacco while high income countries facing the decreasing one. This will affect the development of human quality. This research is aimed to explore relationship between tobacco consumption and human development, using secondary data obtained from UNDP, WHO and World Bank. Data analyzed by regression analysis. The results of this research are: there is a positive relationship between tobacco consumption and HDI among low, medium, and high HDI countries. By contrary, there is a negative relationship between tobacco consumption and HDI among very high HDI countries.

**Keywords:** tobacco, global tobacco epidemy, human development index

## INTRODUCTION

Tobacco has been transform from a healing method to a lifestyle. Those makes people can be more easily impinged or persuaded to smoke. As a result, there is an increasing trend of tobacco consumption worldwide. This is called global tobacco epidemy (Eriksen, 2012). The epidemy reflected by the increasing number of tobacco smokers in low and middle income countries and decreasing number of smokers in high income contries.

In low and middle income countries, the increasing of tobacco consumption potentially intervene household's allocation for non-tobacco expenditure, for instance education and food. A decline in household's education and food expenditure will potentially obstruct human development formation in one country. Thus, this will potentially widening gap between developed and underdeveloped countries.

## CONCEPTUAL FRAMEWORK

Tobacco has been cultivated since 6.000 BC by the Indigenous Americans . In Huron Indian's myth, tobacco is mentioned as plant from God. "In ancient times, when the land was barren and the people were starving, the Great Spirit sent forth a woman to save humanity. As she traveled over the world everywhere her right

hand touched the soil, there grew potatoes. And everywhere her left hand touched the soil, there grew corn. And in the place where she had sat, there grew tobacco.”

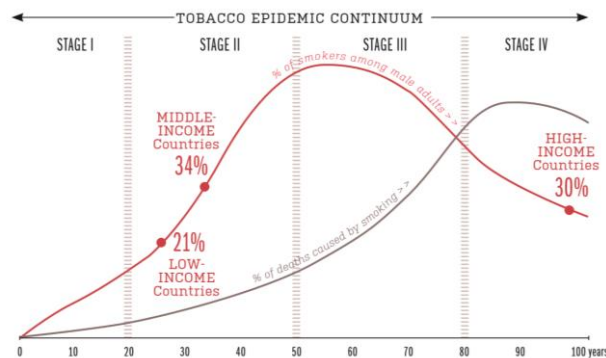
Tobacco then spread out to the world by Columbus' voyage. After Europe, tobacco spread out to Middle East (early 1500s), China (1530-1600), Africa (1560), Korea (1592-1598), India (1600), and Australia (1788). Tobacco, together with coffee, then is seen as fashionable and pro-European. In the fifteenth century, tobacco also used as a cure for toothaches, falling fingernails, worms, halitosis, lockjaw, and cancer. Later, several countries tried to ban tobacco to prevent them from fire risk. In the 1761, there was the first effort to reveal the negative impact of tobacco to health. But the results were tend to be ignored because of the very low incidence of tobacco-related illness.

Tobacco plantation were getting profitable after these three events. Firstly, the invention of portable phosphorus friction matches making smoking more convenient. Previously, matches are big, bulky, and expensive, that make only rich people could afford to buy it. Secondly, the better trade route around the world which guarantee that tobacco can be enjoyed in far places. Thirdly, the invention of first practical cigarette-making machine by James Bonsack (USA) that producing 100.000 cigarettes a day and replacing the labor of 50 people. This significantly reduced cost and exploded production.

In the 20th century, there were more studies conducted to explore negative effect of tobacco. For instance in Japan (1915), Germany (1929), Argentina (1931), The United States (1938), and Canada (1947). The findings sounded to one idea: tobacco has negative effect to health. To encounter it, in 1953 and 1958, big tobacco companies in the United States gave counter-argument. They provided many proofs that tobacco is good for health. In the next years, tobacco companies got pressure from government by the implementation of health warning on the advertisement, the implementation of smoke-free area, and the law to protect people from secondhand smoke.

There is a different demand of tobacco for every country. Low and middle income countries experiencing higher demand of tobacco. At the same time, there is a decreasing demand of tobacco among high income countries. This can be shown in figure 1. Stage 1 shows the initial condition of smoking prevalence. There is very little incidence of deaths caused by smoking. In stage 2, there is an increasing of smoking prevalence, but deaths related to smoking is relatively low (less than 5% of all deaths). In stage 3, there is a sharp increase of deaths caused by smoking. This will leads people to reduce tobacco consumption. As a result, there is a decreasing smoking prevalence. Stage 4 shows the final condition where the number of smokers is lower than deaths caused by smoking.

Most of low-income and middle-income countries are in stage 2. In this condition, those countries face an increasing demand of tobacco. At the same time, most of high-income countries are currently in stage 4, where there is a decreasing demand of tobacco.

**Figure 1. Global Tobacco Epidemdy**

Source: Eriksen (2012)

Tobacco has a negative effect to health. Tobacco is the main factor causing heart attack, stroke, and tuberculosis (TB). In 2011, tobacco kills almost six million people, where 80% of them are from low-income and middle-income countries. (Eriksen, 2012). Tobacco also have negative effect to non-smokers (known as secondhand smoke). Through smoke and ash, people are contaminated poison at the same level as smokers did. Approximately 600.000 secondhand smokers die anually. Tragically, about 75% of them are women and children. This happened because mostly secondhand smokers are suffers from smoke and ash in house, office, and public area. Expectant mothers, fetuses, and infant exposed from secondhand smoke are potentialy suffer from cardiovascular and respiratory system risks.

Tobacco has both positive and negative effect to the economy. Tobacco contributes to economy through taxes and job opportunities. On the other hand, tobacco exhaust economy not only from every packs bought by customer but also through it's direct and indirect costs. Direct costs related to healing costs to cure tobacco-related illness. Indirect costs related to the shrinking of productivity, higher opportunity cost, fire risks, environmental damage because tobacco plantation, and mental pressure experienced by victims and their dependants.

In the larger scale, tobacco gives negative effect to nations. Tobacco consumption blocks household to allocate to other sectors, i.e. education, nutrition, and retrieve information. Thus can be worsened because those sectors are vital to enhance someone's living standard. On the government's side, tobacco drains government budget from health sector, where it should be can be allocated to build, for example, infrastructure.

Countries can be classified based on per capita income. World Bank classifies countries who earned less than US\$ 1.045 as low income countries. Then, countries with per capita income US\$ 1.046 to US\$ 4.125 as lower middle income countries. Countries who have per capita income US\$ 4.126 to US\$12.745 are grouped as upper middle income countries. Lastly, countries with per capita income more than US\$ 12.746 are high income countries.

Human development index (HDI) is a composite index that measure human development's achievement in three dimensions: longevity, knowledge, and living standard (UNDP, 2014). HDI is ranged from 0 to 1, where closer to 1 means higher human development in one country. UNDP classifies countries based on the HDI. Countries with HDI less than 0,550 are grouped in low human development countries. Next, countries with HDI 0,550 to 0,699 are classified as medium human development countries. Countries with HDI 0,700 to 0,799 are classified as high human development countries. Finally, countries with HDI higher than 0,800 are classified as very high development countries.

In 2013, global HDI was 0,703. But this unequally distributed; there were countries with very high HDI and at the same time there were more countries with very low HDI. Based on regions, Latin America and Caribia had highest HDI in the world: 0,740. Then followed by Europeans and Middle Asia which both of them had HDI 0,738. Countries with low HDI can be found in Sub-Sahara African region (0,502) and South Asia (0,588). From 185 countries, Norway had the highest HDI (0,944). Then followed by Australia (0,933), Switzerland (0,917), and the Neatherlands (0,915). In the lowest layer, Middle Africa Republic had the lowest HDI (0,341), then followed by Chad (0,372), Sierra Leone (0,374), and Eritrea (0,381).

One interesting finding is the biggest tobacco-consuming countries are classified as very high HDI and high HDI. For instance, China, the largest tobacco-consuming country, has HDI 0,719. Russia, the second largest tobacco-consuming country, has HDI 0,778. Next, the United States (HDI 0,914) and Japan (HDI 0,890) were grouped as very high HDI countries. Only Indonesia, the fifth largest tobacco-consuming country, has medium HDI (0,684).

## **THEORETICAL FRAMEWORK**

One of indicators to measure one country's development is through its economic performance. The growing economy means there is an increasing output in the economy. The growing output also means the increasing of welfare. Kuznets (1971) in Todaro (2006) stated that economic growth is an increase in long term capacity in one country in order to provide economic goods to its citizen. The increase of capacity is determined by technological progress, institutional development and ideology.

Van den Berg (2005) said that economic growth is a development in citizen's welfare, which proxied from the increase of per capita output. Besides, economic growth can be measured by longevity, average rate of education, infant mortality rate, and nutrition fulfilment. The involvement of human quality in economic growth theory is first introduced by Uzawa (1965) and Lucas (1988) model. This model is derived from neoclassical growth model introduced by Solow (1956). The difference is Uzawa-Lucas didn't involve capital accumulation to

human capital creation. Then, saving rate is endogenous where it is determined by preference and technological parameter.

## **DATA AND METHODOLOGY**

This is a quantitative research using data published by UNDP, WHO and World Bank. Regression analysis will be used to explore the relationship between tobacco cigarette consumption and human development.

### **Findings**

In 2011, on average everyone in this world consumed 699 cigarettes annually, or 1,9 cigarette per day. Serbians smoked 2.861 cigarettes per year. This is the highest consumption in the world. That number is equal to 7,8 cigarettes per capita per day. On the other hand, Guineans smoked 9 cigarettes per capita annually. There was a positive relationship between tobacco cigarette consumption and human development index. The higher the tobacco consumption could boost the increase in HDI, even in the small amount. Statistical results showed that a 0,000143 in tobacco coefficient means that an increase in one cigarette per capita per year will drive to an increase in HDI by 0,000143. While 0,542188 in the constant means if tobacco is disobeyed, HDI will be 0,542188.

There was a unique pattern of the relationship between tobacco consumption and human development index in different group of countries. In very high HDI countries, for example Norway, Australia, and Switzerland, there was a negative relationship between tobacco consumption and HDI. The increase of one tobacco per capita per year will reduce HDI by 0,00000894. The constant value for high HDI countries is 0,872794. In high (e.g. Uruguay, Bulgaria, and Malaysia), medium (e.g. Indonesia, Egypt, and Timor Leste), and low (e.g. Nepal, Pakistan, and Nigeria) HDI countries, there was a same pattern. There was a positive relationship between tobacco consumption and HDI. The difference was in the tobacco coefficient where the coefficient for high, medium, and low HDI countries were 0,00000748, 0,00000565, and 0,000132 respectively. Therefore, countries with lower HDI experienced bigger impact of tobacco comparing to higher HDI countries.

At general, tobacco variable could explain 20,95% of changes in HDI. This showed by the R-squared value 0,209582. The rest 79,05% of changes in HDI were explained by other factors. But, there was a unique pattern related to R-squared. Low HDI countries had higher R-squared (0,130106) than countries with medium (0,010045), high (0,058113), or very high (0,015627) HDI. This indicates that as HDI increases the effect of tobacco decreases.

## **DISCUSSION**

This research found that tobacco has bigger impact to HDI in low HDI countries. This indicates that tobacco gives higher positive contribution to that

countries. We cannot left this findings from the definition of HDI itself, where HDI is the composite index that covers measurement in health aspect, education, and economic development. High consumption of tobacco in low HDI countries will drive to more employment opportunities in tobacco plantations or factories. Others, every pack of tobacco sold gives revenue to government. At the same time, tobacco has negative effect to health (for instance the increasing number of tobacco-related illness) and education (for example the decreasing households' budget for education). But, people saw that those positive effects are still bigger than negative ones.

This idea is relevant with Eriksen (2012) that stated that low income countries—which usually have low HDI—have relatively low prevalence of deaths caused by tobacco (less than 5% of all deaths). Thus, people's awareness of tobacco's negative effects are not growing yet. Society and government consider that tobacco gives positive contribution bigger than its negative effects. This also supported from findings that biggest tobacco's contribution to a country is found in low HDI countries. Then, as HDI increases, there is a declining tobacco's positive contribution. In medium and high HDI countries, tobacco still have positive impact to those countries, for example in economy. Government revenue from tobacco can still conquer tobacco's negative effects on health.

In very high HDI countries, an increase in tobacco consumption will reduce HDI. An additional pack of tobacco bought will reduce people's living standard. This caused by affordability aspect. The affordability of cigarette is defined as the ration of the price of one pack of cigarette to daily income (cigarette price-daily income ratio; CPDIR). A low CPDIR means high affordability, and vice versa.

In 2006, 68,6% of cities in high income countries surveyed have high tobacco affordability (Table 1). It means people only sacrifice a small proportion of their income to buy a pack of cigarette. Thus, this is a potential target for government to increase higher tax on tobacco. As Eriksen (2012) stated that there was a change in affordability in period of 2000-2010. Tobacco is less affordable in more than 10% of high income countries. This can be indicated by higher retail price. Thus, this will increase opportunity cost of tobacco (for example in education or food) and lowering HDI.

**Table 1. Cigarette Affordability Levels by Income Levels in 59 Cities**

Income classification*	Cigarette affordability level			Total
	High (CPDIR $\leq 0.10$ )	Medium (CPDIR $> 0.10$ and $\leq 0.20$ )	Low (CPDIR $> 0.20$ )	
High income	24 (68.6%)	10 (28.6%)	1 (2.9%)	35 (100%)
Upper middle income	5 (45.5%)	6 (54.5%)	0 (0.0%)	11 (100%)
Lower middle income	4 (36.4%)	4 (36.4%)	3 (27.3%)	11 (100%)
Low income	0 (0.0%)	2 (100.0%)	0 (0.0%)	2 (100%)
Total	33 (55.9%)	22 (37.3%)	4 (6.8%)	59† (100%)

CPDIR, cigarette price-daily income ratio.

\*The cities are classified according to their income classification issued by the World Bank to their respective countries.

†The income level of Slovakia has not been classified by the World Bank; therefore, Bratislava is not included here.

The negative relationship between tobacco and HDI in very high HDI countries results in decreasing consumption of tobacco. Beside that, this can be caused by the increasing understanding of the danger of tobacco among people, more health-warning advertisements, and more smoke-free areas. Those decreasing consumption of tobacco will leads tobacco companies to divert their market penetration to lower HDI countries, where health is not an important issue yet.

## CONCLUSION

Tobacco has various effect on HDI based on HDI itself. In low, medium, and high HDI countries, tobacco gives positive relationship to HDI. While in very high HDI countries, tobacco has negative relationship to HDI. In the three first group countries, people and government notice that tobacco gives positive contribution to economy, through job employment and direct and indirect taxes. Therefore, the more tobacco consumed the higher HDI will be. On the other hand, in very high HDI countries, people and government perceive that tobacco's negative effects are bigger than its benefit. An increase in tobacco consumption will reduce HDI.

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