UNIVERSITAS INDONESIA
SEKOLAH KAJIAN STRATEJIK DAN GLOBAL
PUSAT KAJIAN JAMINAN SOSIAL

PARENTAL SMOKING BEHAVIOR AND ITS IMPACT ON CHILDREN DEVELOPMENT

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"Those who smoke will reduce their consumption of nutritional food. This research supports the National Cancer Institute Tobacco Control Monograph. The highlight is the poor smoke more and this impacts poverty. If we want reduce tobacco consumption, we need to increase the tobacco taxes."

JEREMIAS N. PAUL, JR.
(WORLD HEALTH ORGANIZATION)

INTRODUCTION

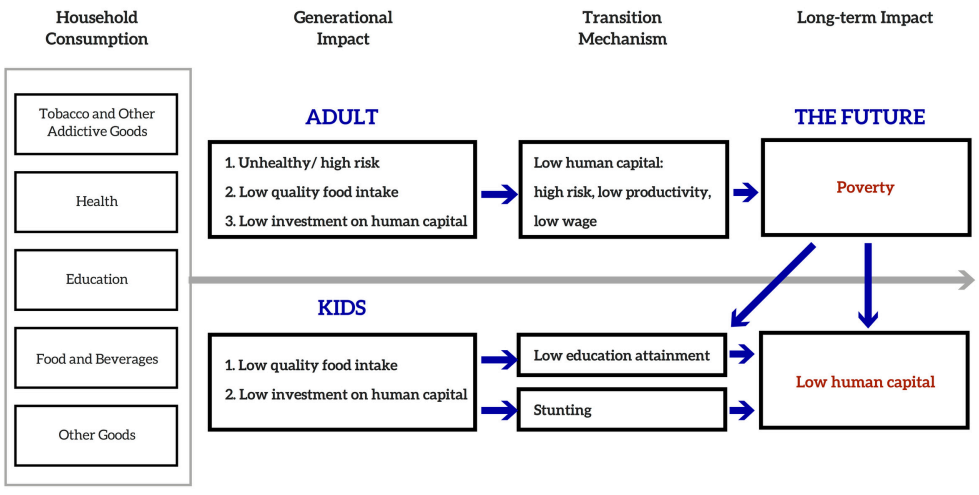
Smoking has been an issue in Indonesia for a long time. Based on World Bank (2000), Indonesia has one of the highest prevalence of smoking in Asia. Based on the Indonesian Socio-Economic Survey (Susenas) in 2017, the number of active smokers in Indonesia has reached 21.38 percent of the Indonesian population (from 21 percent in 2016) which may stem from the affordability of cigarettes in Indonesia (Qian, Li, & Zheng, 2015). In terms of age cohort, in 1993, the number of smokers from age 11 to 20 was at a very low point (1.77%). However, over the last two decades, the number of smokers from age 11 to 20 have significantly increased to 7.7%.

With the increase of active smokers, especially in the young generation, policies to control smoking (e.g. duty, written and picture warnings, and anti-smoking zones) have been considered not able to effectively lower the number of smokers in Indonesia (Adioetomo, Djutaharta, & Hendratno, 2005). This situation is worrying as smoking not only causes short-term problems through the health of active and passive smoker but also causes negative intergenerational problems such as stunting and child cognitive. This may threaten Indonesia's future and may hamper the attainment of Sustainable Development Goals (SDGs).

> *The essence of stunting is growth failure, impaired cognitive, and metabolic disorder. Other than fetal nutrition, environmental risks like tobacco is also a risk factor for stunting among children.*

IR. DODDY IZWARDI, MM.

(DIRECTOR OF NUTRITION, DIRECTORATE GENERAL OF NUTRITION AND MATERNAL AND CHILD HEALTH, MINISTRY OF HEALTH)



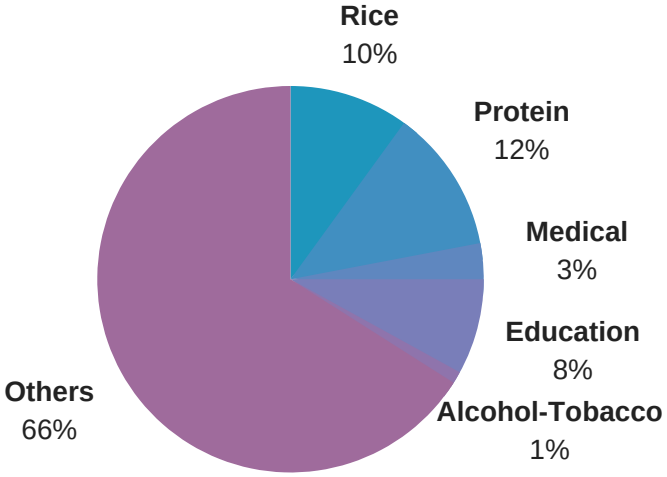
FRAMEWORK OF TOBACCO CONSUMPTION IMPACT

SOURCE: AUTHOR'S ILLUSTRATION

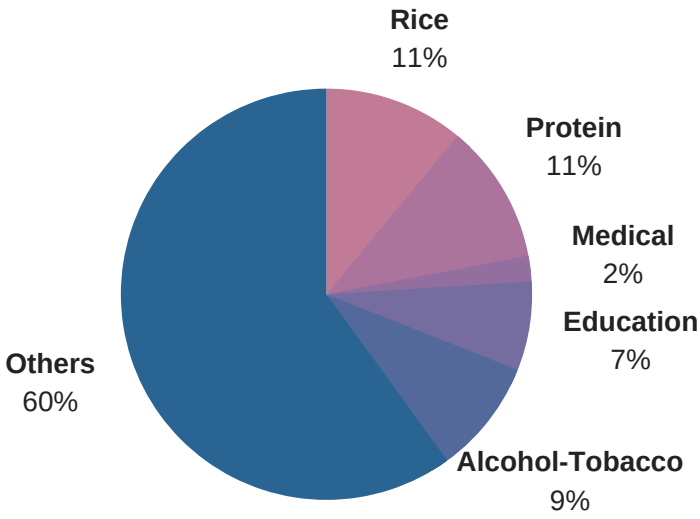
This study would like to give empirical evidence on the intergenerational effects of smoking as there have been limited studies on the topic. We would like to know if parental smoking causes children to experience stunting, increases poverty incidence of the household, and affects children's cognitive. We believe with this study will create awareness for policy makers of these issues which may have not been considered in the policy making process concerning tobacco control.

TOBACCO CONSUMPTION AND CROWDING OUT

Using the Indonesia Family Life Survey (IFLS) data, it shows in the last two decades, the percentage of alcohol and tobacco expenditure from the total expenditure has increased from 3.6 percent in 1993 to 5.6 percent in 2014. This increase in alcohol and tobacco expenditure percentage is accompanied with a decrease in rice, protein, education, and medical expenditure. This shows that the alcohol and tobacco expenditure has crowded-out other expenditures (John, 2008, MacLennan, Ahmed, & Khan, 2015, and Semba et al., 2011). This situation is worrying as the crowded-out expenditures are important for development of human capital (education, health, and nutrition).



NON-SMOKER CONSUMPTION 2014



SMOKER CONSUMPTION 2014

SOURCE: AUTHOR'S CALCULATION

Using only the 4th and 5th wave of the IFLS data, comparing between smokers and non-smokers, the percentage of alcohol and tobacco expenditure is higher in smokers in both 2007 and 2014. This is accompanied by lower expenditure in protein and education expenditure by smokers (compared to non-smokers) in both 2007 and 2014. While medical expenditure is only lower by smokers (compared to non-smokers) in 2014 (in 2007 the percentage was equal). However, interestingly, rice expenditure is higher in smokers compared to non-smokers. Using the Difference-in-difference approach, we find that smokers have significantly lower medical, education, and protein per capita expenditure compared to non-smokers (this approach controls the growth of expenditure between years). While rice per capita expenditure is not significant between smokers and non-smokers. This approach strengthens the claims that there is crowding-out of other expenditures by smokers.

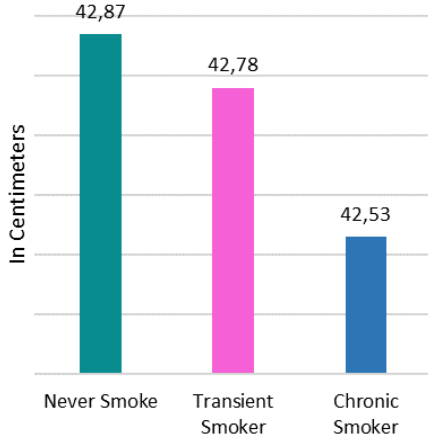
DATA AND METHODOLOGY

The data used in this research is the Indonesia Family Life Survey (IFLS). The IFLS is a socio-economy survey that had been collected in 5 waves (1993, 1997, 2000, 2007, and 2014) by RAND Corporation. The analysis of stunting dynamics will use the IFLS 4th and 5th wave and uses the ordered logit regression. The analysis of poverty dynamics will use the all IFLS waves and uses the ordered logit regression. Lastly, the cognitive analysis will use the 4th and 5th IFLS wave and uses the ordinary least square (OLS) and instrumental variable (IV) regression.

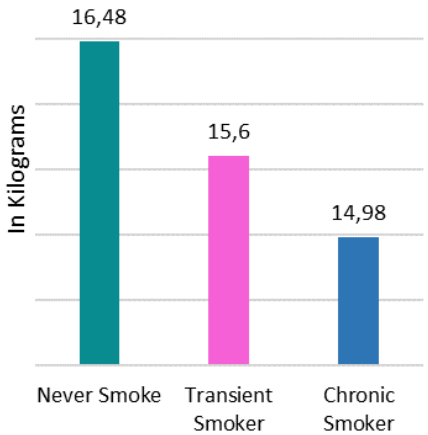
ANALYSIS OF PARENTAL SMOKING BEHAVIOR IMPACT

From the height growth and weight growth of the children, it is the highest when the parents never smoke and the lowest when the parents are chronic smokers (transient smokers' children are in between). Children with parents that never smoke, on average, grow 0.34 centimeters higher and weigh 1.5 kilograms heavier than children with parents that are chronic smokers. Children who have parents that are smokers (either transient or chronic) tend to have lower growth in height and weight compared to children with parents that don't smoke.

There is a positive significant correlation between chronic smokers and stunting dynamics (controlling demographic, environment, nutrition, genetic variables). This means that if the parent is a chronic smoker, the child has a higher probability of stunting continuously compared to parents that never smoke. Using the marginal effect approach, **a child with chronic smoker parents have a 5.5 percent (percentage point from average) higher chance to experience stunting compared to children with parents that are non-smokers.** This shows that parental smoking behavior/exposure does increase the chance of the child to experience stunting (Rona, Chinn, & Florey, 1985 and Muraro et al., 2014). While if the parent is a transient smoker, there is no significant effect on stunting incidence compared to parents that never smoke.



CHILDREN HEIGHT GROWTH BASED ON PARENTAL SMOKING BEHAVIOR FROM 2007-2014



CHILDREN WEIGHT GROWTH BASED ON PARENTAL SMOKING BEHAVIOR FROM 2007-2014

SOURCE: AUTHOR'S CALCULATION

REGRESSION OF STUNTING DYNAMICS

No	Explanatory Variables	Stunting Dynamics
		Coefficient
1	Parents Transient Smoker (1 = Transient Smoker; 0 = Others)	0.167
		(1.00)
2	Parents Chronic Smoker (1 = Chronic Smoker; 0 = Others)	0.253**
		(2.34)
3	Demographic Variables	YES
4	Environment Variables	YES
5	Nutrition Variables	YES
6	Genetic Variables	YES
	N	2366
	pseudo R-Square	0.046
	Chi-Square	149.64

SOURCE: AUTHOR'S ESTIMATION

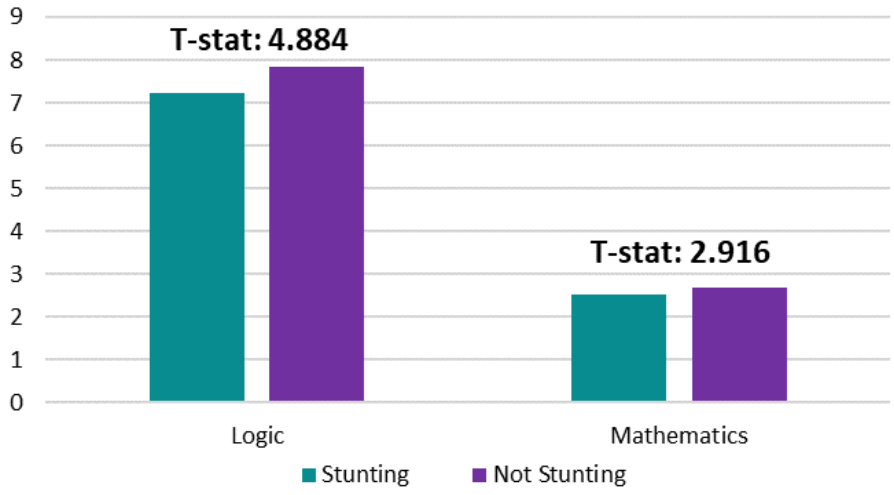
In case of the poverty incidence, an increase of average household share of alcohol and tobacco expenditure before 2014 will increase the probability of a household being continuously poor. Using the marginal approach, **an increase of 1 percent increase in alcohol and tobacco expenditure will increase the probability of the household being poor by 6 percent (percentage point from average)**, this has been controlled with demographic, socioeconomic, and change variables. Households that have higher expenditure will tend to crowd-out other consumptions such as nutrition, health, and education which are important for the development of human capital (Block & Webb, 2009 and Pu, Lan, Chou, & Lan, 2008). Thus, these households will tend to have lower human capital and lower productivity and be unable to move out of poverty, increasing their poverty incidence in the long-run.

REGRESSION OF POVERTY DYNAMICS

No	Explanatory Variables	Poverty Dynamics
		Coefficient
1	Average HH's Share of Alcohol and Tobacco Exp. during 1993, 1997, 2000 & 2007 (in %)	0.402**
		(2.41)
2	Average HH's Share of Medical Exp. during 1993, 1997, 2000 & 2007 (in %)	-1.095***
		(-3.49)
3	Demographic Variables	YES
4	Socioeconomic Variables	YES
5	Change Variables	YES
	N	2735
	pseudo R-Square	0.098
	Chi-Square	902.105

SOURCE: AUTHOR'S ESTIMATION

In terms of child cognitive, we use the IV regression. This is due to the OLS regression showing that parental behavior does not significantly influence child cognitive directly. The IV regression uses stunting as the instrument variable which is significantly influenced by parental smoking behavior. Children that have parents that are actives smokers tend to experience stunting compared to children with parents that are not active smokers. The stunting variable predicted from the instrument regression is regressed with the child logic and math cognitive. This variable has a significant negative effect on the child's logic and math cognitive which means that stunting children will have lower cognitive (logic and math) compared to non-stunting children. **Therefore, unlike the other results, parental smoking behavior does not directly affect the cognitive of the child.** However, parental smoking behavior does increase the probability of the child to experience stunting where then stunting children will tend to have a lower cognitive



COGNITIVE SCORE OF LOGIC AND MATH

SOURCE: AUTHOR'S CALCULATION AND ESTIMATION

IV REGRESSION OF LOGIC AND MATH COGNITIVE SCORE

No	Explanatory Variables	Logic Cognitive	Math Cognitive
		Coefficient	Coefficient
1	Predicted Stunting Status in 2014	-0.302***	-0.120***
		(-3.91)	(-3.09)
2	Demographic Variables	YES	YES
3	Environment Variables	YES	YES
4	Nutrition Variables	YES	YES
5	Genetic Variables	YES	YES
	N	1922	1922
	R-Square	0.130	0.056
	F-Stat	34.50	14.55

SOURCE: AUTHOR'S ESTIMATION

CONCLUSION

Smoking is still an ongoing issue as there has been an increase in smoking prevalence of young aged (21-30 years) from 14.5 percent in 1993 to 23.6 percent in 2014. This is an important warning for tobacco control as the young aged are in their productive phase and are beginning to have families.

An increase of tobacco expenditure proportions from 3.6 percent in 1993 to 5.6 percent in 2014, accompanied by a decrease of important expenditure such as carbohydrate and protein has created long-run impacts to children's stunting condition. Children with parents that smoke (chronic smokers) have a weight growth (on average) 1.5 kilograms less and a height growth (on average) 0.34 centimeters compared to children with parents that are non-smokers. Children with parents that smoke have a probability to experience stunting 5.5 percent (percentage point from average) higher compared to children with parents that are non-smokers. This has been controlled with genetic, environment, and nutrition variables.

On terms of household welfare, higher smoking expenditure does increase the probability of households to be continuously poor. 1 percent increase of tobacco expenditure will increase the probability of household being poor by 6 percent (percentage point from average). Regarding the children cognitive, there has not been strong evidence that parental smoking behavior directly influences children cognitive. However, parental smoking behavior has been found to cause their children to experience stunting and stunting on children is an important factor that determines children cognitive.

Finally, we recommend that there is socialization on the expenditure usages of smokers. Tobacco expenditure will crowd-out other important expenditures such as protein, education, and medical expenditures thatl for the parent themselves and especially for the child who is still in his/her early development. The height, weight, cognitive of the child will be in jeopardy if these important expenditures are crowded-out/substituted. The socialization should imply the importance of these expenditures and they should not be crowded-out by tobacco expenditure. It is also recommended that there must be stronger tobacco control policies through many ways, such as expensive cigarettes, anti-smoking areas, etc. as tobacco control is equal to saving the future of the country by creating a healthy and smart generation. This will enable Indonesia to avoid the middle-income trap.

Tobacco control has always faced difficulties due to labor and revenues issues. Increasing tobacco taxes must be followed with the increase of cigarette prices. This research can complete the policy background to adjust tobacco taxes policy.

DR. NASRUDDIN DJOKO SURJONO

(MINISTRY OF FINANCE)

Indonesia is heading towards a demographic bonus in 2030. There will be a boom of the Y and Z generation. Thus, we need to make education about the dangers of tobacco "cool" to attract the youth. We also hope the whole community makes efforts to minimalize tobacco consumption.

DR. CUT PUTRI ARIANIE, MHKES

(MINISTRY OF HEALTH)

This research can advocate other ministries. For example, the Ministry of Villages that have huge funding can create programs that incentivises villages that succeed in creating regulations that ban smoking inside homes (decreasing smoking and children exposure to smokers) and giving compensations to the villages that ban tobacco advertising.

THERESIA SANDRA DIAH RATIH, MHA

(MINISTRY OF HEALTH)

This shocking fact must be taken seriously due to the issues of tobacco and cigarettes being potentially massive in the near future.

NINA SAMIDI

(THE NATIONAL COMMISSION ON TOBACCO CONTROL)

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REFERENCES

Adioetomo, S. M., Djutaharta, T., & Hendratno. (2005). Cigarette Consumption , Taxation , and Household Income : Indonesia Case Study. Economics of Tobacco Control Paper.

Block, S., & Webb, P. (2009). Up in smoke: tobacco use, expenditure on food, and child malnutrition in developing countries. Economic Development and Cultural Change, 58(1), 1-23. https://doi.org/10.1086/605207

John, R. M. (2008). Crowding out effect of tobacco expenditure and its implications on household resource allocation in India. Social Science and Medicine, 66(6), 1356-1367. https://doi.org/10.1016/j.socscimed.2007.11.020

MacLennan, M., Ahmed, S., & Khan, J. (2015). To what extent does tobacco expenditure crowd-out household expenditure in Bangladesh? Annals of Global Health, 81(1), 97-98. https://doi.org/10.1016/j.aogh.2015.02.726

Muraro, A. P., Gonçalves-Silva, R. M. V., Moreira, N. F., Ferreira, M. G., Nunes-Freitas, A. L., Abreu-Villaça, Y., & Sichieri, R. (2014). Effect of tobacco smoke exposure during pregnancy and preschool age on growth from birth to adolescence: a cohort study. BMC Pediatrics, 14(1), 99. https://doi.org/10.1186/1471-2431-14-99

Pu, C. yun, Lan, V., Chou, Y. J., & Lan, C. fu. (2008). The crowding-out effects of tobacco and alcohol where expenditure shares are low: Analyzing expenditure data for Taiwan. Social Science and Medicine, 66(9), 1979-1989. https://doi.org/10.1016/j.socscimed.2008.01.007

Qian, W., Li, B., & Zheng, L. (2015). The Impact of Non-agricultural Employment on Farmland Transfer and Investment in Agricultural Assets : Evidence from China. In International Conference of Agricultural Economists (pp. 1-34).

Rona, R. J., Chinn, S., & Florey, C. D. V. (1985). Exposure to cigarette smoking and children's growth. International Journal of Epidemiology. https://doi.org/10.1093/ije/14.3.402

Semba, R. D., Campbell, A. A., Sun, K., de Pee, S., Akhter, N., Moench-Pfanner, R., ... Bloem, M. W. (2011). - Paternal smoking is associated with greater food insecurity among poor families in rural Indonesia.; - Asia Pacific journal of clinical nutrition. - Asia Pacific Journal of Clinical Nutrition, 20(4), 618-623. World Bank. (2000). Curbing the Tobacco Epidemic in Indonesia. World Health, (6).