

Tobacco Economic Evidence: *Indonesia*

Background

Indonesia has one of the highest prevalence of tobacco use in the Southeast Asia region and the world (WHO, 2020, 2021). Around one-third of the adult population in the country uses tobacco products, mainly kretek cigarettes. The prevalence of tobacco use in Indonesia continues to be high in the past decade, and the prevalence is rising among Indonesian youth (WHO, 2020). In addition, about 45 percent of adults are exposed to tobacco smoke at workplaces and almost 60 percent of adults are exposed to second-hand smoke at home (Global Adult Tobacco Survey, 2021). Tobacco use imposes significant health and economic costs in Indonesia. Tobacco use is heavily associated with cardiovascular disease and cancer-related deaths (WHO, 2020). The estimated health care costs for tobacco-related diseases were estimated to be IDR18.9 trillion in 2018, a significant burden for the national health insurance program. The high prevalence of tobacco use in Indonesia is mainly driven by relatively cheap and affordable tobacco products (Ratanachena & Dorotheo, 2012; Zheng et al., 2018). Moreover, tobacco products in Indonesia are have become increasingly affordable since 2002 (Zheng et al., 2018).

Despite the high prevalence of tobacco use and inexpensive tobacco products, the Government of Indonesia continues to implement a middle-of-the-road approach to tobacco control. Indonesia has yet to have a robust and effective tobacco taxation scheme to control tobacco use and achieve public health outcomes (Moeis et al., 2022). The tobacco taxation scheme in Indonesia—mainly for cigarettes—is one of the most complex in the world with 8 tiers based on product type, volume, and prices. The complex system design is not effective in reducing smoking prevalence (Vanessa & Murwendah, 2019), and it can complicate collection efforts as costs of oversight is high. While the multi-tiered tobacco taxation scheme was designed to protect small manufacturers, the scheme perversely incentivizes cigarette companies to use the lower tiers, keeping some prices low and facilitating smokers to substitute to these cheaper products. Historical increases in cigarette taxes have been marginal, and tobacco prices have been increasing below the inflation rate (Blecher, 2018).

This narrative first discusses the health and economic costs of smoking and tobacco use in Indonesia and relevant policy responses. It then elaborates existing evidence on the effects of tax and price increases as well as other structural reforms to tobacco control policies on tobacco consumption, health outcomes, employment, the welfare of the poor, and illicit trade.

What are the health and economic costs of smoking and tobacco use, and how can policies address these costs?

The health costs of smoking and tobacco use are tremendous. Smoking and tobacco use are well-established risk factors for communicable diseases such as tuberculosis and respiratory diseases (Heriyani et al., 2013; Liew & Hsu, 2009) and non-communicable diseases such as diabetes (Soewondo & Pramono, 2011), cardiovascular diseases (Sumartono & Herawati, 2010), and cancers (Kristina, Endarti, & Thavorncharoensap, 2016; Kristina, Endarti, Sendjaya, et al., 2016), among others. Overall, the morbidity of smoking-related diseases accounted for close to 22 percent of total cases of chronic diseases (Kristina et al., 2018). The negative health consequences of smoking extend beyond smokers to second-hand smokers. Research shows that second-hand smoke is a risk factor for various forms of cancer and cancer mortality (Kristina et al., 2019)

Economic costs of tobacco use include health care and non-health care costs, morbidity and disability costs, and mortality costs. A recent study estimates that the health care cost of smoking in 2019 was about IDR17.9-27.7 trillion or 0.1-0.2 percent of Indonesian GDP (Meilissa et al., 2021, 2022), a significant increase from the 2015 estimate of IDR13.7 trillion (Kosen, 2017). The 2021 study also shows that the burden of the national health insurance program to cover smoking-attributable direct expenditure was substantial at about 56.3 to 58.6 percent. It is also important to note that the earmarked tobacco tax revenue for the national health insurance program cannot cover the costs of smoking (Meilissa et al., 2021, 2022). The total direct and indirect estimated economic loss due to tobacco was significant in 2015 at IDR438.5 trillion (Kosen, 2017) and in 2019 at IDR410.8 trillion (Meilissa et al. 2022). In addition, a study confirms that tobacco consumption crowds out non-tobacco consumption from food to education (Wisana et al., 2022).

The long-run consequences of smoking on children's cognitive development and eventually labor productivity are also substantial costs of smoking. Children living in households whose parents smoke are exposed to second-hand smoke (The Tobacco Atlas, 2018). Households in which parents smoke have large expenditures for tobacco, second only to expenditure for rice. These households would have fewer resources for nutritious foods and other human capital-improving spending (World Bank, 2018). Two recent studies show that children whose parents smoke have a higher likelihood of stunting (Bella et al., 2022; Dartanto et al., 2018). Children exposed to smoking parents have higher risk of infant and under-5 child mortality (Semba et al., 2008) and child malnutrition (Best et al., 2008). In addition, studies also show a significant increase in the prevalence of smoking among adolescents in Indonesia (Kementerian Kesehatan, 2019;

WHO-SEARO, 2018), who have a high likelihood of becoming lifetime smokers, implying the health and economic costs of smoking in the future.

Studies show that a significant increase in tobacco excise tax can reduce cigarette consumption, save lives, and increase revenue. A 30-percent increase in cigarette tax is estimated to decrease *kretek* consumption by 20.62 percent (Bella et al., 2021), while even a 10-percent increase in cigarette tax can save 3.78 million in quality-adjusted life-years and US\$106 billion in smoking-related health care costs (Matheos et al., 2023). The government's decision to continue the middle-of-the-road tobacco tax policy imposes a significant opportunity lost in terms of tax collection and death avoidance. A report estimates that the Government of Indonesia may have lost between IDR86.09 and IDR108.4 trillion by continuing the current approach (Javier et al., 2022), suggesting that a significant increase in tobacco excise tax and reduction in the number of tiers should be the dominant strategy for the economy and the health care system.

Findings from these studies imply that a significant reduction in smoking prevalence is necessary to reduce the economic costs of smoking. Implementation of aggressive tobacco control policies, particularly through tobacco taxes, can reduce smoking prevalence and eventually health and economic costs of smoking. These studies also suggest that tobacco control among youth is important to reduce the prevalence of long-term smokers and future economic burdens. While the fiscal approach is important in reducing the affordability of tobacco products, limiting adolescents' access to retail cigarettes and single cigarette sticks and smoking bans in public places are also important.

How do tobacco users respond to taxes, price increases, and other structural reforms to policies?

Evidence shows that increasing cigarette prices through a higher tobacco tax is one of the most effective policies to reduce cigarette consumption (Fuchs et al., 2019; Fuchs & del Carmen, 2018; Nazar et al., 2021; WHO, 2020). Given the low-cost tobacco products in Indonesia, regular and significant increases in tobacco taxes that lead to substantial increases in prices are necessary to gradually reduce consumption and the prevalence of tobacco use (Maftuchan et al., 2019; Nurhasana et al., 2019).

Studies confirm the negative price elasticity of tobacco demand ranging from -0.28 to -1.020 in the short run, and about -0.73 in the long run (Bella et al., 2021; Djutaharta et al., 2005; Fauzi & Pongpanich, 2022; Hidayat & Thabrany, 2010; Sahadewo et al., 2018; Setyonaluri et al., 2008). The estimated price elasticities suggest that a significant

increase in tobacco taxes that pushes tobacco prices up would be effective in reducing tobacco consumption. These estimates suggest that a 10-percent increase in tobacco prices would reduce tobacco consumption by about 2.8 to 10.20 percent. Simulations suggest that significant increases in tobacco taxes and simplification of the complex tax tiers would reduce the number of smokers as well as cigarette demand and cigarette expenditure (Bella et al., 2021; WHO, 2020).

The key policy recommendation from these studies is to implement significantly large and consistent annual increases in tobacco taxes that can increase tobacco prices. The increase in tobacco taxes should be complemented with simplifications of the tobacco tax tiers, which would reduce the incentive for smokers to switch to cheaper tobacco products because price variation would shrink markedly.

How do tobacco tax policies affect the price of tobacco products, and how will this price change affect government revenues, consumption, and employment?

The most recent and rigorous study using brand-level data between 2005 and 2017 finds that a percentage increase in tobacco taxes increases tobacco prices by less than 1 percent. This finding suggests that tobacco taxes increase must be substantial enough to sufficiently increase tobacco prices and reduce tobacco consumption. The study also finds that fewer tobacco tax tiers will increase the effectiveness of the tobacco tax system as fewer tobacco tax tiers are associated with higher cigarette prices and less price variation (Prasetyo & Adrison, 2019).

Given the inelastic nature of cigarette demand, higher tobacco taxes would result in higher government revenues (Ahsan et al., 2013; Bella et al., 2021; Sahadewo et al., 2018). The most recent study (Bella et al., 2021) shows that increasing cigarette tax by 30 percent would increase cigarette prices—both kreteks and white—by about 25 percent, reduce kretek demand by 20.62 percent and white cigarette demand by 14.24 percent. Given the inelastic nature of cigarette demand, the increase in cigarette tax would increase government revenues by 2.95 percent or equivalent to Rp5.72 trillion. A more progressive tax increase by 45 percent is estimated to increase government revenue by 4.08 percent.

The gross employment effect of higher tobacco taxes is quite low (Bella et al., 2021; Sahadewo et al., 2018). Depending on the tax increase scenario, the loss of employment is estimated to be between 0.09 percent to 0.41 percent (Sahadewo et al., 2018). Considering households' spending reallocation to other commodities—i.e., individuals will spend on other goods and services instead of tobacco—tobacco tax increases would result in a net gain for employment, income, and output as (Bella et al., 2021). Nargis et

al. (2018) estimated that loss of income due to lower employment was only 0.1 percent of government revenue gained from higher tobacco taxes. Studies also show that the impact of higher tobacco taxes on tobacco farmers and clove farmers would be minimal (Drope et al., 2018; Marquez et al., 2018; Sahadewo et al., 2020). Tobacco farmers are also better off switching to non-tobacco farming (Sahadewo et al., 2020) as tobacco farming has a negative effect on farmers' income (Sahadewo, Drope, Li, et al., 2020).

These studies suggest that the government should adopt an aggressive tobacco tax increase and tier simplification to reduce cigarette consumption. Such a policy would then increase government revenue from tobacco taxation. The employment effect of the policy would be quite minimal. The government can then use higher tobacco tax revenues to compensate for any loss of income and to provide social assistance programs for affected workers.

How do tobacco tax policies affect the poor?

Poor households experience a disproportionately large economic impact from tobacco use. Individuals in Indonesia from poor households are more likely to smoke than their richer counterparts (Rahim et al., 2016). Among poor households, cigarette expenditure is second after rice, and the share of cigarette expenditure exceeds the share of education and health expenditures (Statistics Indonesia, 2022). This is in line with a finding on the crowding-out effect of tobacco consumption among the poor (Wisana et al., 2022), and that the poor divert income to tobacco use from potential food expenditure, but not non-food expenditure (Block & Webb, 2009). It is also important to note that poor households are more sensitive to changes in tobacco price. A study shows that tobacco price elasticities—for both clove and white cigarettes—are higher among poor households in Indonesia (Fuchs & del Carmen, 2018).

Poor households with smoking parents are also associated with a higher risk of household food insecurity (Semba et al., 2011) and child malnutrition (Semba et al., 2007). Given their higher cigarette consumption, the poor are also more likely to experience tobacco-related illness, but they lack the resources to access health care. Consequently, the poor have a higher likelihood of facing catastrophic health expenditures and lower productivity.

Raising tobacco taxes are proven to be effective in reducing tobacco consumption, but there are concerns over its regressive effect. An early study shows that raising tobacco taxes would increase the burdens of cigarette expenditure among the poor or regressive (Nasrudin et al., 2013). However, the study does not consider the potential benefits of lower cigarette consumption. Once considered, studies from the global context (Fuchs et al., 2019; Fuchs & Meneses, 2017) as well as findings from the Indonesian context (Fuchs

and Del Carmen, 2018) show that tobacco tax increases are progressive mainly due to benefits from lower health expenditure and higher productivity among the poor.

A study also conducts simulations on the effects of consistent tobacco tax increases on health expenditure in multiple countries, including Indonesia. The study finds that a substantial and consistent increase in cigarette prices would significantly reduce catastrophic health expenditures. The study suggests that the tobacco tax increase would disproportionately benefit the poor as they have a higher likelihood of experiencing catastrophic health expenditures (Consortium, 2018).

The policy recommendation from this line of studies is quite straightforward: a substantial and consistent increase in tobacco taxes would drive tobacco prices higher. Poor households benefit from such policy owing to higher productivity, lower health expenditure, and a higher likelihood of avoiding catastrophic health expenditure that result from the lower consumption and prevalence (including from both less smoking initiation and quitting).

To what extent are policies related to the illicit trade of tobacco products?

One of the narratives against tobacco control policies such as higher tobacco taxes is a higher incidence of illicit cigarettes in the market. Higher tobacco taxes would induce higher tobacco prices, and higher tobacco prices would incentivize the emergence of lower-priced illicit cigarettes. However, available evidence suggests that there is no association between higher tobacco taxes and the share of illicit cigarettes. The data presented by Ahsan (2019) suggest that the estimated market share of illicit cigarettes was steadily decreasing between 2016 and 2018. The decrease is also contributed by a higher intensity of Indonesia's Directorate General of Custom and Excise efforts in combating illicit cigarettes. A recent survey also shows that the share of illicit cigarettes in the market is quite low, less than 2 percent (Kartika et al., 2019). The evidence suggests that the illicit cigarette narrative should not hinder the implementation of higher tobacco taxes or other relevant tobacco control policies.

References

- Ahsan, A. (2019). Indonesia: Tackling Illicit Cigarettes. In S. Dutta (Ed.), *Confronting illicit tobacco trade: a global review of country experiences*. World Bank Group.
- Ahsan, A., Wiyono, N. H., Kiting, A. S., Djutaharta, T., & Aninditya, F. (2013). Impact of increasing tobacco tax on government revenue and tobacco consumption. *SEADI Discussion Paper Series*, 8.
- Bella, A., Dartanto, T., Nurshadrina, D. S., Kusnadi, G., Moeis, F. R., Nurhasana, R., Satrya, A., & Thabrany, H. (2022). Do parental Smoking Behaviors Affect Children's Thinness, Stunting, and Overweight Status in Indonesia? Evidence from a Large-Scale Longitudinal Survey. *Journal of Family and Economic Issues*. <https://doi.org/10.1007/s10834-022-09864-x>
- Bella, A., Swarnata, A., Nugroho, D., Meilissa, Y., & Dartanto, T. (2021). *The Macroeconomic Impacts of Tobacco Taxation in Indonesia*.
- Best, C. M., Sun, K., de Pee, S., Sari, M., Bloem, M. W., & Semba, R. D. (2008). Paternal smoking and increased risk of child malnutrition among families in rural Indonesia. *Tobacco Control*, 17(1), 38–45.
- Blecher, E. (2018). Cigarette Affordability in Indonesia. In *A Tobacconomics Policy Brief*. University of Illinois at Chicago. <https://tobacconomics.org/uploads/misc/2020/04/Cigarette-Prices-in-Indonesia.pdf>
- 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>
- Consortium, G. T. E. (2018). The health, poverty, and financial consequences of a cigarette price increase among 500 million male smokers in 13 middle income countries: compartmental model study. *BMJ*, 361.
- Dartanto, T., Moeis, F. R., Nurhasana, R., Satrya, A., & Thabrany, H. (2018). Parent smoking behavior and children's future development: evidence from Indonesia Family Life Survey (IFLS). *Tobacco Induced Diseases*, 16(3). <https://doi.org/10.18332/TID/94561>
- Djutaharta, T., Surya, H. V., Pasay, N. H. A., & Adioetomo, S. M. (2005). *Aggregate Analysis of the Impact of Cigarette Tax Rate Increases on Tobacco Consumption and Government Revenue*.
- Drope, J., Li, Q., Araujo, E. C., Harimurti, P., Sahadewo, G. A., Nargis, N., Durazo, J., Witoelar, F., & Sikoki, B. S. (2018). *The economics of tobacco farming in Indonesia*. <http://documents.worldbank.org/curated/en/161981507529328872/The-economics-of-tobacco-farming-in-Indonesia>

- Fauzi, R., & Pongpanich, S. (2022). The effect of price on cigarette consumption among youth in Indonesia: Implications for tobacco tax policy. *World Medical & Health Policy*.
- Fuchs, A., & del Carmen, G. (2018). The Distributional Effects of Tobacco Taxation. *The Distributional Effects of Tobacco Taxation: The Evidence of White and Clove Cigarettes in Indonesia*. <https://doi.org/10.1596/1813-9450-8558>
- Fuchs, A., González Icaza, F., & Paz, D. (2019). Distributional Effects of Tobacco Taxation. *Distributional Effects of Tobacco Taxation: A Comparative Analysis*. <https://doi.org/10.1596/1813-9450-8805>
- Fuchs, A., & Meneses, F. (2017). *Are Tobacco Taxes Really Regressive? Evidence from Chile*.
- Global Adult Tobacco Survey. (2021). *2021 GATS Fact Sheet Indonesia*. World Health Organization. https://cdn.who.int/media/docs/default-source/ncds/ncd-surveillance/data-reporting/indonesia/indonesia-national-2021-factsheet.pdf?sfvrsn=53eac4fd_1&download=true
- Heriyani, F., Sutomo, A. H., & Saleh, Y. D. (2013). Risk factors of the incidence of pulmonary tuberculosis in Banjarmasin city, Kalimantan, Indonesia. *International Journal of Public Health*, 2(1), 1–6.
- Hidayat, B., & Thabrany, H. (2010). Cigarette smoking in Indonesia: Examination of a myopic model of addictive behaviour. *International Journal of Environmental Research and Public Health*, 7(6), 2473–2485. <https://doi.org/10.3390/ijerph7062473>
- Javier, A., Assunta, M., Dorotheo, U., & Ratanachena-McWhortor, S. (2022). *Lost Rupiahs. A Study on Delayed Implementation of Optimal Tax Policy in Indonesia*.
- Kartika, W., Muhammad, R., Dwi, T., Ningrum, R., Ramdlaningrum, H., Fajar, L., & Budiantoro, M. S. (2019). *The Illicit Cigarette Trade in Indonesia*.
- Kementerian Kesehatan. (2019). Laporan Nasional Riskesdas 2018. In *Riskesdas 2018*. Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan.
- Kosen, S. (2017). *health and economic costs of tobacco in indonesia*.
- Kristina, S. A., Endarti, D., Sendjaya, N., & Pramestuty, O. (2016). Estimating the burden of cancers attributable to smoking using disability adjusted life years in Indonesia. *Asian Pacific Journal of Cancer Prevention*, 17(3), 1577–1581. <https://doi.org/10.7314/APJCP.2016.17.3.1577>
- Kristina, S. A., Endarti, D., & Thavorncharoensap, M. (2016). Burden of cancer attributable to tobacco smoking in member countries of the Association of Southeast Asian Nations (ASEAN), 2012. *Cancer Epidemiology*, 44, 84–90. <https://doi.org/10.1016/j.canep.2016.08.005>
- Kristina, S. A., Endarti, D., Wiedyaningsih, C., Fahamsya, A., & Faizah, N. (2018). Health Care Cost of Noncommunicable Diseases Related to Smoking in Indonesia, 2015. *Asia-Pacific Journal of Public Health*, 30(1), 29–35. <https://doi.org/10.1177/1010539517751311>

- Kristina, S. A., Wiedyaningsih, C., Masrida, W. O., Santoso, K. A., & Ahsan, A. (2019). The mortality costs of tobacco related cancers among secondhand smokers in Indonesia 2018. *Research Journal of Pharmacy and Technology*, 12(12), 6075–6080. <https://doi.org/10.5958/0974-360X.2019.01055.2>
- Liew, H.-P., & Hsu, T. (2009). Smoking and health in Indonesia: the need for comprehensive intervention strategies. *Asian Population Studies*, 5(2), 189–209.
- Maftuchan, A., Kartika, W., Thariq, R. M., Ningrum, D. R., & Ramdlaningrum, H. (2019). *The Effect of Large Cigarette Price Increases on Smoking Behavior In Indonesia: What Smokers Tell Us*. www.theprakarsa.org
- Marquez, P. v., Drope, J., Li, Q., Harimurti, P., Araujo, E. C., Sahadewo, G. A., Nargis, N., Durazo, J., Witoelar, F., & Sikoki, B. S. (2018). *The economics of clove farming in Indonesia*. World Bank Group. <http://documents.worldbank.org/curated/en/166181507538499946/The-economics-of-clove-farming-in-Indonesia>
- Matheos, C. C., Liew, D., Zomer, E., & Ademi, Z. (2023). Cost-Effectiveness Analysis of Tobacco Control Strategies in Indonesia. *Value in Health Regional Issues*, 33, 65–75.
- Meilissa, Y., Nugroho, D., Luntungan, N. N., & Dartanto, T. (2021). *The 2019 Health Care Costs of Smoking in Indonesia*.
- Meilissa, Y., Nugroho, D., Luntungan, N. N. H. W., & Dartanto, T. (2022). The 2019 economic cost of smoking-attributable diseases in Indonesia. *Tobacco Control*.
- Moeis, F. R., Nurhasana, R., Rahardi, F., Novitasari, D., Shellasih, N. M., Suriyawongpaisal, P., Patanavanich, R., & Ratih, S. P. (2022). The Framework Convention on Tobacco Control (FCTC) and implementation of tobacco control policies: Lessons learned from Indonesia and Thailand. *World Medical & Health Policy*.
- Nargis, N., Sahadewo, G. A., Araujo, E. C., Harimurti, P., Drope, J., Li, Q., Durazo, J., Kartaadipoetra, F. W., & Sikoki, B. S. (2018). *The economics of kretek rolling in Indonesia*. <http://documents.worldbank.org/curated/en/644791507704057981/The-economics-of-Kretek-rolling-in-Indonesia>
- Nasrudin, R., Trialdi, L., Hartono, D., & Ahsan, A. (2013). *Tobacco Economic of Indonesia: Poor Households' Spending Pattern, Tax Regressivity and Economic Wide Impact of Tax Simplification* (No. 2; Working Paper in Economics and Business). <http://econ.fe.ui.ac.id/workingpage>
- Nazar, G. P., Sharma, N., Chugh, A., Abdullah, S. M., Lina, S., Mdege, N. D., John, R. M., Huque, R., Bauld, L., & Arora, M. (2021). Impact of tobacco price and taxation on affordability and consumption of tobacco products in the South-East Asia Region: A systematic review. *Tobacco Induced Diseases*, 19.

- Nurhasana, R., Ratih, S., Dartanto, T., Hartono, R., Satrya, A., Moeis, F., & Thabrany, H. (2019). Public support for cigarette price increase in Indonesia. *Tobacco Induced Diseases*, 17(1). <https://doi.org/10.18332/tid/111426>
- Prasetyo, B. W., & Adrison, V. (2019). Cigarette prices in a complex cigarette tax system: empirical evidence from Indonesia. *Tobacco Control*, 29(6).
- Rahim, F. K., Suksaroj, T., & Jayasvasti, I. (2016). Social determinant of health of adults smoking behavior: differences between urban and rural areas in Indonesia. *Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, 11(2), 51–55.
- Ratanachena, S., & Dorotheo, U. (2012). *Affordability of Cigarettes and the Impact of Raising Tobacco Excise Taxes in Southeast Asia: Cambodia, Indonesia, Lao PDR, Philippines, Thailand, and Vietnam*.
- Sahadewo, G. A., Drope, J., Kartaadipoetra, F. W., Li, Q., & Lencucha, R. (2020). *The Economics of tobacco farming in Indonesia: results from two waves of a farm-level survey*.
- Sahadewo, G. A., Drope, J., Li, Q., Nargis, N., & Witoelar, F. (2020). Tobacco or not tobacco: Predicting farming households' income in Indonesia. *Tobacco Control*. <https://doi.org/10.1136/tobaccocontrol-2019-055274>
- Sahadewo, G. A., Iglesias, R. M., Araujo, E. C., Nargis, N., Harimurti, P., Drope, J., Li, Q., Durazo, J., Witoelar, F., & Sikoki, B. S. (2018). *The economics of tobacco taxation and employment in Indonesia: health population and nutrition global practice*. World Bank Group. <http://documents.worldbank.org/curated/en/919961507699751298/health-population-and-nutrition-global-practice>
- Semba, R. D., Campbell BS, A. A., Sun, K. M., de Pee, S., Akhter, N. M., Moench-Pfanner, R., Hyun Rah, J., Badham, J., Kraemer, K., & Bloem, M. W. (2011). Paternal smoking is associated with greater food insecurity among poor families in rural Indonesia. In *618 Asia Pac J Clin Nutr* (Vol. 20, Issue 4).
- Semba, R. D., Kalm, L. M., de Pee, S., Ricks, M. O., Sari, M., & Bloem, M. W. (2007). Paternal smoking is associated with increased risk of child malnutrition among poor urban families in Indonesia. *Public Health Nutrition*, 10(1), 7–15. <https://doi.org/10.1017/S136898000722292X>
- Semba, R. D., Pee, S. de, Sun, K., Best, C. M., Sari, M., & Bloem, M. W. (2008). Paternal Smoking and Increased Risk of Infant and Under-5 Child Mortality in Indonesia. *American Journal of Public Health*, 98(10), 1824. <https://doi.org/10.2105/AJPH.2007.119289>
- Setyonaluri, D., Adioetomo, S. M., Barber, S., & Ahsan, A. (2008). *Tobacco Economics in Indonesia*.
- Soewondo, P., & Pramono, L. A. (2011). Prevalence, characteristics, and predictors of pre-diabetes in Indonesia. *Medical Journal of Indonesia*, 20(4), 283–294.

- Statistics Indonesia. (2022). *Pengeluaran untuk Konsumsi Penduduk Indonesia per Provinsi, September 2021 [Expenditures for households' consumption in Indonesia by province, September 2021]*.
- Sumartono, W., & Herawati, M. H. (2010). Smoking and socio-demographic risk factors of cardiovascular disease among middle-aged and elderly Indonesian men. *Health Science Journal of Indonesia*, 1(1), 20–25.
- The Tobacco Atlas. (2018). Indonesia Fact Sheet. In *The Tobacco Atlas Fact Sheet*. The Tobacco Atlas. <https://files.tobaccoatlas.org/wp-content/uploads/pdf/indonesia-country-facts-en.pdf>
- Vanessa, Y., & Murwendah, M. (2019). The Structure of State Levies on Tobacco: A Comparative Study of Indonesia and Thailand. *International Journal of Administrative Science & Organization*, 26(3), 145–155. <https://doi.org/10.20476/jbb.v26i3.10876>
- WHO. (2020). *Raise Tobacco Taxes and Prices for a Healthy and Prosperous Indonesia*.
- WHO. (2021). *WHO global report on trends in prevalence of tobacco use 2000-2025* (4th ed.). <http://apps.who.int/bookorders>.
- WHO-SEARO. (2018). *Indonesia Fact Sheet 2018*. World Health Organization.
- Wisana, D., Swarnata, A., Kamilah, F. Z., Meilissa, Y., & Kusnadi, G. (2022). *The Crowding-Out Effect of Tobacco Consumption in Indonesia [Report]*.
- World Bank. (2018). *Aiming High: Indonesia's Ambition to Reduce Stunting*.
- Zheng, R., Marquez, P. v, Ahsan, A., Wang, Y., & Hu, X. (2018). *Cigarette Affordability in Indonesia: 2002-2017*.

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