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Efficiency and Effectiveness of Earmarking for Public Health in the Philippines

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Efficiency and Effectiveness of Earmarking for Public Health in the Philippines

*Miharu Jay Kimwell, Frances Lois Ngo, Vicente Alberto Puyat,
and George Douglas Siton*



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Efficiency and Effectiveness of Earmarking for Public Health in the Philippines

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Abstract

The Sin Tax Reform Act (STRA) of 2012 (RA 10351) and its amendments paved the way to revisit excise taxation for sin products, such as tobacco, alcohol, heated tobacco products and vapor products, and sweetened beverages. The ad valorem tax system reform has a two-fold aim: (1) increase revenues for public spending on health; and (2) reduce the burden of tobacco smoking and alcohol use. This study has attempted to examine the quality of spending of earmarked funds by the Philippine public health sector, and in doing so, to identify constraints to efficient and effective use. In particular, this study utilized a modified intersectoral framework focusing on four key criteria for evaluating the implementation of the earmarking policy: adequacy, efficacy, equity, and effectiveness. Although the STRA has brought about improvements in program and health outcomes, there is a need to revisit policies and processes to reap the benefits of earmarked funds adequately, efficiently, equitably, and effectively in the public health sector.

Keywords: earmarking, Sin Tax, health financing, universal health coverage

Table of Contents

1.	Introduction	1
2.	Study objectives and statement of policy relevance	3
3.	Literature Review	3
3.1.	International literature on earmarking for health.....	3
3.2.	Earmarking for public health in the Philippines	4
3.3.	Philippine case	4
4.	Data and Methods	13
4.1.	Conceptual framework	13
4.2.	Policy and process review	15
4.3.	Review of allocations and expenditures	16
5.	Results and Discussion	20
5.1.	Public financial management of earmarked Sin Tax revenues for health	20
5.2.	Trends of Sin Tax revenue allocations and expenditure on the health sector and health outcomes	36
6.	Conclusions and recommendations	66
6.1.	Study Limitations	68
7.	References	70
8.	Appendix	75
	Appendix A. Alternative Data Sources and Solutions to Data Issues.....	75
	Appendix B. Time-Series Models	77
	Appendix C. Stationarity Test.....	78
	Appendix D. ARDL model results	80

List of Tables

Table 1. Cross-country Earmarking Policies for Health	4
Table 2: Provisions and revisions of the STRA specific for health.....	5
Table 3. Characterization of the Sin Tax Reform Act (RA 10351) earmarking policy, after the framework in Cashin (2017).....	7
Table 4. Criteria for evaluation of earmarked revenue allocations.....	15
Table 5. Health outcome indicators	17
Table 6. Data Sources	18
Table 7. Provision of RA 10351 and specific program allocations	21
Table 8. Distribution of sin tax revenue attribution per program, in Billion Pesos, 2014-2021	24
Table 9. National Health Insurance Program descriptive statistics	40
Table 10. Health Facilities enhancement program descriptive statistics	40
Table 11. Family Health program descriptive statistics.....	40
Table 12. National Immunization program descriptive statistics	41
Table 13. TB Control program descriptive statistics	41
Table 14. ARDL models for Family Health (FH), Immunization (Imm), and Tuberculosis (TB) Programs	65

List of Figures

Figure 1. Trends in DOH Appropriations for Expenditure from 1996 to 2021.	9
Figure 2. Total and per capita DOH appropriations from 1996 to 2021.	10
Figure 3. DOH appropriations, as a share of GDP, from 1996 to 2021.	11
Figure 4. DOH appropriations, as a share of general government revenue, from 1996 to 2020.	12
Figure 5. DOH appropriations, as a share of general government expenditure, from 1996 to 2021.	12
Figure 6. Conceptual framework for the proposed review Source: Adapted from the World Bank (2020)	14
Figure 7. Appropriation and disbursement amounts for the HFEP from 2014 to 2021	27
Figure 8. Approved DOH GAA Aggregated per Source 2013-2021, in Billion Pesos	29
Figure 9. Year-on-Year Growth of DOH GAA, Sin Tax Revenues, and National Government Counterpart, in Percent.....	30
Figure 12. Appropriation and disbursement amounts for the Family Health program from 2014 to 2020.....	33
Figure 13. Appropriation and disbursement amounts for PhilHealth from 2014 to 2020.	34
Figure 14. Appropriation and disbursement amounts for the TB Control program from 2014 to 2020.....	34
Figure 15. GAA Health Budget (in million PHP).....	37
Figure 16. Appropriations for Health with in-sample forecasts (in million PHP).....	38
Figure 17. Budget Projections with Incremental STRAs (in billion PHP)	39
Figure 18. Program appropriations from 1996-2021: DOH programs and NHIP	42
Note: In 2000-2001, TB and Immunization shared the same budget; 2021 excluded since Family Health and Immunization were under one budget and all communicable diseases were under one budget	42
Figure 19. Program appropriations from 1996-2021: DOH programs.....	42
Figure 20. Program appropriations from 1996-2021: DOH public health services programs.....	43
Figure 21. Total appropriations and per capita appropriations in constant PHP for NHIP subsidies from 2002 to 2021.....	44
Figure 22. Total appropriations and per capita appropriations in constant PHP for HFEP from 2007 to 2021.....	45
Figure 23. Total and per capita appropriations for Family Health program from 1996 to 2020.....	46
Figure 24. Total and per capita appropriations for the NIP from 1996 to 2020.....	47
Figure 25. Total and per capita appropriations for the TB Control program from 1996 to 2020.....	48
Figure 26. Cost-effectiveness ratios for HFEP project completion from 2010 to 2021.	49
(a) Cost per project completed.....	49
(b) Cost per change in proportion of projects completed out of total projects started annually.....	49

Figure 27. Cost-effectiveness ratios for modern contraceptive coverage from 2000 to 2020.....	50
Figure 28. Cost-effectiveness ratios for DTP3 immunization coverage from 2000 to 2020.....	51
Figure 29. Cost-effectiveness ratios for TB case detection rate from 2000 to 2020.	52
Figure 30. Registered PhilHealth members and dependents categorized as indigent or government-sponsored from 2012 to 2021.....	53
Figure 31. Relationship between number of indigent and sponsored members and provincial poverty incidence in 2021.	54
Figure 32. Number of HFEP projects started and completed from 2010 to 2021.	55
a) Annual number of completed and started projects.....	55
b) Subgroup analysis of cumulative sums of projects started from 2010 to 2021, by health facility type.....	55
Figure 33. Relationship between HFEP projects started per region and average regional poverty incidence	56
Figure 34. Service coverage for modern contraceptive methods, DTP3 immunization, and TB case detection rate from 2000 to 2021.....	57
Figure 35. Users of modern contraceptive methods and modern contraceptive coverage of the women of reproductive age population from 2000 to 2021.....	58
Figure 36. Number of DTP3 doses and DTP3 immunization coverage from 2000 to 2021.....	60
Figure 37. TB incidence (per 100,000 population) and case detection rate from 2000 to 2020.....	61
Figure 38. TB Treatment Success Rate and Case Detection Rate from 2000 to 2019. ..	62
Figure 39. Budget Appropriations with Respective Program Outcomes for Family Health and Immunization.....	63
Figure 40. Budget Appropriations with Respective Program Outcomes for Tuberculosis	64

Efficiency and Effectiveness of Earmarking for Public Health in the Philippines

*Miharu Kimwell, Frances Lois Ngo, Vicente Alberto Puyat,
and George Douglas Siton*

1. Introduction

Health financing is a crucial function of the overall health system. With well-crafted health financing policies, significant strides toward universal health coverage (UHC) can be achieved by ensuring effective service coverage and financial protection. At its core, the functions of health financing policy are to support the goals toward effective revenue generation, pooling, and purchasing of resources. However, sustaining progress toward UHC should not only consider the amount of resources for the health system. Funds should ultimately be distributed equitably and used efficiently (Cashin et al., 2017). This entails that health financing policy should be aligned with public financial management to ensure equitable and efficient fund distribution is attained in the process.

In the Philippines, Republic Act (RA) 10351, or “The Sin Tax Reform Act (STRA) of 2012”, was established to enable reforms to tobacco and alcohol excise taxation in alignment with the Philippines’ commitment to the World Health Organization (WHO) Framework Convention on Tobacco Control. The law was intended to support: (1) Revenue generation for public spending in health, and (2) the reduction of tobacco smoking and alcohol use, risk factors associated with the incidence of non-communicable diseases.

The main reforms of the law include: (1) substantial increases in excise tax rates, (2) shifting from a multitiered system with tax rates set based on product prices to a specific tax rate for all products stipulate in the law, (3) an annual increase rate in excise tax, and (4) earmarking of revenues to support progress towards UHC (Diosana, 2020).

Earmarking involves separating all or a specific portion of total revenue from a tax or group of taxes to be used for a designated purpose and is increasingly used as a tool in public health policy to increase tax for consumption of unhealthy products associated with higher risk of disease amongst the population (Cashin et al., 2017). The STRA earmarks around 85% of incremental tax revenues collected from excise tobacco and alcohol taxes to the health sector to fund the health programs and activities of the Department of Health (DOH) and premiums for the Philippine Health Insurance Corporation (PhilHealth), ensuring that there is both predictable and stable source of revenue allocated for progress towards UHC in the country (DOH, 2021).

While consumption taxes and earmarking most directly affect the health system by contributing funds to the health system, they must be considered within the broader context of health financing systems within health systems and how they contribute towards overall UHC. Earmarking policies and other policies for revenue generation must also be accompanied by reforms in policies for pooling, the accumulation and management of revenues to be used on behalf of members of the population, and strategic purchasing, using the pooled fund to purchase health services on behalf of the population, to ensure that overall health financing system ensures distributional equity of

resources, improves the efficiency of health service delivery, and increases transparency and accountability of spending in public health so that members of the population with most health needs have access to high-quality care without risk of catastrophic expenditure on health (McIntyre et al., 2016). Earmarking may increase allocative efficiency through targeted expenditure of revenue, but it can also contribute to the fragmentation of funds that impede distributive capacity and efficiency if allocation rules are too rigid or ineffective pooling of resources if revenues from earmarking are not distributed to programs based on utilization need and quality of outputs from programs (Cashin et al., 2017).

Earmarking policies must also be sensitive to society-wide factors that influence the budgeting process and overall health financing. Even if the STRA's earmarking reform has increased revenue in public health and contributed to reducing the prevalence of tobacco and alcohol consumption nationwide, there is yet to be an assessment of whether financial resources from earmarking were used efficiently and effectively by DOH and PhilHealth programs who receive revenue from the STRA excise taxes. The STRA and earmarking must be assessed in relation to its contribution to achieving the core policy goals of UHC and the entire public health sector, which are (McIntyre, et al., 2016):

1. Equity in the use of health services: Reducing the gap between need and actual use of health services
2. Quality of Care: Achieving desired health outcomes or improved health status through evidence-based interventions and professional and empathetic provider-patient engagements
3. Financial protection: Funding health services in a way that protects individuals and households from adverse effects on their economic livelihood, as a consequence of paying for healthcare, and distributing burden of financing the healthy system across different socioeconomic groups

While increased public expenditure on health can significantly improve health status, it is not the only determinant of health that should be considered. Across countries, variability in mortality was not significantly explained by health spending but by factors not directly related to health service delivery, such as per capita income, income distribution, and female education (Filmer & Pritchett, 1999; Cevik & Tasar, 2013). Multiple studies found that while increases in public health budgets may potentially improve mortality and morbidity rates, it may not necessarily mean that it will improve accessibility and equity of services (Singh, 2014). Furthermore, other health system building blocks must also be considered when assessing how financing affects health outcomes. Governance and organizational capacity at different levels of governance significantly influence health outcomes (Meyer et al., 2012; Hu & Mendoza, 2013). Private health spending is also more effective than public health spending in promoting health outcomes when governance is ineffective (Fujii, 2018). The effect of public health spending on health outcomes is also moderated by the status of infrastructure and technology, with spending having a stronger effect in settings where infrastructure and technology are underdeveloped (Novignon et al., 2012).

2. Study objectives and statement of policy relevance

The general objective of this study was to evaluate the performance of public health budget allocations arising from the Philippine sin tax earmarking policy. Specifically, we sought to answer the following questions:

1. Have the earmarked revenues for aggregate and program levels of public health budgets been **adequate** to address the target public health budgetary needs?
2. Have the earmarked revenues been used **equitably**; that is, have allocations targeted reducing inequalities in access to health services between income classes and government units?
3. Have earmarked allocations been **efficient**; that is, have allocations been assigned to the most productive interventions (allocative efficiency) at the lowest possible cost (technical efficiency)?
4. Have earmarking reforms been **effective**; that is, have they resulted in real improvements in key target program indicators and health outcomes?

While the earmarking reform has undoubtedly increased public spending on health and reduced the prevalence of tobacco and alcohol consumption, the country has yet to examine whether the earmarked resources were used effectively and strategically by the health sector, specifically on the targeted DOH programs and PhilHealth.

This study has thus been an attempt to examine the quality of spending of earmarked funds by the Philippine public health sector, and in doing so, identify constraints to efficient and effective use. To our knowledge, this has been the first study in the country, and one of the few in the world, to empirically assess the performance of earmarking vis-à-vis health systems and social goals.

This study has important policy implications, as it aims to inform government and civil society stakeholders on how to design a more transparent, efficient, and equitable allocation of health resources, particularly in the era of UHC.

3. Literature Review

3.1. *International literature on earmarking for health*

It is common practice among governments to assign revenue to specific government objectives in different economic sectors. Michael, J. (2015) lists the advantages and disadvantages of earmarking government revenues as it applies to general funds of the US. Earmarking government revenue guarantees funding since the program has a prior legal claim to the appropriations. Earmarked funds are predictable, depending on their source, long-term planning may be executed by forecasting intertemporal appropriations from the budget source. Further, when earmarked revenues are closely related to services, this may increase the efficiency of public expenditure and increase public support to the appropriation of tax revenues.

There is also vast literature that provides insights on the disadvantages of earmarking (Ozer, et al., 2020; Christen & Soguel 2021; Bloom, 2022) such as budget rigidity and economic distortions by

giving preference to certain programs to receive larger budget allocations. Earmarking is also inherently procyclical which makes it susceptible to the consumption trends of the goods from which tax revenues are collected. Depending on the implementation of hard or soft earmarking, it may also promote fragmentation which can limit the coordination of different sectors of government due to the misalignment of financial resources. Given these characteristics of earmarking, many countries have experimented with earmarking revenues for health. Cashin, et al. (2017) give an overview of countries that have earmarked specific government revenues for specific types of health expenditures as seen in Table 1.

Table 1. Cross-country Earmarking Policies for Health

Country	Earmarking Policy
Estonia	Earmarked payroll tax to fund health insurance coverage
Ghana	Revenue earmarks to fund the National Health Insurance Scheme
Indonesia	Payroll tax to fund health insurance coverage; general revenue and expenditure earmarking to ensure adequate funds for health at the national and subnational levels
South Africa	Limited revenue earmarking; expenditure earmarking to advance national priorities such as HIV/AIDS response
Vietnam	Earmarked public health tax from tobacco products used for tobacco sector control

Source: Cashin et al. (2017)

3.2. *Earmarking for public health in the Philippines*

Earmarking is the process of dedicating resources by creating special funds and segregating them into specific public services. In theory, earmarking assumes a direct link between revenues and expenditures, however, in most cases earmarked revenues mix with the general fund allotted for the public service.

In the case of sin taxes in the Philippines to fund health, earmarking is referenced as the dedication of a single tax source, which is grouped together as “sin products” under the Sin Tax Law, to a single public service, in this case for health, within a multi-tax, multiservice fiscal unit. At the decision level of an individual, some conditions of earmarking ensure more rational individual choices which creates a desirable collective decision reflective of behavioral changes in relation to participation in revenue collection (Buchanan, 1963)¹. The sensitivity of individual consumers to the changes in the tax system for particular commodities, therefore, affects their behavior to consume these products in varying degrees.

3.3. *Philippine case*

The Sin Tax Reform Act (STRA) of 2012 or RA 10351 is considered one of the most important health legislations in the Philippines in the recent decade, bringing reforms to tobacco and alcohol excise taxation in adherence to the commitment of the Philippines to the World Health Organization (WHO) Framework Convention on Tobacco Control. The motivation of the law was

¹ Partial segregation of fiscal accounts can be shown to be more efficient, from the reference of the individual taxpayer, than overall integration into a comprehensive budgetary system (Buchanan, 1963).

twofold: (1) to increase revenues for public spending on health; and (2) to reduce the burden of tobacco smoking and alcohol use. The main features of the law include a substantial increase in excise tax rates, a shift from a multitiered *ad valorem* system with tax rates based on product prices to one tax rate for all like-products, an annual 4% increase in excise tax, and substantial earmarking of revenues for supporting the implementation of universal health care (Diosana, 2020).

As these products with negative health effects are legislated with higher taxes, the WHO has suggested concentrating these revenues via by using earmarking as a means to increase fiscal space in the health sector to organize resources especially for countries moving towards universal healthcare (UHC) and other health programs (Tandon & Cashin, 2010). On the other hand, earmarking is also an instrument of public health policy to use the increase in excise tax to reduce the consumption of tobacco and alcohol.

The law earmarks around 85% of the incremental tax revenues collected from excise tax tobacco and alcohol to the health sector to fund public health programs of the Department of Health (DOH) and premium payments for PhilHealth, both critical in implementing the country's Universal Health Care program. Of the total health sectoral budget, 80% accounted for the premium subsidy of poor households through the National Health Insurance Program (NHIP), programs to support health-related Millennium Development Goals (MDGs) and health awareness programs of the DOH, while the remaining 20% was allocated nationwide, based on political and district subdivisions, for the Medical Assistance Program (MAP) and the Health Facilities Enhancement Program (HFEP) which are determined by the DOH (Department of Health, 2021). The list of indigent families is provided by the Department of Social Welfare and Development (DSWD) in coordination with PhilHealth and updated at least once every four years.

Unlike the classic “hard” earmarking, the earmarking reform in the Philippines is considered “soft” because the yearly allocation is still decided through the budgetary process and reviewed regularly in accordance with the UHC Medium-Term Expenditure Program, as approved by the Development Budget Coordination Committee (DBCC). The earmarking provisions of RA 10351 were amended and repealed by RA 11346 and RA 11467, respectively. RA 11346 increased excise rates for tobacco products at PhP10.00 per pack and in incremental rates for vapor products in 2020 and 5% every year effective 2021. While RA 11467 increased *ad valorem* tax for both alcohol and tobacco products starting 2020. Both revisions to the STRA introduced new “sin” products, namely: heated tobacco products and vapor products, and sweetened beverages. These revisions to the STRA will affect the allocations earmarked for health beginning 2022. A brief overview of the original and revised STRAs are described in Table 2 below which highlights how revenues are allocated specific for health expenditures and the timeframe of issuance of these revenues to the Department of Health:

Table 2: Provisions and revisions of the STRA specific for health

Republic Act 10351 (2013)	
Sin Products	Tobacco, Alcohol
Allocation for Health	Revenues collected after deducting allocations under RA 7171 and RA 8240 for tobacco farmer protection
Universal Health Care Premiums	80% of the remaining balance after deducting allocations under RA 7171 (1992) and RA 8240 (1996) is allocated for UHC under the National Health Insurance Program, attainment of MDGs and health awareness programs

Other Health Premiums	20% of the remaining balance after deducting allocations under RA 7171 (1992) and RA 8240 (1996) is allocated nationwide, based on political and district subdivisions, for medical assistance and health enhancement facilities program
Issuance of Revenues	The allocation for health shall be based on the collection from the previous fiscal year
Republic Act 11346 (2020)	
Sin Products	Tobacco, Heated Tobacco Products and Vapor Products, Alcohol, Sweetened Beverages
Allocation for Health	For tobacco, alcohol and sweetened beverages: 50% of incremental revenues for health while remainder is earmarked for tobacco farmer protection For heated tobacco products and vapor products: 100% of incremental revenues to be used exclusively for health
Universal Health Care Premiums	80% for the Philippine Insurance Corporation (PhilHealth) for the implementation of Republic Act 11223, otherwise known as the Universal Health Care Act of 2019
Other Health Premiums	20% of the remaining balance after deducting allocations under RA 7171 (1992) and RA 8240 (1996) is allocated nationwide, based on political and district subdivisions, for medical assistance and health enhancement facilities program
Issuance of Revenues	The allocation for Universal Health Care shall be based on the collection of the second fiscal year preceding the current fiscal year
Republic Act 11467 (2021)	
Sin Products	Tobacco, Heated Tobacco Products and Vapor Products, Alcohol, Sweetened Beverages
Allocation for Health	For tobacco and sweetened beverages: 50% of incremental revenues while the remainder is earmarked for tobacco farmer protection For alcohol, heated tobacco products and vapor products: 100% of incremental revenues to be used exclusively for health
Universal Health Care Premiums	For tobacco and sweetened beverages: 80% for the Philippine Insurance Corporation (PhilHealth) for the implementation of Republic Act 11223, otherwise known as the Universal Health Care Act of 2019 For alcohol, heated tobacco products and vapor products: 60% for the Philippine Insurance Corporation (PhilHealth) for the implementation of Republic Act 11223, otherwise known as the Universal Health Care Act of 2019
Other Health Premiums	For tobacco and sweetened beverages: 20% allocated nationwide, based on political and district subdivisions for medical assistance and the Health Facilities Enhancement Program For alcohol, heated tobacco products and vapor products: 20% allocated nationwide, based on political and district subdivisions for medical assistance and the Health Facilities Enhancement Program; 20% allocated for the attainment of the Sustainable Development Goals (SDGs), provided that appropriate SDG targets shall be determined by the National Economic and Development Authority (NEDA)
Issuance of Revenues	The allocation for Universal Health Care shall be based on the collection of the second fiscal year preceding the current fiscal year

Source: Authors' Compilation

The STRAs are revenue earmarks that highlight the increase in fiscal space for health as a political prioritization to fund health programs and initiate the transition of the Philippine health agenda for universal healthcare. Earmarking for health can be described based on the policy's revenue and expenditure characteristics, and further, on how the earmarking policy is adopted and implemented. Table 3 below summarizes the characteristics of the Philippine sin tax earmarking policy based on its revenue and expenditure characteristics.

Table 3. Characterization of the Sin Tax Reform Act (RA 10351) earmarking policy, after the framework in Cashin (2017).

Characteristic	Description
Policy characteristics	
General policy type	Revenue earmarking
Objectives	Increase funds available for public spending on health, particularly for scaling up of Universal Health Care (UHC) Reduce the burden of tobacco smoking and alcohol use
Policy adoption process	Multi-year transition; full implementation began in 2017
Revenue characteristics	
Source	Increased and simplified existing excise taxes on tobacco and alcohol products
Tax instrument	Indirect tax
Earmarked tax rate	Percentage
Earmarked revenue base	Incremental revenue (IR), based on baseline excise collections under RA 9334 tax structure
Portion of revenue base earmarked for health	IR, less shares for tobacco-growing local government units (LGUs) as stipulated by RA 7171 and RA 8240
Health expenditure characteristics	
Purpose	Program targeted
Identifiable benefits rationale	No direct connection between revenue contributors and funded program beneficiaries
Allocation - percentages	~80% to UHC: National Health Insurance Program (NHIP) for health insurance premium subsidies of a targeted subset of poor and near-poor, health-related millennium-development goals (MDGs), and health awareness/information campaign programs ~20% to Department of Health (DOH) Medical Assistance Program (MAP) and Health Facilities Enhancement Program (HFEP); LGU district and regional hospitals Some amounts used for prior-year expenses and other non-UHC expenses (such as for DepEd/DSWD programs in 2016)

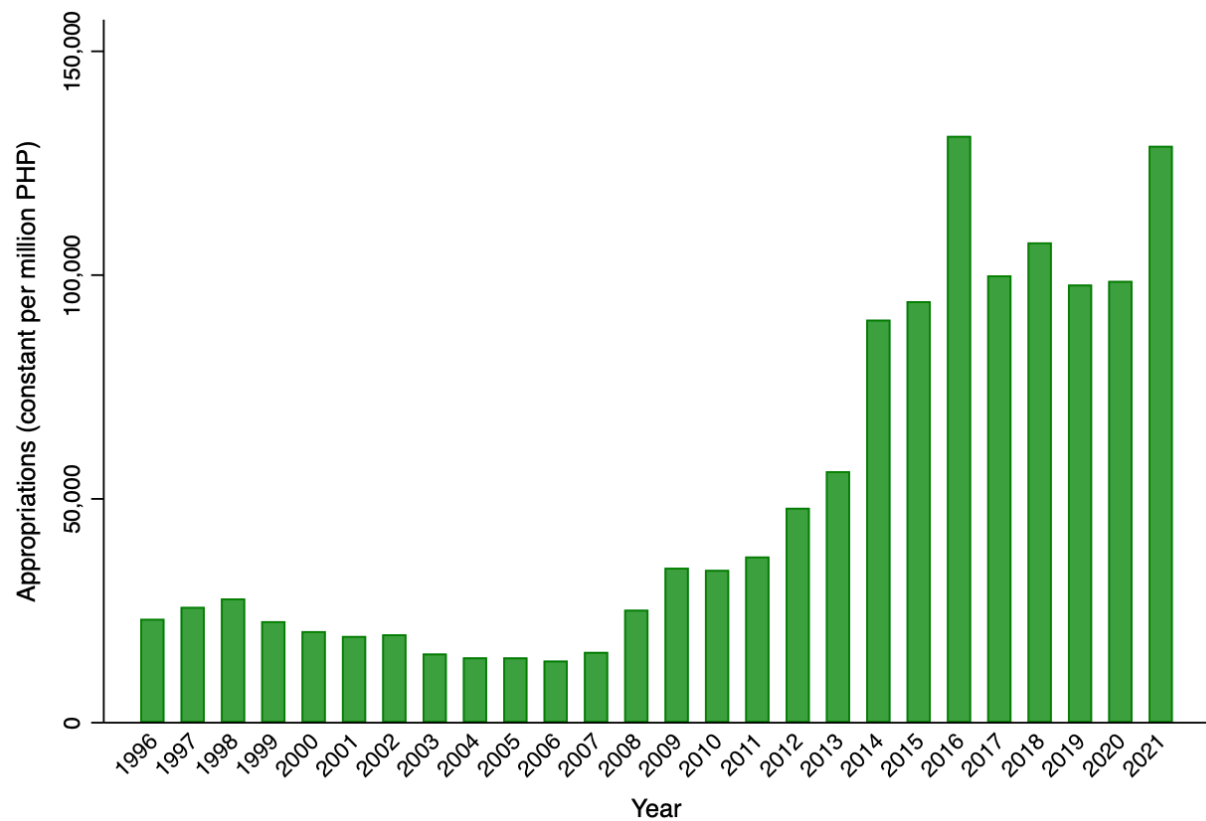
Allocation - process	Integrated in the annual budget process and reviewed annually; IRs are to be assigned to the UHC Expenditure Program according to DOH expenditure plans subject to approval by the Development Budget Coordination Committee (DBCC).
Revenue-expenditure linkage	Not strong; earmarked revenue does not entirely determine expenditure levels
Expenditure level	National and subnational

Sources: Authors' Compilation; Bureau of Internal Revenue (BIR), 2022; Congressional Policy and Budget Research Department (CPBRD), 2017; Kaiser et al., 2016

Various assessments indicate that the law has achieved its original fiscal and health goals. The prevalence of tobacco use substantially decreased over the last decade – evidence suggests that alcohol and tobacco consumption has generally decreased, except for distilled spirits, and cigarettes with a net retail price of PhP11.50 and below that recorded increases in consumption despite increases in the excise tax rates in 2014 (NTRC, 2014), while legal sales and self-reported consumption also declined from 2013 to 2018 by 22.19% and 8.82%, respectively (Lavares et al., 2021). These decreasing consumption trends due to health taxes inducing behavioral responses encourage higher quitting rates, especially in poorer households. The reduced consumption of these products causes a reduction in medical expenditure and an increase in the potential working years of the individual. In fact, it was shown that taxes on sin products, particularly on tobacco, can be progressive and welfare enhancing, therefore, is an effective measure in targeting sensitive, vulnerable, and at-risk groups (Buchanan, 1963).

Since 1996, appropriations to the DOH have increased, with notable increases occurring after 2012, the year the Sin Tax Reform Act was enacted (see **Figure 1**). The increases in overall approved expenditure for public health coincide with the addition of revenue from excise taxes from the Act. Public spending on health per capita increased from US\$20 before the Sin Tax Law to about US\$50 in 2019 (WHO, 2019).

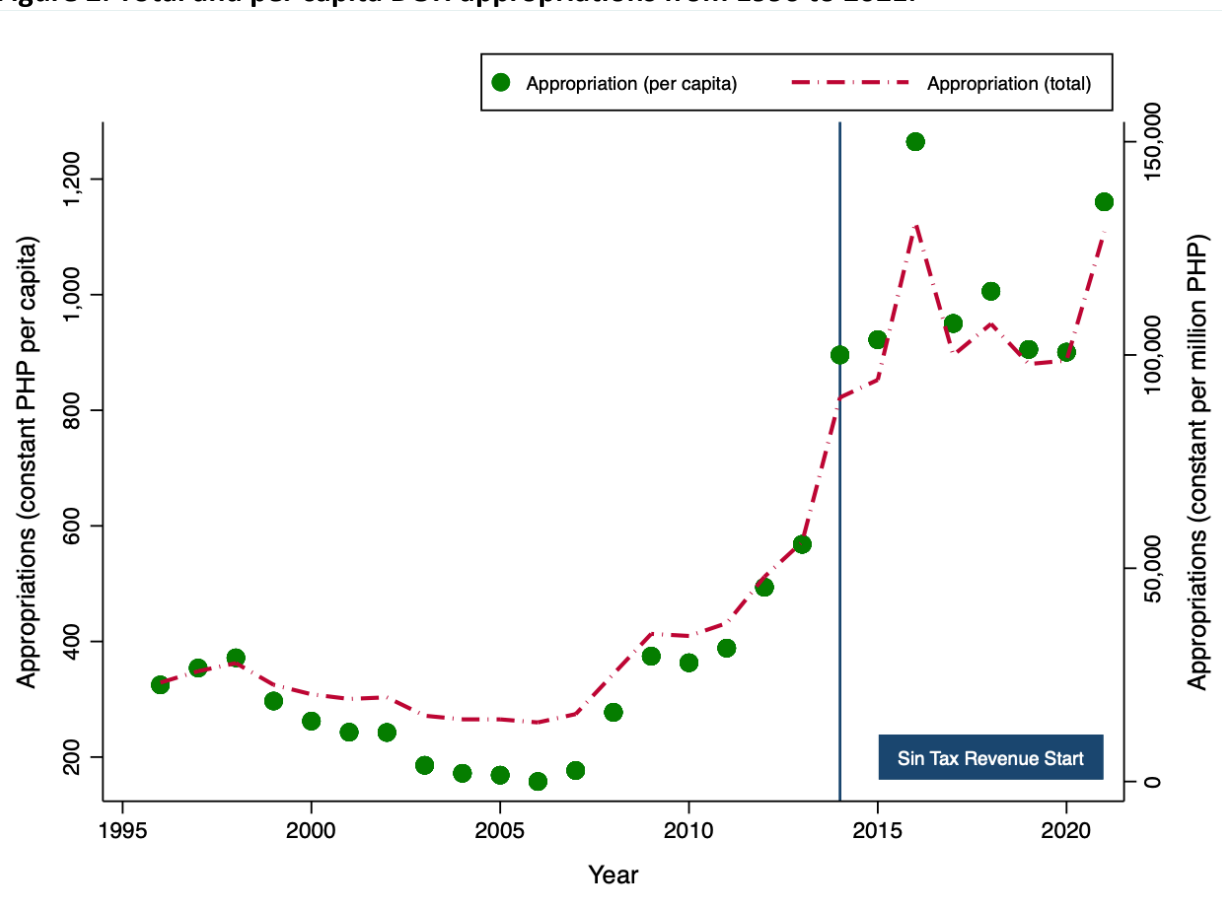
Figure 1. Trends in DOH Appropriations for Expenditure from 1996 to 2021.



Note: GDP Deflator values are based on prices from 2018.

Similarly, per capita appropriations in constant PHP have also increased since 2012 (see **Figure 2**). These trends suggest an increased prioritization of public financing of health over the past decade.

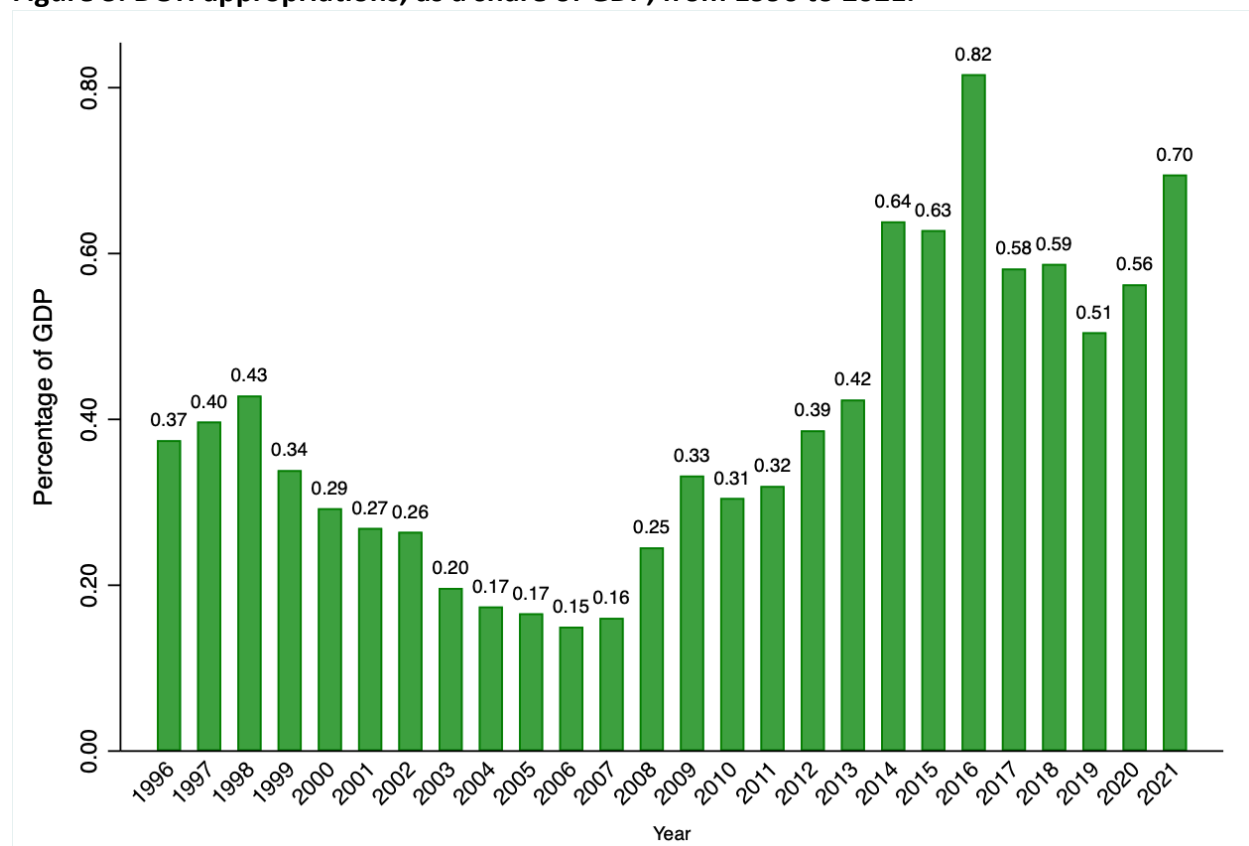
Figure 2. Total and per capita DOH appropriations from 1996 to 2021.



Note: GDP Deflator values are based on prices from 2018. Sin Tax revenues were implemented starting 2014.

Analogous to trends in actual DOH appropriation amounts, the share of DOH appropriations out of GDP in 2021 was almost double that in 1996 (see **Figure 3**). However, DOH appropriations, as a share of GDP, are also inconsistent across years, with shares decreasing after 1998 until 2007, where shares had generally increased until 2016. After 2016, there was a large drop in DOH appropriations share, and shares fluctuated from 0.51 to 0.59% from 2017 to 2020. Since 2019, appropriations, as a share of GDP, increased and the second highest share from 1996 to 2021 was recorded in 2021, reflecting increased prioritization of the national government on health spending in recent years.

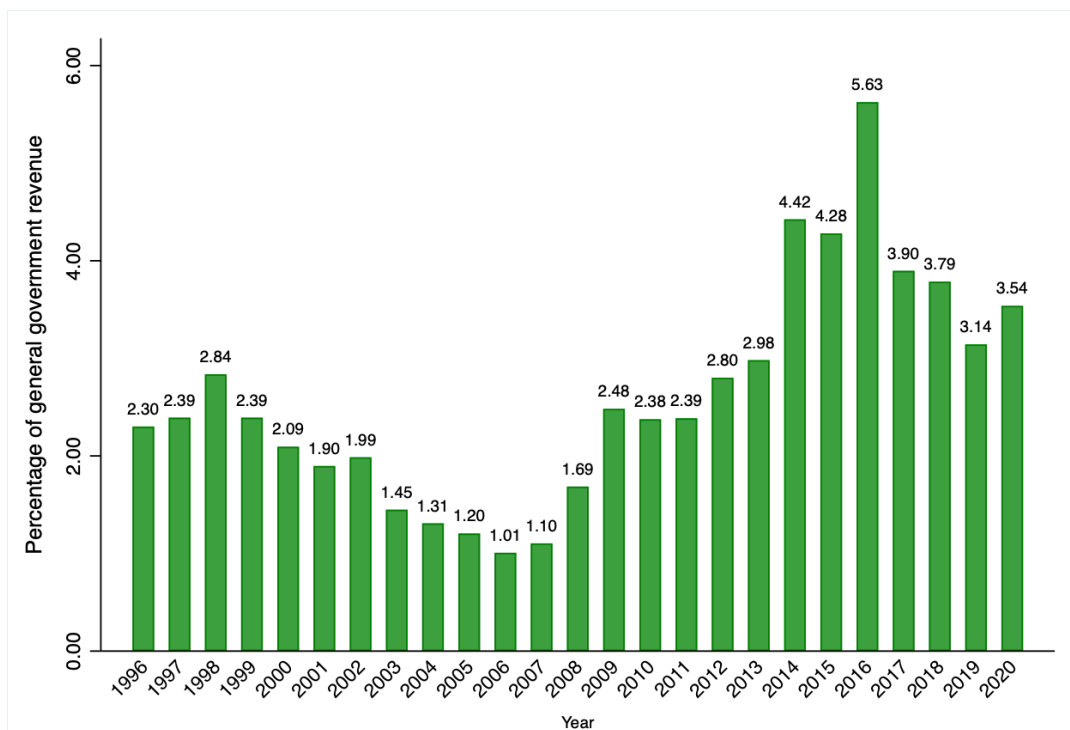
Figure 3. DOH appropriations, as a share of GDP, from 1996 to 2021.



Note: GDP Deflator values are based on prices from 2018.

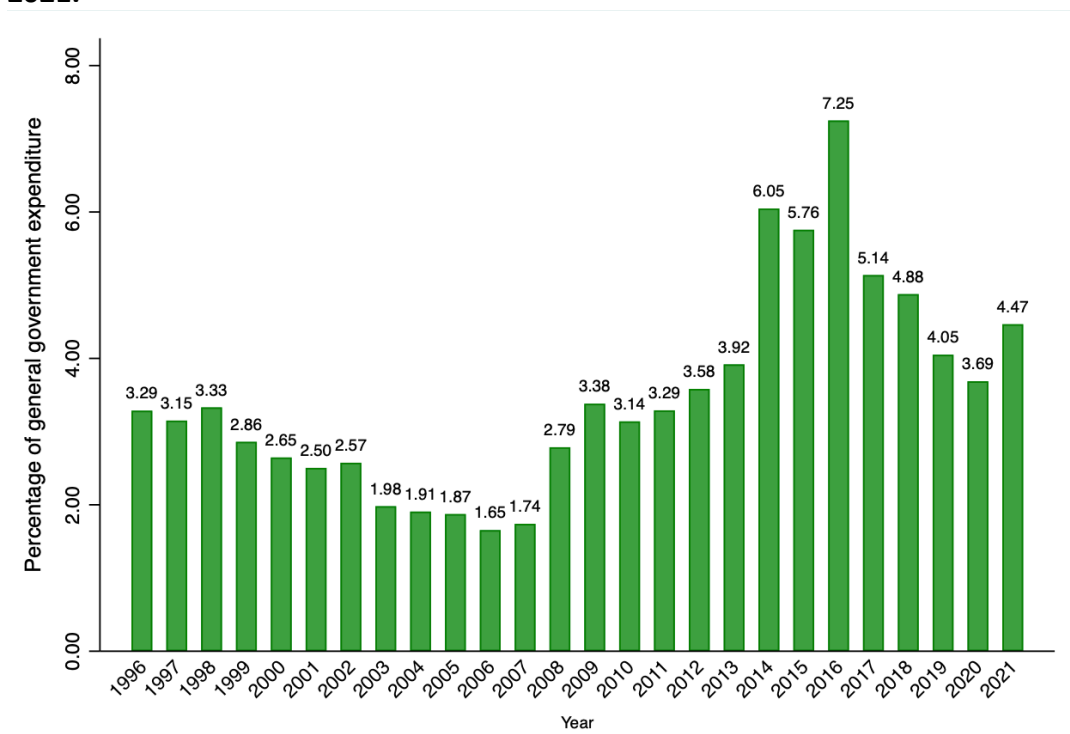
The increased prioritization of national government health spending is also observed in trends of DOH appropriations, as a share of both general government revenue and expenditure (see **Figures 4-5**). Shares out of revenue and expenditure have increased by more than 1% since 1996. As with shares of GDP, DOH appropriation shares of revenue and expenditure are inconsistent, decreasing from 2002 until 2008, where revenue and expenditure for health had generally increased until 2016. It is important to note that shares decreased from 2016 until 2019 for revenue and 2020 for expenditure, respectively, with 2016 shares for both revenue and expenditure being more than 1% greater than shares for 2021. Despite the fluctuations in shares, government revenue and expenditure for health has increased since 2019, also suggesting that, in recent years, the importance placed by the national government on health investment and spending has grown.

Figure 4. DOH appropriations, as a share of general government revenue, from 1996 to 2020.



Note: GDP Deflator values are based on prices from 2018. Revenue data reported only until 2020.

Figure 5. DOH appropriations, as a share of general government expenditure, from 1996 to 2021.



Note: GDP Deflator values are based on prices from 2018.

Notably, the Sin Tax Law also paved way for introducing more tax reform policies against harmful products. In 2018, the Philippine Congress passed the Tax Reform for Acceleration and Inclusion (TRAIN) Act (RA 10963), which imposed additional consumption taxes on products such as sugar-sweetened beverages (SSB) and heated tobacco and vaping products. The tax revenue was used to fund the social program, including health and nutrition. In 2019 and 2020, the Philippine Congress passed further amendments to the Sin Tax Law, with differential rates for various alcohol and tobacco products. For example, in 2020, the tobacco tax rate for classic nicotine products will be PHP45, with an additional PHP5 annually until 2023. After 2024, the incremental tobacco tax for all tobacco will increase by 5% every year.

According to the implementing rules and regulations (IRR) of the STRA (DOH, 2021), the earmarked funds for health in RA 10351, later amended and repealed by RA 11346 and RA 11467, respectively, were intended to support:

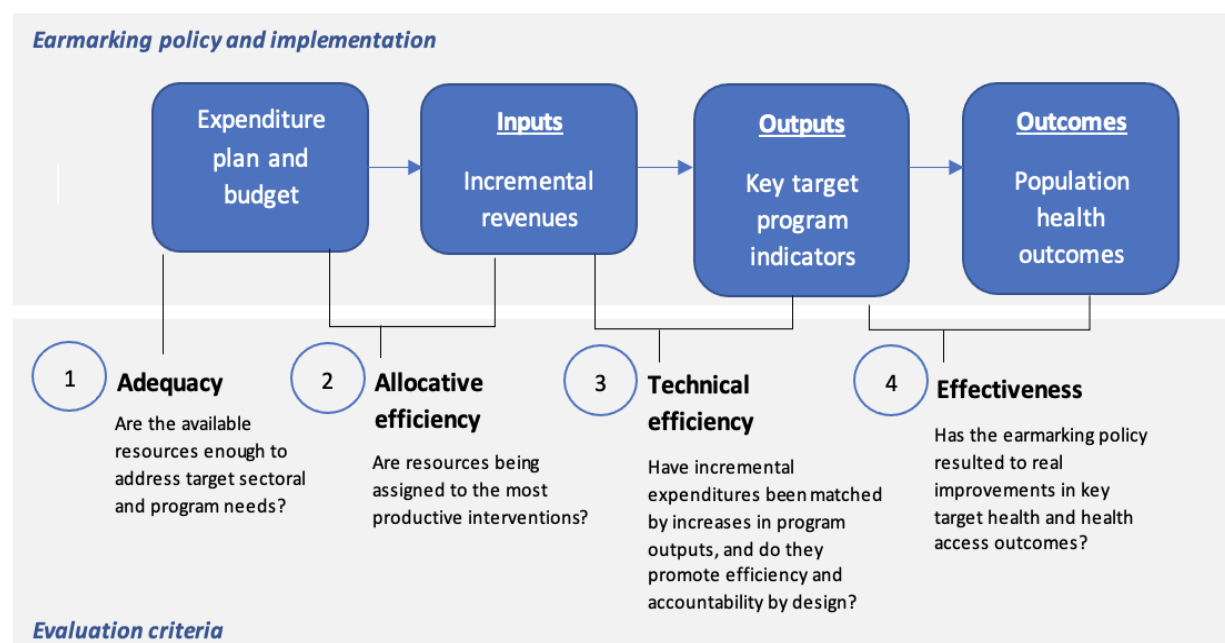
- a) (Rule III) - Allocation for UHC, MDGs, and Health Awareness
 - a. Sec. 2 - Enrollment and coverage of indigent families and members in the informal economy
 - b. Sec. 3 - Strengthening of preventive health programs
 - c. Sec. 4 - Health awareness programs
 - d. Sec. 5 - Implementation research to support UHC
- b) (Rule IV) - Allocation for medical assistance and health facilities enhancement program (HFEP)
 - a. Sec. 2 - Medical assistance
 - b. Sec. 3 - Financial assistance for HFEP
 - c. Sec. 4 - Service delivery networks

4. Data and Methods

4.1. *Conceptual framework*

To achieve the study objectives, we adapted the framework of Pradhan (1996) for reviewing intrasectoral expenditure for health, modified to the context of incremental revenue allocations for UHC and other public health programs. The original framework consists of six elements suitable for an intra- and inter-sectoral public expenditure review. For the purposes of this study, we used a modified intrasectoral framework focusing on four key criteria for evaluating the implementation of the earmarking policy (Kaiser et al., 2016; World Bank, 2020): **adequacy, efficiency, equity, and effectiveness** (Figure 3).

Figure 6. Conceptual framework for the proposed review



Source: Adapted from the World Bank (2020)

Adequacy refers to whether the aggregate levels of revenue are enough to cover the stated sectoral and program-planned expenditures on the one hand and health needs on the other. *Efficiency* describes whether spending is focused on items that maximize social welfare at the lowest possible cost. Allocations are *equitable* if they are designed for and effective at reducing income-based access gaps. Finally, earmarking is *effective* if program outputs achieve the intended population health outcomes.

This study combines an expenditure review with empirical analysis to evaluate the performance of sin tax allocations for the public health sector. We have conducted these in two phases: first, a qualitative policy and process review where we gathered detailed information on how earmarking expenditures are planned, budgeted, and monitored; and second, an expenditure review to assess criteria (1) adequacy, (2) allocative efficiency, and (3) technical efficiency, where we have gathered data year-on-year allocations, utilization, recipient program output indicators, and target health outcomes. The second phase was supplemented with an empirical analysis to assess criterion (4) effectiveness. These are summarized in Table 4 below and described in more detail in the sections that follow.

Table 4. Criteria for evaluation of earmarked revenue allocations

Evaluation criterion	Evaluation methods
Adequacy	Intertemporal comparison of total budget + IR levels to DOH expenditure plans/program priority goals
Efficiency	Allocative: expenditure classification by cost-effectiveness, assessment of whether allocations prioritize high-return and low-cost interventions Technical: compare levels of spending to program output levels; check whether increases in spending been matched by proportional increases in program outputs Process: compare planned vs actual spending to check for signs of inefficiency in budget planning and execution; review whether allocation determination processes
Equity	Expenditure classification by benefit incidence, either through direct targeting of households or through geographic proxy Share of benefit values relative to household income, per income decile
Effectiveness	Dependent variable: program monitoring indicators Independent variable of interest: IR

Source: Adapted from World Bank (2020)

4.2. Policy and process review

For this phase, we have employed a qualitative study design involving a literature search and review of relevant policies and guidelines issued by the Department of Health, including documents relating to the country's health-related MDG targets, fund utilization reports, and other pertinent documents. These have been supplemented with key informant interviews (KII) with the Department of Health and the Philippine Health Insurance Corporation (PhilHealth) to map out the formal processes and challenges of allocating earmarked revenues within the health sector.

In particular, the process of “soft” earmarking between the Department of Health and the Department of Budget and Management (DBM) and the representation of sin tax revenues in the General Appropriations Act (GAA) for the DOH was assessed. Furthermore, the process of using earmarked funds through MDG-related public health programs, medical assistance programs, service delivery networks, and the Health Facilities Enhancement Program was evaluated. Thematic analysis of the transcribed interviews and literature review was implemented.

The public financial management (PFM) framework of the Department of Budget and Management was adapted to guide the discussion of results and to provide insights on issues relating to efficiency, effectiveness, and equity consisting of the following key strategies that drive PFM: (1) policy-based budgeting, (2) comprehensiveness and transparency, (3) credibility of the budget, (4) predictability and control in budget execution, (5) accounting, recording and reporting, and (6) internal and external audit.

4.3. *Review of allocations and expenditures*

To evaluate adequacy, equity, and efficiency, we tracked approved earmarked revenues for health to select DOH program allocations in PhilHealth, public health programs, and HFEP. We evaluated the **adequacy** of allocations in DOH programs based on the annual increase in fiscal space for health, and secondarily how these compare with equivalent programmatic health spending in reference countries.

Assessment of earmarking **efficiency** was based on allocative, technical, and process efficiencies of the intervention. **Allocative efficiency** was measured by comparing the level of budget allocation to the primary care service coverage, local burden of disease, and analysis of intertemporal program line-item budgets accounting obligations, disbursements and balances. To assess **technical efficiency**, the level of spending to the actual increases in program outputs were evaluated by comparing annual budget allocations for different programs and their physical performance indicators to show performance commitments of the DOH specific for the earmarked sin tax revenues, including the commitment of PhilHealth enrolment for the indigent population. **Process efficiency** was evaluated through data collection on actual targets and actual performance in Incremental Revenue for Health Annual Reports and collecting guidelines and interviews about processes in determining individual program budgets, procurement turn-around time for different procurement classifications until the receipt of the end-user. For PhilHealth, the process of enrolment of indigent members shall be assessed.

For **equity**, allocations must be strategically targeted to reduce inequalities in access to health services as what the earmarking of resources was aimed to provide. Data gathered include indigent and government-sponsored beneficiaries enrolled under the NHIP for the list of HFEP-funded projects per geographic location to see how expenditures targeted the households that most benefit them either through direct targeting of these households or by geographic proxy.

4.3.1. Estimating the effect of earmarking on program implementation and health outcomes

Finally, to evaluate **effectiveness**, health allocations and expenditures were also reviewed to assess whether the earmarking policy resulted in real differences in intermediate or program implementation outcome indicators. Table 5 below shows the programs and their corresponding indicators that were selected for assessment in this study. In selecting these programs, the following criteria was followed:

1. Program has been a **consistent recipients** of IR allocations since the enactment of the Sin Tax Law;
2. Has clear, measurable, and trackable program implementation monitoring data throughout the years of interest; and
3. Has clear, measurable, and trackable population or health outcome data throughout the years of interest.

Table 5. Health outcome indicators

Program/Subprogram	Indicator	Numerator	Denominator
Health Facilities Enhancement	Number of annual projects started		
	Number of annual projects completed		
	Completed-Started Project Ratio	Number of annual projects completed	Number of annual projects started
National Health Insurance	Number of indigent and sponsored beneficiaries		
Family Health	Modern contraceptive coverage among women of reproductive age	Users of modern contraceptive methods in a given year	Total population of women aged 15-49 years old in a given year
National Immunization	DTP3 immunization coverage	One year-olds who have received three doses of the combined diphtheria, tetanus toxoid and pertussis vaccine in a given year	Total population of one-year olds in a given year
Tuberculosis	TB Treatment Success Rate	Number of new, relapse, and retreatment cases that completed treatment or were cured in a given year	Total cohort number of TB cases that underwent treatment in a given year
	TB Case Detection Rate	Number of new and relapse cases diagnosed and treated under National TB Control program in a given year	Estimated incidence of TB cases in a given year
	TB Incidence (per 100,000 population)	Estimated number of new and relapse cases in a given year	Total population (per 100,000) in a given year

The programs above were chosen based on their share of Sin Tax revenue allocations and on the WHO Monitoring and Evaluation (M&E) framework for measuring primary healthcare performance in the country (WHO, 2022). The NHIP was selected due to receiving the majority of Sin Tax revenues and the increase in subsidies to indigent and sponsored members provided by the national government since 2012 and measure the extent of financial protection for impoverished populations through membership coverage of indigent and sponsored members.

The HFEP was selected due to being part of the 20% of allocations from Sin Tax revenues in support of service delivery networks and to measure the support provided to physical infrastructure in the health system through HFEP projects. The Family Health program, National Immunization Program (NIP), and Tuberculosis (TB) Control Program were chosen, as these programs provide

services that are included among the WHO core indicators for measuring service coverage towards UHC and the strength of health systems in preventing, diagnosing, and treating diseases across different demographics. As the NIP provides multiple vaccines as part of its full immunization course, DTP3 immunization was selected since it is a core indicator across multiple countries used to monitor the accessibility of vaccines and completeness of care during the first year of life.

Table 6 shows a summary of the data sources used in this study, including alternative data taken from agencies and organizations including WHO, UN Population Division, and the World Bank. Available historical data from the past 25 years was used and supplemented by the key informant interviews from various offices in the Department of Health and PhilHealth.

Table 6. Data Sources

Source	Agency	Year Range	Relevant Variables
General Appropriations Act Reports	DBM	1996 - 2021	Appropriations for DOH and PhilHealth relevant programs/subprograms Changes in program/subprogram structures
Financial Accomplishment Reports	DOH	2014 - 2021	Program obligations and disbursements
Sin Tax Reform Act Annual Report		2014 - 2021	Amount of revenues to DOH Specific allotment of revenues to DOH programs/subprograms
Field Health Services Information System (FHSIS) Report		2000 - 2021	Current users of modern contraceptive methods
HFEP Project Data		2010 - 2021	Number of annual projects started and completed Number of started projects by healthcare facility classification
NHIP Membership data	PhilHealth	2011 - 2021	Number of indigent and sponsored beneficiaries
Poverty Incidence	PSA	2015; 2018; 2021	Poverty incidence per geographic location
Consumer Price Index Reports		2000; 2006; 2012; 2018	Change in average retail prices for commonly purchased goods and services
DTP3 Immunization data	WHO	1999 - 2021	DTP3 immunization coverage among 1-year olds and below DTP3 doses administered
TB Treatment Outcomes data		1996-2019	TB Treatment Success Rate for new, relapse, and retreatment cases
Burden of Tuberculosis data		2000 - 2020	TB Case detection rate TB Incidence

Total population of women by single age groups	United Nations Population Division	1996 - 2021	Total population of women of reproductive age (aged 15-49 years old)
World Development Indicators data	World Bank	1996 to 2021	Total population number Constant GDP GDP per capita growth General government expenditure (constant PHP; % of GDP) Government health expenditure (% of GDP, total health expenditure; total government expenditure) General government revenue (constant) Tax Revenue (constant; % of GDP)

Data from different sources were processed for years 1996 to 2021, based on the availability of data, under a standardized data table structure that linked data to programs per year. See **Appendix A** for some of the data quality issues that came up in the process of analysis, and solutions that were adopted to address them.

All data in local currency were adjusted for changes in price level across years using GDP deflator values, based on prices in 2018. After applying the GDP deflator, total DOH appropriations and appropriations per program were divided by annual population counts to obtain per capita appropriations. Total DOH appropriations were divided by GDP, general government expenditure, and general government revenue to obtain shares of DOH appropriations out of total and government goods and services provided and financed in the country.

For public health services, changes in service coverage from previous year were calculated and used as the indicator of changes in health outcomes in calculating cost-effectiveness of program projects and activities per year. Additionally, cost-effectiveness ratios were also calculated for the number of completed HFEP projects per year, with the assumption that support from the program was required to complete projects.

4.3.2. Regression analysis²

The first goal with the regression analysis for this study was to measure the effect of the STRA on the appropriations from the GAA towards programs for health, mainly under the DOH. We used the ARMAX model, where we model our outcome variable as an Auto Regressive Moving Average (ARMA) disturbance process in terms of a linear combination of independent variables.

Subsequently, to measure attribution of program budget increases with program outcome indicators (using available data for budget, expenditure, and program indicators limited to time variations on the *national level*), we fit these variables into an Auto Regressive Distributed Lag (ARDL) model to account for autoregressive components for both our program outcome variable

² These models only rely on a small sample of observations. Hence, we see our regression results as preliminary to help give direction to more concentrated studies on program expenditure and outcomes.

and program specific-expenditure variable of interest. A reparameterization in conditional Error Correction (EC) form is possible to isolate the long-run effects. For the program outcomes, we establish our hypotheses using the time-series charts over the period 1996 to 2020 and use the ARDL models to firmly establish the long-run trend between the changes in program budgets and program outcome indicators. See **Appendix B** for further discussion on the study's time-series models.

5. Results and Discussion

5.1. Public financial management of earmarked Sin Tax revenues for health

5.1.1. Policy-based budgeting

Establishing the political priority for health initiatives, specifically for universal healthcare, has been a key driving force for policy reform on earmarking sin tax revenues. The increasing general appropriations in the Department of Health (DOH) have effectively increased fiscal space for the agency to support health-related Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), indigent enrollment to social health insurance (Philippine Health Insurance Corporation [PhilHealth]), and infrastructure support for public health facilities. With these financial measures in place that have effectively increased the general appropriations of the DOH, evaluation of the management and utilization of funds is important to describe how the STRA has affected the budget and implementation of different public health programs.

Overview of the Budget Allocation Process

Sin tax revenues are downloaded as a lump sum in the General Appropriations for the DOH together with the National Government counterpart funding. Specifically for RA 10351, a certification of the amount to be received from the STRA is provided by the Department of Budget and Management (DBM) to the DOH before receipt of the General Appropriations. This is an estimated amount of revenues that may increase or decrease and be adjusted in the next fiscal year. For RA 11346 and RA 11467, the amount of revenues will not be estimated anymore, rather the sin tax revenues downloaded into the General Appropriations are the actual amount collected from the previous fiscal year.

Sin tax revenues allocated for health attributes its budget to two general clusters: (1) allocation for universal healthcare (UHC), MDGs (now SDGs), and health awareness, and (2) allocation for the Medical Assistance Program (MAP), and Health Enhancement Facilities Program (HFEP). Furthermore, the first cluster of attribution, which makes up 80% of the total sin tax revenue for health, provides financing for the following health agendas: enrolment and coverage of indigent families and members in the informal economy, strengthening of preventive health programs towards the attainment of MDGs, and health awareness programs; while the second cluster, made up of 20% of total funds, covers medical assistance, health facilities enhancement, and service delivery networks (SDN). Programs for implementation funded by the general appropriations are consistently aligned with the Philippine Development Plan for health and Medium-Term Expenditure Program of the agency. Further, attributions of health programs to the sin tax revenues

are based on the approved version of the STRA and its implementing rules and regulations. Table 7 shows a matrix comparing the implementing rules and regulations of RA 10351 related to the utilization of revenues for health and the actual program allocations made by the DOH:

Table 7. Provision of RA 10351 and specific program allocations

Specific Allocation (Department of Health)	Provision in IRR
Rule III - Allocation for UHC, MDGs, and Health Awareness (80%)	
Sec. 2. Enrollment and Coverage of Indigent Families and members in the informal economy	
National Health Insurance Program	Enrollment and coverage of indigent family members in the informal economy.
Sec. 3. Strengthening of Preventive Health Programs towards Attainment of MDGs	
Public Health Management	Preventing CDs and NCDs, e.g., smoking cessation, alcohol abuse clinics. Effectively target risk factors in the incidence of prevalent diseases in the country, support the attainment of national objectives for health, and ultimately affect the attainment of MDGs.
National Immunization	
Family Health, Nutrition and Responsible Parenting	
Elimination of Disease such as Malaria, Schistosomiasis, Leprosy and Filariasis	
Rabies Control	
Prevention and Control of Other Infectious Disease	
Operation of the PNAC Secretariat	
TB Control	
Assistance to the Philippine Tuberculosis Society	
Prevention and Control of NCDs	
Environmental and Occupational Health	
Epidemiology and Surveillance	
Health Emergency Preparedness and Response	
Human Resources for Health Deployment	
Pharmaceutical Management	
Non-communicable Diseases	
Sec. 4. Health Awareness Programs	
Health Promotion	For health promotion and communication processes at the national level that seek to spread healthy practices and heighten health-seeking behavior in the population, thereby increasing the demand for and availment of high quality promotive, preventive, curative and rehabilitative health care information and services.
Sec. 5. Implementation Research to Support UHC	
Health Sector Research Development	Research in determining the national workforce requirement for health care, innovations in health systems, and service delivery networks that have proven effective in improving health outcomes, replicating relevant best practices, and monitoring the

	outcomes of and removing the barriers to implementation. No specific provision in the STRA IRR
Hospital Operations*	
Quick Response Fund*	
Health Policy, Regulations, and Administration of Personnel Benefits*	
Health Facilities Enhancement Program including CO of DOH Hospitals*	
Implementation of Doctors to the Barrios*	
Rule IV - Allocation for Medical Assistance and Health Enhancement Facilities Program (20%)	
Sec. 2. Medical Assistance	
Assistance to Indigent Patients either Confined or Out-Patients in Government Hospitals/Specialty Hospitals/LGU Hospitals/PGH/ West Visayas State University Hospital	Twenty percent (20%) of the balance of the incremental revenue computed shall be allocated for medical assistance and the health enhancement facilities program.
Sec. 3. Financial Assistance for Health Enhancement Facilities Program (HEFP)	
Health Facilities Enhancement Program	The DOH shall, upon determination of necessity based on credible data provided by the local health office, among others, and subject to appropriate guidelines, provide financial assistance for the continued improvement of government hospitals and government-owned health facilities with at least 20% of their patients utilizing PhilHealth in paying for health care expenditures. Government hospitals and government-owned health facilities in GIDAs shall only need to demonstrate that at least 10% of their patients utilize PhilHealth in paying for health care expenditures. Additional funding shall be allocated only upon verification that no less than 60% of previous HFEP or other funding allocations in favor of the concerned LGU have been obligated.
Sec. 4. Service Delivery Networks	
Human Resources for Health and Institutional Capacity Local Health Systems Development Assistance	The health enhancement facilities program, through the service delivery networks (SDNs) or local health referral systems shall hire skilled health professionals and other allied health professionals with clinical competencies required to deliver quality health care services provided in their facility. The SDNs shall be a basis for estimating the requirements for medical assistance and the health enhancement facilities program.
Implementation of Doctors to the Barrios	No specific provision in the STRA IRR
Note: *Funded under a new item called <i>Access to Quality Services</i> which is not part of the intended programs to be supported by STRA	

Preventive health programs to attain MDG or SDG targets have consistently been the item with a diverse set of programs that are implemented from eight (8) programs in 2014 consisting of the National Immunization Program; Elimination of Diseases such as Malaria, Schistosomiasis, Leprosy and Filariasis; Rabies Control; Prevention and Control of Other Infectious Diseases; Tuberculosis Control; Environmental and Occupational Health; and, Non-communicable Diseases. This was later on expanded to include fifteen (15) programs with consistent attributions beginning in 2019.

Budget Allocation in Practice

As a major driver for population coverage to implement universal healthcare in the country, the STRA has funded the enrollment of the indigent population as indirect contributors to PhilHealth. These indigent enrolments are based on the approved list of indigent population from the Department of Social Welfare and Development (DSWD). Those who are assessed to be financially incapable to pay premiums are entitled to government subsidy for the given year and are assessed annually for renewal³. ***Enrolment of indigents has been the only consistent line item in the overall attributions of sin tax revenues from 2014 to present and also receives the highest attribution annually ranging from 45% to 75% of total sin tax revenues for the year.***

Allocations of DOH programs to sin tax revenues have iterated through the years. Early in the implementation of the STRA, the agency included hospital operations, quick response fund implementation of doctors to the barrios, and health policy and regulations as a group of services under a new item not included in the implementing rules and regulations on Access to Quality Services which was tagged to the allocations for UHC, MDGs, and health awareness. Throughout the allotment for the implementation of the doctors to the barrios program, funding has steadily increased from 89 million Pesos to almost 5 billion pesos from 2014 to 2018 (see Table 8). However, after one year of implementation of the doctors to the barrios program under Access to Quality Services in 2014, it was later realigned into the 20% allocation in medical assistance and health enhancement facilities program. In 2018, the implementation of the doctors to the barrios was renamed to Human resources for health deployment program and returned to its initial tagging for the 80% allocation for UHC, MDGs, and health awareness.

³ PhilHealth Circular No. 2022-0013

Table 8. Distribution of sin tax revenue attribution per program, in Billion Pesos, 2014-2021⁴

Prescribed Allocation	Budget Line Item	2014		2015		2016		2017		2018		2019		2020		2021	
		Increment	%	Increment	%	Increment	%	Increment	%	Increment	%	Increment	%	Increment	%	Increment	%
80% NHIP/MDG/ Health Awareness	Enrolment Coverage	22.70	66.87	24.56	45.80	31.26	62.06	40.59	58.89	48	72.13	54.72	74.14	58.72	62.76	16.91	50.50
	Attainment of MDGs	1.68	4.96	3.41	6.36	3.25	6.45	11.43	16.58								
	Health Awareness Programs	0.03	0.03	0.01	0.02	0.04	0.08			0.16	0.24	0.19	0.26	0.17	0.18	0.06	0.18
	Implementation of Doctors to the Barrios	0.09	0.26														
	Hospital Operations	2.17	6.40	1.33	2.48	5.58	11.08	15.76	22.87								
	Health Policy & Regulations	0.14	0.42	0.03	0.06	7.56	15.01	7.7	11.56								
	Quick Response Fund	0.5	1.47	0.5	0.93	0.51	1.01										
	Health Facilities Enhancement Program including CO of DOH Hospitals			2.87	5.35	7.45	14.79	0.61	0.89								
	Implementation Research to Support UHC									0.11	0.17	0.08	0.11	0.11	0.12	0.04	0.12
	Strengthening Preventive Health Programs									8.72	13.10	17.71	24.01	15.84	16.93	9.783	29.20
	Assistance to Indigent Patients	3.19	9.41														

⁴ Adapted from Sin Tax Law Incremental Revenue for Health Annual Reports 2014-2021, percent distribution recomputed based on the reported GAA of the same report provided in a separate dataset or table due to discrepancies in data in the document.

20% for MAP & HEFP	Confined in Govt Hospitals (MAP)														
	Medical assistance to indigent patients including provision of medicines	2.7 2	5.0 7	3.7 3	7.4 1	3.9 8	5.7 7	4.8 7	7.3 2	9.3 82	12. 71	10. 48	11. 20	4.4 7	13. 35
	Health enhancement facilities program	2.6 7	4.9 8	5.8 6	11. 63	10. 02	14. 54	9.0 0	13. 52	8.5 7	11. 61	7.8 4	8.3 8	2.0 6	6.1 5
	Implementation of doctors to the barrios	1.3 8	2.5 7	4.1 6	8.2 6	4.9 4	7.1 7								
	Service Delivery Networks							0.1 8	0.2 7	0.2 3	0.3 1	0.3 9	0.4 2	0.1 7	0.5 0

The line item on hospital operations funded for the capital outlay of special hospitals, medical centers and institutes for disease prevention and control, dangerous drug abuse treatment and rehabilitation centers (TRCs), and blood centers. TRCs are government facilities that treat drug abuse patients, including those suffering from substance abuse and alcohol abuse, which covers the initial goal of the STRA to fund the operations of alcohol abuse clinics with the overarching goal of reducing the consumption of alcohol through tax reform and treatment and rehabilitation. **However, the DOH does not have a smoking cessation program which is part of the programs that should be funded by the STRA.**

Misalignments between budget attributions and policy objectives are further noted. An item on the Health Facilities Enhancement Program including Equipment Outlay of DOH Hospitals from 2015 to 2017 was created under *Access to Quality Services*. In 2016, the budget allocation was used to enhance barangay health stations and rural/urban health units for PhilHealth accreditation, building school health centers, and creation of mobile dental clinics. This should be differentiated from the Health Enhancement Facilities Program which should be attributed to the 20% MAP and HEFP. Upon the removal of the line item for HFEP and Capital Outlay, all DOH assistance for health facilities in local governments has been collated in the HEFP allocation.

Furthermore, a quick response fund, with a uniform attribution of 0.5% corresponding to almost half a billion for every fiscal year, was included as part of *Access to Quality Services* from 2014 to 2016 which is used as an expedited source of financing during disasters, including, but not limited to, typhoons, volcanic eruptions, and pandemics.

In 2018, line items for every allocation of sin tax revenues have been clearly listed and based on the implementing rules and regulations of the STRA, for the allocation for UHC, MDGs, and health awareness namely: (1) PhilHealth enrolment for indigent members; (2) strengthening preventive health programs which covers public health programs related to MDGs and SDGs; (3) health awareness; and, (4) implementation research to support UHC which only started in 2018 through the Health Sector Research Development (HSRD) Program. While for allocation for MAP and HEFP, the following line items were iterated in 2018: (1) medical assistance; (2) financial assistance for health enhancement facilities program; and, (3) service delivery networks. These clarifications in line items were done in time for the approval of the Universal Healthcare Act (RA 11223) in the first quarter of 2019.

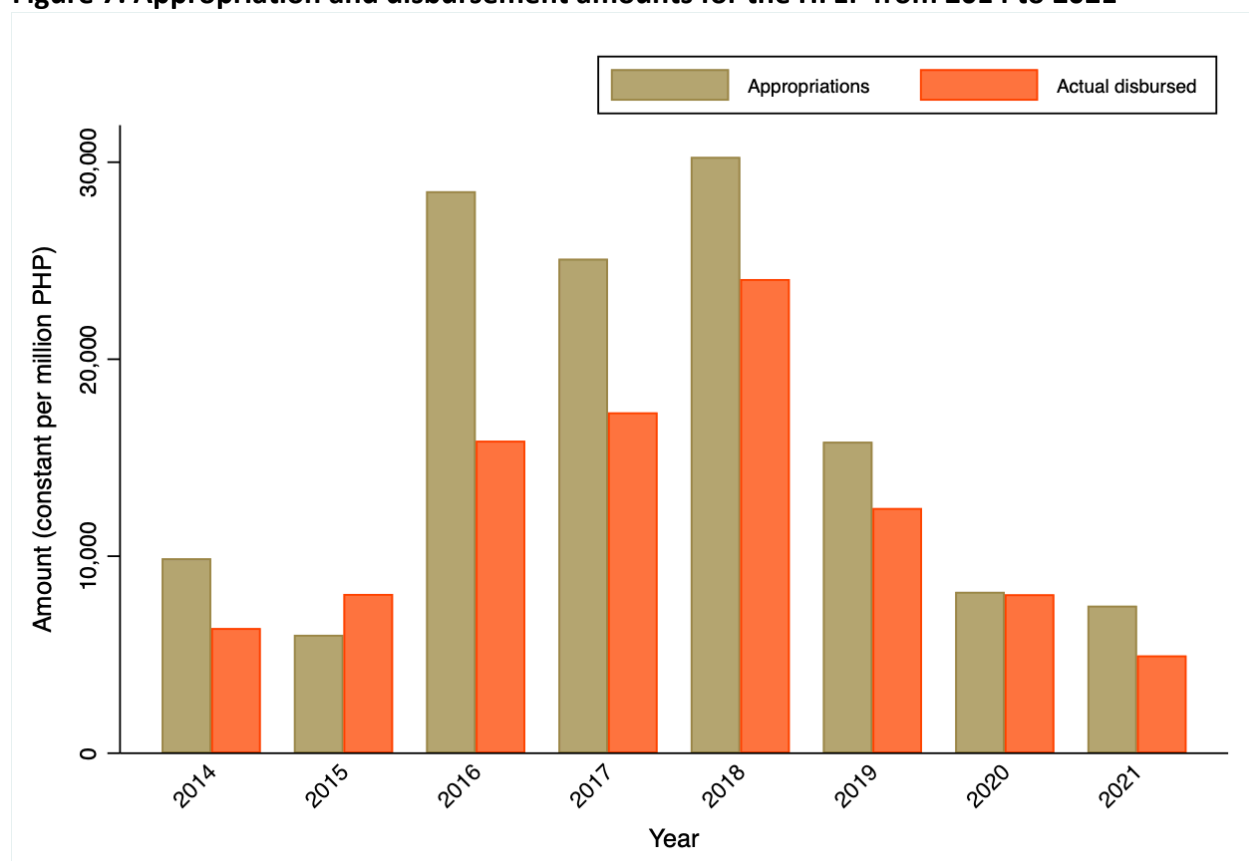
Overall, programs with budget attributions from Sin tax revenues have iterations almost for every fiscal year. The reason for tagging programs into the 80% allocation and then to the 20% allocation year-on-year, or vice versa, is not clear and provides policy gaps in terms of authorization of attribution to these programs. Furthermore, as the fiscal space for health increases every year, justification for the inclusion of new programs related to the objectives for health of the STRA is understandable, however, **the rapid increase in the number of programs should also be considered as the funding of a large number of programs may reduce the effectiveness of the STRA** as a measure to increase the budget of its most important objectives not to mention, there are also programs that the STRA is supposed to fund but is not yet existent within the DOH (e.g. smoking cessation).

5.1.2. Comprehensiveness and transparency

The actual utilization of the appropriated budget by the different programs are governed by the cash-based budgeting system of the DBM which limits the budget implementation to one fiscal year. Therefore, the annual budget of the DOH should contain the projected amounts for programs, activities, and projects that can be implemented and paid for from January to December of the fiscal year. By 2019, the disbursements for the Health Facilities Enhancement Program should be transferred to the Local Government Units (LGU) within the fiscal year.

However, despite an increase in allocated funds, these may not be consistently utilized by the programs. From 2014- 2021, the median disbursement rate for the HFEP was 74%, suggesting that **although the majority of annual appropriations allocated were utilized in program activities and operations, not all funds are utilized each year, and the disbursement rate may not increase proportionately with increases in appropriations** (see Figure 7). In 2015, the actual disbursed amount was greater than what was officially allocated by the DBM, resulting in a utilization rate higher than 100%. This inconsistency may be due to the official DOH obligation and disbursement for the HFEP including funds from other sources aside from the appropriated funds for that year and the actual disbursement of funds allocated by the DBM for the fiscal year may actually be lower.

Figure 7. Appropriation and disbursement amounts for the HFEP from 2014 to 2021



Note: Disbursement data only available for 2014-2021

From the beginning of the implementation of cash-based budgeting, the actual disbursements of HFEP have also been consistently below its approved appropriations for the year. This incomplete use of funds leads to unimplemented facility enhancements or the building of new health facilities which reduces the capacity of the DOH to reach its annual targets for HFEP. Furthermore, the Commission on Audit (COA) has also flagged HFEP due to idle/unused equipment which was attributed to the procurement of equipment that was not appropriate for the needs of the recipient facilities and inadequate procurement planning⁵.

Other reasons stated by the DOH that has led to the underutilization of HFEP funds are the incapacity of the LGUs to prepare for contracts and land to be utilized to be the facility. The reduced absorptive capacity of HFEP to utilize appropriated funds has led to a cutback in budget consistent after 2018. The reduced budget allotment has, however, allowed the program to limit its unutilized funds and better use its budget, and meet its obligations for the past three years (2019-2021) compared to previous fiscal years.

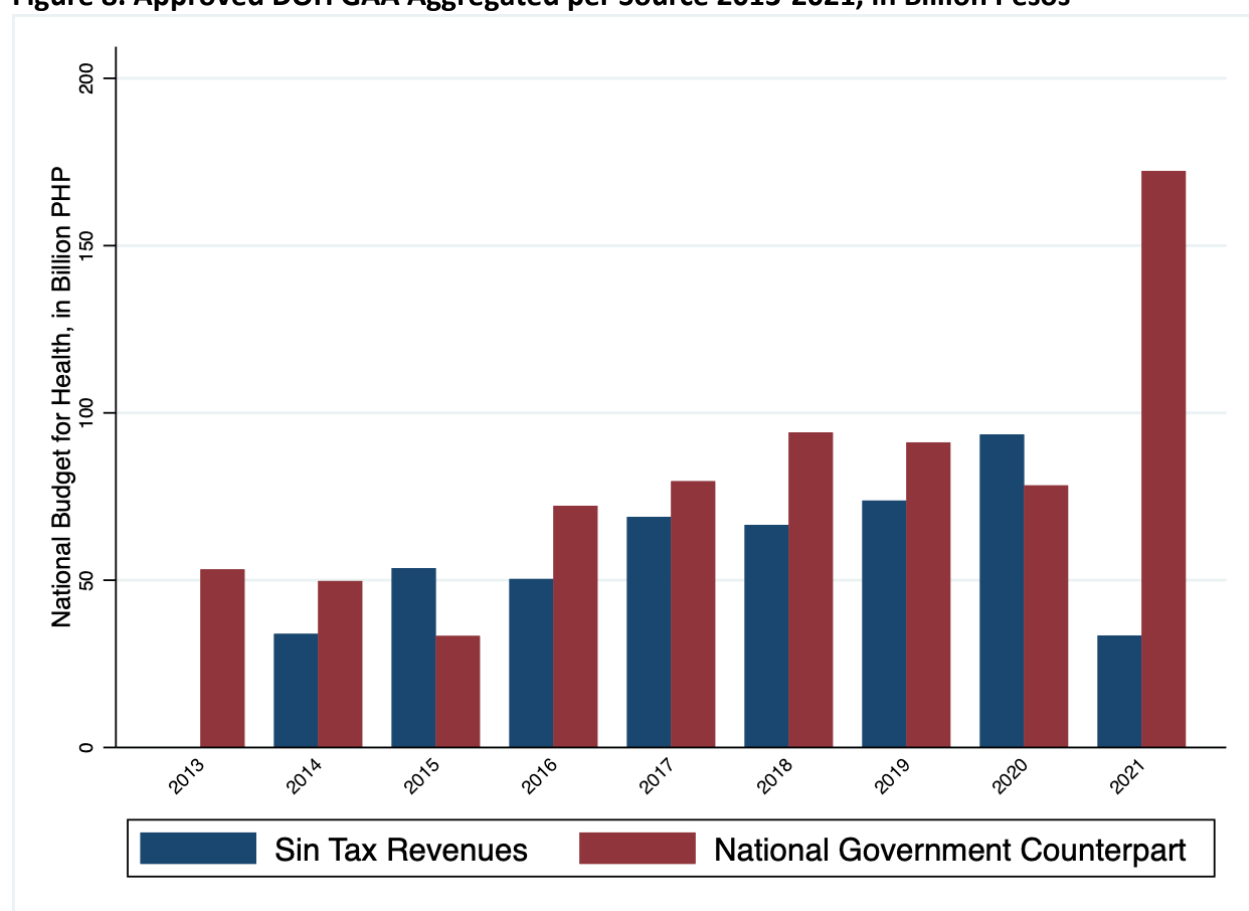
5.1.3. Credibility of the budget

Unstable budget sources for fiscal space expansion

The **STRA has been an effective measure to increase fiscal space for health**, however, the increase in the national budget approved for the DOH is not only because of the inflow of sin tax revenues. The impact of national government funding for health has been increasing (see **Figure 8**) in reference to its baseline amount in 2013 to supplement the approved budget for the agency not covered by sin tax revenues. 2021 was a transition period of the STRA as amended by RA 11346 and RA 11467 which explains the limited budget received from sin tax revenues, while it also served as the year with intensified COVID-19 pandemic efforts thereby increasing national government funding significantly.

⁵ Commission on Audit Performance Audit Report, PAO 2017-05: Health Facilities Enhancement Program

Figure 8. Approved DOH GAA Aggregated per Source 2013-2021, in Billion Pesos



The two sources of national budget for health has ensured that the overall General Appropriations Act (GAA) allocation for the DOH is increasing intertemporally and has allowed the agency to create new programs to support implementation of public health programs, enhancement of facilities, enrollment of indigents to PhilHealth, and promote research and development for health.

RA 11223, or the Universal Healthcare Law, has further increased funding sources to implement universal healthcare programs through the remittance of 50% of the national government share from the profits of the Philippine Amusement and Gaming Corporation (PAGCOR) and 40% charity fund of the Philippine Charity Sweepstakes Office (PCSO)⁶ to the GAA which will be used for PhilHealth benefit packages on medical surgeries, hemodialysis, implants, transplants, and other select procedures. The funding for benefit package expansion shall be released to PhilHealth beginning in 2023.

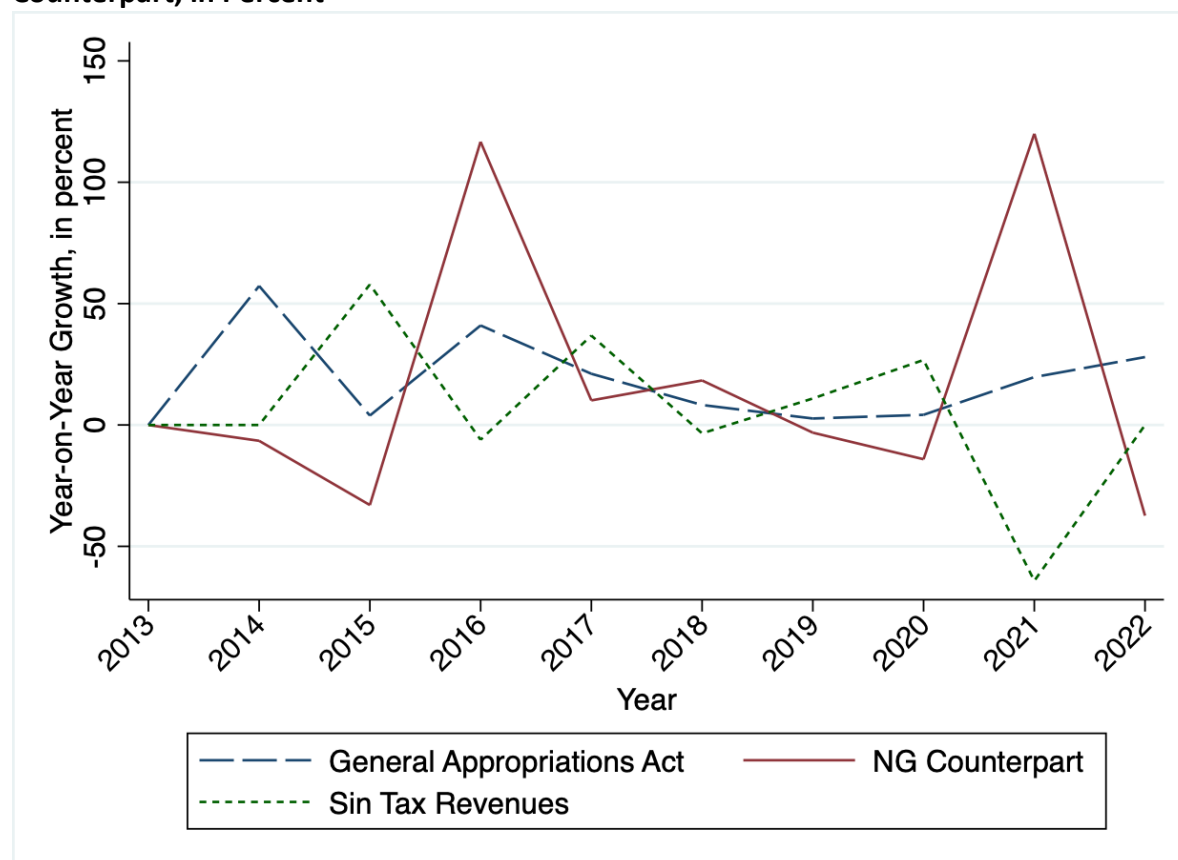
The STRA has been an effective measure to increase fiscal space for health, however, the increase in national budget is not constantly increasing every year as both funding sources supplement each other in financing for the approved budget of the agency. In Figure 9, it can be seen that an increase or decrease in growth from sin tax revenues is supplemented by a reverse increase or decrease on the national government counterpart which hampers the allocative

⁶ Presidential Decree No. 1869 and RA 1169 as amended by RA 11223 and operationalized by Joint Circular No. 0001 s. 2022

efficiency of funding allocations by both financing sources. Thus, having additional sources of funding does not exactly guarantee more money for health in a single-source perspective⁷.

An effective health financing framework should anchor primarily on the national government investment which would ensure that public health programs and universal healthcare strategies can sustainably be implemented without supplement funding sources. This strategy would also ensure that the national government prioritizes the health sector continuously and support the transition and implementation of universal healthcare.

Figure 9. Year-on-Year Growth of DOH GAA, Sin Tax Revenues, and National Government Counterpart, in Percent



Fungibility of budget allocation in DOH programs

The STRA allowed the DOH to retain the implementation of previous public health programs and increase the number of programs as part of the country's UHC strategy. Figure 10 below shows the share of family health, TB control, immunization, health facilities enhancement programs and PhilHealth to the DOH GAA. The trend shows significant variability in budget allocations including the shift in budget prioritization resulting to high fungibility of budget allocations as the number of programs increase. Furthermore, Figure 11 describes the percent share of budget

⁷ Bloom, D. (2022) describes an agnostic perspective on earmarking taxes for health and ways in which specific tax revenues allocated specifically for public health measures does not always lead to budget protection.

allocations for select programs which shows that for programs that have been implemented before the STRA, e.g., Family Health, TB Control, and Immunization. There is no significant increase in percent share to the total budget of DOH while relatively new programs, such as PhilHealth indigent membership and HFEP, take up majority of the share of the DOH budget. This shows how the STRA attributions, and the GAA in general, is spread too thin due to the numerous new and revitalized programs that the DOH needs to allocate resources to.

Figure 10. Share of Select Programs in the DOH GAA, in Billion Pesos

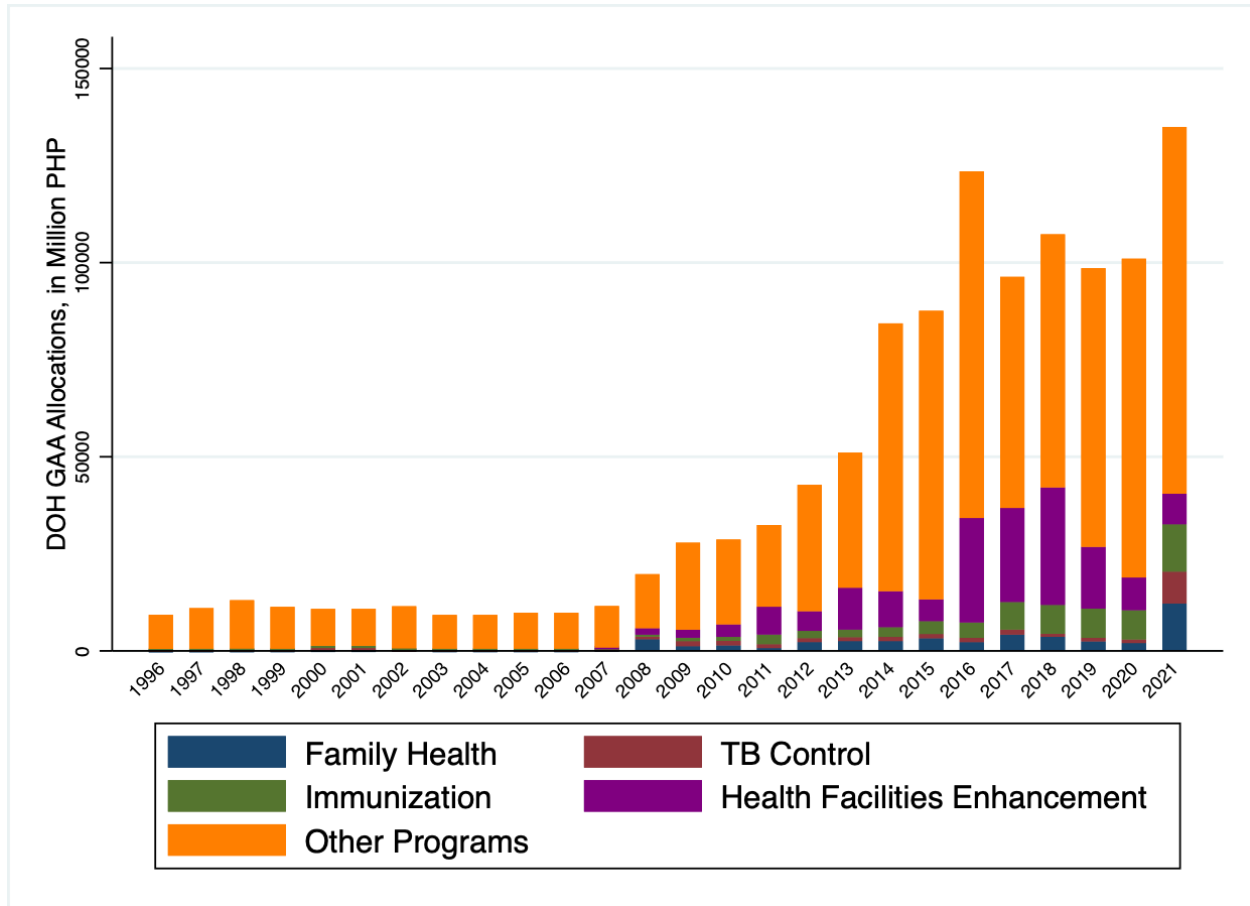
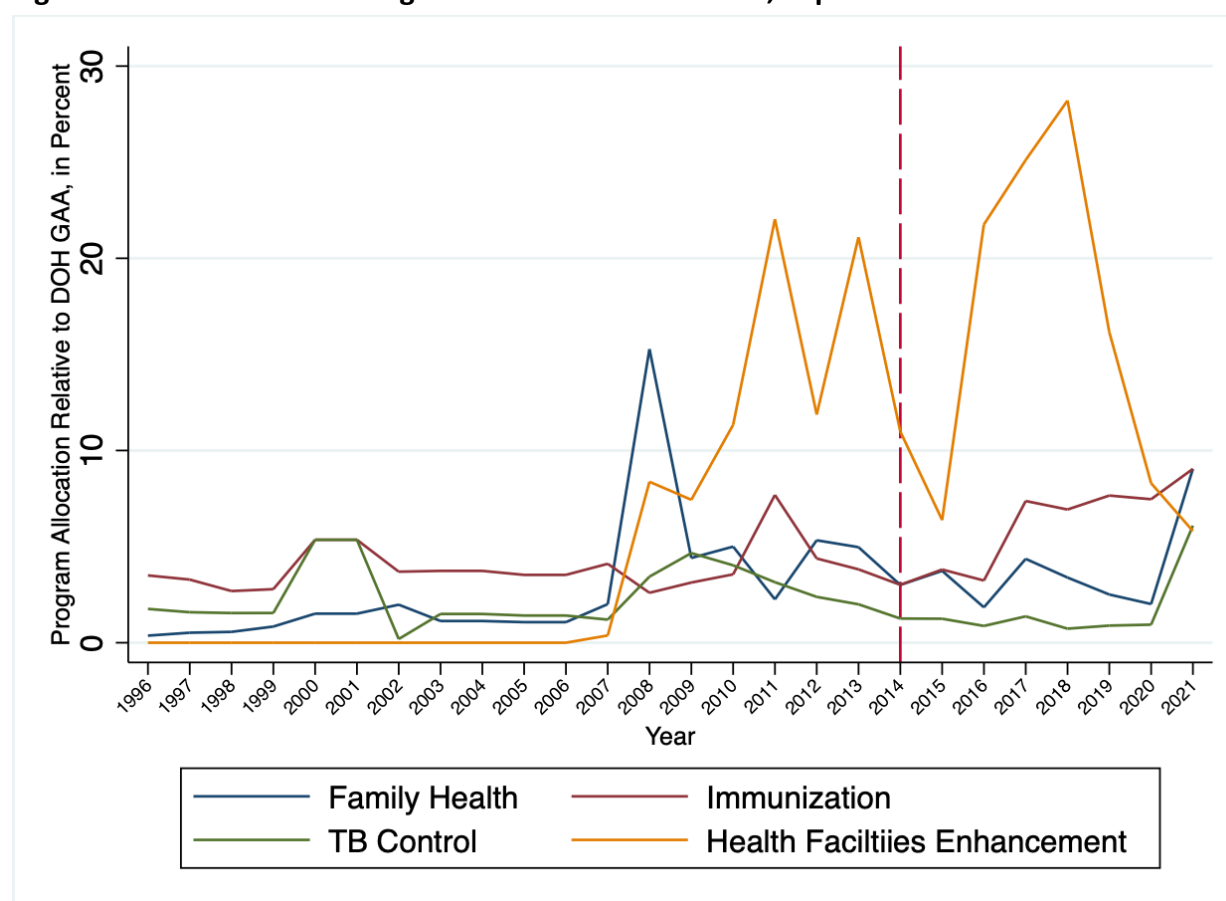


Figure 11. Share of Select Programs Relative to DOH GAA, in percent



Prioritization of new programs crowded out the opportunity for existing programs to expand their share relative to the total DOH budget which highlights how the sin tax revenues have not positively changed the budget allocations for these programs considerably. This is consistent with the results of Dieleman & Hanlon (2014), which showed that many governments will retain its relative allocations across sectors or programs even with earmarking.

5.1.4. Predictability and control of budget execution

Ambiguous attribution of sin tax revenues to DOH programs

Soft earmarking of sin tax revenues allows the government to divert funds to other political priorities when the need arises. Due to this, soft earmarking is recommended over hard earmarks as it gives adequate political maneuvers to reduce economic distortions when used appropriately. However, the concept of soft earmarking is used by the local government to mean that funds are not directly appropriated to specific public health programs and can only be “attributed” or associated to a certain project or program, and therefore, the implementation and results should not be based solely on funds from sin tax revenues but to the GAA as a whole. The practice reduces the transparency and accountability for the utilization of sin tax revenues which does not allow traceability and auditing of resources to which specific operations they are used since **there is no**

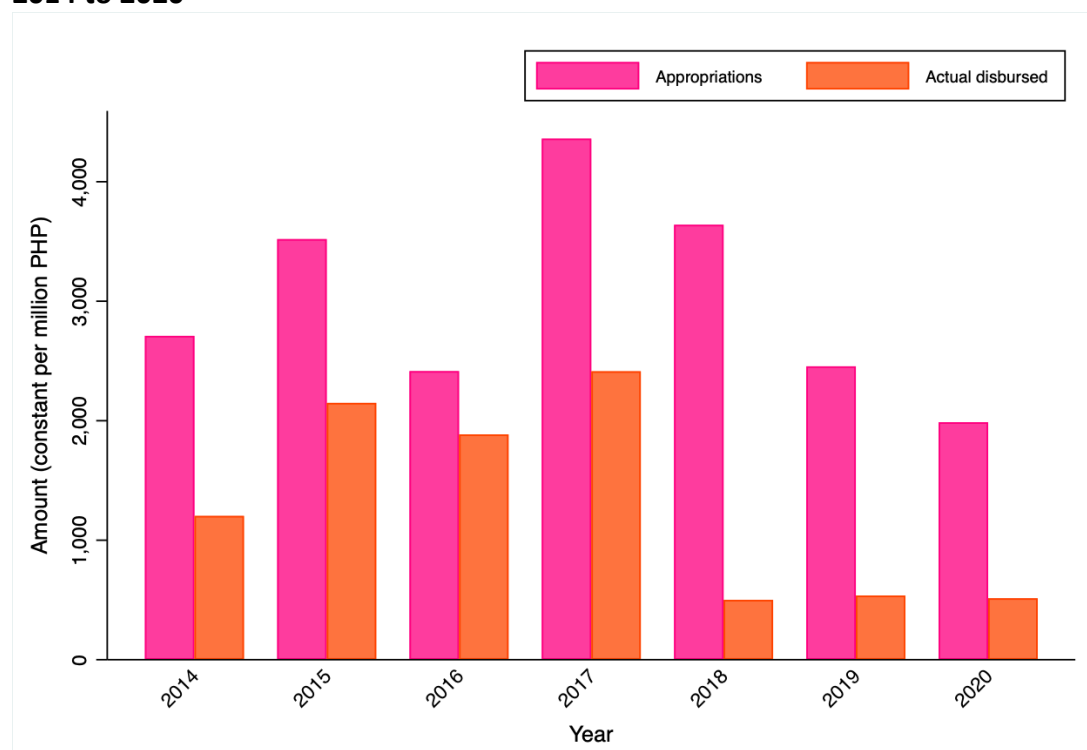
process for national- and local government-level DOH programs to provide information from which funds of the GAA they receive their budget.

Inefficient budget utilization

The DOH Medium Term Expenditure Plan for 2022-2026 devised three scenarios - low, medium, high - for the coming years and showed that for all scenarios a funding gap by allocated GAA in the medium term will be experienced by the health sector due to expansion of quality services (e.g., increase in number and coverage of benefit packages) and provision of more public health programs which would therefore hamper the full implementation of UHC in the country.

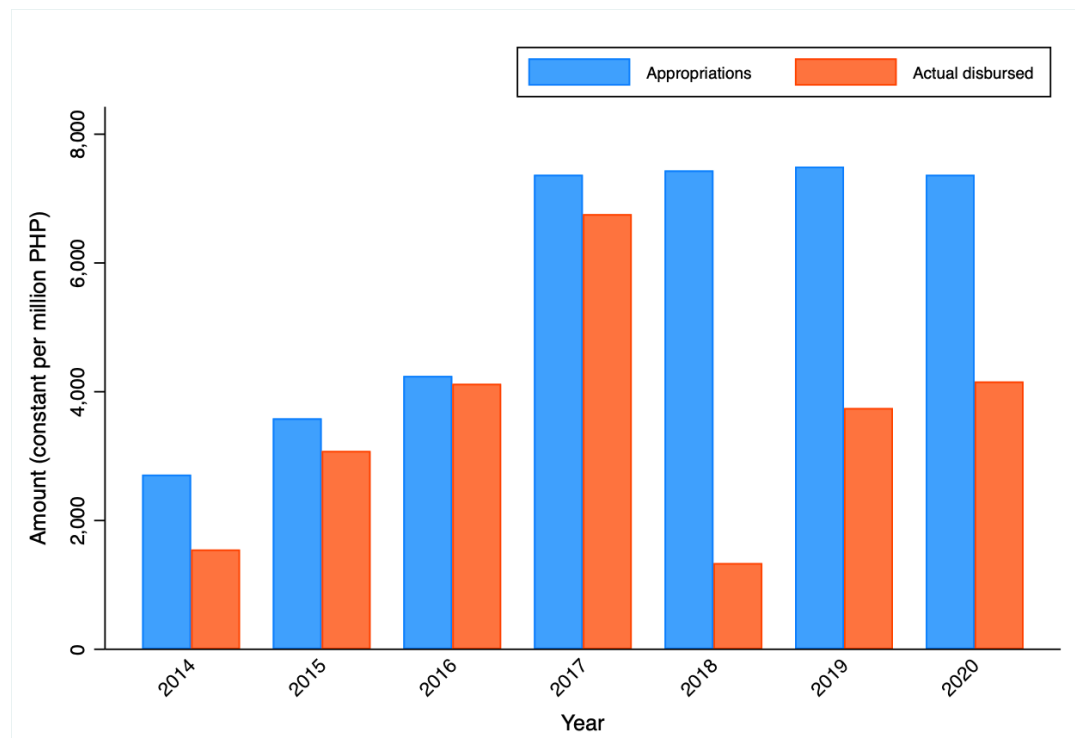
However, **intertemporal data shows that public health programs do not fully utilize their annual approved budget.** For example from 2014-2021, the median disbursement rate for the Family Health, NIP, and TB control programs were 47%, 57%, and 52%, respectively (see **Figures 12-14**), suggesting that large proportions of annually allocated funds are not fully utilized in the planned activities and operations of the public health service programs. **It is imperative that the DOH demonstrate the capability to utilize their increasing budget and provide quantitative results of achieving or failure to reach health targets to provide evidence of the need for further expansion of fiscal space to implement UHC strategies.**

Figure 12. Appropriation and disbursement amounts for the Family Health program from 2014 to 2020



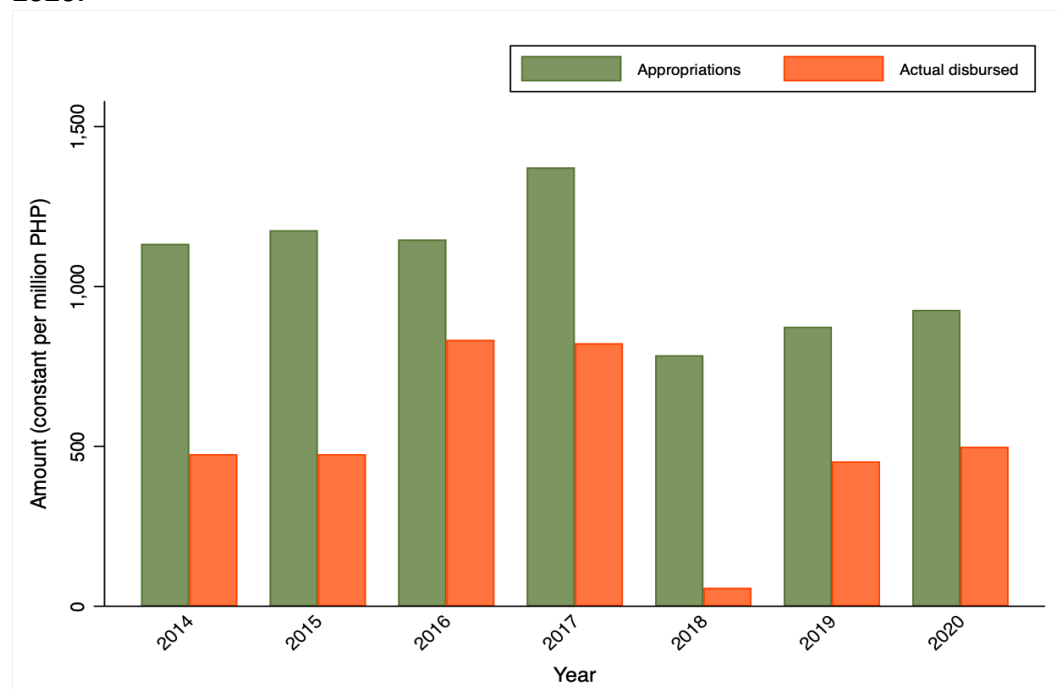
Note: Disbursement data only available for 2014-2020

Figure 13. Appropriation and disbursement amounts for PhilHealth from 2014 to 2020.



Note: Disbursement data only available for 2014-2020

Figure 14. Appropriation and disbursement amounts for the TB Control program from 2014 to 2020.



Note: Disbursement data only available for 2014-2020

5.1.5. Accounting, recording and reporting

Ambiguous accounting of annual sin tax reports

The STRA requires that agencies covered by the law submit annual reports to Congress every August of each fiscal year. The sin tax law incremental revenue for health annual report provides information on the distribution of the DOH budget between sin tax revenues and the national government counterpart, percentage of general and specific allocations to provisions of the STRA, and annual accomplishments. The reports have an evolving reporting structure with some including the overall objectives for health, e.g. FY 2018 provided indicators for the F1 Plus Health Pillars. The annual reports consistently provide the annual budget of DOH aggregated between sin tax revenues and the national government counterpart (2013 baseline), however, **inconsistencies can be observed between the sin tax reports compared with the Department of Budget and Management's GAA reports** except in 2014, 2015, and 2016⁸.

Medical assistance programs and the health enhancement facilities program are internal programs that inject funding from sin tax revenues to specific hospitals and local government units. However, all reports consistently do not provide a transparent list of which third-party institutions benefit from sin tax revenues (20% Rule IV - Allocation for Medical Assistance and the Health Enhancement Facilities Program). From 2014-2018, percent utilization was reported through the budget utilization and major activities section, while in 2019 onwards, budget utilization was reported under financial performance which showed the annual commitments, with obligations and disbursements, and accomplishments for the year, including reasons for incomplete execution of target commitments.

The sin tax law incremental revenue for health annual reports need to be more comprehensive and provide insight on the efficiency of the utilization of funds from sin tax revenues. The new reporting system which started in 2018 provided more transparent information on which of the approved budget has been allotted to specific programs but not disbursed and the amount unspent. The reports have also provided information on the underutilization of budgets and ways forward. However, problems of underutilization persist annually which could indicate that recommendations in the reports are not implemented by the programs concerned.

5.1.6. Internal and external audit

Inappropriate performance indicators

The quality of performance indicators monitored for each program with the attributed budget from sin tax revenues varies widely. Some programs, such as the Family Health, Immunization, Nutrition and Responsible Parenting have acceptable performance indicators covering the number of fully immunized children and modern contraceptive prevalence. However, some programs may need to review their performance indicators in relation to the objectives of the STRA. For example, in the 2022 sin tax report, the performance indicator for the National

⁸ As reported in the General Appropriations Act from the Department of Budget and Management

Health Insurance Program is the percent of the population covered by the NHIP and the registration/enrolment rate, in contrast, the goal of the STRA is to cover the indigent Filipino population only.

There are programs with sin tax revenue attribution that do not have performance indicators, such as health information technology and procurement and supply chain management. While indicators and targets of some programs are achieved through the implementation of another related program. For instance, the targets for health promotion, environmental and occupational health, prevention and control of non-communicable diseases can be achieved in concordance with the achievement of the indicators of public health management programs. However, the indicators listed in the report do not have any relation to the input programs for public health management implementation, e.g., client satisfaction rate, and receipt of health commodities.

There is a need to revisit performance indicators tagged to different P/A/Ps with sin tax revenue attribution. Depending on the availability of data in the information system, indicators should be more specific to clearly quantify the efficiency and effectiveness of each P/A/P to support UHC, MAP and HFEP.

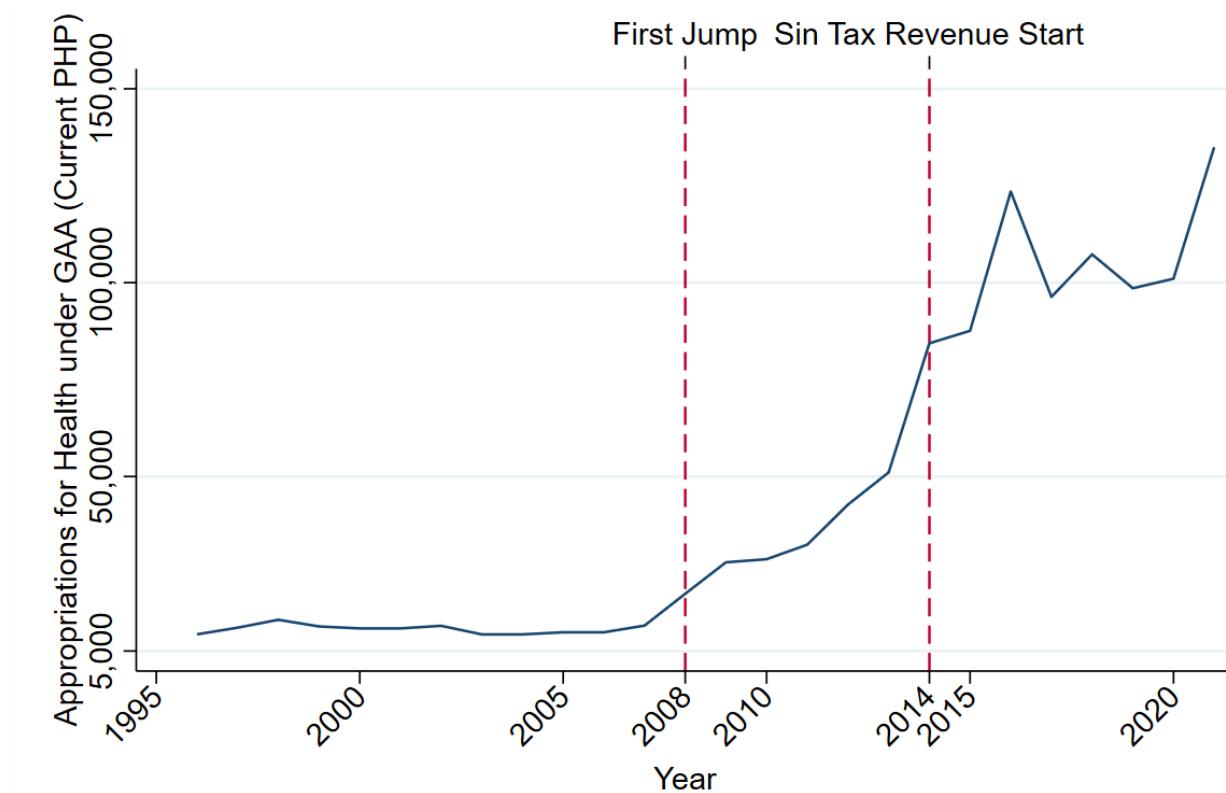
5.2. *Trends of Sin Tax revenue allocations and expenditure on the health sector and health outcomes*

5.2.1. How much did the STRA passage add to the budget?

In this section, we look into how the STRA has resulted in differences on the appropriations from the GAA towards programs for health; followed by examining its effect on the health outcomes of select programs for health.

The pattern of overall budget growth for health was recontextualized using the knowledge of the passage of STRA and the data we see in **Figure 15** below. There are two breaks in the data. First, there is an upward trend from 2008 (labeled as “First Jump”) onwards after a relatively flat series from 1996 (our start in the data). Second, there may possibly be another possible break in the upward trend after the passage of STRA in 2012 (which would affect the budget earliest in 2014).

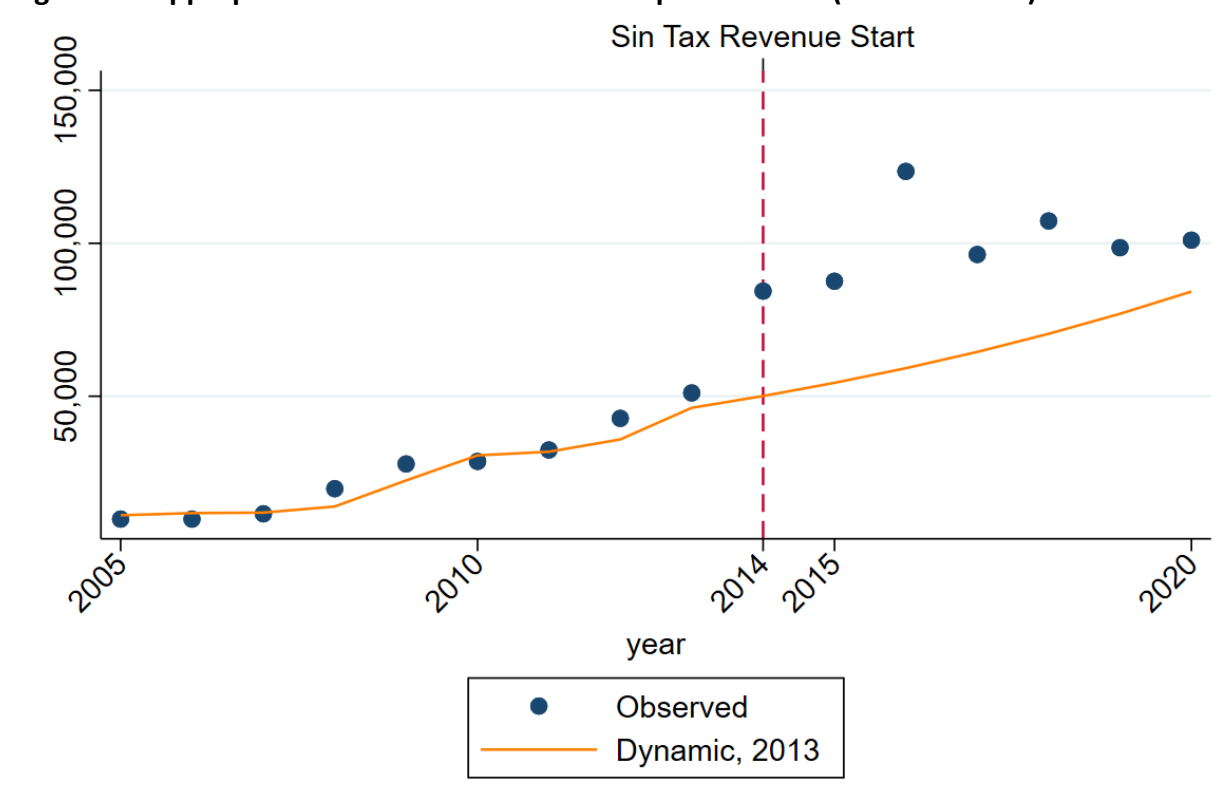
Figure 15. GAA Health Budget (in million PHP)



Noting this possible trend and test the stationarity of the series by using an Augmented Dickey-Fuller Test. Next, AR and MA disturbance order was analyzed by checking the Auto-Correlation Function (ACF) and Partial Auto-Correlation Function (PACF) to observe where the residuals fade. The results seem to show an AR(1) series, which was used for our ARMAX model forecast.⁹

⁹ See **Appendix C. Stationary Tests**

Figure 16. Appropriations for Health with in-sample forecasts (in million PHP)



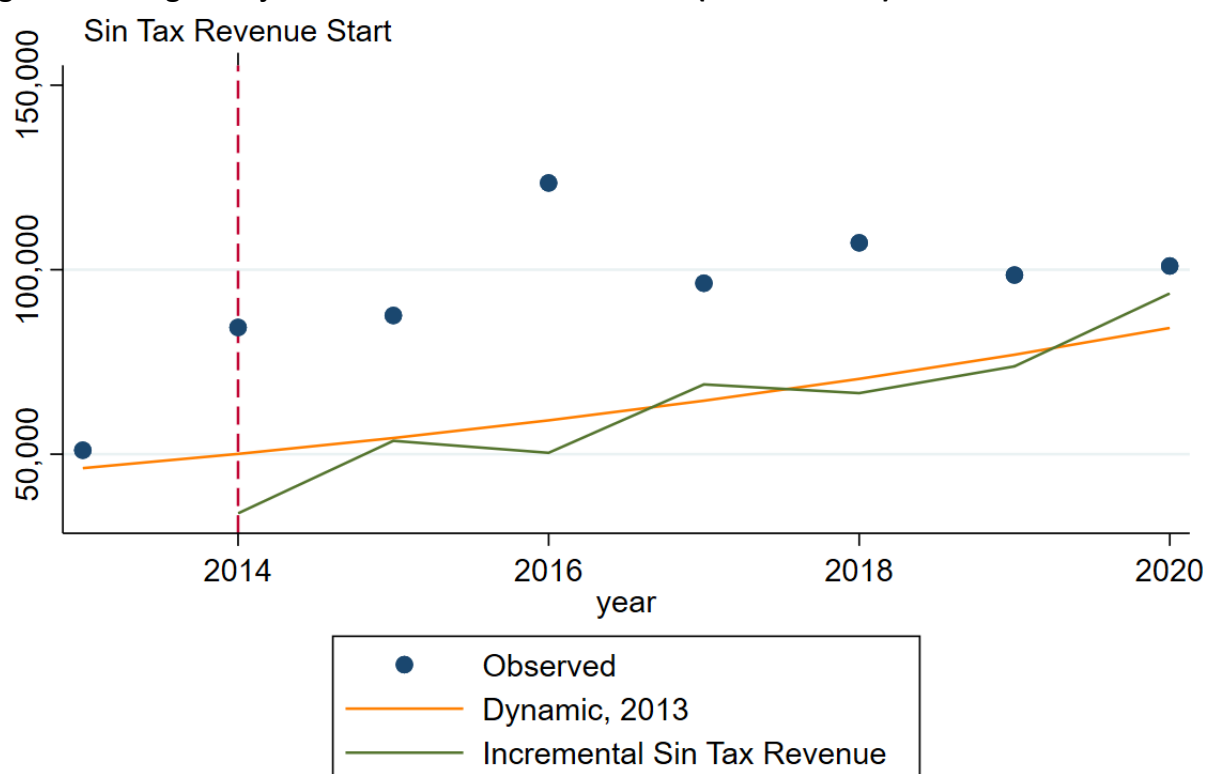
In **Figure 16** above, the actual annual budget is plotted over with the in-sample forecasts. This is the dynamic forecast, wherein it is mainly the same as the set of one-step predictions (observed prediction is based on the previous period's actual observation) but breaks off by only relying on the forecast values starting in 2013. Essentially, we are showing the hypothetical scenario of the trend of the overall budget for health had the STRA not been passed.

In the years before the enactment of the STRA, the in-sample forecasts are close to the values of the actual observations. In contrast, there is a significant jump in 2014 (red line), suggesting that there is indeed a significant increase in the budget that can be attributed to the passage of the STRA. In particular, comparing the actual observations with the orange in-sample forecast trend line of our AR model, the difference is estimated to be an average of 35.207 billion a year. This implies that the passage of the STRA is associated with increases to appropriations for health by an average of PHP 35.207 billion a year from 2014 to 2020.

However, when comparing the dynamic forecasts with the actual budget changes from 2014 onwards, there seem to be other factors that influence appropriations allocations. We expect the increases in the years from 2014 onwards to be positively influenced by the incremental revenue. However, in **Figure 17** below, it is shown that estimated incremental STRA allocated does not seem to be the main factor in the recent movement of the budget starting from 2014. In particular, the movement of the overall budget appropriation for health moves inversely with the changes in the incremental Sin Tax revenue allocation. **The trend in the appropriations after FY 2014 cannot seem to be attributed positively to changes in the estimated incremental Sin Tax**

Revenue allocations. This is possibly related to the trend of national government support seemingly matching the increases in the incremental revenue from Sin Tax inversely from **Figure 9**. This suggests the need for a deeper focus and review on how the budget appropriations were made in relation to the information on the incremental Sin Tax Revenue allocations.

Figure 17. Budget Projections with Incremental STRAs (in billion PHP)



5.2.2. Across select programs for health

Among the select programs that are allocated revenues from the STRA, the highest mean total and per capita appropriations in constant PHP were for subsidies for indigent and sponsored members under the NHIP (Total: 23.8 billion; Per capita: 224.81), followed by appropriations to the HFEP (Total: 11.04 billion; Per capita: 106.69), the NIP (Total: 2.72 billion; Per Capita: 26.89), the Family Health program (Total: 1.87 billion; Per Capita: 18.37), and the TB Control program (Total: 1.05 billion ; Per Capita: 10.76). Mean Sin Tax revenues in constant PHP were also the highest for the NHIP subsidies (37.72 billion), followed by the HFEP (6.66 billion), the NIP (3.2 billion), the Family Health program (1.7 billion), and the TB Control program (0.33 million; see Tables 9-13).¹⁰

¹⁰ By “per capita”, we mean the appropriate target population for each program budget appropriation or program outcome.

Table 9. National Health Insurance Program descriptive statistics

	Mean	Median	SD
National Health Insurance Program appropriations (constant per million PHP)	23.8	8.75	28.2
National Health Insurance Program appropriations per capita (constant PHP)	224.81	90.41	260.13
National Health Insurance Program Sin Tax revenues (constant per billion PHP)	37.72	37.64	15.04
Indigent/sponsored members and dependents under National Health Insurance Program	2,7348,459	3,173,3941	12,399,804.85

Table 10. Health Facilities enhancement program descriptive statistics

	Mean	Median	SD
Health Facilities Enhancement program appropriations (constant per billion PHP)	11.04	8.18	9.65
Health Facilities Enhancement program appropriations per capita (constant PHP)	106.69	74.75	89.3
Health Facilities Enhancement program Sin Tax revenues (constant per billion PHP)	6.66	7.66	3.17
Projects started under Health Facilities Enhancement program	3,179	3,276	1,865
Projects started and completed within the same year under Health Facilities Enhancement program	2,733	2,581	1,569
Completion rate of annual projects started under Health Facilities Enhancement program	88	91	9

Note: Project start and completion data from 2010-2021

Table 11. Family Health program descriptive statistics

	Mean	Median	SD
Family Health program appropriations (constant per million PHP)	1.87	1.18	2.43
Family Health program appropriations per capita (constant PHP)	18.37	12.64	22.35
Family Health program Sin Tax revenue (constant per million PHP)	1.7	1.51	1.05
Current users of modern contraceptive methods	5,274,515	4,759,451	1,623,254
Modern contraceptive coverage (% of women aged 15-49 years)	22.17	20.62	5.00

Table 12. National Immunization program descriptive statistics

	Mean	Median	SD
National Immunization program appropriations (constant per billion PHP)	2.72	1.09	3.03
National Immunization program appropriations per capita (constant PHP)	26.89	12.9	27.02
National Immunization program Sin Tax revenues (constant per billion PHP)	3.2	3.23	1.79
DTP3 coverage (% of children aged 1 year or below)	77.78	79	11.78
DTP3 doses administered	1,814,539	1,866,105	311,489

Note: DTP3 doses is from 2000 to 2020

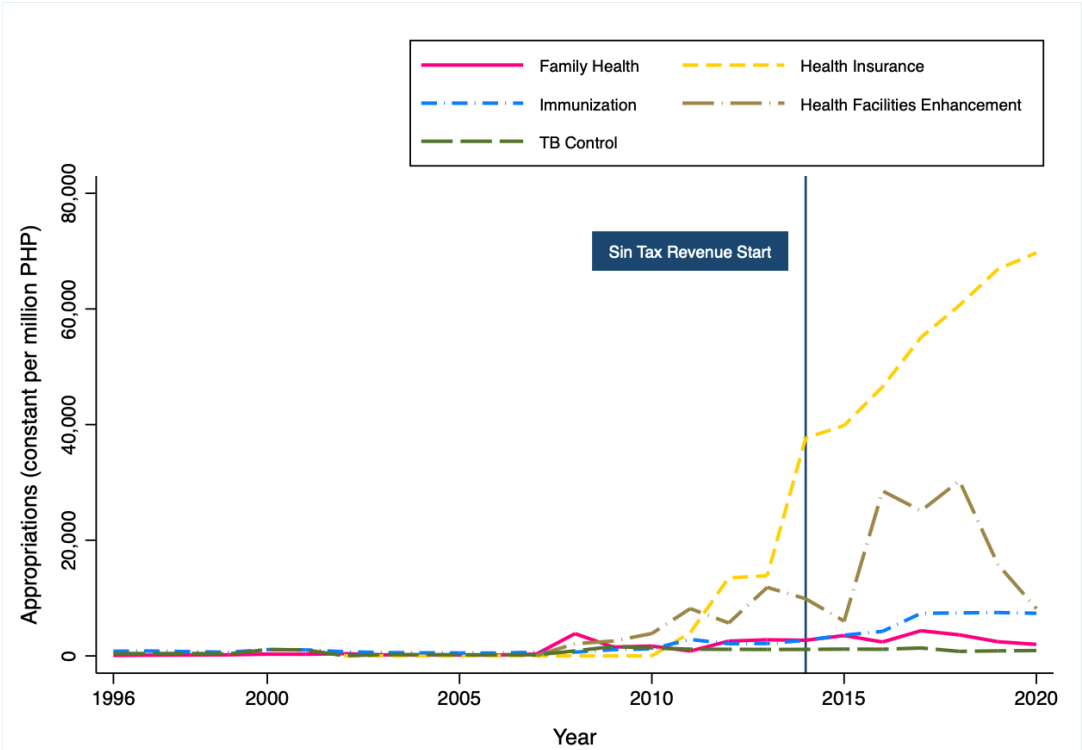
Table 13. TB Control program descriptive statistics

	Mean	Median	SD
TB Control program appropriations (constant per billion PHP)	1.05	0.9	1.46
TB Control program appropriations per capita (constant PHP)	10.76	9	13.07
TB Control program Sin Tax revenues (per constant billion PHP)	0.33	0.35	0.2
TB treatment success rate	84.04	87.61	11.58
TB case detection rate	38.86	33	13.09
TB Incidence per 100,000 population	546.95	546	17.65

Note: Treatment success rate is from 1996 to 2019; Case detection rate and incidence rates are from 2000 to 2020

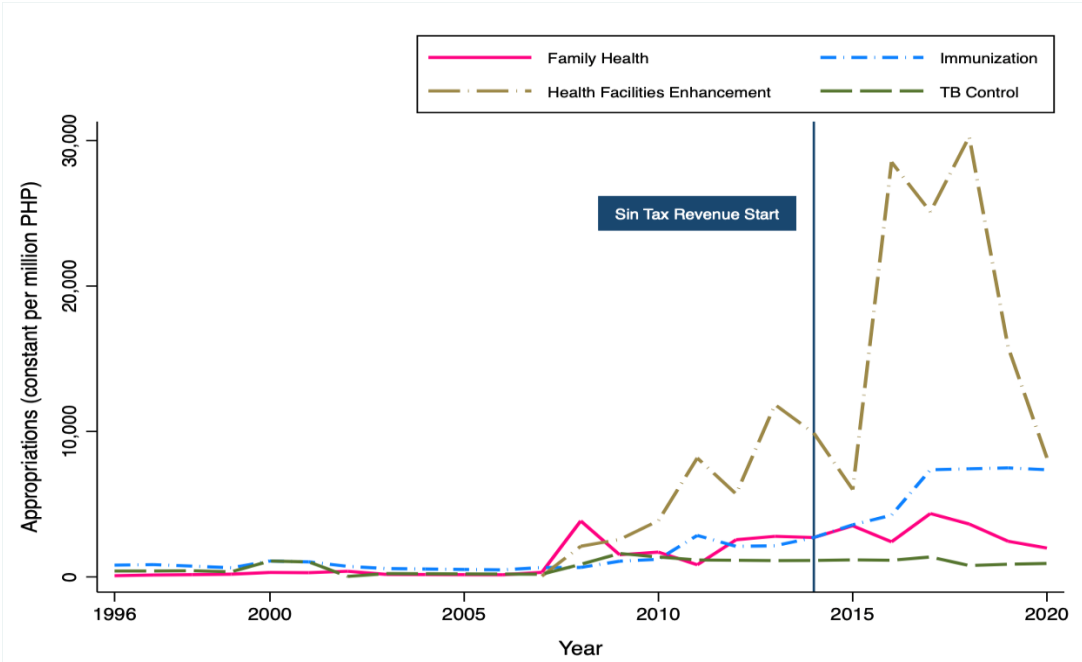
Since the enactment of the STRA in 2012 and the implementation of Sin Tax revenues in 2014, **appropriations have substantially increased for several public health programs** (see **Figures 18-20**). The most pronounced increase in appropriations was for NHIP subsidies for indigent and sponsored members since 2011, with the average amount of subsidies financed by the national government being 4.33 billion in constant PHP from 2011 to 2021. Appropriations in constant PHP for the HFEP increased after 2012, however, the trend fluctuates due to sudden drops in appropriation amounts for 2015 and 2020 onwards. From 2012 to 2020, average appropriations for the HFEP was 1.49 million per constant PHP, greater than the 0.89 billion per constant PHP appropriated in 2011. Among DOH public health services programs, the most pronounced increase in budget since 2011 was observed in the National Immunization Program (NIP), followed by the Family Health program. From 2011 to 2020, the average appropriations for the NIP was 4.73 billion per constant PHP, greater than the 1.22 billion per constant PHP appropriated during 2010. Similarly, the Family Health program was 2.73 billion per constant PHP, an increase from the 1.71 billion per constant PHP appropriated during 2010. However, the trends suggest that appropriations for the Family Health program have been decreasing since 2017.

Figure 18. Program appropriations from 1996-2021: DOH programs and NHIP



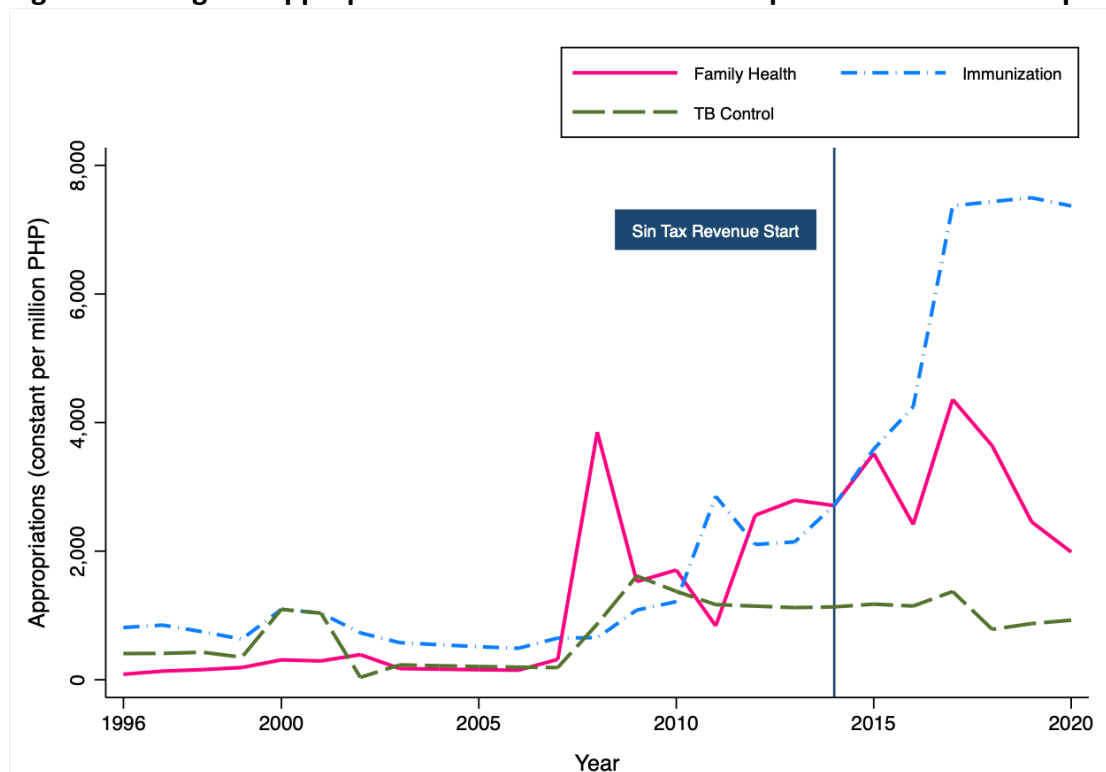
Note: In 2000-2001, TB and Immunization shared the same budget; 2021 excluded since Family Health and Immunization were under one budget and all communicable diseases were under one budget

Figure 19. Program appropriations from 1996-2021: DOH programs.



Note: In 2000-2021, TB and Immunization shared the same budget; 2021 excluded since Family Health and Immunization were under one budget and all communicable diseases were under one budget

Figure 20. Program appropriations from 1996-2021: DOH public health services programs.

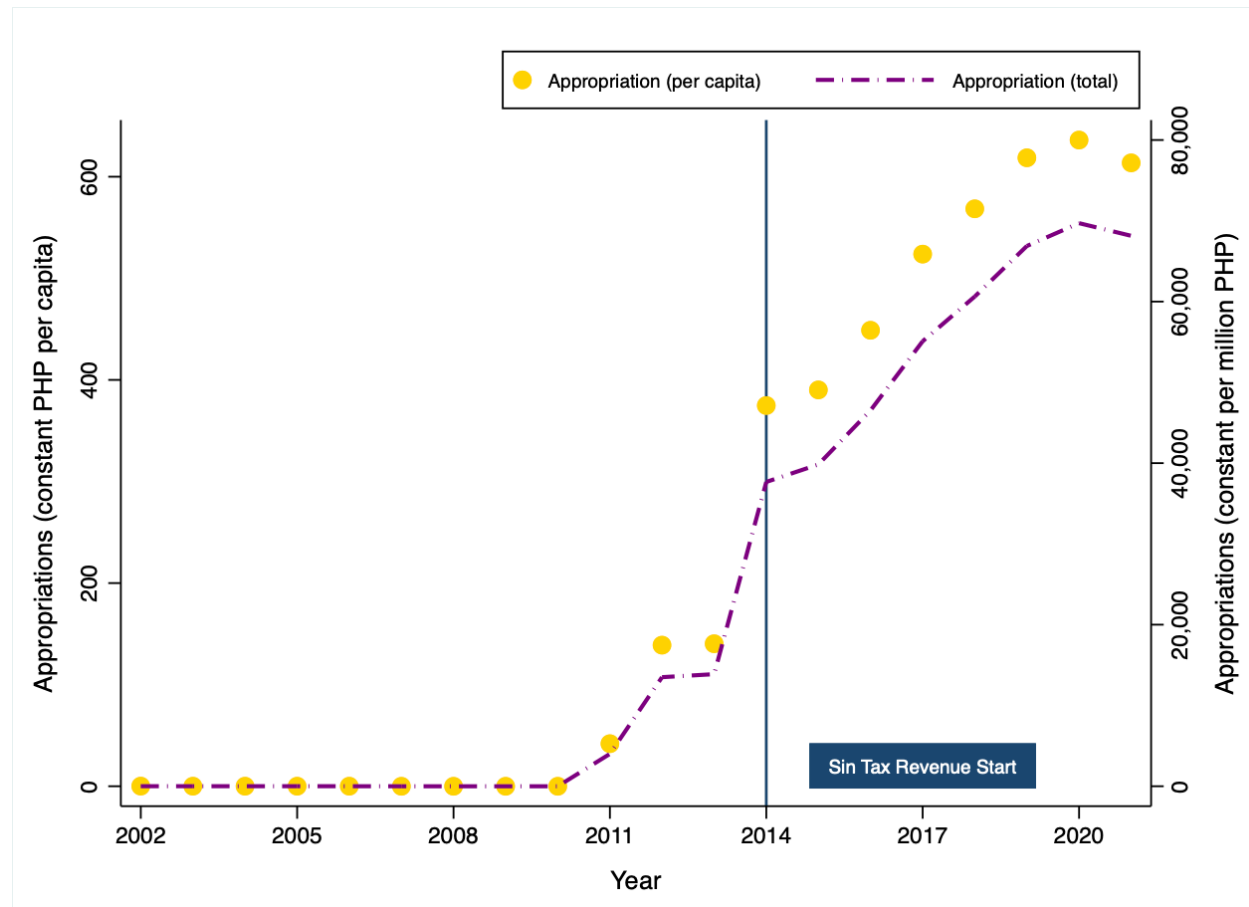


Note: In 2000-2021, TB and Immunization shared the same budget; 2021 excluded since Family Health and Immunization were under one budget and all communicable diseases were under one budget

In contrast, appropriations to the TB control program have not increased since 2009, with the allocated average appropriation from 2010-2020 being 1.11 billion per constant PHP, less than the 1.61 billion per constant PHP allocated for TB control in 2009.

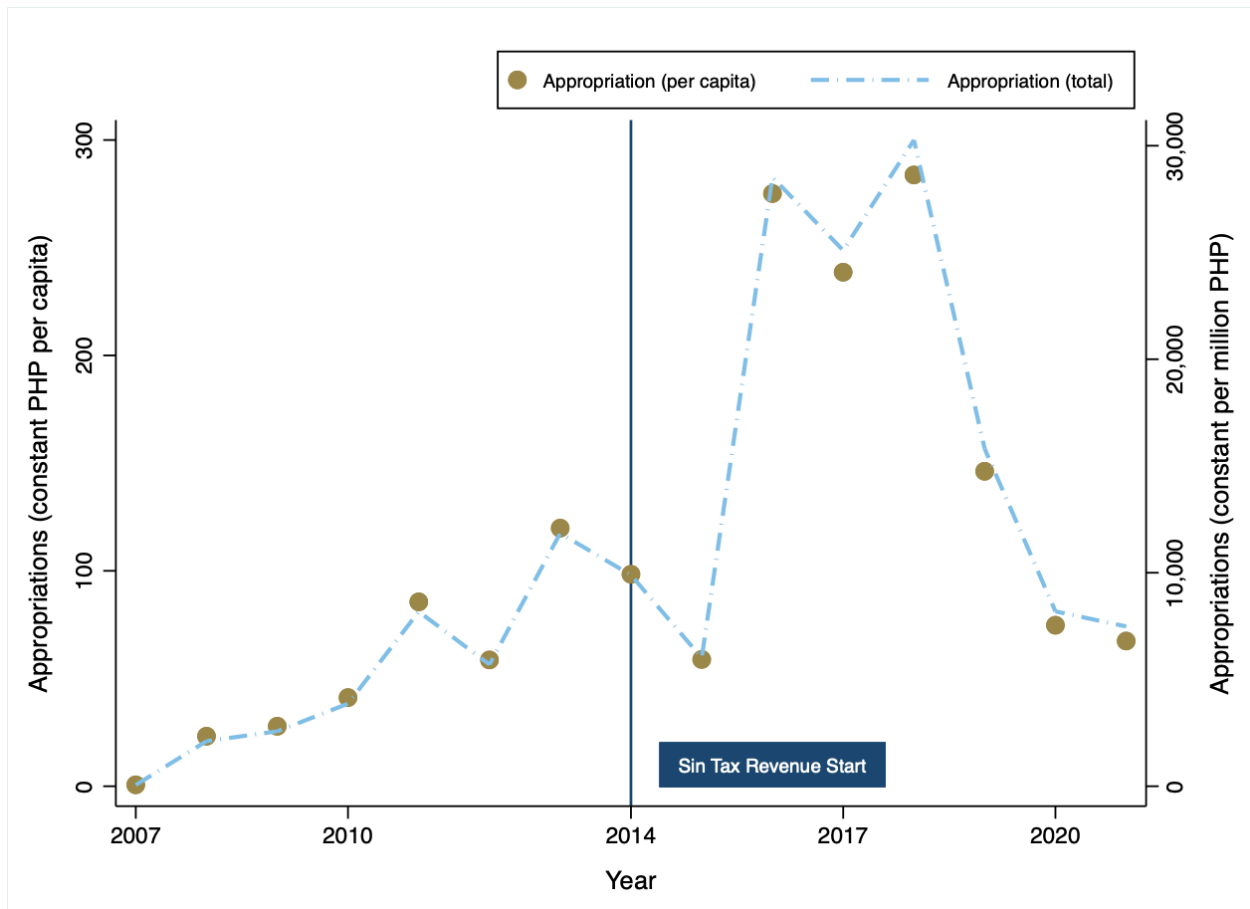
Similar trends were observed when analyzing constant per capita appropriations specific to the chosen programs. Per capita appropriations for NHIP subsidies increased since 2012, with a slight decrease in 2021 from 2020 due to the population in 2021 being larger than in 2020 but the appropriation amount being the same in both years (see **Figure 21** below).

Figure 21. Total appropriations and per capita appropriations in constant PHP for NHIP subsidies from 2002 to 2021.



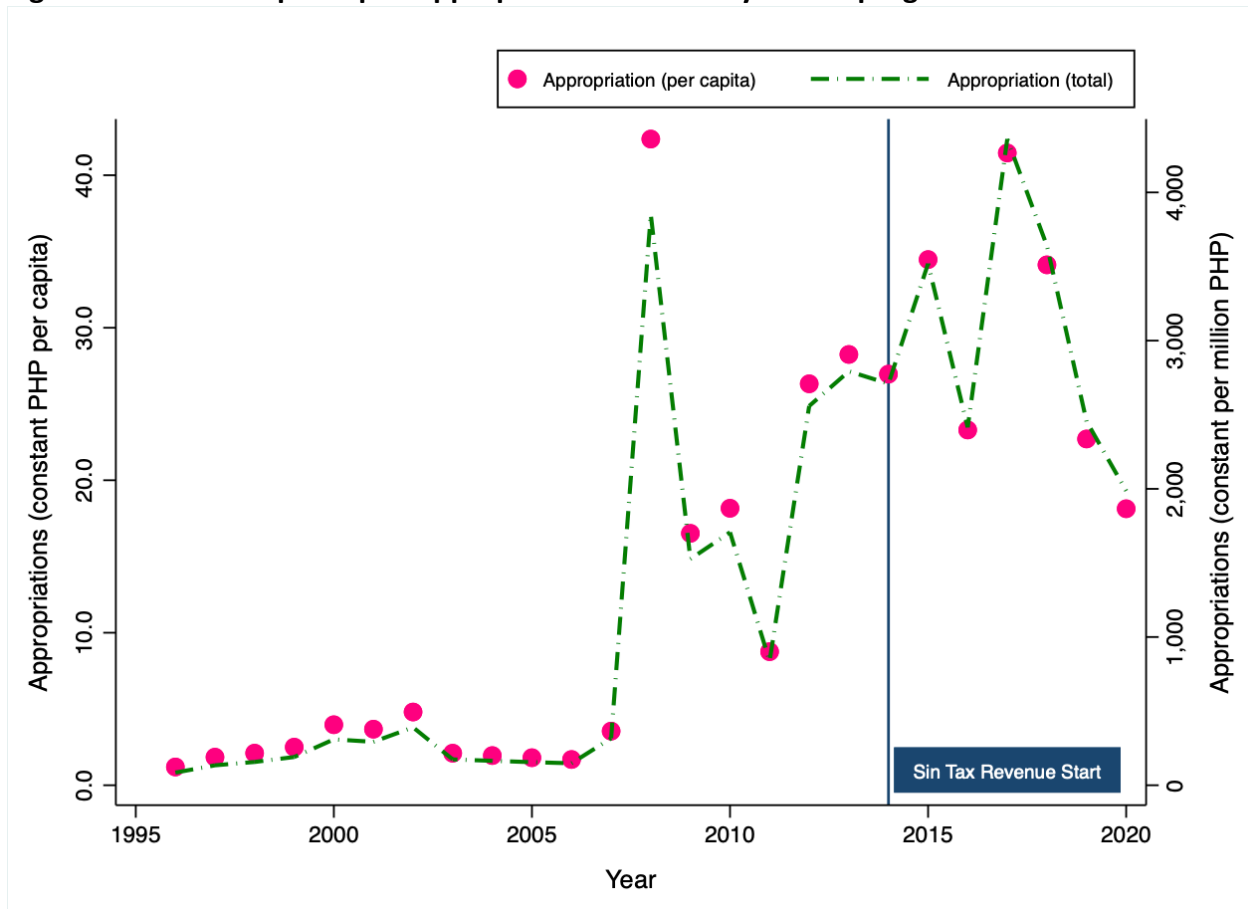
Total and per capita appropriations in 2021 for the HFEP was 7.49 billion in constant PHP, which was lower than total and per capita appropriation in 2011. There was a large increase of total and per capita appropriations for the program in 2015, with appropriations quadrupling from the previous year. From 2015 to 2018, with total remaining above 200 million and per capita amount above 2 in constant PHP. However, appropriations dropped by 47% of the amount allocated to the program in 2018 and have decreased since 2019 (see **Figure 22** below). The trend of decreasing appropriations since 2018 are in concurrence with key events, such as after a program audit conducted by the Philippine Commission on Audit found multiple issues in HFEP project implementation regarding site selection, realignment of project funds, suspension and delays in MOAs and permits by the LGU, and delays in the release of allocated funds, suggesting that the audit influenced final funds allotted to the HFEP (Commission on Audit, 2017) and the DBM's implementation of a cash-based budgeting system for fiscal year 2019 that only funds projects that can be implemented and completed within the fiscal year (Republic of the Philippines, 2019), suggesting that stricter monitoring of HFEP projects contributed to the observed trend.

Figure 22. Total appropriations and per capita appropriations in constant PHP for HFEP from 2007 to 2021.



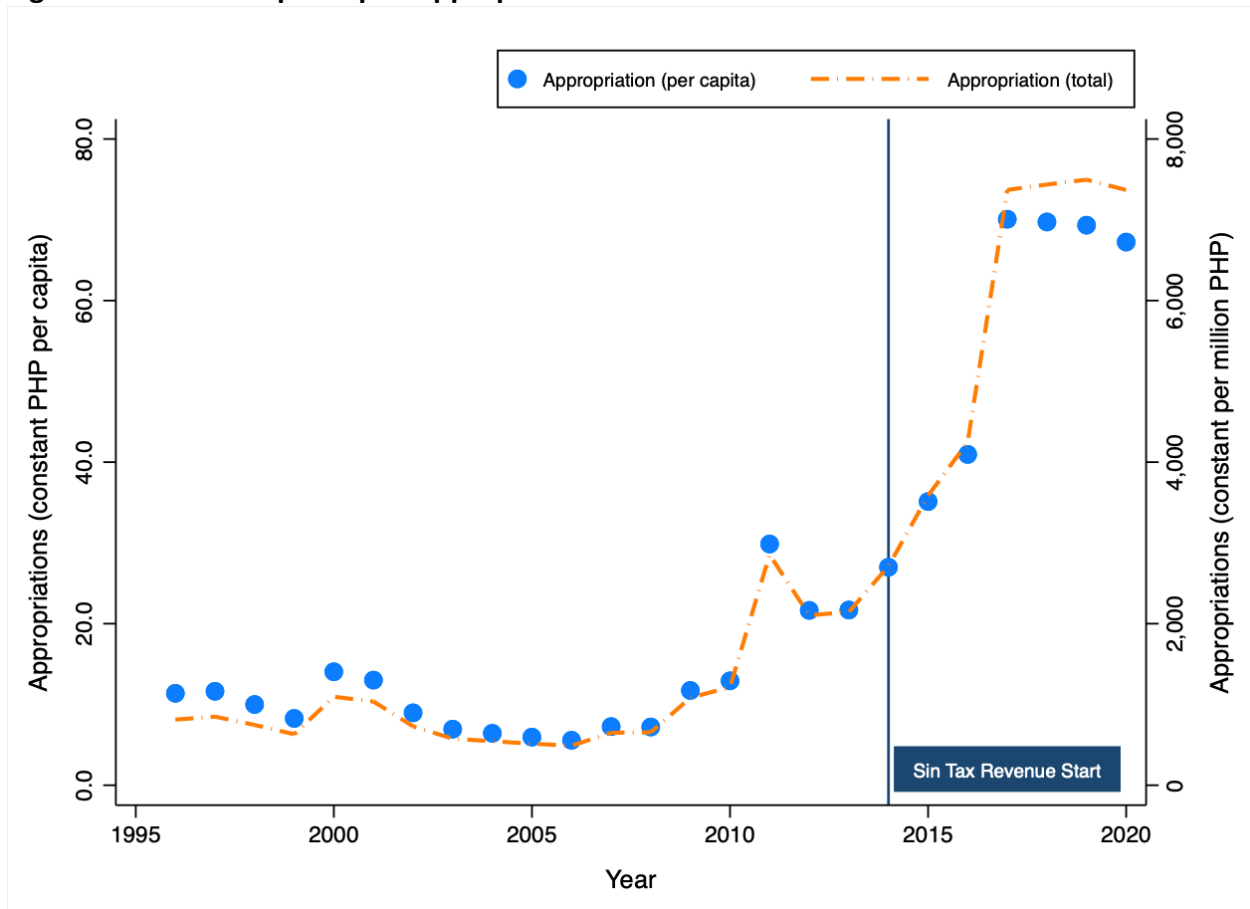
Although total and per capita appropriations in constant PHP decreased for the Family Health program since 2017, total and per capita appropriations are still greater than the amount appropriated in 2011, prior to the enactment of the STRA (see **Figure 23** below).

Figure 23. Total and per capita appropriations for Family Health program from 1996 to 2020.



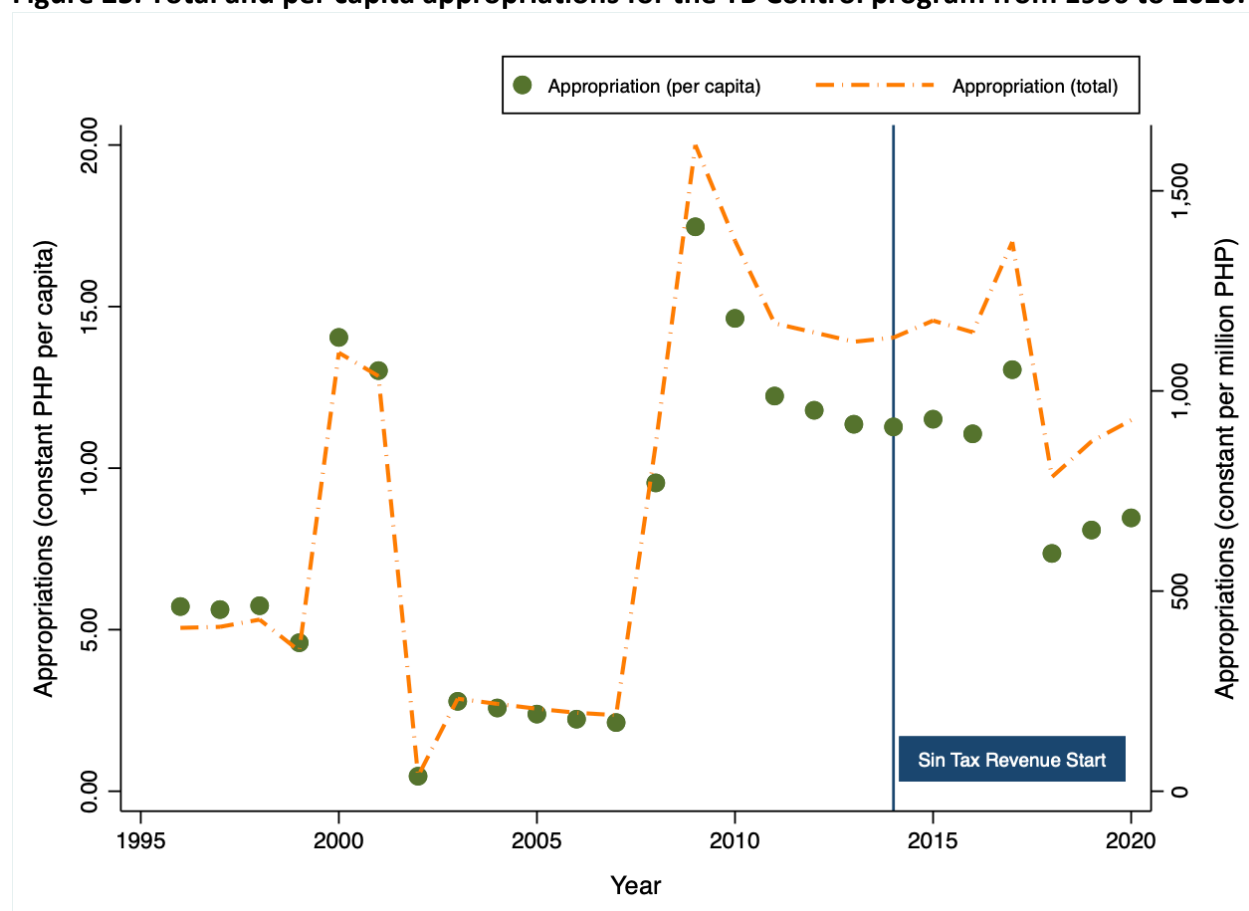
Since 2012, total and per capita appropriations in constant PHP for the NIP have increased. However, per total and per capita appropriations plateaued from 2017 to 2020 (see **Figure 24** below).

Figure 24. Total and per capita appropriations for the NIP from 1996 to 2020.



In contrast to the other public health services programs, total and per capita appropriations in constant PHP decreased for the TB Control program since the enactment of the STRA. Both total and per capita appropriations are lower than the amount initially appropriated for the program since 2009 (see **Figure 25**).

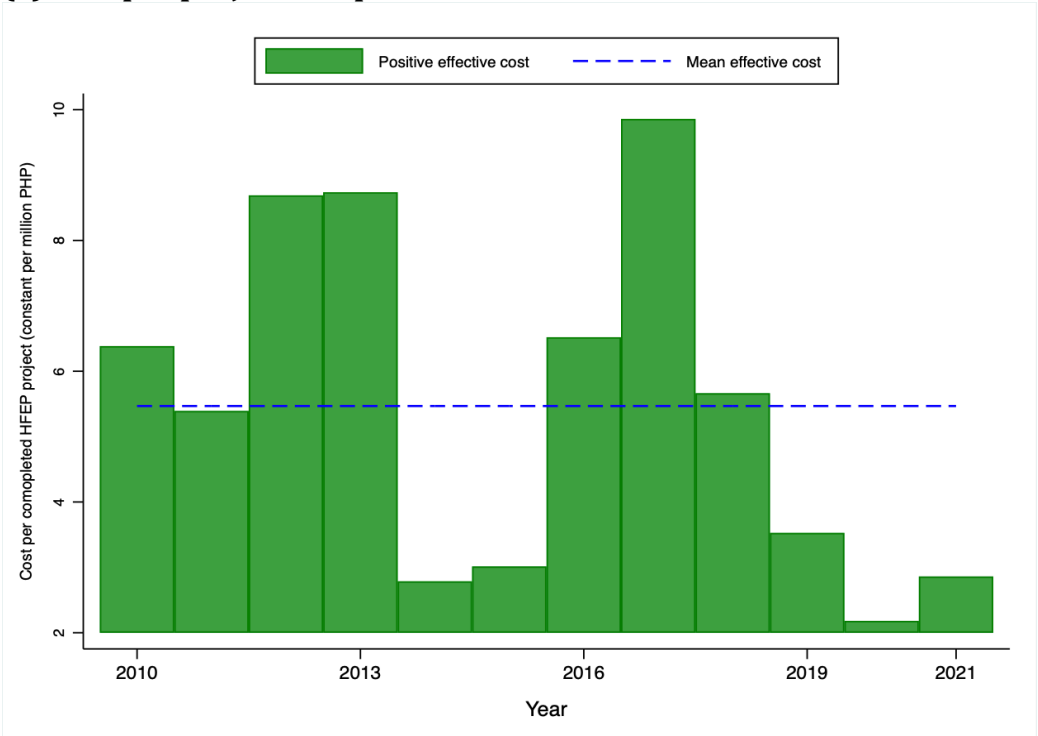
Figure 25. Total and per capita appropriations for the TB Control program from 1996 to 2020.



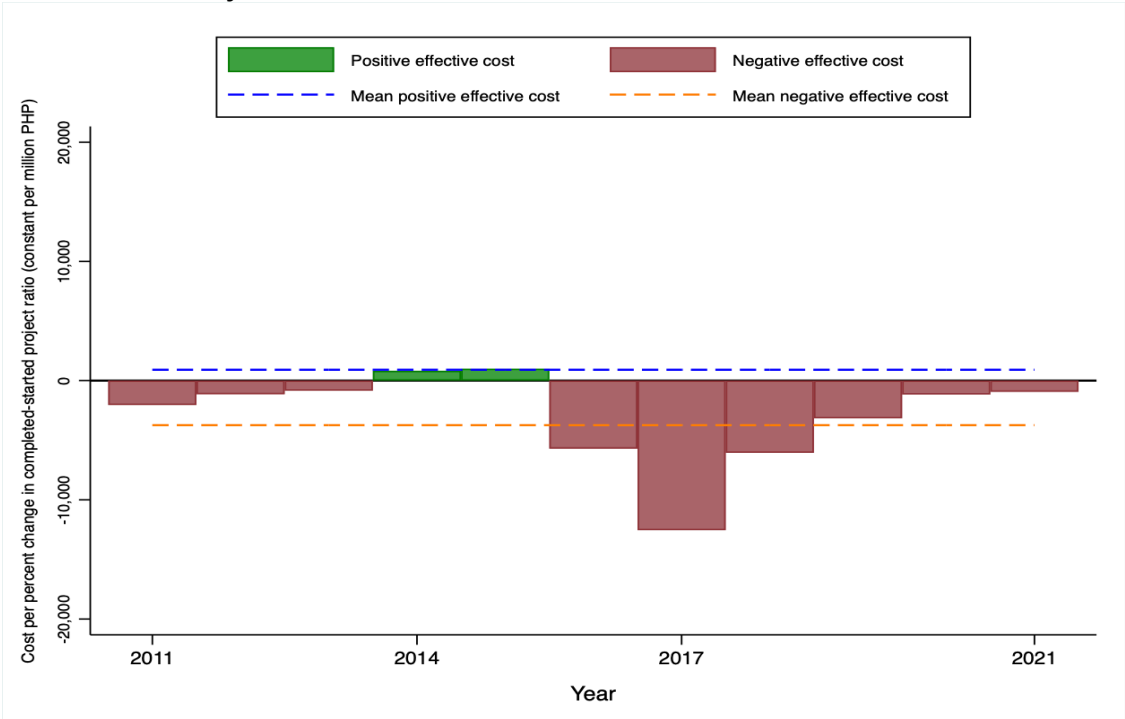
Notably, **available funds may not have been utilized efficiently to achieve the key outcomes of DOH programs**. Based on total appropriations to the HFEP and number of completed projects from 2010 to 2021, the cost per completed project was higher than the average cost across years, suggesting that the appropriations to the HFEP were not consistently utilized efficiently to achieve intended outcomes of the program for augmenting health facilities (see **Figure 26a/b**). Since 2019, the cost per completed project has been lower than the average cost per completed project, suggesting that although total and per capita appropriations to the HFEP have declined, the program has improved its efficiency to utilize allocated funds towards completion of projects supported by the program, which may also be related to stricter monitoring of the program resulting from a 2017 program performance audit and transition to a cash-based budgeting system in 2019 (Commission of Audit, 2017; Republic of the Philippines, 2019). However, the discrepancy between annual projects started and completed has grown since 2016, with the cost per percent change in proportion suggesting that reforms besides the adjustment of allocated funds are required to comprehensively address issues in project implementation that affect timeliness.

Figure 26. Cost-effectiveness ratios for HFEP project completion from 2010 to 2021.

(a) Cost per project completed.



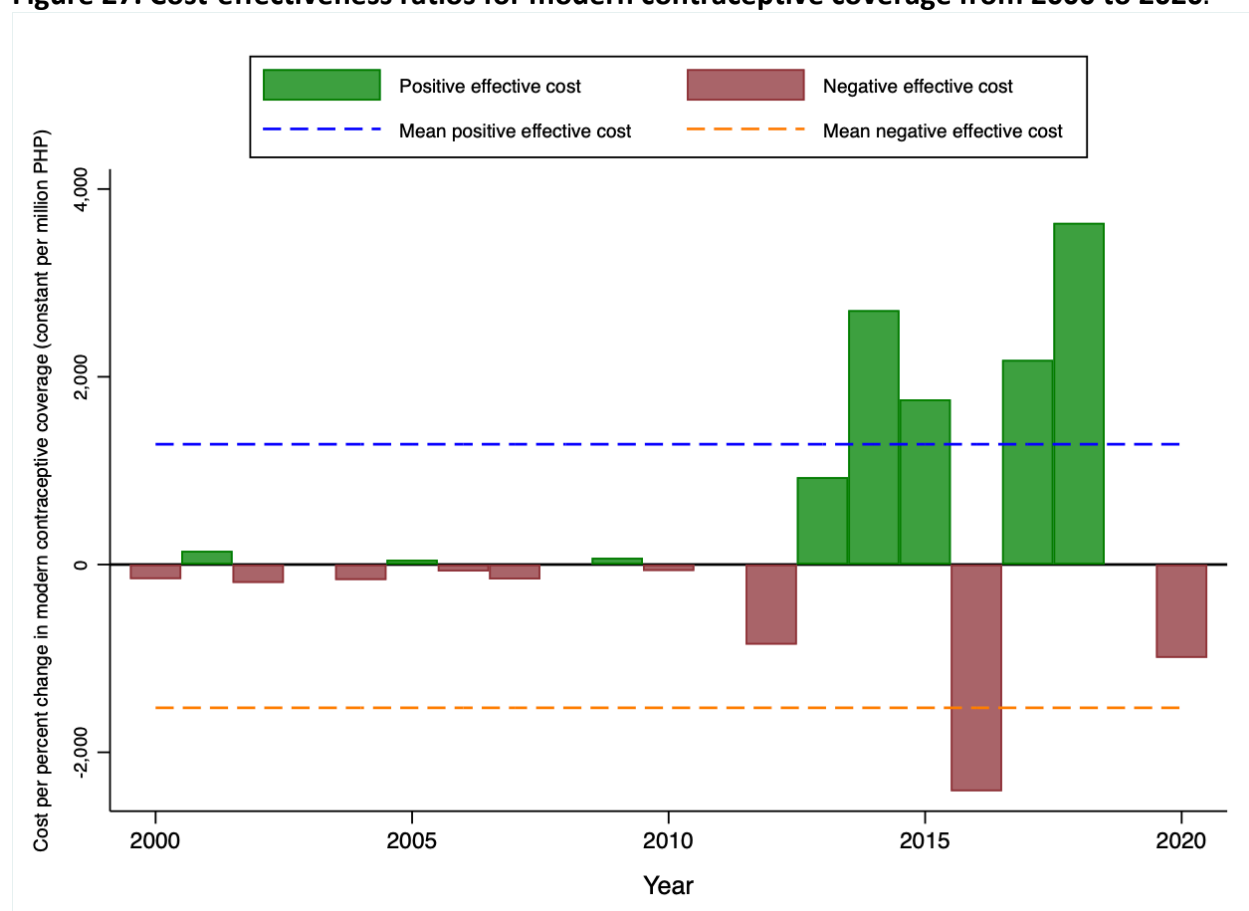
(b) Cost per change in proportion of projects completed out of total projects started annually.



Based on total appropriations per program and growth in healthcare services financially supported by select DOH programs from 2000 to 2020, the **cost per change in service coverage are inconsistent across years for all programs and increased funding for programs did not ensure commensurate increases in key health outcomes.**

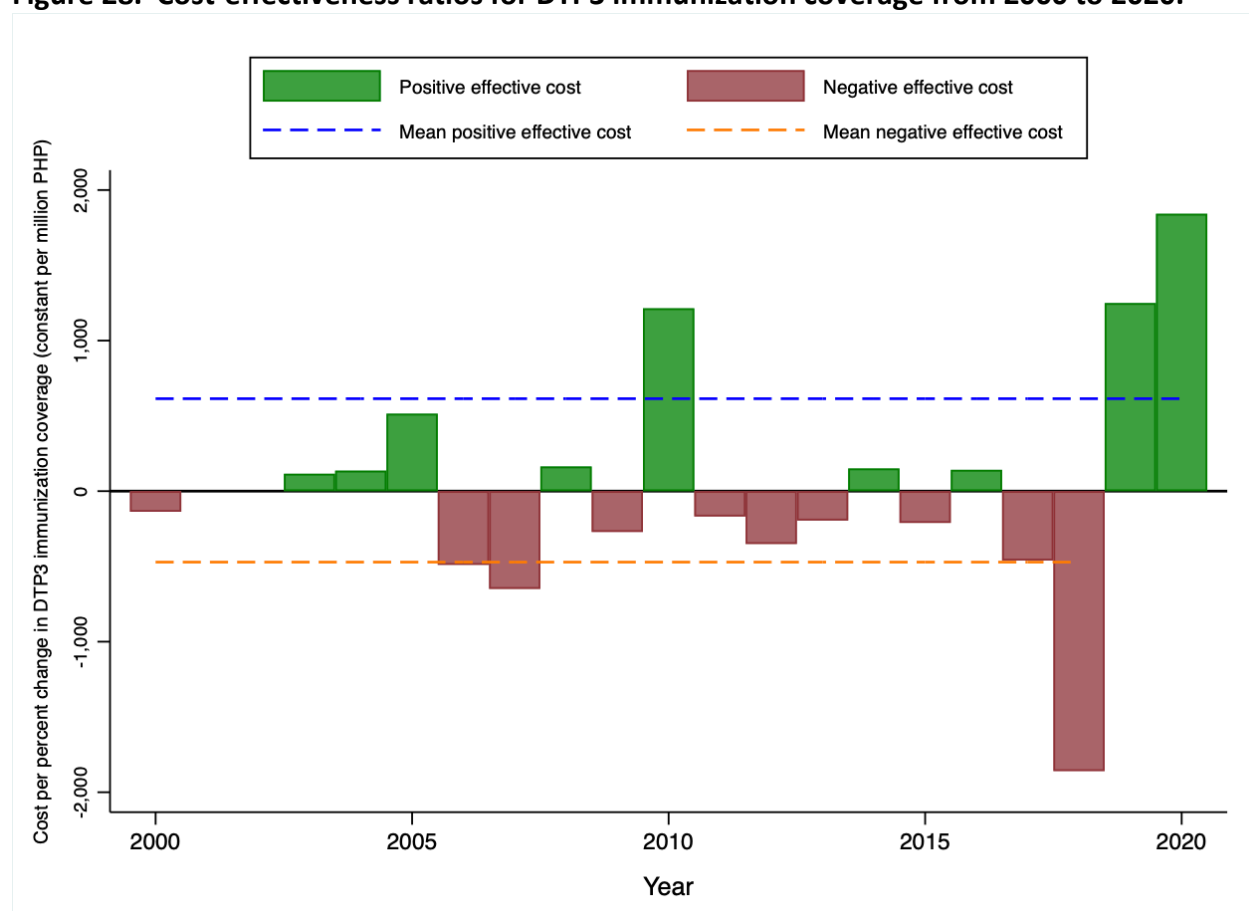
For the Family Health program, the cost per increase in the number of users of modern contraceptive methods out of the total population of women aged 15 to 49 years old for years 2001, 2005, 2009, and 2013 were lower than the average cost per percent increase in coverage for all years, which may suggest that funds were more efficiently utilized in the aforementioned years to achieve intended program outcomes for modern contraceptive coverage. For other years from 2000 to 2020, the cost of each percent change in modern contraceptive coverage was either higher than the average cost per increase in modern contraceptive coverage for all years or coverage did not improve from the previous year, suggesting possible inefficiencies in the utilization of funds to improve national modern contraceptive coverage. **Since the STRA in 2012, the increase in funds did not result in increased cost-effectiveness and modern contraceptive coverage** (see Figure 27).

Figure 27. Cost-effectiveness ratios for modern contraceptive coverage from 2000 to 2020.



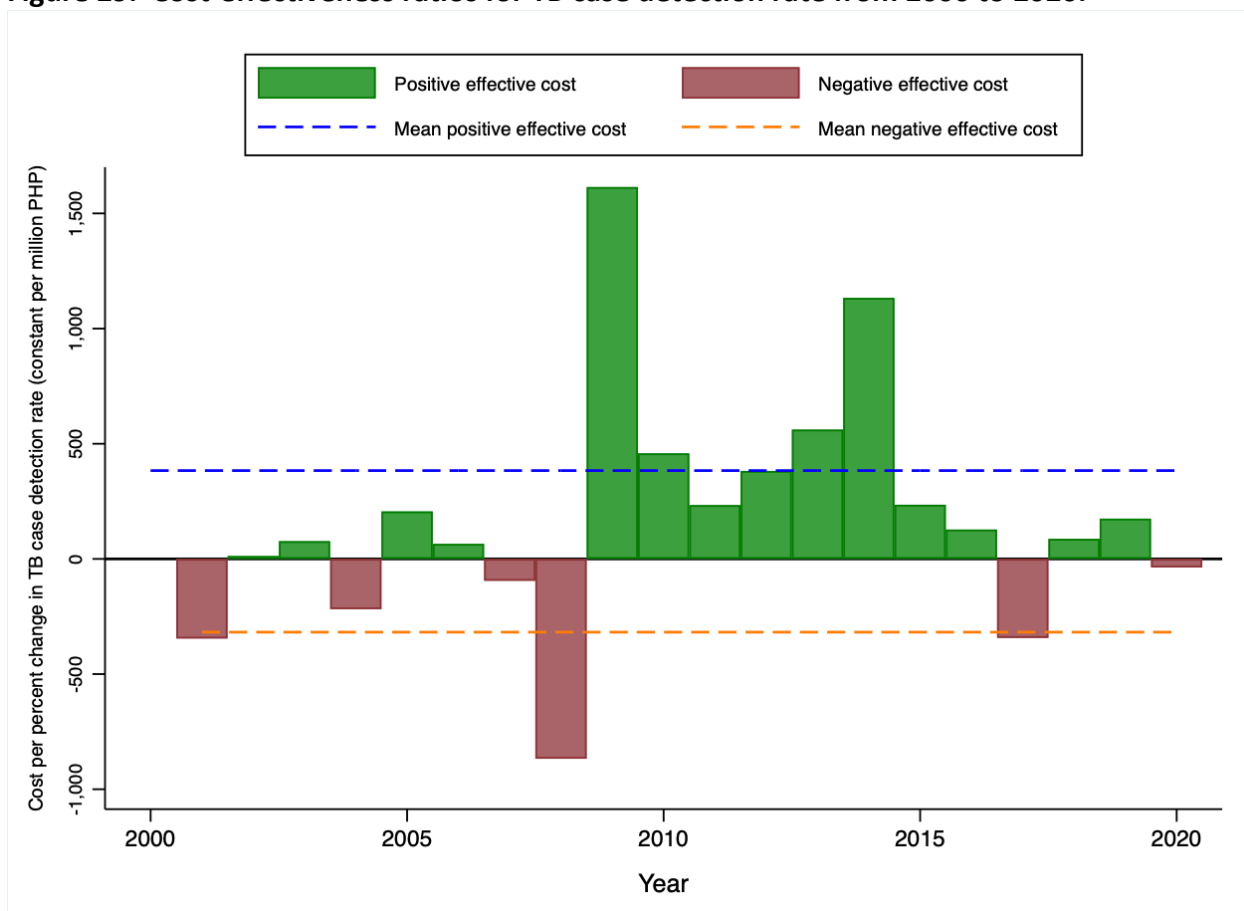
For the NIP, the cost per increase in DTP3 immunization out of the total population of one year-olds and below in the years 2001 to 2005, 2008, 2014, and 2016 were lower than the average cost per percent increase in coverage for all years, which may suggest that funds were more efficiently utilized in the aforementioned years to achieve intended program outcomes for DTP3 immunization. For other years from 2000 to 2020, either cost per percent increase in DTP3 immunization coverage were either higher than the average cost per percent increase in coverage or coverage did not improve, also suggesting possible inefficiencies in the utilization of funds to improve national DTP3 coverage. Since 2012, **the increase in funds did not result in increased cost-effectiveness and DTP3 immunization coverage** (see Figure 28).

Figure 28. Cost-effectiveness ratios for DTP3 immunization coverage from 2000 to 2020.



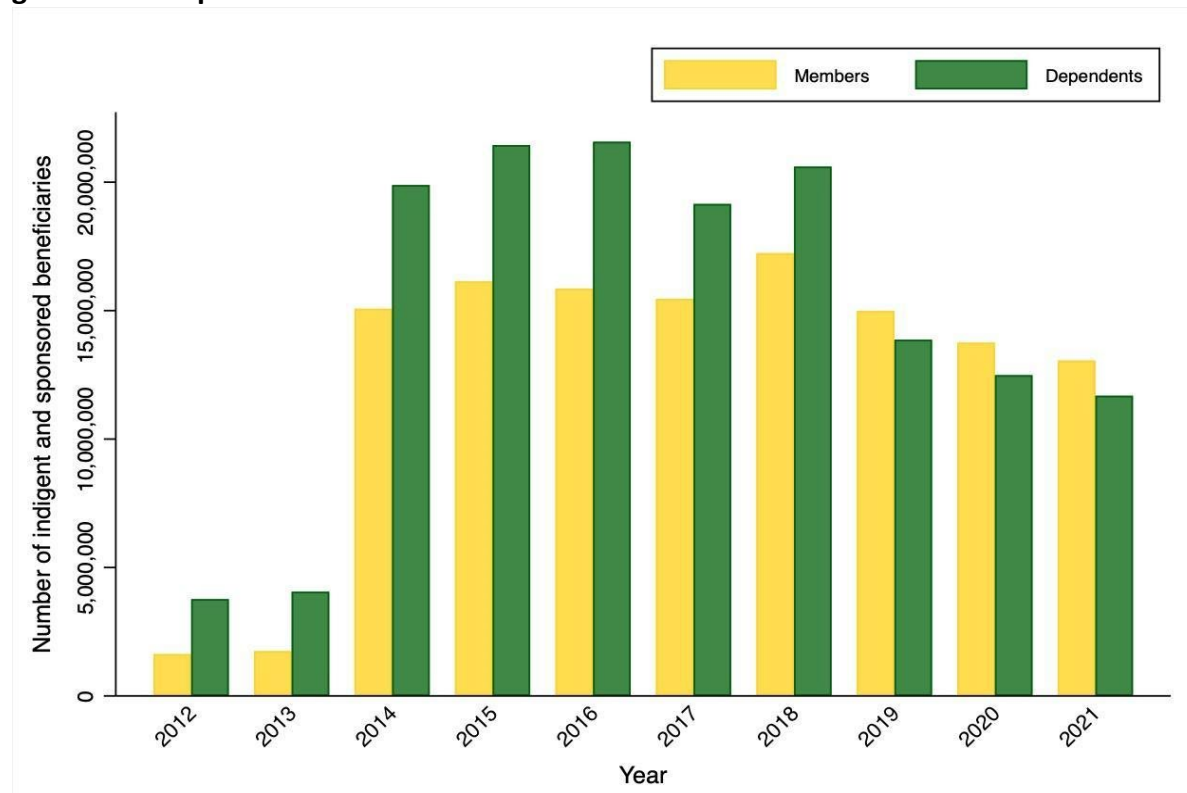
For the TB Control program, the cost per percent increase in case detection rate was lower than the average cost per percent increase in coverage in 10 of the years included in the time period, suggesting that the TB control program was able to improve case detection rate while efficiently utilizing allocated funds for half of the time period from 2000 to 2020. Since 2012, case detection rate has increased annually, excluding 2017 and 2020. After 2014, the cost per percent increase in case detection rate being lower than the average cost across all years suggests that, although allocated funds to the TB Control program have generally decreased since 2009, **the program was generally able to ensure consistent improvements in case detection rates annually** (see Figure 29).

Figure 29. Cost-effectiveness ratios for TB case detection rate from 2000 to 2020.



When examining outcomes for DOH and PhilHealth programs, the temporal trends show that outcomes have generally improved since the enactment of the STRA and years prior. Since 2012, PhilHealth membership for indirect contributors, members under the NHIP that target identified at-risk subpopulations, such as senior citizens, indigents, and government-sponsored individuals, whose level of income is deemed to be inadequate for daily sustenance, has increased (see Figure 30). This trend coincides with both the enactment of the STRA that increased revenue to subsidize premiums of indigents and sponsored members, as well as PhilHealth policies to enroll all families in the National Household Targeting System for Poverty Reduction (NHTS-PR) and all members registered under the DSWD's Pantawid Pamilyang Pilipino Program (4Ps) under the NHIP (PhilHealth, 2013). The large increase in indigent and sponsored beneficiaries suggests that considerable progress has been made in the country toward reducing financial risk protection for poorer and vulnerable subpopulations.

Figure 30. Registered PhilHealth members and dependents categorized as indigent or government-sponsored from 2012 to 2021.

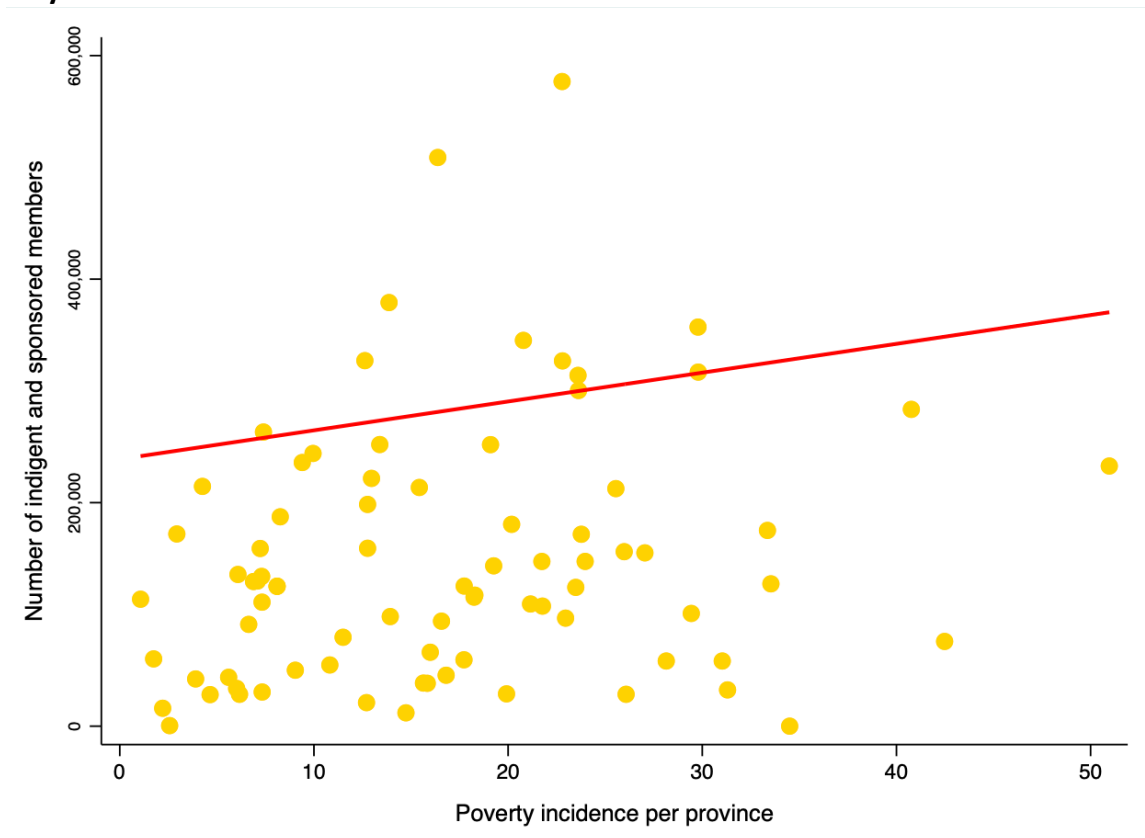


Note: Specific sub-category for indigent members, distinguished from sponsored members, was implemented starting 2011

However, **registered indigent and sponsored beneficiaries have annually decreased since 2018**. This decrease in membership is concerning, due to both an increasing national population and national poverty incidence since 2018 (PSA, 2021). The decreasing membership in recent years and the sudden increase in 2014 may be explained by the method for classifying indigents and sponsored members under the NHIP. Annually, a new list of certified indigents and members of the population under government assistance programs is submitted by LGUs to the DSWD for program monitoring and provision to other government agencies, potentially contributing to sudden increases or decreases in the total members of different municipalities when a large cohort is either identified to be indigent when not present in previous registries or, conversely, a large cohort is removed from the previous year list when verified to no longer meet the criteria for indigency status.

Furthermore, the relationship between total indigent and sponsored beneficiaries enrolled per province and provincial poverty incidence in 2021 is weak and non-significant, $r(85)=0.129$, $p=0.25$. However, the relationship between indigent and sponsored members specifically and provincial poverty incidence is significant at 10% level, $r(85)= 0.205$, $p<0.1$, suggesting that although the number of indigent beneficiaries per province is partially influenced by local poverty incidence, there are other determinants that affect the enrolment of indigent and sponsored beneficiaries per province (see **Figure 31**).

Figure 31. Relationship between number of indigent and sponsored members and provincial poverty incidence in 2021.



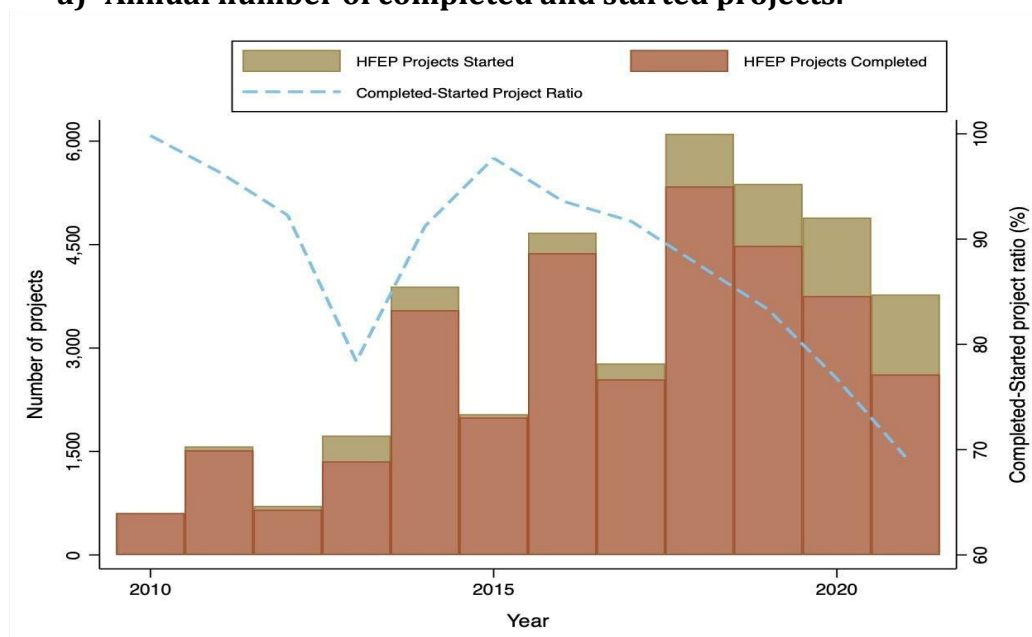
Studies in other countries have found that indigent members of the population may not be enrolled under the National Health Insurance Schemes if the criteria for classifying indigent members is not adjusted to the socioeconomic conditions of subpopulations within the country (Kotoh & Van der Geest, 2016) and the definition of eligible populations is inconsistent between communities (Savadojo et al., 2015). These findings, alongside our results, suggest that there may be process inefficiencies in the classification and enrolment of indigent and sponsored members under the NHIP that limit membership coverage, even when annual subsidies for said subpopulations are increasing. **It is imperative for PhilHealth, in collaboration with other government agencies, to ensure the accuracy, validity, and consistency of data on indigents at both national and sub-national levels in order to improve equity of healthcare throughout the country.**

The number of annual HFEP projects started and completed has generally increased since 2012. The number of projects fluctuates from 2013 to 2018, with alternating rises and drops within this time period, and has been decreasing since 2018. The drop in HFEP projects coincides with the drop in total and per capita appropriations in constant PHP for the program in 2018 onwards (see **Figure 32a**). In 2021, the HFEP reported to have started 3,776 projects and completed 2,617 projects, higher than the reported amounts of 711 and 656 in 2012, suggesting that DOH support towards increasing facility accessibility and augmenting healthcare provider capacity throughout the country has markedly expanded over the past decade. A subgroup analysis of started projects from 2010 to 2021 by health facility classification indicates that most projects were to support

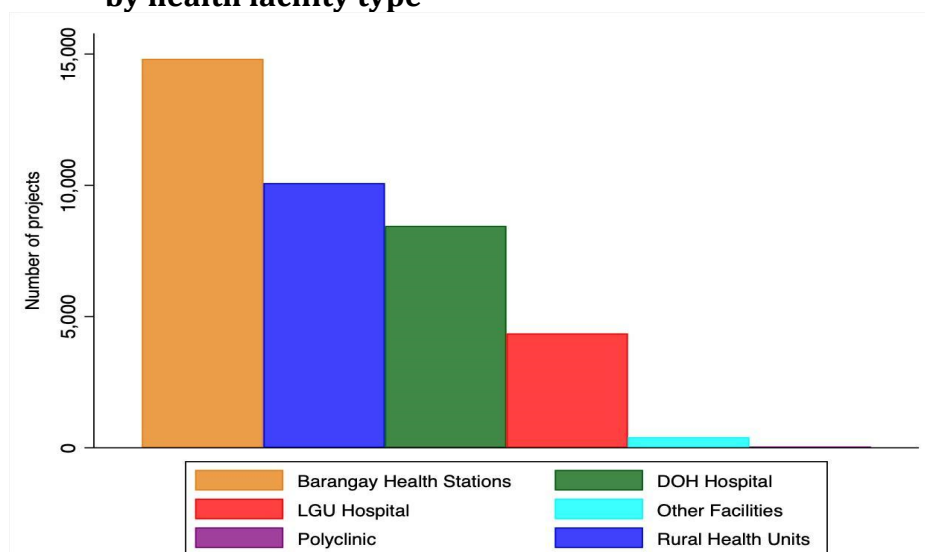
Barangay Health Stations (BHS), Rural Health Units (RHUs), and DOH-retained hospitals, implying an increased focus towards improving accessibility and quality of primary care services and services provided by public facilities nationally during this time period (see **Figure 32b**).

Figure 32. Number of HFEP projects started and completed from 2010 to 2021.

a) Annual number of completed and started projects.



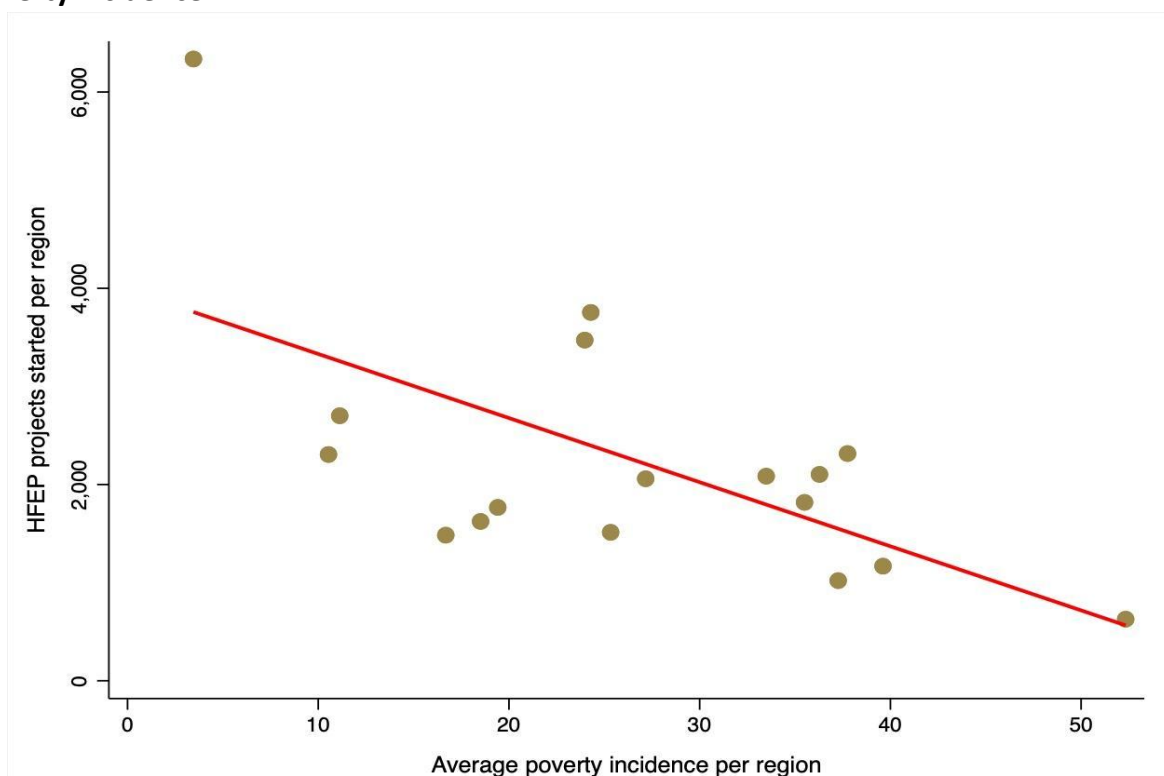
b) Subgroup analysis of cumulative sums of projects started from 2010 to 2021, by health facility type



Cumulative sums for 2010 to 2021: BHS = 14,815, RHU = 10,033, DOH Hospital = 8452, LGU Hospital = 4355, Other = 404, Polyclinic = 47

Despite the increase in projects supported by the HFEP, the annual ratio of completed to started projects has decreased since 2016, with the discrepancy between projects started and completed growing annually. These findings suggest that there is still a need to address inefficiencies and pervasive issues that affect project implementation. Such inefficiencies could be due to historical issues previously noted with the program, such as a lack of a clear monitoring and evaluation system, confusion between stakeholders concerning expected roles and responsibilities, unavailability of project sites, sudden project realignments, suspension and delay of MOAs and permits by LGUs, and delayed release of allotted funds (Lavado et al., 2012; Commission on Audit, 2017). It is also important to note that even if the number of HFEP projects to support basic primary care service delivery has increased, this did not necessarily improve the general health care status in the country. Maternal Mortality Rate (MMR) remains high throughout the country, as issues with the capacity of human resources and availability of services were not consistently addressed alongside HFEP investments in infrastructure (Nisperos et al., 2022). Furthermore, national trends mask possible inequities in the allocation of HFEP projects that occur at sub-national levels. Subgroup analysis of the distribution of projects started per region from 2010 to 2021 revealed that projects funded by the HFEP and average poverty incidence in regions from 2009 to 2021 were strongly and negatively correlated, $r(16) = -0.624$, $p < 0.01$ (see **Figure 33**).

Figure 33. Relationship between HFEP projects started per region and average regional poverty incidence

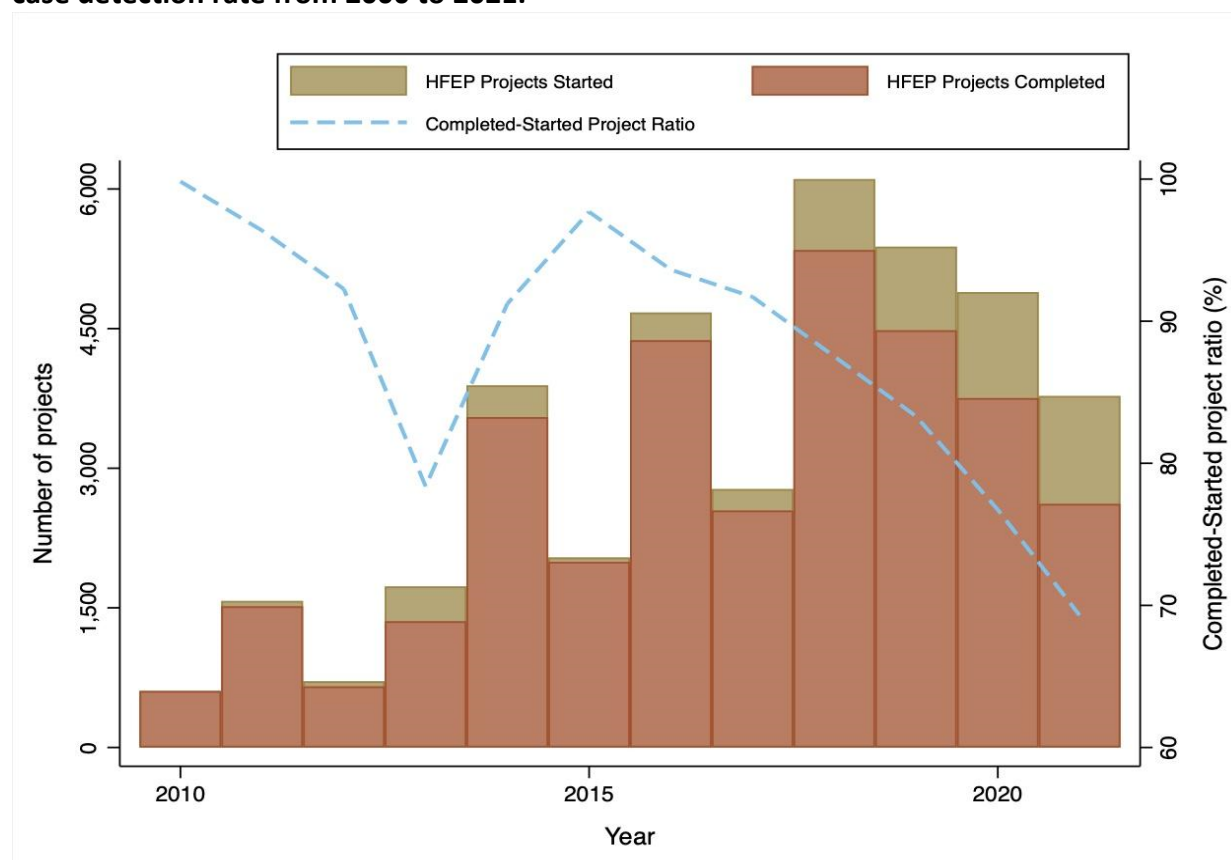


Note: HFEP data is from 2010 to 2021; PSA data is from 2009 to 2021

Concerningly, the largest proportion of total projects started (16.6%) were in the National Capital Region (NCR), the region with the lowest average poverty incidence (3.46%), while the top three regions with highest average poverty incidences, Eastern Visayas (37.75%), CARAGA (39.61%), and BARMM (52.34%), only consisted of 10.77% of total projects. This suggests that **HFEP projects were not consistently allocated, based on poverty incidence and financial risk from health expenditure of different subpopulations within the country**. The results are in line with previous literature suggesting the lack of a structured mechanism for allocating projects considering the capacity of LGUs and provincial poverty incidence (Lavado et al., 2012). Recently, Ulep et al. (2021a) found that there is an uneven distribution of primary care facilities between different municipalities throughout the country, even with grants from the HFEP to augment capital infrastructure requirement of facilities. As disparities in distribution are already seen at regional level, it is possible that disparities may be larger when analyzed at provincial or municipal level. Existing and potential inequities and inefficiencies in the HFEP must be addressed to improve program outcomes in support of service delivery throughout the country.

Since 2012, there has also been an annual increase in both modern contraceptive coverage and TB case detection rate until 2019, with 2020 coverage for both services decreasing from the previous year. DTP3 immunization coverage fluctuates across years, with coverage being higher in 2014, 2016, and 2020 than in 2012 but decreasing in the succeeding year (see **Figure 34**).

Figure 34. Service coverage for modern contraceptive methods, DTP3 immunization, and TB case detection rate from 2000 to 2021.

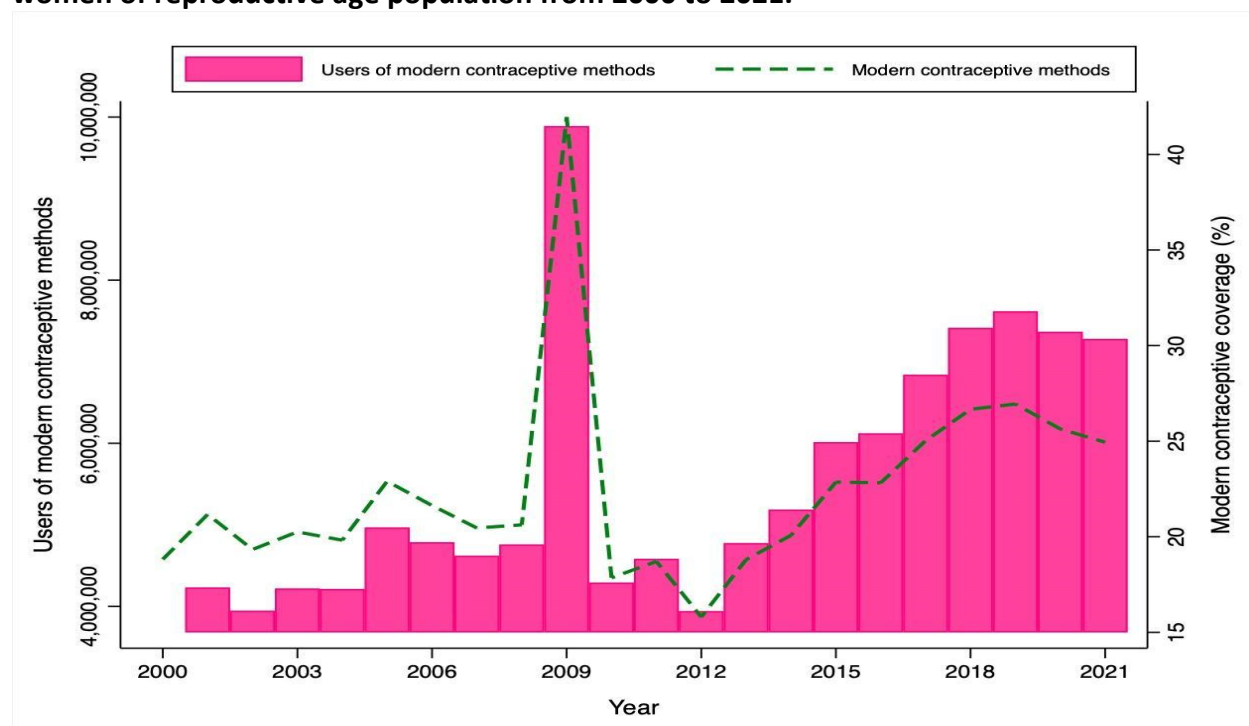


Uy et al. (2022) found that after the onset of the COVID-19 pandemic in late 2019, overall service utilization declined across diseases, which the authors suggested could be due to a combination of lower willingness to seek care due to fear of COVID-19 infection, stricter travel restrictions, and a rapid decline in household income reducing the accessibility of services across the health system. These barriers to accessibility of care may have influenced the coverage of public health services supported by multiple DOH programs during 2020 and 2021.

Since 2012, annual modern contraceptive users and coverage have increased, with 2014 coverage exceeding historical modern contraceptive coverage in years prior to 2012, excluding 2009 (see **Figure 35**). The increasing trend coincides with both the Sin Tax Reform Act and the Responsible Parenthood and Reproductive Health Act of 2012 (RPRHA) to improve both the financing of healthcare services and guarantee universal and free access to modern contraceptive methods at government facilities (Republic of the Philippines, 2012). Although modern contraceptive coverage has considerably increased, the majority of the eligible population is yet to be covered.

The maximum modern contraceptive coverage from 2000 to 2020 was 42% in 2009, almost double the average coverage of 22% for all years (see **Figure 35**). This was after a 35.35 million in constant PHP increase in the Family Health budget in 2008 (see **Figure 23**). However, modern contraceptive coverage dropped by 24% in 2010, after a 23.25 million in constant PHP decrease in Family Health budget in 2009, suggesting the surge and drop in coverage around 2009 may partially be due to the large variations in appropriations during 2007 to 2009, which may have affected the procurement and availability of modern contraceptive methods. This sudden drop in reported coverage may be due to the demand generation for modern contraceptives after 2009 not being sustained, hence, the lower uptake in 2010 to 2012.

Figure 35. Users of modern contraceptive methods and modern contraceptive coverage of the women of reproductive age population from 2000 to 2021.

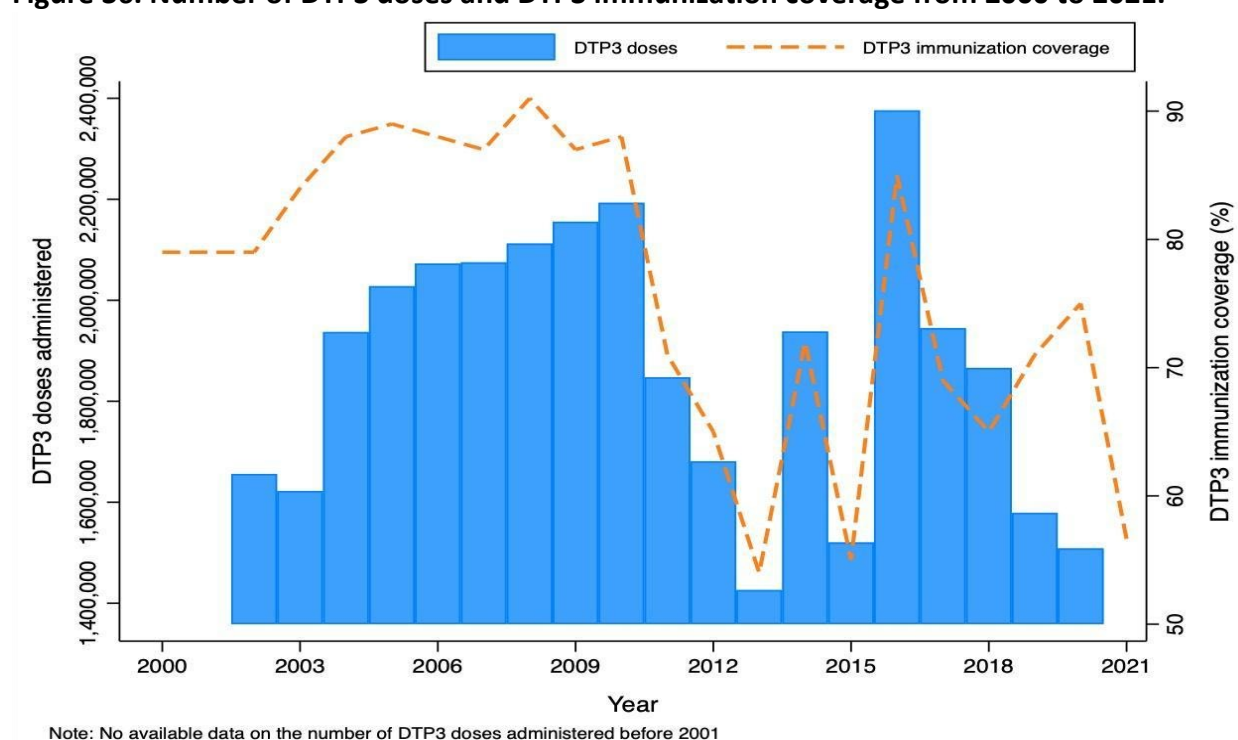


Previous literature suggest that challenges in increasing modern contraceptive coverage are limited by recurring issues with implementation of the RPRHA across years, as lack of a unified multi-sectoral plan, weak M&E system, a weak correlation between demand generation and service delivery, and lack of a transparent logistics system to monitor inventory of commodities have been consistent issues in providing family planning services throughout the country (Van et al., 2021).

Low modern contraceptive use is associated with limited knowledge about methods, misconceptions about reproductive health, and limited decision-making autonomy of women (Williamson et al., 2009; Hindin et al., 2016). However, even with high knowledge among women of reproductive age, modern contraceptive usage may still be low due to stigmas and negative attitudes towards methods (Beson et al., 2018; Asiedu et al., 2020). In the Philippines, religious beliefs, educational attainment, and awareness of family planning are significant determinants of contraceptive usage (Miradora, 2017), suggesting that the limitations of modern contraceptive coverage among women of reproductive age in the country may due to unaddressed barriers in service coverage, including health literacy and sociocultural acceptance regarding the use of modern contraceptives. **In order to maximize the provisions of the Family Planning services, investment should also provide equally important focus on (1) health promotion to generate demand for, educate target populations about the benefits of, and dispel misinformation about, modern contraceptive methods and (2) improving the supply chain and monitoring system for Family Planning services to ensure timely and responsive adjustments to population needs.**

Since 2012, annual DTP3 immunization coverage has been inconsistent, with coverage in in 2014 (72%), 2016 (85%), 2017 (69%), 2019 (71%), and 2020 (75%) being higher than in 2012 (65%), but lower in 2013 (54%), 2015 (55%). The trend also shows that DTP3 immunization rate has decreased annually since 2016, despite the increase in total and per capita appropriations in constant PHP to the NIP since 2013. The highest coverage during 2000 to 2020 was 91% in 2008 but coverage continually declined in the succeeding years until 2013 and did not reach 90% or more coverage after this year (see **Figure 36**).

Figure 36. Number of DTP3 doses and DTP3 immunization coverage from 2000 to 2021.

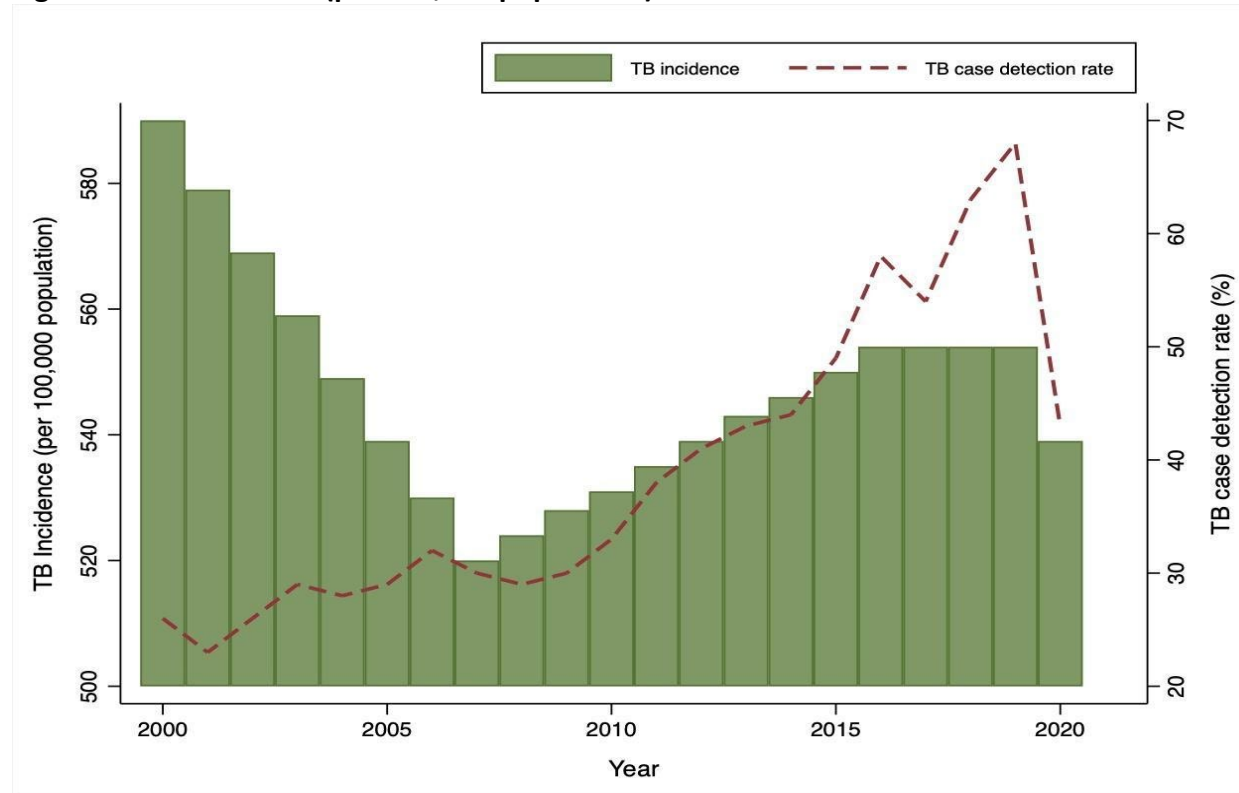


Note: No available data on the number of DTP3 doses administered before 2001

The general decrease in DTP3 immunization coverage after 2012, even with the substantial increase in appropriations to the NIP may be due to the fact that allocated funds may not be utilized to address bottlenecks in the provision of immunization services for DTP3 and other vaccines included in the full immunization coverage of children. In other countries, declines in DTP3 immunization coverage are associated with weak governance, lack of M&E, and misinformation about illnesses and vaccinations (de Araújo Veras et al., 2021). Recently, Ulep and Uy (2021) found that, from 1976 to 2019, the majority of the NIP annual budget is spent on purchasing vaccines and less than 3% is allocated for human resources, vaccine supply chain, health promotion, and research, suggesting that core immunization coverage is limited by the lack of investment in strengthening non-vaccine components, including procurement and logistics, M&E, and human resources, needed to optimize accessibility of vaccination. Furthermore, the authors found that children from poorer households and with mothers without education were more likely to drop out before completing vaccination, suggesting that investment of NIP funds in health promotion and education are also needed to address willingness of vulnerable subpopulations to be vaccinated. Previous literature in the Philippines also supports this need, as health literacy, social support, and vaccine media promotion were found to be positively associated with vaccine acceptability (Young et al., 2010; Sumile et al., 2020).

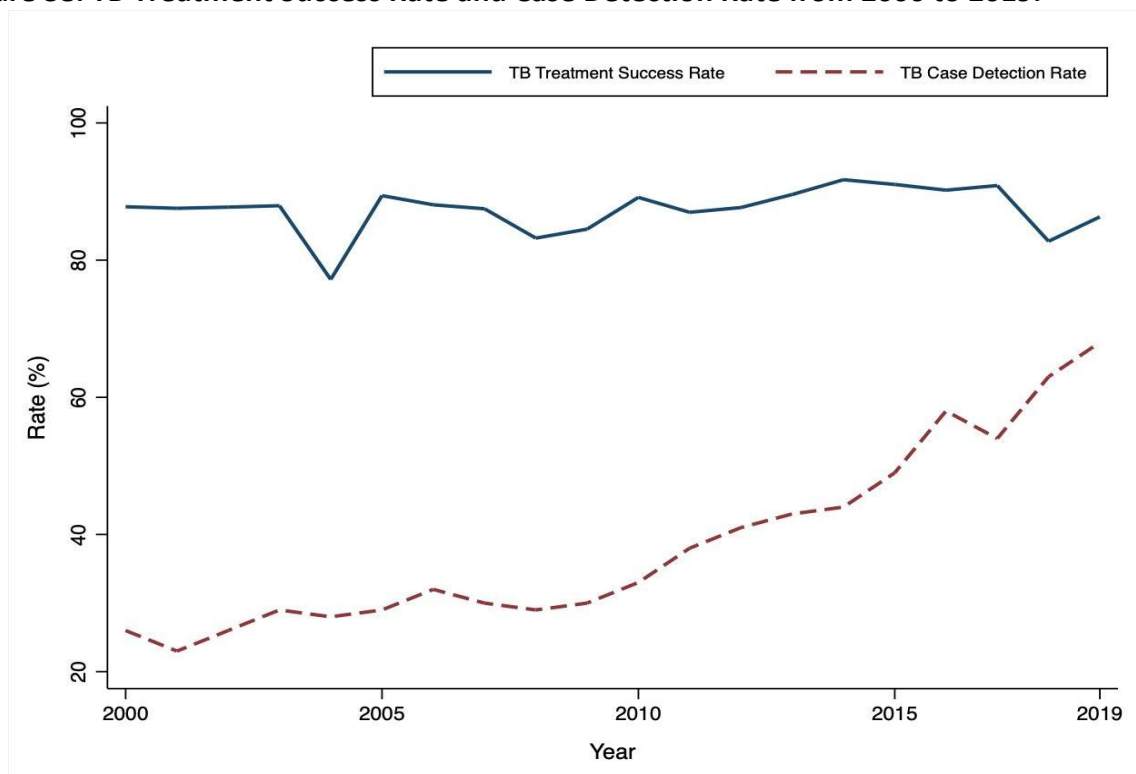
From 2008 to 2019, TB case detection rate has increased in coverage, indicating notable improvements nationally in the early management and control of the disease. The highest incidence rates were recorded in the years before 2005, when case detection rates were lower than in more recent years. However, the temporal trend also displays a concurrent increase in both case detection rate and TB incidence per 100,000 population from 2008 to 2016 (see **Figure 37**).

Figure 37. TB incidence (per 100,000 population) and case detection rate from 2000 to 2020.



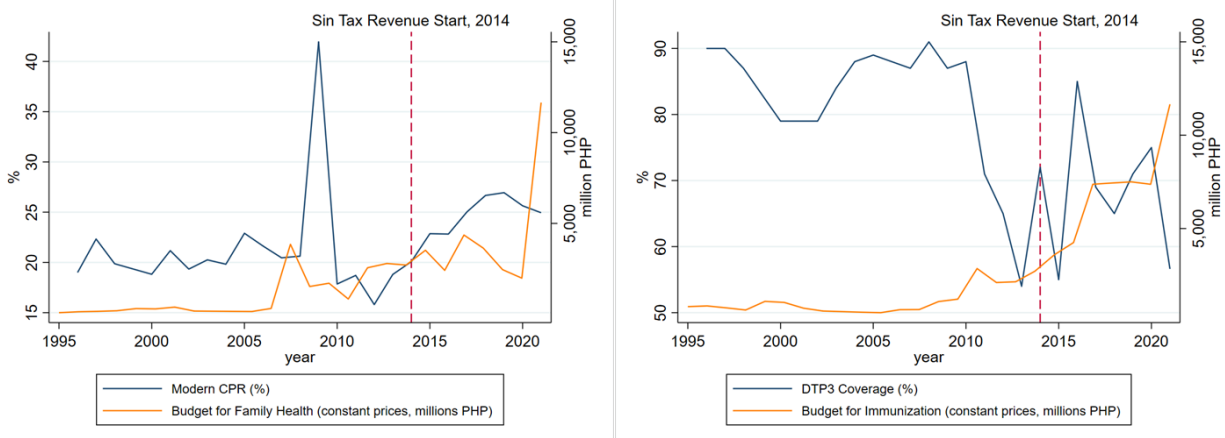
Pelissari et al. (2018) suggest that incidence may increase when case detection rate is high because increased coverage of TB diagnostic services is positively associated with the number of registered patients that undergo treatment, while incidence may also rise when case detection rate is low because of reduced coverage of primary care services to prevent and control risk of TB transmission is positively associated with increased incidence. Furthermore, TB incidence per 100,000 populations stabilized during 2016 to 2019, even when increasing case detection rates during 2016, 2018, and 2019, further suggesting that increases in incidence from 2008 to 2015 may be due to increased TB cases diagnosed and does not necessarily mean poor disease prevention and control. Findings from other countries also suggest that TB incidence tends to rise initially with the expansion of case detection rate, but eventually stabilizes even when case detection rate continuously increases (Hamusse et al., 2014). The TB Control program was able to improve service coverage and health outcomes for TB (see **Figure 38**), in spite of the decrease in total and per capita appropriations in constant PHP since 2008, suggesting the program has consistently improved its effectiveness and efficiency before 2020 in increasing accessibility of TB services throughout the country. The sudden drop in case detection rate from 68% in 2019 to 43% in 2020 may be due to decreased accessibility of facilities providing TB diagnostic and treatment services. Uy et al. (2022) found that admissions for TB decreased by 46% in 2020 from 2019, which suggests that utilization of other TB services may also have decreased due to reduced fear of COVID-19 infection, travel restrictions, and reduced household income.

Figure 38. TB Treatment Success Rate and Case Detection Rate from 2000 to 2019.



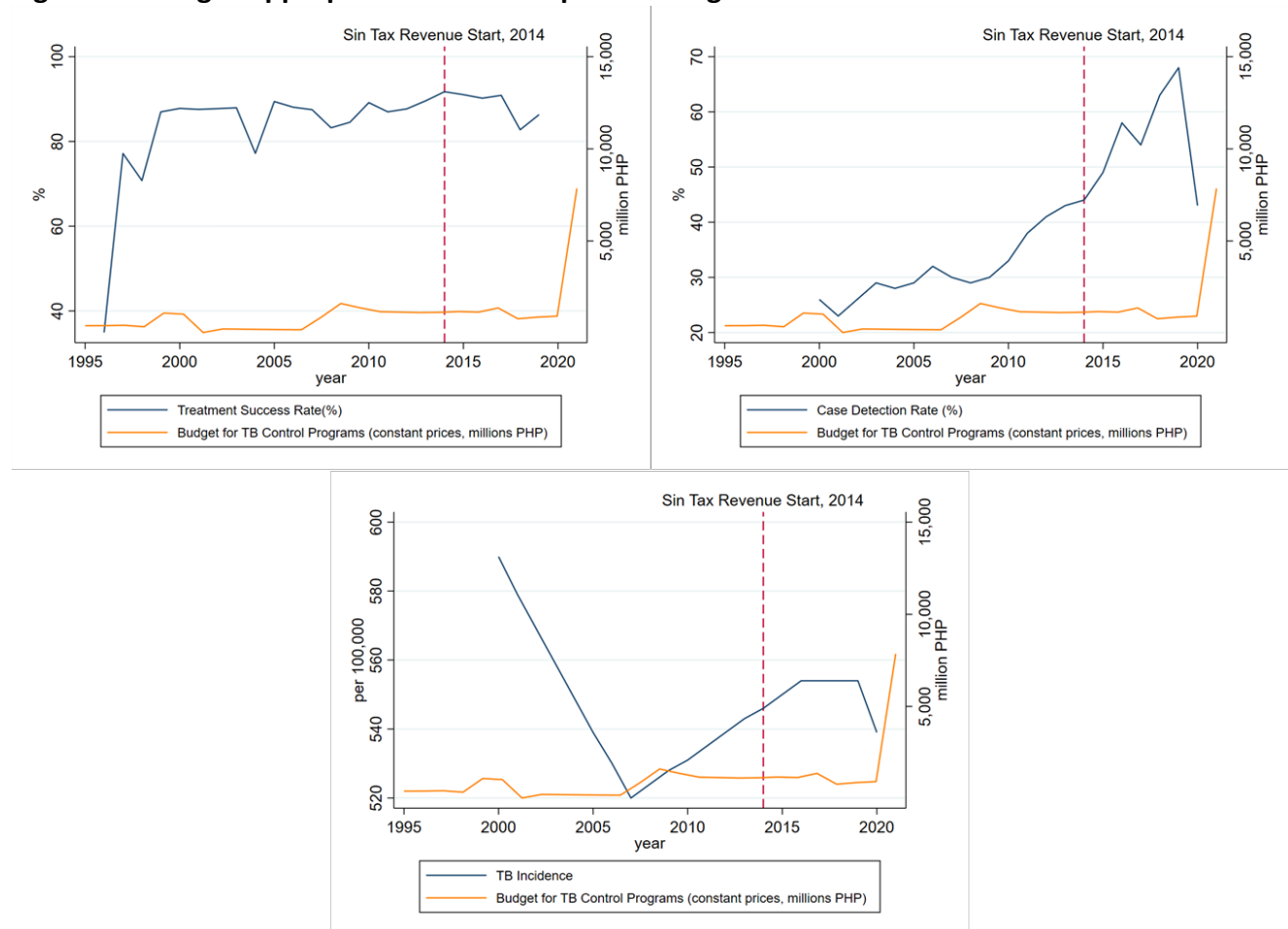
Additionally, results suggest that even if the case detection rate has improved since 2000, the treatment success rate has not improved during this time period and has dropped below the WHO target of 90% treatment success rate (WHO, 2003) since 2017. A possible reason for the lack of improvement in national treatment success rate is the inconsistent quality of care provided to TB patients. Improved treatment success rate and lower mortality rate have previously been associated with community-based interventions for TB that allow increased accessibility and direct supervision of treatment adherence (Izudi et al., 2020). Older age, being male, and patient comorbidities are also associated with lower treatment success rate, and retreatment suggesting the need to also develop interventions sensitive to the special needs of these subpopulations to improve treatment success rate (Vasankari et al., 2007; Talay et al., 2008; Izudi et al., 2020). In the Philippines, Ulep et al. (2021b) found that there was high variability in the protocols and quality indicators used among both public and private hospitals, which may exacerbate poor quality of care and hinder improvement of health outcomes across diseases. **The TB Control Program should aim to improve both case detection and treatment success rate by increasing focus of investments on (1) health promotion to increase patient knowledge on practices for TB prevention and management, (2) the development of standardized clinical practice guidelines for all healthcare providers to improve diagnostic accuracy and adherence to clinical standards, and (3) community-based TB services to increase accessibility of services and collaboration between facilities and community members within municipalities and provinces.**

Figure 39. Budget Appropriations with Respective Program Outcomes for Family Health and Immunization



Using Modern Contraceptive Prevalence Rate (CPR) among women of reproductive age as the target outcome for the Family Health program and DTP3 immunization coverage for Immunization, we see that there may possibly be a positive attribution in increases in budget for the Family Health program to the increases in Modern CPR. However, for the budget in Immunization and DTP3 immunization coverage, there seems to be an opposite correlation. In particular, we see that, while the budget for the NIP seems to steadily grow from 2010, the DTP3 immunization coverage has been moving erratically but dropping down on average.

Figure 40. Budget Appropriations with Respective Program Outcomes for Tuberculosis



Meanwhile, for the TB Control Program, we see that the problem is mainly due to the fact that big variations in the budget for the programs did not happen even after the STRA was enacted. There is only a substantial increase in the budget after 2020. These observations are validated in Table 14 below, showing the results of the ARDL specifications¹¹. Overall, it seems that the budget appropriations are more likely to be attributed nationally if the program target outcomes are program instruments (i.e. contraceptives with Family Health program budget, DTP3 immunization coverage with Immunization program budget) and are less likely to be correlated when program outcomes are the goal measures (e.g., Case Detection Rate and TB Incidence with TB program budget).

¹¹ See **Appendix D**. ARDL model results for the ARDL specification results and the bounds test proposed by Pesaran, Shin, and Smith (2001) and improved upon by Kripfganz and Schneider (2020).

Table 14. ARDL models for Family Health (FH), Immunization (Imm), and Tuberculosis (TB) Programs

Program	Outcome	Bounds Test H ₀ : No Long-Run Relationship	LR Coeff. [S.E.]
FH	MCPR	Reject***	4.18560*** [1.32501]
Imm	DTP3	Reject***	-9.25082* [1.37238]
TB	TSR	Reject***	2.06970 [3.35657]
	CDR	Do Not Reject	-2.44195 [4.92769]
	INC	Do Not Reject	54.65376*** [5.44373]

Note: * - Significant at 10%

** - Significant at 5%

*** - Significant at 1%

Coefficients and standard errors are in 10⁻⁹ units

All models are ARDL (1,1) models, except for Imm which is ARDL (6,6)

Acronyms: FH (Family Health), Imm (Immunization), TB (Tuberculosis), MCPR (Modern CPR), TSR (Treatment Success Rate), CDR (Case Detection Rate), INC (incidence)

Looking at the results of our respective ARDL models for each program budget and outcome, long term coefficients for the Family Health program comparison and the NIP comparison reflect what we see in the run charts. In particular, the ARDL model shows that for every one billion PHP (in constant prices) added in the budget for Family Health is attributed to an average of approximately 4.19 percentage point increase in Modern CPR, while we see that an increase of one billion PHP (in constant prices) for Immunization is attributed to an average decrease of approximately 9.25 percentage points of DTP3 coverage¹². This may be related to the findings from Ulep and Uy (2021). DTP3 doses are not the only vaccines procured by the NIP and the included core vaccinations have shown a trend of expansion over the last few decades. Less than 3% of NIP budget goes to improving cold chains, building capacity of health workers, and into research for vaccines, suggesting that there may be gaps that the budget and program projects and activities are not effectively and efficiently addressing.

For the comparisons in the TB Control program budget and outcomes, the models are either insignificant with the coefficient, or any models estimated show no significant long run relationship. This implies that there needs to be more variation in the data to show attribution to changes in the program outcome target with changes in their respective program budget over the period. These variations would have improved attribution if the analysis is disaggregated over more local areas, especially since these outcomes likely differ in different local government units with respective capacities for providing health services, as well as different socio-economic conditions across different local government units.

¹² These are only attributions and not necessarily causal effects.

6. Conclusions and recommendations

In our study, we evaluated the performance of public health budget allocations arising from the Philippine Sin Tax earmarking policy to determine if (1) budgets were adequate to address targets, (2) earmarked revenues have been used equitably, (3) earmarked revenues have been allocated efficiently, and (4) earmarking reforms have been effective in improving key health outcomes. Our main finding is that **although program and health outcomes of select public health programs have improved since the implementation of Sin tax revenues, these funds have not necessarily been efficiently and equitably utilized by the recipient programs.** We highlight the key findings and relevant policy recommendations, based on the criteria used in evaluating earmarking policy:

- **Adequacy:** The health sector requires additional financing sources to implement UHC strategies and other roles to increase access of patients to public health services. Sin tax revenues have been an essential driver to increase fiscal space for health since the implementation of the STRA and have thus consistently provided a primary source of funding for health. Sustainability of this financing strategy must be reviewed using a standardized method to ensure that the national government is the primary source of financing for health to reduce the impact of procyclical effects of market trends and reduce sector fragmentation due to the earmarking policy (Cashin et al., 2017). The overall appropriations for health seem to have a significant jump after the passage of the STRA in 2012 (which would be reflected earliest in 2014), with our model showing an estimated increase in the overall appropriations for health by an average of PHP 35.207 billion per year from 2014 to 2020. However, the trend of individual budgets in the GAA shows that one budget supplements the other to fund for the approved budget for health, which is evidenced by inconsistent inter-year growth between both budget sources. It should be made clear that other earmarked funding sources are supplementary to the main provisions of the national government for public health programs. Even for programs where there have been considerable increases in constant and per capita appropriations that can be considered adequate for projects and activities, utilization of appropriations and Sin tax revenues did not necessarily lead to increased effectiveness, efficiency, and equity of target outcomes.

As the DOH increases its capacity to implement UHC through strengthening public health programs and increasing population coverage to social health insurance, predictions of the need for more than the forecasted values of sin tax revenues is needed for full implementation. However, the **DOH should exhibit its capability and accountability to utilize its annual budget effectively** as reported in their CONAP and individual program accounting records to show that further increased fiscal space is needed for implementation to achieve optimal health outcomes.

- **Equity:** Majority of the funds from the STRA is used consistently to finance membership of indigent members in the NHIP. This has been an important hallmark to achieve universal access to healthcare to increase coverage to the previously uncovered population. Our study found that poverty incidence was weakly associated with indigent and sponsored membership and inversely correlated with HFEP projects. For all programs, **poverty incidence needs to be consistently included amongst the criteria and administrative processes when allocating funds, projects, and activities** to ensure that

assistance is provided in areas with high at-risk subpopulations increasing access equity. Based on our results, programs need to be reviewed if distribution of resources and services provided are equitable across the country. The HFEP needs to realign itself to properly utilize its criteria to implement projects in regions and local governments with higher poverty incidence and in need of higher financial risk protection. Furthermore, PhilHealth needs to continuously work with the DSWD to ensure that the indigent population are selected on the basis of the National Household Targeting System for Poverty Reduction (NHTS-PR) criteria to ascertain that subsidized membership reaches the indigent households.

- **Efficiency:** The trends from the different sampled programs show that the increases in expenditures do not necessarily lead to improved outcomes. Moreso, the increases in budget did not systematically optimize the spending capacity of programs such that the budget allocated annually was not spent on their respective expected implementation plans. This is evidenced by their respective cost effectiveness ratios that were higher than the historical average. Therefore, programs need to be more strategic in requesting, allocating, and utilizing funds to address these gaps in service coverage.

The inclusion of sin tax revenues into the General Appropriations Act of the agency allows flexibility for the DOH to allocate funds to new and evolving programs developed to support UHC strategies. However, given the increase in fiscal space and autonomy to use the budget, **monitoring and evaluation of the outcomes achieved by the allocations provided by sin tax revenues must be continuously reported.** There is no information asymmetry in terms of the actual budget received by the DOH from different funding sources lumped into the GAA, therefore, the agency can clearly allocate funds from specific budget sources, rather than only attributing specific amounts, to clearly delineate specific program outcomes to the sources of inputs. This would allow the DOH, DBM and DOF to quantify outcomes as a result of sin tax revenues for different programs at the national and subnational levels.

- **Effectiveness:** The quality of performance indicators monitored for each program with attributed sin tax revenue budget varies widely. This makes it more difficult to make conclusions about the effectiveness of earmarking for achieving target outcomes. Our study also found that **even if program indicators show a general trend of improvement, the extent of improvement is limited by issues with efficiency and equity of appropriations and revenue utilization.** Our analysis of select programs also revealed that only the Family Health program showed positive results with increases in budget allocation to increases in modern CPR, which can be attributed to the national government feasibly attaining this through providing contraceptives directly. In contrast, increase in allocations for DTP3 immunization and the TB program did not show a significant positive relationship with their respective performance indicators.

Performance indicators should be revisited for different P/A/Ps, such that these targets can effectively and clearly quantify the service and/or clinical outcomes that should be achieved to support UHC, MAP and HFEP. Furthermore, focusing only on national indicators for different public health programs instead of localized targets will not capture benefits of increases in budget allocations and will thus lead to insignificant or opposite from intended effects to target health

outcomes. The method for selecting indicators and dimensions of disaggregation should be standardized across programs and made transparent to allow for validation of chosen indicators, with regards to how they relate to other indicators and overall goals of UHC. This further strengthens the recommendation for the agency to transform the increases in fiscal space into quantifiable health benefits by addressing service coverage gaps across all programs.

Our current findings are consistent with findings in other countries that demonstrate that, while public expenditure can significantly influence health status outcomes, it is far from the sole or most important determinant. For example, Filmer and Pritchett (1997) found that 95% of inter-group variability in mortality was explained not by health spending but by non-health factors such as per capita income, income distribution, and female education, findings that were been confirmed by later studies (see Çevik and Tasar, 2013 for example). This suggests the need to consider the impact of earmarking and sin tax revenues on health outcomes across different social determinants of health, such as geographic location beyond region, age, sex, and income class and how pooled funds can be equitably distributed across determinants.

6.1. Study Limitations

Our study has several limitations. First, the year range was not consistent among all datasets. For example, disbursement data from DOH was only from 2014 to 2021, limiting the predictive analysis that could be done on actual disbursed amounts of programs and the conclusions that could be derived from the available data. Furthermore, the most recent year of the datasets used were also not consistent, with the most recent data on TB treatment outcomes and burden of disease at the time of analysis being for 2019 and 2020, respectively.

Although most datasets included ranges of 20 years or greater, future studies should aim to standardize the ranges between datasets to allow for compatibility of trends and further analysis of available data. The study also focused mainly on a national level. Although some of the outcomes were analyzed at a regional and provincial level, it was not possible to do so for all outcomes, given the available data. Further disaggregation of how program budgets and Sin Tax revenues are allocated to specific projects and activities, in relation to health outcomes, at provincial or lower level is needed to further understand inequities that are masked by focusing on national level trends. In the Philippines, higher prevalence of tuberculosis is associated with less accessible healthcare providers with provinces, as well as socioeconomic status of local populations (Leining et al., 2020). Furthermore, there are also large disparities between LGUs in terms of availability of human resources, facilities, and funding for primary care, leading to inequalities in healthcare accessibility and financial protection provided to different municipalities within the Philippines (Ulep et al., 2021a). From an empirical perspective, variations across local units such as provinces will lead to extracting a clearer relationship with disbursement and program outcomes. The standardization of processes for monitoring and evaluating allocated funds and revenues in the future will also help the analysis of the effects of earmarking and public health spending on specific activities and health system building blocks, including its effects on the availability of infrastructure, medicines, workforce, technologies, and overall service delivery, across years and geographic location.

Finally, the review of allocations and public health expenditure only included a select number of programs that receive revenue from the STRA and trends may differ for other programs. A more comprehensive analysis of all recipient programs is necessary to determine which programs are most effectively and efficiently utilizing funds to achieve intended objectives. Future research should investigate the adequacy, equity, efficiency, and effectiveness of earmarking and public health expenditure of all health programs that receive Sin Tax revenues at the level of local health systems, given the specific focus of UHC on augmenting the capacity of the LGUs to deliver integrated primary healthcare and strengthening province- and city-wide health systems (Republic of the Philippines, 2019).

7. References

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8. Appendix

Appendix A. Alternative Data Sources and Solutions to Data Issues

Table A1. Data Issues and Solutions

Source	Issues	Solutions
General Appropriations Act Reports	Lack of an accessible consolidated dataset for 1996 to 2021	Created a data table and transcribed data from annual reports to the table
Financial Accomplishment Reports	Data provided was only for 2014 to 2021 Change in GAA line item of programs in 2021	Disclosure that data used for disbursement analysis was only from 2014 Excluded 2021 budget line items that consolidated funds for multiple chosen programs
Sin Tax Reform Act Annual Report	Lack of data on excise taxes for tobacco and alcohol products before 2014 Lack of an accessible consolidated dataset for 2014 to 2021	Data on excise taxes for products obtained and inferred from alternative data sources (World Bank tax revenues) Created a data table and transcribed data from annual reports to the table
Field Health Services Information System (FHSIS) Report	Lack of a consolidated dataset for 1996 to 2021 1998 report missing Inconsistent indicators used for programs each year	Created a data table and transcribed data from annual reports to the table Transcribed available data and noted missing data Supplemented data on indicators from other data sources (e.g. WHO, World Bank) Data from reports used with data from other sources (e.g. Word Bank) to calculate indicators
HFEP Project Data	Data on distribution of projects per type and region not reported per year for 2010 to 2021 Only regional level data provided	Created separate data tables for HFEP data per region and facility type Data on facility type and regions reported as aggregates for 2010 to 2021 Adjusted level of PSA Poverty Incidence rates to Regional level for equity analysis
NHIP Membership data	Member sub-categories were inconsistent across years	Authors designed a new sub-categorization schema, based on sub-categories provided in the UHC Act of 2019, and provided new identifier variable for specific sub-category counts

Poverty Incidence	Data is not annual	Values were reiterated in years with gaps between subsequent surveys Incidence rate was averaged across years for data that spanned multiple survey years
Consumer Price Index Reports		
DTP3 Immunization data	Data on DTP3 doses only from 2021	Available data merged with other data tables Reported available data used for analysis
TB Treatment Outcomes data	Data only until 2019 Definition of treatment success rate changed after 2012	Available data merged with other data tables Reported available data used for analysis Raw numbers of cases cured, cases that completed treatment, and cohort size were obtained for new, relapse, and retreatment cases and processed to have the same table structure before re-calculating treatment success rate
Burden of Tuberculosis data	Data from 2000 to 2020	Available data merged with other data tables Reported available data used for analysis
Total population of women by single age groups	Population counts were given as individual variables per age group	A new variable was generated to consolidate counts for women aged 15 to 49 years old before merging with other data tables
World Development Indicators data	Variable for year did not follow structure of other data tables	Data table from World Bank dataset was reshaped to generate new variable for year consistent with other data tables before merging

Appendix B. Time-Series Models

We model it as the following ARMA (p, q) process:

$$\rho(L^p)(y_t - x_t\beta) = \theta(L^q)\varepsilon_t$$

where,

$$\rho(L^p) = \sum_{i=0}^p \rho_i L^i, \quad \theta(L^q) = \sum_{i=0}^q \theta_i L^i.$$

and

- p is the order of AR,
- q is the order of MA,
- y_t is the dependent variable,
- $x_t\beta$ is the linear combination of regressors,
- ε_t is the disturbance term, and,
- $L^j y_t = y_{t-j}$ is the lag operator.

We model an ARDL model as the following:

$$y_t = c_0 + c_1 t + \sum_{i=1}^p \phi_i y_{t-i} + \sum_{i=0}^q \beta_i' x_{t-i} + u_t,$$

where,

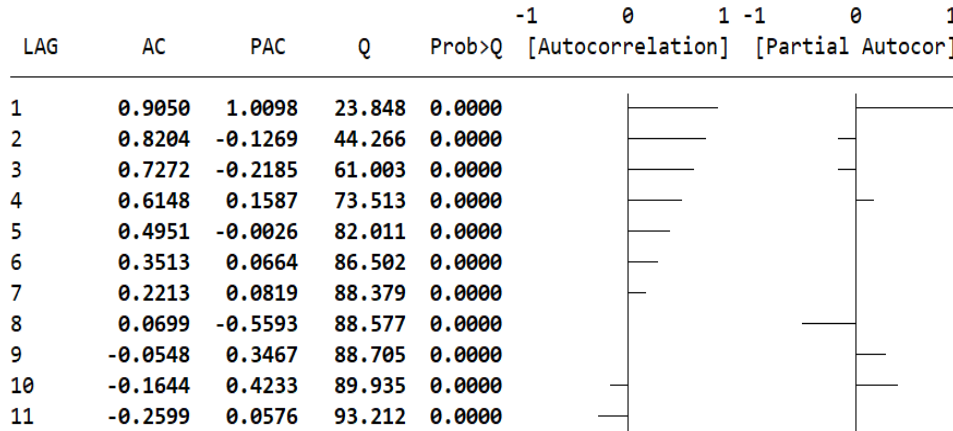
- t is the time variable where $t \in \{\max(p, q), \dots, T\}$
- y_t is the dependent variable,
- $\sum_{i=0}^q \beta_i' x_{t-i}$ is the linear combination of explanatory variables and the corresponding lags,
- u_t is the disturbance term.

A reparametrization in conditional Error Correction (EC) form is possible to isolate the long run effects.

Appendix C. Stationarity Test

Looking at the sample autocorrelations and partial autocorrelations, we see that the series is autoregressive, likely in the first-order.

Figure A1. Autocorrelation and Partial Autocorrelation for GAA Health Budget, 1996 – 2021



We then check to see if it is stationary using the (Augmented) Dickey-Fuller test on the log values of the GAA Health Budget (in current PHP). We do not reject the null hypothesis of a unit root, so we have to use the first difference of this variable.

Table A2. Dickey-Fuller test for unit root

Dickey-Fuller test for unit root			Number of obs	=	25
		Interpolated Dickey-Fuller			
Test Statistic		1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-1.598	-4.380	-3.600	-3.240	
MacKinnon approximate p-value for Z(t) = 0.7931					
D.ln_budge~h	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
ln_budget_~h					
L1.	-.16356	.1023369	-1.60	0.124	-.3757937 .0486738
_trend	.0251988	.0137009	1.84	0.079	-.003215 .0536126
_cons	3.700916	2.290908	1.62	0.120	-1.050136 8.451968

Hence, we use AR(1) for our estimation. We estimate an ARIMA(1,0,0) model on the log values of the GAA Health Budget (in current PHP) and find the following results.

Table A3. ARIMA(1,0,0) regression for GAA Health Budget

ARIMA regression

Sample: 1996 - 2013

Number of obs = 18

Wald chi2(3) = 41.31

Log likelihood = 10.46488

Prob > chi2 = 0.0000

ln_budget_health	OPG		z	P> z	[95% Conf. Interval]	
	Coef.	Std. Err.				
ln_budget_health						
from2008	.4857511	.2574489	1.89	0.059	-.0188396	.9903417
year	.0668016	.0330233	2.02	0.043	.0020771	.131526
_cons	-110.5041	66.29627	-1.67	0.096	-240.4424	19.43416
ARMA						
ar						
L1.	.8566641	.1406874	6.09	0.000	.5809218	1.132406
/sigma	.1304073	.0295366	4.42	0.000	.0725165	.1882981

Note: The test of the variance against zero is one sided, and the two-sided confidence interval is truncated at zero.

Appendix D. ARDL model results

Tables A4-5 show the respective results of the ARDL specification and the respective bounds tests proposed by Pesaran, Shin, and Smith (2001). The estimation of t-statistics was improved upon by Kripfganz and Schneider (2020).

Table A4. Results across ARDL models

ARDL Results	Model 1 - FH	Model 2 - Imm	Model 3 - TB Control		
Program Outcome	MCPR	DTP3	TSR	CDR	INC
Adjustment	-0.98727*** [0.18288]	-1.97523* [0.22184]	-0.86360*** [0.09805]	-0.88848** [0.33054]	-0.17498** [0.06481]
Long Run Coefficient	4.18560*** [1.32501]	-9.25082* [1.37238]	2.06970 [3.35657]	-2.44195 [4.92769]	54.65376*** [15.44373]
Short Run Coefficients					
- Program Outcome					
D1					
LD		1.58733* [0.20511]			
L2D		2.41135* [0.22621]			
L3D		2.25526* [0.31821]			
L4D		1.50211 [0.28832]			
L5D		1.53078* [0.18592]			
- Appropriations, Constant PHP					
D1	-3.66157*** [1.06347]	9.14189 [2.8879]	-1.04730 [3.03116]	-4.42268 [4.22723]	-4.04250 [3.22452]
LD		-1.70662 [2.56375]			
L2D		-7.19754 [2.76458]			
L3D		6.96586 [2.97106]			
L4D		-4.93704 [3.20247]			
L5D		9.61765 [3.27864]			
Year	-0.5135* [0.27661]	7.85049* [1.23509]	0.16109 [0.21154]	1.85624** [0.84246]	-0.00847 [0.20775]
Constant Term	1047.4195* [553.19582]	-15587.13127 [2473.47280]	-250.12828 [419.85144]	-3694.98372** [1679.49243]	102.16792 [424.02473]
Sample	1997 - 2001 but with a gap	2006 - 2021	1997 - 2019	2001 - 2020	2001 - 2020
Observations	23	16	23	20	20

* - Significant at 10%

** - Significant at 5%

*** - Significant at 1%

Coefficients with standard errors in brackets

All statistics, except for adjustment, short run coefficients for the program outcomes, year and constant term are in 10^9 units

Acronyms: FH (Family Health), Imm (Immunization),
TB Control (Tuberculosis Control), MCPR (Modern CPR),
TSR (Treatment Success Rate),
CDR (Case Detection Rate), INC (Incidence)

Table A5. Bounds Test across ARDL models

Bounds Test				Critical Values								
				10%		5%		1%		<i>p</i> -value		
ARDL models	F-stat	t-stat		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
Model 1 - FH	29.144	-5.398	for F-stat	6.173	7.062	7.663	8.714	11.425	12.877	0.000	0.000	
			for t-stat	-3.217	-3.508	-3.610	-3.927	-4.457	-4.826	0.002	0.003	
Model 2 - Imm	39.893	-8.904	for F-stat	5.59	6.26	6.56	7.30	8.74	9.63			
			for t-stat	-3.13	-3.40	-3.41	-3.69	-3.96	-4.26			
Model 3 - TB	TSR	39.205	-8.808	for F-stat	6.173	7.062	7.663	8.714	11.425	12.877	0.000	0.000
				for t-stat	-3.217	-3.508	-3.610	-3.927	-4.457	-4.826	0.000	0.000
	CDR	4.015	-2.688	for F-stat	6.315	7.243	7.932	9.045	12.157	13.745	0.283	0.367
				for t-stat	-3.238	-3.533	-3.655	-3.980	-4.573	-4.960	0.229	0.311
	INC	10.878	-2.7	for F-stat	6.315	7.243	7.932	9.045	12.157	13.745	0.016	0.026
				for t-stat	-3.238	-3.533	-3.655	-3.980	-4.573	-4.960	0.225	0.306

All critical values are based on Kripfganz and Schneider (2020), except for Model 2 - Imm.

H_0 : no level relationship

For Kripfganz and Schneider (2020)

- Do not reject H_0 if either F or t are closer to zero than critical values for I(0) variables (if either p-value > desired level for I(0) variables)

- Reject H_0 if both F and t are more extreme than critical values for I(1) variables (if both p-values < desired level for I(1) variables)