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| RESEARCH ARTICLE

Social Return on Investment of Establishing a Cancer Drug Fund in Thailand

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| ABSTRACT

Cancer remains the leading cause of death in Thailand, with 336 new cases and 221 deaths daily, yet access to high-cost cancer therapies under the universal health coverage system remains limited. This disparity creates significant treatment inequities and highlights the need for innovative financing mechanisms to expand access to life-saving drugs. Drawing lessons from the United Kingdom's Cancer Drug Fund, this study evaluates the potential social return of establishing a similar fund in Thailand. A two-pronged framework was adopted to quantify social benefits: (1) improvements in quality of life, measured by changes in Disability-Adjusted Life Years using an Interrupted Time Series with Control Group model comparing the United Kingdom (treatment group) and Germany (control group), and (2) reductions in inequality of health access, assessed using the Transferability of Economic Evaluation framework by applying per-patient cost data from the UK CDF to the Thai context. Monetary values were derived using Thailand's GDP per capita as a financial proxy. The ITSCG analysis indicated a reduction of 16.95 DALYs per 100,000 population associated with CDF implementation, equivalent to THB 3,381.76 million in social value. In addition, under a simulated annual budget of THB 15,000 million, expanding access to high-cost cancer drugs was estimated to benefit 8,367 patients, generating THB 14,808.68 million in social value. Combining these outcomes, the total social benefit was estimated at THB 18,190.45 million, yielding a Social Return on Investment ratio of 1.21. These findings suggest that establishing a CDF in Thailand could deliver a substantial positive social return by improving health outcomes, reducing access inequalities, and alleviating the long-term burden of cancer. Policy adoption of such a fund could enhance equity, ensure financial sustainability, and strengthen Thailand's public health system.

| KEYWORDS

Cancer Drug Fund, Social Return on Investment, DALYs, Quality of Life, Health Access, Interrupted Time Series, Thailand.

| ARTICLE INFORMATION

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1. Introduction

Investment in public health has been a central priority of Thailand's government, with a total health budget of THB 332,582 million in 2024 aimed at expanding access to care, improving population health outcomes, and fostering medical innovation. Despite these substantial investments, the returns on health spending are often realized in social value rather than direct economic gains, underscoring the need for rigorous evaluation of health interventions. One prominent international model is the UK Cancer Drug Fund (CDF), established in 2011 by the National Health Service (NHS) to provide early access to high-cost cancer medicines. In response to sustainability and cost-effectiveness concerns, the fund underwent a major reform in 2016, becoming integrated into the National Institute for Health and Care Excellence (NICE) framework. This reform introduced key mechanisms—a fixed annual budget of £340 million, use of Managed Access Agreements (MAA) for outcome-based drug pricing, and strengthened cost-effectiveness review processes—enhancing transparency and financial sustainability while preserving rapid patient access to innovative therapies.

In contrast, Thailand has yet to establish a CDF, despite cancer being the country's leading cause of death since 1999, with 336 new cases and 221 deaths daily and an estimated 784,552 prevalent cases in 2024. Access to targeted cancer therapies remains highly restricted, with only 7 of 28 approved drugs included in the national essential medicines list, accounting for THB 473 million annually, while the country spends over THB 21 billion per year on imported cancer medicines. This disparity highlights a pressing policy question: how can Thailand expand equitable access to life-saving cancer treatments within a sustainable financing framework? This study addresses this gap by evaluating the potential social return of establishing a CDF in Thailand, drawing lessons from the UK CDF model. The analysis quantifies social benefits in terms of improved quality of life and reduced inequality in access, offering evidence-based recommendations for adapting such a mechanism to the Thai health system.

2. Literature Review

The CDF of the United Kingdom is a dedicated budgetary mechanism established to increase access to cancer treatment drugs. It was initiated in 2011 under the oversight of the National Health Service (NHS). In 2016, the fund underwent a structural reform, transferring its administrative authority to the National Institute for Health and Care Excellence (NICE), which plays a central role in evaluating the cost-effectiveness of medicines and providing recommendations to the national health system regarding drug reimbursement. The CDF is one of the UK's special-purpose funds, along with the Innovative Medicine Fund (IMF), which supports non-cancer drugs. Both funds have an equal annual budget of £340 million and share the objective of expanding early access to innovative medicines prior to their inclusion in the national formulary (Faradiba, 2023).

When comparing similar fund structures in the UK, Hong Kong, and Italy, it is found that the UK and Italy adopt comparable approaches by allowing early access to innovative medicines that lack long-term efficacy data, through temporary inclusion mechanisms and collection of real-world data for future evaluations. This differs from the case of Hong Kong, which primarily focuses on financial assistance through the Samaritan Fund (SF) and Community Care Fund (CCF), particularly for drugs not listed in the national formulary. Furthermore, the UK and Italy have integrated drug assessment mechanisms into their routine reimbursement systems and do not impose co-payments on patients. In contrast, Hong Kong employs a means-tested co-payment system and lacks a systematic patient outcome monitoring program.

In terms of access duration, the UK permits access to CDF-supported drugs for up to 24 months, while Italy offers a longer coverage period of 36 months before re-evaluation for permanent reimbursement inclusion. Both countries maintain patient registry systems for clinical and outcome data collection, reflecting an iterative policy learning design. Budget control mechanisms are also in place, such as refund agreements with pharmaceutical companies when expenditures exceed pre-defined thresholds. Although Hong Kong has demonstrated effective budget control, its CDF expenditures account for up to 5% of total pharmaceutical spending, compared to just 1% in the UK, highlighting structural and strategic differences in fund design and objectives across country contexts (Luksameesate et al., 2024).

Regarding cancer drug pricing, a study by Prasad and Mailankody (2016) highlights the imbalance between costs and benefits for certain cancer drugs. For instance, brentuximab was found to cost up to £250,000 per patient, while the UK's health system lacked effective price negotiation mechanisms with manufacturers, placing a heavy financial burden on the public health system. The authors proposed reforms to the drug procurement system through price negotiation mechanisms, import promotion, and cost transparency initiatives to mitigate long-term fiscal risks.

In Canada, Gotfrit et al. (2022) investigated factors influencing the reimbursement of 43 cancer drugs used for advanced-stage treatments between 2011 and 2019. The study found that the most significant factors in reimbursement decisions were tumor type, drug class, and recommendations from the pan-Canadian Oncology Drug Review (pCODR), while list price was not significantly associated with the likelihood of approval. The study also observed that immunotherapy drugs were approved faster than chemotherapy and targeted therapies, despite their higher prices. This reflects a health system prioritization of clinical outcomes over cost in Canada's reimbursement decisions.

Finally, in Thailand, although universal health coverage (UHC) includes all population groups, access to cancer drugs remains limited, especially for drugs not listed in the national essential medicines list or those lacking sufficient evidence of efficacy within the Health Technology Assessment (HTA) system. Several researchers have proposed that Thailand consider establishing a dedicated CDF to support equitable access. Such a fund should incorporate transparent selection criteria, systematic monitoring of real-world outcomes, and effective budget management mechanisms such as refund agreements, time-limited access periods, and non-co-payment policies to maintain equity across different benefit schemes (Luksameesate et al., 2024).

3. Methodology and Data

3.1 Methodology

This study focuses exclusively on assessing the social return of establishing a CDF in Thailand, rather than economic return. This is because, under the current healthcare and industrial structure, all high-cost cancer drugs are imported with no domestic manufacturing or technology spillover effects. As a result, the implementation of a CDF is unlikely to generate direct domestic economic value added. Therefore, this study only evaluates on the social impacts, which are the most relevant and measurable consequences of such a policy.

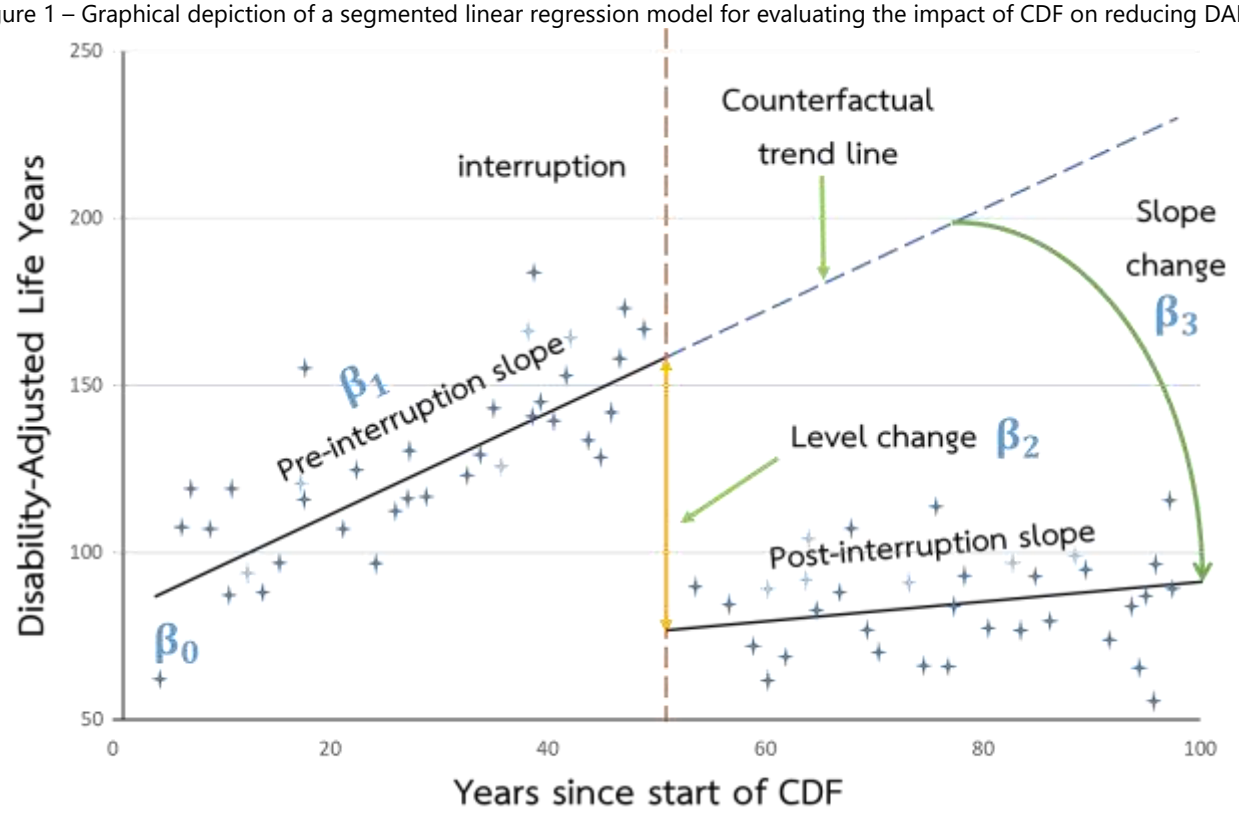
To quantify the social return, a two-pronged framework is adopted, reflecting the two most salient dimensions of health-related social benefit: (1) improvements in quality of life, and (2) reduction in inequality of health access. The selection of these two outcome variables is grounded in both global policy practice and empirical research. By focusing on quality of life, the analysis aligns with internationally endorsed health technology assessment frameworks and reflects the primary intent of a CDF—improving patients' lived experiences by increasing access to effective treatments (George et al., 2015). The second dimension, reduction in inequality of health access, addresses the widespread concern that high-cost cancer therapies disproportionately benefit those with greater financial means or privileged insurance coverage (Knaul et al., 2012; Komparic & Vries, 2018). Recent studies underscore the importance of equity in resource allocation and interventions (Marten et al., 2020; Wagstaff, 2002), particularly in low- and middle-income countries where financial barriers remain significant determinants of cancer outcomes.

3.1.1 Method for Measuring Improvements in Quality of Life

To measure improvements in quality of life attributable to the CDF, this dimension is assessed using Disability-Adjusted Life Years (DALYs) associated with major cancer types. DALYs is a widely recognized summary measure of population health used to quantify the burden of disease (Devleesschauwer et al., 2014) and has been applied in diverse public health contexts to capture contemporary understandings of disability (Mont, 2007). It has been extensively employed to assess the magnitude of disease, health risks, and premature mortality at both global (Murray & Lopez, 1996; Lopez et al., 2006) and national levels (Melse et al., 2000; Mathers et al., 2001; Michaud et al., 2006). A reduction in DALYs reflects a decline in disease burden, thereby indicating improvements in population health and overall quality of life.

To evaluate whether the CDF contributes to a reduction in DALYs, this study applies an Interrupted Time Series with Control Group (ITSCG) design, as illustrated in Figure 1. Interrupted time series analysis is a quasi-experimental method commonly used in public health research to assess the impact of interventions that may influence both the level and trend of outcomes (Turner et al., 2021; Navazi et al., 2022). When only one group is exposed to the intervention, researchers typically employ a "pre-post" observational study design; however, if two groups are available and only one is exposed to the intervention, a "pre-post with control" design—also known as a difference-in-differences approach—can be applied, where the unexposed group serves as a control to better isolate the intervention effect from underlying nonlinear trends in the outcome (Navazi et al., 2023). Incorporating a control group solidifies the study, therefore this approach will be adopted in our study.

Figure 1 – Graphical depiction of a segmented linear regression model for evaluating the impact of CDF on reducing DALYs



Source: Applying from Turner et al. (2021)

The credibility of evaluating an intervention depends on the comparability between the treatment and control groups, consistent with the assumption of exchangeability in quasi-experimental designs. Therefore, it is essential to select a control country with characteristics closely matching those of the United Kingdom. The selection mechanism for the control group was based on two criteria: ((1having a comparable level of health system performance to the treatment country, and ((2having a similar population size. Germany meets both criteria, as it ranks closely to the UK in terms of health system performance (Schneider et al., (2021and has a population size that is not significantly different from that of the UK. Thus, Germany is selected as the matched-control country in this study.

The study draws upon longitudinal data during 1990–2021 from the UK and Germany. The UK, having implemented a CDF since 2011, serves as the treatment country, while Germany—with no such intervention—acts as the control country. We fitted ITSCG using segmented linear regression models as follows:

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 X_t T_t + \beta_4 Z + \beta_5 Z T_t + \beta_6 Z X_t + \beta_7 Z X_t T_t + \varepsilon_t$$

Let Y_t denote the DALYs at time t. T_t represents time since the start of the study, Xt is a dummy variable indicating the post-intervention period (1 after the CDF implementation and 0 otherwise), and $X_t T_t$ is their interaction term. Z is a dummy variable denoting the cohort assignment (1 for the UK [treatment group] and 0 for Germany [control group]), while ZT_t, ZX_t, and $ZX_t T_t$ are the corresponding interaction terms. Coefficients $\beta_0 - \beta_3$ represent the intercept, trend, and level/trend changes for Germany, whereas $\beta_4 - \beta_7$ capture the differential effects for the UK. Specifically, β_4 captures the baseline level difference in DALYs between the UK and Germany prior to CDF implementation, β_5 captures the difference in pre-intervention trends, β_6 measures the differential immediate level change in DALYs post-intervention, and β_7 represents the differential trend change post-intervention. The key parameter of interest, $\beta_3+\beta_7$, reflects the differential post-intervention change in DALYs for the UK relative to Germany. This combined parameter accounts for both the level change observed in the control group and the additional differential effect attributable to the CDF. Under the assumption that the policy improved both the volume and timeliness of access to cancer therapies, a negative and statistically significant $\beta_3+\beta_7$ would indicate that the CDF was associated with a significant reduction in DALYs compared with the control country, providing empirical evidence of the policy's effectiveness in improving population-level health outcomes.

3.1.2 Method for Measuring Reduction in Inequality of Health Access

This study applies the Transferability of Economic Evaluation framework proposed by Welte et al. (2004) to evaluate reductions in inequality of access to cancer drugs. This approach is appropriate because Thailand currently lacks a dedicated CDF and detailed cost data for high-cost cancer drugs, creating significant constraints for conducting a full domestic cost assessment. The framework allows the use of data from a well-established system—namely, the UK CDF—while systematically adapting it to the Thai context.

The rationale for adopting the Welte framework is fourfold. First, it reduces the data collection burden in resource-constrained settings by leveraging cost and utilization data from countries with robust health technology assessment systems, such as the UK. Second, it provides a structured analytical framework to distinguish between directly transferable components (e.g., drug efficacy) and those requiring contextual adaptation (e.g., unit drug costs and procurement structures). Third, it explicitly accounts for context-specific factors influencing per-patient drug costs, such as pricing policies, procurement mechanisms, and labour costs in the Thai healthcare system. Finally, it enhances the credibility and transparency of the analysis, particularly for generating budgetary simulations and informing policy proposals such as establishing a national CDF in Thailand.

The analysis proceeds in four steps: (1) contextual assessment of access barriers among vulnerable populations in Thailand and identification of the UK CDF as a reference model; (2) collection of key operational data from the UK CDF, including annual budget, actual drug expenditures, and patient utilization, to derive per-patient cost estimates; (3) application of an outcome mapping approach to evaluate the social implications of reducing inequality in drug access; and (4) simulation of potential social benefits and budgetary requirements for Thailand by applying adjusted per-patient costs to the relevant population size.

3.2 Data

This study uses secondary data to evaluate the social impacts of establishing a CDF in Thailand. The data cover economic, social, and health-related variables from reliable international and national sources. Table 1 summarizes the variables, measurement units, descriptions, and sources.

Table 1 – Summary of Variables and Data Sources

Variable	Unit	Description	Source
Cancer Disability-Adjusted Life Years	DALYs per 100,000 population	Cancer burden by type measured in DALYs per 100,000 people	Institute of Health Metrics and Evaluation
Population	Persons	Total population of country i in year y	World Bank
Gross Domestic Product	Thai Baht	Total value added from all domestic producers plus product taxes minus subsidies	World Bank
Total drug costs and number of patients in the CDF	Thai Baht per patient	Total expenditures on cancer drugs and the number of patients treated under the CDF	National Health Service
Exchange rate	THB per GBP	Thai Baht per British Pound exchange rate	Bank of Thailand

4. Results

The results of this study are divided into subsection: social return on improvements in quality of life, social return on reduction in inequality of health access, and social return on investment (SROI).

4.1 Results of Social Return on Improvements in Quality of Life

Table 2 presents the estimated changes in DALYs associated with the introduction of the CDF using the ITSCG model. The combined post-intervention level parameter ($\beta_3+\beta_7$) was estimated at –16.95 DALYs per 100,000 population (p-Value < 0.05), indicating that the trend in cancer-related DALYs in the UK decreased more rapidly than in Germany following the implementation of the CDF. This finding suggests that the policy was associated with a meaningful reduction in the cancer burden at the population level.

Table 2 – Estimated impact of CDF on DALYs

Name of Component	Coefficient Estimates	p-Value
Intercept	3,743.11	0.020**
Baseline trend (control)	-35.91	0.000***
Level change (control)	215.36	0.000***
Trend change (control)	-9.12	0.048**
Baseline level difference	-7.59	0.034**
Baseline trend difference	12.57	0.064
Immediate level difference	55.97	0.224
Trend difference post-intervention	-7.82	0.049**
Treated Group	-40.29	0.000***
Control Group	-23.34	0.000***
Difference between Treated and Control Group ($\beta_3+\beta_7$)	-16.95	0.048**

Note: ** indicates a significance level of 0.05 and *** indicates a significance level of 0.01.

To present the results in monetary terms, this study converts the reduction in DALYs into economic value by using Gross Domestic Product per capita (GDP per capita) as a financial proxy. This approach assumes that one year of healthy life lost corresponds to the average annual economic output per person. Thus, the estimated reduction in DALYs obtained from the Interrupted ITSCG model was multiplied by Thailand's GDP per capita to approximate the monetary value of the social impact of establishing a CDF. This method is consistent with established practices in economic evaluation, where GDP per capita is used as a proxy for the value of a life year in cost-effectiveness analyses (WHO, 2001; Hutubessy et al., 2003; Leech et al., 2018; Bertram et al., 2016; Kamari et al., 2021).

Additionally, to systematically map stakeholders, inputs, activities, and outcomes, an outcome mapping approach was applied. This allowed the conversion of qualitative outcomes into quantifiable measures suitable for social return on improvements in quality of life analysis. Table 3 summarizes the key stakeholders, inputs, outcomes, financial proxies, and indicators used in this analysis.

Table 3 – Outcome Mapping for Social Return Analysis

Stakeholders	**Inputs**	**Outcomes**	**Financial Proxy**	**Indicators**
Cancer patients	CDF budget allocation (THB 15,000[1] million per year)	Reduction of 16.95 DALYs per 100,000 population	GDP per capita (THB 264,607.7)	Social return on improved quality of life

The social return on improved quality of life was calculated using the following formula:

$$\text{Social return on improved quality of life} = \Delta\text{DALYs} \times \text{Thai population} \times \text{GDP per capita}.$$

Under the assumption of an annual CDF budget allocation of THB 15,000 million, the estimated monetary value of the social benefit from reduced DALYs attributable to the CDF is approximately THB 3,381 million. This represents the economic value of the health gains associated with decreased cancer burden at the population level.

4.2 Results of Social Return on Reduction in Inequality of Health Access

Using the Transferability of Economic Evaluation Results Between Countries framework (Welte et al., 2004), this study incorporated average per-patient drug costs from the UK CDF as a proxy for estimating budgetary requirements and social

[1] In the UK, the CDF operates with an annual budget of approximately THB 15,000 million (equivalent to £340 million) per year.

impacts in Thailand. Although such costs are categorized as "adaptation required," they provide a reasonable assumption for policy simulation in a context where Thailand lacks an operational CDF or comparable national cost data. Importantly, these estimates would need contextual adjustments, such as reflecting Thailand's essential drug pricing, centralized procurement mechanisms, and state-negotiated reference prices, to ensure alignment with the domestic health financing system.

The UK CDF has operated with a fixed annual budget of £340 million (≈ THB 15,000 million[2]) since its 2016 reform. According to the 2023–2024 Q4 CDF activity report, the fund supported 8,543 patients, with total drug expenditures of £247.07 million (≈ THB 10,386.26 million), including £226.51 million under Managed Access Agreements (MAA) and £20.56 million under interim access agreements. These figures were used to derive an average per-patient cancer drug cost of approximately THB 1,769,891.80.

Table 4 – Outcome Mapping for Social Return on Reduction in Inequality of Health Access

Stakeholders	Inputs	Outcomes	Financial Proxy	Indicators
Cancer patients	CDF budget allocation (THB 15,000 million per year)	8,367 additional patients gaining access to cancer treatment[3]	Average per-patient drug cost (THB 1,769,891.80)	Social return on reduced inequality of health access

To evaluate the social return of improved access to cancer care, outcome mapping was conducted to identify key stakeholders, inputs, outputs, and outcomes. Financial proxies were applied to monetize these outcomes. Table 4 summarizes the mapping and corresponding financial proxies used in the analysis.

The social return on reduced inequality of health access was calculated using the following formula:

$$\text{Social return on reduced inequality of health access} = \text{Additional patients gaining access to cancer treatment} \times \text{Average per-patient drug cost}$$

Drawing on the UK CDF as a reference, which operates with an annual budget of approximately THB 15,000 million, this study simulated a similar budget allocation for a hypothetical CDF in Thailand. Based on the 2023–2024 Q4 CDF activity report, the average per-patient drug cost was estimated at THB 1,769,891.80, derived from the ratio of total cancer drug expenditures to the number of patients enrolled in the fund. Under the assumed allocation, an estimated 8,367 additional patients could gain access to cancer treatment. Multiplying these figures yields a projected social benefit of THB 14,808.68 million, representing the economic value of improved access to high-cost cancer therapies under the modelled CDF budget.

4.3 Results of SROI

To assess the overall social return of establishing a CDF in Thailand, the estimated social benefits from improved quality of life and reduced inequality of health access were aggregated. Under the assumption of an annual CDF budget allocation of THB 15,000 million, the combined social benefits were estimated at THB 18,190.45 million.

The Social Return on Investment (SROI) was calculated using the following formula:

$$SROI = \frac{\text{Benefits from improved quality of life} + \text{Benefits from reduced inequality}}{\text{CDF budget allocation}}$$

Substituting the estimated values into the equation yielded an SROI ratio of 1.21, indicating that for every THB 1 invested in the CDF, approximately THB 1.21 of social value would be generated. This finding suggests that a national CDF could deliver a positive social return, supporting its potential justification as an investment in public health and social welfare.

5. Conclusion

This study demonstrates that establishing a CDF in Thailand could generate substantial social value. The estimated SROI was 1.21, meaning that for every THB 1 invested, approximately THB 1.21 of social value would be created. Social benefits were assessed across two key dimensions: improved quality of life—measured by a reduction of 16.95 DALYs per 100,000 population, equivalent to THB 3,381.76 million in economic value—and reduced inequality of health access, estimated at THB 14,808.68 million by enabling 8,367 additional patients to access high-cost cancer treatment.

[2] This study used a 5-year average exchange rate of 43.59 THB/GBP from Bank of Thailand.

[3] Estimated number of patients under a MAA based on a projected CDF budget of THB 15,000 million.

When aggregated, these benefits totalled THB 18,190.45 million under an assumed annual budget allocation of THB 15,000 million, confirming that a CDF would deliver a positive social return. Beyond its economic value, the fund could reduce the national cancer burden, improve survival and quality of life, and mitigate long-term healthcare expenditures.

From a policy perspective, adopting a MAA framework, as implemented in the UK, would allow cost containment through outcome-based reimbursement and ensure budget predictability. Coupled with evidence-based assessment and a clearly defined budget cap, this approach could optimize resource allocation while expanding equitable access to life-saving therapies.

Therefore, the establishment of a CDF represents a promising strategy to reduce the cancer burden, enhance equity in access to essential medicines, and deliver socially worthwhile returns. Policymakers should consider integrating such a mechanism into Thailand's health system to advance equity and long-term sustainability.

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References

[1] Bertram, M. Y., Lauer, J. A., De Joncheere, K., Edejer, T., Hutubessy, R., Kieny, M.-P., & Hill, S. R. (2016). Cost–effectiveness thresholds: pros and cons. Bulletin of the World Health Organization, 94(12), 925–930. https://doi.org/10.2471/BLT.15.164418
[2] Connell, J. P., & Kubisch, A. C. (1998). Applying a theory of change approach to the evaluation of comprehensive community initiatives: Progress, prospects, and problems. The Aspen Institute.
[3] Corvo, L., Pastore, L., Mastrodascio, M., & Cepiku, D. (2022). The social return on investment model: A systematic literature review. Meditari Accountancy Research, 30(7), 49-86. https://doi.org/10.1108/MEDAR-05-2021-1307:contentReference[oaicite:0]{index=0}.
[4] Corvo, L., Pastore, L., Mastrodascio, M., & Cepiku, D. (2023). The Social Return on Investment (SROI) Model. University of Rome Tor Vergata.
[5] Devleesschauwer, B., Havelaar, A. H., Maertens de Noordhout, C., Haagsma, J. A., Praet, N., Dorny, P., Duchateau, L., Torgerson, P. R., Van Oyen, H., & Speybroeck, N. (2014). Calculating disability-adjusted life years to quantify burden of disease. International Journal of Public Health, 59(3), 565–569. https://doi.org/10.1007/s00038-014-0552-z
[6] Faradiba, D. (2023). Learning from Cancer Drug Fund (CDF) in England: A special reimbursement pathway for high-cost cancer drugs (Issue #2). Health Intervention and Technology Assessment Program (HITAP). https://www.hitap.net/documents/220539
[7] George, B., Harris, A., & Mitchell, A. (2015). Cost-effectiveness analysis and the consistency of decision making: Evidence from pharmaceutical reimbursement in Australia. Pharmacoeconomics, 33(4), 361–369.
[8] Gibbs, N. (2015). Good Practice Guide: An Introduction to Social Return on Investment. University of Sheffield and CFE Research.
[9] Gotfrit, J., Jackson, A., Shin, J. J. W., Stewart, D. J., Mallick, R., & Wheatley-Price, P. (2022). Determinants of the cancer drug funding process in Canada. Current Oncology, 29(3), 1997–2007. https://doi.org/10.3390/curroncol29030162
[10] Hutubessy, R., Chisholm, D., Edejer, T. T.-T., & WHO-CHOICE. (2003). Generalized cost-effectiveness analysis for national-level priority-setting in the health sector. Cost Effectiveness and Resource Allocation, 1(1), 8. https://doi.org/10.1186/1478-7547-1-8
[11] Kamari, N., Sensale, S., Malvolti, S., & Chokshi, D. A. (2021). Cost per DALY averted in low, middle- and high-income countries: A systematic analysis. International Journal of Health Policy and Management, 10(2), 79–85. https://doi.org/10.34172/ijhpm.2020.36
[12] Knaul, F.M., et al. (2012). Closing the Cancer Divide: An Equity Imperative. Harvard Global Equity Initiative.
[13] Komparic, N., & Vries, E. (2018). Reducing inequalities in access to cancer medicines. The Lancet Oncology, 19(2), e54–e62.
[14] Leech, A. A., Kim, D. D., Cohen, J. T., Neumann, P. J., & Salomon, J. A. (2018). Use and misuse of cost-effectiveness analysis thresholds in low- and middle-income countries: Trends in cost-per-DALY studies. Value in Health, 21(7), 759–761. https://doi.org/10.1016/j.jval.2017.11.003
[15] Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (Eds.). (2006). Global burden of disease and risk factors. Oxford University Press.
[16] Luksameesate, P., Nerapusee, O., Patikorn, C., & Anantachoti, P. (2024). Scoping review of international experience of a dedicated fund to support patient access to cancer drugs: Policy implications for Thailand. International Journal of Health Policy and Management, 13, 7768. https://doi.org/10.34172/ijhpm.2023.7768
[17] Marten, R., et al. (2020). An assessment of equity in the distribution of global health funding for cancer care in low- and middle-income countries. Health Policy and Planning, 35(3), 356–366.
[18] Mathers, C. D., Vos, T., Lopez, A. D., Salomon, J., & Ezzati, M. (2001). National burden of disease studies: A practical guide. World Health Organization.
[19] Melse, J. M., Essink-Bot, M. L., Kramers, P. G., & Hoeymans, N. (2000). A national burden of disease calculation: Dutch Disability-Adjusted Life-Years. American Journal of Public Health, 90(8), 1241–1247. https://doi.org/10.2105/ajph.90.8.1241
[20] Michaud, C. M., Murray, C. J. L., & Bloom, B. R. (2006). Burden of disease—implications for future research. JAMA, 295(8), 939–943. https://doi.org/10.1001/jama.295.8.939
[21] Mont, D. (2007). Measuring health and disability. The Lancet, 369(9573), 1658–1663. https://doi.org/10.1016/S0140-6736(07)60752-1
[22] Murray, C. J. L., & Lopez, A. D. (1996). The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Harvard School of Public Health.

[23] Navazi, F., Yuan, Y., & Archer, N. (2022). The effect of the Ontario stay-at-home order on Covid-19 third wave infections including vaccination considerations: An interrupted time series analysis. Plos one, 17(4), e0265549.
[24] Navazi, F., Yuan, Y., & Archer, N. (2023). Calculating the effectiveness of COVID-19 non-pharmaceutical interventions with interrupted time series analysis via clustering-based counterfactual country. Engineering Proceedings, 39, 51. https://doi.org/10.3390/engproc2023039051
[25] Prasad, V., & Mailankody, S. (2016). The UK Cancer Drugs Fund experiment and the US cancer drug cost problem: Bearing the cost of cancer drugs until it is unbearable. Mayo Clinic Proceedings, 91(6), 707–712. https://doi.org/10.1016/j.mayocp.2016.04.028
[26] Schneider, E. C., Shah, A., Doty, M. M., Tikkanen, R., Fields, K., & Williams, R. D., II. (2021). Mirror, Mirror 2021: Reflecting Poorly: Health Care in the U.S. Compared to Other High-Income Countries. The Commonwealth Fund. https://www.commonwealthfund.org/publications/fund-reports/2021/aug/mirror-mirror-2021-reflecting-poorly
[27] Turner, S. L., Karahalios, A., Forbes, A. B., Taljaard, M., Grimshaw, J. M., & Bero, L. (2021). Comparison of six statistical methods for interrupted time series studies: Empirical evaluation of 190 published series. BMC Medical Research Methodology, 21, 134. https://doi.org/10.1186/s12874-021-01306-w
[28] Wagstaff, A. (2002). Inequality aversion, health inequalities and health achievement. Journal of Health Economics, 21(4), 627–641.
[29] Welte, R., Feenstra, T. L., Jager, H. C. de, & Bruggen, M. J. van. (2004). A decision chart for assessing and improving the transferability of economic evaluation results between countries. Pharmacoeconomics, 22(13), 857–876. https://doi.org/10.2165/00019053-200422130-00004
[30] WHO Commission on Macroeconomics and Health. (2001). Macroeconomics and health: Investing in health for economic development. World Health Organization