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Will patients benefit from the current Philippine Legislative Bill on Medical Cannabis? A Cost-Benefit Analysis

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The Philippine Congress is pushing House Bill (HB) 6517 to decriminalize medical cannabis use in the Philippines. This study aims to evaluate the cost and benefit that will likely result from the legalization of medical cannabis. Focus group discussions, key informant interviews, and review of secondary data were done with stakeholders to validate and localize the benefits and costs associated with the legalization of medical cannabis versus the current status quo. Cost-benefit analysis (CBA) was based on the requirements of HB 6517. Only direct effects on major stakeholders were covered in the final CBA. Results were expressed as Net Present Value (NPV) to society. Medical cannabis legalization in the Philippines will yield a positive NPV to society but will take approximately 14 years before benefits for both the government and patients can be realized. More than 90% of the total benefit goes to patients, and < 10% goes to the government. In terms of economic viability, NPV turns positive once benefits are realized. The return on investment will be at 60% by the 14th year of implementation, with a 10% projection of benefits going to the government in taxes and net income. Based on projected simulations, Filipino may benefit from the legalization of medical cannabis.

Keywords: cost-benefit analysis, government, medical cannabis, patients, Philippines

Abbreviations: CBA – cost benefit analysis, NPV - net present value, HB - house bill, FDA - Food and Drug Administration, KII - key informant interview, FGD - focus group discussion, MCCC - medical cannabis compassionate center, IEC - Information, Education, and Communication, CSP - compassionate special permit, NSB - net social benefit, THC - tetrahydrocannabinol, CBD - cannabidiol

INTRODUCTION

The human rights crisis in the Philippines heightened as the government continued its "war on drugs" campaign. According to the Philippine Drug Enforcement Agency (PDEA), 4,948 suspected drug users and dealers died during police operations from July 1, 2016, to September 30, 2018. In addition, the government vowed to continue the anti-drug campaign (HRW 2019). Despite the ongoing anti-drug campaign, the Philippines House of Representatives considers it timely to legalize and regulate the use of medical cannabis in the country. On January 29, 2019, legislators approved the final reading of House Bill (HB) 6517, also known as the "Act Providing Compassionate and Right of Access to Medical Cannabis and Expanding Research into its Medicinal Properties and for Other Purposes." HB 6517 states that the use of cannabis will be legal for patients suffering from debilitating medical conditions, including severe and chronic pain, severe nausea, seizures including those characteristics of epilepsy, or severe and persistent muscle spasms (Cepeda 2019). Conversely, the Philippine Senate Committee on Health expressed their openness in conducting hearings to tackle HB 6517 that aims to

legalize the use of medical cannabis and expand research into cannabis' medicinal properties. Currently, the Philippines prohibits the use of any form of cannabis. The Comprehensive Dangerous Drugs Act of 2002 imposes punitive measures for the possession of ≥ 10 grams of marijuana resin (hashish) or oil or ≥ 500 grams of marijuana (Cruz 2019).

The Philippine Medical Association and various medical specialty societies have opposed the bill since the evidence on its effectiveness and safety for certain conditions remain inconclusive or even contradictory. The potential for habituation or substance abuse continues to lurk over the heads of many lawmakers and medical professionals (Nolasco 2017). However, the use of cannabis in its medicinal preparations is allowed based on Administrative Order 4S 1992 or the "Compassionate Special Permit for Restricted Use of Unregistered Drug or Devices Product." The permission happened because the Food and Drug Administration (FDA) of the Department of Health (DOH) recognized the need for drugs, medical devices, and food products that are not registered or are in the process of registration in the Philippines. Special permits are signed by the FDA Director and granted to a specialized institution or a specialty society to avail of the unregistered drug through a licensed establishment for a particular type of patient, in a specific volume and period. Permits issued by the FDA for medical cannabis if the law permits will provide relevant information on the following: demand for medicinal marijuana; the indication of use; the operation and efficiency of the section in charge of issuing the permit; what and how long is the process for obtaining a permit; and what resources in money, human and time are being used to implement the law. In addition, some of the advocacy societies are pushing for the pending bill to pass. These societies are groups of advocates pushing for safe, legal, and affordable access to medical cannabis, which include members who are ill or have relatives who need medical cannabis as an alternative option for treatment.

The legalization of medical cannabis in the Philippines has to be rationalized and subjected to critical review because of cannabis's psychoactive property and potential for psychological dependence. Moreover, most studies which assessed the medical benefits against the costs and risks of taking cannabis are inconclusive (NIDA 2019). Therefore, a sound risk-benefit management scheme that is sufficiently grounded from scientific studies must be part of the implementing rules and regulations of the law that is going to be created. The study aimed to evaluate the cost and benefit that will likely result from the legalization of medical cannabis in the Philippines based on the provisions of HB 6517.

MATERIALS AND METHODS

The study was carried out from May 2019 to November 2019 in Metro Manila, Philippines. Qualitative methods were used to validate and localize the costs and benefits associated with the legalization of medical cannabis. Review of secondary data and a series of key informant interviews (KIIs) and focus group discussions (FGDs) were conducted with various stakeholders. Semi-structured interviews with key informants were used to allow the costs and benefits of the legalization of medical cannabis to be ascertained together. FGDs with patients and doctors were done to discuss risks and benefits from medical cannabis legalization amongst the sick and in-need populations and enable the triangulation of results needed for the cost-benefit analysis (CBA).

CBA is generally used to establish superior efficiency of a specific intervention or policy over the alternatives, in this case, compared to the current status quo (Boardman and others 1996). In addition, CBA is also used to compare the impacts of with and without the policy, i.e., the baseline versus the alternative scenario (Lee 1986). Since the associated monetary benefits and costs to the policy are realized at different points in time, the net present value (NPV) or the sum of all discounted benefits and costs over the implementation period of the policy was used as one of the basis for concluding that the policy is economically viable (positive NPV) or not (Boardman et al. 1996).

Participants

The initial list of participants for the KIIs and FGDs was generated in consultation with the Dangerous Drugs Board - Office of the President of the Philippines and Philippine Institute of Traditional and Alternative Health Care - DOH. Snowball sampling recruited additional key informants and FGD participants. Interviewees were selected based on their knowledge or information on costing requirements for the introduction of new regulated substances in the Philippine context. Furthermore, participants should have the knowledge or information about the potential medicinal uses of medical cannabis in the Philippine setting. In addition, the focus of the discussions with the likely patients was only on medical cannabis usage on cancer, epilepsy, and multiple sclerosis. There was a 100% response rate in the recruitment of participants. A total of 28 participants were involved in two FGDs and 12 KIIs (Table 1). All interviews were audio-taped, transcribed, and discussed amongst the research team post-interview to identify the data needed in the analysis. All participants gave written consent, and the study received institutional review board approval.

Table 1. Characteristics of focus group discussion participants and key-informants (N = 28).

Focus Group Discussion Participants and Key-Informants	Number of Participants
KII with Neurologist	1 (1 female)
KII with PDEA staff	3 (2 females, 1 male)
KII with Chief Policy Consultant of the HB 6517	1 (1 female)
KII with Manager at DOH Drug Rehabilitation Program	2 (2 males)
KII with Chief at FDA Center for Drug Regulation and Research	1 (1 female)
KII with Lawyer at Public Attorney's Office	1 (1 male)
KII with Lawyer at Office of the Chief Prosecutor	1 (1 male)
KII with Dangerous Drugs Board staff	2 (2 females)
FGD with the patients	10 (1 male, 9 females)
FGD with Pediatric Oncologists	6 (3 females, 3 males)

Data Collection and Cost and Benefit Analysis

A combination of literature review, secondary data review, and actual costing surveys and interviews was utilized to determine the values for each component needed for the analysis. Data collected from the KIIs and FGDs conducted were guided by the pending HB 6517. The data collection methods used, the difference between the present scenario on illegal use of cannabis, and the anticipated changes once its medical use becomes legal, are detailed in Supplemental Table 1. Moreover, if data were available, Philippine-specific values were utilized; otherwise, the benefits transfer approach, i.e., values from various CBA research done elsewhere, were used for the model.

Comparing Key Aspects of the Status Quo and Alternative Case for the Use of Medical Cannabis

Currently, the use of cannabis for medical purposes is not allowed by law. However, with the passing of HB 6517, this will be permitted to some patients. The scenarios used by our study were based on the current draft of HB 6517, in which medical cannabis will be allowed if certain conditions were met.

Data were gathered through KII and FGDs, and review of secondary data. Qualified patients include those diagnosed by a certifying qualified physician as having a debilitating medical condition and should receive therapeutic or palliative benefits from the medical use of cannabis. However, only certain cannabis forms will be allowed, including capsules and oil in their pharmaceutical formulation, and distributed solely through the medical cannabis compassionate centers (MCCCs). As stated by HB 6517, the medical cannabis products will undergo routine product testing in order to maintain quality and efficacy. Information on this operation was collected from the FDA. Moreover, data related to the initial and operating costs and the time involved to establish the registration and monitoring systems were also ascertained. Furthermore, data regarding monitoring, regulation, dispensing, licensing, importation, cultivation, registration of the physicians, nurses, and caregivers, and the information dissemination were all collected from respective government agencies such as DDB, PDEA, DOH, and various hospitals.

Assumptions Made in the Performance of the Cost-Benefit Analysis CBA

Data ascertained from the stakeholders combined with the literature review, secondary data review, and actual costing surveys and interview data were used for the CBA. Values used in the CBA were based on various assumptions (Supplemental Data 1).

Prior to the legal access of medical cannabis by the patients, the government has to set up the facilities and capacitate the workforce to implement the law correctly. The cost of Philippine Pesos (PhP) 10M to 20M for the purchase of FDA equipment and personnel training for about 1 to 2 years was used. In addition, the cost of establishing the Cannabis Plant Monitoring System (CPMS) for four years was pegged at PhP 12.5M. This data was also used for the establishment of a Prescription Monitoring System (PMS) and electronic database. The time it will take to train, develop, and certify physicians and nurses was assumed to be four years, accounting for about PhP 10M. Data gathered also indicated that the cost of negotiating with potential MCCCs would be PhP 150M each for about five years; the initial figure was an approximate estimate from an office personnel interviewed and did go through the process of validation. The final assumptions used were presented to and validated by multi-stakeholder groups who will be involved in the negotiation and establishment of MCCCs. It was also assumed that about eight years would be needed to produce medical-grade cannabis oil with a cost of about PhP 100M.

The standard rate of 12% for VAT was attached to the analysis of taxes accrued to the government, while the usual tariff of 30% for income of corporations was affixed to the tax accrued from the profit of the MCCCs.

Based on PDEA records of cannabis-related cases filed in the past years, it was tabulated that there were, on average, 814 cases every year; the same number of cases was reflected in the assumptions used in the study. However, PDEA did not have any records of filed cannabis cases for medical use. Nonetheless, it is implicit that there are people using cannabis for medication; for this reason, the analysis used a minimum of 2%.

After developing their cannabis product(s), MCCCs would need to have them licensed with the FDA. The analysis presumed that the license fee of the MCCCs would be PhP 75,000 using the existing fee matrix of FDA that shows that the licensing of drugs would cost between PhP 50,000.00 to PhP 100,000.00. The study assumed that the supply of cannabis products would be equal to the demand of the patients. On this assumption, the total annual production of cannabis oil was estimated to be 8,280,964 bottles each year. The analysis merely considered the treatment of epilepsy, cancer, and multiple sclerosis with medical cannabis, as strongly supported by previous studies. Prevalence rates for the indicated diseases were used as the assumption for the demands. Considering that not all of these patients would opt for or have the means to use medical cannabis, the analysis further assumed that only a certain percentage would demand medical cannabis. In addition, assumptions were also made for patients taking additional dosage and patients without treatment plans.

Most of the time, the condition of the patients forces a family member to skip or resigned from work. Affected members of the family are earning from PhP 125.00 to PhP 2,150.00 per hour as per respondents. It is supposed that the average hourly income of relatives is PhP 1,137.50. We initially considered the average wage rates for estimating the loss in productivity. Nevertheless, with a better understanding of the profile of families that would benefit from HB 6517, such as the capacity to access the drug, it is more realistic to use wage rates above the national average and utilize the data from key informants. However, with medical cannabis, it is anticipated that patients will become better and that family member will resume working at a certain point. This brings the analysis to regaining two working days a week or equivalently a total of 96 days every year. The beneficiaries considered in the paper are those with debilitating cases since they are the only ones qualified to use the drug under the law. It would require almost full-time care from family members and thus the high number of work-loss days than usual illnesses. As for the cost, the indirect effects are higher than the direct costs since the patients are already ill to start with and are shifting medication as compared to the usual cost of illness studies where the individual is starting from a healthy state.

The flow of costs and benefits accumulated from the onset of the passing of the bill until a certain period that MCCCs are operational to provide patients with medical cannabis was taken into consideration. From the pre-utilization stage, significant investments from the government will occur. In addition, it will entail outlays for the establishment of different facilities, development of certification protocols and training modules, negotiations and establishment of MCCCs, development of the cannabis oil product, and creation of Information, Education, and Communication (IEC) activities. The certification of the doctors would need PhP 150,000.00 for a year, while the training of nurses will necessitate about PhP 10M to be developed in two years.

All the activities are supposed to be done simultaneously once the law has been passed. The establishment of the MCCCs will start in the 3rd year. On the assumption that there will be one MCCC put up every year, the establishments will be completed on the 8th year for the proposed target of five MCCCs. The establishment of the MCCCs will require PhP 15M each. While the establishment of MCCCs is ongoing, the development of the cannabis oil will begin for the first MCCC established and is set to commence on the 5th year lasting for eight years. A total of PhP 500M worth of funds is expected to be poured into the development of the products. Furthermore, the next four years will be devoted to informing the public about the law and will involve annual spending of PhP 3.125M. Even as IEC activities are still taking place, the medical cannabis would already be accessible to the patients after a year of information dissemination, approximately on the 14th year. However, it is expected that fewer patients will be consuming medical cannabis as the information might not have yet reached some patients. For this reason, it was presumed that the initial utilization rate would only be 50%. After the IEC years, full-blown usage of medical cannabis is anticipated to happen, putting up the utilization rate to 100%. A summary of the assumptions used in projecting the benefit and cost items in the computation is present in Table 2.

Data Analysis

Regarding the costs and benefits of the legalization, key findings were grouped into outcomes that are substantiated by other data sources and findings that sit on their own. The CBA was centered on the primary stakeholders, namely, the government, the physicians and nurses, the MCCCs, and the patients affected by the passing of the law. The net social benefit (NSB) was computed using a 12% social discount rate used by multilateral banks once the values for each component have been obtained, including the data collected from FGDs and KIIs. The assessment examined the likely impacts of the law for each sector, monetized these impacts, and estimated the net financial impacts (NFI) correspondingly (Supplemental Data 2). Summarized data were inputted within a framework matrix, followed by an in-depth analysis and interpretation of the CBA results.

Table 1. Key assumptions used in projecting the cost and benefit items in the computation.

Variables	Assumptions Based from Data Gathered	Values per Year
General		
Cost of the FDA equipment and training of personnel	PhP10M to PhP20M for two years	PhP 7.5M
Cost of establishment of Cannabis Plant Monitoring System	PhP10M to PhP15M for 3 to 5 years	PhP 3.13M
Cost of establishment of Prescription Monitoring System and electronic database	PhP10M to PhP15M for 3 to 5 years	PhP 3.13M
Cost of developing Physicians' Certification	PhP100,000 to PhP200,000 for 3 to 5 years	Php 150k
Cost of developing training course for nurses	PhP10M to PhP15M for 3 to 5 years	Php 5.0M
Cost of negotiation with initial potential MCCCs	PhP1.2M for 2 years	Php 600k
Cost of establishing an MCCC	15M for 5 years	Php 3.0M
Cost of developing cannabis oil	100M for 8 years	Php 12.5M
IEC Expenditures	PhP10M to PhP15M for 3 to 5 years	Php 3.13M
Government		
Expenditure for implementation of Cannabis Plant Monitoring System	PhP10M to PhP15M	Php 10.0M
Expenditure for implementation of Prescription Monitoring System and electronic database	PhP10M to PhP15M	Php 10.0M
Certification expense of government	PhP500 to PhP1,000 per doctor	Php 750.00
Training expense of government for nurses	PhP15,000 per nurse	Php 15k
Additional budget allotted for the regulatory body	PhP10M to PhP15M	Php 15M
FDA drug testing cost	PhP10,000 to PhP20,000	Php 15k
Doctors and Nurses		
Certification fee paid by doctors	Based on current physicians' certification of PDEA	Php 500.00
Training fee paid by nurses	Based on current training and seminar fee for CPD units application	Php 15k
Medical Cannabis Compassionate Centers (MCCCs)		
License fee of MCCCs	PhP50,000-PhP100,000	Php 75k
Total annual production	Supply of the cannabis products would be equal to the demand of the patients.	8,280,964 bottles
Average total sales of MCCCs	MCCCs operating each year to produce the total demand of 8,280,964 bottles,	Each MCCC - 1,656,193 bottles of cannabis oil
Estimated annual purchase of medical cannabis	The total 8,280,964 bottles of cannabis oil produced by the MCCCs every year will also be the same volume that will be bought by the patients.	8,280,964 bottles
Average legal market price of cannabis oil	When the medical cannabis is legalized, it is expected be much lower than the black-market price	PhP5,000 per bottle of 60 ml cannabis oil.
Average operating expenses of MCCCs	Literature discloses that operating costs of companies are about 80%-90% of their total sales. An MCCC is able to sell all his produce of 1, 656,193 at PhP5,000 each, assuming that MCCCs operating expenses is 90% of their total sales amount, then operating expense would be PhP7.45B on the average	PhP8.28B
Estimated profit of MCCCs	Building on the 90% operating costs, the estimated profit of the MCCCs would leave it at 10%	PhP828,096,500 Equivalently, the MCCC approximately earns PhP500 per bottle of cannabis oil

RESULTS

Stakeholders welcomed the idea of the legalization of medical cannabis in the Philippines, especially the patients and their advocates that will be involved and will be affected by the implementation of the proposed legalization of medical cannabis.

Limited Resources for Monitoring and Evaluation of Government Programs and Projects

Most of the stakeholders interviewed from the government pointed out that their resources were minimal in monitoring and evaluating existing government programs and projects. With a limited number of people and facilities, including sufficient storage for data, the stakeholders think that additional tasks of stricter monitoring on the use of medical cannabis in the future would limit their existing capacity to monitor existing programs. Furthermore, supplementary resources are needed to implement the pending bill that would cater to the additional activities for their respective offices. These resources include efficient databases for monitoring, complete analysis laboratories, highly trained individuals to carry out specialized tasks such as cannabis analyses and cannabis use regulation, and additional office spaces for the increase in human resources.

Mixed Opinion on Usage, Safety, and Efficacy

Data collected from physicians interviewed gave varied opinions on cannabis. One physician said that his patients purchase cannabis oil in the country's northern region, where the black market for this product exists. Relatives of cancer patients reported that the pain experienced from the disease diminished after using cannabis oil. Some of the patients and relatives also boiled the leaves and consumed the concoction like a tea drink. Not all physicians are in favor of legalizing the bill. The safety and efficacy of cannabis are not yet well studied; legalizing its use for medicinal purposes is an insult to both the medical and scientific communities in the country. In addition, there are other existing ways to avail the benefits of cannabis products – by utilizing the Compassionate Special Permit (CSP) through the FDA to avail US FDA registered cannabis-derived products.

Willingness to Use as An Alternative

Most of the patients said that due to the difficulty in getting CSP to purchase cannabis products outside of the country, they were hopeful that the use of cannabis products for medical purposes would be legalized. Legalizing medical cannabis would help the situation of the patients primarily if these products are sold at low prices. Moreover, most of the patients also said that synthetic drugs and Western treatments gave them a lot of side effects, which would cost them another type of drug to counteract.

Cost-Benefit Analysis

The analysis showed that the net benefits of implementing the law are already significantly positive, even just in the first year of the utilization of medical cannabis. It posted an NPV of PHP 6.73 billion at a social discount rate of 12%. Equally, this provides a high rate of return at 60%. As the population of patients also increases through time as estimated using the respective growth rates, the net gains and even the Internal Rate of Return (IRR) also displayed expansion. In the 20th year of adoption, the NPV reached PHP 121 billion at 77% IRR.

The streams of benefits to the government exceed the flow of expenditures when confining the analysis to the government. By the first year of the administration of legalized medical cannabis to patients, the government earns at a rate of 25%. Moving forward to the subsequent years, the IRR grew even further. Moreover, results also showed that more than 90% of the total benefit goes to patients, and less than 10% goes to the government, specifically the established MCCCs. A minimal cost to nurses and physicians is expected that can be covered by the salary or consultation premium, which were not estimated in this CBA.

Supplemental Table 2 presents the investment cost and benefit to the government if the legalization of medical cannabis will be implemented and the net benefits to the MCCC and the anticipated patients of cannabis products. The benefit to the government, MCCC, and the anticipated patients can be seen only on the 14th year of implementation. The benefit to anticipated patients outweighs the benefit to MCCC by more than 90%. Furthermore, 10% of the projected benefits go to the government in terms of taxes and net income from the proposed MCCCs

In addition, Supplemental Table 2 also shows the overall net benefit if HB 6517 will be implemented in 30 years. A positive overall net benefit can also be seen on the 14th year (PhP 34.92 billion) of implementation and will double on the 17th year with full-blown adoption. In terms of economic viability, the NPV turns positive once benefits are realized. In addition, more than 90% of the total benefit goes to patients, and less than 10% goes to the government. The calculated NPV is robust under different social discount rates, maintaining a positive NPV of PhP 55.5 billion and PhP 180 billion, respectively, under social discount rates of 15% and 10%. These social discount rates are pre- and post- 2016 discount rates used by the National Economic Development Authority (NEDA).

DISCUSSION

The CBA exhibited that the passing of HB 6517 is viable and will be beneficial to society despite the substantial outlays of the government in the initial years and during the implementation. Results indicated that it would yield a positive NPV to society but will approximately take 14 years for the government to get the benefit from implementing HB 6517. In addition, other benefits are yet to be realized still after more than ten years from the time the law is passed. However, patients who immediately need medical cannabis at present will not be made available by the current provisions of the bill. These patients may not be able to wait that long to experience the advantage of medical cannabis to their debilitating conditions such as epilepsy, cancer, and multiple sclerosis.

In 2014, a study published on the CBA of two policy options for the legalization of medical cannabis in Sydney, Australia, in terms of monetary aspects expressed as net social benefits (NSBs). Unlike the results of our study, their study did not look at the number of years it will take before the benefits can be seen if such law will be implemented. On the contrary, their study determined the amount the government may be expecting from legalizing cannabis. The study results indicated that

the mean NSB per annum from Monte Carlo simulations for the illegal use of cannabis was 294.6 million Australian dollars (AUD) [95% credible intervals (95% CI): 201.1 to 392.7 million United States dollars (USD)], which is not substantially different from the AUD 234.2 million (95% CI: USD 136.4 to 331.1 million) for the legalized–regulated model which excluded government revenue as a benefit. However, when government revenue is included as a benefit, the NSB for legalized–regulated is higher than for the illegal use of medical cannabis (Shanahan and Ritter 2014). Conversely, in our study, the overall net benefit of PHP 34.30 B will be after the 14th year of implementation with an NPV of PHP 6.7 billion (USD 134.7 million at 1 USD = 50 PHP).

The United Kingdom published a report on licensing and regulation of cannabis towards the development of CBA. The report cited that the heated public debate on cannabis policy is much too limited in scope. They have identified sources of social cost or benefit that might contribute to the outcome of comprehensive market reform. The relative importance of these sources depends critically on regulation and the nature of market responses to reform. In addition, the report also said that cost-benefit evaluations should not assume that there are zero personal benefits from consumption. The report used a net external benefit criterion based on the view that the consumer perceives a tremendous personal benefit from consumption as there are individual costs and risks from consumption. It is a conservative approach, producing results biased in favor of the status quo under the assumption of competent, well-informed decision-makers (Bryan et al. 2013).

In addition, a paper on the legalization of recreational cannabis was published to outline the plausible effects on cannabis use and cannabis-related harm and determine what research is needed to evaluate the public health impact of these policy changes. Based on existing medical cannabis laws, the study used an implemented law in the United States as the basis for their data collection (Hall and Lynskey 2016). In contrast, our study looked at the legalization of medical cannabis (HB 6517) as our basis for the CBA. Furthermore, the researchers reviewed the drug policy literature to identify pointers from studies of the effects of legalizing medical cannabis use and indicators of cannabis use and cannabis-related harm. The review was conducted to assess the impact of these policy changes, which were very similar to our study. The study added that the legalization of recreational use would probably increase consumption in the long term. In addition, it would be critical to monitor the number of cannabis plants to be legally produced and the tetrahydrocannabinol (THC) content of cannabis. Moreover, indicators of cannabis-related harms that should be monitored include car crash fatalities and injuries, presentations to addiction treatment services, and the prevalence of regular cannabis use among young people in mental health services and the criminal justice system (Hall and Lynskey 2016). These indicators were the same highlighted identified indicators during our FGDs and KIIs among the stakeholders.

This study is the first that looked at the CBA on the possible legalization of medical cannabis not just in the Philippines but also in South East Asia. Thailand legalized the use of medical cannabis in 2019; one study discussed medical cannabis with a particular focus on the new perspectives but did not look at the CBA on the use of medical cannabis. The authors reported that after starting the implementation process in early March 2019, there were already registered patients for medical cannabis and emphasized that registration is the fundamental process for controlling the use of cannabis drugs (Mungmunpuntipantip 2019). The key findings of our KIIs were analogous to the results of the Thailand study; the control of cannabis products is the utmost concern, especially from various government stakeholders. Moreover, our study is also the first study that looked at the CBA of medical cannabis in oil form. Most of the published studies looked at the most common pharmaceutical forms of cannabis, such as capsules, lozenges, tinctures, dermal patches, oral or dermal sprays, cannabis edibles, and vaporizing or smoking dried buds (Brown 2019; Ko et al. 2016; Pardo 2014; Steele et al. 2019).

Like any CBA studies, the results were based on the assumptions used in the analysis. Any change in the plans, details in the implementing rules and regulations of the law, and the law's actual implementation can change the CBA results. In addition, our CBA only focused on the oil form of cannabis, particularly the CBD or the cannabidiol, which is the non-addictive cannabis constituent due to limitations on data availability. Moreover, our research involved illegal products and working with patients with debilitating conditions, which had limited availability of respondents. Hence, volunteer participants and key informants were the respondents included in the study. Additionally, only direct effects to major stakeholders were covered in the CBA of our research; external and unintended effects were not included in the calculations and should be addressed in future studies. Furthermore, our study only focused on medical cannabis for cancer, epilepsy, and multiple sclerosis and excluded other indications cannabis may

potentially be therapeutic. Further studies are also needed to determine the strategies to reduce the time it takes to get the benefits from medical cannabis to be delivered to the identified patients.

CONCLUSION

CBA results presented will yield a positive NPV to society. However, after all the costs have been invested in the establishment of cannabis centers, proper research and development channels for cannabis, and strict monitoring of dispensing and administration of the said product, it will take approximately 14 years before the government and patients can realize the benefits. In addition, the utilization of the results can be applied to optimize the implementation process while reducing the time interval between benefits down streaming to the patients and the adoption of the law.

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Ethics Approval and Consent to Participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee (University of the Philippines Manila Review Ethics Board: UPMREB 2018-380-01) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All participants gave consent to participate in the study.

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Supplemental Data 1. Assumptions made in the performance of the Cost-Benefit Analysis (CBA).

Prior the legal access of medical cannabis by the patients, the government has to set up the facilities and capacitate the work force to properly implement the law.

1.Cost of Purchase FDA equipment and training of personnel (PhP)
The cost of the FDA equipment and training of personnel ranges from PhP10M to PhP 20 M, but the analysis placed it at its average of PhP 15 M. The cost for purchasing start up equipment is based on the interview done with FDA personnel in-charge of the laboratory.

2. Time needed to purchase FDA equipment and training of personnel (Years)
The training of personnel and procurement of the equipment for FDA may last for one to two years according to the FDA personnel interviewed. For the analysis, it was supposed that it will take two years to complete the training and procurement of the equipment.

3. Cost of establishment of Cannabis Plant Monitoring System (PhP)
The cost of establishing the Cannabis Plant Monitoring System (CPMS) was pegged at PhP 12.5 M following the price range provided by the Research Head of the Dangerous Drugs Board (DDB) of PhP 10 M to PhP 15 M.

4. Time needed to establish Cannabis Plant Monitoring System (Years)
The analysis took the average of four years, from the three to five years mentioned by the Research Head of DDB, for the length of time necessary to put up the CPMS.

5. Cost of establishment of Prescription Monitoring System and electronic database (PhP).
DDB gave a similar cost estimate of PhP10M to PhP15M for establishment of the Prescription Monitoring System (PMS) and electronic database. The average PhP12.5M was also utilized for the exercise.

6. Time needed to establish Prescription Monitoring System and electronic database (Years)
It is also said that the set-up of PMS will be completed within three to five years. Four years was employed in the analysis.

7. Cost of developing Physicians' Certification (PhP)
The development of the Physicians' Certification is estimated to spend a minimal of PhP100,000 to PhP200,000 according to PDEA. It was presumed that it will cost the average of PhP150,000 to accomplish this.

8. Time needed for development of Physicians' Certification (Years)
PDEA mentioned that the development of the certification for doctors will take three to five years. However, PDEA just needs to incorporate it with or revise the current certification protocols. Thus, it was inferred that this will not take that long. It was assumed rather that this will only entail one year to perform.

9. Cost of developing training course for nurses (PhP)
PDEA noted that the expenditures related to the development of the training course for nurses will be about PhP10M to PhP15M. The exercise took on the lowest cost of PhP10M to differentiate it with the earlier costs associated with purchase of equipment.

10. Time needed for development of training program for nurses (Years)
Development of the training course is also estimated to be completed in three to five years also as per interview with PDEA. It was also presumed that this will not take so long, but will only need two years to finish.

11. Cost of negotiation with initial potential MCCCs (PhP/MCCC)
The interview with a personnel in the office of the principal author of the bill indicated that the cost of negotiating with potential MCCCs would be PhP150M each. This seems a huge expense for such activity. Thus, the study assumed only a PhP1.2M for expenses associated with negotiations with potential MCCCs.

12. Time allotment for negotiations (Years)
It was mentioned by the office personnel of the principal author that five to ten years is expected to carry out the negotiations for potential MCCCs. The analysis, however, deemed reasonable and a much shorter duration of two years for this activity.

13. Number of MCCCs operating
Based on the Bill, there will be at least five MCCCs operating in the country every year. To simplify the exercise, five MCCCs were used for all the years of implementation.

14. Time needed for the establishment of an MCCC (Years)
The office of the principal author cited three to five years is needed to establish the initial MCCCs. Since there will be five MCCCs, the study take on the maximum five years, indicating one MCCC established per year.

15. Cost of establishing an MCCC (PhP)
Accordingly, it would entail PhP15M to set up an MCCC based on the interview with the office of the principal author. The same amount was set for this.

16. Time needed for cannabis oil development (Years)
To simplify the analysis, the analysis focused on the development of cannabis oil since it is much popular than the capsule form. Doctors indicated that the development spans five to ten years. Eight years was employed in this analysis.

17. Cost of developing cannabis oil (PhP)
The cost stated by the doctor interviewed, PhP100M, was mirrored in the assessment.

18. IEC Expenditures (PhP)
DOH personnel informed that expenses for IEC would be around PhP10M to PhP15M. It was the average of PhP12.5M that was set for this examination.

19. Time period for IEC (Years)
Similarly, DOH mentioned a period of three to five years to perform IEC activities. Four years then was used herein. The law is ready for implementation once the abovementioned activities were concluded. The implementation stage presents both advantages and disadvantages to the stakeholders.

<u>Government</u>

20. Expenditure for implementation of Cannabis Plant Monitoring System (PhP per year)
The government is expected to spend for the operations of the CPMS. According to DDB, the estimated annual expense for such is PhP 10M to PhP 15M. PhP 10M was utilized in the study.

21. Expenditure for implementation of Prescription Monitoring System and electronic database (PhP/year)
The government is likewise anticipated to incur spending to operate the PMS and electronic database, around the same amount of PhP10M to PhP 15M. In this case, PhP10M was also taken for such spending.

22. Certification expense of government (PhP/doctor/year)
Another projected expenditure of the government is on the certification of doctors. The current physician certification system of PDEA costs PhP 500 to PhP 1,000 per doctor. As such, it was estimated in the analysis that it would cost PhP 750.

23. Number of certifications (Certifications/year)
Based S2 certification given by the PDEA, the number of qualified doctors that were given certification were about 1,000 to 2,000 every year. The exercise employed an average of 1,500 doctors certified each year.

24. Training expense of government for nurses (PhP/nurse/year)
The Bill stipulates that the government will also shoulder the training expenses

of the nurses who will administer the medical cannabis to patients. It was supposed that the training would cost PhP15,000 per nurse per year based on the usual spending of government agencies for training.

25. Number of trained nurses (Nurses/year)
PDEA indicated that approximately 200 to 300 nurses will be trained every year for the implementation of the bill. It was then presumed that 250 nurses will have training each year for the assessment.

26. Additional budget allotted for the regulatory body (PhP/year)
The execution of the law will involve stricter monitoring on the dispensing and administration of cannabis products and this will require additional budget for PDEA. Although this responsibility will just be incorporated in the existing tasks of PDEA, it would still incur roughly PhP10M to PhP15M annually as mentioned by the PDEA officer. The exercise pegged the maximum PhP 15M for this.

27. Additional budget allotted for police force (PhP/year)
The police forces also need minimal reinforcement that would require the same PhP15M as pointed out by PDEA.

28. FDA drug testing cost (PhP/drug)
The current service fees of FDA shows that testing of a drug is between PhP10,000 to PhP20,000. As such, PhP15,000 was employed in the computation.

29. FDA Sampling Percentage (%)
FDA performs testing of drugs only on samples for every batch of medicines. Per a batch of 100 bottles, three bottles are being tested. With that, 3% was the estimated sampling percentage used in the study.

30. Value Added Tax rate for cannabis products (%)
The common rate of 12% for VAT was attached to the analysis of taxes accrued to the government.

31. Income tax rate of MCCCs (%)
The usual tariff of 30% for income of corporations was affixed to the tax accrued from the profit of the MCCCs.

32. Court expense (PhP/case/year)
The assessment emulated the PhP100,000 expended for court hearings for a case in a year as advised by a legal prosecutor.

33. Average number of cannabis cases filed (Cases/year)
Based on PDEA records of cannabis cases filed in the past years, it was computed that there is 814 cases every year. This same number of cases was reflected in this exercise.

34. Proportion of cannabis cases for medical users (%)
PDEA do not have any records of filed cannabis cases for medical use. However, it is understood that there are people using cannabis for medication. For this reason, the analysis used a minimal of 2%.

35. Legal aid expenditures (PhP/case/year)
The government provides free legal assistance to those who cannot afford such. The assessment imitated the amount of PhP150,000 for legal aid for a case every year as mentioned by a legal prosecutor.

36. Proportion of accused needing legal aid (%)
In case of accused medical cannabis users, some of them might need legal assistance. The proportion of 90% accused needing legal aid according to the interviewed legal prosecutor was also taken in the study.

37. Cost of rehabilitation services (PhP/person/year)
Some accused users of cannabis may necessitate rehabilitation. The price of rehabilitation per person per year ranges from PhP10,000 to PhP20,000 depending on the facility. The cost employed in the analysis was PhP15,000.

38. Proportion of accused needing rehabilitation (%)
The same percentage of 9% needing rehabilitation indicated by a legal prosecutor was assumed in the exercise.

Doctors and Nurses

39. Certification fee paid by doctors (PhP per year)
The current physicians' certification of PDEA is priced at PhP500. For this examination of costs and benefits, the certification fee of doctors was placed similarly at PhP500.

40. Spending on documentary requirements/certification for doctors (PhP)
The certification would require physicians to submit some documents to PDEA as part of the application. The acquisition of the documents may entail expenses amounting to PhP500 up to PhP1,000. As such, it was assumed in the analysis that the spending would be PhP750.

41. Training fee paid by nurses (PhP)
The study supposed the current training and seminar fee for CPD units application of PhP15,000 as cited by the interviewed nurse. However, this will be taken care of the government.

42. Spending for attendance to trainings (PhP/day)
Even though the nurses will not be paying for the training fee anymore, going to the training would necessitate transportation and other related expenses. Using the estimate of PhP15,000 for the training fee, the daily spending for attendance to trainings was computed, dividing it by 22. The estimated spending per day amounts to PhP681.82.

43. Number of training days (days)
The interview with a nurse revealed that the duration of trainings for special cases such as for medical cannabis is typically long at 30 days.

Medical Cannabis Compassionate Centers (MCCCs)

44. License fee of MCCCs (PhP/year)
After developing their cannabis product(s), MCCCs would need to have them licensed with FDA. The analysis presumed that the license fee of the MCCCs would be PhP75,000 using the existing fee matrix of FDA that shows that the licensing of drugs would cost PhP50,000-PhP100,000.

45. Spending on documentary requirements for MCCCs (PhP)
The application for license would also need some documents to support the application. This was assumed to be around PhP750, more or less the same as with the doctors.

46. Total annual production (bottles/year)
The study supposed that the supply of the cannabis products would be equal to the demand of the patients. On this assumption, the total annual production of cannabis oil was estimated to be 8,280,964 bottles each year. The analysis merely considered epilepsy, cancer and multiple sclerosis to be treated with medical cannabis as strongly supported by previous studies. Correspondingly, past researches showed that medical cannabis would be valuable in reduction or elimination of epileptic seizures, nausea and vomiting, pain and appetite loss for cancer as well as muscle spasms, pain and bladder problems for multiple sclerosis. Not all epileptic, cancer and multiple sclerosis patients are qualified to access medical cannabis. Only 30% of epileptic patients are considered to have chronic status. Meanwhile, only 21% of cancer patients suffer severe nausea and vomiting, 1% enduring severe pain and another 1% experience appetite loss. For multiple sclerosis patients, 48% suffer severe muscle problems and pain and 80% go through bladder problems. Taking these into account, the total number of patients that may qualify to use medical cannabis would be nearly 1.7 million. If each patient will consume a total of 12 bottles a year on the average, then the total bottles of cannabis oil needed annually would be more than 22 million. Considering that not all of these patients would opt for or have means to use medical cannabis, the analysis further assumed that only a certain percentage of the patients would demand for medical cannabis. Supposing that there are 5% of them that are already consuming medical cannabis despite it is yet illegal, 10% are taking additional dosages of the current medications and about 25% to 35% taking no medications or treatments who are willing to utilize medical cannabis once it is legalized, a total of 690,080 patients will require it. Again, if they will consume an average of 12 bottles a year, the total annual demand would become 8,280,964 bottles.

47. Average total sales of MCCCs (Volume/MCCC/year) In the assumption that there will be MCCCs operating each year to produce the total demand of 8,280,964 bottles, each MCCC have to produce approximately 1,656,193 bottles of cannabis oil per year.

48. Estimated annual purchase of medical cannabis (bottles/year) Since it was presumed that supply would be equal to the demand, the total 8,280,964 bottles of cannabis oil produced by the MCCCs every year will also be the same volume that will be bought by the patients.

49. Average legal market price of cannabis oil (PhP/60 ml)
When the medical cannabis is legalized, it is expected be much lower than the black market price. It is thus placed at PhP5,000 per bottle of 60 ml cannabis oil.

50. Average operating expenses of MCCCs (PhP/year)
Literature discloses that operating costs of companies are about 80%-90% of their total sales. If an MCCC is able to sell all his produce of 1, 656,193 at PhP5,000 each, then total sales would reach PhP8.28B. Assuming that MCCCs operating expenses is 90% of their total sales amount, then operating expense would be PhP7.45B on the average.

51. Estimated profit of MCCCs (PhP/bottle) Building on the 90% operating costs, the estimated profit of the MCCCs would leave it at 10% totaling to PhP828,096,500. Equivalently, the MCCC approximately earns PhP500 per bottle of cannabis oil.

Epileptic Patients

52. Prevalence rate of epilepsy in the Philippines (%)
The Philippine League Against Epilepsy noted that epilepsy has a prevalence rate of 0.9% in the country. This was adopted in the analysis.

53. Number of epileptic patients as of 2019
The current population of the Philippines is 107,562,436. Multiplying this with the prevalence rate, the number of epileptic patients arrived at 968,062.

54. Growth in the number of epileptic patients (%)
A study revealed that the number of epileptic patients have changed by 8% from 1990 to 2016 in the Philippines, translated to an average of 0.31% growth annually. This yearly growth rate was reflected in the analysis to project for the future number of epileptic patients that would need medical cannabis.

55. Epileptic patients qualified for medical cannabis (%)
The law stipulates that only debilitating cases shall be allowed for medical cannabis consumption. Literature displays that about 30% of the total epileptic patients are not responsive to their medications anymore and they suffer seizures despite their medications. As such, the study assumed that the same percentage is only the proportion of epileptic patients qualified for use of medical cannabis in the country.

56. Common medicine provided to epileptic patients for seizures
Several medicines are available to control seizures among epileptic patients. Based on literature, one common medication is Valproate. Valproate was presumed as the medication of epileptic patients in this exercise.

57. Price of the common medicine provided to epileptic patients (PhP) Drug stores in the country sell Valproate around PhP24 each.

58. Total quantity provided to epileptic patients (Quantity/year) The discussions with patients and/or their relatives reveal that medicines for seizures are administrated to them 72 to 80 times in a year. To simplify the analysis, it was supposed that a total 72 administrations are performed every year.

59. Frequency of seizures of epileptic patient (Frequency/month)
Seizures are frequent to epileptic patients ranging from 15 to 20 times monthly according to patients and/or their relatives interviewed. An average of 18 seizures per month was utilized for the purposes of this examination.

60. Average expenditures related to seizures (PhP/month)
There are associated medical expenses with the seizures suffered by epileptic patients. This is estimated at PhP7,500 following the range provided by patients and their relatives of PhP7,000 to PhP8,000 per month.

Cancer Patients

61. Number of cancer patients as of 2019
The Philippine Cancer Registry has recorded a total of 6 million cancer patients as of the moment.

62. Growth in the number of cancer patients (%)
The number of cancer patients has grown by 19% in the past years according to Philippine Cancer Control Program of DOH. The analysis used 19% to forecast the number of cancer patients in the next years.

63. Cancer patients qualified for medical cannabis due to nausea and vomiting (%)
According to literature, nausea and vomiting is prevalent among 70% of advanced cancer patients and 30% of the current cancer patients are in the advanced stage. In that case, it is inferred that only 21% of the total cancer population are going through serious nausea and vomiting.

64. Cancer patients qualified for medical cannabis due to pain (%)
The exercise utilized the rate of 1% of cancer patients suffer from acute pain that past researches disclosed that.

65. Cancer patients qualified for medical cannabis due to loss of appetite (%)
There are also 1% of the cancer patients who endures appetite loss based on previous studies.

66. Common medicine provided to cancer patients for nausea and vomiting
Apprepitant is one of the usual medications given to cancer patients with serious nausea and vomiting. It was supposed that this medicine is consumed by the cancer patients in the study.

67. Price of the common medicine provided to cancer patients for nausea and vomiting (PhP)
A pack of three costs an average of PhP3,216 in the market nowadays. Equivalently, one piece would cost PhP1,072.

68. Total quantity provided to cancer patients with nausea (Quantity/year)
Patients and their relatives divulge that the total quantity of medicine for nausea and vomiting administered to their cancer patients ranges from 60 to 84 pieces. This assessment took on the highest quantity of 84 considering the frequency of nausea and vomiting for cancer patients.

69. Frequency of nausea and vomiting of cancer patient (Frequency per month)
Patients and their relatives cited that there are 10 to 12 occurrences of nausea and vomiting monthly. To make easier, the study supposed that are 12 episodes of nausea and vomiting every month.

70. Average expenditures related to nausea and vomiting (PhP per month)
The nausea and vomiting of cancer patients is a taking a monthly toll of PhP5,000 to PhP7,000 based on the interviews. This exercise took the average of PhP6,000 for the monthly expenditure related to nausea and vomiting.

71. Common medicine provided to cancer patients for pain
Being a very common medication for cancer pain, morphine was presumed to be the medicine consumed by the cancer patients in this analysis.

72. Price of the common medicine provided to cancer patients for pain (PhP)
Morphine is priced currently in the market at PhP80 per piece on the average.

73. Total quantity provided to cancer patients with pain (Quantity per year)
Patients in the advanced stage were assumed to suffer chronic pain about 20 times per month. Thus, morphine is administered to them approximately 240 times in one year.

74. Frequency of pain of cancer patient (Frequency/month)
Cancer patients endure 15 to 20 episodes of serious pain every month according to the interviewed patients and their relatives. The study employed 20 occurrences of pain monthly.

75. Average expenditures related to pain (PhP/month)
About PhP7,000 to PhP10,000 are being expended by the patients every month in times of terrible pain. The average of PhP8,500 was rather used for the analysis.

76. Common medicine provided to cancer patients for loss of appetite
The assessment made use of the corticosteroids as one of the medicines usually prescribed to cancer patients experiencing appetite loss.

77. Price of the common medicine provided to cancer patients for loss of appetite (PhP)
Each corticosteroid has an average price of PhP20.

78. Total quantity provided to cancer patients with loss of appetite (Quantity per year)
Utilizing the given quantities of patients ranging from 36 to 48 pieces a year, the analysis took on the highest amount of 48.

79. Frequency of loss of appetite of cancer patient (Frequency per month)
At the same time, occurrences of loss of appetite was approximated at 20 considering that it happens 15 to 20 per month to a cancer patient as per the discussions with patients and their relatives.

80. Average expenditures related to loss of appetite (PhP per month)
Patients and their relatives indicated an average spending of PhP 4,000 monthly for loss of appetite.

Multiple Sclerosis Patients

81. Number multiple sclerosis patients as of 2019
The Asian Hospital and Medical Center estimated that there are 8,400 patients presently diagnosed with multiple sclerosis in the country.

82. Prevalence rate of multiple sclerosis in the Philippines (%)
The same hospital noted that multiple sclerosis is prevalent in 1% of the population.

83. Growth in the number of multiple sclerosis patients (%)
A study exhibited that the cases of multiple sclerosis in the Philippines grew by 27.8% from 1990 to 2016. Equivalently, this is approximately 1.1% growth every year.

84. Multiple sclerosis patients qualified for medical cannabis due to muscle problems (%)
Muscle spasms have varying degrees among multiple sclerosis patients but only 48% reported painful spasms according to past studies. With this, it is assumed that 48% of the multiple sclerosis patients are eligible to consume medical cannabis for muscle spasms.

85. Multiple sclerosis patients qualified for medical cannabis due to pain (%)
Multiple sclerosis patients also suffer pain and 48% similarly indicated to have long lasting pain according to literature. Hence, 48% may utilize medical cannabis for pain due to multiple sclerosis.

86. Multiple sclerosis patients qualified for medical cannabis due to bladder condition (%)
Among multiple sclerosis patients, 80% have overactive bladders. As such, 80% of multiple sclerosis patients are considered qualified for use of medical cannabis.

87. Common medicine provided to multiple sclerosis for muscle problems
The exercise employed one of the common medicines for muscle problems among multiple sclerosis patients, Tizanidine.

88. Price of the common medicine provided to multiple sclerosis patients for muscle problems (PhP)
Current market price of Tizanidine is PhP45/each.

89. Total quantity provided to multiple sclerosis patients with muscle problems (Quantity per year)
The analysis considered a total of 60 administrations annually for the medicine, taking into account the range provided by the interviewees of 52 to 60.

90. Frequency of muscle problems of multiple sclerosis patient (Frequency per month)
The frequency of muscle problems was placed at 12 times a month given the number cited by the respondents.

91. Average expenditures related to muscle problems (PhP per month)
According to the FGD respondents, they are spending PhP7,000 to PhP10,000 every month for muscle spasms. The average of PhP8,500 was then employed in the assessment.

92. Common medicine provided to multiple sclerosis for pain
The analysis looked at Baclofen as the usual medication provided to multiple sclerosis patients suffering long lasting pain.
93. Price of the common medicine provided to multiple sclerosis patients for pain (PhP)
Baclofen is priced at PhP50/piece at present.

94. Total quantity provided to multiple sclerosis patients with pain (Quantity per year)
The examination speculated that the total quantity of medication administered to multiple sclerosis with pain is 60 in a year.

95. Frequency of pain of multiple sclerosis patient (Frequency per month)
There are about 10 to 12 periods of pain occurring with multiple patients every month according to interviewed patients and relatives. The study considered a total of 12 occurrences instead.

96. Average expenditures related to pain (PhP per month)
Patients gave a range of PhP10,000 to PhP12,000 a month for expenditures related to pain due to multiple sclerosis. The exercise used the average of PhP11,000.

97. Common medicine provided to multiple sclerosis for bladder condition
In the analysis, Enablex was supposed to be the medication of patients with bladder problems.
98. Price of the common medicine provided to multiple sclerosis patients for bladder condition (PhP)
Enables is bought at an average of PhP175 per piece as of the moment.

99. Total quantity provided to multiple sclerosis patients with bladder condition (Quantity/year)
A total of 60 pieces are assumed to be administered to the patients in a year, following the 60 to 70 pieces estimate of the respondents.

100. Frequency of bladder conditions of multiple sclerosis patient (Frequency/month)
According to the interviewed patients, bladder problems happen 5 to 6 times a month. This assessment set the occurrences at 6.

101. Average expenditures related to bladder condition (PhP per month)
This examination took the average of PhP 5,000 and PhP 7,000, which is PhP6,000 for the monthly expenses incurred due to bladder problems.

Existing Cannabis Users

102. Number of patients currently using cannabis for medical use (%)
It is known that there are some patients resorting medical cannabis already as of the moment. However, there is no existing record of the number of patients currently using cannabis for medical purposes since this is performed underground. The study just presumed a minimal percentage of 5% to account for these patients.

103. Proportion of existing medical cannabis users using cannabis oil (%)
Since the interviews revealed that most of medical cannabis users are consuming cannabis oil, the exercise supposed that 100% is using cannabis oil.

104. Proportion of accused for using cannabis (%)
Once again, PDEA do not have any records of filed cannabis cases for medical use. For this reason, the analysis used a minimal of 2% to illustrate the impacts of the bill to the stakeholders.

105. Proportion of unaccused for using cannabis (%)
Supposing that 2% is accused, the remaining 98% was presumed to be not accused despite of their usage of medical cannabis.

106. Average quantity of cannabis oil purchased by patients (bottles/month)
In the interviews, patients consume one bottle a month on the average. Correspondingly, the assessment fixed the average monthly consumption of the patients for cannabis oil at one.

107. Average black market price of cannabis oil (PhP per 60ml)
The respondents disclosed that they are able to buy cannabis oil of 60 ml bottle for PhP5,000 to PhP10,000. Because the legal price is already estimated at PhP5,000, the exercise employed the highest amount of PhP10,000 rather.
108. Duration of usage of 60 ml cannabis oil (in months)
Respondents also cited that they consume one bottle per month. As such, it was supposed that the 60 ml bottle of cannabis oil will last for one month.

109. Proportion of patients that will be administered with cannabis oil (%)
Focusing just on cannabis oil production and no capsule yet, the study further assumed that all the patients needing medical cannabis will be given cannabis oil.

110. Frequency of purchase of cannabis (Frequency/year)
Based on the bill, the patients are only allowed to purchase medical cannabis from the MCCCs once a month. Given this, there will be a total of 12 purchases every year for each patient.

111. Average transportation cost (PhP/month)
The dispensing of medical cannabis would only take place in the MCCCs, for which the patients or their relatives would need to go to. Since the potential locations are yet to be established, the study took a minimal amount PhP1,000 per two-way trip monthly for transportation.

112. Average legal defense expenses (PhP/person/year)
A legal prosecutor estimated that legal defense expenses is about PhP60,000 in a year.

113. Number of family members attending the court hearing
Due to the medical condition of the patients, they are likely unable to attend court hearings if they are accused for prohibited use of cannabis. Usually, one relative represents the patient in the hearings.

114. Income of family member (PhP per hour)
Affected members of the family are earning from PhP125 to PhP2,150 per hour as per respondents. It is supposed that the average hourly income of relatives is PhP1,137.50.

115. Productivity gained of family member (days)
The condition of the patients most of the time forces a family member to skip or totally resigned from work. With medical cannabis, it is anticipated that patients will become better and that family members will be able to resume working at a certain point. This brings the analysis to regaining 2 working days a week or equivalently a total of 96 days every year.

116. Time spent for court hearings (Hours/hearing)
According to a legal prosecutor, hearings could take about 3 to 4 hours including the waiting time. This examination utilized 3 hours spent per court hearing.

117. Total number of hearings (Number of hearings per year)
Since the legal system is very much faster now, at least one hearing per quarter is expected as per the legal prosecutor. As such, there are four hearing in a year considered in the study.

118. Estimated initial utilization rates after legalization of existing cannabis users (% per year)
It is expected that the current users of medical cannabis will also continue consumption once the medical cannabis is legalized in the country. However, in the first three years of implementation while the IEC activities are still ongoing, utilization rates would be lower at 50%.

119. Estimated utilization rates after legalization of existing cannabis users (% per year)
Starting the 4th year of the implementation, it is projected that 100% will already be using medical cannabis.

Patients Taking Additional Dosage

120. Proportion of epileptic patients taking additional dosage (%)
The assessment placed the percentage of epileptic patients taking additional dosage at 10%. This is based on the interview with a neurologist wherein 10% of the patients are not responding to normal dosage.

121. Rate of additional dosage applied by epileptic patients (%)
The same rate of 10% was supposed as the added dosage from their prescribed quantities based on the interview.

122. Decrease in frequency of seizures of epileptic patient due to medical cannabis (%)
The interview with the doctor indicated that epileptic seizures may be reduced by 60% to 70% with medical cannabis. The 70% was taken as the effect of medical cannabis to epileptic patients.

123. Decrease in frequency of seizures of epileptic patient due to additional dosage (%)
60% to 70% was also the cited reduction of seizures with additional dosage of their present medications. To show that medical cannabis is superior to this practice, the 60% reduction was considered the effect of additional dosage.

124. Proportion of cancer patients taking additional dosage (%)
Based on an interview with an oncologist, 10% of the patients are not responding to standard dosage. Thus, 10% of cancer patients is approximated to be taking extra dosage of their medicines.

125. Rate of additional dosage applied by cancer patients (%)
The same rate of 10% was supposed as the added dosage from their prescribed quantities based on the interview.

126. Decrease in frequency of nausea and vomiting of cancer patient due to additional dosage (%)
Nausea and vomiting decreases by 60% to 70% is potential with medical cannabis as per the interviewed doctor. The additional dosaging was pegged to reduce nausea at 60%.

127. Decrease in frequency of nausea and vomiting of cancer patient due to medical cannabis (%)
Meanwhile, the reduction of nausea caused by consumption of medical cannabis was set at 70%.

128. Decrease in frequency of pain of cancer patient due to additional dosage (%)
Medical cannabis is anticipated to lower down occurrences of pain for cancer patients by 70% to 80% according to the oncologist. On the assumption that medical cannabis is a better alternative for this condition, it was presumed that the reduction due to taking of extra dosages will be 70%.

129. Decrease in frequency of pain of cancer patient due to medical cannabis (%)
Accordingly, medical cannabis would have better impact on cancer patients reducing pain episodes by 80% .

130. Decrease in frequency of loss of appetite of cancer patient due to additional dosage (%)
Appetite loss is expected to improve with medical cannabis consumption approximately by 50% to 60%. Additional dosage rather would decrease appetite loss by 50%.

131. Decrease in frequency of loss of appetite of cancer patient due to medical cannabis (%).
On the other hand, usage of medical cannabis will cut down appetite loss frequency by 70%.

132. Proportion of multiple sclerosis patients taking additional dosage (%)
The assessment placed the percentage of epileptic patients taking additional dosage at 20%. This is based on the interview with a neurologist wherein 20% of the patients do not positively respond to regular dosage.

133. Rate of additional dosage applied by multiple sclerosis patients (%)
The rate of 20% was supposed as the added dosage from their prescribed quantities based on the doctor's interview.

134. Decrease in frequency of muscle problems of multiple sclerosis patient due to additional dosage (%)
Frequency of muscle problems is likely to go down by 40% to 50% when the patient consumes medical cannabis according to a doctor. Since it is regarded the medical cannabis will have enhanced effects on the patients, it was supposed that taking additional dosage of their existing medications would lessen muscle problems by 40%.

135. Decrease in frequency of muscle problems of multiple sclerosis patient due to medical cannabis (%)
Correspondingly, medical cannabis consumption will minimize muscle problems among patients by 50%.

136. Decrease in frequency of pain of multiple sclerosis patient due to additional dosage (%)
Medical cannabis is anticipated to lower down occurrences of pain for multiple sclerosis patients by 50% to 60% according to the neurologist. On the assumption that medical cannabis is a better alternative for this condition, it was presumed that the reduction due to taking of extra dosages will be 50%.

137. Decrease in frequency of pain of multiple sclerosis patient due to medical cannabis (%)
The decrease of pain episodes for multiple sclerosis patients would be 60% with the usage of medical cannabis.

138. Decrease in frequency of bladder condition of multiple sclerosis patient due to additional dosage (%)
Bladder problems are anticipated to get lower with medical cannabis consumption approximately by 30% to 40%. Additional dosage was presumed however to lessen only by 30%.

139. Decrease in frequency of bladder condition of multiple sclerosis patient due to medical cannabis (%)
While additional dosage is likely to reduce bladder problems by 30%, medical cannabis is estimated at 40%.

140. Estimated initial utilization rates after legalization of patients taking additional dose (% per year)
The patients taking additional dosages are projected to be consuming medical cannabis once it is legalized. In the first three years of implementation though, utilization rates would be lower at 50% since the IEC is not yet completed.

141. Estimated utilization rates after legalization of patients taking additional dose (% per year)
100% of the patients taking additional dosages are projected to be consuming medical cannabis once it is legalized.

Patients Without Treatment

142. Proportion of epileptic patients without treatment (%)
Records of DOH show that 30% of epileptic patients are not having any medications or treatments.

143. Proportion of cancer patients taking without treatment (%)
DOH also reported that 20% to 30% or an average of 25% of cancer patients are not taking medications and treatments.

144. Proportion of multiple sclerosis patients without treatment (%)
DOH similarly cited that approximately 35% (or 30% to 40%) of multiple sclerosis patients are not receiving medication or treatments for their medical condition.

145. Estimated initial utilization rates after legalization of patients without treatment (% per year)
After the legalization of the medical cannabis, it is presumed that patients not taking any medications will opt to consume medical cannabis to treat their medical conditions, but will only be 50% on the first three years until the IEC phase is finished.

146. Estimated utilization rates after legalization of patients without treatment (% per year)
It is presumed that all patients not taking any medications will opt to consume medical cannabis to treat their medical conditions starting on the 4th year.

Supplemental Data 2. Net Financial Impacts (NFI) for each of the main stakeholder to be affected by HB 6517.

Government

The NFI for government is displayed in Figure 1. Aside from the expenditures related to the establishment of the necessary facilities and protocols for the execution of the law, the Philippine government will also be spending on the operations of these facilities and protocols to implement the law properly. The associated spending includes the annual operating costs for the Cannabis Plant Monitoring System, Prescription Monitoring System and Electronic Database, Physicians' Certification, Nurses' Training, additional budget for the regulatory body and police force and the FDA's cost of testing the cannabis drugs. The biggest spending will be on the testing of the cannabis drugs wherein every year, it is estimated that the government will be spending more thanPhP3 billion. Following the assumptions, the annual additional cost taken on by the government will be close to PhP4 billion, in consequence.

Because of the legalization of the medical cannabis, the estimated 2% of cannabis cases will be eliminated. If the average cannabis cases are 814, about 16 cases are for medical users, with 14 receiving legal assistance and 1 to 2 gaining rehabilitation supports from the government. As a result, the government benefits from the reduction in spending on legal and rehabilitation assistance as well as court proceeding expenditures for these medical cannabis cases. The government will be able to save approximately PhP3.8 million from these.

In addition, the government will make money through collection of taxes from the incomes of the MCCCs and the value added of the medical cannabis products. Income taxes is estimated at PhP1.2 billion every year whereas VAT may reach almost PhP5 billion annually, collecting 30% and 12% respectively from the sales of more than 8 million bottles of cannabis oil. All in all, the government may earn revenues of more than PhP6 billion every year.

With the projected total earnings of the government every year at PhP6.2 billion, compared to the estimated annual expenditures of PhP3.8 billion, the government is likely to generate a net annual income of PhP2.4 billion when the production and dispensing of medical cannabis legally starts to operate.

Government
Using Medical Cannabis
For one year

Income Reducing		Income Increasing	
Added Costs	**3,781,308,998**	**Added Benefits**	**6,210,723,330**
a. Operating cost for Cannabis Plant Monitoring System (Annual expenditure for implementation of Cannabis Plant Monitoring System)	10.000.000	a. Income tax generated from MCCCs (Estimated annual income per MCCC x Number of MCCCs to Operate x Tax rate) (Php500 x 1,656,193 bottles x 5 MCCCs x 30%)	1.242.144.666
b. Operating cost of Prescription Monitoring System and electronic database (Annual expenditure for implementation of Prescription Monitoring System and electronic database)	10.000.000	b. Valued Added Tax generated from purchase medical cannabis (Estimated annual purchase of medical cannabis x Price of medical cannabis product x Tax rate) (8.280.964 bottles x Php5.000 x 12%)	4.968.578.664
c. Operating cost for Physicians' Certification (Certification expenses per doctor x No. of certification per year) (Php750 x 1.500 doctors)	1.125.000		
d. Operating cost for Nurses' Training (Training expenses per nurse x No. of trainings per year) (Php15.000 x 250 nurses)	3.750.000		
e. Cost of drug testing of FDA (FDA testing cost per drug x Total annual production x Sampling percentage) (Php15.000 x 8.280.964 bottles x 3% tested)	3.726.433.998		
f. Additional operating cost of the regulatory body (Additional budget alloted for operations of the regulatory body)	15.000.000		
g. Additional police actions costs (Additional budget alloted for police force)	15.000.000		
Reduced Benefits	**nil** *nil*	**Reduced Costs**	**3,847,778**
		a. Decrease court costs (Court expense per case per year x No. of marijuana cases x Proportion of medical users) (Php100.000 x 814 x 2%)	1.628.000
		b. Decrease of legal aid cost (Legal aid expenditure per case x No. of marijuana cases x Proportion of medical users x Proportion of accused needing legal aid) (Php150.000 x 814 x 2% x 90%)	2,197,800
		c. Decrease corrective or rehabilitation servi (Rehabilitation expenses per person per year x Proportion of marijuana cases x Proportion of medical users x Proportion needing rehabilitation) (Php150.000 x 814 x 2% x 9%)	21,978
Sub-Total (Income Reducing)	**3,781,308,998**	**Sub-Total (Income Increasing)**	**6,214,571,108**
	Net Financial Impact = 2,433,264,552		

Figure 1. NFI for the Government.

On the first three years, however, the NFI will be less amounting to just PhP1.19 billion accounting for the lower utilization rates of patients that will impact on the production of MCCCs and tax revenues collected by the government.

Physicians and Nurses

Physicians and nurses will play an important role in the implementation of the law. The law will only allow certified doctors to prescribed medical cannabis and trained nurses to administer the cannabis to patients.

Figures 2 and 3 exhibits that the physicians will shell out approximately PhP1,250; PhP500 to pay for the certification and PhP750 for the preparation of the documents needed to submit for the certification. On the other hand, nurses are anticipated to incur spending for attendance to the 30-day training for a total of PhP20,455.

Although the analysis showed a negative net impact for the physicians and nurses, the physicians' certification will enable them to provide appropriate

Physicians
For certification to prescribe medical cannabis
For one year

Income Reducing		Income Increasing	
Added Costs	**1,250**	**Added Benefits**	**nil**
a. Cost of certification (Certification fee + Spending on documentary requirements) (Php500 + Php750)	1,250		*nil*
Reduced Benefits	**nil** *nil*	**Reduced Costs**	**nil** *nil*
Sub-Total (Income Reducing)	**1,250**	**Sub-Total (Income Increasing)**	**nil**
	Net Financial Impact = -1,250		

Figure 2. NFI for the Physicians.

Nurses
For license to administer medical cannabis
For one year

Income Reducing		Income Increasing	
Added Costs	**20,455**	**Added Benefits**	**nil**
a. Cost of training (Daily spending for attendance to training x No. of training days) (Php681.82 x 30 days)	20,455		*nil*
Reduced Benefits	**nil** *nil*	**Reduced Costs**	**nil** *nil*
Sub-Total (Income Reducing)	**20,455**	**Sub-Total (Income Increasing)**	**nil**
	Net Financial Impact = -20,455		

Figure 3. NFI for the Nurses.

prescriptions to keep their patients while the nurses may be able to have employment advantage provided by trainings.

MCCCs

MCCCs will be the authorized supplier of the medical cannabis in the country. It is expected that the business will be profitable for the owners of the MCCCs with 90% of the total sales amount covering the production expenses and the remaining 10% as income. Supposing an annual sale of 1,656,193 bottles of cannabis oil with an estimated per unit margin of PhP500, an MCCC will already generate a net income, after tax, of PhP579.7 million annually (Figure 4).

MCCCs
For cultivation, manufacturing and dispensing
For one year

Income Reducing		Income Increasing	
Added Costs	**248,428,933**	**Added Benefits**	**828,096,444**
a. Income tax paid by MCCCs (Estimated annual income x Tax rate) (Php500 x 1,656,193 bottles x 30%)	248,428,933.20	a. Income from sales of medical cannabis (Total annual sales x Per unit profit) (1,656,193 bottles x Php500)	828,096,444
Reduced Benefits	**nil** *nil*	**Reduced Costs**	**nil** *nil*
Sub-Total (Income Reducing)	**248,428,933**	**Sub-Total (Income Increasing)**	**828,096,444**
	Net Financial Impact = 579,667,511		

Figure 4. NFI for MCCCs.

With the lower estimated utilization rate of 50% in the initial years of the implementation, MCCCs are also expected to produce and sell just half of the total estimated demand. As such, NFI for the MCCCs for the first three years will only be PhP289.8 million.

Patients

Three potential users of the medical cannabis would be patients of epilepsy, cancer and multiple sclerosis with severe cases. As mentioned earlier, medical cannabis is promising to reduce seizure among epileptic patients, lessen nausea and vomiting, pain and appetite loss among cancer patients and muscle problems, pain and bladder problems among multiple sclerosis patients.

Among these severe cases, it is further assumed that some are already using medical cannabis, several are taking additional drug dosages and others are not having any medication at all for the abovementioned conditions of their illnesses. A minimal of 5% is approximated to be already using medical cannabis, where 2% are charged for illegal use of and the remaining 98% are not accused. Some 10% of the adding a little bit more to their prescribed dosages. 30%, 25% and 35% of epileptic, cancer and MS patients respectively are not taking any medicines for their situations of seizures, pain, nausea and vomiting, appetite loss, muscle and bladder problems.

The table below presents the frequencies of medical symptoms that are potential for treatment of medical cannabis. The table shows that the average number of occurrences happens to patients without treatment. These conditions are improved with additional dosage of medicines, posting declines in the number of episodes. Further reductions are noted with the consumption of medical cannabis. Using the average monthly expenditure for each symptom, spending per occurrence was estimated.

Table 1. Estimated frequencies of medical symptoms.

Occurrence per month	No treatment	With Additional treatment	With Medical Cannabis	Average monthly spending	Estimated spending per occurrence
Epileptic seizures	18	7.2 (60% reduction)	5.4 (70% reduction)	7,500	416.67
Cancer nausea & vomiting	12	4.8 (60% reduction)	3.6 (70% reduction)	6,000	500
Cancer pain	20	6 (70% reduction)	4 (80% reduction)	8,500	425
Cancer appetite loss	20	10 (50% reduction)	8 (60% reduction)	4,000	200
MS muscle problems	12	7.2 (40% reduction)	6 (50% reduction)	8,500	708.33
MS pain	12	6 (50% reduction)	4.8 (60% reduction)	11,000	916.67
MS bladder problems	6	4.2 (30% reduction)	3.6 (40% reduction)	6,000	1,000.00

Patients without treatment

Patients shifting from no treatment to medical cannabis will incur full expense for the purchase of the medical cannabis and transportation costs to avail the product. However, the occurrences of the related medical conditions will be greatly reduced.

a. Epileptic patients

From zero expense for medications, there will be a jump to a total of PhP72,000 for medicines and treatment when an epileptic patient opts to consume medical cannabis. The purchase of 12 bottles a year will cost the patient PhP60,000 for the cannabis oil and PhP12,000 for transportation.

However, the usual 18 monthly occurrences of seizures among severe epileptic patients is likely to become just 5.4 with medical cannabis, eliminating about 12.6 seizures in a month. With an average spending of PhP416.67 per seizure, the cut down in seizure episodes will bring monthly savings of PhP5,250 or an annual savings of PhP63,000. Adding to that, it is anticipated that a family member will be able to regain productivity losses amounting to PhP109,200.

The shift to medical cannabis would result therefore to a net benefit of PhP100,200 every year to the patient (Figure 5).

Patients without treatment (Epileptic Patients for Seizures)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	72,000	**Added Benefits**	109,200
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	60,000	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	nil	**Reduced Costs**	63,000
	nil	a. Decrease in expenditure related to sickness (Reduction in seizure frequency x Average expenses related to seizure x 12 months) (12.6 x Php416.67 x 12)	63,000
Sub-Total (Income Reducing)	72,000	**Sub-Total (Income Increasing)**	172,200
Net Financial Impact = 100,200			

Figure 5. NFI for the Epileptic Patients (Without Treatment).

b. Cancer patients – Nausea and vomiting

In the case of the cancer patient suffering from nausea and vomiting, the patient would similarly incur new spending for the consumption of medical cannabis at PhP72,000 but regain productivity losses amounting to PhP109,200.

The main effect of the consuming medical cannabis would be on pain frequencies, which from the average of 12 occurrences would become 3.6 per month. The patient gets rid of 8.4 occurrences of pain that corresponds to supposedly spending of PhP4,200 every month or PhP50,400 a year. The comparison of benefits and costs to the cancer patients affords the patient an annual NFI of PhP87,600 (Figure 6).

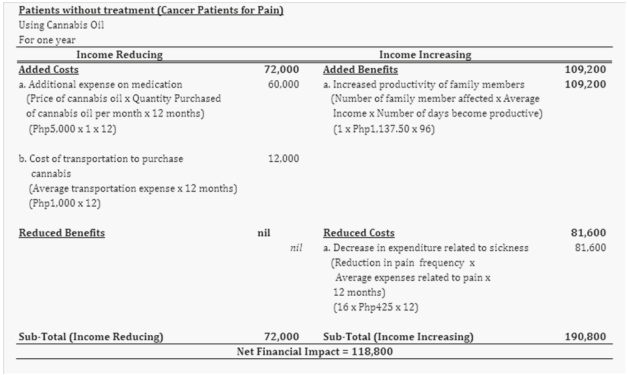
Patients without treatment (Cancer Patients for Nausea & Vomiting)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	72,000	**Added Benefits**	109,200
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	60,000	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	nil	**Reduced Costs**	50,400
	nil	a. Decrease in expenditure related to sickness (Reduction in nausea and vomitting frequency x Average expenses related to nausea and vomitting x 12 months) (8.4 x Php500 x 12)	50,400
Sub-Total (Income Reducing)	72,000	**Sub-Total (Income Increasing)**	159,600
Net Financial Impact = 87,600			

Figure 6. NFI for Cancer Patients – Nausea and Vomiting (Without Treatment).

c. Cancer patients – Pain

Cancer patients suffering chronic pain would also hurt the pockets of the patients for PhP72,000. However, they will acquire PhP109,200 from regained productivity losses. The 80% potential reduction in severe pain attacks for cancer patients will be lessened from the usual 20 repetitions to merely 4 per month. The patient saves PhP425 per attack and so the patient can set aside a total of PhP81,600 for one year for all the 192 attacks that the patient was not able to experience due to medical cannabis usage. Thus, the annual net gains to the patient would be PhP118,800 (Figure 7).

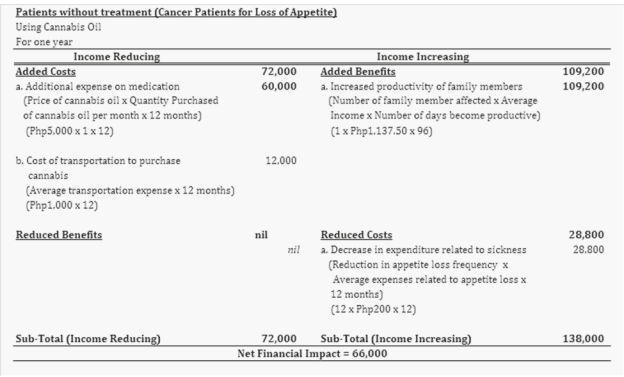


Patients without treatment (Cancer Patients for Pain)			
Using Cannabis Oil			
For one year			
Income Reducing		**Income Increasing**	
Added Costs	**72,000**	**Added Benefits**	**109,200**
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	60,000	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	**109,200**
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**81,600**
	nil	a. Decrease in expenditure related to sickness (Reduction in pain frequency x Average expenses related to pain x 12 months) (16 x Php425 x 12)	81,600
Sub-Total (Income Reducing)	**72,000**	**Sub-Total (Income Increasing)**	**190,800**
Net Financial Impact = 118,800			

Figure 7. NFI for Cancer Patients – Pain (Without Treatment).

d. Cancer patients – Appetite loss

Appetite loss is also happening to cancer patients, at a frequency of 20 times a month. Although the patient will spending the same amount of PhP72,000 for purchase of medical cannabis, he/she will benefit from the frequency reduction of appetite loss by medical cannabis from 20 to just 8 times per month. This translates to a monthly savings of PhP2,400 or PhP28,800 every year on the assumption that each occurrence approximately costs the patient PhP200. Adding the income of a family member recovered, the analysis presents a net annual gain of PhP66,000 (Figure 8).



Patients without treatment (Cancer Patients for Loss of Appetite)			
Using Cannabis Oil			
For one year			
Income Reducing		**Income Increasing**	
Added Costs	**72,000**	**Added Benefits**	**109,200**
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	**60,000**	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	**109,200**
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**28,800**
	nil	a. Decrease in expenditure related to sickness (Reduction in appetite loss frequency x Average expenses related to appetite loss x 12 months) (12 x Php200 x 12)	28,800
Sub-Total (Income Reducing)	**72,000**	**Sub-Total (Income Increasing)**	**138,000**
Net Financial Impact = 66,000			

Figure 8. NFI for Cancer Patients – Appetite Loss (Without Treatment).

e. Multiple sclerosis patients – Muscle problems

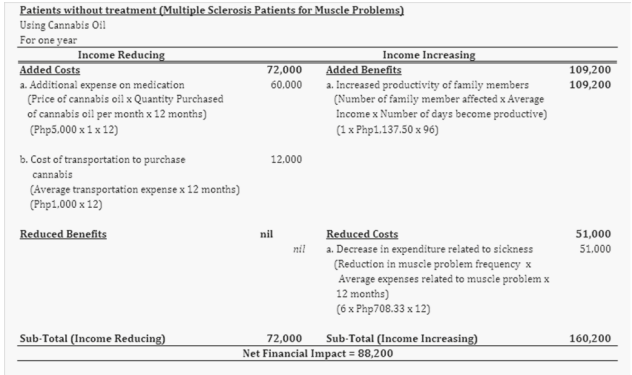
MS patients alike would incur the PhP72,000 spending for acquisition of medical cannabis and earn PhP109,200 because of possible re-employment of a family member. MS patients specifically suffering muscle problems endures an average of 12 episodes per month, involving an estimated expenditure of PhP708 per episode. The consumption of medical cannabis is potential to put these 12 episodes to 6 per month. The patient will be able to save an amount equivalent to PhP51,000 for those episodes eliminated. As a result, the patient has a net benefit of PhP88,200 in one year (Figure 9).

f. Multiple sclerosis patients – Pain

Severe pain is similarly happening 12 times monthly to an MS patient. If medical cannabis will be administered to the patient, this may shrink to 4.8. On the assumption that each pain incidence entails PhP916.67, the annual savings brought about by this decline would be PhP79,200. Deducting the PhP72,000 for medical cannabis purchase and adding PhP109,200 earnings, the use of medical cannabis for MS patients for severe pain is beneficial furnishing the patient with net benefit of PhP116,400 (Figure 10).

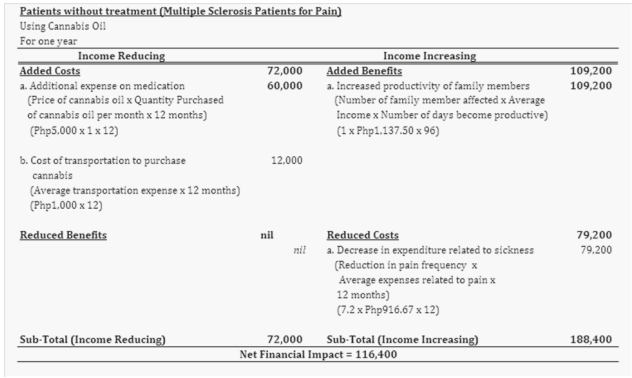
g. Multiple sclerosis patients – Bladder problems

Bladders of MS patients are overactive and do MS patients endure an average of 6 incidences of bladder problems in a month. With the use of medical cannabis, it is supposed to decline to 3.6, putting away 2.4 incidences. This means a cut down in the annual expenses for about PhP28,800, resulting to a net benefit of PhP66,000 annually, with the addition of re-employment income of a family and a deduction of PhP72,000 for buying medical cannabis (Figure 11).



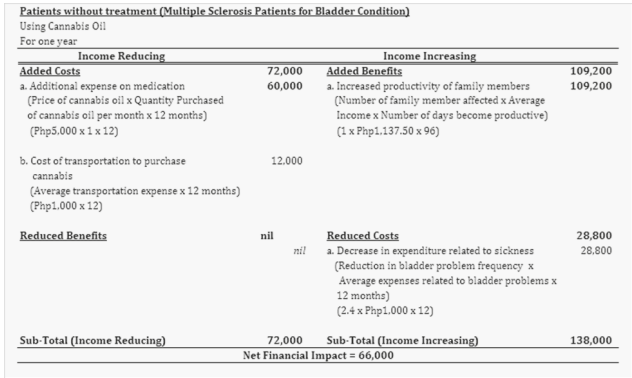
Patients without treatment (Multiple Sclerosis Patients for Muscle Problems)			
Using Cannabis Oil			
For one year			
Income Reducing		**Income Increasing**	
Added Costs	**72,000**	**Added Benefits**	**109,200**
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	60,000	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	**109,200**
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**51,000**
	nil	a. Decrease in expenditure related to sickness (Reduction in muscle problem frequency x Average expenses related to muscle problem x 12 months) (6 x Php708.33 x 12)	51,000
Sub-Total (Income Reducing)	**72,000**	**Sub-Total (Income Increasing)**	**160,200**
Net Financial Impact = 88,200			

Figure 9. NFI for Multiple Sclerosis Patients – Muscle Problems (Without Treatment).



Patients without treatment (Multiple Sclerosis Patients for Pain)			
Using Cannabis Oil			
For one year			
Income Reducing		**Income Increasing**	
Added Costs	**72,000**	**Added Benefits**	**109,200**
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	**60,000**	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	**109,200**
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**79,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in pain frequency x Average expenses related to pain x 12 months) (7.2 x Php916.67 x 12)	79,200
Sub-Total (Income Reducing)	**72,000**	**Sub-Total (Income Increasing)**	**188,400**
Net Financial Impact = 116,400			

Figure 10. NFI for Multiple Sclerosis Patients – Pain (Without Treatment).



Patients without treatment (Multiple Sclerosis Patients for Bladder Condition)			
Using Cannabis Oil			
For one year			
Income Reducing		**Income Increasing**	
Added Costs	**72,000**	**Added Benefits**	**109,200**
a. Additional expense on medication (Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months) (Php5,000 x 1 x 12)	**60,000**	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	**109,200**
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**28,800**
	nil	a. Decrease in expenditure related to sickness (Reduction in bladder problem frequency x Average expenses related to bladder problems x 12 months) (2.4 x Php1,000 x 12)	28,800
Sub-Total (Income Reducing)	**72,000**	**Sub-Total (Income Increasing)**	**138,000**
Net Financial Impact = 66,000			

Figure 11. NFI for Multiple Sclerosis Patients – Bladder Problems (Without Treatment).

Patients Taking Additional Dosage

The analysis presumes that patients adding a bit more to the recommended quantity of their medicines take about 10% - 20% more of their medicines. With the little addition over the prescribed dosages of their medicines they are experiencing fewer occurrences of the conditions associated to their illnesses. With the use of medical cannabis, it is anticipated that recurrences will be even lesser, such that expenses attached to occurrences of medical conditions are brought down even more. In the same way that patients shifting from no treat-

ment to medical cannabis benefits from, though not full time, resumption to work of family members who gave up their jobs to take care of the patients as a part of the income of the affected family member is restored, the patients taking additional dosage will also experience the same. However, the patient in this case is anticipated to increase spending on medication because the price of the medical cannabis is higher than the current medicines of the patient. Also, the patient will have to spend for transportation to buy the medical cannabis from the MCCC.

a. Epileptic patients

Epileptic patients commonly take Valproate as medication to prevent seizures, administered to them approximately 72 times in a year. At PhP24 per unit of Valproate and additional dosage of 10%, patients normally spend PhP1,900.80 for one year for their medicine. This practice nonetheless lessens occurrences of seizures by 60%. The usual 18 seizure per month will be down to 7.2.

Those who will use medical cannabis to treat seizures in place of their current medications is estimated to be spending an additional of PhP58,099 for medical cannabis and PhP12,000 for transportation in the acquisition of the cannabis supposing that the patient will utilized a total of 12 bottles of medical cannabis in a year priced at PhP5,000 per bottle and buy at the MCCC 12 times spending for transportation for PhP1,000 on the average. However, it is projected that there will a further decline in the number of seizures at 70% or approximately 10% more than the current decrease brought about by the additional dosage. Thus, there will be an improvement equivalent of 1.8 seizure episodes less per month. If the average spending per seizure is PhP416.67, then decrease in seizure frequency will furnish the patient a savings of PhP9,000 in one year. Also, the family member affected will be able to earn again about a total annual income of PhP109,200. The epileptic patient using cannabis as a remedy to his seizures will therefore have a net financial impact of PhP48,101 (Figure 12).

Patients taking additional dosage (Epileptic Patients for Seizures)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**70,099**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php24 x 72 x 110%])	58,099	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**9,000**
	nil	a. Decrease in expenditure related to sickness (Reduction in seizure frequency x Average expenses related to seizure x 12 months) (1.8 x Php416.67 x 12)	9,000
Sub-Total (Income Reducing)	**70,099**	**Sub-Total (Income Increasing)**	**118,200**
Net Financial Impact = 48,101			

Figure 12. NFI for Epileptic Patients (Taking Additional Dosage).

b. Cancer patients – Nausea and vomiting

Aprepitant is one of the medicines taken for nausea and vomiting, costing PhP1,072 per piece taken roughly 84 times in a year. On the assumption that this medicine is taken by the patient, the high cost of the medicine showed that the patient will benefit from the lower cost of the medical cannabis.

Associated expenses on the event of nausea and vomiting amounts to PhP6,000 monthly or PhP500 per occurrence. Adding 10% more of the prescribed dosage of medicine reduces in the incidences of nausea and vomiting by 60%, but using medical cannabis is expected to reduce it further to 70%. This is tantamount to 1.2 less nausea and vomiting in a month amounting to a total of PhP7,200 for a year. Similarly, a family member will be able to go back to work and earn PhP109,200 more. In the end, the patient gains a total of PhP143,453 annually (Figure 13).

Patients taking additional dosage (Cancer Patients for Nausea & Vomiting)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**(27,053)**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage) ([Php5,000 x 1 x 12]-[Php1.072 x 84 x 110%])	(39,053)	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**7,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in nausea and vomitting frequency x Average expenses related to nausea and vomitting x 12 months) (1.2 x Php500 x 12)	7,200
Sub-Total (Income Reducing)	**(27,053)**	**Sub-Total (Income Increasing)**	**116,400**
Net Financial Impact = 143,453			

Figure 13. NFI for Cancer Patients – Nausea and Vomiting (Taking Additional Dosage).

c. Cancer patients – Pain

Morphine is administered to patients throughout the year bought at the average of PhP80 per piece. The switch to medical cannabis will raise medicine expenditure of the patient by PhP38,880 and add PhP12,000 transport cost. Morphine intake is said though to reduce pain attacks by 70%; medical cannabis is better reducing it to 80%. Hence, there will be 2 less pain attacks in a month that will bring a total savings to the patient of PhP10,200 for one year. Adding the regained income of a family member affected will give the patient an estimated total benefit of PhP119,400 or equivalently a net benefit of PhP68,520 every year (Figure 14).

Patients taking additional dosage (Cancer Patients for Pain)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**50,880**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php80 x 240 x 110%])	38,880	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**10,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in pain frequency x Average expenses related to pain x 12 months) (2 x Php425 x 12)	10,200
Sub-Total (Income Reducing)	**50,880**	**Sub-Total (Income Increasing)**	**119,400**
Net Financial Impact = 68,520			

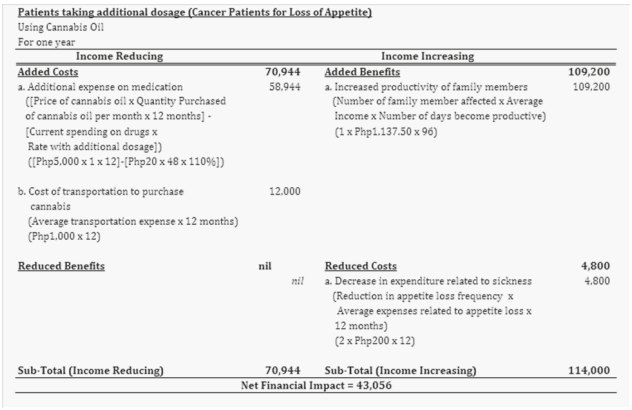
Figure 14. NFI for Cancer Patients – Pain (Taking Additional Dosage).

d. Cancer patients – Appetite loss

Each incident of appetite loss induces an estimated spending of PhP4,000. Medicine intake with a little addition is assumed to decrease appetite loss by 50%. However, the use of medical cannabis is anticipated to reduce appetite loss more at 60%. This brings an annual savings of PhP4,800. To lessen these events, the patient usually intakes corticosteroids brought at PhP20 each and given roughly 48 times to the patient in one year. Substituting medical cannabis will incur added spending of PhP70,944 to the patient. In the end, the net gains of the patient for one year amounts to PhP43,056 (Figure 15).

e. Multiple sclerosis – Muscle problems

Muscle spasms happening to an MS patient involves a rough spending of PhP8,500 monthly. With additional medication, it is reduced by 40%. With medical cannabis, it is expected to be reduced by 50%, affording the patient a cutback in expenditure of PhP10,200.

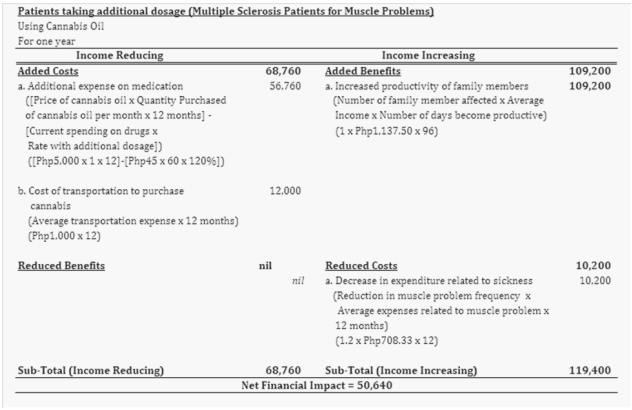


Patients taking additional dosage (Cancer Patients for Loss of Appetite)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**70,944**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php20 x 48 x 110%])	58,944	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**4,800**
	nil	a. Decrease in expenditure related to sickness (Reduction in appetite loss frequency x Average expenses related to appetite loss x 12 months) (2 x Php200 x 12)	4,800
Sub-Total (Income Reducing)	**70,944**	**Sub-Total (Income Increasing)**	**114,000**
Net Financial Impact = 43,056			

Figure 15. NFI for Cancer Patients – Appetite Loss (Taking Additional Dosage).

The common medicine given to these patients is Tizanidine which costs at PhP45 each and taken about 60 times in a year at 120% dosage. The move to medical cannabis is likely to add spending of PhP68,760. Ultimately, the patient gains PhP50,640 annually nonetheless (Figure 16).



Patients taking additional dosage (Multiple Sclerosis Patients for Muscle Problems)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**68,760**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php45 x 60 x 120%])	56,760	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**10,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in muscle problem frequency x Average expenses related to muscle problem x 12 months) (1.2 x Php708.33 x 12)	10,200
Sub-Total (Income Reducing)	**68,760**	**Sub-Total (Income Increasing)**	**119,400**
Net Financial Impact = 50,640			

Figure 16. NFI for Multiple Sclerosis Patients – Muscle Problems (Taking Additional Dosage).

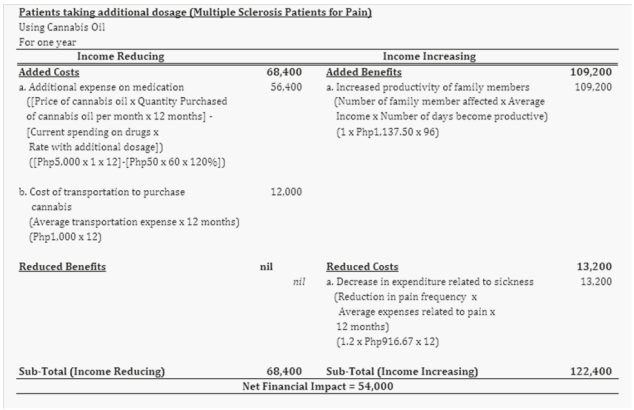
f. Multiple sclerosis – Pain

These events of severe pain for MS patients incur expenses of PhP8,500 monthly. Additional dosage intake of the current medicine is said to reduce pain attacks by 40%, but medical cannabis would reduce it to 50%. Thus, the use of medical cannabis will provide 1.2 less attacks, saving the patient from potential expense of PhP13,200. Putting in also the gains from the re-employment of a family member, estimated total benefits accumulated by the patient is PhP122,400.

Baclofen (Lioresal) is commonly administered to MS patients with severe pain. Estimated per unit price is PhP50, given approximately 60 times in one year. Using medical cannabis instead of baclofen will entail extra spent of PhP68,400. Despite of this, the patient has an annual estimated net gains of Ph54,000 (Figure 17).

g. Multiple sclerosis – Bladder problems

Bladder problems more or less necessitate a monthly spend of PhP6,000 to the patient. The additional medication helps by decreasing the frequency by 30%. The medical cannabis however is potential to reduce it to 40%. As such, the patient may get away from possible expense of PhP7,200 annually. The addition of PhP109,200 from regained income from labor of a family member will accrue a total benefit of PhP116,400 to the patient.

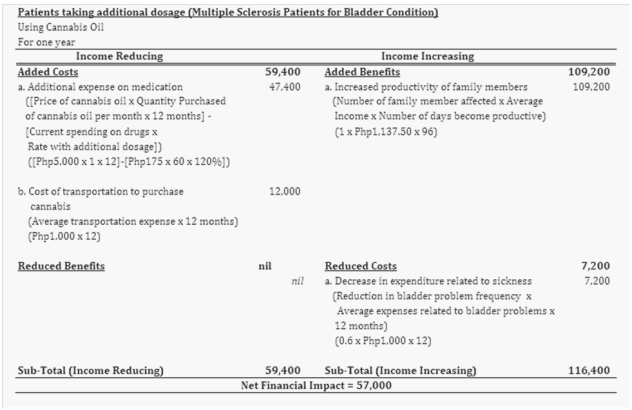


Patients taking additional dosage (Multiple Sclerosis Patients for Pain)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**68,400**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php50 x 60 x 120%])	56,400	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**13,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in pain frequency x Average expenses related to pain x 12 months) (1.2 x Php916.67 x 12)	13,200
Sub-Total (Income Reducing)	**68,400**	**Sub-Total (Income Increasing)**	**122,400**
Net Financial Impact = 54,000			

Figure 17. NFI for Multiple Sclerosis Patients – Pain (Taking Additional Dosage).

On the contrary, there is an extra spend involved in using medical cannabis. Instead of just taking 120% of Enablex for 60 times a year, costing PhP175 each, the patient will disburse PhP60,000 for the medical cannabis. Apart from that, the patient will shell out PhP12,000 for transportation, producing a total of additional expenditure of PhP59,400. In the end, the patient will still benefit from using medical cannabis with PhP57,000 every year (Figure 18).



Patients taking additional dosage (Multiple Sclerosis Patients for Bladder Condition)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**59,400**	**Added Benefits**	**109,200**
a. Additional expense on medication ([Price of cannabis oil x Quantity Purchased of cannabis oil per month x 12 months] - [Current spending on drugs x Rate with additional dosage]) ([Php5,000 x 1 x 12]-[Php175 x 60 x 120%])	47,400	a. Increased productivity of family members (Number of family member affected x Average Income x Number of days become productive) (1 x Php1,137.50 x 96)	109,200
b. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1,000 x 12)	12,000		
Reduced Benefits	**nil**	**Reduced Costs**	**7,200**
	nil	a. Decrease in expenditure related to sickness (Reduction in bladder problem frequency x Average expenses related to bladder problems x 12 months) (0.6 x Php1,000 x 12)	7,200
Sub-Total (Income Reducing)	**59,400**	**Sub-Total (Income Increasing)**	**116,400**
Net Financial Impact = 57,000			

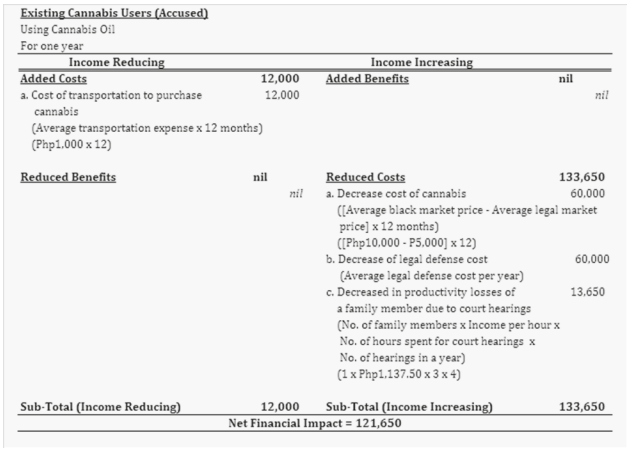
Figure 18. NFI for Multiple Sclerosis Patients – Bladder Problems (Taking Additional Dosage).

Existing Medical Cannabis Users

With the legalization of the use of medical cannabis, the existing users will benefit from it through the reduction in the price of the medical cannabis that they can purchase as black-market items are commonly priced significantly high. Though, they will be incurring transportation expenses in purchasing the medical cannabis from the MCCCs.

a. Accused

If the patient is accused for using cannabis illegally, his expenditures for legal defense and productivity losses of the family member attending to hearings in behalf of the patient will be eliminated. The ballpark amount of these reduced costs is PhP73,650. The cutback in medical cannabis expenditures on the other hand amounts to PhP60,000, in the assumption that the legal market price is PhP5,000 and the black-market price is PhP10,000 with 12 bottles purchased for an entire year. Their savings is but reduced roughly with PhP12,000 (PhP1,000 per month) allotted for transportation. The patient, nevertheless, have a net gain of approximately PhP121,650 for one year (Figure 19).



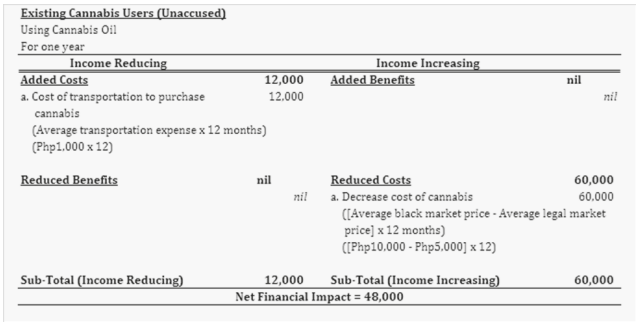
Existing Cannabis Users (Accused)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**12,000**	**Added Benefits**	**nil**
a. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1.000 x 12)	12,000		*nil*
Reduced Benefits	**nil**	**Reduced Costs**	**133,650**
	nil	a. Decrease cost of cannabis ([Average black market price - Average legal market price] x 12 months) ([Php10.000 - P5.000] x 12)	60.000
		b. Decrease of legal defense cost (Average legal defense cost per year)	60.000
		c. Decreased in productivity losses of a family member due to court hearings (No. of family members x Income per hour x No. of hours spent for court hearings x No. of hearings in a year) (1 x Php1.137.50 x 3 x 4)	13.650
Sub-Total (Income Reducing)	**12,000**	**Sub-Total (Income Increasing)**	**133,650**
Net Financial Impact = 121,650			

Figure 19. NFI for Accused (Existing Cannabis User).

b. Unaccused

The unaccused patient already consuming medical cannabis basically just benefit from the decrease in price of medical cannabis estimated at PhP60,000. However, the patient will incur additional spend on transportation for PhP12,000 per year. Total net gains of patient then is PhP48,000 every year (Figure 20).



Existing Cannabis Users (Unaccused)
Using Cannabis Oil
For one year

Income Reducing		Income Increasing	
Added Costs	**12,000**	**Added Benefits**	**nil**
a. Cost of transportation to purchase cannabis (Average transportation expense x 12 months) (Php1.000 x 12)	12,000		*nil*
Reduced Benefits	**nil**	**Reduced Costs**	**60,000**
	nil	a. Decrease cost of cannabis ([Average black market price - Average legal market price] x 12 months) ([Php10.000 - Php5.000] x 12)	60.000
Sub-Total (Income Reducing)	**12,000**	**Sub-Total (Income Increasing)**	**60,000**
Net Financial Impact = 48,000			

Figure 20. NFI for Accused (Existing Cannabis User).

The estimation of the costs and benefits for each player reveals that the stakeholders in general will potentially gain from the passing of the law, except for the physicians and nurses which posted negative net impacts. These streams of net benefits were then analyzed side by side with other projected expenditures associated with the passing of the law to ultimately determine the viability of the program.

Supplemental Table 1. Summary table comparing key aspects of the status quo and alternative case for the use of medical cannabis.

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
Scenario (on use of medical cannabis)	Illegal	Legalized and regulated for medical use of qualified patients	Number of qualified patients over time (can be used to project future beneficiaries) % share of qualified patients that already have access to cannabis even under status quo	Secondary Data Collection
Allowed Users	None	Qualified patients who has been diagnosed by a certifying qualified physician as having a debilitating medical condition and should receive therapeutic or palliative benefits from the medical use of cannabis (Note: to indicate estimated number)	Information regarding the suggested certification process, including (1) time and cost requirements for securing certification for patients and (2) time and cost requirements for application to be qualified physician who can issue certification	Key Informant Interviews (certification body for the physicians, physicians or group of physicians to identify criteria for qualified patients with debilitating medical condition, etc.)
Allowed Forms (of medical grade cannabis)	Illegal in any form including any plant parts and the likes.	Only cannabis products such as capsules and oil in their pharmaceutical formulation which shall have detailed and accurate information regarding the concentration of THC and CBD.	Detailed specification of every allowed form and data on estimated production cost.	Secondary Data Collection or Key Informant Interviews (production cost from either available literature or from target legal/certified producers, i.e. MCCC)
Access to Allowed Forms	Illegal Black Market (Note: to indicate system of transaction and the estimated price under this system)	Through Medical Cannabis Compassionate Center (MCCC) dispensaries following the process provided by the law (Note: to indicate estimated price under this system)	Market price every allowed form and market price (during the status quo if data is available and expected market price when legalized) Details on how the market/transaction system will operate and costs involved (if any)	Secondary Data Collection and Key Informant Interviews (buying price of anonymous users during the status quo; expected market price from target legal/certified producers, i.e. MCCC)
Monitoring System and Registration Database for Entities (DOH)	None (specific to use medical cannabis)	(Need for a) DOH established Prescription Monitoring System and electronic database accessible to PDEA compliance service and MCCCs (Note: consider the time needed for this system to be fully operational)	Information related to the cost (both initial cost and operating cost, e.g. personnel) and time involved to establish the (1) PM system and (2) electronic database. Penalties involved for non-compliance.	Key Informant Interviews (DOH, PDEA, etc.)

Supplemental Table 1. Continuation...

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
Product Testing (FDA)	None (specific to use medical cannabis)	(Need for a) FDA with capacity (facilities and personnel) to undertake testing of medical cannabis products (Note: consider the time needed for this)	Information related to the cost (both initial cost and operating cost) and time involved in building (1) capacity of FDA personnel, (2) facilities for testing	Key Informant Interviews (FDA, etc.)
Monitoring, Regulation, and Information System for the Supply Chain (DDB & PDEA)	None (specific to use medical cannabis)	(Need for a) DDB & PDEA established Monitoring, Regulation, and Information System for the Supply Chain (Note: consider the time needed for this system to be fully operational)	Information related to the cost (both initial cost and operating cost) and time involved for this system Details on the how the supply chain looks like or would look like.	Key Informant Interviews (DDB, PDEA, etc.)
Legally acceptable Medical Cannabis Dispensaries and Sourcing	Not present	Established five Medical Cannabis Compassionate Centers (MCCCs) (DOH- and PDEA-licensed centers) responsible for acquiring, possessing, delivering, transferring, transporting, cultivating, manufacturing, storing, importing, selling, supplying, and dispensing medical cannabis, following the guidelines in the IRR. (Note: consider the time needed for the center(s) to be fully operational and guidelines to be effective)	Information related to the time needed for the center(s) to be fully operational and guidelines to be effective. If government operated or supported, should include the cost involved.	Key Informant Interviews (DOH, PDEA, MCCC, licensed centers, etc.)
Issuance of license and permit for the cultivation, importation, production and distribution of medical cannabis (PDEA)	None	PDEA issuing appropriate license and permit subject to DDB guidelines as per the developed IRR.	Information of the DDB guidelines re license and permit issuance of PDEA	Secondary Data Collection (if guidelines is available) Key Informant Interviews (PDEA, DDB, etc.)
Cannabis Plant Monitoring System (cultivation facility and PDEA)	None	(Need for an) Established Cannabis Plant Monitoring System by the cultivation facility for testing and data collection of regulatory agencies (Note: consider the time needed for this system to be fully operational)	Information related to the time needed for the PM system to be fully operational. If government operated or supported, should include the cost involved.	Key Informant Interviews (PDEA, individual/groups involved in the cultivation facility, etc.)
Legally recognized physician who can dispense medical cannabis to patients	No legally acceptable entity.	A licensed physician registered with the DOH and PDEA to prescribe dangerous drugs specifically medical cannabis.	Number of qualified physicians versus the number needed (e.g. based on guidelines if any)	Secondary Data Collection (if guidelines is available) Key Informant Interviews (DOH, PDEA, group of physicians, etc.)
Caregiver of Medical Cannabis Patient	Non-existent	A licensed nurse registered with PDEA to administer medical cannabis	Number of qualified nurses versus the number needed (e.g. based on guidelines if any)	Key Informant Interviews (DOH, PDEA, group of nurses, etc.)

Supplemental Table 1. Continuation...

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
Cultivation, Importation, Production and Distribution of Medical Cannabis	Present but illegally practicing (Note: to indicate the extent of this, i.e. estimated area/volume/ frequency of transaction/ employment/income from these activities if information is available (if not, we assume that these activities does not exist))	PDEA will issue appropriate license and permit for the cultivation, importation, production and distribution of medical cannabis subject to DDB guidelines to accredited cultivating facility as identified by the Technical Working Group. It will also adopt measures that will ensure the prevention of misuse and illicit traffic of the cannabis plant such as establishment of a cannabis plant monitoring system. (Note: to indicate the expected or target economic activities that will arise as a result of the license/permit, i.e. estimated area/volume/ frequency of transaction/employment /income from these activities)	Information on the estimated area/volume/ frequency of transaction/ employment/income from these activities (1) under status quo, and (2) based on the targets allowed by the law	Key Informant Interviews (PDEA, DDB, industry stakeholders, etc.
Testing of Medical Cannabis (in terms of conformity to standards set, research and development, etc.)	Legal, based on the Comprehensive Dangerous Drugs Act citing that Research and Development of cannabis is allowed in accordance with the guidelines set by DDB.	FDA shall test all medical cannabis prior to its distribution, dispensation and sale to determine its potency, consistency, safe and effective use.	Covered by the data collected above	
Patient –centered management or patient engagement	Not present	A DOH accredited physician, registered patients, registered cannabis caregiver, and people working in MCCC will be exempted from civil and criminal liability.	Covered by the data collected above	
Law Enforcement System 1. Operations (incl. Regulatory) 2. Prevention (incl. IEC campaigns) 3. Apprehension	Police officers and the PDEA agents are the one responsible for the operation and regulation of cannabis in the country. In the current system, PDEA agents are responsible for seizing big cannabis plantations while police officers go after the users. IEC materials are available from both regional PDEA offices as well as the LGUs. If apprehended, users (possession of cannabis in any form) usually go on trial. In the present data, no one claimed that they are using cannabis for medical needs.	Patients who will be enrolled under MCC will be given identification cards which will serve as their permits in using cannabis for their medical needs. It will be anticipated that apprehensions on cannabis users will likely to decline.	Data over time on (1) number of activities/ programs for 1,2, (2) number of incidences for 3,4,5, (3) government costs related to each (or all if not possible to disaggregate cost), and (4) personal defense cost/ productivity lost for cases related to cannabis/ cannabis products Expected reduction in number of activities/ programs, incidences and costs.	Secondary Data Collection and Key Informant Interviews

Supplemental Table 1. Continuation...

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
4. Prosecution	Police officers and the PDEA agents are the one responsible for the operation and regulation of cannabis in the country. In the current system, PDEA agents are responsible for seizing big cannabis plantations while police officers go after the users. IEC materials are available from both regional PDEA offices as well as the LGUs. If apprehended, users (possession of cannabis in any form) usually go on trial. In the present data, no one claimed that they are using cannabis for medical needs.	Patients who will be enrolled under MCC will be given identification cards which will serve as their permits in using cannabis for their medical needs. It will be anticipated that apprehensions on cannabis users will likely to decline.	Other data to be collected based on the expected changes	Key Informant Interviews
5. Rehabilitation				
Existing Support Programs for Patients with Debilitating Condition	Patients with debilitating conditions such as cancer, epilepsy and multiple sclerosis are supported by PhilHealth but not fully. In government hospitals, patients who are indigent can avail the No Balance Billing Policy of PhilHealth. Most of them are also enrolled under the Medical Assistance Program of the Department of Health thus, sometimes when they are confined, they do not pay anything. However, in the private institutions, only certain discounts can be given since they are not covered under the Medical Assistance Program of the Department of Health.	Same as the status quo but with additional benefits. There can be an expected outcome of declined number of hospitalizations and decline number purchase of prescribed conventional drugs.	Data over time on (1) number of patients (including treatment period and cost covered by the programs, on the average), (2) support programs and (3) government and N-G costs related to each program (or all if not possible to dis-aggregate cost) related to cannabis/ cannabis products	Secondary Data Collection and Key Informant Interviews (should include a few patients to interview on the estimated time and cost)

Supplemental Table 1. Continuation...

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
1. Government	Furthermore, most of these patients with the debilitation conditions have identification card on PWD (people with disability) therefore, discounts are being given in terms of medical supplies including medicines as well as everyday needs.	Same as the status quo but with additional benefits. There can be an expected outcome of declined number of hospitalizations and decline number purchase of prescribed conventional drugs.		
2. Non-Government			Expected reduction/ increase in treatment period and cost for patients, programs and associated costs.	
			Other data to be collected based on the expected changes	
				Key Informant Interviews
Tax Revenues	None.	No desired target.	Information on expected (or allowed) volume of transaction, market price and tax rate for cannabis products	Key Informant Interviews
Alternative Medication and/or Care by Patients with Debilitating Condition	For those without access to medical cannabis, some of the families opted to use organic food as form of medications to their child. Some used essential oils because they believe it will ease the pain. Some use herbal medicines as form of alternative health care. For those with access to medical cannabis, they use the oil as a form of additional/ complementary medication to their prescribed drugs by their physicians.	It can be expected that many will be given access to medical cannabis. Patients will be given equal opportunity to access medical cannabis.	Data over time on (1) number of patients that has undergone alterative medication (including treatment period and personal cost they incur for the alternative medication/care), and (2) details on the alternative medication/care for both w/ & w/o access to medical cannabis	Secondary Data Collection and Key Informant Interviews (should include a few patients (w/ & w/o access to medical cannabis) to interview on the estimated time and cost)
1. Without access to medical cannabis				
2. With access to (Illegal) medical cannabis			Expected reduction/ increase in treatment period and cost for patients.	
			Other data to be collected based on the expected changes	Key Informant Interviews

Supplemental Table 1. Continuation...

Parameters	Anticipated Changes with HB 6517		Data Collection	
	Status Quo	With Medical Cannabis Law	Data Collected	Methodology
Extent of Care (on the average)				
1. Time in hospital or under care of patient and unpaid caregivers/family members	On the average, people with epilepsy, MS, and cancer are confined for 5 -7 days. Some of their relatives (mostly parents or spouse) resigned from work since taking care of these people is a full-time job. They are spending about 10-15k a month if hospitalized in government hospitals, and about 30-50k a month in the private hospitals. Other related costs include radiation therapy and therapy for the epileptic patients.	With medical cannabis, hospitalizations and other related costs may be limited.	Data over time on (1) time in hospital or under care of patient and unpaid caregivers/family members, (2) hospitalization cost, and (3) other related costs	Key Informant Interviews
2. Hospitalization cost				
3. Other related costs				
Well-being of Patients with Debilitating Condition	Patients with debilitating conditions are continuously suffering since there is still no cure or direct treatment from these conditions.	The use of cannabis may be a complementary treatment for the patients with debilitating conditions especially in the reduction of pain for cancer and MS patients, and reduction of seizures for the epileptic patients.	Expected improvement in well-being of patients	Key Informant Interviews