HiTAP
Health Intervention and Technology Assessment Program

ASSESSING THE IMPLICATIONS OF THAILAND'S GOVERNMENT USE LICENSES, ISSUED IN 2006-2008

A draft for consultation

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IHPP Thailand

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May 2009

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This study was funded by a grant from the Health Insurance System Research Office and the Bureau of Policy and Strategy, Ministry of Public Health, Thailand. The findings, interpretations, and conclusions expressed in this document do not necessarily reflect the views of the funding agency.

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Acknowledgements

This study was conducted with funding from the Health Insurance System Research Office and the Bureau of Policy and Strategy, Ministry of Public Health, Thailand. The Health Intervention and Technology Assessment Program (HITAP) was supported by the Thai Health Promotion Foundation, the Health Systems Research Institute, the Bureau of Policy and Strategy and the Thai Health-Global Link Initiative Project. The findings and opinions in this report have not been endorsed by the above funding agencies and do not reflect the policy stance of these organizations.

The authors are also grateful to many individuals and organizations including the survey respondents, from whom we have obtained valuable data and information for use in our research. We would like to express our gratitude to Professor Ammar Siamwala and other experts who provided helpful comments and suggestions on the research proposal and early versions of preliminary report. The authors, however, are solely responsible for any errors and omissions in this report.

Executive Summary

When the policy of universal health coverage was adopted in Thailand in 2001, it promised greater access to healthcare for many poor Thais who would otherwise struggle to afford treatments and pharmaceuticals. The Universal Coverage scheme provided subsidized health care for the majority of the Thai population which had hitherto not been covered by a public health insurance scheme. This coverage now entitled them to full access to drugs within the National List of Essential Medicines (NLEM). The government, subsequently in 2003, also declared its commitment to provide universal access to HIV/AIDS treatment. Several policy measures were employed by the government, in its attempt to meet its commitment to ensure access to essential drugs. The national health budget was increased, to its current level of 9% of the overall national budget in 2009, having been 7.6% in 2004, and 5.8% in 1993.

Unsurprisingly, the government also sought to identify and adopt a number of cost containment measures in the face of increasing health drug expenditure, a measure not uncommon among more developed countries with public health insurance schemes. One such measure was the government's decision to grant government use licenses for seven drugs over the period 2006-2008. The seven drugs are efavirenz (EFZ) and the lopinavir/ritonavir (LPV/r) combination (which are antiretroviral drugs); clopidogrel (for the treatment of coronary artery disease); and four anti-cancer drugs - imatinib, erlotinib, letrozole, and docetaxel. These drugs are under patent protection in Thailand, hence no generic competition exist. The government use licenses, a form of compulsory licensing by the government for the public interest, were intended to permit the import of the more affordable generic equivalents of the drugs for use in the public health system, to increase access to these drugs. Thailand's government use of the patents on the seven drugs is an exercise of the right provided for in Section 51 of the Thai Patent Act BE 2522, which authorizes the government use of patents in the general public interest, so that "any ministry, bureau or department of the

Government" may exercise the rights in any patent "to carry out any service for public consumption".

This study aims to assess impact of the government use licenses, which have been the focus of great controversy. Despite the adoption of the Doha Declaration on the TRIPS Agreement and Public Health in 2001, which affirmed the right of governments to take measures such as compulsory licensing to limit exclusive patent rights when the public health interest so demands, there has been much criticism of the grant of the government use licenses. Many of the critics challenge the legal validity of the licenses under international and domestic law, but there are those who question the motives and rationale of the grant of the licenses. They raised doubts that the government use licenses would not meet their stated objectives of increasing access to the drugs in question. There were also concerns that the political and economic costs of the grant of these licenses, in terms of trade sanctions from foreign governments opposed to the government use licenses, and of pharmaceutical companies retaliating by withdrawing or delaying drug registrations in Thailand, would far outweigh the benefits expected to be obtained from the government use licenses.

Whilst much has been written about the legal and political controversies surrounding the government use licenses, there has been no study, to date, which seeks to assess the actual and potential impacts of the policy. This study therefore, conducts assessments of the health, economic and psychosocial implications of the government use licenses. In this regard, this study represents the first evidence-based attempt to assess the impact of the government use licenses, with a view to clarifying aspects of the controversy and enabling a better-informed, evidenced-based debate between the key stakeholders.

Health impacts

The assessment of the public health impact of the government use licenses is intended to determine or estimate the actual and expected increase in number of patients with access to the relevant drugs, and the public health benefits derived from such increased access, in terms of gains in patients' health utility, measured in Quality-Adjusted Life Years (QALYs) gained or Disability-Adjusted Life Years

(DALYs) averted. The study adopted a five-year timeframe for the assessments, commencing from the time of the grant of the government use licenses.

The methodology and the findings in this respect are described in detail in **Chapter 2**. In summary, the study estimated the increase in the number of patients with access to EFV and LPV/r over the five-year period to be 17,959 and 3,421, respectively. For clopidogrel and the four anti-cancer drugs, the study projected an increase in number of patients with access to the drugs using estimates of patients in need of the drug minus the numbers of patients expected to receive the original drugs. The estimated increase in patients to clopidogrel was estimated to be 40,947. For the anti-cancer drugs, the estimates are as follows: 8,916 patients for letrozole; 10,813 for docetaxel, 1,846 for imatinib; and 256 for erlotinib. Given the limitations of data and the fact that importation of the generic drugs has only taken place for EFV, LPV/r and clopidogrel, further study is recommended to improve accuracy of these estimates, particularly, when data on actual number of patients with access to each drug becomes available.

The public health benefits derived from such increased access, from increased life expectancy and improved quality of life was measured in the QALYs gained or DALYs averted. The study relied on a literature review of international and domestic research papers to estimate the QALYs for the use of each drug, compared to the alternative or standard treatments used prior to the grant of the government use licenses. The QALYs gained as a result of the use of the each drug in question was then multiplied against the estimated increase in patient numbers for the five-year timeframe. The results, in terms of QALYs gained (in order of drugs with the greatest health gains):

1. letrozole: a gain of 3,656 QALYs;
2. EFV: 2,694 QALYs gained;
3. clopidogrel: 2,457 QALYs gained;
4. imatinib: a total of 2435 QALYs gained (1384 QALYs for Chronic Myeloid Leukemia (CML) patients; 1051 QALYs for Gastrointestinal Stromal Tumor (GIST) patients); and
5. docetaxel: 1,251 QALYs gained

There was no comparative study on utility of LPV/r and erlotinib versus alternative treatments, hence the study was not able to estimate the increase of QALYs resulting from increased access and use of these drugs. Table 2.1 summarises the projections of number of patients with access to drugs and increased health status within the study timeframe.

Chapter 3 considers the health-related economic impacts of the government use licenses; through an assessment of the impact of two mutually exclusive scenarios. Scenario 1 assumes a situation of full access for all patients to the seven patented drugs, at the time of the grant of the government use licenses, and the economic impact to be assessed is the expected decrease in drug expenditure that would arise from the use of generic drugs under the government use licenses to maintain full access under the national health system. Scenario 2, on the other hand, is based on the assumption that not all patients have access to the seven patented drugs at the time of the grant of the government use licenses (reflecting the current situation), and that the government use licenses will result in an increase in access. This scenario permits a cost-benefit assessment; of the benefits, in terms of the positive impact from the increase in national productivity as a result of increased access, improved life expectancy and quality of life, and number of patients returning to work; and the costs, in terms of net changes in public health expenditure for drug procurement.

In Scenario 1, the use of the generic versions of the six original drugs under government use license would result in a reduction of the national health expenditure, with the estimated cost savings of approximately 357.8 million USD for the 5-year timeframe. The anti-cancer drug, imatinib, was not included in the model, since implementation of the government use license was suspended on condition that the original drug is provided free to patients under the Novartis Glivec International Patient Assistance Program (GIPAP). While Scenario 1 does not reflect the true level of access to drugs, it is still important to assess the impact of the use of generic drugs on the national health budget, given the government's commitment to ensure access to medicines for all patients. In Scenario 2, impact was assessed in terms of the incremental benefits to health, which was estimated to be approximately 132.4 million USD for the 5-year study

timeframe. Benefits obtained under Scenario 1 exceed that of Scenario 2 for a number of reasons; first, Scenario 1 assumes access for all patients in need whereas, Scenario 2 only assessed the impact of the incremental number of patients who received accessed to treatment as a result of the government use licenses; and secondly, the comparison in Scenario 1 used the original drug versus the generic versions, while Scenario 2 also compared the use of alternative or existing drugs available prior to government use licenses].

Impact on trade and foreign investment

It was widely believed that the US withdrawal of the Generalized System of Preferences (GSP) benefits from three Thai exports (i.e., gold jewellery, polyethylene terephthalate in primary forms and flat screen colour television sets) was a retaliatory measure by the US government, which had formally expressed its concerns over the grant of the government use licenses (one example of which is its elevating of Thailand to a Priority Watch List Country in its Special 301 Report of 2007). It was also a concern of domestic critics that the flow foreign investments in the country would be reduced, as a result of the negative publicity from the government use licenses. In **Chapter 4**, the assessment of the impacts on trade and foreign investment seeks to respond to these concerns, through an analysis of (1) the impact of the withdrawal GSP benefits for the three Thai export products, in respect of the exports of the said products in the context of Thailand's overall export performance; and (2) the impact on foreign investment, both foreign direct investment (FDI) and short-term investments in the financial markets, in Thailand.

With respect to the impact of the withdrawal of GSP benefits for the three Thai export products, the analysis found that the value of these exports to the US did decline, particularly in the case of polyethylene terephthalate in primary forms. The export value of the same products to the rest of the world, however, increased. Hence, the impact of the GSP withdrawal did not adversely affect the overall export status of the products. It was also noted that Thailand's overall exports are expected to increase; although exports to the US are expected to decrease, exports to other countries are expected to increase, particularly those

to the ASEAN countries, offsetting the decrease in exports to the US market. The total value of US exports attributable to products with GSP status is small, amounting to 7% of overall exports in 2008, and expected to decline further, implying that the GSP benefits were becoming less important. A noteworthy point is that although the GSP privilege was withdrawn for the three export products in 2007, an additional eight products were granted the GSP status in the same year, a fact which has received little attention.

As regards foreign investments, data from the Thai Board of Investment indicated steadily rising FDI over the period 2002 to 2007, with a dip in 2006 following the change of government. In the current global economic slowdown, FDI levels are expected to decrease from 2008, but the study found no evidence of a link between the grant of the government use licenses and the level of FDI flow. In the same vein, the study found little evidence of a link between the government use licenses or the removal of GSP status, with changes in investor confidence. This study examined changes in activity in the Stock Exchange of Thailand (SET) Index in the seven days prior to, and after, the grant of the government use licenses and the announcement of the withdrawal of GSP status for the three products, as an indicator of the level of investor confidence in Thailand. In terms of changes in the value of the SET Index, it found that the Index seemed most responsive to the changing economic conditions of the US market, the Thai political climate and fluctuations of the Thai Baht, rather than the grant of the government use licenses**.** It was not possible, however, to determine longer-term impacts, given that decisions on major long-term foreign investments occur over a longer period of time. In summary, given that both short- and long-term investments are influenced and affected by a complex mix of issues, it was difficult to determine the effect of a single factor.

Psychosocial implications

Chapter 5 examines the psychosocial aspects related to the grant of the government use licenses. Given the controversy and debate generated by the licenses, it was thought important to gather information and better understand the views and perspectives of the key stakeholders, both Thai and international. A questionnaire survey was conducted to ascertain the following: which factors

influenced the respondents' support for, or opposition to, the government use licenses, and the perspectives of various stakeholders on the grant of government use licenses for essential drugs and on the use of other price regulation measures. The questionnaire also sought to assess respondents' attitude towards the inclusion of the different drugs (i.e., ARVs, clopidogrel for heart disease and anti-cancer drugs) under the government use licenses. The questionnaire, was distributed to identified groups of key stakeholders, comprising health care workers, researchers/academics, policy makers and foreign stakeholders from developed and developing countries, for their completion.

In brief, the survey found a correlation between the level of general knowledge regarding the TRIPS Agreement flexibilities and attitudes towards compulsory licensing, especially among those in the health, research/academic sectors and among respondents from developing countries. Those with substantial knowledge on the area were more likely to support the government use licenses, while those with less knowledge tended to oppose them. Most of the Thai and international respondents from developed countries agreed with the statement that the government use licenses were likely to improve access to antiretroviral drugs to treat HIV-infected patients. There was, however, no clear consensus as regards the grant of the licenses to improve access to drugs for treatment of patients with cardiovascular disease and cancer. These findings can be of use to policy makers, and lend support to the efforts to increase knowledge and understanding of the relevant issues, especially among health personnel and researchers/academics.

In conclusion, the assessment of the public health benefits of the government use licenses is a positive one. Specifically, the government use licenses are expected to help alleviate the cost barrier to access to drugs, through importation of cheaper generic drugs, and hence, increase access to the drugs. The level of benefits gained varied according to the drug. In light of the findings, the study makes a number of policy recommendations. First, the selection of drugs when government use licenses or compulsory licensing is sought to be introduced, should adhere to a clear criteria, and six elements are proposed to be taken into

consideration for drug selection. Secondly, there is also a need for a wide range of measures to support the effective use of government use licenses, including strengthening the country's information systems relating to public health, insurance programs and intellectual property, so as to ensure the speedy registration and importation of the generic drugs under the government use licenses. Better and more timely dissemination of information regarding the use of TRIPS flexibilities and the government use licenses to the general public will also help to generate support for the licenses, but there should also be efforts to introduce other evidence-based, and appropriate options to promote access to specific essential drugs.

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Chapter 1

Introduction and background

1.1 Background and rationale

In 2001, Thailand adopted the policy of universal health coverage. The National Health Security Act, passed by parliament in November 2002, seeks to provide universal coverage for the provision of health care for the population of 62 million in Thailand. With this legislation, all Thais are now covered by one of three national public health insurance schemes which entitle them to full access to drugs within the National List of Essential Medicines (NLEM).

However, antiretroviral drugs (ARVs) were not provided under the Universal Coverage Scheme (UC), covering 78% of the population, due to the high cost of the drugs and the fact that patients would need treatment for the rest of their life. On 1 October 2003, the government declared its commitment to provide universal access to ARVs, and responded to this commitment by increasing the national health budget. This was, however, still not sufficient to meet the goal of universal access for ARVs in Thailand; further expansion of the antiretroviral treatment (ART) program needed more financial resources. In the same vein, although the oral antiplatelet agent, clopidogrel, which is used to treat patients with coronary artery disease (CAD) was included in the NLEM, the drug could not be provided to all patients in need, owing to the high price of the drug and insufficient government budget (Ministry of Public Health and National Health Security Office,2007).

In 2006 and 2007 Thailand's Ministry of Public Health (MoPH) granted the government use licenses for three patented drugs; namely, two ARVs, efavirenz (EFV) (Department of Disease Control,2006), and the lopinavir/ritonavir (LPV/r) combination (Department of Disease Control,2007), and clopidogrel (Ministry of Public Health,2007). In January 2008, the MoPH granted the government use licenses for four anticancer drugs: letrozole (Ministry of Public Health,2008d),

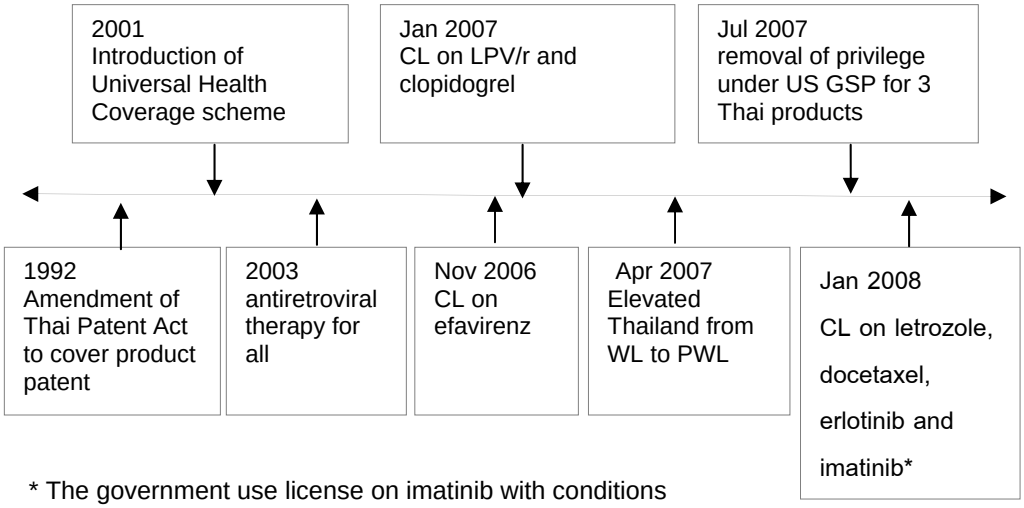
docetaxel (Ministry of Public Health,2008a), erlotinib (Ministry of Public Health,2008b) and imatinib (Ministry of Public Health,2008c). Although the drugs are highly effective for the treatment of various cancers, they were expensive. The UC scheme could not shoulder the high cost of these drugs, which was the main reason for their exclusion from the NLEM. MoPH's authorization for the government use licenses for the four drugs was aimed at ensuring access to the anti-cancer drugs for needy patients (Ministry of Public Health and National Health Security Office,2008).

The grant of these government use licenses provoked a mixed reaction from governments, international organizations and civil society organizations. Unsurprisingly, there was strong objection from the patent holding drug companies. In the case of Abbott Laboratories, the company decided to withdraw its registration application for ten new drugs in protest of the government use licenses on the LPV/r combination. This raised concerns in Thailand about the loss of access to new drugs, due to delays in or withdrawal of drug registration by multinational pharmaceutical companies (The Nation,2007). Subsequent to the grant of the government use licenses, the Office of the United States Trade Representative (USTR), in its Special 301 Report of 2007, elevated Thailand from Watch List (WL) to Priority Watch List (PWL) because of "in late 2006 and early 2007, there were further indications of a weakening respect for patents, as the Thai Government announced decisions to issue compulsory licenses for several patented pharmaceutical products. While the United States acknowledges a country's ability to issue such licenses in accordance with WTO rules, the lack of transparency and due process exhibited in Thailand represents a serious concern". It seemed likely that further trade sanctions would be imposed on Thailand, including making it a Priority Foreign Country (PFC) (Maneerungsee and Arunmas,2007). Further, on 1 July 2007, the USTR announced that privileges under the Generalized System of Preferences (GSP) would be removed for three Thai products: gold accessories jewelry, polyethylene terephthalate, and flat screen television sets (U.S. Commercial Service,2007).

On the other hand, Thailand's grant of the government use licenses received support from the agencies of the United Nations (UN), international organizations and civil society organizations around the world. The Joint United Nations Programme on HIV/AIDS (UNAIDS) was first in lending its support to the Thai government on this issue, commending Thailand for its efforts to provide access to ART. The Director General of the World Health Organization (WHO), Margaret Chan, sent a letter to the Thai Minister of Public Health to express WHO's support for developing countries' use of TRIPS flexibilities to ensure access to drugs; noting that the decision to issue compulsory licenses was a national one (Chan,2007). Chan's letter was largely seen as an apology, after her comments at a press briefing in Thailand had led to news reports that WHO was critical of the decision to grant the government use licenses for the ARVs and clopidogrel. WHO had been sharply criticized for those comments by civil society organizations, active in the international public health arena, including Medicins Sans Frontieres (MSF), Knowledge Ecology International (KEI), the AIDS Access Foundation and Third World Network (TWN).

These major policy decisions and events related to drug patents and the government use licenses are illustrated in Figure 1.1.

Figure 1.1: Significant events in Thailand related to the government use licenses



* The government use license on imatinib with conditions

1.2 Government use licenses in Thailand

The grant of the government use licenses in Thailand attracted a range of views, as described above. It received support from a range of actors, precisely because it was the type of policy action that developing countries were arguing for, in the debate on the implications of intellectual property on access to essential drugs. The effect of patents on the prices of, and access to, drugs has received intense attention from the international community, particularly since the coming into force of the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) in 1995. In various international and national fora, developing countries and civil society organizations have raised concerns over the escalating cost of drugs, and called for action to address the adverse effects of patent protection on access to drugs, which has been further exacerbated by the implementation of the TRIPS Agreement. The debate at the WTO, which focused on the developing countries' demand to clarify that the TRIPS Agreement does not prevent governments from taking measures to protect public health and ensure access to drugs, led to the adoption of the Doha Declaration on the TRIPS Agreement and Public Health in 2001 (the Doha

Declaration). The Doha Declaration is often regarded as a breakthrough, as it affirmed that the TRIPS Agreement does contain a degree of flexibility that permits governments the ability to consider different options when formulating laws and policies in relation to patent protection and public health.

Subsequent to the Doha Declaration, the WTO Members also agreed under the August 30 Decision in 2003 to permit the export of medicines produced under CL to countries in need, in particular those without the capacity to produce the drugs themselves (WTO,2003). In support of these measures, Member States of the WHO at the World Health Assembly in May 2007, passed resolution WHA 60.30 (WHO**,**2007), which calls on the WHO Director General, in collaboration with other international organizations, to support Member States, in terms of capacity and policy, to make use of TRIPS flexibilities to promote access to medicines and other health-related products.

In practice, however, only a few developing countries have made use of the so-called TRIPS flexibilities to promote access to essential drugs (Commission on Intellectual Property Rights Innovation and Public Health,2006). The lack of IP management capacity at national level and appropriate institutional mechanisms are some of the reasons the TRIPS flexibilities have been infrequently used to improve access to medicines (Correa,2001). Other reasons for developing countries not using TRIPS flexibilities such as government use licenses (Oliveira, Bermudez, and Chaves,2004) include the following:

1. lack of capacity to effectively use compulsory licenses, in terms of the capacity to interpret and implement national laws or patent regulations;

2. risks of trade sanctions, especially for countries in process of trade negotiations with industrialized countries; and

3. insufficient industrial capacity for local pharmaceutical production.

While developing countries face such major obstacles, and have rarely made use of compulsory licenses and other TRIPS flexibilities, this is in contrast to the

developed countries, where measures such as government use licenses has been “part of the law and practice of many industrial countries”, such as Australia, Canada, Germany, Ireland, Italy, New Zealand, the UK and the US (UNDP,2001).

For example, with regard to the government use licenses issued in Thailand, this right of the government to use patents without the consent of the patent holder is often a standard feature of patent laws in many developed countries. In brief, the government use of patent is a form of compulsory licensing, which enables a government to license the use of a patented invention to itself or a third party, without the consent of the patent-holder. Most national laws permit the government to make use of patented inventions for public purposes with fewer bureaucratic obstacles than those applicable to the private sector. The TRIPS Agreement refers to such use as “public, non-commercial use” and as patents “used by or for the government”. In the US legislation, under 28 USC 1498, public use of patents are broadly framed, in which the US government may use patents or authorise a third party to use patents for virtually any public purpose (Third World Network,2003). The US government does not have to seek a government use license or negotiate for the use of a patent or copyright. The patent holder is entitled to ‘reasonable and entire compensation’, but may not have recourse to injunctive relief to prevent the use of the patent. A similar approach applies in the UK with regard to the ‘Crown use’ of a patent, whereby use of a patent “in the services of the Crown” without the prior consent of the patent holder is not considered an infringement of the patent.

A primary distinction between public sector and private sector compulsory license would be in the nature or purpose of the use of the patent. Government use is confined to ‘public, non-commercial purposes’. Article 31 of TRIPS sets forth a number of conditions for use of a patent without the authorisation of the patent holder, which applies to both compulsory and government use licenses. There is however, an important distinction; that is, where the government uses a patent for public purposes, the requirement for prior negotiations with the patent holder for a voluntary government use license is waived. This waiver allows for speedy

action; permitting a ‘fast-track’ process, which is of importance when life-saving medicines are required urgently. In the public health context, this form of compulsory licenses will enable domestic production and/or importation of generic medicines by both the private and public sectors, as means of overcoming patent barriers to access to medicines.

Thailand’s government use of the patents on the seven drugs described above, is an exercise of the right provided for in Section 51 of the Thai Patent Act BE 2522. The Thai Patent Law allows the use of compulsory licenses by the private and public sector. According to Article 46 of the Patent Act 1979, a compulsory license may be granted on two grounds: (1) where no production of the patented product or application of the patented process has taken place in the country without legitimate reason; or (2) where no product produced under the patent is sold in the domestic market, or where the product is sold at unreasonably high prices or does not meet the public demand, without legitimate reason. Articles 51 and 52 of the Patent Act provides for the government use of patents. Whilst Article 52 provides broad powers to the Prime Minister to order the use of any patent necessary for national defense and security during war or emergency, Article 51 authorizes the government use of patents in the general public interest, so that “any ministry, bureau or department of the Government” may exercise the rights in any patent “to carry out any service for public consumption”. It further provides that the government may use a patent, either by itself or through others, subject to the condition of a royalty payment to the patent holder. There is a requirement for prompt notification to the patent holder, but no obligation for negotiations prior to the grant of the government use license (Kuanpoth J.,2007).

Government use licenses

The term government use licenses refers to the exercise of the right of the government to use a patent for public consumption, by virtue of Section 51 of the Thai Patent Act B.E. 2522 (A.D. 1979). As mentioned above, the government use license is a form of compulsory licensing, which permits the government to license the use of a patented invention to itself or a third party, without the consent of the patent-holder. Hence, in this report the term "government use licenses" is used interchangeably with "compulsory licenses" when referring to the authorization to use the patents related to the seven drugs; namely, EFV, LPV/r, clopidogrel, letrozole, docetaxel, erlotinib and imatinib.

Despite the Doha Declaration's affirmation of the right of countries to use these flexibilities; including compulsory licenses, parallel imports and exceptions to patent rights, there remain major challenges for many developing countries to interpret and implement the TRIPS Agreement. (Musungu and Oh,2005). In fact, the interpretation of the Doha Declaration and the use of TRIPS flexibilities such as compulsory licenses or government use licenses are still subjects of controversy, as reflected in the opposing views to the Thai government use licenses.

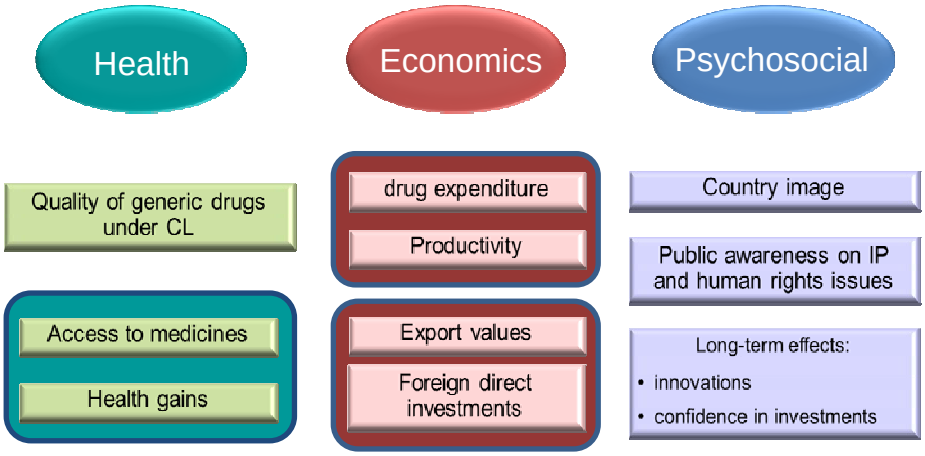
1.3 Framework of the study

Supporters of the government use licenses argue that there will be positive effects of these policy measures for national public health, most importantly, in the increase in numbers of patients who had access to drugs. It is also argued that the consequences of the government use licenses will not only benefit Thailand, but other countries would also derive benefit from the effect of competition from generic products and the subsequent price reductions by the multinational pharmaceutical companies. There are, however, questions from Thai society about the overall impact of the government use licenses. There are concerns about the negative implications for the country's economy; particularly with respect to the impact of trade sanctions by other countries on the Thai

export industry (which revenue constitutes a large proportion of the national GDP), and the effect on the confidence of foreign investors. There is also a debate among the stakeholders for and against the government use licenses over how the incentives for innovation and the image of the country may be affected.

To address these issues the HITAP convened an expert group meeting on June 12, 2008 to develop an appropriate framework for assessing the implications of the government use licenses, taking into account the concerns and arguments raised above. Three main areas of focus were identified: the effects on health, and the economy, and the psychosocial aspects, The framework for the assessment of these three components is illustrated in Figure 1.2. The findings of this study are intended to assist policymakers and other key stakeholders in future policy development related to access to drugs, drug patents and the use of TRIPS flexibilities.

Figure 1.2: Study framework



1.4 Structure of this report

The findings of this study are presented by the three key areas for ease of understanding, as follows:

Health impact

Chapter 2 of this report addresses the effects of the government use licenses on public health. The public health implications of the government use licenses are related to the expected increase in the numbers of patients having access to relevant drugs, and the subsequent impact of such access to drugs in increasing life expectancy and the quality of life of patients. The methodology employed seeks to assess the number of patients accessing the drugs, based on real data available in Thailand. The measurements of life expectancy and quality of life of patients are based on a review of national and international literature. The issue of quality of generic drugs imported under the government use policy compared with their original versions was also considered.

Economic impact

There are two main areas of economic impact to be assessed. The first is the expected decrease in drug expenditure due to drug price reductions, and the implications of the increased access to medicines and associated increase in national productivity due to improved health. The economic impact in relation to health gains will be assessed by comparison of situations with and without the government use licenses. Chapter 3 therefore, addresses the issue of health related economic impact of the government use licenses using the societal viewpoint.

The second area of economic impact relates to the trading status of the country and the impact of the government use licenses on national exports. The impact of the government use licenses on foreign investment is also assessed, as this may potentially affect the country's opportunity to benefit from investment in technology and technological transfer. On the other hand, it may be possible too

that the government use licenses have increased the opportunity of importing new technology and know-how from generic producers such as India in order to help develop domestic generic production in Thailand. The assessments were undertaken using data from the Thai Board of Investment on the investment in Thailand, literature review and qualitative research. Chapter 4 thus, focuses on the economic impact in terms of exports and foreign investment in Thailand. Although there was no clear relationship between the government use licenses and the Thai export industry, the indirect negative effect of the government use licenses on Thai exports has been used as an argument against the use of the licenses. Hence, this study seeks to determine the impact of the trade sanctions, such as the GSP withdrawal status for Thai exports, and the changes in short- and long-term investments in Thailand.

Psychosocial impact

The impact of the public debates and conflicts over the government use licenses is also considered within this study. In Chapter 5, the psychosocial impacts of the government use licenses are discussed. Through a survey on opinions of various sectors of Thai society with regard the potential positive and negative consequences of the licenses, the study seeks to gain a better understanding of the concerns of key stakeholders who supported or opposed the grant of the government use licenses, as well as their views on alternatives to improve access to patented drugs. A questionnaire survey was developed, and conducted with groups of Thai stakeholders; namely government officers in the MoPH, the Ministry of Commerce, and the Ministry of Foreign Affairs; the private sector, including representatives of multinational pharmaceutical companies and domestic drug manufacturers, exporters affected by the withdrawal of GSP status; and civil society organizations. Stakeholders from other developing and developed countries were also included in this section of research.

Chapter 6, the final chapter, discusses the key findings of the study and proposes a number of policy recommendations.

Chapter 2

Health impact

2.1 Background

The decision to grant the government use licenses was based on the assumption that the licenses would reduce the cost of drugs and decrease the government spending on health, which would in turn allow the national health budget to cover the expenditure required to ensure universal access to medicines. As stated by the MoPH, the rationale for the grant of the government use licenses for the seven drugs is primarily to achieve universal access to essential medicines for all Thais, rather than to reduce the health budget. In this context, the grant of government use licenses for the drug EFV was expected to reduce the monthly cost from 1400 Baht/month to only 650 Baht/month. This reduction in price would thus allow the MoPH to provide EFV to an additional 20,000 patients under the same budget. In the case of LPV/r, the government use license was expected to result in at least a 20% reduction of the current price. This price reduction would then allow MoPH to respond to the needs of the increasing number drug-resistant patients, the basis of the finding that prevalence of resistance to first-line ARV treatment in Thailand is approximately 10%. For the anti-cancer drugs, MoPH cited the high cost of the specific drugs as the key barrier to access, and the need to address the situation given the fact that cancer has become a major cause of death in Thailand. Although no data was provided on the number of patients to be provided access, the government use licenses were expected to significantly reduce the cost of these drugs, hence promoting increased access to the said drugs(Ministry of Public Health and National Health Security Office,2007)

Despite these justifications provided by MoPH, questions have been raised as to whether or not the grant of the government use licenses will ensure increased access to drugs. Further, there are also concerns about the quality of the generic drugs that have been, or will be, imported under the government use licenses

(Ministry of Public Health and National Health Security Office,2007). This Chapter is to address these questions.

2.2 Objectives and methodology

2.2.1 Consideration of the issue of the quality of generic drugs imported under the compulsory license in comparison to the original drugs.

In order to fulfill this objective, data on drug quality information, submitted in the process of drug registration such as results of bioequivalence studies, as well as information on the drug registration process, was collected from the key organizations in the process of drug registration and assessment of quality of drugs; namely the Food and Drug Administration (FDA) and the Department of Medical Sciences, in order to understand how the quality of generic drugs is ensured prior to marketing in Thailand.

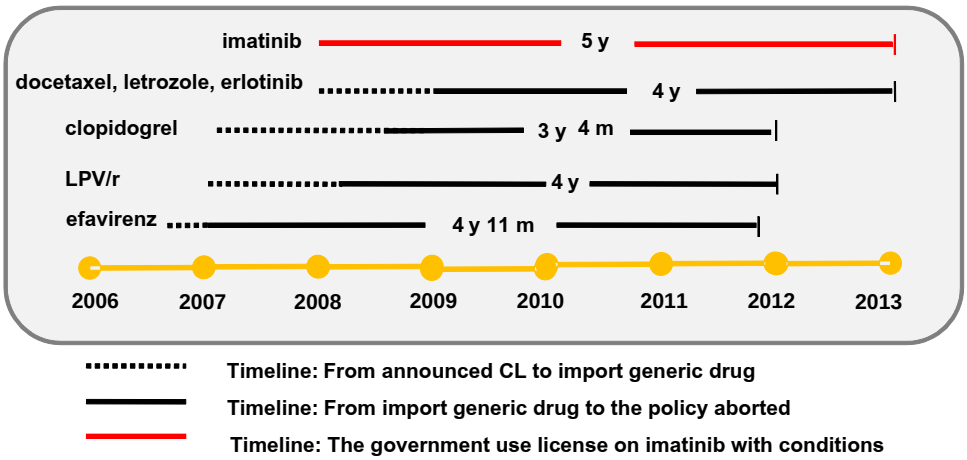
2.2.2 Assessment of the health benefits arising from the government use licenses

The study sets a clear timeframe to determine the health impacts as a result of the government use licenses. It is assumed there will be health impacts only after the importation of the generic drugs under the licenses. In the case where no importation of the generic drug has taken place at the time of this study, it is assumed that the drug will be imported in early 2009. The exception is imatinib; for which the implementation of the government use license has been suspended, subject to the provision of the drug free to patients covered by the UC scheme, by the Novartis' GIPAP programme (Ministry of Public Health,2008c).

Based on data available as of September 2008, three generic drugs have been imported under the government use licenses: the generic versions of EFV and LPV/r were imported in January 2007 and January 2008 respectively; and a generic version of clopidogrel was imported in August 2008. The assessment of the health impact is based on a five-year timeframe, following the issuance of the government use license for each drug. Therefore, if the government use license was issued in November 2006 for EFV, and January 2006 for both LPV/r and

clopidogrel, the timeframe for the impact assessment of the drugs are 4 years 11 months for EFV, 4 years for LPV/r, and 3 years and 4 months for clopidogrel, based on timing of importation of the generic drugs (Figure 2.1). In the case of the 3 anti-cancer drugs, letrozole, docetaxel and erlotinib, the government use licenses were issued in 2008, but there is as yet no importation of the generic equivalents. The assumption is made that the import of generics will occur in January 2009, hence the assessment timeframe is 4 years. As for imatinib, since the modified criteria of the GIPAP program was effective immediately at the time of the grant of the government use license, the timeframe for the impact assessment was set at 5 years.

Figure 2.1 Time frame of study in each drug



The assessment of health benefits is presented in two parts, as follows:

(a) The assessment on access to drugs is presented in terms of increase in the number of patients with access to the drugs, following the grant of the government use licenses. Data was obtained from relevant organizations or national research institutes in Thailand, as described below.

- Efavirenz and lopinavir/ritonavir: to determine access to before and after the grant of the government use licenses, data on actual number of

patients receiving each drug was obtained from National Health Security Office (NHSO) managed HIV/AIDS Fund.

- Health Intervention and Technology (HITAP) provided data on the incidence of acute coronary syndrome by each age group, derived from its research project on economic evaluation of HMG-CoA reductase inhibitor (statin) for primary prevention of cardiovascular diseases among Thai population(Tamtiranont Y,2007). These variables are then multiplied by the total population by age groups for year 2007(Department of Provincial Administration,2007) to estimate the total patient population for 2007, and the estimated future population by age group (National Economic and Social Development,2000) to estimate total patient population for year 2008-2011.

- Information from FDA on the quantity of the original anti-cancer drugs (i.e., clopidogrel, letrozole, docetaxel, erlotinib and imatinib) imported before the grant of the government use licenses was used to calculate the number of patients accessing these drugs prior to the government use licenses, adjusted for the dosage per patient as recommended by the NHSO.

- Estimates of incidence of lung and breast cancer were obtained from the Thai Network of Cancer Registries, the Health Information System Development Office (HISO) and the Ministry of Public Health. Further data on the prevalence of lung cancer, breast cancer, and leukemia was also obtained from the Burden of Disease and Injury Project, the International Health Policy Program (IHPP). The data was used to estimate the number of patients in need of cancer drugs by item. This data was adjusted for dosages needed for medical treatment, according to NHSO data and the probability of receiving each drug, based on expert opinion from the National Cancer Institute (NCI). In addition, data was also obtained from Novartis' Glivec International Patient Assistance Program (GIPAP) Thailand Program on the number of patients currently receiving imatinib under its programme [(International Patient Assistance Program,2008).

The above data was used in the linear equation below;

$$y_i = \beta_0 + \beta_1 X_i + u_i \quad \text{.....(1)}$$

Where

y is the expected number of patients to receive the drug

x is year in access to drug

u is error measurement

To estimate the following

(i) the number of patients who would have access to each drug of the seven drugs if there was no grant of the government use licenses;

(ii) the increase in number of patients who will access the two ARV drugs as a result of the grant of the government use licenses based on the data of actual increase in access of the drugs after the grant of the government use licenses.

In the case of clopidogrel, letrozole, docetaxel and erlotinib, the study estimated the total number of patients who would need the drugs based on epidemiological data as described above because of insufficient or unavailable data on the number of actual patients with access to drugs after the grant of the government use licenses.

(b) The assessment of benefits in terms of health status was based on the increase in the number of patients accessing the seven drugs and the patient's utility[1] gained from use of each drug based on data derived from a literature review of national and international research papers. The analysis is presented in terms of increased life expectancy and improved quality of life following the government use licenses, in terms of Quality-Adjusted Life Years (QALYs) gained or its equivalent namely Disability-Adjusted Life Years (DALYs) averted.

[1] Utility is an approach to assessing health-related quality of life. It is useful to compare different diseases such as AIDS, coronary heart disease, and cancer, in terms of the QALYs or DALYs averted, both being the most widely used technique for economic evaluation of patient's life year gained.

2.3 Results

2.3.1 Quality of imported generic drugs

The quality of medicines is a well-regulated arena in Thailand; the regulations require compliance with quality assurance standards, for both the raw materials and finished products. The main government organizations responsible for this process include FDA and the Department of Medical Science. As a requirement for drug registration in Thailand, sample collections of each drug are sent to the research laboratory for testing and evaluation, prior to importation, marketing and use in the country. The regulations do not permit information submitted as part of the drug registration process to be revealed to a third party. This study therefore was not able to consider or compare information and data related to the quality of the drugs, both original and generic.

2.3.2 Change in health status in the five-year period after the grant of the government use licenses

(a) Increased number of patients with access to drugs

The study makes a comparison between the numbers of patients with access to the relevant drugs with[2] versus without[3] the government use licenses. The data is presented in the series of figures below: the observed data is represented by the straight lines, the estimated data using the linear equation is represented by the dashed lines, and the increase in the number of patients with access to each drug as a result of the government use licenses is represented by the areas highlighted in red.

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[2] Number of patients with access to drugs prior to the government use licenses was based on data on the amount of imported original drug, taking into account the defined daily doses. Monthly data of EFV and NVP/r was collected during July 2006-Jan 2007 and Feb-Sept 2007, respectively. For other drugs, the study used annual data available from FDA, from data of their availability in the Thai market.

[3] Number of patients with access to drug after the government use licenses was based on actual data from the patient registry under the national access to antiretroviral program for people living with HIV/AIDS (NAPHA) during the period Jan-May 2007 from the Department of Disease Control, and the number of patients receiving drug during Dec 2007- June 2008 from the National Health Security Office. The number of patients accessing drugs during the period June-Sept 2007 for which data was unavailable, was estimated using the moving average technique. For other drugs, the study used estimated data, derived from the use of different techniques.

For EFV, the calculation was based on the estimated number of patients receiving GPO-vir® as the first-line treatment. Where patients cannot tolerate GPO-vir®, they are switched to EFV, as recommended by the current national guidelines for ARV treatment (The health care committee of HIV/AIDS patients,2007). As Figure 2.2 shows, the increase in number of patients with access to EFV as a result of the government use license was 17,959 for the five-year timeframe. The increase in the number of patients with access to LPV/r[4] was estimated to be 3,421 for the timeframe of the study, as shown in Figure 2.3. The estimated increase in number of patients with access to clopidogrel was 40,947 in terms of the use of the drug for secondary prevention in Coronary Artery Disease (CAD) within the study timeframe, as seen in Figure 2.4.

[4] Information from experts at National Health Security Office in case of LPV/r prescription indicated that physician likely prefer to increase prescribing LPV/r to patient at 1 month before generic version distributed because they believe that the drug can provided sufficiently. The estimated number of patient access to the drug before implementing government use licenses would be excluded the last month before generic distributed because of the changing of accessibility trend. The last month was used to estimate trend of access to after the policy implemented

Figure 2.2 Increase in number of patients accessing EFV following grant of government use government use license

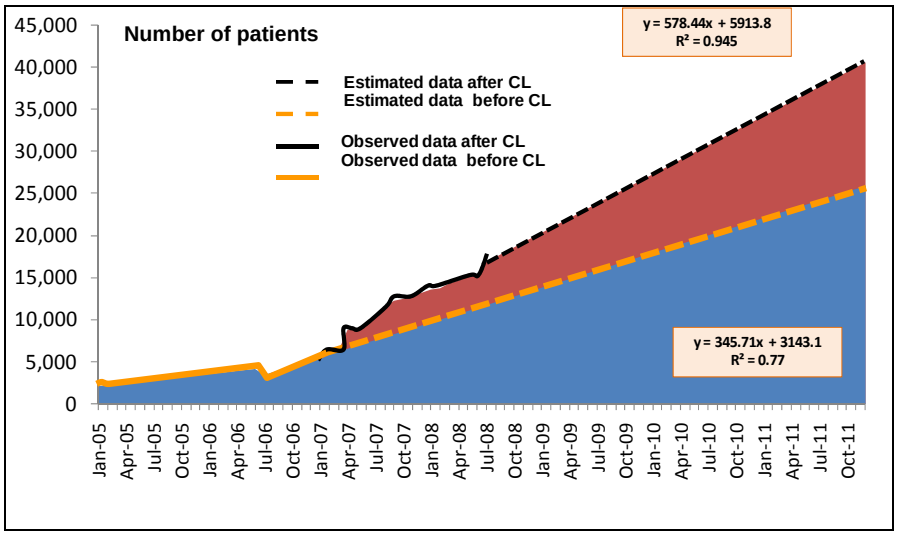


Figure 2.3 Increase in number of patients accessing to LPV/r following grant of government use government use license

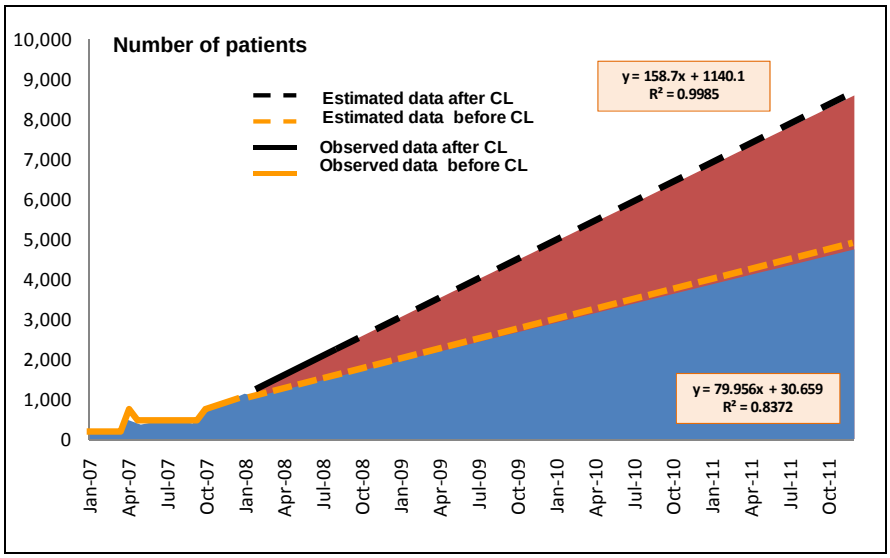
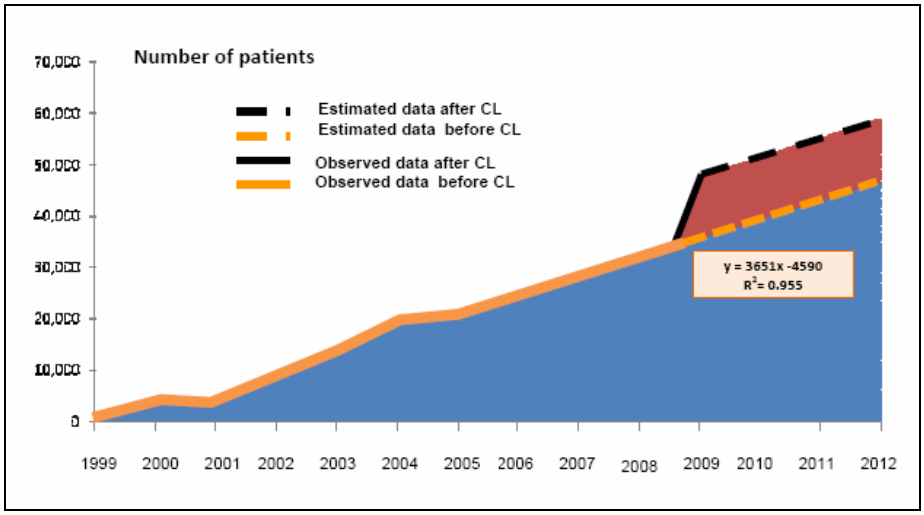


Figure 2.4 Increase in number of patients accessing clopidogrel following grant of government use government use licens



The results in terms of the increase in the number of patients with access to the four anti-cancer drugs are presented below:

The estimated increase in the number of patients with access to letrozole, as first-line hormone therapy for breast cancer patients, was estimated to be 8,916 within the timeframe of the study, as shown in Figure 2.5. Although docetaxel is used for treatment of breast cancer, lung cancer, gastric cancer, and prostate cancer, this study only assessed the increase in numbers of patients accessing the drug for the treatment of breast and lung cancer, given the high numbers of patients with these types of cancers. The increase in number of patients using this drug for treatment of breast cancer was 5,958 patients, and 4,855 for treatment of lung cancer. Therefore, the total increased number of patients with access to this drug was approximately 10,813 individuals, as illustrated in Figure 2.6. The estimated increased in number of patients with access to erlotinib was 256, within the timeframe of the study, as shown in Figure 2.7.

Figure 2.5 Increase in number of patients accessing letrozole following grant of government use government use license

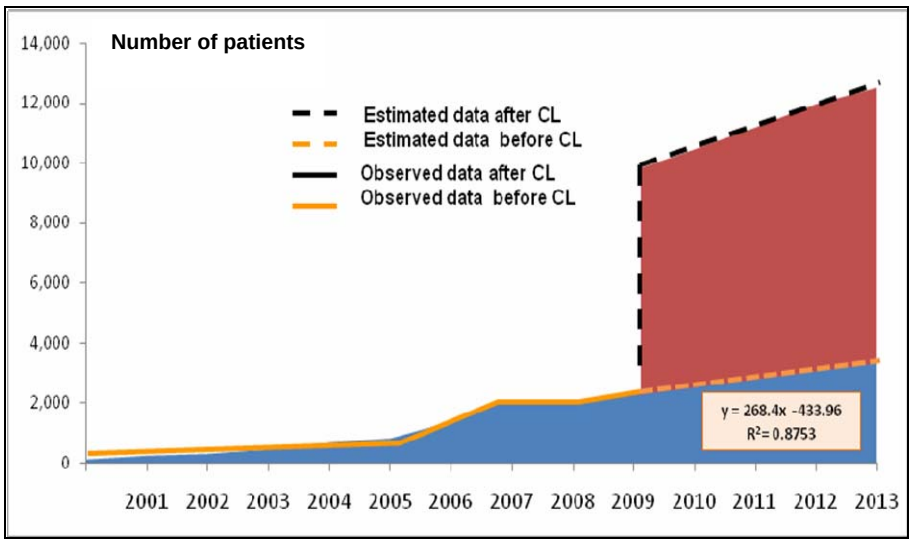


Figure 2.6 Increase in number of patients accessing to docetaxel to treat breast and lung cancer following grant of government use government use license

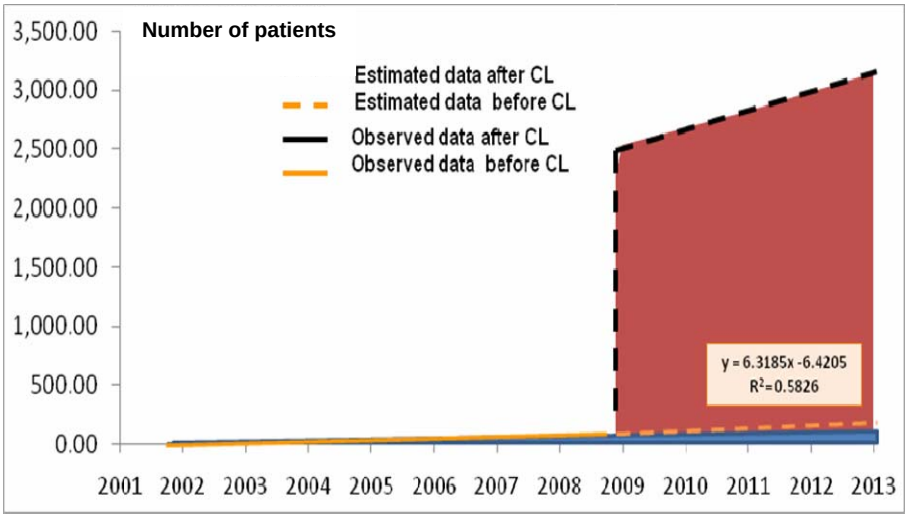
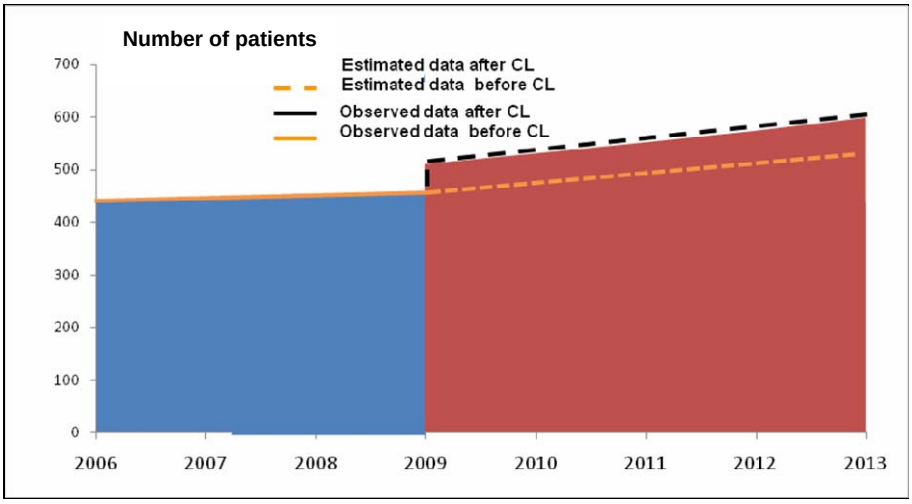


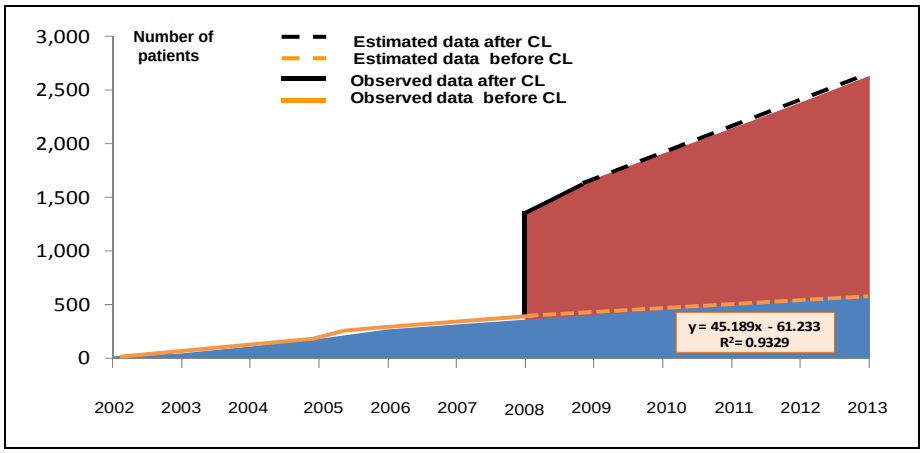
Figure 2.7 Increase in number of patients accessing erlotinib following grant of government use government use license



In the case of imatinib, as mentioned above, all patients under the UC scheme who require access to the drug will be provided it free under the Novartis GIPAP Program. As of September 2008, a total of 1,380 patients had access to this drug (International Patient Assistance Program,2008). An estimate of the number of patients with access to the drug in the future can be made, based on the projected incidence by the National Cancer Institute. It is estimated that an additional 1,293 patients with CML[5] and 553 patients with GIST - a total of 1,846 patients - will have access to imatinib within the five year timeframe of the study, as shown in Figure 2.8 below.

[5] Within the number of patients in the Leukemia registration, approximately 10-18% have chronic myeloid leukemia (CML).

Figure 2.8 Increase in number of patients accessing imatinib following grant of government use government use license



(b) The assessment of benefits in health status following grant of the government use licenses

The assessment of benefits in terms of health status is based on the analysis of increased life expectancy and improved quality of life, as measured by Quality-Adjusted Life Years (QALYs) gained or Disability-Adjusted Life Years (DALYs) averted of the patients accessing the drugs. The study also examined the advantages and disadvantages of a new drug compared to alternative or existing drugs used prior to the government use licenses, based on information from a literature review of national and international research papers. The details of the assessment by drug are as follows:

(a) Efavirenz (EFV):

EFV is the standard antiretroviral drug in the Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) class. It is in the same class as nevirapine (NVP), which has more severe adverse reactions than EFV, such as rash symptoms that can develop into the Stevens Johnson syndrome and hepatitis in severe cases. Patients receiving first-line ARV treatment in Thailand receive a fixed-dose combination tablet of GPOvir, which is the combination of stavudine+lamivudine+nevirapine. GPOvir was developed to increase compliance and efficacy of ARV treatment, as it is convenient for the patient to

take the once-a-day tablet combining the three drugs. Where patients develops an adverse reaction to NVP, they will be switched to EFV as a replacement for NVP (The health care committee of HIV/AIDS patients,2007). A study in Thailand on the cost-effectiveness of EFV compared to NVP, for the treatment of patients with a CD4 count 200 cell/ml, reported higher health care costs for patients on life-long NVP-based treatment because of the costs related to addressing adverse reactions to NVP (Maleewong, Kulsomboon, and Teerawattananon,2008). Further, the effectiveness in terms of DALYs averted was lower in NVP-based treatments compared to EFV-based treatments.

The same study in Thailand also reveals that DALYs averted from EFV-based treatment was 5.69 compared to 5.54 from NVP-based treatment (Maleewong, Kulsomboon, and Teerawattananon,2008). The increase in QALYs is equivalent to 0.15 of DALYs averted. Hence, the increase of 17,959 patients accessing EFV after the government use licenses, would lead to benefit of 2,694 QALYs within the study timeframe.

(b) LPV/r:

LPV/r is a Protease Inhibitor (PI), used as a second-line treatment of HIV patients who have developed resistance to the first-line treatment. It is recommended that patients with first-line drug resistance be treated with IDV/r rather than LPV/r. LPV/r should be provided to patients who cannot tolerate IDV/r, due to its toxicity (The health care committee of HIV/AIDS patients,2007). The review of literature also found that patients on IDV/r were less likely to achieve viral suppression than patients on LPV/r (Bongiovanni et al.,2004). Because there was no data available on the QALYs related to the use of LPV/r, this study cannot estimate QALY gained from LPV/r under the government use license.

(c) Clopidogrel:

Clopidogrel is an antiplatelet drug in the Thienopyridine drug group. It is used as an alternative, or in addition to, aspirin to increase the efficacy of treatments of coronary stenting for heart disease (Bureau of Medical Technical Treatment,2004). It has also been found that the use of clopidogrel with aspirin

for secondary prevention in cardiovascular patients can reduce the death rate of heart disease (American Heart Association,2008) and increase QALYs more than by treatment with aspirin alone (Karnon et al.,2005). Expert opinion from the National Health Security Office found that the high cost of clopidogrel was an obstacle to access to this drug, as only the patients, who can afford to purchase the drug or those under a particular health insurance scheme i.e. the Civil Servant Medical Benefit Scheme (CSMBS) for the government employees and their dependents, can access to clopidogrel for secondary prevention.

International research on use of clopidogrel and aspirin, reported a QALYs of 7.37 compared to 7.31 when using aspirin alone (Karnon et al.,2006). This represents an increase in QALYs of 0.06. As the estimated increased number of patients accessing to clopidogrel was 40,947 individuals, this would represent an additional 2,457 QALYs gained within the study timeframe.

(d) Letrozole:

Letrozole is hormone therapeutic drug inhibiting the production of estrogen which is essential for the growth of breast cancer cells. It is recommended for treatment of local or metastatic breast cancer that is hormone receptor positive or has an unknown receptor status in postmenopausal women. It is recommended that letrozole be used to replace tamoxifen for patients who cannot tolerate tamoxifen (The committee of the health care improvement of breast cancer treatment,2006). A study of health benefits of letrozole as first-line hormone therapy for breast cancer compared to tamoxifen, reported higher QALYs in patients receiving letrozole had QALYs compared to those on tamoxifen.

An international study on the utility of the patients on letrozole with a lifetime horizon of 30 years, found that patients on letrozole had a QALY of 13.14, whilst those on tamoxifen had 12.73, (Delea et al.,2007). The increased QALYs of letrozole was 0.41 compared with tamoxifen. It is estimated that following the government use government use license, the increased number of patients who receive letrozole will be 8,916, representing a gain of 3,656 QALYs within the study timeframe.

(e) Docetaxel:

Docetaxel is a chemotherapy drug used mainly for treatment of breast, lung, gastric and prostate cancer. This study analyses the impact for patients with breast and lung cancer only, due to the large number of patients with these types of cancers.

- Breast cancer treatment

Paclitaxel is another drug used in the treatment of breast cancer. Both paclitaxel and docetaxel are in the same drug group, and are currently used as alternative treatments for breast cancer in the metastases stage, in patients with a negative result for hormone receptor and at high risk of relapse. Paclitaxel is recommended for use as a second-line drug in metastases stage (The committee of the health care improvement of breast cancer treatment,2006). As the patent for paclitaxel has expired, the generic version of this drug has been widely available and used as the main drug of choice. Following the government use government use license on docetaxel, it may now be used instead of paclitaxel. An international study reported that patients on docetaxel had QALYs of 0.87 and 0.66 on paclitaxel (Brown and Hutton,1998). The use of docetaxel compared to paclitaxel represented an increase of 0.21 QALYs. Hence, with the increased number of patients accessing docetaxel at 5,958 patients, the increase in health status would be 1,251 QALYs within the study timeframe.

- Lung cancer treatment

For the treatment of non-small cell lung cancer (NSCLC) stage IV (including IIIB with malignant pleural effusion) or/and malignant pericardial effusion with performance status of 0 or 1 with recurrent or relapse of the disease after platinum based chemotherapy, docetaxel is recommended. An alternative drug is pemetrexed (The committee of the health care improvement of lung cancer treatment,2006). However, pemetrexed is an expensive drug and difficult to access. Further, international studies on the efficacy of docetaxel and pemetrexed, found that both achieved similar overall survival and progression free survival rates. The utility of the patients on both drugs for two years reported similar QALYs of 0.41 (Carlson et al.,2008). In this context, the estimated number of additional patients with access to docetaxel was 4,855 as a result of the

government use licenses but the QALY gained does not change, compared to the alternative.

(f) Erlotinib:

Erlotinib is chemotherapy drug in the Tyrosine kinase inhibitors group used for the treatment of lung cancer (i.e. NSCLC) in patients with recurrent or relapse after platinum-based chemotherapy and docetaxel treatment. The advantage of this drug is the side effects from Neutropenia and Febrile neutropenia are lower than when using docetaxel and pemetrexed (The committee of the health care improvement of lung cancer treatment,2006). A comparative study of erlotinib and docetaxel found that patients on erlotinib reported higher QALYs than patients on docetaxel and pemetrexed (Carlson et al.,2008).

The utility of the patients on erlotinib from the same study was 0.42 QALYs (Carlson et al.,2008). However, as there is no comparative study with alternative drug, such as gefitinib, this study cannot assess the increase in health status benefits of patients receiving this drug comparing its alternative.

(g) Imatinib:

Imatinib is a chemotherapy drug for treatment of chronic myeloid leukemia (CML). An international study found patients on imatinib reported a QALY of 1.07 (Huse et al.,2007). The increased number of CML patients accessing this drug was 1,293 persons, which provides an increased health status of 1,384 QALYs within the study timeframe. Imatinib can also be used for the treatment of Gastrointestinal Stromal Tumor (GIST). An international study has shown that patients on this drug reported QALYS of 1.9 higher than patients without treatment (Dalziel et al.,2004). The increased number of patients receiving this drug for treatment of GIST was 553 persons, leading to an increased of 1,051 QALYs within the study timeframe.

Table 2.1 Projections of number of patients with access to drugs and increased health status within the study timeframe

Drug	Increase in number of patients accessing the drug	QALYs gained per person*	Total QALYs gained
1. EFV	17,959	0.15	2,694
2. LPV/r	3,421	No data	-
3. Clopidogrel, in use for secondary prevention of CAD	40,947	0.06	2,457
4. Letrozole in early stages of breast cancer	8,916	0.41	3,656
5. Docetaxel in advanced stages of breast cancer	5,958	0.21	1,251
6. Docetaxel in advanced stages of lung cancer	4,855	0	0
7. Erlotinib in advanced stages of lung cancer	256	No data	-
8. Imatinib in CML	1,293	1.07	1,384
9. Imatinib in GIST	553	1.9	1,051
Total	**84,158**		**12,492**

** QALY gained per person form the drugs compared with alternative or existing drugs used prior to the government use government use license*

The above table illustrates the health impact, in terms of QALYs gained following the grant of the government use licenses for the seven drugs, which are used in nine disease settings. The total increase in number of patients accessing all these drugs is 84,158 individuals, within the five-year time frame after the grant of the compulsory licenses. If the gains in health status in terms of quality of life is included, when data is available, the benefits over alternative or existing drugs used prior to government use licenses within the study timeframe is an additional 12,492 QALYs gained.

2.4 Summary and discussion

This study was not able to directly assess the quality of the generic drugs imported under the government use licenses. To ensure efficacious and safe treatment, an essential measure is the optimal active level of ingredients in the pharmaceutical drugs, along with appropriate drug levels and duration of release of active ingredient. These are the basis of bioequivalence studies to compare generic drugs with original drugs. Such a study assesses the vitro release, an essential factor from the product, and the in vitro dissolution of essential ingredient into the blood system and the location of drug release. In Thailand, since 1994, a bioequivalence study is needed for market authorization of the generic version of all new drugs (Teerawattananon et al.,2003). This suggests that the drugs imported in Thailand is quality assured, once it passes the FDA requirements it is guaranteed to be of good quality, an important assurance of efficacy and safety of treatments for the patients who will receive these drugs.

In this study, we estimated that the increase in numbers of patients with access to EFV and LPV/r over the five-year period will be 17,959 and 3,421, respectively following the grant of the government use licenses. It should be noted that these numbers are relatively low, given the estimated total number of HIV-infected patients in need of treatment in Thailand between 2005 and 2025. The low number of patients on treatment is due to a number of factors, including fear of stigma or discrimination from the community or family members which prevent them from disclosing their HIV status and seeking treatment. The government use license alone will not be sufficient to resolve all the problems related to improving access to treatment of HIV infected patients. Other policies will be needed, including interventions to change societal attitudes and behaviors towards HIV/AIDS, improved channels to access treatments, increased distribution of information on free access to care, and promotion of HIV screening.

For clopidogrel and the four anti-cancer drugs, there was no importation of generic equivalents at the time of this study conducted. The study projected an increase in number of patients accessing these drugs using estimates of patients in need of the drug minus the numbers of patients expected to receive the original drugs. We found the largest number of patients were in need of clopidogrel for secondary prevention, whereas among cancer patients the greatest need, in order, was as follows: letrozole, docetaxel, imatinib, and erlotinib, respectively. This is however, only a projection that may deviate from reality. Therefore, we recommend further study of this issue, with collection of data on actual number of patients with access to each drug to inform future policies and plans for disease control and the use of flexibilities of the TRIPS Agreement.

If we consider the projected gains in health status, this study found that the drugs with greatest health status gains when compared to alternative or standard treatments used prior to the government use licenses was: letrozole, EFV, clopidogrel, imatinib and docetaxel respectively. There was no comparative study on utility of LPV/r and erlotinib versus alternative treatments.

2.5 Limitations of study

The main limitation of this study is the inadequacy of data, particularly with regard the number of patients with access to each drug prior to, and after, the grant of the government use licenses, needed to accurately assess the health benefits. In September 2008, government use licenses were issued for tree drugs: EFV, LPV/r and clopidogrel; for which the generic versions have been imported in the last 18, 5 and 1 month(s), respectively. There have not been any imports of generic cancer drugs. Due to these limitations, we had to estimate the increase in the number of patients based on current data using three methods for each drug group. Each method has different strengths and weakness. The following describes the methods per disease group, in order of the accuracy of results.

For the ARVs, linear regression was used to estimate the increase in the number of patients. The strength of this method is the reliance on real data for the number of patients currently receiving drugs. This increases the precision for

prediction. The weak point, however, is that the analysis was based on an assumption of a linear effect in increasing access to these drugs, regardless of other factors that might affect the number of patients accessing drugs after the grant of the government use licenses. These may include changes in the management of health insurance policy including health service networks, changes in treatment of HIV and opportunistic infections, changes in attitudes and behavior of the people in affected communities in the future. Therefore, as the study timeframe increases, there is increasing margin for error. The timeframe was limited to five years to minimize the errors of the projected results.

For the anti-cancer drugs, there has not been any importation of generic anti-cancer drugs into Thailand. The study projects the increase in the number of patients accessing the drugs based on data from the Thai Cancer Information Network and the Health Information System Development Office (HISO). The strength of this method is the use of epidemiological data for analysis. The weakness of this method is that it projects access to drugs based on the total population of cancer patients, for the use of all four anti-cancer drugs. In reality, not every patient will want to use the treatments, or some may reject the drug due to its side effects. The results may not, therefore, be wholly accurate.

For clopidogrel, although importation of the generic drug has taken place, information on access to the drug is only available for one month. This data is not sufficient to base future projections of access to treatment. There was also no information of the estimated total number of patients with heart failure. Therefore, the study projections were based on incidence of the disease in the general population. This method has a weakness, in that the analysis does not include data on current access to the drug or other related factors in the analysis. Therefore, the estimate of access to clopidogrel following the government use government use license is likely to be less accurate than projections of drugs to treat the other above diseases.

There are also limitations in terms of the measures of utility used in the study. Of the studies on utility of the patients, only one study was based in Thailand (which was the study on the use of EFV). All other studies were on different populations

which may or may not indicate the same health preferences as those of the Thai population and this may affect the precision of the results.

Chapter 3

Health related economic impact

3.1 Background

The concept of human capital assumes all individuals to have the capacity to contribute towards productivity of the national economy. Illness and premature death result in losses for the society and the national economy (Koopmanschap and Vanineveld,1992). This loss is often measured at the national level in terms of per capita Gross Domestic Product (WHO,2003).

This concept is used in this study to assess the impact of the government use licenses on the national economy in respect of the health gains. With the increase in the number of patients with access to drugs and its consequence of extending life expectancy and improving the quality of life, it is assumed that these individuals are then able to return to work and contribute towards the national economy. This positive impact for the society can be quantified in terms of national productivity. Where patients already had access to a drug, the government use licenses may have an indirect benefit in terms of reduced burden on the government's budget health through reduced cost of drugs. Both the direct and indirect economic impacts of the government use licenses are considered.

3.2 Framework of the study

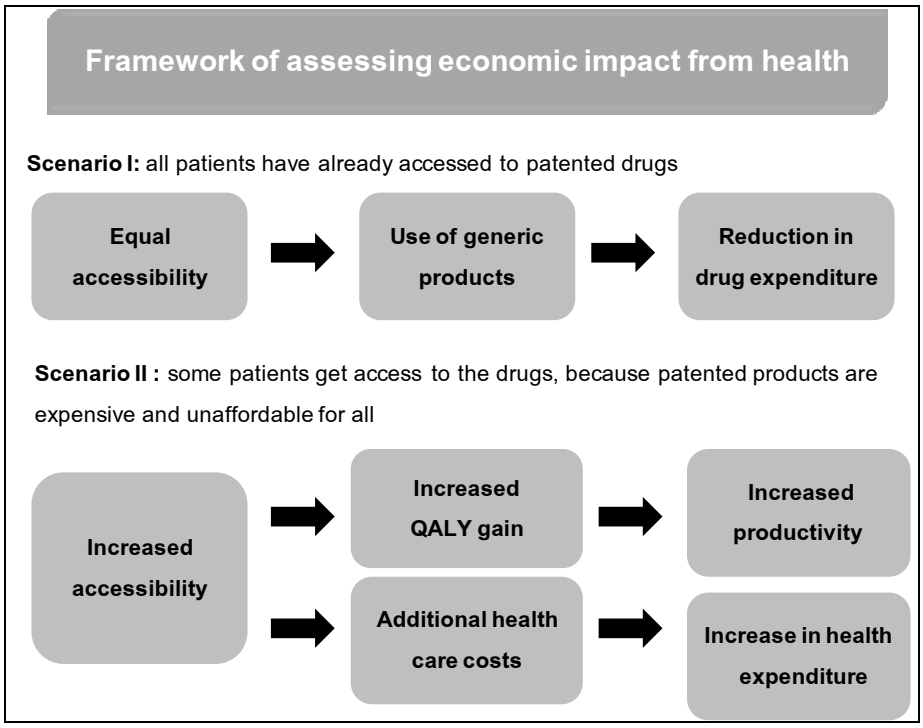
This study assessed the implications of the government use licenses in terms of their: (1) impact on the health budget for drug procurement; and (2) impact in the number of patients accessing treatments. A counterfactual framework was developed, composed of two scenarios as shown in Figure 3.1, to ensure inclusiveness and prevent duplication in measures of the impacts. In the first scenario, it is assumed that at the time of the grant of the government use licenses all patients have full access to the seven patented drugs, because these drugs have been included in the NLEM since 2007. The NLEM is the only pharmaceutical reimbursement list, to which all public health insurance schemes

have to refer. In this scenario, the economic impact would be based on the reduced cost of drug procurement through the purchase of generic drugs.

In the second scenario, it is assumed that not all patients have access to the seven patented drugs at the time of the grant of the government use licenses. The government use licenses are assumed to enable more patients to access the seven drugs, in which case the impacts can be measured in terms of: (i) increase in the number of patients accessing the drugs; (ii) changes in health expenditure; and (iii) changes in national productivity through increased life expectancy and quality of life of patients on treatment.

The two scenarios described above were considered to be mutually exclusive for the following reasons. Given the assumption of full access for Scenario 1, there will be no changes in the number of patients with access to the drugs, nor will there be any change to national productivity. In contrast, Scenario 2 is an attempt to determine the incremental gains from the expected increase in the number of patients with access to the drugs after the government use licenses and its resultant impact on national productivity. This scenario also measures the changes in health expenditure, with a comparison of the use of the generic drugs against the use of alternatives drugs where the government use licenses were not granted.

Figure 3.1 Conceptual framework to assess the expected economic impact over five years



3.3 Objectives and methodology

3.3.1 Assess the economic impact of Scenario 1, in terms of the decrease in drug expenditure through the purchase of generic drugs.

3.3.2 Assess the economic impact of Scenario 2, in terms of increase in numbers of patients accessing each drug following the grant of the government use licenses:

(a) positive impact (benefit): increase in national productivity due to increased access to drugs, life expectancy and quality of life, and number of patients returning to work; and

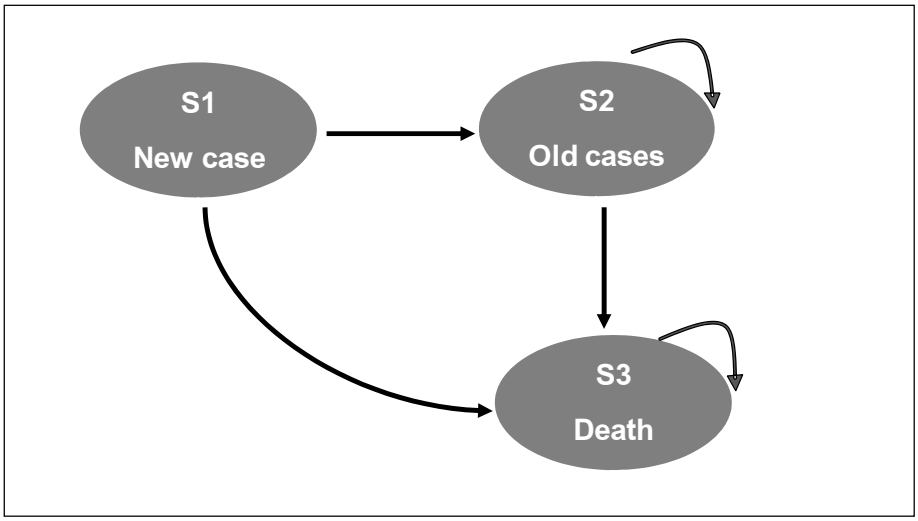
(b) negative impact (cost): increase in public health expenditure in terms of drug procurement for increased number of patients accessing treatments.

Scenario 1: Methodology

This scenario is based on the assumption that all patients have full access to the drugs through the national health system at the time of grant of the government use licenses. While this assumption does not reflect the true level of access to drugs, it is an important assumption given the government's commitment to ensure access to medicines for all patients. Scenario 1 reflects the Thai government's assertion that the grant of the government use licenses will result in significant savings for the health budget.

The measure of direct cost is based on cost of treatment of patients using the original patented drug versus the generic drug. The cost of treatment for adverse effects from use of the drug and other costs incurred by the patient are not included, since it is assumed that use of either the original or generic drug does not affect these costs. The anti-cancer drug, imatinib, was not included in the model as there was no importation of the generic version. This assessment was conducted within the same five-year timeframe as the health impact assessment in Chapter 2 above (see Figure 2.2).

Figure 3.2 Framework of the Markov model



Parameters to include in the Markov model, used to assess the impact of the government use licenses in terms of government spending on drugs, was identified following a literature review, data obtained from the public and private sectors. Consultations with experts were also held to test the validity of the parameters, including the Thai National Cancer Institute which was consulted on the cancer model. Details of the parameters are described below.

1. Data on disease epidemiology comprised prevalence data to estimate cumulative cases (all old cases in need of treatment and projections of incidence to estimate new cases needing treatment in the future). For HIV/AIDS, we used data on estimated total number of persons living with HIV/AIDS each year, which combines the old and new cases, as seen in Table 3.1. For cancer, we used prevalence data (instead of number of old cases) and estimates of incidence as seen in Table 3.2 and 3.3, respectively. For clopidogrel, data on the actual number of patients prescribed the drug under the public health system was used instead of epidemiological data, as the drug is mainly prescribed for patients with stents for treatment of coronary artery disease, as shown in Table 3.4.

Table 3.1 Projected number of symptomatic and asymptomatic patients living with HIV/AIDS between 2008-2011 in need of antiretroviral drugs (includes asymptomatic patients with CD4<200 cells/mm^3)

Year	Number of persons living with HIV/AIDs in need of ARV treatment
2008	142,067
2009	162,175
2010	179,797
2011	194,127
2012	205,351

Source: Wiwat Peerapatanapokin, HIV/AIDS projection in Thailand: 2005-2025, A^2 Thailand Team and Thai Working Group, 4 July 2007

Table 3.2 Prevalence of patients with cancer in 2004

Type of cancer	Number of patients
1.Breast cancer	28,426
2.Lung cancer	12,549
3.Stomach cancer	3,589
4.Leukaemia	1,107

Source: Burden of Disease and Injury Project Database, International Health Policy Program Thailand

Table 3.3 Actual and projected incidence of cancer (number of patients) 2004 - 2012

Type of Cancer	2004	2005	2006	2007	2008	2009	2010	2011	2012
1.Stomach	2,030	2,112	2,212	2,313	2,413	2,442	2,471	2,500	2,624
2.Lung	9,001	9,312	9,672	10,033	10,393	10,828	11,262	11,697	12,176
3.Breast	9,763	10,425	11,208	11,992	12,775	13,742	14,709	15,676	16,765
4.Leukaemia[6]	2,152	2,241	2,347	2,453	2,559	2,685	2,811	2,937	3,078

Source: Thai Cancer Information Network, Health Information System Development Office

[6] Within the number of patients in the Leukemia registration, approximately 10-18% have chronic myeloid leukemia (CML), mostly aged under 20years.

Table 3.4 Actual prescription and estimated use of the drug clopidogrel, mostly used by patients with coronary artery disease

Year	Estimated use (no. tablets)
2004*	470,722
2005*	761,152
2006*	1,635,732
2007**	1,863,953
2008**	2,292,303
2009**	2,720,655
2010**	3,149,005
2011**	3,577,355

Source: *Actual hospital procurement data from Department of Medical Supplies, Ministry of Public Health

** Forecast based on the following equation y = 42,835 x - 27,779 (R^2 = 0.87)

2. Data on drug prices was obtained from the government agencies responsible for the various aspects of implementation of the government use licenses; namely MoPH, the National Health Security Office (NHSO) and the Government Pharmaceutical Office (GPO). The prices of the original and generic versions of the seven drugs are listed in Table 3.5 below. The price data compares the market prices of the original drugs at the time of the grant of the government use licenses with the prices of the generic equivalents. Generic drug prices were based on data of actual imported generic drugs, or in the case of the anti-cancer drugs, the estimates from MoPH sources

Table 3.5 Price of original and generic drugs

Drug specification	Price (USD)		% of price reduction
	Original	Generic	
1. EFV 600mg	2.0[1]	0.7[1]	66%
2. LPV/r 133mg/33mg	2.1[1]	-	70%
LPV/r 200mg/50mg	-	0.6[1]	
3. Clopidogrel 75mg	2.3[3]	0.1[2]	98%
4. Letrozole 2.5mg	7.0[4]	0.2[4]	97%
5. Docetaxel 80mg	863[3]	37.9[5]	96%
Docetaxel 20mg	237.71[3]	9.1[5]	96%
6. Erlotinib 150mg	83.7[3]	22.4[4]	73%
7. Imatinib 400mg	111.6[3]	-	-

Source: [1] Data from the National Health Security Office for: EFV (Original drug, Nov-Dec 2006, Generic drug, Jan 2007) and LPV/r (Original drug, Dec 2006, Generic drug, April 2007)

[2] Data from agreement to purchase generic drugs, Government Pharmaceutical Organisation, 18 April 2008

[3] News information, Department of Medical Supplies, Ministry of Public health, Oct-Dec 2007.

[4] Ministry of Public Health (2008), answer number 10 in important points about government use licenses policy for Cancer Drugs (No data available on agreement to purchase generic equivalent of the original drug)

[5] Bureau of Policy and Strategy, Ministry of Public Health

3. The data on probability of patients receiving drugs vary by disease. In the case of EFV and LPV/r, data on number of patients receiving ARVs is based on follow-up cases under the NHSO Fund for HIV/AIDS. For clopidogrel, the study used actual prescription to estimate use of the drug; hence there was no need for this parameter. For cancer patients, the generic drugs have not yet been imported, therefore, estimates were based on literature review and expert opinion as shown in Table 3.6 and Appendix 3.

Table 3.6 Probability of patients receiving drugs

Drug name	Disease	Mean	Standard Error	Distribution
EFV	HIV/AIDS	0.26*	0.0019	beta
LPV/r	HIV/AIDS	0.03*	0.0007	beta
Docetaxel	Breast Cancer	0.10**	0.003	beta
Docetaxel	Lung Cancer	0.11**	0.0035	beta
Erlotinib	Lung Cancer	0.02**	0.0016	beta
Letrozole	Breast Cancer	0.18**	0.0038	beta
Imatinib	CML cancer	0.09**	0.0059	beta
Imatinib	GIST cancer	0.04**	0.0068	beta

Source : * Survey by the National Health Security Office

** Estimates by experts from the National Cancer Institute in response to scenario 1; see appendix 3.

4. The transition probability of dying by each group of patients was based on findings of a literature review on the survival rate of patients receiving a specific drug. These rates were used to estimate the cost of providing drugs to patients with increased life expectancy, based on the assumption of continued drug provision. In the case of cancer patients in Thailand, it was found that the drug Letrozole for treatment of breast cancer, Imatinib for treatment of Gastrointestinal Stromal Tumor (GIST) and chronic myeloid leukemia (CML) needs to be provided for over one year. The estimated short- and long-term costs to the government in terms of drug procurement based on data from literature review are outlined in Table 3.7.

Table 3.7 Transition probability of dying by group of patients

Group of patient	Transitional probability of dying	Reference
Breast cancer patients on Letrozole	0.02	(Mouridsen,2007)
GIST patients on imatinib	0.12	(Demetri et al.,2002)
CNL patients on imatinib	0.02	(Druker, Guilhot, and O'Brien,2006)

Using the Markov model, we were able to project the number of patients to access drugs per year. The direct cost of treatment was based on this number multiplied by the cost of drugs for the treatment for one person per year. This analysis was conducted for each drug, costs was based on the average Thai baht-US dollar exchange rate for current year 2008 (from January to September 2008), based on rates from the Siam Commercial Bank, Bangkok of 32.86 baht per USD. This study applied a discount rate for costs of 3% for estimating the future costs and benefits of the treatment (Permsuwan, Guntawongwan, and Buddhawongsa,2008). The study also assessed the level of parameter uncertainty, including the estimated number of patients in need of drugs, access to drugs, and cost of treatment per person, using the Probabilistic Sensitivity Analysis, which assesses the robustness of the results in costs of care when using 1,000 rounds of random combination of parameter uncertainties. The average cost was then determined (Limwattananon,2008).

The results of the impact on cost of drugs when using generic instead of original drugs are presented with a 95% confidence interval, as shown in Appendix 4.

Scenario 2: Methodology

Scenario 2 assumes that some patients do not have access to the drugs needed, due to the high cost despite their inclusion in the NLEM. Patients with access to the drugs are those who can afford to pay, or those covered under the CSMBS which covers the costs of these drugs. The government use licenses are therefore intended to increase access to the drugs for the remaining population (approximately 90% of the population in Thailand). Assuming an increase in access to drugs, Scenario 2 assesses the health economic impact from the societal perspective; namely, the increase in number of patients with access to the drugs and the subsequent positive and negative impact in terms of quality of life, extended life expectancy, ability to return to work and contribute towards national productivity. At the same time, the increased number of patients accessing drugs should also result in increased expenditure on health. The difference between the two would be the net benefit arising from the government use licenses. The study also compared the cost of treatment using generic drugs to alternatives or existing drugs available prior to the government use licenses, in order to estimate the incremental benefit of the increased number patients with access to drugs. A final point to consider in this evaluation of health economic impact is the additional benefits from the government use licenses, in terms of the benefit to patients who have experienced adverse side effects or low efficacy on alternative drugs, prior to the government use licenses. With the availability of generic drugs, patients may be more inclined to switch drugs, in which case the benefits would increase.

In summary, the impact of the government use government use license for each drug is based on the change in the number of patients accessing generic drugs compared to access to drugs prior to the government use government use license. The study does not consider patients who already have access to the drugs in question prior to the government use licenses, since this number would not change. This scenario allows for a cost-benefit assessment of the government use licenses. To determine the net benefit, this study assessed the impact on national productivity and government spending on each drug following the grant of the government use licenses, based on a comparison of the two

indicators under the conditions with, and without, the government use licenses to determine the Incremental Benefit.

1. Analysis of change in national productivity: It is assumed that all patients with access to drugs will contribute towards national productivity. The increase in national productivity is calculated by multiplying the Gross Domestic Product (GDP) per capita with the estimated QALYs gained from the increased access to drugs as a result of the government use licenses, described in Chapter 2.

2. Analysis of increase in health care costs: The cost of drugs can be grouped into two categories: (1) direct medical costs; and (2) indirect medical costs, which includes the cost of treatment of adverse effects of the drugs (if data is available)[7]. This study does not include non-medical costs such as cost of infrastructure or cost of travel to the hospital incurred by the patient, as these costs should not differ between the compared drugs. The key parameters used for the cost; total increase in number of patients with access to drug by year[8] multiplied by cost of drugs per patient per year as shown in Table 3.8 and 3.9

[7] EFV: Cost of drug includes direct cost and indirect cost including cost of treatment of adverse effects to the drug and cost of treatment of patients with increased life expectancy. Other drugs only include direct cost due to lack of data on indirect costs.

[8] In the case of EFV, LPV/r, Letrozole and Imatinib, the study assumed the patient would receive the drug for duration of five years; therefore the number of patients receiving the drug per year would include both the old and new patients. For other drugs, it is assumed the drug is provided for not more than 1 year, in accordance to guidelines for care for these illnesses under the National Health Security Office. Therefore the number of patients receiving drugs each year is only composed of new patients.

Table 3.8 Current and projected increase in number of patients with access to drugs

Drug	Disease	2007	2008	2009**	2010**	2011**	2012**
EFV	AIDS	2,815*	6,264*	10,391	14,255	17,959	
LPV/r	AIDS	***	623*	1,529	2,475	3,421	
Clopidogrel	2nd prevention ACS	***	4,069	12,207	12,307	12,394	
Letrozole	Breast Cancer		***	7,499	7,929	8,392	8,916
Docetaxel	Breast Cancer		***	1,347	1,440	1,533	1,638
Docetaxel	Lung Cancer		***	1,146	1,190	1,235	1,284
Erlotinib	Lung Cancer		***	52	60	68	76
Imatinib	CML		892	833	928	1,134	1,293
Imatinib	GIST		487	437	478	515	553

Source: * Data based on number of persons living with HIV/AIDS receiving drugs within the national health budget.

** Estimation based on linear equation

******* Imports of generic equivalent drugs are not yet available

Table 3.9 Health expenditures on drugs

The drugs under the government use licenses	Health expenditure (USD/yr)	Type and breakdown of cost estimates
1.EFV	1,922	Direct + indirect medical costs Include cost of adverse events to drug, cost of treatments of opportunistic diseases for the rest of the life
2.LPV/r (200/50 mg)	910	Direct cost of regimen based on 800/200 mg/d*
3.Clopidogrel+ASA	19	Direct cost of regimen- based on clopidogrel 75mg/d for *
4.Letrozole	78	Direct cost of regimen - based on 2.5mg/d*
5.Docetaxel (Breast Cancer)	225	Direct cost of regimen - based on 120mg/m2 IV over 1hr q 3 wk 4 cycle**
6.Docetaxel (Lung Cancer)	188	Direct cost of regimen – based on 100mg/m2 q21 4 cycle**
7.Erlotinib	2,684	Direct cost of regimen – based on 150mg/d 0ral in 4 months**
The comparative drugs	**Health expenditure (USD/yr)**	**Type and breakdown of cost estimates**
8.NVP	3,087	Direct + indirect medical costs Include cost of adverse events to drug, cost of treatments of opportunistic diseases for the rest of the life
9.IDV/r	1,210	Direct cost of regimen based on 1,600 mg/d*.
10.Aspirin	2	Direct cost of regimen - based on 75-325 mg/d*
11.Tamoxifen	111	Direct cost of regimen - based on 20mg/d *
12.Placlitaxel	1,826	Direct cost of regimen - based on 175mg/m2 IV over 3hr q 3 week 4 cycle*
13.Pemetrexed	5,470	Direct cost of regimen - based on 500mg/m2 q21 4 cycle*

Source: * National Health Security Office: antiretroviral regimens

**National Cancer Institute: regimens for treatment of cancer

3.4 Results

Results for the two scenarios are presented below:

3.4.1 Scenario 1

Based on the assumption that all patients had full access to all drugs of interest prior to the grant of the compulsory government use license, the study found that the government use licenses resulted in a significant reduction in government drug expenditure (Figure 3.3). The savings for the government's health budget, as a result of the government use licenses, are shown in Table 3.10 below.

Figure 3.3 Comparison of public expenditure with and without the use of government use licenses by drug (in million USD)

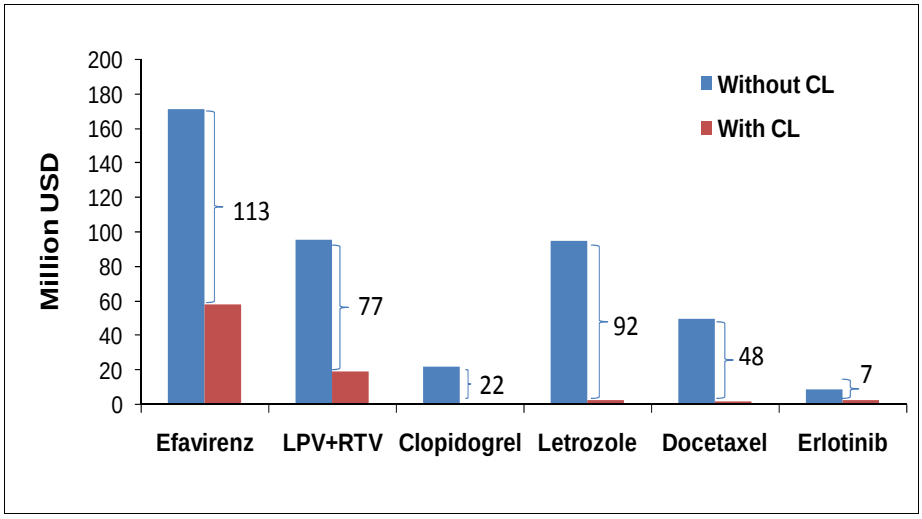


Table 3.10 Cost savings by drug through the use of government use licenses

Drugs included in the Patent Policy	Cost savings through Government use licenses (millions USD)	95% confidence interval (millions USD)
1. EFV	113.4	112.3-114.6
2. LPV/r	76.8	76.1-77.4
3. Clopidogrel	21.5	21.5-21.6
4. Letrozole	91.8	85.4-98.2
5. Docetaxel	47.6	44.4-50.8
6. Erlotinib	6.7	6.1-7.3
Total	**357.8**	**345.8-369.9**

This study found that the government use licenses for six drugs resulted in a net benefit, in terms of reduced cost of drug expenditure over a five-year period following the grant of the licenses. The cost savings amount to approximately 358 million USD. The use of generic version of EFV resulted in the largest cost savings, as it is the main component of HIV/AIDS treatment. The second largest cost saver was letrozole, which is used for treatment of initial stages of breast cancer and provided to relatively large number of patients. Furthermore, the cost of the original drug of letrozole is 30 times higher than its generic version. The third biggest cost saver is LPV/r, an ARV drug used in cases where patients are resistant to the EFV, of which there are relatively few at present. Docetaxel, used for treatment of breast cancer and lung cancer at the advanced stage, is the next in costs saving. The drugs with relatively small cost savings are clopidogrel, used for patients with coronary artery disease and erlotinib, used for patients with advanced lung disease when docetaxel is no longer effective. There are relatively few cases using the latter two drugs when compared to the other drugs.

3.4.2 Scenario 2

The study found that the greatest increase in number of patients with access to drugs was in the case of EFV (Table 3.11). A large number of patients will have switched from NVP, and further, the incidence of adverse effects is higher in NVP. EFV has higher efficacy and is less costly than NVP. The government use government use license for EFV resulted in a net benefit of 67 million USD. In the case of LPV/r, there was limited data on utility of patients accessing this drug. Consequently, the analysis was based on the utility of general patients with CD4 under 200 cells/ml and viral load of less than 400 copies/ml (i.e., those in need of ART with an utility estimate of 0.863 QALYs). Assuming patients receiving LPV/r or IDV/r have a similar utility as general symptomatic patients, there would be no additional gain in utility through the use of LPV/r, and the study therefore assesses only the difference in cost, which is estimated at 2.3 million USD.

For clopidogrel, the government use government use license may increase access to this drug if it was used for secondary prevention of coronary artery disease; where patients would receive clopidogrel and aspirin, instead of aspirin alone. The incremental benefits, when compared to provision of aspirin alone, are estimated at 5.7 million USD. In the case of letrozole, if a generic version is imported, the drug could be used for hormone therapy instead of tamoxifen, for treatment of early and late stage breast cancer. The incremental benefits are estimated at 12 million USD.

For docetaxel, when used as treatment for advanced cases of breast cancer, patients will be able to access this drug instead of paclitaxel. Docetaxel is more efficacious, resulting in an incremental benefit of 12.5 million USD. If the drug is used for advanced cases of lung cancer, it would provide an important alternative treatment option over pemetrexed. The incremental benefit of provision of docetaxel for lung cancer patients would be 25.7 million USD.

In the case of erlotinib, which is used for advanced cases of lung cancer for patients who cannot use docetaxel, there are relatively few cases and few

alternative treatments (gifetinib is one of the few alternative treatments). Due to limitations in data to make comparison to its alternatives, this study compared costs and benefits of erlotinib with the null scenario ('do nothing'), for which we found that there will be a net loss of 0.3 million USD.

In the last case of imatinib, used for treatment of CML and GIST, both of which there is no alternative treatment, all patients currently receive free access to the drugs under the GIPAP Program. The analysis therefore includes only the net benefit since there are no costs. The estimated benefits in use of imatinib to treat CML and GIST are 4.1 million USD and 3.1 million USD, respectively. The main reason that the benefits are higher in the treatment of CML compared to GIST is that prevalence of CML is approximately double that of GML. In total, the incremental benefit of increased access to imatinib is estimated at 7.2 million USD.

Table 3.11 Net and incremental benefits from the government use government use license, comparing public health expenditure prior to and after the government use licenses

Drug Name	Treatment	Access to the drug (number of patients & duration)	Benefit (millions USD)	Health expenditure (millions USD)	Net Benefit (millions USD)	Incremental Benefit (millions USD)
EFV	1st line ARV	17,959 over 4 years and 11 months	309	97	212	**67**
NVP			301	156	145	
LPV/r	2nd line ARV	3,421 over 4 years	8.6	6.9	1.7	**2.3**
IDV/r			8.6	9.2	-0.6	
Clopidogrel+ASA	2nd prevention of ischemic events	40,947 over 3 years and 4 months	870.6	0.9	869.7	**5.7**
ASA only			864.1	0.1	864.0	
Letrozole	Breast Cancer Hormone therapy	8,916 over 4 years	343	2	341	**12**
Tamoxifen			332	3	329	
Docetaxel	Breast Cancer Chemo therapy	5,958 over 4 years	14.6	1.3	13.3	**12.5**
Paclitaxel			11.1	10.3	0.8	
Docetaxel	Lung Cancer Chemo therapy	4,855 over 4 years	5.6	0.8	4.8	**25.7**
Pemetrexed			5.6	26.5	-20.9	
Erlotinib	Lung Cancer Chemo therapy	256 over 4 years	0.3	0.6	-0.3	**-***
Imatinib	CML Chemo therapy	1,293 over 5 years	4.1	-**	4.1	**7.2**
	GIST Chemo therapy	553 over 5 years	3.1	-**	3.1	
Total		**84,158**				**132.4**

* Erlotinib: no data available to assess the incremental benefit

** Imatinib: no data on cost of drug as patients access the drug for free under the GIPAP Program

3.5 Summary and discussion

In Scenario 1, where all patients already have access the drugs prior to the government use licenses, the use generic drugs instead of original drugs resulted in a reduction of the national health expenditure. This study estimates cost savings to the country, as a result of use of generic versions of the six drugs in question, will be approximately 357.8 million USD during the five-year study timeframe.

Although this scenario is not appropriate to assess the impact of the government use licenses for the seven drugs (since it does not reflect the true situation of lack of access), it was still important to consider, because it is the scenario used by MoPH and NHSO to explain to the public the expected benefits of the government use licenses (Ministry of Public Health and National Health Security Office,2007). This scenario is more useful in the situations where full access to specific drugs already exist, but affordability or sustainability is of concern.

In Scenario 2, where some patients are assumed not to have access to the drugs, the government use licenses will have increased access to treatment. The impact was assessed in terms of incremental benefits to health, as a result of increased access to the seven drugs; this was estimated to be approximately 132.4 million USD for the five-year study timeframe.

Benefits obtained under Scenario 1 exceed that of Scenario 2 for a number of reasons. First, Scenario 1 assumed access for all patients in need while Scenario 2 used only the incremental number of patients who received access to treatment as a result of the government use licenses. Second, Scenario 1 measured only the difference in the costs of treatment using the original versus genetic product of the same drug, while Scenario 2 compared the costs of treatment of the generic drug under the government use licenses versus its alternative medication. Scenario 2 is the most appropriate for use as it reflects the situation in Thailand.

It is interesting to note that the economic impact varied for each drug. EFV provided the greatest economic benefit in both scenarios, due to the high number of HIV patients in need of the drug as a replacement for NVP. For letrozole and docetaxel, for which there was the greatest price difference between the original and generic drugs and a large number of patients in need of these drugs, both demonstrated large incremental benefits from the government use licenses. In the case of erlotinib, which is only used for treatment of certain cases of lung cancer, such as patients who has already failed docetaxel based treatments, it had the lowest economic impact (impact assessment only possible for Scenario 1) as few patients are in need of this drug (The committee of the health care improvement of lung cancer treatment,2006).

This Chapter and the previous Chapter have shown that the government use licenses for the seven drugs have resulted in significant benefits on health and economics. However, the potential benefits could be even greater if the importation of generic drugs were conducted more speedily. The delays experienced are due to numerous reasons. For instance, the generic producers were threatened with prosecution by the patent holding companies (Velasquez, Aldis, and Timmermans,2008). There were also political changes in Thailand coupled with changes in policy, which caused delays in the implementation of the government use licenses and the drug registration process. It can be argued that were the government agencies more prepared to facilitate the administrative process for the registration and import of the generic drugs, despite the political changes, the importation would have been speedier.

3.6 Limitations of the study

The economic impact assessment of the government use licenses is based on the notion of human capital, which considers ill health or premature death as a loss to the society. It should be noted that analysis based on this concept has been critiqued on a number of aspects; including the use of GDP per capita which is based on paid work and does not include the value of unpaid work (e.g., housework) that provides significant benefits to society. Therefore, the impact on national productivity may have been underestimated. On the other hand, the measure of GDP per capita includes work by foreign nationals in the country, which may result in an overestimation of

national productivity. Furthermore, the potential activity of patients receiving treatments will vary by age and disease. For example, HIV patients are often of a younger age than patients with coronary heart disease, hence each group would contribute to national productivity at different levels. The use of GDP per capita, however, is based on the national average life expectancy, assuming all patients are the same. Although there are age or illness differences, the average contribution of the person has been treated as the same.

As with the previous Chapter, there are limitations in the methodology used, due to limited data. Much of the analysis is based on available data on current access to drugs, which may change in the future. The study did not allow for other factors of influence in a patient's access to drugs, due to limited data on these areas of study. Therefore this study timeframe was set at five years following the grant of the government use licenses - a longer timeframe may lead to further inaccuracies. The health care costs for the care of patients with increased life expectancy (as a result of increased access to generic drugs), was assessed for a period of five years, with the exception of EFV (which is a lifelong treatment). For this reason, the actual cost of treatment may well be higher than the estimated cost, and if the estimated benefits are divided by the cost of health care to derive the net benefit, it may be higher than actual benefit.

For Scenario 2, the benefits from the grant of the government use licenses may have been underestimated, since the cost savings of patients who had previously been treated with original drugs but switched to the generics after the government use licenses, were not included. The study was not able to differentiate the number of patients receiving original drugs at government hospitals who may switch to generic drugs after the grant of the government use licenses, from those patients receiving original drugs in private hospitals (who would not be eligible to access the imported generic drugs). The full extent of the potential benefits could not be determined, due to these limitations.

Chapter 4

Impact on national economy and foreign investment

4.1 Background

As stated in Chapter 1, one of the main barriers to developing countries using the TRIPS flexibilities, including government use licenses, is the fear of retaliation from the more powerful industrialised countries. Thailand is one of many developing countries heavily reliant upon exports, which constitute approximately 60% of its Gross Domestic Product (GDP). The main export market for Thailand is the United States, which currently accounts for 15% of total exports.

Following the grant of the government use licenses in Thailand, at the end of 2006 and early 2007, the Office of the United States Trade Representative (USTR) announced the elevation of Thailand from the Watch List (WL) to the Priority Watch List (PLW) in its Special 301 Report of 2007. Insufficient protection of intellectual property rights (IPR) and the grant of the government use licenses were stated as the reasons for the elevation: "(*I)n addition to these longstanding concerns with deficient IPR protection in Thailand, in late 2006 and early 2007, there were further indications of a weakening of respect for patents, as the Thai Government announced decisions to issue compulsory licenses for several patented pharmaceutical products. While the United States acknowledges a country's ability to issue such licenses in accordance with WTO rules, the lack of transparency and due process exhibited in Thailand represents a serious concern."* (USTR,2007b).

On the 1 July 2007, the USTR announced its decision to withdraw benefits under the Generalized System of Preferences (GSP) for three Thai exports; namely: 1) gold jewellery; 2) polyethylene terephthalate in primary forms; and 3) flat screen colour television sets. It was widely speculated that the GSP withdrawal for these products was due to the grant of the government use licenses.

Questions were raised about the impact of these measures on Thailand's export income and on the industries affected by the withdrawal of GSP benefits. Reports in the printed and electronic media suggested that the export value in jewellery sector might be reduced by 20% (Prachachart Turakit,2007). In one estimate, it was claimed that the removal of duty free status for the products would result in losses of 982 million USD (33,388 million baht) for Thai exporters (380 degree,2007).

It was also anticipated that there may be a reduction in foreign investments in Thailand, particularly by multinational pharmaceutical companies as a result of their lack of confidence in the intellectual property rights protection system in Thailand. Some commentators predicted that the grant of the government use licenses would deter foreign investors from investing from Thailand (Money Channel True Visions 80,2007).

It is noted that a wide range of factors can affect the performance of the export industry and the level of foreign investments in Thailand, including the overall economic and political environment, the exchange rate, technological advancement and labour costs (Tookey,1964) and (Mello,1997). Despite claims that the GSP withdrawal benefits for Thai exports was not due to the grant of the government use licenses, it is widely believed that the decision was highly influenced by the use of compulsory licenses in Thailand and is likely to have enormous impact on Thai exports. It is also noted that the 15 GSP eligibility criteria includes one related to intellectual property protection.

This component of the study does not aim to demonstrate the relationship between the government use licenses and Thai exports because there are many other more influential factors at play, such the exchange rate, price of products, specific characteristics of products or purchasing power of the buyer (Tongpakdi N,1999). This study aims, instead to study the possible impact on national exports and on short- term foreign investments in Thailand, following the grant of the government use licenses.

4.2 Objectives and methodology

4.2.1 Assessment of impact of GSP withdrawal status on national exports

The US established its GSP program in 1976 for a group of developing countries, which included Thailand. Products under GSP coverage receive duty free entry into the US market for a specified duration. The initial duration was until 1993, but Thailand has since renewed its eligibility for the fifth time, which covers the period 1 January 2007 to 31 December 2008. It should also be noted that, apart from the US, Thailand has also GSP status vis-à-vis the European Union, Japan, Canada, Switzerland, Norway, Turkey and Russia (Department of Foreign Trade,2005).

Table 4.1 United States GSP system

Conditions of GSP	- Market is open to US products and services - Protection of intellectual property rights - Protection of labour rights in accordance to international standards - Level of economic development determined by GNP per capita (USD), revised every year (in 2003 set at 10,066 USD GNP per capita) - Clear policies on investments and removal/reduction of conditions attached to investments - A necessary in receiving GSP status of developing country - Support for the United States against terrorists
Clauses of the GSP	(1) Ineligibility for GSP status: countries eligible for GSP may have products removed or temporarily removed from the GSP benefit if the annual value of import to the US exceeds the following Competitive Need Limit (CNL): - Exceeds 50% of the US market share - Import value exceed annual limit (in 2006, the limit was set at USD 125 million USD, the limit increases by 5 million USD per year) The provision of GSP status is reviewed annually, there has been Thai products removed from the GSP list due to it exceeding the CNL. (2) Reinstating GSP status: Products removed of its GSP status may be reinstated by two means: 2.1 Redesignation: the product has GSP status restored if the CNL has not been exceeded in the following year. 2.2 Waiver of CNL: if the product was removed from the GSP list and the export level in the following year exceeds the CNL, the GSP status maybe restored under discretion of the president of the United States.
CNL Waiver Review	Products may be deemed eligible for CNL Waiver for a period of five years or less under the following conditions: Value of product exceeds 150% of CNL for that year (in 2006 CNL set at 125 million USD, 150% would be in excess of 187.5 million USD) Value of product exceeds 75% of the value of total US imports of the article from all countries or under consideration of the president of the United States.
Decision options regarding GSP	1. GSP withdrawal status by product (based on CNLs) 2. GSP withdrawal status by country (based on GNP per capita)

Source: Department of Foreign Trade

Following an examination of values of exports to the United States in 2006, it was announced in 2007 that GSP eligibility would be removed for three Thai products. GSP status for polyethylene terephthalate in primary forms and flat screen colour television were removed due to their competitive needs limitations (CNL) being exceeded. Both products had received the CNL waiver for the previous five years. All three products constituted an US import value exceeding 125 million USD, as outlined in Table 4.2. Hence, it would seem likely that the GSP withdrawal benefits for these products was due to the exporting value exceeding their CNLs, rather than to the grant of the government use licenses.

Table 4.2 Product identification and details of US import values of products removed from GSP eligibility in 2007

Product identification HTS8	Import value (USD)	Market share (%)	Product details
3907.60.00	134,455,839	11.5%	Polyethylene terephthalate in primary forms
7113.19.50	700,362,824	10.5%	Precious metal (o/than silver) articles of jewelry and parts thereof, whether or not plated or clad with precious metal, nesoi
8528.72.64	148,201,745	30.7%	Color television reception apparatus w/flat panel screen, video display diagonal over 34.29 cm, incorporating a VCR or player

Source: Office of United States Trade Representative

On investigation at the Department of Export Promotion, Ministry of Commerce, we found that Thailand had changed from the Harmonized system HS2002 to HS 2007 as of 1 January 2007 and the eight digit product identification code of the products removed from GSP status could not be found to compare tariffs/custom duty from the Customs Department. Hence, data for this study was collected

from the USTR using the USTR product identification codes for the relevant products to compare the value of exports before and after the GSP withdrawal status.

Table 4.3 Product identification codes used in this study

USTR product identification code of products removed from GSP status	Identification code used in the study (year)
3907.60.00*	3907.60.0 (2005-2007) 3907.60 (2008)
7113.19.50	7113.19
8528.72.64	8528

*An explanation of product match data in Thailand

4.2.2 Assessment of the impact on foreign investment in Thailand

Foreign investment takes place either through the more classic form of foreign direct investment (FDI) or through investments in the stock and bonds market. When assessing the impact of foreign investments on a national economy, the focus is generally on FDI as they are considered long-term investments in land, property and equipment that can result in employment, technology transfer and know-how, hence contributing to the economic development of the country (Brimble,2002). In this study, however, both forms of investments are considered.

a) Foreign Direct Investment

To study the changes in FDI, the analysis was based on data, obtained from the Thailand Board of Investment, on applications for permits for foreign investment, as this reflects the level of confidence of investors in investing in Thailand. Statistics from the Thailand Board of Investment divides businesses into seven categories (The Board of Investment of Thailand,2007) as follows

Category 1 Agriculture and agricultural products
Category 2 Minerals, ceramics and metals
Category 3 Light industry such as production of threads, gems
Category 4 Metal production, machinery, transportation equipment
Category 5 Electronics industry and electric appliances
Category 6 Chemical, paper and plastic industry
Category 7 Service industry and infrastructure

This study focuses on the categories most related to health and research and development, and will focus on applications for permits for FDI in Categories 5, 6 and 7. Particular attention was paid to the latter two categories as they are most likely to be related to pharmaceutical industries and industries related to the production of medical equipment and health services. In addition, a list of companies based in the US or European Union, which requested permits for FDI since 1970 was collected and analysed to assess the composition of investment in industries in Thailand.

b) Short-term investments

Short-term investments are defined as investments of less than a year, such as investments in the stock and bonds markets. Although short-term investments may not have the same national benefits as long-term investments, it can be an indicator of the level of investor confidence in Thailand. This study examined changes in activity in the Stock Exchange of Thailand (SET) Index in the seven days prior to, and after, the grant of the government use licenses and the announcement of the withdrawal of GSP status for the three products. Given that the stock market is highly sensitive to such announcements, it should be a good indicator of investor confidence in Thailand. In summary, this study assesses the conditions of the Thai financial market to assess fluctuations in the period before and after the grant of the government use licenses and announcement of GSP withdrawal status, using data from the SET Index, focusing on health-related industries.

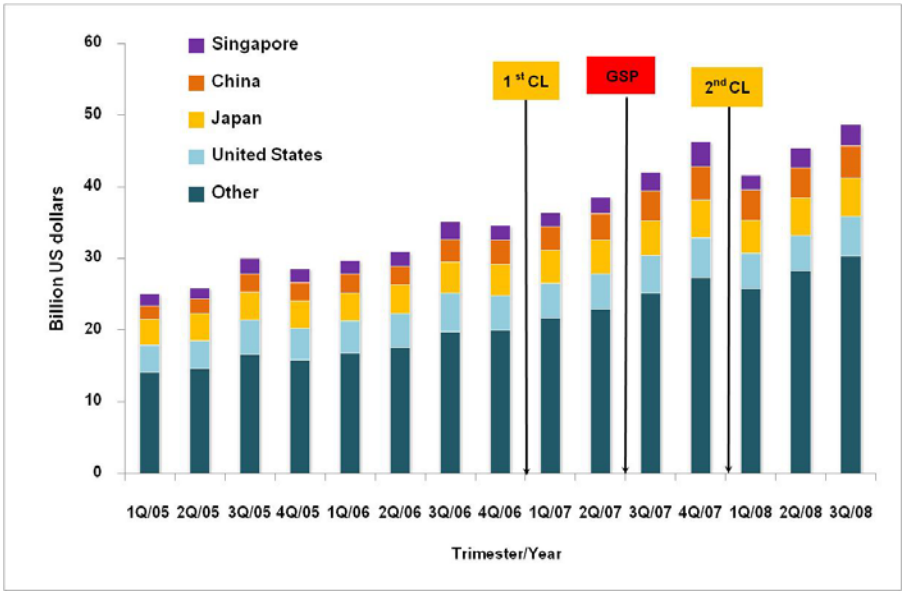
4.3 Results

The results of the analysis are presented in four parts as follows: (1) status of Thailand's overall exports and the export value of three products for which GSP status was removed; (2) the estimated impact on exports; (3) status of long-term investments; and (4) status of short-term investments in the financial market.

4.3.1 Thailand's overall exports and export value of the tree products

Over the past three years (2006-2008), the total value of Thailand's exports increased steadily; including exports to the US despite the government's use of CL and the announcement of GSP removal. Although the US has always been Thailand's most important trading partner, Thai exports to Japan in 2008 came close to the same value as exports to the US, as seen in Figure 4.1

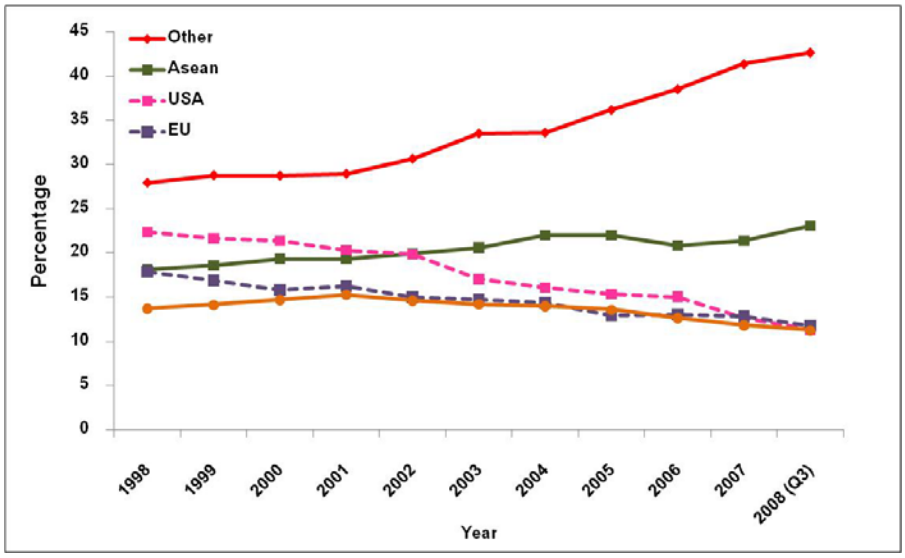
Figure 4.1 Value (in billions USD) of Thailand's total exports by countries and timing of issuance of government use licenses and GSP withdrawal status



Source: Department of Export Promotion

Figure 4.2 below shows the share of Thailand's exports to its main trading partners over the past ten years: exports to the US and EU have been decreasing, there is little change in exports to Japan, while there has been an increase in the exports to ASEAN and other countries. For the past three years, the value of exports to the US has seen little increase; in 2005, the figure was 16.9 billion USD, 19.6 billion USD in 2006 and 20.6 billion USD in 2007. Although a very important trading partner, the proportion of exports going to the US is clearly decreasing.

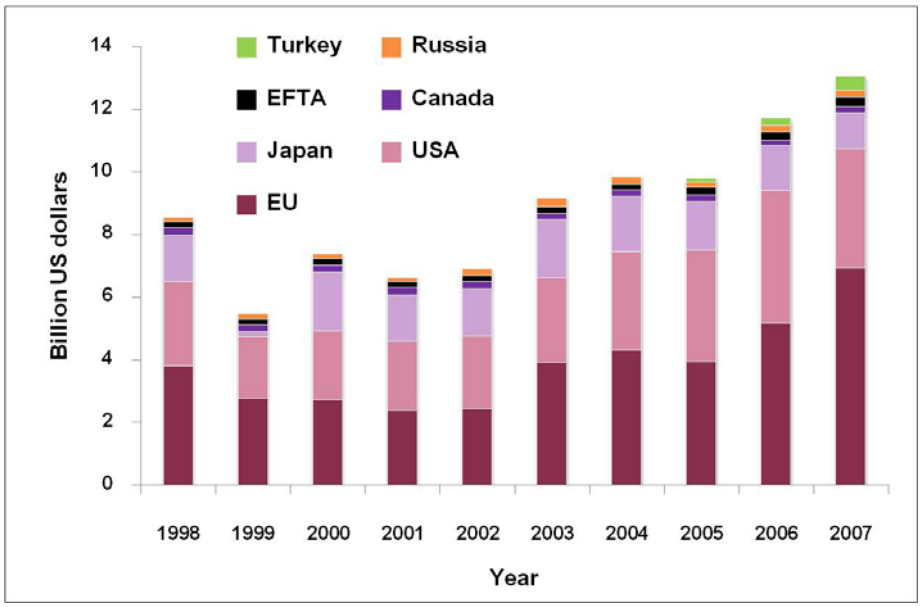
Figure 4.2 Share (%) of exports to main trade partner from 1998 to the third quarter of the year 2008



Source: Information and Technology Communication Centre, Office of Permanent Secretary, Ministry of Commerce in collaboration with the Customs Department

In terms of GSP exports, Thailand exported products under GSP status to the European Union, United States, Japan, Canada, European Free Trade Association, and Russia, during the period 1998 and 2007. In addition, Thailand began exporting products under GSP status to Turkey from 2003. In 2007, Thailand's total exports under GSP status to all countries was valued at approximately 13 billion USD, with the largest number of GSP exports going to the EU, followed by the US and Japan, as shown in Figure 4.3 below.

Figure 4.3 Value (in billion USD) of exports under GSP

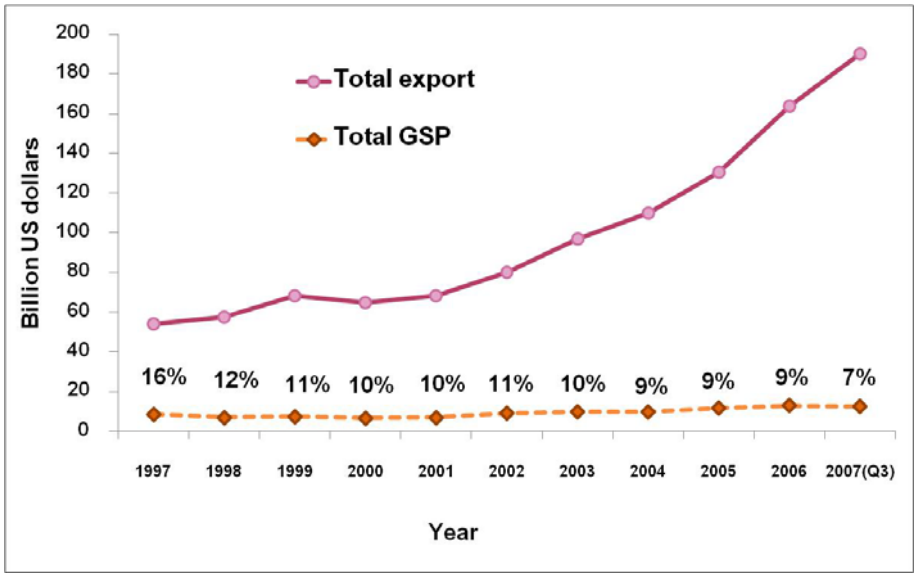


Source: Trade Benefits Office, Department of Foreign Trade

Comparing the value of exports under GSP status with the overall value of exports, for the period 1998 to 2007, and the forecast for 2008 (based on export values of the same month from the previous year, August 2007), we find that the value of GSP exports has not changed much over the past ten years, ranging from 8-10 billion USD. At the same time, the value of total exports has increased steadily, resulting in decreasing proportion of exports of products with GSP status, as shown in Figure 4.4 below. From Figure 4.4, we can see that the total value of Thai exports has quadrupled over the past 10 years. The proportion of

exports of products with GSP status has decreased significantly, from 16% in 1997 to 7% in 2004.

Figure 4.4 Value of exports under GSP compared to value of total exports (GSP product as proportion of total export market in percentages).

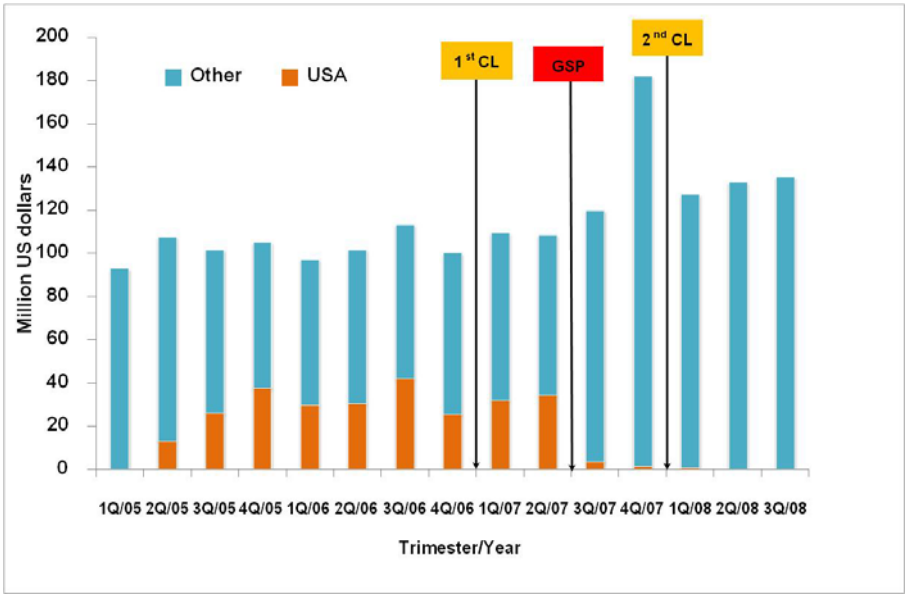


Export status of the tree GSP products

1. Polyethylene terephthalate in primary forms

Data on the overall export of this product over the past 3 years has seen little change. In terms of exports to the US, Thailand began exporting this product from the second quarter of 2005 and experienced a gradual increase in export value. However after the GSP withdrawal status, exports to the US declined dramatically, from 34 million USD in the second quarter of 2008, to 4 million USD in the third quarter of 2008. In 2007, the US was the fifth biggest export market for polyethylene terephthalate in primary forms for Thailand, but by the third quarter of 2008, the position fell to number 34. The total value of exports of this product from Thailand fell to 1.4 million USD or 0.36% of value of total exports. The most important export market for this product is now Japan, Australia and Vietnam.

Figure 4.5 Value (in million USD) of export of Polyethylene terephthalate in primary forms to the United States and other countries

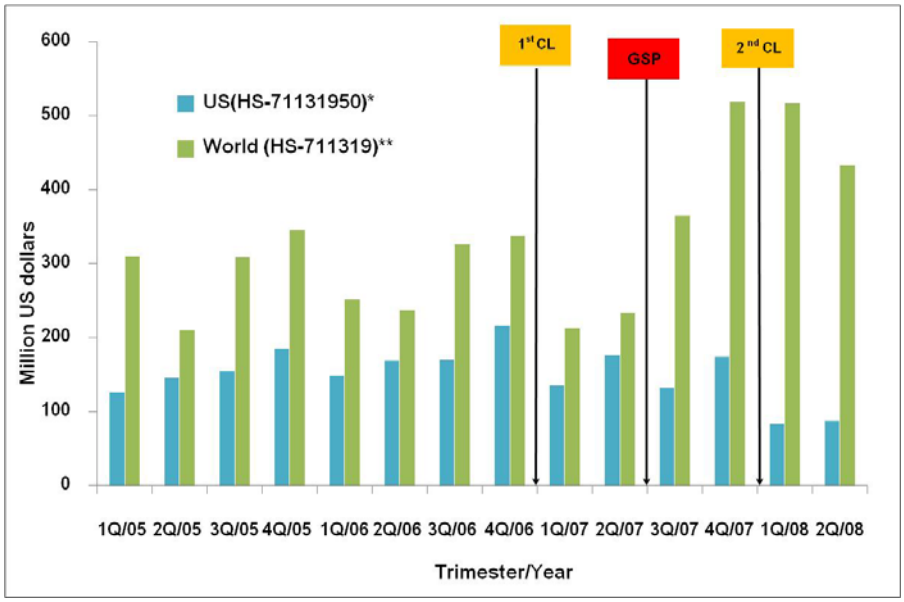


Source: Department of Export Promotion

2. Gold jewellery [9]

There was no data available for this product under the GSP product codes, therefore, we compared US data on imports with Thailand's export data under the product identification code HS 7113.19[10]. As shown in Figure 4.6 below, the value of exports of this product to the US has seen little change and the overall picture for exports of gems and jewellery tend to be positive. Data indicates that the biggest export market for Thailand for gems and jewellery is the US, followed by Hong Kong. After the grant of the government use licenses and the GSP withdrawal status, exports of jewellery to the rest of the world market increased, with a doubling of export value in the first quarter of 2008, an increase comparable to the total increase of the previous year, rising from 226 million USD to 516 million USD.

Figure 4.6 Value (in million USD) of exoprts in jewellery to the United States and Other countries



Source: * www.ustic.gov, ** Department of Export Promotion

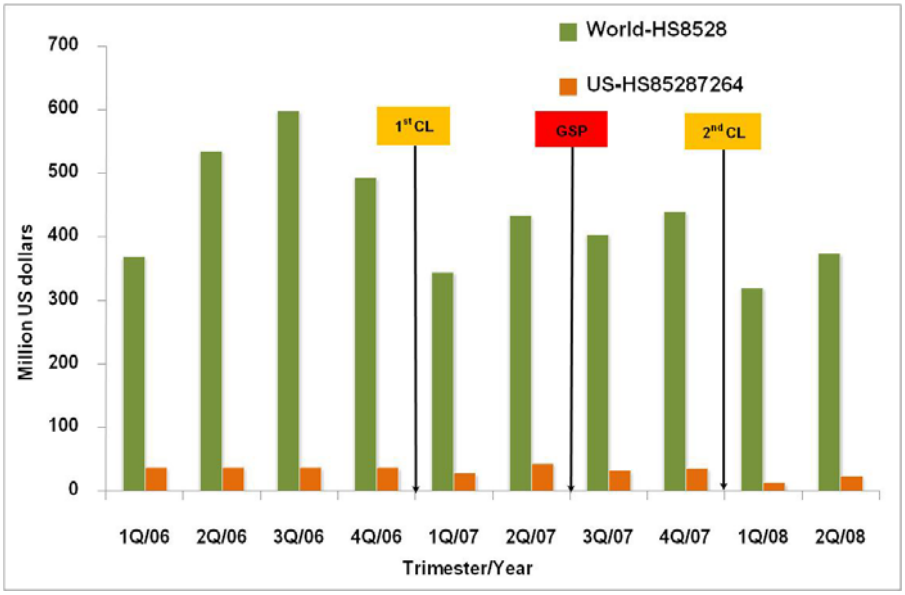
[9] HTS 7113.19.50: Precious metal (o/than silver) articles of jewelry and parts thereo, whether or not plated or clad with precious metal,nesoi

[10] HS 7113.19 :Articles Of Jewellery & Pts Thereof Of/O Prec Met W/N Plated/Clad W Prec Met

3. Flat screen colour television sets[11]

Due to limited data on tariffs for this product, we compared data on exports under the product identification code HS 8528. The largest export market for this product, in the third quarter of 2008 was the 'Rest of the World' (i.e., non-US) market with approximately 350-600 million USD. However, the US is the largest national market followed by India.

Figure 4.7 Value (in million USD) of export of Flat screen colour television sets to the United States and rest of the world.

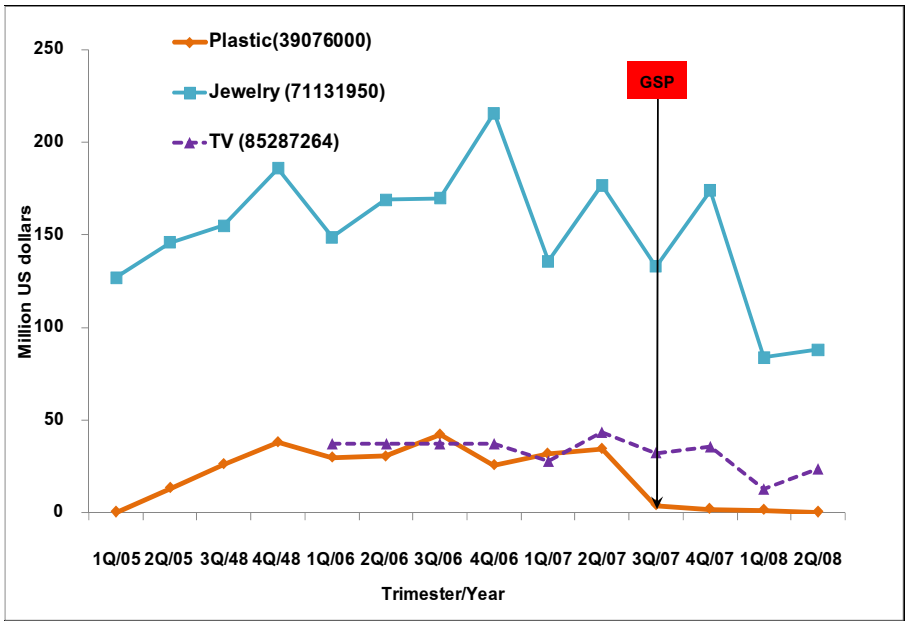


Source: Department of Export Promotion

A summary of exports prior to and after the GSP withdrawal status is illustrated in Figure 4.8 below. It should also be noted that the combined export value of the three GSP products represent 1.4% of the total national export in the first quarter of 2006 and reduced to 0.5% in the second quarter of 2008, as can be seen in Figure 4.9 below.

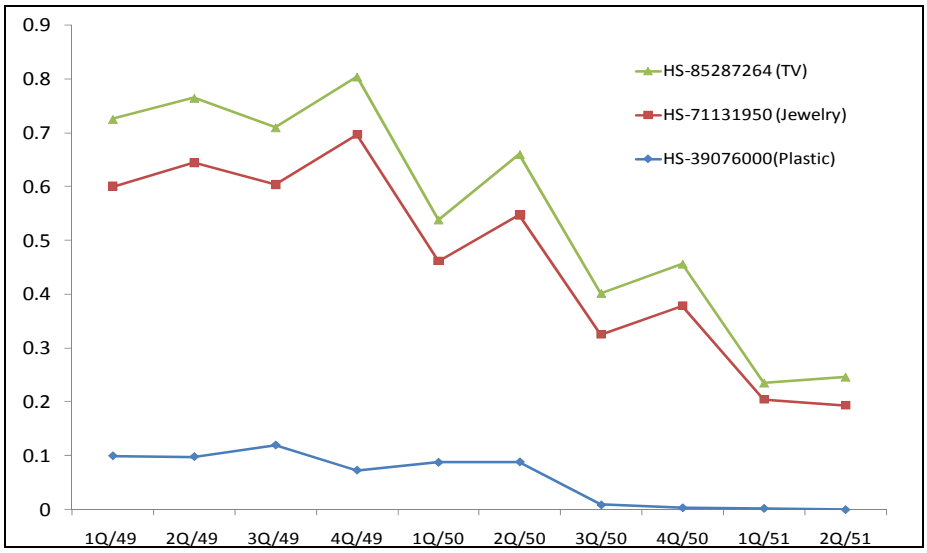
[11] Product indentification code 8528 : Mon & Projtr, W/O Tv Recep,Tv Rece W/N W Radio-Broad Rece/Snd/Video Rec/Reprod App

Figure 4.8 Change in value of export by product, prior to and after **GSP** withdrawal status



Source: Department of Export Promotion

Figure 4.9 Export of the 3 GSP products as percentage of Thailand's total export value



Source: Department of Export Promotion

4.3.2 Estimated Impact

As a result of the GSP withdrawal status, an import tariff of 6.5% was imposed on polyethylene terephthalate in primary forms, 5.5% on gold jewellery and 3.9% on flat screen colour television sets. Table 4.4 below outlines the increase in cost of export by product when applying import tariffs compared to having no import duty under GSP status.

Table 4.4 Increased cost for US importer and changes in value of export in each GSP cut's products(in million USD)

Product	Increased cost for US importer	Change in value of export[12]	
		US	Rest of the World
HS 3907.60.00 (plastic)	0.4	-128	130
HS 7113.19.50 (jewellery)	26	-220	723[13]
HS 8528.72.64 (Colour TV)	4.4	-40	-332[14]
Total	**30.8**	**-388**	**+521**

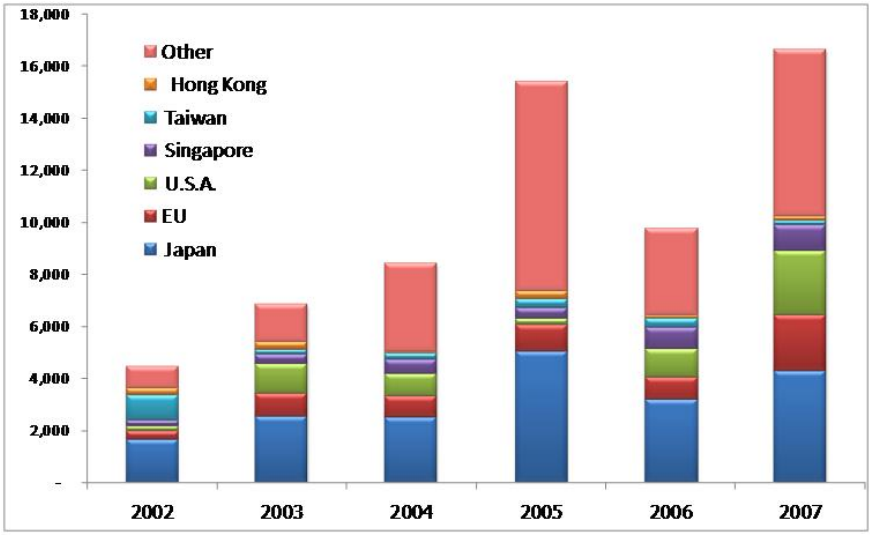
As seen in Table 4.4, the investment cost to the US importer increased by 30.8 million USD due to the cost of import duties for the three products following the GSP withdrawal status in the second quarter of 2008 (USTIC,2008). The study found that the total value of exports of the three products to the US was reduced by 388 million USD. At the same time, however, exports of these products to the 'Rest of the World' increased by 521 million USD.

[12] Change in costs 1 year before and after GSP withdrawal status
[13] HS 7113.19
[14] HS 8528

4.3.3 Status of foreign direct investment in Thailand

Data from the Thai Board of Investment indicate that FDI has increased steadily from 2002 to 2007, rising from 4 billion USD in 2002 to 16 billion USD in 2005. FDI decreased to 9 billion USD in 2006, following the political instability in Thailand, but then increased again to 17 billion USD by 2007

Figure 4.10 Total foreign direct investment in Thailand between 2002 and 2008, by country (in billion USD)

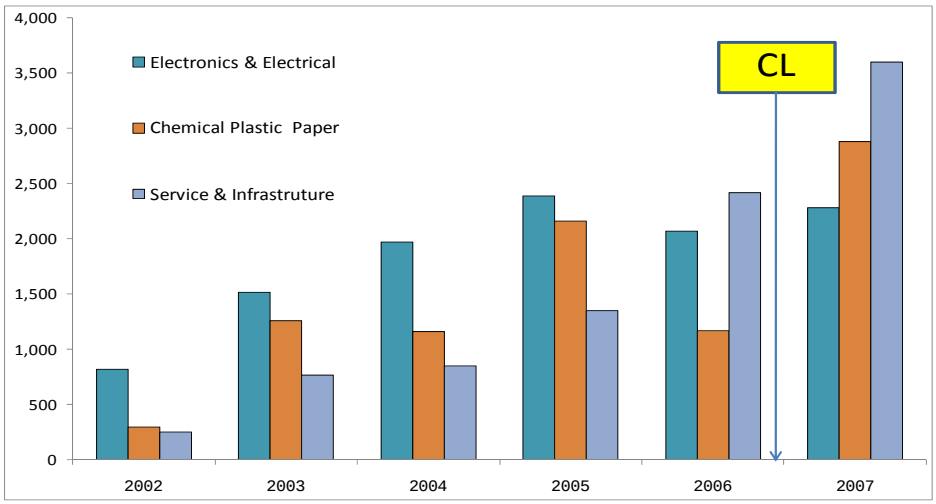


Source: Board of Investment, Thailand

The industry which attracted greatest interest from foreign investors was Category 7: Service industries and infrastructure, while Category 1: Agriculture and agricultural products, and Category 3: Light industries, received the lowest level of interest. The country providing the largest amount of foreign investment was Japan, followed by the European Union and the US.

Since 2002, foreign investments in the service industry and infrastructure have increased steadily from approximately 300 million USD in 2002 to 3.5 billion USD, an 11-fold increase over a five year period. The chemicals, plastic and paper industries, and the electronics and electrical appliances industry also saw an increase in foreign investments, but less than that observed in the services industry and infrastructure.

Figure 4.11 Total foreign direct investment by industry between 2002 and 2007 (in million USD)



Source: Board of Investment, Thailand

The level of foreign direct investments into Thailand is expected to decrease in 2008 due to the global economic slowdown. To date, there has been no evidence of a link between the government's use of CL and level of foreign investments to Thailand.

From data gathered on application for foreign investments in Thailand from 1970 to 2007, we found seven applicants from the US, which are related to pharmaceutical or medical supplies industry, with investments valued at approximately 14.37 million USD. Similar investments from five applicants from the European Union amounted to approximately 24.55 million USD, and resulted in the employment of 380 Thai nationals persons and 6 international staff. In summary, the level of investment and employment gained in these industries are very small in comparison to other major industries receiving foreign investments.

Table 4.5 Sources and amounts of investments from the United States in the pharmaceutical and medical supplies industry between 1970-2007

Rank	Company name	Sector	Total investment (millions USD)	Employment		Year
				Thai	Inter national	
1	Rhodia Thai Industries Ltd.	Acetic Acid, Aspirin	5.69	46	2	1970-2005
2	Rhodia Thai Industries Ltd.	acetic Acid, Paracetamol	2.11	4	0	1970-2005
3	J.E.P. Enterprise Co.,Ltd.	Medical gas equipments	0.30	69	2	1970-2005
4	Science development and management Co.	Antibody Antigen Test Kits	0.30	16	2	1970-2005
5	Vascular Innovations Co.,Ltd.	Cardiac Vascular Closure Device	0.46	34	3	2006
6	International Drug Development co., Ltd.	Clinical Trial	5.47	38	1	2007
7	Delphi Health Services Ltd.	Scientific Laboratories	0.05	4	0	2007
Total			**14.37**	**211**	**10**	

Source: Board of Investment, Thailand

Table 4.6 Sources and amounts of investments from the European Union in the pharmaceutical and medical supplies industry between 1970-2007

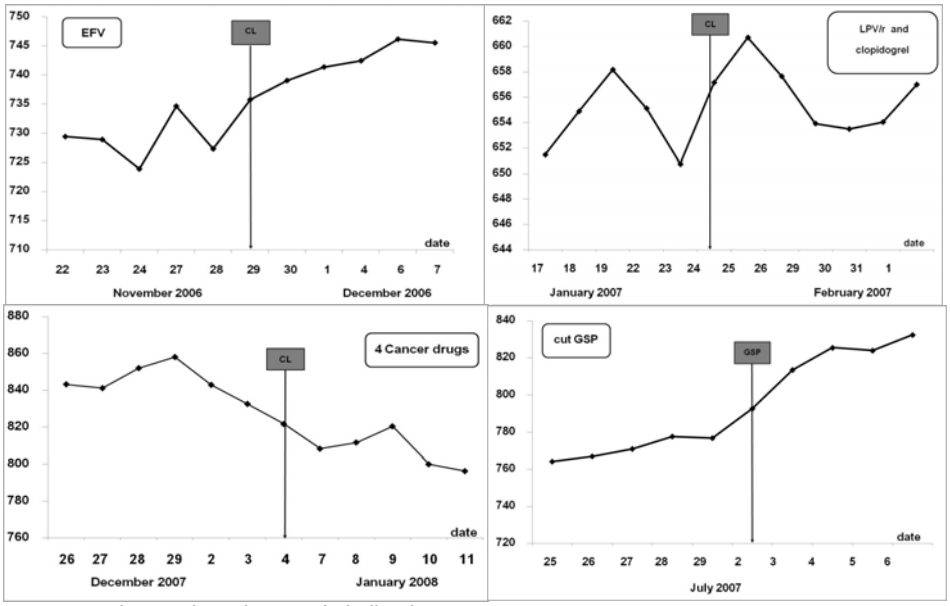
Rank	Company name	Sector	Total investment (millions USD)	Employment		Year
				Thai	Inter national	
1	Thai Nippon Rubber Industry Co.,Ltd.	Condom	3.20	99	1	1970-2005
2	W.A.Rubbermated Co.,Ltd.	Surgical Latex Gloves	2.68	119	1	1970-2005
3	Generic Bio-One Co.,Ltd.	Blodd Collection Tube	17.91	53	0	2006
4	Cyrtina Center Co.,Ltd.	Artificial Teeth; Guide for Artificial	0.58	10	1	2006
5	Oris Team Co.,Ltd.	Artificial Dental Products	0.18	99	3	2007
Total			24.55	380	6	

Source: Board of Investment, Thailand

4.3.4 Changes in the short term investment market

This study did not find major changes in the Thai Stock Exchange (SET) Index. In terms of changes in the value of the SET Index, it found that little evidence of a link with the timing of government use licenses or the GSP withdrawal status; rather, the SET Index seemed most responsive to the changing economic conditions of the US market, the Thai political climate and fluctuations of the Thai Baht, as illustrated in Figure 4.12.

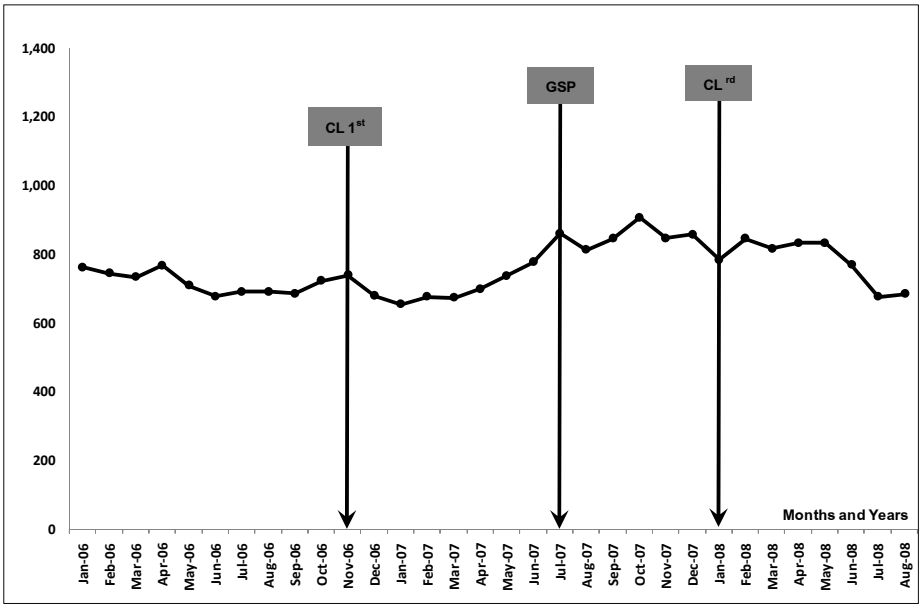
Figure 4.12 Changes in SET Index prior to and after the issueance of government use licenses (by drug) and GSP withdrawal status**.**



Source: The Stock Exchange of Thailand

In terms of changes in the health sector on the SET Index, such as investments in the 13 large private hospitals in Thailand, there was a general gain, with an exception for the period after the GSP withdrawal status, when some losses observed. It is not possible, however to make a clear link between the announcements of the government use licenses to the changes in the SET Index for this sector. See Figure 4.13 below.

Figure 4.13 Changes on the SET Index in the Health Sector prior to and after the issueance of government use licenses and GSP withdrawal status**.**



Source: The Stock Exchange of Thailand

4.4 Summary and discussion

The findings in this Chapter suggest that the government use licenses did not impact Thailand's overall exports, in spite the GSP withdrawal status for the 3 products. Thailand's overall exports are expected to increase; although exports to the US are expected to decrease, exports to other countries are expected to increase, particularly those to the ASEAN countries. We also found that the proportion of total value of exports to the US attributed to products with GSP status was small, amounting to only 16% of overall export value in 1997 and 7% in 2008. The is expected to decrease further

On the withdrawal of GSP status for the three products, there was a decrease in value of exports to the United States. Exports of the same products to the rest of the world, however, increased.

While the Thai government and mass media were concerned by the GSP withdrawal status, exporters of the affected products clearly understood the situation. As the President of the Thai Jewellery Association noted, the exporters were already making preparations for the GSP withdrawal status for their products by creating new markets. According to the Chairman of the Board of Pranda Jewellery, PLC. the company was not too concerned about the withdrawal of GSP status; in fact, they had considered withdrawing from the GSP program two years ago, in order to focus on high-end rather than lower-cost, low-end products. Therefore, when the import duty of 5.5% was implemented, they experienced limited losses in sales and were able to maintain 35% of all their exports to the US. For the plastics industry, a set of new strategies were established, in terms of market strategy, establishing standards and investments in human resources (Manager Online,2007).

It can be argued that trade barriers often arise in times of economic difficulties. As such, they cannot be directly linked to the government use licenses. Importers of electronic goods in numerous countries often cite non-tariff barriers such as safety standards or environmental friendly standards as examples of such obstacles.

This study indicates that the government use licenses did not have an impact on foreign investments in Thailand or on the confidence of short-term investors. It is not possible, however, to determine whether there will be any longer-term impact, as decisions regarding major long-term foreign investments occur over a longer period of time. There are also numerous other internal and external factors that influence investor decisions, such as the aggressive push for foreign investment by new emerging economies like China, India, Russia and Vietnam. On the domestic front, there are issues related to the cost of labour, political stability, access to materials, basic infrastructure, utilities, etc. (Cheng and Kwan,2000). The government use licenses are expected to have little impact on foreign investment as compared to other influential factors discussed. Despite the fact that no visible short-term impact was found, further study may be needed to assess the possible long-term impact.

In summary, given that both short- and long-term investments are influenced and affected by a complex mix of factors, it would be difficult to determine the effect of a single factor.

4.5 Limitations of the study

This study assessed the impact of the government's use of CL and the GSP withdrawal status for three products. This was done by comparing the value of exports of these products to the US with the total exports to the rest of the world. As mentioned earlier, data on the product codes was limited, and the product identification number of exports from Thailand did not always match the product identification number of imports of the United States, hence, errors can be expected.

Although the study set the timeframe of analysis at five years (from 2007 to 2012), there was limited time for data collection. The study was able to analyze only one year's worth of data, using data on exports and foreign investments up to the third quarter of 2008. Forecasting the impact of the government use licenses over the next four years in these changing times will be difficult within a limited timeframe.

Chapter 5

Psychosocial impact

5.1 Background

The grant of the government use licenses to import generic drugs provoked a wide range of opinions from supporters and opponents of the policy on the potential impact on society. This study seeks to examine the perspectives of the key stakeholders, which include health care workers, researchers/academics and civil servants - who were directly, involved in the policy making process – as well as officials from related government authorities, the private sector, non-governmental organizations (NGOs) and foreign stakeholders. The study aims to evaluate the psychosocial impact of the policy, to build upon the findings of the impact on public health and national economy, as described in the previous chapters.

5.2 Objectives and methodology

The aim here is to gather information and better understand the views and perspectives of key stakeholders, both Thai and international, with to the following:

- general knowledge regarding Intellectual property rights and TRIPS flexibilities;
- attitudes towards the use of CL for specific drugs;
- views on the positive or negative impacts of the government use licenses at the national and international levels, and in developed and developing countries;
- opinions on alternative measures to improve access to medicines.

In terms of the methodology, a questionnaire survey was developed and distributed to identified groups of key stakeholders for their completion. The survey was conducted with health care workers, researchers/academics, policy makers and foreign stakeholders from developed and developing countries.

5.2.1 Questionnaire

The questionnaire comprised three parts, as described below:

Part 1: Personal information: age, gender, educational level and area of expertise

Part 2: General knowledge regarding the TRIPS Agreement: Participants were asked to determine whether a set of statements about the TRIPS Agreement were true or false (see Table 5.1), in order to evaluate their level of understanding of the issues. It was envisaged that the level of understanding, based on the answers to above statements, would correlated with the stakeholder's position of support or opposition to the CLs. It was also assumed that stakeholders would have varying levels of understanding of the issue.

Table 5.1 True or False statements about the TRIPS Agreement used to assess the level of understanding (correct answers provided).

Statement	Answer
1. Intellectual property rights cannot be violated under any circumstances	False
2. Members of the World Trade Organization (WTO) can issue a compulsory license for patented drugs of private companies only under the circumstance of severe shortage of drugs as a result of a state of war.	False
3. The TRIPS Agreement should not prevent WTO members from taking measures to protect public health and, in particular, to promote access to medicines for all.	True
4. Thailand was the first country to have the government issue a compulsory license.	False
5. Compulsory license is a violation of international trade law	False
6. In some countries, the use of compulsory license has been effective in reducing in the price of medicines.	True

Part 3: Assessment of attitudes towards the government use licenses through the questions listed below.

(a) Level of agreement or disagreement with the use of CL for each drug.

(b) Views on the potential impact of the government use licenses in Thailand and other countries (both developed and developing). Respondents were asked to identify what they thought would be positive and negative impacts of the government use licenses. The positive and negative impacts listed in the questionnaire were derived from a literature review. The positive impacts as listed in the questionnaire are as follows: “(1) price reductions for medicines for which the Thai government implemented CL; (2) an increasing number of

patients having gained access to those medicines; (3) people have realized the importance of intellectual property laws; (4) the public has learned more about TRIPS flexibilities; (5) more countries will follow the Thailand policy on CL; and (6) Thailand's image will be enhanced". In the Thai version of the questionnaire, respondents were asked about an additional positive impact; whether the grant of the government use licenses resulted in the positive impact; namely, "the public realizes that access to drugs is a basic human right".

The negative impacts as listed are: "(1) patients receive low quality generic medicines under CL policy; (2) a decreasing number of medicines will apply for registration; (3) technology transfer from developed nations is reduced; (4) incentives for inventions are reduced; (5) there is criticism from the international community; (6) economic sanctions by the patent holding nations have resulted in a reduction in Thai exports; (7) foreign investors and manufacturing bases are shifting away from Thailand; (8) there are price increases for original drugs for which CL has not been implemented as a means to compensate for the lost incurred from CL affected drugs; and (9) there is price increase in other countries for original drugs for which CL has been implemented as a means to compensate for the loss incurred from CL affected drugs".

(c) Opinions on alternative measures to control drug prices and improve access to essential drugs in Thailand. Respondents were asked to pick alternative measures they thought would be suitable for adoption in Thailand solve the problem of inadequate access to drugs. Seven alternative measures identified from the literature review were proposed. In terms of measures by government authorities, they were: (1) compulsory licensing; (2) direct price control; (3) tax exemption or tax reduction for pharmaceutical products; (4) parallel import; and (5) increased health budget. With respect to pharmaceutical companies, they were asked if they should adopt differential pricing structures for different countries based on demand and level of economic development. Finally, with regard international organizations, respondents were asked if they should adopt collective bulk purchasing to negotiate for lower prices as an alternative measure.

(d) Views on the revocation of the government use licenses. This question was added because the government had considered revoking the government use licenses, which had also provoked wide debate. This question was only addressed to Thai stakeholders.

Note: The term compulsory license (CL), as used in the questionnaire, refers to the general concept of compulsory licensing as a type of TRIPS flexibility, as well as to the specific government use licenses for the seven drugs, where applicable. See text box in Section 1.2 above.

5.2.2 Survey respondents

Survey respondents were identified by an expert meeting, comprising Thai and international stakeholders. Six groups of Thai survey respondents were identified as follows:

Group 1: Health personnel This group consisted of physicians who treat HIV/AIDS patients, cardiologists, physicians who treat cancer patients in both public and private hospitals. Prospective participants were identified from physicians enrolled at The Heart Association of Thailand under the Royal Patronage, the Associations of Physicians who treat cancer patients and the Thai AIDS Society.

Group 2: Researchers/ academics This group consisted of lecturers from the Department of Social and Administration Pharmacy, Faculty of Pharmacy; Department of International Business, Faculty of Business Administration; Department of International Economics, Faculty of Economics; Department of Intellectual Property Law, Faculty of Law; Department of Politics and Governance and Department of International Relations, Faculties of Political Sciences and Social Sciences.

Group 3: Civil servants This group consisted of senior civil servants (rank 9 or above), from the Ministry of Public Health, Ministry of Commerce, Ministry of Foreign Affairs, Ministry of Justice and the Ministry of Finance.

Group 4: Private sector This group consisted of executives of domestic and multinational pharmaceutical companies, executives from the three private industries whose GSP benefits were withdrawn; that is, the jewelry industry, plastics compound industry, the electronics and electrical industry. Also included was the Thai National Shippers' Council.

Group 5: Civil society organizations or non-governmental organizations (NGOs) This group consisted of staff from NGOs involved in public health and consumer protection issues.

Group 6: Governmental organizations This group consisted of public agencies responsible for ensuring human rights, access to essential medicines and health care provision; namely the National Health Commission Office, The Patent Committee, The National Human Rights Commission, The Medical Council and The Pharmacy Council.

International survey respondents comprised representatives from embassies in Thailand and participants at international conferences.

5.2.3 Method of recruiting respondents

The survey questionnaires were sent by post to executives of all domestic and multinational pharmaceutical companies, directors of relevant NGOs, and representatives of foreign embassies in Thailand. In the case of researchers/academics, since there were too many potential respondents in Thailand, a sample of relevant departments/faculties was randomly selected from academic institutes in Bangkok. Where the number of departments available in Bangkok was deemed too small, as in the case of the Faculty of Medicine and

the Faculty of Pharmacy, then all Faculties of that discipline in the country were included in the sample. Most questionnaires were sent in mid-July 2008, with the deadline for the completed questionnaires to be returned by end of August 2008. Questionnaires to representatives of embassies were sent at a later date on the 25 August 2008, with a return deadline of 6 October 2008.

Questionnaires were distributed directly, by hand, to targeted civil servants and representatives of the private sector. This is because a low response rate was expected among these groups if the questionnaire was sent by post. Foreign stakeholders (other than embassy representatives) were randomly identified during various international conferences. Details of the distribution and collection of questionnaires are as follows:

- Senior civil servants: questionnaires were distributed by hand between 16-31 July 2008
- Private sector: questionnaires were distributed by hand at:
  - Committees of the Thai National Shippers' Council on 2 September 2008
  - Executives from the jewelry industry, the plastics compound industry and the electronics and electrical industry in August 2008
- Health personnel attending the monthly meeting of the Medical Council of Thailand on 14 August 2008 and the Pharmacy Council on 18 August 2008
- International participants at the "XVII International AIDS conference" in Mexico City, Mexico, 3-8 August 2008 and the "The 3rd ISPOR Asia-Pacific Conference" in Seoul, South Korea, 7-9 September 2008.

5.3 Results

In total, 1,500 Thai questionnaires and 150 English questionnaires were distributed, of which 367 questionnaires (25%) were completed and returned. Of this number, 308 were from Thai respondents and 58 (39%) from international respondents. Among the international respondents, 16 (28%) were from developed countries (high-income countries), 38 (65%) were from developing countries (middle or low income countries). The country of origin was not stated in 4 questionnaires (7%). The findings from the survey are presented below.

5.3.1 Respondents personal information

The mean age of Thai respondents was 46 years (range 21 to 83 years). 54% or 165 respondents were men. The highest level of education of respondents were: 19% PhD, 46% Master's degree, 31% Bachelor's degree, 4% below Bachelor's degree and 1% unknown.

Of the foreign respondents, 18 (31%) were men, two (3%) were of unspecified gender. The educational levels of the foreign respondents were as follows: 24% PhD, 51% Master's degree and 20% Bachelor's degree.

5.3.2 General knowledge regarding flexibilities of the TRIPS Agreement

The median number of correct responses to the true or false questions was calculated from the questionnaires received, and the results are presented for Thai and international respondents, separately.

Thai respondents:

The mean score among Thai respondents was 4.2 out of 6 (Standard Deviation (SD) 1.7). By profession, health personnel had the highest level of knowledge, with a mean score of 4.9 (SD 1.5), followed by senior civil servants and NGO staff, with a mean score of 4.5 and SD of 1.5 and 1.8, respectively. The mean score of researchers/academics was 3.6 (SD 1.9), while respondents from the private sector had the lowest mean score of 3.4 (SD 1.6). Figure 5.1 illustrates the scores by profession/sector.

The highest number of correct answers was observed for statement 6: "In some countries, compulsory license is an effective measure to reduce the price of medicines for those countries", with 80% of respondents giving the correct answer. Statement 4: "Thailand was the first nation where the government implemented compulsory government use license for medicines" received the lowest number of correct answers (62%). Statement 5: "Compulsory government use license is a violation of international intellectual property law" had the highest

number of incorrect answers (34%), followed by Statement 2: “Members of the World Trade Organization (WTO) can implement compulsory licenses for patented drugs of private companies only in cases of severe shortages of drugs as a result of a state of war” (30%). Statement 1: “Intellectual property rights cannot be violated under any circumstances” received 36% incorrect answers. The overall results are presented below in Figure 5.2.

Figure 5.1 The mean score of general knowledge regarding flexibilities of the TRIPS Agreement by type of respondents

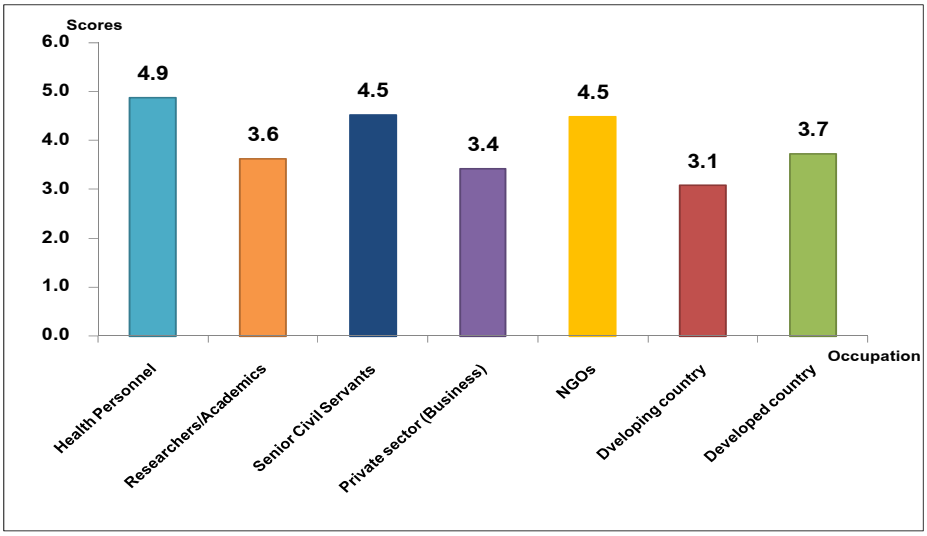
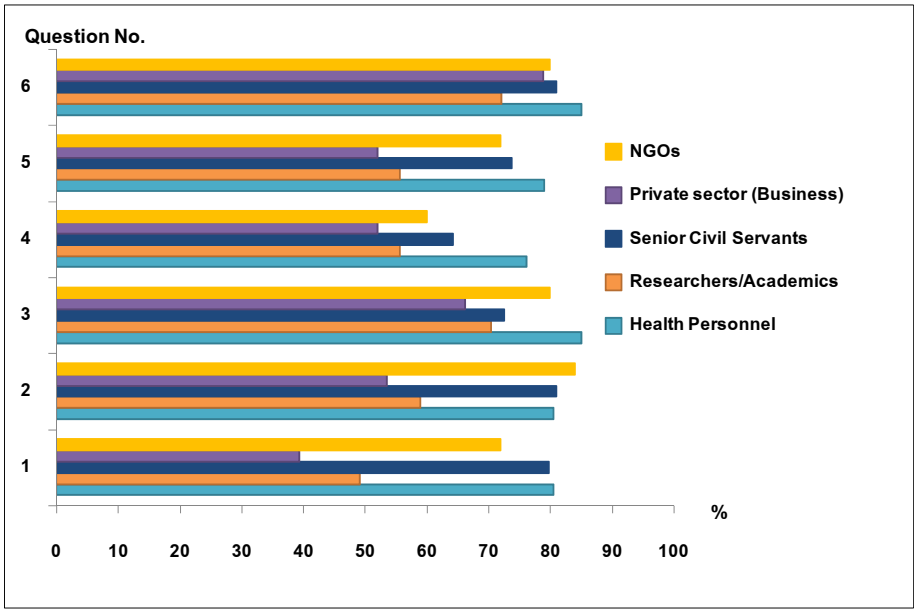


Figure 5.2 The percentage of correct answers to each question regarding flexibilities of the TRIPS Agreement among Thai respondents by profession.

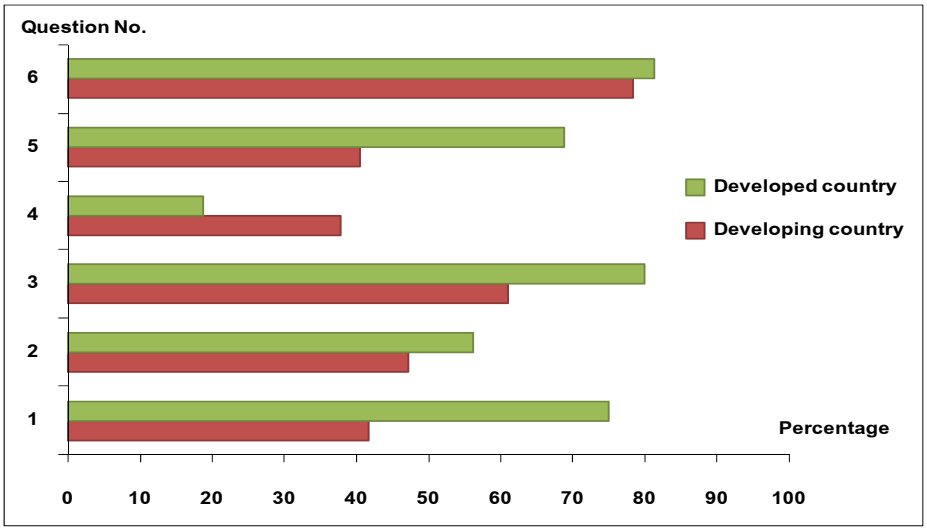


International respondents

The mean score among international respondents was 3.1 with standard error of 1.8. The difference between the mean scores of respondents from developed and developing countries was not statistically significant (p-value < 0.05): mean score of respondents from developed countries was 3.7 (SD 1.6) compared with 3.1 (SD 1.9) in respondents from developing countries (see Figure 5.1).

As with the Thai respondents, Statement 6: “In some countries, the use of compulsory license was effective in reducing in the price of medicines” received the highest number of correct answers, with 80% and 78% of correct answers in respondents from developed and developing countries, respectively. The lowest number of correct answers was observed for Statement 4: “Thailand is the first nation where the government has issued a compulsory license”, with 38% and 19% correct answers from respondents from developed and developing countries, respectively. The results are presented in Figure 5.3.

Figure 5.3 The percentage of correct answers to each question regarding flexibilities of the TRIPS Agreement among international respondents, by developed and developing country of origin.



5.3.3 Attitude towards the government use licenses

The majority of Thai respondents were supportive of the government use licenses. Seventy-eight percent of the respondents agreed with the use of the government use licenses or compulsory licenses for ARVs. The proportion of the respondents who agreed with the government use licenses for other drugs varied between 67-72%. The results are presented in Table 5.2.

Table 5.2 Thai respondents' attitude towards use of compulsory license by drug, answers in percentage

Drug	Strongly disagree	Disagree	No comment	Agree	Strongly agree
Efavirenz (EFV)	3	6	13	37	41
Lopinavir/ritonavir (LPV/r)	4	7	12	39	39
Clopidogrel	4	10	14	39	33
Docetaxel	5	10	16	35	34
Letrozole	4	9	17	37	34
Erlotinib	4	9	15	37	36
Imatinib	5	10	18	34	33

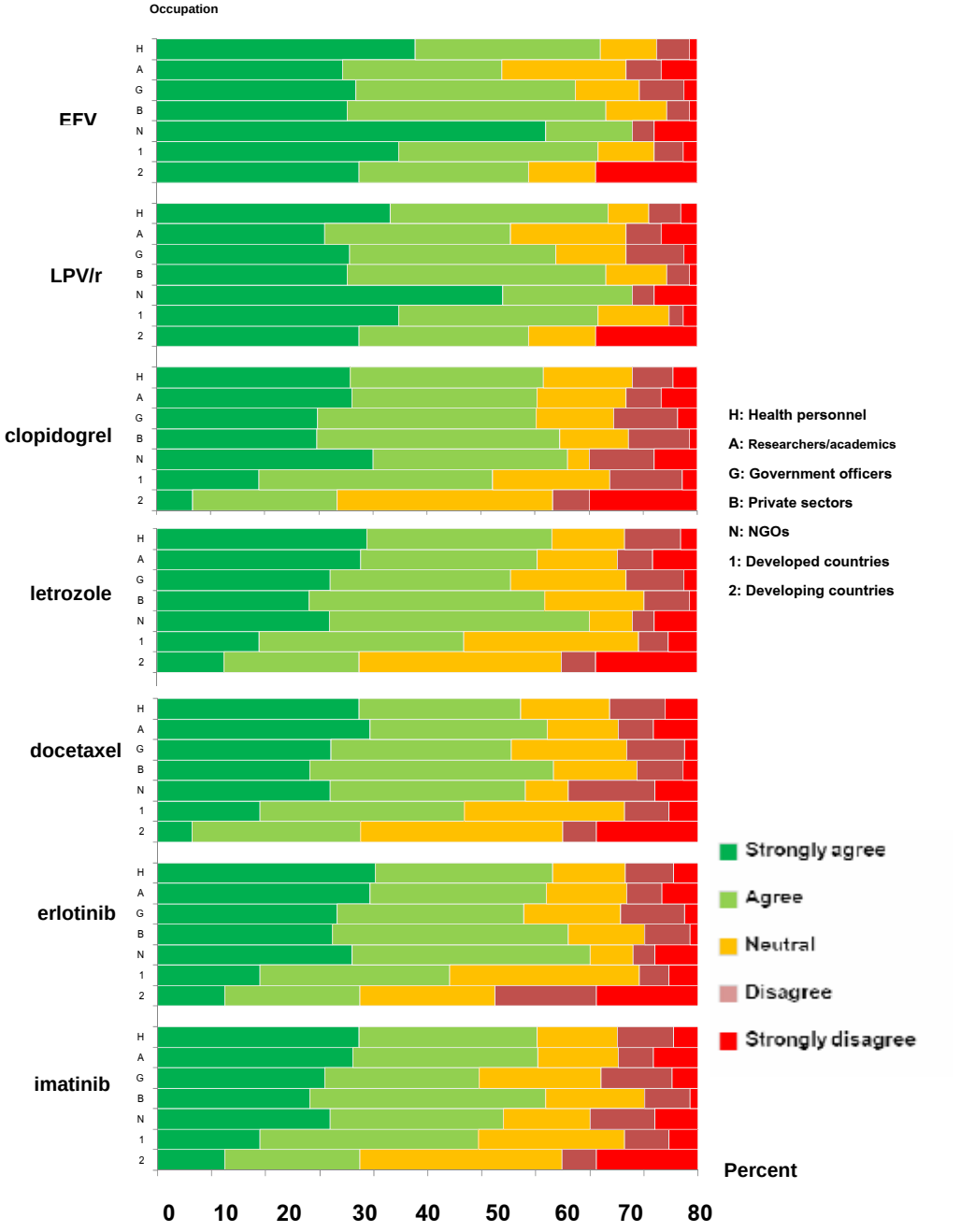
The majority of Thai and international respondents agreed with the government use licenses for the seven drugs. Details of their responses are as follows:

- International respondents, especially those from developed countries, tend to disagree with the grant of government use license for the listed drugs. However, it was interesting to see that the proportion of respondents who disagreed with the policy was lower in the case of LPV/r and clopidogrel compared to other drugs.

- The highest proportion of Thai respondents who supported the grant of the government use licenses were NGO staff, particularly for ARVs and clopidogrel

- Among Thai non-NGO respondents, the proportion of respondents who agreed or disagreed with the policy did not differ by drug.

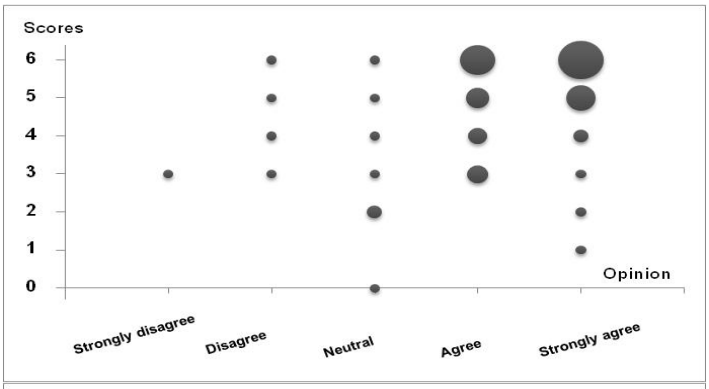
Figure 5.4 Attitudes of respondents towards the government use licenses policy by drug, profession and country of origin



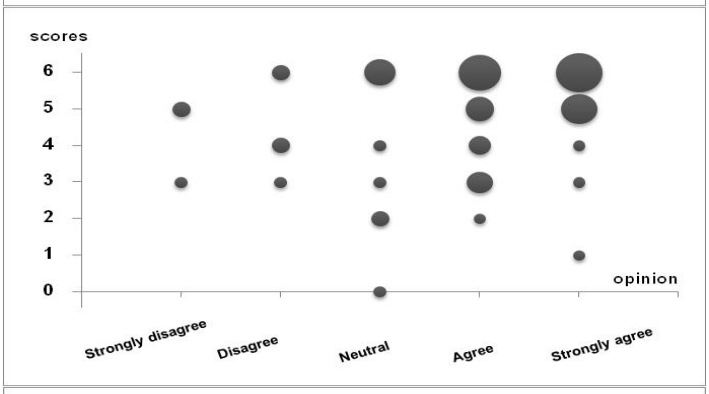
5.3.4 Correlation between knowledge of the flexibilities of the TRIPS Agreement and support of the government use licenses policy

Spearman's correlation was used to examine the correlation between the respondents' general knowledge regarding the flexibilities of the TRIPS Agreement and their support or opposition to the government use licenses. General knowledge of the TRIPS Agreement was highly correlated with support for the government use licenses. Respondents who were knowledgeable about the TRIPS flexibilities were much more likely to agree with the policy. For example, the majority of health personnel with a good knowledge of TRIPS Agreement and its flexibilities, tended to support the policy for three drugs, as shown in Figure 5.5.

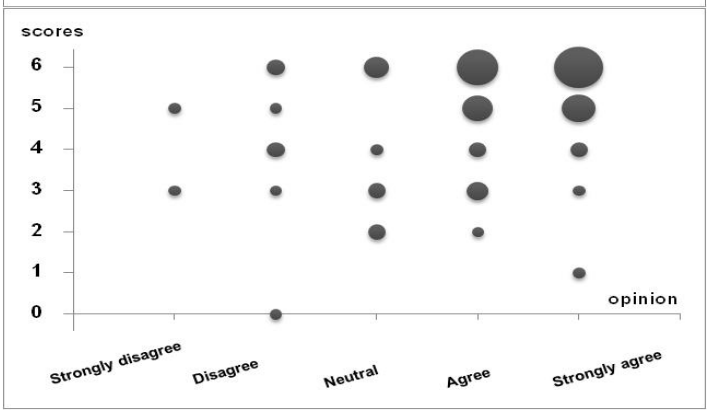
Figure 5.5 Health personnel: Correlation between general knowledge regarding flexibilities of the TRIPS Agreement and support for government use licenses for three specific drugs



efavirenz



clopidogrel

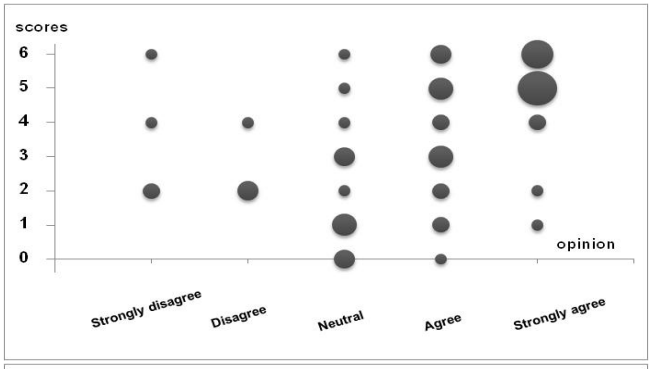


letrozole

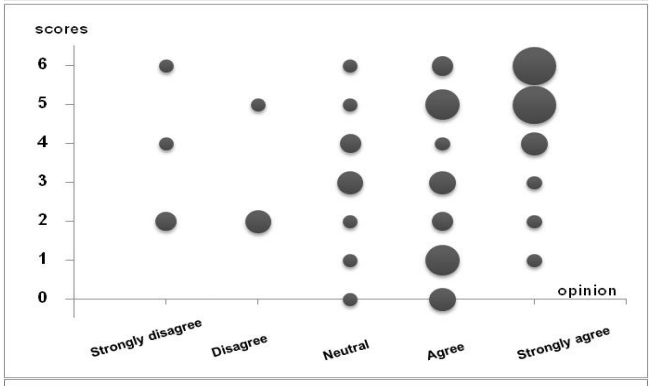
The study found that researchers/academics with extensive knowledge regarding the TRIPS flexibilities were most likely to support the policy, while those with less knowledge were more likely to oppose the policy for the drugs, EFV and

clopidogrel. However, the correlation between knowledge and support for the policy for letrozole was not significant as respondents who supported the policy for this drug were both those with high and low levels of knowledge. Figure 5.6 shows the correlation of knowledge and support for the policy for the three drugs.

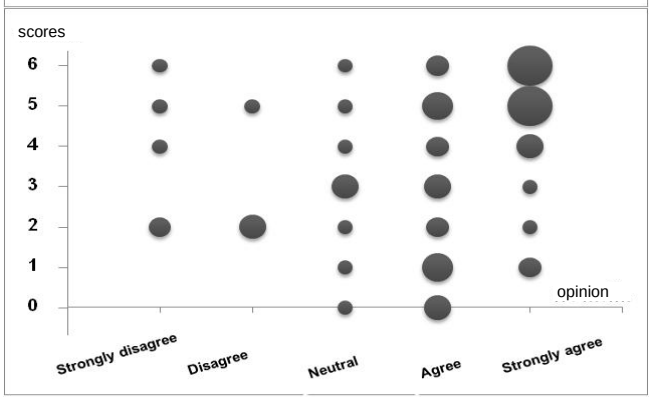
Figure 5.6 Researchers/academic: Correlation between general knowledge regarding flexibilities of the TRIPS Agreement and support for government use licenses for three specific drugs



efavirenz



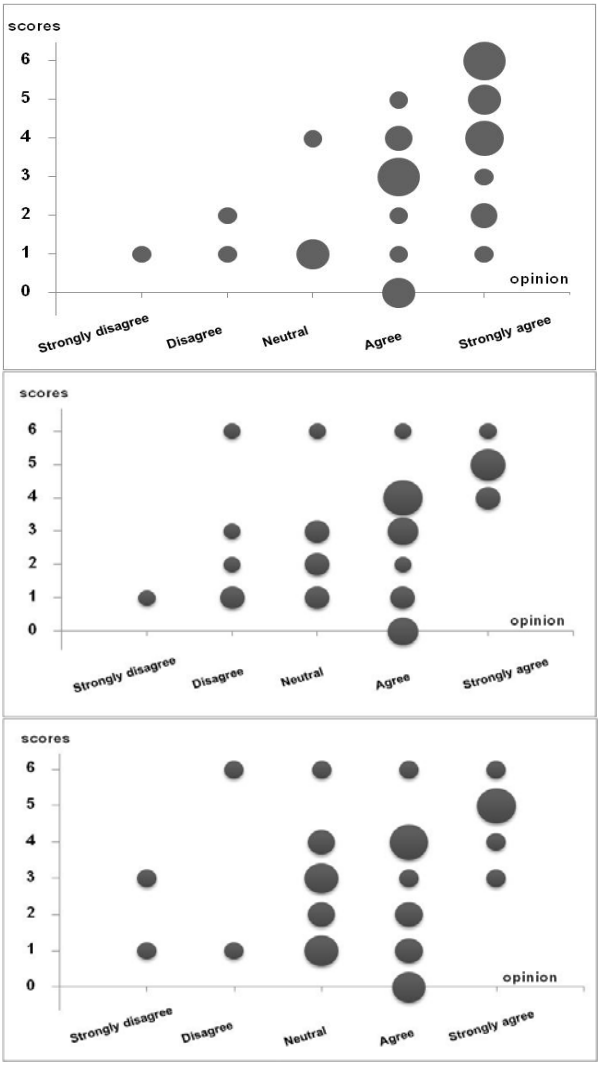
clopidogrel



letrozole

However, in relation to respondents from developing countries, there appears to be no correlation between their levels of knowledge of the TRIPS flexibilities with their support for, or opposition to, the government use licenses. Regardless of level of knowledge, developing country respondents were more likely to support the government use licenses, as shown in Figure 5.7.

Figure 5.7 Developing country respondents: Correlation between general knowledge regarding flexibilities of the TRIPS Agreement and support for government use licenses for three specific drugs



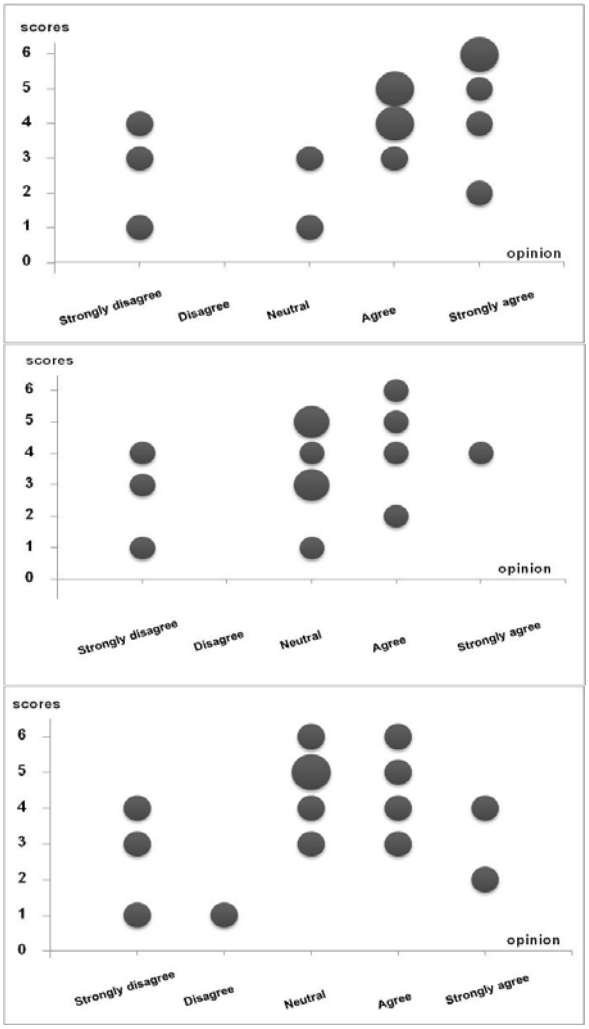
efavirenz

clopidogrel

letrozole

SImilarly, in the case of respondents from developed countries, the level of knowledge of the TRIPS flexibilities did not correlate with their position on the government use licenses. Some respondents with limited knowledge supported the policy while some with extensive knowledge opposed the policy, as seen in Figure 5.8.

Figure 5.8 Developed country respondents: Correlation between knowledge regarding flexibilities of the TRIPS Agreement and support for government use licenses for three specific drugs



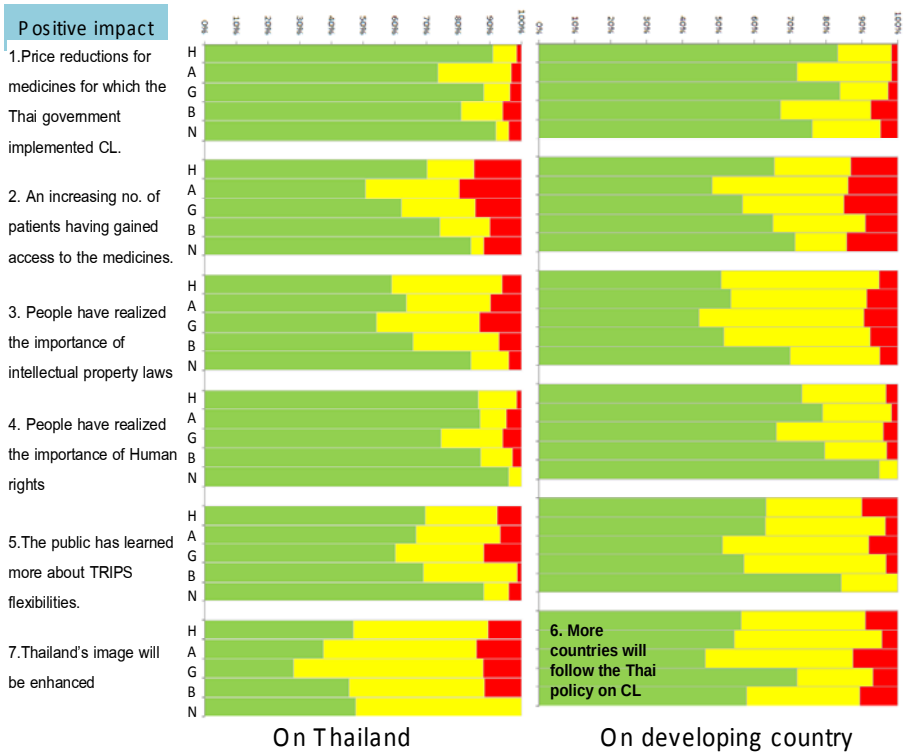
5.3.5 Perceptions on the impact of the government use licenses

Reponses to the positive impact statements

Respondents were presented with a list of statements on the positive impacts of the government use licenses. For the Thai respondents, all groups of professions agreed with the positive impact statements of: “Price reductions for medicines for which the Thai government implemented CL” and “An increasing public awareness of the importance of human rights and equity in access to medicines”. These two positive impacts occurred in Thailand but also affected other countries (details are presented in Figure 5.9).

Thai respondents were least likely to agree with the positive impact statement that the government use licenses have “enhanced the international reputation of Thailand”. Less than 30% of senior civil servants agreed with this statement. Thai respondents from all professions agreed that there were more positive impacts in Thailand than in other developing countries. More than half the Thai respondents agreed that other developing countries may follow Thailand’s footsteps with the use of similar policies.

Figure 5.9 Thai respondents: Responses to statements on the positive impact of the government use licenses

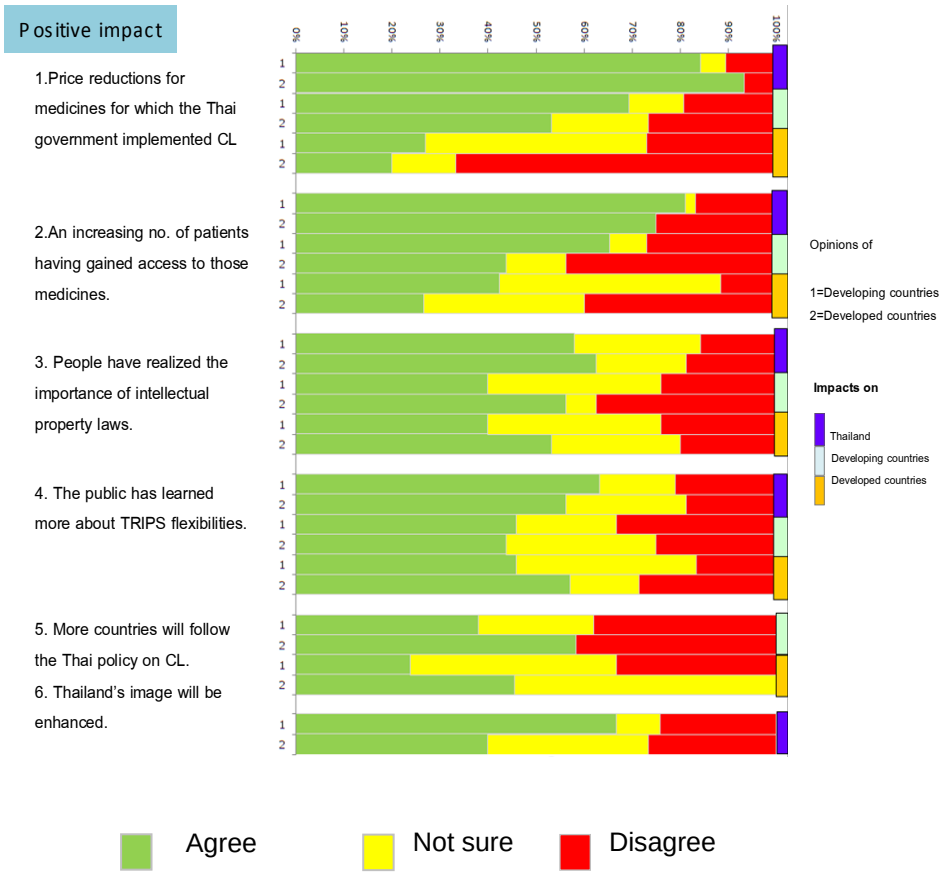


Among international respondents from both developed and developing countries, the statement that the policy resulted in reduction in price of drugs in Thailand and other developing countries received the most agreement. However, compared with other positive impact statements, the lowest proportion of respondents agreed that the price of drugs would also reduce in developed countries (details in Figure 5.10).

The second statement that most international respondents agreed with was that of "increased numbers of patients accessing the drug" both in Thailand and in other developing countries. A smaller proportion of respondents agreed that the number of patients accessing the drug would also increase in developed countries.

The proportion of the respondents who agreed with the statement that developed and developing countries were going to implement similar policies following Thailand's example was higher among those from developed countries. Finally, more than 70% of respondents from developing countries agreed with the statement that the international reputation of Thailand was enhanced by the policy. In contrast, less than half of the respondents from developed countries agreed with the statement.

Figure 5.10 International respondents: Responses to statements on the positive impact of the government use licenses

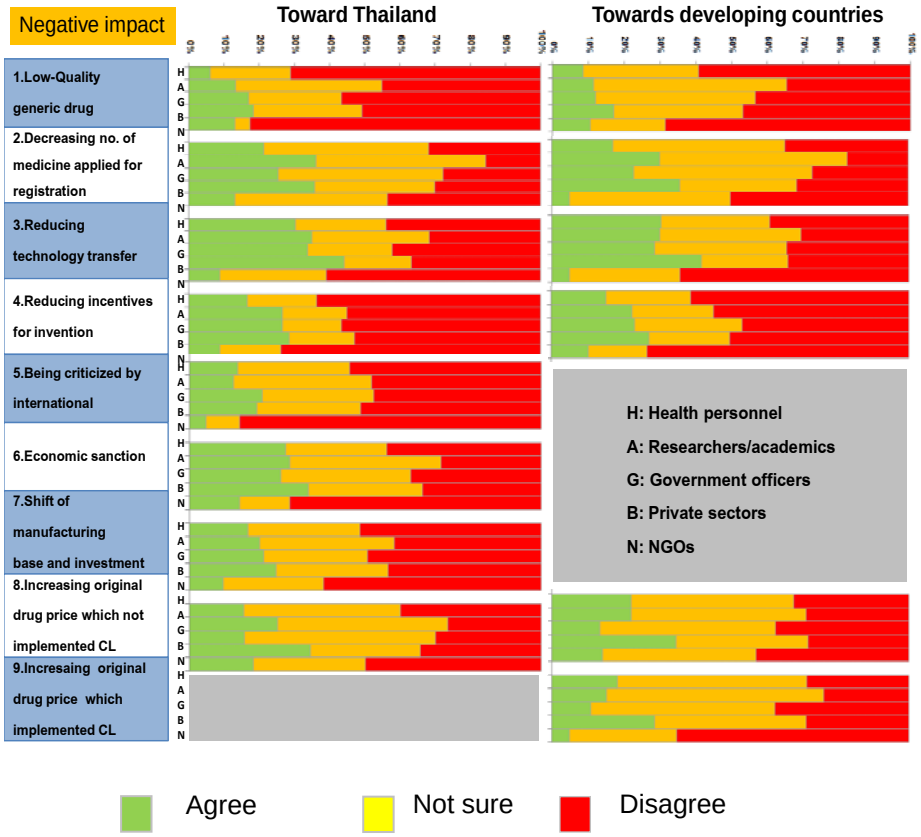


Reponses to the negative impact statements

Less than half the Thai respondents from all professions agreed with the statements on the negative impact of the government use licenses. The highest proportion of respondents agreed with the statements: "Technology transfer from developed nations is reduced", followed by "Economic sanctions by the patent holding nations have resulted in reduction in Thai exports" and "A decreasing number of medicines will apply for registration". Results are illustrated in Figure 5.11. Interestingly, Thai respondents perceived the negative impact in Thailand would be no different from those in other developing countries.

The majority of Thai respondents disagreed with the statement that there would be “Reduced incentives for technological innovations” and that “There is criticism from the international community”. It is also worth noting that over 70% of health personnel disagreed with the statement that “Patients receive low quality generic medicines under CL policy”.

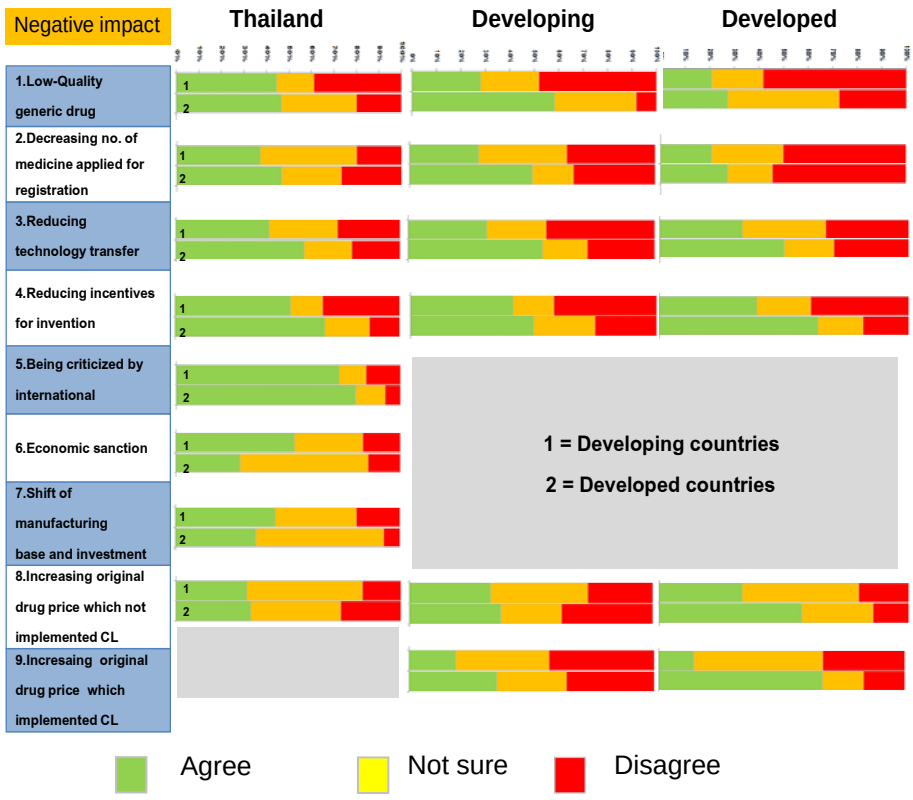
Figure 5.11 Thai respondents: Responses to statements on the negative impact of the government use licenses



In contrast to the Thai respondents, a small proportion of international respondents disagreed with the statements that “There is criticism from the international community” and “Incentives for inventions are reduced”. Most respondents from developing countries agreed with the statements that “There are price increases for original drugs for which CL has not been implemented as a means to compensate for the loss incurred from CL affected drugs” and “There are price increases in other countries for original drugs for which CL has been implemented as a means to compensate for the loss incurred from CL affected drugs” (See Figure 5.12).

In terms of negative impacts for other developing countries, the statements with highest proportion of agreement were “Technology transfer from developed nations is reduced” and “Incentives for inventions are reduced”.

Figure 5.12 International respondents: Responses to statements on the negative impact of the government use licenses



5.3.6 Views on alternative measures to control drug prices and improve access to medicines in Thailand

Among Thai respondents, the large majority agreed that the government use licenses was an appropriate measure to control the price of antiretroviral drugs and increase access to treatment for HIV-infected patients. The private sector had the highest rate with 90% in agreement with the statement. Interestingly, senior civil servants in equal proportion thought that the government use licenses and collective bulk purchasing were appropriate measures. Details are shown in Figure 5.4.

Increasing the health budget as a measure to control drug prices and increase access to antiretroviral treatment for HIV infected patients received the lowest rate of agreement among Thai respondents in all professions, except for those in the private sector. A small proportion of the respondents from the private sector agreed with the alternative measure of differential pricing.

Most respondents from developing countries agreed with the grant of government use licenses or compulsory licenses to control drug prices and improve access to drugs, while most of those from developed countries agreed with alternative measures such as direct price control of patented drugs by government bodies, e.g. the Ministry of Commerce. Both Thai and international respondents were least likely to agree that increasing the national health budget was an alternative measure.

Table 5.3 Responses on support (by %) for alternative measures to control drug prices and increase access to antiretroviral drugs by profession and nationality

Alternative Measures	Health	Academics	Civil servant	Business	NGOs	Developing	Developed
CL	87	80	81	90	88	82	80
Direct price control	72	66	66	70	64	69	90
Tax control	61	59	69	78	60	69	70
Parallel Import	72	75	72	70	72	74	70
Increasing budget	48	51	61	76	40	57	63
Differential pricing	76	67	64	63	64	69	77
Bulk purchasing	81	75	80	79	72	70	78

In the case of drug price control to improve access to treatment of cardiovascular disease, there was a mixed response from Thai and international respondents. Health personnel and NGOs employees were most likely to agree to the government use licenses or compulsory licenses. Researchers/ academics and NGOs employees were most supportive of use of parallel import, while collective bulk purchases were most supported by senior civil servants and the private sector. Details are presented in Table 5.4.

Respondents least likely to agree that increasing the health budget as an alternative measure to improve access to cardiovascular drugs were health personnel, researchers/academics and NGOs employees. Most senior civil servants and private sector respondents disagreed with direct drug price control of the patented drug and differential pricing as alternative measures.

Most respondents from developing countries perceived tax reduction as the most appropriate alternative measure while respondents from developed countries supported the increase of health budget. Both groups were least likely to agree to the government use licenses to control price and improve access to treatment for cardiovascular diseases.

Table 5.4 Responses on support (by %) for alternative measures to control drug prices and increase access to drugs for cardiovascular disease, by profession and nationality.

Alternative Measures	Health	Academics	Civil servant	Business	NGOs	Developing	Developed
Compulsory Licensing	72	82	69	72	68	38	20
Direct price control	69	71	59	75	68	59	70
Tax control	58	67	64	75	60	75	80
Parallel Import	69	81	68	66	68	67	80
Increasing budget	42	54	60	70	44	67	88
Differential pricing	72	74	60	59	64	72	77
Bulk purchasing	70	71	76	80	64	70	75

Most Thai respondents from the health and research/academic sector agreed with the government use licenses for the anticancer drugs to improve access to treatments. High-ranked civil servants and private sectors were most likely to agree with bulk purchasing, while NGO staff were most likely to agree with the use of parallel import as alternative measures. Details are presented in Table 5.5.

Increasing the health budget as an alternative measure to control drug prices and increase access to treatments for cancer, received the lowest level of agreement among Thai respondents from all sectors with the exception of the private sector. Respondents from private sectors were least likely to agree with parallel import as an alternative measure.

Respondents from developing countries considered bulk purchasing as the most appropriate alternative measure. Most respondents from developed countries agreed with tax reduction as an alternative measure. Both groups were least likely to agree with the government use licenses for anticancer drugs.

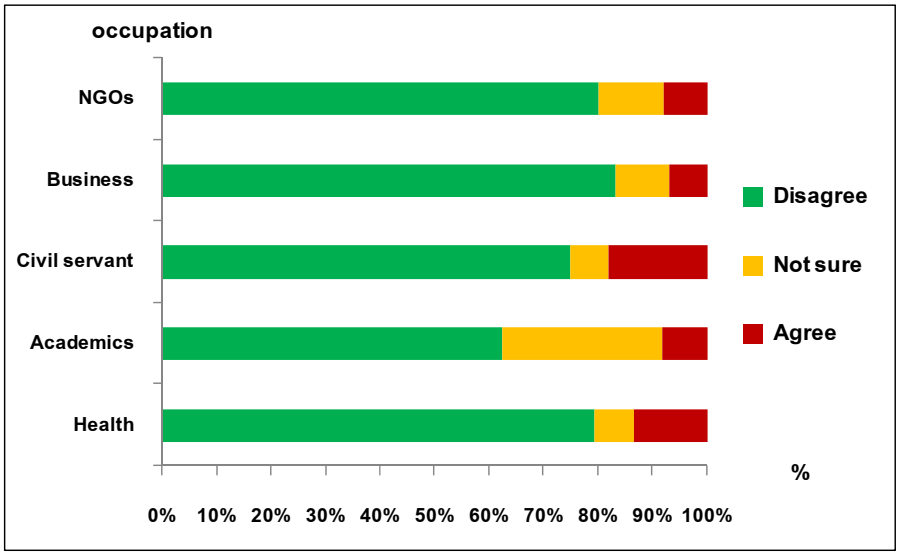
Table 5.5 Responses on support (by %) for alternative measures to control drug prices and increase access to anti-cancer drugs, by profession and nationality

Alternative Measures	Health	Academics	Civil servant	Business	NGOs	Developing	Developed
Compulsory Licensing	79	85	77	83	72	53	50
Direct price control	70	75	64	79	68	59	80
Tax control	58	71	68	82	68	66	89
Parallel Import	67	82	74	66	80	63	89
Increasing budget	52	57	66	78	48	71	88
Differential pricing	72	75	64	61	60	66	77
Bulk purchasing	78	75	78	86	64	70	78

5.3.7 Views on the revocation of the government use licenses (only among Thai respondents)

The majority of Thai respondents disagreed with a revocation of the government use licenses. Researchers/academics were least likely to disagree with the revocation, while civil servants and health personnel had highest proportion of persons agreeing to a revocation, as presented in Figure 5.13.

Figure 5.13 Attitudes towards the reversal of the government use licenses



5.4 Summary and discussion

The survey among key stakeholders indicated a correlation between the level of general knowledge regarding the TRIPS flexibilities and attitudes towards the government use licenses (referred to in the questionnaire as CL), especially among those in the health, research/academic sectors and among respondents from developing countries. The survey also found that those with substantial knowledge on the area are likely to support the government use licenses, while those with less knowledge tended to oppose. These findings are helpful for policy makers, and lend support to the efforts to increase knowledge and understanding of the relevant issues, especially among health personnel, researchers/academics and colleagues from developing countries. However, increasing knowledge and understanding of the TRIPS agreement may not necessarily shift the attitudes of some groups; for example, respondents from developed countries.

Compared with international respondents, Thai respondents scored significantly higher with regard their general knowledge of the TRIPS Agreement and its flexibilities (the mean score of Thai respondents was 4.2 compared to 3.1 in international respondents). A number of reasons can be put forward for this

result. It may be due to the long debate on this issue in Thailand. It may suggest that information about the government use licenses and related issues have been more widely disseminated in Thailand than in the countries of origin of the international respondents. The Thai respondents in this study were representatives of key stakeholder groups directly involved with the policy, and therefore may have more access to information on the issue and may be more motivated to comprehend the policy implications. Nevertheless, Thai respondents were most likely to answer incorrectly to the statement that “Thailand was the first country to have the government issue a compulsory license”, followed by “Compulsory license is a violation of international intellectual property law”. These are common misunderstandings, which should be corrected by the government, particularly among key stakeholders who may be affected by the policy.

The majority of Thai and international respondents agreed with the government use licenses, particularly in respect of ARVs. The positive impact statement which received most agreement from both Thai and international respondents was that the cost of drugs would be reduced. The negative impact which received most agreement among Thai respondents was that “Technology transfer from developed countries would be delayed”, while most of the international respondents agreed with the negative impact statement of: “Thailand would be widely criticized by the international community”.

Most of the Thai and international respondents from developed countries agreed with the positive impact statement that the government use licenses would improve access to antiretroviral drugs to treat HIV-infected patients. However, there was no such consensus as regards this positive impact for clopidogrel and the anti-cancer drugs. In terms of alternative measures to control drug prices and increase access to treatments, collective purchasing and parallel imports received strongest support while increasing the health budget received least support.

5.5 Limitations of the study

Since the survey was conducted largely through the post, the response rate was low. Other obstacles were encountered in reaching identified individuals. At the request of the multinational pharmaceutical companies based in Thailand, copies of the questionnaire was sent to the Pharmaceutical Research and Manufacturers Association (PReMA) to facilitate the distribution and return of the questionnaires. However, the response rate in this group was very low, only two out of 35 companies responded. The multinational pharmaceutical companies may have assumed that the study results may have negative impact on their interests. The response rate of representatives of foreign embassies in Thailand was also low. Some questionnaires were returned after the deadline because they had been forwarded to the responsible government agency, such as the Ministry of Health, in their home countries. Some questionnaires were returned unanswered, possibly because the respondents assumed no direct responsibility on the issue.

In the circumstances, the results of this survey cannot be taken as representative of the attitudes of all key stakeholders nor of the general Thai population. The international respondent population may also have been subject to some selection bias, as almost one-third of the respondents were participants of the XVII International AIDS conference, mainly composed of academics and NGO staff, who were more likely to advocate policies in the interest of HIV/AIDS patients.

Chapter 6

Discussion

6.1 Discussion of the study

During the period 2006-2008, the Thai government announced the grant of government use licenses for seven drugs. This policy measure provoked criticism, both domestically and internationally. The critics questioned the rationale and justification of the licenses, and challenged the legitimacy, transparency of the decision-making process and the criteria for selection of drugs and the negotiations with patent holders. They also challenged the legal validity of the measure, and questions were raised over the "true intentions" behind the measure and the potential impact of its implementation – both positive and negative. These issues are highly controversial, and it is a difficult task to respond to all critics to their satisfaction. The key stakeholders, such as governmental organizations, health personnel, researchers/academics, multinational pharmaceutical companies, governments of some industrialized countries, non-governmental organizations (NGOs) and patient's groups continue to disseminate information to mobilize support among the public, to support their respective standpoints.

In order to clarify the key issues, the Thai Ministry of Public Health (MoPH), in collaboration with National Health Security Office (NHSO), as the key government authorities responsible for the grant of government use licenses, published two editions of the "White Paper" to inform the public of the key issues involved (Ministry of Public Health and National Health Security Office,2007). In addition, MoPH also requested a mission by the team of the experts led by the World Health Organization (WHO) to provide legal and technical advice on the use of compulsory licenses and other flexibilities within the TRIPS Agreement. The report by the WHO Mission was distributed by MoPH (WHO Mission,2008). In addition, a qualitative study was conducted by an independent research arm of MoPH, the International Health Policy Program (IHPP), with the aim of examining key stakeholders' roles in the decision-making process, and identifying the domestic and international factors influencing the participation, including the

influence of different interest groups in the policy processes (Tantivess, Kessomboon, and Laongbua,2008).

There has, however been no study to date to assess the impact of the introduction of CL. This study represents the first evidence-based attempt to assess the impact of the government use licenses in improving access to essential drugs in Thailand. It is hoped that the results of this study may help resolve some of the disputes among key stakeholders.

In brief, this study finds that grant of the government use licenses did result in public health benefits for the nation. Specifically, the government use licenses helped to alleviate one of the main barriers to access to essential drugs, through importation of cheaper generic products. The generic drugs were made available, in the public sector, to patients in need, under the national universal health coverage (UC) scheme. The levels of benefits gained varied according to the type of drug; the importation of generic anti-HIV drugs was found to have the greatest benefit. A survey conducted among key stakeholders found that the government use licenses on these drugs was well supported by the majority of stakeholders. This finding is not unexpected, given that the HIV/AIDS epidemic and the inadequate access to antiretrovirals (ARVs) and drugs for the prevention and treatment of opportunistic infections have drawn much attention from the international community. The fact that the majority of patients suffering from AIDS, tuberculosis and malaria in developing countries may die because of limited access to affordable essential drugs, has long been recognised as a key public health problem. A number of developing countries, such as Indonesia, Malaysia, Ghana, Swaziland, Zambia and Zimbabwe, have also made use of the TRIPS flexibilities to ensure access to ARVs, prior to Thailand's grant of the government use licenses.

On the other hand, the government use licenses for clopidogrel, and the four anticancer drugs (i.e., drugs to treat chronic non-communicable diseases), not only generated less public health benefits when compared to ARVs, but also

received comparatively less support among stakeholders, even from Thai health care professionals. The government use licenses for these drugs received significant criticism, both domestic and international. Some of these critics have made known their views through the media and several international conferences. It highlights the continuing controversies around the issue. Further analysis is needed to better understand the causes of these disputes.

Opponents of the government use licenses argue that the TRIPS flexibilities are not intended to alleviate the problem of inadequate access to drugs for chronic and non-communicable diseases, that they are limited for use to address certain diseases and epidemics in poor countries; namely HIV/AIDS, tuberculosis and malaria. Others argue that cancer and coronary heart diseases or even HIV/AIDS in Thailand do not qualify as a “national emergency or other circumstances of extreme urgency” for which the use of the TRIPS flexibilities is justified (Froehner,2007). They therefore, argue that the Thai government use licenses are in violation of the TRIPS Agreement (Gerhardsen,2006).

As a response, it may be argued that if members of the World Trade Organization (WTO) considered the government use licenses to be a violation of the TRIPS Agreement, they could have raised the issue at the WTO TRIPS Council, or brought Thailand to the dispute settlement system at the WTO (WTO,2001). Yet, the matter has not been raised at the WTO. The ambiguity maintained by this lack of clarification may be intended by those who oppose the use of flexibilities within the TRIPS Agreement (Na Songkhla M,2009).

Data from this study confirm that the government use licenses had various levels of impact on public health, the economy and certain psychosocial perspectives. In order to successfully implement any public policy, the government requires the collaboration and support of key stakeholders along with the wider public, in order to facilitate the policy processes and hence, increase the chances of meeting the desired policy objectives. Therefore, research to gain greater

understanding of the policy processes and impacts is needed to guide successful policies in the future.

In this respect, the selection of drugs and the importation of generic products are crucial steps. These decisions, made by policy makers in the MoPH, NHSO, Governmental Pharmaceutical Organisation (GPO) and other related committees, should be based on rigorous evidence and accompanied by carefully devised operational plans, in order that the introduction of the government use licenses be substantially beneficial. It is suggested that to ensure the maximum benefit, the drug selection criteria should take careful consideration of the following:

1. The number of patients in need of the drugs in question. If the number of patients is large, the policy will yield greater benefits for public health through increased access to the required medicines and subsequently, lead to greater benefits for the national economy. However, in some cases, the treatment needs for certain rare diseases may also be appropriate for consideration;

2. Additional benefits of the generic drugs under government use licenses or compulsory licenses as compared with existing drugs commonly prescribed. Drugs to be considered for selection should have greater effectiveness and safety compared to existing drugs; and

3. Availability of generic drugs should be significantly cheaper than the patented drugs and existing drugs normally prescribed.

Other than the aforementioned criteria, this study found that there are drugs included in the government use license plans which may be used for more than one indication. For instance, clopidogrel, which is indicated in myocardial infarction cases on eluting stent to prevent the recurrence infarction as well as in patients with recurrent stroke (American Heart Association,2008; U.S.FDA.,2002). However, in Thailand the drug was recommended only for

treatment of the former cardiovascular disorder (Bureau of Medical Technical Treatment,2004). The grant of the government use license for clopidogrel without clarifications on the specific medical indication may result in its prescription for other uses. This may attract widespread criticism from those who oppose the policy. The responsible organisations should install appropriate measures to ensure the rational prescription of the drug.

The use of compulsory or government use licenses is not the only measure to improve access to essential drugs. There are viable alternative options, such as bulk purchasing, parallel import, drug price control and tax reductions (Vernon,2003). Some of the said measures are currently in use in Thailand. The survey conducted on key stakeholders as part of this study found that different measures were considered appropriate for different drugs. The majority of stakeholders agreed with the government use licenses for ARVs, but bulk purchasing and parallel imports were preferred over government use licenses for improving access to the anticancer drugs and drugs for cardiovascular diseases. Further research on the potential benefits and drawbacks of alternative measures in increasing access to each specific drug should be encouraged. However, it is noted that the introduction of any other regulatory measures such as price controls and others require preparatory processes to ensure the success and their effectiveness. In this regard, the government should consider the range of available options as well as the required implementation measures.

One of the most important issues regarding the government use licenses has been the delay in the importation and registration of the generic drugs, despite the attempts by MoPH to accelerate the registration process for the importation of generic drugs. It is suggested that there are a number of reasons for the delays. First, the government was not ready in identifying pharmaceutical companies able to supply quality generic drugs, which were able to cooperate with the appropriate authorities for the registration of the drugs in Thailand. The government should, therefore ensure that all the preparations required are met to accelerate the importation and distribution of generic drugs to improve access among people in need as quickly as possible. Secondly, the issue of political

instability in Thailand, including the call for reconsideration of the government use licenses by the new governments, caused considerable concern among the generic drug producers with regards the registration and distribution of their products in Thailand. To ensure that the government use licenses can be effectively implemented to improve access to essential drugs, information should be widely disseminate on the potential benefits of the policy to the general public to mobilize pressure on politicians to ensure policy sustainability and implementation. Thirdly, some of the patent holding drug companies alleged that the government use licenses did not adhere to the TRIPS Agreement and the Thai Patent Law., and hence the production the generic drugs for importation to Thailand would be an infringement of intellectual property rights. This caused confusion and concern among the generic producers. Under the circumstances, the government should endeavour to correct and timely information regarding the validity of the government use licenses to inform the generic producers, so as to avoid delays in the production and importation of the generic products.

In order to achieve the goal of improving access to essential drugs, it is also important that physicians comply with the policy by prescribing the imported generic drugs for patients in need. The general public also has a role to play in disregarding the myth that patented drugs are of higher quality than generic drugs; patients should not insist that their physicians prescribe the patented original products. This study found that the majority of health personnel (70%) with extensive experience in the use of both patented and generic drugs, disagreed with the following statement: “Patients receive low-quality generic medicines under the government’s CL policy”. Only 25 % answered “Not sure” and 5% agreed with the statement. However, approximately half of the respondents who were senior government officials, researches/academics and businessmen stated that they did not have confidence in the quality of generic drugs. This implies a need for a campaign to improve understanding and confidence in generic drugs, in particular among health care workers. The latter are critical stakeholders who are responsible for drug prescription and who are also able to help build the public’s confidence in generic drugs.

Psychosocial elements are complex and sensitive, and resistant to control or management by policy makers. Although the MoPH and the NHSO took measures to affirmed the validity of, and the need for, the government use licenses, there is still a considerable amount of confusion as a result of misleading information. As can be seen from the survey, a number of respondents are still misled about intellectual property rights protection and hence, more likely to disagree with the use of the TRIPS flexibilities in Thailand. Insights can be drawn from the policy process to help provide correct and accurate information on the government use licenses, including the following: dissemination of relevant information to each target group; negotiations with key stakeholders who oppose the policy; and seeking assistance or collaboration with domestic and international organizations to alleviate the existing barriers. The findings of this study may be helpful in addressing some of these supporting strategies.

Although the grant of the government use licenses was initiated by the MoPH and the NHSO, it cannot be successfully implemented at national level without the support of other critical government ministries. An important illustration relates to the threat of US trade: the country's trade status was downgraded from the "Watch List" (WL) to the "Priority Watch List" (PWL) for intellectual property violations. The Generalized System of Preferences (GSP) privilege for a number of Thai exports to the US was also cancelled. It has been claimed that these retaliations dramatically damaged the Thai economy. The literature suggests that many developing countries are similarly concerned about the threat of trade retaliation over alleged violations of intellectual property rights of patent holders from developed countries. Thailand itself had considerable experience regarding such threats since 1992, when the country was pressed by the US to amend its intellectual property legislation. Since the 1990s, the Thai government had been urged by NGOs to make use of TRIPS flexibilities to improve access to essential medicines for HIV/AIDS drugs and drugs for the prevention and treatment of opportunistic infections. However, threats of trade retaliation and GSP withdrawal have always been used to discourage the use of TRIPS safeguards.

During 2006-2008, selective information regarding intellectual property rights was disseminated by opponents of the government use licenses to mislead the debate. For example, it was stated that the policy would have negative impact on Thai exports to the US, which accounted for USD 4.3 billion (estimated value in 2006). However, the authors of this study maintain that we should examine this claim more closely through the following questions:

1) What are the other factors, aside from the government use licenses, which may also have a role in inducing the US trade retaliation?

2) What are the actual implications of the downgrade of Thailand's trade status, and the true cause of GSP withdrawal?

3) Would the GSP status for the three products be withdrawn, even if Thailand had not announced the government use licenses?

4) What is the cost incurred as a result of the withdrawal of GSP benefits for the three products?

5) What is the status of Thai exports, in terms of exporters' ability to adapt to international markets and the level of dependency on the GSP in Thailand's overall foreign trade?

In this regard, the Ministry of Commerce should play an important role, in providing answers to the above questions, since international trade negotiations and intellectual property rights protection are the primary concerns of the Ministry. It seems, however, that the Ministry of Commerce was reluctant to fully cooperate with the MoPH. As reported by the media on many occasions, the Ministry was concerned that the government use licenses would have negative implications on international trade, although no supporting evidence has been put forward to support this claim. This study, on the contrary, provides some evidence that the government use licenses did not have significant impact on exports to the US or foreign investments. The proportion of Thai exports to the US under GSP is small, accounting for 9% of overall Thai exports, and has been decreasing gradually. This suggests the capacity of Thai exporters to adapt with product innovations and market expansion. In addition, the Thai export business does not depend solely on a single foreign market. The GSP benefits were

therefore becoming less important. Although the GSP privilege was withdrawn for three of Thailand's export products in 2007, an additional eight products were granted the privilege under this system. This fact has, however received little attention.

The allegation of inadequate protection of intellectual property in Thailand resulted in its classification as a "Priority Foreign Country" (PFC) during 1991-1993. Although the 2007 GSP withdrawal was linked to the government use licenses, it is argued that the debate on the implications for Thailand's exports should be based on empirical evidence (USTR,2007a). The GSP scheme is provided by the US government largely to take advantage of its standing in international trade. Whilst there are conditions in determining whether a country should be designated as a beneficiary in the GSP scheme, these conditions are not always met. The decision, ultimately, depends on the key authorities (Sapir and Lundberg,1983). As found in this study, many of the Thai respondents were concerned about the threat of trade retaliation from the patent holding countries. Responsible agencies and supporters of the policy should disseminate relevant information to encourage better understanding towards such an issue among key stakeholders.

This study has several strengths: the policy implications were systematically and comprehensively assessed, based on the high quality data provided with the cooperation from many of the governmental organizations including the NHSO, the MoPH's National Cancer Institute and Bureau of Policy and Strategy, and the Ministry of Commerce's Department of Export Promotion. In addition, helpful comments and suggestions were provided by experts and key stakeholders through brainstorming sessions.

However, there are limitations that should be highlighted:

First, this study was conducted to explore the immediate effects of the government use licenses. It does not aim to address any long-term consequences; for example, the increased level of access to anti-cancer medicines or the long-term impact on foreign investment.

Second, the time horizon of this study is set at five years after the grant of the government use licenses. It is possible that changes may arise beyond this point, hence the finding of positive or negative impacts is not definitive. For instance, it will take a long time to observe the impact on drug innovations and technology transfer from developed countries to developing countries, if any.

Third, the results of the study may be distorted by a number of dynamic factors influencing the effects of the government use licenses on public health and the economy. For example, as the advancement in medical technologies may lead to considerable changes in treatment of HIV/AIDS, cardiovascular diseases and cancer, drugs imported under the government use licenses may no longer be necessary after a certain period of time. Moreover, changes in the current world economy may have significant implications on the direction of economic development.

Finally, the findings from this study may not be applicable in forecasting the impact of a similar policy, where implemented in other countries. This is due to the differences in the health systems, disease prevalence and economic characteristics which were found to be strong determinants of the impact of this policy implementation. However, the conceptual framework and methodology of the study may be applied for studying the effects of CL introduction in other poor countries.

6.2 Policy recommendations

1. The selection of drugs for grant of CL

To achieve the maximum benefits of the policy, the criteria of drug selection should include the following elements:

1.1 The number of patients in need of the drugs. This can be estimated by using epidemiological data, including the disease prevalence and incidence. The probability that drugs will be prescribed according to their indications should also be considered.

1.2 The safety and efficacy of the drugs of interest. The safety and efficacy of the proposed drugs should be compared with their alternatives currently available on the market

1.3 The difference in prices between the currently available patented drugs and the proposed generic drugs.

1.4 Variations in prescription practice of health professionals and the potential for irrational use of particular drugs.

1.5 The preparedness for speedy registration, importation and distribution of generic drugs undergovernment use or compulsory licenses.

1.6 The remaining duration of term of patent protection of the original drug in question.

2. Need for improvement of information systems to aid the decision making process

This study identifies several problems and impediments with the existing information systems for decision making and monitoring of the policy impact. The following issues warrant attention:

2.1 Updated information on patent status is crucial to assist the decisions on whether or not the drug should be considered for government use licenses. Such information is also useful for local pharmaceutical companies to

be able to prepare for prompt production of generic versions of patented drugs once the patent term ends. Moreover, the information can help prevent unintentional infringement of intellectual property rights of drugs under patent protection.

2.2 Drug utilization information should be collected on all drugs prescribed under the three publicly-subsidised benefit schemes. Such information is crucial to facilitate the decision making process and can be used to monitor and identify inappropriate drug prescription.

3. Knowledge dissemination to promote public understanding of the government use licenses

Respondent groups in the survey with knowledge about the TRIPS Agreement and its flexibilities supported the government use licenses. Therefore, supporters of this policy should create channels to disseminate information, organize awareness campaigns and mobilize support from the public, to do the following:

3.1 Clarify common misunderstandings that the government use licenses violated international trade agreements. It should be noted that many developed countries, including the US and European countries, had made use of compulsory license for public health and other public interest purposes.

3.2 Stress that the ultimate objective of the government use licenses is primarily to ensure access to essential medicines; hence saving lives of patients and providing a better quality of life, rather than to reduce health care costs.

4 . Supporting measures to improve access to medicines

This study found that the government use licenses alone cannot resolve the problems of inadequate access to drugs. In this respect, the government should consider implementing the following measures:

4.1 Enforce various measures to regulate drug prices; for example, direct price controls, tax reduction/exemption, bulk purchasing and parallel

imports, etc. However, research should be conducted to explore the effectiveness and feasibility of the above measures.

4.2 Promote access of people living with HIV/AIDS to the health system, by combating stigma and discrimination associated with the disease. There should be improved access to HIV/AIDS testing facilities to increase early diagnosis and care of HIV infected persons.

4.3 Promote capacity building of Thailand’s research & development in pharmaceutical industry to promote the independence and sustainability of access to essential medicines.

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Appendix 1 Details of the government use licenses and current situation in Thailand

The Department of Disease Control, Ministry of Public Health announced the issuance of government use licenses for 7 patented pharmaceutical drugs. The details are as follows along with a summary of the current status as illustrated in Table 1(Appendix 1).

1.1 The timeframe of the compulsory license:

- EFV from November 29th, 2006 to December 31st, 2006
- LPV/r from January 24th, 2007 to January 31st, 2012
- clopidogrel from January,25th 2007 until the compulsory license has expired or the drug is no longer in use
- anti-cancer drugs(letrozole, docetaxel, erlotinib and imatinib) from January,4th 2008 until the compulsory license has expired or the drug is no longer in use

1.2 Estimates of the number of patients to receive the generic drugs in relation to whose in need of the drug, in accordance to the National Health Security Act 2002, Social Security Act 1990, and provide access to all government officers. For EFV and LPV/r , the maximum number of the patients would not exceed 200,000 and 50,000 persons per year, respectively. For clopidogrel, letrozole, docetaxel, erlotinib, and imatinib there was no limit on the number of patients to receive these drugs, prescription was based on the physician's decision.

1.3 Compensation to the patent holders would not exceed 0.5% of the total selling price of generic drugs by the Government Pharmaceutical Organization for EFV, LPV/r, and clopidogrel and 3% for letrozole, docetaxel, erlotinib, and imatinib.

Table 1 Summary of the status of compulsory license by drug (as of September 2008)

Medicine	Declaration of CL	First Generic Drug Registration date	First Generic Drug Importation date	Generic Drug Distributed date
1.EFV	Start Nov 29th,2006 End Dec 30th,2011	Jan 18th,2007	Jan 26th,2007	Jan,2007
2.LPV/r	Start Jan 24th,2007 End Dec 30th,2012	Oct 12th,2007	Jan 14th,2008	Feb,2008
3.Clopidogrel	Start Jan 24th,2007	Sep 11th,2007	Jul 19th,2008	Sep,2008
4.Docetaxel	Start Jan 4th,2008	Mar 8th,2007	In progress	
5.Letrozole	Start Jan 4th,2008	In progress	-	
6.Erlotinib	Start Jan 4th,2008	No pharmaceutical companies registered for the generic drugs		
7.Imatinib	Start Jan 4th,2008	In process	Expanding GIPAP right, no importation	

* White Paper from Ministry of Public Health

** Food and Drug Administration Office of the Commission, Ministry of Public Health

*** Government Pharmaceutical Organization

Appendix 2 Framework and Research methods to assess the impact of the government use licensespolicy

HITAP arranged a meeting with experts and stakeholders involved in the government use licensespolicy to determine the study framework and assessment of the impacts on June 12th,2008. The researchers proposed the study framework draft in 3 aspects, the impact on health, economy, and psychological impact. For each area, we outlined the effects which were measurable and unmeasurable, along with the immediate and ultimate effect. The study of measurable effects were transformed to monetary value units (Baht). For the unmeasurable effects, the monetary value were based on outcomes of a questionnaire conducted among key stakeholders and related persons from all sectors from Thailand and internationally. The participants of the meeting shared their opinions and gave suggestions for improvements of the study framework as outlined in Table 2.

Table 1 Study framework of the impact from the government use licensespolicy

Measurable effects

Impact	Immediate effect	Ultimate effect	Method to assess
1. Health	**+** increase in number of patients accessing the drug	**+** increased life expectancy of patients **+** improved quality of life ⇨ increased national labor productivity	**Method:** - for increased number of patients accessing the drug, will be based on actual data collected in Thailand. - Life expectancy and quality of life will be based on literature review nationally and internationally - the two above data will be used to assess the productivity cost, which is in monetary value unit
	? patients may receive generic drugs of poor quality	**?** higher incidence of adverse events **?** poorer efficacy	**Method:** Bioequivalent study has specific indicators based on standard practice to assess if the generic drug is of same quality as original drug.
	- withdraw of drug registration or delays in new drug registration	**?** reduce opportunity to access new drugs and original drugs	**Method:** Collect data on drug registration and studies on quality of drugs
2. Economic	**+** reduce price of drugs	**?** national health expenditure increase **?** appropriateness of health budget in wider context of national budget	**Method:** Collect data on actual health expenditures at current to compare with hypothetical scenario of no compulsory license.
2. Economic (continued)	**?** change of status PWL / PFC GSP withdrawal status for Thai products	**?** reduced export earnings	**Method:** Collect data on actual exports and a study on quality
	? Reduction in national production	**?** increase unemployment	**Method:** Collect actual data on change in national production and a study on quality

Impact	Immediate effect	Ultimate effect	Method to assess
	? Foreign Direct Investment) by Sector (set a meeting to verify)	**?** reduce opportunity for technology transfer and access to new Know-How **?** increase opportunity for technology transfer and access to new Know-How, as the use of compulsory license may open new opportunities to access new Know-How or for technology transfer such as from generic drug producers from India to enable Thailand to produce generic drugs in	**Method:** 1) Foreign direct investments through intermediaries PreMa, assess based on Thailand's competitiveness in international setting which may indicate the level of investors' confidence. Research team must further study the feasibility of assessing a direct relationship between use of compulsory license and national economic competitiveness. 2) To assess opportunity of technology transfer and Know-How , researchers should conduct a literature review and assess the quality.
	+ price of drugs drop in other countries, others follow in Thailand's footstep with a similar policy	**?** the market mechanisms change and drug producers restructure the prices to a more reasonable level	**Method:** Collect data based on review of the market mechanisms and assess the quality

Note : (+) indicates positive impact, (-) indicates negative impact, and (?) indicates impact which are yet unclear if positive or negative

Effects which cannot be measured in terms of monetary value

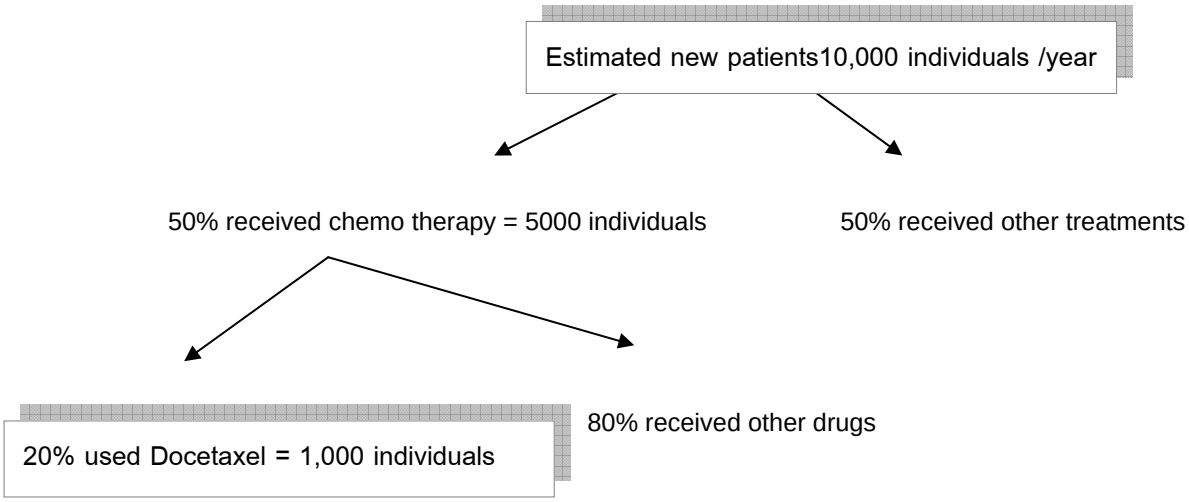
Impact	Immediate effect	Ultimate effect	Method to assess
1 At the family level	**+** delay children with HIV+ parents from becoming orphans **+** delay the time until loss of a member of a family	**+** health of human resources **+** family stability	**Method:** the researchers indicated the methods to assess and data to review
2 At the society / national level	**-** social divisions (conflicting positions of supporters and opposition, in terms of legal right to use compulsory license, moral issues, and level of confidence in quality of generic drugs)	**-** Social instability + social education such as the right to protect public health, the government's right to intervene in the market **both at the national and international level **	**Method:** The researchers outlined the method and quality and seeked opinions and in conducted in-depth interviews
3 At the international level	**-** Thailand will be criticised internationally	**-** Thailand's international reputation will be damanged	**Method:** A qualitative method such as opinion survey
	+ Thailand will be praised in the international community	**+** Thailand's international reputation will improve	**Method:** A qualitative method such as opinion survey
	- effect on innovation	**?** reduction in innovations	**Method:** A qualitative method such as opinion survey

Note: (+) indicates positive impact, (-) indicates negative impact, and (?) indicates impact which are yet unclear if positive or negative

Appendix 3: The proportion of patients who received drugs under the government use licensespolicy (Source : National Cancer Institute)

Estimation of usage of Docetaxel for

1. **Breast cancer**



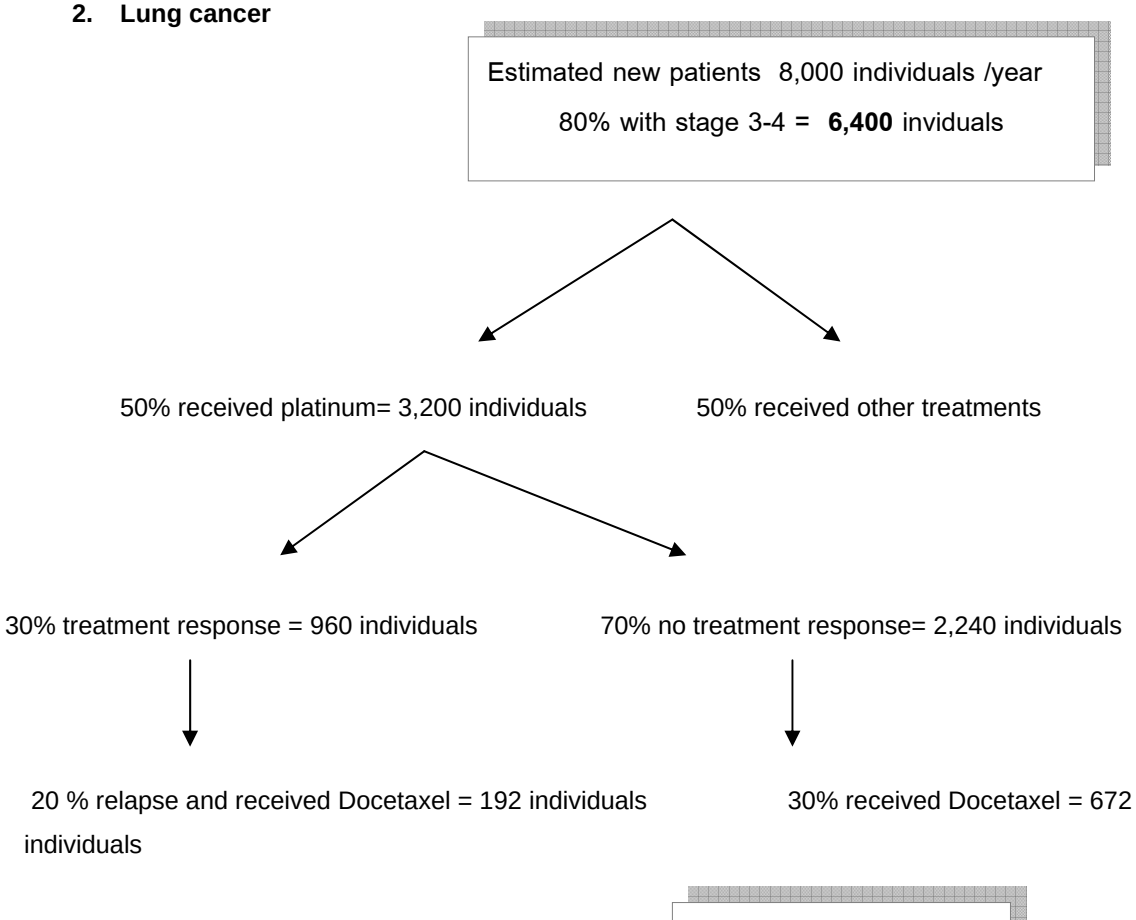
Calculation of quantity of drugs per individual = 120 mg/time,

average of 4 doses per year = 120 x 4 = 480 mg

Thus the total quantity of drugs used per year = 480 mg x 1000 individuals/year = 480,000 mg

Estimation of usage of Docetaxel for

2. Lung cancer



Thus total patients received Docetaxel = 192 + 672 = **864 individuals/year**

Calculation the quantity of drugs 100 mg/per individual = 120 mg/time,
average 4 doses a year = 120 x 4 = 480 mg
Thus the quantity of drug per year = 480 mg x 864 individuals/year = 345,600 mg/year

Estimation of use of Imatinib for:

1. Leukemia type CML

Estimated new patients 200 individuals/year

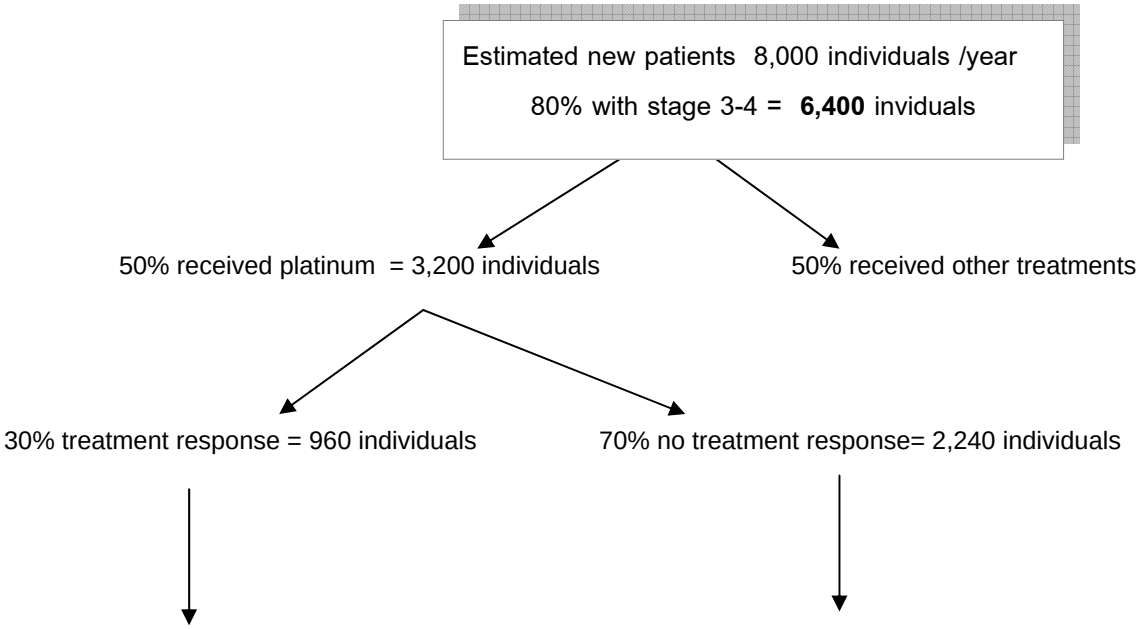
Thus the quantity of drug per year 400 mg x 200 individuals x 365 = 2,9200,000 mg/year

2. GIST

Estimated new patients 100 individuals/year

Thus the quantity of drug per year 400 mg x 100 individuals x 365 = 1,440,000 mg/year

Estimation of use of Erlotinib for Lung cancer



20 % relapse and received Docetaxel = 192 individuals

30% received Docetaxel = 672 individuals

Thus total patients received Docetaxel = 192 + 672 = 864 individuals

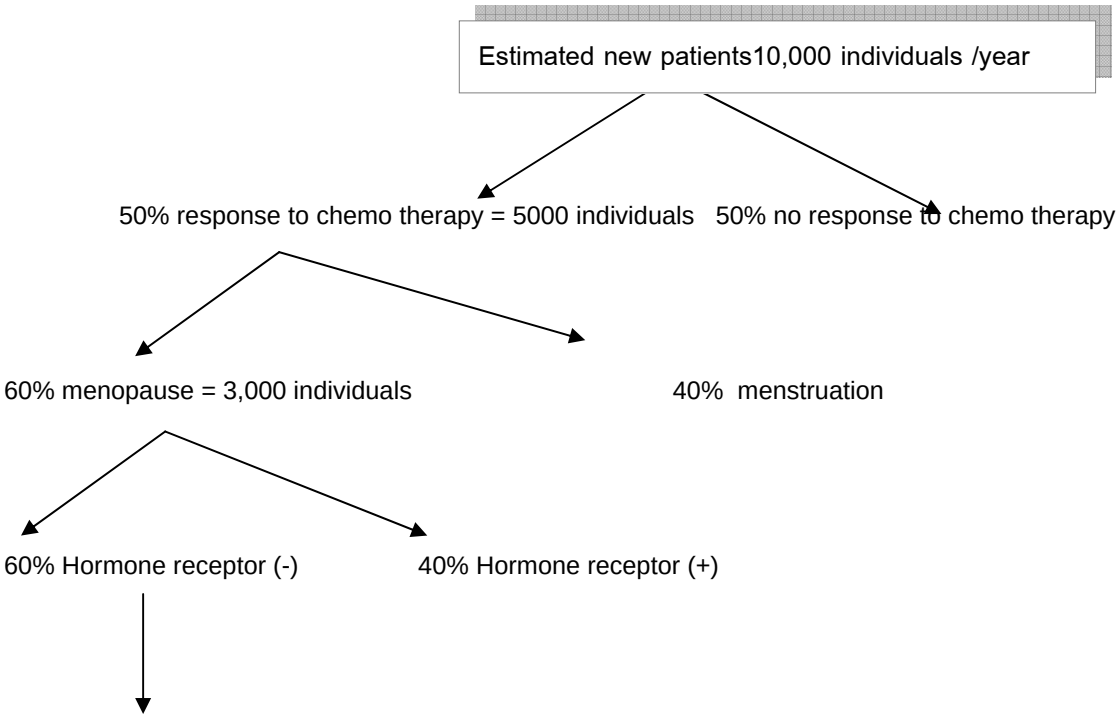
20 % used Erlotinib = **173 individuals/year**

Calculation of the quantity of drugs: 150 mg per individual.

for 4 months = 173 x 120 = 20,760 item/year

Thus the quantity of drug per year = 20,760 tablets

Estimation of use of Letrozole for Breast cancer



Calculation based on estimation of all patients used Aromatase Inhibitor and Letrozole

Thus the quantity of drug use per individual per day 2.5 mg (1 tablet)

for 12 months = 1800 x 365 = 657,000 tablets/year

Appendix 4 The impact of the government use licenses policy on health care costs based on Scenario 1

Antiretroviral drugs to treat HIV infected patients: The analysis of the impact of the government use licenses policy on health care costs over the following 5 years, in reference to two antiretroviral drugs: EFV which is a first line drug, and LPV/r which is a second line drug used for patients who have failed first line treatments.

Generic equivalent of these drugs were imported since 2007, and therefore the price for this study was based on standard price in 2007, using a discount rate of 3 % then transform the cost for 2008 using Consumer Price Index(CPI). LPV/r was imported in 2008 after the government use licenses notification in 2007, valid for 4 years.

The results are illustrated in Table 1 and 2 respectively.

Table 1: 95% confidence interval of drug costs of EFV with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2007	27.6-28.0	9.4-9.5	18.1-18.5
2008	31.5-32.0	10.7-10.8	20.7-21.1
2009	35.0-35.4	11.9-12.0	23.0-23.5
2010	37.7-38.2	12.8-13.0	24.8-28.3
2011	39.9-40.4	13.6-13.7	26.3-26.8
Total	Total costs for 5 years based on 3% discount rate		
	170.7-172.9	58.0-58.7	112.3-114.6

Table 2: 95% confidence interval of the drug costs of LPV/r with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2008	21.8-22.1	4.3-4.4	17.5-17.7
2009	24.1-24.5	4.8-4.9	19.3-19.7
2010	26.1-26.4	5.2-5.3	20.9-21.2
2011	27.6-28.0	5.5-5.6	22.1-22.5
Total	Total costs for 4 years based on 3% discount rate		
	96.2-96.4	18.9-19.1	76.1-77.4

From the data in Table 1 and 2, we found that the use of government use licenses could reduce the costs of drugs for EFV by 133 million USD and 77 million USD for LPV/r for the duration of the study timeframe.

Table 3 95% confidence interval of the drug costs of EFV and LPV/r with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2007	27.6-27.9	9.4-9.5	18.1-18.5
2008	53.3-54.0	15.0-15.2	38.2-38.9
2009	59.1-60.0	16.7-16.9	42.3-43.1
2010	63.8-64.6	18.0-18.2	45.7-46.5
2011	67.5-68.4	19.0-19.3	48.4-49.3
Total	Total costs for 5 years based on 3% discount rate		
	265.9-269.3	76.9-77.9	188.4-192.0

In summary the health care costs for two antiretroviral drugs without use of compulsory license was approximately 267 million USD, and 77 million USD with use of government use licenses. Thus government use licenses can reduce the health care costs for these drugs by approximately 190 million USD for the study timeframe.

Clopidogrel for patients with coronary heart disease: Following the government use licenses policy in January 2007, the generic equivalent of this drug was imported from August 2008. Therefore the analysis of the impact is based on 3 years and 4 months only.

Table 4: 95% confidence interval of the drug costs of Clopidogrel with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2008 (4 months)	1.7-1.8	0.046-0.047	1.6-1.7
2009	6.2-6.3	0.16-0.17	6.0-6.1
2010	7.1-7.3	0.19-0.20	6.9-7.1
2011	8.1-8.2	0.21-0.22	7.8-8.0
2012	9.0-9.1	0.23-0.24	8.7-8.9
Total	Total costs for 3 years and 4 months based on 3% discount rate		
	21.8-22.1	0.58-0.59	21.5-21.6

In summary the health care costs of Clopidogrel without use of compulsory license was 22 million USD, reducing to 0.58 million USD when importing generics under compulsory license. Thus the policy would reduce the costs for this drug by approximately 21 million USD for the timeframe.

Anti-cancer drugs. The government issued a compulsory license for anti-cancer drugs in January 2007, however, to date (September 2008) there has yet been no importation of the generic equivalent of these drugs. Therefore the analysis of the impact on the budget will be for 4 years only. It is assumed that the government will import the generic anti-cancer drugs in 2009. For Docetaxel, the

analysis is based on its use to treat breast and lung cancer. Docetaxel may also be used for treatments of other cancers such as gastric or prostate cancer, however the impact on those cancers will not be considered in this study due to their relatively low incidence.

Table 5 95% confidence interval of the drug costs of Letrozole for breast cancer therapy with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2009	21.5-24.6	0.7-0.8	20.7-23.8
2010	23.0-26.3	0.7-0.8	22.2-25.5
2011	24.6-28.2	0.8-0.9	23.8-27.3
2012	26.3-30.1	0.9-1.0	25.4-29.2
Total	Total costs for 4 years based on 3% discount rate		
	88.4-101.2	2.8-3.2	85.4-98.2

Table 6 95% confidence interval of the drug costs of Docetaxel for lung cancer and breast cancer therapy with/without use of compulsory license (CL) in million USD.

Year	Health care cost of Docetaxel					
	Breast Cancer			Lung Cancer		
	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2009	6.7-7.6	0.2-0.3	6.4-7.3	4.8-5.5	0.21-0.24	4.6-5.3
2010	7.2-8.2	0.3-0.4	6.9-7.9	5.0-5.7	0.22-0.25	4.8-5.5
2011	7.6-8.7	0.3-0.4	7.3-8.4	5.2-5.9	0.23-0.26	5.0-5.7
2012	8.2-9.3	0.3-0.4	7.8-8.9	5.4-6.1	0.24-0.27	5.2-5.9
Total	Total costs for 4 years based on 3% discount rate					
	27.6-31.4	1.2-1.3	26.3-30.1	19.0-21.6	0.8-0.9	18.1-20.7

Table 7 95% confidence interval of the drug costs of Erlotinib for lung cancer therapy with/without use of compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2009	2.2-2.5	0.6-0.7	1.6-1.9
2010	2.3-2.6	0.6-0.7	1.6-1.9
2011	2.4-2.7	0.6-0.7	1.7-2.0
2012	2.5-2.8	0.7-0.8	1.7-2.1
Total	Total costs for 4 years based on 3% discount rate		
	8.7-9.8	2.4-2.7	6.1-7.3

With the government use licenses policy, the cost of Letrozole reduced by approximately 92 million USD over the study timeframe. In the case of Docetaxel, used for treatment of breast and lung cancer, use of compulsory license reduced the cost by approximately 48 million USD. Lastly, the cost of Erlotinib was reduced by approximately 7 million USD through use of compulsory license.

Table 8 95% confidence interval of the combined cost of three anti-cancer drugs with/without compulsory license (CL) in million USD.

Year	No CL (use original drugs) (1)	Use of CL (use generic drugs) (2)	Difference (1-2)
2009	35.2-40.2	1.8-2.0	33.3-38.3
2010	37.5-42.8	1.9-2.1	35.5-40.8
2011	39.9-45.5	2.0-2.3	37.7-43.4
2012	42.4-48.4	2.1-2.4	40.2-46.2
Total	Total costs for 4 years based on 3% discount rate		
	143.7-163.9	7.2-8.2	136.0-156.3

Table 8 shows the impact of the government use licenses policy on the combined cost of all three anti-cancer drugs. Without compulsory license the cost of these drugs would total to approximately 153 million USD, this would reduce to 7 million USD with use of compulsory license to import generic drugs. Therefore compulsory license would lead to a total saving of 146 million USD over the set timeframe.

Appendix 5: Estimation of number of persons in need of drugs for cardiovascular disease

To assess the impact of improved access to clopidogrel, need to assess the number of persons to receive clopidogrel for secendary prevention of cardiovascular disease, based on Scenario 2.

Calculation : Estimated no. patients = the number of population *x* incidence

Table appendix 5. Estimation of the number of persons in need of clopidogrel for secondary prevention of cardiovascular disease

Age group	Population (persons)		Incidence		Estimated no. patients (persons)	
	Male	Female	Male	Female	Male	Female
30-34	2,655,259	2,686,385	0.01	0.01	266	269
35-39	2,687,546	2,802,888	0.02	0.01	538	280
40-44	2,535,820	2,695,778	0.04	0.02	1014	539
45-49	2,203,092	2,358,169	0.08	0.05	1762	1179
50-54	1,792,949	1,973,348	0.13	0.12	2331	2368
55-59	1,362,792	1,519,512	0.18	0.18	2453	2735
60-64	933,645	1,060,447	0.27	0.25	2521	2651
56-69	773,244	914,584	0.36	0.36	2784	3293
70-74	577,553	734,910	0.37	0.36	2137	2646
75-79	377,557	515,583	0.47	0.46	1775	2372
80-84	188,760	282,542	0.49	0.56	925	1582
85-89	80,277	130,866	0.49	0.54	393	707
90-94	30,372	52,760	0.49	0.65	149	343
95-99	9,366	15,749	0.49	0.69	46	109
100	11040	15806	0.49	0.76	54	120

Source : * Department of Provincial Administtration 2007

** HITAP

Information sheet

A Study: Assessing the Implications of Compulsory Licensing Policy in Thailand.

Research institute: The Health Intervention and Technology Assessment Program (HITAP) is a health technology assessment agency in Thailand that is jointly funded by the Thailand Health Promotion Foundation, the Health Systems Research Institute, and the Bureau of Health Policy and Strategy, Ministry of Public Health. The HITAP aims to provide sound evidence to guide policy decisions about health care resource allocation in Thailand.

Objective: The purpose of this study is to assess, from a social perspective, the implications of the Thai government use of patents for seven medicines from 2006 to 2008.

Information relevant to the study:

According to Section 51 of Thailand's Patent Act, in cohesion with the agreement on the Trade-Related aspects of Intellectual Property Rights (TRIPS), the Doha Ministerial Declaration on the TRIPS agreement and Public Health 2001, the Government reserves the right to use patents in situations of "vital importance." Specifically, the section states:

"In order to carry out any service for public consumption or which is of vital importance to the defense of the country or for the preservation or realization of natural resources or the environment or to prevent or relieve a severe shortage of food, drugs or other consumption items or for any other public service, any ministry, bureau or department of the Government may, by themselves or through others, exercise any right under Section 36 by paying a royalty to the patentee or his exclusive licensee under paragraph 2 of Section 48 and shall notify the patentee in writing without delay, notwithstanding the provisions of Section 46, 47 and 47 bis"

In 2006 and 2007, Thailand's Ministry of Public Health declared its intentions to enforce government use of patents for two HIV/AIDS drugs, Efavirenz and Lopinavir+Ritonavir, and an oral antiplatelet agent, Clopidogrel. In early 2008, the public health safeguard was introduced for four anti-cancer drugs, namely Imatinib, Erlotinib, Tetrozole and Docetaxel. The detailed information on medicines for which the Thai government issued compulsory licenses in the period from 2006 to 2008 has been provided in the table below:

Medicines	Uses	Patent holder in Thailand	Estimated No. of Patients Requiring Medication (per year)	Estimated Budget Required without CL Policy (USD)
Efavirenz	First-line treatment for HIV/AIDS (to avoid severe adverse reactions from Nevirapine-based regimens)	Merck Sharp and Dohme	200,000	95 million
Lopinavir + Ritonavir	Second-line treatment for HIV/AIDS	Abbott Laboratories Limited	50,000	109 million
Clopidogrel	Prophylaxis of coronary artery obstruction	Sanofi-Aventis Limited	300,000	47 million
Docetaxel	Treatment of breast, lung, prostate and stomach (GIST) cancers	Sanofi-Aventis Limited	1,500-2,000	680,000
Letrozole	Treatment of breast cancer	Novartis	4,900	8 million
Erlotinib	Treatment of lung cancer	Roche	4,600	140 million
Imatinib	Treatment of chronic myeloid leukemia and GIST	Novartis	2,500	* (see NOTE)

(Source: Ministry of Public Health and the National Health Security Office 2007, 2008)

NOTE: * Novartis, the patent holder of Imatinib, set up an initiative to provide free medicine to low-income patients in the government's health benefit scheme. For this reason, the MOPH would not import or manufacture generic Imatinib.

Prior to the implementation of compulsory licensing, a series of price negotiations between the Health Ministry and patent holders was organized. Nevertheless, the drug companies' proposals were not agreed upon by the government since the reduced prices were still too high, and in some cases, the price reduction was offered with unacceptable conditions.

The above information suggests that inadequate access to patented medicines was a significant public health problem in Thailand. In light of the measures enforced by the Thai administration, the country was expected to overcome such barriers to the population's health and well being, though the Thai policy has been seen as controversial according to parties both inside and outside the country. Several pro and con assertions regarding this issue have been made, not only in official forums but in the

media as well. These have included arguments on a broad range of potential consequences of Thai policy regarding this issue, which are worth exploring in a systematic way.

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Country Group by income Source: World Bank

Low-income economies		
Afghanistan	Haiti	Rwanda
Bangladesh	Kenya	São Tomé and Principe
Benin	Korea, Dem Rep.	Senegal
Burkina Faso	Kyrgyz Republic	Sierra Leone
Burundi	Lao PDR	Solomon Islands
Cambodia	Liberia	Somalia
Central African Republic	Madagascar	Tajikistan
Chad	Malawi	Tanzania
Comoros	Mali	Togo
Congo, Dem. Rep	Mauritania	Uganda
Côte d'Ivoire	Mozambique	Uzbekistan
Eritrea	Myanmar	Vietnam
Ethiopia	Nepal	Yemen, Rep.
Gambia, The	Niger	Zambia
Ghana	Nigeria	Zimbabwe
Guinea	Pakistan	
Guinea-Bissau	Papua New Guinea	

Lower-middle-income economies		
Albania	Georgia	Namibia
Algeria	Guatemala	Nicaragua
Angola	Guyana	Paraguay
Armenia	Honduras	Peru
Azerbaijan	India	Philippines
Bhutan	Indonesia	Samoa
Bolivia	Iran, Islamic Rep.	Sri Lanka
Bosnia and Herzegovina	Iraq	Sudan
Cameroon	Jordan	Swaziland
Cape Verde	Kiribati	Syrian Arab Republic
China	Lesotho	Thailand
Colombia	Macedonia, FYR	Timor-Leste
Congo, Rep.	Maldives	Tonga
Djibouti	Marshall Islands	Tunisia
Dominican Republic	Micronesia, Fed. Sts.	Turkmenistan
Ecuador	Moldova	Ukraine
Egypt, Arab Rep.	Mongolia	Vanuatu
El Salvador	Morocco	West Bank and Gaza

Upper-middle-income economies		
American Samoa	Grenada	Poland
Argentina	Jamaica	Romania
Belarus	Kazakhstan	Russian Federation
Belize	Latvia	Serbia
Botswana	Lebanon	Seychelles
Brazil	Libya	South Africa
Bulgaria	Lithuania	St. Kitts and Nevis
Chile	Malaysia	St. Lucia
Costa Rica	Mauritius	St. Vincent and the Grenadines
Croatia	Mayotte	Suriname
Cuba	Mexico	Turkey
Dominica	Montenegro	Uruguay
Fiji	Palau	Venezuela, RB
Gabon	Panama	

High-income economies		
Andorra	French Polynesia	New Caledonia
Antigua and Barbuda	Germany	New Zealand
Aruba	Greece	Northern Mariana Islands
Australia	Greenland	Norway
Austria	Guam	Oman
Bahamas, The	Hong Kong, China	Portugal
Bahrain	Hungary	Puerto Rico
Barbados	Iceland	Qatar
Belgium	Ireland	San Marino
Bermuda	Isle of Man	Saudi Arabia
Brunei Darussalam	Israel	Singapore
Canada	Italy	Slovak Republic
Cayman Islands	Japan	Slovenia
Channel Islands	Korea, Rep.	Spain
Cyprus	Kuwait	Sweden
Czech Republic	Liechtenstein	Switzerland
Denmark	Luxembourg	Trinidad and Tobago
Estonia	Macao, China	United Arab Emirates
Equatorial Guinea	Malta	United Kingdom
Faeroe Islands	Monaco	United States
Finland	Netherlands	Virgin Islands (U.S.)
France	Netherlands Antilles	

"Appropriate health interventions and technologies for Thai society."

NO……

Assessing the Implications of Compulsory Licensing Policy in Thailand

Please take a few minutes to complete the following questions. Please answer by filling in the blanks and checking (✓) the appropriate boxes. All information in this questionnaire will be kept confidential and used only for the purposes of this project.

Part 1: Personal Information

1.Gender ☐ Male ☐ Female

2.Education ☐ Bachelor's degree ☐ Doctorate degree ☐ Master's degree ☐ Other (……..)

3. Country Group
(Please see information sheet page 4)

☐ Low-income

☐ Lower middle-income

☐ Upper middle-income

☐ High-income

4.Organization

☐ Government Sector

☐ Private Sector

☐ Non-Government Organization (NGO)

☐ Other……

5.Areas of expertise (check multiple items if applicable)

☐ Public Health/ Healthcare

☐ Business/ International Trade

☐ International Relations

☐ Intellectual Property

☐ Economics

☐ Social Development

☐ Public Policy

☐ Other.....

Part 2: The flexibilities of the agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)

Definitions:

A patent is a set of exclusive rights granted by a state to an inventor in order to protect said inventions from piracy or copy without permission from the patent holder.

Compulsory Licensing (CL) is when a government allows someone else to produce the patented product or process without the consent of the patent owner. It is one of the flexibilities on patent protection included in the WTO's agreement on intellectual property — the TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement.

6. Please check (✓) the appropriate box regarding the following statements.

STATEMENTS	YES	NO	NOT SURE
1. Intellectual property rights can not be violated under any circumstances.			
2. Members of the World Trade Organization (WTO) can implement CL for the patented drugs of private companies only in cases of severe shortages of drugs as a result of a state of war.			
3. The TRIPS agreement should not prevent WTO Members from taking measures to protect public health and, in particular, to promote access to medicines for all.			
4. Thailand was the first nation where the government implemented CL for medicines.			
5. CL is a violation of international intellectual property law.			
6. In some countries, CL is an effective measure to reduce the prices of medicines for those countries.			

Part 3: Perspective concerning Compulsory Licensing in Thailand

7. Do you agree with the use of CL for the following patented medications? Please check (✓) where appropriate.

MEDICINE	FOR TREATMENT OF	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1.Efavirenz	HIV/AIDS					
2.Lopinavir+Ritonavir						
3.Clopidogrel	Coronary artery disease					
4.Docetaxel	Cancers					
5.Letrozole						
6.Erlotinib						
7.Imatinib						

8. In your opinion, what are the likely positive implications, domestic and international, related to the current CL policy in Thailand?

Please check (✓) where appropriate.

POSITIVE IMPACTS	THAILAND			DEVELOPING COUNTRIES			DEVELOPED COUNTRIES		
	Agree	Disagree	Not sure	Agree	Disagree	Not sure	Agree	Disagree	Not sure
1. Price reductions for medicines for which the Thai government implemented CL.									
2. An increasing number of patients having gained access to those medicines.									
3. People have realized the importance of intellectual property laws.									
4. The public has learned more about TRIPS flexibilities.									
5. More countries will follow the Thai policy on CL.	---- leave blank ----								
6. Thailand's image will be enhanced.				---- leave blank ----			---- leave blank ----		
7. ……..									
8. ……..									
9. ……..									

9. In your opinion, what are the likely negative implications, domestic and international, related to the current CL policy in Thailand?

Please check (✓) where appropriate.

NEGATIVE IMPACTS	THAILAND			DEVELOPING COUNTRIES			DEVELOPED COUNTRIES		
	Agree	Disagree	Not sure	Agree	Disagree	Not sure	Agree	Disagree	Not sure
1. Patients receive low-quality generic medicines under CL policy.									
2. A decreasing number of medicines will apply for registration.									
3. Technology transfer from developed nations is reduced.									
4. Incentives for invention are reduced.									
5. There is criticism from the international community.				---- leave blank ----			---- leave blank ----		
6. Economic sanctions by the patent holding nations have resulted in a reduction in Thai exports.									
7. Foreign investors and manufacturing bases are shifting away from Thailand.									
8. There are price increases for original drugs for which CL has not been implemented as a means to compensate for the loss incurred from CL affected drugs.									
9. There are price increases in other countries for original drugs for which CL has been implemented as a means to compensate for the loss incurred from CL affected drugs.	---- leave blank ----								
10……									

10. In your opinion, which of the following alternative measures are appropriate for adoption in Thailand, for the purpose of solving the problem of inadequate access to medicines? Please check (✓) the appropriate boxes. More than one alternative measure may be chosen.

ALTERNATIVE MEASURES	Anti-retroviral drugs	Cardio vascular drugs	Cancer drugs
Government			
1. Compulsory Licensing: giving other parties the right to make copies of patented drugs at lower prices.			
2. Direct price control of patented drugs launched by the Ministry of Commerce as necessary goods.			
3. Reduced tax rates for patented drugs.			
4. Parallel Import: buying patented drugs or original drugs from countries where prices are already lower.			
5. Increase health budget			
Pharmaceutical companies			
6. Differential pricing: a pricing strategy in which a company sets different prices for the same product on the basis of disease prevalence or a country's economy status.			
International organizations			
7. Price negotiation by third parties or regional bulk purchasing			
Other alternative measures			
8……..			
9. ……..			

11. If you were a policy maker, for which of the following medicines would you implement CL in Thailand? Please check (✓) the appropriate boxes.

Medicines	Diseases	Yes	No	Not sure	Reasons
1.Efavirenz	HIV/AIDS				
2.Lopinavir+ Ritonavir					
3.Clopidogrel	Coronary artery disease				
4.Docetaxel	Cancers				
5.Letrozole					
6.Erlotinib					
7.Imatinib					

12. Do you have any suggestions regarding the Thai government's CL for patented medicines?

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS STUDY

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