The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Country Reports

Japan International Corporation of Welfare Services (JICWELS)

Contents

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Cambodia

KINGDOM OF CAMBODIA

Nation Religion King

Ministry of Health

Department of Drugs and Food

Country Report

The Study Program on

Quality Management of Essential Medicines Good Manufacturing Practice (GMP) and Inspection

November 4, 2012 – November 30, 2012

Sponsored by :

The Government of Japan

Japan International Cooperation Agency (JICA)

Department of Drugs and Food

Ministry of Health, Cambodia.

I- COUNTRY PROFILE

A-Geography

Cambodia is an agricultural country located in South East Asia which bordering the Gulf of Thailand, between Thailand, Vietnam, and Laos. Its approximate geographical coordinates are 13°N 105°E. Its 2,572 km border is split among Vietnam (1,228 km), Thailand (803 km) and Laos (541 km), as well as 443 km of coastline. Cambodia covers 181,035 square kilometers in the southwestern part of the Indochina, Cambodia lies completely within the tropics; its southernmost points are only slightly more than 10° above the equator. The country is bounded on the north by Thailand and by Laos, on the east and southeast by Vietnam, and on the west by the Gulf of Thailand and by Thailand. It consists of the Tonle Sap Basin and the Mekong Lowlands. To the southeast of this great basin is the Mekong Delta, which extends through Vietnam to the South China Sea.

Cambodia's climate, like that of the rest of Southeast Asia is dominated by monsoons, which are known as tropical wet and dry because of the distinctly marked seasonal differences. The temperatures are fairly uniform throughout the TONLE SAP Basin area, with only small variations from the average annual mean of around 25 °C (77.0 °F). The maximum mean is about 28.0 °C (82.4 °F); the minimum mean, about 22.98 °C (73.36 °F), Cambodia is influenced by Monsoon. Every year, the Monsoon winds blow from the North-East bringing cold weather with some rain from November to March and from May to October, the Monsoon blow from South-West bringing along with lots of rains and humid weather that January is the coolest month and April is the warmest.

Cambodia’s populations in 90% are Khmer and the rest are other minority such as Cham, Vietnamese, Chinese and group of tribe people like PHNONG, STING and KOUY who live with a belief of

Mountain People.

The population of Cambodia was census in 2011 recorded a total of 14.7 million, with a population growth rate of 1.7% per annum (WB data 2011). The proportion of population living in rural areas is 80.5%; only 19.5 % of country's residents live in urban areas. The population density in the country as a whole is 75 per square kilometer, with approximately 1.3 million inhabitants living in Phnom Penh.

Since the 1991 Paris Peace Accord, Cambodia's economy has made significant progress after more than two decades of political unrest. However, Cambodia still remains one of the poorest and least developed country in Asia, with the gross domestic product per capita estimate at approximately 3.3 million Riel or $805 in 2010 (International Monetary Fund,2011). Agriculture, mainly rice production, is still the main economic activity in Cambodia. Small scale subsistence agriculture, such as fisheries, forestry, and livestock, and is another important sector. Garment factories and tourism services are also important components of foreign direct investments.

B- LANGUAGE:

Khmer or Cambodian, is the language of Khmer people and the official language of Cambodia, however the people are free of use their mother tongue and other language. **Khmer** has been considerably influenced by **Sanskrit** and **Pali**, especially in the royal and religious registers, through the vehicles of Hinduism and Buddhism. In old generation, for secondary language is French but after election in 1993 the Government has adopted the free market policy, we are to use other languages without limited refer to working places/offices, many investors have came to Cambodia for their business and also Non-Government Organizations have started their activities in Cambodia. Thus English,

Chinese, French, Japanese and Korean are widely spoken, especially in business field and in government offices. Cambodians from different regions of country speak variant accents, but it is understood by all people throughout the country.

C- CULTURE:

Cambodia culture has had a rich and varied history dating back many centuries, and has been heavily influenced by India and China. However, Cambodian have still kept the own culture for long time such as Khmer weeding, Khmer New Year in April, PHUM BEN, Water festival, etc. The Ministry of Culture has concentrated on culture and Khmer custom and tradition. 90% of Cambodian people have abided by tradition and customs.

KHMER WEDDING

PHUM BEN

WATER FESTIVAL

APSARA DANCING

D-RELIGION:

Cambodia is predominantly **Buddhist** with 90% of the population being Theravada Buddhist, 1% Christian and the majority of the remaining population follows Islam, atheism, or animism, but in Highland tribal groups, most with their own local religious systems, probably number fewer than 100,000 persons. The **Khmer LOEU** has been loosely described as animists, but most tribal groups have their own pantheon of local spirits. However, in our national constitution is decided to Buddhist is the religion of state.

E-EDUCATION SYSTEM:

Education in Cambodia was traditionally offered by Pagodas (Buddhist temples), thus providing education exclusively for the male population.

The formal educational structure consists of six years of primary school (grades 1–6), three years of lower secondary school (grades 7–9), and three years of upper secondary school (grades 10–12).

The Education field is very mains to create the human resources, develop the National country and educate people all the rank. The Government pays attention to the human resources and it is always enhanced by Government.

There are Education in System and Education out System

- Education in system means that Education in the state school.

- Education out system means that Education follows organization and private school.

Education in Cambodia divided into 3 kinds

1- State School

2- Private School

3- Organization School

Cambodia has 7 phases Education

1- Kindergarten

2- Elementary School

3- Secondary School

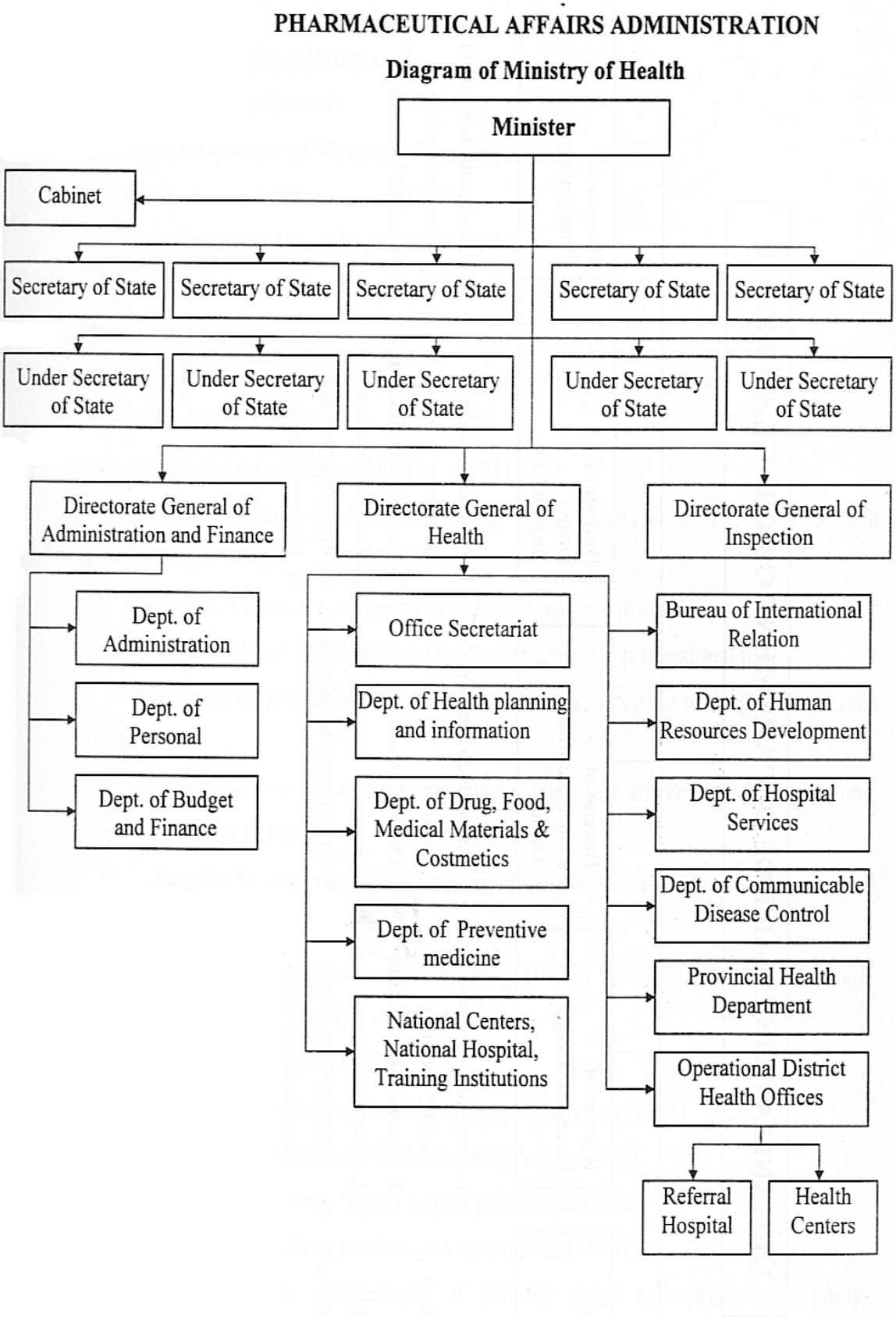
4- High School

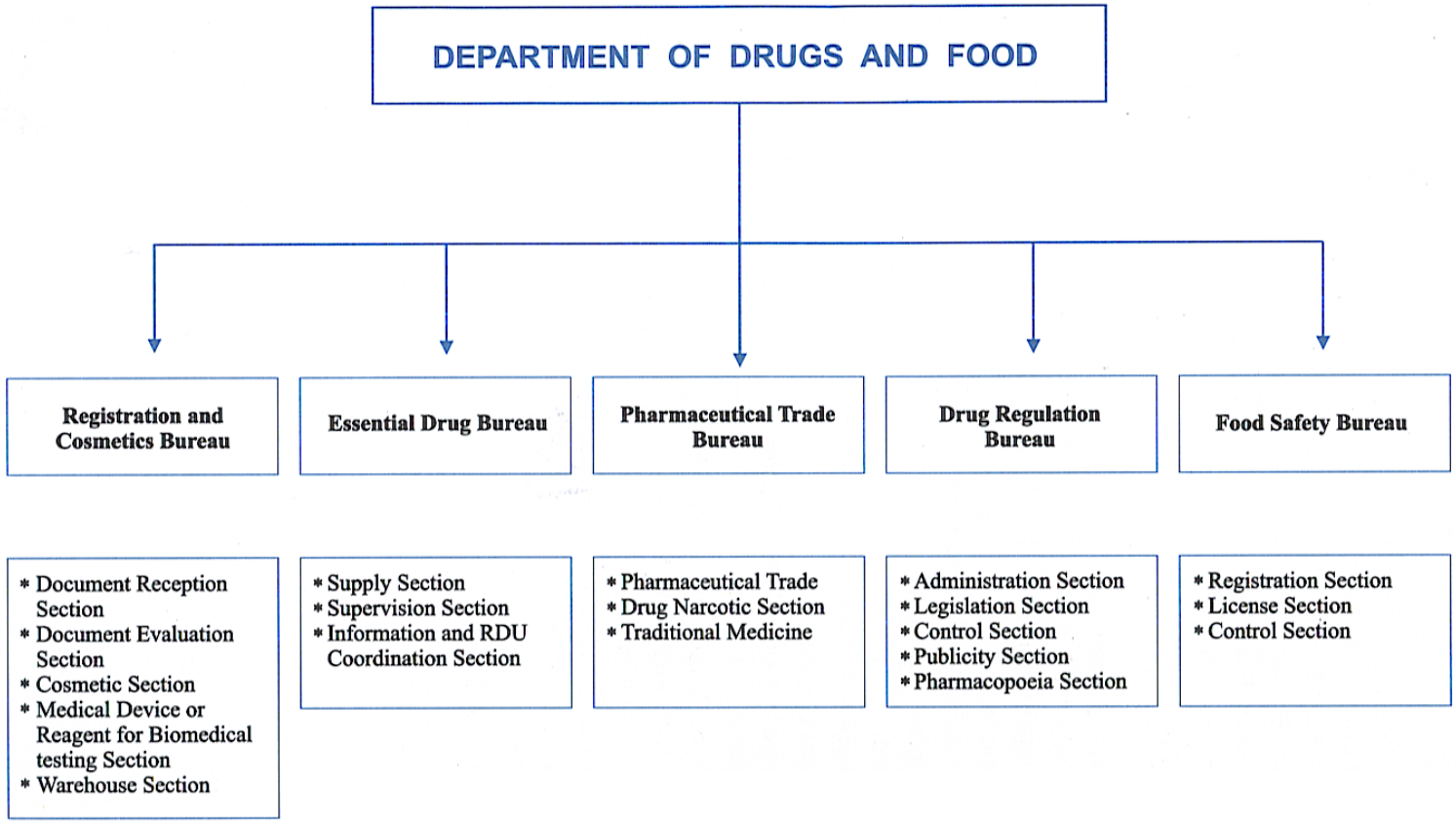
5- Faculty / University

6- Master Degree

7- .Doctor Degree

II- STATISTICAL DATA




DEPARTMENT OF DRUGS AND FOOD
Registration and Cosmetics Bureau
Essential Drug Bureau
Pharmaceutical Trade Bureau
Drug Regulation Bureau
Food Safety Bureau
* Document Reception Section
* Document Evaluation Section
* Cosmetic Section
* Medical Device or Reagent for Biomedical testing Section
* Warehouse Section
* Supply Section
* Supervision Section
* Information and RDU Coordination Section
* Pharmaceutical Trade
* Drug Narcotic Section
* Traditional Medicine
* Administration Section
* Legislation Section
* Control Section
* Publicity Section
* Pharmacopoeia Section
* Registration Section
* License Section
* Control Section

Department Drugs and Food reported,

September 2012

a- **Number of pharmaceutical manufacturers are nine sites:**

1-Chea Chamnan
2-Medical supply
3-EUPHAC
4-PPM
5-CPE
6-Bio- Meta
7-GEN PHARMA
8-BRIGHT FUTURE
9-LLCO

b- **Number of pharmaceutical Importers are 116 sites**

c- **Number of pharmaceutical Whosalers are 1601 sites**

III- HISTORICAL DEVELOPMENT of PHARMACEUTICAL SERVICE

A-History of the National plan on Pharmaceutical Services:

The First National Drug Policy published in 1995, then reviewed and endorsed in 1998, and last update in 2010 by the Minister of health assisted by World Health Organization in Phnom Penh, as the guidelines of the development about:

-Legislation and Regulations of Drugs

-Selection of Pharmaceutical products

-Drugs supply system

-Drugs distribution and Good storage Practices

-Drugs quality control system

-Financing of drugs and Pricing Policy

-Rational drugs use

-Traditional Medicines

-Monitoring and Evaluation (which will enable progress and adjustment of Strategies)

The main mission of Department of Drugs and Food in 2012

To control and eliminate illegal drug outlets in whole country

To serch the source of counterfeit and substandard medicines to eliminate.

To assure that manage all medicines at public health services.

To Educate guidance and use all nacotic medicine upon to technical

To publish all counterfeit medicine and issue of counterfeit medicine

To monotoring and evaluate the usage of medicines at public health services

To strenghtening register system as the same as regional country.

To educate and guidance focus on law that related to food hygien and safety to restaurant owner.

B-History of GMP

Ministry of Health decided to follow of WHO GMP, and step by step harmonize with regional Asian GMP. Now Cambodia GMP follows ASEAN GMP guidelines, but we had gradually modified according to our current situation and through experience from training courses provided by international partners such as WHO, especially JICA, JICWELS...

In 1999, the ministry of health advised the local pharmaceutical manufacturers to implement the principles of GMP as in Prarkas (Decision) number 513 issued in December 1999, the meaning of GMP is base on the WHO GMP and Japan GMP and flexible of Asian GMP, such as focus on the definition, personnel, premises, equipment, sanitation and hygiene, production, quality control, self inspection, recall product and documentation, etc,

Since then, the department of drugs and food, MoH and WHO started to develop the guideline and conduct training to key persons of local manufacturers and pharmacist responsible and

quality control staffs to get the knowledge of GMP, and some workshops of dissemination were prepared that corporate with the manufacturers association and WHO expertise,

In 2006, under support of WHO, the guideline of the conducting of GMP inspection was established, and training the inspectors team in the same year,

From year to year, JICA and JICWELS always has supported of department of drugs and food and national health product quality control center to attend the GMP training course to upgrade of GMP knowledge and practice of GMP in Japan, and do evaluate in place by JAPAN GMP expert every year,

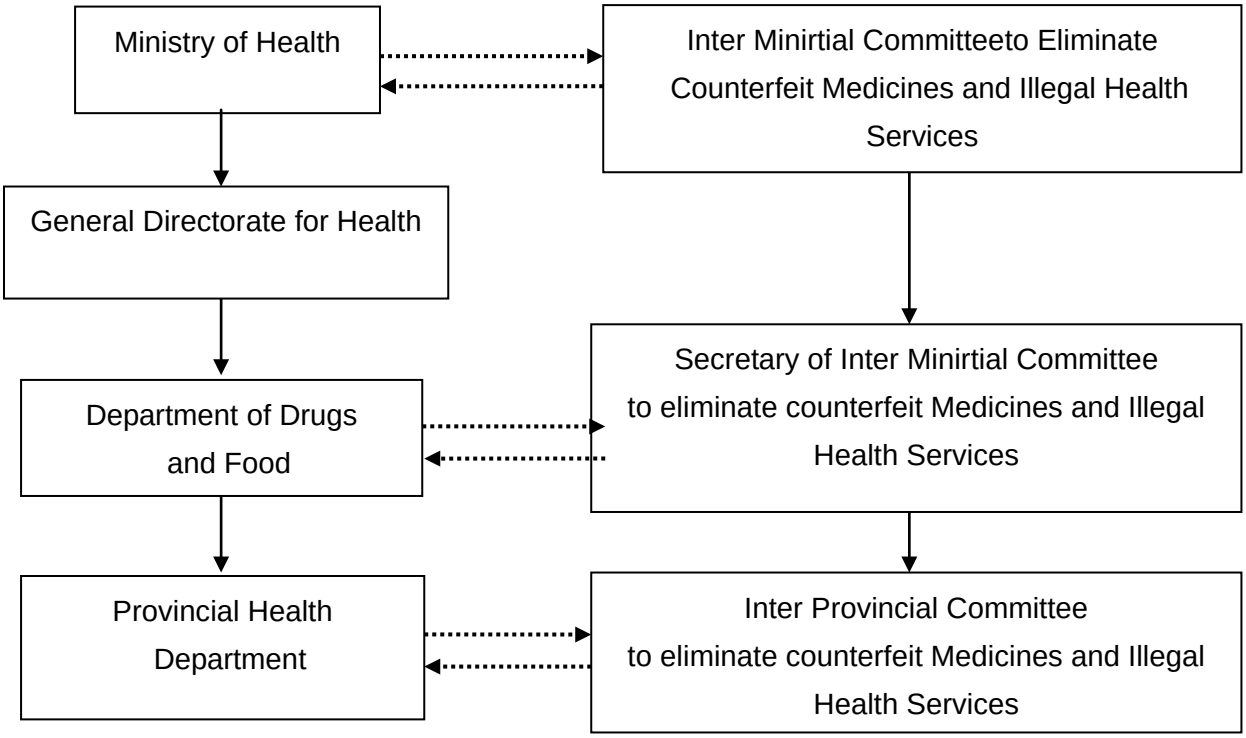
While going on inspection, the drugs inspectors from DDF look properly at the personnel, premises, equipment, Sanitation and Hygiene, production (storage of stating material and bulk produces, process validation, contamination, batch and lot numbering systems, weighing and dispensing, finished products and quarantine, warehouse) quality controls, documentation, handing of products (rejected drugs, product complaints and returned drugs, as per GMP guidelines of ASEAN. However, at present the procedure of GMP inspection uses the notification on procedure of opening, closing or transferring of Pharmaceutical Pants (Degree N0 505 dated September 1998).

Until 2008, the national health product quality control center moved from national drugs

quality control was signed by prime minister has a mission to joint with department of drugs and food inspector of GMP to inspect the local manufacturers to evaluate the GMP follow the ASEAN inspection guideline that we need to fully harmonized in 2015,

IV- GMP System:

1) Central and local organization in charge of pharmaceutical affairs administration:



Inter-Ministerial Committee to Eliminate Counterfeit Medicines and Illegal Health Services

2010: The Inter-Ministrial Committee

-H.E Mam Bun Heng	Minister of Ministry of Health	Chair
-H.E Chou Yin Sim	Secretary of State (MoH)	Member
-H.E Heng Tay Kry	Secretary of State (MoH)	Member
-H.E Chhim Chhuon	Under Secretary of State (Interior)	Member
-H.E Tek Reth Kamrong	Under Secretary of State (Commerce)	Member
-H.E Srun Dara	Under Secretary of State (Finance)	Member
-H.E Meas Kim Sivaro	Under Secretary of State (Forest)	Member
-H.E Chan Thy	Under Secretary of State (Information)	Member
-H.E Pok Manny	Under Secretary of State (Justice)	Member
-H.E Tun Sa Im	Under Secretary of State (Education)	Member
-H.E Touch Sarom	Deputy Governor of Phnom Penh	Member
-Dr. San Sary	Director of Hospital Department	Member
-Dr. Heng Bun Kiet	Director of Food and Drug Department	Secretary

Inter-Ministerial Committee and Inter-Provincial Committee to Eliminate Counterfeit Medicines and Illegal Health Services

The members of Secretary of Inter-Ministrial Committee:

-Mr. Heng Bun Keit	Director of Drug and Food Department	Chair
-Dr. Huot Seng Thong	Vice Director of Drug Department	Deputy
-Dr. San Sary	Director of Hospital Department	Deputy
-Mr. Hang Moeun	Vice Director of Department(Commerce)	Member
-Mr. Suon Nara	Representative of Interior Minister	Member
-Mr. Sok Kalyan	Representative of Justice Phnom Penh	Member
-Mr. Chheng Kim Sun	Representative of Forest Ministry	Member
-Mr. Has Piseth	Representative of Forest Ministry	Member
-Ms. Nov Phalla	Drug Registration Bureau	Member
-Ms. So Pokhoan	Drug Legislation Bureau	Member
-Mr. Neang Phearith	Legislation and Ethics Bureau	Member
-Mr. Titt Suosdey	Vice chief Legislation and Ethics Bureau Member	Member
-Mr. Tey Sovannarith	National Laboratory for Drug Quality Control	Member
-Mr. Kleang Sameth	Drug Inspecter	Member
-Mr. Eav Dararoth	Drug Inspecter	Member
-Mr. Pan Sokunna	Drug Inspecter	Member
-Mr. Som Samnang	Drug Inspecter	Member
-Mr. Hun Huong	Drug Inspecter	Member
-Mr. Kao Seng	Drug Inspecter	Member
-Mr. Moey Tha	Drug Inspecter	Member

The objective of pharmaceutical affairs is insuring Quality, Efficacy and Safety of pharmaceutical products to all people who are used of medicinal products to cure or prevent their health.

This first national Pharmaceutical Sector Strategic Plan provides direction to the pharmaceutical sector and to donors interested in supporting pharmaceutical sector development for the next 5 years. The plan is intended to compliment the National Health Sector Strategic Plan. The Planning process was led by the Department of Drugs and (DDF) with participation from the National health product quality control center (NHQC) and others sector institutions. Technical support was provided by the World Health Organization (WHO).

The Ministry of Health (MOH) is committed to creating an environment of ongoing quality improvement in the pharmaceutical sector. The goal is to provide effective health care for the people of Cambodia, and to equip them to care for themselves by protecting pharmaceutical quality, in turn ensuring good quality health care and good quality health care advice. For many people in Cambodia, especially the poor and those living in rural areas, the first source of modern medical advice and treatment is usually the drug seller. Evidence suggests that the people of this country are spending a large proportion of their household income on health care without gaining significant change in their health status. It is likely that most of this spending is on pharmaceuticals.

However, by constant improving the quality of services and products in the pharmaceutical sector, the morbidity and mortality rate can be reduced, and when successful, contribute to the economic, human and overall development of Cambodia.

The commitment to improve quality in the pharmaceutical sector is reflected in the strategies and outcomes described in this 5-years strategic plan, which includes an implementation framework and annual operational plans. However, these outcomes cannot be achieved by the pharmaceutical sector alone. Pharmaceuticals are an important part of the entire health sector. The MOH, other government ministries and Non-Government Organizations (NGO) must support all the dedicated workers in the pharmaceutical sector. Continuing technical and financial assistance from our donors is essential and most graciously appreciated.

2) Legal and institutional position of GMP, GMP guideline:

The ministry of health has given the power to the department of drugs and food to manage and control of medicines include the GMP guideline and inspection,

In 2000, the official of Good Manufacturing Practice Guideline was developed and published by department of drugs and food, that followed by ASEAN GMP, It has 10 chapters and 100 articles, the training of this guideline was supported by WHO with 3 days time on course,

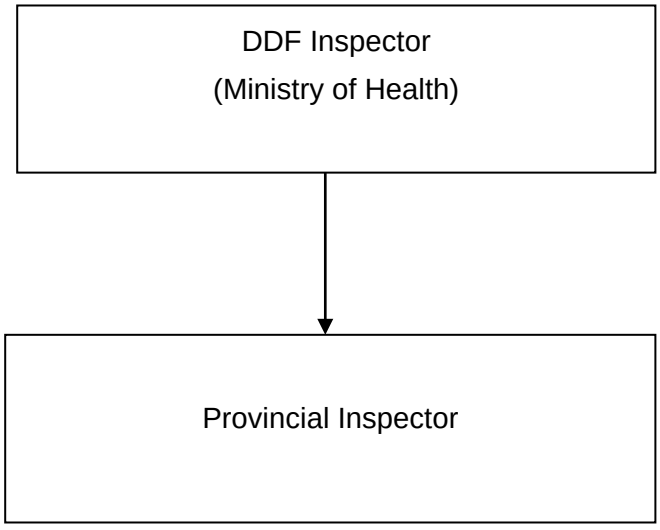
The guideline focuses on:

- Definition that explain of technical words and glossary,
- Personnel describe about responsibilities staffs on GMP, and training about GMP
- Premises detail on location of apartment in manufacturer, infrastructure, water supply, power supply and waste management, etc,
- Equipment include the design and construction, installation, and maintenance,
- Sanitation and hygiene were described on personnel are working with, premises and equipments include the hygiene practice,
- Production is concentrated on starting material, process validation, contamination, batch and lot numbering system, weighing and dispensing, returns, recovered material, return goods, control record of shipment of drugs products and contract manufacture,
- Quality control is focus on control laboratory, validation, reprocessing, production procedure, product complain, product record and review, etc

- Self inspection is report system by internal auditor and supervisor
- Recovery or recall product describe about market report, complain system, return back, and system control recall,
- Documentation is detail on documentation keeping, quality of documentation, specification record, self inspection report, and stock management system, etc,

For inspection division is under control of department of drugs and food, It is a bureau of regulation and inspection, that has around 10 persons working and lead by deputy director of department of drugs and food, It is only based in central government,

3) Inspection of Pharmaceutical affairs, Organization of Inspection Division, Number of Inspectors (Central govment/local govment, their role):



DDF inspector is 15 people

24 Provincial inspectors are 85 people

4) Scope of Pharmaceutical products under GMP inspection:

The scope of GMP inspection of Cambodia is:

- To ensure that our pharmaceutical companies comply with all of the regulations and laws pertaining to their business.

- To find out of our pharmaceutical companies non-comply with GMP guideline, regulatory,

- To advise their company on the regulatory affairs and climate that would affect proposed activities.

- To contact with the concern person is responsible for providing all technical data to pharmaceutical regulatory agency where he/she want to register the pharmaceutical product for sale, hence he/she must have knowledge on:

.Pharmaceutical Administration and Management,

.How to Handling laboratory and manufacturing deviations

.Pre approval inspections,

.Impact of total Quality performance

.Maintenance and Update of Product Master Files ,

.Internal Compliance of Documentation

.Quality systems,

.Quality Assurance,

.Method Validations,

.Standard Operating Procedures (SOPs)

.Auditing and Compliance Functions

.Stability as per ICH ,guidelines, International harmonization ,

. Pharmacological, Toxicological and Clinical Trial Information, Re-registration Documents Design,

.Clinical Pharmacy,

.Drug Trials and Vaccine Trials Guidelines,

.Clinical Trials,

.Intellectual Property Rights,

.Patent Application Procedure,

On other hand is opportunities to fill the check list and evaluate the manufacturers about GMP implementation in Cambodia as:

. Organization and personnel

. Premises

. Equipment

. Materials, sources and waste management

. Good practices in production

. Quality control

. Sanitation and hygiene

. Validation master plan,

. Documentation

. Complain

. Products recall

. Self-inspection and quality audits

5) Frequency of GMP inspection:

Usually, Cambodia inspection follows the guideline of the Conducting of GMP Inspection that was established and update in 2006 under supported by WHO, the guideline is integrated of WHO, ASEAN and PIC guideline,

The frequency of GMP inspection is at least 1 time per year in general, but they need to inspect on each ward on one time until the finish job, however, the ministry allow to inspect of several time per year in case of complain, recall products and damage suspecting of products, and other

For complex manufacturer, the guideline advice to inspect ward by ward to all,

6) Method (s) of GMP inspection (field inspection, documentary inspection)

In GMP inspection guideline 2006, there are 11 points of methodology for GMP inspecting procedure:

- Planning of inspections: inspection team develop the annual plan for inspection like frequency

timetable, and human resources are responsible to prepare the documents and materials,

- Preparation of inspection: check documents of manufacturer is registering with the ministry of health, pharmaceutical products of manufacturer will visit, check report on last visit, documents are related to the manufacturers and GMP check list,
- Inspection inform: contact to manufacturer about time and date to visit the manufacturer purpose of visit, and persons will contact during of visit,
- Opening meeting: after welcome, inspectors team need to introduce about purpose of visit among of meeting persons, pharmaceutical policy, regulations and arrange meeting after finish their works,
- Inspect manufacturer facility: visit an around of manufacturer facilities, production chain, quality control unit, storage places, and finish production warehouse,
- Verify documentation: checking standards operational procedures, specification, work instruction, master manufacturing formula, batch processing, packaging, batch release procedure,
- Complain,
- Self inspection
- Final meeting: inform to key persons or meeting attendances about result on inspection visit,
- Inspection report: keep check list is filled during of visit with signing of inspectors team and manufacturer responsible,
- Next plan inspection visit arrangement.

7) Qualification of GMP inspectors, education,

training system

The qualification of GMP inspectors is base on WHO supported and JICA, JICWEL and harmonization of ASEAN GMP inspection in 2015, most of GMP inspection are trained in Japan, and ASEAN meeting or workshops, however, WHO always conduct training on GMP inspection and checklist every year that called refreshing training such as 2009 training, USP PQM has conducted training on “Good Manufacturing Practices Auditing Fundamentals” in 2006 after GMP guideline was established, the training module is designed to assist the Department of drugs and Food (DDF) or inspectors and internal auditors personnel with the basics of Good Manufacturing Practices (GMP) auditing techniques that the course corporate with WHO, and also every year, JPMA, JICA pharmaceutical expert come to evaluate the Cambodia GMP and coach of inspectors team to update their capacities and share experiences, however this kind of activities do not exactly the training system, we expect in 2015 that ASEAN become a Union, It is opportunity of Cambodia to strengthening of capacity to harmonize with ASEAN region as European Union,

8) Case of recalled pharmaceutical products arising from compromised quality (number of cases, outline of cases over the past 5 years):

In case of recalled pharmaceutical products, example Paracetamol 500mg tablet was sale to central medical store for distributing to public health facilities in 2005, and also Cotrimoxazole 480mg tablet in the same situation in 2008, theses products after distribute to health facilities, we note that it is changing the appearance of tablet, it arise black spots in tablets, and easy to be the powder, the

facilities make complain to manufacturer and inform to the ministry of health to change the new batch are suspected fail of quality, the supplier start to collect or call back their products and replace the new batch and amount to fill up health facilities without charge on transport and other fee, other case for import products in 2007 (India progesterone birth spacing pill), the pill are cracked in blister during of storage condition, it pass quality control before delivery, however, suppliers happy to collect and destroy their products and replace to facilities services stock,

In 2010, some products are selling in the market, after JPMA find out their quality are failed by quality control on dissolution test at Kanasawa University that study on post marketing surveillance, the ministry of health decide to stop import and recall of products stock and destroy after confirming testing such as compound of Amoxicillin and clavulenic Acid from Indonesia, and Cimetidine domestic product, within the collect and recall of pharmaceutical products, the ministry of health is announcing to public and medical professional to stop using these products until renew announcement about that case from the ministry informal, this some of case for recalling pharmaceutical and there are …..case for recall products during of last 5 years include public and privates sectors.

9) Manufacturing, Import and Export of pharmaceutical products (products name of main medicine, kind of preparation: Tablet, injectable solution)

Since 1994 authorized licensees either manufacturers or importers can apply for drug registration. All drugs are approved by the Drug Registration Committee. The pharmaceutical products are registered,

they are able to sell in the Cambodia market and be able to export to other countries for domestic manufacturer, the validation of register license is 5 years and they need to re-register again for 5 years more,

The required documents for the Registration are:

PART I: ADMINISTRATIVE DATA & PRODUCT INFORMATION

SECTION A: INTRODUCTION

SECTION B: OVERALL TABLE OF CONTENT

Table of contents

1- Application Form for Marketing Authorization

2- Letter of Authorisation

3- Certification

4- Labeling

5- Product Information

SECTION C: ADMINISTRATIVE DATA & PRODUCT INFORMATION

PART II: QUALITY DOCUMENT

SECTION A: Table of Contents
SECTION B: Quality Overall Summary
S: Drug Substance
P: Drug Product
SECTION C: Body of Data

S- Drug Substance

S1: General Information

S1.1: Nomenclature

S1.2: Structural formula

S1.3: General Properties

S2: Manufacture

S2.1: Manufacturer (s)

S2.2: Description of Manufacturing Process and Process Controls

S2.3: Control of Materials

S2.4: Controls of critical Steps and Intermediates

S2.5: Process Validation and/or Evaluation

S2.6: Manufacturing Process Development

S3: Characterization

S3. 1: Elucidation of Structure and Characteristic

S3.2: Impurities

S4: Control of Drug Substance

S4.1: Specification

S4.2: Analytical Procedures

S4.3: Validation of analytical procedures

S4.4: Batch analyses

S4.5: Justification of Specification

S5: Reference Standards or Materials

S6: Container Closure System

S7: Stability

Stability Summary & Conclusion

Post-approval Stability Protocol & Stability Commitment

Stability Summary Data

P- Drug Product

P : Description and Composition

P2: Pharmaceutical Development

P2.1: Information on Development Studies

P2.2: Component of Drug Product

P2.2.1: Active ingredient

P2.2.2: Excipients

P2.3: Finished product

P2.3.1: Formulation Development

P2.3.2: Overages

P2.3.3: Physicochemical and Biological Properties

P2.4: Manufacturing Process Development

P2.5: Container Closure System

P2.6: Microbial Attributes

P2.7: Compatibility

P3: Manufacture

P3.1: Batch formula

P3.2: Manufacturing Process and Process control

P3.3: Control of Critical Steps and Intermediates

P3.4: Process Validation and/or Evaluation

P4: Control of Excipients

P4.1: Specification

P4.2: Analytical Procedures

P4.3: Excipients of Human and Animal Origin

P4.4: Novel excipients

P5: Control of Drug Product (Finished product)

P5.1: Specification

P5.2: Analytical Procedures

P5.3: Control of Analytical Procedure

P5.4: Batch Analyses

P5.5: Characterization of Impurities

5.6: Justification of Specification

P6: Reference Standards and Materials

P7: Container Closure System

P8: Product Stability

Stability Summary and Conclusison

Post – approval stability and stability commitment

Stability data

P9 : Product Interchangeability

SECTION B: QUALITY OVERALL SUMMARY
SECTION C: BODY DATA

Note: For some generic product required for bioequivalent/bioavailability as in the list of DDF requirement

Part III: Non Clinical document

1. Pharmacology
2. Toxicology

Part IV: Clinical document

From March 2010, Cambodia starts to harmonize Asian registration guideline as we call ACTR/ACTD (Asian Comment Technical Requirement/Asian Comment Technical Dossier).

The common pharmaceutical do import from India in 30% for essential medicine with other products such as:

- Paracetamol syrup or tablet,
- Multivitamin + Mineral syrup or tablet
- Promethazine syrup or tablet

- Co-trimoxazole (sulfamethoxazole + trimethoprim, suspension or tablet
- Amoxicillin suspension or tablet
- Ciprofloxacin (as hydrochloride) suspension or tablet, etc

But for French products in 10%, that are always for espial items such as:

- Bupivacaine 0.5% Spinal heavy injection
- Fentanyl injection
- Ceftriaxone injection
- And other medicine for Diabetic, hypertension, Cardiology, etc
- Etc,

10) Sales and distribution of medicines products, proportion of imported medicinal product distribution:

Reported of ministry of health 2011, they are 10171 products are registered and do marketing in Cambodia market that amount of this number is 969 common products are produced by the local manufacturers (7 local manufacturers), It is nearly 10% if we compare to import products from other countries like India 3002 items or 30%, French 846 items or 8%, Thailand 748 items or 7%, Malaysia 621 items or 6%, Korea 626 items or 6%,Vietname 418 items or 4%,Germany 383 items or 4%, China 347 items or 3%, Indonesia 341 items or 3%, Bangladesh 276 items or 3%,paistan 190 items or 2%, and other countries include USA, Swizeland, Taiwan, Cyprus, Philipines, Belgium, Australia, England UK ..etc

11) Products name of medicines domestically manufacturers and products name of Imported medicines in the market (main products):

The main products in the market of domestic products such as:

1- Gynomax® Metronidazole 250mg, Neomycin sulfate 100mg, Nystatin 100 000IU and Hydrocortisone acetate 5mg B/2x6 ovules

2- Kalfen® Ibuprofen 400mg B/10x10 tabs.

3- Omeprazole 20mg Omeprazole 20mg B/10blx10 caps.

4- Panol® Paracetamol 250mg/5ml B/bottle/100ml

5- Kinal gelule Paracetamol,Cafeine (500mg+50mg) Box/10x10Caps.

6- Polymoxyl 250 Cap. Amoxicilline Box/2x10Caps.

7- Befix-250 Cephalexin 250mg. B/10x10 Tab

8- Erythromycine 500mg Tab. Erythromycine Bottle/500Tab.

9- Penicilline 500.000 UI Phenoxymethylpenicillin B/100 x 10 tab.

10- Ethambutol-INH 400/150 Ethambutol,Isoniazide Bottle/200Tabs.

11- Gliclazide® 80mg Gliclazide Box/500Tabs.

12- Glucofree® 850mg Metformin Chlorhydrate Box/3x10film coated Tabs.

13- Griséofulvine 500 mg Griseofuvine Box/10x10 Tabs.

14- Haloperidol 1mg Haloperidol Bottle/300Tabs.

15- Mefloquine 250mg Mefloquine Bottle/100Tabs.

16- Arquine 50 Tab. Artesunate Plastic Bott/100Tabs.

17- Polyvit® Syrup VitB1,B2,B5,B6,B12,A,C,D3,E,PP Box/1bott/100ml

18- Acicloral CPE 200mg Aciclovir Bottle/30Tabs.

19- Pyrazinamide 500mg Pyrazinamide Bot./1000Tabs.

20- Rifampicine - Isoniazide CPE Rifampicine 150mg , Isoniazide 100mg Bot./1000Tabs.

21- Staviro CPE 15mg Stavudine Bott/60Caps.

22- Triviro-30 CPE Nevirapine,Lamivudine Bottle/60Tabs.

23- Metronidazole 250mg Metronidazole 250mg B/10x10 tabs.

24- Etc,

However, Cambodia need to other brand of products out of domestics products have such as:

1- Aspirine pH 8TM 500mg Acide acetylsalicylic B/5 x 10 Cp.

2- Dextrose 5 % in distilled water , Dextrose

3- Dextrose 5 % + 0,9% normal saline , Dextrose , Sodium chloride

4- Dextrose 5% + 1/2 NaCl, Dextrose , Sodium Chloride

5- Dextrose 5% + 1/3 NaCl, Dextrose , Sodium Chloride

6- Atropine sulfate 1mg/ml, Atropine sulfate

7- Bupivacaïne Adrénaline 0,25%, Chlorhydrate de bupivacaïne anhydre-Tartrate d'Adrénaline

8- Lidocaïne Aguettant 2%, Chlorhydrate de lidocaïne anhydre

9- Osmotan-G 5%, Sodium-Potassium-Chlorure-Glucose

10- Mannitol 20% , Mannitol

11- Ringer Lactate (Hertmann's Solution), Na,KCl,CaCl2 6H2O

12- Macrazyt-500, Azithromycin 500mg

13- Met XL 100mg, Metoprolol Succinate 100mg

14- Azithral-500, Azithromycin

15- 10% Dextrose Inj , Dextrose, B/1bottle/250ml

16- Monocrin 1g Ceftriaxone 1g B/1vial

17- Efavirenz capsules 50mg Efavirenz 50mg

18- Lamivudine 150mg & Zidovudine 300mg tablets, Lamivudine 150mg, Zidovudine 300mg

19- Utrogestan 100mg, Progesterone

20- Clumox® Tab. 625 Amoxicillin 500mg, Potassium clavulanate 125mg

21- Valium 5mg, Diazepam

22- Emixef® Capsule, Cefixime 200mg Box/3x4Caps.

23- Etc,

12) Legal and institutional regulations on the sales and distribution of pharmaceutical products

Refer to the regulation on medicines management in Cambodia, such as:

- Law on creation of Ministry of Health (1996)

- Law on Drugs Management (1996)

- Sub-Decree on Drugs Registration (1994)

-Sub-Decree on Manufacturing Exporting Importing and selling of Traditional Medicines (1998).

-Regulation on Functions and Responsibilities of Drugs Inspectors at international Ports (1996).

- Registration Book for Potent Drugs (Toxic, dangerous, Psychotropic and narcotic drugs).

- Counterfeit Book for Physician to prescribe narcotic drugs for patient use.

- Counterfeit Book for pharmacist to request drugs for professional use.

- Regulation on procedure of opening closing or transferring of drug selling stores (1996).

- Regulation on procedure of opening closing or transferring of drug Import Export companies (1996).

- Regulation on procedure of opening closing or transferring of pharmaceutical factories (1998).

- Regulation on procedure of opening closing or transferring of traditional medicine selling stores (1998).

- Regulation on drug leaflets (1997).

- Regulation on implementation of Drug registration (1994).

- Ministerial decision on National Drug Policy (1998).

- Regulation on drug Import Export procedures (1999).

- Regulation on drug products advertisements (1999).

- Regulation on management of narcotic drugs and psychotropic drugs precursors (1999).

- Notification on traditional medicine registration (1998).

- Notification on cosmetics safety importation (2000).

- Requirements for renewal of drug registration license (2000).

- Decision on medical devices registration (2001).

- Ministerial decision on Prohibition of selling of Counterfeit medicines (01/08/2003).

- Ministerial decision on the sticking of vignette on the Pharmaceutical box (15/03/2005).

- Sub-Decree: Create the Inter-ministerial Committee and Provincial Committee to eliminate Counterfeit drugs and illegal Health services (29/08/2005)

Private Sector:

The ministry of health has established a committee registration to select and evaluate of all pharmaceutical products and other health products to giving the register license for selling in Cambodia market, the committee were composed by the department of drugs and food as register office is as the secretariat to study the administrative dossiers with technical pharmaceutical dossiers, the national health product quality control center is responsible for analyzing the dossier and part of technical on quality control processing, expertise medical doctor from national hospital are responsible for study on clinical trial and effect on treatment to patients,

The committee always meet every quarterly to decide or approve on products are completed the criteria of guideline which under guide from ministry secretarial,

The department of drugs and food as the pharmaceutical trade office are responsible to analysis on drugs import and drugs approval distribute proposal to ministry of health before selling in the market,

The importer or destructors of pharmaceutical products need to send the documents to department of

drugs and food to check it before make approval from the ministry of health, the documents are:

- Airway bill or Bill of lading from original sources
- Commercial invoice with price attachment
- Parking list with weight of products
- List of pharmaceutical products with number of register license
- Official letter address to the minister of ministry of health
- Etc,

The ministry of health usually approves after they check that documents are legal and respect the guideline like expiry date is over 18 months when arrival in Cambodia, property storage condition, not include other products are effect to medicines, IEC material need to declare and other points of guideline,

When the pharmaceutical products are selling in the market, the ministry of health established a team inspection were corporate with police and lawyer to control of medicines products are suspected to counterfeit which collect the samples to national health product quality control center to check their quality, if the result are failed, the ministry of health ask to police and lawyer to justice course and destroy and penalty refer to the medicine management law.

Public Sector:

The central medical store (CMS) of ministry of health is a legal institution for distributing of pharmaceutical products and other health products to national hospital, referral hospital and the operational district (OD) or regional store, the operational district (OD) is distribute to health centers,

public clinics and other health posts,

Cambodia is a system of centralization procurement for public health sector, It mean the procurement

Central level public procurement is done by different procurement agents, depending on funding sources. There are currently 3 main procurement units (PUs) responsible for public procurement of pharmaceuticals:

- National Budget (NB) PU – uses funds allocated from the National Budget
- Global Fund/Principal Recipients (GF/PR) PU – for GF grants
- Health Sector Support Program (HSSP) PU - uses donor funds (World Bank, ADB, DFID, UNFPA, JICA etc). However, it is important to note that currently all World Bank procurements, including pharmaceuticals, is done by an external/international contracted procurement agent – the Grown Agent.

However, after receiving of commodities from suppliers, CMS is responsible to storage, repackage, and distribute to other public health services by checking the national plan service and screening the quarterly report from referral hospital and operational district,

The ministry of health also have allowed to national hospital, referral hospital and other health services procured by themselves but under control processing and auditing budget sources,

13) Existence or nonexistence of recalled system of products distributed:

When there are some pharmaceutical products are counterfeited in the market, the inspector

collect the samples to the national health product quality control center to confirm the quality and the department of drugs and food are verify the register license of the product and design to compare the registered product and samples are taken from the market, if the products need to recall from the market, the ministry of health make announcement to all health services and pharmacy store take attention to stop using and sell to patients about the brand name of product, design (include showing picture), lot or batch number, manufacturing date of product, country produce, and source.., the company or importer has a role responsible to turn back their stock and report to department of drugs and food or ministry of health about stock status and establish a committee to destroy of that products with is disseminated information by television and newspapers, if there do not know about importer or distributor, It is nearly the same process but the collection of products from the market are responsible by department of drugs and food, drugs and food safety office of all provinces and municipality or city authority to corporate with private sectors as pharmacy association, medical association and pharmacy or medical doctor are responsible on technique on their field to collect the products recall to ministry of health or department of drugs and food to destroy,

Every year, the project of Japan Pharmaceutical Manufacturer Association (JPMA) and Kanasawa University has conducted a post marketing surveillance that corporate with ministry of health, department of drugs and food, national health product quality control center to collect the sample and analysis of sample in Japan and some part at national health product and quality control center to find out of quality of essential medicines in Cambodia market, If the product are failed testing quality, the ministry of health take action to recall of products and do not allow of that product to sell in the market,

and some of them delete out the number of license in the register list,

14) Name of organization for analyzing recall products:

Usually, if there are suspicious samples or products recalled, the national health products quality control center are responsible to analysis of samples collection to confirm their quality before decide to recall products from the market which 5 analyzing staffs are responsible, in case of national health product quality control center is not enough capacity to analysis, the ministry of health to decide send that samples to analysis in Viet Nam or Thailand to confirm the quality control and take the action recall from the market by collect from the pharmacy store, clinic and other stock to destroy which corporate with the provincial health department and health professional association,

V- Essential Drug List in 2010

The National Essential Drug list is composed of 134 items and 134 items of consumables excluding drugs specifics for the national programs 231 items such as:

1- Eye unit…….....12 items

2- Tuberculosis…….....22 items

3- Malaria/Shistosomiasis and Helminthiasis/Dengue Hemorrhagic Fever/Filariasis Program

   a- Malaria…….....14 items

   b- Shistosomiasis and Helminthiasis ..... 01 items

   c- Dengue Hemorrhagic fever.....03 items

   d- Filariasis .....03 items

4- Birth Spacing…….....08 items

5- Leprosy .....05 items

6- Psychiatry .....21 items

7- STD .....05 items

8- Dermatologic…….....22 items

9- HIV/AIDS CARE…….....35 items

10- Oral Health:

   - Medecines.....11 items

   - Materials .....12 items

11- National immunization program .....09 items

12- Pain Relies medicines/Palliative care .....17 items

13- Anti cancer Medicines .....12 items

14- Anti-Diabetic medicines.....05 items

15- Endocrinology and Hormonology.....02 items

16- Nutrition ..... 02 items

ESSENTIAL DRUG LIST

This list is updated every two years

ឡរ **Nº**	លរ **Nº**	រាយឈ្មោះឱសថសំភារៈបរិក្ខារពេទ្យ **Description**	កំរិត **strength**	ប្រភេទ **Form**	**Therapeutic category and/or other uses (not intended to serve as a substitute for clinical judgement)**
I- BASIC MEDICINES					
I-1- ORAL MEDICINES					
1	1	Acetylsalicylic Acid	500mg	Tab	Analgestic, Antipyretic, antimigraine, antithrombotic
2	2	Aluminium Hydroxide	500mg	Tab	Antacid
3	3	Aminophylline	100mg	Tab	Anti-asthmatic/brochodialator
4	4	Amlodipine	10mg	Tab	Antihypetensive
5	5	Amoxicillin	250mg	Tab	Antibacterial (beta lactam)
6	6	Amoxicillin	500mg	Cap	Antibacterial (beta lactam)
7	7	Amoxicillin + Clavulanic acid	500mg+125mg	Tab	Antibacterial (beta lactam)
8	8	Amoxicillin Dry Powder/Granules 60ml	125mg/5ml	Btl	Antibacterial (beta lactam)
9	9	Atenolol	50mg	Tab	Antihypetensive; antiangino
10	10	Bromhexin	8mg	Tab	Broncho mucolytic/antitussive
11	11	Bromhexin Syrup 60ml	4mg/5ml	Btl	Broncho mucolytic/antitussive
12	12	Captopril	25mg	Tab	Antihypetensive
13	13	Charcoal Activated (Carbon Absorbent)	125mg	Tab	Antidote (non-specific) for poisoning
14	14	Chlorpheniramine maleate	4mg	Tab	Anti-histamine; anti-allergic

15	15	Chlorpromazine (as hydrochloride)	25mg	Tab	Psychotic disorders
16	16	Cimetidine	200mg	Tab	Antacid (h2-receptor histamine antagonist - inhibits production of acid in the stomach)
17	17	Ciprofloxacin (as hydrochloride)	500mg	Tab	Antibacterial
18	18	Cloxacillin (as soldium salt)	250mg	Tab	Antibacterial (beta lactam)
19	19	Cloxacillin (as soldium salt)	500mg	Tab	Antibacterial (beta lactam)
20	20	Co-trimoxazole (sulfamethoxazole+trimethoprim)	100+20mg	Tab	Antibacterial
21	21	Co-trimoxazole (sulfamethoxazole+trimethoprim)	400+80mg	Tab	Antibacterial
22	22	Co-trimoxazole (sulfamethoxazole+trimethoprim) Suspension 60ml	200+40mg/5ml	Btl	Antibacterial
23	23	Diazepam	5mg	Tab	Anxiolytic, sleep disorders, mild muscle relaxant
24	24	Diclofenac	50mg	Tab	NSAID, analgesic
25	25	Digoxin	0.25mg	Tab	Cardiovascular medicines used in heart failure
26	26	Doxycycline (as hydrochloride)	100mg	Tab	Antibacterial
27	27	Enalapril	10mg	Tab	Anti-hypertensive;congestive heart failure and improvement of survival after a heart attack.
28	28	Erythromycin (as stearate or ethyl succinate)	250mg	Tab	Antibacterial
29	29	Erythromycin stearate Dry Powder/Granules 60ml	125mg/5ml	Btl	Antibacterial
30	30	Fenofibrate	300mg	Tab	Anti-cholesterol and triglyceride
31	31	Ferrous fumarate Suspension 60ml	100mg/5ml	Btl	Antianaemic
32	32	Ferrous Sulphate + Folic Acid	200+0.40mg (60mg Iron element + 0.4 mg Folic acid)	Red Tab	Nutrition supplement for use in pregnancy
33	33	Fluconazole	100mg	Tab	Oral antifungal
34	34	Folic Acid	5mg	Tab	Antianaemic
35	35	Furosemide	40mg	Tab	Diuretic and anti-hypertensive; also used in heart failure
36	36	Hydralazine	25mg	Tab	Anti-hypertensive; Should be used in pregnancy induced acute and severe hypertension. Not recommended for the treatment of essential hypertension.

37	37	Hydrochlorothiazide (scored tablet)	50mg	Tab	Diuretic and anti-hypertensive; also used in heart failure
38	38	Indometacin	25mg	Tab	NSAID, analgesic
39	39	Isosorbide Dinitrate	10mg	Tab	Vasodilator used in , e.g. angina pectoris, anal fissure and congestive heart failure.
40	40	Mebendazole	500mg	Tab	Intestinal anthelminthic
41	41	Methyldopa (Aldomet)	250mg	Tab	Anti-hypertensive; Should be used in pregnancy induced acute and severe hypertension. Not recommended for the treatment of essential hypertension.
42	42	Metoclopramide (as hydrochloride) (Primperan)	10mg	Tab	Antiemetic
43	43	Metronidazole	250mg	Tab	Antibacterial/antiamoebic/antigiardiasis
44	44	Mifepriston + Misoprostol (Medabon)	(01x200mg)+(04x200µg)	Tab	Medical abortion
45	45	Misoprostol (Cytotec)	200µg	Tab	Oxytocic
46	46	Multivitamin + Mineral		Tab	Vitamin and minerals supplement
47	47	Nalidixic Acid (Negram)	500mg	Tab	Anti-infective (quinolone)
48	48	Niclosamide	500mg	Tab	Intestinal anthelminthic
49	49	Nifedipine Retard	20mg	Tab	Anti-hypertensive (calcium chanel blocker) also used as an anti-angina.
50	50	Nystatin	500.000IU	Tab	Oral antifungal
51	51	Oral Rehydration Salts (Low osmolarity 1L), for glucose-electrolyte solution	Glucose: 13.5g/l, Sodium chloride:2.6g/l, Potasium chloride 1.5g/l, Trisodium citratedihydrate:2.9g/l (20.5g)	Sachet	Oral remedy for rehydation
52	52	Paracetamol	100mg	Tab	Analgesic, antipyretic, antimigraine (acute); without anti-inflamatory action
53	53	Paracetamol	500mg	Tab	Analgesic, antipyretic, antimigraine, without anti-inflamatory action
54	54	Paracetamol	500mg	Supp	Analgesic, antipyretic, antimigraine; without anti-inflamatory action
55	55	Paracetamol Syrup 60ml	125mg/5ml	Btl	Analgesic, antipyretic without anti-inflamatory action
56	56	Phenobarbital	50mg	Tab	Anticovulsant/antiepileptic
57	57	Phenoxymethyl Penicillin (as potassium salt)	250mg	Tab	Antibiotic (beta lactam)
58	58	Potassium Chloride	600mg	Tab	Treatment of hypokalemia in patients predisposed to loss o K+ e.g. patients on

					high doses of diuretics
59	59	Prednisolone	5mg	Tab	Anti-inflammatory ; Anti-allergic/anaphylaxis
60	60	Promethazine	25mg	Tab	Antihistamine, anti-emetic
61	61	Promethazine (as hydrochloride) 0.1% syrup 60ml	5mg/5ml	Btl	Antihistamine, anti-emetic
62	62	Retinol / Vitamine A (red color capsule with nipple)	200,000IU	Soft Cap	Vitamin A supplement
63	63	Retinol / Vitamine A (blue color capsule with nipple)	100,000IU	Soft Cap	Vitamin A supplement
64	64	Salbutamol	4mg	Tab	Antiasthmatic/bronchodialator
65	65	Salbutamol for Inhalation 200doses	0.1mg/dose	Btl	Antiasthmatic/bronchodialator
66	66	Simvastatine	20mg	Tab	Anti-cholesterol; used to prevent cardio vascular disease
67	67	Tiemonium (Visceralgine)	50mg	Tab	Antispasmodic
68	68	Vitamin B1	50mg	Tab	Vitamin B1 supplement
69	69	Vitamin B6	10mg	Tab	Vitamin B6 supplement
70	70	Zinc Sulphate (Dispersible)	20mg	Tab	Diarrhoea in children used as with/an adjuct to ORS

I-2. INJECTABLE MEDICINES

71	1	Adrenaline (epinephrine)	1mg/1ml	Amp	Anti-allergic, anti-anaphylaxis
72	2	Ampicillin	500mg	Vial	Antibacterial (beta lactam).
73	3	Ampicillin	1g	Vial	Antibacterial (beta lactam)
74	4	Antisnake Venon Polyvalent	10ml	Vial	Antisnake immunoglobulin
75	5	Antitoxin,Tetanus	500IU/1ml	Amp	Antitetanus
76	6	Atropine Sulphate	1mg/1ml	Amp	Pre-operation medication; specific antidote for some poisoning
77	7	Bupivacaine 0.5% Spinal heavy	20mg/4ml	Vial	Local/Spinal anaesthetic
78	8	Butylscopolamine (Hyoscin, Buscopan)	20mg/2ml	Amp	Antispasmodic
79	9	Calcium Gluconate 10%	1g/10ml	Amp	Specific antidote for some type of poisoining
80	10	Ceftazidime (as pentahydrate) (powder for injection)	250 mg	Vial	Broad-spectrum (beta-lactam antibacterial) for the treatment of melioidosis infection caused by Burkholderia pseudomallei
81	11	Ceftriaxone	1g	Vial	Antibacterial (beta lactam)
82	12	Chloramphenicol	1g	Vial	Antibacterial
83	13	Chlorpromazine (as hydrochloride)	50mg/2ml	Amp	Psychotic disorders

84	14	Cimetidine	200mg/2ml	Amp	Antacid (h2-receptor histamine antagonist - inhibits production of acid in the stomach)
85	15	Cloxacillin (as soldium salt)	1g	Vial	Antibacterial (beta lactam)
86	16	Dexamethasone phosphare (as disodium salt)	4mg/1ml	Amp	Antiallergic, anti-anaphylaxis
87	17	Dextrose 50%	50ml	Vial	Hypoglycemia (low blood sugar) in emergency care; management of coma of unknown origin; and restoration of energy.
88	18	Diazepam	10mg/2ml	Amp	Psychotropic, pre-operation sedation for short term procedures; anti-convulsant/antiepileptic
89	19	Dopamine (as hydrochloride)	200mg/5ml	Amp	Symphomimetic used in heart failure, shock and other conditions where sympathomimetic action is desirable.
90	20	Ephedrine (for dilution, as hydrochlorided)	30mg/1ml	Amp	Spinal anaesthesia during delivery to prevent hypotension
91	21	Ergometrine Methyl (Methergin)	0.2mg/1ml	Amp	Oxytocic (uterine contraction)
92	22	Etamsylate (Dicynone)	250mg/2ml	Amp	Anticoagulant
93	23	Fentanyl	0.1mg/2ml	Amp	Chronic pain management
94	24	Furosemide	20mg/2ml	Amp	Diuretic normaly used in heartfailute
95	25	Gentamycin (as sulfate)	80mg/2ml	Amp	Antibacterial
96	26	Hydralazine Powder + Solvent	20mg/1ml	Amp	Antihypertensive: for acute management of severe pregnancy-induced hypertension only.
97	27	Hydrocortisone (as Sodium succinate)	100mg	Vial	Anti-inflammatory ; Anti-allergic/anaphylaxis
98	28	Ketamine	500mg/10ml	Vial	General anaesthetics – injectable
99	29	Lidocaine 2%	50ml	Vial	Local anaesthetic – injectable
100	30	Magnesium Sulphate 50% IM/IV	10ml	Amp	For treating eclampsia and severe pre-eclampsia not other forms of convulsant disorders
101	31	Metoclopramide (as hydrochloride) (Primperan)	10ml/2ml	Amp	Antiemetic
102	32	Metronidazole	500mg/100ml	Vial	Antibacterial/antiamoebic/antigiardiasis:
103	33	Morphine (as hydrochloride or sulphate)	10mg/1ml	Amp	Chronic pain management
104	34	Neostigmine	0.5mg/1ml	Amp	Muscle relaxant
105	35	Oxytocin	10 IU/1ml	Amp	Oxytocic (uterine contraction)
106	36	Penicillin - G, IM/IV	1MIU	Vial	Anti-infective

107	37	Potassium Chloride 10%	10ml	Amp	Treatment of hypokalemia
108	38	Salbutamol	0.5mg/1ml	Amp	Antiasthmatic
109	39	Sodium Bicarbonate 8.4%	20ml	Amp	Alkalising agent for the treatment of acidocis
110	40	Suxamethonium (as chloride)	100mg/2ml	Vial	Muscle relaxant
111	41	Thiopental	1g	Vial	General anaesthetics – injectable
112	42	Tramadol Chlorhydrate	100mg /2ml	Amp	Chronic, moderate to severe pain management
113	43	Vecuronium (bromide) + Solvent	10mg/10ml	Vial	Muscle relaxant/anesthesia
114	44	Vitamin K1 (Phytomenadione)	10mg/1ml	Amp	Coagulant: affects blood coagulation; helps to stop bleeding
115	45	Water for Injections	5ml	Amp	Diluent for injection

I-3. IV FLUIDS

116	1	Dextran 40 + IV giving set	500ml	Btl	Anticoagulant during surgical operations; plasma expander/subsitute
117	2	Dextrose 10% + IV giving set	500ml	Btl	Rehydration and energy; diluent for other IV medications
118	3	Dextrose 5% + IV giving set	500ml	Btl	Rehydration and energy; diluent for other IV medications
119	4	Dextrose 5%+0.45% Saline + IV giving set	500ml	Btl	Electrolyte replacement, rehydration, and source of energy
120	5	N S S 0.9% + IV giving set	1000ml	Btl	Electrolytes replacement, rehydration, and source of sodium, sugar and energy
121	6	Plasma Substitute + IV giving set	500ml	Btl	Plasma expander
122	7	Ringer's Lactate + IV giving set	1000ml	Btl	

I-4. EXTERNAL MEDICINES

123	1	Benzoic Acid 6% + Salicylic Acid 3%	500g	Jar	Antifungal (topical)
124	2	Benzyl Benzoate 25%	1L	Btl	Scabicide, pediculicide
125	3	Sodium Dichloroisocyanurate (Water Purification)	167mg	Tab	Water Purification
126	4	Chlorhexidine digluconate 20%	1L	Btl	Antiseptic concentrate; 5% solution used as antiseptic
127	5	Gentian Violet Powder	25g	Jar	Anti-infective (topical) as a 0.5 aqueous solution or tincture
128	6	Fluorthane (Halothane)	250ml	Btl	General anaesthetics – inhalation
129	7	Hydrogen Peroxide (20 volumes)	1L	Color Glass Btl	Antiseptic concentrate; 5% solution used as antiseptic
130	8	Polyvidone Iodine 10%	200ml	Btl	Antiseptic
131	9	Potassium Permanganate	250g	Btl	Anti-infective (topical) as a aqueous

					solution 1:10,000
132	10	Soda lime (Chaux Sodee)	4.5kg	Btl	Adjuct to general anaesthesia
133	11	Petroleum Jelly (Vaseline)	500g	Jar	Emollient (skin lubrication and mosturizer)
134	12	Zinc oxide 10%	500g	Jar	Hypoallergenic (minimize itching due to skin allergic reactions)

II- CONSUMMABLES

135	1	Adhesive Tape Zinc Oxide perforated	18cm x 5m	Roll	
136	2	Adhesive Tape Zinc Oxide perforated	5cmx5m	Roll	
137	3	Airway (ambuls oxygene)	Size 1	Pcs	
138	4	Airway (ambuls oxygene)	Size 2	Pcs	
139	5	Bandage, Crepe	8cmx4m	Roll	
140	6	Bandage, Gauze Non-sterile	7.5cmx10m	Roll	
141	7	Bandage Tubular Elastic	8mm x 4cm	Pcs	
142	8	Blades for Surgical Knife	#15	Pcs	
143	9	Blades for Surgical Knife	#22	Pcs	
144	10	Blood Collection Bag (CPD)	350ml		
145	11	Catheter Foley, Ballon 2 ways 10ml, sterile	CH12	Pcs	
146	12	Catheter Foley, Ballon 2 ways 10ml, sterile	CH14	Pcs	
147	13	Catheter Foley, Ballon 2 ways 10ml, sterile	CH16	Pcs	
148	14	Catheter IV	18G	Pcs	
149	15	Catheter IV	20G	Pcs	
150	16	Catheter IV	22G	Pcs	
151	17	Catheter IV	24G	Pcs	
152	18	Catheter IV	26G	Pcs	
153	19	Colostomy Bag, Disposable	38mm	Pcs	
154	20	Cotton Wool Absorbent	500g	Roll	
155	21	Cotton Wool Non Absorbent	500g	Roll	
156	22	Developer for X-Ray Film (For manual use)	for 22,5 L	Pack	
157	23	Developer for X-Ray Film	1 Gallon	Btl	
158	24	Drainage Strip (Delbet)	25x3cm	Pcs	
159	25	Eye Shields		Pcs	
160	26	Fixer for X-Ray Film (For manual use)	for 22,5 L	Pack	
161	27	Fixer for X-Ray Film	1 Gallon	Btl	
162	28	Dressing for burns with Paraffin	10x10cm	Pcs	
163	29	Gauze, absorbent (BP17g/m^2)	90cmx91m	Roll	
164	30	Glove examination, non sterile, Latex	Small	Pcs	
165	31	Glove examination, non sterile, Latex	Medium	Pcs	

166	32	Glove examination, non sterile, Latex	Large	Pcs	
167	33	Glove, sterile, Long Cuff (for Gynaecological use)	Small	Pcs	
168	34	Glove, sterile, Long Cuff (for Gynaecological use)	Medium	Pcs	
169	35	Glove, sterile, Long Cuff (for Gynaecological use)	Large	Pcs	
170	36	Glove Surgical, sterile, latex	Small	Pcs	
171	37	Glove Surgical, sterile, latex	Medium	Pcs	
172	38	Glove Surgical, sterile, latex	Large	Pcs	
173	39	High Quality Printing Paper UPP- 110s	110mm x 20m	Pcs	
174	40	Infusion set with burette 100ml, Disposable	60drops/minute	Pcs	
175	41	Iol Intra Ocular Lens	#18	Pcs	
176	42	Iol Intra Ocular Lens	#19	Pcs	
177	43	Iol Intra Ocular Lens	#20	Pcs	
178	44	Iol Intra Ocular Lens	#21	Pcs	
179	45	Iol Intra Ocular Lens	#22	Pcs	
180	46	Medical Plastic Bags (Khmer printing, as sample)	7cm x 11cm	Pcs	
181	47	Medical X ray films, Green sensitive	18cm x 24cm	Pcs	
182	48	Medical X ray films, Green sensitive	18cm x 43cm	Pcs	
183	49	Medical X ray films, Green sensitive	24cm x 30cm	Pcs	
184	50	Medical X ray films, Green sensitive	30 cm x 40cm	Pcs	
185	51	Medical X ray films, Green sensitive	35cm x 35cm	Pcs	
186	52	Medical X ray films, Green sensitive	35cm x 43cm	Pcs	
187	53	Monitoring electrode with Micropore Tape Backing and solid gel	Ag/Agcl	Pcs	
188	54	MVA Kit		Kit	
189	55	Needle Disposable	19G x 1.½"	Pcs	
190	56	Needle Disposable	21G x 1.½"	Pcs	
191	57	Needle Disposable	23G x 1"	Pcs	
192	58	Needle Disposable	25G x 1"	Pcs	
193	59	Needle Spinal Disposable	22G/0.7 x 90mm	Pcs	
194	60	Needle Spinal Disposable	25G/0.5 x 90mm	Pcs	
195	61	Needle Suture Cutting	Assorted	Pcs	
196	62	Needle Suture Round	Assorted	Pcs	
197	63	Oxygen mask with reservoir bag	Children	Pcs	
198	64	Oxygen mask with reservoir bag	Adult	Pcs	
199	65	Paper face mask 2 plies		Pcs	

200	66	Plaster of Paris	10cm	Roll	
201	67	Plaster of Paris	15cm	Roll	
202	68	Plaster of Paris	20cm	Roll	
203	69	Red O Pack		Set	
204	70	Rubber bulb with Valve for sphygmomanometer		Pcs	
205	71	Safety Box for Used Syringe	5L	Pcs	
206	72	Safety Box for Used Syringe	10 L	Pcs	
207	73	Scalp Vein	23G	Pcs	
208	74	Scalp Vein	25G	Pcs	
209	75	Scalp Vein	27G	Pcs	
210	76	Sterile eyes pads		Pcs	
211	77	Stomach Wash Out tube, Fraucher Type	CH27	Pcs	
212	78	Sut/Catgut Chromic25mm½circle Rb75cm	2/0	Pcs	
213	79	Suture/Catgut Chromic30mm½circle Rb75cm	3/0	Pcs	
214	80	Suture/Catgut Chromic35mm½circle Rb75cm	0	Pcs	
215	81	Suture/Catgut Chromic38mm½circle Rb75cm	1	Pcs	
216	82	Suture/Catgut Chromic40mm½circle Rb75cm	2	Pcs	
217	83	Suture/Catgut Chromic85mm B P Cvd Rb	2	Pcs	
218	84	Suture/Catgut Plain 22mm curved cutting 75cm	3/0	Pcs	
219	85	Suture/Catgut Plain 25mm½ circle Rb 75cm	2/0	Pcs	
220	86	Suture/Catgut Plain 30mm½ circle Rb 75cm	0	Pcs	
221	87	Suture/Polyglycolic Acid 30mm½ circle round body 75 cm (Vicryl)	1	Pcs	
222	88	Suture/ Polyglycolic Acid 30mm½ circle round body 75 cm (Vicryl)	0	Pcs	
223	89	Suture/ Polyglycolic Acid 30mm½ circle round body 75cm (Vicryl)	2/0	Pcs	
224	90	Suture/ Polyglycolic Acid 30mm½ circle round body 75cm (Vicryl)	3/0	Pcs	
225	91	Suture/ Polyglycolic Acid double arms spatulates (S 24)	6/0	Pcs	
226	92	Suture/Polyamide 30mm ½ circle cutting 75cm (Nylon)	2/0	Pcs	

227	93	Suture/Polyamide Curved Rev cutting 26mm (Nylon)	3/0	Pcs	
228	94	Suture/Polyamide 30mm ½ circle cutting 75cm (Nylon)	4/0	Pcs	
229	95	Suture/ Black monofilament double arms spatulates 30cm (Nylon)	10/0	Pcs	
230	96	Suture/Silk 16mm curved 45mm	4/0	Pcs	
231	97	Suture/Silk 6mm curved 38mm	6/0	Pcs	
232	98	Suture/Silk 8mm double needle micro-point spatula ½ circle 30mm	8/0	Pcs	
233	99	Suture/Silk double needle micro-point spatula curved 30mm	10/0	Pcs	
234	100	Syringe Disposable & Needle 26G	1ml	Pcs	
235	101	Syringe Disposable & Needle 25G	2ml	Pcs	
236	102	Syringe Disposable & Needle 25G	5ml	Pcs	
237	103	Syringe Disposable & Needle 23G	5ml	Pcs	
238	104	Syringe Disposable & Needle 23G	10ml	Pcs	
239	105	Syringe Disposable	20ml	Pcs	
240	106	Syringe Disposable	50ml	Pcs	
241	107	Talc	1kg	Box	
242	108	Tape Test for Autoclave		Roll	
243	109	Tape Umbilical Non sterile 3mm		Roll	
244	110	Tape/Strips Test For Poupinel		Roll	
245	111	Thermometer Oral/Rectal ^{o}C		Pcs	
246	112	Thorax Drain + Trocart	CH12	Pcs	
247	113	Thorax Drain + Trocart	CH14	Pcs	
248	114	Thorax Drain + Trocart	CH16	Pcs	
249	115	Thorax Drain + Trocart	CH18	Pcs	
250	116	Thorax Drain + Trocart	CH20	Pcs	
251	117	Tongue depressor wood adult		Pcs	
252	118	Tracheal tube	#6.5	Pcs	
253	119	Tracheal tube	#7	Pcs	
254	120	Tracheotomy tube	#6	Pcs	
255	121	Tracheotomy tube	#7	Pcs	
256	122	Tube Nasogastric/Feeding	CH5	Pcs	
257	123	Tube Nasogastric/Feeding	CH8	Pcs	
258	124	Tube Nasogastric/Feeding	CH12	Pcs	
259	125	Tube Nasogastric/Feeding	CH14	Pcs	
260	126	Tube Nasogastric/Feeding	CH16	Pcs	

261	127	Tube Redon Drain	CH12	Pes	
262	128	Tube Redon Drain	CH16	Pcs	
263	129	Tube Suction Disposable	CH8	Pcs	
264	130	Tube Suction Disposable	CH12	Pcs	
265	131	Tube Suction Disposable	CH16	Pcs	
266	132	Ultra Sound Gel	1 kg	Bttl	
267	133	Umbilical cord clamp		Pcs	
268	134	Urine Drainage Bag with non-return valve	2litre	Pcs	

III-NATIONAL PROGRAM MEDICINES

III-1.EYE UNIT PROGRAM

269	1	Acetazolamide (Diamox)	250mg	Tab	Opth. Anti-glaucoma
270	2	Atropine Sulphate eye drop 5ml	1%	Vial	Opth. with mydriatic
271	3	Ciprofloxacine eye drop 5ml	0,3%	Vial	Opth.- anti-infective
272	4	Fluoresceine eye drop 10ml		Vial	Opth. diagnostic
273	5	Neomycine + Polymycine B + Dexamethasone , eye drop (Maxidrol eye drop) 5ml		Vial	Opth. Anti-infective/anti-inflammatory
274	6	Pilocarpine (as sodium phosphate) eye drop 5ml	2%	Vial	Opth. with mitotic
275	7	Prednisolone Acetate eye drop 5ml	1%	Vial	Opth. Anti-allergic/anti-inflammatory
276	8	Tetracaine eye drop 5ml	0.50%	Vial	Opth.- anti-infective
277	9	Tetracycline eye ointment 5g	1%	Tube	Opth.- anti-infective
278	10	Timolol eye drop 3ml	0.50%	Vial	Opth. Mitotic
279	11	Tropicamide eye drop 10ml	1%	Vial	Opth. diagnostic
280	12	Viscoelastic Solution 1ml		Syringe	Steril clear viscous solution with elastic property used in cataract, glaucoma and corneal ophthalmic surgical procedures.

III-2. TUBERCULOSIS MEDICINES

		First Line Ant-TB Medicines			
281	1	Ethambutol	400mg	Tab	Anti-tuberculosis
282	2	Ethambutol	100mg	Tab	Anti-tuberculosis
283	3	Ethambutol / Isoniazide	400mg/150mg	Tab	Anti-tuberculosis
284	4	Isoniazide	100mg	Tab	Anti-tuberculosis
285	5	Pyrazinamide	400mg	Tab	Anti-tuberculosis
286	6	Rifampicine	150mg	Tab	Anti-tuberculosis

287	7	Rifampicine / Isoniazide	150 + 75mg	Tab	Anti-tuberculosis
288	8	Rifampicine / Isoniazide	60+30mg	Tab	Anti-tuberculosis
289	9	Rifampicine / Isoniazide / Pyrazinamide	60+30+150mg	Tab	Anti-tuberculosis
290	10	Rifampicine/Isoniazide/Pyrazinamide/Ethambutol	150+75+400+275 mg	Tab	Anti-tuberculosis
291	11	Streptomycine	1g	Vial	Anti-tuberculosis
		Second Line Ant-TB Medicines			
292	1	Amikacin	500mg	Vial	2nd line anti-infective (aminoglycoside) - multidrug resistant gram negative bacteria
293	2	Capreomycin	1g	Vial	2nd antimycobacterials: tuberculosis and leprostatic agents
294	3	Cycloserine	250mg	Cap	Anti-infective used as 2nd line anti-TB
295	4	Ethionamide	250mg	Tab	Anti-infective used as 2nd line anti-TB
296	5	Gatitfloxacin	500mg	Tab	Anti-infective used as 2nd line anti-TB
297	6	Kanamycin	1g	Vial	Anti-infective used as 2nd line anti-TB
298	7	Levofloxacin	250mg	Tab	Anti-infective used as 2nd line anti-TB
299	8	Moxifloxacin	400mg	Tab	Anti-infective used as 2nd line anti-TB
300	9	Ofloxacin	200mg	Tab	Anti-infective used as 2nd line anti-TB
301	10	Para Amino Salicylic Acid	4g	Sachet	Anti-infective used in combination with other anti-TB as 2nd line
302	11	Prothionamide	250mg	Tab	Anti-infective used as 2nd line anti-TB

III-3. MALARIA/Shistosomiasis and Helminthiasis/ Dengue Haemorrhagic Fever / Filariasis Program

a-Malaria Program

303	1	A+M1 (Artesunate + Mefloquine)	50mg+250mg	Blister	for severe malaria (1-5yrs)
304	2	A+M2 (Artesunate + Mefloquine)	50mg+250mg	Blister	for severe malaria (6-10yrs)
305	3	A+M3 (Artesunate + Mefloquine)	50mg+250mg	Blister	for severe malaria (11-14yrs)
306	4	A+M5 (Artesunate + Mefloquine)	50mg+250mg	Blister	for severe malaria (> 15yrs)
307	5	Artesunate Rectocap	50mg	Tab	for severe malaria
308	6	Artesunate Rectocap	200mg	Tab	for severe malaria
309	7	Artemeter injectable	40mg/ml	Amp	for severe malaria
310	8	Artemeter injectable	80mg/ml	Amp	for severe malaria
311	9	Chloroquine base	150mg	Tab	2nd line anti-malaria *(P.vivax infection)*
312	10	Dihydroartemisinin and Piperaquine phosphate	40mg+320mg	Tab	Proposed new first line ACT for malaria caused by *P. faciparum*
313	11	Mefloquine	250mg	Tab	Used in combination with artesunate
314	12	Quinine Sulfate	300mg	Tab	Used in severe malaria and should be used in combination with Doxycycline
315	13	Quinine Dihydrochloride	600mg/2ml	Amp	P. falciparum malaria; no longer recommended by the WHO as first line treatment for malaria

					and should only be used when ACTs are not available
316	14	Tetracycline	250mg	Cap	Anti-infective - with action on malaria parasite

b- Shistosomiasis and Helminthiasis Program

317	1	Praziquantel	600mg	Tab	Intestinal anthelminthic:antischistosomal/antitrematode

c- Dengue Haemorrhagic Fever Program

318	1	5% Dextrose in Isotonic Saline Solution + IV Giving Set	500ml	Blt	Water, electrolyte replacement and source of energy
319	2	5% Dextrose in Acetate Ringer's Solution + IV Giving Set	500ml	Blt	Water, electrolyte replacement and source of energy
320	3	5% Dextrose in 1/3 Saline + IV Giving Set	500ml	Blt	Water, electrolyte replacement and source of energy

d- Filariasis

321	1	Albendazol	400mg	Tab	Intestinal anthelmenthic
322	2	Diethylcarbamazine (dihydrogen citrate)	100mg	Tab	Antifilarial
323	3	Invermectin (scored tablets)	3mg or 6mg	Tab	Antifilarial

III-4. BIRTH SPACING MEDICINES

324	1	Depo-medroxyprogesterone acetate	150mg/3ml	Vial	Injectable hormonal contraceptive - long acting
325	2	Norgestrel (Progestin-Only-Pill)	0.075mg	Blister	Oral Contraceptive
326	3	Ethinyloestradiol + Levonorgestrel (Combined Oral Contraceptive)	0.03/0.15mg	Blister	Combined Oral Contraceptive
327	4	Condom	49mm	Pcs	Physical barrier contraceptive
328	5	IUD Copper T 380A	T380A	Pcs	Intra-uterine device (IUD) Contraceptive
329	6	Female Condom (Lubricated loose-fitting Polyurethane, pouch closed at one end, open at the other with soft rings at each end. 160-180mm width, 41-61µ thickness, 2.23-2.53mm outer ring, 56.5-58-5mm inner ring	160-180mm	Pcs	Physical barrier contraceptive
330	7	Levonorgestrel 0.75mg (Emergency Contraceptive Pills, 2 pill per Blister)	0.75mg	Blister	"Morning after" contraceptive
331	8	Etonogestrel (Implant subdermal, small, semi-rigid plastic rod, 4 cm in length and 2mm in diameter,)	68mg	Implant	Implant hormonal contraceptive - long acting

III-5. IEPROSY MEDICINES

332	1	Clofazimine	100mg	Cap	Antileprosy
333	2	MB (multibacillary) Adult		Blister	Antileprosy

334	3	MB (multibacillary) Child		Blister	Antileprosy
335	4	PB (paucibacillary) Adult		Blister	Antileprosy
336	5	PB (paucibacillary) Child		Blister	Antileprosy

III-6. PSYCHIATRY MEDICINES

337	1	Amitriptyline (as hydrochloride)	25mg	Tab	Depressive disorders
338	2	Amitriptyline (as hydrochloride)	50mg	Tab	Depressive disorders
339	3	Carbamazepine	200mg	Tab	Bipolar disorders
340	4	Chlorpromazine (as hydrochloride)	100mg	Tab	Psychotic disorders
341	5	Clomipramine (as hydrochloride)	25mg	Cap	Obsessive compulsive and panic attacks
342	6	Fluoxetine (as hydrochloride)	20mg	Cap	Depressive disorders
343	7	Haloperidol	10mg	Tab	Psychotic disorders
344	8	Haloperidol	5mg	Tab	Psychotic disorders
345	9	Imipramine	25mg	Tab	Antidepressant
346	10	Lithium Carbonate	300mg	Tab	Bipolar disorders
347	11	Methadone Hydrochloride (Biodone Forte)	5mg/ml or 10mg/ml	Bottle	Substance dependance program use
348	12	Nortriptiline HCL	25mg	Tab	Antidepressant
349	13	Perphenazine	8mg	Tab	Anti-psychotic, antidepresnt; used to treat symptoms of schizophrenia
350	14	Phenytoine	100mg	Tab	Anticovulsants/anti-epileptic
351	15	Thioridazine	10mg	Tab	Anti-psychotic, antidepresnt; used to treat symptoms of schizophrenia
352	16	Trihexyphenidyl (benzhexol)	5mg	Tab	Antiparkinsonian agent (antimuscarinic class)
353	17	Benztropine Mesylate	2mg/ml	Amp	An adjunct therapy to all forms of parkinsonism. Sldo useful controlling extrapyramidal disorders
354	18	Fluphenazine decanoate	25mg/ml	Amp	Psychotic disorders
355	19	Haloperidol	5mg/ml	Amp	Psychotic disorders
356	20	Haloperidol decanoate	50mg/ml	Amp	Psychotic disorders
		Second Line			
357	1	Risperidone	1-2-4mg	Tab	Psychotic disorders (in adult)

III-7.STD PROGRAM

358	1	Azithromycine	500mg	Tab	Antibacterial
359	2	Cefixime	200mg	Tab	Antibacterial (beta lactam)
360	3	Benzathine Penicilline	2.4MIU	Vial	Antibacterial (beta lactam)
361	4	Clotrimazole (vaginal tablets)	500mg	Pessary	Antifungal
362	5	Podophyllin solution 25%	5ml	Vial	Skin differentiation and proliferation

III-8.DERMATOLOGIC

363	1	Aciclovir	400mg	Tab	Antiviral/antiherpes
364	2	Aciclovir Cream	15g	Tube	Antiviral/antiherpes (topical)
365	3	Benzoyl peroxide 5% Gel	40g	Tube	Topical use - affects skin differentiation and proliferation
366	4	Betamethasone (as valerate) Cream / Ointment 0.1%	30g	Tube	Anti-inflammatory, antipruritic (topical)
367	5	Betamethasone (0.05%) Cream +Salicylic Acid (3%) Ointment	30g	Tube	Anti-inflammatory, antipruritic (topical)
368	6	Betamethasone 0.05% +Fucidic acid 2%	15g	Tube	Topical Anti-infectives with Corticosteroids
369	7	Clobetasole propionate 0.05% cream	10g	Tube	Topical corticosteroids with anti-inflammatory, antipruritic, and vasoconstrictive properties.
370	8	Clotrimazole 1% cream	30g	Tube	Antifungal (topical)
371	9	Crotamiton 10% cream	30g	Tube	Scabicidal and antipruritic for treating scabies and relieving itching
372	10	Fusidic Acid 2% cream	15g	Tube	Topical anti-infectives
373	11	Hydrocortisone (as acetate) 1%	15g	Tube	Anti-inflammatory, antipruritic (topical)
374	12	Ketokonazole 2% cream	15g	Tube	Topical broad spectrum antifungal
375	13	Miconazole 2% gel	40g	Tube	Antifungal (topical) - fungal infections of the mouth, throat and gut
376	14	Tretinoin 0.05% cream	30g	Tube	Treatment of acne vulgaris
377	15	Triamcinolone acetonide Cream 0.1 %	30g	Tube	Topical corticosteroid for the treatment of inflammatory and pruritic manifestations/ dermatoses
378	16	Urea Cream 10%	100mg	Tube	Skin differentiation and prolifiration (for topical use)
379	17	Clobetasole lotion	30ml	Bttl	Topical adrenocortical steroid - antinflammatory and anti- itching
380	18	Coaltar Lotion (Polyar Liquid)	150ml	Bttl	Topical use - affects skin differentiation and proliferation
381	19	Cetirizine hydrochloride	10mg	Tab	Antihistamine/anti-allergic
382	20	Griseofulvine	500mg	Tab	Oral systemic antifungal
383	21	Itraconazole	100mg	Tab	Oral systemic antifungal
384	22	Minocycline hydrochloride	100mg	Tab	Anti-infective

III-9.HIV/AIDS CARE

385	1	Abacavir (ABC) (as sulfate)	300mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
386	2	Abacavir (ABC) (as sulfate) 240ml syrup	20mg/ml	Bttl	ARV: nucleoside/nucleotide reverse transcriptase inhibitor

387	3	Amphotericin B	50mg	Amp	Antifungal/antileishmaniasis
388	4	Cotrimoxazol	800 + 160mg	Tab	OI - anti-infective, prophylaxis
389	5	Cotrimoxazole IV 480mg/5ml	5ml	Amp	OI - anti-infective
390	6	Calamine lotion 15%	100ml	Bttl	Anti-inflammatory, antipruritic (topical)
391	7	Lamivudine (3TC) + Stavudine(d4T)	150+30mg	Tab	ARV: 2-FDC
392	8	Didanosine (ddl) (buffered, chewable, dispersible)	25mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
393	9	Didanosine (ddl) (buffered, chewable, dispersible)	50mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
394	10	Didanosine (ddl) (buffered, chewable, dispersible)	100mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
395	11	Didanosine (ddl) (unbuffered enteric coated tablet)	250mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
396	12	Didanosine (ddl) (unbuffered enteric coated tablet)	400mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
397	13	Efavirenz (EFV or EFZ)	50mg	Tab	ARV: Non-nucleoside reverse transcriptase inhibitor
398	14	Efavirenz (EFV or EFZ)	200mg	Tab	ARV: Non-nucleoside reverse transcriptase inhibitor
399	15	Efavirenz (EFV or EFZ)	600mg	Tab	ARV: Non-nucleoside reverse transcriptase inhibitor
400	16	Lamivudine (3TC)	150mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
401	17	Lamivudine (3TC) 100ml Syrup	50mg/5ml	Bttl	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
402	18	Loperamid	2mg	Tab	OI – antidiarhea
403	19	Lopinavir/Ritonavir (LPV/r)	100mg/25mg	Tab	ARV: Protease inhibitor
404	20	Lopinavir/Ritonavir	200mg/50mg	Tab	ARV: Protease inhibitor
405	21	Lopinavir/Ritonavir 160ml Syrup	80mg/20mg/ml	Bttl	ARV: Protease inhibitor
406	22	Nevirapine (NVP)	200mg	Tab	ARV: Non-nucleoside reverse transcriptase inhibitor
407	23	Nevirapine (NVP) Syrup	50mg/5ml	Bttl	ARV: Non-nucleoside reverse transcriptase inhibitor
408	24	Ritonavir	100mg	Tab	ARV: pharmacological booster
409	25	Stavudine (d4T)	15mg	Cap	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
410	26	Stavudine (d4T)	20mg	Cap	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
411	27	Tenofovir (TDF) (disoproxil fumerate)	300mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor

412	28	Baby : Stavudine(d4T) + Lamivudine(3TC) + Nevirapine(NVP)	6+30+50mg	Tab	ARV: 3-FDC
413	29	Baby : Stavudine(d4T) + Lamivudine(3TC) + Nevirapine(NVP)	12+60+100mg	Tab	ARV: 3-FDC
414	30	Adult : Stavudine(d4T) + Lamivudine(3TC) + Nevirapine(NVP)	30+150+200mg	Tab	ARV: 3-FDC
415	31	Lamivudine(3TC) + Zidovudine(AZT)	150+300mg	Tab	ARV: 2-FDC
416	32	Lamivudine(3TC) + Zidovudine(AZT) + Nevirapine(NVP)	150+300+200mg	Tab	ARV: 3-FDC
417	33	Zidovudine (AZT or ZDV)	100mg	Cap	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
418	34	Zidovudine (AZT or ZDV)	300mg	Tab	ARV: nucleoside/nucleotide reverse transcriptase inhibitor
419	35	Zidovudine (AZT or ZDV) 100ml Syrup	50mg/5ml	Bttl	ARV: nucleoside/nucleotide reverse transcriptase inhibitor

III-10.ORAL HEALTH MEDICINES

1- Medicines

420	1	Calcium Hydroxide		B/2P	
421	2	Composite light cure highbriand microfiller 4g(color A3, A3.5) for restorative filling dental cavity		Pcs	
422	3	Eugenol USP	10ml	Vial	Toothache and other related uses e.g. mixed with zinc oxide - restorative and prosthodontic
423	4	Glass ionomer for Rest Gc Fuji II	Powder 15g + liquid 10g	Box	
424	5	Glass ionomer for Rest Gc Fuji IX	Powder 15g + liquid 10g	Box	
425	6	Glass ionomer for Rest Gc Fuji VII	Powder 15g + liquid 10g	Box	
426	7	Lidocain 2% Adrenaline 0.001%	1.8 ml	Cart	Local anaesthetic
427	8	Lidocain 2% Non-adrenaline	1.8 ml	Cart	Local anaesthetic
428	9	Polyhexa+didecyl St 72.17 Hexanios for Soaking instruments before Sterilization	Sachets /25ml	Sachet	Instrument sterilization
429	10	Sodium Fluoride (NaF)* powder	Kg		
430	11	Zinc Oxide Powder	1Kg	Jar	Mixed with Eugenol produce material which has restorative and prosthodontic applications.

2-Materials

431	1	Barbed broach (tire -nerf) to take the nerf from dental canal		Pcs	
432	2	Burr cylinder Highspeed		Pce	
433	3	Burr cylinder Lowspeed		Pce	
434	4	Burr round for contra Angle Highspeed		Pce	
435	5	Burr round for contra Angle Lowspeed		Pcs	
436	6	Files Complete set length 21 mm (files used for root treatment)	#15, #20,#25,#30,#35,#40	Pcs	
437	7	Lentulo, Complete set (used for root canal treatment)		Pcs	
438	8	Matrix bands medium (Metal Matrix)		Pcs	
439	9	Needle Dental	27G .21mm	Pcs	
440	10	Needle Dental	27G . 30mm	Pcs	
441	11	Needle Dental	27G . 35mm	Pcs	
442	12	Surgical blade #11 (use for Surgical Procedure)		Pcs	

III-11.NATIONAL IMMUNIZATION PROGRAM

443	1	BCG Vaccine with diluent (+VVM)	20doses	Vial	Vaccine
444	2	DTP-Hep-Hib Vaccine (+VVM)	0.5ml/Dose	Vial	Vaccine
445	3	Hepatitis B Vaccine 10µg/0.5ml (+VVM)	1doses	Vial	Vaccine
446	4	Japanesse Encephalitis Vaccine with diluent (+VVM)	5 Doses	Vial	Vaccine
447	5	Measle Vaccine with diluent (+VVM)	10doses	Vial	Vaccine
448	6	Oral Polio Vaccine with dropper (+VVM)	10doses	Vial	Vaccine
449	7	Tetanus Toxin Vaccine (+VVM)	10doses	Vial	Vaccine
450	8	Autodestruct Syringe 0.05ml + Needle	27G x 3 / 8	Pcs	Consumable Supplies
451	9	Autodestruct Syringe 0.5ml + Needle	23G x 1	Pcs	Consumable Supplies

III-12.PAIN RELIEF MEDICINES/ PALLIATIVE CARE

452	1	Clonazepam	2mg	Tab	Anxiolytic with muscle relaxantion and anticonvulsant action
453	2	Clonazepam Drop	2.5 mg/ml	Btl	Anxiolytic with muscle relaxantion and anticonvulsant action
454	3	Codeine	30mg	Tab	Opioid analgesic
455	4	Codeine Phosphate Syrup	1g/ml	Btl	Opioid analgesic
456	5	Gabapentin	100mg	Cap	Neuropathic pain relief
457	6	Ibuprofene	200mg	Tab	Analgesic – NSAIM
458	7	Ibuprofen (ped)	250mg	Rectocap	Analgesic – NSAIM

459	8	Ibuprofen Drop	2g/100ml	Btl	Analgesic – NSAIM
460	9	Macrogol 4000 Powder (ped)	4g	Btl	Laxative
461	10	Macrogol 4000 Powder	10g	Btl	Laxative
462	11	Morphine Sulphate (Lasting 4 h)	10mg	Tab	Opioid analgesic, psychoactive
463	12	Morphine Sulphate (Lasting 4 h)	30mg	Tab	Opioid analgesic, psychoactive
464	13	Morphine Sulphate retard	10mg	Tab	Opioid analgesic, psychoactive
465	14	Morphine Sulphate retard	30mg	Tab	Opioid analgesic, psychoactive
466	15	Paracetamol	250mg	Rectocap	Analgesic and antipyretic without anti-inflamatory effect
467	16	Tramadol Chlorhydratre	50mg	Tab	Opioid analgesic - moderate to severe pain
468	17	Tramadol Chlorhydratre (Retard)	100mg	Tab	Opioid analgesic - moderate to severe pain - slow release

III-13.ANTI CANCER MEDICINES

469	1	Bleomycin Sulfate	15mg	Vial	Cancer chemotherapy -various types
470	2	Cisplatin	50mg/50ml	Vial	Cancer chemotherapy -various types
471	3	Cyclophosphamid (endoxan)	500mg	Vial	Cancer chemotherapy -various types
472	4	Dacabarzine 100mg + Solvent	100mg	Vial	Antineoplastic chemotherapy drug - for various cancers
473	5	Doxorubicin Hydrochloride	50mg/25ml	Vial	Cancer chemotherapy -various types
474	6	Etoposide	100mg/5ml	Amp	Cancer chemotherapy -various types
475	7	Fluorouracil	250mg/5ml	Amp	Cancer chemotherapy -various types
476	8	Methotrexate	50mg/2ml	Vial	Cancer chemotherapy -various types
477	9	Mitomycine	2mg	Vial	Cancer chemotherapy
478	10	Ondansetron hydrochloride	8mg/4ml	Amp	Antiemetic - nausea and vomiting during chemotherapy.
479	11	Tamoxifen Citrate	20mg	Tab	Hormone/anti hormone
480	12	Vincristine Sulphate	1mg/1ml	Vial	Cancer chemotherapy -various types

III-14.DIABETES MEDICINES

481	1	Glibenclamide	5mg	Tab	Anti-diabetic
482	2	Metformine (Glucophage)	500mg	Tab	Anti-diabetic
483	3	Insuline, intermediate acting (8-12 hours efficacy)	1000 IU/ 10ml	Vial	Anti-diabetic
484	4	Insuline, rapid acting (3-6 hours efficacy)	1000 IU/ 10ml	Vial	Anti-diabetic
485	5	Premixed Insuline 70/30 (Semi-lente 70/ Rapid 30) or Long acting Insuline	1000 IU/ 10ml	Vial	Anti-diabetic

III-15.ENDOCRINOLOGY and HORMONOLOGY

486	1	Hydrocortisone	10mg	Tab	Anti-inflammatory and other endocrinal uses
487	2	Neomercazole	5mg	Tab	Anti-hyperthyroidism.

III-16.NUTRITION

488	1	Iron-Folate Weekly Iron-Folic Supplementation (WIFS)	60mg Iron element + 2.8 mg Folic acid	Rose Tab	Weekly Iron-Folic Supplementation (WIFS) in Women of Reproductive Age
489	2	Rehydration Solution for Malnutrition (ReSomal) (Glucose 55mmol; Sucrose 73mmol; Potassium 45mmol; Chloride 70mmol; Citrate 7mmol; Magnesium 3mmol; Zinc 300µmol; Copper 3µmol)	42.1g	Sachet	Treatment of rehydration in severally malnourished children

VI-Difficulties and Constrains in Manufacturing Control of Essential Drugs

Our domestic pharmaceutical plants now are small investments, they are equip with small capacity machines and their human resources also still have no enough knowledge on GMP.

Mr. KAZUHIRO OMATA, JPMA Technical Adviser was invited to visit and inspect all of the manufacturers about compliance with GMP requirements.

- In May 2009

After his inspection, he had some records as following:

1. DOCUMENT AND RECORD

- *The content of work has been changed without revising the document.*
- *The work actually done is not appropriately put into writing.*
- *Records actually used are not provided for with the document as a style.*
- *All necessary records do not remain. Or, there is an empty column.*

- *The revision history doesn't remain though the document is revised.*
- *It is filled in with the pencil.*
- *There is no correction sign.*
- *There is no raw data of the record.*
- *Neither the distribution nor the abolition rule of the document is provided.*
- *When the document is revised, the original doesn't manage to replace it of the distribution all duplicates though correctly replaces.*
- *The old document abolished to a present manual places, it is crowded, and an old document is not understood at one view (In a word, a present procedure is not clear).*
- *All items that are necessary because of the ministerial ordinance and the enforcement notification are not filled about various standard book, manuals, product master formula, and various records.*

2.Manufacturing control and Sanitary control

- *Work is not actually done as it is an established procedure in the document.*
- *A front room and two doors in the work room are opened at the same time.*
- *The mop is put on the room that should be cleaned in baring.*
- *There is no garbage box of the paper towel (It doesn't seem to actually wash one's hand).*
- *The corrugated cardboard and the wooden boxes are brought in to the work*

room with high clean level.

- *Filters of air-conditioning have not been regularly exchanged.*
- *There is not an examination inspection passing no label display of failing or nor a distinction in the place when the raw material, materials, and the product, etc. are kept.*
- *Neither the provider, those who check nor those who approve sign.*
- *The equipment is un-dried, but the display shows "Washed it". (There is a possibility to be used under the un-dried condition.)*
- *It remains damaging a part of equipment.*
- *A person noticed the wrong labeling and corrected it, but this action was not recorded.*
- *The temperature confirmation is insufficient though the product is kept with the refrigerator.*

3. Quality control

- *The record that responds to the fact that the test outcome shifts from the standard doesn't remain.*
- *The item of the analysis testing that is regulations by the product master formula is not corresponding to the item of the test log.*
- *A necessary measuring instrument machine is not calibrated. The provided frequency is not observed.*

- *The check of the measuring instrument machine is not done in daily life.*
- *“When it was calibrated” and “the next calibration day” were not clear.*
- *Neither the check nor the calibration rules of the equipment are provided after a new measuring instrument machine is bought.*
- *The rule of the re-testing is not decided.*
- *When the reagent was opened is not understood.*
- *The reagent is kept under the normal temperature though it must be kept in the cool dark place.*
- *The reagent out of the expiration date for use is kept.*

4. OTHERS

- *There is no management manual of the shipment (delivery) that is necessary with GMP.*
- *Because the improvement following is not recorded, the confirmation whether improved it cannot be taken though it is a self-check and there is a suitable item.*
- *The education and training is not done systematically. The action on the absentee is not taken.*
- *Even if the education and training is done, it doesn't record, and correspondence is asunder according to each time and the lecturer.*
- *In the change management, an enough education and training is untried even if it changes.*

- *The influence on the quality is not evaluated though the temperature of the raw material keeping refrigerator deviated.*
- *The results of retest were all within ranges of the standard against the quality complaint. Therefore, it is judged that it was not the one that originates at the factory and the result of executed cause investigation and analysis test was not put on the record.*
- *The reference is not correct though it is described that another manual is referred to in the product master formula.*
- *The validation is not executed as planned.*

- *The validation is not done though the manufacturing apparatus that had a big influence on the quality was changed.*

- In Feb 2010

During this audit he found that the level of GMP now is higher in comparison to the first audit. He also recommended there is no end in GMP, they must apply the method of PDACE-cycle (P: plan, D: do, A: action, C: check and E: evaluate).

Refer to Mr. KAZUHIRO OMATA‘s inspection shows that there is an improvement step of GMP in Cambodia Pharmaceutical Plants after his audit. However, they still have no enough GMP in comparison to WHO GMP, so they must have plans to get that standard level. So they must equip more reliable instruments either for manufacturing sections or quality control lab, and update training staff on GMP is

also very important. To assure that all medicines produced are of good quality, all of manufacturers must have good manufacturing process plus good quality control and strict internal audit as well.

In addition to the development themselves, sequence regular inspections from inspectors/MoH and WHO experts are indispensable to strengthen and update their GMP grade.

VII- Current situation concerning counterfeit and substandard Drugs and its countermeasures

Due to the implementation of Drug Law is now not very strict, many drug smugglers have brought some medicines through the borders, and then, distributed to the markets directly. Some smugglers have parked their own products as similar as other licensed registered products and distributed too. Some registered products are also found that they were substandard after checking their quality.

To combat counterfeit and substandard medicines, Department of Drug and Food, Ministry of Health has implemented the following measures:

-Eliminate unlicensed drug stores in years 2011

-Registration: pharmaceutical products on the market must be registered.

-Routine inspection: to check unregistered products on the market.

-International cooperation: cooperated with JPMA, USP PQM, Global Fund for post marketing surveillances.

-Published list of the counterfeit products found either names or pictures to announce among

pharmacies, drugs stores and public.

-Recall the products punished the responsible persons.

- Common items found in Cambodia as counterfeit and Substandard medicines such as Ampicillin, Amoxicillin, Artesunate, Phenoxymethyl penicillin, Cimetidine, Co-amoxycillin, Ciprofloxacin, Omeprazole, …etc.

- Five Manufacturers found as counterfeit manufacturers as below:

1. VKP Pharmaceutical Co., Ltd, Thailand

2. Shen Wei Pharmaceutical Co., Ltd, China

3. China Southern Da zhong Pharmaceutical Co., Ltd, Chiana

4. Fu Li Pharmaceutical, China

5. SG. Pharmaceutical, China.

VIII- Overview of relationship with oversea assistant organization.

- WHO, as International Technical Assistance has worked with the department of drugs and food since 2007 in order to strengthen on public medicine management, especially on the essential medicine assess to patients and also on national medicine policy implementation.

- Global Fund has supported MoH since 2006 as a main supplier for Opportunity Infectious and Anti-HIV medicines, and supported on drug quality testing since 2008 focus on the medicines which bought by Global Fund budget.

- USP PQM (Former name was USP DQI) support MoH on drug quality testing, especially provided some analytical instruments to the national laboratory, and Minilabs to sentinel sides for basic testing

- Japan Pharmaceutical Manufacturers Association, JPMA has supported MoH since 1993 through sponsoring staff of National Health Product Quality Control Center (NHQC) former call National Laboratory for Drug Quality Control and Department of Drug and Food (DDF) for training courses on Drug Quality Control and Quality Assurance in Japan and Thailand. JPMA has also provided analytical equipments for National Health Product Quality Control Center and support for conducting post marketing surveillance in Cambodia since year 2006.

IX- Overview of Technical assistance Program in the fields of Pharmaceuticals GMP, Quality control.

-WHO supported in provide training courses of GMP inspection, Drug registration, Quality control

- USP PQM (USP DQI) supported training on basic of GMP inspection and quality control using the minilab (basic testing) in provincial where borders between Thailand, Laos and Viet Name,

- UNICEF, WORLD BANK support on supervision of Drugs management and Rational drugs use..

- JICWELS /JICA supported in Provide training course on manufacturing control of Essential Drugs.

- JPMA has provided technical support on drug quality control, and post marketing surveillance cooperated with Kanazawa University and National Health Product Quality Control Center, MoH. Moreover, JPMA has invited GMP expert, Mr. Kazuhiro Omata to audit the local pharmaceutical plants

three times so far, and also trained MoH's inspectors on GMP and Inspection. .

- Global Fund support inter-ministerial committee for combating counterfeit and substandard drug meeting on counterfeit essential medicines, anti-malaria drugs and antibiotics,

- KfW Germany support on quality supply of birth spacing

Personal Note:

It is our greatest honor and happiness that we are accepted as participants for the Training Program on Quality Management of Essential Medicines, Good Manufacturing Practice (GMP) and Inspection courses. We hope that the training courses will show us good knowledge on GMP and Inspection which are very important for us and MoH. We will try all the best to learn and bring back the experience to practice in Cambodia in order to combat counterfeit medicines especially for Essential Medicines, sharing technical support and strengthening the local manufacturers to get GMP.

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Indonesia

COUNTRY REPORT

QUALITY MANAGEMENT OF ESSENTIAL MEDICINES
GOOD MANUFACTURING PRACTICE AND INSPECTION 2012

JAPAN, November 4th, 2012 - November 30th, 2012

NATIONAL AGENCY OF DRUG AND FOOD CONTROL

INDONESIA

1. COUNTRY PROFILE

Indonesia is the largest archipelago in the world, stretching for more than 5,000 kms across the equator. It lies on crossroads between two oceans, the Pacific and the Indian, and bridges of two continents, Asia and Australia. It is an appropriate description of the archipelago as there are estimated to be a total of 17,508 islands, of which only about 6,000 are inhabited.

Five main islands and about 30 smaller archipelagoes are home to the majority of the population. The five main islands are: Sumatra (473,606 sq. km); Java/Madura (132,187 sq. km); Kalimantan, which comprises two-thirds of the island of Borneo (539,460 sq. km); Sulawesi (189,216 sq. km); and Papua (421,981 sq. km) which is part of the world's second largest island, New Guinea. The capital city of Indonesia, Jakarta is located in Java Islands.

Indonesia has tropical climate with two seasons, namely the dry season and the rainy season. Indonesia's populations are almost 238 millions which consist of hundreds of ethnic groups, languages and cultures. It is about 300 ethnic groups and cultures, each with its own language (speaking in 583 languages), and the national language Bahasa. Indonesian people Majority are Moslem, other religions like Christian, Catholic, Hinduism, and Buddhism.

2. STATISTICAL DATA

1) Population

a. Population density per 1 sq km

Data : 124
Year : 2010

b. Number of population

Data : 237, 641,326
Year : 2010

c. Precentage distribution by three broader age groups (%)

		0-14	15-64	65 years and over
Data	:	28.87%	66.09%	5.04%
Year	:	2010	2010	2010

d. Rate of natural increase of population (% per annum)

Data : 1,49%
Year : 2010

2) Vital statistics

a. Five leading causes of death

causes	number	year
1. Coronary heart disease	220,000	2010
2. Tuberculosis disease	127,000	2010
3. Blood Disorder	123,000	2010
4 Respiratory disease	104,000	2010
5 Pneumonia	73,000	2010

3) Medical care

a. Number of hospitals

	Government/Public Hospital	Private hospital
Data :	852	732
Year :	2008	2008

b. Number of health manpower

	Physcians	Dentists	Nurses
Data :	32,494	10,164	220,575
Year :	2011	2011	2011

c. Number of Pharmacists
   Data : 8,676
   Year : 2010

d. Number of drug manufacturers/plants
   Data : 217
   Year : 2011

e. Number of traditional medicine manufacturers/plans
   Data : 1398
   Year : 2011

f. Number of cosmetic products manufacturers/plants
   Data : 760
   Year : 2011

g. Number of drug importers
   Data : 147
   Year : 2011

h. Number of drug wholesaler
   Data : 2750
   Year : 2010

i. Number of pharmacies
   Data : 12,774
   Year : 2010

j. Number of drug stores
   Data : 9380
   Year : 2010

k. Number of registered drugs
   Data : 19,483
   Year : 2010

4) Educational Information for Pharmacist

a. System of Education

Primary School	:	6	years system
Age at enrolment	:	6	years old
Secondary school	:	3	years system
High school	:	3	years system

b. System of university or college education

University or college years	:	4 years
Professional education	:	1 years
Practical training	:	18 - 20 weeks
Duration of training each facility:		1 - 7 weeks
Hospital Pharmacy	:	8 weeks
Pharmacy	:	8 weeks
Pharmaceutical company	:	8 weeks
Other (government office)	:	8 weeks

c. National examination system for pharmacist

Academic exams	:	6 days
Clinical exams	:	5 days

d. Requirement to obtain pharmacist's license
   - Be a university or college graduate
   - Pass the national examination
   - Conclude practical training after graduating in drug factory, pharmacy, hospital, and government office

e. Graduates number of pharmaceutical university or college. people per year (as of 600-800)

3. Historical Development of Pharmaceutical Services

A. History of the National Plan on Pharmaceutical Services

To achieve the ultimate goal of the National Health Development Program, overall and integrated health efforts have been undertaken. In these efforts, drug has become an important element. The current domestic pharmaceutical industries are growing and developing steadily. Although drug production and distribution are increasing, the communities are still unable to obtain the required drugs due to the economical situation. To increase availability of drug among low-income people, the government provides essential drugs as well as generic drugs. Generic drug are cheaper due to absence of promotion cost and low cost packaging. Rigorous monitoring and quality control is carried out by the pharmaceutical industries by applying good manufacturing practice as it found in "Guide lines for production and manufacturing a good quality drugs". The governments monitor all of this process.

B. History of Good Manufacturing Practice (GMP)

The Activities of GMP in Indonesia have been stated since 1986, by implementation the WHO GMP. By April 1994, all drug manufacturers should implement GMP. The implementation of GMP in Pharmaceutical Industries is under control of National Agency of Drug and Food Control.

4. GMP System

1) Organization Chart

a. Details of the National Agency of Drug and Food Control (see Figure 1.)

b. Details of the Provincial Office of Drug and Food Control (see Figure 2.)

2) The role of national/state and local pharmaceutical administrative organizations.

a. The Main Functions of NADFC are:

- Legislation, regulation and standardization;
- Licensing and certification of pharmaceutical industries based on Good Manufacturing Practices;
- Pre-market evaluation of products;
- Post-marketing vigilance including product sampling and laboratory testing, inspection of production and distribution facilities, investigation and law enforcement;
- Research on drug and food policies implementations;
- Public communication, information and education including public warning.

A Technical implementation unit of the National Agency of Drug and Food Control is Regional Office of Drug and Food Control.

b. GMP Inspection

GMP inspection is conducted by Directorate of Control of Production of Therapeutic products and household product of NADFC. The activities of GMP in Indonesia have been started since 1986, by implementation the WHO GMP. By April 1994, all drugs manufacturer should implement GMP. The implementation of GMP in Pharmaceutical Industries is under control of National Agency of Drug and Food Control

GMP inspectors are government officials who work under NADFC. The pharmaceutical inspectors regularly make on the spot inspections of therapeutics products, narcotics and psychotropic, addictive substance. The major duties are to inspect GMP compliance; to watch for unlicensed, defective and substandard drugs with unlawful labeling; and to control counterfeit drug. Directorate of control of production of therapeutic products has 24 inspectors well qualified and trained. Since we are joining with the PIC/s, it is must done 8 inspection/year of each inspector.

The inspection covers all the production aspect on the List of GMP Inspection and Guidance, are:

- Quality Management
- Personnel
- Premises
- Equipment
- Sanitation and Hygiene
- Production
- Quality Control
- Self Inspection and Quality Audit
- Handling of product recall; Product Complaint & Return drug product
- Documentation
- Contract Manufacture and Analysis

- Qualification and Validaton

Every inspector makes inspection report after inspection. It consists of the observation findings which are grouping to Critical, Major, and others, and the conclusion of the inspection report.

c. Post Market Control

One of main functions of NADFC is post marketing vigilance including product sampling and laboratory testing, inspection of production and distribution facilities, investigation and promotion. NADFC undergoes a multi face dimension and a complex aspect of consequences. Therefore, a comprehensive control system is needed from the use in community.

There are three layers of control sub-system:

- Manufacturer Control Sub-system
  Manufacturer should have an internal control system for complying with the requirements of the Code of Good Manufacturing Practices to enable early detection of every product deviation of quality standards.
- Consumer Control Sub-system
  The control system by consumers is through increased awareness and improved knowledge on product quality and safety for the intended purpose.
- Government Control Sub-system
  The control system conducted by the government includes legislation and regulation, standardization, evaluation of safety, efficacy and quality of products before marketing, inspection and investigation, product sampling in the market and laboratory testing, public warning together with law enforcement.

Recall Product

According the Decree of The Head of NADFC No. HK.04.1.33.12.11.09938 year of 2011 on criterias and mechanism of recall from the defective products, recall are divided into two class which mandatory recall and voluntary recall. Mandatory recall is given by NADFC to the pharmaceutical industry to the defective product that found in the market. Voluntary recall is initiated by the pharmaceutical industry itself to the defective drug. Recall is conducted to the defective drug of its quality, efficacy and safety. Recall over past five years in Indonesia happens because the defective of the drug quality such as substandard of dissolution test and assay.

Effort for Drug Safety

In order to guarantee the safety of drug marketed in Indonesia, Adverse Drug Reaction Monitoring (ADRM) Program introduced in 1975 as a Pilot Project and in 1980 as national Program. Regulatory actions such as suspension of the marketing authorization; withdrawal of the product from the market; and restriction on the indication, strength, dosage, access, distribution or packaging size, could be taken following Adverse Drug Reaction reports.

National Center for ADRM at the National Agency of Drug and Food Control has been established in 1980's, consist of experts from University, general

physicians, pharmacist, for evaluating, analyzing and making recommendations for necessary regulatory actions. The monitoring program collected reports from many volunteers such a doctor, dentist, pharmacist and other health professionals.

d. Drug Distribution System
Flowchart of drug distribution at government and private sector is available on figure 3.

e. NADFC and PIC/s
From 2005, NADFC (Indonesia) is trying to become of PIC/s member. After all this year working hard and strong willing, NADFC (Indonesia) becomes the 40th member of PIC/s. Joining PIC/s will give benefits for NADFC such as the monitoring of drugs, improving inspectors quality, and many others that can help NADFC to protect Indonesian people health.

5. Essential Drug List

National Essential Drug List (NEDL) is applied in order to increase the preciseness, safety, rationality of drug user.
The criteria of choosing the essential drugs are:

- Have the most advantage benefit risk ratio for patient
- Quality guarantee, including stability and bioavailability
- Practical on storage and transported
- Practical on usage and delivery which suitable with paramedic infrastructure and health facility
- Advantage for patient compliance and acceptability
- Have the highest benefit cost ratio based on direct and indirect cost
- If it has more than one choice with the same physiological effect. The choice will be consider as :
  - The most popular characteristic based on scientific data
  - The most advantage Pharmacokinetic characteristic
  - The better stability
  - Easier to get

Fixed combination of drug has to follow the criteria of:

- On the form of fixed combination, drug should be useful for patient.
- Fixed combination should be safer and has more advantage than other component
- Fixed combination should have more proven advantages over single compounds in the therapeutic effect, safely or compliance
- Dosage ratio for fixed combination component should be the most suitable combination for more than half patient.
- Fixed combination should increase the benefit cost ratio
- Fixed combination on antibiotic should prevent or decrease of resistance and other disadvantageous effect

In Essential Drug Information, the information of every drug listed on NEDL should include preciseness and helpful information for paramedic. The information should include indication, contra indication, dosage, user guide, warning, side effect, drug interaction and dosage form.

NEDL should be revised periodically. Revision should be covered not only on scientific matter but also in practicality for using and delivering which is suitable for paramedic. Revision should be conducted on every three years.

6. Difficulties and constrains in Manufacturing and Quality Control of Essential Drugs

A license of manufacture drugs is given after confirming that the applicant has an adequate ability or condition to do such business, and whether he can secure appropriate facilities and personnel for that purpose. Requirements for approval license applications for drugs are needed.
The license is granted on examination of material conditions such as buildings and facilities for safe and hygienic manufacture, and of the conditions of personnel such as the manufacturing control managers, quality control manager accordance to GMP.

Manufacturer should confirm GMP requirements, GMP Certificate will be given if the requirements is confirmed and GMP certificate is issued for each dosage form.

NADFC carries out pre-market evaluation on efficacy, safety and quality of drugs, biological products and medical devices in Indonesia as well as operates a clinical trial scheme followed by post-market control of therapeutic products, narcotics, psychotropic and addictive substance.

Since 1973, sampling of marketed drugs has been carried out and subsequently tested by the quality control laboratory's network. Sampling are taken by drug inspector from the provincial offices. Samples are taken from manufacturers, wholesalers, pharmacies and drug stores, and tested in laboratory of the provincial offices. An ongoing sampling program for testing gives priority to, among other:

- Products which are inherently unstable
- Products which are broadly used such as antibiotic
- Products which have tendency to be counterfeited
- (OTC product)

Most of raw materials of drug (95%) must be imported. The industry for producing raw material of drug still faces some problem:

- The high cost of investment
- The high of production

7. Relationship with Overseas Assistance Organization

NADFC have good relationship with overseas assistance organization in example WHO, TGA, JICA, and PICS.

8. Technical Assistance Programmes in the field of Pharmaceuticals, GMP, QC organized by International Organizations

There are several technical assistance for NADFC organized by International Organizations like WHO, JICA, TGA, EU-ASEAN, in example:

-
- Global Training Network on Vaccine Quality GMP. Korea, Juni 2007 Organized by WHO.
- Third Country Training Program on Quality Assurance of Live Attenuated Polio and Measles Vaccines. Indonesia, November 2006, organized by JICA.
- Training Program on Medicinal Product GMP. Australia, November 2006, organized by TGA.
- Quality System Documentation and Procedure. Thailand, November 2005, organized by EU-ASEAN.
- Blood Safety and Quality Training Program. Australia, 2005, organized by TGA.
- GTN Workshop on GMP for Vaccines. Indonesia, April 2005, organized by WHO
- Regional Workshop on Sampling Procedures. Vietnam, Oktober 2005, organized by EC-ASEAN.

Figure 1.
ORGANIZATION STRUCTURE OF NATIONAL AGENCY OF DRUG AND FOOD CONTROL

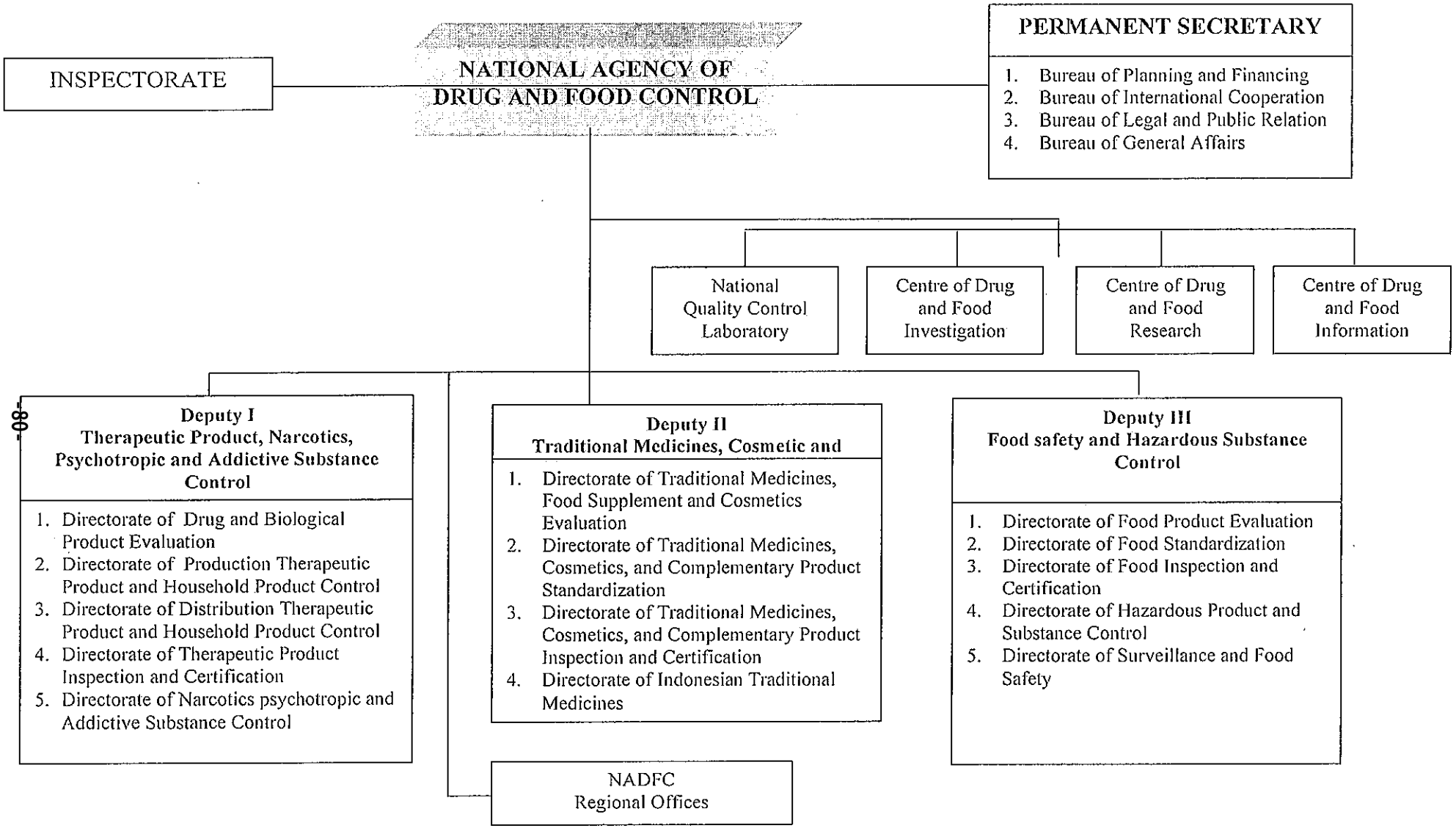


Figure 2.
ORGANIZATION STRUCTURE OF REGIONAL DRUG AND FOOD CONTROL OFFICE

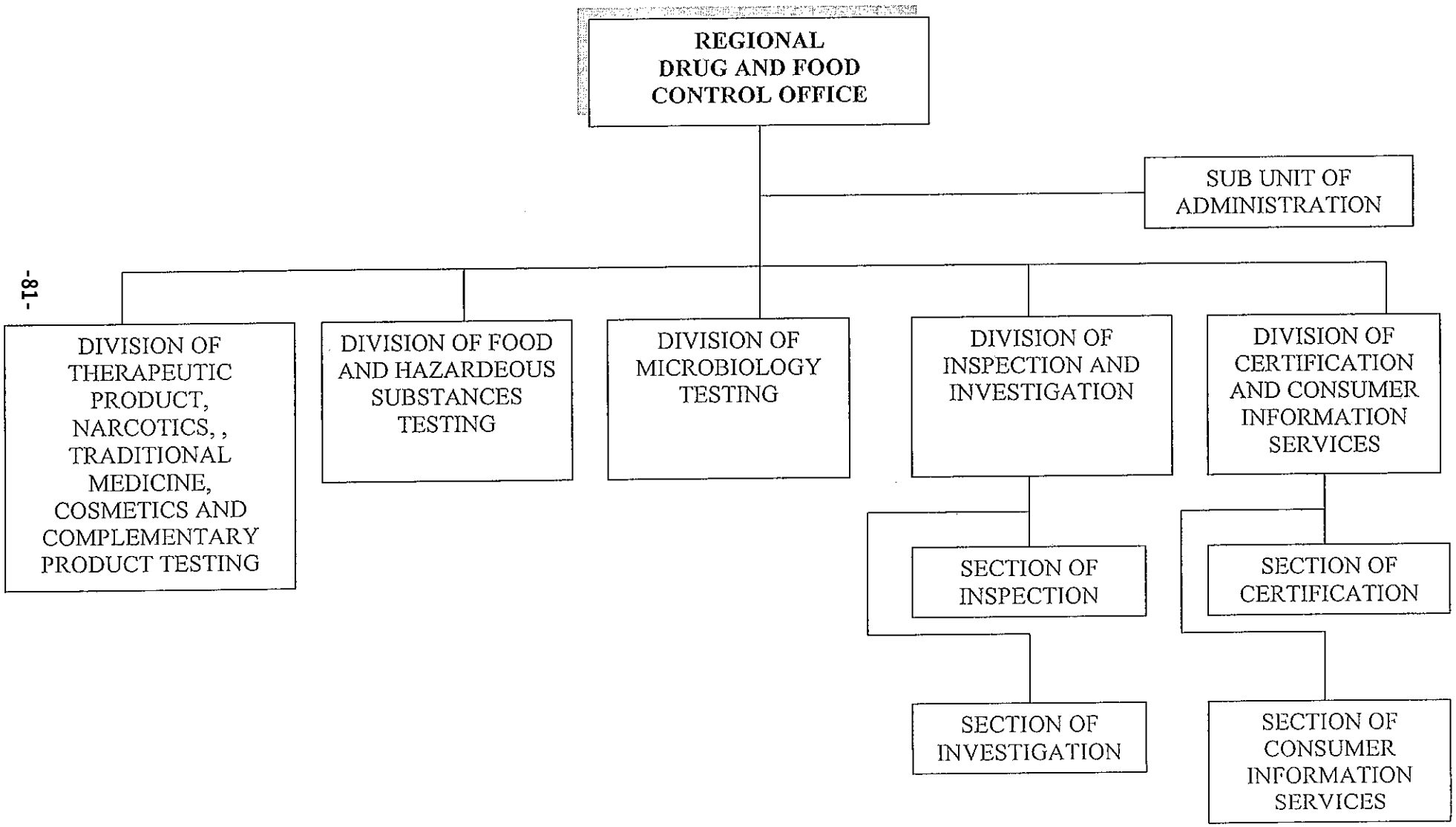
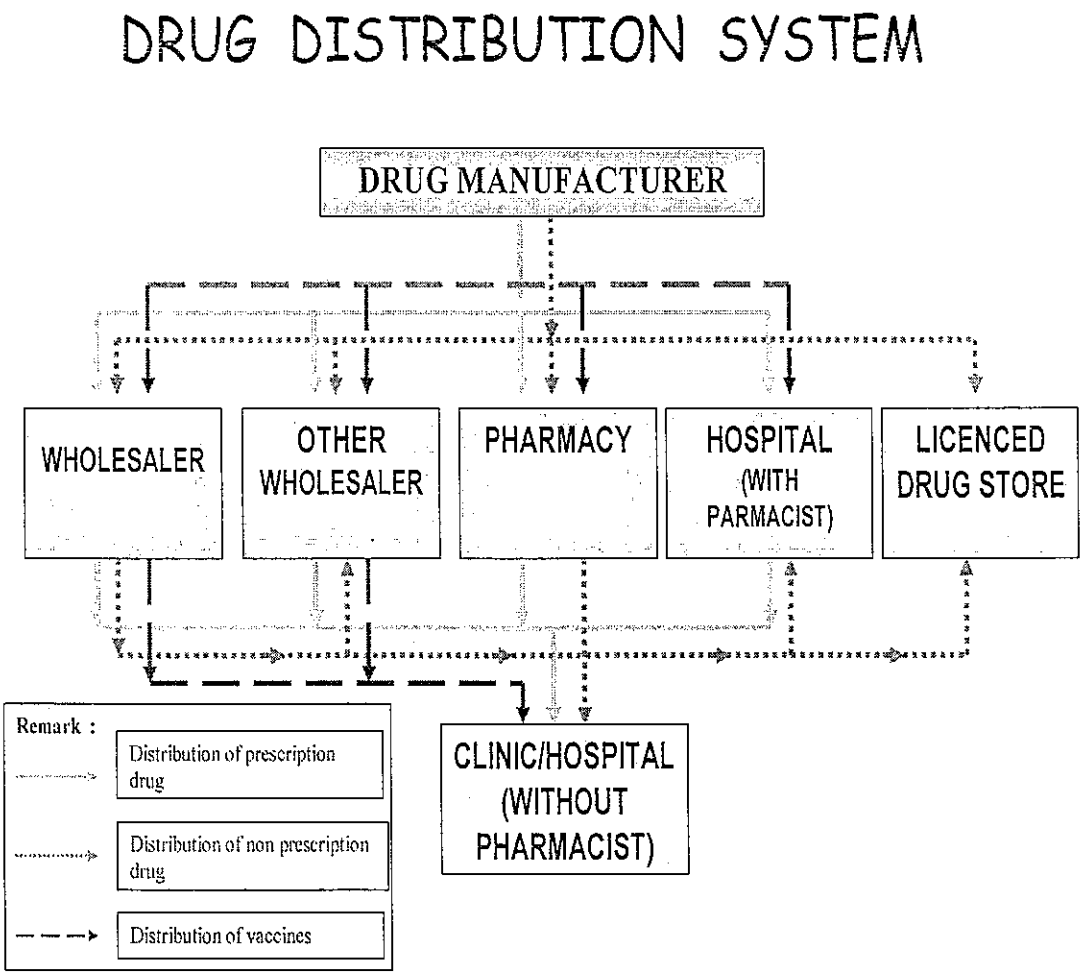


Figure 3.


DRUG DISTRIBUTION SYSTEM
DRUG MANUFACTURER
WHOLESALER
OTHER WHOLESALER
PHARMACY
HOSPITAL (WITH PARMACIST)
LICENCED DRUG STORE
CLINIC/HOSPITAL (WITHOUT PHARMACIST)
Remark :
Distribution of prescription drug
Distribution of non prescription drug
Distribution of vaccines

COUNTRY REPORT

Drug Regulatory Authority

Badan POM

National Agency For Drug and Food Control - NADFC

INDONESIA

Tokyo, November 2012

BADAN POM

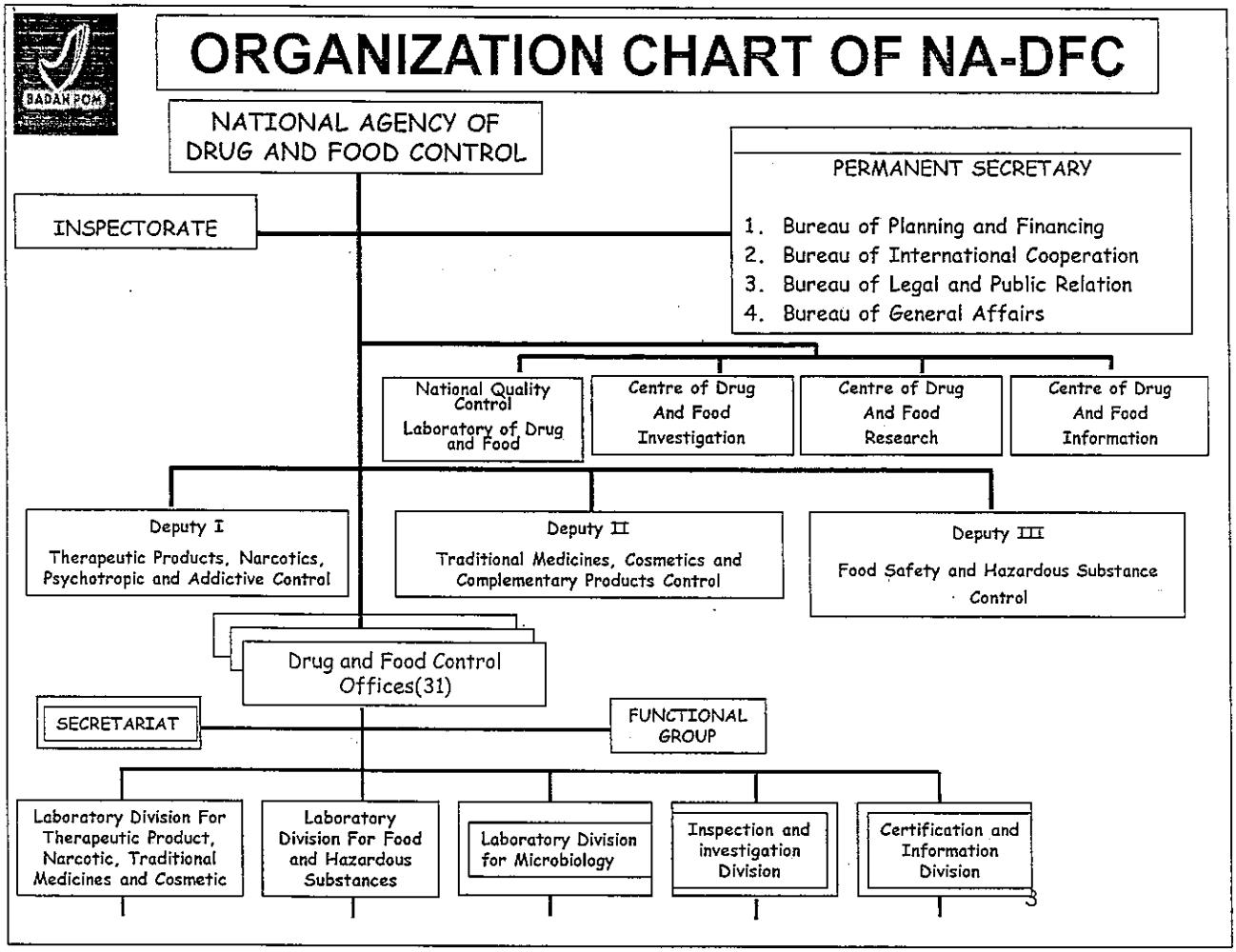
Vission

Becoming an innovative, credible and internationally recognized drug and food regulatory authority for public protection.

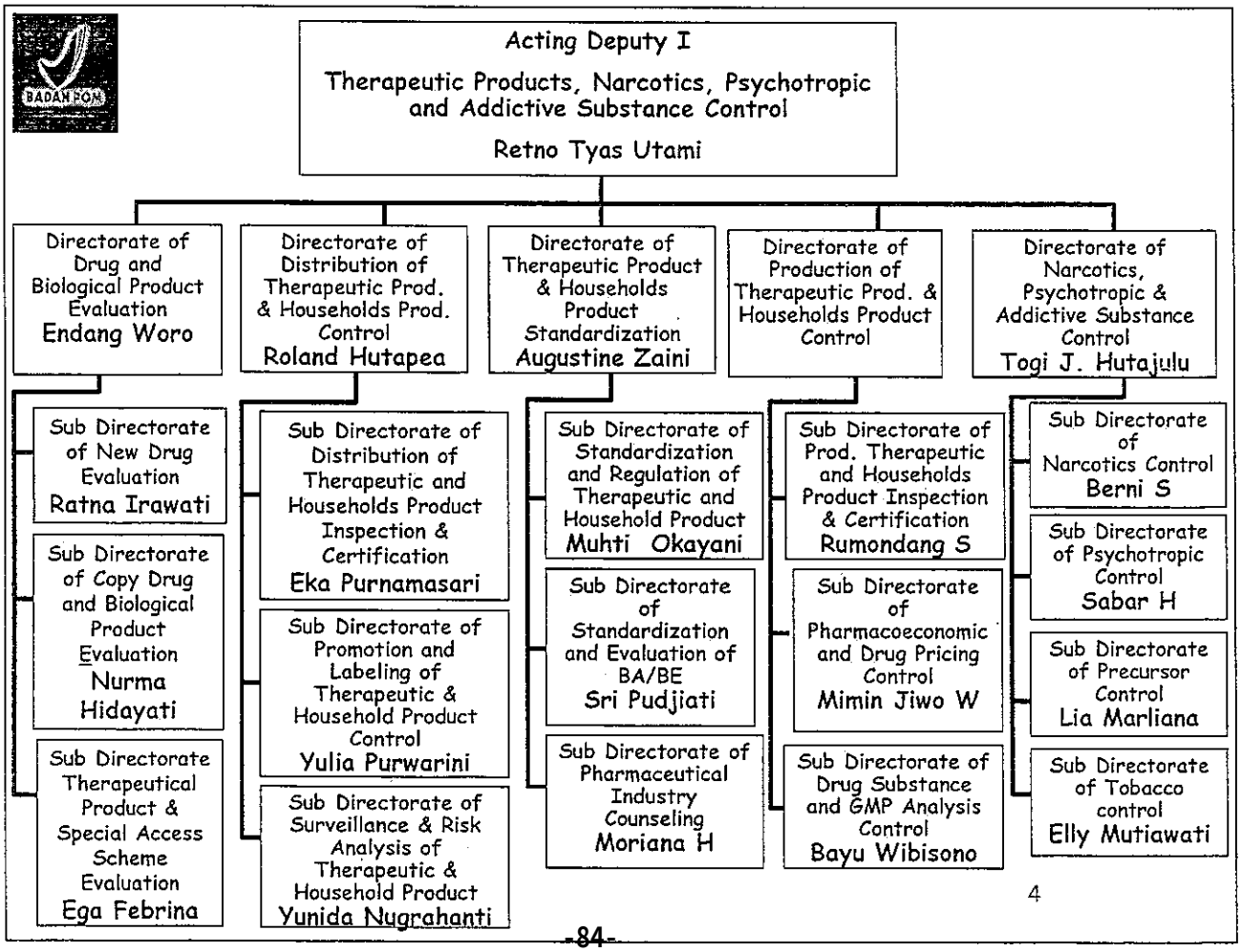
Mission

- To conduct pre-market evaluation and post-market control based on international standard.
- To implement quality management system consistently.
- To optimize partnership with stakeholders in various lines.
- To empower public in protecting themselves from the risk and harmful drug and food to health.
- To build the learning organization.

ORGANIZATION CHART OF NA-DFC

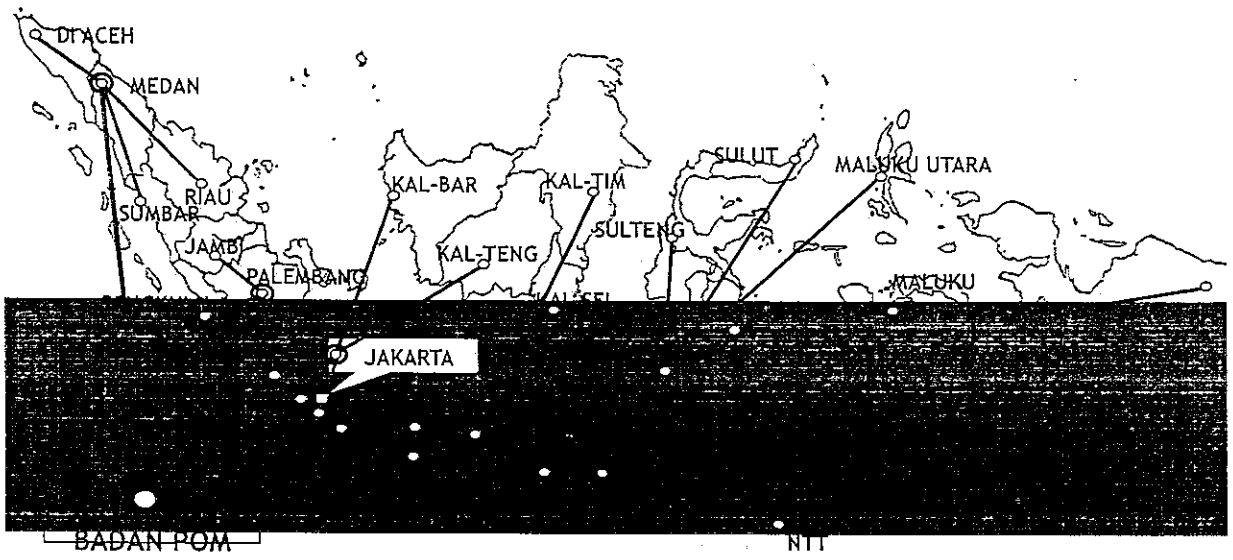


3



4

NATIONAL NETWORKING OF DRUG AND FOOD CONTROL SYSTEM



- NA-DFC have Regional Offices in 31 provinces, including 4 new provinces (Banten, Batam, Gorontalo, Bangka Belitung, Manokwari).
- Only 9 provinces having pharmaceutical industry

PRE MARKET CONTROL

GMP

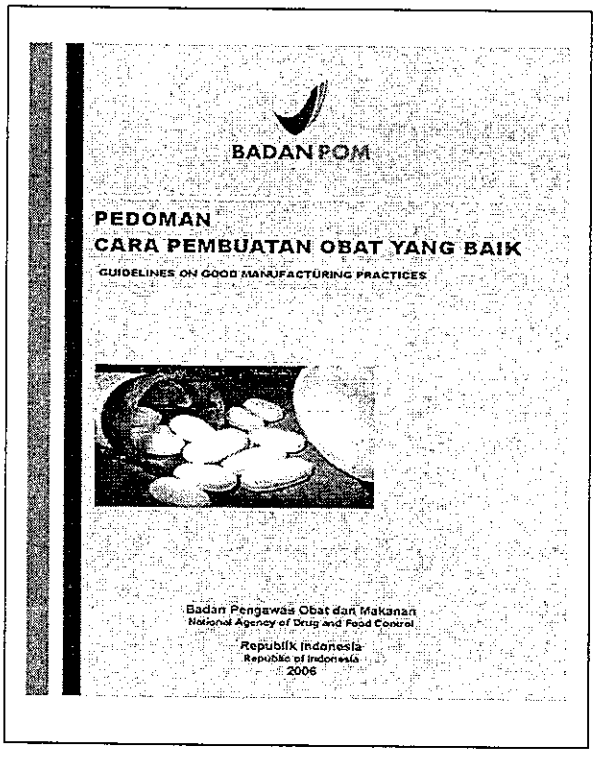
(GOOD MANUFACTURING PRACTICE)

GMP
(Good Manufacturing Practice)

GMP
CERTIFICATION

- Manufacturer should confirm with GMP requirements
- GMP Certificate will be given if the requirements is confirmed
- GMP Certificate is issued for each dosage form

GMP GUIDELINE



INSPECTION

- Carried out regularly by NADFC
  (under Directorate of Control of Production of Therapeutic Product and Household Product)
- Manufacturers are inspected for its GMP compliance on aspects:
  - Quality management
  - Personnel
  - Premises
  - Equipment
  - Sanitation and Hygiene
  - Production
  - Quality control
  - Documentation
  - Self Inspection and Quality Audit
  - Handling of Product Recall, Product Complaint and Return Drug Product
  - Qualification and Validation
  - Contract Manufacture and Analysis

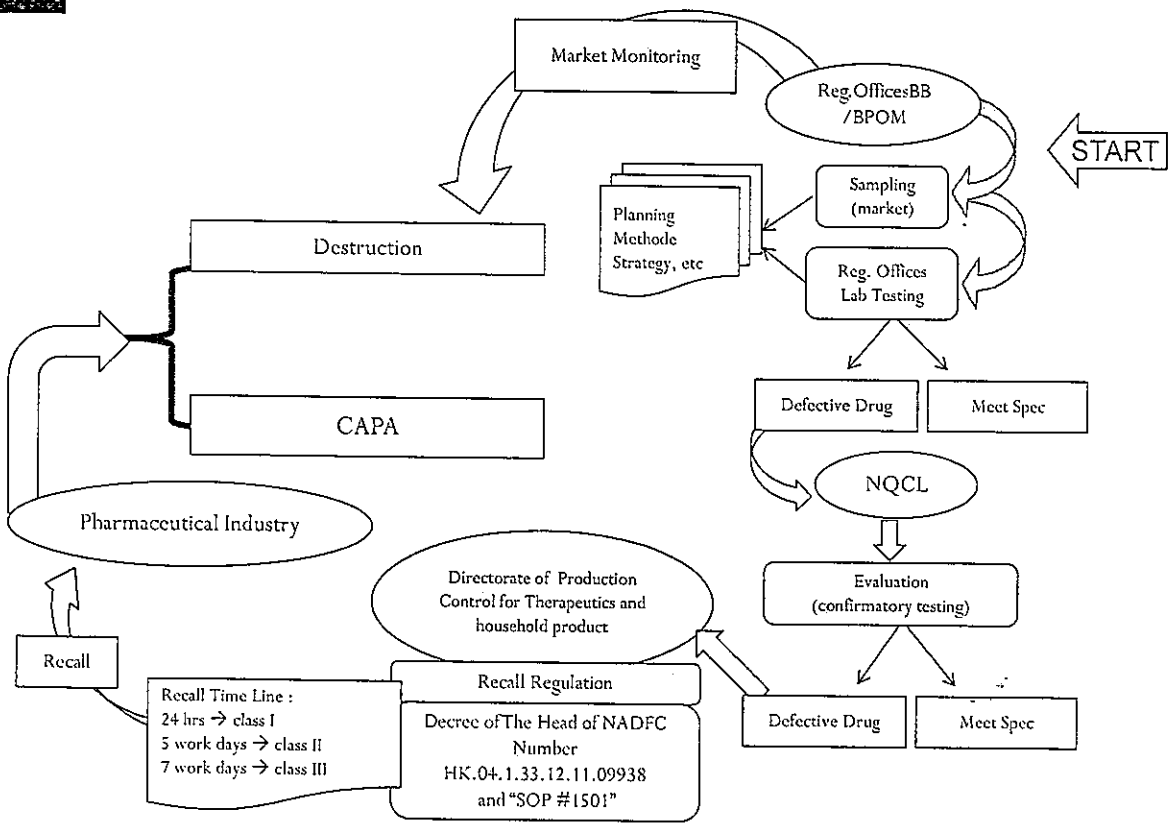
Qualification of GMP Inspector

- GMP inspector in NADFC are qualified and trained
- GMP inspectors are divided into:
  - Trainee
  - Junior Inspector
  - Senior Inspector
  - Lead Inspector
- Training among others:
  Basic GMP Training, Advance GMP Training, Qualification and Validation, Sterile Product.

POST MARKET CONTROL

SAMPLING & TESTING

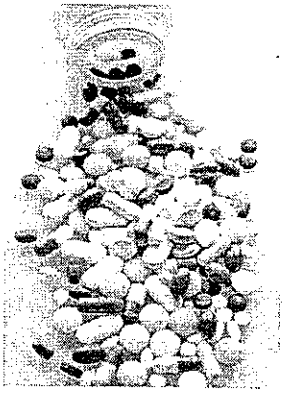
Post Market Control of Registered Drugs



RECALL SYSTEM

- Recall product :
  Mandatory recall : requested by NADFC
  Voluntary recall : initiated by the pharmaceutical Industry

- Recalls are initiated for a range of reasons from defected products to labeling errors, and carried- out on a mandatory basis



DIFFICULTIES & PROBLEMS

1. Pharmaceutical industry not comply to curent GMP requirements, Inconsistently GMP implemented .
2. Inadequate number of inspectors
3. Lack of inspection training
4. Ineffectiveness process of recall product by pharmaceutical industry

Terima Kasih
Arigatoo Gozaimasu

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Malaysia

QUALITY MANAGEMENT OF ESSENTIAL MEDICINE GOOD MANUFACTURING PRACTICE (GMP) AND INSPECTION 2012

Tokyo, Japan

COUNTRY REPORT MALAYSIA

NATIONAL PHARMACEUTICAL CONTROL BUREAU
MINISTRY OF HEALTH, MALAYSIA

1. Country Profile

1.1. Introduction

The Federation of Malaya Agreement was signed in August 1957. At the end of the month, Independence was finally achieved with Tunku Abdul Rahman as the first Prime Minister. Malaysia was formed on 16 September 1963. At that time, Malaysia comprised of Malaya, Sabah, Sarawak and Singapore. Singapore separated from Malaysia on 7 August 1965.

1.2. Geographical Background

Malaysia, in the region of South-East Asia consisting of Peninsular Malaysia, the states of Sabah and Sarawak and the Federal Territory of Labuan in the north-western coastal area of Borneo Island. Peninsular Malaysia has its frontiers with Thailand in the North and Singapore in the south, while Sabah and Sarawak border the territory of Indonesia's Kalimantan province. The two distinct parts of Malaysia, (Peninsular Malaysia and the states of Sabah and Sarawak) separated from each other by the South China Sea.

Figure 1.1: Malaysia Map

The capital of Malaysia is none other than Kuala Lumpur. Also, Malaysia comprises of 13 states and three Federal Territories (Kuala Lumpur, Putrajaya and Labuan). The 13 states are Johor, Pahang, Negeri Sembilan, Melaka, Selangor, Perak, Terengganu, Kelantan, Kedah, Pulau Pinang, Perlis, Sabah and Sarawak.

1.3. Climate

Malaysia lies near the Equator between latitudes 1^{o} and 7^{o} North and longitudes 100^{o} and 119^{o} East. The year is generally divided into the South-East and the North-East Monsoon seasons. The average daily temperature throughout Malaysia varies from $21^{o}C$ to $32^{o}C$. Humidity is high that is 80%.

1.4. Population

As of the 2010 census, the population of Malaysia was 28,334,135. The population of Malaysia consists of many ethnic groups. Malays make up 50.4 per cent of the population, 23.7 per cent of the population are of Chinese descent, while those of Indian descent comprise 7.1 per cent of the population while other of other ethnic groups which are the indigenous races of Sarawak and Sabah, that is, the Dayaks, Kadazans (Dusuns), Bajaus, Melanaus and Muruts; and the aborigines of Peninsular Malaysia make up another 11 per cent. There are also Europeans and Eurasians.

1.5. Society and Culture

Malaysia is a multi-racial country with a rich cultural heritage. The base of the national culture is Malay culture, which is native to this region. Islamic values are embedded in Malay Culture. The Malay culture emphasises values on courtesy, moderation, tolerance, harmony and cordial relations among family members, neighbors and community. As Malaysian respect each other's beliefs and faiths, cultural and religious festivals such as Hari Raya, Chinese New Year, Deepavali, Christmas, Gawai Day and other auspicious occasions are given due importance.

One of the unique features of Malaysia is its multi-racial population which practices various religions such as Islam, Buddhism, Taoism, Hinduism and Christianity. Each ethnic group has its own beliefs. Under the Federal Constitution, Islam is the official religion of Malaysia but there is freedom of worship. The Malay Language (BahasaMelayu) is the national language of the country. However, the people are free to use their mother tongue and other languages. English as the second language is also widely used.

1.6. Constitution and Separation of Power

Malaysia practices a system of parliamentary democracy and is ruled as a Constitutional Monarchy, with His Majesty the Yang di-PertuanAgong as the Head of the country. The Yang di-PertuanAgong is elected to the throne for a five-year term from one of the hereditary Rulers of the nine states in the Federation which are ruled by Sultans. The states are Perlis, Kedah, Perak, Selangor, Negeri Sembilan, Johor, Pahang, Terengganu and Kelantan.

Duli Yang MahaMuliaAlMu'tasimuBillahiMuhibuddinTuankuAlHaj Abdul HalimMu'adzam Shah IniAlMarhum Sultan Badlishah is the 27thSultan of the state of Kedah, Malaysia, and the 14th Yang di-PertuanAgong since 13 December 2011.

In the other states, namely Melaka, Pulau Pinang, Sabah and Sarawak, the Head of State is the Yang di-PertuaNegeri of Governor of the State. The Yang

di-PertuaNegeri is appointed by the Yang di-PertuanAgong for a four-year term.

The Federal Constitution of Malaysia clearly divides the authority of the Federation into its Legislative Authority, Judicial Authority and Executive Authority. The separation of power occurs both at federal and state levels, as in keeping with the concept of federalism, which form the basis of the government administration.

1.7. Executive Authority

Executive Authority that is, the power to govern, is vested by Article 39 in the Yang di-PertuanAgong/King but is exercised by a Cabinet of Ministers headed by the Prime Minister. The Cabinet is responsible to the Yang di-PertuanAgong. The Yang di-PertuanAgong is the Head of Executive Authority in the country. Every executive act of the Federal Government flows from the Royal authority, whether directly or indirectly. But, in accordance with the principle of a democratic ruling system, the Chief Executive is the Prime Minister. Therefore, in this section, emphasis is given to the role of the Prime Minister, the Cabinet and the government administrative machinery which has been set up to carry out the executive functions. Datuk Seri NajibTunRazak was sworn in as Malaysia's sixth prime minister, taking over from TunAbdullah bin Haji Ahmad Badawi since 3rd April 2009.

1.8. Education System

Education in Malaysia may be obtained from government-sponsored schools, private schools, or through homeschooling. The education system is highly centralised, particularly for primary and secondary schools, with state and local governments having little say in the curriculum or other major aspects of education. Standardised tests are a common feature. Education in Malaysia broadly consists of a set of stages which are:

- Pre-school
- Primary Education (6 years)
- Secondary Education (5 years, excluding pre-university education for 2 years)
- Tertiary Education
- Postgraduate

Primary and secondary education in government schools is handled by the Ministry of Education, but policies regarding tertiary education are handled by the Ministry of Higher Education.

1.9. Literacy Rate

According to the Department of Statistic Malaysia, the trend of adult literacy rate (15 years and above) in Malaysia has showed agradual increase from 84.3 per cent in 1989 to 92.8 per cent in 2008.

Generally, the adult literacy rate in urban areas was much higher than in rural areas. Until 2008, the adult literacy rate in rural areas remained low which wasless than 90.0 per cent while in the urban areas it reached almost 95.0 per cent.However the gap between urban and rural areas appeared to be narrowing since2003, i.e. between 6.0 to 8.0 per cent.

In 2000, the adult illiteracy rate in Malaysia declined to 9.7 per cent compared tothe preceding year at 10.6 per cent. This positive improvement continued until2008 recording only 7.9 per cent of illiterate population.

2. Statistical Data

Item	Year	Data
a. Number of pharmaceutical manufacturer	2011	71
b. Number of traditional medicine manufacturer	2011	184
c. Number of pharmaceutical importers	2011	234
d. Number of pharmaceutical wholesaler	2011	533

3. Historical Development Of Pharmaceutical Services

Medicinal products must be registered with Drug Control Authority (DCA) before they can be marketed and sold in Malaysia. Only licensed manufacturers can manufacture registered product and in order for them to be licensed, they have to comply with GMP.

GMP was introduced in phases with Phase 1 for prescription drugs in 1985, followed by Phase 2 for OTC products in 1988, Phase 3 for traditional medicines in 1992 and Phase 4 for cosmetics in 2002. A system of licensing for manufacturers, importers and wholesalers of pharmaceutical products containing scheduled poisons was enforced in May 1987 and for products containing non-scheduled poison it was enforced in April 1992. For traditional medicines, licensing exercise was enforced in January 1999 while for cosmetics it was enforced in January 2004.

Just like any other responsible management of an organisation, NPCB had planned and provided a comprehensive training program to all her staff to strengthen their competency and knowledge in order to improve the delivery of service and also to meet the high expectations of her clients. Besides attending various courses, seminars and training program organized locally, GMP inspectors also involved in training program organized by PIC/S, WHO and in ASEAN Cooperation program.

A. Pharmaceutical Affairs Administration

Administrative Organisation Chart

As a National Drug Regulatory Authority (NDRA), National Pharmaceutical Control Bureau (NPCB) focused its objective to ensure the quality, safety and efficacy of pharmaceuticals products. NPCB stand alone but still under the umbrella of Pharmaceutical Service Division while hospital pharmacy administered by the hospital itself.

Vision and Mission of Pharmaceutical Services Division

Vision for Pharmacy

Leading in quality management of medicines through a competent workforce and appropriate science and technology development; in partnership with stakeholders.

Mission

Ensuring quality medicines for the nation.

Objective

Ensuring all pharmaceutical and health products in the market are of quality, safe and efficacious, regulated according to relevant legislations and used rationally.

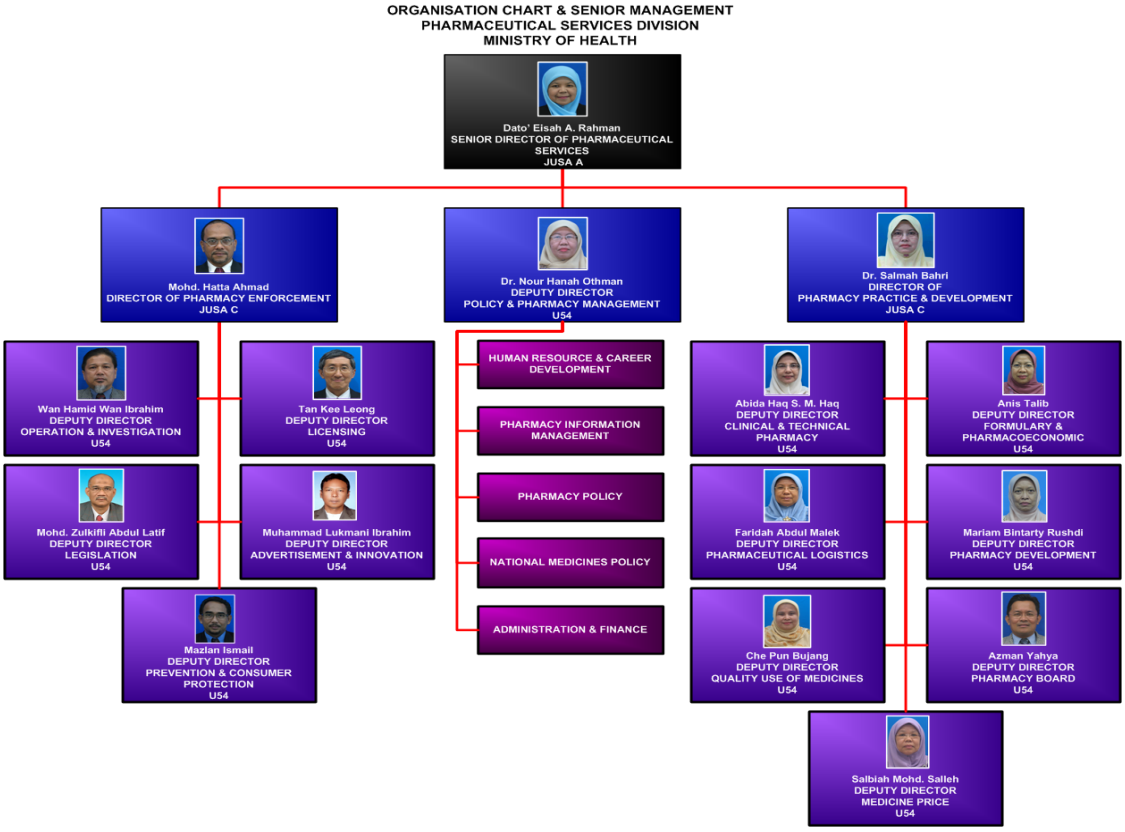


Figure 3.1: Organization Chart for Pharmaceutical Services Division

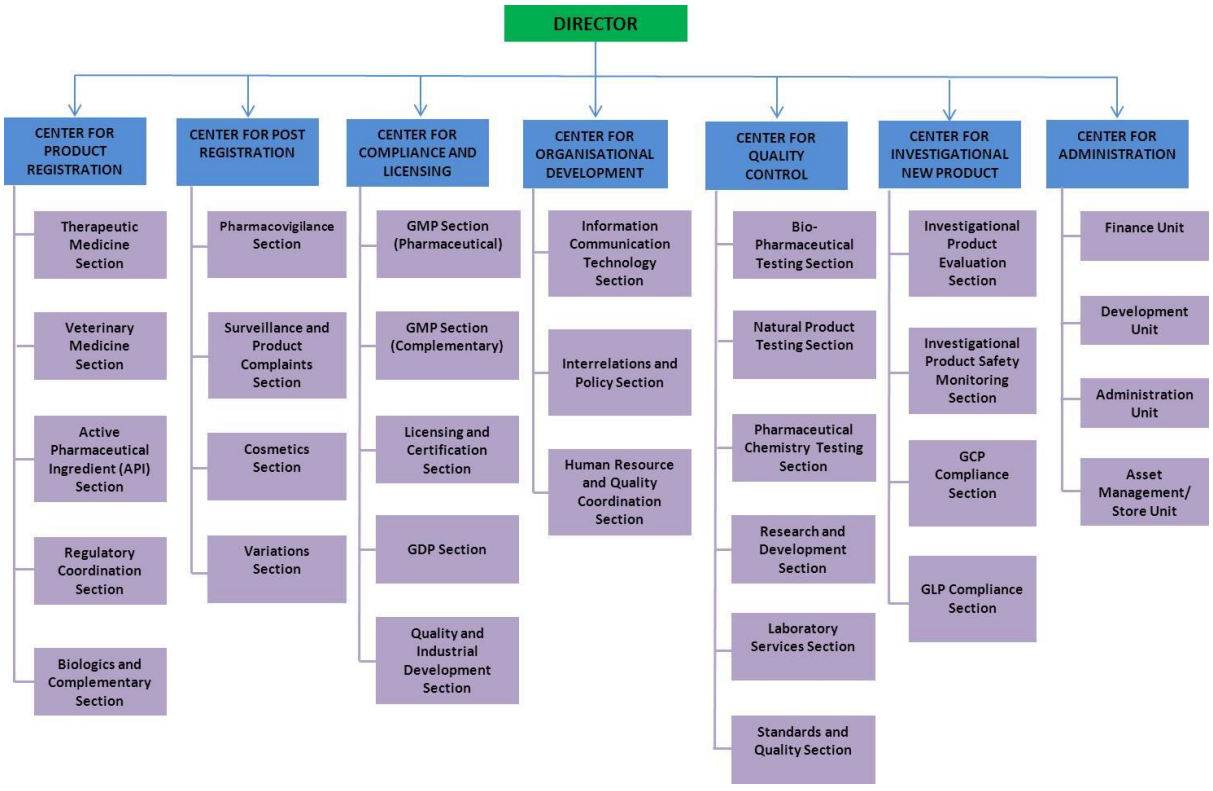


Figure 3.2: Organization Chart for NPCB

Regulatory Control in Malaysia

A) Products Regulations

Pharmacy Legislation in Malaysia

The establishment of the Pharmaceutical Services Division in January 1974, under the Ministry of Health Malaysia, has remarkably led to the expansion in the role and functions of the overall pharmacy services, which contributed towards development of the healthcare sector. The Pharmaceutical Services Division currently undertakes 3 component activities namely **Quality Assurance of Pharmaceutical Products, Pharmacy Enforcement and Licensing, and Pharmaceutical Care**. The enabling powers that allow the division to control and regulate the pharmaceutical sector are embodied in the following legislations :

- ***Registration of Pharmacist Act 1951*** which provides the establishment of the Pharmacy Board and Registration of Pharmacists

- ***Poisons Act 1952*** which regulates the importation, possession, manufacture, compounding, storage, transport, sale and use of scheduled poisons. Basically this Act determines whether a pharmaceutical product is a prescription item, a pharmacy-only item or an OTC.

- ***Sale of Drugs Act 1952***

- ***Control of Drugs and Cosmetics Regulations 1984***which regulates the sale of pharmaceuticals through a system of product registration and licensing of manufacturers, importers and wholesalers.

- ***Dangerous Drug Act 1952*** which regulates the importation, exportation, manufacture, sale and use of narcotics.

- ***Medicines (Advertisement and Sale) Act*** which regulates advertisement of over-the-counter (OTC) medicines in the lay media.

The Pharmaceutical Services Division in the Ministry of Health ensures that the Malaysian public is accessible to quality, safe, efficacious and affordable **pharmaceutical and healthcare products** including advice in using them rationally. In this context, the division plays the following 3 major roles:-

- Contributing directly towards public health through quality assurance whereby the Pharmaceutical Services Division, through the National Pharmaceutical Control Bureau, is responsible for regulating the pharmaceutical industry. This is to ensure that pharmaceutical products conform to acceptable standards of quality, safety and efficacy before they are registered; and that all premises and practices employed to

manufacture, store and distribute these products comply with the required standards till they are delivered to the end users.

- Enforcement of related acts and regulations.

- Provision of pharmaceuticals for hospitals and health clinics under the Ministry of Health. Ensuring a patient-focused service through the concept of Pharmaceutical Care. The ultimate aim is to ensure provision of optimum drug therapy, both by contributing to the preparation/manufacture, supply and control of medicines and associated products, and by providing information and advice to those who prescribe or use pharmaceutical products.

Drugs and Cosmetics Regulations

The promulgation of the Control of Drugs and Cosmetics Regulations in June 1984 marked the dawn of the regulatory era in Malaysia. This laid the groundwork necessary towards moulding a systematic pharmaceutical regulatory system in Malaysia. In January 1985, the Drug Control Authority (DCA) was established under the chairmanship of the Director General of Health Malaysia, with a mission of ensuring the safety, efficacy and quality of pharmaceuticals as well as safety and quality of traditional medicines and cosmetics marketed locally. To accomplish this goal, the DCA through its Secretariat based at the National Pharmaceutical Control Bureau (NPCB) undertakes several functions which include evaluation and registration of products; analysis of samples; inspection and licensing of manufacturers, importers and wholesalers premises; post-marketing surveillance; adverse drug reaction (ADR) monitoring and dissemination of information.

Food Regulations

Food safety responsibilities throughout Malaysia are executed through a system of administration including the central, state, district and local authority levels. Within the Ministry of Health, the Food Safety and Quality Division, which was established in 1974, is responsible for the overall technical supervision of food safety activities; formulation of legislation, codes of practice and guidelines; determination of food safety policies; adoption of food sampling and food premises inspection strategies; and coordination of activities at the state and district levels. The Food Act 1983 (Act 281 of the Laws of Malaysia) and its regulations are the primary legislative documents for food safety activities in Malaysia. The regulations deal with such subjects as food hygiene, labelling, import and export, advertising and laboratories, and also contain numerous and detailed food standards.

Profession Regulation – Pharmacists

Registration of Pharmacists

The government of Malaysia is already made it mandatory for pharmacists to serve the government for a period of 4 years. This is the compulsory service and it mimics that which has already been implemented for the medical and dental profession.

The Registration of Pharmacist Act has been amended [Act A1207 - The Registration of Pharmacists [Amendment] Act 2003] to allow this to be carried out. In this compulsory service, Pharmacy graduates are required to be provisionally registered with the Pharmacy Board of Malaysia and on being provisionally registered, engaged in employment as a public servant in a listed premise for a period of not less than one year. This is the equivalent of the training period as a pupil [pupilage] under the old law. Under Act A1207, there is no "pupilage". On satisfactory completion of the period of provisional registration, pharmacists can apply for full registration with the Pharmacy Board of Malaysia. They would then be required to serve the government for 3 years. Failure to serve the government on full registration may lead to a fine not exceeding fifty thousand ringgit.

At the present moment, there is a gross imbalance of pharmacists in the public sector (about 20%) compared to in the private sector (about 80%). This limited manpower curtails the types of pharmaceutical services that can be delivered to the public. With this compulsory service, the government hopes to fill the many vacancies in the government and thus strengthen the services.

Health Promotion & Regulations

The Government continues to emphasize primitive and preventive health services as important components of the health development programme. Health promotion, education and awareness programmes are given priority in order disseminate information to a wider audience. In this regard, the mass media and the Internet are utilized to disseminate current information on the health status of the population and health promotion activities. In addition, the registration of traditional medical practitioners and the documentation of their medical products will be undertaken to ensure quality, safety, efficacy and affordability.

Research and Development (R&D)

Pharmacy research has a wide scope with high potentials. Generally researches done in 2005 were focused on descriptive studies to obtain baseline data to initiate future studies. Even though research has not resulted in policy changes, efforts were made to study priority areas such as those

pertaining to cost saving, patient safety, consumer's education, and clinical pharmacy.

Post-Marketing Surveillance (PMS)

After the products are registered, the quality of the products in the market is continuously monitored by NPCB through its Post-Marketing Surveillance (PMS) programme which was initiated in 1990. A total of 2,483 registered products were sampled for this purpose and this represented 8.13% of the targeted number of registered products. A total of 1,428 labels and package inserts had been checked. 42 products were issued warning letters and NPCB handled 269 complaints. 74 products were recalled from the market; 3 Degree One (within 24 hours) product recalls were issued, all of which were traditional medicines. There was no Degree Two (within 72 hours) product recall for the year 2005. A total of 71 product batches were recalled within 30 days (Degree Three) comprising 12 prescription drugs, 3 non-prescription drugs and 56 traditional medicines.

Adverse Drug Reactions (ADR) Monitoring

The Adverse Drug Reaction (ADR) Monitoring programme was first launched in 1987. In 1990 a national advisory committee known as the Malaysian Adverse Drug Reaction Advisory Committee (MADRAC) was established and also in 1990 Malaysia was accepted by the WHO Collaborating Centre as the 34th member of its Drug Safety Programme. In October 1998, a website for MADRAC was officially launched. Malaysian guidelines for the reporting and monitoring of ADR have been developed to outline the requirements and procedures to be followed for submission of reports of adverse drug reactions to the Drug Control Authority (DCA). Throughout the year 2005, NPCB received a total of 2,363 adverse drug reaction (ADR) reports, a 42% increase as compared to the previous year 2004. Out of those reports, 2,009 reports were evaluated and subsequently submitted to become a part of the WHO ADR Monitoring Centre database in Uppsala, Sweden. The majority of the ADR reports were submitted by medical practitioners from government hospitals.

Pharmacopoeia

Quality control activity is an important element in the evaluation of pharmaceutical, traditional and cosmetic products. The products tested include products for registration, post-marketing surveillance of registered products, complaints on registered products and products from enforcement activities. The tests conducted are based on pharmacopoeias mainly British Pharmacopoeia (BP) and United States Pharmacopoeia (USP), in-house or manufacturers' approved protocols of analysis and specifications.

Drug Advertisement

The Medicine (Advertisement and Sale) Act 1956 provides the basis for the control of advertisements of medicines, appliances, remedies, skill and services that relate to medical and health claims. The Pharmaceutical Services Division, Ministry of Health as the custodian of this Act has put into place an enforcement mechanism that is committed to eradicating illegal advertisements. A total of 81 cases were investigated under Medicine (Advertisement and Sale) Act 1956 and 160 warning letters were issued in 2005.

Drug Price Mechanism

Drug price regulation does not exist in Malaysia, and the Government has no control over the prices of medicines. Under the present practice, market forces are expected to stabilize drug prices. In Malaysia, medicines are available from many outlets such as private clinics, hospitals, retail pharmacies and supermarkets (for OTC products only) but however patient treated in government hospitals will get the medicines almost free of charge. Ministry of Health Malaysia has set-up a Price Monitoring Unit (PMU) under the Pharmaceutical Services Division to carry out continuous price monitoring activity for trending purposes guided by the WHO Consultant.

Classification of Pharmaceuticals and Medicinal Products

In Malaysia, pharmaceuticals and medicinal products are classified into four categories which are poison, non-poison (OTC), traditional medicines and cosmetics. These products must be registered with Drug Control Authority (DCA) before can be marketed and sold in Malaysia. The product is classified as:

- **Poison** – if it does contain scheduled poison
- **Non-Poison (OTC)** – if it does not contain scheduled poison
- **Traditional** – if consist material of natural origin such as plants and animals
- **Cosmetic** – if it's intended to be placed in contact with various external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with teeth and the mucous membranes of the oral cavity, with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance and/or correcting body odors and/or protecting them or keeping them in good condition

B. Good Manufacturing Practice (GMP) in Malaysia

The promulgation of the Control of Drugs and Cosmetics Regulation in 1984 provided the foundation for development of a systematic pharmaceutical regulatory system. To maintain standards and safeguard public well-being, measures were undertaken by the National Pharmaceutical Control Bureau

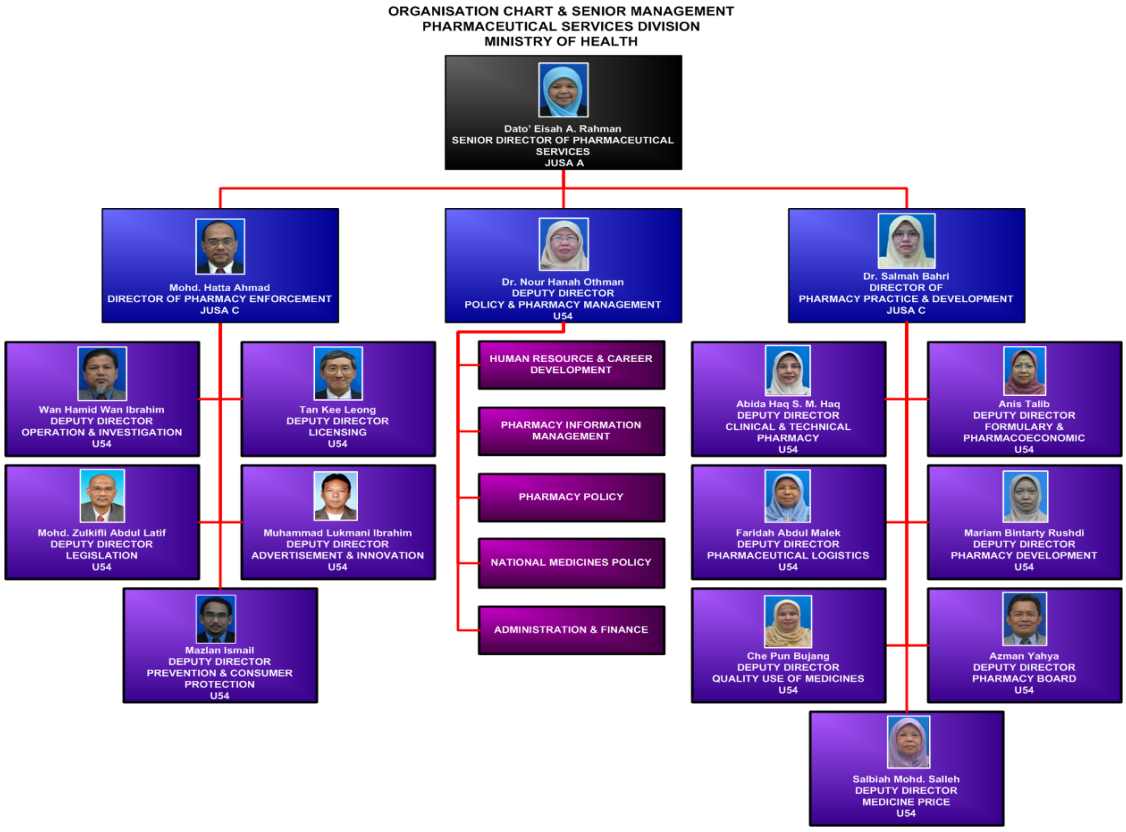
(NPCB) to implement a drug and cosmetic registration and licensing scheme which covered pharmaceutical manufacturers, importers and wholesalers as well as clinical trials. NPCB also provided technical assistance to local pharmaceutical manufacturers to upgrade manufacturing standards to levels equivalent to the requirements of Good Manufacturing Practice (GMP) as recommended by the World Health Organisation (WHO) and other relevant organisations.

With globalisation and trade liberalisation, efforts were made to ensure the competitiveness of the pharmaceutical industry through continuous improvement in standards and quality assurance requirements. Effective from 1st January 2002, Malaysia became the 26th member of the Pharmaceutical Inspection Cooperation Scheme (PICS), a cooperative arrangement between international pharmaceutical inspection authorities in the field of GMP. The acceptance of Malaysia into the PICS paved the way for the local pharmaceutical products to be recognised internationally. The GMP guidelines that are currently applied are PIC/S Guidelines on GMP for Pharmaceuticals, Malaysian Guidelines on GMP for Traditional Medicines and ASEAN Guidelines on GMP for Cosmetics. Be a member of PIC/S, the Quality Management System of manufacturers and the quality of pharmaceutical products produced must be at par with other member countries. Manufacturers having a tough time to comply with the high standards, need to spend much to upgrade their facilities and also need to train the personals involved.

In order for the products to be registered, all manufacturers must comply with Good Manufacturing Practice (GMP). Poor understanding of GMP and registration procedures, communication breakdown, used of undeclared ingredients i.e. premixes in production and increasing number of adulteration cases were some of the major problems encountered. Nevertheless, several initiatives have been taken by the Ministry to assist the local industries. Regular dialogues, guidance and advice, training programmes and dissemination of information have led to fruitful outcomes. Ministry is also proactively making wide surveillance on the products in the market and would continue to monitor the situation. Should any product found to contain harmful substances, there would be an immediate recall of these products from the shelves.

4. GMP System

4.1. Central and local organization in charge of pharmaceutical affairs administration



Organization chart for Pharmaceutical Services Division

4.2. Legal and intuitional position of GMP in your country, GMP guidelines

Pharmaceutical product lifecycle is continuous process. It began with research and development (GLP) and then followed with preclinical development (GCP) and then continued with manufacturing (GMP). Manufacturing is define as making or assembling of the product, enclosing or packing of the product in any container in the form suitable for administration or application, and the labelling of the container or carrying out any process in the course of any of the foregoing activities (CDCR 1984).

GMP guidelines according to product category:

Product category	Guidelines
Pharmaceutical	PIC/S GMP Guide
Traditional Medicine and Health Supplements (TMHS)	Guidelines on Good Manufacturing Practice for Traditional Medicines and Health Supplements
Cosmetic	Annex 1, Part 9 : Guidelines on Good Manufacturing Practice (GMP) for Cosmetic : Guidelines for Control of Cosmetic Products in Malaysia

4.3. Inspection and guidance of pharmaceutical affairs, organization of inspection division, numbers of inspectors (central government/local government, their role).

4.3.1. Pharmaceutical Enforcement Division

Intelligence-gathering

Intelligence gathering is an effort to gather, process and utilize specific information about an identified individual/organization for ensuring successful raids and for the benefit of the organization. As an important activity of enforcement organizations, it enables them to focus on potential criminal activities and understand the offences being done or future threats/trends.

Operation

The main objective of this unit is to conduct raids at the individual/company/business with inputs from the intelligence-gathering unit, diversion control unit, precursor unit and the others. The unit also receives the information from public complaints, media reports, all state enforcement branches and other enforcement agencies. Raids are carried out from time to time either by each state single-handedly or with the co-operation of enforcement officers from the state enforcement branches in large-scale operations.

All pharmaceutical and traditional products in Malaysia must be registered with Drug Control Authority, Ministry of Health. Therefore, the purpose of conducting raids is to ensure that the pharmaceutical and traditional products available in the market comply with the rules and regulations and also to eradicate unregistered, counterfeit and adulterated pharmaceutical and traditional products.

Investigation

The investigation unit is responsible to investigate any case that violates any of the provision of the laws enforced by the Pharmacy Enforcement Division. Investigations cover various media and are also based on public complaints. Moreover, the unit also carries out the investigation of advertisement that violates the Medicines (Advertisement and Sale) Act 1956 (Act 290) and Regulations.

Investigation starts by collecting of exhibits (documents) from various agencies such as Companies Commission of Malaysia, Road Transport Department, National Registration of Malaysia, Chemistry Department, National Pharmaceutical Control Bureau etc, and taking statements from the suspects and the raiding officers. The charge will be prepared and the investigation file will be submitted to the Deputy Public Prosecutor office to obtain the sanction for prosecution. Once the sanction is issued, the file or case will be registered in court for legal action.

4.3.2. National Pharmaceutical Control Bureau

The NPCB conducts inspections on manufacturers of pharmaceutical, traditional and cosmetic products to ensure compliance with Good Manufacturing Practice (GMP). Besides that, in an effort to ensure compliance with Good Storage Practice (GSP) among the importers and wholesalers, the NPCB collaborates with the State Pharmacy Enforcement Branch in conducting GSP inspections. The NPCB also strives to ensure that clinical research conducted in Malaysia are internationally accepted and recognised by carrying out inspections on clinical research centres. Research carried out in Malaysia must be in accordance to the Good Clinical Practice (GCP) and Good Laboratory Practice (GLP) guidelines as well as applicable legislations.

4.4. Scope of pharmaceutical product GMP inspection

All pharmaceutical products for all dosage forms including sterile and non-sterile products.

4.5. Frequency of GMP Inspection

The conclusion of the routine GMP audit report should state the overall GMP compliance which is graded as 'Good', 'Marginal' or 'Poor'. The grading of GMP compliance and the frequency of routine audit is depicted as below:-

Compliance/Risk	High	Medium	Low
Good	18 months	24 months	36 months
Marginal	12 months	18 months	24 months
Poor	6 months	6 months	6 months

Risk of products

Risk	Types of products
High	Injectable products
Medium	All drugs listed in the Scheduled Poison Drugs List (prescription drugs) and internal preparations of non-Scheduled Poison Drugs (OTC), and other sterile products, except injectable products.
Low	External preparations of OTC products, Traditional medicines and cosmetic products.

4.6. Method(s) of GMP inspection (field inspection, documentary inspection)

4.6.1. Inspection of plant facilities

4.6.2. Review of documentation

4.7. Qualification of GMP inspectors, education, training system

4.7.1. Candidates should have the following education and academic qualifications:

4.7.1.1. Degree in Pharmacy

4.7.1.2. Registered with the Malaysian Pharmacy Board as a Pharmacist

4.7.1.3. Appointed by the Malaysian Public Services Department as a Pharmacist

4.7.2. Candidates should undergo training to develop the knowledge and ability required for conducting audits. Training provided may be conducted by NPCB or other external organization. Training may include the following areas :

4.7.2.1. Familiarization of the relevant GMP guidelines, standards and regulations

4.7.2.2. Techniques of examining, questioning, recording information, evaluating and reporting

4.7.2.3. Abilities required for communicating and planning, organizing and directing an audit

4.7.2.4. Knowledge, abilities and personal attributes may be achieved through training and possession of these may be demonstrated orally or written, direct observations or peer review.

4.8. Cases of recalled pharmaceutical products arising from inferior quality (no of cases, outline of cases over the 5 years)

-

4.9. Manufacturing, import and export of pharmaceutical product, proportion of imported medicinal products distributed

-

4.10. Sales and distribution of medicinal products, proportion of imported medicinal product distributed.

Pharmaceutical product registered 2010 =13,067products
OTC product registered 2010 = 9,918products

4.11. Product name of medicinal drug domestically manufactured and product name of imported medicinal drugs in the market (main products)

Category of product	Number of registered product (cumulative) for year 2010
Prescription	13,067
Non-prescription	9,918
Traditional	20,775

4.12. Legal and institutional regulations on the sales and distribution of pharmaceutical products

[Refer paragraph 3]

4.13. Existence or nonexistence of recalled system of product distributed

The recall system for product distributed is exist.

4.14. Name of organization for analyzing recalled products, no. persons in charge for analysis

National Pharmaceutical Control Bureau
Ministry of Health Malaysia

5. Essential Drug List

5.1. Introduction

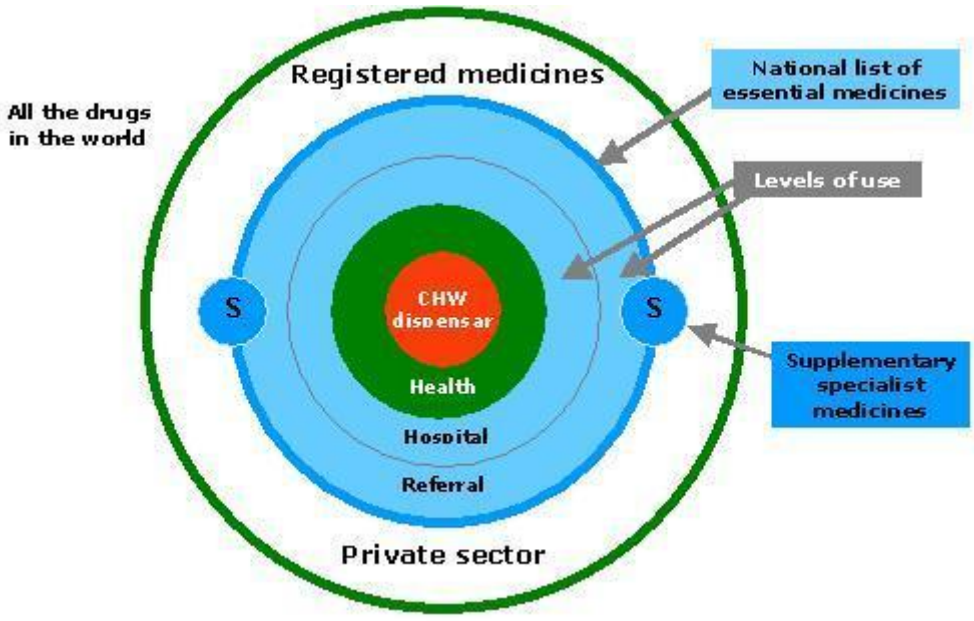
Essential medicines are those that satisfy the priority health care needs of the population; thus should be easily available in adequate quantities and in

suitable dosage forms. The Essential Medicine List [EML] is a tool that can help manage the purchasing and distribution of medicines and the selection of quality assured and cost-effective products and thus one of the vital tools needed to improve and maintain health.

5.2. The WHO concept of essential medicines

A limited range of carefully selected essential medicines leads to better health care, better drug management, and lower costs
Selection criteria: Essential medicines are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost-effectiveness
Purpose: Essential medicines are intended to be available within the context of functioning health systems at all times, in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price the individual and the community can afford.
Implementation: The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations; exactly which medicines are regarded as essential remains a national responsibility.

5.3. The Essential Medicines Target



5.4. Malaysian NEDL

The suggestion to create Malaysia's National Essential Drugs List [NEDL] for use both in the private and public sectors was first mooted in 1996, as one of the strategies to ensure that the public could afford to purchase drugs. The NEDL was formulated after consultation with all the stakeholders in the health

care industry and based on the Ministry of Health's (MOH) Drugs List, which serves as the essential drugs list for the Ministry of Health since 1983.

The Honourable Minister of Health launched the first edition of NEDL in January 2000. The first part of the NEDL consists all preparations needed for primary, secondary and tertiary health care treatment. It consists of 358 chemical entities and 605 preparations. The second part of the NEDL is the supplementary list consisting of drugs used for tertiary treatment and contains 257 chemical entities and 391 preparations.

The NEDL was formulated with the following objectives:-

1. Ensure the cost-effectiveness of treatment through suitable therapy, the use of generic drugs and cheaper alternatives.
2. Encourage the rational use of drugs by avoiding over-prescribing and mis-prescribing.
3. Make the healthcare system more transparent.
4. Control the rising cost of healthcare and thus help control inflation.
5. Ensure the patient's right to obtain adequate information, especially:-
    i. The right to complete information that is easily understood regarding the drugs that are prescribed and sold.
    ii. The right to choose among competitive products.

The concept of essential medicines is forward-looking. It incorporates the need to regularly update medicines selections to reflect new therapeutic options and changing therapeutic needs; the need to ensure drug quality; and the need for continued development of better medicines, medicines for emerging diseases, and medicines to meet changing resistance patterns.

Updating of the first NEDL started in year 2005 by the Drug list Review Panel, with the help of the Technical Drug Working Committee, Ministry of Health. The Technical Drug Working Committee of MOH can get the feedback from their counterparts in the private sector on the selection of the list in their particular discipline. The Drug List Review Panel finally accepted the list in September 2008.

6. Difficulties and Constrains in Manufacturing Control of Essential Drug

Challenges faced in improving Good Manufacturing Practice (GMP) and Good Storage Practice (GSP) standards of manufacturers, importers as well as wholesalers:

i) To further improve the standard of local manufacturers in terms of Good Manufacturing Practice (GMP) requirements

ii) To expand the coverage of Good Storage Practice (GSP) inspections to importers' and wholesalers' premises outside the Klang Valley area

iii) To strive towards implementing GMP requirements on veterinary product manufacturers

iv) To regulate GMP requirements on the manufacture of biological/blood products

7. Current situation concerning Counterfeit and Substandard Drugs and its countermeasures

7.1. Background

Malaysia has a counterfeit market value of $378 million, with software dominating $289 million of that market value. In 2007, the Malaysian software industry lost $311 million to pirated software sales. The range of counterfeit products available includes all the usual suspects such as music, movies, luxury brands and, more recently, pharmaceuticals but also everyday items such as batteries, engine oil, toothpaste and consumables.

Back in 2003, Abdullah Nawawi, Director General of Enforcement at the Ministry for Trade and Consumer Affairs, commented "Counterfeit products are available widely and involve many consumer items - garments, electrical items, pharmaceuticals, shoes, bags, leather goods, branded watches, cigarettes, and detergents. It's difficult to quantify how widespread the market for imitation goods is". The general feeling is that, since 2003, the problem has only escalated and is infiltrating and tainting the lives and prospects of the Malaysian people.

2007 was the Malaysian Tourist Board's "Visit Malaysia" year and there is acute awareness that Malaysia's reputation could be sullied through the illicit activities of counterfeiters; as a tourist it is relatively easy to avoid buying fake handbags and sunglasses but another matter when it comes to consumables and pharmaceuticals. In addition to the public safety risks, there is also a fear that the commercial trade sector could be affected, as well as the potential for foreign investment.

Persistent raids on the behalf of the Ministry for Trade and Consumer Affairs enforcement division have reaped results and uncovered counterfeit rings, but have also opened a "can of worms". Microsoft and the Business Software Alliance (BSA) have also instigated crackdowns and raids by the authorities to discourage software counterfeiters.

In his article Counterfeit Goods in Daily Malaysian Lives, IP specialist PatrikMirandah suggests that these officials "lack expertise in identifying and distinguishing the fake from the original" and goes on to promote the concept that intellectual property owners in Malaysia need to get more

closely involved and work together with the Ministry to fight the counterfeiters and bring them to justice.
However, on a local level, the current awareness programmes and efforts to educate the public are having a trickle-down effect and the issue of counterfeiting will be emphasised by government initiatives such as the recently launched Malaysian IP Day. For tourists and locals alike, ultimately the only way to prevent the spread of counterfeit trade in Malaysia is to be aware of the risks and what to look out for.

7.2. Legislation

As far as concerns the issue of IP law, amongst the measures taken to protect registered trademarks, the Trademarks Act of 1976 has been amended to contain provisions for border measures prohibiting counterfeit trademark goods from being imported into the country. Click here to read more about how IP rights are being enforced in Malaysia. So how does this affect tourists? In his key note address at the third Global Congress on Combating Counterfeiting and Piracy in 2007, the Malaysian Minister of Domestic Trade and Consumer Affairs noted that "a significant proportion of those purchasing counterfeit and pirated goods were not Malaysians but tourists!" Basically the government realises the importance of preventing tourists from purchasing and exporting pirated and counterfeit goods. To this end, a special export unit was established in 2005, with officers stationed at exit points to prevent attempts to export illegal products. High-tech scanners machines have also been placed at the major airports in the country. Random and 'tip off' checks are also being carried out.

In September 2008 the Malaysian Government proposed a new bill to combat pharmaceutical counterfeiters, urging the establishment of stiffer penalties, including heavier fines and mandatory jail sentences. The bill came out of roundtable discussions held under the auspices of the Special Taskforce to Combat Counterfeit Products, a unit established this year and overseen by the Ministry of Domestic Trade and Consumer Affairs, and the Pharmaceutical Association of Malaysia.

Counterfeiting of drugs is a significant issue in Malaysia and is being taken very seriously be the Malaysian Ministry of Health. Steps to combat the problem have included the introduction of the Meditag system in 2005, increased consumer awareness, tightening of legal provisions and stepping up of market surveillance. The prevalence of counterfeit drugs in the market has greatly reduced but the problem still persists. Things to look out for are: over-the-counter drugs such as Panadol pills and Eye-Mo drops, both of which have been counterfeited in the past. A 1997 survey on cough and cold medication carried out in Malaysia found that 5% of such medicines in the market were counterfeits. In a 2007 New Straits Times article, Pfizer Malaysia Corporate Affairs Director claimed that there were counterfeit versions available of many of their drugs, including Viagra, Diflucan and the anti-depressant Zoloft.

As of 1st May 2005, the Ministry of Health has implemented Phase 1 of the compulsory ruling requiring manufacturers and importers of pharmaceutical products to fix security hologram labels onto their products or packaging. When affixed, the hologram labels raise the expectation that these products have been duly registered with the Drug Control Authority (DCA). This latest move by the Ministry was motivated by the need to curb counterfeit problems with pharmaceutical products and augment enforcement efforts against imitation of such products. The hologram label will have a unique serial number that can be traced to the licensed manufacturer or importer of the product, which makes it easier for monitoring purposes.

8. Overview of relationship with Overseas Assistance Organization

The NPCB continues to play an active role in harmonization efforts through the ASEAN Consultative Committee for Standards and Quality (ACCSQ) Pharmaceutical Product Working Group (PPWG), Traditional Medicines and Health Supplements Product Working Group (TMHS PWG) as well as the ASEAN Cosmetic Committee (ACC). Other international involvements include Pharmaceutical Inspection Co-operation Scheme (PIC/S) activities.

Under the ASEAN Technical Co-operation among Developing Countries (ASEAN TCDC) Program, NPCB has been chosen and recognised by the ASEAN countries as the regional training centre for quality control of pharmaceuticals. NPCB has been the host for the training program in quality control and has successfully conducted such training since 1986. Apart from that**,** NPCB has been receiving trainees from ASEAN and other countries including Myanmar, Bangladesh, Vietnam, Pakistan, Philippines, Indonesia, India, Sri Lanka, Thailand, Macao, Singapore, Hong Kong, Laos, Cambodia and Mongolia.

In view of the technical expertise and training capabilities of NPCB, it received the recognition as a "WHO Collaborating Centre in the Regulatory Control of Pharmaceuticals" since 10 May 1996.

9. Overview of Technical Assistance Programs in the field of Pharmaceutical, GMP, Quality Control organized by International Organizations and NGO

As a member to PIC/S, NPCB is entitled to participate in PIC/S training programme under its own expenses.

9.1. Annual Seminar

The annual PIC/S training Seminar is attended by GMP inspectors from Participating Authorities and other interested Drug Regulatory Authorities. The Seminar is hosted by a different PIC/S Participating Authority each year.

Each Seminar focuses on a particular aspect of GMP, with the aim of providing training and harmonisation in the field.

9.2. Expert Circles

PIC/S has formed several Expert Circles to enable specialised inspectors to discuss and exchange information in a specific area of GMP. Expert Circles on Active Pharmaceutical Ingredients (APIs), Computerised Systems, Human Blood & Tissue and Quality Risk Management (QRM) are currently active and meet at least annually. The aim of the Expert Circles is to develop guidance documents (e.g. recommendations or aide-memoires) or to draft / revise Annexes to the GMP Guide. Expert Circle meetings are open to inspectors from PIC/S Participating Authorities and Applicants, but also to inspectors from non-PIC/S Regulatory Authorities (provided that the meeting also provides training to inspectors).

9.3. Joint Visits Programme

"Another avenue for the training of inspectors from PIC/S Participating Authorities is the joint visits programme for the training of inspectors. Under this program, three inspectors from three different countries are teamed up to observe typical inspections in each country with a view to comparing inspection procedures and techniques. Any differences in inspection procedures and techniques are reported to the PIC/S Working Group on Training for appropriate action. Joint visit groups are also encouraged to recommend specific training needs for inspectors, including topics for future PIC/S Seminars".

9.4. Coached Inspections

In order to provide training to new inspectors or inspectors who wish to improve their inspection skills in a specific field, PIC/S introduced in 2009 a programme on coached inspections. The programme consists in teaming up a junior inspector with an experimented inspector during a routine inspection. The programme is open to inspectors from Participating Authorities and Applicants.

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Philippines

REPUBLIC OF THE PHILIPPINES

COUNTRY REPORT

Training on Good Governance of Medicines for Pharmaceutical Regulation Authorities

04 November to 29 November 2012

Food-Drugs Regulation Officer- III
Food and Drug Administration
Department of Health
Philippines

I. The Philippines: Background

The Philippines is located in Souteast Asia and divided by 7,107 various islands and speaks the varied attitude but with a common culture of being hospitable. This is located in between the South China Sea on the west and the Philippine Sea on the east. The major islands are Luzon in the north, the Visayan Islands in the middle, and Mindanao in the south. The total area is about 300,000 square kilometers, including about 298,000 square kilometers of land and about 2,000 square kilometers of water.

The Philippines has a tropical marine climate, with the northeast monsoon, which produces a cool, dry season from December to February, and the southwest monsoon, which brings rain and high temperatures from May to October. Between March and May, hot, dry weather prevails. Manila is the capital city and Baguio City as the summer capital of this country. Temperatures in Manila range from 21˜2˜C to 3C, with an average annual temperature of 27˜C. Temperatures elsewhere in the Philippines have been recorded at more than 37˜C. The average monthly humidity ranges from 71 percent in March to 85 percent in September. Annual rainfall is heavy but varies widely throughout the Philippines, ranging from 965 millimeters in some sheltered valleys and the southern tip of the island of Mindanao to 5,000 millimeters along the mountainous east coasts of the islands of Luzon, Samar, and the northern tip of Mindanao. The Philippines lies astride the typhoon belt and experiences 20 to 25 typhoons a year from July through October, of which five or six may cause serious destruction and death. About 83 percent of the population is Roman Catholic; 9 percent Protestant, including Presbyterian, Methodist, Philippine Independent Church, and Philippine

Church of Christ; 5 percent Muslim; and 3 percent Buddhist and other religions. The constitution guarantees freedom of religion and separation of church and state. But Christianity predominates, and Muslims historically have been marginalized.

The group constituting more than 90% of the population is predominantly Roman Catholic, although the Philippine Independent Church and the Iglesia ni Cristo command significant followings. The hill tribe practice tribal religions and Islam is strongest in the Sulu Archipelago, Southern Palawan, and parts of Southern Mindanao.

The Philippines has two official languages, Pilipino (Tagalog) and English, while in Visayas and Mindanao the common language is Bisaya (or Cebuano speaking). Filipinos has eight major dialects, in order of use: Tagalog, Cebuano, Ilocano, Hiligaynon or Ilonggo, Bicol, Waray-waray, Pampango, and Pangasinense. Filipino, based on Tagalog, is related to Malay and Indonesian and is part of the Malayo-Polynesian subgroup of the Austronesian language family. Filipino is the common language used between speakers of different native languages, which are closely related but not mutually intelligible. English and Pilipino are used in the government and as the medium of instruction in higher education.

This year, Department of Education commenced Grade Seven making it seven years of primary education which is basically free and compulsory; the four-year secondary education program is free but not compulsory. The Philippines has one of the highest literacy rates in Asia. The many colleges and universities include the University of the Philippines (1908) and

the University of Sto. Tomas (1611). Higher education is greatly valued, although the economy cannot absorb all college graduates.

Article II of the 1987 Constitution of the Republic of the Philippines explicitly states that the Filipino political system is both democratic and republican, placing the right to govern with the people. The Philippines has a government that is elected by the people who retain some form of control over the running of the state.

Republican - Article VI of the Philippines Constitution vests "legislative power" in the Congress, giving Congress the power to create laws. The President's power is derived from Article VII of the Constitution, allowing him the authority to appoint Congressmen during recesses as well as the executive departments similar to the President's cabinet in the United States. As commander-in-chief, the Filipino President ensures civilian control of the military.

Democratic - The government of the Republic of the Philippines is elected by the people, and any authority given to the government comes from the people as stated in the Philippine Constitution. Members of the executive and legislative branches of government are elected by the people to serve predetermined terms of office. Article VII mandates that the President and Vice President of the Philippines be elected through a direct election by the people. The President may only serve one six-year term. Members of Congress are elected by the citizens in their individual districts.

All economic activities in the country give yearly a final output of goods and services. This 'GNP per capita' shows the general economic achievement of a country. The figure of the

GNP for the Philippines shows that the country is ranking somewhere in the middle position of all countries in Pacific Asia.

The rich body of indigenous artistic traditions includes folktales, music, and the folk dances made famous by the Bayanihan Dance Troupe. Painting and Sculpture often combine Asian & Western elements. Spanish and English have been the vehicles for such writers as Jose Rizal, N.V.M. Gonzalez, Bienvenido Santos, and F. Sionil Jose.

II. STATISTICAL DATA

II.A. Philippines Demographics Profile as of 2012

Population	103,775,002 (July 2011 est.)
Age structure	**0-14 years:** 34.6% (male 17,999,279/female 17,285,040) **15-64 years:** 61.1% (male 31,103,967/female 31,097,203) **65 years and over:** 4.3% (male 1,876,805/female 2,471,644) (2011 est.)
Median age	**total:** 22.9 years **male:** 22.4 years **female:** 23.4 years (2011 est.)
Population Growth Rate	1.873% (2011 est.)
Net migration rate	-1.27 migrant(s)/1,000 population (2011 est.)
Urbanization	**urban population:** 49% of total population (2010) **rate of urbanization:** 2.3% annual rate of change (2010-2015 est.)
Sex ratio	**at birth:** 1.05 male(s)/female **under 15 years:** 1.04 male(s)/female **15-64 years:** 1 male(s)/female **65 years and over:** 0.76 male(s)/female **total population:** 1 male(s)/female (2011 est.)
Total fertility rate	3.15 children born/woman (2011 est.)
HIV/AIDS - adult prevalence rate	less than 0.1% (2009 est.)
HIV/AIDS - people living	8,700 (2009 est.)

with HIV/AIDS	
HIV/AIDS - deaths	fewer than 200 (2009 est.)
Major infectious diseases	**degree of risk:** high **food or waterborne diseases:** bacterial diarrhea, hepatitis A, and typhoid fever **vectorborne diseases:** dengue fever, malaria, and Japanese encephalitis **water contact disease:** leptospirosis (2009)
Nationality	**noun:** Filipino(s) **adjective:** Philippine
Ethnic groups	Tagalog 28.1%, Cebuano 13.1%, Ilocano 9%, Bisaya/Binisaya 7.6%, Hiligaynon Ilonggo 7.5%, Bikol 6%, Waray 3.4%, other 25.3% (2000 census)
Religions	Roman Catholic 80.9%, Muslim 5%, Evangelical 2.8%, Iglesia ni Kristo 2.3%, Aglipayan 2%, other Christian 4.5%, other 1.8%, unspecified 0.6%, none 0.1% (2000 census)
Languages	Filipino (official; based on Tagalog) and English (official); eight major dialects - Tagalog, Cebuano, Ilocano, Hiligaynon or Ilonggo, Bicol, Waray, Pampango, and Pangasinan
Literacy	**definition:** age 15 and over can read and write **total population:** 92.6% **male:** 92.5% **female:** 92.7% (2000 census)
School life expectancy (primary to tertiary education)	**total:** 12 years **male:** 12 years **female:** 12 years (2008)
Education expenditures	2.8% of GDP (2008)
Health Expenditures	3.8% of GDP (2009)

II.B. VITAL STATISTICS

1. Rate of vital Statistics (per 1,000 population)		
1.1 Infant Mortality Rate	**total:** 18.75 deaths/1,000 live births **male:** 21.21 deaths/1,000 live births **female:** 16.18 deaths/1,000 live births (2011 est.)	
2. Five Main Diseases Causing Morbidity	No. of Cases	Rate/100,000
2.1. Acute Lower Respiratory Tract	776,562	971.6

Infection & Pneumonia		
2.2. Bronchitis/Bronchiolitis	719,982	900.8
2.3. Acute Watery Diarrhea	577,118	722.0
2.4. Influenza	379,910	475.3
2.5. Hypertension	342,284	428.2
3. Five leading causes of mortality	No. of Cases	Rate / 100,000
3.1. Diseases of the Heart	70,138	17.7
3.2. Diseases of the Vascular System	49,519	12.5
3.3. Malignant Neoplasms	38,821	9.8
3.4. Pneumonia	34,218	8.6
3.5. Accidents	33,617	8.5
4. Life expectancy at birth	**Total population:** 71.94 years **male:** 68.99 years **female:** 75.03 years (2011 est.)	
5. Maternal Mortality Rate	94 deaths/100,000 live births (2008)	
6. Children under the age of 5 years underweight	20.7% (2003)	
7. Physician's Density	1.153 physicians/1,000 population (2004)	
8. Hospital Bed Density	0.5 beds/1,000 population (2006)	
9. Obesity - adult prevalence rate	4.3% (2003)	

2 MEDICAL CARE POLICY

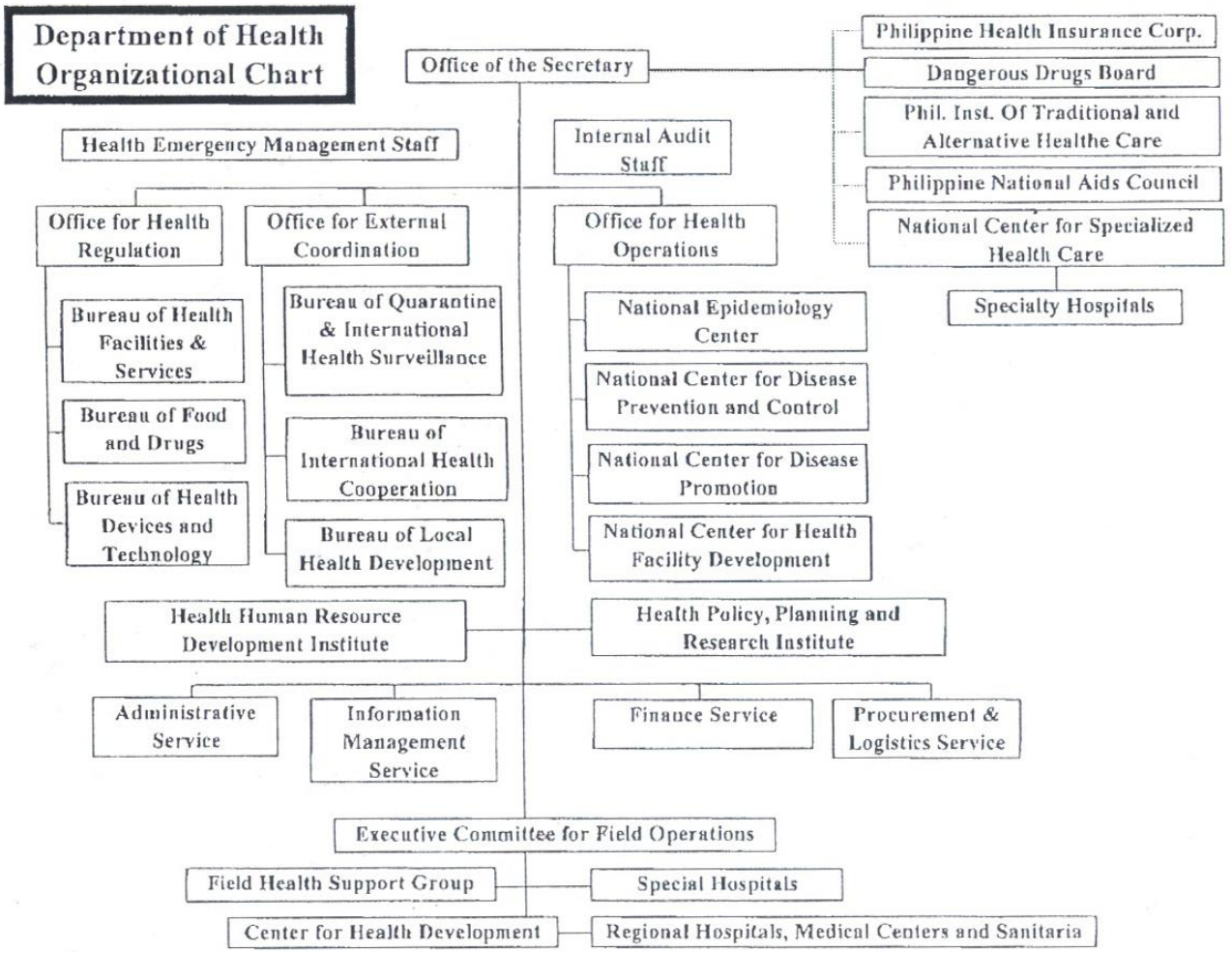
1.1 Estimated No. of Patients who Received Medical Treatment on the Specified Date 3.1.1. Government Hospital 3.1.2. Public Hospital 3.1.3. Private Hospital	
1.2 No. of Hospitals by Establishing Organ (1999-2009) 3.2.1. Government Hospitals 3.2.2. Private Hospitals	721 1,074
1.3 No. of Health Manpower	
3.3.1. Physicians (year)	
2005-2010	106,450
3.3.2. Dentists (year)	
2005-2010	47,337
3.3.4. Pharmacists (year)	
2005-2010	52,312
3.3.5. Nurses (year)	
2005 - 2010	382,624
3.3.6. Medical Technologists (year)	
2005- 2010	49,605
3.3.7. Midwives (year)	
2005 -2010	242
3.3.8. (Licensed)Pharmaceutical Manufacturing (year)	
2012	302
3.3.9. (Licensed) Traditional Medicine Manufacturers (year)	
2012	8
3.3.10. (Licensed) Drug Importers (year)	
2012	748
3.3.11. (Licensed) Wholesalers (Year)	
2012	5,090

3 PHARMACEUTICAL AFFAIRS ADMINISTRATION

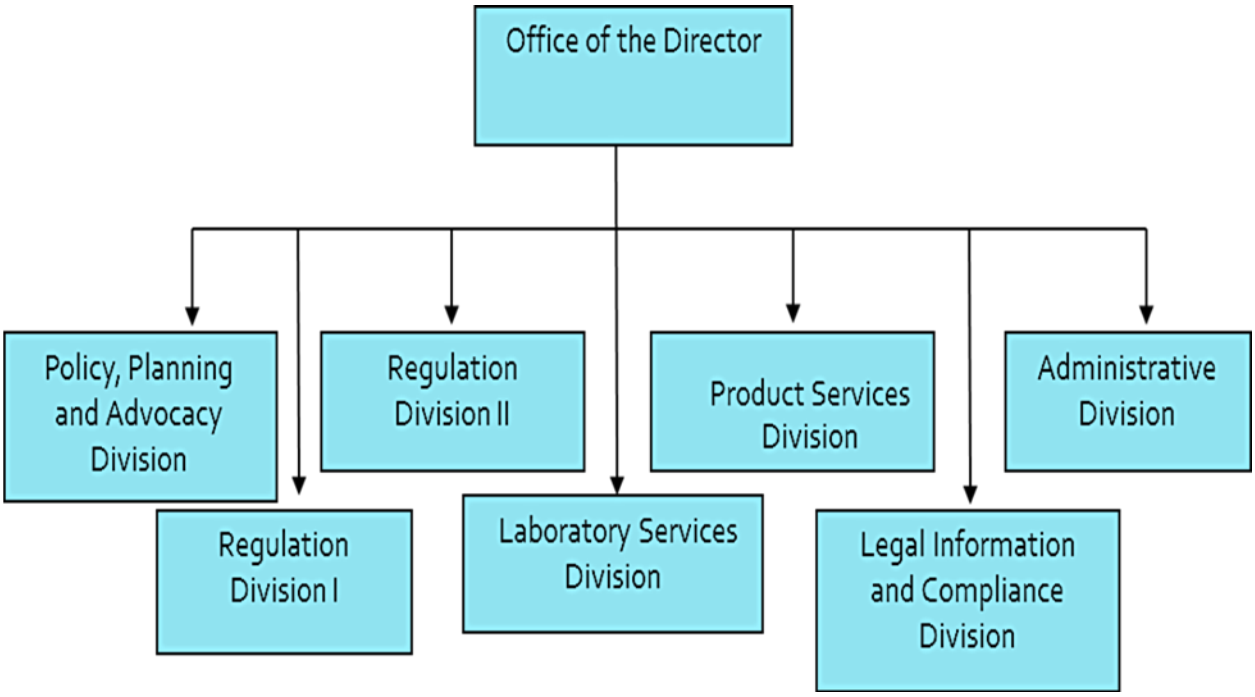
IV.1. ADMINISTRATIVE ORGANIZATION CHARTS
(Please see attached pages)

IV-1.1 DEPARTMENT OF HEALTH

IV-1.2 FOOD AND DRUG ADMINISTRATION


Department of Health
Organizational Chart
Office of the Secretary
Philippine Health Insurance Corp.
Dangerous Drugs Board
Phil. Inst. Of Traditional and Alternative Healthe Care
Philippine National Aids Council
National Center for Specialized Health Care
Specialty Hospitals
Health Emergency Management Staff
Internal Audit Staff
Office for Health Regulation
Office for External Coordination
Office for Health Operations
Bureau of Health Facilities & Services
Bureau of Food and Drugs
Bureau of Health Devices and Technology
Bureau of Quarantine & International Health Surveillance
Bureau of International Health Cooperation
Bureau of Local Health Development
National Epidemiology Center
National Center for Disease Prevention and Control
National Center for Disease Promotion
National Center for Health Facility Development
Health Human Resource Development Institute
Health Policy, Planning and Research Institute
Administrative Service
Information Management Service
Finance Service
Procurement & Logistics Service
Executive Committee for Field Operations
Field Health Support Group
Special Hospitals
Center for Health Development
Regional Hospitals, Medical Centers and Sanitaria

ORGANOGRAM OF FOOD AND DRUG ADMINISTRATION



- **Bureau of Food and Drugs (BFAD)**
  - Republic Act No. 3720 was passed into law known as the " Food, Drug and Cosmetics Act" on June 22, 1963 ; " To ensure the safety, purity, and quality of foods, drugs and cosmetics being made available to the public"
- **Legal Basis**
  - 1987 Philippine Constitution

Sec. 12, Article XIII "*The state shall establish and maintain an effective food and drug regulation system and undertake appropriate health, manpower development, and research, responsive to the country's health needs and problems."*

- **STRATEGIES**
  - Inspection and licensing of establishments dealing with food, drugs, medical devices, cosmetics, *in vitro* diagnostic reagents, and household hazardous substances.
  - Evaluation, testing and registration of products.
  - Approval of product label prior to marketing.
  - Monitoring of quality of products in the market.
  - Evaluation and monitoring of sales promotion and advertisements of regulated products and establishments.
- **FUNCTIONS**
  - Develops plans, policies and programs pertaining to the regulation of processed foods, drugs, and other related products.
  - Provides technical information and assistance to clients and the general public on matters pertaining to food drug, and cosmetics laws, regulations, functions and services.
- **Republic Act No. 9711**
- An Act Strengthening and Rationalizing the Regulatory Capacity of the Bureau of Food and Drugs (BFAD) by Establishing Adequate Testing Laboratories and Field Offices, Upgrading its Equipment, Augmenting its Human Resource Complement, Giving

Authority to Retain Its Income, Renaming it the Food and Drug Administration (FDA), Amending Certain Sections of Republic Act No. 3720, As Amended, and Appropriating Funds Thereof.

3.1 LAWS/REGULATIONS COVERING PHARMACEUTICAL AFFAIRS

3.1.1 PRODUCT REGULATIONS

3.1.1.1 **Republic Act 3720** - Food, Drug and Cosmetic Act later amended by EO 175 otherwise known as Foods, Drugs, and Devices and Cosmetics Act- an act to ensure the safety and purity of food and cosmetic and the purity, safety, efficacy and quality of drugs and devices being made available to the public vesting BFAD with the authority to administer and enforce the law.

3.1.1.2 **Republic Act 6675** - Generics Act of 1988- it is an act to promote, require to ensure the production of an adequate supply, distribution, use and acceptance of drugs and medicines identified by their generic name.

3.1.1.3 **Republic Act 8203** - Special Law on Counterfeit Drugs - it is the policy of the state to protect and promote the right to health of the people and still health consciousness among them. It further declared the policy of the state that in order to safeguard the health of the people, the State shall provide for their protection against counterfeit drugs.

3.1.2 PROFESSIONAL REGULATIONS

3.1.2.1 **Republic Act 5921** - Pharmacy Act as amended by E.O. 174 s. 1987 - the act regulating the practice of pharmacy and setting standard of pharmaceutical education in the Philippines and other purposes.

3.1.3 HEALTH PROMOTION & REGULATIONS

3.1.3.1 Health Establishments Regulations

3.1.3.1.1 **Republic Act 4226-** an act requiring the licensure of all hospitals in the Philippines and authorizing the Bureau of Licensing and Regulations**.**

3.1.3.1.2 **Administrative Order 55-** (for laboratory clinics)- revised rules and regulation in the licensing of laboratory performing HIV testing. The licensure of laboratory clinic is done by the Bureau of Research and Laboratory.

3.1.3.1.3 **Administrative Order No. 56 s. 1989-** Licensing requirements for securing BFAD License to Operate.

3.1.3.1.4 **Administrative Order No. 43- s. 1999- an amendment of A.O. 220 s. 1974,** Current Good Manufacturing Practice. With the development in the Science and technology, industry and public health interest, the Current Good Manufacturing Practice Guidelines for Drugs was adopted and implemented.

3.1.3.1.5 **Administrative Order No. 90 s. 2002-** current Good Manufacturing Guidelines for Cosmetics Products- linient guidelines for cosmetics as compared with A.O. 43-A s. 1999.

3.1.3.2 **TRADITIONAL MEDICINES**

3.1.3.2.1 **Republic Act 8423-** an act creating the Philippine Institute of Traditional Medicine and Alternative Health Care to accelerate the developments of traditional and alternative health care in the Philippines.

3.1.3.2.2 **Administrative Order 12 s. 1993-** Traditional Medicine Program for promotion and development of traditional medicines that has been found safe and effective.

3.1.3.3 HEALTH ECONOMICS

3.1.3.3.1 **Section 2.3 BFAD Regulation No. 5 s. 1987 and A.O 65 s. 1989-** No pharmaceutical products classified by BFAD as a Prescription or Ethical Drug shall be advertised or promoted in any form of mass media except through medical journals, publications and/or literature solely intended for medical and allied professions.

3.1.3.3.2 **Article 116 of Republic Act 7394 or the Consumer Act of the Philippines-** That any sales promotion campaign using medical prescriptions in any part thereof or attachment thereto for raffles or a promise of reward shall not be allowed, nor permit be issued thereof.

3.1.3.3.3 **Section 4 of BFAD regulation No. 5 s. 1989-** Press releases, editorials, health columns and features and public service announcements on health and medicines shall not specify brand/ trade names. Generic names are, however, permissible. For prescriptions drugs, it should be clearly stated that this product can be bought only with a prescription and a doctor’s advice shall be sought.

3.1.3.3.4 **A.O 119 s. 2000 (item no. 1)-** Consistent with the rational drug use policy, the promotion of OTC drug to the public will only be allowed if its known adverse effect are also cited. Moreover, it is the intention of R.A 6675 or the Generic Act of 1988, to promote drug safety by minimizing duplication medications and/or use of drugs with potentially adverse drug reaction.

3.2 LICENSING SYSTEM

4.3.1. PHARMACEUTICAL INSPECTION AND GMP

The Food and Drug Administration is the regulatory agency under the Department of Health, responsible for ensuring that the products distributed in the market by licensed establishments has met the basic GMP requirements based on A.O. 43 s. 1999 and the ASEAN Code of GMP. Through the assistance of AUSAID, a Senior GMP Auditor of Therapeutic Good Administration (TGA) came to Manila to conduct a comprehensive training on GMP and other relevant codes were extensively renewed and discussed. It was in this occasion that drug inspectors realized that the written supplement to the existing guidelines was deemed vital both to the pharmaceutical industry and the regulators since BFAD also envisions to be a world class regulatory agency.

Basic GMP Guidelines:

4.3.1.1. Personnel – should be adequate in number and qualified at all levels and provided with skills and capabilities relevant to their respective functions.

4.3.1.2. Premises – it must be of suitable size, design, construction and location to facilitate proper operation, cleaning and maintenance.

4.3.1.3. Equipment – it shall be of appropriate design, construction, size and suitably located in order to assure product quality, process reproducibility and facilitate cleaning & maintenance.

4.3.1.4. Sanitation & Hygiene – high level of sanitation shall be practiced in every aspect of manufacturing drug products.

4.3.1.5. Storage of Starting & Packaging Materials, Intermediate Bulk Products & Finished Products

4.3.1.6. Production

4.3.1.7. Packaging

4.3.1.8. Finished Product Quarantine & Delivery to Warehouse – the finished product is quarantined before the product is transferred to the warehouse and becomes available for distribution to the market.

4.3.1.9. Quality Control - it is essential part of GMP to provide assurance that products will be consistently of quality appropriate to their intended use.

4.3.1.10. Documentation it is part of management information system, which includes – specifications, procedures, methods and instructions, reports & records & other documents required for planning, organizing & controlling & evaluating the whole activities of drug products manufacturing

4.3.1.11. Self – Inspection – the purpose of self-inspection is to evaluate the manufacturer's compliance with GMP on all aspects of production and quality control

4.3.1.12. Guidelines for Handling of Product Complaint, Product Recall and/or Returned Product – a system for handling each of these shall be designed and include written standard operating procedures, stating who is responsible, the investigation conducted & results

evaluated and actions taken up and shall record all details relevant to the product complaint, product recall or product returned.

4.3.2. PHARMACEUTICAL INSPECTION AND GUIDANCE

In the Philippines, there are about 117 drug inspectors stationed all over the country. There are 36 inspectors from the National Capital Region (central office) and 81 inspectors detailed in the different regions. In the National Capital Region, drug inspectors are assigned in two (2) Divisions:

Regulation Division I - drug inspectors are responsible for the inspection of retail drugstores, non-prescription drug retail outlets, Chinese drugstores, hospital pharmacies, drug distributors (importers, exporters and wholesalers) of food, drug, cosmetic, medical devices and household hazardous substances.

Regulation Division II - drug inspectors are responsible for the inspection of establishments that deals with the manufacture and repacking of foods, drugs, cosmetics, medical devices and household hazardous substances.

Inspectors regularly make on the spot inspection on all licensed establishments and establishments applying for a license. Based, on the outcome of the inspection, if there is non-compliance with CGMP, they will require the establishment to correct the deficiencies noted within the specified period. A follow- up inspection will be made and if there were no changes or corrections done, the inspector will recommend for the suspension of license to operate of the establishment to the Bureau's Legal and Compliance Division.

4.3.3 POST MARKETING SURVEILLANCE (PMS)

One of the functions of the Food and Drug Administration is Post Marketing Surveillance. PMS is a close observation of drug effects, whether beneficial or adverse, following the marketing of a drug. The Bureau ensures that all products regulated by the agency conform to the standards and its specifications. One way of surveillance is by routine sampling of products in the market during inspection. Samples are submitted to the laboratory for testing. Appropriate actions or product recall is decided by the legal division depending on the result of the analysis.

4.3.4 DRUG DISTRIBUTION SYSTEM

4.3.5 Drug distribution is done by a Licensed Drug Distributor (importer, exporter, and wholesaler) by licensed Drug manufacturer and Drug Traders. Usually, the Drug Distributors are authorized by Drug Manufacturers and Traders to distribute their products. Distribution Agreement between each client is provided. Documentation system such as records of delivery receipts and invoices are required between the distributor and the supplier. Such records are needed for easy traceability in case of a product recall. (Same as to from distributors to retail drugstores/ hospital pharmacies)

No medicine, pharmaceutical or drug whatever nature and kind or devices shall be compounded, dispensed, sold or resold, or otherwise be made available to the consuming public except through a prescription drugstore or hospital pharmacy duly established in accordance with the provision of Republic Act 5921 section 25. Pharmaceutical, drug or biological manufacturing establishments, importers and wholesalers of drugs, medicines or biological products are authorized to sell their products only at wholesale to duly established retail drugstore or hospital pharmacy.

Every pharmacy, drugstore or hospital pharmacy whether owned by the government or a private person or firm shall at all times when open for business be under the supervision of a registered pharmacist. In cases, when a drug establishment operates in more than one shift, each shift must be under the supervision and control of a registered pharmacist.

Products distributed should always be registered by the Bureau and should have an individual distribution record regardless of dosage strength and availability. The purpose of providing distribution records is to assure a systematic procedure of distribution and a prompt recall from outlets if products are found to be defective and violative.

Proper generic dispensing of drugs and pharmaceuticals in retail outlets should always be evaluated by the pharmacist. Incorrect prescriptions are not to be dispensed and patients/customers should be instructed to secure a proper prescriptions from physicians.

4.4.5 STABLE SUPPLY OF VACCINES

The Philippines has only one manufacturer of vaccines- the Biological and Vaccine Production Division which is directly under the Department of Health. Currently the agency has produced the BCG vaccine. The vaccines are already imported to supplement the needs of the people.

10. PRESENT SITUATION IN THE NATIONAL DRUG POLICY INCLUDING ESSENTIAL DRUGS AND TRADITIONAL MEDICINES

From the continuous implementation of the GMP in the Philippines, FDA still finds some Drug Companies not in compliance to the guidelines. Due to the economic crisis arising from the country, more drug companies opted to just have their products toll manufactured. The issue of the local pharmaceutical laboratories is that they cannot easily cope up with the advanced technology of the multinationals. The knowledge, skills and capability of the personnel in every manufacturing facility can be pirated by other laboratories or they may have the opportunity to go to other countries. Other manufacturing companies still have not improved or established quality management system. The proliferation of the counterfeit drugs by unknown “fly by night” manufacturers still exists.

On the part of the implementing agency both in the FDA Central and Regional Health Offices, the main problem is the insufficient number of food and drug regulation officers particularly in the regions. The expertise is not fully acquired due to the limited budget of the FDA Central to conduct seminars to reecho the latest updates on the GMP inspections. Insufficient numbers of vehicles to locate and reach some drug manufacturing facilities is also a problem.

At the moment, FDA Philippines is on the strengthening process to be able to function as mandated by R.A. 3720, as amended, and RA 9711, to fulfill the vision. The agency is very strict in issuing License to Operate to Drug Establishments and Outlets. The

continuous coordination of the Central Office to the Regions has been done using the zonal approach.

Other solutions, being considered by FDA Philippines are the additional plantilla, technical training and technical competency enhancement, and competitive salary standards.

11. DRUG PRICE MECHANISM

In the Philippines, high prices of drugs and other products do not only alarm the public but also the government. High prices are usually based by manufacturers on the cost of imported raw materials, taxes, labor fee, etc. For this, the government has created Republic Act 7581 on June 7, 1992, otherwise known as the “Price Act.” The Act provides protection to consumers by stabilizing the price and supply of the basic necessities and prime commodities and by prescribing measure against undue price increase especially during the emergency situation.

The Department of Trade & Industry controls the prices of medicines. The Republic Act 7432 - the Senior Citizen Act gives a 20% discount on all senior citizens card holders.

In 2009, Republic Act 9502, otherwise known as the Universally Accessible and Cheaper Medicines Bill, which reduced the prices of 21 drug products to 50% of their original prices, hence, is making them more affordable and accessible to the consuming public.

The Food and Drug Administration and the National Drug Policy conduct monthly monitoring of prices of drugs, especially essential drugs.

The Department of Health also, through the National Center for Pharmaceutical Access and Management (NCPAM) conducts monthly monitoring of drug prices through electronic Drug Price Monitoring System where in all community and hospital pharmacies both private and government upload the drug prices of essential drugs after registering their drug establishments through the Data Encoder hired by DOH Central Office and assigned in each Regional Offices. (Dept. Order No. 2010-007)

12. PHARMACOPOEIA

The Philippine Pharmacopeia Project is an undertaking of the Department of Health and is being implemented by FDA Philippines, in collaboration with various government and non-government organizations.

Under Executive Order No. 302 dated 29 March 2004, the Philippine Pharmacopeia (PP) 1st edition 2004 and any supplement thereto, has been declared and adopted as the official book of standards and reference for the determination of the identity, purity, and quality of pharmaceutical products and crude plant drugs in the Philippines. Thirty (30) synthetic pharmaceutical products, thirty - one (31) crude plant drugs and twenty - two (22) crude powdered drugs have been identified for monograph development.

The Government of Japan, through the Japan International Cooperation Agency (JICA) extends technical assistance and financial support to the Project.

13. LIST OF REFERENCES

Country Report on the study programme on Manufacturing Control of Essential Drugs, Mary Ann R. Malicse, 2008
National Demographic and Health Survey - 2008
List of Licensed Establishments and their classification under Regulation Division I 2012 – Food and Drug Administration, Philippines.
List of Licensed Drug Manufacturers 2012 – Food and Drugs Phil. Regulation Division II Philippines.
List of accredited Government Hospitals and Private and Other Health Facilities for the Calendar Year 2006 – Department of Health Philippines.
National Objectives for Health Philippines 1999 – 2004, Department of Health Philippines.
National Health Plan 1995 – 2020, Department of Health Philippines
National Health Statistics 2002 – 2004, Department of Health Philippines.
Compilation of Administrative Orders and Memorandum Circulars with Summaries and Annotations 1992 Edition.

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Sri Lanka

QUALITY MANAGEMENT OF ESSENTIAL MEDICINES

GOOD MANUFACTURING PRACTICE (GMP) AND INSPRCTION

04 – 30 NOVEMBER 2012

TOKYO, JAPAN

SRI LANKA COUNTRY REPORT

STATE PHARMACEUTICALS MANUFACTURING CORPORATION

COUNTRY PROFILE

Sri Lanka is an island in the Indian Ocean, lying off the southeastern tip of the Indian subcontinent. It is positioned between latitudes 5° and 10°N, and longitudes 79° and 82°E. Island is separated from India by Palk Strait and Gulf of Mannar and the Arabian Sea lies to the west, the Bay of Bengal to the northeast, and the Indian Ocean to the south.

In the ancient times, Sri Lanka was known by various names: such as Lanka or Sinhala according to the Indian history, ancient Greek geographers called it as Taprobane and Arabs referred to it as Serendib. As a British crown colony, the island was known as Ceylon, and achieved independence under the name Dominion of Ceylon in 1948. In 1972, the official name of the country was changed to "Free, Sovereign and Independent Republic of Sri Lanka". In 1978, the name of the country was changed to the "Democratic Socialist Republic of Sri Lanka".

The island consists of flat-to-rolling coastal plains, with mountains rising only in the south-central part. Amongst these, Pidurutalagala is the highest point, reaching 2,524 meters (8,281 ft.) above sea level. The climate of Sri Lanka can be described as tropical and warm. Its position endows the country with a warm climate moderated by ocean winds and considerable moisture. The mean temperature ranges from about 17 °C (62.6 °F) in the central highlands and to a maximum of approximately 33 °C (91.4 °F) in other low-altitude areas.

Although the country is relatively small in size, it has the highest biodiversity per 10,000 square km in Asia. Remarkably high proportion of the species among its flora and fauna, 27% of the 3,210 flowering plants and 22% of the mammals, are endemic. Sri Lanka has declared 24 wildlife reserves, which are home to a wide range of native species such as Asian elephants, leopards, sloth bears, and a variety of deer and etc.

Sri Lanka is a democratic, socialist republic and a unitary state which is governed by a semi-presidential system, with a mixture of a presidential system and a parliamentary system. It has 3 branches:

Executive: The President of Sri Lanka is the head of state, the commander in chief of the armed forces, as well as head of government, and is popularly elected for a six-year term. In the exercise of duties, the President is responsible to the parliament.

Legislative: The Parliament of Sri Lanka is a unicameral 225-member legislature with 196 members elected in multi-seat constituencies and 29 by proportional representation. Members are elected by universal (adult) suffrage based on a modified proportional representation system by district to a six-year term. The president may summon, suspend, or end a legislative session and dissolve Parliament any time after it has served for one year.

Judicial: Sri Lanka's judiciary consists of a Supreme Court – the highest and final superior court of record, a Court of Appeal, High Courts and a number of subordinate courts. The

Criminal law is almost entirely based on British law. Basic Civil law relates to the Roman law and Dutch law. The President appoints judges to the Supreme Court, the Court of Appeal, and the High Courts. A judicial service commission, composed of the Chief Justice and two Supreme Court judges, appoints, transfers, and dismisses lower court judges.

Administrative divisions

For administrative purposes, Sri Lanka is divided into 9 provinces and 25 districts. In 1987 under 13th Amendment to the 1978 Constitution of Sri Lanka, provincial councils were established to serve increasing demand for a decentralization of the Government of Sri Lanka.

The provincial council is an autonomous body and is not under any Ministry and it undertakes activities which had earlier been undertaken by the Central Government Ministries, Departments, Corporations and Statutory Authorities. But importantly, land and police authorities are not given to provincial councils in practice. Sri Lanka is also divided into 25 districts and each district is administered under a District Secretariat. The districts are further subdivided into 256 divisional secretariats and these in turn, to approximately 14,008 Grama Niladhari divisions.

There are 3 other types of local authorities: Municipal Councils (18), Urban councils (13) and Pradeshiya Sabha.

Economy

According to the International Monetary Fund, Sri Lanka has a yearly gross domestic output of US$59 billion as of 2010. It has a GDP of US$116 billion in terms of purchasing power parity and it recorded a GDP growth of 8.3% in 2011.

In the 19th and 20th centuries, Sri Lanka was famous for its production and export of cinnamon, rubber and Ceylon tea. In 1977 the free market economy was introduced to the country, incorporating privatization, deregulation and the promotion of private enterprise. While the production and export of tea, rubber, coffee, and agricultural commodities remains important, the nation has moved steadily towards an industrialized economy with the development of food processing, textiles, telecommunications and finance. At present main economic sectors of the country are tourism, tea export, clothing, and rice and other agricultural products. In addition to these economic sectors, overseas employment contributes highly in foreign exchange, most of them from the Middle East. As of 2010, the service sector makes up 60% of GDP, the industrial sector 28% and the agriculture sector 12%.

Demographics

Sri Lanka annual population growth rate is 0.73% and population density is highest in western Sri Lanka, especially in and around the capital. The largest ethnic group is Sinhalese with 74.88% of the total population and Sri Lankan Tamils are the second major ethnic group in the island, with a percentage of 11.2. Sri Lankan Moors comprise 9.2%. There are also small ethnic groups such as the Burghers (of mixed European descent) and Austronesian peoples from Southeast Asia. Moreover, there is a small population of Vedda people who are believed to be the original indigenous group to inhabit the island.

Sinhalese and Tamil are the two official languages of Sri Lanka and the Constitution defines English as the link language. English is widely used for education, scientific and commercial purposes. Sri Lanka is also a multi-religious country. Buddhism constitutes the religious faith of about 70% of the population of the island, most of whom follow the Theravada school of Buddhism. Buddhism was introduced to Sri Lanka in the 2nd century BCE by Venerable Mahinda. Buddhism is given special recognition in the Constitution which requires Sri

Lankan to "protect and foster the Buddha Sasana". Hinduism is the second most prevalent religion in Sri Lanka and Islam is the third most dominant religion in the country, having first been brought to the island by Arab traders. Christianity was also brought into the country by Western colonists in the early 16th century. Around 8% of the Sri Lankan population are Christians.

Education

Sri Lanka has one of the most literate populations amongst developing nations with a literacy rate of 92.5%. Its youth literacy rate stands at 98%, computer literacy rate at 35%, and primary school enrolment rate at over 99%. An education system which dictates 9 years of compulsory schooling for every child is in place. The free education system established in 1945, and is one of the few countries in the world that provide universal free education from primary to tertiary stage.

National Schools are controlled directly by the Ministry of Education and the provincial schools by the provincial government. Sri Lanka has approximately 9675 government schools, 817 private schools and Pirivenas. The number of public universities in Sri Lanka is 15, however, lack of responsiveness of the education system to labour market requirements, disparities in access to quality education, lack of an effective linkage between secondary and tertiary education remain major challenges for the education sector. A number of private, degree awarding institutions have emerged in recent times to fill in these gaps.

STATISTICAL DATA

		Year	Source
Mid-year population	20,653	2010	Annual report 2011
('000 persons)	20,869	2011	Central Bank of Sri Lanka
Real Output			
GNP	7.9	2010	
	8.4	2011	Annual report 2011
GDP	8.0	2010	Central Bank of Sri Lanka
	8.3	2011	
Public Health			
Hospital beds per 1,000 persons	3.3	2011	
Persons per Doctor (number)	1,274	2011	Annual report 2011
Nurses per 10,000 persons	13.9	2011	Central Bank of Sri Lanka
Government expenditure on health (per cent of GDP)	1.4	2011	
Number of Pharmaceutical Manufactures / manufacturing sites			
Large Scale	8	2012	Ministry of Health
Small Scale	21	2012	CDDA (refer Annexure I)
Number of traditional medicine manufactures / manufacturing sites	98	2009	
Number of pharmaceutical Importers	228	2011	CDDA
Number of pharmaceutical wholesalers	771	2011	CDDA

HISTORICAL DEVELOPMENT OF PHARMACEUTICAL SERVICES

The history of medicine in Sri Lanka has been reported over the centuries and it is unique to the country. The traditional system is referred as Ayurvedic medicine and it has much influence from India. In this system, decoctions are prepared by boiling 10 – 15 varieties of plants materials, apart from that some animal extracts as well as mineral products such as gold, mercury etc. were also used in treatment. The literature on this medical system is written in Sanskrit and it has been widely practiced in Sri Lanka for more than 2000 years.

The modern medicine was introduced to the country by British about 150 years ago, and the early phase of British medicine belonged to the military that controlled both the military and civil health institutions. A new phase was started with creation of separate Civil Medical Department in 1858, by which medical facilities were provided to the civilian by a department free of military control. The British were very much concerned about the health of the local population and as a result, the consumption of imported modern drugs was swiftly increased.

"Pharmacopoeia of Ceylon Hospitals" was established in 1876 of its first edition under authority of civil medical department. There were 10 later editions, and the 10^{th} was published in 1951. In this publication, all drugs were classified according to the basic nature and then available in hospitals.

Before 1950's, the Ministry of Health imported all the drugs to fulfill the public demand of the country, however in 1957, a committee was appointed to solve the problems in supply of health services in the country. As a result of this, "The Ceylon Hospital Formulary 1959" was developed and it was a powerful tool for the control of pharmaceuticals in the entire country at that moment.

In 1963, government published a gazette notification illustrating a list of approved drugs, and thereafter, import and manufacture of drugs by the private sector was restricted to only approve drugs.

The government which came into power in 1970, appointed a committee to formulate a national plan on pharmaceuticals. Today, this committee is known as Bibile Wickramasinghe Committee and as a result of this State Pharmaceuticals Corporation was established in 1971 and it became that sole importer of all the drugs imported into the country. The price of the drugs was controlled by the regulations imposed under the control of price act.

With the changes of the government in 1977, economy was liberalized and price control on drugs was removed, and the private sector was also allowed to import drugs into the country. These changers resulted in wider availability and also wider variety of drugs. With these changes a new set of regulation was enacted to protect the consumers and to regulate the supply of pharmaceuticals.

1) Introducing of the cosmetic devices and drugs act number 27 of 1980 and regulations under the act of 1985
2) Development of essential drug list (1980 to 1988)
3) Establishment of State Pharmaceuticals Manufacturing Corporation (SPMC) in 1987
4) Development of standard treatment schedule in 1987
5) Publication of manual on Management of Drugs
6) Price control of drugs in 1989
7) Establishment of new drug quality assurance laboratory in 1990
8) Monitoring of all drug advertisements in 1992

Sri Lanka had a partly written Drug Policy from the 1960s; however there was no comprehensive document developed. Therefore, an attempt to develop a National Medicinal

Drug Policy (NMDP) has been started in 1991 & 1996; while the documents were accepted by the Ministry of Health, they did not reach the final step of cabinet approval. The present effort building upon previous efforts brings together the elements of a National Medicinal Drug Policy (NMDP) in one document and has been developed based on WHO documents through discussion with all stakeholders.

The objectives of the Sri Lankan National Medicinal Drug Policy (NMDP) are;

1) To ensure the availability and affordability of efficacious, safe and good quality medicines relevant to the health care needs of the people in a sustainable and equitable manner.
2) To promote the rational use of medicines by healthcare professionals and consumers.
3) To promote local manufacture of Essential Medicines.

In this policy making, it has been consider the overall health policy of the country, concept of Essential Medicines, focusing on the health sector coordinating with relevant areas such as education, finance, agriculture, animal husbandry, pharmaceutical industry and trade and also consider the safeguard of patients / consumer rights. An NMDP will be covered all systems of medicine including allopathic, homeopathy, ayurveda, sidda, unani and any other systems recognized in the country. It was suggested to cover the following elements;

1. Selection of essential medicines
2. Affordability and Equitable Access
3. Financing options
4. Supply systems and Donations
5. Regulation and quality assurance
6. Quality Use of Medicines
7. Research

8. Human resources
9. Viable Local Pharmaceutical Industry
10. Monitoring and evaluation

Currently the Health Ministry of Sri Lanka is progressing with development of Health Master Plan (HMP) to solve past challenges in the entire health service. These challenges include: changing demographic and disease patterns, limited resources, increased demand and expectations by the public, the need for equity and the development of a management ethos that ensures good governance and value for money in delivering quality services.

The HMP will be carefully designed to support Sri Lanka's overall economic and social goals. It aims to facilitate equity through ease of access to health services, improve productivity and ensure that resources allocated to health result in a healthier population that is able to contribute to the economic and social well-being of the country. This is to be achieved by responding to the people's needs and working in partnership to ensure access to comprehensive, high-quality, equitable, cost-effective and sustainable health services. The overarching aim of improving health status and reducing inequalities will be achieved by the five strategies, namely:

1. To ensure the delivery of comprehensive health services, which reduce the disease, burden and promote health;
2. To empower communities (including households) towards more active participation in maintaining their health;
3. To improve the management of human resources for health;
4. To improve health financing, resource allocation and utilisation; and
5. To strengthen stewardship and management functions of the health system.

Sri Lanka provides free healthcare services to all the citizens irrespective of their status, income or geographic location, and has achieved remarkable health outcomes, particularly relative to neighboring countries with a similar income range. At the same time, there are certain drawbacks in the hospital-based healthcare delivery system which have affected the quality and efficiency of its services as demonstrated by overcrowding in the higher level institutions, deficiencies of amenities and patient dissatisfaction. The National Guidelines for Improvement of Quality and Safety of Healthcare Institutions provide a comprehensive set of quality and safety standards and affordable measures to improve the hospital services. All the hospitals in Sri Lanka are therefore expected to be fully oriented on these Guidelines and prepared to improve their service delivery structure and process. Japan International Cooperation Agency (JICA) has provided valuable technical assistance throughout this process development.

State Pharmaceutical Manufacturing Corporation (SPMC) was incorporated in June 1987 under the State Industrial Corporation Act no 49 of 1957 with the commitment to manufacture quality, effective and safe medicinal drugs at affordable price to public of Sri Lanka. SPMC has already completed 25 years of continuous service producing drugs of superior quality conforming to the highest international standards, and have achieved a formidable position in the field of pharmaceutical manufacture in Sri Lanka, with a gradual growth in pharmaceutical business. This has made possible through the advance technology provided by the Japanese Government by way of a grant to the Government of Sri Lanka. In the beginning, SPMC technical staff trained under the supervision of Japanese experts and JICA and JICWELS training programmes very much help to develop Good Manufacturing Practices (GMP) concept among the Sri Lankan Pharmaceutical manufacturers.

GMP SYSTEM

In Sri Lanka, both the public and private sector provide health care. The Department of Health Services (DHS) which comes under ministry of Health and provincial health sector encompass the entire range of preventive, curative and rehabilitative health care provision. Refer the organizational structure of Ministry of Health in Annexure II.

The Cosmetic, Devices and Drugs (CDD) Act No 27 of 1980 (as amended by Act No. 38of 1984, No 25 of 1987 and No. 12 of 1993) provides the legislative framework to control the use of cosmetics, medical devices and medicinal drugs in the country. This act controls the registration, manufacture, importation, transportation, sale (retail and wholesale), labelling, advertising, distribution of drugs, testing and disposal of outdated or spoilt drugs.

The Director General of Health Services (DGHS) is the head of the Cosmetic, Devices and Drugs Authority and a Technical Advisory Committee (TAC) has been operated under this Act to advise the Hon. Minister of Health on matters pertaining to the implementation of the Act. There are four Sub Committees set up by TAC to implement the CDD Act, namely;

1) Drugs Evaluation Sub-Committee (DESC) to review and make recommendation on drugs submitted for registration,
2) Cosmetics Evaluation Sub-Committee to review and make recommendation on cosmetics submitted for registration,
3) Devices Evaluation Sub-Committee to review and make recommendation on devices submitted for registration,
4) Advertisement Sub-Committee (DESC) to screen advertisements of drugs and to make recommendation on the information given in the advertisements.

To implement the CDD Act and the regulations therein, Hon. Minister of Health has appointed authorized officers from flowing categories;

Provisional Directors and Regional Directors of Health Services

Medical Offices of Health

Divisional Pharmacists

Food & Drug Inspectors

Public Health Inspectors

To support implementation of these activities, an organizational framework exists within the Ministry of Health that comprises of the followings;

a) CDDA (Office of D/MT&S) for registration of drugs.

b) The Medical Supplies Division at the central level for estimation, storage, distribution and monitoring of drugs.

c) National Drug Quality Assurance Laboratory (NDQAL) for quality assurance of drugs.

d) The State Pharmaceuticals Corporation (SPC) for procurement

e) Regional Medical Supplies Divisions (RMSD) at regional level (26 in number) for storage and distribution for provincial council institutions.

f) A drug store in each health care institution.

Organizational structure of drug management of Sri Lanka is elaborated in the Annexure III.

WHO Good Manufacturing Practices (GMP) have been adopted to ensure the quality assurance of products controlled to the quality standards appropriate to their intended use. GMP covers all aspects of the manufacturing process: defined manufacturing process; validated critical manufacturing steps; suitable premises, storage, transport; qualified and trained production and quality control personnel; adequate laboratory facilities; approved written procedures and instructions; records to show all steps of defined procedures have

been taken; full traceability of a product through batch records and distribution records; and systems for recall and investigation of complaints. Under Director- Medical Technology and Supplies there are four food and drug inspectors to carry out inspection of GMP further to them there are trained regulatory pharmacists who have undergone overseas training on GMP auditing and inspection (refer Annexure IV). They carry out field inspection and documentary inspection in once a year.

In Sri Lanka there is no official designation as a GMP Inspector. Generally GMP inspection team will compromise of a Pharmacists, drug inspectors and doctors. They conduct on the job training for fellow pharmacists and Drug inspectors. Basic required qualification for the post of pharmacist is GCE Advanced level and registration as a pharmacist. Drug inspector is a promotional grade for public health inspectors.

Since the manufacturing of pharmaceutical products is not well developed in Sri Lanka, country requirement of many products namely; injectable solutions, tablets and capsules and other preparations are imported through State Pharmaceuticals Corporation (SPC). Only few number of products in the category of tablets and capsules are formulated strictly control GMP environment at State Pharmaceuticals Manufacturing Corporation (SPMC). Apart from that there are very few private manufactures in the country that produce tablets, capsules and oral solutions. Refer annexure V for the list of domestically manufactured products.

Essential Medicines are selected with due regards to clinical needs and disease prevalence, together with evidence on efficacy and safety, and comprehensive cost effectiveness. To develop this list of medicines, it has been followed the WHO Model list of essential medicines and modified in according to the Sri Lankan population.

There are twenty eight categories of medicines listed under essential medicines and it is available http://www.cdda.gov.lk/images/stories/new/pdf/EML_2009.pdf for references.

Approximately 9000 drug products are registered and out of that 80% are imported drugs and only other 20% manufacture in locally (refer Annexure VI for DHS annual requirement).

Quality assurance of drugs is the total sum of the organized activates performed with the object of ensuring that pharmaceutical products are of required quality for their intended use.

The principal institutions responsible for examining recalled products are; Office of Director Medical Technology & Supplies (D/MT&S) and National Drug Quality Assurance Laboratory (NDQAL). The primary function of the NDQAL is to conduct laboratory tests necessary for determining compliance with product safety and quality requirements. Quality testing of drug products is carried out on samples collected on random basis at different points of the distribution; namely at pre-marketing and post marketing stages, and issue reports/recommendations based on the analyses/evaluations. There are about fifteen persons in charge of testing at NDQAL.

There are 51 reported cases of drug recalls up to August in 2012 according to CDDA web site (Annexure VII) and 04 drug recalls in December 2011. As the computerisation of CDDA data is still in progress it is hard to trace the history in this regard.

Medical supplies division (MSD) provides Pharmaceuticals including Narcotics & Radioactive items, Surgical dressings, Surgical Consumables & Non consumables, Laboratory items including Chemicals, Devises & Glass ware & Medical gasses to government health Institutions Island wide. State Pharmaceutical Corporation (SPC) is the procurement agent for MSD and in addition MSD has its own supply branch for emergency local purchases for selected items. These Medical items are distributed directly to line Ministry institutions & to institution under provincial council administration through Regional Medical Supplies Divisions (RMSD) based on their annual estimates or on the requests of these institutions. Items are distributed directly to 26 RMSD and major hospitals and healthcare institutions administered by Central Government. These 26 Regional Medical

Supplies Divisions (RMSD) are responsible for the supplying medical items to General Hospitals, base hospitals, District Hospitals, Peripheral Units, Rural Hospitals, Central Dispensaries, Maternity Homes & Central Dispensaries and other small Hospitals under the purview of Provincial Councils.

DIFICULTIES AND CONSTRAINS IN QULAITY ASSURENCE OF ESSENTIAL MEDICINES

a) mainly SPMC as a government organization undertake formulation of few number of essential drugs, there is resrictions to procure qulaity starting materials due to governmet procument procedure.

b) high value of refernce standards and there is no facility to procure those items directly by the NDQAL. Thereofere, many reference standards needed for quality checking are not availble in the NDQAL at the required time.

c) lack of trained staff of inspectors, regulatory pharmacists to implement, regular monitoring of drug quality assurance procedure and GMP.

d) The first step of drug registration procedure is the evaluation of the manufacturer for compliance to Good Manufacturing Practices (GMP) standards. Applications for registration of drugs are accepted only if the production facilities of the relevant manufacturer conform to required standards of GMP. Evaluation of foreign manufactures is done by evaluating their company profiles while local manufactures are inspected by a team of officers attached to the Office of MT&S and the National Drug Quality Assurance Laboratory (NDQAL) for GMP compliance. Every foreign manufacture has to appoint an agent in Sri Lanka who is responsible for registration and other activities related to their products in Sri Lanka.

However, it has been identified the facility of foreign manufacture must be inspected prior to register their products and already action taken to implement by the D/MT&S.

e) In Sri Lanka Pharmacy degree programme was started very recently in year 2000. Even though there are several batches of graduate pharmacist who have passed out still there is no significant contribution by them in the government health sector.

d) lack of trained staff for maintenance of laboratory instruments.

f) there is no carder positions for Graduate Pharmacists in Government sector.

CURRENT SITUATION OF SUBSTANDARD MEDICINES

The PDHSS, RDHSS and Head of Institutions are responsible for destroying stocks according to the WHO guidelines after receiving circulars for withdrawals from the D/MSD.

OVERVIEW OF RELATIONSHIP WITH OVERSEAS ASSISTANCE ORGANIZATIONS

WHO Collaborated Activities of Human resource training at Drug regulatory Authority (DRA);

Training for 2 senior staff.

Formation of a multi-stakeholder committee and developing a mechanism and guidelines for the regulation and monitoring of medicines prices.

Awareness programmes for pharmacies and pharmacy owners and Authorized officers Training of 2 DRA staff in pre and post marketing quality assurance of vaccines and biological products for 2 weeks in a regional country.

Consultative workshops to develop SOP’s on pre and post marketing surveillance of pharmaceutical products including vaccines and biologicals.

Promotion of rational use of medical products by strengthening the drug advertisement regulating unit of the DRA.

Apart from that Japanese government help to develop Sri Lankan pharmaceutical manufacturing industry by various way; for example SPMC was an outright gift of Japanese government and the organizations JICA and JICWELS had arranged many training programmes for technical staff of SPMC in the beginning. The Japanese government also grants their corporation to expand Medical research Institution, to establish nurses' training school and many other system developments.

Indian government occasionally offers two week training programme on Advanced Quality assessment of Drugs & Pharmaceuticals and there is very rare opportunity to complete master degree in pharmaceutics (Manufacturing Pharmacy) for two years under TICA programme with the collaboration of Thailand government.

However, there is very limited Technical Assistance Programs organized in the fields of Pharmaceuticals, GMP and Quality Control by the International Organizations may be due limited budgetary allocations. We believe as a developing country the Technical assistant progarmmes conducted by the international organization like WHO, JICA helped us to enhance knowledge by interacting people in developed counties and we very much appreciated this kind of assistance ships in future.

The Study Programme
for the Quality Management of Essential Medicines
- Good Manufacturing Practical (GMP) and Inspection -

Thailand

Country Report
Thailand

Study Programme on Quality Mangement of Essential Medicines – Good Manufacturing Practice (GMP)

Tokyo,Japan
4– 30 November 2012

Ministry of Public Health
Kingdom of Thailand

Index

Country Profile

1. Country

Location, Territory and Boundary

Thailand's territory, its shape like a conventionally hand-made ladle or an ancient axe, covers an area of approximately 514,000 square kilometers. Thailand is the third largest country among the ten Southeast Asian nations, ranking after Indonesia and Myanmar. Thailand's borders cover a distance of the about 8,031 kilometers, of which 5,326 kilometers are inland and 2,705 kilometers are coastlines.

North: the northernmost part of Thailand is in Mae Sai District, Chiang Rai Province, bordered by Myanmar and the Lao People's Democratic Republic.

South: the southernmost part is in Betong District, Yala Province, bordered by Malaysia and the Gulf of Thailand.

East: the easternmost part is in Phibun Mangsahan District, Ubon Ratchathani Province, bordered by the Lao People's Democratic Republic and the Kingdom of Cambodia.

West: the westernmost part is in Mae Sariang District, Mae Hongson Province, bordered by Myanmar, the Andaman Sea and the Strait of Malacca.

The whole Kingdom is in the same time Zone, seven hours ahead of the Greenwich Mean Time.

Population, Language and Religion

As of the Year 2008, the population of Thailand was approximately 63.21 million. The men population was approximately 31.18 million and the women population was approximately 31.13 million. About 95 percent of the citizens are Thais. The remainder include ethnic Chinese, Indians, and other ethnic minorities.

The official national language, spoken and written by almost 100 percent of the population, is Thai. However, English language is increasingly playing a greater crucial role, notably in the business sector.

Buddhism, the national religion, is the professed faith of 94.6 percent of the population. Islam is embraced by 4.6 percent of the Thai people while the rest of the population practice Christianity, Hinduism and other religions.

Culture and Arts

Thailand's classical arts have developed almost exclusively (and anonymously) in the service of theravada Buddhism. Accordingly, the best showcase is the wat, where traditional architecture, typified by sweeping, multi-tiered roofs, countless Buddha images and murals, and decorative arts, such as woodcarving, stucco relief, gilt, lacquer, colored glass mosaic and mother – of – pearl inlay, are all used to striking effect.

Education System

For education in a school-related system, it is provided by educational Institutions, characterized by a class system, and the use of curriculum specified for the level and type of education so as to develop learners in accordance with curriculum objective. In other hand, education from way-of-life learning process is self-learning from various sources of knowledge and environment related to ways of life naturally existing or modified to enhance and service learning.

Education in a school-related system is divided into four levels: pre-school education, primary education, secondary education and higher education.

Society and Politics

In spite of the pressures of change, Thai society is relatively stable. The Concept of the extended family is important in Thailand, as in other parts of Asia. Children live with their parents, often sleeping in the same room, until marriage. Elders are always accorded respect within families and in society. There are beautiful etiquette that Thais practice in their life, such as Wai (saluting by placing the hands palm against palm and raising them to the face) and approach their superior on

their knees. Thais are renowned for their tolerance of other cultures and friendliness to visitors. Offence is taken only if there is any perceived disrespect to the king or Buddhism.

The monkhood (sangha), some 250,000 strong, plays a crucial social role. Most teenage boys become monkhood properly later in life and may choose its austere precepts for life. Monks conduct numerous Buddhist rites, ranging from festivals to everyday blessings and other social events. In rural areas, they traditionally play an important role as school teachers, a profession that in Thailand is perhaps held higher in regard than anywhere else in the world.

There is no criticism of the king in Thailand's press. Constitutional since 1932, the monarchy is revered almost as much as when king were chakravatin, or "lords of life". In contrast, politicians are held in far less respect, and the Thai press makes no hesitation in criticizing the running of the country. The present monarch , King Bhumibol Adulyadej (Rama IX) is the longest – reining living monarch in the world, having ascended to the throne in 1946, and has won widespread respect for his devotion to welfare and environmental projects throughout Thailand.

Education information for Pharmacist in Thailand

a) System of education

Primary School	:	6 years system
Age at enrollment	:	7 years old
Secondary School	:	3 years system
High School	:	3 years system

b) System of university or college education

University or college years	:	5 years
Professional education	:	6 years
Practical training	:	12 weeks
Duration of training by each facility:		3 weeks
Hospital Pharmacy	:	3 weeks
Pharmacy	:	3 weeks
Pharmaceutical Company	:	3 weeks
Age at graduation	:	24 years old

c) National examination system for pharmacist in your country

Academic Exams	:	- days
Clinical Exams	:	- days
None	:	-

d) Requirement to obtain pharmacist's license (Please check)

/- Be a university or college graduate

/- Pass the national examination

- Conclude practical training after graduation

e) Graduates number of pharmaceutical university or college.

People per year (as of :)

f) Percentage of alumni's progressive (as of : 2001)

Hospital	46.6 %
Community Pharmacy	13.8 %
Government Organization	7.1 %
Enterprise	25.6 %
Others(Education sector)	6.9 %

2. Statistical data

a) Number of pharmaceutical manufacturers / manufacturing sites

Year	Number of modern pharmaceutical manufacturers
2012	169

b) Number of traditional medicine manufacturers / manufacturing sites

Year	Number of traditional medicine manufacturers
2012	1,122

c) Number of pharmaceutical importers

Year	Number of modern pharmaceutical importers	Number of traditional pharmaceutical importers	Number of pharmaceutical importers (sum)
2012	650	196	846

d) Number of pharmaceutical wholesalers

Year	Number of modern pharmaceutical salers/ Whole salers	Number of modern ready packed pharmaceutical salers/ Whole salers	Number of traditional pharmaceutical salers/ Whole salers	Number of veterinary pharmaceutical salers/ Whole salers	Number of pharmaceutical salers
2012	11,603	3,838	731	2,022	18,194

3. Historical Development of Pharmaceutical Services

A. History of the National Plan on Pharmaceutical Services

Before 1936, there was practically no control of drugs. The Sale of Drug Act B.E.2479 (1936) was the first legislative measure implemented in the field of drug control which dealt only with the sale practices regardless the formulas nor the ingredients. The control of drug was much improved following an enactment of the Sale of Drug Act B.E.2493 (1950). This law encompassed many more aspects of drug control other than the control of sale practices, for instance, production control and registration of pharmaceutical products. Standard requirements of drug quality were also included.

After endeavoring for several years in order to replace the existed law of B.E.2493(1950), the Drug Act B.E.2510 (1967) was promulgated. For almost three decades which this act has been employed, it brought in quite substantial improvement in all aspects of drug control. However, four subsequent additions were made in order to cope with the fast growing industry and present global situation and to a large extent to facilitate development in pharmaceutical services.

B. History of GMP in Thailand

The project of developing manufacturing standards in pharmaceutical industry is stipulated in the 6th National Economic and Social Development Plan (1987-1991) and the 7th plan (1992-1996). The aim of the project is to promote and support drug manufacturers for implementation of Good Manufacturing Practices. The current code of Thai Good Manufacturing Practices has been published in 1987 as a recommendation.

To encourage drug manufacturers for implementation of GMP, the Ministry of Public Health has stipulated in the purchase regulation that the government hospitals can purchase drug products

only from drug manufacturers comply with GMP since 1992. In addition, FDA has requested retail pharmacies to purchase drug products from drug manufacturers comply with GMP as well.

In 2003, GMP for modern pharmaceutical product has become to the law for the first time on March 2003. As the result every modern pharmaceutical manufacturers must comply with GMP. GMP code is developed in accordance with the WHO GMP 1992 guideline.

Thai FDA plans to become PIC/S membership by the year 2012. Both domestic manufacturers and public sector need preparations before becoming PIC/S member. For this matter, Thai FDA had informed and educated manufacturers since April 2005. In addition, Thai FDA has made an operation plan for 2005-2008 and extend the plan to 2012 regarding

- Preparation for inspection
- Capacity building
- Establishment of quality system
- Development of related regulations

In the year 2000, Thai Government was settle down to cope the economic problem so there was a project for supporting and developing product in communities called OTOP (One Tumbon One Product). This project encourage communes to produce the special products and services from their own local intelligence and raw materials. So there are many varieties of OTOP ie. food, beverages, handicraft including traditional medicine. In order to prepare for PIC/S membership the producers in the rural area should be assisted to comply with GMP standard by making step by step development. The Good Sanitation Practice for those products was performed

In October 2011, GMP code for modern pharmaceutical product s has be revised in accordance with the PIC/S guideline.

The GMP code for traditional pharmaceutical product s is during the process to the law. It hope to be the law in early 2012.

Thai FDA has strongly determined to develop and increase capacity of staffs to cope with changing environment of pharmaceutical industry to assure that people will have the access to good quality, safety and efficacy of drugs. The participation in many international co-operations such as Developing Countries Vaccine Regulators Network (DCVR), JICA, JICWELS KFDA, TGA and other co-operations or networks under World Health Organization all assist in improvement of our drug regulatory system and capacity building in evaluation of safety and efficacy of the products filed for market authorization.

4. GMP System

1) Organization Chart

Pharmaceutical affairs administration

1.1) Administration organization chart

The Administration of Ministry of Public Health have been divided into two parts that are The Central Administration and The Provincial Administration.

1.1.1)The central administration

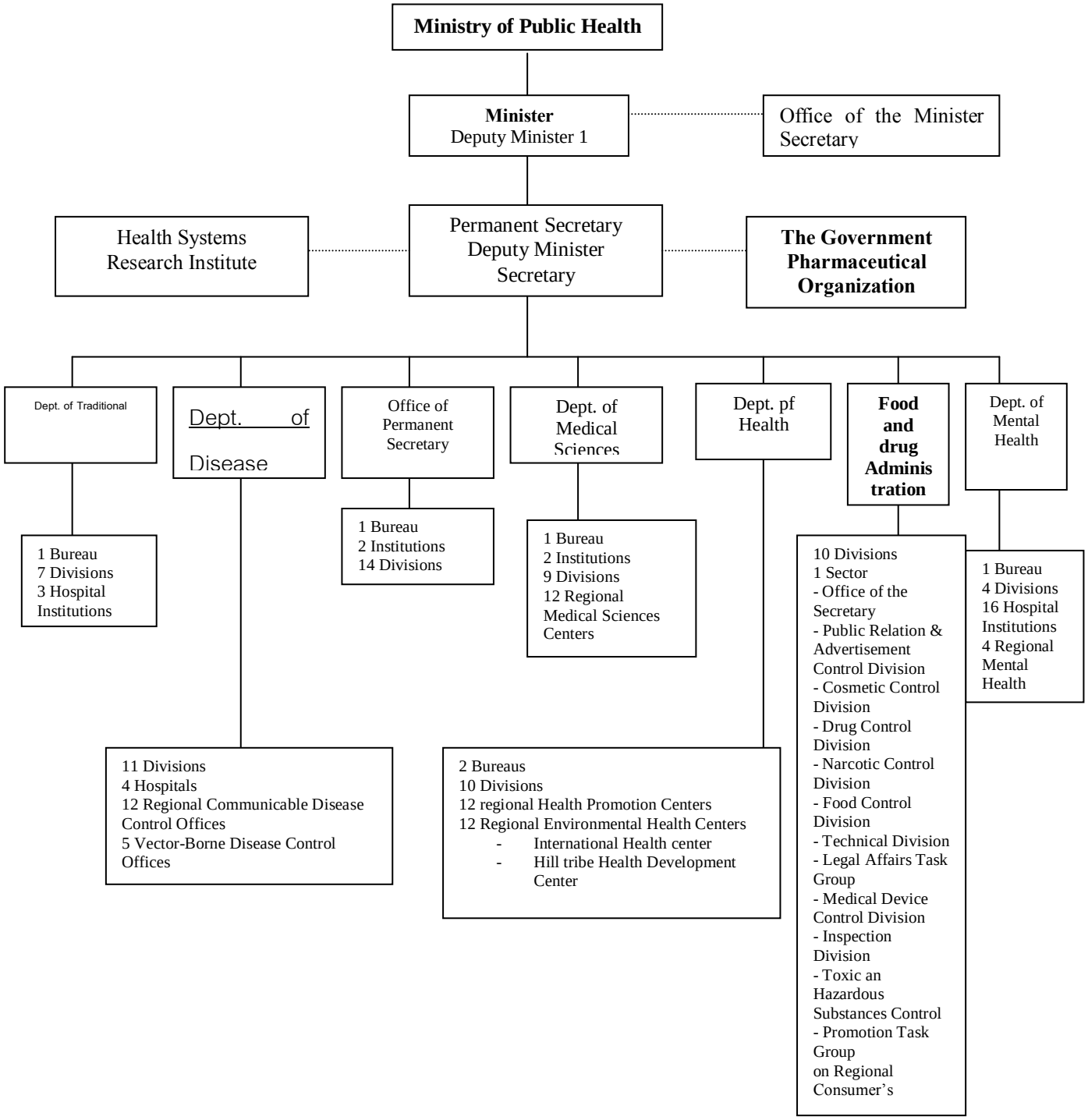
The Central Administration of Ministry of Public Health comprises of the Office of the Permanent Secretary for Public Health, the Office of the Secretary to the Minister and six departments and the Food and Drug Administration.

In addition there are two more organizations under the supervision of the Ministry. One is the Government Pharmaceutical Organization (GPO) which is the state enterprise, the other is Health Systems Research Institute (HRSI) which is autonomous agency.

1.1.2) The provincial administration

Systems Research The Provincial Administration of Ministry of Public Health comprises of Provincial Public Health Offices, District Public Health Offices and Health Centers respectively.

ADMINISTRATION ORGANIZATION CHART



The Ministry of Public Health (MOPH)

According to the Ministry and Department Reorganization Act of B.E.2534 (1991), The MOPH has authority and functions related to medical care, public health, health promotion and development, food and drug control, anything toxic or hazardous to the public health, and the Red Cross supervision and support.

The major functions of the Ministry of Public Health include the promotion, support, control and coordination of all activities related to physical and mental health including well-being of the people, and the provision of health services with four principal objectives as follows:

- To make the Thai people healthy physically and mentally, and live happily in society.
- To make the Thai people free of illnesses that will cause suffering, labour loss or physical disability (by providing services related to disease prevention, early diagnosis, prompt treatment, disability limitation, and rehabilitation).
- To make the Thai people have a long life expectancy, without any premature death.
- To protect Thai people's well-being from misfortunes (environmental pollution, food or drug poisoning, etc.).

Food and Drug Administration (FDA)

The main function of FDA is quality and standard control of manufacturing, imports and distribution of food, drugs, cosmetics, hazardous substances, psychoactive substances, narcotics, medical equipment, and volatile substances. FDA's operations include business licensing for operation and use of products or active ingredients in production, in accordance with eight Acts, and six international conventions and agreements.

The Government Pharmaceutical Organization (GPO)

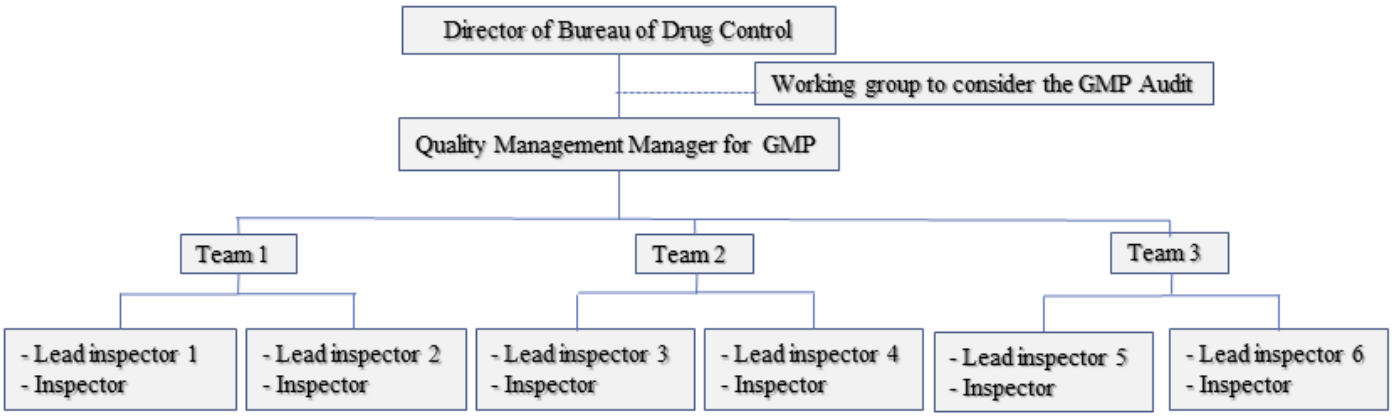
GPO is a state enterprise established in 1966 under the Minister of Public Health whose primary mission is - produce pharmaceutical products and medical supplies that contribute to the public health in Thailand.

- Research and development on drugs including raw materials for production.
- Control the quality of pharmaceutical products.
- Drug price balancing.

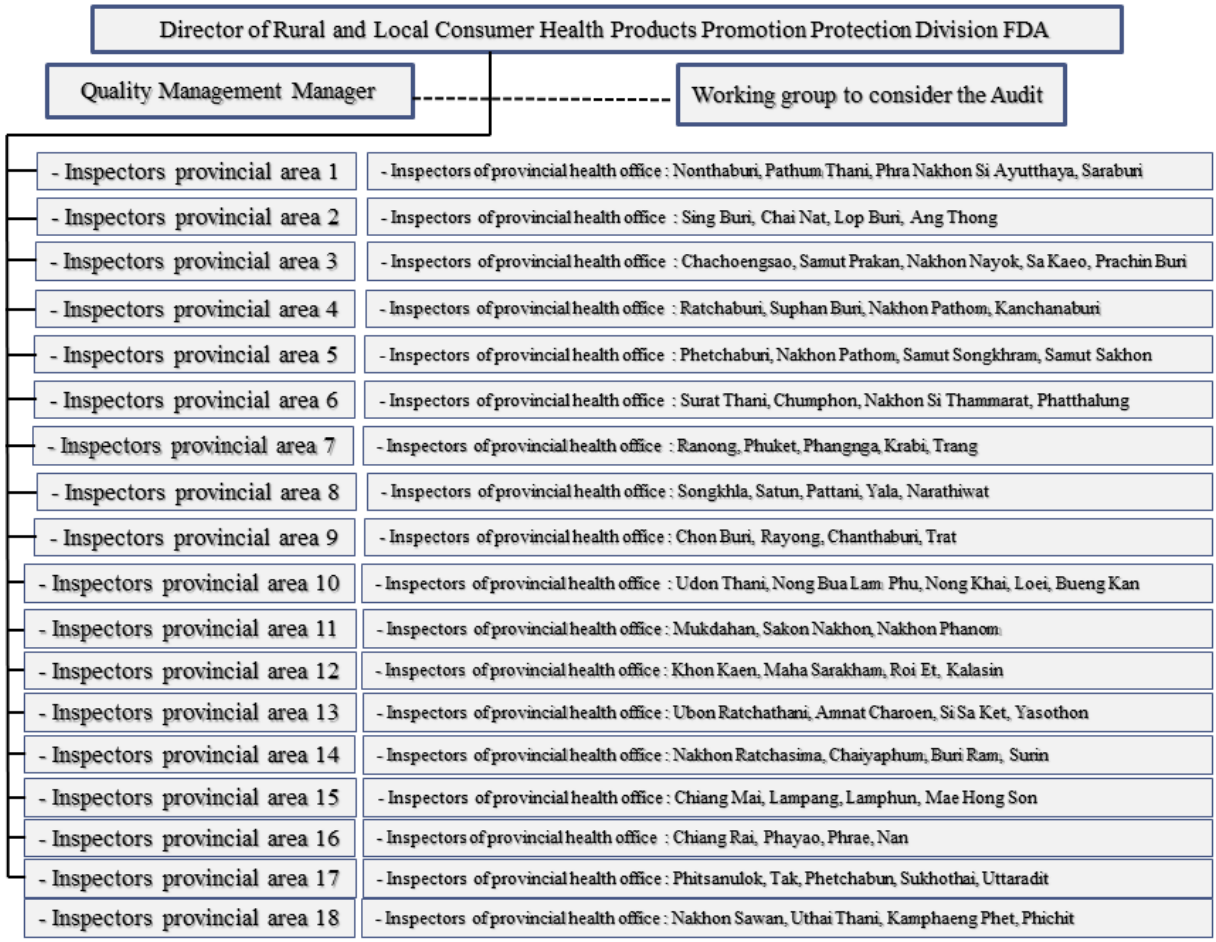
GPO manufactures and distributes pharmaceutical products and medical supplies more than 300 items. GPO has about 2,300 staffs, thereof 440 pharmacists and scientists.

GPO Products 1.Biological product
2.Injection
3.Oral preparation : tablet, capsule, liquid preparation
4.External preparation : ointment & cream, liquid preparation for external use
5.Antiretroviral drugs
6.Natural products & cosmetic
7.Chemical and others
8.Household remedy

GPO has been asked by the Thai Ministry of Public Health and consequently by Thai FDA to become the lead model for the Thai pharmaceutical industry in regards to PIC/S GMP compliance.


Director of Bureau of Drug Control
Working group to consider the GMP Audit
Quality Management Manager for GMP
Team 1
Team 2
Team 3
- Lead inspector 1
- Inspector
- Lead inspector 2
- Inspector
- Lead inspector 3
- Inspector
- Lead inspector 4
- Inspector
- Lead inspector 5
- Inspector
- Lead inspector 6
- Inspector

future.


Director of Rural and Local Consumer Health Products Promotion Protection Division FDA
Quality Management Manager
Working group to consider the Audit
- Inspectors provincial area 1
- Inspectors of provincial health office : Nonthaburi, Pathum Thani, Phra Nakhon Si Ayutthaya, Saraburi
- Inspectors provincial area 2
- Inspectors of provincial health office : Sing Buri, Chai Nat, Lop Buri, Ang Thong
- Inspectors provincial area 3
- Inspectors of provincial health office : Chachoengsao, Samut Prakan, Nakhon Nayok, Sa Kaeo, Prachin Buri
- Inspectors provincial area 4
- Inspectors of provincial health office : Ratchaburi, Suphan Buri, Nakhon Pathom, Kanchanaburi
- Inspectors provincial area 5
- Inspectors of provincial health office : Phetchaburi, Nakhon Pathom, Samut Songkhram, Samut Sakhon
- Inspectors provincial area 6
- Inspectors of provincial health office : Surat Thani, Chumphon, Nakhon Si Thammarat, Phatthalung
- Inspectors provincial area 7
- Inspectors of provincial health office : Ranong, Phuket, Phangnga, Krabi, Trang
- Inspectors provincial area 8
- Inspectors of provincial health office : Songkhla, Satun, Pattani, Yala, Narathiwat
- Inspectors provincial area 9
- Inspectors of provincial health office : Chon Buri, Rayong, Chanthaburi, Trat
- Inspectors provincial area 10
- Inspectors of provincial health office : Udon Thani, Nong Bua Lam Phu, Nong Khai, Loei, Bueng Kan
- Inspectors provincial area 11
- Inspectors of provincial health office : Mukdahan, Sakon Nakhon, Nakhon Phanom
- Inspectors provincial area 12
- Inspectors of provincial health office : Khon Kaen, Maha Sarakham, Roi Et, Kalasin
- Inspectors provincial area 13
- Inspectors of provincial health office : Ubon Ratchathani, Amnat Charoen, Si Sa Ket, Yasothon
- Inspectors provincial area 14
- Inspectors of provincial health office : Nakhon Ratchasima, Chaiyaphum, Buri Ram, Surin
- Inspectors provincial area 15
- Inspectors of provincial health office : Chiang Mai, Lampang, Lamphun, Mae Hong Son
- Inspectors provincial area 16
- Inspectors of provincial health office : Chiang Rai, Phayao, Phrae, Nan
- Inspectors provincial area 17
- Inspectors of provincial health office : Phitsanulok, Tak, Phetchabun, Sukhothai, Uttaradit
- Inspectors provincial area 18
- Inspectors of provincial health office : Nakhon Sawan, Uthai Thani, Kamphaeng Phet, Phichit

2) Legal and institutional position of GMP in Thailand, GMP guideline

The Thai modern medicine GMP code is under Ministerial Regulation describe the method of the production on modern medicines Issued : B.E. 2554 (2011). There are 528 compulsory topics in the code which are detail in Notification of the Ministry of Public Health about the rules and procedures in the production of modern medicine. Issued : B.E. 2554. (2011). For new modern pharmaceutical manufacturers in Thailand, full implementation was accomplished in October 2011. For Old modern pharmaceutical manufacturers in Thailand full implementation will accomplish in October 2012 (one-years transition period).

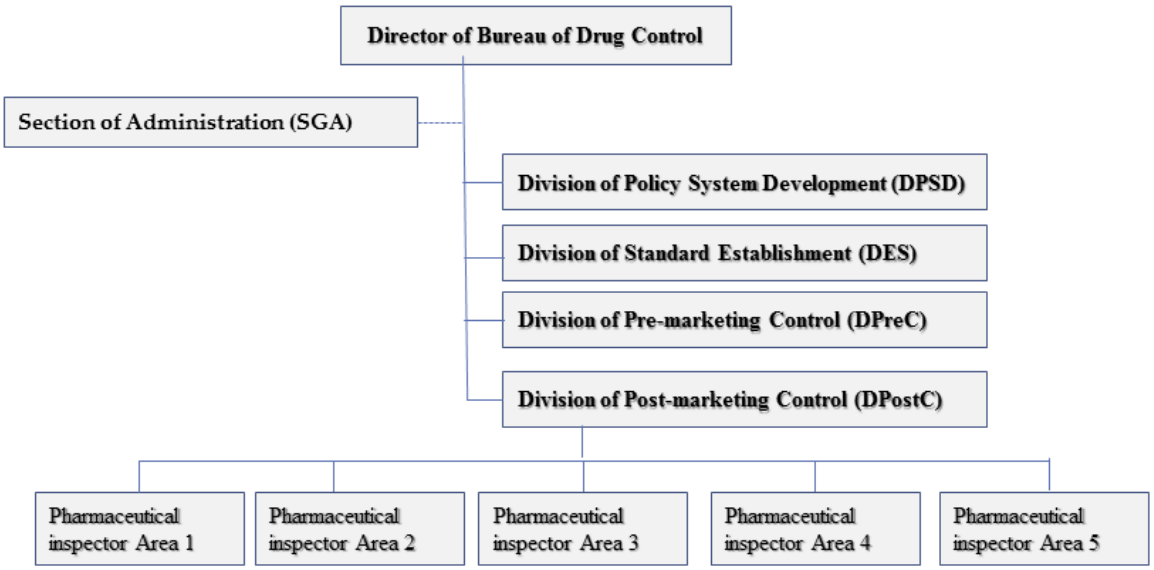
The GMP code for traditional pharmaceutical product s is during the process to the law. It hope to be the law in early 2012.

3) Inspection of pharmaceutical affairs, Organization of Inspection division, Number of inspectors (central government/local government, their role)

Since the Thai inspection division of FDA was promoted to Bureau of Import and Export Inspection. The responsibilities of the officers are mainly in the area of health products import and export surveillance, inspection and recall the substandard product. There are 47 ports of entry.

After establishment of Bureau of Import and Export Inspection, the main mission for pharmaceutical consumer protection in the area of post marketing system in the country was transferred to Division of Post-marketing Control (DPostC) or Inspectorate Unit under Bureau of Drug Control, Thai FDA. Now, the Inspection of pharmaceutical affairs in Bangkok is performing by DPostC which has around 24 inspectors. The Inspection of pharmaceutical affairs in 76 provincial areas is performing by health office of each province. There are around 2-6 pharmaceutical inspectors for each provincial health office. The Rural and Local Consumer Health Products Promotion Protection Division of Thai FDA is perform as health products regulation consultancies in order to support technical information and coordinate activities of consumer protection with provincial area. There are around 42 pharmaceutical inspectors for this Division. So, there are around 370 postmarketing pharmaceutical inspectors in Thailand. The role activities of inspectors on pharmaceutical area are conforming to related pharmaceutical regulation such as Drug Act, B.E. 2010. They inspect pharmaceutical premises, collect the samples for surveillance every year. When customer complain to FDA or provincial health office or any sigh of illegal activities occur the inspectors will perform action such as collect illegal evident, seize the illegal pharmaceutical products e.g. smuggling drug, counterfeit drug, substandard drug, unregistered drug in collaborate with policemen. When any pharmaceutical product is approved to be substandard, the inspectors will also order the stake holder to perform recall action

In the central or Bangkok, the pharmaceutical inspectors of Bureau of Drug Control are both perform as pharmaceutical inspectors and GMP auditors. The organization of DPostC for pharmaceutical post marketing surveillance is overlap with GMP as the picture show below :



4) Scope of pharmaceutical products under GMP inspection.

From SOP-S-D3-103 declare the scope of modern medicinal GMP audit in dosage forms below

1. STERILE PRODUCTS
   - 1.1 LARGE VOLUME LIQUID DOSAGE FORMS
   - ASEPTICALLY PREPARED
   - TERMINALLY STERILISED
   - 1.2. SMALL VOLUME LIQUID DOSAGE FORMS
   - ASEPTICALLY PREPARED
   - TERMINALLY STERILISED
   - 1.3 SEMI-SOLID DOSAGE FORMS
   - 1.4. POWDERS
2. NON-STERILE PRODUCTS
   - 2.1. POWDERS
   - 2.2. TABLETS
   - 2.3. CAPSULES
   - 2.4. LIQUID DOSAGE FORMS
   - 2.5. SEMI-SOLID DOSAGE FORMS
   - 2.6. SUPPOSITORIES
   - 2.7. INHALERS
   - 2.8. MEDICATED PLASTERS
3. BIOLOGICAL PRODUCTS
   - 3.1. VACCINES
   - 3.2. SERA
   - 3.3. BLOOD PRODUCTS
   - 3.4. OTHERS describe: e.g. HORMONES, ENZYMES OF HUMAN OR ANIMAL ORIGIN, GENETICALLY ENGINEERED PRODUCTS
4. PACKAGING ONLY
   - 4.1. LIQUID DOSAGE FORMS
   - 4.2.SEMI-SOLID DOSAGE FORMS
   - 4.3. SOLID DOSAGE FORMS

The dosage form other than all above products such as special group of drug which high risk e.g.: Penicillin products, Cephalosporin products, Sex hormones, Anti-cancer products, the special inspection will be performed case by case and in the certificate will show the status of each manufacturer for special group of drug.

5)Frequency of GMP Inspection

Since the frequency GMP audit adjustment of some E.U. country such as England. Thailand has revised SOP P-D3-102, GMP inspection procedure, in the area of frequency of GMP inspection since January 2011. For High risk group such as sterile products, Biological products, Blood products, Penicillin products, Cephalosporin products, Sex hormones, Anti-cancer products the inspection will perform every 18 months. For low risk products such as non-sterile products, the inspection will perform every 36 months.

6)Method(s) of GMP Inspection

Thai FDA monitors the quality assurance programme of pharmaceutical products in the market by collaboration with Department of Medical Sciences (DMS c). The results of analysis from DMS c would be compiled and the recommendation would be made for the authorities to take over some actions in order to correct the existed deficiencies. There are 4 types of inspection programme : regular inspection (planned), follow-up inspection, abbreviated inspection, suspected or petition inspection.

The details of inspection method(s) are perform step by step as follow:

- Make yearly plan for GMP inspection by using Risk based assessment
- Select Lead Inspector for each manuacturer and select Inspector for each team
- Select Special Inspector (if needed.)
- Read site Master File (updated)
- Read the last inspection report or any other cases of the manufacture report (e.g. product quality problems)
- Prepared Inspection schedule by Lead Inspector
- Prepared for necessary documents such as
  - : Aide-memoire
  - : Inspection Note
  - : GMP Inspection record

: List of manufacturing dosage forms

: Name list record of persons who attend to opening and closing meeting.

Inspection Steps

- Opening Meeting by lead inspector , introduce GMP inspectors , watch presentation from manufacture (briefly)
- On site inspection e.g. Production area , Laboratory, Water production area , HVAC system , Warehouse, Water treatment area.
- Break for lunch (1 hour)
- Continued inspection on documentation and other system such as risk management, validation master plan, trend analysis, change control. computerized system, training, self inspection ect.
- Discussion between inspectors
- Classify Critical , Major , Minor defects
- Closing Meeting
- Do formal report within 30 working days.
- Send inspection letter include Critical , Major , Minor Defects to manufacture
- Manufacture do CAPA for Critical and Major Defect and send CAPA plan to TFDA.
- Lead Inspector and QSM accept CAPA
- Approved CAPA by QSM .

In case of different opinion for CAPA between lead inspector and QSM, have to discuss in the GMP committee .

If the ex-major defects still occur after manufacturer sent CAPA to FDA in the last inspection , this defects will bring to working group for GMP audit for discussion then inform manufacturer if against regulation.

Types of inspections :

- Routine inspection
- Follow-up inspection
- Concise inspection
- Special inspection

1 Routine Inspection

A routine inspection is a full review of all aspects and components of GMP within a facility. The inspector should also be aware of the licensing provision. Routine inspections may be announced or unannounced, depending on the history of the company, previous inspections and the policy of the country. It is appropriate to perform a routine inspection under the following circumstances:

- When there is an application for a new manufacturing license for a newly established manufacturer
- When a manufacturing license is due for renewal.
- If there have been significant changes such as new products or new product lines, modification to manufacturing methods or processes, or changes in key personnel, premises, and or equipment.
- If the company has an history of non-compliance with GMP.

2 Follow-up Inspection

A follow-up inspection is also referred to as a re-inspection or a re-assessment of the manufacturer. A follow-up inspection is performed specifically to monitor the result of corrective actions of the manufacturer following a previous inspection. The manufacturer would not necessarily know in advance about the follow-up inspection. Depending on the nature of the defects and the work required, the follow-up inspection could be carried out between 6 weeks and 6 months after the original inspection had taken place.

The inspection is limited to specific GMP requirements that have not been observed or that have been inadequately implemented by the manufacturer.

3 Concise Inspection

A concise inspection is the evaluation of limited aspects relating to GMP compliance within a facility. (It is known as an abbreviated inspection in some countries.) A limited number of GMP requirements are selected by the inspector to serve as indicators of overall GMP compliance by the manufacturer. The inspector also has to identify and evaluate any significant changes that could have been introduced by the manufacturer since the last inspection.

Collectively, the selected indicators and identified changes indicate the manufacturer's attitude towards GMP.

Depending on national practice, a company would normally not be warned in advance about a concise inspection.

A concise inspection is applicable under the following circumstances:

- Where a manufacturer has a consistent record of GMP compliance through routine inspections in the past.
- Where a sample of aspects can be taken as a good indication of the overall level of GMP compliance.

However, if the concise inspection uncovers evidence that the level of GMP compliance has fallen, a more comprehensive or full GMP inspection should then be performed soon after the concise inspection.

4 Special Inspection e.g. after receiving a complaint, etc

There are a number of circumstances in which special visits or inspections may be necessary. A special inspection is undertaken to do spot checks. Spot checks could focus on one product, a group of related products, or specific operations e.g. mixing, or labeling.

The manufacturer may or may not be aware in advance of the inspection, depending on the reason for it.

If there have been complaints about a specific product that suggest there may be defects, then a special inspection could be performed to investigate the quality defects of the product. It is unlikely that the company would be warned in advance in this case.

If there has been a product recall, this can also trigger an inspection, as would adverse drug reactions.

In the above cases, the inspection would focus on the specific product or aspect of production that is suspect.

An application for a marketing authorization or an export certificate may also trigger such an inspection.

A special inspection could also be performed to gather specific information, or to investigate specific operations of the manufacturer. In some cases, this opportunity is used to advise the manufacturer on specific regulatory requirements.

7) Qualification of GMP inspectors, education, training system

Types of Thai GMP inspectors are

1. Lead Inspector/Auditor
2. Inspector/Auditor
3. Special Inspector/Auditor

Qualification

The GMP Inspectors must comply with Personnel Qualification in SOP : S-D3-104.

The qualification need for Lead inspector are :

- Thai FDA personnel
- Professional Pharmacist Level (Level 7)
- Graduated from Faculty of Pharmaceutical Science
- Experienced in GMP inspection not less than 5 years and 72 GMP inspections or 144 days for inspections within the latest 3 years
- Have GMP knowledge
- Attended to Lead inspector course not less than 20 hours
- Approved by Quality System Manager
- No conflict of interest

The qualification need for inspector are :

- Thai FDA personnel
- Professional/Practitioner Pharmacist Level
- Graduated from Faculty of Pharmaceutical Science
- Experienced in GMP Inspection not less than 1years and 10 GMP inspections or 20 days for inspections within the latest 6 months.
- Pass all training programs in P-D3-105 (Training course for GMP Inspector)
- Approved by Quality System Manager
- No conflict of interest

The qualification need for special inspector e.g. biological products manufacturer are

- Qualified Person by QIT committee.
- Pass all training in P-D3-105 or Training course for GMP Inspector
- No conflict of interest

Training system

- All inspectors must be well trained in the field of their responsibilities, especially how to do GMP inspection and all necessary knowledge
- must be followed Procedure for personnel training P-D3-105

- Training programme should be annually prepared by QSM & approved by the Director
- Survey for training need must be done completely, before the preparation of training programme
- Training profile/ history must be thoroughly documented and kept for each person
- Conclusion report should be proposed for management review once a year

Type of training

I) Basic training

- newly recruited person & external expert
- basic training issues include at least;
  : Duties & Responsibilities of Thai FDA & the Inspectorate Unit
  : Law and Regulations (Drug Act B.E.2510, Ministerial Order and Notification)
  : Drug system/ quality management system
  : GMP Guideline & Related issues
  : training for following all procedures especially about GMP inspection
  : Inspection Techniques

II) In-service/ On-the-job training

- After obtain the basic training, newly recruited person must be trained as the observer in the GMP inspection done by the qualified inspector
- Topic for training includes at least;
  : doing GMP inspection together with the inspection team at least 12 times (24 working days) within 6 months.
  : preparing the GMP inspection report not less than 6 times within 3 months.

III) Continuous training

- All qualified persons (QSM, Lead inspector and Inspector) should be re-trained, in order to review and improve their knowledge up-to-date
- Frequency: at least 10 working days/ person/year

Example:

: all details of pharmaceutical manu.& QC, Quality management system, GMP, inspection techniques, quality system, etc.
: External training
: Mock inspection & Joint-inspection (cooperation with other NRA)

IV) Training when change(s) occur in Quality system of the Inspectorate Unit

- new revision/ correction/ obsolete of document
- separated into 2 kinds of change;
  : Major/ Complicated change
  : Minor change

Training evaluation

- Training evaluation on GMP will use the evaluation form, in order to examine & assess all trainees whether they understand completely or not
- Training evaluation on GMP assessment will perform by the head of each person, in order to ensure that all trainees understand and be able to do their work correctly

8) Cases of recalled pharmaceutical products arising from compromised quality :

The table below show number of cases for voluntary Recall compare to compulsory Recall over the past 5 years

Year	Voluntary Recall	Compulsory Recall	**Sum**
2007	9	35	**44**
2008	6	34	**40**
2009	7	29	**36**
2010	10	69	**79**
2011	-	7	**7**

The table below show number of cases problem for over the past 5 years

Problem	Year					**sum**
	2007	2008	2009	2010	2011	
Filling/ packing/ labeling problem	1	1	2	-	-	**4**
Physical problem	5	3	6	10	2	**26**
Adverse Drug Reaction (ADR) problem	7	2	1	1	-	**11**
Quality problem	26	32	24	66	5	**153**
Others problem	3	-	3	-	-	**6**
Counterfeit problem	2	2	-	2	-	**6**
Sum	**44**	**40**	**36**	**79**	**7**	**206**

The table below show number of recall cases for each country origin for over the past 5 years as show below :

country	Year					**sum**
	2008	2009	2010	2011	2012	
Argentina	-	-	1	-	-	**1**
Austria	-	-	1	-	-	**1**
Belgium	1	2	-	-	-	**3**
China	4	-	-	-	-	**4**
Cyprus	-	-	2	-	-	**2**
Denmark	-	1		-	-	**1**
England	2	-	1	-	-	**3**
France	-	-	-	1	1	**1**
Germany	1	-	1	-	-	**2**
India	9	7	17	3	1	**37**
Japan	-	-	1	-	-	**1**
Pakistan	-	2	-	-	-	**2**
Singapore	-	-	1	-	-	**1**
Slovenia	-	-	-	-	-	**0**
Thailand	22	21	51	3	3	**100**
The United state	-	3	3	-	-	**6**
Sum	**39**	**36**	**79**	**7**	**5**	**165**

9) Manufacturing, import of pharmaceutical products

The main of manufacturing medicines in the country are show in the table below:

Rank	Generic Name	Bath
1	paracetamol	1,920,090,568.51
2	amoxicillin	1,725,977,220.22
3	metformin	1,521,914,119.63
4	sodium chloride	1,178,378,202.76
5	ceftriaxone	878,788,998.25
6	ketoconazole	759,183,784.20
7	roxithromycin	698,170,997.99
8	simvastatin	691,750,986.93
9	cefazolin	679,263,564.23
10	stavudine, lamivudine and nevirapine	616,993,320.00

The main of import medicines in the country are show in the table below:

Rank	Generic Name	Bath
1	atorvastatin	3,775,477,745.95
2	anastrozole	2,831,224,791.15
3	erythropoietin alfa	1,826,949,094.62
4	glucosamine	1,760,221,444.83
5	rosuvastatin	1,472,902,404.90
6	clopidogrel	1,271,279,198.83
7	erythropoietin beta	1,147,172,362.77
8	cyproterone+ethinylestradiol	1,138,462,554.78
9	hyaluronic acid	1,094,710,836.41
10	nifedipine	936,265,160.12

10) Sales and distribution of medicinal products in Thailand, proportion of imported medicinal products compared to manufacture medicinal products distributed.

For modern medicine, the proportion shows in the table below.

Year	Sales and distribution of modern medicine Manufactured in Thailand (Million Bath)			Sales and distribution of modern medicine Imported to Thailand (Million Bath)			Proportion imported/ manufactured
	Human Medicine	Veterinary Medicine	Sum	Human Medicine	Veterinary Medicine	Sum	
2007	41,232.43	1,473.91	42,706.34	53,000.10	3,237.14	56,237.23	1.32
2008	35,322.85	1,517.68	36,840.53	64,148.13	3,169.97	67,318.09	1.83
2009	37,525.38	2,182.58	39,707.96	70,607.22	4,139.10	74,746.32	1.88
2010	46,895.75	1,927.37	48,823.13	99,660.24	7,734.01	107,394.25	2.20
2011	30,910.92	1,831.21	32,745.13	45,004.55	3,584.50	48,589.05	1.48

Below table show sales and distribution of Traditional medicinal products in Thailand, proportion of imported Traditional medicinal products compared to Traditional manufactured medicinal products distributed.

Year	Sales and distribution of Traditional medicine Manufactured in Thailand (Million Bath)			Sales and distribution of Traditional medicine Imported to Thailand (Million Bath)			Proportion import/ manufacture
	Human Medicine	Veterinary Medicine	Sum	Human Medicine	Veterinary Medicine	Sum	
2007	2,183.73	4.39	2,188.12	270.48	0	270.48	0.12
2008	2,543.15	4.15	2,547.30	330.62	0	330.62	0.13
2009	2,799.29	4.86	2,804.15	398.19	0.01	398.2	0.14
2010	3,139.87	6.86	3,146.73	359.01	0.14	359.15	0.11
2011	2,197.26	3.432	2,200.72	244.251	0.097	244.349	0.11

11) Product name of medicines domestically manufactured and product name of imported medicines in the market (5 main products) are Tylenol, Augmentin, Glucophage, Rulid, Zocor.

12) Legal and institutional regulations on the sales and distribution of pharmaceutical products

The laws under the responsibility of FDA which relevant to pharmaceutical affairs are a total of three acts which are laws issued by the legislative power, plus ministerial regulations, notices or decrees issued by virtue of the acts, as follows:

1. Drug Act B.E.2510 (1967), Drug Act (2nd revision) B.E.2518 (1975), Drug Act (3rd revision) B.E.2522 (1979), Drug Act (4th revision) B.E.2527 (1984) and Drug Act (5th revision) B.E.2530 (1987)
2. Narcotic Act B.E.2522 (1979), Narcotic Act (2nd revision) B.E.2528(1985) and Narcotic Act (3rd revision) B.E.2530 (1987)
3. Psychotropic Substance Act B.E.2518 (1975)

Under Drug B.E.2510 (1967), there are others mandatory regulations to enforce the stake holder related to the distribution of pharmaceutical products such as:

Ministerial regulations on medicines.

- Ministerial regulation No. 15. Content about how to permit premise license for modern medicine pharmacy. Issued : B.E. 2525
- Ministerial regulation No. 16.Content about how to permit premise license for modern medicine importer. Issued : B.E. 2525 (1982)
- Ministerial regulation No. 17. Content about how to permit premise license for traditional manufacturer , pharmacy, importer. Issued : B.E. 2525(1982)
- Ministerial Regulation No. 18. Content about the registration method and edit method for modern medicine and traditional medicine registration. Issued : B.E. 2525 (1982)
- Ministerial Regulation No. 19. Content about officers identity conform to Drug Act BE. 2510. Issued : B.E. 2525 (1982)
- Ministerial Regulation No. 20. Content about medicine recall. Issued : B.E. 2525. (1982)
- Ministerial Regulation No. 21. Content about the duty of modern medicine pharmacy to prepare for the sale of medicine and equipment to support a licensed pharmacy . Issued : B.E. 2528 (1985)
- Ministerial Regulation No. 22. Content about the duty of traditional medicine pharmacy to prepare for the sale of medicinesand equipment for prescribe the traditional medicine. Issued : B.E. 2528(1985)
- Ministerial Regulation No. 24. Content about examining modern medicine or traditional medicine import to the Kingdom of Thailand and practicing of the officers at the checkpoint or the port of entry. Issued : B.E. 2537 (1994)
- Ministerial Regulation No. 25. Content about the production of traditional medicines by means of percussion pellet, a coating, terms of additives and preservatives as well as how to check traditional medicine produced by the above method. Issued : B.E. 2537 (1994)

- Ministerial Regulation No. 26. Content about the fee License / substitution at the pharmacy, Drug registration, the applicant for registration of medicines, for modern and traditional medicines . Issued : B.E. 2537(1994)

- Ministerial Regulation No. 27. Content about the application for drug import premise relocation or a place to store import medicines relocation specified in the license' permit. Issued : B.E. 2537(1994)

- Ministerial Regulation No. 28. Content about the application for relocation of the drug premise specified in the license' permit for all types of traditional medicine. Issued : B.E. 2537(1994)

- Ministerial Regulation describe the duty of the licensee to bring or order medicine to the Kingdom of Thailand in respect of pharmaceutical chemicals, active ingredients or semi-finished pharmaceutical products containing the active ingredient Issued : B.E. 2547 (2004)

- Ministerial Regulation describe Lot release process to ensure the production of biological medicine Issued : B.E. 2553. (2010)

- Ministerial Regulation describe the method of the production on modern medicines Issued : B.E. 2554 (2011)

Notification of the Ministry of Public Health on medicines.

- Notification of the specific details about the rules and procedures in the production of modern medicine. Issued : B.E. 2554. (2011)

- Notification of port of entry for health products.

- Notification of special controlled substance

- Notification of Dangerous drug.

- Notification of medicine to be used in the warning label and the leaflet and the text of the warning.

- Notification of Household remedies for modern medicine.

- Notification of Household remedies for traditional medicine.

- Notification of the treatises on medicine for Thai regulation.

- Notification of the object that has been except to be medicine.

- Notification of the specific details about the rules and procedures in the production of biological products. Issued : B.E. 2549 (2006)

- Notification of the rules, procedures and conditions relating to the manufacture or import of medicines to the Kingdom of Thailand. These medicines are Anti-Inflammatory medicines, Analgesics, Antipyretics in combination with Corticosteroids.

- Notification of the rules, procedures and conditions relating to the manufacture or import of medicines to the Kingdom of Thailand for Amidopyrine or Aminophenazone combination.

- Notification on the pharmacy of ready packed medicine premises in the provincial area.

- Notification of the declaration of expiration date on the label.

- Notification of the object identifier to be the drug or medicine. Under the Drug Act. BE 2510.

- Notification about the prohibit disease of the licensee.

- Notification about disease or symptoms of disease or medication that prohibited to advertise.

- Notification about rules, procedures and conditions prescribed to import medicine into the Kingdom of Thailand without registration licenses.

- Notification of the declaration of expiry date on Chloramphenicol eye drop.

Notification of the Thai Food and Drug Administration on medicines .

- Notification of the prescribed control method for medicine combine with Diphenhaydramine, Promethazine, Dextromethorphan.

- Notification of the prescription control method for cold medine compose of Pseudoephredrine.

- Notification of the FDA method for sale report of Sildenafil, Tadalafil and Vardenafil

- Notification of the FDA method for sale report of liquid dosage form medicines compose of Diphenhydramine or Promethazine

- Notification of the FDA method for sale report of Dexamethasone and Prednisolone

- Notification of ASEAN Guidelines for the Conduct of Bioavailability and Bioequivalence Studies

- Notification of ASEAN Harmonization Product on Pharmaceutical Registration

- Notification of the FDA method for sale report of liquid dosage form medicines compose of Diphenhydramine or Promethazine

The order of Ministry of Public Health.

- The Ministry of Health order the amendment of drug registration.

- The Ministry of Health order the cancellation of drug registration.

Notification of the Thai Food and Drug Administration

- Notification of license revocation or suspension

- Notification of the procedure to conduct with Certificate of Free Sale : CFS

Regulation of the Ministry of Public Health.

- The processing for common property in dispute which is not a drug. Issued : B.E. 2521. (1978)

- The method of maintaining trade secrets of the drug for Issued : B.E. 2550 (2007)

13) Existence of recalled system of products distributed

There is an existence of medicinal recall system or rapid alert system conform to SOP-P-D3-110. The recall system operated by Rapid Alert Working Group of Bureau of Drug Control. The working group make the decision to classify or ranking the severity status of defected medicinal products. The severity of pharmaceutical problems are classified in to 3 levels., The working group also specify type of recall action duration and has close cooperation with other Thai FDA office such as Technical and Planning Division which help the working group to distribute recall information to other pharmaceutical network area e.g. ASEAN country. In the recall system, it enforce the product owner to perform recall action and enforce to report back to FDA to evaluate the recall activities. The activities to destroy defected products also in this system. More over , the system has the chanal to distribute recall information by announce on other media such as on internet, FDA Safety-Alert web-site, in order to inform the customer as much as possible. The recall information letter also distribute directly throughout health government service and other private health service such as hospitals retailers in the country.

14) Name of organization for examining recalled products, no. of persons in charge of testing

Bureau of Drug and Narcotic and Institute of Biological Product, Department of Medical Sciences (DMS c) have the main mission not only testing , examining pharmaceutical and biological products but also making lot release for biological products. The pharmaceutical laboratory examining the sample collected from the market system including retailers, manufacturers, importers, government and private hospitals. Not only examine the legal products but also identify or assay all complained pharmaceutical products or illegal products such as recalled, counterfeit, smuggling, unregistered pharmaceutical products. There are around 150 analysts in DMSc for pharmaceutical and biological products testing.

When all examination finished and approved that the pharmaceutical product is substandard, they will inform Thai FDA to order the owner of the substandard pharmaceutical products to remove those products from the market by perform recall action.

5. Essential Medicine List

The Thai Essential Drug List is considered by the Essential Drug List Comitee established by Drug comitee. There are others 17 expert comitees for each therapeutic sytem of Essential Drug . In the year 2011, Essential Drug List divide in to 2 main groups. The first group is traditional medicine. It compose of 21 herbs developed medicines and 50 Thai traditional medicines. The second group is modern medicine. Essential Drug List for modern medicine is classified medicine according to therapeutic classification for human use. There are 17 therapeutic systems in Essential Drug List for modern medicine as below:

1. Gastro-intestinal system
2. Cardiovascular system
3. Respiratory system
4. Central nervous system
5. Infections

6. Endocrine system
7. Obstetrics, gynaecology and urinary-tract disorders
8. Malignant disease and immunosuppressant
9. Nutrition and blood
10. Musculoskeletal and joint diseases
11. Eye
12. Ear, nose, or pharynx and oral cavity
13. Skin
14. Immunological products and vaccines
15. Anaesthesia
16. Antidotes
17. Contrast media and Radiopharmaceuticals

The list of modern medicines are sow below:

1. Gastro-intestinal system

1.1 Antacids and other drugs for dyspepsia
- Aluminium hydroxide : chewable tab, tab, susp, susp (hosp)
- Aluminium hydroxide + Magnesium hydroxide chewable tab, tab, susp, susp (hosp)
- Simeticone (Simethicone) chewable tab, susp
- Aluminium hydroxide + Magnesium hydroxide + Simethicone 25-50 mg chewable tab, tab
- Compound Cardamom Mixture sodium bicarbonate (Mist Carminative) mixt, mixt (hosp)

1.2 Antispasmodics and other drugs altering gut motility
- Dicycloverine hydrochloride (Dicyclomine hydrochloride) tab
- Domperidone tab (as base/maleate), susp (as base/maleate)
- Hyoscine butylbromide (Hyoscine-n-butylbromide) tab, syr, sterile sol
- Metoclopramide tab, syr, sterile sol
- Mebeverine hydrochloride tab

1.3 Ulcer-healing drugs and drugs used in variceal bleeding
- Omeprazole EC cap (as base)
- Ranitidine hydrochloride film coated tab
- Omeprazole sodium sterile pwdr
- Ranitidine hydrochloride sterile sol
- Pantoprazole sodium sterile pwdr
- Sucralfate tab, susp
- Somatostatin acetae sterile pwdr
- Lauromacrogol 400 (Polidocanol) sterile sol
- Ranitidine bismuth citrate tab

1.4 Drugs used in acute diarrhoea
- Oral rehydration salts (ORS)
- oral pwdr, oral pwdr (hosp)
- Zinc sulfate oral sol (hosp)
- Loperamide hydrochloride cap, tab

1.5 Drugs used in chronic bowel disorders
- Sulfasalazine tab, EC tab
- Mesalazine (Mesalamine) EC tab , rectal supp

1.6 Laxatives
- Bisacodyl EC tab, rectal supp
- Castor oil
- Glycerol rectal supp
- Senna tab
- Magnesium hydroxide susp, susp (hosp)
- Magnesium sulfate mixt, mixt (hosp), sol, sol (hosp)
- Sodium phosphates enema
- Lactulose syr
- Macrogols with electrolytes (Polyethylene glycol, PEG) oral pwdr (hosp)
- Sodium phosphate oral sol

1.7 Local preparations for anal and rectal disorders
- Local anesthetic + Corticosteroid with/without astringent cream, oint, rectal supp

1.8 Drugs affecting intestinal secretions
- Colestyramine (Cholestyramine) oral pwdr
- Ursodeoxycholic acid (Ursodiol) cap
- Pancreatic enzymes cap, tab , EC cap , EC tab

2. Cardiovascular system

2.1 Positive inotropic drugs
- Digoxin tab, elixir, sterile sol
- Milrinone lactate sterile sol

2.2 Diuretics
- Furosemide tab, sterile sol
- Hydrochlorothiazide (HCTZ) tab
- Mannitol sterile sol
- Spironolactone tab
- Amiloride hydrochloride + Hydrochlorothiazide (HCTZ) tab (only 5 + 50 mg)

2.3 Anti-arrhythmic drugs
- Adenosine sterile sol
- Atropine sulfate sterile sol
- Lidocaine hydrochloride (preservative free) sterile sol (hosp)
- Magnesium sulfate sterile sol
- Verapamil sterile sol
- Amiodarone hydrochloride tab, sterile sol
- Flecainide acetate tab
- Propafenone hydrochloride tab

2.4 Beta-adrenoceptor blocking drugs
- Atenolol tab
- Metoprolol tartrate immediate release tab
- Propranolol hydrochloride tab
- Carvedilol tab

2.5 Drugs affecting the renin-angiotensin system and some other antihypertensive drugs

2.5.1 Vasodilator antihypertensive drugs
- Hydralazine hydrochloride tab, sterile pwdr
- Sodium nitroprusside sterile pwdr

2.5.2 Centrally acting antihypertensive drugs
- Methyldopa tab

2.5.3 Alpha-adrenoceptor blocking drugs
- Prazosin hydrochloridetab
- Doxazosin mesilate immediate release tab

2.5.4 Angiotensin-converting enzyme inhibitors
- Enalapril maleate tab
- Captopril tab

2.5.5 Angiotensin-II receptor antagonists
- Losartan potassium tab (only 50, 100 mg)

2.6 Nitrates, calcium-channel blockers and other vasodilators

2.6.1 Nitrates
- Glyceryl trinitrate sterile sol
- Isosorbide dinitrate tab, sublingual tab
- Isosorbide mononitrate tab

2.6.2 Calcium-channel blockers
- Amlodipine besilate tab
- Diltiazem hydrochloride slow release cap/tab (only 120 mg) (not include controlled release)

- Verapamil hydrochloride tab, SR tab (only 240 mg)
- Diltiazem hydrochloride immediate release tab
- Nimodipine tab, sterile sol

2.6.3 Other vasodilators
- Beraprost sodium tab

2.7 Sympathomimetics

2.7.1 Inotropic sympathomimetics
- Dopamine hydrochloride sterile sol
- Isoprenaline hydrochloride (Isoproterenol hydrochloride) sterile sol
- Dobutamine hydrochloride sterile sol

2.7.2 Vasoconstrictor sympathomimetics
- Norepinephrine (Noradrenaline) sterile sol (as bitartrate or hydrochloride)
- Ephedrine hydrochloride sterile sol

2.7.3 Drugs used in cardiopulmonary resuscitation
- Epinephrine (Adrenaline) sterile sol

2.8 Anticoagulants
- Warfarin sodium tab
- Heparin sodium sterile sol
- Enoxaparin sodium sterile sol

2.9 Antiplatelet drugs
- Aspirin (Acetylsalicylic acid) tab (75-325 mg), EC tab (75-325 mg)
- Ticlopidine hydrochloride tab
- Clopidogrel bisulfate tab
- Dipyridamole sterile sol
- Eptifibatide sterile sol

2.10 Fibrinolytic drugs
- Streptokinase sterile pwdr
- Alteplase (Recombinant tissue - type plasminogen activator)sterile pwdr

2.11 Haemostatics
- Human thrombin + Calcium chloride + Fibrinogen +Tranexamic acid sterile sol
- Factor VIII concentrate, dried sterile preparation for intravenous use
- Factor IX concentrate, dried sterile preparation for intravenous use
- Factor IX complex (coagulation factors II, VII, IX, X) concentrate, dried sterile preparation for intravenous use

2.12 Lipid-regulating drugs
- Gemfibrozil cap (only 300, 600 mg), tab (only 600 mg)
- Nicotinic acid immediate release tab
- Simvastatin tab (only 10, 20 & 40 mg)
- Colestyramine (Cholestyramine) oral pwdr
- Fenofibrate cap (100, 160, 200, 300 mg)

3. Respiratory system

3.1 Bronchodilators

3.1.1 Adrenoceptor agonists
- Procaterol hydrochloride syr
- Salbutamol sulfate tab, syr, DPI, MDI, sol for nebulizer
- Terbutaline sulfate tab, syr, sterile sol
- Terbutaline sulfate DPI, MDI, sol for nebulizer
- Procaterol hydrochloride tab

3.1.2 Compound antimuscarinic bronchodilators
- Ipratropium bromide + Fenoterol hydrobromide MDI, sol for nebulizer

3.1.3 Theophylline
- Aminophylline tab, sterile sol
- Theophylline SR cap , SR tab
- Theophylline + Glyceryl guaiacolate syr (50+30 mg in 5 ml)

3.2 Corticosteroids
- Beclometasone dipropionate DPI, MDI
- Budesonide DPI, MDI, susp for nebulizer
- Fluticasone susp for nebulizer
- Fluticasone MDI
- Budesonide + Formoterol DPI
- Fluticasone + Salmeterol DPI, MDI

3.3 Leukotriene receptor antagonists
- Montelukast sodium chewable tab (4 & 5 mg), film coated tab (10 mg)

3.4 Antihistamines
- Brompheniramine maleate tab, syr
- Chlorpheniramine maleate (Chlorphenamine maleate) cap, tab, syr, sterile sol
- Diphenhydramine hydrochloride cap, sterile sol
- Hydroxyzine hydrochloride tab, syr
- Cetirizine hydrochloride tab, syr
- Loratadine tab, syr

3.5 Pulmonary surfactants
- Phospholipids (type: Poractant alfa or Beractant) sterile intratracheal susp

3.6 Cough preparations
3.6.1 Cough suppressants
- Dextromethorphan hydrobromide tab, syr
- Opium and Glycyrrhiza Mixture Compound (Brown Mixture ; Mist. Tussis) mixt (hosp)
- Squill and Ammonia Mixture mixt (hosp)
- Codeine phosphate + Glyceryl guaiacolate tab/cap (only 10+100 mg)

3.6.2 Expectorant and demulcent cough preparations
- Ammonium carbonate and senega mixture mixt (hosp)
- Glyceryl guaiacolate tab, syr

3.7 Systemic nasal decongestants
- Pseudoephedrine hydrochloride tab, syr

3.8 Other respiratory preparations
- Aromatic Ammonia Spirit spirit ,spirit (hosp)

4. Central nervous system

4.1 Hypnotics and anxiolytics
- Chloral hydrate oral sol (hosp)
- Chlordiazepoxide cap,tab
- Diazepam cap, tab, sterile sol
- Lorazepam tab
- Clonazepam tab
- Dipotassium clorazepate cap, tab
- Hydroxyzine hydrochloridetab, syr
- Alprazolam tab

4.2 Drugs used in psychoses and related disorders
4.2.1 Antipsychotic drugs
- Chlorpromazine hydrochloridetab, sterile sol
- Fluphenazinetab (as hydrochloride), sterile sol (as decanoate)
- Haloperidoltab (as base), oral sol (as base), sterile sol (as base or decanoate)
- Perphenazine tab
- Trifluoperazine hydrochloridetab
- Thioridazine hydrochloride tab
- Clozapine tab
- Pimozide tab
- Risperidone tab

- Flupentixol (Flupenthixol) tab (as hydrochloride), sterile sol (as decanoate)
- Risperidone oral sol, oral sol/syr (hosp)
- Zuclopenthixol tab (as hydrochloride), sterile sol/sterile emulsion (as acetate or decanoate)

4.2.2 Antimanic drugs
- Carbamazepinetab
- Lithium carbonate cap, tab
- Sodium valproate EC tab, oral sol
- Carbamazepin SR tab
- Sodium valproate SR tab
- Lamotrigine tab (only 25, 50, 100 mg)

4.3 Antidepressant drugs
- Amitriptyline hydrochloride film coated tab
- Fluoxetine hydrochloride cap, tab
- Imipramine hydrochloride tab
- Nortriptyline hydrochloride tab
- Mianserin hydrochloride tab
- Clomipramine hydrochloride tab
- Sertraline tab(50 mg)
- Trazodone hydrochloride tab

4.4 Central nervous system stimulants
- Methylphenidate tab (10 mg)

4.5 Drugs used in nausea and vertigo

4.5.1 Drugs used in nausea and vomiting
- Domperidonetab (as base/maleate), susp (as base/maleate)
- Metoclopramide tab, syr, sterile sol
- Ondansetron tab (as base or hydrochloride), sterile sol (as hydrochloride)

4.5.2 Drugs used in vestibular disorders
- Dimenhydrinate compressed tab, film coated tab, syr, sterile sol
- Betahistine mesilate (Betahistine mesylate) tab (only 6, 12 mg)

4.6 Analgesics and antipyretics
- Paracetamol (Acetaminophen) tab, syr
- Aspirin (Acetylsalicylic acid) compressed tab, film coated tab (only 300 mg up)
- Ibuprofen film coated tab, susp

4.7 Analgesics

4.7.1 Opioid analgesics
- Buprenorphine hydrochloride sublingual tab, sterile sol
- Codeine phosphate tab
- Fentanyl sterile sol (as citrate), transdermal therapeutic system (as base)
- Methadone hydrochloride tab, oral sol
- Morphine sulfate cap, tab, SR cap, SR tab, sterile sol
- Nalbuphine hydrochloride sterile sol
- Pethidine hydrochloride sterile sol
- Tramadol hydrochloride cap, tab, SR cap, SR tab, sterile sol

4.7.2 Drugs for neuropathic pain
- Amitriptyline hydrochloride film coated tab
- Carbamazepine tab
- Nortriptyline hydrochloride tab
- Carbamazepine SR tab
- Gabapentin cap (only100, 300, 400 mg), tab (only600 mg)

4.7.3 Antimigraine drugs

4.7.3.1 Drugs for acute migraine attack
- Paracetamol (Acetaminophen) tab
- Aspirin (Acetylsalicylic acid) compressed tab, film coated tab (only300 mg up)
- Ibuprofen film coated tab
- Ergotamine tartrate + Caffeine compressed tab, film coated tab (only 1 + 100 mg)

4.7.3.2 Drugs used in the prophylaxis of migraine

- Amitriptyline hydrochloride film coated tab
- Propranolol hydrochloride tab
- Cyproheptadine hydrochloride tab
- Metoprolol tartrate immediate release tab
- Pizotifen malate tab
- Sodium valproateEC tab, SR tab
- Topiramate tab

4.8 Antiepileptics

4.8.1 Drugs used in the control of epilepsy

- Carbamazepine tab, syr, susp
- Magnesium sulfate sterile sol
- Phenobarbital tab (as base or sodium)
- Phenytoin (as base) chewable tab
- Phenytoin sodium cap, SR cap
- Sodium valproate EC tab, oral sol
- Carbamazepine SR tab
- Clonazepam tab
- Sodium valproate SR tab
- Lamotrigine tab (only 25, 50, 100 mg)
- Levetiracetam tab (only 250 & 500 mg)
- Nitrazepam tab
- Topiramate cap, tab
- Vigabatrin tab

4.8.2 Drugs used in status epilepticus

- Diazepam sterile sol
- Phenobarbital sodium (Phenobarbitone sodium) sterile pwdr
- Phenytoin sodium sterile sol
- Sodium valproate sterile pwdr
- Midazolam hydrochloride sterile sol

4.9 Drugs used in movement disorders

- Atenolol tab
- Diazepam cap,tab
- Levodopa + Benserazide as hydrochloride (Co-beneldopa) cap/tab (200+50 mg)
- Levodopa + Carbidopa as monohydrate (Co-careldopa) tab (100+25 mg, 250+25 mg)
- Propranolol hydrochloride tab
- Trihexyphenidyl hydrochloride tab
- Baclofen tab
- Clonazepam tab
- Levodopa + Benserazide as hydrochloride (Co-beneldopa) CR cap/dispersible tab (100+25 mg)
- Bromocriptine mesilate tab
- Entacapone tab
- Piribedil SR tab(only 50 mg)
- Botulinum A toxin sterile pwdr (only 100 & 500 IU)

4.10 Drugs used in substance dependence

- Clonidine hydrochloride tab
- Methadone hydrochloride oral sol

5. Infections

5.1 Antibacterial drugs

5.1.1 Penicillins

- Phenoxymethylpenicillin potassium (Penicillin V) cap, tab, dry syr
- Benzylpenicillin (Penicillin G) sterile pwdr (as sodium or potassium)
- Benzathine benzylpenicillin (Penicillin G benzathine) sterile pwdr
- Procaine benzylpenicillin (Penicillin G procaine) sterile sol, sterile susp
- Dicloxacillin sodium cap, dry syr
- Cloxacillin sodium sterile pwdr
- Amoxicillin trihydrate cap, dry syr

- Ampicillin sodium sterile pwdr
- Amoxicillin trihydrate + Potassium clavulanate (Co-amoxiclav) tab (only 250/125, 500/125 mg)
- Amoxicillin trihydrate + Potassium clavulanate (Co-amoxiclav) tab (only 500/125, 875/125 mg), dry syr (only 200/28.5, 400/57 mg)
- Amoxicillin sodium + Potassium clavulanate (Co-amoxiclav) sterile pwdr
- Ampicillin sodium + Sulbactam sodium sterile pwdr
- Piperacillin sodium + Tazobactam sodium sterile pwdr

5.1.2 Cephalosporins, cephamycins and other beta-lactams
- Cefalexin (Cephalexin) cap, dry syr
- Cefazolin sodium sterile pwdr
- Cefuroxime axetil tab, dry syr
- Cefotaxime sodium sterile pwdr
- Ceftriaxone sodium sterile pwdr
- Ceftazidime sterile pwdr
- Cefixime cap, dry syr
- Cefoperazone sodium + Sulbactam sodium sterile pwdr
- Cefoxitin sodium sterile pwdr
- Imipenem + Cilastatin sodium sterile pwdr
- Meropenem sterile pwdr

5.1.3 Tetracyclines
- Doxycycline hyclate (Doxycycline hydrochloride) cap, tab
- Tetracycline hydrochloride cap, tab

5.1.4 Aminoglycosides
- streptomycin sulfate, amikacin sulfate & kanamycin sulfate>Antituberculous drugs
- Neomycin sulfate tab
- Gentamicin sulfate sterile sol
- Amikacin sulfatensterile sol
- Netilmicin sulfate sterile sol

5.1.5 Macrolides
- Erythromycin estolate susp /dry syr
- Erythromycin stearate or succinate dry syr
- Roxithromycin cap / tab (only 100 & 150 mg)
- Azithromycincap (not include sustain release) , dry syrup (not include sustain release)
- Clarithromycin tab, dry syr

5.1.6 Quinolones
- Norfloxacin tab
- Ofloxacin tab
- Ciprofloxacin hydrochloride tab
- Ciprofloxacin lactate sterile sol
- Levofloxacin hemihydrate sterile sol
- Levofloxacin hemihydrate tab (only 500 mg)

5.1.7 Some other antibacterials
- Chloramphenicol sodium succinate sterile pwdr
- Metronidazole cap/tab (as base), susp (as benzoate), sterile sol (as base)
- Clindamycin cap (as hydrochloride), sterile sol (as phosphate)
- Lincomycin hydrochloride sterile sol
- Nitrofurantoin tab
- Colistimethate Sodium (Sodium colistinmethanesulphonate) sterile pwdr
- Fosfomycin sodium sterile pwdr
- Sodium fusidate tab
- Vancomycin hydrochloride sterile pwdr

5.1.8 Sulphonamides and trimethoprim
- Sulfadiazine tab
- Sulfamethoxazole + Trimethoprim (Co-trimoxazole) cap, tab, susp, sterile sol
- Trimethoprim tab

5.1.9 Antituberculous drugs
- Ethambutol hydrochloridefilm coated tab
- Isoniazid tab
- Pyrazinamide tab
- Rifampicin cap, tab, dry syr, syr, susp

- Streptomycin sulfate sterile pwdr
- Isoniazid + Rifampicin cap/tab (only 100+150 mg & 150+300 mg)
- Isoniazid + Rifampicin + Pyrazinamide tab (only 75 + 150 + 400 mg)
- Isoniazid + Rifampicin + Pyrazinamide + Ethambutol hydrochloride tab (only 75 + 150 + 400 + 275 mg)
- Amikacin sulfate sterile sol
- Cycloserine cap
- Ethionamide tab
- Para-aminosalicylic acid (PAS) EC tab
- Kanamycin sulfate sterile pwdr
- Ofloxacin tab

5.1.10 Antileprotic drugs
- Clofazimine cap
- Dapsone tab

5.2 Antifungal drugs
- Fluconazole cap
- Griseofulvin tab
- Ketoconazole tab
- Nystatin oral susp
- Saturated solution of potassium iodide (SSKI) sol (hosp)
- Itraconazole cap
- Amphotericin B sterile pwdr (only conventional formulations)
- Fluconazole sterile sol
- Itraconazole oral sol
- Liposomal amphotericin B sterile pwdr

5.3 Antiviral drugs

5.3.1 Non-antiretrovirals
- Aciclovir (Acyclovir) tab
- Aciclovir sodium (Acyclovir sodium) sterile pwdr, sterile sol
- Ganciclovir sodium sterile pwdr
- Lamivudine (3TC) tab (only 100, 150 mg)
- Oseltamivir phosphate cap, dry syr

5.3.2 Antiretrovirals
- Atazanavir sulfate cap
- Didanosine (ddI) tab, oral pwdr
- Efavirenz cap, tab
- Indinavir sulfate cap
- Lamivudine (3TC) tab (only 100, 150 mg), syr
- Lamivudine + Stavudine + Nevirapine tab (only 150+30+200 mg & 150+40+200 mg)
- Lopinavir + Ritonavir cap, oral sol
- Nelfinavir mesilate tab, dry syr
- Nevirapine tab, susp
- Ritonavir cap, oral sol
- Saquinavir cap (as base or mesilate)
- Stavudine (d4T) cap, dry syr
- Tenofovir disoproxil fumarate tab
- Zidovudine (AZT) cap, oral sol
- Zidovudine + Lamivudine (AZT+3TC)tab (only 300+150 mg)
- Zidovudine + Lamivudine + Nevirapine tab (only 250 + 150 +200 mg)

5.4 Antiprotozoal drugs

5.4.1 Antimalarials
- Chloroquine phosphate tab
- Primaquine phosphate tab
- Quinine compressed/film coated tab (as sulfate), sterile sol (as dihydrochloride)
- Artesunate tab (not include lactab & rectocap), sterile pwdr
- Mefloquine hydrochloride tab

5.4.2 Other antiprotozoal drugs
- Metronidazole cap/ tab (as base), susp (as benzoate), sterile sol (as base)

- Pyrimethamine tab
- Pentamidine isetionate (Pentamidine isethionate) sterile pwdr

5.5 Anthelmintics
- Albendazole tab, susp
- Diethylcarbamazine citrate tab
- Mebendazole tab, susp, susp (hosp)
- Niclosamide tab
- Praziquantel tab
- Pyrantel embonate (Pyrantel pamoate) tab, susp
- Ivermectin tab

5.6 Antiseptics
- Chlorhexidine gluconate sol (aqueous), sol (only 2% , 4% & 5%) , sol/sol (hosp)(only 2% , 4% in 70% alcohol)
- Ethyl alcohol sol, sol (hosp), gel (hosp)
- Gentian violet sol (paint)
- Hydrogen peroxide sol
- Potassium permanganate pwdr (hosp)
- Povidone-iodine sol, sol (hosp)
- Tincture of iodine (Iodine in alcohol) sol, sol (hosp)

6. Endocrine system

6.1 Drugs used in diabetes

6.1.1 Insulins
- Biphasic isophane insulin (Soluble insulin + Isophane insulin) sterile susp
- Isophane insulin (NPH; Isophane protamine insulin) sterile susp
- Soluble insulin (Neutral insulin; insulin injection) sterile sol
- Insulin aspart sterile sol
- Biphasic insulin lispro (Insulin lispro + Insulin lispro protamine) sterile susp

6.1.2 Oral antidiabetic drugs
- Glibenclamide tab (only 2.5, 5 mg)
- Gliclazide tab (only 80 mg)
- Glipizide tab
- Metformin hydrochloride tab
- Acarbose tab
- Pioglitazone hydrochloride tab (only 15, 30 mg)
- Repaglinide tab (only 0.5, 1, 2 mg)

6.1.3 Treatment of hypoglycemia
- Diazoxide tab

6.2 Thyroid and antithyroid drugs

6.2.1 Thyroid hormones
- Levothyroxine sodium (L-thyroxine sodium) tab
- Liothyronine sodium tab

6.2.2 Antithyroid drugs
- Lugol 's solution (Aqueous iodine oral solution, Strong iodine solution) oral sol (hosp)
- Propylthiouracil tab
- Saturated solution of potassium iodide (SSKI) oral sol (hosp)
- Thiamazole (Methimazole) tab

6.3 Corticosteroids
- Dexamethasone cap/tab (as base), sterile sol (as sodium phosphate or acetate)
- Hydrocortisone tab (as base) , sterile pwdr (as sodium succinate), sterile susp (as acetate)
- Prednisolone cap, tab
- Fludrocortisone acetate tab
- Methylprednisolone sterile pwdr/sterile susp (as hemisuccinate or sodium succinate or acetate)

6.4 Sex hormones

6.4.1 Female sex hormones Medroxyprogesterone acetate tab (only 2.5 , 5 & 10 mg)
- Norethisterone tab
- Conjugated estrogens tab

- Estradiol valerate tab
- Hydroxyprogesterone caproate sterile oily sol for inj
- Conjugated estrogens sterile pwdr

6.4.2 Male sex hormones and antagonists
- Testosterone enantate (Testosterone enanthate) sterile oily sol for inj
- Cyproterone acetate tab

6.5 Hypothalamic and pituitary hormones

6.5.1 Hypothalamic and anterior pituitary hormones
- Chrorionic gonadotrophin (Human Chorionic Gonadotrophin ; HCG) sterile pwdr
- Tetracosactide (Cosyntropin)sterile pwdr

6.5.2 Posterior pituitary hormones and antagonists
- Chlorpropamide tab
- Desmopressin acetate (DDAVP) tab, nasal spray, nasal sol, sterile sol

6.6 Drugs affecting bone metabolism
- Calcitonin-salmon sterile sol
- Disodium pamidronate sterile pwdr ,sterile sol

6.7 Other endocrine drugs

6.7.1 Bromocriptine and other dopaminergic drugs
- Bromocriptine mesilate tab

6.7.2 Drugs affecting gonadotrophins
- Leuprorelin acetate sterile pwdr (only 3.75 mg)

7. Obstetrics, gynaecology and urinary-tract disorders

7.1 Drugs used in obstetrics

7.1.1 Prostaglandins, prostaglandins antagonists and oxytocics
- Methylergometrine maleate sterile sol
- Oxytocin sterile sol
- Alprostadil sterile sol (only 0.5 mg/ml)
- Indomethacin sodium sterile pwdr
- Sulprostone sterile pwdr

7.1.2 Myometrial relaxants
- Salbutamol sulfate tab
- Terbutaline sulfate tab, sterile sol

7.2 Treatment of vaginal and vulval conditions
- Clotrimazole vaginal tab
- Nystatin vaginal tab
- Conjugated estrogens vaginal cream

7.3 Contraceptives
- Ethinylestradiol + Levonorgestrel tab (only 30 + 150 mcg)
- Levonorgestrel tab (only 750 mcg)
- Medroxyprogesterone acetate sterile susp
- Ethinylestradiol + Desogestrel tab (only 20 + 150 mcg)
- Ethinylestradiol + Gestodene tab (only 20 + 75 mcg)
- Lynestrenol tab (only 0.5 mg)

7.4 Drugs for genito-urinary disorders

7.4.1 Drugs for benign prostatic hyperplasia
- Alfuzosin hydrochloride SR tab (only 10 mg)
- Doxazosin mesilate immediate release tab (only 2 & 4 mg)
- Finasteride tab (only 5 mg)

7.4.2 Drugs for urinary frequency, enuresis, and incontinence
- Oxybutynin hydrochloride immediate release tab
- Trospium chloride tab

7.4.3 Drugs used in alkalinisation of urine
- Potassium citrate oral sol (hosp), dry pwdr for oral sol (hosp)
- Sodium citrate + Citric acid (Shohl’s solution) oral sol (hosp)

- Sodium citrate + Potassium citrate oral sol (hosp)

8. Malignant disease and immunosuppressant

8.1 Cytotoxic drugs

8.1.1 Alkylating drugs
- Busulfan tab
- Chlorambucil tab
- Cyclophosphamide tab, sterile pwdr
- Melphalan tab
- Ifosfamide sterile pwdr

8.1.2 Cytotoxic antibiotics
- Bleomycin sterile pwdr (as sulfate or as hydrochloride)
- Dactinomycin sterile pwdr
- Doxorubicin hydrochloride sterile pwdr,sterile susp ,sterile sol
- Idarubicin hydrochloride sterile pwdr
- Mitomycin sterile pwdr , sterile sol
- Mitoxantrone hydrochloride sterile pwdr, sterile sol

8.1.3 Antimetabolites
- Cytarabine sterile pwdr, sterile sol
- Fluorouracil sterile sol
- Mercaptopurine tab
- Methotrexate tab (as base or sodium), sterile pwdr / sterile sol (as sodium)
- Capecitabine tab
- Gemcitabine hydrochloride sterile pwdr
- Tioguanine (Thioguanine) tab

8.1.4 Vinca alkaloids and etoposide
- Etoposide cap (as base), sterile sol (as base)
- Vinblastine sulfate sterile pwdr, sterile sol
- Vincristine sulfate sterile pwdr, sterile sol

8.1.5 Other antineoplastic drugs
- Asparaginase (Crisantapase) sterile pwdr
- Cisplatin sterile pwdr, sterile sol
- Carboplatin sterile pwdr, sterile sol
- Hydroxycarbamide (Hydroxyurea) cap
- Paclitaxel sterile sol
- Docetaxel sterile sol
- Imatinib mesilate tab (only 100 & 400 mg)

8.2 Drugs affecting the immune response
- Dexamethasone cap (as base) , tab (as base), sterile sol (as sodium phosphate or acetate)
- Prednisolone cap, tab
- Azathioprine tab
- Ciclosporin (Cyclosporin) cap, oral sol, oral susp, sterile sol
- Methylprednisolone sterile pwdr/sterile susp (as hemisuccinate or sodium succinate or acetate)
- Antithymocyte immunoglobulin, rabbit (ATG) sterile pwdr , sterile sol
- Basiliximab sterile pwdr
- Mycophenolate mofetil cap
- Tacrolimus cap, sterile sol (concentrate for infusion)
- BCG freeze-dried pwdr for bladder instillation
- Human normal immunoglobulin, intravenous (IVIG) sterile pwdr, sterile sol
- Sirolimus (Rapamycin) oral sol (only 1 mg/ml), tab (only 1 mg)

8.3 Sex hormones and hormone antagonists in malignant disease

8.3.1 Progestogens, anti-estrogens and enzyme inhibitors
- Tamoxifen citrate tab
- Letrozole tab (only 2.5 mg)
- Megestrol acetate tab

8.3.2 Prostate cancer
- Flutamide tab

9. Nutrition and blood

9.1 Whole blood, blood products and drugs used in some blood disorders

9.1.1 Whole blood and blood products

- Fresh dried plasma
- Fresh frozen plasma
- Frozen cryoprecipitate
- Leukocyte depleted platelets concentrate
- Leukocyte depleted pooled platelets concentrate, random donor (LD-PPC) Lyophilized cryoprecipitate
- Packed red cell
- Packed red cell, leukocyte depleted
- Packed red cell, leukocyte poor
- Platelets concentrate, random donor
- Platelets concentrate, single donor
- Whole blood
- Leukocyte depleted platelets concentrate, single donor
- Packed red cell, leukocyte depleted single donor 2 units
- Packed red cell, irradiated
- Packed red cell, leukocyte poor, irradiated
- Platelets concentrate, irradiated
- Packed red cell, leukocyte depleted, irradiated

9.1.2 Drugs used in hypoplastic, haemolytic and renal anaemias

- Folic acid tab (not less than 5 mg)
- Oxymetholone tab
- Deferoxamine mesilate (Desferrioxamine mesilate) sterile pwdr
- Iron sucrose sterile sol
- Antithymocyte immunoglobulin, rabbit (ATG) sterile pwdr, sterile sol
- Deferiprone tab (only 500 mg)
- Epoetin alfa (epoetin alpha) sterile pwdr/ sterile sol (only 1000, 2000, 3000, 4000, 5000 IU)
- Epoetin beta sterile sol (only 2000, 3000, 5000 IU)

9.1.3 Drugs used in bone marrow transplantation

- Filgrastim sterile sol
- Lenograstim sterile pwdr

9.2 Fluids and electrolytes

- Dextran in normal saline with/without dextrose sterile sol
- Glucose with/without sodium chloride sterile sol
- Intermittent peritoneal dialysis sterile sol
- Potassium acetate sterile sol (hosp)
- Potassium chloride syr (hosp), sterile sol
- Potassium citrate oral sol (hosp), dry pwdr for oral sol (hosp)
- Sodium acetate sterile sol (hosp)
- Sodium bicarbonate tab, sterile sol
- Sodium chloride tab (only 300 mg), sterile sol
- Sodium lactate intravenous infusion compound (Hartmann's solution for injection; Ringer - Lactate solution for injection) sterile sol
- Water for injection sterile sol
- Calcium polystyrene sulfonate oral pwdr
- Continuous ambulatory peritoneal dialysis basic bag sol, double bag sol

9.3 Vitamins

- Folic acid tab (only 400 mcg & 5 mg)
- Multivitamins syr c
- Multivitamins drop
- Multivitamins cap, tab
- Vitamin A cap, tab (only 25,000-50,000 IU per 1 cap/tab)
- Vitamin B1 tab (only 100 mg), sterile sol
- Vitamin B12 (cyanocobalamin , hydroxocobalamin) tab (not less than 100 mcg), sterile sol (only 1 mg)
- Vitamin B2 tab (not less than 10 mg)
- Vitamin B6 (Pyridoxine hydrochloride) tab (not less than 50 mg), sterile sol

- Vitamin C tab (only 50, 100 mg)
- Vitamin D2 (Ergocalciferol) cap
- Vitamin K1 (phytomenadione) sterile sol
- Vitamin B complex cap, tab
- Vitamin C sterile sol
- Vitamin B complex sterile sol composition of Vitamin B1, B2, B6 & Niacinamide
- Alfacalcidol (1 alpha-hydroxyvitamin D3) cap, tab
- Vitamin E emulsion (hosp)

9.4 Intravenous nutrition

- Amino acid solution for newborns sterile sol composition of isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine, histidine & contain tyrosine, cysteine & arginine & No sugar alcohol
- Amino acid solution : high branched chain amino acid sterile sol composition of i branch chain amino acid 35-45% ของ total amino acid
- Amino acid solution : high essential amino acid sterile sol composition of iessential amino acid > 60% of total amino acid
- Amino acids with/without minerals sterile sol
- Complete water-soluble and fat soluble vitamins preparation preparation for intravenous use (sterile pwdr, sterile sol, sterile emulsion)
- Complete water-soluble and fat soluble vitamins preparation from formulation of Fat soluble vitamins 4 types : A, D, E, K & water soluble vitamins 9 types : B1, B2, B6, B12, niacinamide, folic acid , pantothenic acid , biotin , Vitamin C
- Dextrose solution with minerals with electrolytes sterile sol
- Fat emulsion sterile emulsion (only 10%, 20%)
- Fat emulsion composition of long chain triglycerides & phospholipids have/not have medium chain triglycerides (MCT)
- Multiple trace minerals solution , sterile sol

9.5 Minerals

- Aluminium hydroxide tab, susp, susp (hosp)
- Calcium carbonate cap, tab
- Calcium gluconate sterile sol
- Ferrous sulfate cap, tab, oral sol, drop
- Iodine cap
- Magnesium hydroxide tab, susp, susp (hosp)
- Magnesium sulfate sterile sol
- Sodium fluoride tab, oral sol
- Trace element solution oral sol (hosp)
- Zinc sulfate oral sol (hosp)
- Ferrous fumarate cap, tab, oral sol, susp
- Copper sulfate solution sterile sol (hosp)
- Dipotassium hydrogen phosphate sterile sol
- Oral acidic phosphate solution (Joulie's solution), Oral sol (hosp) composition of Potassium phosphate and/or Sodium phosphate

monobasic/dibasic

- Oral neutral phosphate solution oral sol (hosp) composition of Potassium phosphate and/or Sodium phosphate monobasic/dibasic
- Zinc sulfate cap, tab, sterile sol (hosp)

9.6 Vitamin and Minerals for pregnancy

- Ferrous fumarate tab (only 65 mg as iron)
- Ferrous sulfate tab (only 60 & 65 mg as iron)
- Folic acid tab (only 400 mcg)
- Potassium iodide tab (only 150 mcg as iodine)
- Ferrous salt + Folic acid tab (only 60 mg as iron + 400 mcg)
- Ferrous salt + Folic acid + Potassium iodide tab (only 60 mg as iron + 400 mcg + 150 mcg as iodine)

10. Musculoskeletal and joint diseases

10.1 Drugs used in rheumatic diseases and gout

10.1.1 Non-steroidal anti-inflammatory drugs

- Aspirin (Acetylsalicylic acid) tab, EC tab
- Diclofenac sodium EC tab, sterile sol
- Ibuprofen film coated tab, susp
- Indomethacin cap
- Naproxen compressed tab (as base)
- Piroxicam cap (as base), compressed tab (as base), film coated tab (as base)

10.1.2 Disease-modifying antirheumatic drugs (DMARDs)

- Chloroquine phosphate compressed tab, film coated tab
- Hydroxychloroquine sulfate tab
- Azathioprine tab
- Methotrexate tab (as base or sodium), sterile pwdr/sterile sol (as sodium)
- Penicillamine (D-Penicillamine) cap
- Sulfasalazine EC tab
- Sodium aurothiomalate sterile sol
- Ciclosporin (Cyclosporin) cap, oral sol, sterile sol

10.1.3 Drugs for treatment of gout and hyperuricaemia

- Colchicine tab
- Allopurinol tab
- Probenecid film coated tab
- Benzbromarone tab

10.2 Drugs used in neuromuscular disorders

10.2.1 Drugs which enhance neuromuscular transmission

- Pyridostigmine bromide tab
- Neostigmine methylsulfate sterile sol

10.2.2 Skeletal muscle relaxants

- Diazepam cap, tab, sterile sol
- Baclofen tab
- Tizanidine hydrochloride tab

10.3 Drugs for relief of soft-tissue inflammation

10.3.1 Rubifacients

- Methyl salicylate cream compound cream (hosp)
- Methyl salicylate ointment compound (Analgesic Balm) oint (hosp)

11. Eye

11.1 Anti-infective eye preparations

11.1.1 Antibacterials and eye wash solution

- Boric acid eye wash sol
- Chloramphenicol eye drop, eye oint
- Tetracycline hydrochloride eye oint
- Gentamicin sulfate eye drop, eye oint
- Polymyxin B sulfate + Neomycin sulfate + Gramicidin eye drop
- Fusidic acid eye drop (in gel base)

11.1.2 Antibacterials with corticosteroids

- Dexamethasone sodium phosphate + Neomycin sulfate eye drop
- Dexamethasone sodium phosphate + Chloramphenicol + Tetrahydrozoline hydrochloride eye drop
- Dexamethasone + Neomycin sulfate + Polymyxin B sulfate eye oint

11.1.3 Antifungals

- Natamycin eye susp

11.1.4 Antivirals

- Aciclovir (Acyclovir) eye oint

11.2 Corticosteroids and other anti-inflammatory preparations

- Antazoline hydrochloride + Tetrahydrozoline hydrochloride eye drop
- Fluorometholone eye susp (as base)

- Prednisolone acetate eye susp
- Sodium cromoglycate (Cromolyn sodium) eye drop

11.3 Mydriatics and cycloplegics
- Atropine sulfate eye drop
- Cyclopentolate hydrochloride eye drop
- Phenylephrine hydrochloride eye drop
- Tropicamide eye drop

11.4 Drugs for treatment of glaucoma
- Glycerol oral sol (hosp)
- Acetazolamide tab
- Pilocarpine eye drop (as hydrochloride or nitrate)
- Timolol maleate eye drop
- Betaxolol hydrochloride eye susp, eye sol
- Brimonidine tartrate eye drop
- Brinzolamide eye susp
- Bimatoprost eye drop

11.5 Local anaesthetics
- Tetracaine hydrochloride eye drop

11.6 Tear deficiency, ocular lubricants and astringents
- Hypromellose (with preservative) eye drop
- Carbomer (with preservative, with/without sorbitol) eye gel
- White petrolatum + Mineral oil + Liquid lanolin anhydrous (preservative free) eye oint
- Hypromellose + Dextran 70 (preservative free) eye drop
- Acetylcysteine (N-acetylcysteine) eye drop
- Dried protein-free dialysate of calf blood eye gel

11.7 Ocular diagnostic and peri-operative preparations and photodynamic treatment
- Balance salt sol for ocular irrigation, sol for intraocular irrigation
- Carbachol sterile sol for intraocular use
- Diclofenac sodium with preservative eye drop
- Fluorescein sodium sterile sol for inj
- Sodium chondroitin sulfate + Sodium hyaluronate sterile sol for intraocular use
- Sodium hyaluronate sterile sol for intraocular use
- Verteporfin sterile pwdr for intravenous infusion

12. Ear, nose, or pharynx and oral cavity

12.1 Drugs acting on the ear

12.1.1 Otitis externa & otitis media
- Chloramphenicol ear drop
- Dexamethasone + Framycetin sulfate + Gramicidin ear drop/ear oint (only 0.5 mg+5 mg+0.05 mg in 1 ml or 1 g)
- Hydrocortisone + Neomycin sulfate + Polymyxin B sulfate ear drop (only 10 mg + 3400 U + 10000 U in 1 ml)

12.1.2 Drug used in otomycosis
- Acetic acid ear drop (hosp) (only 2% in aqueous & 2% in 70% isopropyl alcohol)
- Boric acid ear drop (hosp) (only 3% in isopropyl alcohol)
- Gentian violet sol (hosp)
- Clotrimazole ear drop

12.1.3 Other drugs acting on the ear
- Ofloxacin ear drop
- Sodium bicarbonate ear drop (hosp)

12.2 Drugs acting on the nose

12.2.1 Drugs used in nasal allergy
- Beclometasone dipropionate nasal spray
- Budesonide nasal spray
- Fluticasone propionate nasal spray

- Triamcinolone acetonide nasal spray

12.2.2 Topical nasal decongestants
- Ephedrine hydrochloride nasal drop (hosp) (only 0.5-3%)
- Sodium chloride sterile sol (for irrigation) (only 0.9%)
- Oxymetazoline hydrochloride nasal drop, nasal spray

12.3 Drugs acting on the oropharynx and oral cavity

12.3.1 Drugs used in treatment of oral ulcer
- Borax (in glycerin) sol, sol (hosp)
- Chlorhexidine gluconate mouthwash sol (only 0.1-0.2% w/v)
- Fluocinolone acetonide oral cream (hosp), oral gel (hosp), sol (hosp)
- Talbot's solution sol (hosp)
- Iodine Paint, compound sol (hosp)
- Iodofrom (in ether) sol (hosp)

12.3.2 Oropharyngeal antifungal drugs
- Clotrimazole lozenge
- Miconazole nitrate oral gel
- Nystatin oral susp

12.3.3 Antiseptics for root canal treatment
- Camphorated parachlorophenol sol (hosp)
- Camphorated phenol sol (hosp)
- Chlorhexidine gluconate sol (hosp) (only 2%)
- Clove oil
- EDTA sol (hosp) (only 14% or 17%)
- Formocresol (Cresolated formaldehyde, Formaldehyde and Cresol solution) sol (hosp)
- Sodium hypochlorite sol (hosp)

12.3.4 Drugs used in prevention and treatment of dental plaque and caries
- Chlorhexidine gluconate mouthwash sol (only 0.1-0.2%w/v)
- Sodium fluoride tab, oral sol

12.3.5 Other dental preparations
- Epinephrine (Adrenaline) sterile sol
- Artificial saliva (Saliva substitutes) sol (hosp)
- Hydrogen peroxidemouthwash sol (1.5% w/v)
- Sodium chloride sterile sol
- Special mouthwash mouthwash sol (hosp)
- Tincture of iodine (lodine in alcohol) sol, sol (hosp)
- Zinc oxide pwdr (hosp)
- Zinc oxide with zinc acetate pwdr (hosp)
- Carnoy's solution sol (hosp)
- White head varnish varnish (hosp)

13. Skin

13.1 Anti-infective skin preparations

13.1.1 Antibacterial preparations
- Sulfadiazine silver (Silver sulfadiazine) cream
- Fusidic acid cream
- Sodium fusidate oint
- Mupirocin oint

13.1.2 Antifungal preparations
- Benzoic acid + Salicylic acid (Whitfield’s ointment) oint, oint (hosp)
- Sodium thiosulfate sol, sol (hosp)
- Clotrimazole cream
- Ketoconazole cream

13.1.3 Parasiticidal preparations
- Benzyl benzoate emulsion/lotion (only 25%)
- Sulfur (Sulphur) oint
- Lindane (Gamma benzene hexachloride) cream

13.2 Emollient and barrier preparations
- Aluminium acetate (Aluminium subacetate)sol (hosp)
- Mineral oil (hosp)

- Olive oil
- Urea cream (hosp), oint (hosp)
- White petrolatum oint (hosp)
- Zinc oxide oint (hosp), paste (hosp)
- Zinc sulfate lotion (hosp)

13.3 Topical antipruritics
- Calamine lotion, lotion (hosp)
- Menthol + Phenol + Camphor topical dosage form (hosp)

13.4 Topical corticosteroids
- Hydrocortisone acetate cream
- Prednisolone cream
- Betamethasone dipropionate cream, oint
- Betamethasone valerate cream
- Triamcinolone acetonide cream, lotion
- Clobetasol propionate cream
- Betamethasone valerate lotion, sol
- Desoximetasone (Desoxymethasone) cream
- Betamethasone dipropionate + Salicylic acid oint (only 0.05% + 3%)
- Clobetasol propionate oint
- Clobetasol propionate lotion
- Mometasone furoate cream

13.5 Other preparations for psoriasis (excluding topical corticosteroids)
- Coal tar topical dosage form (hosp)
- Salicylic acid lotion (hosp)
- Dithranol (Anthralin) paste (hosp)
- Methotrexate tab (as base or sodium)
- Methoxsalen tab, topical sol (paint)
- Calcipotriol oint
- Acitretin cap
- Ciclosporin (Cyclosporin) cap, oral sol

13.6 Preparations for warts and calluses
- Podophyllin (Podophyllum resin) paint, paint (hosp)
- Salicylic acidoint (hosp), paste (hosp)
- Silver nitrate sol (hosp), crystal (hosp),stick (hosp)
- Trichloroacetic acid sol (hosp)
- Salicylic acid + Lactic acid colloidal sol

14. Immunological products and vaccines
- Anti-D immunoglobulin, human inj
- BCG vaccine (Bacillus Calmette-Gu`rin) inj
- Diphtheria antitoxin (DAT) inj
- Diphtheria-Tetanus vaccine , DT(children type) & DT (adult type) inj
- Diphtheria-Tetanus-Pertussis vaccine (whole cell) (DTPw) inj
- Diphtheria-Tetanus-Pertussis-Hepatitis B vaccine (DTP-HB) inj
- Hepatitis B vaccine (HB) inj
- Influenza vaccine (trivalent) strain conform to WHO formulation inj
- Influenza vaccine pandemic strain influenza strain conform to WHO formulation inj
- Japanese encephalitis vaccine (JE) inj
- Measles-Mumps-Rubella vaccine (MMR) inj
- Measles vaccine inj
- Poliomyelitis vaccine, live attenuated (OPV) oral sol, oral susp
- Rabies immunoglobulin, horse (ERIG) inj
- Rabies vaccines except for human diploid cell vaccine (HDCV) inj
- Rubella vaccine inj
- Tetanus antitoxin, horse inj
- Tetanus vaccine (Tetanus toxoid) inj
- Rabies immunoglobulin, human (HRIG) inj

- Tetanus antitoxin, human (Anti-tetanus immunoglobulin, human) inj
- Hepatitis B immunoglobulin, human (HBIG) inj

15. Anaesthesia

15.1 General anaesthesia

15.1.1 Intravenous anaesthetics

- Propofol sterile emulsion
- Thiopental sodium (Thiopentone sodium) sterile pwdr
- Ketamine hydrochloride sterile sol

15.1.2 Inhalational anaesthetics

- Halothane volatile liquid
- Isoflurane volatile liquid
- Sevoflurane volatile liquid

15.1.3 Muscle relaxants (Neuromuscular blocking drugs)

- Atracurium besilate sterile sol
- Cisatracurium besilate sterile sol
- Pancuronium bromide sterile sol
- Rocuronium bromide sterile sol
- Suxamethonium chloride (Succinylcholine chloride)sterile pwdr, sterile sol
- Vecuronium bromide sterile pwdr

15.1.4 Sedative and analgesic peri-operative drugs

- Diazepam cap, tab, sterile sol
- Fentanyl citrate sterile sol
- Morphine sulfate sterile sol
- Pethidine hydrochloride sterile sol
- Midazolam hydrochloride sterile sol
- Midazolam maleate tab

15.1.5 Anticholinesterases and antimuscarinic drugs used in anaesthesia

- Atropine sulfate sterile sol
- Neostigmine methylsulfate sterile sol

15.2 Local anaesthesia

- Benzocaine gel, oint
- Lidocaine + Prilocaine cream
- Lidocaine hydrochloride gel, oint, spray, sterile sol (dental cartridge), sterile sol (local infiltration), viscous sol
- Lidocaine hydrochloride + Epinephrine sterile sol (local infiltration), sterile sol (dental cartridge)
- Mepivaciane hydrochloride sterile sol (dental cartridge)
- Mepivaciane hydrochloride + Epinephrine sterile sol (dental cartridge)
- Bupivacaine hydrochloride sterile sol (local infiltration)
- Bupivacaine hydrochloride sterile sol (spinal, epidural)

16. Antidotes

- Acetylcysteine (N-acetylcysteine) sterile sol
- Antivenom sera sterile preparation
  : King Cobra antivenin
  : Cobra antivenin
  : Banded Krait antivenin
  : Malayan Krait antivenin
  : Malayan Pit Viper antivenin
  : Green Pit Viper antivenin
  : Russell's Viper antivenin
- Atropine sulfate sterile sol
- Bentonite magma susp (hosp)
- Benzatropine mesilate (Benztropine mesylate) sterile sol
- Calcium gluconate sterile sol
- Charcoal, activated pwdr
- Diazepam sterile sol
- Diphenhydramine hydrochloride cap, sterile sol
- Ethanol sterile sol

- Macrogols with electrolytes (Polyethylene glycol, PEG) oral pwdr (hosp)
- Naloxone hydrochloride sterile sol
- Pralidoxime chloride (2-PAM) sterile pwdr
- Sodium bicarbonate sterile sol (only 44.6 mEq)
- Vitamin K1 (Phytomenadione) sterile sol
- Sodium calcium edetate (Edetate calcium disodium, Calcium EDTA) sterile sol
- Cyclophosphamide sterile pwdr
- Deferoxamine mesilate (Desferrioxamine mesilate) sterile pwdr
- Penicillamine (D-Penicillamine) cap
- Protamine sulfate sterile sol
- Sodium nitrite sterile sol (hosp)
- Sodium thiosulfate sterile sol (hosp)
- Vitamin B6 (Pyridoxine hydrochloride) sterile sol (only 50 mg)
- Calcium folinate (Leucovorin calcium) cap, tab, sterile pwdr, sterile sol
- Flumazenil sterile sol
- Mesna sterile sol
- Norepinephrine (Noradrenaline) sterile sol (as bitartrate or hydrochloride)
- Phenobarbital sodium (Phenobarbitone sodium) sterile pwdr

17. Contrast media and Radiopharmaceuticals

17.1 X - ray contrast media, iodinated

17.1.1 Drugs used in urography and computed tomography
- Iopromide sterile sol (only 300 & 370 mg/ml as iodine), (50 ml, 100 ml)
- Meglumine ioxitalamate + Sodium ioxitalamate sterile sol (only 350 mg/ml as iodine), (50 ml)

17.1.2 Drugs used in angiography
- Iohexol sterile sol (only 300 mg/ml as iodine), (100 ml)
- Iopromide sterile sol (only 300 mg/ml as iodine), (100 ml)

17.1.3 Drugs used in myelography
- Iopamidol sterile sol (only 300 mg/ml as iodine), (10 ml)

17.1.4 Drugs used in cardiovascular catheterization
- Iobitridol sterile sol (only 300 & 350 mg/ml as iodine), (50 ml)
- Iopromide sterile sol (only 300 & 370 mg/ml as iodine), (50 ml, 100 ml)
- Meglumine ioxitalamate + Sodium ioxitalamate sterile sol (only 350 mg/ml as iodine), (50 ml, 100 ml)

17.1.5 Drugs used in Intracavitary, Hysterosalpingography (HSG), Urethrography, Voiding cysto-urethrography
- Meglumine ioxitalamate + Sodium ioxitalamate sterile sol (only 350 mg/ml as iodine), (50 ml, 100 ml)

17.2 X - ray contrast media, non - iodinated
- Barium sulfate pwdr for oral susp

17.3 Magnetic resonance imaging contrast media (MRI diagnostic agents)
- Meglumine gadopentetate sterile sol (only 469 mg/ml of gadopentetic acid), (10 ml, 15 ml)

17.4 Radiopharmaceuticals
- Tc-99m dextran sterile sol for inj (hosp)
- Tc-99m diethylene triamine penta acetic acid (DTPA) sterile sol for inj (hosp), aerosol for inhalation (hosp)
- Tc-99m dimercaptosuccinic acid V (DMSA [V]) sterile sol for inj (hosp)
- Tc-99m dimercaptosuccinic acid (DMSA) sterile sol for inj (hosp)
- Tc-99m iminodiacetic acid (IDA) sterile sol for inj (hosp)
- Tc-99m methylene diphosphonate (MDP) sterile sol for inj (hosp)
- Tc-99m phytate sterile sol for inj (hosp), aerosol for inhalation (hosp)
- Tc-99m sulfur colloid sterile sol for inj (hosp)

6. Difficulties and constraints in Quality Assurance of Essential Medicines (e.g. GMP, etc.) that Thailand facing these days and clear directions in the future.

1) Substandard pharmaceutical products

1.1 Herbal medicines

Herbal medicines play an important role in the everyday life of the Thai people. The use of herbal medicines has increased remarkably in line with the global trend of people returning to natural therapies. The Government and authorities concerned have taken part in the promotion and regulation of local herbal medicines in order to ensure that their quality, efficacy and safety meet international requirements and those they are used rationally. Manufacturers are also encouraged by the Government to improve their production standards to meet the requirements of Good Sanitation Practice for traditional medicine which adopt from PIC/S core GMP chapter 2-5, ASEAN Good Manufacturing Practices (ASEAN GMP) and to conform to the higher specifications needed for the global market such as PIC/S standard. Now, Thailand has participated in the development of the new ASEAN Guidelines on GMP for Traditional Medicines and Health Supplement which adopt from full PIC/S GMP standard.

Good Sanitation Practice for herbal and traditional medicine in Thailand is the beginning step for herbal or traditional medicine manufacture. It is currently being implemented and recommended that herbal medicinal products should be manufactured in a Good Sanitation Practice environment to ensure acceptable quality.

The problem affecting the quality of traditional drugs about microbial contamination usually found since herbal medicinal products must therefore comply with the accepted limits for microbial stability specified in the Thai Pharmacopoeia, although the use of synthetic preservatives is permitted and heavy metal contamination. The exceeding contamination of heavy metal in herbal or traditional medicinal products was found sometime especially the contamination of Arsenic, Lead, and Cadmium. An adulteration of modern medicine in traditional medicine such as Steroid, Sibutramine and Sildenafil analogue occasionally found.

Thai traditional medicine is a valuable heritage of the Thai people. The Royal Thai Government has tried to revitalize its significance as an effective alternative treatment.

1.2 Modern medicines

In order for the country's healthcare system to become more self-reliance and cost-effective. The National Policy on Drugs is elaborated on avocations on local manufacturing of raw materials from locally available resources for domestic supply and for export and upgrading along with promoting of domestic pharmaceutical industry and generic drug usage. However, Thailand still faces the problem from substandard products of essential medicines that destroy confidence in using domestic pharmaceutical products of Thailand.

Out of the total number of 169 pharmaceutical manufacturers in Thailand , 159 are producing finished products , only 10 are producing 25 different kinds of raw materials. The proportion of locally produced drugs as compared imported ones experienced a downward trend from 40 : 60 in 2006 to 31 : 69 in 2010.

2) Technology advance and legislation

Nowadays, advanced technology applied in pharmaceutical industry, especially in joint-ventured company. Although Thai FDA has the role in evaluating and monitoring medicinal products before and after placing in the market, in order to reach the goal, Thai FDA have built network together with academe, NGO, importers and manufacturers. However, Thai FDA is facing the lack of knowledge and skill on developing drug system. The current Thai GMP is adapted from Pharmaceutical Inspection Co-operation Scheme (PIC/S) Guide to Manufacturing Practices for Medicinal Products PE 009-9 1 September 2009, which is not cover for traditional medicine manufactured in the country. Moreover, the Thai GMP regulation does not cover some particular topics in annexes of PIC/S such as manufacture of immunological veterinary medical products, manufacture of medicinal gases, manufacture of investigational medicinal products, manufacture of products derived from human and parametric release. So the GMP regulation needs to be revised.

The opportunity to gain technique and knowledge from leading country by attending the training course. All the obtained experience can guide the optimal way in development.

3) Manufacturing

There are somes problems of the manufactures such the GPO,as followings;

- Lack of human resources, instrument and place.
- Increase output affects improvement GMP.
- More workload of human and machine.
- The old production building is difficult to make adjustment.
- Most equipments, raw materials and reference standards use in quality control are imported and expensive.
- Quality management is not complete because of work is mostly not done according to The SOPs/work instructions or other documentation.

7. Current situation concerning Substandard Medicines and its countermeasures.

The current substandard situation in past 3 years are shown in the table as below:

Collected Case/ office	Year		
	2009	2010	2011
Surveillance of Hospital	19%	8%	8%
Cooperation Surveillance of DMSc & Bureau of Drug Control, FDA	11%	14%	13%
Cooperation Surveillance of DMSc & Bureau of Import and Export Inspection, FDA	6%	9%	8%
Special Case/ Complaint	23%	11%	12%
Other case	3%	12%	10%
RBM (Roll back Malaria Project)	8%	-	-

The out of specification products are collected form various sources. The cooperation surveillance of DMSc & Bureau of Drug control or Bureau of Import and Export Inspection collect the sample form local manufacturer and port of entry, respectively. The defect of quality problems are not only the assay but also dissolution, related substances, uniformity of content, etc. The main problems are dissolution, related substances and deforming activity of antacid medicines.

For Traditional medicines, the main problem affecting the quality of traditional drugs is microbial contamination which is about 25% are substandard from this problem. The other problem is from heavy metal contamination which is about 5%.

8. Relationship with Overseas Assistance Organization

In the analytical area, Ministry of public health has close relationship with others foreign country organization such as USP which in 2009 the DMSc was performed cooperation on the project of Quality Assurance of Antimalarial Drug in the Mekong Region. The Roll Back Malaria (RBM) in the Mekong Region was initiated by WHO in 1999 with the objective to reduce mortality and morbidity due to malaria in Mekong countries. It has been identified that counterfeit/substandard drugs are one of the serious problems that hamper the achievement of the goal of rolling back malaria. WHO in collaboration with United States Pharmacopoeia (USP) conducted a survey in 2002 on the drug quality assurance capacity of existing laboratory facilities in five Mekong countries. Bureau of Drug and Narcotic, Thailand national laboratory for drug quality control was also visited by WHO-RBM and USP Drug Quality Information (USP-DQI) for the evaluation of the competency in the analysis of antimalarial drug products. As a result of the evaluation the Bureau was selected to be an international center for antimalarial drug analysis in Southeast Asia.

In the analytical area, there are other relationship with JPMA (Japan pharmaceutical Manufacture Association). DMSc has cooperation in the project on ASEAN Reference Substances. This project is established as part of regional cooperation among the ASEAN countries to ensure the quality, safety and efficacy of pharmaceuticals in the ASEAN region. ASEAN Reference Substances Project was technically supported by WHO and financially supported by UNDP and JPMA, with Thailand as the coordinating center. These standards are validated in the national

laboratories of the ASEAN member countries; Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam and are formally adopted after stringent qualitative and quantitative tests are carried out on the candidate substances. These substances provide the ASEAN laboratories with readily available and affordable reference materials for their routine quality control analysis and also available to the pharmaceutical industries

On the GMP area, Thai FDA has relationship with overseas government organization such as Therapeutic Good Administration (TGA), U.S. Food and Drug Administration (US FDA) , Malaysian National Pharmaceutical Control Bureau (NPCB), Singapore's Health Sciences Authority (HSA), Korea Food and Drug Administration (KFDA) and other private organization such as ISPE (International Society for Pharmaceutical Engineering).

9. Technical Assistance Programs in the fields of Pharmaceuticals, GMP, Quality Control organized by International Organizations show in the table beow :

Program Name/ Outline	Duration	Organizer	Aims
The cGMP Influenza Vaccine Manufacturing training program	3 weeks	US FDA	Training/ site visit
Project of Quality Assurance of Antimalarial Drug in the Mekong Region	1 year	USP	Surway Research
Study Programme on Manufacturing Control of Essential Drugs	28 days	JICA	Training/ site visit
GMP study program	1 month	JICWELS	Training/ site visit
The project on the Production and Utilization of ASEAN Reference Substances	4 years	JPMA	Make available of ASEAN Reference Substances (ARS)
Communicable Disease Prevention	29 days	KOICA Korea	Training/ site visit
GTN on Vaccine Quality "GMP" course	9 days	WHO/ Korea	Training
Global training for vaccine quality course on Good Manufacturing Practices (GMPs) Inspection for vaccines	11 days	KFDA /Korea	Training/ site visit
Drug Information In Australia and GMP	6 weeks	DIA (Drug Information Association)-TGA	Training/ site visit
GMP Inspection training course	5 days	TOEL/ USA	Training
BIOKOREA Conference & Exhibition	4 days	KFDA /Korea	Meeting
Upstream Bioprocessing training and workshop	5 days	WHO	Training

出典：平成 24 年度 JICA 集団研修カントリーレポート

- 平成 24 年度 JICA 集団研修「必須医薬品製造品質管理（GMP）」

Japan International Corporation of Welfare Services (JICWELS) was established with the sanction of the Minister for Health, Labour and Welfare in July 1983 and implements international technical cooperation programmes with purpose of contributiing to the promotion of health and social welfare activities in the friendly nations.

Japan International Corporation of Welfare Services (JICWELS)
Toranomon YHK Bldg. 4F, 2-3-20, Toranomon
Minato-ku, Tokyo 105-0001 JAPAN
Phone: +81-(0)3-6206-1137
Fax: +81-(0)3-6206-1164
http://www.jicwels.or.jp

公益社団法人国際厚生事業団（JICWELS）は、国際的な保健・福祉分野の国際協力に貢献することを目的として、1983 年（昭和 58 年）7 月 7 日に厚生省（現厚生労働省）から社団法人の認可を受け設立されました。開発途上国の行政官研修や WHO フェローの受入れ、調査企画や研究開発並びに情報の交換及び広報活動など、海外諸国との国際交流活動を推進しています。

公益社団 国際厚生事業団 JICWELS
広報活動委員会

〒105-0001
東京都港区虎ノ門 2-3-20 虎ノ門ＹＨＫビル 4 階
電話 03-6206-1137（事業部）　Fax03-6206-1164
http://www.jicwels.or.jp