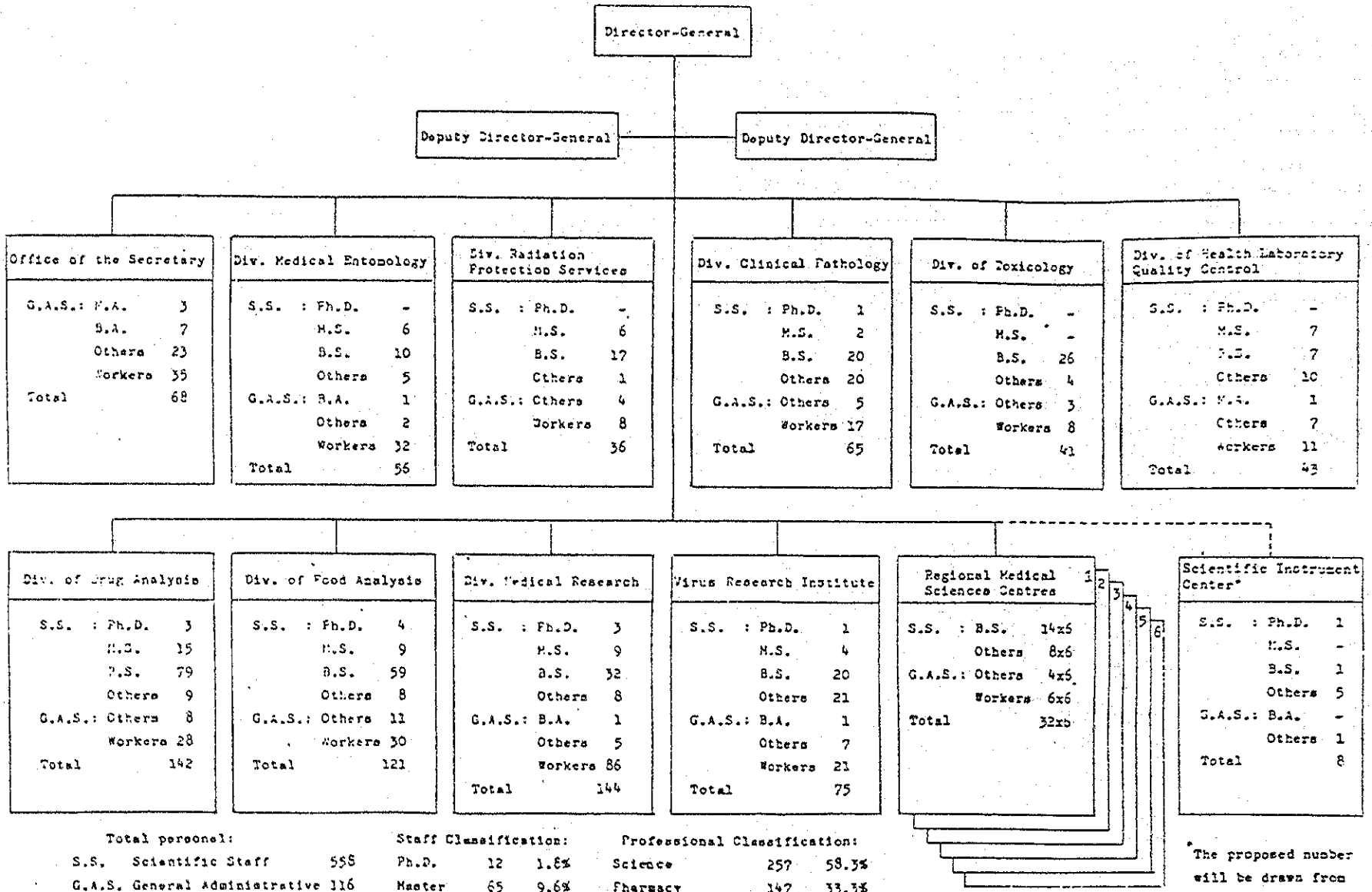
Organization Chart and Staff of Department of Medical Sciences.



Total personel:

S.S.	Scientific Staff	558
G.A.S.	General Administrative Staff	116
	Workers	312
	Total	986

Staff Classification:

Ph.D.	12	1.8%
Master	65	9.6%
Bacherer	364	54.0%
Others	233	34.6%
Total	674	100.0%

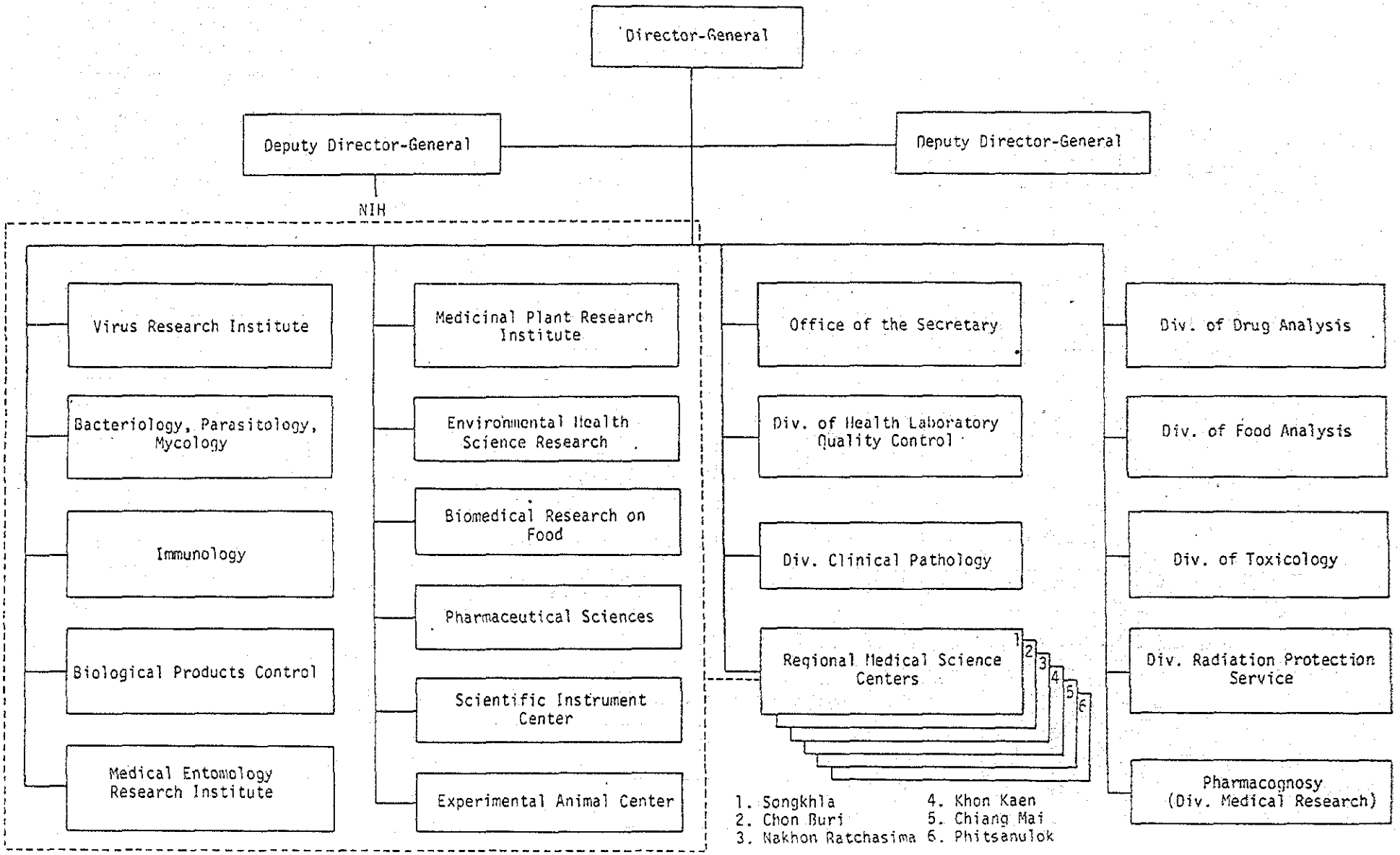
Professional Classification:

Science	257	58.3%
Pharmacy	147	33.3%
Doctor of medicine	16	3.6%
Veterinary	7	1.6%
Social science	14	3.2%
Total	441	100.0%

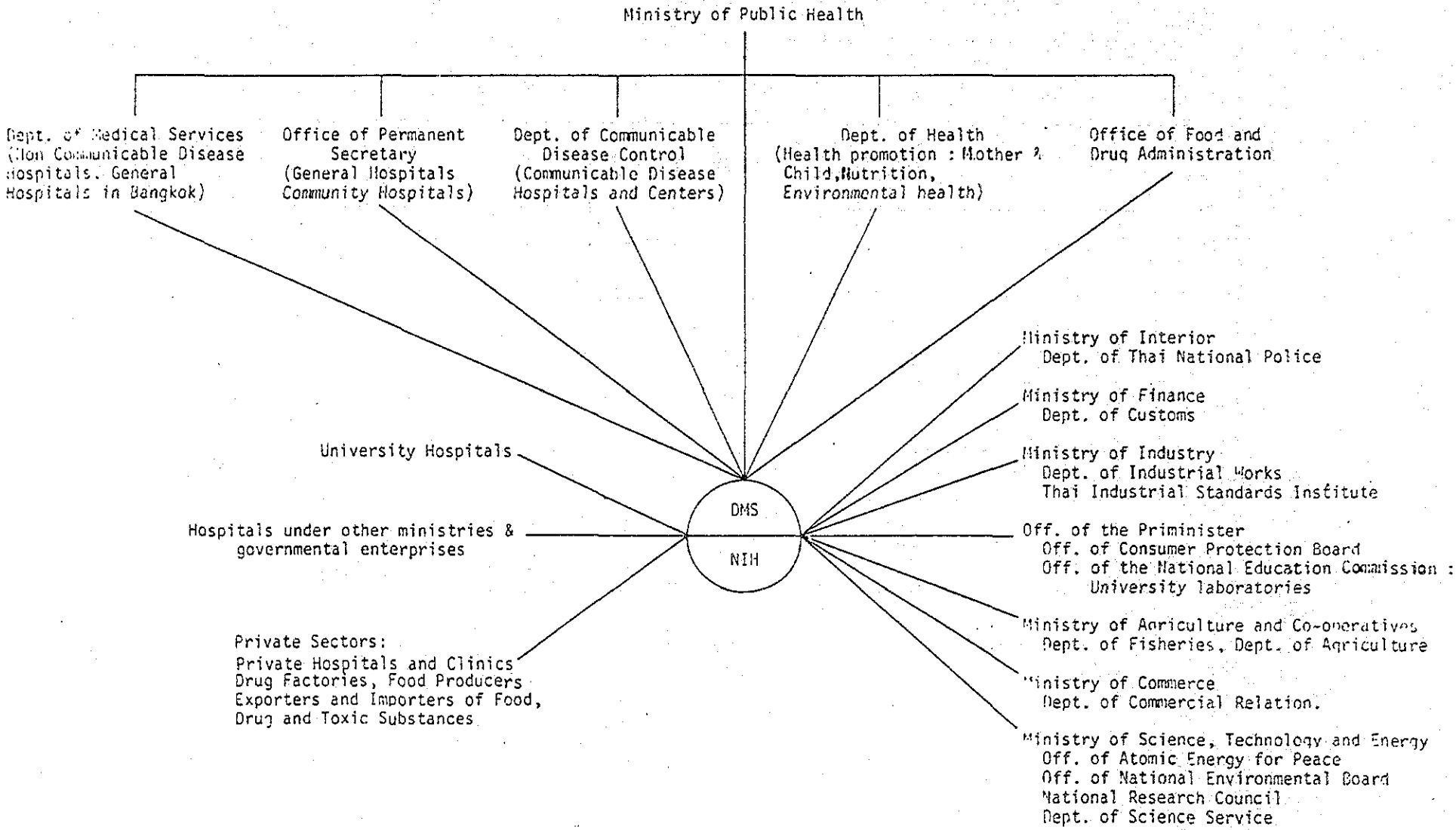
*The proposed number will be drawn from other divisions.

October 1, 1983

Department of Medical Sciences



RELATIONSHIPS BETWEEN DMS/NIH AND OTHER ORGANIZATIONS



4. ASSISTANCE REQUESTED (1984 - 1988)

Activities	EXPERTS		FELLOWSHIPS	
	No.	m/m	No.	m/m
1. Research Planning and Statistics	2	24	-	-
2. Virology	5	42	5	48
3. Immunology	2	18	2	24
4. Bacteriology, Mycology & Parasitology	4	30	7	54
5. Biological Products Control	4	12	6	36
6. Medical Entomology	5	21	6	45
7. Medicinal Plant Research	2	30	8	84
8. Environmental Health Science Research	2	24	3	36
9. Biomedical Research on Food	3	36	7	54
10. Pharmaceutical Sciences	2	18	6	51
11. Scientific Instrument Center	4	21	6	35
12. Experimental Animal Centers	1	12	1	6
13. General Administration	-	-	6	18
14. Regional laboratories	-	-	23	132
Total	36	288	86	623

4.1 Expert

Field of operation/Activity	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
1. Research planning & statistic	2	24	1	12	1	12	-	-	-	-	-	-
2. Immunology	2	18	1	12	-	-	-	-	-	-	1	6
3. Virology												
3.1 RIA of viral diseases	1	12	1	12	-	-	-	-	-	-	-	-
3.2 Rickettsial diseases	1	6	-	-	-	-	1	6	-	-	-	-
3.3 Mycoplasma	1		-	-	-	-	1	6	-	-	-	-
3.4 Biotechnology	1	12	-	-	-	-	-	-	1	12	-	-
3.5 Oligonucleotide Mapping	1	6	-	-	1	6	-	-	-	-	-	-
4. Bacteriology, Mycology & Parasitology												
4.1 Identification of the fungi producing toxin, yeast identification and sero-mycology	1	12	-	-	1	12	-	-	-	-	-	-
4.2 Bacterial toxin study	1	6	-	-	1	6	-	-	-	-	-	-
4.3 Plasmid characterization	1	6	-	-	-	-	-	-	1	6	-	-
4.4 Anaerobic bacteriology	1	6	-	-	-	-	1	6	-	-	-	-
5. Biological Products Control												
5.1 Production and Control of JE vaccine	1	3	1	3	-	-	-	-	-	-	-	-
5.2 Quality Control of bacterial vaccines	1	3	-	-	1	3	-	-	-	-	-	-

Field of operation/Activity	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
5.3 Quality Control of viral vaccines	1	3	-	-	-	-	1	3	-	-	-	-
5.4 Quality Control of antitoxins & immunoglobulins	1	3	-	-	-	-	-	-	1	3	-	-
6. Medical Entomology												
6.1 Mosquito ecology	1	3	-	-	-	-	1	3	-	-	-	-
6.2 Ectoparasite	1	6	-	-	-	-	-	-	1	6	-	-
6.3 Insect bacteriology	1	3	-	-	-	-	1	3	-	-	-	-
6.4 Insect Taxonomy	1	3	-	-	-	-	-	-	1	3	-	-
6.5 Electrophoresis study	1	6	-	-	-	-	1	6	-	-	-	-
7. Medicinal Plant Research												
7.1 Pharmacology (Drug evaluation & toxicity)	1	18	-	-	-	-	1	12	(1)	6	-	-
7.2 Pharmacokinetic	1	12	-	-	-	-	-	-	-	-	1	12
8. Environmental Health Science Research												
8.1 Mycotoxin analysis	1	12	-	-	-	-	1	12	-	-	-	-
8.2 Environmental toxicology (chemistry)	1	12	-	-	-	-	-	-	1	12	-	-
9. Biomedical Research on Food												
9.1 Drug and hormone residues in food of animal origin	1	12	-	-	-	-	1	12	-	-	-	-
9.2 Food poisoning bacteria	1	12	-	-	-	-	-	-	-	-	1	12
9.3 Carcinogenic substances in food	1	12	-	-	-	-	-	-	1	12	-	-

Field of operation/Activity	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
10. Pharmaceutical Sciences												
10.1 RIA in Pharmaceutic	1	12	-	-	-	-	1	12	-	-	-	-
10.2 Pharmaceutical animal test and assays	1	6	-	-	-	-	1	6	-	-	-	-
11. Scientific Instrument Center												
11.1 Analytical instruments	1	6	-	-	-	-	1	6	-	-	-	-
11.2 Radioactive analytical tools	1	3	-	-	-	-	-	-	1	3	-	-
11.3 Electronmicroscopy	1	6	-	-	-	-	1	6	-	-	-	-
11.4 Computer application	1	6	-	-	-	-	1	3	-	-	(1)	3
12. Experimental Animal Center												
12.1 Operation and administration	1	12	-	-	-	-	1	12	-	-	-	-
Total	36	288	4	39	5	39	16	114	8	63	3	33

ustification:

- Consultant for research planning and statistic (1) is requested or detail planning of the whole project and performing workshops or seminar research planning and biostatistic.

- Joint project research in various aspects will be performed by ai researchers and Japanese experts (2 - 10)

- Experts for Scientific Instrument Center (11) are scheduled to nduct educational programmes on instrumentation and to develop proper asurement for instrument accreditation. Computer application expert (11.4)

is requested to work on detail system analysis, software development, evaluation and future planning.

- Expert for Experimental Animal Center is required for teaching Thai technicians in organization and management of animal testing.

4.2 Fellowships

Field of study/training	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
1. Virology												
1.1 Rickettsiology	1	12	-	-	1	12	-	-	-	-	-	-
1.2 Biotechnology	1	12	-	-	-	-	-	-	1	12	-	-
1.3 Clamydia and Myooplasma	1	6	-	-	-	-	-	-	-	-	1	6
1.4 Electronmicroscopy (Micotomy)	1	6	-	-	1	6	-	-	-	-	-	-
1.5 CMV and EB viruses	1	12	-	-	-	-	-	-	1	12	-	-
2. Immunology	2	24	-	-	1	12	1	12	-	-	-	-
3. Bacteriology, Mycology & Parasitogy												
3.1 New techniques for bacterial sero-immunology	1	6	1	6	-	-	-	-	-	-	-	-
3.2 Bacterial gastro-intestinal infections	1	6	1	6	-	-	-	-	-	-	-	-
3.3 Antiserum & antigen production	1	6	-	-	1	6	-	-	-	-	-	-
3.4 Mycoses	1	12	-	-	-	-	1	12	-	-	-	-
3.5 Medical parasitology	2	18	-	-	-	-	1	12	1	6	-	-
3.6 Bacterial acute respiratory infections	1	6	-	-	-	-	-	-	1	6	-	-

Field of study/training	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
4. Biological Products Control												
4.1 Production of Japanese Encephalitis vaccine	1	3	1	3	-	-	-	-	-	-	-	-
4.2 Quality Control of DPT vaccine	1	3	-	-	1	3	-	-	-	-	-	-
4.3 Quality Control of live viral vaccines	1	3	-	-	-	-	1	3	-	-	-	-
4.4 Purificartion of pertussis vaccine	1	3	-	-	-	-	-	-	1	3	-	-
4.5 Development of new vaccines	1	12	-	-	-	-	-	-	1	12	-	-
4.6 Production and Control of immuneserum and immunoglobulin	1	12	-	-	-	-	-	-	-	-	1	12
5. Medical Entomology												
5.1 Insect Ecology & Biology	1	6	1	6	-	-	-	-	-	-	-	-
5.2 Insect Taxonomy & Pathology	1	12	-	-	1	12	-	-	-	-	-	-
5.3 Insect Control	1	6	-	-	-	-	1	6	-	-	-	-
5.4 Insect Toxicology	1	6	-	-	-	-	-	-	1	6	-	-
5.5 Biostatistic	1	12	-	-	-	-	-	-	-	-	1	12
5.6 Insect Bioefficacy	1	3	-	-	-	-	-	-	-	-	1	3
6. Medicinal Plant Research												
6.1 Pharmacognosy (Histological Study of Sectional Plants and Powdered Drugs)	1	6	1	6	-	-	-	-	-	-	-	-
6.2 Botany	1	6	-	-	-	-	1	6	-	-	-	-

Field of study/training	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
6.3 Phytochemistry, especially isolation of water-soluble bio-active compounds and structure elucidation	2	24	-	-	1	12	-	-	1	12	-	-
6.4 Organic Synthesis	1	12	-	-	-	-	1	12	-	-	-	-
6.5 Pharmacology	2	24	1	12	-	-	1	12	-	-	-	-
6.6 Pharmacokinetics and Biopharmaceutics	1	12	-	-	1	12	-	-	-	-	-	-
7. Environmental Chemistry												
7.1 Environmental Toxicology	1	12	-	-	1	12	-	-	-	-	-	-
7.2 Toxins Evaluation and Safety Monitoring	1	12	1	12	-	-	-	-	-	-	-	-
7.3 Cosmetic and Health Hazardous Material Analysis	1	12	1	12	-	-	-	-	-	-	-	-
8. Biomedical Research on Food												
8.1 Analytical Food Chemistry	1	12	1	12	-	-	-	-	-	-	-	-
8.2 Food Sciences	1	12	-	-	1	12	-	-	-	-	-	-
8.3 Plastic Food Containers	1	6	1	6	-	-	-	-	-	-	-	-
8.4 Radioimmunoassay	1	6	-	-	1	6	-	-	-	-	-	-
8.5 Enzymatic Analysis	1	6	-	-	-	-	-	-	1	6	-	-
8.6 GC - MS Technique	1	6	-	-	-	-	1	6	-	-	-	-
8.7 Bacterial Toxin in Food by RPLA + ELISA	1	6	-	-	1	6	-	-	-	-	-	-

Field of study/training	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
9. Pharmaceutical Sciences												
9.1 Training in RIA Technique	1	12	-	-	1	12	-	-	-	-	-	-
9.2 Nuclear medicine for pharmaceutical science	1	6	-	-	-	-	1	6	-	-	-	-
9.3 Training in Stability Testing of Pharmaceutical Products	1	6	-	-	1	6	-	-	-	-	-	-
9.4 Biological test of pharmaceuticals and plastic container	1	12	1	12	-	-	-	-	-	-	-	-
9.5 Biological assay of hormone, vitamin and digitaloid drug	1	12	-	-	-	-	1	12	-	-	-	-
9.6 Study tour in animal test and assay laboratory and management	1	3	-	-	1	3	-	-	-	-	-	-
10. Scientific Instrument Center												
10.1 Repair and Maintenance	2	24	-	-	1	12	1	12	-	-	-	-
10.2 Computer Application	1	4	-	-	1	4	-	-	-	-	-	-
10.3 Optical Technology and Computer Application	1	3	-	-	-	-	1	3	-	-	-	-
10.4 Instrumental Laboratory Accreditation	1	1	1	1	-	-	-	-	-	-	-	-
10.5 Study Tour of Instrumental Technique	1	3	-	-	-	-	-	-	-	-	1	3

Field of study/training	Total		1984		1985		1986		1987		1988	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	no.	m/m	No.	m/m
11. Experimantal Animal Center												
11.1 Management of experimental animal center	1	6	-	-	-	-	-	-	1	6	-	-
12. General Administration												
12.1 General administration of laboratories	1	3	1	3	-	-	-	-	-	-	-	-
12.2 Commodity Management	1	3	-	-	1	3	-	-	-	-	-	-
12.3 Doccumentary Management	3	9	1	3	-	-	1	3	-	-	1	3
12.4 Librafy	1	3	-	-	-	-	1	3	-	-	-	-
13. Regional laboratories												
13.1 Drug Analysis	6	24	1	4	1	4	1	4	1	4	2	8
13.2 Food Analysis	6	24	1	4	1	4	1	4	1	4	2	8
13.3 Toxicology	6	24	1	4	1	4	1	4	1	4	2	8
13.4 Microbiology	3	36	1	12	-	-	1	12	-	-	1	12
13.5 Parasitology	2	24	-	-	1	12	-	-	1	12	-	-
Total	86	623	18	124	22	175	19	144	14	105	13	75

4.2.1 Justification for requesting fellowships

Short term programmes and study tours (1-6 months) are required for senior scientists to visit research institutes in Japan in order to gain ideas and have a better understanding in health sciences research.

Long term training fellowships (12 months) are necessary for scientists to increase their experiences and skillful in new techniques for analysis methodologies.

In general, the entire programme for training and study tours will increase the efficiency of manpower in both technical and management areas, improve work output of the whole institute which will lead to the achievement of the project.

4.3 Equipment

	1984	1985	1986	1987	1988	Total
Equipment requested US $	246,440	521,030	345,530	298,960	303,930	1,648,390

Detail of equipment for each research activities is shown on the attached list.

Equipment

Activities	Total (U.S.$)	1984	1985	1986	1987	1988
1. Virology	296,350	-	44,800	108,900	93,700	48,950
2. Bacteriology, Mycology and Parasitology	113,760	54,140	49,420	10,200	-	-
3. Biological products Control	79,000	-	79,000	-	-	-
4. Immunology	44,800	-	12,200	11,800	13,300	7,500
5. Medical Entomology	42,900	-	23,610	8,280	11,010	-
6. Medicinal Plant Research	23,300	23,300	-	-	-	-
7. Environmental Chemistry	60,950	6,600	48,600	5,750	-	-
8. Biomedical Research on Food	130,200	15,600	25,900	25,500	39,200	24,000
9. Pharmaceutical Sciences	102,730	24,200	17,900	17,500	9,150	33,980
10. Regional Laboratories	714,400	122,600	122,600	122,600	122,600	224,000
11. General Services	40,000	-	10,000	10,000	10,000	10,000
Total	1,648,390	246,440	521,030	345,530	298,960	303,930

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
1) Virology								
1. Photographic enlarger	1	3,000	3,000	-	1	-	-	-
2. Electric desicator	1	2,200	2,200	-	1	-	-	-
3. pH meter	1	2,200	2,200	-	1	-	-	-
4. Inverted microscope with photographic apparatus	1	2,000	2,000	-	1	-	-	-
5. Deep freezer, horizontal type (-75°c, 12 cub. ft., with alarm system)	3	11,000	33,000	-	1	1	1	-
6. Deep freezer, upright type (-75°c, 12 cub. ft.) with alarm and temp. recorder)	1	11,000	11,000	-	-	-	1	-
7. Freezer (-20°c, 13 cub. ft) with boxes chest	3	7,000	21,000	-	1	1	1	-
8. Refrigerator (15 cub. ft.)	5	1,300	6,500	-	-	2	2	1
9. Electric autoclave, upright type, chamber dimension 240 mm die x 420 mm high	4	2,800	11,200	-	1	1	1	1
10. Circulating water bath (max. temp. 100°c); 33 cm x 53 cm x 40 cm	3	1,800	5,400	-	1	1	1	-
11. CO_2 incubator (temp. 30-60°c, 6 cub. ft. with CO_2 controller	3	5,000	15,000	-	1	1	-	1
12. Low temperature incubator with humidification system (temp. range 0-50°c, 29 cub. ft.)	1	10,800	10,800	-	-	1	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
13. Incubator (temp. range ambient to 50°c, 10 cub. ft)	5	4,100	20,500	-	-	1	2	2
14. Incubator (temp. range ambient to 50°c, 5 cub. ft.)	1	3,000	3,000	-	1	-	-	-
15. Refrigerating centrifuge (max speed 20,000 vpm with complete rotors and microtiter plate rotor)	1	16,700	16,700	-	-	1	-	-
16. Refrigerating centrifuge (max speed 6,000 rpm) with swinging buckets for 3 ml, 5 ml, 10 ml and 50 ml)	1	4,000	4,000	-	-	-	-	1
17. Ultracentrifuge (max speed 55,000 rpm, with fix, swinging and vertical rotor)	2	40,000	80,000	-	-	1	1	-
18. Larminar flow carbinet	1	1,300	1,300	-	-	1	-	-
19. Ultrasonic cell disruptor (generator 200-300 watts with cooling jackets, titernium tip:- standard size and microtip)	1	3,000	3,000	-	-	-	1	-
20. Gas sterilizer	1	8,700	8,700	-	-	-	-	1
21. Microtiter plate washer	1	700	700	-	-	-	-	1
22. Film dryer	1	800	800	-	-	1	-	-
23. Dark room equipment set	1	600	600	-	-	-	1	-
24. Mouse cage (small size with food container and water bottle)	300	18	5,400	-	-	-	-	300

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
25. Mouse cage (big size with food container and water bottle)	150	17	2,550	-	-	-	-	150
26. Rabbit cage (with food container and water bottle)	100	40	4,000	-	-	-	-	100
27. Glassware and chemical	-	-	22,000	-	5,000	5,000	5,000	7,000

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
2) Bacteriology, Mycology and Parasitology								
1. Tissue culture cabinet	1	2,600	2,600	1	-	-	-	-
2. Low temperature incubator (-10°c to +50°c) SANYO Model MIR 550	3	4,000	12,000	3	-	-	-	-
3. Centrifuge for 36 tubes	1	2,400	2,400	1	-	-	-	-
4. Humidity controller	1	2,600	2,600	1	-	-	-	-
5. Agarose gel electrophoresis	1	12,500	12,500	1	-	-	-	-
6. Chromatograph with fraction collector	3*	10,200	30,600	1	1	1	-	-
7. Horizontal autoclave	1	14,000	14,000	-	1	-	-	-
8. Water bath 40 cm x 60 cm x 15 cm; (30-100°c)	1	300	300	1	-	-	-	-
9. Water bath; boiling; 50 cm x 26 cm x 20 cm.	1	300	300	-	1	-	-	-
10. Circular boiling bath diameter 25 cm x depth 25 cm	1	220	220	-	1	-	-	-
11. Circulating water bath; 33 cm x 53 cm x 40 cm; (max 80°c)	1	6,600	6,600	1	-	-	-	-
12. Magnetic stirrer with hot plate	1	500	500	-	1	-	-	-
13. Bench centrifuge	1	900	900	-	1	-	-	-
14. Electrical balance	1	500	500	-	1	-	-	-
15. Automatic Petridish filling machine	1	3,400	3,400	1	-	-	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
16. Automatic multipoint inoculator	1	3,600	3,600	-	1	-	-	-
17. Spectrophotometer with accessories	1	16,100	16,100	-	1	-	-	-
18. Ultra-low temperature freeaer	1	3,100	3,100	-	1	-	-	-
19. Millipore filter	2	220	440	2	-	-	-	-
20. Automatic dispenser in spotting phage	1	1,100	1,100	1	-	-	-	-
*Recommended by Japanese team.	-	-	-	-	-	-	-	-
3. Biological Products Control								
1. Ultracentrifuge	1	79,000	79,000	-	1	-	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
4. Immunology								
1. Ion-exchange chromatography with fraction collector, chart recorder and column size 26 mm dia x 40 cm l., 26 mm dia x 100 cm l.	1	7,000	7,000	-	1	-	-	-
2. Immunoelectrophoresis set	1	3,000	3,000	-	-	1	-	-
3. Polyacrylumide gel electrophoresis set	1	3,000	3,000	-	-	1	-	-
4. Ultrafiltration set	1	900	900	-	1	-	-	-
5. Stirring hot plate (800 watts)	1	3,000	3,000	-	1	-	-	-
6. Centrifuge (swinging type, adjustable speed upto 5,000 rpm, capacity 4 x 50 ml, 24 x 15 ml)	1	2,600	2,600	-	-	-	1	-
7. Electric autoclave, upright type, 240 mm dia x 420 mm high	1	2,800	2,800	-	-	-	1	-
8. Low temperature incubator (temp rang 0-60°c, 10 cub. ft.)	1	3,900	3,900	-	-	-	1	-
9. Circulating water bath (max temp. 100°c, capacity 28 litres)	1	1,800	1,800	-	-	1	-	-
10. Automatic multi-cell washer for microtiter plate	1	3,500	3,500	-	-	-	-	1
11. Glassware and chemical	-	-	15,000	-	3,000	4,000	4,000	4,000

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
5. Medical Entomology								
1. Stereoscopic dissecting microscope (Nikon SMZ - 10)	2	2,100	4,200	-	2	-	-	-
2. Nikon Universal Illuminator (EPI)	3	350	1,050	-	3	-	-	-
3. Graduate mechanical stage fit for Nikon Binocular microscope	1	870	870	-	1	-	-	-
4. Microscope monocular tube with ocular micrometer Olympus Model K	1	2,000	2,000	-	1	-	-	-
5. Water Checker Horiba Model U-7 220 V.	1	400	400	-	1	-	-	-
6. Humidity and temperature Recording Zuzuki with spare record graph	3	1,500	4,500	-	3	-	-	-
7. FHK - Light Trap 220 V.	6	40	240	-	6	-	-	-
8. Black-Light tube of FHK-Light trap	24	10	240	-	8	-	-	-
9. Refrigerator 6 cu.ft. 220 V.	1	450	450	-	1	-	-	-
10. Top loading balance Range 0-80 gm. readability 0.0001 gm. Sartorius Model 1207 MP2-BCD	1	2,200	2,200	-	1	-	-	-
11. A printing machine for labelling the scientific name	1	220	220	-	1	-	-	-
12. Monocular microscope (Nikon EL)	1	300	300	-	1	-	-	-

Descroption	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
13. Microscope, Nikon Optiphot with triocular eye piece tube	1	2,700	2,700	-	1	-	-	-
14. Magnetic Stirer Model KHS-2 (KAYAGAKI IRIKAXOGYO LTD)	1	450	450	-	1	-	-	-
15. Deionizer Model GS-20N (TOYO KAGAKU COMP.)	1	1,600	1,600	-	1	-	-	-
16. Agar gel maker Model ST-1 (TOYO KAGAKU COMP.)	1	150	150	-	1	-	-	-
17. Capillary Centre fuge with Refrigerator (4°C')Comp. - Any	1	1,200	1,200	-	1	-	-	-
18. Refrigerator 12 Cu.ft. National Model	1	1,000	1,000	-	1	-	-	-
19. Trinocular stereoscopic with automatic camera (Nikon SMZ 10) Model HFX	1	4,900	4,900	-	-	1	-	-
20. Micro slide storage cabinets with microslide trays (one cabinet can keep about 1,000 slides)	3	200	600	-	-	3	-	-
21. pH meter Orion Model 201 220 V.	2	300	600	-	-	2	-	-
22. Tachometer	1	350	350	-	-	1	-	-
23. Thermohygrograph	5	330	1,650	-	-	5	-	-
24. Transister Megaphone	4	25	100	-	-	4	-	-
25. Instrument for rapid analysis of DOD, COD, DS and oxygen consumed	1	2,000	2,000	-	-	-	1	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
26. Refrigerator 14 cu.ft.	1	2,100	2,100	-	-	-	1	-
27. NRK pincett RR-type made from stainless steel coated with unifrom (KFC-20)	6	15	90	-	-	-	6	-
28. NRK pincett No.-3 (KFC-231) made from stainless steel coated with unifrom	6	15	90	-	-	-	6	-
29. Fine Balancing	1	3,000	3,000	-	-	-	1	-
30. Mosquito collecting set	3	435	1,300	-	-	-	3	-
31. Top loader balancing Precisa Model 80 A Read ability 0.0001 gm.	1	2,100	2,100	-	-	-	1	-
32. Spray cabinet with electric fan	1	150	150	-	-	-	1	-
33. Automatic carbondioxide incubator	1	100	100	-	-	-	1	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
6. Medicinal Plant Research								
1. Soxhlet extraction apparatus with electromantle for 2000, 5000 ml.	2	875	1,750	2	-	-	-	-
2. Hot air oven, 80 x 60 x 50 cm. Stainless steel temperature up to 220°c	1	2,000	2,000	1	-	-	-	-
3. Metabolic cage with spare part	12	146	1,750	12	-	-	-	-
4. Fraction collector	1	2,600	2,600	1	-	-	-	-
5. Freeze-drying machine	1	15,200	15,200	1	-	-	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
7. Environmental Chemistry								
1. Gas liquid chromatography	1	41,000	41,000	-	1	-	-	-
2. Weighing balance accurate	3	3,300	9,900	1	1	1	-	-
3. Dehumidifier	1	1,000	1,000	1	-	-	-	-
4. Dessicator	3	450	1,350	1	1	1	-	-
5. pH meter	2	2,000	4,000	-	1	1	-	-
6. Pipette washer	2	550	1,100	1	1	-	-	-
7. Thermostat water bath	2	1,300	2,600	1	1	-	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
8. Biomedical Research on Food								
1. High and low speed refrigerating centrifuge with rotors.	1	4,000	4,000	-	1	-	-	-
2. CO_2 incubator for cell culture	1	3,100	3,100	-	1	-	-	-
3. Stomachor (Colworth)	1	2,200	2,200	-	1	-	-	-
4. Incubator 37°, 30°, 25°	2	2,200	4,400	-	2	-	-	-
5. Anaerobic incubator	1	2,600	2,600	-	1	-	-	-
6. Microscope with phase contrast attachment.	1	2,200	2,200	-	1	-	-	-
7. Muffle furnace	1	3,700	3,700	1	-	-	-	-
8. Analytical balance	1	2,200	2,200	-	-	-	-	1
9. Top pan balance	1	2,200	2,200	1	-	-	-	-
10. Microbalance	1	3,500	3,500	-	-	1	-	-
11. Shaker	1	1,300	1,300	1	-	-	-	-
12. Refrigerator	2	1,600	3,200	1	1	-	-	-
13. pH meter	1	700	700	1	-	-	-	-
14. U.V. Lamp	1	500	500	1	-	-	-	-
15. T.L.C. Kit	1	3,500	3,500	-	-	1	-	-
16. Potentiometer	1	13,000	13,000	-	-	-	-	1
17. Hot air oven	2	1,100	2,200	1	-	-	1	-
18. Gas chromatograph, multidetector	1	32,600	32,600	-	-	-	1	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	19886	1987	1988
19. Solvent delivery system	1	13,000	13,000	-	-	1	-	-
20. Micro Kjeldahl	1	1,300	1,300	-	1	-	-	-
21. Gel filtration Apparatus	1	1,800	1,800	-	-	-	-	1
22. Chemical and glassware (year by year basis)	-	-	27,000	4,500	4,500	5,500	5,500	7,000

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
9. Pharmaceutical Sciences								
1. Refrigerated Centrifuge (10,000 rpm) and accessories	1	15,400	15,400	1	-	-	-	-
2. Tube Mixer (Vortex genie)	4	200	800	1	1	-	2	-
3. Top Loading Balance	1	1,800	1,800	-	1	-	-	-
4. Fraction Collector with Solid State Circuit and Digital Display. Capacity of 20 racks holding 12-18 mm. OD test tube	1	3,500	3,500	-	1	-	-	-
5. Dry bath incubator	1	1,300	1,300	-	1	-	-	-
6. Magnetic Stirrer hot plate	3	250	750	-	1	1	1	-
7. Refrigerator 9Cu.ft nofrost	2	850	1,700	-	1	1	-	-
8. Hot air oven 5 Cu.ft	2	2,400	4,800	-	-	1	-	1
9. Analytical Balance	1	2,100	2,100	-	-	1	-	-
10. Desicating Cabinet	2	500	1,000	-	-	1	1	-
11. Ultrasonic cleaner	1	1,600	1,600	1	-	-	-	-
12. Water bath, temperature controlled	2	1,000	2,000	1	-	1	-	-
13. Autoclave (Barnstead Rectangular Steriliger)	1	21,000	21,000	-	-	-	-	1
14. Hot Plate	1	180	180	-	-	-	-	1
15. UV lamp	2	400	800	-	-	1	-	1
16. pH meter	1	2,000	2,000	-	-	1	-	-
17. Glassware (for KIA, Chemical, animal lab.)	-	-	40,000	6,000.	8,000	8,000	8,000	10,000
18. I B M Typewriter	1	2.000	2.000	-	1	-	-	-

Description	Amount requested	Unit price (U.S.$)	Total (U.S.$)	1984	1985	1986	1987	1988
10. Regional Laboratories								
1. Pyrogen Testing equipment (for 4 regional lab.)	4	10,600	42,400	1	1	1	1	-
2. HPLC, with UR-VIS spectrophotometer detector and manual loop injector (for 6 regional lab.)	6	27,000	162,000	1	2	1	1	1
3. Gas chromatograph (for 6 regional lab.)	6	25,000	150,000	1	2	1	1	1
4. Atomic Absorption Spectrophotometer (for 6 regional lab.)	6	35,000	210,000	1	2	1	1	1
5. TLC-Densitometer (for 6 regional lab.)	6	25,000	150,000	1	1	2	1	1
11. General Services								
1. Vehicle	4	10,000	40,000	-	1	1	1	1

資料 2. 事前調査団の討議レポート

Report on the Preliminary Discussion on Technical Cooperation for the National Institute of Health Project

23 - 30 July 1984

Report on the Preliminary Discussion
on Technical Cooperation for
the National Institute of Health Project
23 - 30 July 1984

The Japanese Preliminary Survey Team headed by Dr. Ryosuke Murata visited Thailand to exchange views and discuss with Thai authorities concerned of the Department of Medical Sciences (DMS) regarding the technical cooperation for the National Institute of Health Project officially requested by the Government of Thailand.

The agenda and list of participants of this meeting are attached as Appendix I and II of this report.

The meeting was chaired by Dr. Nadhirat Sangkawibha, Director-General of DMS. Following topics were discussed.

1 Background information of the project

The Department of Medical Sciences was established with the main objective of promoting health laboratory services and medical research. The rapid growth of various activities provokes an expansion of the organization. Thus, National Institute of Health (NIH) has been established to serve solely the medical research. The construction of the NIH building in Nonthaburi province will begin in late 1984 with the cooperation of grant aids from the Government of Japan.

To be ready for starting up research activities at the NIH right after completion of the building in 1986 and to continue the effective and efficient research output, the Technical Cooperation in the forms of experts, fellowships and equipment is needed.

2 Organization and activities of NIH

Various divisions of DMS contribute their activities in the NIH. Research works are separated from DMS and performed in NIH. Besides, NIH functions as reference institute of DMS for other health laboratories. Nevertheless, the NIH is still under the supervision of Director-General of DMS in order to coordinate the inter-divisional activities effectively.

Organization chart of NIH and DMS as shown in the project proposal was discussed. The strategies and research priorities of each division and unit of DMS was noted as follows:

2.1 Virus Research Institute (VRI)

VRI conducts activities on diagnosis, survey and research in virus diseases, acting as reference center for other laboratories, consultation services and training. VRI also serves as WHO National Influenza Center and WHO National Center for Viral Hepatitis.

The new activities developed in the NIH are

1. Establishment of new laboratories for chlamydia, rickettsia and oncogenic virus (Epstein-Barr virus, cytomegalovirus etc.).

2. Research to provide informations for prevention, control and treatment of viral diseases : Japanese Encephalitis (JE), dengue haemorrhagic fever (DHF), viral hepatitis, viral diarrhoea, acute respiratory viral diseases, and new diseases suspected of virus etiology.

3. Studies on molecular virology including interferon, monoclonal antibody, techniques for characterization of viruses, and attenuation of virus strains and biotechnology for the development of new viral vaccines. (Rabies vaccine, Hepatitis B vaccine, JE vaccine).

4. Research and development of rapid techniques as well as production of virus diagnostic reagents to supply to other laboratories : regional and provincial diagnostic laboratories and laboratories in foreign countries (DHF, JE, rabies, hepatitis, viral diarrhoea).

2.2 Bacteriology, Parasitology and Mycology (BPM)

Laboratories for BPM serve as central and reference laboratories for the country and carry out research work on etiology, epidemiology and immunology of various bacterial, parasitic and mycological diseases including some diseases of academic interest.

The research activities to be carried out in the NIH, priority as follow:

1. Establishment of mycoplasma laboratory.
2. Introduction of molecular genetics in bacteriology.
3. Etiology and epidemiology of acute respiratory and gastrointestinal infections.
4. Drug susceptibility of malarial parasite.
5. Study of toxin production in some pathogenic bacteria (e.g. enterotoxigenic E. Coli and Vibrio).
6. Production of new diagnostic reagents.
7. Study of epidemiology, pathogenesis and virulence of some mycotic agents.
8. Surveillance of some parasitic diseases.

As far as identification of microorganisms which cause infectious diseases is concerned, studies and development of new techniques such as plasmid characterization and serological typing are necessary. In addition, diseases caused by opportunistic organisms should be studied. The results of these researches should consequently lead to the prevention and control of diseases.

2.3 Immunology

Immunology of infectious diseases will carry activities both in Immunobiology and Immunochemistry as follows.

(1) Study of cell mediated immunity of infectious disease i.e. Herpes virus, RS virus and other bacterial and parasitic diseases.

(2) Study of applied immunology in monoclonal antibody for applied virology, production of immunoglobulin for typing virus and bacteria.

(3) Study on the antigen antibody complexes which related to infectious diseases.

(4) Biotechnology and genetic engineering for viral vaccine production such as Rota viral vaccine and Hepatitis B vaccine.

Major emphasis is put on future development in genetic engineering technique in bacteriology and virology. Such biotechniques are important in immunology of infectious diseases. The discussion also led to the method and the application of radioimmunoassay for detection of antigen and antibody.

2.4 Development and Control of Biological Products.

At present this unit serves as the national quality control laboratory for biological products which are mostly produced in Thailand by the Governmental Pharmaceutical Organization. As the need for biological production in Thailand is increasing, this unit will be expanded as a division in the near future. Activities performed at NIH will be

1. Test production of mouse brain Japanese Encephalitis vaccine (first priority).

2. Test production of immunoserum against some infectious diseases e.g. Rabies, Hepatitis A.

3. Strengthening facilities for the quality control of all biological products: vaccines, serum and blood products used in the country.

4. Distribution of standards and reference preparations to other vaccine manufacturers such as Red Cross or private sector.

2.5 Medical Entomology

Medical Entomology conducts activities on applied research on vector surveillance, vector control, insecticide susceptibility of vector. Several bio-efficacy studies on pesticides are performed.

The new activities to be developed in the NIH are:

1. Studies on the natural enemies and their potential use for control mosquito vectors which are the main vector of Japanese Encephalitis.

2. Studies on biology and ecology of the mosquito carrying diseases and also rodents habouring diseases.

3. Studies on susceptibility of insect vectors to pesticides and other control agents.

4. Studies on the control measure which consist of chemical, biological, mechanical, environmental, electrical etc., in order to search for the most appropriate and efficient means with minimum cost.

5. Studies the suitable ways to prevent and combat the outbreak of vector borne diseases including community involvement and participation.

2.6 Medicinal Plant Research

Research on medicinal plants involves cultivation in experimental gardens, physico-chemical analysis of active constituents, structure elucidation, and pharmacological and toxicological studies.

The activities developed in the NIH are

(1) Study on some plants used as antihelmintic, anti-malarial, and antimicrobial drugs.

(2) Toxicological study of medicinal plants and traditional medicines intended to be used in Primary Health Care System.

(3) Analysis of Thai medicinal plant in order to set up the standards.

(4) Development of Information Center for Medicinal Plants and Traditional Medicines.

(5) Study of Diosgenin-bearing plants, started by preliminary screening of various plants.

Several research projects have been done by the cooperation with other institutions, e.g. studies on anti-asthmatic and anti-diabetic drugs with Siriraj Hospital, study on antimalarial drug with the AFRIMS (Armed Forces Research Institute of Medical Sciences) and study on scabicide with the Division of Medical Entomology.

2.7 Environmental Health Science Research (EHSR)

EHSR conducts chemical analysis in chemical poisons, toxins, mycotoxins, and cosmetic products. Biological and microbiological examination in the field of forensic chemistry and clinical toxicology are also employed.

The new activities at the NIH are

1. Mutagenecity and carcinogenicity testing of chemical hazards, toxins and pollutants in bioassay using bacteria i.e Ame's test and sister-chromatid exchange test.

2. Toxicity testing in animal of environmental toxins such as mycotoxin both acute and chronic testing.

2.8 Biomedical Research in Food

Biomedical Research in Food conducts the studies on toxicity of local food, food additives, chemical and microbiological contaminants.

The new activities developed in the NIH are

1. Conducting a nationwide survey on food contaminants causing by environmental pollution, e.g. foodborne microorganisms, pesticide residues, heavy metals and industrial waste.

2. Study on the actual intake of contaminants and additives.

3. Methodology development for qualitative analysis of food including appropriate methods for regional laboratories need.

4. Study on toxicology of local food from animal and plant origins for example antibiotic residue in poultry and meat.

Cooperation are made with the Environmental Health Science Research, Bacteriology and Mycology.

2.9 Pharmaceutical Sciences

Pharmaceutical Sciences is mainly responsible for quality control of drugs. There are also several researches carried on to promote the better control of the assessment of pharmaceutical sciences. The activities which are developed in NIH are as follows :

1. Initiation of radioimmunoassay (RIA) technique for quality control of pharmaceuticals, production of antisera and tracer used in RIA Laboratories.

2. Quality control of radio-pharmaceutical products.

3. Study on the stability of pharmaceutical preparations.

4. Animal tests and assays of pharmaceutical preparations.

5. Testing and development of methods for the assay of pharmaceutical preparations.

2.10 Scientific Instrument Center (SIC)

The Scientific Instrument Center plays the important roles in assisting the researches in NIH by conducting the following activities :

1. Instrumentation Services :
   - Instrument Accreditation: Quality Assurance and Control of Instruments.
   - Training in instrumentation for sophisticate instruments such as the Electron Microscope, GC-MS, etc.
2. Computer Applications :
   - Hardware setup and implementation supports for the NIH's Computer Network.
   - Organize and manage the NIH's Data Base.
3. Radioisotope Laboratory : to give technical and instrumental support for RI Lab.

2.11 Animal Experiment Center

Presently at DMS, each division has its own animal handling system which is tidious and not effective. The Animal Experiment Center at NIH will act as a center for common animal experiment facilities supporting the research work. Major duties are

1. Purchase, accquire, quarantine and housing of normal animal for experimentation.

2. Management of animal for experimentation, housing, control and sacrification of infected animals.

2.12 Regional Medical Sciences Centers

Regional Laboratories are new facilities located in 6 different regions: Chiang Mai, Phitsanulok, Khon Kaen, Nakhon Ratchsima Songkhla and Chon Buri. The major objective is to provide the good health to the people in the rural areas. The centers are officially designated in April 1983. Scope of important activities include:

1. to function properly as the central communication with other provincial health services such as provincial hospitals and municipal health centers of the Ministry of Interior, etc.

2. To act as the quality control laboratories by analysing the samples collected from the provincial areas. It is also perform the duty of setting up the laboratories for the provincial hospitals.

3. To assist the research facilities in collecting the requested information and feeding back data obtained from the six regional laboratories.

2.13 Radioisotope Laboratory (RIL)

Many divisions are interested to initiate the RIA technique in chemical analysis work as the technique has been efficiently achieved in the Division of Drug Anlysis. There are few scientists of DMS who has basic knowledge in RIA from their training and post graduate study abroad. The Japaness team has the opinion that the management of RIL in NIH should be independent from the Scientific Instrument Center but technical instrumentation will be supported by the SIC

3 Others

3.1 Nonproject funding from JICA. It was agreed that

- Japanese experts (1-2) will station at DMS for 2 months starting from Nov. 1984 to study the feasibility of the project implemintation.

- DMS Official (1) will study activities and management of medical research, infectious and noninfectious diseases, at various Japanese research institutes for about 1 month. DMS strongly requested 2 officials.

3.2 Epidemiology, DMS provides laboratory services to the Division of Epidemiology, Office of Permanent Secretary and to the Department of Communicable Disease Control and other health service agencies. One medical doctor from DMS is now taking 3 years course in Feild Epidemiology Training Programme organized by WHO at Division of Epidemiology, MPH.

3.3 Equipment reguested. It was informed by the Team that final decision for equipment requested in the Grant Aid will be made in November 1984. Updating of equipment list can be made before that time. Priority croteria for decision making will be put on maximum benefit to NIH. It was agreed that duplicate allotment of big equipment from Grant Aid and Technical Cooperation will be avoided.

3.4 Publication of research results.

The Bulletin of the Department of Medical Sciences, a quartery issued, is the media for distribution of research results of NIH to interested people. Bacteriological and virological finding from DMS laboratories are also weekly published in the Epidemiology Report. Several articles are published in the international journals.

3.5 Administrative staff. The necessities for the fellowships for nonscientific staff, i.e., computer operator, commodity management and librarian were discussed.

Preliminary Survey on Technical Cooperation Schedule

for

National Institute of Health Project

23 - 30 July 1984

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July 24, 1984 (Tuesday)	Discussion with the Department of Medical Sciences
	- Background information of the proposed project
	- Organization and activities of NIH
	- Requests of each divisions
July 25, 1984 (Wednesday)	Visit the facilities of DMS laboratories
9.00-9.30	Medicinal Plant Research
9.30-10.00	Clinical Pathology
10.00-11.00	VRI
11.00-11.30	Medical Entomology
11.30-12.15	Lunch
12.30-14.30	Visit to construction site of NIH.
14.30-16.30	Discussion on the building plan of the animal experiment centre
July 26, 1984 (Thursday)	Visit the facilities of DMS laboratories
9.00-9.30	Environmental Sciences
9.30-10.00	Biomedical Research in Food
10.00-10.30	Pharmaceutical Sciences
10.30-12.00	Biological Products
12.00	Lunch hosted by DMS
14.00-16.00	Final Discussion
July 27, 1984 (Friday)	Visit the Regional Medical Sciences center in Chiang Mai(leave Don Mueng Airport at 7.30 AM)
July 28-29, 1984 (Saturday-Sunday)	Japanese team's intenal meeting
July 30, 1984 (Monday)	
9.00	Courtesy visit to the Permanent Secretary of MPH.
10.30-12.00	Confirmation of the report.

Appendix II

2. Participants

1) DMS

Dr. Nadhirat Sangkawibha	Director-General
Mrs. Preeya Kashemsant	Deputy Director-General
Dr. Panchitta Ekachampaka	Deputy Director-General
Miss Panida Kanchanapee	Director, Division of Medical Research
Mr. Prakong Phanurai	Senior Scientist Division of Medical Entomology
Dr. Kanai Chatiyanonda	Director, Virus Research Institute
Mr. Alan Idsavas	Director, Division of Toxicology
Dr. M.L. Ratanasuda Phanurai	Director, Division of Clinical Pathology
Miss Boonlarp Kitisin	Director, Division of Drug Analysis
Miss Amnueyporn Tantivejakul	Director, Office of Secretary
Miss Chawewan Halilaminan	Director, Division of Food Analysis
Dr. Somkiat Wangkobkiat	Chief Scientist, Scientific Instrument Center
Miss Amara Vongputapitak	Senior Scientist, Div. of Food Analysis
Mrs. Sangthong Sawadiphah	Senior Scientist, Div. of Drug Analysis
Dr. Chuinrudee Jayavasu	Senior Scientist, Virus Research Institute
Ms. Kanchana Leelasivi	Senior Scientist, Division of Medical Research

Dr. Chongdee Wongpinairat	Senior Scientist Division of Drug Analysis
Dr. Suthinee Junlowjiraya	Senior Scientist Division of Drug Analysis
Ms. Sumol Pavittranon	Senior Scientist Division of Toxicology
Dr. Panadda Sae-Eung	Scientist, Division of Food Analysis

2) Japanese Team

(1) Dr. Ryosuke Murata	Leader, Ex-Director, National Institute of Health of Japan
(2) Dr. Konosuke Fukai	Director-General, Research Foundation of Microbial Diseases of Osaka University
(3) Dr. Akira Wake	Chairman, Dept. of Bacteriology, National Institute of Health of Japan
(4) Mr. Yoshio Imai	Unit Chief, University Hospital Supervising Office, Medical Education Div., Higher Education Bureau, Ministry of Education, Science & Culture
(5) Mr. Akira Kumakura	Deputy Head, Medical Cooperation Div., Medical Cooperation Dept., JICA

資料3. 医療統計等

1. 人口動態、人口分布

付図－1および付表－1に人口動態の概要を示した。最近の人口増加率は1.7％で、マレーシアより少ないが、日本の2.5倍である。5カ年計画では1986年までに1.5％に下げることを目標としている。平均寿命は、男女ともに日本人よりも16年も少ない。人口の年令分布を見ると、付図－2のようなピラミッド型で、中年層の多い日本とは著るしい対照を示している。また、国民の80％以上が地方農村の住民である（付表2）。このことは公衆衛生・医療問題を扱うさいに重要な因子となる。付図－3、4に出生率および死亡率の年次変化を他の国と比較し示した。

2. 栄養状態

栄養状態は病気の罹患や予後に影響を与える。付表－3にタイ、日本、マレーシアの栄養摂取状態の比較を示した。カロリーについてはタイと日本の差はほとんどないが、タイ人の蛋白質の摂取量は体格の似ている日本人の必要量（65g）の70％で、とくに動物性蛋白が少ない。

3. 死亡率、死因

過去20年間の努力により、タイ国民の保健衛生状態は著るしく改善され、人口1000人当たりの死亡は1967年の10.1から1982には5.1と減少し、平均寿命も過去20年間に4才も延びた（付表－1）。付表－4には数年間の主要死因を示した。先進国に比較すると、感染症による死亡が腫瘍や循環系疾患を上まわっている。付表－5はアジア諸国の死因を比較したものであるが、感染症死亡の比率をみると、タイは日本と他の東南アジアの国の中間にあると言えよう。

付表－1　人　口　動　態

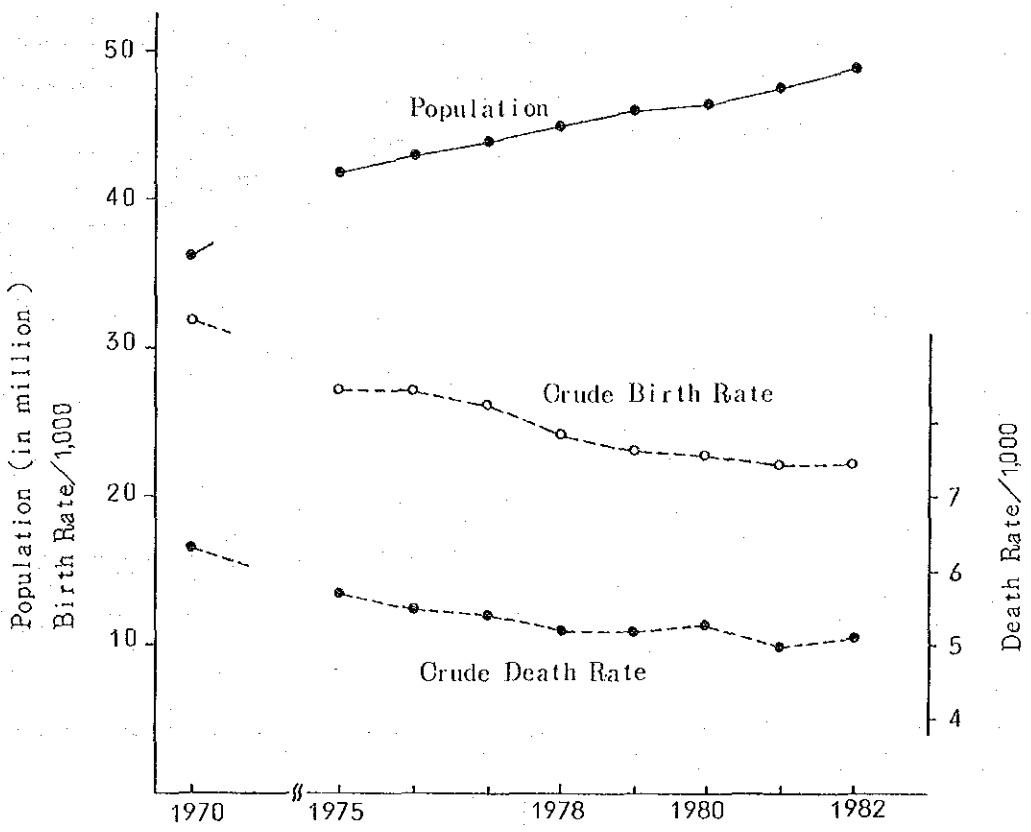
	人　口 ($\times 10^6$)	人口1000対比			
		出　生	死　亡	乳児死亡	自然増
1980	46.5	23.2	5.3	13.3	17.9
1981	47.5	22.4	5.0	12.5	17.4
1982	48.6	22.2	5.1	12.4	17.1
日　本（1982）	118.5	12.8	6.0	6.6	6.8
マレーシア（1980）	14.8	31.7	5.9	24.9	25.8

平均寿命	男	女
1960	53.6	58.7
1974－75	57.6	63.6
1975－80	57.6	63.0

アジア諸国平均寿命

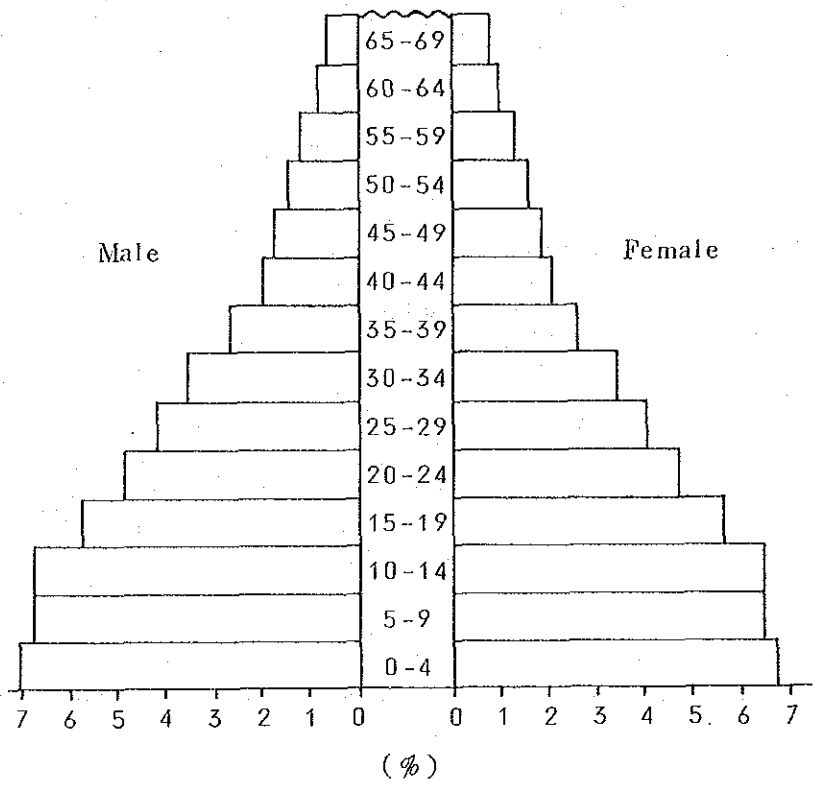
年度	インドネシア 1975—1980	日　本 1981	フィリピン 1975—1980	シンガポール 1970	タ　イ 1974—1975	マレーシア（半島部） 1976
男	48.7	73.79	59.1	65.1	57.63	66.2
女	51.3	79.13	62.4	70.0	63.56	71.4

付図1　人口動態

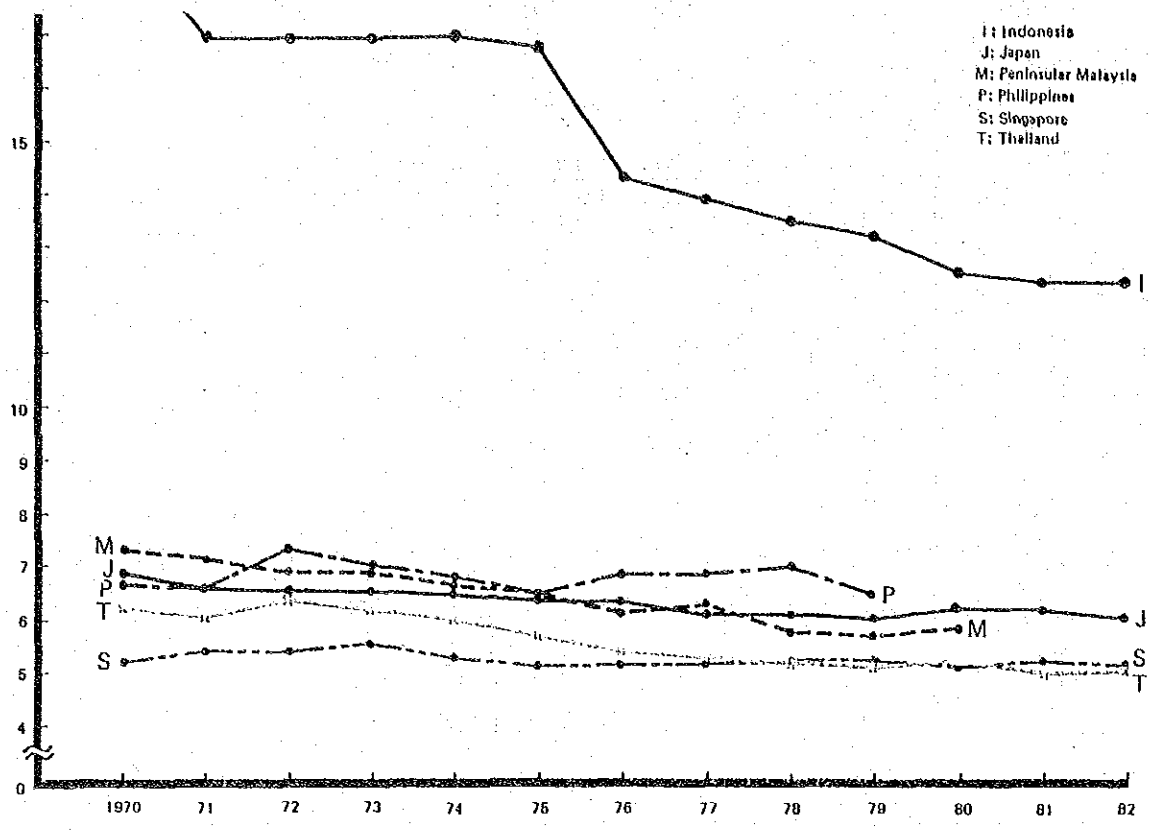


(SEAMIC Hlth ST, 1983)

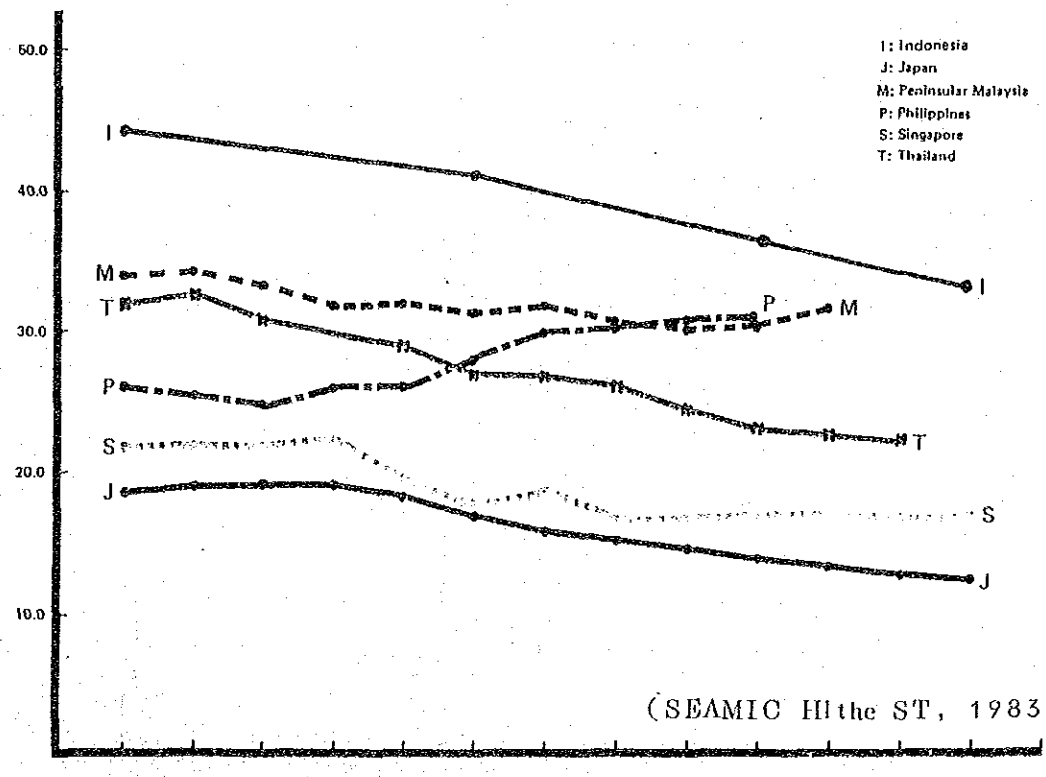
付図2　Population Pyramid (1980)



(SEAMIC Hlth ST 1983)



付図 3　Annual Change of Crude Death Rate (Per 1000)
(SEAMIC Hlthe ST, 1983)



(SEAMIC Hlthe ST, 1983)

付図 4　Annual Change of Crude Birth Rate (Per 1000)

付表－2　人　口　分　布

		Urban	Rural	Urban/Total(%)
1970	Total	4,553,100	29,844,274	13.2
	M	2,257,068	14,866,794	13.2
	F	2,296,032	14,977,480	13.3
1980	Total	8,279,979	38,681,359	17.6
	M	4,197,301	19,430,246	17.8
	F	4,082,678	19,250,933	17.5

（SEAMIC Hlth ST, 1983）

付表－3　栄　養　状　態　比　較

国名	カロリー (Kcal/日)			蛋白質 (g/日)			脂肪 (g/日)		
	総量	植物性	動物性	総量	植物性	動物性	総量	植物性	動物性
タイ (1977)	2,098	1,952	146	46.3	32.2	14.1	22.5	13.8	8.7
日本 (1978)	2,167	1,705	443	80.0	39.8	39.8	54.7	27.8	26.7
マレーシア (1977)	2,613	2,319	294	57.6	35.7	21.9	45.5	29.2	16.3

（SEAMIC Hlth ST, 1983）

付表－4　主　要　死　因

件数 Cases	1976		1977		1978		1979		1980		1981	
	件数 Cases	死亡率 Rates	件数 Cases	死亡率 Rates	件数 Cases	死亡率 Rates	件数 Cases	死亡率 Rates	件数 Cases	死亡率 Rates	件数 Cases	死亡率 Rates
Total 合計	237062	552.8	236854	539.3	241146	536.2	241111	523.4	247970	533.8	239423	504.2
Injury and Poisoning 事故及中毒	12566	29.3	15210	34.6	17076	38.0	16599	36.0	16672	35.9	16426	34.6
Pneumonia 肺炎	6116	14.3	5624	12.8	5144	11.4	4655	10.1	4639	10.0	4250	9.0
Neoplasms 腫瘍	6352	14.8	8380	19.0	9174	20.4	9672	21.0	10961	23.6	11726	24.7
Tuberculosis 結核	6437	15.1	6934	15.8	7470	16.6	6738	14.6	6643	14.3	5587	11.8
Diseases of circulatory system 循環器病	7005	16.3	6981	15.9	6764	15.0	13246	28.8	14607	31.4	14891	31.4
Acure diarrhoea 急性下痢症	5847	13.6	5787	13.2	6499	14.5	5031	10.9	3834	8.3	3187	6.7
Malaria マラリア	4919	11.5	4771	10.9	4595	10.2	3787	8.2	3755	8.1	4071	8.6
Pepticulcer 消化器潰瘍	3656	8.5	3308	7.5	2986	6.6	2830	6.1	2212	4.8	2155	4.5
Compications of pregnancy, child birth and puerperium 異常妊娠，分娩，産じょく	1738	4.1	1391	3.2	1355	3.0	1105	2.4	1061	2.3	863	1.8
Nutritional deficiencies 栄養不良	1358	3.2	1033	2.4	1280	2.8	1164	2.4	850	2.3	817	1.7
Others その他	181072	422.2	177435	404.0	178803	397.6	176284	382.7	182736	393.4	175450	369.5

死亡率　対人口 100,000

付表－5　死因としての感染症[1)]

死因	インドネシア (B50, 1980)		フィリッピン (ICD8A, 1976)		タイ (ICD8A, 1978)		日本 (ICD8A, 1978)	
下痢症[2)]（又は胃腸炎）	130.3	②	35.5		16.5		2.0	
結核	62.6	④	71.8		15.0		7.2	
腸チフスその他サルモネラ症	24.7	⑩	1.5		1.2		0.0	
破傷風	48.7[3)]	⑤	9.4	①※	3.4	③※	0.1	⑦※
麻疹	2.5		11.6		0.2		0.2	
肝炎			1.8		0.0		0.9	
その他感染症	20.5		25.7		21.6		1.7	
急性気道感染	—		8.6		33.3		3.2	
インフルエンザ	0.8		6.4	②※	1.9	④※	0.6	④※
肺炎	131.9	①	107.7		11.8		24.7	
気管支炎	16.5		16.3		2.8		10.6	
髄膜炎	37.1	⑥	6.2		1.9		0.8	
感染症計	475.6[4)] (63.7%)		302.5 (44.1%)		109.6 (21.1%)		52.0 (8.6%)	
症状診断不明状態	35.5		70.4	④	243.3	①	30.0	⑥
肝疾患	30.5	⑦						
腫瘍	25.5	⑨	31.7	⑦	18.7	⑥	136.7	②
循環系疾患	70.0	③	94.0	③	25.3	⑤	261.8	①
事故・中毒等	26.4	⑧	40.1	⑥	60.7	②	46.4	③
全死亡	746.3		685.4		518.5		607.6	

資料：SEAMIC Health Statistics, 1981, 1982.

1) 数字は人口100,000に対する死亡率，○内は十大死因中の順位を示す。ICD－8A分類を採用している国では※感染症を一括集計（SEAMIC Hlth ST）

2) コレラ，赤痢を含む。

3) 世帯調査（1980）より推定した。

4) カッコ内数値は全死亡に対する比率

資料4. Annual Report of DMS (1979～1983)

THE DEPARTMENT OF MEDICAL SCIENCES

MINISTRY OF PUBLIC HEALTH

1984

Yod-se, Bumrungmung Road

Bangkok Thailand

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The Department of Medical Sciences

Ministry of Public Health

1984

Office 693 Bumrungmueng Road, Bangkok, Thailand

Responsilities

The Department of Medical Sciences has responsibilities in the health laboratory services with the main objectives to serve as the national testing laboratories for food, drug, toxicology, radiation instruments in central part and upcountry area, to assist medical and health officers in diagnosis and to promote research on virus, medicinal plants and medical entomology.

The Department of medical Sciences is organised into 10 Divisions and 6 Regional Centers as follows:

1. Office of the Secretary
2. Division of Medical Entomology
3. Division of Radiation Protection Services
4. Division of Clinical Pathology
5. Division of Toxicology
6. Division of Health Laboratory Quality Control
7. Division of Drug Analysis
8. Division of Food Analysis
9. Division of Medical Research
10. Virus Research Institute

11. Regional Center of Medical Sciences 1 Songkhla
12. Regional Center of Medical Sciences 2 Chon Buri
13. Regional Center of Medical Sciences 3 Nakornrajsima
14. Regional Center of Medical Sciences 4 Khonkaen
15. Regional Center of Medical Sciences 5 Chiengmai
16. Regional Center of Medical Sciences 6 Phitsanuloke

Division of Medical Entomology

The Division of Medical Entomology, Department of Medical Sciences was established in 1968.

The responsibilities of this Division are fundamental and applied research in medical entomology and related fields; vector surveillance, vector control, insecticide susceptibility of vectors. Besides the insect vectors, the Division also works on rodent, flea and acari.

The Division has 5 sections : Biology & Ecology of vectors, Insecticide testings, Chemical control, Biological Control and Rodent, flea acari research.

The staff are composed of 1 medical doctor, 12 entomologists, 3 medical science officers, 1 general administrative officer, 2 cherks, 1 typist and 1 mechanic, 21 mosquito collectors, 5 drivers, 2 workers altogether 47 persons.

With existing budget and facilities the Division had carried out the activities as follows :-

1. Vector Biology and Ecology Section.

Routine work : Produced Aedes aegypti, C. quinquefasciatus flies, Toxorhynchites, Aedes togoi, Aedes albopictus and Culex tritaeniorhynchus for bioefficacy testing, mosquito repellent testing and for bio assay. Produced 105 litres of mosquito repellent solution for FAO inorder to use in malaria prevention in Cambodian refugee camps.

Research Projects

(1.) A study on sources and factors of head lice epidmic among school children in rural area.

This project started since 1981 and finished in 1983 the purpose was to survey head lice infestation in school children, to find out the causes and factors that enhanced the epidemic. The result revealed that head lice infestation rate was as high as 58 to 74%. Most of them had poor hygiene and had history of lice infestation in the family.

(2.) A study on mosquito repellent machine with high sound frequency. The machine was tested by using man bait mosquito collection at night time comparing between using and not using the machine. The result showed that with the machine the number of mosquitos collected was 30% lesser than with out the machine.

(3.) Aedes aegypti surveillance through school children via questionaires. 18,450 copies of questionaires were sent to 62 schools in 20 provinces, 12,296 copies were sent back. The results showed that 90,964 potential Aedes aegypti breeding habitats were inspected and 39,645 containers were positive with Aedes larvae. The values of House Indices, Container Indices and Breteau Indices were ranging :- 71 to 94, 31 to 53 and 221 to 554 respectively. The values might be higher than the values obtained by the health workers, however the school children would learn by experience on Aedes aegypti habitats.

(4.) Monitoring Japanese Encephalites vectors in various places in Thailand.

Light traps were placed at pig pens from 7 to 9 p.m. the trapped mosquitos were quickly identified as J.E. vectors and counted. The results were as follows :-

Province	Month	Number of working nights	Number of working traps	Total No. of J.E vectors	No. Mos. per trap per hour
Nakorn Pathom	May	12	36	7993	218
	June	12	36	37228	1012
	July	12	36	5852	624
Nan	August	2	14	1915	60
Fang	August	3	9	2103	31

(5.) Head lice surveillance in schools in rural areas.

This project was to survey head lice infestation rates in different places to study the distribution and situation of head lice in different places. In 1983, 435 school children in 3 schools in Petchabun province were inspected, infestation rate was 58.

(6.) A study on the effect of lights on the attractiveness to the mosquito vectors.

Three light traps were set up during night time and the trapped mosquitos were compared in number. The results showed that Monkwood light trap with black light was more attractive than Monkwood with neutral light and CDC light trap with tungsten lamp.

2. Insecticide testing Section

Routine work :-

(1.) Susceptibility testings : Samplings of Aedes aegypti, Culex quinquefasciatus, Musca domestica and American cockroaches were collected from different provinces in Thailand and reared in the

insectarium. F_1 and F_2 were tested with technical grade pesticides. In 1983 the samples were collected from Sukhothai, Pitsanulok, Chiang Mai, Lampang, Yala, Narathiwat, Pattani, Surat Thani. The results of tests carried out were as follows :-

- Aedes aegypti being tested to temephos, malathion and fenitrothion, the strain from Yasothorn (collected last year) had tendency to tolerance to malathion.

- Culex quinquefasciatus being tested to malathion, fenitrothion, the results showed that Yala strain had tendency to tolerste to fenitrothion.

- Musca domestica being tested to fenitrothion, propoxur, bioresmethrin and dieldrin the results showed that Chiang Mai strain was prone to resist to malathion and bioresmethrin, Lampang, Yala and Surat Thani strains were prone to resist on bioresmethrin.

- American cockroaches bing tested to malathion fenitrothion, dieldrin using topical application method 5 microlitres of the pesticide per one cockroach. The results showed that cockroaches from Surat Thani were more tolerant to dieldrin than those from Phuket.

- Susceptibity testings on laboratory colony of American cockroaches against propoxur, fenitrothion and dieldrin. The results showed that propoxur was more effective than the others.

Research project

(1.) A simulated field trial of Dimilin 25 WP against Aedes aegypti larvae.

Three replicates of 50 litre water jars were once treated with Dimilin 25 WP at the dosage rate of 0.1 ppm. The jars

were emptied and refilled with water every day. Twenty five third instar Aedes aegypti larvae were exposed to the waters for 24 hours each day. The larval mortality was noted. Results showed that the treated jars were effective for 1 week for which period the larvae were 100% killed. Twenty five percent mortality was observed for 2 more weeks.

(2.) Laboratory testing the efficacy of OMS 2014 (IGR) against Aedes aegypti larvae.

In beakers the Aedes aegypti larvae at different stages were tested to OMS 2014 a' different concentrations. The larvae were observed every day for number of dead larvae, dead pupae, incomplete emergence abnormal adults, normal adults. The results were as follows :- Table I The concentration in ppm. which gave

Aedes aegypti larval stage	LC_{50}	LC_{95}	LC_{100}
1	0.15	0.20	0.25
2	0.14	0.19	0.25
3	0.11	0.19	0.50
4	0.28	1.0	2.0

LC_{50}, LC_{95}, LC_{100} = lethal concentrations of 50%, 95% and 100% of the larvae.

Table II The mortality of larvae at given concentrations.

Larval stage	0.25 mg/l.	0.5 mg/lt.	control
1	100%	100%	2.7%
2	100%	100%	5.6%
3	96.0 %	97.3%	4.0%
4	58.1 %	97.3%	12.1%
pupa	0	0	0

(3.) Simulated natural habitat testings of OMS 2014 against Aedes aegypti larvae.

Water jars with 50 litres of water were once treated with OMS 2014 at the dosage rate of 1 ml/lt. for 24 hours, then the jars were everyday emptied and refilled with water. 25 Aedes aegypti third instar larvae were exposed to waters in the treated jars everyday. The mortality larvae and length of control were observed. The results showed that larval mortality 84 to 100% occured during the first week and 0 to 24% mortality occured in the second to the fourth week.

3. Chemical Control Section

Routine work :-

(1.) Equipment and pesticide testings.

Field trials against Aedes aegypti using a new equipment and pesticide were carried out as follows :-

- A test of Igeba TF 30, a portable fogging machine was carried out. It was noted that the machine which was the original model was not quite perfect, flames came out couple times during the field control operation. However the company had sent a new model to be tested next year.

- A field trial of 2% fenitrothion plus 0.05% tetramethrin against Aedes aegypti using swing fog SN 11. Two applications of the formulation at 7 days interval in Changthaburi.

- A field trial of K-Othrine ULV 100 concentrate (100 g/lt.) 0.1% in diesel oil against Aedes aegypti via fontan a back pack sprayer. The trial was carried out in 115 houses, two applications at 7 days interval the result showed that after the second application the field Aedes aegypti density was under controlled for 2 weeks.

- A field trial of Fluvalinate 0.0625, 0.125, 0.25% ai using Hudson x-pert sprayer against cockroaches. One application for one concentration was carried out in 67 houses in an isolated village at Prachachuen low income area at 1 and 2 months interval. The results showed that there was no effect on the cockroach population density.

- A field trial of Baythroid H for house fly control. The result showed that Baythroid H at 30 mg/square metre could control adult flies for 2 weeks.

(2.) Bioefficacy testings.

In 1983, 114 samples of house hold pesticides were tested for knockdown effect, standardization and acute toxicity using suckling mice. They were as follows :-

60 samples of mosquito coils, 57 were in standard.

9 samples out of 10 of sprayed and aerosol house hold pesticides were in standard.

35 samples of mosquito coils were tested for acute toxicity, all were non toxic.

Besides the above mentioned the following pesticides were tested :-

2 samples of sprayed pesticides against cockroaches.

1 sample of cockroach baits.

2 samples of powder pesticides against cockroaches.

3 samples of electrical repellent machine.

1 sample of vaporizer against cockroaches.

Research project

(1.) Field trials of methoprene against Aedes aegypti. Culex quinquefasciatus, and Culex tritaeniorhynchus

- The field trial of methoprene against Aedes aegypti was carried out in 82 containers in a village of 25 houses. The water jars were treated with 10% metnoprene (Altosid tablet 0.3 gm) at 1 ppm. The result showed that this dosage could control the emergence for 21 days.

- The field trial of methoprene against Culex quinquefasciatus was carried out in Chanthaburi low income area. Methoprene (Altosid 10 F) solution 10% was applied to Cx. quinquefasciatus breeding habitats at the dosage rate of 1 ppm. The result showed that the IGR at that dosage could control the Cx. quinquefasciatus for 60 days.

- The field trial of methoprene against Cx. tritaeniorhynchus was carried out at Tgad Ngao, Chanthaburi. Methoprene 10% solution at 1 ppm. could control the emergence for 35 days.

4. Biological Control section.

Routine work : Produced Aedes aegypti and Cx. quinquefasciatus and cockroaches for Baccilus testing and for the study of predators and parasites.

Collection of vectors and predators for reference museum.

Research projects

(1.) A survey for local strains of pathogenic organism against mosquito vectors in Thailand.

Since 1981, 111 strains of B. sphaericus were isolated from dead larvae of different provinces, among these strains 23 strains had killing effect to Cx. quinquefasciatus at the concentration 1×10^5 cells/ml. and 225 strains of B. thuringiensis were selected and of these only 10 strains were effective against Aedes aegypti larvae at the concentration 1×10^5 cells/ml. The study has to be going on to select the strains which would give quick killing effect at lower concentrations.

(2.) A survey and study on biology of natural enemies of cockroaches in Bangkok metropolitan and neighbor provinces.

Tetrastichus hagenowi and Evania appendigaster have been colonized in the laboratory for biological study and mass production for further simulated field study.

(3.) Laboratory testings the efficiency of various formulations of Bt. H-14 and B. sphaericus against mosquito larvae.

Bt. H-14 in forms of wettable powder, water concentrate, granules and slow release briquettes were tested against Aedes aegypti larvae. The tests have been going on.

B. sphaericus strains 1593 and 2362 from Dr. E Davison, Arizona State University and from WHO have been tested against Cx. quinquefasciatus as well as strain 2362 from Dr. Dulmage of U.S. Department of Agriculture.

5. Rodent Study Section.

Research project

(1.) A study on population density of urban rodents in Chanthaburi province.

The study has been carried out in 0.50 km^2 in 2,400 houses the municipality area of Chanthaburi province. Removal method has been used. The study was carried out during April, May and August, September for hot and rainy seasons. From number of rodents trapped, it could be calculated out the rodent population (all species) during hot season were 3,028/km^2 or 0.65 animal per house while during rainy season were 2,519/km^2 or 0.61 animal per house.

Publications.

1) Phanurai P., Thavara U., Indra-udom P., : A study on sources and factors of head lice epidemic among school children in rural area. Bull, Med. Sci. 25(2) : 101-106.

2) Poonyos Rielrangboonya, Mongkol Chenchittikul, Kazuo Buei and Boonluan Phanthumachinda : Field trial of ISA-2-OE against Anopheles philippinensis in Makham district, Chanthaburi province, Interim Report 4 1983, Thai Japan Cooperative Project Promotion of Provincial Health Services.

3) Kazuo Buei, Mongkol Chenchittikul, Boonluan Phanthumachinda and Megumi Hasegawa ; Survey of Mosquitoes in Chanthaburi Province with special reference to the epidemiology of mosquito borne diseases : Interim Report 4 1983, Thai Japan Co-operative Project Promotion of Provincial Health Services.

4) Nipa Benjapongs : "The mosquito eater" ; Bull. Med. Sci. 2526 26(3).

5) Boonluan Phanthumachinda ; Problems of DHF in Thailand, Bull. Med. Sci. 2526 26(3).

6) Monkol Chenchittikul, Somchai Daengpium, Megumi Hasegaws Takeshi Ito and Boonluan Phanthumachinda : A study of Commensal Rodents and Shrews with Reference to the Parasites of Medical Importance in Chantaburi Province, Thailand. The Southeast Asian Journal of Tropical Medicine and Public Health, 1983. 14(2) : 255-259.

Division of Radiation Protection Services

1. Function :

1.1 Registration of X-ray machines.

1.2 Radiation Surveys in diagnostic, industrial and research uses of X-ray machines.

1.3 Output measurement and protection Surveys in radiotherapy departments.

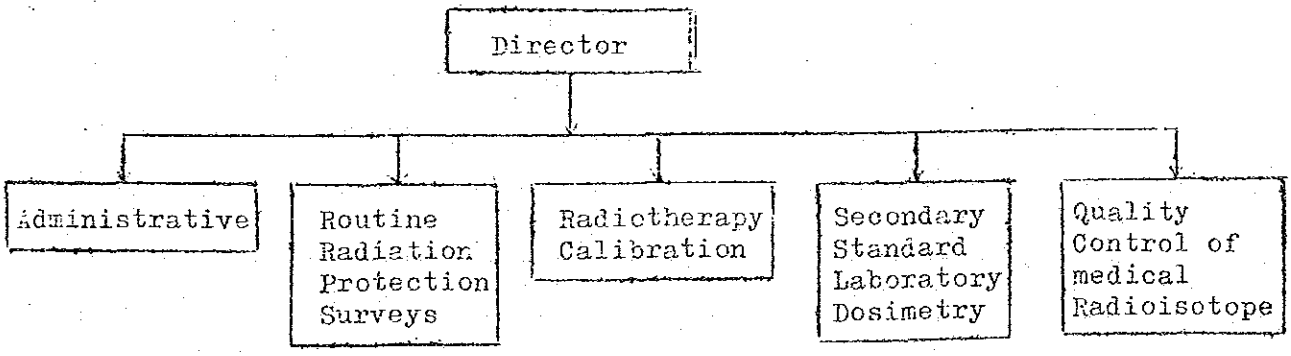
1.4 Nuclear medicine assessment services.

1.5 Radiation protection surveys in clinical usage of radioisotopes.

1.6 Radiation monitoring film service.

1.7 Normalize the radiation dosemeter available in Thailand.

2. Organization and man power :



(3 administrators) (6 physicists) (9 physicists) (7 physicists) (2 physicists)
(1 typists) (1 electrician)
(2 drivers) (1 technician)

3. Activities (October 1982 - September 1983)

In the past fiscal year the Division of Radiation Protection Services performed its duty as follow :-

3.1 Registrations of X-ray machines:

Institutions	X-ray machines
495	1306

3.2 Radiation Protection Surveys :

Provinces	Institutions	X-ray machines
23	113	212

3.3 Output Measurement in Radiotherapy Departments :

Institutions	Radiation Machines	Techniques
16	33	646

3.4 Advisory for Radiation Protection Planning :

The protection planning is given to 3 institutions

3.5 Radiation Monitoring Film Services:

Institutions	Radiation officers	Film-Dispensed	Film Received
530	4,413	22,776	19,812

3.6 Calibration of Radiation Dosimetry:

Dosemeters	Techniques
19	35

3.7 Quality Control of Medical Radioisotope:

- 10 institutions were visited

3.8 Depth Dose Factor:

- 28 techniques of depth dose factor were measured by using ion chamber and TLD.

3.9 TLD Postal Dose Intercomparison for Cobalt-60 in Bangkok:

- 7 machines were measured.

3.10 Research Project "Measurement of Depth Dose Factors for Various Co-60 and X-ray beams using Ion Chamber and Thermoluminescent Dosemeter" under auspices of IAEA.

Division of Clinical Pathology

The Division of Clinical Pathology, formerly the Division of Diagnostic Laboratories, was established in 1942. Its main responsibility was to serve as central diagnostic laboratories of the Ministry of Public Health. In 1957, WHO National Salmonella and Shigella Center was established in the division and under the Thai-German Technical Assistance Programme in 1967, the functions of the division were strengthened and expanded to serve as the national reference center for diagnostic laboratories. At present, it is responsible for the following:

1. Routine examination and confirmation of diagnosis in bacteriology, mycology, parasitology, biochemistry, hematology and serology.

2. Research works on public health problems in each field.

3. Production and standardization of diagnostic antisera, antigens and antibiotic sensitivity disce.

4. Technical training for students, medical technologists, medical laboratory technicians and other persons undertaking public health service.

5. Co-operation, exchanging information and research material with other institutions, and participation in the following projects:

5.1 The Thailand External Quality Assessment Scheme.

5.2 WHO Salmonella Surveillance Programme.

5.3 SEAMIC Data Exchange Project.

5.4 WHO External Quality Assessment Programme in Clinical Chemistry.

The Division has 8 main sections, namely: Enteric Bacteriology, Miscellaneous Bacteriology, Mycology, Parasitology, Biochemistry, Hematology, Serology, and Administrative Sections. The staff is composed of 11 medical doctors, 15 medical scientists, 21 laboratory technicians and assistances, 10 laboratory aids, 3 clerks, 2 typists, 2 drivers, and 5 workers.

With the existing facilities, the Division is able to perform the following activities:

1. Isolation and identification of pathogenic bacteria from clinical and non-clinical specimens, and antibiotic sensitivity testing of the isolated strains.

2. Serotyping of enteric pathogens: Salmonella, Shigella, enteropathogenic E. coli, Vibrio cholerae and Vibrio parahaemolyticus; colicine typing of Shigella sonnei; Streptococcus grouping.

3. Production of diagnostic antisera for Salmonella, Shigella, enteropathogenic E. coli and V. cholerae; Widal and Weil-Felix antigens; Salmonella phages (O1 Felix and rough) and Mukerjee phage IV.

4. Identification of fungi, including dermatophytes, systemic fungi, airborne fungi and mushrooms from clinical and non-clinical specimens.

5. Identification of toxin-producing fungi in food-stuffs, animal feed and composts.

6. Confirmation of laboratory diagnosis in mycology and parasitology.

7. Examination for medical parasites in stool, blood, urine, sputum and leukorrhea.

8. Helminth-eggs count in stool and stool examination for occult blood.

9. Routine examination in biochemistry: blood, serum, C.S.F., ascitic fluid, urinalysis.

10. Production of standard solutions and pooled sera.

11. Blood examination for : complete blood count, blood pictures in various blood diseases, blood grouping and Rh factor, hemoglobin typing and miscellaneous tests.

12. Serological tests for syphilis : VDRL, cardiolipin and Pallues complement fixation test.

13. Fluorescent Treponemal Antibody test (FTA).

14. Serological tests for rheumatoid arthritis by Latex RF, and Latex CRP.

5 year activities

Bacteriology	1979	1980	1981	1982	1983
Routine examination and research	23,293	17,202	15,034	17,344	8,899
Serotyping and confirmation of diagnosis	6,390	8,860	8,983	11,161	13,676
Antibiotic sensitivity test	7,673	8,207	8,300	5,941	6,899
Production of:					
Antisera (ml)	11,000	11,968	12,159	12,950	13,175
Antigen (ml)	641,500	607,200	643,000	333,500	366,500
Antibiotic discs					
(test star)	28,800	31,700	31,900	32,350	32,500
(single)	1,500	1,600	2,000	2,500	2,500
Supply of bacterial cultures	173	147	525	341	537
Media preparation (ml)	2,945,615	2,858,980	3,062,520	2,956,514	3,572,335

Mycology	1979	1980	1981	1982	1983
Routine examination	1,958	5,458	2,291	4,371	3,318
Examination for research	7,016	1,071	2,048	472	1,641
Confirmation of diagnosis	25	60	72	17	376
Parasitoloty					
Routine examination and examination for research	11,631	9,802	4,842	4,558	4,726
Slide preparation for teaching	152	-	-	45	40
Biochemistry					
Routine examination	8,830	14,800	13,504	19,850	14,657
Hematology					
Routine examination	9,868	7,281	9,872	8,493	7,596
Slide preparation for teaching	250	200	100	100	-
Serology					
Routine examination	23,801	20,678	13,063	10,56[illegible]	6,930

Research Projects

1, The Relationship between Nutrition and Intestinal Helminthiasis in School Children in Amphur Sriraja, 1980-1981.

2. Colicine typing of Shigella sonnei, 1981-1982

3, Serotyping of Pseudomonas aeruginosa, 1981-1982.

4. Isolation of Campylobacter jejuni from diarrheal patients, 1981-1982.

5. Phage typing and drug sensitivity test of S.typhi and S.paratyphi A, 1976-1982.

6. Legionnaires' disease in Thailand, 1983.

7. Epidemiology of Clostridium difficile in Bangkok, 1983.

8. Detection of enterotoxigenic E. coli by BIKEN method, 1983.

9. The study on Toxin Producing Fungi in Food-Stuff and Animal Feed, 1982.

10. An Ecological Study on Cryptococcus neoformans and the Prevalence and Occurence of Cryptococcosis, (1982)

Firstly the study was carried out to investigate the ecology of Cryptococcus neoformans in Bangkok. Samples of pigeon droppings were collected from various temple grounds and bird shops. The purpose of this study is to locate the sources of Cryptococcus neoformans and to inform the public health authorities of the findings in order to prevent health hazards of Cryptococcosis. This research is still going on.

Recent Publications

1983

Report case of Ascaridia galli in poultry egg. Bull. Dept. Med. Sci., Vol.25 : No.1, Jan-Mar, 1-8, 1983.

1982

1. The Relationship between Nutrition and Intestinal Helminthiasis in School-Children, Amphur Sriraja. Bull. Dept. Med. Sci., Vol.24 : No.1, Jan-Mar, 31-45, 1982.
2. The Economic Method for Sterilization of the Ear-cleaning Inplements. Bull. Dept. Med. Sci., Vol.24 :No.1, 47-52, 1982.
3. A Research in Sterilization of Banana Leaf from Fungi and/or Other Microbes for Wound Dressing Processes. Vajira Hospital Bulletin (In press).

1981

Serotyping of Enteric Pathogens Isolated from Chanthaburi Province in 1979. Bull. Dept. Med. Sci., Vol.23 :No.1, Jan-Mar.,33-40, 1981

1980

Bacteriological and Epidemiological Features on Gestrointestinal Diseases in Chanthaburi, 1979, Bull. Dept. Med. Sci., Vol.22 : No.4 October, 221-246, 1980

1979

1. Isolation and Identification of Enteropathogenic Bacteria from Diarrheal Patients in Chanthaburi, 1978. Bull. Dept. Med., Vol.21 : No.2, April-June, 85-94, 1979.
2. Antibiotic Sensitivity Patterns of Enteropathogenic Bacteria Isolated from Patients in Chanthaburi Provincial Health Laboratories. Bull. Dept. Med. Sci., Vol.21 : No.2, April-June, 95-100, 1979.

Division of Toxicology

The Division of Toxicology was up grade to be a division within the department of Medical Sciences in 1974. Actually detection of poison had been already performed before 1974. in this department.

The responsibilities of this division are as followed

1. Investigation and Identification of toxic substances are acheived by means of chemical and physical analysis combined with scaintific instruments as well as microbiological examination to serve medical diagnostic and forensic purpose.

2. Analysis of harmful substances and micro organism in cosmetics, household products, toys.

3. Analysis of poisonous plants and animals.

4. Searching for appropriate method of hazardous substances analysis.

5. To standardize the methods of analysis and training toxicologist among regional Medical Sciences laboratories

Samples are supplyied from Food and Drug administration, Bangkok city and provincial hospitals, Provincial health offices, Custom department, Metropolitan and provincial polices, other industrial manufacturers and personals.

The division has been divided to 5 sections

- Poisoning materials analysis
- Methodology development
- Cosmetic analysis

- Toxico micro biological analysis

- Administration section

The staff is composed of 14 chemists, 8 pharmacists, 4 laboratorial technicians, 1 clerk, 2 typists and 6 workers.

With existing facilities, the division is able to perform the following activities

1. Poisoning material analysis.

Dangerous pesticides of all types, metallic poisons, organic and inorganic chemicals poisons are extracted from human or animal tissues, corpse organs, (liver, kidney) and body fluids (urine, blood, stomach contents) and identified for specific purpose.

2. Cosmetic and household product analysis

This division rsponses for conducting analysis of cosmetic and household products when such analysis are deemed necessary for enforcement of Cosmetic Act both domestic and imported products under standard quality control aspect.

Examining for health hazardous material contaminants in products, biological standard test for toxicity and irritation are regulary perfomed.

In case of epidemic from unknown causes particularly from environments are involved will be taken as important role in finding fact.

5. Years activities

	1979	1980	1981	1982	1983
Pesticide	84	324	595	518	262
Organic & Inorganic poisons	176	354	295	697	165
Abuse drug & narcotic detection from urines	9	249	406	502	15
Health hazardous substances in cosmetic and household products	345	822	972	1054	943
Biological examinations	21	38	39	23	11
Research & method developed	5	6	6	2	6
	640	1793	2312	2769	1402

The publications

1983 1. Risk of using Insecticide., Bull. Dept. Med. Sci. vol.25 No.3 (Jul.-Sep.)

2. Domestic Insecticidal preparation of proper selection, Bull. Dept. Med. Sci. vol.25 No.4 (Oct.-Nov.)

3. Gonyaulax Toxin in Mussels, Bull. Dept. Med. Sci., vol.25 No.2 (Apr.-June)

1982 1. The Hazard of Anticholinesterare Insecticides, Bull. Dept. Med. Sci., vol.24.2 (Apr.-Jun.) p. 101-109

2. Purification of Morphine in Urine for TLC Identification by Using Non-ionic resin, Bull. Med. Sci., vol.24:3 (Jul.-Sep.)

1981 Ricinin Toxic in Castor-bean, Bull. Dept. Med. Sci., vol.22 No.4 (Oct.-Nov.), p.273

Division of Health Laboratory Quality Control

The Division of Health Laboratory Quality Control (DHLQC) is responsible for the quality control in all disciplines of technology in health laboratories, produotion of medical laboratory technicians, training of laboratory personnels and co-ordinating in quality control programme with all universities concerned in Thailand and also international federation and organization.

The manpower in this division is composed of : 1 director, 11 medical technologist, 1 chemist, 10 medical laboratory technicians, 1 general administrator, 4 clerks, 3 typists, 4 drivers and 5 workers.

The division has three main activities namely :-

1. Administrative section. This section is composed of :-
   - 1.1 General administration
   - 1.2 Documentation and Referenees
   - 1.3 Information
2. Training sub-division. This sub-division is composed of :-
   - 2.1 School of Medical Laboratory Technician.

     This school is responsible for :-

     - 2.1.1 First year course called "Medical Laboratory Assistants or MLA" which enrolls students from the high school's by entrance examination.
     - 2.1.2 Second year course called "Medical Laboratory Technicians or MLT" which enrolls the students who graduated from the first year course atleast 2 years by entrance examination

2.2 In-service training section. This section is responsible for the In-service training in special course of clinical pathology to the several level of Medical Laboratory Technicians in order to develop their knowledge attitude and skill in their role and responsibility and also to strengthen the technical efficiency and effectiveness in health laboratory services. These special courses of clinical pathology are as follows.

2.2.1 Bacteriology course

2.2.2 Clinical Chemistry course

2.2.3 Hematology course

2.2.4 Clinical Immunology course

2.2.5 Clinical Microscopy course

2.2.6 Maintenance of Scientific Equipment course

2.3 Career ladder course for Medical Laboractry Technicians for continuing education to B.Sc. in the Faculty of Medical Technology.

3. Quality Control sub-division. This sub-division is responsible for the performance of the Quality Control Programme, National level in all disciplines of Technology in the laboratories of Regional hospitals, General hospitals and Community hospitals. This sub-division is divided into:-

3.1 Quality Control in Bacteriology section

3.2 Quality Control in Clinical Chemistry section

3.3 Quality Control in Hematology section

3.4 Quality Control in Clinical Immunology section

3.5 Quality Contorl in Clinical Microscopy section

3.6 Quality Control in Blood Bank section

3.7 Evaluation section

3.8 Technical supervision section

4. Activities in 1983

4.1 Trained Medical Laboratory Assistants first year course : 98 students.

4.2 Trained Medical Laboratory Technicians second year course : 50 students.

4.3 Trained in special course of clinical pathology :

4.3.1 Training course in clinical bacteriology : 32 trainee.

4.3.2 Training course in clinical chemistry : 32 trainee.

4.3.3 Training course in hematology : 34 trainee.

4.3.4 Training course in clinical immunology : 30 trainee.

4.3.5 Training course in clinical microscopy : 22 trainee.

4.3.6 Training course in maintenance of scientific equipment : 42 trainee.

4.4 Performed external quality control in the following field :

4.4.1. Quality control in bacteriology 86 laboratories.

4.4.2 Quality Control in clinical chemistry 163 laboratories.

4.4.3 Quality Control in hematology 93 laboratories.

4.4.4 Quality Control in clinical immunology 221 laboratories.

4.4.5 Quality Control in clinical microscopy 351 laboratories.

4.5 Participated in external quality control in microbiology, conducted by WHO collabarative centre for External Quality Assessment 3 times.

4.6 Technical supervision 7 times: 43 laboratories.

Division of Drug Analysis

The Drug Analysis Division was established in 1952.
The responsibilities of the division are as follows:

1. To analyse all types of pharmaceutical products, materials intended for medicinal use and containers for sterile products.

2. To analyse all kinds of narcotics and psychotropic substances.

3. To supervise the local drug manufacturers on the standards and operation of their control laboratories.

4. To establish Thai Pharmacopoeia as a legal reference in the quality control of drugs.

5. To act as the expert witness for the legal cases related to the analysis of drugs, narcotics and psychotropic substances.

6. To educate and train the personnel in the technical aspects of pharmaceutical analysis

7. To co-ordinate with the domestic and foreign authorities in the matter concerned with the analysis of drugs, narcotics and psychotropic substances.

8. To act as a cooperation and information centre in the establishment of ASEAN Reference Substances.

9. To inspect the performance of the analysis of drugs in various laboratories in order to control the standard of their activities.

Samples are supplied by the Food and Drug Administration, drug manufacturers, drug exporters, drug importers, drug stores, the Government Pharmaceutical Organization, Department of Customs, and other government offices.

The Division has 9 main sections, namely :

Method Testing and Development

Pharmacopoeia,

Drug Evaluation and Reference Substances,

Physico-chemical Assay I,

Physico-chemical Assay II,

Narcotics and Psychotropic Substances Test,

Instrumental Analysis,

Microbiological Assay,

Biological Test.

The staff is composed of 93 analysts 6 laboratorial technicians, 1 electrician, 4 laboratory helpers, 7 clerks, 8 typists, 1 driver and 18 workers.

With the existing facilities, the Division is able to perform the following activities :-

1. Analysis of Pharmaceutical Preparations (modern and traditional) and Necessities

Analyse pharmaceutical dosage forms, raw materials and pharmaceutical aids which have been submitted by government and private agencies. The methods involved in the analysis are physico-chemical and biological determination. The requirements of pharmaceutical preparations such as content of active ingredient (s), content uniformity, disintegration, dissolution, pH, weight variation, potency, pyrogen, toxicity, sterility, bacterial contamination, stability tests, etc have been performed.

2. Narcotics and Psychotropic Substances.

Test of narcotics and psychotropic substances, in support of legal cases, is one of the most important roles of Drug Analysis Division's responsibilities. Since the nature of the charge and sentencing of the defendant depend upon the amount and purity of the drug, qualitative and quantitative determination of various drugs encountered in the enforcement of Narcotic and Psychotropic Substances Laws is essential. The Division also offers assistance to any duly authorized law enforcement agency, at home or abroad, in drug analysis and in court testimony.

3. Drug Screening Test Projects

The appropriate analytical method has been developed for drug screening test projects in the quality control of drug products on a large volume basis. Analysis of the drugs, which have been randomly sampled by the inspector from the Bureau of Food And Drug Administration, have been performed according to the project agreed between the Drug Analysis Division, Department of Medical Sciences and F.D.A. In 1983, drug scereening test project includes the dissolution test of chlorpropamide tablets, the determination of salicylamide in common cold preparations, etc.

4. Analytical Method Test

All the pharmaceutical preparations of single and combined drugs, which have been sold in the country, have to be registered. According to the process of registration, every preparations (about 5,000 formulars per year) have to be approved of the suitability of the analytical method for quality control. There is usually a standard method for analysis of a single drug or drugs officially in pharmacopoeia, but complications arise in the combination preparations. Drug Analysis Division, the only authorized government laboratory for drugs, has a responsibility to investigate these problems. Due to the lack of man power, it is difficult to have all the pharmaceutical preparations practically checked. About 1,000 preparations per year were tested when they were submitted for registration. From the recent record, it has been found that the majority of unreliable menthods were the combination preporations from local drug manufacturers. After the strict measures have been imposed, the quality is greatly improved. Drug Analysis Division is now trying to accomplish the goal of having all pharmaceutical preparations checked when they are submitted for registration.

5. Pharmacopoeia

Due to the fact that several problems are enceuntered in justifying the standard of drugs when referring to different pharmacopoeia. It became clear that Thai Pharmacopoeia was a necessity. The Thai Pharmacopoeia Committee was appointed in 1979, upon the approval of the cabinet. Following that subcommittees were set up by the Committee to perform functions assigned to them. Up to 1982, eight subcommittees, i.e.

Drug Selection, Drug Safety, Drug Standards and Analytical Methods, Drug Stability, General Specifications, Editorial Board, Biological products, and Crude Drugs, have been established.

The Pharmacopoeia is divided into two volumes. The first volume includes the general methods of analysis, monographs of drug substances, pharmaceutical and medicinal substances, and appendixes. The second volume comprises of the monographs of drug preparations. About eighty-one monographs, thirty-four appendixes, three items in general notices have so far been completed.

6. ASEAN Reference Substances

The Division was selected to act as the Cooperation and Information Center for the Establishment of ASEAN Reference Substances. This project was one of the six activities under Technical Cooperation among ASEAN countries on pharmaceuticals which were implemented by United Nations Development Programme (UNDP) and World Health Organization (WHO). Drug Analysis Division has initiated the first meeting from 25-27 November 1980, and the second meeting from 11-13 May 1982, in Bangkok. The objectives of the project are to promote the cooperation among ASEAN countries in the production of regional reference standard, to provide the member countries with low-cost reference substances of established quality in order to reach the concept of self-reliance and to improve quality, efficacy and safety of drugs used in ASEAN countries.

The progress activities of the project have so far been summarized as follows.

(i) five trainees (one from each country) were trained in chemical analysis in Sweden for 3 months,

(ii) observation tour group visited the pharmacopoeial laboratories in London and Sweden for 3 weeks,

(iii) thirteen compounds were analysed, in which 3 of them had the results evaluated statistically.

Equipments needed for the preparation of reference substances are now under the process of ordering.

Research Projects

1982 - 1983

1. Investigation of Seized Hercin Profile in Thailand.
2. Survey for Polymorph A of Chloramphenical Palmitate in Commercial Suspensions and Tablets.
3. Colorimetric Determination of Piperazine in Pharmaceutical Preparations
4. Determination of Aflatoxin in Traditional Drugs.
5. Drug Borne Disease

Research Projects in Progress

1. Fermentation Pilot Plan of Penicillins.
2. Strain Improvement of Microorganisms Utilized in Microbiological Assay.
3. Simultaneous Quantitative Analysis of Fluorine Containing Drugs with NMR Technique.
4. Determination of Local Anaesthetics and Adrenergics in Injection Supplied in Cartridges for Dental Use.
5. Determination of Defoaming of Dimethicone in Antacid
6. An In Vitro and in Vivo Study of Bioavailabitity of Digoxin Tablets.

Statistics of samples analyzed in 1981 - 1983

	1981	1982	1983
1. Modern and Traditional drugs	5,613	4,803	5,569
Modern Drugs	5,076	4,484	5,128
Analgesics and antipyretics	1,524	846	593
Vitamins	693	469	463
Antimicrobial drugs.. beside antibiotics (content and dissolution)	420	795	607
Antibiotics	1,412	1,384	1,153
Drugs affecting central nervous system	26	19	9
Tranquilizers (content and dissolution)	231	180	506
Gastrointestinal drugs (content and acid consuming capacity)	144	233	223
Hormones and steroids (content and dissolution)	192	501	182
Antihistamines	418	626	598
Respiratory drugs	711	269	229
Sedatives and hypnotics	28	3	4
Local and general anesthetics	6	11	23
Cardiovascular drugs (content and dissolution)	129	130	115
Anthelimintics	22	60	78
Blood fluid and electrolytes	47	65	90
Miscellaneous	400	277	255
Traditional Drugs	537	319	441

	1981	1982	1983
2. Pharmaceutical Necessitites (medical reagents and supplies, Pharmaceutical flavoring, coloring, proservatives, etc.)	81	115	169
3. Narcotics and Psychotropic Substances	10,463	9,838	14,773
Narcotics			
Heroin	5,627	5,814	8,513
Morphine	86	274	162
Codeine	73	260	156
Cannabis	3,735	2,709	4,977
Kratom	123	62	112
Opium	31	105	35
Miscellaneous	390	383	97
Non narcotics	98	122	386
Psychotropic substances	115	35	166
Narcotics & Psychotropic preparation	192	94	169
4. Testing the method of controlling Pharmaceutical preparations submitted for registration	857	995	827
5. Establishment of Thai Pharmacopoeia	136 sessions	156 sessions	186 sessions

Division of Food Analysis

1. History

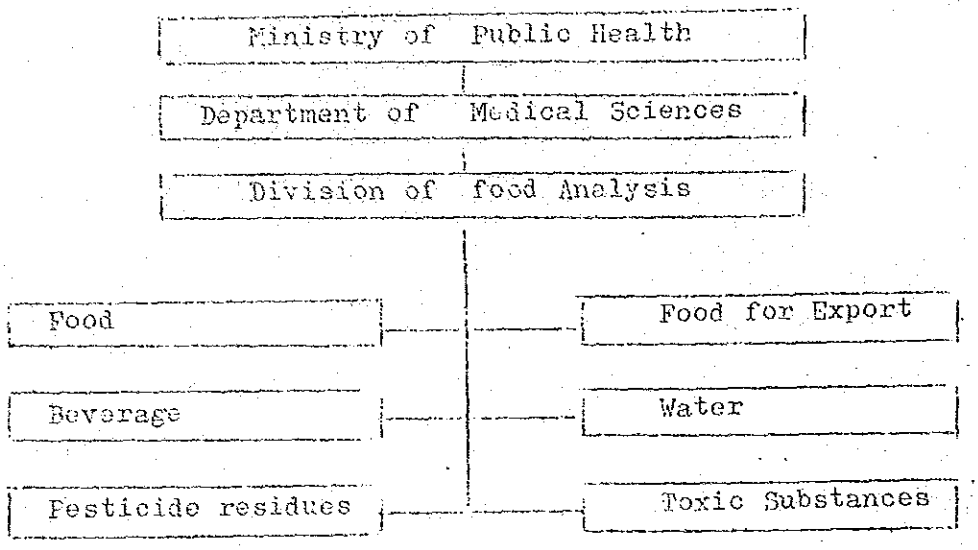
The Government of Thailand started food analysis activities in 1941. Analysis of coconut oil, peanut oil, preservatives, food composition of some Thai dishes and chemical quality of water were recorded. In 1951 the Division of Food and Beverage Analysis was organized in the Department of Medical Sciences, Ministry of Public Health. Its main activities included investigations of food adulteration, analysis of food additives, quality analysis of dairy products and soft drinks in order to support Public Health food quality control program. Routine analysis of tap water in Bangkok and Thonburi was carried out to insure safety. Survey projects on quality of the Chao Praya River water and food values of local foodstuffs were conducted.

The Division has been reorganized and has changed its name to the Division of Food Analysis since 1973. In spite of the shorter name, the Division has been expanding its activities to cope with food quality and safety services in control of imported food, domestic food and food intended for export. Modern methods and effective scientific equipment have been introduced in the analysis of contaminants in foods. Technical cooperation from international agencies and foreign governments has made rapid progress in manpower development and technological capability.

In the fifth National Development Plan, The Division proposes to serve as Public Health Central Food analysis laboratory.

2. Administrative Structure

2.1 Organization chart.



2.2 Functions

The Division of Food Analysis is responsible for analyses and researches in the field of food quality and safety to benefit people of the whole country. It also functions as food analysis reference laboratory and provides laboratory quality assurance services.

3. Activities

In attempts to protect consumers health and welfare, to support public heath and industrial food control activity, to promote high quality foods for the people and for exportation, the Division establishes its activities to cover 4 main objectives. namely :-

1. To protect consumers against hazards from foodborne diseases and food contaminants.

2. To support food standard and food control programs in both public health and industrial aspects.

3. To promote high quality food productions and quality screening of food for export.

4. To provide national and international technical cooperation including public relations in all aspects of food quality and safety.

4. Current Situation in 1983.

4.1 Staff : a total of 109 staff members falls into the following classifications.

Food Analysts	70
Laboratory Assistants	8
Clerical staffs	11
Laboratory workers	22

4.2 Analytical services

Domestic foods	Number of samples analysed.
- Central Lab	7,744
- Food for export.	5,416
Total	13,160

4.3 Export promotion

No. of Certificates issued	10,546
Total weight of foods certified as safe (M/tons)	103,598

4.4 Training services

	Number of attendants
Training course	110
Lectures	415
Total	525

4.5 Recent publications

4.5.1 Accumulation of Lead in Thousand-year-old Egg. Bull Dept. Med. Sci., vol.23 : No.4, 231 - 241, 1981.

4.5.2 Contamination of Insecticides in Marine Fish. Proceedings of the second seminar on the Water Quality and the Quality of Living Resources in Thai Waters, 232, 237, 1981.

4.5.3 Mercury Contents in Marine Faunas. Proceedings of the second seminar on the Water Quality and the Quality of Living Resources in Thai Waters 238 - 242, 1981.

4.5.4 Distribution of Staphylococcus aureus in foods. Bull Dept. Med. Sci, vol.22 : No.4, 193 - 208, 1981.

4.5.5 Occurrence of Enterococci : a sanitary indicator in frozen Seafoods. Bull Dept. Med. Sci., vol.24 : No.4, 205 - 215, 1982

4.6 List of committees and programmes participated

National activities.

- Ministry of Public Health :-
  - Subcommittee on Food Research and Study.
  - Subcommittee on Food Registration Approval.
  - Subcommittee on Food Standard and Specification.
  - Subcommittee on Licensing Approval.

- Ministry of Industry.
  - National Council For International Standard Organization.
  - Technical Subcommittee on Acceptance of ISO - TC.
  - Technical Subcommittee on Acceptance of Codex Standards.
- Ministry of Sciences, Technology and Energy.
  - Food and Nutrition Research Committee.
  - Subcommittee on Asean Protein Research.
  - Subcommittee on Quality of Water and Living Resources in Thai Waters.
  - Subcommittee on hazardous environment.
- Ministry of Agriculture and Co-operatives.
  - Subcommittee on Toxic Substances.
- Ministry of University Affairs.
  - Training and research on food and nutrition committee.
- Ministry of Commerce.
  - Export development Committee.

International activities

- WHO - Food Safety Project.
- JICA - Promotion of Provincial Health Project.
- University of Miami - Quality control programme UC/AID Pest Management and Related Environmental Protection Project.
- Collaboration Center - Joint FAO/WHO Food and Animal Feed Contamination Monitoring Programme.

5. Future trend.

The Division plans to continue expanding its services both qualitatively and quantitatively in order to support the activities of Food Control for safety Which is now facing with adulteration or deception due to the economic problem. Survey researches in food hygiene with reference to diseases and eating habit as well as in toxic substances contaminated food chains through polluted environments will be conducted. Laboratory quality assurance programme and supervision of regional - food laboratories are among the important goals for the future activities.

Division of Medical Research

The Division of Medical Research was established in 1952. The main work is to conduct research studies on medicinal plants and biologics. Research on medicinal plants involves cultivation in experimental gardens, physico-chemical analysis of active constituents, structure elucidation, and pharmacological and toxicological studies.

The Division has 9 main sections, namely: Biological Control and Research, Botanical Research, Pharmacognostic Research, Phytochemical Research, Organic Synthesis, Pharmacological Research, Pharmacokinetic Research, Research on Production and Safety of Traditional Medicines, and Administrative sections.

The staff is composed of 38 Pharmaceutical Research Scientists, 6 laboratorial technicians, 2 administrative officers, 2 typists, 2 drivers, 26 permanent workers, and 52 temporary workers.

With the existing facilities, the Division is able to perform the following activities:

1. Research and development of methods for the production of all biologics (vaccines and sera), supervision of biological production at the Government Pharmaceutical Organization, biological standardization of vaccines and sera produced locally and imported, and acting as the National Control Laboratory for Biologicals.

2. Surveying and ecological study of local medicinal plants, collecting, identification and cultivating them in experimental gardens. The section is also responsible for cultivation of cinchona at two plantation stations.

3. Identification of medicinal plants (crude drugs) by morphological, histological examinations, either macro or microscopically, with some chemical tests in order to determine the quality, purity and adulterants of such drugs.

4. Extraction, separations, purification and identification of plant constituents, and study of their physical and chemical properties qualitatively and quantitatively in order to establish the standard for crude drugs.

5. Structural elucidation of active components derived from plants, and synthesis of some principles and their analogs which have been believed or proved to be biologically active.

6. Research study on pharmacological and toxicological actions of plant extracts and isolated principles from plant materials. Study of the therapeutic effect of drugs both in animal and man is also undertaken.

7. Study of drug absorption, distribution, metabolism and excretion, and also of the relationship of these processes to the intensity and time course of therapeutic and adverse effects of drugs. These informations can provide a reasonable basis for the design of dosage forms and dosage regimens of drug products originated from natural products.

8. Development and formulation of traditional remedies and effective medicinal plants including their extracts and active principles for manufacturing. It is also responsible for the test for safety of the drug produced.

9. Establishment of one Botanical Garden at Chanthaburi Province and two Cinchona Plantations at Chieng Mai Province.

Activities. 1. Biological Standardization.

Bacterial Vaccine	1981	1982	1983
- Typhoid vaccine	33	96	86
- Cholera vaccine	7	13	9
- Tetanus toxoid	34	106	76
- DT vaccine	13	82	89
- DTP vaccine	39	91	67
Viral Vaccine			
- Polio vaccine	8	-	7
- Rabies vaccine	117	195	204
Serum			
- Antisnake venom	3	36	15
Miscellaneous	6	1	33

2. Research projects in Progress.

2.1 Biological Products.

2.1.1 Stability of Typhoid Vaccine at concentration of 500 and 1,000 million organisms per ml., kept in 2-8°C at different intervals.

2.1.2 Stability of Antisnake Venom Serum, kept in 2-6°C at different intervals.

2.1.3 Production of Purified Tetanus Antitoxin (Equine).

2.2 Medicinal Plants.

2.2.1 The Pharmacognostical study on some plants used for Anthelmintic.

2.2.2 The Pharmacognostical study on some plants used for Cardio-tonic.

2.2.3 Phytochemical Study of Medicinal Plants used as Anti-diabetic.

2.2.4 Phytochemical Study of Bun-nak Flowers (Mesua ferrea Linn.) used as Anti-hypertensive.

2.2.5 Chemical Investigations of Thai Zingiberaceous Plants

2.2.6 Research on Identification and Production of Diosgenin Producing Plants for Opium Poppy Substitute in the Highland of Northern Thailand (In association with Kasetsart University).

2.2.7 In vitro response of Plasmodium falciparum to chemical constituents isolated from Thai Medicinal Plants.

2.2.8 Analysis to set up the Standard of Thai Medicinal Plants.

2.2.9 Aflatoxin analysis in medicinal plants and herbal medicines.

2.2.10 Analogs of (E)-4-(3',4'-dimethoxyphenyl)-but-3-en-1-ol as Smooth Muscle Relaxants.

2.2.11 Pharmacokinetic study of bronchodilating compound in Plai (Zingiber cassumunar Roxb.)

2.2.12 Cardiotonic Property of Medicinal Plants and Traditional Remedies.

2.2.13 Toxicological Study of Medicinal Plants intended to be used in PHC.

2.2.14 Center for Pharmacological and Toxicological Informations of Medicinal Plants and Traditional Medicine.

2.2.15 Study on the toxicity of Puak-haad (Artocarpus lakoocha Roxb.)

2.2.16 Screening for the toxicity of wild foliage plants.

2.2.17 Research on the toxicity of Thai traditional medicines.

2.2.18 Hepatotoxicity plants in Thailand.

2.2.19 Development of berberine from Kamin-krua.

2.2.20 Cinchona Plantation Project.

2.2.21 Exploration and Botanical Study on Medicinal Plants used as Anti-diabetic.

2.2.22 Exploration and Botanical Study on Medicinal Plants used as Anti-malaria.

2.2.23 Exploration and Collection of Cloves in Thailand.

Recent Publication.

1983.

1. Defensive Mechanism and Neutralizing Antibody Response to Fixed Rabies Virus in Mice of Herbal Medicines. The Bull. Dept. Med. Sci., 25(1), Jan.-March, 9-17, (1983) (Thai, Eng. Abst.).
2. Isolation of Hypoglycemic Components from Hedyotis biflora (L.) Lamk. Mahidol University Journal of Pharmaceutical Sciences, 10(1), 9-14 (1983)(Eng.).
3. Flavonoids in The Black Rhizomes of Boesenbergia pandurata (Roxb.) Schltr. Phytochemistry, 22(2), 625(1983) (Eng.).
4. ($1'$ RS, $2'$(SR, $6'$ RS)-(2, 6-dihydroxy-4-methoxy phenyl) $3'$-methyl-$2'$-($3''$-methylbut-$2''$-enyl)-$6'$-phenylcyclohex-$3'$-enyl methanone (Panduratin A)-A Constituent of the Red Rhizomes of a Variety of Boesenbergia pandurata (Roxb.) Schltr. Aust. J. Chem. in press. (1983) (Eng.).

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1. Chemical Constituents of Schefflera sp. J. Sci. Thailand, 8, 115-117 (1982), (English).
2. Constituents of Boesenbergia pandurata (Roxb.) Schltr (Syn. Kaempferia pandurata Roxb.) : Isolation, Crystal Structure and Synthesis of (±) - Boesenbergin A. Aus. J. Chem, 35, 351-61 (1982) (English).

2.2.22 Exploration and Botanical Study on Medicinal Plants used as Anti-malaria.

2.2.23 Exploration and Collection of Cloves in Thailand.

Recent Publication.

1983.

1. Defensive Mechanism and Neutralizing Antibody Response to Fixed Rabies Virus in Mice of Herbal Medicines. The Bull. Dept. Med. Sci., 25(1), Jan.-March, 9-17, (1983) (Thai, Eng. Abst.).
2. Isolation of Hypoglycemic Components from Hedyotis biflora (L.) Lamk. Mahidol University Journal of Pharmaceutical Sciences, 10(1), 9-14 (1983)(Eng.).
3. Flavonoids in The Black Rhizomes of Boesenbergia pandurata (Roxb.) Schltr. Phytochemistry, 22(2), 625(1983) (Eng.).
4. ($1'$ RS, $2'$(SR, $6'$ RS)-(2, 6-dihydroxy-4-methoxy phenyl) $3'$-methyl-$2'$-($3''$-methylbut-$2''$-enyl)-$6'$-phenylcyclohex-$3'$-enyl methanone (Panduratin A)-A Constituent of the Red Rhizomes of a Variety of Boesenbergia pandurata (Roxb.) Schltr. Aust. J. Chem. in press. (1983) (Eng.).

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1. Chemical Constituents of Lobefflora sp. J. Sci. Thailand, 8, 115-117 (1982), (English).
2. Constituents of Boesenbergia pandurata (Roxb.) Schltr (Syn. Kaempferia pandurata Roxb.) : Isolation, Crystal Structure and Synthesis of (±) - Boesenbergin A. Aus. J. Chem, 35, 351-61 (1982) (English).

3. Identification of some Thai Medicinal Plants. Mahidol University J. of Pharm. Sci. Vol.9, No.3 (1982) (English).

4. Stability Test of Rabies Vaccines, Semple type, Sheep brain and Suckling mouse brain at different temperatures and intervals. Bull. Dept. Med. Sci. 24(1), 21-29 (1982), (Thai, Eng. Abs).

5. Could In-ta-nin (Lagerstroemia speciosa Pers) be used as Anti-diabetic drug. Bull. Dept. Med. Sci. 24(2), 111-113 (1982), (Thai).

6. Effect of Coconut Milk on Absorption of Ma-Klua. Report to The National Research Council. (1982), (Thai).

7. Aflatoxin Analysis in Crude drugs and Herbal Medicines. Report to The National Research Council. (1982), (Thai),

8. Study on Toxicity of Ma-klua (Diospyros mollis griff.) used as a Traditional Anthelmintic in Thailand.) Bull. Dept. Med. Sci., 24(4) Oct.-Dec., 227-236 (1982) (Eng., Thai. Abst.)

9. Stydy on the Toxicity of Ma-klua Berry Juice mixed with Coconut milk. Bull. Dept. Med. Sci., 24(4) Oct.-Dec., 237-253, (1982) (Eng., Thai Abst.)

10. Hypoglycemic Effect of Hedyotis biflora (Linn.) Lamk. Bull. Dept. Med. Sci., 24(4), 193-204, (1982) (Thai, Eng. Abst.)

11. The Pharmacognostical Study on some plants used for Anthelmintic (Quisqualis indica Linn). Report to The National Research Council. (1982), (Thai, Eng. Abs).

1981.

1. Phenylbutanoids from Zingiber cassumunar Roxb. Phytochem., 20, 1164-65 (1981), (English).
2. The Pharmacognostical Study on Khu'n-Chai (Apium graveolens Linn.). Bull. Dept. Med. Sci, 23 (2), 67-79 (1981), (Thai, Eng. Abst.).
3. Traditional Medicines in Primary Health Care. Bull. Dept. Med. Sci. 23 (4), 269-275 (1981), (Thai).
4. Absorption of Some Bronchodilating Compounds. Report to The National Research Council. 1980 (Thai).
5. The Pharmacognostical Study on some plants used for Anthelmintic. (Cassia alata Linn.). Report to The National Research Council. (1980), (Thai, Eng. Abst.)
6. The Pharmacognostical Study on some Zingiberaceae Plants. Report to the National Research Council. (1981), (Thai, Eng. Abst.).

1981.

1. Phenylbutanoids from Zingiber cassumunar Roxb. Phytochem., 20, 1164-65 (1981), (English).
2. The Pharmacognostical Study on Khu'n-Chai (Apium graveolens Linn.). Bull. Dept. Med. Sci., 23 (2), 67-79 (1981), (Thai, Eng. Abst.).
3. Traditional Medicines in Primary Health Care. Bull. Dept. Med. Sci. 23 (4), 269-275 (1981), (Thai).
4. Absorption of Some Bronchodilating Compounds. Report to The National Research Council. 1980 (Thai).
5. The Pharmacognostical Study on some plants used for Anthelmintic. (Cassia alata Linn.). Report to The National Research Council. (1980), (Thai, Eng. Abst.)
6. The Pharmacognostical Study on some Zingiberaceae Plants. Report to the National Research Council. (1981), (Thai, Eng. Abst.).

Virus Research Institute

The Virus Research Institute, Department of Medical Sciences, Ministry of Public Health, Thailand was established in 1963.

The responsibilities of this Institute are fundamental and applied research in virology and related fields; investigation of clinical specimens to provide information needed by the physicians for diagnosis, prophylaxis and treatment; virological surveys which may assist the epidemiologist in evaluating pertinent situations or in planing preventive measures; acting as reference centre for laboratories; provision of consultation services and training to local laboratories, serves as a WHO National Influenza Centre, a WHO National Viral Hepatitis Centre and a National Serum Bank.

The Virus Research Institute has 9 main sections, namely: Enteroviruses, Arboviruses, Respiratory Viruses, Miscellaneous Viruses, Immunology, Immunochemistry, Electron-microscopy, Preparation of Apparatus and Mouse Colony, and Administrative sections.

The staff is composed of 4 medical doctors, 6 veterinarians, 12 technologists, 19 lab technicians, 1 electrician, 8 laboratory helpers, 1 general administrator, 3 clerks, 1 typist, 4 drivers and 3 workers.

With the existing facilities, the Institute is able to do the following laboratory activities:-

1) Tissue culture work : primary cells being used are pig kidney and chick embryo fibroblast cells. More than 10 different cell lines such as HEp-2, LLC-MK2, KB, FL, Hela, MA 104, MDCK, C6/36 (Aedes albopictus cell), BHK-21, Vero, HEL are maintained and used.

2) Isolation of viruses in tissue culture, suckling mice, embryonated eggs, and mosquitoes.

3) Neutralization test in tissue culture and animals for identification of virus isolates and quantitation of antibodies.

4) Serology: - HI, NT, PHA, RPHA test.

5) Detection of virus infection and determination of viral antibodies by FAT, ELISA, RIA.

6) Electrophoresis and immunodiffusion test.

7) Electronmicroscopy.

8) Production of antigens, antisera, nutrient media.

1) Diagnostic examinations

Virus Diseases	1979	1980	1981	1982	1983
Adenovirus infections	24	64	43	160	77
Acute Haemorrhagic Conjunctivitis	33	1	32	49	202
Arbovirus isolations	-	-	151	101	91
Hepatitis A	-	7	14	10	9
Hepatitis B	390	376	1445	149	269
Herpesvirus infections	29	57	45	113	55
Haemorrhagic fever	3759	7106	3464	4007	2161
Viral diarrhoea	-	-	188	74	12
Infectious mononucleosis	2	7	14	8	7
Influenza	82	114	324	133	320
Japanese encephalitis	732	818	724	561	389
Measles	33	49	97	104	148
Mumps	19	1	17	42	40
Other enterovirus infections	103	104	110	220	256
Poliomyelitis	414	85	110	159	97
Rabies	165	234	143	153	204
Respiratory syncytial virus	37	27	5	105	26
Rubella	936	780	499	533	527
Smallpox (to be ruled out)	10	4	3	2	2
Total	6768	9836	7428	6683	4890

2) Epidemiological surveys

Serological surveys for antibodies against viral diseases such as poliomyelitis, coxsackie B, measles, acute haemorrhagic conjunctivitis, Rotavirus, Herpes simplex virus, rubella, influenza, J.E., dengue and chikungunya infections were carried out among the general population in Bangkok Metropolis or some special groups of population in various parts of Thailand.

In addition sera collected from human and animals in Nepal were tested for Japanese encephalitis and dengue antibodies, on the request of World Health Organization, South East Asia Region.

3) Test production of vaccine

- Modified live virus tissue culture origin.

- Inactivated chick embryo fibroblast tissue culture rabies vaccine for human use.

- Inactivated tissue culture rabies vaccine for animal use.

4) Research project on the way

1. A Prospective Epidemiological Study of DHF in Thailand. The Rayong Study.

2. Seroepidemiological study of DHF in Thailand.

3. Adaptation of rabies virus in tissue culture cells.

4. Inactivated tissue culture rabies vaccine for animal use.

5. The etiological study of epidemic acute haemorrhagic conjunctivitis.

6. The study of Poliomyelitis in Bangkok, Thailand.

7. The determination of rotavirus in stool of acute gastroenteritis in Bangkok by ELISA and RPHA.

8. Etiological study of viral diarrhoea in Bangkok Metropolis.

9. Reduced schedule immunization of human against rabies with suckling mouse brain vaccine.

Recent Publications

1983

1. Epidemiological Investigation on Arboviruses in Chanthaburi Province, 2, Entomological Surveillance:
A Trial on Isolation of Viruses from Field-Collected Mosquitoes in Aedes albopictus C6/36 Cells. Interim Report 4.

2. A Pilot Study as an Etiological Survey on Diarrheal Diseases in Chanthaburi. Interim Report 4.

3. Epidemiological Investigation on Arboviruses in Chanthaburi Province: 1, Serological Surveillance:
Detection of HI-Antibody for the J.E. Virus in Domestic Pig Sera in Chanthaburi. Interim Report 4.

4. Application of Formalinized Goose Red Blood Cells to Arbovirus Haemagglutination (HA) and Hemagglutination-Inhibition (HI) Test. Interim Report 4.

5. Prevalence of Rotavirus Antibody in Bangkok Metropolis 1982. J. Diar. Dis. Res. 1983 Mar; 1(1): 29-31.

6. Measles Immunization in Thai Children. Ramathibodi. Med. J. Vol. 5. No. 4. 245-252. 1982.

7. Seroepidemiological study of poliomyelitis in Bangkok Metropolis 1982. (Reported to WHO)

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1. Isolation of an Influenza H_1N_1 Virus from A Pig Virology. Vol.117: No.2, 485-489, March 1982.

2. Isolation of influenza viruses in Thailand during June-August 1981. J. Nippon, Med. Sch, Vol.49: No.3, 146-149, 1982.

3. The study on coxsackie B in Thai patients with cardiac symptoms 1980-1981. Bull of Infectectious Disease Group of Thailand. Vol.5: No.1 1-9, 1982.

4. The poliomyelitis Bull of Infectious Disease Group of Thailand. Bol.5: Nol, 48-49, 1982.

5. Japanese Encephalitis in Thailand. Bull. Dept. Med. Sci. Vol.24: No.1, 1-19, January-March 1982.

6. The Determination of Dengue Neutralizing Antibodies Blood-Sampling Paper Strip. Bull. Dept. Med. Sci. Vol.24: No.2, 91-99, 1982.

7. Serological Survey of antibody to Measles virus in the population of Bangkok Metropolis 1982, J. of Ministry of Pub. Hlth. 1982; 1: 15-21.

8. Prevalence of antibody to coxsackie B viruses in Bangkok Metropolis and cardiac diseases 1980-1981. Bull of Infect Dis gr of Thailand 1982, 5: 1-9.

9. A long term study of rotavirus infection in the infant and children with diarrhoea. Southeast Asian J. Trop. Med. Pub. Hlth 1983; 13: 373-76.

10. Study of Human Antibody Response by 0.1 ml of Human Diploid Rabies Vaccine Intradermally. Bull of Dept. Med. Sci. Vol.24: No.4, October-December 1982.

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1. Sero epidemiology survey of HSV (hominis) in Bangkok and Chinat province, 1979. Bulletin of Infections Diseases Group of Thailand, Vol.4: No.1, 1-9, 1981.

2. The Potency of Semple Vaccine and the antibody Titer from Semple Vaccination. Com. Dis. J., Vol.7: No.2, April-June, 73-79, 1981.

3. Antigenic and genetic analysis of A/Hong Kong (H_3N_2) influenza viruses isolated from swine and man.

4. The electronmicroscopic study of human Rotavirus infection in acute diarrhoea in Thailand. Bull. Dept. Med. Sci., Vol.23: No.1, January-March, 1-11, 1981

5. RSV antibody surveys in Bangkok, 1974, 1975. Bull. Dept. Med. Sci., Vol.23: No.1, January-March, 13-20, 1981.

6. Antibody response to different Rabies vaccines. Bull. Dept. Med. Sci., Vol.23: No.1, April-June, 87-98, 1981.

7. Isolation and identification of dengue viruses by combined use of C6/36 cells and the immune adherence hemagglutination test. Japan. J. Med. Sci. Biol. Vol.34: No.6, 1981.

8. Infectivity rate of dengue and chikungunya infection in Chanthaburi. Promotion of Provincial Health Services, Interim report II, 166-186, 1981

9. DHF surveillance in Thailand 1980. Bull. Dept. Med. Sci., Vol.23, No.3, July-September, 159-176, 1981.

10. Serological diagnosis of JE in Thailand 1980. Bull. Dept. Med. Sci., Vol.23, No.3, July-September, 177-193, 1981.

Regional Center of Medical Sciences

The Regional Center of Medical Sciences in six provincial areas were recognized in 1983. Actually, the first Regional Center in the North-East, Nakornrajsima, was set up in 1977 with complete basic equipments. The followings were established on the consecutive years in the South (Songkhla), North (Pitsanuloke), North-East (Khonkhaen) and North (Chiengmai) respectively. The last one in the East (Chonburi) is in the process of establishment.

The activities of the Regional Centers serve the upcountry people in the following fields.

Food Analysis : for safety, standard quality and contaminants of food, water and beverage by physical, chemical and microbiological method.

Drug Analysis : for quality assurance of pharmaceuticals prepared or submitted by governmental hospitals or agencies, and assisting in the legal cases concerned with drug quality control.

Toxicology : to investigate and identify poisonous and toxic substances by physical and chemical method for diagnostic and forensic purposes.

Clinical pathology : to serve as the regional reference in clinical pathology of regional health laboratory of governmental hospitals, and for some special clinical pathological investigations for diagnostic purposes.

The complete technical staff of each centers will consist of fourteen medical scientists and eight medical laboratory technicians. At present, the staff of the Division of Food Analysis, Division of Drug Analysis and Division of Toxicology take turn on working at these centers for a period of eight weeks, one person from each division, join with the provincial staff of the Health Laboratory. The manpower is expected to be fulfilled in 1986 and the activities shall be completed by then.

The activities in 1983 are as follow :

Food Analysis

Regional Center	Total number of samples	Standard quality *	Contaminants *	Safety *
1 Songkhla	437	50/83	187/319	33/35
3 Nakornrajsima	946	28/91	237/377	106/478
4 Khonkhaen	688	35/80	219/343	67/265
5 Chiengmai	181	19/34	98/147	-
6 Pitsanuloke	395	59/99	154/296	-

* Number of conformed samples/total number of samples

Drug Analysis

Regional Center	Total number of samples	Standard quality			Identification
		samples (tests)	quantity*	other* qualities	samples (tests)
1 Songkhla	96	87(260)	69/85	149/175	9 (12)
3 Nakornrajsima	609	102(251)	107/142	98/109	507(1,308)
4 Khonkhaen	479	106(288)	117/151	89/137	373(1,016)
5 Chiengmai	178	14(29)	15/17	12/12	164(302)
6 Pitsanuloke	244	140(298)	187/210	85/88	104(352)

* Number of conformed tests/total number of tests

Toxicology

Regional Center	Total number of samples	Toxic substances*	Narcotic in urine*	Cholinesterase activity level in blood**
1.Songkhla	559	114/173	189/367	18/19
3 Nakornrajsima	3,799	165/283	1/2,885	541/631
4 Khonkhaen	-	-	-	-
5 Chiengmai	-	-	-	-
6 Pitsanuloke	325	47/82	58/103	128/140

* Number of samples with the substances/total number of samples

** Number of samples with abnormal level (less than 1,900 mu/ml)

The Scientific Instrument Center

Scientific instruments play an important role in succeeding the scientific research and analysis. Its development is endles and following closely the progress of experimental methods and technologies including that of the medical sciences. Research and analysis in medical sciences needs the supportation of INSTRUMENTATION: a science of procurement, installation, utilization, maintenance, precision control, modification and repair of instrument. By many reasons, medical man is not always ready to take responsibility for these whole spectrum of instrumentation. It is necessary for someone or group of people to fill up these vocations. A modern medical research and analysis institute such as the Department of Medical Sciences is particularly the case.

The needs in expanding the scope of responsibility make the quantity and quality of works of the Department of Medical Sciences increase drastically. Number of instruments in use becomes bigger and bigger, and budget for purchasing new instruments is multiple year by year. But the instrumentation is hardly keeping pace with. Often, routine analysis and research works have to be suspended due to the failure of instruments. On the other hand, many instruments are left idle for long time or even from the time of delivery. Also there is some that never be started for they have not been installed properly. Problems faced are complex and need systematic proper measures. Supplier is not always a good after service agent.

2. Repair record.

The following record (table 1) is for scientific instrument only. An amount of 1,001,850 Baht of service charge in average can be considered as has been saved.

3. Other activities.

3.1) In January 1983, SIC was sponsored by Thai-Japan cooperation project of Provincial Health Promotion to conduct a seminar-workshop in Laboratoy Instruments Maintenance and Preliminary Repair.

3.2) In February 1983, SIC had joined the Mahidol University in promoting an International Seminar and Workshop in Clinical Laboratory Equipments.

3.3) On May 24, 1983, SIC has given a special lecture and demonstration on Small Computer Application in Medical Sciences Research and Analysis.

3.4) SIC has been granted by the National Research Council for carrying on research study in Problems on Using Scientific Instruments in Health Service.

New projects

1. Instrumental Accreditation.
2. Routine Preventive Care Service.
3. New registration and record system for scientific instruments.
4. Computer Application Advice and Service.
5. Self-contained in instrumental means for the 6 new established Medical Sciences Centers.

To promote an effective use of budget for instruments and better instrumentation, the project of setting up the Scientific Instrument Center (SIC) was announced by the Director of Department of Medical Sciences in May, 1981. A working subcommittee is appointed soon after to implement the scheme.

Since the SIC is still in its fetal state. It is officially attached to the secretariat of the department. But, in practical, directed by its own chief who is also the director of the working subcommittee. Though the working subcommittee is composed of 13 members, there are only one doctor of engineering, one physicist, two electricians and one medical technologist who take their responsibilities seriously. These people work on a voluntary basis. There is no clear division at the present time, but just a group of instrumental service staffs.

According to the project's scheme, the SIC is divided functionally into 5 sections namely:

1) Service Section This covers the works in installation, maintenance, repair and precision/quality assurance.

2) Research and Development Section Beside a Theoretical and Technical Advisory Board of Instrumentation, there are groups of people work for modifying the existing equipments, developing instruments for specific purposes, and contributing the knowledges of instrumentation to the public by means of seminar, training, and publications.

3) Computer Application Section With a MZ 2000 Personal computer system and its supporting softwares donated by the Japanese International Cooperation Agency, routine data collection, reduction and manipulation can be carried out with not too much effert. It may be interfaced with many other instruments for no-line operation. It can be utilized as a host computer for other microprocessing system being develop in our laboratory too.

4) Sophisticated Instruments Pool This is a proposed solution for more effective management in instrumentation. Any complicated, huge and expensive equipments are centralized to provide common facility, ease for maintaining and repair. By this way, it is expected to be able to save a lot of money and man power.

5) Admintstration Section There are here an office for the director, a project planning and analysis board, a registration and statistics commission, and also an investment/resource recovery/ supportation searching implement committee.

To fulfil the above mentioned scope of works, a minimum required number of man power is estimated to be twenty-one. Beside the present five active subcommittee members, it is expected to recruit 4 electronics engineers, 3 computer personnels, 1 statistician, 1 medical physicist and 4 administerial staffs. However, under the present circumstance, 2 electronics engineers and 1 administerial staff is approved during the years 1984 to 1986.

Official records during October 1982 to September 1983.

1. Number and categorization of instrumrnts used in the Department of Medical Sciences.

1.1) Optics:

Instruments classified in this category are bases on the nature and physical or chemical reaction of light with matters. These are, for example, various kinds of spectrometer and microscope with a total unmber of 130 units.

1.2) Thermal:

Incubator and lyophilyser are examples of instruments applying the concept of heat in their operation. There are about 360 units of this kind in our department.

1.3) Mechanics, Gravitational or Pressure:

These are balance, centrifuge etc. that employ the mechanism of mechanics, gravitational or pressure in their performance. They are counted to a number of 180 units.

1.4) Polarization, Ionization and Nuclear:

There are electrophoresis, gamma counter and pH meter etc. with a total number of 40 units in this department. All these work on the principle of polarization, ionization and nuclear.

1.5) Miscelleneous:

There are also a total number of 100 instruments that can not be grouped in the above mentioned 4 categories. These are, for example, battery charger and ultrasonic cleaner etc.

TABLE 1 REPAIR RECORD

Name of Instrument	Number (Frequency)	Service Charge Range/Unit (1000 Baht)	Averaged Service Charge (1000 Baht)
Autoclave	7	2-4	21
Atomic Absorption Spectrometer	1	20	20
Balance, Electronic & Analytical	3	2	6
Battery Charger	2	2	2
Calculator, Programmable	1	4	4
Cell Counter, Automatic	1	.3	.3
Centrifuge	16	2-5	56
Differential Counter	3	5-10	22.5
Disintegration Rate Unit	3	2-10	18
Dissolution Rate Meter	2	2-10	12
Electron Microscope	3	12-30	63
Electrophoresis	1	2	2
Flame Photometer	10	.5-10	52.5
Freezer, Ul Tralow Temperature	1	3	3
Gas Chromatograph	10	4-10	70
Heating Mantle	4	1.2-4	10.4
Hot Plate/Stirror	8	.5-10	42
Hood, Sterilizing	1	.5	.5
Incubater	4	1-3	8
Infrared Spectrophotometer	1	5	5
Light Microscope	22	2-4	66
Lyophilyser	2	2	4
Melting Point Apparatus	1	.5	.5
Mixer	2	1	2
Microheamatocrit Centrifuge	7	1	7
Magnetic Stirror	3	.5-10	15.75
Mill, Electric	1	1	1
Nmr Spectroscope	2	.5-5	5.5
Oven	8	1-2	12
Pyrometer	2	2-5	7

Name of Instrument	Number (Frequency)	Service Charge Range/Unit (1000 Baht)	Averaged Service Charge (1000 Baht)
Portable Thermostatic Circulator	1	1	1
Pipette Washer/Dryer	3	.5-10	15.75
pH Meter	6	2-6	24
Refrigerated Centrifuge	1	2	2
Rotator	2	1-2	3
Rotating Evaporator	2	1-4	5
Shaker	2	1.5-3	4.5
Shaking Bath	1	2	2
Timer, Interval	2	.5-1	1.5
UV-VIS Spectrophotometer	44	.5-10	231
Vacuum Pump	4	.5-2	20
Voltage Stabilizer	4	2-10	24
Water Bath	12	0.4-4	26.4
Water Distrillator	8	3	24
Total	223	101.4-236.3	1001.85

Office of the Secretary

The Office of the Secretary of the Department of Medical Sciences is responsible for general administration, correspondence, office files, personnel affairs, financial matters and library services.

In the year 1984, the activities are carried out as follows.

Budget

Annual budget of the Department of Medical Sciences and its budget for the past 2 fiscal years is shown in the following table as compared with the total Government budget. Our fiscal year covers the period of 1 October - 30 September.

Fiscal Year	Amount of Dept. Budget.	Percentage of Total Government Budget
1982	63,236,700	0.95
1983	69,915,700	0.88
1984	76,210,400	0.91

A breakdown of Department budget for 1984 gives the following picture.

	Amount (Baht)	Percentage
Salaries	47,329,300	62.10
Supplies	12,307,000	16.15
Equipments	13,464,100	17.67
Public Services	3,110,000	4.08

Manpower

The personnels of the Department of Medical Sciences consist of 986 persons in 5 different fields of practice. This includes, as the main technical personnel, 674 of medical Scientists, analyst, veterinarians, radiation physicists, entomologists and laboratory technicians. In addition to those, there are also 312 workers.
