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DISEASE INVESTIGATION CENTERS IN INDONESIA

— their function and activities —

December, 1977

Technical Cooperation Project on
Animal Health Improvement Programme

JAPAN INTERNATIONAL COOPERATION AGENCY

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FORWORD

The Technical Cooperation Project on Animal Health Improvement Program in Indonesia has inaugurated since July 7, 1977 under the Record of Discussions (the R/D) mutually signed by the Japanese Agriculture Survey Team organized by JICA and the Indonesian Authorities Concerned.

The period of the technical cooperation mentioned in this R/D will be three (3) years from the date of signature, and the first phase of the Project, JICA has assigned three Japanese experts to Medan and one as technical adviser to Jakarta from October 25, 1977.

Dr. Muneo Ogata, Ministry of Agriculture and Forestry, had been assigned as a said technical adviser to Directorate of Animal Health in Jakarta and concerned in assisting the smooth implementation of the Project and coordinating among the Directorate of Animal Health in Jakarta and the Local Government in Medan and Tanjungkalang for establishing DICs from October 25 to December 10, 1977.

This report is a compilation of individual report submitted by him after completion of his term and was mentioned not only the general plan of the Project, but also the problems on animal health in Indonesia without the Project.

We should be most happy if this report could be a useful for those who not only directly participated in this Project, but also are going to take part in international cooperation project in this field in future.

January 1978

Director of Agriculture Development
Cooperation Department,

Japan International Cooperation Agency

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DISEASE INVESTIGATION CENTERS DIC

- their function and activities -

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by : M. OGATA

C.P. Expert on Animal Health

December 1977, Jakarta

DISEASE INVESTIGATION CENTERS

- their function and activities -

I. Backgrounds

- 1) Development of livestock industry has vital importance among agricultural sectors in order to supply more animal protein foods to human being as well as increase in farmers' incomes. Animal health services are one of the basic elements for sound development of livestock, in preventing animal infectious diseases, losses due to unfavorable sanitation, mal-nutrition, and reproductive disorders, etc. To maintain and increase the productivity of livestock which is the common target of modern type of livestock farming, animal should be ensured for health, free from diseases and proper management all the time.
- 2) On the contrary, there are number of diseases prevailing in the regions both infectious and non-infectious, and parasitic diseases as well. Even in developed countries, annual losses due to animal health problems roughly estimated as much as 10 to 20 % of total production value of livestock in the country. In the ages of limited resources of present world, one can not neglect these vast losses which we have endured in the past. Improvement of animal health services is one solution that we could contribute to the coming food problems.
- 3) In order to assure this, current position of animal health, incidence of economically significant diseases, etc. should be clarified. And then prompt and early diagnostic services, analysis of the disease situation, etc. are essential tools for effective and smooth operation of animal health services. This is why disease surveillance and epidemiological survey become so important in recent years in veterinary administration in every countries.

- 4) However, present situation of diagnostic services, disease investigation and surveillance in Indonesia is still insufficient due to lack of laboratories and trained technical staffs. Field officers dealing with veterinary administration in the provinces are rather concentrated on their works for routine administrative ones and not directed to this field. Most of animal diseases in the fields, therefore, are customarily disposed or treated without further scientific approaches. This may lead inadequate handling and treatment of animal, and may result improper and/or ineffective control measures against epidemics by which allowing great losses due to such diseases.
- 5) Disease Investigation Center (DIC) project will provide introduction and diffusion of modern scientific techniques of veterinary medicine to the fields. So that livestock farmers will benefit by DIC services to solve their problems on animal health. Moreover, by collecting necessary information on animal health through DIC services, veterinary services can provide most effective and efficient disease control campaigns and guidance, etc. which are absolutely necessary for the improvement of animal health in the regions concerned.
- 6) It is also obvious, on the other hand, that DIC can not achieve this goal alone. It needs well-established close collaboration of Provincial Animal Husbandry services and other relevant institutions as well as intensification of animal health services such as disease surveillance and reporting, veterinary practicing, vaccination, etc.

II. Purpose and Objectives of DIC

- 1) For the purpose of promoting the development of veterinary technique and animal health situation, and thus of contributing to livestock development, DIC will have following activities:
 - (1) diagnosis and survey of animal diseases of major importance in fields;
 - (2) veterinary investigation related to the said activities;
 - (3) establishment of channels of sample collection from the fields for laboratory examination, and preparation and distribution of specimen containers and preservatives;
 - (4) strategic storage and distribution of veterinary biologics;
 - (5) technical training for veterinary officers and technicians engaged in animal health activities;
 - (6) supporting in and the participating animal disease control by means of guidance, planning and providing medicines, etc;
 - (7) dissemination of information related to animal health including disease situation, and extension of animal health knowledge;
 - (8) investigation of veterinary biologics including trial production;
 - (9) and others which deem necessary for the purpose of DIC services.

- 2) As immediate objectives of the DIC, all efforts should be concentrated on infectious diseases which are hampering national livestock production at present and economically significant ones in the respective regions. In parallel with the progress of the DIC, branches of DIC (smaller scale of laboratories, called B and C types DIC) should be established within provinces at selected livestock development localities to support DIC activities as a network of DIC services. This will strengthen more intensive disease investigation services in the fields and ensure in the near future, prompt diagnostic services.

- 3) So diagnostic services of common diseases and non-sophisticated laboratory examination and tests could be carried out at the B or C type DIC in provinces, and then DIC would be concentrated their services upon higher technical matters. Thus DIC services which are directed to infectious diseases of major importance in immediate objectives could be expanded to the fields of animal reproduction, nutrition, feed and feeding, food sanitation (meat and milk hygiene, including control of antibiotics residue), toxicology, etc. in the view point of veterinary science and technology.

III. Operational Plan of DIC:

1. Collection of Laboratory Specimens and Materials

Majority of DIC activities will depend upon regular and systematic collection of specimens and materials for laboratory tests and examination. For this purpose, efficient and systematic network for disease reporting and surveillance should be established as the first priority.

1-1. Reporting of Diseases

In addition to legislative disease reporting system of certain important diseases which are specified by the law and regulations for disease prevention and eradication (Table 1), incidences of major diseases including poultry diseases in the fields should be informed by systematic ways. And following measures should be considered (Fig. 1).

(1) All farmers who raise animal and poultry, should be well informed that when they recognize a disease - especially suspected as infectious or communicable disease, and/or case of sudden death, etc. - prompt reporting should be made to nearest provincial Animal Husbandry Officers or to head of villages or towns.

2) The provincial officer who received such reporting from farmers or through heads should make prompt visit on the spot, and conduct necessary investigation of animal and collection of specimens and materials to be send to DIC, when necessary.

3) Such investigation shall include following items:

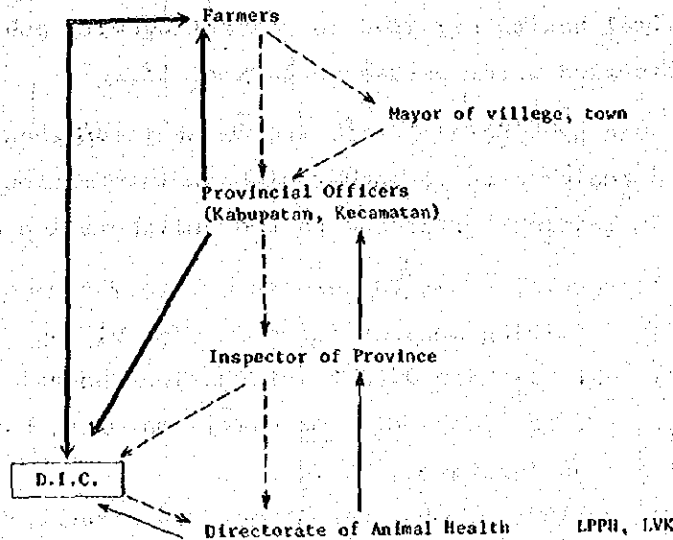
- (1) Name of farmers and his address;
- (2) Number of animal (poultry) raised;
- (3) History and present situation of the disease;
 - date of disease or abnormality found or recognized
 - conditions of diseased animal at present
 - number of animals diseased, died, disposed and recovered
 - treatments or other actions taken

- (4) Conditions of animals in surrounding areas in relation to the disease;
 - (5) Treatments or control measures directed to the farmers, and collection of laboratory specimens to be sent to DIC;
 - (6) Date of visit and name of officers in charge.
- 4) When conducting investigation mentioned above, the officer in charge should accompany specimen containers and necessary equipment which are provided from DIC for collection of specimens. The officer in charge should also pay full attention for disinfection of his belongings in order to prevent possible dissemination of the disease, if it happened to be an infectious disease.
 - 5) After the investigation, the officer in charge should report his findings stated in 3) above to the Inspector of Animal Husbandry Services of the Province, and also send the specimens collected, if taken, to the DIC by quickest ways.
 - 6) The Inspector should inform the DIC of each case of the report and, when he seems necessary, further survey and/or collection of specimens should be arranged from the DIC.
 - 7) The Inspector, in case of the notifiable disease specified by the law and regulations concerned (Table 1), should make a report of each case to the Directorate of Animal Health, Department of Agriculture, and monthly report should be followed with detail of actions taken to the disease.
 - 8) Besides the report mentioned above, the Inspector should prepare a general report monthly covering the incidences of non-reportable diseases and animal health situation collected through the Provincial Animal Husbandry Officers.
 - 9) The Directorate of Animal Health should prepare and circulate disease information bulletin which summarized disease situation of both notifiable and non-notifiable diseases in the country to the Provincial Animal Husbandry Offices including Kabupatan, and related institutions.

Table 1. List of Official Disease (Notifiable diseases)

Rinderpest	Ruminant and swine
Anthrax	All animal
Haemorrhagic septicaemia	Ruminant and swine
Foot-and-mouth disease	Ruminant and swine
Glanders	Horse
Infectious lymphangitis (pseudo-farcy).....	Horse
Scabies	All animal
Trypanosomiasis (surra)	All animal
Dourine	Horse
Piroplasmosis (Babesiosis).....	Ruminant
Tuberculosis	Cattle and buffalo
Rabies	All animal
Infectious pleuro-pneumonia	Cattle
Hog cholera (swine fever).....	Swine
Black-leg.....	Ruminant and swine

Fig. 1. Proposed Channels of Reporting and Specimen Collection



- - - - -> Reporting
 - - - - -> Information by monthly bulletin
 - - - - -> Investigation and specimen collection

1-2. Disease Surveillance

Our aims of disease surveillance are principally to detect the disease in question (important infectious diseases, for example) without delay and to grasp disease situation in the fields for implementation of the most adequate and efficient disease control activities for the regions and country. However, this is not only depending upon disease reporting system but also systematic and positive survey and investigation of disease.

- 1) There is almost no veterinary practitioners in the fields. As in the case of Province of North Sumatra, limited number of technical staffs are obliged to cover such vast areas and a large number of animals including poultry as well as animal production and regulatory services. On an average, for example, one technical staff covers 316 Km² of the area and looks about 1,634 heads of cattle, 1,002 buffalo, 3,237 sheep and goats, 5,478 swine and 49,722 kampung chickens and 1,277 commercial chickens, respectively (Tables 2 and 3). Provincial Animal Husbandry Services should gear to collect and evaluate disease information as regular activity of disease surveillance. Strengthening and improvement of animal health services in contacting with public would be discussed later as the network of DIC.
- 2) At the provincial level, following items should be planned and implemented to gather disease information in the regions as a routine services with the collaboration of the DIC.
 - (1) regular visit to farmers by provincial officers;
 - (2) providing monitor farms in each village level;
 - (3) establishing direct information channel from farmers;
 - (4) regular inspection of cattle markets, hatcheries, and breeding farms, etc.;
 - (5) collection of information from slaughter-houses, feed manufacturers, drug dealers, cattle dealers, etc.
- 3) Those information should be assembled to the Inspector, and be prepared monthly report after necessary screening, analysis and evaluation as the current situation of animal

health in the Province, together with notifiable diseases.

- 4) The Inspector should inform the DIC, when he seems unknown epizootics, malignant and/or exotic diseases, for immediate investigation and diagnosis.
- 5) DIC should support the disease surveillance activity of the Provinces in providing necessary equipment, technical guidance and information, diagnostic reagents, and laboratory diagnosis as well. Furthermore the DIC should plan field investigation and survey at selected farms and areas in consulting with the Inspector concerned in order to obtain field situations.

Table 2. Livestock Situation of Province of Sumatra Utra

Districts	No. of Animals and Poultry					
	Cattle	Buffalo	Sheep, Goat	Pig	Kaji. Chicken	Com. Chicken
Kotomadya Medan	2,865	322	3,346	7,045	171,561	58,000
Kodya Bindjei	1,214	41	2,001	330	52,224	1,434
" Pem. Siantar	905	127	508	19,733	50,720	5,433
" Tebing Tinggi	102	-	23	-	600	179
Kab. Langket	64,225	2,911	81,189	22,184	1,047,540	37,944
" Simelungun	67,849	54,072	75,428	140,603	1,113,607	62,955
" Asahan	23,625	5,967	113,870	28,038	1,520,032	18,867
" Labuhan Baru	10,753	772	101,628	15,633	859,788	202
" Karo	44,212	23,913	6,776	69,270	430,352	173
" Dairi	2,929	7,040	6,420	64,335	332,077	-
Deli Serdang	86,291	24,157	197,122	244,240	2,551,652	89,114
Tapanuli Utra	8,919	58,294	26,783	302,028	839,585	6,580
" Tengah	2,244	7,095	23,776	26,687	194,930	38
" Selatan	49,202	38,441	81,544	12,782	1,368,236	944
" Nias	755	547	4,703	269,695	581,629	-
Total	366,134	224,428	725,057	1,227,057	11,137,627	286,120

Table 3. Manpower and Geographical Figures of Province of Sumatra Utra

Districts	Personnel		Animal Units	Animal Units per Tech.	Area (km ²)	Animal Density km ²	Distance from Medan (km)
	Tech.	Admini.					
Kotomadya Medan	20 (1)	9	7,225	361	51	142	-
Kodya Bindjei	2	1	2,057	1,029	17	121	22
" Pen. Siantar	4 (1)	6	5,589	1,397	12	466	128
" Tebing Tinggi			111		3	37	
Kab. Langket	15 (1)	7	90,544	6,036	6,335	14	100
Kab. Simelungun	24 (1)	6	169,347	7,056	4,399	38	128
Kab. Asahan	6	2	61,974	10,329	4,829	13	230
Kab. Labuhan Baru	8 (1)	3	33,412	4,177	8,590	4	271
Kab. Karo	15 (2)	1	86,960	5,797	2,071	42	80
" Dairi	14	-	26,798	1,914	3,223	8	235
Kab. Deli Serdang	23	3	205,415	8,931	4,824	43	-
Tapanuli Utra	32	6	139,436	4,357	11,240	12	232
Tapanuli Tengah	5 (1)	2	19,002	3,800	1,916	10	300
Tapanuli Selatan	17	4	112,044	6,590	18,006	6	350
Tapanuli Nias	12	3	61,527	5,127	5,265	12	300+Ship
Inspectorate	27 (5)	27	-	-	-	-	-
Total (or Means)	224 (13)	80	1,021,442	4,560	70,787	14.4	

1-3. Equipment and Materials Necessary for Collection of Specimens

DIC should provide specimen containers and necessary equipment for collection of specimens and materials to each and every stations posted Provincial Animal Husbandry Officers. Followings would be a minimal standard:

Slide glasses (4), with vinyl sealed
Needles for blood collection (2)
Test tubes (2)
Thermometers (2)
Surgical scissors (2)
Tweezers (2)
Thermos (1)
Polyethylene bags (different size)
Polyethylene bottles (2), 100 ml volume
 one with 10 % formalin solution for pathology
 one with 50 % glycerin solution for microbiology

Note: For the areas of Foot-and-Mouth disease, specific container and preservative solution should be provided. And this should be sent to LVK, Surabaya directly.

1-4. Training

DIC should hold training courses regularly to the Provincial field officers on collection and handling of laboratory specimens, and also prepare hand-booklet for smooth implementation of the collection channel. This training course and hand-booklet would include following contents:

- (1) Role of animal health services for livestock development, and function and activities of field officer and DIC;
- (2) Major important diseases of the country and of particular regions;
- (3) Disease reporting and surveillance;
- (4) Outline of clinical inspection of animal - observation and documentation of clinical symptoms;
- (5) Method of blood collection, preparation of blood smear and blood specimens;
- (6) Collection of visceral organs and preparation of organ specimens;
- (7) Handling, processing and sending of laboratory specimens.

1-5. Instruction of Specimen Collection

- 1) Collection and preparation of organs or specimens for laboratory services differ with the disease in question and also kinds of laboratory tests to be conducted. Provincial Animal Husbandry Officers should give keen attention to collect the most adequate organs (specimens) at the most suitable stage of the disease, and be preserved and treated in right manner, and then be sent in safe and quickest ways.
- 2) Since the procedures of laboratory tests and examination at DIC are not formulated yet, general considerations for the collection and transportation of laboratory specimens are prepared in Appendix 1. In parallel with the progress of standardization of laboratory procedures, detailed information on specimen collection should be provided by DIC.

2. Laboratory Tests and Diagnosis

2-1. Receiving of Laboratory Specimens

- 1) One of the DIC staffs preferably dealing with epidemiology should be designated as a responsible officer to receive the specimens from fields. He should examine specimens and documents attached with upon arrival, and then record and distribute to particular laboratory(s) for necessary tests and diagnostic procedures.
- 2) The recording should include following items:
 - (1) date and code No. of acceptance;
 - (2) name of applicant;
 - (3) name and address of which specimen derived;
 - (4) kind and number of specimen;
 - (5) purpose of tests and laboratory(s) involved;
 - (6) results and findings (to be completed after the tests);
 - (7) action taken or directed (" ");
 - (8) date of reply and reference No.;
 - (9) others.

For this purpose punch cards could be used as a form of recording in order to assist further arrangements and regulation of office procedures.

- 3) Each laboratory may also provide its own documentation for laboratory tests and examination besides the recording form.
- 4) The Director of DIC should check and control periodically on laboratory activities including recording in order to avoid undue delay.
- 5) If laboratory tests and examination are beyond DIC's capacity, the officer who is responsible for receiving specimen should make necessary arrangement in sending such specimen to other DIC, LPPH, or LVK, etc. Specimen for foot-and-mouth disease, for example, should be sent to LVK without delay. For this purpose routine laboratory diagnosis of each institutions, such as DIC of A, B, and C types, Research Institutes, should be well defined according to their capacities and the purpose of activities.

2-2. Laboratory Tests and Examination

- 1) Considering the importance of laboratory tests and examination which might bring legal actions under the veterinary administration, for example, in case of official diseases, laboratory procedures in each DIC should be standardized as possible. Kinds of laboratory tests and examination to be done, methods of tests procedures, reagents to be used, and evaluation of results - titers and degree of reactions, etc. - should be unified.
- 2) Such standard should be a practical one from the view point of present capacity of each institutions regarding their facilities, equipment and technical matters concerned, but also lead out future target to be accomplished. The standard should be reviewed periodically with the progress of veterinary science and technology.

- 3) In compliance with the standard of laboratory tests and examination, each DIC should provide necessary facilities and equipment as well as technical staffs. The first priority should be given to the fields of microbiology, virology, pathology, parasitology, and epidemiology in order to deal with major infectious diseases which are hampering sound development of livestock industry in the regions.
- 4) Supply of antigens, reagents and anti-sera for laboratory use is also indispensable matters. LPPH and/or LVK have been producing antigens for Brucellosis (rapid agglutination test), Tuberculin, Malein, Pullorum disease antigen and Newcastle disease HI antigens, but the quantity will not meet the demand when intensive disease surveillance is introduced. Arrangement should be considered to increase the production capacity and to share such supply from DICs taking advantages of each DIC. Fluorescent-labelled antigens against rabies, Newcastle disease, hog cholera, bovine rhinotracheitis, etc. should also be arranged considering the prevalences of these diseases.
- 5) It is also necessary to prepare standardization and improvement of antigens and reagents to meet international level or requirements, in parallel with the standardization of laboratory procedures.
- 6) In connection with the standardization of laboratory procedures, diagnosis of major diseases including official diseases in each level of veterinary institutions - such as veterinary officer, B or C type Lab. of DIC, and LPPH, LVK - should be established (defined) to avoid unnecessary confusion and possible delay. An example is shown in Appendix 2.
- 7) For diagnosis of certain diseases, reference laboratory services are needed; such as Salmonellosis, Leptospirosis, Clostridium infection, Pasteurellosis, Entero-virus infection, etc. Either LPPH, LVK and DIC would act as such reference laboratory regarding their capacities concerned.

2-3. Information and Analysis of Laboratory Tests and Examination

- 1) The results of laboratory services should be returned to the persons concerned such as the Inspector of the Province, Officers of Provincial Animal Husbandry Services and farmers, etc. without delay. However to avoid unnecessary duplication and confusion, the result should be sent to the applicant (most of the case, field officers) and a copy to the Inspector of the Province. When the applicant is farmers or commercial enterprises concerned, the result would be informed through a field officer in charge.
- 2) Such information to the farmers and commercial enterprises should include not only the results of the tests or diagnosis but necessary guidance and directions to be taken - treatment, care and management, drugs, if available.
- 3) The results of laboratory tests and examinations performed at each DIC laboratory on divided samples should be concentrated to lead final conclusion or diagnosis. One of the DIC staffs - preferably epidemiologist - should be responsible for this purpose on behalf of Director of DIC.
- 4) DIC should prepare monthly report on his laboratory services, and submit to Directorate of Animal Health, Jakarta, and a copy to each Inspector of the covering Provinces. In case of official diseases and others as seemed important for animal health services and administration, prompt report should be made in each occasion.
- 5) The monthly report of DIC should comprise following items and be submitted by 10th of each month for the previous month concerned.
 - (1) Number of specimens received, by kinds of animals and types of specimens;
 - (2) Number of applications made, by applicants - farmers, commercial enterprises, field officers, slaughter-houses, B and C type DIC or DIC itself;
 - (3) Results of the month, by diseases (including specimens received in the previous months);

Name of diseases: Number of cases diagnosed: Note:

- (4) Remarks - particular disease or zoo-sanitary situation would be highlighted during the month.

Note: Both quantitative and qualitative evaluation and documentation of laboratory works are found difficult comprising various kinds of specimens and materials, and types of laboratory tests and examinations. So here in the monthly report, simply figure out by kinds of animals and specimens, and number of applicants.

- 6) DIC, in preparing monthly report, should analyze the results of laboratory services and evaluate disease situation for further improvement of laboratory services and disease prevention in the fields.

2-4. Activities Following Laboratory Services

- 1) The main activities of DIC would be to supply and provide necessary animal health information to the field officers of Province through diagnostic services in order to ensure more efficient and useful animal health services, and to assist disease control and eradication scheme to be implemented in the regions.
- 2) In principle, DIC would not provide further treatment and measures of sick animal in relation to laboratory services. However, it would not exclude necessary assistance and/or guidance to farmers concerned from DIC directly or through Provincial Animal Husbandry Services, such as provision of drugs, disinfectants, disposal of diseased animal, etc.
- 3) Since there is almost no veterinary practitioners in fields, Officers of Provincial Animal Husbandry Services should participate certain treatments as a kind of technical services with substantial support of expendable materials by farmers interested in.
- 4) Diagnostic services of DIC should be free of charge in order to facilitate prompt reporting and early detection of diseases in the fields.

IV. Supporting Network of DIC and Collaboration of DIC Activities

DIC activities could not be accomplished by DIC alone. As aforementioned, active cooperation of Provincial Animal Husbandry Services, LPPH, LVK and other related administrative and research institutions are strongly requested.

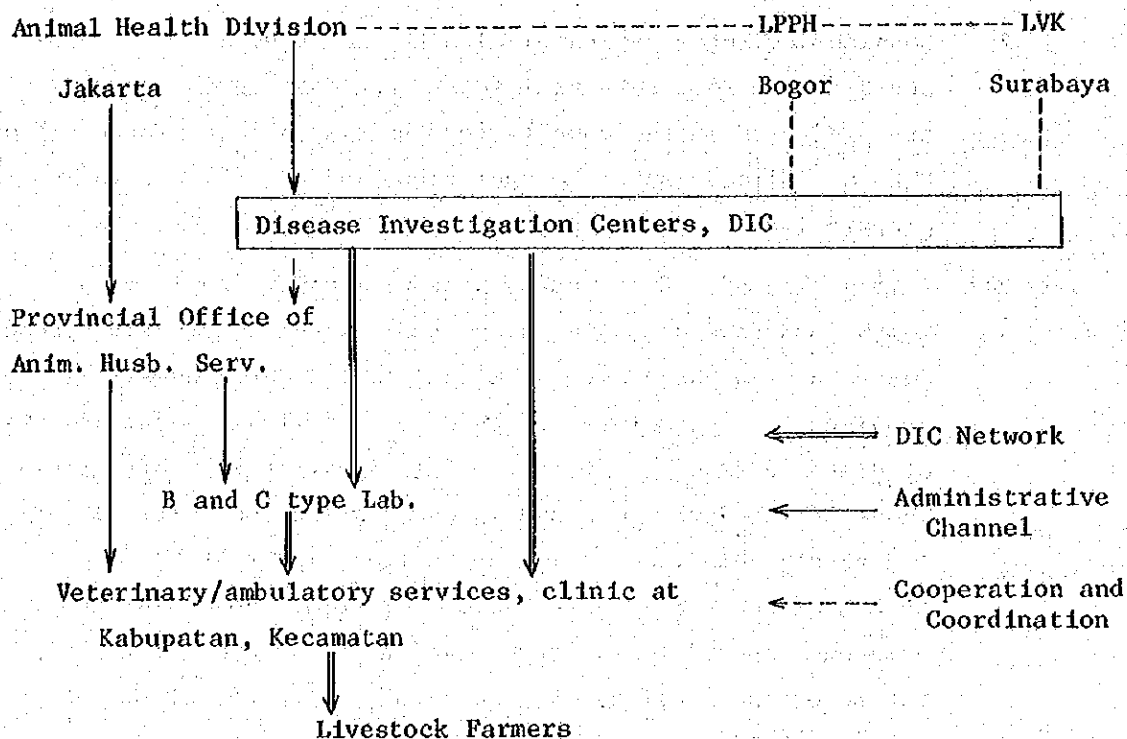
1. Network of DIC.

- 1) The geographical condition of Indonesia (consisting of islands) has several advantages in confining further spread of epizootics, facilitating disease eradication and control campaign, etc. On the other hand, however, it has also disadvantages for intensive disease surveillance, transportation and communication, etc.
- 2) Considering these geographical situation together with livestock development potential in the regions, seven (7) DICs are projected in the country for the time being. Three (3) of them are already put into operation, and two (2) are under preparation.
- 3) As the case of DIC in Medan which will cover Provinces of North Sumatra and Asahan, areas to be serviced are widespread. Among 14 major Kotamadya and Kabupaten of North Sumatra Province, for example, 7 of them located within about 150 km of distance from the site of DIC (approximately 3 hrs driving). Those areas where DIC could extend his services directly or indirectly comprises 73.1 % of cattle, 47.0 % of buffalo, 50.5 % of sheep and goats, 41.0 % of swine, 48.6 % of kampung chickens, and 89.1 % of commercial chickens among total population of the Province (Ref. Tables 2, 3). Situations of the other DIC are even worse than that of DIC in Medan.
- 4) To cope with this situation, smaller scale of laboratories, so called B and C types Lab, should be established regarding geographical and livestock conditions in the regions. This may provide easy and rapid access of field investigation as well as basic diagnostic services in the remote areas from

DIC. (See Appendix 2) The B and C type Lab. should be operated by either Province or Kabupaten concerned under technical guidance and assistance from the Central Government.

- 5) Moreover, Offices of the Provincial Animal Husbandry Services at the level of Kabupaten and Kecamatan should facilitate ambulatory veterinary services as a first aid of animal health services, since there is almost no veterinary practitioners in the fields. The whole picture of the supporting network of DIC is illustrated in Fig. 2.

Fig. 2. Supporting Network of DIC



2. Collaboration of DIC Activities

- 1) In addition to the cooperation of relevant institutions of DIC, close collaboration between DICs has also vital importance. As already mentioned in III. Operational plan of DIC, there are a number of items to be common to each and

every DIC. Each DIC should take charge of a portion of works to formulate these items as mutual function under the chairmanship of the Directorate of Animal Health.

- 2) Regular meeting of DIC staffs, participating one of the DIC at least once a year, should also be held in order to exchange their experiences and ideas for effective implementation and improvement of DIC activities, and to obtain latest technical informations. Later on, this meeting should be developed as a form of seminar inviting all ASEAN DIC concerned in order to harmonize and promote common animal health activities in this regions as a whole.

V. DIC Activities in ASEAN Countries and Others

DIC activities and its operation in ASEAN countries and others are not the same depending upon their geographical and livestock situation, organization of veterinary services, socio-economic condition, etc., although the importance of DIC activities was recognized at the FAO Regional Conference on Animal Production and Health in Kuala Lumpur in 1971 for example,

Followings are brief information on DIC activities abstracted from writer's observations and related documents.

1. Malaysia

Veterinary Research Institute at Ipoh is the central veterinary laboratory dealing with research and diagnosis as well as vaccine production. To improve the animal health services, Regional Diagnostic Laboratory (RDL) was planned to be established in selected localities of the country.

The first RDL in Petaling Jaya was established in 1971 and is now fully operated. The second RDL in Bukit Tengah near Penang has also constructed in 1975 and now begins operation. The third one is nearly completion at Kuantan. Plans are well underway to establish another laboratories in Johor Baru and Kuching.

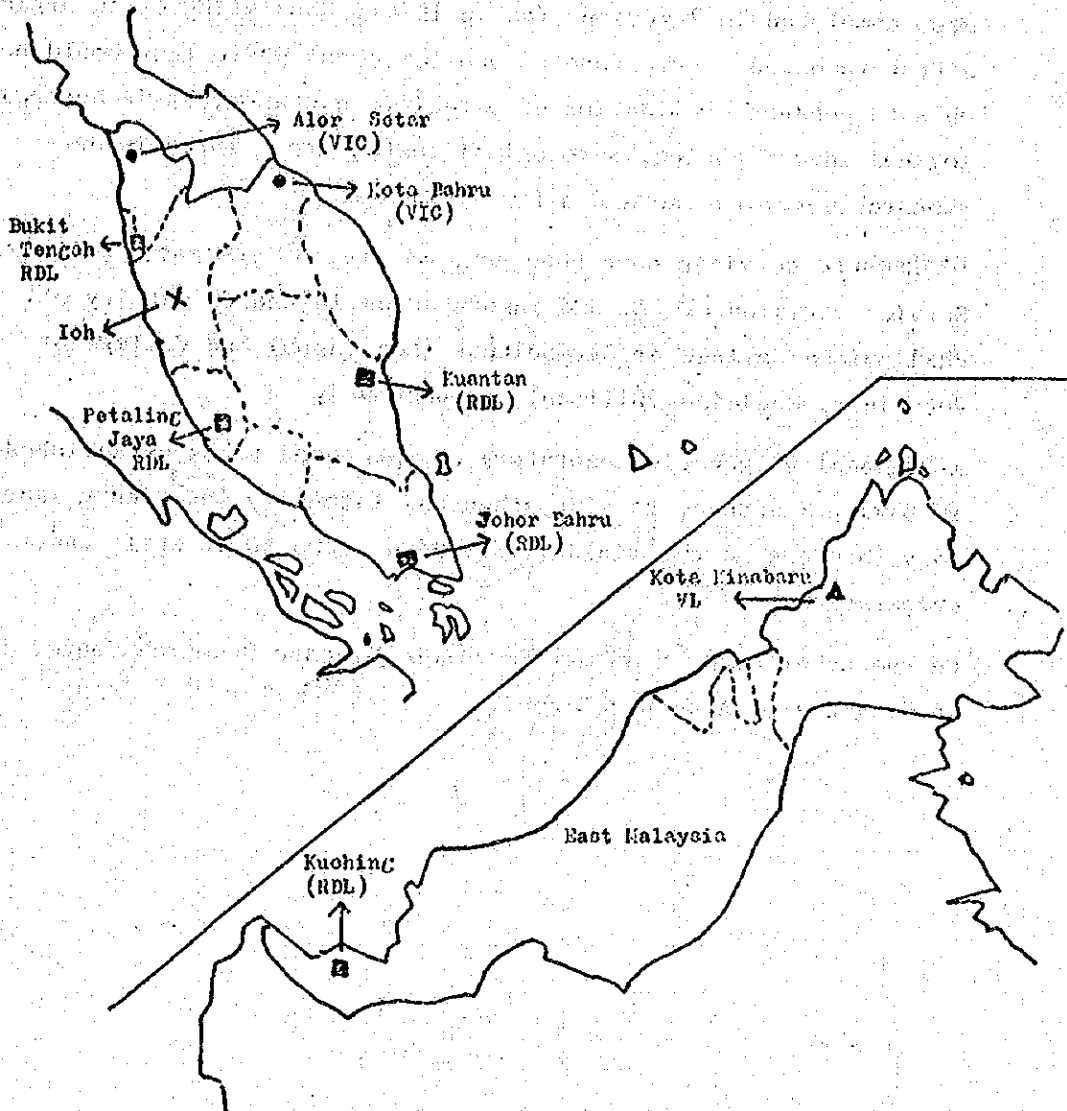
RDL will conduct diagnostic services in the fields of bacteriology, mycology, parasitology, hematology and histopathology as routine laboratory tests and examination. Serology for brucellosis and melioidosis, virology for common poultry and swine viral diseases, vaccination response on poultry diseases also be dealt in some extent. Toxicology, feed analysis and clinical pathology as well as intensification of field investigation will be future subjects for expansion.

Besides the RDL, Veterinary Investigation Center (VIC) are planned as the third tier. The VICs are expected to provide limited diagnostic services and act as feeder laboratories to RDL. The first one has been established in Alor Setar (North of Peninsular Malaysia) and the second one is expected in Kota Baru (North East). VIC will conduct field investigation based on mainly basic bacteriology, parasitology and hematology.

There are also three (3) small laboratories at Kuala Lumpur, Kuching and Kota Kinabalu at present providing limited diagnostic services.

The total picture is illustrated in attached figure.

LOCATION OF VETERINARY LABORATORIES
IN MALAYSIA



- Note: X Veterinary Research Institute
 ■ Regional Diagnostic Laboratory
 ● Veterinary Investigation Center
 ▲ Veterinary Laboratory
 () under projection

2. Philippines

The Bureau of Animal Industry (BAI), providing veterinary services to livestock raisers, set up Regional Offices in 11 localities and Provincial Offices in every 70 provinces throughout the country. BAI undertakes establishing diagnostic laboratories in each Regional Offices of BAI except Manila in view of decentralization of animal health services.

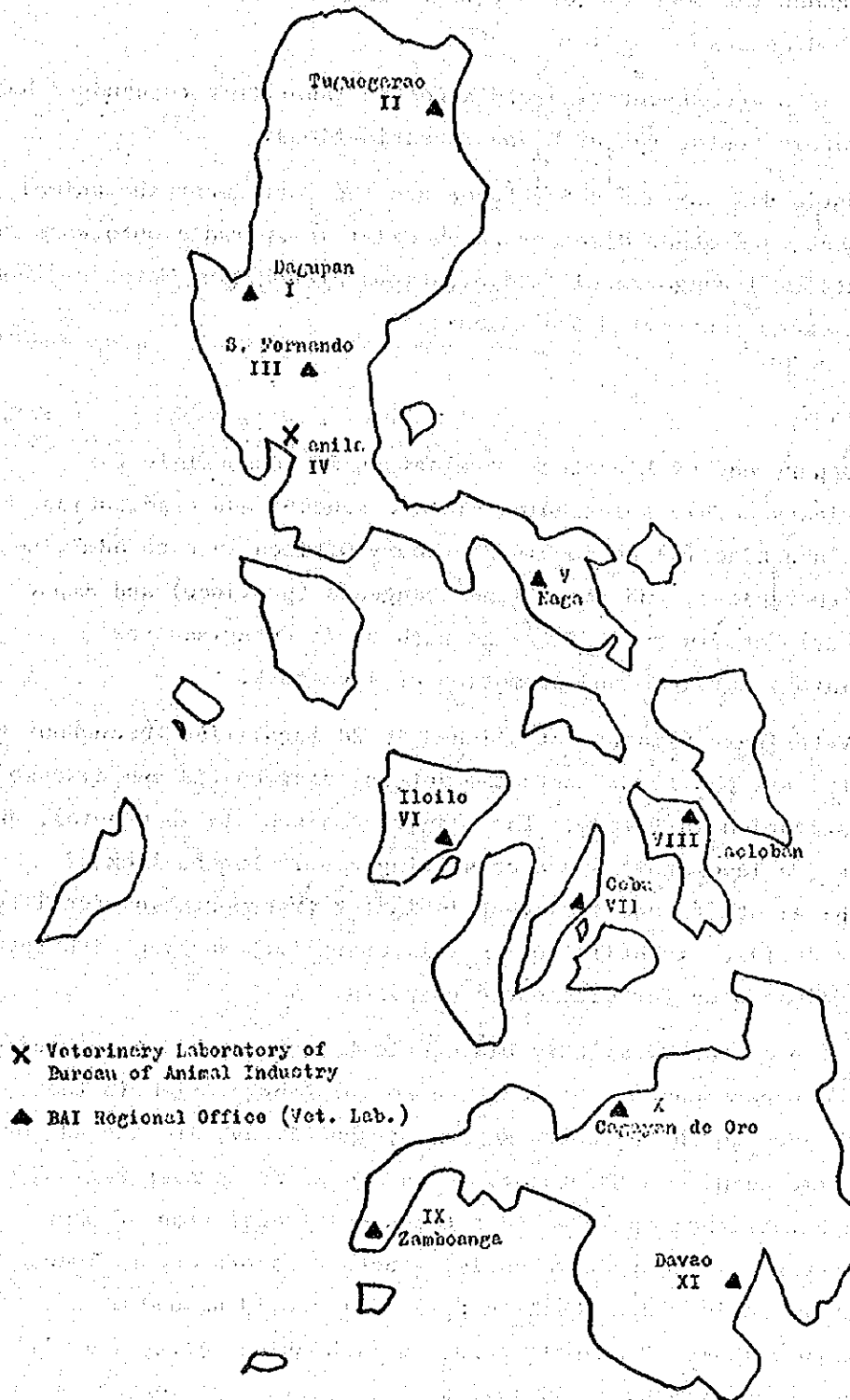
The diagnostic laboratory of the Regional BAI Offices has already been completed in 7 regions (as in 1974), consisting of an office, a test room and a preparatory room (kitchen) where they could be able to conduct examination of parasitic diseases, basic bacteriological investigation, serological tests, etc. There is one research veterinarian and a few assistants.

Diagnostic services have been done mostly, at present, by Laboratory Service Division of BAI and laboratories in the University of Philippines College of Agriculture (Los Baños) and College of Veterinary Medicine (Diliman), respectively.

A Regional Diagnostic Laboratory was proposed to be established in Davao, Mindanao, to strengthen and intensify veterinary laboratory services in the fields. The plan seems to be still under preparation.

On the other hand, a Animal Parasitic Disease Research Center is in progress in Alabang, Luzon.

**LOCATION OF VETERINARY LABORATORIES
IN PHILIPPINES**



3. Singapore

The Primary Production Department has 10 veterinary clinics located throughout the country for clinical diagnosis and treatment of animal diseases.

There is a modest veterinary diagnostic laboratory to conduct basic laboratory tests, research and investigations.

Newcastle disease and swine fever are the most important animal diseases, and other diseases which exist in sporadic outbreaks are infectious laryngotrachitis, infectious bronchitis, Marek's disease of chickens, and swine Brucellosis.

4. Thailand

The Department of Livestock Development is responsible for veterinary services including disease control and eradication. There are nine (9) Regional Veterinary Offices in each administrative regions, and as well as Changwads (province) and Ampur (county) Veterinary Officers in each of 71 Changwads for regulatory services and promotion of livestock.

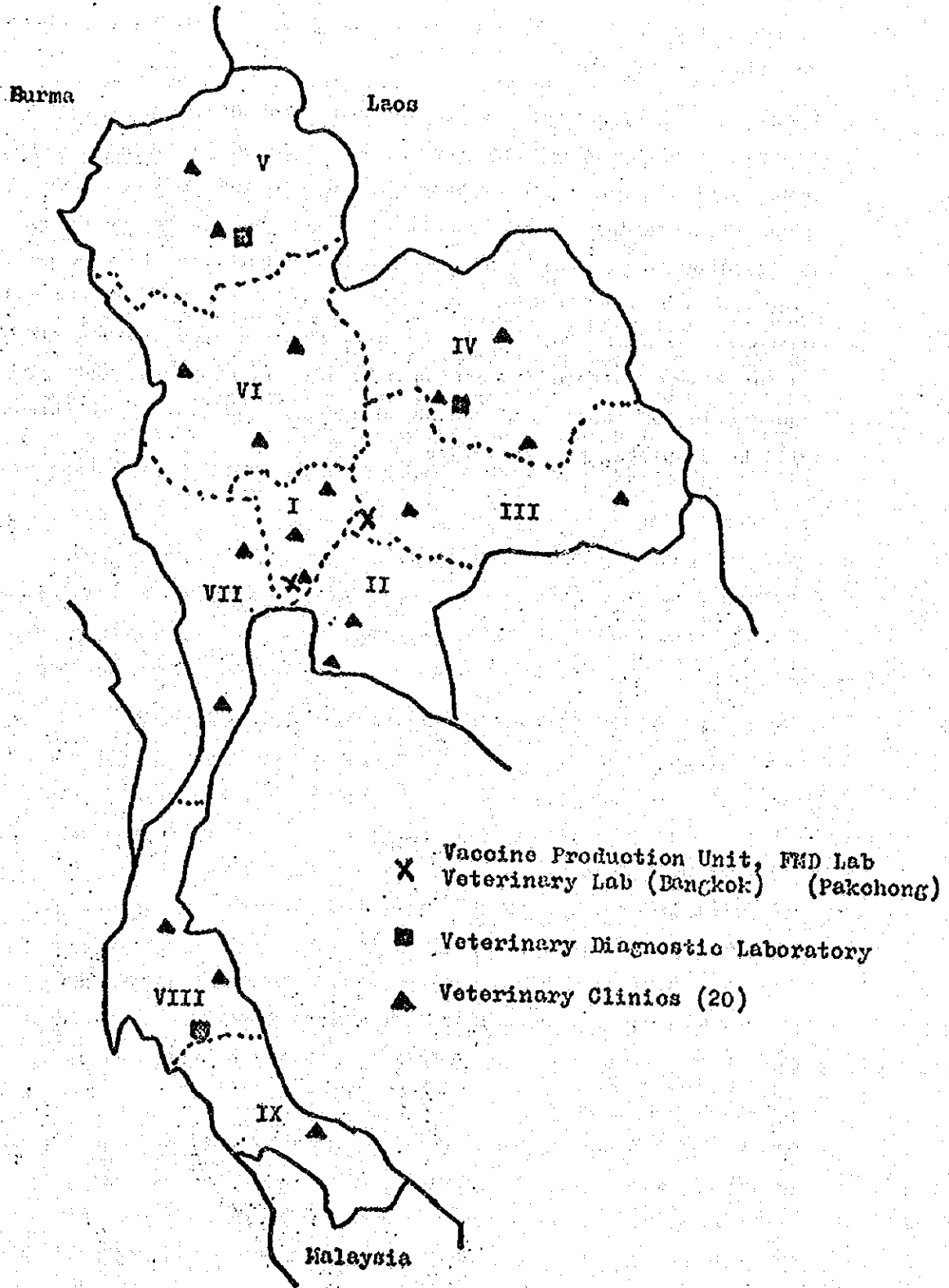
The Veterinary Clinics established in 20 localities throughout the country are the first contact point for diagnostic and disease investigation in fields. The Clinic consists of, in general, an office, a laboratory and a consulting room. Due to lack of technical staffs and equipment including transportation facility, their activity is still not in full operation, dealing with rather limited samples for diagnostic purposes.

The plan of the Veterinary Diagnostic Laboratory has been studied by the Department and at least three (3) Laboratories in the Northeast, North and South Regions respectively, are needed for the time being. A Laboratory in Khon Kaen North East Region, has been established in 1974 and a technical cooperation of West Germany has introduced recently. Another Laboratory in Tung Song, Southern Peninsula, established in 1977 providing 600 m² of laboratory rooms, 2 animal sheds, staff housing, etc., and will begin to operate by early 1978 with the participation of Japanese technical cooperation. The third ones at Lampang, Northern Region, is under the preparatory stage.

The Laboratory provides modern type of laboratory equipment and utensils which are necessary for diagnosis, disease investigation and field research activities. It also acts as a reference center to the existing Veterinary Clinics, in-service training for field veterinary officers.

Vaccine production units of Vaccine and Serum Division of the Department of Livestock Development are located in Pakchong and Mong Sarai, 175 km north of Bangkok. The former produces several kinds of bacterial and viral vaccines, and the latter, Foot-and-Mouth Laboratory, deals with FMD vaccine and diagnostic services. Research and investigation are rather limited due to facility and manpower reasons. For FMD laboratory, an expansion project introducing tissue culture production method is in progress, under the cooperation of Japan, and the buildings and auxiliary facilities will be completed by early 1978.

LOCATION OF VETERINARY LABORATORIES THAILAND



5. Korea

At national level, Veterinary Division of Bureau of Livestock is the headquarters of veterinary administration including meat and milk hygiene. The National Institute of Veterinary Research at Suwon, under the Office of Rural Development, is responsible for research and production and assay of biologics as well as reference diagnostic services.

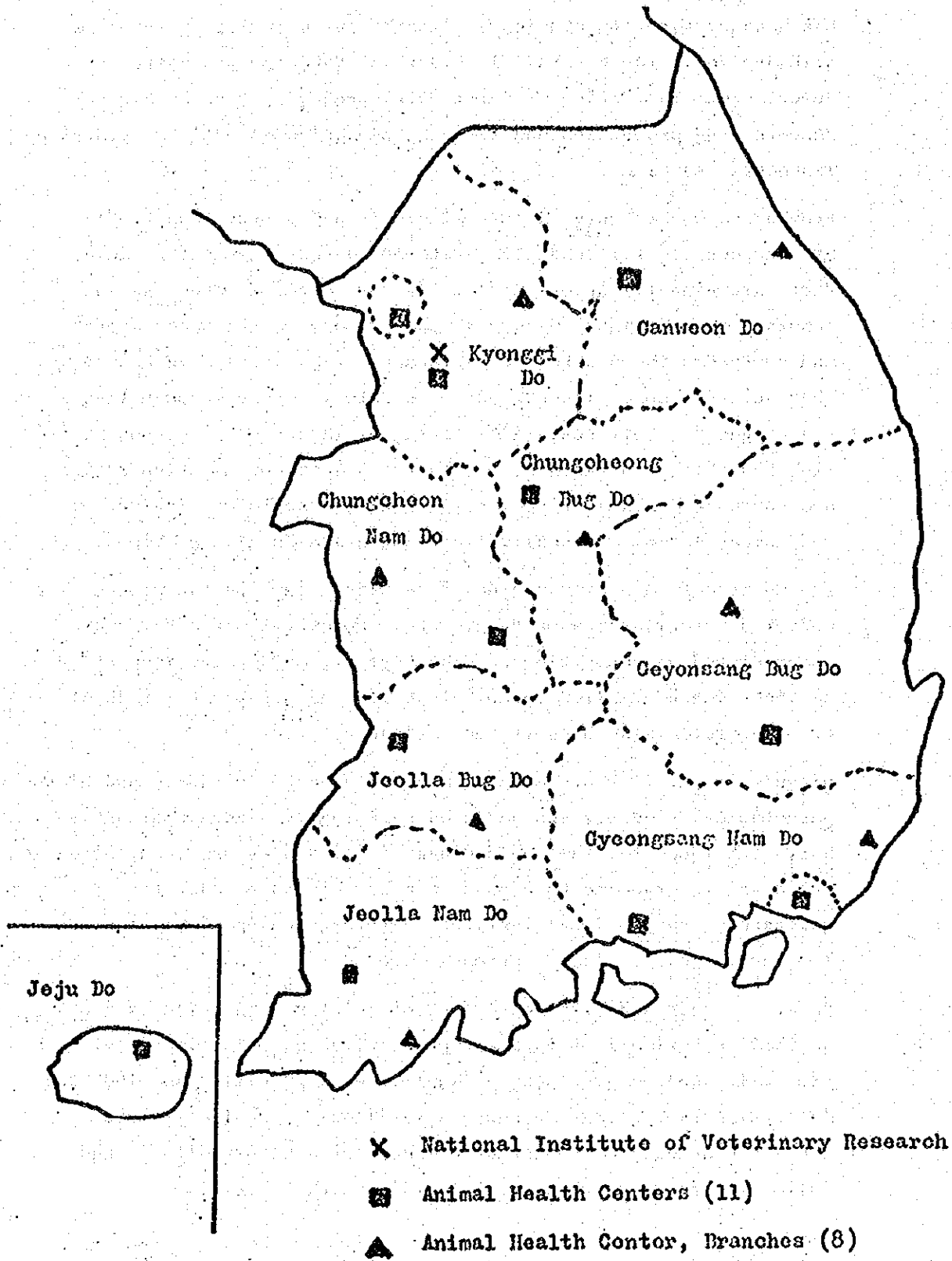
Provincial Governments (2 special cities and 9 provinces "Do") are responsible for conducting veterinary services in the field. There are nine (9) Animal Health Centers (disease investigation laboratory) and eight (8) branch Centers are established in each and every Provinces with the assistance of National Government. They act as a core of veterinary laboratory services conducting (i) diagnostic services, (ii) testing of infectious diseases (Tuberculosis, Brucellosis, etc.), (iii) meat and milk inspection and sanitary control of processing plants concerned, (iv) survey and investigation of locally important animal health problems.

The Center of each province has 8 veterinarians and the branch Center 5 veterinarians on an average. However their efforts are concentrated on conducting routine type of testing and inspection services due to limited technical staffs and equipment. Lack of transportation also hinders their field activity.

Diagnostic services are made mainly on the basis of anto- and histopathological findings and basic bacteriology. Fluorescent antibody techniques for the rapid diagnosis of Rabies has been introduced and is expected to expand to other diseases under the guidance of the National Institute. Strengthening of virological and serological fields is urgently needed.

Under the Animal Health Centers, 2 official veterinarians and 2 - 4 public veterinarians (private practitioners, part-time duty) are designated in each county (Kun) level - 30 cities and 150 Kuns in total. They conduct disease surveillance, vaccination etc. whereas testing and inspection of Tuberculosis, Brucellosis and Pullorum disease by Provincial Animal Health Centers.

LOCATION OF VETERINARY LABORATORIES KOREA



6. New Zealand

The country is divided six (6) veterinary regions having each Regional Veterinary Offices and then 25 Veterinary Districts with District Veterinary Offices. Some of the Veterinary Districts further provide 1 - 8 Livestock Instructor Offices.

As for Laboratory services, Animal Health Reference Laboratory is located at Wallaceville, and five (5) Animal Health Laboratories are provided at Ruakura, Whangarei, Palmerston North, Lincoln, and Invermay, respectively. Besides these laboratories, Central Brucellosis Laboratory (Wallaceville) and 14 of Brucellosis Processing Centers are scattered throughout the country for the campaign of Brucellosis.

Animal Health Laboratory has the function of (i) diagnose animal disease throughout New Zealand and help to define, protect and improve animal health, (ii) work on diseases of agricultural and companion animals and diseases transmissible between animals and man, and (iii) look for new or exotic diseases.

Animal Health Laboratory at Ruakura, for example, has been receiving approximately 20,000 samples a year from veterinary practitioners of the covering areas (there are about 250 veterinary practitioners in all), and a half of which are samples and specimens derived from abortion and aborted fetus. Laboratory tests and examinations are conducted in the fields of histology, hematology, bacteriology, virology, immunology, parasitology and toxicology (trace elements, biochemistry, poisons) by 9 veterinarians and 14 other technical staffs. Results are correlated, and then a report is mailed to veterinarian who sent the specimens without delay. The veterinarian notifies to the owner of results.

7. Japan

Veterinary services belong to the Animal Health Division whereas veterinary public health including meat and milk hygiene under the public health and welfare sector. National Institute of Animal

Health deals with research and investigation, production of biologics, reference services, and training of veterinary officers. The central Institute is located at Kodaira, Tokyo, and 5 branch laboratories are scattered from Hokkaido to Kyushu of which one is specialized in poultry diseases research.

At Prefectural level, 202 of Animal Hygiene Service Centers in all are provided throughout the country as responsible institutions for animal health in each regions providing disease surveillance, tests and vaccination, prevention and control, technical guidance, as well as regulatory services. The activity and the facilities of the Centers are regulated through technical and financial supports of the National Government in order to integrate nation-wide networks. The Center has at least 10 full-time veterinarians with diagnostic room, autopsy room, incinerator, etc.

One of the Centers in each Prefecture is designated as Diagnostic Laboratory (47 localities in all) providing bacteriology, virology, pathology and biochemistry laboratories with trained veterinary staffs in each fields. In certain Prefectures, Diagnostic Laboratory has been set up separately from the Animal Hygiene Service Center to expand more investigation and research activities. The samples and specimens collected to Diagnostic Laboratory are mostly from Animal Hygiene Service Centers which receive or collect field materials from veterinary practitioners and farmers and conduct necessary tests and examinations.

Some of the specimens are also be sent to National Institute of Animal Health to further investigation and diagnosis as well as reference purpose.

Followings are the brief figures which dealt at Diagnostic Laboratories of whole country in 1973-1975. (Table 4 and 5)

Table 4. Number of Specimens Received, by Animals

	1973/74		1974/75		1975/76	
	Cases	%	Cases	%	Cases	%
Cattle (dairy)	7,133	28.9	6,951	32.2	13,101	42.8
Cattle (beef)	4,245	17.2	2,461	11.4	5,540	18.1
Horse	2,147	8.7	194	0.9	214	0.7
Swine	3,233	13.1	4,728	21.9	4,316	14.1
Sheep, Goats	25	0.1	43	0.2	61	0.2
Poultry	7,084	28.7	6,455	29.9	6,612	21.6
Others	815	3.3	755	3.5	752	2.5
Total	24,682	100.0	21,587	100.0	30,592	100.0

Table 5. Number of Specimens Received, by Applicants or Sender

	1973/74		1974/75		1975/76	
	Cases	%	Cases	%	Cases	%
Animal Hygiene Centers	11,717	47.5	10,734	49.7	19,657	64.3
Other Prefectural Offices	944	3.8	786	3.6	1,139	3.7
City, Town, villates	2,301	9.3	1,388	6.4	826	2.7
Animal Health Organization	1,332	5.4	355	1.6	257	0.8
Health Insurance Association	1,352	5.5	951	4.4	920	3.0
Agricultural Cooperatives	1,456	5.9	2,441	11.3	2,837	9.3
Private Practitioners	2,801	11.3	958	4.4	1,039	3.4
Livestock Raisers	1,753	7.1	2,868	13.3	2,783	9.1
Commercial Concerned	320	1.3	719	3.3	954	3.1
Slaughter-houses	142	0.6	126	0.6	54	0.2
Others	564	2.3	261	1.2	127	0.4
Total	24,682	100.0	21,587	100.0	30,592	100.0

APPENDIX 1.

Procedures for Specimen Collection and Transportation

A. Basic considerations for the collection of specimen.

- 1) Specimen should be collected from among typical diseased animal. In case of group of animal, severe and mild cases, onset and recovered stages of animal should be selected, respectively. For bacteriological examination, however specimen should be collected prior to antibiotics treatments. For dead animal, fresh carcass should be selected avoiding post-mortem changes and secondary contamination.
- 2) Collection of specimen should be carried out by aseptic manner. Equipment and containers should be thoroughly washed, dried and sterilized.
- 3) Specimen should be harvested in separate containers by animals, and by the purpose of laboratory tests, with necessary identification.
- 4) Specimen should be kept as cool as possible using ice and ice box in the fields.
- 5) When dissecting carcass, possible dissemination of pathological agents should be minimized by disinfection and disposal of sanitary manners - especially for anthrax.

B. Specimen for detection and isolation of pathological agents

In general, specimen should be collected from an early stage of the disease aseptically, and be sent under at 0 - 4°C within a couple of days. If not, 50 % glycerin buffered solution or 50 % glycerin saline solution are used.

Kind of specimen should be varied by the disease to be suspected (or to be examined). However, such organs related to symptoms and/or those

having pathological changes, their exudate, nasal discharge, nasal swab, defibrinated blood, peripheral blood, fetus, feces, urine are usually collected.

C. Serum specimen for serological diagnosis and tests

Serum should be collected aseptically, be kept at cool temperature and be sent as soon as possible without preservatives and heat treatment. For evaluation of titre against particular diseases, a paired sera (onset and recovered ones 2 weeks interval at least) are needed providing 5 samples from a group, respectively. Volume of sera should be 5 ml for cattle, 3 ml for pigs and 1 - 2 ml for chicken, in general.

D. Specimen for pathological examination

Such organs and spots which have macroscopic pathological changes and those of related to the symptoms should be collected together with other visceral organs, including brain and spinal cord, lympho-nodes, digestive tracts. Size would be 2 to 4 cm a side and fixed with 10 % formalin solution.

E. Transportation of specimen

Specimen should be sent safe and quickest ways on the day of collection or by following days. Attention should be paid preventing from break and/or leak during the transportation. Tightly sealed, taped with vinyl, and placed into a vinyl bags are usually recommended. Ice box could be used for transporting box with ice cubs. When dry-ice is used, specimen should not be exposed of carbon-dioxide.

APPENDIX 2.

Proposed Defining of Diagnostic Services on Main Diseases

Followings are a target of diagnostic services to be done or capable at each level of institutions in nearest future. "LPPH" for Research Institute for Animal Diseases, Bogor, "LVK" for Research Institute for Animal Viral Diseases, Surabaya. "A" for Disease Investigation Center (DIC), and "BC" for B and C type DIC, respectively. The institutions in parenthesis indicate assisting institutions, and arrow mark means laboratory confirmation and reference services.

A. Bacterial Diseases

Diseases	I	II	III	IV	V	VI	Diagnosis
Pleuropneumonia	A (BC)	-	LPPH	LPPH	LPPH	LPPH(A)	LPPH
Hemorrhagic septicemia	A (BC)	A	A	A	A	A	A, LPPH
Fowl cholera							
Glanders	A (BC)	A	A	A	Malein ABC	A	A, LPPH
Epizootic lymphangitis	A (BC)	A	A	-	-	A	A LPPH
Anthrax	A (BC)	A	A	A	Ascoli-ABC	-	A
John's disease	A (BC)	A	A	-	CF-A Jonin-ABC	A	A
Tuberculosis	A (BC)	BC	A	-	Tub-ABC	-	ABC
Brucellosis	A (BC)	BC	A	-	Agg-ABC CF-A	-	A
Black-leg	BC	BC	A	A	-	-	A
Swine erysipelas	BC	BC	A	A	-	-	ABC
Pullorum disease	BC	-	A	-	Agg-ABC	-	ABC
CRD, Mycoplasmosis	BC	-	A	-	Agg-ABC	-	ABC
Chicken coryza	BC	-	A	-	A	-	A
Bovine vibriosis	BC	BC	A	-	-	-	A

Note: I : Autopsy and collection II : Microscopic examination
 III : Isolation and culture IV : Animal inoculation
 V : Serological tests VI : Histo-pathological exami-

B. Viral Diseases

Diseases	I	II	III	IV	V	Diagnosis
Foot-and Mouth	A (BC)	-	LVK	LVK	LVK	LVK
Rinderpest	A (BC)	-	LPPH	LPPH	LPPH	LPPH
Sheep pox	A (BC)	-	LPPH	LPPH	-	LPPH
TGE	A (BC)	A	Neut-A	A	A	A
Hog Cholera	A (BC)	A	Fa-A	A	A	A
Encephalitis, horse	A (BC)	-	Neut-A	A	A	A
Infectious anemia, horse	A (BC)	A	Gel-A	-	A	A
Rabies	BC	-	-	Fa-A	A	A
Jamburana disease	A (BC)	A	A	A	A	A
Bovine Resp. disease	A (BC)	A	HI-A Neut-A	A	A	A
Newcastle disease	ABC	A	HI-BC Neut-A	A	A	A
AE (avian enceph.)	BC	-	Neut-A	A	A	A
IB (bronchitis)	BC	-	Neut-A	A	A	A
ILT(laryngo- Trachi.)	BC	-	Neut-A	A	A	A
Fowl Pox	BC	-	Neut-A	A	A	BC A

Note : I : Autopsy and collection

II : Heamatology

III : Serology

IV : Virus isolation

V : Histo-Pathological
examination

