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THE NATIONAL INSTITUTE OF HEALTH IN JAPAN. THE CONTRIBUTION IN PUBLIC HEALTH

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It is my great honour to have an opportunity to attend this symposium celebrating the 50th anniversary of the foundation of the Istituto Superiore di Sanità. On behalf of all of my Institute, I would like to extend our heartiest congratulations to this memorable anniversary and pay our respect to your long years contributions not only to your own country but also to the other parts of the world. In fact, some of the staff of our Institute have the profitable experience to stay at the Istituto Superiore di Sanità studying their specialities of public health. Taking advantage of this opportunity, I would like to express our hearty thanks to your kindness.

According to the terminology of World Health Organization, a public health institute is a unit in preventive medicine primarily for identifying and investigating the causative factors of ill health in the community. Our Institute, National Institute of Health of Japan, is certainly of such kind, but its functions have been concerned mainly with the area of communicable diseases. In fact, the national government has established separate institutes for foods and drugs, environmental pollution, mental health, cancer, heart and vascular diseases, leprosy, and education of public health personnel, respectively.

Our Institute was established in 1947 as the consultant institute for the Ministry of Health and Welfare. It was only 2 years after the end of World War II and many acute and chronic infections diseases were still prevalent all over the country. Needless to say, economy and industry of Japan were almost collapsed at that time. Therefore, the only way to counteract against such an epidemiological status was the use of vaccines and antibiotics. National Institute of Health of Japan was founded to meet this urgent need of public health. In other words, one of the characteristics of our Institute has been the control laboratory of biologics. Especially, we have been doing our utmost effort in introducing and developing various virus vaccines. In this regards, microbiology and immunology are the background science which have been supporting our biologics control.

Technology is also essential in this area. The development of the isolation and fractionation technology for biological materials and their components made it possible to prepare vaccines, antigens and antibodies in a purified form. For example, we were successful in producing less toxic preparations of pertussis and influenza vaccines.

In more recent years, the younger generation of our staff has been trying to introduce recombinant DNA technique to the development of new vaccines such as hepatitis B, hepatitis A, and herpes simplex vaccines, and also to the cloning of human rota virus, human papova virus, and complementary DNA of polio virus genes. Most of those attempts are still in the try and error stage, but we are expecting their success sooner or later.

Some other staff are working hard to develop various monoclonal antibodies which may be useful as immunologic and diagnostic reagents. All these are the good examples to show that biotechnology will be the key factor for the future development of public health laboratory services.

The second characteristic or our Institute is the central laboratory in the national network system of surveillance and reference for communicable diseases. The network consists of our National Institute of Health, district public health laboratories, and health center laboratories. As a cooperative work of this system, we have been publishing monthly report, in which the information of bacterial and virus isolates from district public health laboratories is collected in a nation-wide scale and summarized and classified according to the items of surveillance and epidemiology. In addition to this isolate information system, our Institute has been running domestic and WHO serum banks, through whose activity we can get good information about serum epidemiology or the immunological status of the community. Needless

to say, the introduction of computer system was essential in establishing these surveillance system.

The National Institute of Health of Japan is considered as the central reference laboratory for microbiological testing work or public health; for example, the supply of standard strains, antiserum, and antigens, standardization of testing method, proficiency test of public health personnel, and identification of the microbiological isolated for the administrative purpose.

Recently, instrumentation and automation were introduced to a large extent even into the work of bacterial isolation and identification. And, various convenient kits diagnostic reagents became commercially available for public health laboratory services. The quality control of these equipments and kits is now considered to be an important part of the reference activity of our Institute. In any case, instrumentation and automation in the public health laboratory is the results of development in technology.

As stated above, biologics control, surveillance and reference activity have directly contributed to the improvement of public health in our country. However, it must not be forgotten that our basic

Table 1. – *Ten leading causes of death in Japan (National survey of mortality and morbidity)*

Causes of death	Number of deaths			Death rate per 100,000		
	1965	1974	1978	1965	1974	1978
Cerebrovascular diseases	172,773	178,333	167,431	175.8	163.0	146.2
Malignant neoplasms	106,536	133,702	150,265	108.4	122.0	131.2
Heart diseases	75,672	98,169	106,749	77.0	89.7	93.2
Pneumonia & bronchitis	36,663	35,677	34,676	37.3	32.6	30.3
Accidents	40,188	35,664	29,776	40.9	32.6	26.0
Senility	49,092	32,476	27,972	50.0	29.7	24.4
Hypertensive diseases	18,987	20,109	16,776	19.3	18.4	16.4
Suicide	14,444	19,085	20,187	14.7	17.4	17.6
Tuberculosis	22,366	11,410	8,258	22.8	10.4	7.2
Cirrhusis of liver	9,791	14,645	16,073	10.0	13.4	14.0

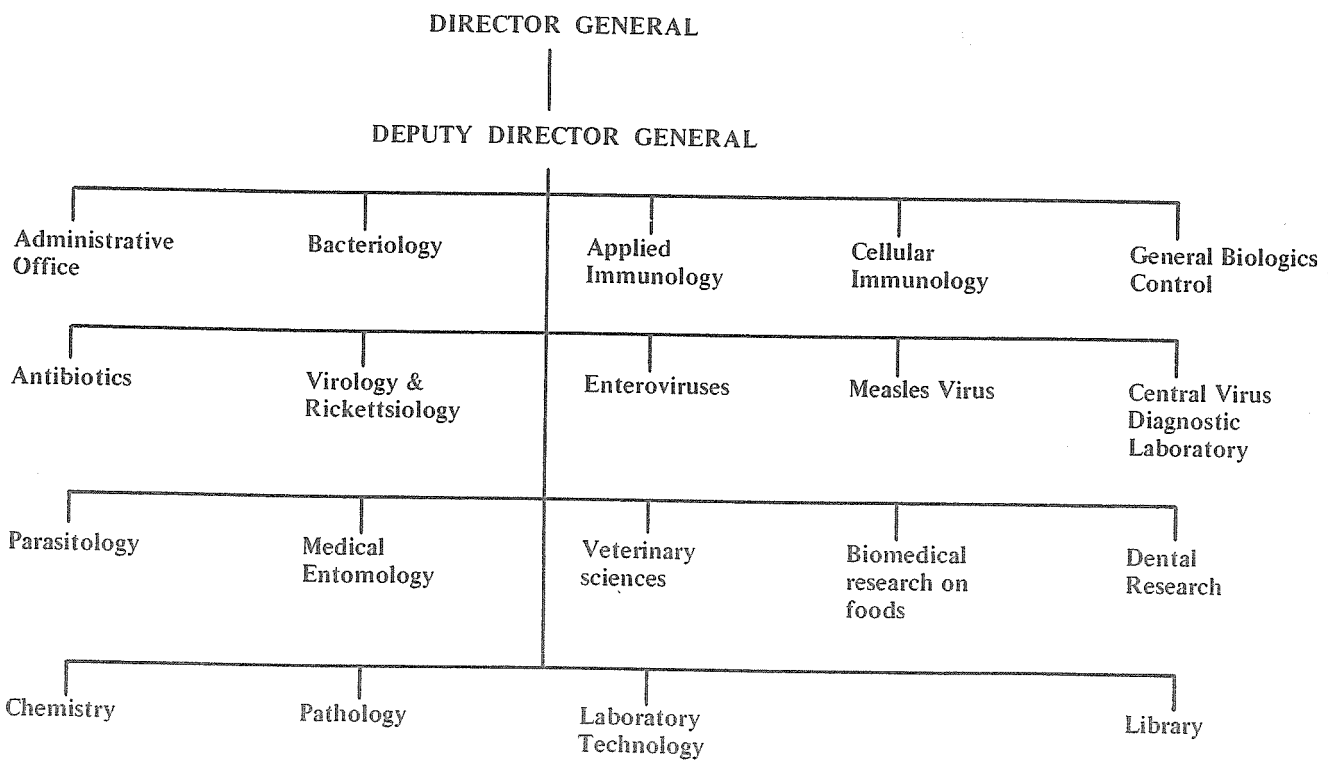

Fig. 1. – National Institute of Health (1 office, 17 departments and 1 library)

research activity has been supporting the potentiality for such an applied science of public health. Therefore, the organization of our Institute is still consisting of the areas of medical and biological sciences as stated in Fig. 1.

More than 35 years have elapsed since the foundation of our Institute. During this period many acute infections diseases together with tuberculosis have been brought under control. I believe that our Institute has made a definite contribution to this success through its public health activities. At the same time, we must acknowledge the fact that the improvement of living environment and nutrition was the other big factor for such a success. In the last, I would like to show you the changing patterns of incidences of some infectious diseases as a partial evidence for our efforts (Table 1 and Figs. 2-7).

In addition, some schematic figures (Figs. 8-12) will be presented which show the role of public health services in the community and of sciences and technology as potentialities to support and develop it.

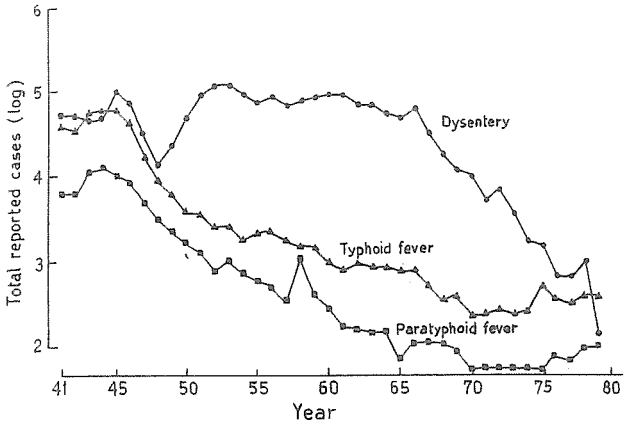

Fig. 2. – Incidences of dysentery, typhoid fever, and paratyphoid fever in Japan, 1941-1979 (*National survey of mortality and morbidity*)

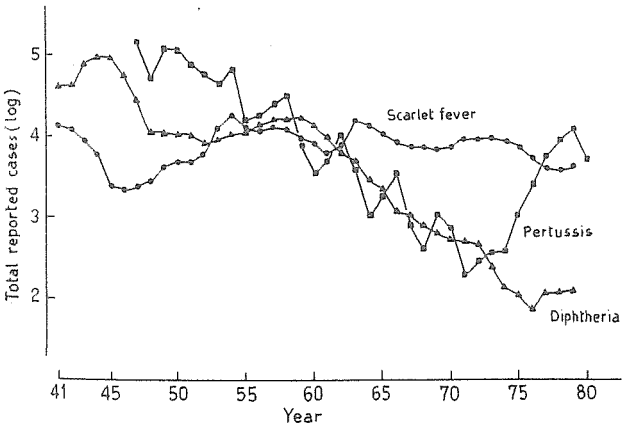

Fig. 3. – Incidences of scarlet fever, pertussis, and diphtheria in Japan, 1941-1979 (*National survey of mortality and morbidity*)

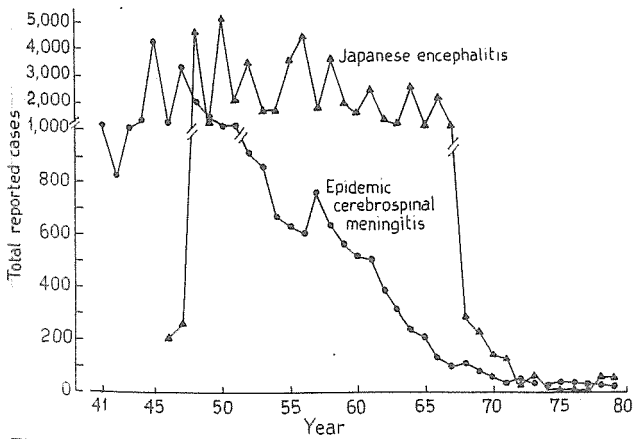

Fig. 4. – Incidences of epidemic cerebrospinal meningitis and Japanese encephalitis in Japan, 1941-1979 (*National survey of mortality and morbidity*)

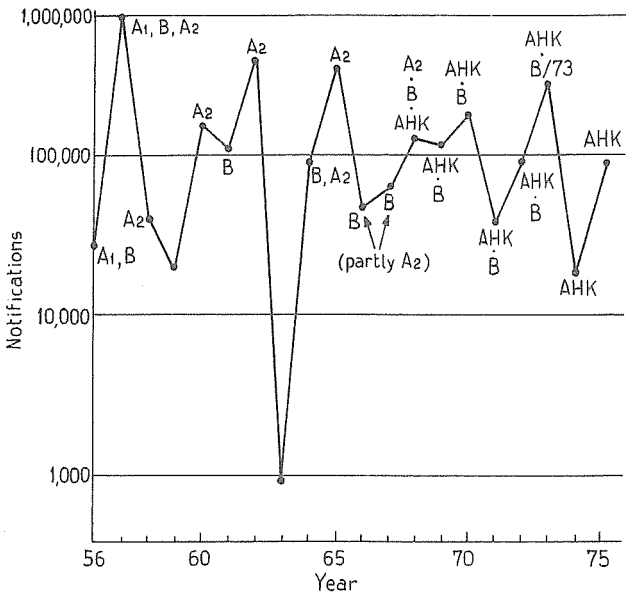

Fig. 5. – Annual change of reported influenza cases (*National survey of mortality and morbidity*)

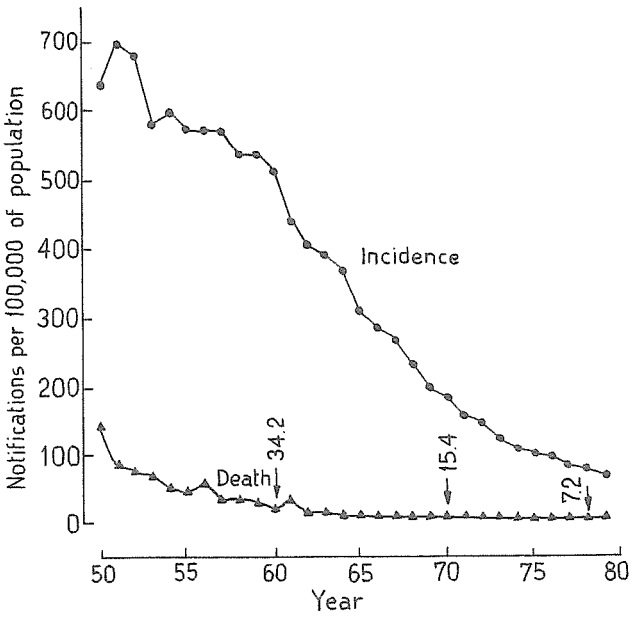

Fig. 6. – Incidences and deaths from tuberculosis per 100,000 of population in Japan, 1979 (*National survey of mortality and morbidity*)

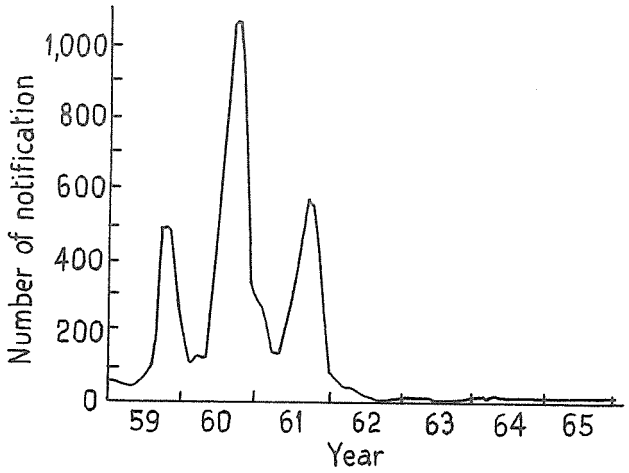

Fig. 7. – Polio–"eradication" in Japan, by mass–vaccination since 1961 (*National survey of mortality and morbidity*)

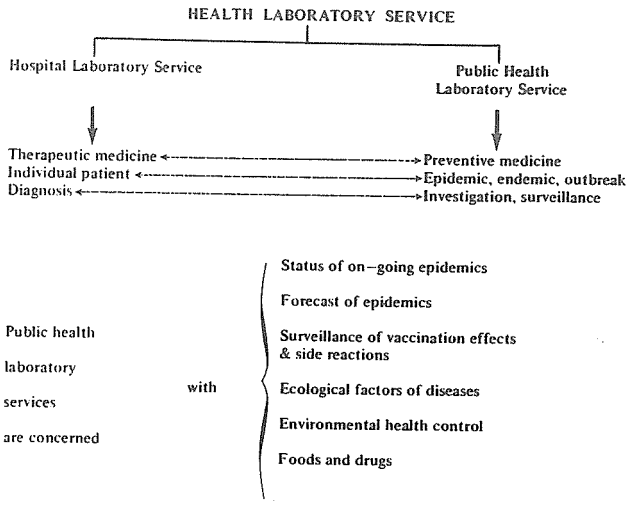

Fig. 8. – What is the Health Laboratory Service?

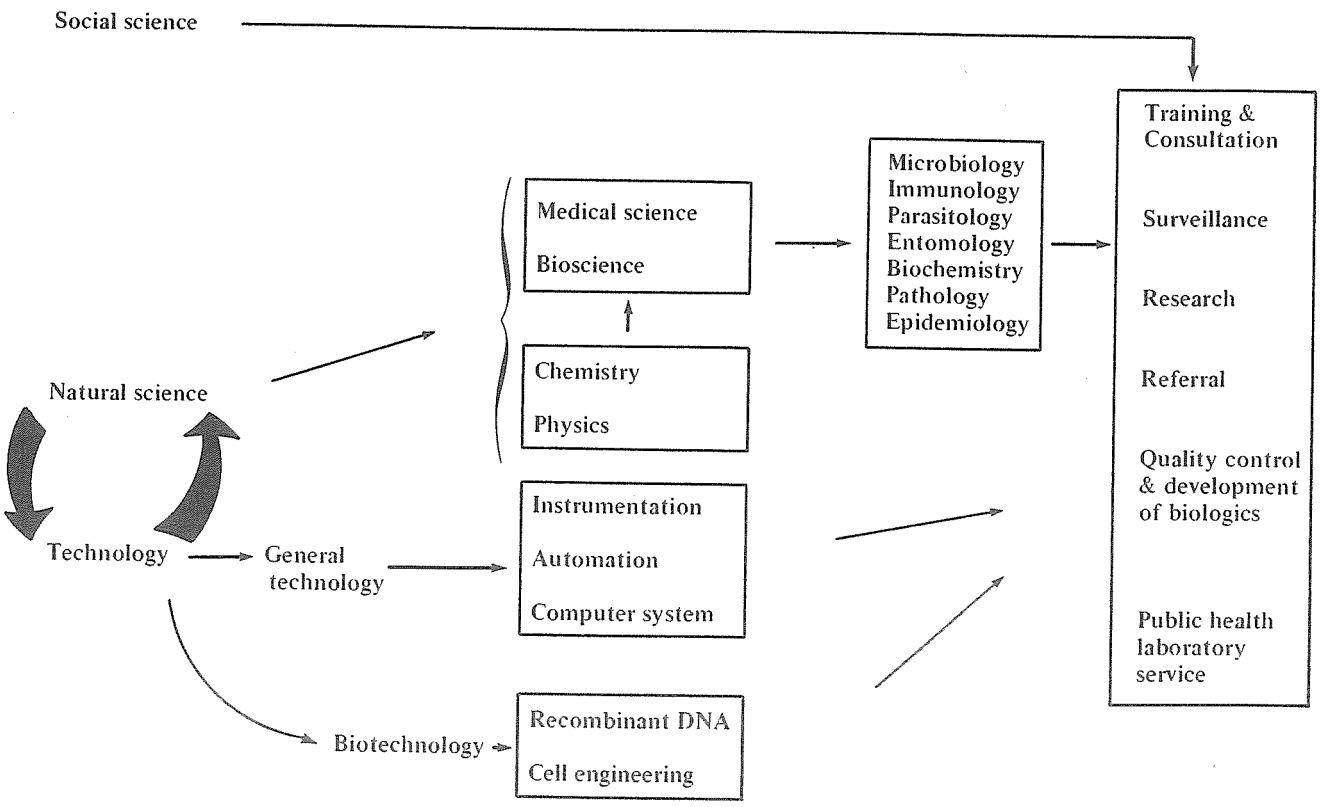

Fig. 9. – Science and technology supporting the potentiality of Public Health Services

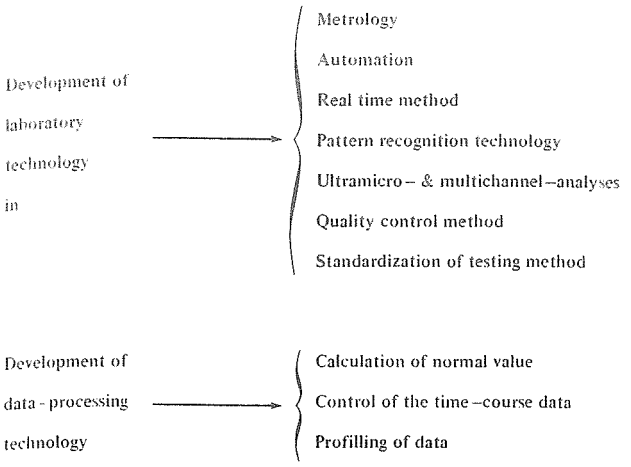

Fig. 10. – Development of laboratory technology and data-processing technology as influenced on public health laboratory services

Use of recombinant DNA for the study of

1) Virus hepatitis
2) Structure and function of hepatitis B virus genes
3) Development of a new host–vector system in antibiotic–producing streptomyces
4) Analysis of the mechanism of carcinogenesis by herpes simplex virus and development of the vaccine

Cloning of

1) Hepatitis B virus
2) Complementary DNA of hepatitis A virus
3) Papova virus DNA
4) Complementary DNA of poliovirus gene
5) Human rota virus

Fig. 11. – Research subjects in National Institute of Health of Japan by recombinant DNA technology

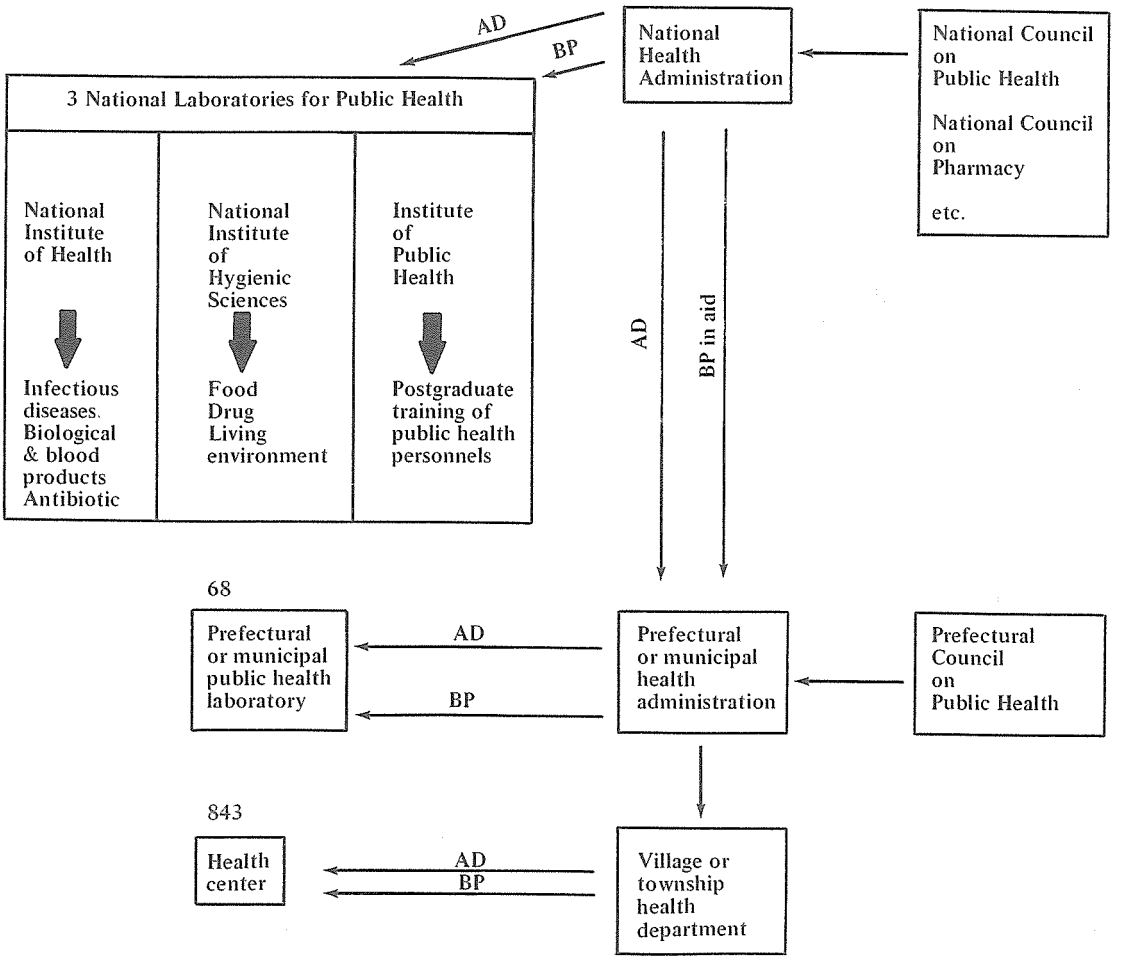

Fig. 12. – The national network of public health services in Japan

Note: AD: Administrative direction; BP: Budgetary prevision.