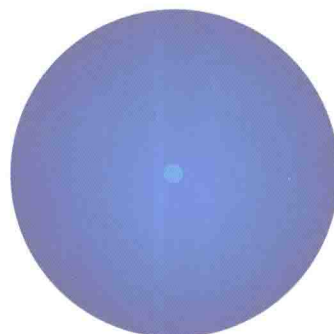
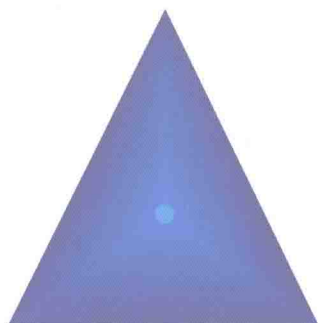
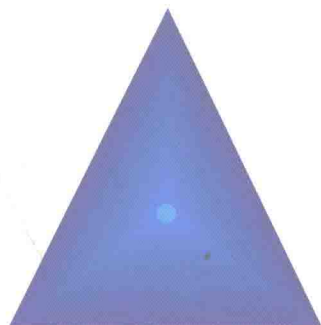
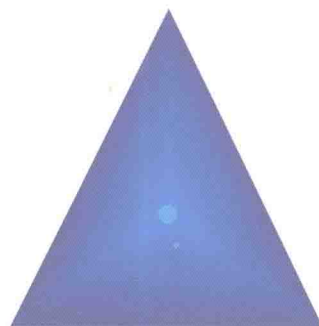
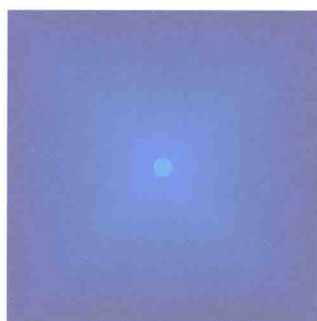
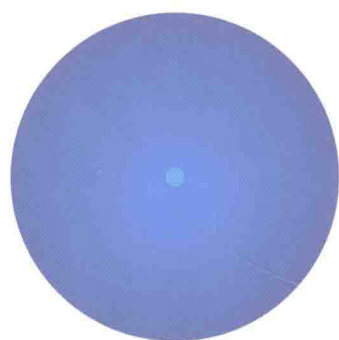


PREVENTION AND CONTROL OF COMMUNICABLE DISEASES IN HONG KONG



DR. LEE SHIU-HUNG

Dedicated to all health care workers who have been involved
in the prevention and control of communicable diseases in
Hong Kong.

FOREWORD

By

PROFESSOR DAVID TODD

While infectious diseases are no longer the leading cause of mortality in Hong Kong, they remain a common cause for patients seeking medical advice. Furthermore, infections are still a major health problem in many neighbouring countries and pose a hazard to those who travel. Hong Kong has a commendable record in its control of communicable diseases, and much of the credit must go not only to advances in medicine, but to efficient health surveillance, improved sanitation, better education, nutrition and housing. However, the recent spread of human immuno-deficiency virus infection to South-east Asia reminds us to be ever vigilant. As "old" infections such as small-pox disappear, new ones emerge and previously treatable infections may become drug-resistant.

A modern and comprehensive text on communicable diseases in Hong Kong is timely, and Dr. S H Lee is to be congratulated on his book. His contributions to the control of infections are well known, and we are grateful he is sharing his knowledge and wide experience in this way.

Dr. Lee reviews the past, describes and evaluates present developments in public health measures to control infections, including sexually transmitted diseases, and makes recommendations for a national epidemiological service. The emphasis is on prevention, and rightly so. He concludes by commenting on the way ahead. There is no doubt the objectives of this publication as stated in the Preface are more than achieved and all those concerned with medicine and health are indebted to Dr. Lee for this important and useful contribution to the medical literature.



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FOREWORD

BY

DR. S.T. HAN

Communicable diseases have caused considerable morbidity and mortality in many countries and territories in this Region. In the past two decades there has been substantial progress in the prevention and control of these diseases. Hong Kong's achievements are particularly remarkable as some of the target diseases in the Expanded programme on Immunization have either been eradicated or well brought under control.

However, despite the good progress that has been made globally towards control of communicable diseases, there are still reports of epidemics or outbreaks of such diseases in different parts of the world. Examples are the recent upsurge of cholera in Asia, including a newly identified strain and an increase in malaria morbidity in some countries in this Region. In addition, AIDS is becoming a major public health problem and sexually transmitted diseases have also been shown to facilitate transmission of HIV infection. There is, therefore, a need to continue our efforts, reinforce our activities and strengthen our surveillance system in reducing the incidence of communicable diseases in the Region.

This book is a testimony to the achievements of the healthcare workers in Hong Kong. Its contents are wide-ranging, covering organization of epidemiological services; immunization programmes; port health; public health laboratory services; detailed review of various communicable diseases in the community; sexually transmitted diseases; vector control; epidemiological surveillance and the importance of health education.

The author, Dr S H Lee, has considerable expertise and wide and extensive experience in the field of communicable disease prevention and control. Indeed, the World Health Organization Regional Office for the Western Pacific in 1988 awarded a medal to Dr Lee in recognition of his outstanding contribution to the improvement of public health in Hong Kong.

This book is based on the author's experience in tackling the problems of communicable diseases over the past 34 years and in developing sound strategies for their effective control. I commend this book as a valuable source of reference for health care workers. It is a work which is combining principles and practical experience and setting out new models to deal with new challenges in the years ahead.



S.T. Han, MD, Ph.D.
Regional Director
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PREFACE

This book provides a comprehensive review of the communicable diseases situation in Hong Kong. It records Hong Kong's experience in tackling its communicable disease problems, in seeking solutions and appraising results. Epidemiological surveillance activities and research data on a wide spectrum of communicable diseases in HongKong are described.

In the past three decades the territory has achieved remarkable success in the control of most communicable diseases so much so that this has led to an optimistic assumption by many that communicable diseases no longer pose public health problems in Hong Kong. This assumption is incorrect because some old diseases are still persistent and new diseases caused by dangerous pathogens of recent years are tending to increase. Furthermore, Hong Kong is situated in the midst of countries where dangerous epidemic and endemic diseases are prevalent. With an increasing volume of movement of people between these areas, the territory is vulnerable to the introduction of communicable diseases and the risk of outbreaks of epidemic diseases is ever present.

The practice of quarantine is no longer effective in preventing the introduction and spread of communicable diseases. Epidemiological surveillance is now the cornerstone of work in the control of communicable diseases.

This book was written with three objectives: (1) to review the pattern and epidemiology of the common communicable diseases which have been encountered in the past; (2) to identify the various preventive and control measures which have been employed and where appropriate draw up models of control for the future reference; and (3) to serve as an overall reference for health care workers involved in the prevention and control of communicable diseases and in the planning and organization of a national epidemiological service.

I hope this book will stimulate the health care workers to develop their interest on communicable diseases and encourage them to further advance our tools and strategies on prevention and control. I also hope this publication will be of value for research and teaching purposes.

In writing this book, I had sought the views and comments of my colleagues. I am grateful to them for their valuable advice and assistance.



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Many colleagues in the Department and in other Government departments have given valuable assistance and advice in the planning and publication of this book. I would like to express my warmest thanks to all of them. I would like to mention, in particular, those who have helped me in various ways in facilitating the publication of this book.

I would like to record my thanks especially to Dr Philip Ho, Mrs Amy Chan and Mr Simon Yeung of the Statistics Unit who have helped me so much in reviewing the various chapters and providing the various statistics.

I am also grateful to Mr Harold Yau and Miss Winnie Wong of the Government Information Services who have given valuable advice in the design and art work of this book.

Special mention must also be made to the Consultants and other medical staff of the Department for their advice and comments on various subjects in the chapters in their respective expert areas.

I am also grateful to the University of Hong Kong for permission to quote some of the materials contained in my MD thesis entitled 'Epidemiological Surveillance of Communicable Diseases in Hong Kong'.

Last but not the least, I would like to express my special thanks to Mr Harris Myers, Government Printer, who has been so understanding and helpful in facilitating the printing of this book.

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CONTROL OF COMMUNICABLE DISEASES AT INTERNATIONAL LEVEL

1.1 THE EARLY HISTORY OF QUARANTINE

The earliest medical problem to become the concern of more than one government was the problem of preventing epidemics spreading from one country to another. The practice at first employed was the erection of sanitary barriers or community isolation.

The idea behind such a practice was to isolate the community for a limited period so that the passage of time would allow the disease to manifest itself among those who were in the incubation period, and would thus dissipate the 'infection' before they were allowed to enter the community without restriction.

The word 'quarantine' was derived from the forty-day (quaranta) isolation period imposed at Venice in the 14th century during the Black Death pandemic in which quarantine stations were set up to ensure that all incoming ships, travellers and goods from infected ports were subjected to strict inspections and detention for 40 days. The forty-day period of isolation and detention was said to be based on the period during which Jesus and Moses had remained in isolation in the desert (1).

In 1423 Venice established its first LAZARETTO (quarantine station), so called from the Church of Santa Maria of Nazareth - "The Nazarethum" on the island for quarantine purpose (2). The establishment of LAZARETTOS stamped out from a conception that contagion was propagated by three causes, the air, diseased persons, and goods transported from infected places, and ships coming from infected places were obliged to perform quarantine.

Although the quarantine practices appeared to be effective against the introduction of plague, they were practically useless against cholera, as evidenced by the spread of cholera epidemics to Europe, USA and Central Asia indicating the ineffectiveness of

the quarantine system. Furthermore, the quarantine measures adopted by different countries were uncoordinated and obstructive causing considerable hinderance to travel and trade.

At the First International Sanitary Conference held in Paris on 23 July 1851, agreements were reached to bring in some uniformity into quarantine practice and the measures were more rational and less burden-some to traffic than the older systems.

1.2 THE INTERNATIONAL OFFICE OF PUBLIC HEALTH (L'OFFICE INTERNATIONAL D'HYGIENE PUBLIQUE) AT PARIS, 1907 - 1946

The earlier part of the 20th century saw the creation of a permanent body, the International Office of Public Health (The Office) at Paris under the Rome Agreement of 1907 (3).

The main works of the Office were connected with epidemic notification and other quarantine problems. The Office made arrangements with the Far Eastern Bureau of the League of Nations at Singapore, the Pan American Sanitary Bureau at Washington and the Sanitary Maritime Quarantine Council of Egypt at Alexandria to act as regional bureaux of the Paris Office and receive the information from the countries in their regions and transmit it to the Office as well as to the countries in their own areas. The Office also published a weekly communique' summarizing the information received and recording the progress of epidemics.

The quarantine problems dealt with by the Office were deratization and exemption certificates, the deratization of ships and 'the struggle against rats', quarantine signals, ships surgeons and bills of health. The Pilgrimage Commission also received annually the state of health of each pilgrimage and the sanitary and quarantine arrangements.

1.3 THE HEALTH ORGANIZATION OF THE LEAGUE OF NATIONS, 1921 - 1946

The Health Organization of the League of Nations was established a few years after the First World War (4). The major and immediate task of the Health Organization of the League was to improve the Epidemic Intelligence System.

The publication of Weekly Epidemiological Record began in 1925. Its purpose was primarily to supply sanitary administrations and port health authorities with recent data on epidemic diseases and quarantine measures.

The epidemiological record consisted of two parts : (i) Weekly notification of epidemic diseases made by governments under the international sanitary conventions and prepared by the Paris Office; and (ii) Elaboration and development of these notifications so as to allow health administration to gauge the epidemic situation in other countries.

1.4 THE WORLD HEALTH ORGANIZATION (WHO), 1948- Present

When the World Health Organization was established on 7 April, 1948 as a single international health organization of the United Nations in the field of health, it took over the works of the International Office of Public Health and the Health Organization of the League of Nations. Among the many activities of the World Health Organization, the following were particularly important in the worldwide surveillance of communicable diseases.

(1) THE INTERNATIONAL HEALTH REGULATIONS

The International Health Regulations were originally called International Sanitary Regulations (5). They cover all forms of international transport - ships, aircraft, trains and road vehicles. They deal with the sanitary

conditions to be maintained and measures to be taken against diseases at seaports and airports open to international traffic, including measures on arrival and departure, sanitary documents and sanitary changes. The Regulations stipulate that each health administration shall notify the WHO of the occurrence of quarantinable diseases first by telegram to be followed by detailed reports by writing.

Towards the end of the 1960's, the International Sanitary Regulations were re-titled as International Health Regulations and the first edition of the International Health Regulations (1969) came into force on 1 January 1971 (6). There were two main changes made to the former International Sanitary Regulations when the new Regulations were brought into use. Firstly the diseases in the Regulations were no longer called 'quarantinable diseases' but were named as 'diseases subject to the Regulations'. Secondly, the Regulations include only four infectious diseases - plague, cholera, yellow fever and smallpox which remain to be subject to the Regulations. The other two infectious diseases - louse-borne typhus and louse-borne relapsing fever, which were included in the former International Sanitary Regulations were deleted from the International Health Regulations. These two diseases together with paralytic poliomyelitis, malaria and viral influenza form the basis of a separate reporting system known as 'diseases subject to international surveillance'. Under the international surveillance system it is obligatory for member states to report to WHO when outbreaks of such diseases occur. The term 'outbreaks' is not defined and is left to the discretion of the member states as to what they should or should not report.

Following the formal announcement by the WHO on the complete eradication of smallpox from the surface of the globe on 8 May 1980 the diseases subject to the Regulations were subsequently reduced to only three-cholera, plague and yellow fever.

(2) THE WEEKLY EPIDEMIOLOGICAL RECORD

The Organization's Weekly Epidemiological Record (WER) (7), which is issued each Friday morning, contains notifications of diseases subject to the International Health Regulations, information about the application of the Regulations, as well as epidemiological notes and reviews concerning diseases of international importance such as influenza and poliomyelitis. A series of technical guides for the surveillance of selected communicable diseases also appears in the WER.

(3) WHO REFERENCE LABORATORIES

The Organization maintains networks of reference laboratories in all parts of the world for viral, bacterial and parasitic diseases. These networks play a crucial role, both direct and indirect, in international surveillance of communicable diseases. The reference laboratories also work closely with the national laboratories of health administrations and provide technical assistance to these national laboratories where required. The Virus Laboratory at Queen Mary Hospital in Hong Kong has been designated by WHO as the national laboratory for the surveillance of influenza and the Virus Unit regularly sends isolates of influenza viruses to the reference laboratories at the National Communicable Disease Centre (NCDC), Atlanta, Georgia, USA or the Public Health Laboratory at Colindale, London, for the identification of various strains and sub-types of influenza viruses. The WHO also has serum reference banks which are intended to facilitate the use of serological techniques in surveillance.

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ORGANIZATION OF EPIDEMIOLOGICAL SURVEILLANCE OF COMMUNICABLE DISEASES IN HONG KONG - PART I

2.1 CHANGE IN EMPHASIS

In the world of today the ever-increasing volume and speed of national and international traffic and other ecological changes favour the spread of communicable disease. The new approach is one that is based on national and international surveillance of selected communicable diseases (1).

The term 'disease surveillance' as distinct from personal surveillance (the supervision of contacts without restricting their movements) covers 'the continuing scrutiny of all aspects of the occurrence and spread of a disease which are pertinent to effective control' (2, 3, 4). Thus, the purpose of epidemiological surveillance of communicable diseases at the national level is for the national health authorities to be kept informed of the pattern of diseases prevailing in the country, on their occurrence in the community and on the factors influencing their distribution. Extending the national surveillance programme of each country to an international level, the epidemiological information that is made available by national health authorities to an international organization such as the World Health Organization will contribute to the establishment of a world-wide surveillance programme on communicable diseases at international level.

Broadly speaking, the activities cover three distinct features:

- (a) the systematic collection of pertinent data;
- (b) the consolidation and evaluation of these data; and
- (c) the prompt dissemination of relevant information.

2.2 ORGANIZATION OF EPIDEMIOLOGICAL SERVICE ON SURVEILLANCE OF COMMUNICABLE DISEASES

In Hong Kong the epidemiological service for the surveillance of communicable diseases consists of a comprehensive

network of facilities for the detection, notification, investigation of cases or outbreaks, as well as for the conduct of surveys, study of animal reservoirs and vector distribution, the analysis and consolidation of data and the dissemination of the resulting information. To begin with, a communicable disease as defined under the Quarantine and Prevention of Disease Ordinance, Chapter 141 is statutorily notifiable to the health authority in order to permit early measures to be undertaken for the control of the spread of the infection. This legislation also makes provision for the health authority to carry out the necessary investigation into the source of infection, isolation of cases, tracing of contacts and other preventive and control measures.

A comprehensive network of facilities consisting of maternal and child health centres, hospitals, accident and emergency departments, general out-patient clinics as well as all clinics and hospitals operated by the private medical practitioners provide a means for the diagnosis and reporting of communicable diseases. This system of surveillance is further supplemented by facilities available in the various government laboratories, health offices and regional hospitals for laboratory diagnosis, isolation and treatment of cases and contacts as well as for the investigation and control of the source of infection.

In addition the Port Health Authority maintains close contact with ports and airports of the neighbouring countries and the WHO for the exchange of epidemiological information about the occurrence of communicable diseases subject to the IHRs and other diseases of international importance.

Close co-operation is maintained with other relevant government departments, the Hospital Authority and the clinical departments of the Faculties of Medicine of the two Universities in the regular consultation and exchange of information on the prevention and control of communicable diseases. Typical examples are the co-operation and

liaison between the Department of Health and the Agriculture and Fisheries Department on problems concerning zoonoses such as anthrax and rabies and the Urban Services Department and Regional Services Department on vectors distribution and control.

Because of Hong Kong's close geographical relationship with China and Macau and the large volume of movement of people between Hong Kong and these areas, special liaison has also been established with the Bureau of Public Health of the Guangdong Province, China and the Health Department in Macau in the exchange of information and consultation on the control of communicable diseases.

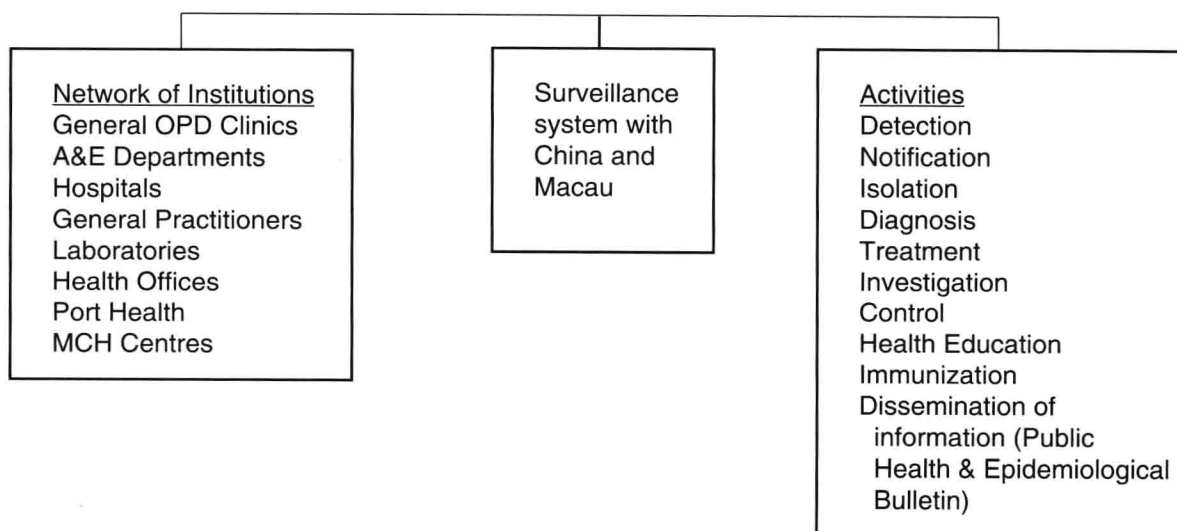
On top of this effective system in the epidemiological surveillance of communicable diseases is the health education activities which are incorporated in the preventive health care system for the whole community. Through the health education activities the health care workers as well as the public will become more aware of the importance of communicable diseases, their prevention and control. The system of epidemiological surveillance of communicable diseases in Hong Kong is shown in Figure 2.1.

2.3 NOTIFICATION OF COMMUNICABLE DISEASES

Under Section 4 of the Prevention of the Spread of Infectious Diseases Regulations, any medical practitioner or medical officer is required by law to notify the Director of Health the existence of a case of infectious disease in accordance with a form as indicated in the Schedule (Appendix 1, 2). A notifiable infectious disease means any disease specified in the First Schedule of the Quarantine and Prevention of Disease Ordinance. Since December 1993, the Legislative Council approved the addition of dengue fever, Legionnaires' disease, mumps, rubella and tetanus to and the deletion of smallpox, chickenpox, ophthalmia neonatorum and puerperal fever from the schedule making a total of 26 diseases notifiable under this Ordinance as shown in Appendix 3. The amended ordinance came into effect on 18 March 1994.

Where necessary the Director of Health may amend the Schedule of Infectious Diseases by publication in the Gazette. In addition to the above list of statutorily notifiable communicable diseases, doctors

Figure 2.1
Surveillance System on Communicable Diseases in Hong Kong



are also welcomed to notify voluntarily some other communicable diseases such as Japanese encephalitis.

2.4 CONSOLIDATION AND EVALUATION OF DATA

Consolidation and evaluation of data is carried out by the Statistics Unit in the Headquarters of the Department of Health. In analyzing the geographical distribution of communicable diseases, the territory is first divided into four regions, namely Hong Kong Island, Kowloon, New Territories (East) and New Territories (West), and then within each region, a number of epidemiological districts.

Each epidemiological district (equivalent to district board district) is composed of a number of tertiary planning units of the territory's Outline Plan produced by the former Crown Land and Surveys Office. Each planning unit has well defined boundaries and the population data in each unit are available. This system will enable the incidence rates of communicable diseases for each epidemiological district to be calculated. Close liaison is maintained between the Statistics Unit and the Regional Health Offices in notification, case investigation and surveillance activities. On the advice of two WHO consultants, a separate notification form DH 1(A) (Appendix 2) was introduced to facilitate the notification and investigation of cases and contacts of tuberculosis. All tuberculosis notifications are directly received by the Central Tuberculosis Registry in the Chest Service.

With the availability of qualified and trained statistical personnel, the quality of statistical analysis of epidemiological data has greatly improved. However, there is a limit for the statistical data to be efficiently analyzed manually, and modern data processing facilities including micro-computer are gradually introduced into the Statistics Unit. Special investigation forms to guide the investigation of communicable diseases were used. Essential information obtained during

the investigation of some communicable diseases are now entered into specially designed form for data analysis. Although computerized investigation format is not available for all diseases, where necessary special and ad hoc epidemiological investigations and detailed analysis of data are carried out.

2.5 DISSEMINATION OF INFORMATION

The Statistics Unit in Headquarters prepares and issues the routine reports (number of cases by disease and by epidemiological districts) regularly to all branches of the health services, hospitals, and officers responsible for the surveillance of communicable diseases. The distribution of the reports is on a weekly and monthly basis. However, the officers responsible for surveillance of communicable diseases will receive the reports daily. The monthly statistical reports are also distributed to WHO and the neighbouring health departments in China and Macau.

Where necessary, special circular letters are issued to the medical associations drawing the attention of the doctors particularly those in the private practice the occurrence of certain communicable disease and requesting their co-operation in keeping a watch-out for such cases and reporting promptly to the health authority for investigation.

The mass media such as newspapers, radio and television net-works are also made use of where indicated so that the public are aware of the occurrence of outbreaks of communicable disease and that they will take the necessary precautionary measures. At times of epidemics, the dissemination of information through the media is particularly important as the public may be misled by rumours and correct information will dispel misconceptions and allay public anxiety. Under such situations, the task will be undertaken by the Department's Public