



CHAPTER II

LITERATURE REVIEW

2.1 Death Notifying System in Thailand (Mastery Department, 1988)

As for the procedure of Population Registration, when a person has died, the death must be reported, together with the medical death certificate that was issued by a professional medical caregiver, to the registration officer within 24 hours. In case of finding the dead body at home, the person who has to notify the officials is either a household member or the person who found the body. If a deceased person is found outside the house, the person who has to notify the authorities is the person who accompanied the decedent or the one who found the body. After reporting the death, a registration officer will issue a death certificate as a document allowing you to deal with the dead body by either keeping, bury, or cremating, as stated on the certificate. It is illegal to handle the situation differently than stated on the certificate.

According to the regulations of the Central Registration Office, Mastery Department, Ministry of Interior 1972, identified in regulation No. 38 concerning death registration, the notification of death within the residential area of the decedent, or if within the municipal area, the local registration officer must be notified. If it is out of the municipal area, the notification of death should be done either through the sub-district registration officer or the assistant to the sub-district registration officer in each

village, depending upon the convenience of the person who reports the case. After the registration officer has been notified of the death, the following procedures should be followed:

2.1.1 Within municipal area

- 2.1.1.1 Ask for house registration from the person who reported the death and check the related documents, as well as other documents in order to obtain the most complete information for issuing the death certificate.
- 2.1.1.2 If the decedent was treated by professional medical care, ask for the medical death certificate from that medical care provider.
- 2.1.1.3 Fill in the three parts of the death certification.
- 2.1.1.4 Discharge the decedent from house registration and its copy, by stamping “deceased” in red in front of his/her name.
- 2.1.1.5 Present part 1 of the death certification form and a copy of the house registration to the person who reported the death.
- 2.1.1.6 Discharge the decedent registration by stamping “deceased” in red and filing separately.
- 2.1.1.7 Submit part 3 of the death certification form to the municipality doctor.
- 2.1.1.8 File part 2 of the death certification form, the front part (if available), and medical death certificate (if available) with the decedent registration.

2.1.2 Out of municipal area

2.1.2.1 If the death is notified to sub-district registration officer, the procedure is as followed :

- (1) Ask for the house registration from the person who reported the death and check the related documents as well as other documents in order to obtain the most complete information for issuing the death certificate.
- (2) If the decedent was treated by professional medical care, ask for the medical death certificate from that medical care provider.
- (3) Fill in 3 parts of the death certification.
- (4) Provide part 1 of the death certificate to the person who reported the death
- (5) Submit part 2 and 3 of the death certificate and medical death certificate (if available), including a copy of the house registration to the district registration officer.

2.1.2.2 Once the district registration officer receives part 2 and 3 of the death certificate, medical death certificate, and a copy of house registration, the procedure is as followed:

- (1) Discharge the decedent out of house registration and its copy by stamping “deceased” in red in front of the name.
- (2) Return a copy of the house registration to the one who reported the case.

- (3) Discharge the decedent registration by stamping “deceased” in red and file separately and submit part 3 of the death certificate to the provincial doctor.
- (4) File part 2 and the front part of the death certificate (if available), and the medical death certificate (if available) and decedent registration.

2.1.2.3 In the case of notifying the death to the assistant to sub-district registration officer in the village, the procedure is as followed:

- (1) Ask for the house registration from the person who reported the death and check the related documents as well as other documents in order to obtain the most complete information for issuing the death certificate.
- (2) If the decedent was treated by professional medical care, ask for the medical death certificate from that medical care provider.
- (3) Follow the procedure of death notification and submit the death certification form and a copy of the house registration to sub-district registration officer.
- (4) Submit the front part of the death certification form, the medical death certificate (if available), and a copy of the house registration to the sub-district registration officer.
- (5) The sub-district registration officer issues the death certificate in 3 parts as in 1.1-1.5.

- (6) The district registration officer discharges the decedent from the house registration and its copy as in 1.1-1.5.
- (7) The assistant of the village registration officer receives part 1 of death certificate and a copy of house registration from registration office to return to the one who reported the death.

Regulation No. 39 states that after the registration officer was notified of a deceased person in his area, and if the deceased person was a resident in the area but dies outside of the house where he is registered, the process of death notification is to notify a household member where the dead person was registered and bring a copy of house registration to collect the name list.

Regulation No.40 states that after the registration officer was notified of a deceased person in his area and the deceased person was not registered in his area, the process of death notification is to specify in part 3 of death certification form (on the left side) “outlander” and present part 1 of the death certificate to the person who reported the case and submit part 2 to the registration office where the deceased person is registered.

After the registration office received part 2 of death certificate, the officer has to follow the following procedures:

- (1) Check the list of decedent along with the house registration. If the list in part 2 of death certificate is incomplete or incorrect, the officer has to correct it and sign his name and position.

- (2) Discharge the decedent from the house registration and its copy
- (3) Submit part 2 of the death certificate to the Provincial Registration Office and then compile it to submit further to the Central Registration Office.

2.2 History of Medical Death Certificate (Health Information Section, Public Health Planning and Policy Department, 1999)

The investigation of human causes of death has a long history dating back to before the middle ages, from Hippocrates to Galen. However, science systematic investigation started seriously in the middle ages, the Renaissance, which has been very useful for studying the nature of many diseases, including seeking new direction and disease prevention. The study of history and ideas to develop the study of the causes of death gives us an understanding of purpose and the use of the summarization of the causes of death. Moreover, the development of cause of death, death statistic, and death confirmation was considered an essential part when developing the system of disease classification internationally called International Statistical Classification of Diseases and Related Health Problem Tenth revision ICD-10.

History

Sir George Nibb, the Australian statistician who praised Francaue Bosia de kacraue (1706-77), tried to classify diseases systematically. His work was written under the name of Nosolojia Methodica. Sallvage got his inspiration from Linious, the great doer (1707-1778), under the name Genera Morboram at the beginning of the 19th century. The most classical system belonged to William Callen (1710-90) of Adinberg, printed in 1785 under the name of Sinobsis Nosolojia Methodica.

However, on the basis of practicality, the classification of disease statistic was initiated almost a century before, according to the works of John Grunt concerning the law of mortality of London. The classification of diseases of this initiated work was simply done. He attempted to forecast the proportion of infant mortality before the age of six, but there were no records of that age at death. He categorized the types of death as, faint, osteopathy, tooth, pathology, miscarriage, distortion, infant, including adding almost half of the cause of death by smallpox, measles, and helminthiasis. Even though, this categorization was done roughly, the results of the expectation of infant mortality for children under six years of age was 36%, which later was accepted as being a good work. Three centuries have passed and left something accurate, according to the methodical diseases classification. Despite this good work, there were numerous people who had doubts about the benefits of the attempt at recording disease statistics or death statistics, because of the difficulties in classifying diseases. Later on there was progress on preventive medicine when the registration office in England and Wales, which was established in 1837, appointed William Farr (1807-83) the first pathological statistician who had applied for the excellent disease classification and the attempt to improve its system and to practice at the same profile internationally.

Farr discovered Callen's disease classification, the one that was used in health service in the old days, which was demoted because it excluded the progress of medicine and it was inappropriate for use in medical statistic. In the first annual report for the registration office, Farr explained the possible principles in disease classification and pushed for the modification of disease classification to be at the same profile. The benefit of the same profile of designation, even it was still incomplete but it was

prominent, even though, there was never the support in using disease classification lists in mortality law. As we can see, each disease at each different condition was named differently and each name described each of the various diseases, among these, names of disease were given confusing meanings, inappropriate use of wording, and sometimes record illness complications instead of the primary cause of illness.

Farr studied the designation and the list of disease classification for as long as we can follow, from every annual report of the registration office. The initiation of the use of the same profile of the list to classify diseases was prominent during the first meeting conference on International Statistic at Brussels, Belgium, in 1853. During this meeting, the assembly asked William and Mark Despine of Geneva to design the list of disease classification as the cause of death to use international level. Until the next conference in 1855 in Paris, Farr and Despine demonstrated two name lists, each of them designed by using totally different principles. Farr's list categorized diseases into 5 groups, transmitted diseases, general diseases, organic diseases, diseases during physical development, and diseases caused by violence. Despine categorized diseases regarding the nature of the illness (Gout, Herpes, Blood diseases). The assembly compromised 139 names on the list until the year 1864 when his disease classification list was modified in accordant to Farr's direction. Since then, there were several modifications as in 1874, 1880, and 1886. Although this disease classification list has never been officially accepted worldwide, the idea of Farr in categorizing diseases, including disease classification according to physics and it is still in use as a basic of the list to classify diseases which caused death internationally.

2.3 The Manual of Medical Death Certification (Public Health Planning and Policy Department, 1999)

2.3.1 Death certificate documents

Currently, there are 2 forms of death certificate use in Thailand,

- Thai language form (4/1) to certify a death at a hospital for the use of reporting the death and to get the death certificate.
- Thai-English language form to record cause of death for internal information for the hospital.

Thai language form is used in every public and private hospital, by indicating several practitioners to be able to fill in the cause of death, for instance, physicians, nurses, mid-wife nurses, alternative medicine doctors, etc. The Thai-English language form is used mostly in public hospital under the Ministry of Health; it is on the back part of the summary report form called report form 501, 502, 503. It is very rare when private hospitals use this form. The responsible person who can fill in the Thai-English language form is the physician who cared of that patient.

Each hospital may use either forms or only the Thai form. But, if using both forms, it might be more helpful, as sometimes doctors may fill in a Thai form inconsistent with the actual cause of death. But, by filling out the English form, and using the technical terms on the form, they will collect more accurate death information. For example, if a person died from AIDS, his/her relatives may ask the doctor to change the cause of death, from AIDS to another cause on the medical death certificate, because they want to avoid the possible resulting social problems. If there

were 2 forms, a doctor could change the cause of death on the Thai form (the form which used in the process of recording the death to get the death certificate) and confirm the actual cause of death on the English form (the use of ICD-10 illness code and formulate death statistic). Both forms were tailored from medical certificate of cause of death, which was identified in Book II of the 10th revision of the International Classification of Cause of Death (ICD). WHO recommended that all country members use a standard death certificate, and most, including the USA, England, France, Japan, Australia, and Thailand complied.

2.3.2 The components of the medical certificate of cause of death

The medical death certificate consists of the first part, which requests specific information on each individual decedent and the area that requests the cause of death is considered to be the core area, because it is the major part used to record the actual cause of death.

The part requesting the cause of death is divided into 2 parts.

- Part I: direct cause of death. There are 4 lines to be completed: lines a, b, c and d in the Thai-English form and line, ก, ข, ค, ง in the Thai form or 3 lines, ก, ข, ค. on the Thai only form.
- Part II illness or other conditions. There are 2 lines with no alphabet.

The outline of Part I and Part II

I. Direct cause	(a) or (ก) _____	(b) or (ข) _____
	(c) or (ค) _____	(d) or (ง) _____

II. Illness or other conditions _____

Both parts are divided into 2 columns with a cross line, and each column has a descriptive heading. The first column is for filling in the illness or condition, which was considered to be the cause of death, and the second column is for filling in the period of time the decedent had the illness, in order to make the decision on the cause of death.

The last part on the English form of the death certificate consists of 2 blank spaces to fill in additional details. In the case of a patient who was injured or harmed, in the first blank, fill the actual cause of the injury, i.e. by accident or self inflicted, or caused by other persons. In the second blank, add details concerning the death or the type of injury.

2.3.3 Filling the Medical Certificate on Cause of Death

The person responsible for filling in the medical death certification at the hospital, is the doctor who cared for the patient because he is the one who knows the details concerning diagnosis, complications, treatments, etc. The selection of the cause of death of each decedent comes from the consideration of a doctor who treated the patient; therefore, a doctor should have genuine knowledge and understanding in filling a medical death certificate.

Filling the medical death certificate: part I is the most important part since it is going to be analyzed and consequently, the selection of cause of death of a decedent

demonstrates sequence of disease condition or any complication which caused death. The sequence of illness condition starts from present to past; the latest condition will be on the top line and the previous conditions will be listed at the bottom until the actual cause of death is on the last line.

Filling part I of the medical death certificate consists of 3 majors principles as follows:

2.3.3.1 Do not use mode of death instead of the underlying cause of death.

Modes of death are heart failure, respiratory failure, cardio respiratory failure, shock, severe brain injury, etc., the words describing modes of death are used in Clinical-Pathological Conferences. These words cause confusion with the underlying cause of death. Many doctors and personnel think that mode of death is the cause of death, which is not correct.

Mode of death differs from underlying cause of death in that, mode of death indicates which major organ stopped functioning before a person died, while, cause of death indicates the primary cause of injury or illness which creates various complications until death. Research and analysis of the cause of population death in each country is beneficial for effective prevention and planning on the causes of death, including, medical researches and epidemiology. The analysis of mode of death may have some benefits for the study of anatomy. As a wide angle, we can see that the analysis of cause of death will have benefits on national and international levels, therefore, rules and regulations of ICD-10 emphasize on the selection of accurate cause

of death and not recommending for filling by mode of death in the medical death certificate.

2.3.3.2 Filling in diseases which caused death by putting in order from present to past.

File information on the medical death certificate by putting it in order from present to past. The condition before dying is put on the top line and its cause is under the top line. Continue listing the causes respectively, until reaching the actual cause of death, which will be the last line (line d in part I).

2.3.3.3 File the primary cause of death on the last line

In cases of disease with no prior conditions, a doctor fills in what he/she considers the most primary cause of death on the last line of part 1 (line d), the most significant disease to be considered is the disease which caused other complications and other impacts and death at last.

In cases of dying from any injury, specify the injury as either accident, suicide or homicide and note down the mechanism of injury on the last of part 1 (line d). This can be written in Thai if you do not know the English term.

Filling Part II. On the medical death certificate, note diseases or other conditions, found in a patient, that a doctor does not think could have caused death. Noted separately, this part may describe additional diseases that a patient had and can be a significant part in making a selection on the cause of death.

Different locations of written diseases on the death certificate, may effect the selection of the cause of death; for instance, diseases were noted down on the wrong line, or diseases written on the same line (i.e. more than one disease in one line) The principles of the selection of the cause of death of ICD-10, relies on the position of the disease on the medical death certificate.

2.4 Death Information System in Thailand (Health Information section, Health Policy and Planning Department, 1999)

In Thailand, the collection of the cause of death information and the death statistic of the population were implemented for ICD-7 around 1963 (Medical Division, 1963), and now have been changed to ICD-10. Apparently, the death information system in Thailand is considered to be of low quality, having unreliable statistics, and vague. Due to these characteristics of the death information, they are unable to be analyzed and utilized for planning, developing, and improving the effectiveness of the health service system.

The current conditions of the death information system are as follows:

- 2.4.1 Information collection uses low quality methods causing low reliability on the information.
- 2.4.2 The medical death certificate summarized by the physician is highly inaccurate.
- 2.4.3 Most of the medical death certificates filled by personnel other than the physician uses improper processes.

2.4.4 There is no accurate data from the information collection for the statistical process.

2.4.5 Death statistic are downgraded and may be used as references incorrectly.

2.4.1 Information collection uses low quality methods causing the low reliability of the information

The current death statistic collection is done by the Ministry of Health by requesting the death information from the death registration at the Ministry of Interior. The requested data is calculated and analyzed for death statistic. The weak point of this process is that no one knows what the percentage of reliability, accuracy, data collection error, and the completion of information, is. The registration officer who issues the death certificate has less knowledge and understanding of the cause of death than the Ministry of Interior has, and the Minister of Interior has never utilized the cause of death, and lacks the insight to recheck the accuracy of the notified cause of death.

2.4.2 The medical death certificate summarized by a physician is highly inaccurate

The majority of Thai physicians at present, have less knowledge concerning summarizing a document to certify a death, since there has been no classroom lectures on it in any medical school and the minimum standard of medical graduates of the Medical Congress do not indicate that physicians must know how to write a medical death certificate accurately. Therefore, most physicians do not know how to write one

and new graduate physicians usually observe and duplicate the process of their seniors or use the process of autopsy as Clinical-Pathological Conference as seen in medical schools. (use the principle of mode of death), With the result of the summarizing of the death certificate by physician incorrectly, according to the principles. Often found errors include: noting down only one mode of death and noting down a mode of death along with other diseases or conditions which may be the cause of death.

2.4.3 Most medical death certificates, filled by personnel other than the physician use an improper process

According to the study of death certificate from various places, most of them (70-80%) were filled in by other personnel, such as, sub-district health personnel, community leader, mid-wife nurses, and nurse aids. Since most Thai's do not want to die in the hospital, most patient die at home, and the personnel who fill in the death certificate has no explicit practice guidelines, therefore, they mostly use their own judgment in learning the cause of death from others or from the media, so they fill the information in using mode of death, such as, heart failure, elderly, injured, fainted, etc.

2.4.4 Inaccurate data from information collection used for statistical purpose

Death information collection from the Thai population has been done by sectors of the Ministry of Interior, which depends mainly on the people's notification of death. The officers complete the process without knowing the differences of death notification from the actual death, whether or not this has been included in the missing persons report. It results in the inability to determine the completion of death information.

2.4.5 Death statistic are delayed and may be used as references incorrectly

Death statistics in Thailand are delayed, as are other health statistics in Thailand. Currently, the delay is about 2 years, which means in 1998, the latest death statistic we have are for the year 1996 (the Ministry of Health 1996,). The delay of death statistic reporting occurs in every process, starting from the collection of death information at district and provincial levels, to the submission of the information to the Registration Administration Bureau, then it goes to the Ministry of Interior, then the submission of the information from the Ministry of Interior to the Ministry of Health, and then information collection and analysis in the Ministry of Health, and finally the process of printing and publishing. These numerous procedures are important factors in causing the delay of death statistic for 2 years and may affect the inability to utilized it.

Delayed statistics impact the ability to recognize current problems, which adversely affect the ability to see trends and the ability of vision building to prevent future health problems. The inaccuracies in death statistic reporting, may create incorrect references; for example, if the public understands that heart disease is the primary cause of death in Thailand, even though it may not be, the commencement of too many developments for preventive and curative measures for heart disease and the establishment of more Heart Centers in private hospitals, might occur. This might utilize too many scarce resources that could be used to develop personnel, buy medication and equipment in order to cure heart disease. This may cause lots of waste, despite the fact that heart disease may not be the primary cause of death.

2.5 International List of Disease Classification (Health Information Section, Health Policy and Planning Department, 1999)

List of disease classification means the set up of a coding system in recording illness under the conditions indicated in each code. The purpose of setting up ICD is to provide the opportunity to record, analyze, and interpret the information, including the comparison of mortality and morbidity information systematically among various countries or areas and/or in different time. ICD has been used in interpreting disease diagnosis and other health problems, from wording to coding, combining letters and numbers for the convenience of filing and to utilize information. Later on ICD has been internationally practice standard in classifying disease diagnosis in general epidemiology at all aspects as well as the aspects of public health administration and management, including, situation analysis on health aspects of population, monitoring the incidence of diseases and other health problems which are related to other variables, such as, the condition of a patient. ICD is neither suitable nor convenient for the set up of sub-index of each disease. The use of ICD for the financial aspect, for instance, cost calculation and resource allocation still has some limitation. ICD is able to use it to classify diseases and other health problems that are recorded in various health records and in population registration. ICD has been used to classify cause of death, which is recorded on the death registration. Later, ICD expanded its utilization to classify diseases and injuries, though, in the beginning, ICD was designed for classifying diseases and injuries, the diagnosis was done explicitly, but, at all cases of patient appointment, it is unable to diagnose explicitly as mentioned. Therefore, the development of ICD has the essential feature in indicating coding for classifying illness symptoms, unusual conditions found during examination and social status related to health will be summarized in diagnosis report. Therefore, ICD is used to classify

information recorded under various topics, such as, “disease diagnosis”, “rationale of patient admission”, “treatment situation”, and “rationale for counseling”, these topics found recorded widely and differently and have been collected statistically along with other health information.

The concept of “family” of diseases and health related classification was developed. Though, ICD is appropriately utilized in many aspects of implementation, it may not be able to describe efficiently in some specific medical “family” and in some cases, the information may need to be classified by other characteristics, not only by ICD. Therefore, it is recommended that, in addition to ICD, there should be other classification lists which provide health status and health service information.

The main ICD (the classification list with coding of 3 letters and 4 letters), is comprised of 3 issues of ICD 10. It is unable to classify those data and should remain the principle for general users. Therefore, there is the idea of setting up a list to classify “groups of diseases” and other public health classification lists separately from the main ICD. Sequentially, the idea is to print the family of diseases and health related issues separately from the 3 issues of ICD 10. The classification list of ICD 10 is a 3 letter code, and the level at which it has been authorized for coding in statistic report internationally, allows report submission in order to include it in mortality data base of the World Health Organization, and to compare it with international general data. The classification at the level of 4 letters is not authorized for international reporting. WHO suggested that the classification in the 4-letter level is suitable for multipurpose use and to be a part of ICD in the same manor as the special list table.

The classification list is divided into 2 types: The lists in the first group, covered data of disease diagnosis and health status that had been modified directly from ICD by comprising and extending the list table. This condensed list can be used for data presentation in many aspects and it can be the table of statistic summarization and may also be used as an advocate in developing the health service system. The extended list table has been used in providing additional information for clinics; for instance, the list of specific diseases classification of each specialist. This includes additional detail classifications, but ICD list table provides information of diagnosis according to the principle of classification derived from the main list, for example, the classification in accordance with the features of morphology of tumors.

The second group of classification lists covered many aspects related to health problems. Generally, this is the diagnosis principle of the current situation, as well as other classifications concerning health care. This group includes handicap classification and curative medicine and surgery. Concerned with the consequences of health care providers, the ICD group covered the concept frame of definition, standard, and methods. It cannot be classified by itself and it is not linked to ICD. For a long period of time, one of the ideas has been the development of collection methods and the utilization of local information in order to advocate primary health care. Another related publication, but not obtained from ICD, is naming specific diseases universally (IND). The differences between disease classification and naming disease universally have been seriously discussed.

2.5.1 The acceptance of international cause of death disease classification list

During the conference of the International Statistic Institution, the official authority of the International Statistic Congress in Vienna, 1891, has appointed a committee and named Chark Bartione (1851-1922) the chief of Statistic Service of Paris, as a chairman for the set up of the cause of death classification list, Baritone was the grandchild of Archill Gillard, botanician and statistician, who suggested a guideline to solve problems by allowing Farr and Despine to set up disease classification list. During the first conference of the International Statistic Congress in 1853, Bartione reported the implementation outcomes of this committee to the assembly of the International Statistic Institute at Chicago in 1893 and this disease classification list was accepted. The classification of Bartione was influenced by the cause of death classification list, which was used in Paris. After modification, this list represented the synthesis of disease classification list in England, Germany, and Switzerland. This list held on to Farr's principle in classifying general diseases from the diseases of organs or physicality. The work corresponded with the recommendations derived from the meeting in Vienna by Al Gillermo, Director of Statistic Department of State of Switzerland. Baritone created 3 issues of disease classification lists; the first issue consisted of 44 lists, the second had 99 lists and the third had 161 lists. Many countries and cities named accepted Baritone's disease classification list in general. James D. Monhara initially used this list in the North Americas Statistical of San Luis de poetic. Later, in 1898, the conference of US Public Health Organization held in Ottawa Canada recommended the acceptance of Baritone's list for registering deaths in Canada, Mexico, and the USA. The organization also suggested list modification every 10 years.

During the conference among International Statistic Institutes held in Christinia, 1899, Baritone reported progress on the disease classification list including the suggestion for the US. Public Health Organization's modification every 10 years and the International Statistic Institutes accepted the principle as follows:

- 2.5.1.1 International Statistic Institutes accepted the essential of the designation in comparing various countries. The assembly acknowledged gratefully that every statistic office in North America, some offices in South America and some in Europe agreed to use the cause of death classification list, which was presented in 1893.
- 2.5.1.2 Strongly confirmed that this designation system was accepted in principle and didn't need to be modified by every statistic institute in Europe.
- 2.5.1.3 Accepted the suggestion of a modification every 10 years that was proposed by the US. Public Health Organization during the conference held in Ottawa, 1898.
- 2.5.1.4 Convinced other statistic offices to use the comparable designation.

The French government hosted the international conference to modify Baritone's cause of death classification list in August 1900, in Paris. Representatives from 26 countries participated. Disease classification list (in detailed issue) consisted of 179 lists and Disease classification list (summarized issue) consisted of 35 groups of diseases and were accepted on 21 August, 1900, and required modification every 10

years. Later on, the French government was requested to conduct another conference in 1910, but, eventually, the conference was conducted in 1909, after that the French government conducted 3 more conferences in 1920, 1929, and 1938. Baritone worked continuously to push and advocate the use of the cause of death classification list. During the list modification in 1900, 1910, and 1920, Baritone, was always the leader by holding the position of the secretariat of the international conference. He submitted the modification drafted in 1920 to more than 500 persons for their opinions. His death in 1922, was a great loss of an important leader.

In 1923, Michael Hooper, the later secretariat of International Statistic Institutes, positioned after Baritone, acknowledged the lost of a leader and proposed a solution for the International Statistic Institutes by changing the determination which was formed in 1893, regarding cause of death classification list and suggested cooperating with other international organizations in order to prepare for the next modification. The international health organizations was interested in live statistic and appointed a group of statistic experts to study disease classification and causes of death, including the study on other problems in medical statistic. E. Rosalie, the leader of statistic experts wrote the article suggesting the expansion of topics used in the international cause of death classification list in 1920, and encouraged utilizing this list in statistic of cause of illness. International Health Organization published the result of this study in 1928. To collaborate between the two organizations, they formulated a committee called "the combination committee", comprised half of members from International Statistic Institutes and the other half from the International Health Organization. This committee was responsible for drafting the cause of death

classification list and to propose it for consideration during the fourth conference in 1929 and the fifth conference in 1938.

2.5.2 The modification conference in the fifth decade

The conference on cause of death classification modification in the fifth decade arranged by the French government was similar as the previous conferences, and took place in Paris in October, 1938. The assembly adopted the use of 3 items, the first one: a detailed list of 200 topics, the second one: a moderate of 87 topics, and the third one: the summarization of 44 topics. Other than modification and addition of newly discovered diseases, especially the topic of infectious diseases, post delivery diseases, and various accidents, the assembly had changed few parts of the proposed list; content, quantity, and topic's numbers. Moreover, there was the acceptance of death at birth as one cause of death.

In Thailand, there have been developments in the use of medical certificate of death from ICD-7 in 1963 to the current use of ICD-10. However, there has never been training on how to fill in the medical death certificate correctly by physicians; not even in practice manual or report registration of the Health Statistic Division, 1989. Currently, health information gives the following short description, "to write cause of death on the report form 501, 502, 503 (Health Statistic Division, 1989). Though, there was an attempt to make an additional description by Dr. Thawat Jayaneeyayothin in 1995, it has never been published nor distributed to any physicians.

2.6 Other Related Researches

The researcher has studied the research, which utilized the information from death certificate reports as secondary information (Hathai Singh sa-nga and his group (1994).) The study on the accuracy of the cause of death on the death certificate, Nampong District, Khonkan Province, 1994. It was a descriptive study reviewing information of the past regarding the population, in Nampong District, who died in 1994 and a random sampling from death certificates of the decedents who domiciled in Nampong District. The samples were of 115 cases from 394 death cases, and the coverage was of 61 villages in 12 sub-districts. Information collection was done by interviewing persons who knew the symptoms of the decedent most, the questionnaire was adapted from the cause of death investigation manual of the Health Statistic Division, the Ministry of Health. Information was collected on 93 cases from the death certificate and 13 cases that were certified by hospitals, for a total of 106 samples. The research found the cause of death obtained from the interviews, with the use of the questionnaire, was linked to death certificate by only 59.43%.

The top 5 diseases listed on the death certificate were senility, heart disease, emphysema, tumor, and diseases which had cleared symptoms, and the cause of death found during the interview were tumor, emphysema, senility, heart disease and diseases with clear symptoms, respectively. Not regarding accidents and injuries, the most accurate was the group of tumors and the least was the group of senility. It is noticeable that on the death certificate, male deaths were more accurate than female, farmers and labors were found to be the least accurate, similar to the studies of Chayanthorn Pratoomanon, Chamaiporn Thawithchsri, and Phakpoom Thawong (1999), who studied

the accuracy of the report of AIDS deaths on the death certificate (a descriptive cross-sectional study) within 4 sub-districts in Meawang District, Chiangmai Province, by collecting death information from death certificate from October 1996 to September 1998. The collection of the illness history and illness conditions before their death from close relatives was done by the use of in-depth interviews. The obtained information was revised, summarized, and an opinion was formed. The cause of death as recorded by physicians, was analyzed for being complete and accurate in comparison with the cause of death identified on the death certificate and found causes of death classified by various group of diseases on death certificate. It reported 42 AIDS cases (20.9%); the other causes of death were classified by groups of various ages and reported by physicians at 64 AIDS cases (31.8%). The accuracy of the report of AIDS death = 89.1% ($\kappa = 0.72$), sensitivity = 65.6 and specificity = 100%. There were 22 cases of people we had died of AIDS (34.4%) but were recorded on the death certificate as died from other diseases, such as blood circulation disease 1 case (4.6%), emphysema 8 cases (36.4%), mental and neurotic system 1 case (4.6%), diseases of the digestive system 3 cases (13.6%), urinary system 1 cases (4.6%), allergy 5 cases (22.7%) and suicide 3 cases (13.6%). Moreover, the findings of correspondent causes of death were not relevant to age, gender, place of death, time of death, and the person who reported the death. The reason for not being accurate may come from social factors; for instance, AIDS death has not been accepted openly in the study target areas, therefore, the completion of the report of AIDS death on the death certificate remains a problem in this country.

Moreover, Surasingh Wissaruttana, Prawet Tuntiphiwattanasakul, and Sriket Thunyawinilkul (1999) studied the primary factors relating to suicides in Chiangmai. According to the death certificates, in order to search for characteristics and relevant factors of suicides in Chiangmai relatives of decedents were interviewed. The study samples were those who committed suicide within a 1-year period (May 1996-April 1997) as reported on the death certificate and additional numbers reported from health centers, for a total of 369 study cases. This study was able to collect 241 cases (65.3%). The study showed that most of the persons who committed suicide were in the age range of 25-44 years, and were male (88.0%), and the most common methods used in committing suicide was by poison intake (agricultural chemical) and hanging (48.1% and 45.6%). The causes that led to committing suicide came from various factors and this study found the relevant primary factor was AIDS infection (29.4%), the second factor was alcoholism (18.7%), and chronic diseases (17.8%). The comparison of the suicide rate in Chiangmai and other provinces in Thailand in 1995, found the suicide rate in Chiangmai was 24.12 per 100,000 population which was the second highest rate in the country, and in 1996, the suicide rate was 27.79 per 100,000 population, the highest in the country.

Concerning the study on death certificates, there were other case that did comparison studies with information from other sources. For example, the study of Aree Phormmo and Philippe Gust 1996, who studied factors indicated on death information reports. The study was divided into 2 parts; the first part was the study on quality assessment of death information from the secondary sources by comparing death level of infants. The information obtained from significant sources in the country,

for example from the system of population registration which is compiled as health statistic, it is considered the most up to date information and it is classified by province. The second source was from death information from a health survey collected by the Provincial Health Offices in which the Ministry of Health had initiated in 1995. The third source was from a population survey by the National Statistic Department, and the fourth was from a national survey. The second part was a qualitative study on the system of death notification and people's opinions towards death notification (group discussion and in-depth interview) in 2 villages of Munjakiree District, Khonkan Province. The participants in the discussion consisted of heads of households, whom were specified by law to be the one who has to report a death, and local officer who are involved with the registration system in the village. The results of the study showed that the information received from vital statistics indicated that the lowest mortality rate was for infants. In comparison to the national survey, population survey, and rapid survey reflected the quality of statistic that assumed to be missing from the death notification. The system of death notification in communities has been in existence for a long time and known by the people in the community. Factors that indicate quality of death information relevant to the one who reports the death, was included in the death notification system. Therefore, the improvement of quality of death information should consider the above mentioned factors.

As for the study of the decedent's age group from the death certificate, Naraumon Silaruk and the Assistant Professor Yongyoot Khajornthom in 1996 studied the mortality rate divided by age group, gender, and region during the period of 1981–1992. This descriptive study analyzed mortality profiles to perceive the cause of death

and the significant inclination for a 12 year period, by collecting the secondary information of death report from death certificate which were reported to the Health Information Section, the Office of Health Policy and Planning (report 517/2) by classifying the cause of death on the basis of ICD 9 by gender and age group during 1991 – 1992, and the collection of population information classified by age group and gender during the same period of time from the Population Institute as the base information for standardization. The study revealed that the inclination of mortality rate of Thai people is stable as a whole picture by showing small increases since 1985, especially in the age group of 14 – 39 years. The significant causes were traffic accidents and cancer, and the information from crude death rate was unable to demonstrate this information explicitly because it did not consider the changes of the population structure.

Similarly, the study of Pholdej Pin-prathip et al. (1995), studied the situation and inclination of death in the population groups for the ages of 20–39 years and 25–34 years old in region 9, 1991–1997, with a retrospective study which utilized the information from death certificate by random sampling the province representing region 9. The procedure started with selecting 3 provinces from the 6th region, which were Phrae, Uttaradit, and Phitsanuloke. The study revealed that the population at every age group in the area of region 9 was having a slow increase in the mortality rate and the mortality rate of the age group of 20-39 and 25-34 was increasing more rapidly than other age groups. The investigation of cause of death of the province and of region 9, found a clear increase in the mortality rate in the age group of 20-39 years and/or 25-34 years. This probably was caused by traffic accidents and AIDS which were the major causes of death of the population at these ages.

Wanchai Arjkhian and his group (1994), studied a group of deceased children under the age of 5, by utilizing death certificate as secondary information for retrospective case control study. The study group were children under the age of 5 in Phayao Province who died from October 1992 through May 1994 and were recorded on the death certificate, the comparison group was children who were born in the same year and lived in the same village. Information collection from interviewing family members and medical case history at hospital, were used to analyze the relevance, the difference of disperse and the average of various variables. The study found 116 children age under 5 years old died, with the most common cause of death as AIDS (24.1%), pneumonia (20.7%), congenital malformations and genetic diseases (12.1%) respectively. The factors found relevant to the death were birth weight, nutrition status, children's health problems, chromosomal abnormalities, HIV infection and the death of their parents.

As we can see, the above researches support the errors on death certificate and some researches emphasized a specific disease or certain age groups only. The researcher has the opinion that researches regarding cause of death in Phayao Province, have the specific situations apart from other areas as mentioned above.

The derived information should be fundamental in developing a death information filing system in order to obtain the information to utilizing problem solving corresponding to actual situation.