

10-1-1991

## Assessment of health status in Klong Toey slum:whose viewpoints

Chitr Sitthi-amorn

Follow this and additional works at: <https://digital.car.chula.ac.th/clmjournal>



Part of the [Medicine and Health Sciences Commons](#)

---

### Recommended Citation

Sitthi-amorn, Chitr (1991) "Assessment of health status in Klong Toey slum:whose viewpoints," *Chulalongkorn Medical Journal*: Vol. 35: Iss. 10, Article 4.

DOI: 10.58837/CHULA.CMJ.35.10.4

Available at: <https://digital.car.chula.ac.th/clmjournal/vol35/iss10/4>

This Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in Chulalongkorn Medical Journal by an authorized editor of Chula Digital Collections. For more information, please contact [ChulaDC@car.chula.ac.th](mailto:ChulaDC@car.chula.ac.th).

## Assessment of health status in Klong Toey slum: whose viewpoints

Chitr Sitthi-amorn\*

**Sitthi-amorn C. Assessment of health status in Klong Toey slum: whose viewpoints. Chula Med J 1991 Oct; 35(10): 641-650**

*Since the nature and extent of health status varies according to data sources, the health status of 1,746 Klong Toey slum families (9,453 individuals) was assessed by three methods: validated diary records, household consensus and focus-group discussions. One household volunteer kept a diary record of the household. The ability to read and write was pre-requisite to the selection of the household volunteer. The diary records were collected every fortnight. The information obtained was supplemented and validated by household interviews and bi-monthly hospital and clinic record audits of illnesses. At the end of the study, each volunteer obtained a household consensus of the four most important perceived problems of the community. Finally, a consensus on perceived community problems was obtained from focus group meetings with 10 community leaders.*

*In was found that death and morbidity in the slum were similar to the national averages. The major perceived needs from household consensus and community leaders were: sanitation, control of drug addiction, improved health service delivery and a multi-professional leadership approach to community problems. It was concluded that each of the multiple data sources on health problems helped shed light on a different aspect of health problems, and that all viewpoints should be brought to bear in planning strategies towards achieving health improvement and social development.*

*Key words: Assessment methods, Health status, Viewpoints.*

Reprint request : Sitthi-amorn C, Department of Internal Medicine, Faculty of Medicine,  
Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. April 2, 1991.

---

\* Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University.

**จิตร สัทธีอมร. สุขภาพของชาวชุมชนแออัดคลองเตย: ทักษะของใคร? จุฬาลงกรณ์เวชสาร 2534 ตุลาคม; 35(10): 641-650**

ผู้วิจัยได้ประเมินสถานะทางสุขภาพของสมาชิกที่อาศัยในชุมชนแออัดคลองเตย เพื่อศึกษาความสอดคล้องของสภาพปัญหาสุขภาพที่ประเมินได้จากข้อมูลแหล่งต่าง ๆ การศึกษากระทำใน 1746 ครัวเรือน ซึ่งมีผู้พักอาศัย 9543 คน ข้อมูลได้มาจากสามแห่งคือ : 1) บันทึกการเจ็บป่วยประจำวันซึ่งตรวจสอบความถูกต้องจากบันทึกการตรวจรักษาที่สถานพยาบาล, 2) ข้อสรุปความเห็นของแต่ละครัวเรือนเกี่ยวกับสถานะทางสุขภาพของชุมชน และ 3) ข้อสรุปความเห็นเกี่ยวกับปัญหาสุขภาพที่ได้มาจากการประชุมผู้นำชุมชน

อาสาสมัครประจำครอบครัวเป็นผู้บันทึกข้อมูลการเจ็บป่วย การรักษา ค่าใช้จ่ายที่เสียไปและผลลัพธ์ของการเจ็บป่วยที่เกิดขึ้นลงในสมุดบันทึกทุกวัน อาสาสมัครคัดเลือกจากผู้ที่อ่านออกเขียนได้ เติมใจให้ความร่วมมือ และเป็นที่ยอมรับจากสมาชิกส่วนใหญ่ในครอบครัวว่าจะทำหน้าที่นี้ได้ดี ผู้วิจัยจะนำสมุดบันทึกมาเปลี่ยนให้ใหม่ทุกสองสัปดาห์ พร้อมกับตรวจสอบข้อความในสมุดบันทึกที่มีข้อมูลแล้วโดยการสัมภาษณ์อาสาสมัครนั้น และโดยการค้นประวัติของการตรวจรักษาจากสถานพยาบาลต่าง ๆ ที่ผู้ป่วยอ้างว่าได้ไปขอรับบริการ ในเดือนสุดท้ายของการวิจัย อาสาสมัครประจำครอบครัวได้สำรวจความเห็นครัวเรือนเกี่ยวกับปัญหาสุขภาพของชุมชน นอกจากนี้ผู้วิจัยยังประชุมผู้นำชุมชนเพื่อหาข้อสรุปเกี่ยวกับปัญหาสุขภาพของชุมชนแออัดตามความคิดเห็นของกลุ่มผู้นำด้วย

ข้อมูลจากบันทึกการเจ็บป่วยประจำวันระบุว่า อัตราป่วยและอัตราตายของชาวชุมชนแออัดคลองเตยใกล้เคียงกับอัตราป่วยและอัตราตายเฉลี่ยของประเทศ ปัญหาสุขภาพของชุมชนแออัดในความเห็นของครัวเรือนและผู้นำชุมชนได้แก่ ปัญหาสุขภาพบิดา ยาเสพติด การปรับบริการสุขภาพ และการระดมผู้เชี่ยวชาญสาขาต่าง ๆ ให้เป็นแกนนำแก้ไขปัญหาชุมชนแออัด

สรุปว่า ข้อมูลแต่ละแหล่งเสริมให้การมองปัญหาสุขภาพของชุมชนแออัดได้หลากหลาย และครบถ้วนยิ่งขึ้น และจำเป็นต้องใช้ข้อมูลจากหลายแหล่งมาวางแผนยุทธวิธีที่เหมาะสมในการแก้ปัญหาสุขภาพและพัฒนาสังคมในชุมชน

A proper understanding of health status, available choices and their utilization is important for making correct and, consequently, pursuing the right course of action in order to improve the health of the population. Most information for health planning comes from the health service system<sup>(1-32)</sup>, trends analysis<sup>(33-36)</sup> and specific research.<sup>(37-43)</sup> Poor registration of vital statistics and a poor disease reporting system have rendered health service information inadequate for planning purposes. This is evident from the lack of quantification of the magnitude of error over time.<sup>(44)</sup>

Information outside the health service has been provided by specific research supported by funding agencies. Some information has been relevant to national needs.<sup>(37,38)</sup> However, because researchers and funding agencies have their specific expectations from research, certain issues used in planning might be made unduly prominent. On the other hand, certain important issues might be overlooked because researchers and funding agencies are not interested in them.

The present study was designed to reveal the magnitude of differences in health status as assessed from multiple data sources by using three population-based methods for assessment: i.e. validated diary records, surveys of household consensus and focus-group discussions. The study was carried out among an under-privileged population, i.e. residents of the Klong Toey slum in Bangkok.

## Methodology

The study was started in July 1986 and ended 18 months later in December 1987.

**1. Target Population:** The target population lives in an old but stable slum in Bangkok. Many of its residents provide labor for the Port of Bangkok. The slum has been described elsewhere.<sup>(45)</sup>

In the selected study areas, community leaders were contacted for cooperation. A household census was performed to document family size and establish a sampling frame. Members of eligible households must have lived in the area for more than one year. In addition, they must not have been planning to move out of the community within the next year.

The study households were selected by probability sampling, the chance of selection being proportional to the number of subjects of all age in a given household.

Out of a total of 7,390 families 1,746 families (20% of all eligible families) in the target area were selected; they comprised 9,453 individuals. This number of subjects was adequate to detect a true event rate of 0.25%.

## 2. Strategies for Collecting and Validating Information:

The study site is unique. It presents many difficulties and uncertainties. For the study, many strategies and facts aimed at obtaining reliable information were formulated, pilot tested and modified to ensure the reliability and the validity of the data collected. The two main tactics used included:

### 2.1 Tactics to Gain Cooperation and Participation of the Community:

Health care service was used primarily to introduce the research team to the community. Contacts were made through community leaders and elders. The prime objectives of the study were explained. Health team members were instructed to treat the people as equals; they were encouraged to respect the people's viewpoints despite differences of opinion. An important element of getting cooperation was the community perception of the team members' sincerity and genuine concern for their affairs, which was evinced by the provision of services for treating some diseases (i.e. diarrhea, hypertension and diabetes). Such efforts were considered by many influential members of the community as evidence of the team members' sincerity.

**2.2 Multiple Method of Data Gathering:** Three methods of data gathering were used: the validated diary record, household interview and focus-group discussion methods. We intended to use these three methods to get balanced viewpoints about the community's health problems. All the methods started with sources outside the health service. At the time of the study information from the local health service was not routinely collected.

#### 2.2.1 Validated Diary Record:

One household volunteer was asked to keep a diary record for each selected household. The criteria for selection of the household volunteer included the ability to read and write, willingness to participate in the programme, and acceptance by most household members as being the most suitable person for the task. Items of interest for recording included births, deaths, illnesses, care sought, money spent on care, lay diagnosis, and the outcome of care. Research assistants revisited each household at least once every fortnight. They collected the diary and clarified by

interview any ambiguous information in the diary. A new diary was given to each household in exchange for the old diary.

Diary record data were supplemented and validated by household interview and observation. Details were ascertained about the nature of illnesses, health-care-seeking behavior, and the cost and quality of care. Also collected in detail were the events concerning death.

Hospital and clinic record audits were performed twice monthly to validate the reported events of the target families according to the diary records. A sampling of clinic records was also performed to estimate unreported events. Clinical data as well as physicians' diagnoses were ascertained. When births occurred, the birth weight of the babies was documented.

**2.2.2 Survey of Household Consensus:** Each household volunteer was requested to obtain a household consensus of the four most important perceived problems of the community.

**2.2.3 Focus-Group Discussion:** Finally, a group of 10 community leaders or their representatives was assembled. They were requested to arrive at a consensus about the important community health problems.

### 3. Outcome definition

**3.1 Disease-oriented measurements:** Information on death, acute severe illnesses and chronic illnesses was obtained. These parameters emphasized the negative aspect of health rather than health promotion and disease prevention. They could pose a demand on health services. These are defined below:

**Death:** Deaths from all causes, even if preceded by acute or chronic illnesses, were considered an eligible outcome.

**Acute severe illness:** These were illnesses which caused the patients to be confined to bed for at least 24 hours or illness that required hospital stay.

**Chronic illnesses:** Those who could be categorized under any one of the three following characteristics were considered to have chronic illness: first, receiving medication at least twice a week during the previous 30 days; second, having similar symptoms every month for at least the previous 12

months; and third, being definitely diagnosed by a physician as having a chronic disease either from a survey or record audit.

Some could have had a chronic episode, superimposed by acute illnesses terminated by death. Since each of these episodes posed a demand for health services, all were considered an outcome. For each household, all rates were counted for the 18 months of observation and computed for 12 months.

**3.2 Household perception of health problems:** Household perceptions of health problems were collected in an unstructured manner. The household volunteers were requested to get the consensus of their family about the four most important health problems of the community. They were also requested to provide reasons for their choices.

**3.3 Leaders' perceptions of health problems:** Community leaders or their representatives were assembled. They discussed important community health problems. The research team did not interfere in the discussions. A group of secretaries, also appointed from the leaders, helped abstract the discussion and arrive at a conclusion.

## Results

**1. Population profile:** There were 238 live births out of a population of 9,453, making the birth rate 2.52% per year. A total of 261 of the 1,555 women of reproductive age were pregnant during this period. The number of young age pregnancies (age 16-25) was 101. There were 86 deaths per annum, yielding a death rate of 9.1 per 1,000 population. Thus, the population growth rate was 1.61% per year.

**2. Mortality:** There were 261 pregnancies and 238 live births; of this number, 230 survived to the end of the first month, and 227 survived to the end of 12 months. Thus, the infant mortality rate was 46.2 per 1,000 live births. The age-specific mortality rate and the two most common causes of mortality for each age group are shown in Table 1. The highest mortality rate was seen in the elderly (60 years of age and over). The common causes of death for each age group were similar to those in most other developing countries, except for heroin-related death and pelvic inflammatory disease (PID). The latter two conditions could be considered endemic in the slum.

**Table 1.** Causes of death as revealed by the validated diary record of the study sample.

Age group (years)	Rate/1,000	Main causes
Below 1	46	Pneumonia diarrhea
1 – 5	12	Pneumonia diarrhea
6 – 15	1.52	Pneumonia rabies
16 – 29	1.66	Heroin, PID*
30 – 44	4.69	Alcohol, injury
46 – 59	17.63	Hypertension, heart (RHD)**
60 and over	79.11	Sudden, stroke Death

Note : PID\* = pelvic inflammatory disease.  
RHD\*\* = rheumatic heart disease.

**3. Acute severe illness:** There were 556 acute illness episodes per annum. The age-specific rates as well as main causes are presented in Table 2. Drug dependence related illnesses, injuries and pelvic

inflammatory disease accounted for a significant share of the illnesses among the young. These conditions are therefore unique for the slum area.

**Table 2.** Age - specific acute illness as revealed by the validated diary record of the study sample.

Age group (years)	Rate/1,000	Main causes
Below 5	85	Injury, diarrhea, pneumonia
6 – 15	58.5	Pneumonia, DHF*
16 – 30	20.6	Drugs, PID,** injury
31 – 45	37.6	Accident, asthma
46 – 60	112.3	DM COMP.***, UTI****
Over 60	46	DM COMP.***, UTI****

Note : DHF\* = dengue haemorrhagic fever.  
PID\*\* = pelvic inflammatory disease.  
DM COMP.\*\*\* = complication from diabetes mellitus.  
UTI\*\*\*\* = urinary tract infection.

**4. Chronic illness:** Table 3. shows the age specific rates of chronic diseases and their main causes for each age group. Skin diseases, tuberculosis, asthma and rheumatic heart disease prevailed among

the young. Peptic ulcer, hypertension and diabetes mellitus were common occurrences among those in middle age. Osteoarthritis as well as aches and pains affected the elderly.

**Table 3.** Age - specific chronic illnesses of all study sample as revealed by the validated diary record.

Age group (years)	Rate/1,000	Main causes
Below 5	24.4	Skin
6 - 15	31.6	TB*, otitis
16 - 30	61.3	Asthma, RHD,** TB*
31 - 45	159.6	PU,*** TB*
46 - 60	312.6	HT,**** DM,***** headache
Over 60	446.2	OA,***** DM,***** aches & pains

Note : TB\* = Tuberculosis.  
 RHD\*\* = rheumatic heart disease.  
 PU\*\*\* = peptic ulcer.  
 HT\*\*\*\* = hypertension.  
 DM\*\*\*\*\* = diabetes mellitus.  
 OA\*\*\*\*\* = osteoarthritis.

**5. Health service utilization:** Table 4. shows the use of health services by three slum sub-populations: those who were in debt, those who had savings and those who had neither.

**Table 4.** Utilization of health service according to the perception of severity of illnesses as well as debts and saving status of the study sample as revealed by the validated diary records (the numbers in the table are expressed as percentages of the total illness episodes\*\*).

Facilities	Mild			Severe		
	Debt	No debt & Savings	Savings	Debt	No debt & Savings	Savings
	(n = 1,016)*	(n = 527)*	(n = 203)*	(n = 1,016)*	(n = 527)*	(n = 203)*
1. Chula	0.1	0.3	—	53.9	51.9	63.5
2. Other hospitals	0.1	0.1	—	44.7	46.4	60.0
3. BMA***	19.8	4.5	1.9	8.5	9.4	2.9
4. Charity clinic	35.6	1.3	0.9	15.7	8.1	0.9
5. Drug store	39.2	34.7	32.0	0.2	0.1	—
6. Private clinic	1.5	83.1	89.2	0.2	0.1	—
7. No care sought	38.5	20.2	9.4	5.2	1.1	—
Total	2,743	1,156	437	386	121	49
Illness episodes						

Note : 1. \* = number of families.  
 2. \*\* = patients usually seek care from more than one type of facility.  
 3. \*\*\* = Bangkok Metropolitan Authority Primary Medical Care Facility (Health Station # 14).

Health service utilization was further classified by the people's perceptions of mild versus severe illnesses. The data showed that the local health station was infrequently used. Many who were in debt did not seek care. Some patients preferred to work for their daily living instead of seeking treatment for minor ailments and chronic diseases at the government hospitals or health stations. Ignoring their conditions thus might adversely affect their future health.

**6. Collective perception of health problems by the people:** Each household volunteer was asked about his or her perception of four main health problems of the community. The results are shown in Table 5. It was interesting that 53.4% of the household volunteers were content with the present situation of the community. They did not perceive any major health problem. Among those who thought there were problems, sanitation was considered the most important one, followed by heroin-related problems and violence.

**Table 5.** Health problems according to household consensus of the study sample as revealed by the Survey of Household Consensus.

Health problem	Magnitude (%)
No Problem	933 (53.4)
Sanitation	608 (34.7)
Addiction	293 (16.7)
Violence	48 ( 2.7)

**7. Problems perceived through focus-group discussion:** Three main problems, phrased in the form of questions, were posed. First, how can the health sector contribute to the overall improvement of local environmental sanitation and the control of flooding? Second, what should be done to increase the efficiency of coordination between the local health service and Chulalongkorn Hospital (the university hospital)? Third, how can multi-professional leadership be developed to control drug problems in

the community?

**Discussion**

Table 6 summarizes the findings of the study. It is clear that the perceptions of health problems may differ according to the people consulted and the methods of assessment used. The problems were perceived in entirely different ways by the people affected compared with how they were analysed by scientists using survey data.

**Table 6.** Priority ranking of health problems of the study sample according to survey data and people's perception.

Health problems ranking	Validated diary record	Household consensus	People's perception
1	Infection	No Problem	Sanitation
2	Addiction	Sanitation	Flooding
3	Violence	Addiction	Health service
4	Young pregnancy	Violence	Professional leadership

Diary records provided disease-oriented information. They were useful for estimating the incidences of acute conditions and the prevalence of

chronic diseases. Epidemiological parameters were critical for planning preventive and curative services.<sup>(46-51)</sup>



This facet of information was not readily apparent from the perception of either the leaders or household members. This could be considered the strength of the diseases-oriented approach.

The perceptions of the volunteers and the community leaders added other dimensions to the understanding of the health status. Both groups perceived sanitation and better health service organization as important health problems. These were beyond the scope of the data collected by the diary record surveillance system. These added dimensions of health problems were important in planning for more comprehensive care<sup>(52,53)</sup>

All three sources of information identified heroin-related problems as very important. However, only community leaders suggested a way to deal with it. The leaders encouraged a multi-professional leadership approach; they also suggested that families and the community do more to deal with their problems. How much influence their suggestion would have for policy formulation was difficult to estimate in light of the rigidity of the health service system. Nevertheless, it implied that the people were concerned and that their wisdom might not be sufficiently tapped for planning purposes.

Household and leader perceptions had several things in common. The people's viewpoints were based on experience, social norms, feasibility judgement and operational details. The main weakness of people's perceptions was their vision and possibly inappropriate expectations. The people had wants and needs. Issues related to the real needs of the people might not always be felt since awareness and vision was missing.<sup>(37)</sup> However, the people's viewpoints and disease-oriented data should be used together for planning purposes.

The leaders' suggestions about the problems as well as their solution would require an effort more than the health sector alone could handle. They would also require a major reorientation of the government health service system as well as the incorporation of health into a broader socio-economic context.

Future political developments are unpredictable and the term "multi-professional leadership approach" is vague. Therefore, major changes in the provision of health care services could not be expected soon. However, an effort to clarify the concepts and to set an appropriate frame and goal might be worth pursuing. This might lead to future improvement in policy formulation.

Finally, only one-fifth of the slum population used the local health service, mostly for mild illnesses. Therefore, reliance on local health service data alone could grossly underestimated both the magnitude and the nature of the problems faced by the residents of that community. With certain exceptions,<sup>(54)</sup> our finding supported the notion that most of the existing information within the health systems in developing countries is suboptimal for planning, especially when the formulation of specific strategies to deal with problems is needed.

### Acknowledgement

The author wishes to acknowledge with sincere thanks partial support from the Rockefeller Foundation.

### References

1. Deaths by sex, number and rates per 1000 population, 1957-84. Public Health Statistics, Ministry of Public Health. Bangkok, Thailand. 1984.
2. Livebirths, deaths, natural increase and vital index, Thailand 1951-83. Division of Health Statistic, Ministry of Public Health. Bangkok, 1983.
3. Stillbirths, perinatal deaths, infant deaths, and maternal deaths, 1951-83, Division of Health Statistic, Ministry of Public Health. Bangkok, 1983.
4. Diarrhea mortality rate (1980-87). Division of Health Statistics, Ministry of Public Health. Bangkok, Thailand. 1987.
5. Malaria Mortality (1975-86). Division of Health Statistics, Ministry of Public Health. Bangkok, Thailand. 1986.
6. Homicide and injuries inflicted by others on purpose (1957-84). Division of Health Statistic, Ministry of Public Health. Bangkok, Thailand. 1984.
7. Suicide statistics 1977-84. Division of Health Statistic, Ministry of Public Health. Bangkok, Thailand. 1984.
8. Mortality from Cancer. Division of Health Statistic, Ministry of Public Health. Bangkok, Thailand. 1984.
9. Mortality from traffic accidents (1981-4). Division of Health Statistics, Ministry of Public Health and the National Safety council to Thailand. Office of the Prime Minister. Bangkok, Thailand. 1984.
10. Morbidity Report of Health Consumer 1980-85. Division of Health Statistics, Office of the

- Permanent secretary for Public Health, Ministry of Public Health. (Morbidity and percentage of 17 cause groups according to report no. 504 out-patient classification, Non-communicable disease report. 504), Bangkok, Thailand. 1985.
11. Reported Mortality of Vaccine-Preventable Diseases in Thailand (1982-6). Division of Epidemiology and the Tuberculosis Division, Ministry of Public Health. Bangkok, Thailand. 1986.
12. Diarrhea morbidity rate (1980-87). Original Data from Routine Surveillance Report, Division of Epidemiology, Ministry of Public Health. Bangkok, Thailand. 1987.
13. Reported Cases of Dengue Hemorrhagic Fever in Thailand 1975-84. Division of Epidemiology, Ministry of Public Health. Bangkok, Thailand. 1984.
14. Reported Cases of Hepatitis in Thailand 1980-84. Division of Epidemiology, Ministry of Public Health. Bangkok, Thailand. 1984.
15. Weekly and Annual Report of Routine Surveillance. Division of Epidemiology, Ministry of Public Health. Bangkok, Thailand. 1990.
16. National Statistics Office. Population and Housing Census. Bangkok, Thailand. 1980.
17. National Statistics Office. The Survey of Population Change 1974-76. Bangkok, Thailand. 1980.
18. Life Expectation at birth and 5 years of age, by sex, projected for 1970-2000. Report of Working Group on Population Projections, National Statistical Office. Bangkok, Thailand. 1981.
19. Malaria Morbidity (1975-86). Malaria Division, Ministry of Public Health. Bangkok, Thailand. 1986.
20. Prevalence of Anemia in children under five by regions. Nutrition Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1986.
21. Prevalence of Iodine Deficiencies 1985. Nutrition Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1985.
22. Nutritional Status of Children Under Five (1982-6). Nutrition Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1986.
23. Nutritional Status of School Age Children. Nutrition Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1986.
24. Latrine coverage (1960-86). Sanitation Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1986.
25. Budget Allocation and Latrine Coverage. Sanitation Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1986.
26. Occupational Accidents Mortality and Morbidity. Data from Office of the Compensatory Fund for Occupational Injuries, Ministry of Interior (1980-4). Bangkok, Thailand. 1984.
27. Dental Health Problems. Dental Health Division, Department of Health, Ministry of Public Health. Bangkok, Thailand. 1984.
28. Cases of AIDS and HIV positive in Thailand. Department of Communicable Disease Control, Ministry of Public Health. Bangkok, Thailand. 1990.
29. Number and diagnosis of patients seeking care from mental hospitals (out-patients and in-patient). Mental Health Program, Department of Medical Services, Ministry of Public Health. Bangkok, Thailand. 1989.
30. Ranking of Selected Communicable Disease By Average Hospital Stay in Thailand. Department of Medical services, Ministry of Public Health. Bangkok, Thailand. 1983.
31. Drug Dependence Statistics in Thailand. Office of the Narcotic Control Board and the Institute of Health Research, Chulalongkorn University. Bangkok, Thailand. 1989.
32. Morbidity from Cancer. Cancer Statistics, National Cancer Institute, Ministry of Public Health. Bangkok, Thailand. 1989.
33. Thienchay Kiranadana. Population and Development in Thailand: With Special Reference to Health/Nutrition, Education and Old-Age Security. Bangkok: ESCAP, 1987.
34. Thienchay Kiranandana. A Projection of Thai Urban-Rural Population, Bangkok: Thailand Development Research institute. Bangkok, Thailand. 1985.
35. Bulatao, RA, Popez P, Stephens. Estimates and projections of mortality by cause: a global overview, 1970-2015. In: Jamison D, Mosley WH, eds. Evolving Health Sector Priorities in Developing Countries. Population, Health and Nutrition Division, The World Bank. Washington D.C.: World Bank, 1989.
36. Caldwell JC, Galdwell P, Changing health conditions. In: Reich MR, Marui E, eds. International Cooperation for Health: Pro-

- blems, Prospects, and Priorities. Dover, Mass: Auburn House, 1989.
37. Suwanwela C, Poshyachinda V, Tasanapradit P, Dharmkrong-at A, Larbsomtob A. Health Service Research towards HFA 2000-A Case Study at Hill Tribe Villages in Northern Thailand. Technical Report No. RM 1/80, Institute of Health Research, Chulalongkorn University. Bangkok, Thailand. 1980.
  38. Rabhbadhana A. Report of the Feasibility Study for the Research and Development Institute at Khon Kaen University. Research & Development Institute Publication, Khon Kaen University. Khon Kaen, Thailand. 1983.
  39. Bangladesh Rural Advancement Committee. Controlling a Forgotten Disease: The Case of Tuberculosis in a Primary Health Care Setting in Rural Bangladesh. Dhaka: BRAC, 1989.
  40. Basta SS, Soekirman M, Karyadi D, Scrimshaw NS. Iron deficiency anemia and the productivity of adult males in Indonesia. *Am J Clin Nutr* 1979 Apr; 32(4): 916-25.
  41. Berg A, Brems S. Micronutrient Deficiencies: Present Knowledge on Effects and Control. Population, Health and Nutrition Department. World Bank: Washington DC, 1986.
  42. Calloway DH. Functional consequences of malnutrition. *Rev Infect Dis* 1982 Jul-Aug; 4(4): 736-45.
  43. Sommer A, Hussaini G, Tarwotjo I, Susanto D. Increased mortality in children with mild vitamin A deficiency. *Lancet* 1983 Sep 10; 2(8350): 585-88.
  44. Feachem RG, timaeus I, Graham WJ. Identifying Health Problems and Health Research Priorities in Developing Countries. A background paper for the Independent International commission on Health Research for Developing Countries. July. 1987.
  45. Sitthi-amorn C, Chandraprasert S, Bunnag SC, Plengvidhaya C. The prevalence and risk factors of hypertension in Klong Toey slum and Klong Toey government apartment houses in Bangkok. *Int J Epidemiol* 1989 mar; 18(1): 89-94.
  46. Ghana Health Assessment Project Team. A quantitative method of assessing the health impact of different diseases in less developed countries. *Int J Epidemiol* 1981 Mar; 10(1): 73-80.
  47. Lopez AD. Causes of Death: An Assessment of Global and Regional Patterns of Mortality Around 1985. In: Jamison DJ, Mosley WH, eds. *Evolving Health Sector Priorities in Developing Countries*. The World Bank Population, Health and Nutrition Department. Washington D.C. 1989.
  48. McCord C, Freeman HP. Excess mortality in Harlem. *N Engl J Med* 1990 Jan 18; 322(3): 173-77.
  49. Murray CJL. Mortality among black men. *N Engl J Med* 1990 Jan 18; 322(3): 205-6.
  50. Walsh JA. Establishing Health Priorities in Developing World. United Nations Development Programme, Division for Global and Interegional Programmes, New York: Adams Publishing Group, 1988.
  51. Review of the Health Situation in Thailand: Priority Ranking of Diseases. The Fact Finding Commission, National Epidemiology Board of Thailand. Bangkok, Thailand. 1987.
  52. Rifkin SB, Walt G. Why health improves: defining the issues concerning "comprehensive primary health care" and "selective primary health care". *Soc Sci Med* 1986; 23(6): 559-66.
  53. Rosenfield P. Linking theory with action: the use of social and economic research to improve the control of tropical parasitic diseases. *Southeast Asian J Trop Med Public Health* 1986 Sep; 17(3): 323-32.
  54. Alderson MR, Meade TWM. Accuracy of diagnosis on death certificate compared with that in hospital records. *Br J Prevent Soc Med* 1967 Jan; 21(1): 22-9.