

CHAPTER VI

DISCUSSION

A. Introduction

The primary purpose of this study was to employ the concept of relevance for the assessment of a postgraduate public health education program, which required an in-depth analysis of need. More specifically, the intent was to apply relevance indicators in assessing and describing the extent to which the LWP Program is relevant to professional needs in Thailand.

This study was done with the expectation that the processes involved can be generalised and would, therefore, be a useful contribution to other schools of public health. Although related studies were recently undertaken in the USA, to the author's knowledge this is the first such effort undertaken in SEA. The significance of the study lays also in its magnitude and systematic approach by involving a variety of stakeholders in exploring professional needs in public health in Thailand.

This study provides: (1) an information base that can support program development efforts; (2) a base to foster partnerships for the LWP Program at the national level; (3) a contribution in positioning the LWP Program as a viable strategy in responding to the needs of public health practice at the international level; (4) a process to arrive at indicators for program relevance to support decision-making in schools of public health.

This discussion addresses the research questions to explain how the study results support answers to these questions, as well as to describe the relationships among findings and place it in the context of the literature to arrive at conclusions.

B. How can Required Practice for Health Systems Development be identified?

1. How can a Health System be described?

During the past decade, a number of approaches and conceptual models were developed for public health systems development and to frame studies of public health practice.

Kleczkowski, Roemer and Van Der Werff (1984) developed for the World Health Organisation (WHO) a conceptualisation of a health system that was predominantly sector oriented. This view on a health system became outdated in the 90's. As discussed by Roper and Mays (2000) and Corso, et al. (2000), the Institute of Medicine (IOM) in the USA proposed the 'core functions model' in 1988 (Assessment, Policy Development and Assurance). Although Roemer (1991) described another model based on his study 'Health Systems of the World' which deals with generic functions from an economic perspective, it is not suitable for this study. WHO developed another model in 1996 identifying '12 essential public health functions. More recently WHO (2000) reviewed the 12 essential public health functions and collapsed these into a set of '4 Core Functions'. Although these developments are important contributions to describe and frame public health and its performance, none of these models offers a well-defined theoretical framework, which addresses all of the requirements for this study. As described in Chapter-II, recognising the limitations of this study, based on a review of the literature, a framework that suits a holistic concept of public health was developed, for the sole purpose of this study.

In 1992, the Centre for Disease Control (CDC) USA presented a model to employ the core functions through '10 public health practices'. During 1994, the USA based National Association of County and City Health Officials (NACCHO) in collaboration with CDC developed the 'essential elements model' to assist local health departments in developing their role and services in a changing health care arena. Simultaneously, the Department of Health and Human Services (DHHS), USA developed a model consisting of '10 essential services'.

Several researchers have tested performance measures for local public health agencies based on the IOM and CDC models. CDC and Pan American Health Organisation use the DHSS and WHO models in studies of local and state public health performance (Corso, et al. 2000). In 1998, the Council for Linkages between Academia and Public Health Practice (CLAPHP), USA, initiated a discussion on the development of an agenda for public health practice research using the 10 Essential Services (Wood Johnson Foundation, 1999).

2. What Factors determine the need for Health Systems Development?

Mays and Halverson (2000) discussed a CDC study, which revealed a broad consensus on the need for measurement systems that support the development of public health systems but substantial variation in perceptions about the importance of specific measurement concepts and methods. Corso, et al. (2000) reported that efforts are under way to develop a performance measurement monitoring system for local public health systems in the USA based on the Essential Public Health Services.

These developments support the approach applied in this study where the Essential Services, developed by DHSS, were adopted for review by the panel of experts. This panel adopted one more Service namely 'Planning and Management' which was considered to be appropriate for Thailand. This modification is in line with the conceptual model developed by the USA based Public Health Functions Steering Committee (1995) that recognises the importance of system management but does not label it as an Essential Service per se. In the absence of performance measures, the set was then used to collect the perceptions of key stakeholders on the Performance of Services in rural Thailand.

Turnock, et al. (1999) provided a conceptual framework on Core Functions, Practices and Services and an operational definition for Practices, which was of particular use in this study. They defined Public Health Practices as the priorities that have been set based on an examination of the relationships between:

- Health system inputs (context information)
- Core function-related processes,
- Outputs (responsive services), and
- Outcomes (public's well being).

3. What are the Development Needs for a Health System?

Based on Turnock and Handler's definition (1997), the panel, then, used the opportunity to adopt the work undertaken by the MOPH and academic advisors in preparing the 9th National Health Development Plan to arrive at required Public Health Practices for Thailand.

These are (1) Health Promotion, (2) Health Insurance, (3) Equity, (4) Health System Reform, (5) Decentralisation, (6) Build Civil Society, (7) Develop Primary Care, (8) Quality of Services, (9) Research and Development and (10) Develop Health Industry.

4. What Services are required to foster Health Systems Development?

A mailed questionnaire was, then, used to assess perceptions on the current Performance of Services. The respondents perceived that the overall Performance of none of the 11 Public Health Services was a Strength, that the overall Performance of five was Satisfactory and that the Performance of six of the eleven Public Health Services were perceived as a Weakness. The latter are (1) Monitor Health, (2) Diagnose and Investigate, (3) Evaluation, (4) Partnerships, (5) Enforce Laws and (6) Research. Contributions from educational institutions to the development of the provincial public health systems in Thailand will have to address these weaknesses.

When classifying Public Health Services into functional areas (Development of Information, Development of Responses, Development of Support and Development of Programs), the Professionals perceived that there were Weaknesses in all areas. It is interesting to see that four (Monitor Health, Diagnose and Investigate, Evaluation and Research) of the Weak Services share similar Public Health Skills.

A limitation of the questionnaire on Services was the use of an ordinal scale with 3 categories, which created extra challenges in the analysis to deal with a possible response bias. Another lesson learned is that it is important to carefully prepare a demographic data section in questionnaires. The analysis could have enriched with detailed knowledge on the profile of the respondents.

The mailed questionnaire also included questions on the Level of Staff Involvement in each of the Services. Front-line Staff were not considered to be Responsible for any of the 11 Services, while Mid-level Management Staff only shares Responsibility with Top-level Management Staff for only two Services i.e. 'Disseminate Information' and 'Evaluation'. The majority of Responsibilities were attributed to Top-level Management Staff. Further study is required to explore whether this could be explained as a possible response bias or whether this is a reflection of organisational culture within the Thai public health sector. Given these results, we must ask the following questions: Should all students in postgraduate public health programs receive training in these Services? And if so: What Level of Mastery is needed for the Skills related to these Services?

It is acknowledged that job categories are defined broadly and the lines of distinction between them are not always clear. However, categories are meant to be flexible and adaptable to a profession, which is still evolving and attempting to adapt to the changing needs of both the community and governmental agencies. It is also recognised that, in many public health settings, job category is often related to educational background. However, educational level and years of experience are not included in the job category definitions because they do not necessarily dictate function within a public health organisation.

The findings were not conclusive in identifying a Target Group among professionals to address the Services that are considered to be a Weakness. Further study was needed to determine the Target Group for the LWP Program.

Semi-structured interviews with panel members were used to prioritise the Practices and Services. The outcome can be summarised as follows:

- (1) Although all 10 Practices are national priorities, 'Health Promotion', 'Health Insurance', 'Decentralisation' and 'Develop Primary Care' were considered as top priorities.
- (2) Among the Services perceived as a Weakness, 'Monitor', 'Diagnose and Investigate' and 'Access to Services' were considered as very important. All other Services were considered to be important except 'Policy Development' (perceived to perform Satisfactory), which was considered as less important.

Finally, a professional and academic panel explored the relationship between Practices and Services. The two questions that needed an answer were (1) what Practices would affect which of the Services and (2) how are these Practices going to affect Services? It is acknowledged that summations on Practices that affect Services do not reflect the complexity of relationships. However, it is of interest to see how many Practices are considered to affect a single Service, then, comparing these findings with perceived Service Performance and perceived Priority. Such comparison showed that among the Weak Services 'Partnerships' is most frequently affected by Practices. Among those Services that are considered to be Satisfactory 'Policy Development', 'Planning and Management', 'Disseminate Information' and 'Assure Human Resources' were most frequently affected by Practices. This raises questions such as (1) is 'Policy Development' really less important and (2) will these Services continue to perform Satisfactory under the 9th National Health Development Plan? Acknowledging that the descriptions on the nature of the relationships between Practices and Services were limited to broad terms, they can provide meaning and insight for curriculum development efforts.

The outcome of this study on Public Health Practices and Services will complement data from the next section on Public Health Competencies and facilitate selection of priority Services and related Competencies in Thailand.

C. How can Requirements for Developing Competencies be identified, given the Needed Practices and Services?

1. What Competencies are needed to implement Required Services within a Health System?

There has been a focus on developing Public Health Staff in recent years. The Council on Linkages between Academia and the Public Health Workforce (CLAPHW, 1998) was largely responsible for the adoption of Essential Services and the identification of Core Competencies in Public Health.

This list of Public Health Competencies represents ten years of work on this subject by numerous organisations and individuals in public health academia and practice settings. Over 1,000 international public health professionals have also reviewed the list during a public comment period. (CLAPHP, 2001).

The Core Competencies represent a set of skills, knowledge and attributes necessary for the broad practice of public health. They go beyond the boundaries of the specific disciplines within public health and help to unify the profession. These Competencies have also been cross-linked with essential Public Health Services to ensure that Competencies help build the Skills necessary for providing these Essential Services. However, because the list only captures the crosscutting Competencies for public health practice, it may not contain Competencies that are specific to certain disciplines within the field (CLAPHP, 2001).

Public health Core Competencies were developed based on the need for improving the relevance of public health education to the demands of public health in the practice setting. The need for such improvement, to place a higher value on practice-specific education and research, is extensively documented in the literature (Chapter II).

These Core Competencies may be used to help develop discipline specific competencies, assess human resource development needs, develop curriculum in public health education or develop job description or performance appraisals.

Because the Competency Model of the CLAPHW is the most recent model and well researched, the expert panel adopted this model for use in this study.

2. What Knowledge, Attributes and Skills are needed to arrive at Required Competencies?

Some studies (Potter, Pistella, Fertman, Dato, 2000; Chauvin, Anderson, Bowdish, 2001; CLAPHP, 2001) have recently been completed on assessing need for professional development of Public Health Staff in the USA. Chauvin et al. (2001) have used Essential Public Health Services as a framework to design an instrument for assessing Competency development need in 4 states of the USA. Their study examined professional categories, demographic data and perceptions on training need, using a questionnaire that reflected the Essential Services with sub-sets of Public Health Competencies. Need for training was perceived for all Essential services except for # 3 'Disseminate Information'. For each Service, the perceptions on training need by competency were detailed as well. Potter et al. (2000) report a need assessment based on 'universal' public health competencies only. Their training need assessment tested the use of 'universal' competencies in establishing a model training agenda for 7 states in the USA. Public health agency supervisors prioritised competencies, and regional and national public health leaders used their findings to design a model training agenda. Priority setting among competency domains varied among states and included some not listed within the universal set. The study resulted in a training agenda that reflect the supervisors' priorities and leaders' perspectives. The authors concluded that the universal competencies provide a useful starting point, but are not necessarily an exclusive framework for assessing training need. The Council on Linkages between Academia and Public Health Practice (2001) completed its large scale study to identify Levels of Skill Mastery by Level of

Staff and report what Skills are related to what Essential Public Health Services. However, the study did not include an assessment of these Services.

This study is part of a broad-based need assessment to facilitate curriculum revision for the LWP in Thailand. Therefore, the perceptions of key stakeholders on the overall Performance of each Public Health Service were considered to be appropriate, in addition to perceptions on required Competencies in assessing training need. The degree of detail required depends on the perspective adopted and on the purpose of the assessment. To the author's knowledge, no study has been undertaken in Asia to assess perceptions on the required Levels of Mastery in Public Health Competencies.

The mailed questionnaire was also used to assess perceptions on the required Level of Skill Mastery within the Competency Domains; focusing on Core Skills as they apply to Front-line, Mid-level Management and Top-level Management Staff.

Levels of Mastery in Skills were assigned to each Skill based for each staff category. The three Mastery Levels are Awareness, Knowledgeable and Proficiency. The Level of Mastery for each Skill by staff category represents the Weighted-Mean of four Constituencies among 228 respondents. This resulted in the identification of 41 Core Skills and 2 Not Core Skills for Front-line Staff and 65 Core Skills for both Mid-level and Top-level Management Staff. However, the findings were not conclusive as to whether the 27 Skills for Front-line Staff and 5 Skills for both Mid-level and Top-level Management Staff were a Core or Not Core Skills. To address this problem, a panel of public health experts and professionals reviewed each of these Skills for each staff category. This review concluded that 26 Skills were considered Core Skills and 1 Not Core Skill for Front-line Staff, while all 5 Skills for both Mid-level and Top-level Management Staff were Core Skills.

In the questionnaire high item non-response rates were seen for both the Administrators and the Academics. Analysis of item non-response in this study was based on

the literature (Groves, 1989; Krosnick, 1991; Biewen, 1999; De Leeuw, 1999; University of Michigan, 2001 and Borgers and Hox, 2002). For the Administrators (many of whom were not in health related administrative positions), the difficulty of the task and limitations in sector insights and for the Academics limitations in field exposure, might have been the factors responsible for their high item non-response. Again, more detailed information on respondents' profiles might have been helpful to explain this phenomenon with more certainty.

3. Who are the Target Groups for the LWP program?

As discussed earlier, the staff was classified into 3 categories. Required Levels of Skill Mastery do differ among these categories, therefore, it was necessary to identify a Target Group among staff to facilitate curriculum review. The mailed questionnaire, Focus Group Discussions and semi-structured interviews were not conclusive on the question "Who should be the Target Group for the LWP?" Findings from the mailed questionnaire and semi structured interview point to Mid-level and Top-level Management Staff. The Focus Group Discussions and semi-structured interviews describe the Target Group profile as:

- (a) A public health professional;
- (b) With a health or non-health Bachelor Degree;
- (c) From any functional level within the provincial health system i.e. provincial, district and sub-district level.

Finally a panel discussion with PCMO and public health experts was needed to select a Target Group. Mid-level Management Staff with a health or non-health Bachelor Degree and from any functional level within the provincial health system was selected. The rationale for this decision was that the required Practices and perceived Level of Service Performance require Mid-level Management Staff development.

Focus Group Discussions were organised prior to the analysis on mailed questionnaire findings. The findings of this method could have been improved if the Focus Groups had been

planned after the analysis of the mailed questionnaire; thus providing an understanding of the outcomes of the questionnaire.

4. What is the need of the Health System and Target Groups in terms of Programmatic Requirements?

Focus Group Discussions with PCMO and LWP Program Students describe the need for Programmatic Requirements in 3 categories, (1) program Level, (2) program Type and (3) program Major.

Although a postgraduate Diploma is considered useful from a functional perspective, a Master Degree is clearly the preferred Level from a social perspective. Participants expressed the need for a professional oriented over an academic oriented program Type. The Major should be a broad generalist program and orientated to health system reform and development.

5. What would be the Requirements for developing appropriate Competencies?

Requirements to develop appropriate public health competencies can be classified into three categories namely: (a) partners, (b) process and (c) pedagogy. Conclusions on these aspects are derived from the literature review, from the Focus Group Discussions and from the in-depth interviews.

(a) Partners

From an educational point of view, the key partners in education are professionals, students and academia. In terms of relevance the professional and student perspectives are especially important; the professionals ensuring that practice needs are identified and the students' perspective emphasising the social aspects of education, career and self development. As pointed out in detail in Chapter-V Results, there is a need for collaboration, co-ordination and communication among the LWP Program partners i.e. the College, Provincial Health Offices and students. Another important partner is the MOPH, which contributes in

terms of policy development and strategic planning. The academics will ensure that not only the assessable need is being addressed but also that the essential knowledge is provided.

Strong institutional support and leadership are essential to bridge the gap between learning (academic) and practice (professional). Improving the relevance of public health education requires constructive partnerships. This poses various challenges.

First, there is the need for continuing dialogue among the stakeholders. The College should have a mechanism in place to assure such dialogue with key stakeholders (institutes). Importantly, the participants (individuals) need to value such dialogue by demonstrating consistent and motivated involvement. Partnerships become valued if there is a shared goal and mutual gain. This leads us to the issue of desirable partnerships.

From a public health system perspective, partners should be public health professionals, academics and, importantly, community representatives. Such partnerships need to be viewed from both angles, individual as well as institutional affiliation. Common practice in an Asian context is the use of personal relationships to initiate and develop change. The inherent risk, of using personal connections as a single strategy, is that institutional support for such liaisons might be weak and, therefore, may have a pernicious effect on sustainability. A dual strategy is required to ensure a continuum in dialogue among partners. Institutional commitment is essential in addition to leadership qualities in building reciprocity in partnerships that foster relevant public health education.

Reciprocity fuels the development of partnerships, as well as the feedback loop, which are essential to improve the relevance of education in public health. Continuous dialogue and carefully designed educational strategies will yield mutual gain for all partners: the field of public health practice will receive graduates with relevant competencies; the communities' well being will be addressed more appropriately; and the College will have the opportunity to integrate learning experiences with real world problems.

(b) Process

Health systems, human resources and educational program development processes are the key elements to address relevance in education. The model discussed in Chapter-II Literature Review presents the different elements required in defining relevance of educational programs in public health.

Working backwards with this model, the impact is community 'health' need addressed through appropriate health practice. To arrive at this impact, Public Health Practices and Services to ensure development of the health system are required as outcomes. This outcome is assumed deriving from appropriate competencies, which are the outputs of a learning process. It is acknowledged that there is more to performance than competencies, as challenged by Nowlen (1990), however an educational institute cannot control this. The input to this learning process is program design based on an analysis of need. The perspective on the input-process-output model should be that of a broad and inclusive view of public health. This is important because it will provide direction on how to deal with the different elements and steps of the model. For example, defining community health need should be consistent with a holistic view of health and of its determinants.

(c) Pedagogy

As discussed in Chapter-II Literature Review, the educational model of Diamond (1998) offers a well-researched base to explore relevance. The model allows a specific sequence in curriculum development that (a) begins with an assessment of need and a statement of educational goals and objectives and is followed by (b) the design, implementation, assessment and revision of the curriculum.

In program assessment the sequence is then (a) assessing a program requires (b) a statement of goals and objectives, (c) which requires an analysis of need, (d) that will facilitate the development of an assessment protocol.

D. How can Programmatic Development Need be evaluated, for the implementation of Relevant Postgraduate Educational Programs in Public Health, given the requirements for achieving Competencies?

1. How can a Program be described?

This study used the Program and Curriculum Design Model from Bligh, Jaques and Piper (1981) in addition to the Systematic Design Model from Diamond (1998) as discussed in Chapter-II Literature Review. Both are process models and are well researched. The various elements of an educational program, can be summarised as follows:

- (1) Analysis of need
- (2) Statement of goals and objectives
- (3) Student selection
- (4) Curriculum design
- (5) Teaching methods
- (6) Assessment methods
- (7) Instructional process
- (8) Assessment of teaching

It is important to note that in addition to the various elements of an educational program, there is the organisation that implements a program. Organisational performance will affect the program's performance. Although it was recognised that organisational performance is clearly important, it was beyond the scope of this study, which focussed on the program aspects only. Future study is required to assess the relationship between organisational and program performance.

2. Which Factors in Program Design are Essential to ensure Relevance?

Universities and colleges of public health, under the quality assurance movement in higher education, will find out during their assessment, as pointed out by Diamond:

“No matter where you begin in the process, you will need to go back to the statement of need before you can develop a statement of goals on which assessment must be based” (1998, p.10).

This supports the design of this study, which started with a need assessment, and because the study focus is on the relevance of education to practice, needs were limited to professional and student perspectives only. From this relevance perspective, the desired program’s purpose, objectives and curriculum were identified; these, then, became inputs for the assessment design.

3. What would be appropriate Indicators of Relevance for Educational Programs?

For the purpose of this study, based on educational models and from an operational perspective, relevance of learning to practice in public health was defined as the congruence (in general terms) between:

- (a) Need as defined by those involved in the practice of public health,
- (b) A program’s purpose and objectives,
- (c) Student selection¹,
- (d) Curriculum design² and
- (e) Student assessment³.

Based on this operational definition, an assessment of need and educational principles (discussed under D.2) an instrument to assess the relevance of the LWP was developed. For each of these components, relevance factors, indicators, their measures, data sources and methods were defined as described in Research Report-8. However, as indicated in the footnotes, not all components in the definition of relevance have been assessed; partially because ‘Student Selection’ and ‘Student Assessment’ touch upon organisational performance, which was not within the scope of this study, and partially because of lack of data, especially for ‘Curriculum Design’.

¹ A relevance component not tested in this study

² Only partially tested because of lack of data

³ Restricted to student self-assessment

To set boundaries for this study, the relevance factors were classified into Essential Factors and Complementary Factors. The Essential Factors were (a) Public Health Practices and Services, (b) Competencies, (c) Target Group, (d) Programmatic Requirements, (e) Partnerships (f) Specialisation and Major, (g) Program Objectives, (h) Course Descriptions and (i) Instructional Objectives.

The Essential Relevance Factors were tested through an evaluation of the LWP Program. Validation of the complete RAI requires future testing of Complementary Relevance Factors.

Program relevance and program quality are interrelated. Assessing relevance is only one aspect of program performance. It is recognised that the assessment of relevance may not reveal root problems. Awareness about problems related to program design and implementation are only partly addressed by the assessment instrument. It is also recognised that program performance is affected by organisational performance.

Instrument testing faced some limitations because curriculum content-areas for the LWP were poorly documented. To overcome this problem, an alternative strategy was applied. Faculty was given a self-administered questionnaire to indicate which of the Core Skills they taught at what Level.

Reflection on findings and factors was done during and at completion of the evaluation in order to arrive at a judgement on the applicability of the instrument in terms of measures of association such as reliability, validity, as well as social desirability bias. Modifications were discussed and applied to further improve the instrument. The panel of education and public health experts had a key role in the formulation of judgements and modifications.

It cannot be assumed that those responsible for Public Health Services that perform 'Weak' would lead to the Target Group for the LWP.

Sample selection for prioritising Public Health Services and Competencies could be limited to Public Health Professionals and MOPH representatives. Tests of statistical significance and item-non response analysis indicated that Public Administrators and Academics were not well positioned to provide a judgement.

Focus Group Discussions were instrumental to explore and provide meaning for both, assessing need and contribute to evaluation.

Triangulation of findings from various data collection methods was very useful in the analysis in terms of validation, identification of discrepancies and possible response bias. Therefore, triangulation of results should be advocated where appropriate in the instrument description.

To assess a program it is important that the program is well documented. In its absence, the strategy applied in this study, a Faculty Questionnaire offered a useful, feasible and applicable alternative.

Assessing 'documented' Learning Objectives/Content Areas by using the list of Skills might create challenges for content analysis because the Skills vary in their level of description and in level of complexity and some do overlap. Direct use of these Skill descriptions as analysis codes is not feasible in terms of reliability. To deal with measures of agreement (congruence) between need and curriculum content, as well as with reliability of the content analysis, the Skills should be redefined to ensure that they are mutually exclusive as analysis codes. In absence of complete curriculum documentation this could not be tested. Future study is required to develop the code-book. In addition the faculty questionnaire based on the Skills can complement content analysis findings. Self-assessment by students, using the same questionnaire framework as for faculty, provides another option to triangulate findings.

The LWP Program's Purpose and Objectives and partly Curriculum Design were derived from the program's documents. Documents usually reflect the program's policy and as pointed out by Herman, Morris and Fitz-Gibbon (1987), because program implementation is subject to policy interpretation and to situational as well as individual factors, program practices do not always mirror their guiding policies. Therefore, in addition to explicit information, the partners' perspectives were included to arrive at an integrated judgement.

The LWP Specialisation and Major, a Professional Master Degree in Public Health with a Major in Health Systems Development, was congruent with the need for Public Health Practice, Services, Target Group and Programmatic Requirements in Thailand. However, findings indicated that the need for partnerships was not met.

Although the accreditation document (University approval document) could be improved in terms of defining the program's purpose, this might be subject to University regulations, the General Objectives as defined in the actual LWP plan are congruent with the perspectives of the stakeholders in Public Health Practice.

Program Objectives captured in broad terms only the public health practice need.

The statistically significant difference between student groups might be due to the differences in student profiles between groups. For example, the Ayutthia students received their previous degree from universities as Chulalongkorn and Mahidol, while the Isaan group had several students that obtained their previous degree in distant learning programs. Ayutthia was the only group that had physicians in addition to pharmacists and nurses. Also functional positions differed between groups. Ayutthia had no students from the sub-district level, while Chonburi-I had several provincial level students. The findings were also in line with observations in students' Focus Group Discussions. Moderator and observer reports indicated more frustration and negative feelings among Ayutthia students, more self-esteem among Chonburi-I students and a more positive atmosphere among Isaan students compared with other Focus Groups.

Perceptions of Chonburi-II students on achieved Level of Mastery in Public Health Skills (Self-assessment) showed lower Levels than required Levels of Mastery and this deficiency was in all Competency Domains.

Although instructions for the Student Self-assessment clearly stated that questions referred to Levels of Skill Mastery gained from the LWP, it is acknowledged that students might not always made the distinction between what they learned from the LWP and what was acquired from other learning opportunities. For example for a few Skills students responded that they achieved a Level of Mastery as Awareness or Knowledgeable, while faculty responded that these Skills were Not Taught.

Findings indicated problems at the instructional level:

- (a) Accredited courses did not address all need in terms of Services and Competencies
- (b) Descriptions of accredited and actual courses did not match and this not only because the LWP is a non-traditional program.
- (c) There was lack of documentation on actual course objectives
- (d) Not all need in terms of Services, Competencies and specific Learning Need, were being addressed.

In absence of a well-documented LWP curriculum, assessment of Learning Objectives and Curriculum Content was based on the perceptions of teachers. Triangulation indicated a possible risk of response bias. For example, one could question why there were only 5/13 Skills in the Basic Public Health and 3/12 Skills in the Analytical Competency Domains that were not taught or were taught at an insufficient level, while students, in the Focus Group Discussion, pointed out that they lack skills in applied research.

The correlation between the self-assessment among the total sample of Students (61) and Public Health Professionals (119) showed as significant difference for 62/70 Skills at $p. \leq$

0.01 across all Competency Domains. The perceptions on achieved Level of Skills Mastery were significant lower than the perceptions on required Levels of Skill Mastery.

The self-assessment among 9 LWP students (Chonburi-II), using the same Skill sets as for the faculty questionnaire, could not be correlated with faculty perceptions on Learning Objectives covered at what Level, because both instruments measured inter-related but different concepts i.e. teaching and learning. In order to link these concepts further study is needed in terms of methods, sequencing, learning applications and student assessment.

As discussed by CLAPHP (2001), Competency Domains represent Core Skills, knowledge and attitudes necessary for the broad public health practice. Because the list only captures the crosscutting competencies for public health practice, it may not contain competencies that are specific to certain disciplines within the field. While attitudes may be more difficult to measure, they can be part of what is taught and should be included in curriculum and content development efforts.

In terms of Learning Objectives and, therefore, Curriculum Content the LWP Program showed a deficit in delivering the content as considered required by those involved in the practice of public health.

Of the 70 Public Health Skills only 30 Skills were taught at a sufficient Level of Mastery, 30 Skills were taught but at an insufficient Level of Mastery and 10 Skills were not taught at all.

Of the 70 Skills 57 were attributed to Public Health Services that have a perceived current Level of Performance as a 'Weakness'. Considering those Skills of particular interest for provincial health system development, 26 out of the 57 Skills were taught at a sufficient Level of Mastery, 21 were taught but at an insufficient Level of Mastery and 10 were not taught at all.

Considering the total set of Skills, deficiency occurred in each Competency Domain.

Following Competency Domains were more affected than others in terms of:

(a) Skills Not taught:

- Basic Public Health Skills
- Analytical Skills and
- Partnership Skills

(b) Skills taught at a lower Level than required:

- Policy Development Skills
- Strategic Management Skills
- Communication Skills
- Partnership Skills and
- Operational Management Skills.

The 57 Skills attributed to 1 up to 6 Public Health Services that were considered to Perform Weak might be of particular interest in curriculum development.

E. Limitations of the Study

A limitation of this study is that there is no direct link between Public Health Practices and Skills in the evaluation of the LWP and it seems impossible to make that link because the study described:

- (1) what Practices were believed to affect which of the Services,
- (2) how Practices were believed to affect the services,
- (3) what was the perceived Level of Service Performance,
- (4) what Skills were attributed to each of the Services,
- (5) what level of Skill mastery was considered Taught,
- (6) what Level of Skill mastery was believed Achieved and
- (7) what Level of Skill Mastery was considered Required?

The evaluation, then, compared Taught and Achieved Skill Mastery by Service but this could not provide a link with Practices. Based on the analysis on how Practices affect Services, attempts to identify what Skills might be involved, could not be validated. To my knowledge no study has been published that deals with the link between Practices and Skills.

The CDC model of Public Health Practices (1992), the NACCHO model of Essential Public Health Elements (1994) and the DHHS model of Essential Public Health Services (1994), although developed for different purposes, are conceptually almost identical (Corso et al, 2000). It is of interest to note that the work of Turnock and Handler (1997 and 1999) that provided a definition and a conceptual framework for Public Health Practices is of a later date than the development of the Practices and Services models. That these Practices and Services models have a lot in common is likely the result of development efforts in the absence of the theoretical framework, as discussed by Roper and Mays (2000).

Using Turnock and Handler's definition of Public Health Practices, this study, then, arrived at 10 Practices that reflect the priorities within the 9th National Health Development Plan in Thailand and, therefore, the Practices in this study differ from the adopted Services.

This study also described the inter-relationships between Practices and Services, but further study is needed to identify possible demands on Skill Mastery created by these inter-relationships. However, findings on the inter-relationships between Practices and Services do provide useful context information for curriculum development.

This limitation is in addition to those already noted in previous sections of the Discussion, which include:

- (1) The development of a health system model for the sole use in this study as discussed in Section B.1.
- (2) In the absence of performance measures for Services, the use of key stakeholders' perceptions as discussed in Sections B.2 and C2.

- (3) The use of an ordinal scale with 3 categories for the mailed questionnaire as discussed in Section B.4.
- (4) Limitations in demographic data on respondents for the mailed questionnaire as discussed in Section B.4.
- (5) Broadly defined job categories as discussed in Section B.4.
- (6) Summations of Practices that affect services do not reflect the complexity of inter-relationships as discussed in Section B.4.
- (7) Public Health Competencies only capture crosscutting Competencies for public health practice as discussed in Section C.1.
- (8) The use of key stakeholders' perceptions on required Level of Skill Mastery as discussed in Section C.2.
- (9) High item non-response for Administrators and Academics in the mailed questionnaire as discussed in Section C2.
- (10) The mailed questionnaire, Focus Groups and semi-structured interviews were not conclusive as discussed in Section C.2.
- (11) The sequencing of Focus Groups as discussed in Section C.3.
- (12) The limitation on organisational performance in the assessment instrument as discussed in Section D.1.
- (13) The focus on professional and student perspectives in the need assessment as discussed in Section D.2.
- (14) The limitation to testing Essential Relevance Factors only of the instrument as discussed in Section D.3.
- (15) The limitations in the assessment of Curriculum Content as discussed in Section D.3.
- (16) The possible response bias in students' self-assessment as discussed in Section D.3.
- (17) The possible response bias in the faculty questionnaire as discussed in Section D.3.

(18) The limitation in correlating student and faculty questionnaires as discussed in Section D.3.

F. Strengths of the Study

- (1) To my knowledge this is the first study in the field of public health that addresses the total cluster of Public Health Practices, the current Performance of Services and the required Levels of Skill Mastery for Staff Categories. As discussed in Section C.2, there are only a few studies available that deal with Competencies only, this despite all the rhetoric in the literature.
- (2) To my knowledge this is the first study in Southeast Asia that deals with the assessment of need for public health practice for the purpose of developing an educational program in public health.
- (3) The strength of the study lays also in its systematic approach to involve a wide variety of stakeholders such as provincial public, NGO and private sector professionals, public administrators, academics, MOPH representatives, students, program developers and teachers.
- (4) Despite all the rhetoric on the relevance of education to practice in the literature, to my knowledge, this study is also an unprecedented effort to restore the link between education and the practice of public health.

G. Hypothesis

The null hypothesis in this study was:

The purpose, objectives and curriculum design of the LWP are congruent, in general terms, with the need as perceived by key stakeholders in Thailand; with the stakeholders being

defined as public health professionals, public administrators, public health academics and MOPH representatives.

To test the hypothesis:

- a) The need as expressed by key stakeholders were determined and validated.
- b) With this information a relevance instrument was developed and validated.
- c) Essential factors of the relevance instrument were then applied against the current LWP Program.

In general terms, the Learning @ the Workplace's Purpose and Objectives were congruent with perceived Need.

At the Instructional Level, Curriculum Design was not congruent with the professional need as follows:

- Course Descriptions & Objectives vs. Services and Learning Need
There were distinctive differences.
- Required Level of Skill Mastery vs. Achieved Level of Mastery
 H_0 was rejected and H_1 was accepted (statistical significance).
- Required Level of Skill Mastery vs. Taught Level of Skill Mastery
There were distinctive differences.