Education Reform of Health Professionals for the 21st Century: A Situation Analysis in Thailand

การปฏิรูปการศึกษาวิชาชีพสุขภาพในศตวรรษที่ ๒๑: การวิเคราะห์สถานการณ์ในประเทศไทย

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ISBN 978-616-92278-1-6
First Published August 2016
Quantity 1,000 pcs.

National Library of Thailand Cataloguing in Publication Data
Health Professional Education Foundation (NHPE)
Education Reform of Health Professionals for the 21st Century:
A Situation Analysis in Thailand—Nonthaburi: The Health Professional Education Foundation of Thailand, 2016.
112 pages

Cover Design Mathuwan Srikong
Printer P. A. Living Co., Ltd
4, Soi Sirinthorn 7, Bang Phlat District, Bangkok 10700 Thailand.
Tel 0-2881-9890-2

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FOREWORD

By the beginning of the 21st century, there were several changes affecting worldwide health care services. Inequities in access to health care, and healthcare cost have been increasing significantly, rapidly and continuously over the years. Biomedical knowledge has also been progressing rapidly, but health professional education has not responded well to the challenges; critically, because of outdated, static and fragmented content oriented curricula. They are producing graduates with insufficient knowledge, skills, inadequate collaboration among health professionals and competent response to the present and future population and communities' health needs.

A report entitled "Education of health professionals for the 21st century: a global independent Commission" was launched by the Lancet Commission in response to current health professional education problems. Consequently, five countries in Asia, namely Bangladesh, China, India, Thailand and Vietnam formed a network called Asia-Pacific Network on Health Professional Education Reform (ANHER) to move this issue forward. Each country agreed to conduct situation analysis based on the network's common protocol and tools. The initial phase of situation analysis in Thailand focused on medical and nursing professionals.

This report presents an assessment of Thailand's current health care profile, the national policy for health professional education, institutional profiles, curricula and learning resources. It also describes last year medical and nursing students' attitudes towards working in rural areas, job preference and the perception about their competencies. In addition, medical and nursing graduates' attitudes about working in rural areas, work dynamics and perception of competencies were also reported.

Finally, we compared Thai current situation with WHO Guidelines (2013): Transforming and scaling up health professionals' education and training and proposed a comprehensive recommendation for transforming the education of health professionals in Thailand.

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ACKNOWLEDGEMENTS

We would like to thank Professor Charas Suwanwela, Professor Prawase Wasi, Professor Vicharn Panich, Dr. Suwit Wibulpolprasert, International Health Policy Program (IHPP), Ministry of Health, Thailand, Professor Lincoln Chen, China Medical Board and Professor Timothy G Evans, James P Grant School of Public Health, BRAC University, Bangladesh for the initiation and their academic support of the collaborative work. We thank the Thai Health Promotion Foundation, the China Medical Board and the Southeast Asian Regional Office (SEARO)/ World Health Organization for financial support.

We also would like to thank the Consortium of Thai Medical Schools and the Thailand Nursing and Midwifery Council as well as the Deans, Deputy Deans and Directors of 19 medical schools and 40 nursing schools (Annex 1) for contribution in data collection.

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EXECUTIVE SUMMARY

At the beginning of the 20th century, Flexnor's, Welch-Rose's and Goldmark's reports led the intregration of modern science into the curricula at unversity-based medical, nursing and public health schools, the reforms equipped health professionals with the knowledge that contributed to the doubling of life span during the 20th century. However, during the final part of the 20th and the beginning of the 21st century, there are several changes affecting worldwide health care services.

The Commission on Education of Health Professionals for the 21st century launched a report on "Education of health professionals for the 21st century: a global independent Commission" on December 4th, 2010. Since then there was a solid movement in health education reform in many regions; Africa, Asia, and the Americas. A network of 5 countries, including Bangladesh, China, India, Thailand and Vietnam volunteered to conduct situation survey.

The objectives of this survey were to assess current Thai health care profile, national policy for health professionals, health professional curricula and learning resources. Survey of the just about to leave students and in-service graduates was also conducted to assess their attitudes towards working in rural areas, job preferences and competencies. In Thailand, the initial phase of these situation analyses focused only on medical and nursing professionals.

RECOMMENDATIONS

1. National level policy

1.1 Establish clear mechanism and support for implementing this written policy and strategy through better collaboration between health professional education and systems including implementation of programs particularly, incorporation of health policy and system needs in the curricula.

1.2 Better coordination among those key actors for accreditation and quality assurance is required to minimize redundancy and unnecessary work.

1.3 National HRH Commission should be a responsible body for national HIS in term of completeness, timely, and utilization;

1.4 Maintain current production plan for professionals until 2030; with condition of increasing retention through WHO 2010 recommendations such as rural recruitment, local training, compulsory and hometown placement;

1.5 Keep regular adjustment of projection, at least every 5 years, taking account of dynamics of technology, labor market, socio-demographic, epidemiological, environmental change, ratio of generalist- specialist, task shifting.

2. Medical education

2.1 All medical schools should design and implement mandatory continuous development program for faculty, teaching staff relevant to the evolving health-care needs of their communities;

2.2 Medical schools should have comparative national health systems, second language, health equity, humanities and social justice and cultural sensitivity in their curricula. Curriculum should focus more on competency based learning;

2.3 All medical schools should implement curriculum about inter-professional education systematically;

2.4 Accreditation process should be continued but better coordinated to avoid redundancy and time consuming;

2.5 Skilled lab should be more implemented;

2.6 IT based learning model should be implemented more extensively and appropriately;

2.7 Medical school consortium and Thai Medical Council should consider conducting physician cohort study to assess workforce dynamic and understand natural history of medical doctor.

3. Nursing education

3.1 All nursing schools should design and implement mandatory continuous development program for faculty, teaching staff relevant to the evolving health-care needs of their communities;

3.2 Curriculum should be competency based and need to be revised to include important topics related to health system;

3.3 Teaching and learning methods need to be transformed, various strategies that promote critical thinking and practice in real situations need to be considered;

3.4 Consortia of all health professional education should create task force for mandating IPE in the curricula;

3.5 Standardization and quality assurance processes should minimize workload and move toward collaborated accreditation from all regulatory bodies;

3.6 Promoting optimized utilization of nursing laboratory and simulation in all faculties and need seamless integration into the curriculum;

3.7 Faculty development program needs to be strengthened especially in MOPH;

3.8 IT based learning model should be implemented more extensively and appropriately;

3.9 The target recruitment management should be reviewed and improved for improving distributions in specific underserved areas to increase access to nursing education;

3.10 Implement effective interventions to promote work-life balance, health and quality of life of nurses to ensure patient safety and quality of care and nurse cohort study should be promoted to have a better understanding of health quality of life and workforce dynamic of Thai nurses.

PART I:
INTRODUCTION

At the beginning of the 20th century, Flexnor's, Welch-Rose's and Goldmark's reports led the integration of modern science into the curricula at unversity-based medical, nursing and public health schools, the reforms equipped health professionals with the knowledge that contributed to the doubling of life span during the 20th century. However, during the final part of the 20th and the beginning of the 21st century, there are several changes affecting worldwide health care services. Inequities in access to health care and quality underscore failure to share health advances both domestically and internationally. Emerging or re-emerging infectious diseases, environmental and behavioural risks, associated various socio-economic factors, especially increasing ageing population threaten health security of all. Healthcare cost also significantly increases rapidly and continuously over the years. The World Health Organization has recommended that Universal health coverage should be the most important strategy for achieving health care equity.

Recently, advancement in biomedical knowledge has been rapidly progressing as well as global information technology (IT) and this progression will definitely be even much faster in the future. Moreover, these will affect healthcare and healthcare delivery system worldwide. At the present, the health professional education has not been well adapted to address these challenges; largely, because of outdated, static and fragmented, content oriented curricula, which produce graduates with insufficient knowledge, skills and competence responsive to the present and future population and communities' health needs. The problems also consist of various factors; poor teamwork across different professions and inadequate collaboration among health professionals, narrow contextual understanding, episodic encounters with patient illnesses rather than continuous health care, emphasizing treatment rather than disease prevention, lack of understanding in social determinants of health and imbalance between health workforce and health needs in both qualitative and quantitative aspects. There is also inadequate collaboration and communication between health professional

There is also increasing consensus globally that the education of health professionals is failing to keep pace with the scientific, social and economic changes transforming the healthcare environment. The Commission on Education of Health Professionals for the 21st Century was established and chaired by Professor Lincoln Chen (President of China Medical Board) and Professor Julio Frenk (Dean of Harvard School of Public Health). The commission launched a report "Education of health professionals for the 21st century: a global independent Commission" on December 4th, 2010. Since then there was a solid movement in health education reform in many regions; Africa, Asia, and the Americas. A network of 5 countries, including Bangladesh, China, India, Thailand and Vietnam volunteered to conduct situation survey. The objectives of this survey were to assess current health care profile of the countries, national policy for health professionals, health professional curricula and learning resources. Survey of the just about to leave students and in-service graduates was also conducted to assess their attitudes towards working in rural areas, job preferences and competencies. In Thailand, the initial phase of these situation analyses focused only on medical and nursing professionals.

PART II:
STUDY METHODS

There are four main components of this situation analyses:

1. National level assessment for context and health professional education policy
2. Medical and Nursing Institutes
3. Just about to graduate medical and nursing students
4. Medical and nursing graduates

1) National level assessment

This is to assess at the national level, health professional education in the current national context. The contents included national basic indicators, national policy for higher education in health, demand and supply of human resources for health, accreditation of health professional institutes, national standard for curricula, innovative education policy and outcomes, perspectives and viewpoints from selected stakeholders.

Methods include literature review and synthesis, in-depth interview and focus group discussion with key stakeholders and poll survey.

2) Institutional level assessment: medical and nursing schools

This is to assess medical and nursing institutes in term of physical and financial status, curriculum, teaching methods and teaching staff. The contents included institutional governance, curriculum analysis, student recruitment, student evaluation, teaching staff workforces, staff recruitment and retention, staff development, performance evaluation, institute financing, infrastructure and information technology, quality assurance in education.

Methods include questionnaire, review of available data, in-depth interview and focus group discussion.

3) Survey of medical and nursing students who were just about to graduate

This is a self-assessment of students just about to graduate on knowledge, skill and competencies during their medical and nursing studies. The contents included socio-demographic information of the students and their parents, attitude towards rural, remote or hardship areas, job preferences and competency self-assessment.

Self-administered questionnaire was used to collect information.

4) Graduate survey for medical doctors and nurses

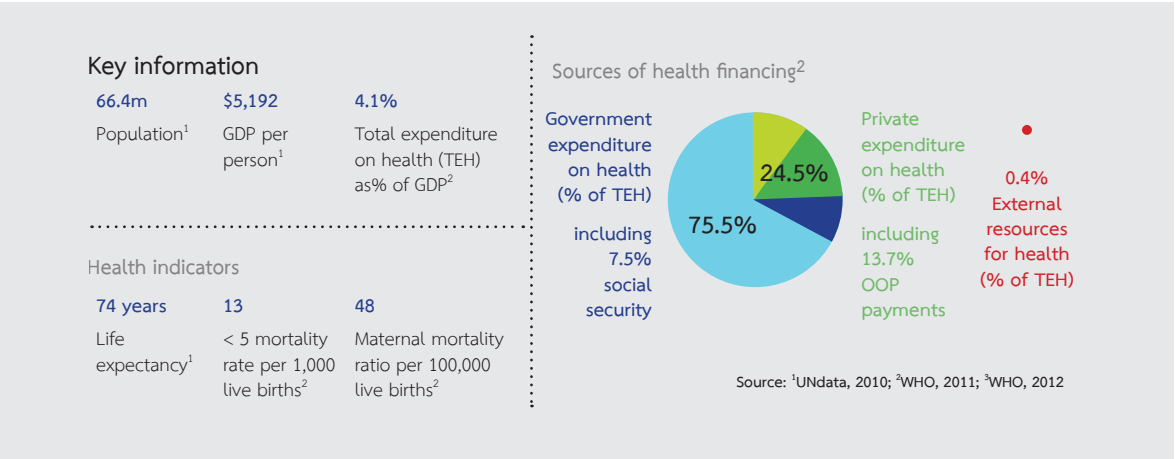
This is an attitude self-assessment of medical doctors and nurses on working in rural, remote or hardship areas as well as their knowledge, skill and competencies. The contents included: socio-demographic information of the graduates and their parents, attitudes towards working in rural, remote or hardship areas, employment and transition, job transition and competency self-assessment.

Self-administered questionnaire was used to collect data.

PART III:
RESULTS

3.1 National context and health professional education policy

3.1.1 National basic indicators



Ref: http://resyst.lshtm.ac.uk/resources/extending-health-coverage-Thailand

	2000	2005	2010
Heath service infrastructure			
• Hospital, total	3,820	3,873	3,862
• Private hospital, % total	9.0	8.9	8.3
• Hospital beds, total	166,014	176,646	162,160
• Private hospital beds, % total	21.0	20.1	20.6
• Health centre, total	9,738	9,765	9,768
HRH indicators			
• Medical doctors, total[1]	23,956	30,400	37,396
• Medical doctors in private, % total	21.7	21.6	18.3
• Nurse, total	70,987	101,465	120,012
• Nurse in private, % total	7.97	8.20	8.77
• Doctor per 1,000 pop, total	0.38	0.46	0.54
• Doctor per 1,000 pop, urban	0.79	0.99	1.15
• Doctor per 1,000 pop, rural	0.18	0.21	0.28
• Nurse per 1,000 pop, total	1.14	1.58	1.88
• Nurse per 1,000 pop, urban[2]	3.40	3.35	6.20
• Nurse per 1,000 pop, rural	NA	0.70	0.21
Health services utilization			
• OP visits per capita per annum	1.8	2.2	3.7
• Admission rate per capita per annum	0.09	0.09	0.12
• Institutional delivery, % total	99	97	99.4

[1] only data doctors who currently active contact

[2] due to data limitation, doctor in rural was defined as doctors who working in community hospital level or lower; doctor in urban was defined as doctors who working in general hospital level or above including private doctors

HRH Information system

National HRH information systems, is responsible by MOPH in producing, its reliability, timely production for decision making. However, there are HRH database systems in many relevant organizations such as professional Council, MOPH, MOE, MOD and private sector. Now a day, there is a limitation of data completeness and adequacy for national human resource planning but HIS information is used for decision making and recommendations for improvement including setting the national target for health professional production.

3.1.2 Medical education policy

There were National Strategies or Plans for medical education in 1956, 1964, 1971, 1979, 1986, 1996, 2001, and 2009. However, they were unclear in target achievement and lack of its evaluation. Furthermore, the Code of Practice for Health Promoting Medical School is the common commitment among all medical schools from the latest forum. Additionally, there is Thailand Human Resources for Health Strategic Plan 2007-2016, under the National Committee for HRH, including health professional education. It emphasized to produce new physician with competency of 'generalist' rather than 'specialist' and encourage rural recruitment and hometown placement.

There is an official forum or mechanism for interactive dialogues between Ministry of Health, Ministry of Education, Medical Schools, and general public on the assessment of medical education in the country, the emerging health needs of the population, determinants of ill-health, and contributions by medical schools to health systems development. Interactive dialogue is explicitly launched during national medical education forum, held every 7 years. Wider stakeholders are involved in the forum such as medical students, faculty, employers, patients, health professionals, NGO, and others. This mechanism is written in the process of curricula approval regulated by the Office for National Education Standards and Quality Assessment (ONESQA). The Consortium of Thai Medical School is another mechanism to coordinate among Deans of Thai Medical Schools both public and private usually regularly held every 45 days.

Office of the Higher Education Commission and Office for National Education Standards and Quality Assessment (ONESQA) are the authorized bodies for approving degree and curricula. While the authorized body for licensing and regulating the content of curricula is The Medical Council of Thailand—operating through the Consortium of Thai Medical Schools. It was not specificly defined how often the curricula approval should be.

The Medical Council of Thailand is an authorized body for medical licensing. The professional core competencies (updated in 2012) including Professional habits, attitudes, moral, and ethics; Communication and interpersonal skills; scientific knowledge of medicine; patient care; health promotion and health care system: individual, community and population health; and continuous professional development

The Commission of Higher Education, MOE, 2003 set the standard criteria for Thai Medical School establishment. New medical degree program, the institution is required to fulfill the qualifications, resources and identify the readiness.

Demand and supply for physicians

Thailand had 3.9 physician 10,000 populations in 2014. Recently, Bureau of Policy and Strategy, MOPH projected demand for physician using physician: population ratio. The study in 2004 suggested that in order to increase production, especially respond to health system needs[3,4,5] to reach an optimal ratio of one physician to 1,800 population, 6,000 additional more physicians should be produced by 2006.

In 2011, Thailand had 19 medical schools (one was non-government owned). Seven of those schools were located in capital city. Additionally, there were 16 schools having special program on recruitment of student from rural, or under-served areas. In 2010, there were 1,811 medical graduates while 2,555 new students recruited at the same year. Projection by supply side, it was estimated to reach 1 physician per 1,491 population and 1,167 population in 2020 and 2030, respectively[6]. However, distribution of physician between regions is still concerned[7].

3.1.3 Nursing education policy

In the present time nursing education strategies was initiated by Thailand Nursing and Midwifery Council under participation of all stakeholders. Thailand Nursing and Midwifery Council take role as a coordinator to organize official meeting additionally. Main objective is to promote interactive dialogues among Ministry of Public Health, Ministry of Education, representatives of nursing schools both public and private, and representatives of health care service providers especially on assessment and evaluation of nursing education focusing on effectiveness of nursing education in the country in terms of adequacy in number, quality of graduated and relevancy to population health need and health system. Moreover, Nursing Dean Consortium of MOE, MOPH, MOD and private nursing schools are another mechanism to coordinate among deans. The meeting is usually regularly held every 2 months.

All nursing curricula and nursing schools in Thailand have to be assessed and accredited by Thailand Nursing and Midwifery Council. New nursing schools have to pass an accreditation standard every year in four years to assure that any schools take along with standard to produce qualified nurses before operating. Moreover, the Higher Education Commission and Office for National Education Standards and Quality Assessment (ONESQA) is the authorized body for external quality assurance process. Thailand Nursing and Midwifery Council sets standard criteria for nursing schools development. All nursing schools are required to achieve the qualifications, resources and identify the readiness.

For professional practice regulation, Thailand Nursing and Midwifery Council is an authorized body for nursing licensing. All graduated nurses who need to practice in Thailand have to pass National licensing examination and have to complete continuing professional development at least 50 CNE for renew licensing every 5 years.

Demand and supply for nurses

Thailand had 20.8 nurses 10,000 populations in 2014. Recent projection suggested to increase 2,600 enrolment per year in all public nursing schools during 2014-2017. There were 80 nursing schools in 2010[8], 59 of those were public-owned and also having special program on recruitment of student from rural, or

under-served areas. Fifteen schools located in capital city. In 2010, there were 7,577 nurse graduates while 7,860 new students were recruited in the same year. Projection by supply side, it was estimated to have 152,648 nurses or reaching 1 nurse per 459 populations in 2022[9]. So far, nurses are still concentrated in Bangkok and urban area[10].

3.2 Medical education assessment

3.2.1 Medical Institution

During the time of the survey in 2012, there were 19 medical schools in Thailand. We conducted a census survey and all medical schools participated. Twelve (63.2%) schools were outside Bangkok and only one (5.3%) was private school. Only 3 (15%) schools reported that their governing body was selected from various groups, while 85% were not. All medical schools have affiliated hospitals as many as 87 hospitals.

More than 50% of medical schools have distinctive courses in clinical decision making and critical thinking and second language. Twenty five to 50% of medical schools have distinctive courses in health policy, communication skill, professional ethics and law, epidemiology, biostatistics, health promotion and disease prevention, social determinants of health and diseases, humanities and social justice, evidence based practices, research methodology and information technology. Less than 25% of medical schools have distinctive courses in health management, leadership and management, public mind and voluntarism, cultural sensitivity, health equity and comparative national health system (Table 3.1.1).

Thirteen out of 19 medical schools had curriculum revision in the past two years. All medical schools have a plan to revise the curriculum every five to seven years. Of note is that all schools have mechanisms for reviewing the curricula with respects to the mandate imposed by the university council. All schools need to pass the accreditation review and quality assurance prior to its establishment and for maintaining its operation.

Regarding inter-professional education there were response from 16 medical schools. Three, 7 and 6 medical schools reported that they had none, <50% and >50% subjects with inter-professional education respectively.

Table 3.1.1 Coverage of some important subjects in medical curriculum _n (%)

Subject	Not cover	Yes, in a distinctive course	Yes, integrated in a course	Missing data
Health policy	0	12 (63.2)	6 (31.6)	1(5.3)
Health management	0	13 (68.4)	4 (21.0)	2 (10.6)
Communication skill	1 (5.3)	11 (57.9)	6 (31.5)	1(5.3)
Leadership and management	1 (5.3)	12 (63.1)	4 (21.0)	2 (10.6)
Public mind and voluntarism	1 (5.3)	3 (15.8)	11 (57.8)	4 (21.1)
Professional ethics and laws	0	8 (42.1)	10 (52.6)	1(5.3)-
Epidemiology	0	7 (36.8)	10 (52.6)	2 (10.6)
Biostatistics	0	7 (36.8)	10 (52.6)	2 (10.6)
Health promotion	0	9 (47.4)	8 (42.0)	2 (10.6)
Social determinants of health	1 (5.3)	10 (52.6)	7 (36.8)	1 (5.3)
Humanities and social justice	3 (15.8)	8 (42.1)	7 (36.8)	1 (5.3)
Cultural sensitivity	3 (15.8)	9 (47.3)	5 (26.3)	2 (10.6)
Health equity	4 (21.1)	10 (52.6)	4 (21.1)	1 (5.3)
Evidenced-based practice	0	9 (47.4)	9 (47.4)	1 (5.3)
Research methodology	0	7 (36.8)	11 (57.9)	1 (5.3)
Critical thinking	0	8 (42.0)	9 (47.4)	2 (10.6)
Comparative national health systems	9 (47.4)	7 (36.8)	2 (10.5)	2 (10.6)
Information technology	2 (10.6)	6 (31.6)	10 (52.6)	1 (5.3)
Second language	5 (26.3)	1 (5.3)	12 (63.1)	1 (5.3)

Regarding teaching method, most schools (78%) stated that they provided problem-based learning. About half of schools had community based teaching and system based learning. Only 6 (31.6%) reported that they had competency based learning (Table 3.1.2).

Table 3.1.2 Number of schools currently having certain types of learning methods

Learning method	No (%)	Yes (%)	Total
Community based	9 (47.4)	10 (52.6)	19 (100.0)
Problem based	4 (21.1)	15 (78.9)	19 (100.0)
System based	9 (47.4)	10 (52.6)	19 (100.0)
Competency based	13 (68.4)	6 (31.6)	19 (100.0)

In term of research, 6 out of 19 medical schools required their students to complete their research work, either as individual or as group work, for their graduation.

Regarding percentage of time spent on study modules, on the average, students spent 28% of their time in classroom, 25% on self-study, 24% on clinical work, 13% in community work, 9% on laboratory work and 6% on skill laboratory (Table 3.1.3).

Table 3.1.3 Median percentage of time spent of different study modules

Study modules	Median percentage
Lecture in classroom	28
Clinical practice in patient wards	25
Self study	16
Community practice	10
Laboratory study in basic science classes	9
Skilled-lab study	5
Others	7

Concerning off campus exposure opportunity, 18 out of 19 medical schools gave their students this opportunity. The four most popular places were local communities, community hospitals, provincial hospitals and abroad.

Regarding the student assessment, Multiple Choice Question (MCQ) and Objective Structure Clinical Examination (OSCE) were the two most common methods (95%) followed by Modified Essay Question (MEQ) (90%), long case exam (84%), attendance rate (48%), overall clinical performance (53%), essay examination (32%) and oral examination (36.8%), Table 3.1.4.

Table 3.1.4 Student assessment

Assessment methods	Number of schools having this kind of assessment (%)
Multiple choice questions (MCQs)	18 (94.7)
Objective Structured Clinical/Practical Examination (OSCE/OSPE)	18 (94.7)
Modified essay questions (MEQs)	17 (89.5)
Long paper	16 (84.2)
Overall clinical performance	10 (52.6)
Class participation	9 (47.4)
Essay test/exam	6 (31.6)
Oral exam	6 (31.6)
Term paper	4 (21.1)

* Each school may have more than one assessment methods

Innovation for student assessment

Fourteen of 19 medical schools claimed that they had innovation in student evaluation. Interesting innovations include literature search, portfolio assessment, team work assessment, ethical assessment form, computer based examination, etc, Table 3.1.5.

Table 3.1.5 Student assessment innovation

Innovation	No. of school
1. Literature search assessment	4
2. Team work assessment	3
3. Portfolio assessment	3
4. Ethics assessment	2
5. Computer based examination	1
6. Constructed response essay questions	1
7. Expanded matching questions	1

Special competencies were provided and assessed in some schools, ranging from 16%-37%. Evidence-based and information technology competencies were the most popular categories, followed by inter-professional, ethics and humanized care competencies, Table 3.1.6.

Table 3.1.6 Assessment for special competencies

Mode of assessment	Number of schools having this kind of assessment
Evidence-based competency	7 (36.8)
Information technology competency	7 (36.8)
Inter-professional competency	5 (26.3)
Ethics	5 (26.3)
Humanized care competency	4 (21.1)
Health systems understanding	3 (15.8)
Public health competency	3 (15.8)
Understanding on cultural and individual diversity	3 (15.8)

Except those new 7 schools which have no graduates before 2012, around 97% of graduates who started their medical schools between 2001 and 2004 passed the National Licensing Examination.

Faculty recruitment

Schools had various criteria to select their faculty members. The three most common criteria, doctoral degree or equivalent, outstanding academic performance and pedagogic competency were used in 75%, 63% and 56% of schools respectively, Table 3.1.7.

Table 3.1.7 Selection criteria for faculty members

Criteria	Number of schools having this criteria
Doctoral degree or equivalent	12 (75.0)
Outstanding academic performance	10 (62.5)
Pedagogic competency	9 (56.3)
Second language competency	3 (18.8)
Rural experience	2 (12.5)
Other criteria	5 (31.3)

About 50% of schools participating in this study recruited their faculty members from other institutions, public hospitals or other medical schools in public sector. Around 44% of faculties were selected from their own institution graduates, Table 3.1.8.

Table 3.1.8 Revious workplace/institution of faculty members that were selected by schools

Previous workplace/institution of Faculty members	Number of schools selecting significant number of faculty members from this place
Other institutions' graduates	9 (56.3)
Public hospitals	8 (50.0)
Other medical schools in public sector	8 (50.0)
Own institution' s graduates	7 (43.8)
Private hospitals	5 (31.3)
Other medical schools in private sector	2 (12.5)
Outside countries	2 (12.5)
Others	7 (43.8)

Note: N=16, three schools had missing data. Each school can select more than one choice for this question

The three most common reasons for faculty member attrition were family reasons, inadequate financial support and poor fringe benefits at 56%, 36% and 31% respectively. After resigning from the medical schools, 63%, 50%, 31%and 25% went to private hospitals, other medical school, public hospitals and abroad respectively.

Twelve medical schools provided information about their revenue. The three main sources of revenue were government budget, clinical services and registration fee. The main revenue for medical schools without university hospitals were from government budget (77-93%), while student registration was the total revenue for private medical school.

Most medical schools had reasonably adequate to highly adequate facilities in term of buildings, library resources, teaching facilities, information technology (except conference call, video conferences and telemedicine), IT training, field study sites, learning materials, student accommodation and transportation, student health services, amenities, student sports and recreational facilities.

Quality assurance (QA) and accreditation

All 19 schools have a unit specifically responsible for QA and accreditation. This unit has activities with various levels of personnel including dean, associate deans, assistant deans, department chairs, faculty members, supporting staff. Some schools also implemented these QA and accreditation activities in their affiliated hospitals. The main missions of this unit include quality improvement and accreditation, supervision and development of plans for improving educational quality, performance evaluation and collection of relevant data for quality assurance assessment.

Key performance indicators include 1) national license examination passing rate of students; 2) students' satisfaction on learning process and curriculum; 3) number of research and innovations; 4) grants for research and innovations; 5) incomes from clinical services and 6) academic positions of faculty members.

Important strategic plans for quality assurance and quality improvement include:

1) Continuous improvement based on indicators set by The Office of the Higher Education Commission (OHEC) and the Office for National Education Standards and Quality Assessment(ONESQA);
2) Implement Thailand Quality Award (TQA) or Education criteria for Performance Excellence (EdPEx) guideline;
3) Development to national and international standard by continuous quality improvement;
4) Accredited by World Federal Medical Education (WFME) and
5) Follow university and consortium of Thai medical schools.

Besides the evaluation by professional organizations, medical schools were externally evaluated by the following organizations:

1. The Office of the Higher Education Commission (OHEC);
2. The Office for National Education Standards and Quality Assessment (ONESQA);
3. The Office of the Public Sector Development Commission;
4. The Consortium of Thai Medical Schools/ The Thai Medical Council;
5. The Healthcare Accreditation Institute;
6. Thailand Quality Award and
7. The Education Criteria for Performance Excellence.

The major issues for accreditation/evaluation were: 1) overall performance; 2) physical structure; 3) curriculum and 4) administrative structure. The following suggestions/ recommendations were given by the external evaluators:

1) Administration:
   a) Administrators should create institute culture and core values;
   b) Administrators should communicate the concept of center of excellence and core values down to all units;
   c) Decentralization by having various committees;
   d) Using role model in building new generation of administrators;
   e) Increase communication channels in the organization;
   f) Increase two-way communication;
   g) Increase the use of IT for administration
   h) Develop systems and mechanisms to facilitate research productivity with impact;
   i) Promote career development for academic and supporting staff;
   j) Promote the achievement of research university;

2) Institute:
   a) Should be center of excellence in clinical services;
   b) Assure hospital accreditation;
   c) Monitor income and expenditure closely to ensure financial security;
   d) Promote safety, health and environment (SHE)
   e) Adequate basic facility support for academic and supporting staff;
   f) Analyze workforce (quantity and competency) requirement;
   g) Improve IT facilities to have information for teaching, services, research and administration;
   h) Having clinical services separated from teaching and research;
   i) Assign jobs or responsibilities appropriated for competencies;
   j) Appropriate competency based training;
   k) Give more attention to education services other than clinical services;
   l) Create channel to get services from professional services;
   m) Preparation to be medical hub for ASEAN;
3) Curriculum:
   a) Integration between pre-clinical and clinical learning;
   b) Create mechanism to continuously monitor and modify curriculum as appropriated;
   c) Integrate education with services and research;
   d) Promote students to have initiative and constructive thinking and enthusiasm in learning;
   e) Promote inter-professional education;
   f) Learning process should strictly follow what was written in the curriculum;
   g) Time allocated to each subject should be based on its credit;
   h) Increase general education according to the consensus of National Medical Education meeting;
   i) Pay more attention to evaluation/assessment processes;
   j) Use feedback/evaluation for improving learning process;
   k) Use nationally or internationally known faculty members as role model for students, academic and supporting staff;
   l) Faculty members should pay more attention to quality assurance;
   m) More health promotion learning in the curriculum;
   n) Emphasize more on second language;
   o) Produce more than on type of graduates e.g. practitioners, faculty members, researchers;
   p) Assure that graduates have enough competencies for their responsibilities.
4) Students
   a) Improve students' competencies and rate of passing national license examination;
   b) Increase One District of One Doctor (ODOD) to improve mal-distribution of doctors;
   c) Student recruitment should be based on population need;
   d) Monitor students' problems regularly and implement appropriate interventions;
   e) Allow students to have more free times for relaxation and extra-curricular activities;
   f) Consider students' competencies to work internationally;
   g) Promote learning process and activities so that students will achieve all competencies.

Key findings

1. About 60% of Thai medical schools are outside Bangkok. Only one private medical school which is in Bangkok (now there are two). All medical schools have affiliated hospitals ranging from district hospitals to regional hospitals and as many as 87 affiliated hospitals.
2. Less than 25% of medical schools have distinctive courses in health management, leadership and management, public mind and voluntarism, cultural sensitivity, health equity and comparative national health system.
3. Thirteen out of 19 medical schools had curriculum revision in the past two years.
4. The three most common curriculum approaches were problem based, community and system based learning. Only five medical schools used competency based learning.
5. The four most common methods of student evaluation were Multiple Choice Question (MCQ), Objective Structure Clinical Examination (OSCE), Modified Essay Question (MEQ) and long case examination.
6. Only one-third (6/19) of medical schools required their students to complete research work for graduation.
7. The three most common criteria used for faculty recruitment were doctoral degree or equivalent, outstanding academic performance and pedagogic competency.
8. The three most common reasons for faculty member attrition were family reasons, inadequate financial support and poor fringe benefits.
9. Most medical schools had reasonably adequate to highly adequate facilities except conference call, video conferences and telemedicine.
10. All 19 schools have a unit specifically responsible for QA and accreditation.
11. Medical schools were externally evaluated by many organizations including The Office of the Higher Education Commission (OHEC); The Office for National Education Standards and Quality Assessment (ONESQA); The Office of the Public Sector Development Commission; The Consortium of Thai Medical Schools/ The Thai Medical Council; The Healthcare Accreditation Institute; Thailand Quality Award and The Education Criteria for Performance Excellence.
12. Key performance indicators include
    1) national license examination passing rate of students;
    2) students' satisfaction on learning process and curriculum;

Key findings

3) number of research and innovations;
4) grants for research and innovations;
5) incomes from clinical services and
6) academic positions of faculty members.

13. The major issues for accreditation/evaluation were
1) overall performance;
2) physical structure;
3) curriculum and
4) administrative structure.

14. Key recommendations by external evaluators included:
a). Decentralization by having various committees;
b). Increase communication channels in the organization;
c). Increase the use of IT;
d). Promote career development for academic and supporting staff;
e). Promote the achievement of research university;
f). Analyze workforce (quantity and competency) requirement;
g). Assign jobs or responsibilities appropriated for competencies;
h). Create mechanism to continuously monitor and modify curriculum as appropriated;
i). Promote inter-professional learning;
j). More health promotion learning in the curriculum;
k). Emphasize more on second language;
l). Produce more than one type of graduates e.g. practitioners, researchers;
m). Student recruitment should be based on population need;

3.2.2 Medical Students

Responses were received from 56.3% (n=1,238) of the 2,200 medical students surveyed, who had completed 19 medical schools in academic year 2012. We compiled the data altogether with Bangladesh, China, India and Vietnam. Table 3.2.9 shows socio-demographic data of these students.

Table 3.2.9 Socio-demographic data of the students

	No (%) (Total respondents = 1,238)
Sex	
Male	512 (58.0)
Female	707 (42.0)
Mean age (sd) [Range]	24.9 (1.6) [23-40]
Domicile during childhood	
Urban	228 (20.3)
Semi-urban	183 (16.3)
Rural	713 (63.4)
Domicile during high school	
Urban	959 (85.5)
Semi-urban	110 (9.8)
Rural	53 (4.7)
Domicile of parents	
Urban	746 (62.4)
Semi-urban	214 (17.9)
Rural	236 (19.7)
Occupation of father	
Health professionals	100 (8.7)
Other professionals	456 (39.9)
Others or non-professionals	587 (51.4)
Occupation of mother	
Health professionals	123 (10.7)
Other professionals	369 (32.1)
Others or non-professionals	658 (57.2)

	No (%) (Total respondents = 1,238)
Education of father	
Below bachelor/diploma	795 (67.0)
Bachelor degree/diploma or above	392 (33.0)
Education of mother	
Below bachelor/diploma	773 (64.3)
Bachelor degree/diploma or above	430 (35.7)
Admission mode	
Normal track	721 (59.5)
Special track	491 (40.5)

58% of students were male (n=512). Age ranged from 23 to 40 years, with a mean age of 24.9 years. 713 (63.4 %) students were in rural areas during childhood. The comparable figure with a rural domicile during high school period was 53 (4.7 %) while only 19.7% of their parents had a rural domicile. The parent occupation was more likely to be non-professional. The percentages of students' fathers and mothers with education levels lower than bachelor or diploma were 67% and 64.3%, respectively. Almost half of the students (40.5%) were admitted through the 'collaborative project for increasing production of rural doctors (CPIRD)' and 'one district one doctor (ODOD)' compared to 59.5% through the original 'national entrance examination' tract.

Thirteen statements were used to evaluate students' attitude to work in rural areas including:

1. Rural work provides more opportunity to practice a variety of skills;
2. There are supportive environment when working in these areas;
3. Rural work limits communications with professional peers;
4. Rural work provides opportunities to work independently;
5. There are lack of amenities and entertainment in these areas;
6. People in these areas are friendly;
7. Rural work results in "isolation" from friend and family;
8. Working as medical doctor in hospitals in these areas is the most important contribution to health of population;

9. Medical school prepared me well to work in these areas;
10. Medical education inspires me to work in hospitals in these areas;
11. There are abundant amenities and entertainment in these areas;
12. Working in hospitals in these areas is most challenging;
13. Working in hospital in these areas provide opportunities for real-life problem solving.

Eighty-six percent of the students had positive attitude to work in rural areas. Ninety-two percent of students preferred working in public sector immediately after graduation comparing to 4% intending to work in private sector. However, the percentage of students preferring working in public sector was reduced to 85% in the next five-year work (Table 3.2.10).

Table 3.2.10 Job preference of students immediately after graduation and in the next five-year.

Job preference	After graduation		In the next five year	
	Freq.	Percent	Freq.	Percent
Pro-public	1,098	92.4	1,029	85.5
Pro-private	48	4.0	58	4.8
Going abroad	15	1.3	31	2.6
Others (including working for NGOs)	27	2.3	85	7.1
Total	1,188	100	1,203	100

Using a univariate analysis, the only factor associated with pro-public job preference immediately after graduation was admission mode (Table 3.2.11). Similarly, factors associated with pro-public job preference in the next five-year were domicile of parents and admission mode (Table 3.2.12).

By multiple logistic regression analysis, factors found to be negatively associated with immediate job preference in public sector include male gender (OR 0.55, 95%CI 0.33, 0.93) and maternal education (OR 0.41, 95%CI 0.19, 0.87) while admission by special track significantly increased immediate job preference in public sector (OR 1.90, 95%CI 1.03, 3.51). However, no factors were found to be associated with next-five year job preference in public sector.

Table 3.2.11 Factors associated with pro-public job preference immediately after graduation of students (univariate analysis)

Factors	Immediate job preference	
	Pro-public	Not Pro-public
Sex	[P = 0.058]	
Male	447	46
Female	647	44
Domicile during childhood	[P = 0.417]	
Urban	640	54
Semi-urban	172	9
Rural	205	15
Domicile during high school	[P = 0.438]	
Urban	865	68
Semi-urban	104	5
Rural	46	5
Domicile of parents	[P = 0.519]	
Urban	666	58
Semi-urban	200	12
Rural	211	17
Occupation of father	[P = 0.837]	
Health professionals	89	8
Other professionals	413	29
Others or non-professionals	535	40
Occupation of mother	[P=0.782]	
Health professionals	107	10
Other professionals	337	24
Others or non-professionals	595	47
Education of father	[P=0.572]	
Below bachelor/diploma	356	26
Bachelor degree/diploma or above	716	60
Education of mother	[P=0.100]	
Below bachelor/diploma	399	25
Bachelor degree/diploma or above	685	64
Admission mode	[P=0.001]*	
Normal track	628	68
Special track	460	22

Note: * Statistical significance over 95% level of confidence

Table 3.2.12 Factors associated with pro-public job preference in the next five-year (univariate analysis)

Factors	Next five-year job preference	
	Pro-public	Not Pro-public
Sex	[P=0.667]	
Male	601	75
Female	424	99
Domicile during childhood	[P=0.057]	
Urban	592	113
Semi-urban	164	19
Rural	197	25
Domicile of high school	[P=0.737]	
Urban	808	139
Semi-urban	95	13
Rural	46	7
Domicile of parents	[P=0.013]*	
Urban	612	123
Semi-urban	193	21
Rural	205	26
Occupation of father	[P=0.183]	
Health professionals	78	18
Other professionals	396	54
Others or non-professionals	498	84
Occupation of mother	[P=0.108]	
Health professionals	98	21
Other professionals	325	41
Others or non-professionals	550	99
Education of father	[P=0.086]	
Below bachelor/diploma	341	44
Bachelor degree/diploma or above	668	119
Education of mother	[P=0.394]	
Below bachelor/diploma	367	56
Bachelor degree/diploma or above	649	115
Admission mode	[P=0.011]*	
Normal track	590	117
Special track	431	55

Note: * Statistical significance over 95% level of confidence

The confidence of last year medical students on their administrative, communication, inter-professional, overall clinical, overall public competencies were 21.4%, 88.8%, 84.5%, 64.9% and 60.0% respectively.

By univariate analysis, factors found to be significantly associated with confidence in administrative competency were gender and domicile during high school, Table 3.2.13. Factor significantly associated with confidence on communication competency was the domicile of their parents, Table 3.2.14. Factors significantly associated with confidence on inter-professional skills were domicile during high school and their parents' domicile, as well as education of their father and mother, Table 3.2.15. Gender was significantly associated with their confidence on overall clinical competency, Table 3.2.16. Factors significantly associated with their confidence on overall public health competency were gender and domicile during childhood, Table 2.2.17. Multiple logistic regression analysis was used to identify factors associated with different competencies.

For administrative competency, factors positively associated confidence include male students, OR 2.5 (95% CI, 1.8-3.5) and parents living in semi-urban areas, OR 2.4 (95% CI 1.0-5.9) or urban areas, OR 2.8 (95% CI 1.3-5.8) while domicile during childhood had negative association, OR 0.4 (95% CI 0.2-0.8.

Students whose parents lived in urban areas had significantly more confidence in communication competency, OR 2.5 (95% CI 1.1-5.7)

Students who lived in urban (compared to rural areas) during high school had significantly more confidence in inter-professional communication competency, OR 3.1 (95% CI 1.5-6.3)

Factors positively associated with confidence in overall clinical competency include male gender, OR 1.8 (95% CI 1.3-2.4) and parents living in urban (compared to rural) areas, OR 1.9 (95% CI 1.0-3.6).

Regarding confidence in overall public health competency, male gender and domicile of parents in urban area (compared to rural) areas were found to be positively associated, OR 1.4 (95% CI 1.1-1.8) and 2.0 (95% CI 1.1-3.7) respectively while domicile during childhood was negatively associated, OR 0.4 (95% CI 0.2-0.8).

Table 3.2.13 Factors associated with confidence in administrative competency (univariate analysis)

Factors	Administrative competency	
	Yes	No
Sex	[P = 0.000]*	
Male	159	353
Female	102	605
Domicile during childhood	[P = 0.455]	
Urban	142	571
Semi-urban	40	143
Rural	54	174
Domicile during high school	[P = 0.101]*	
Urban	197	762
Semi-urban	20	90
Rural	17	36
Domicile of parents	[P = 0.730]	
Urban	156	590
Semi-urban	49	165
Rural	47	189
Occupation of father	[P = 0.206]	
Health professionals	17	83
Other professionals	87	369
Others or non-professionals	134	453
Occupation of mother	[P=0.423]	
Health professionals	24	99
Other professionals	69	300
Others or non-professionals	145	513
Education level of father	[P=0.789]	
Below bachelor/diploma	84	308
Bachelor degree/diploma or above	165	630
Education level of mother	[P=0.833]	
Below bachelor/diploma	89	341
Bachelor degree/diploma or above	164	609
Admission mode	[P=0.323]	
Normal track	161	560
Special track	98	393

Note: * Statistical significance over 90% level of confidence

Table 3.2.14 Factors associated with confidence in communication competency (univariate analysis)

Factors	Communication competency	
	Yes	No
Sex	[P = 0.345]	
Male	460	52
Female	623	84
Domicile during childhood	[P = 0.500]	
Urban	636	77
Semi-urban	163	20
Rural	197	31
Domicile during high school	[P = 0.163]	
Urban	858	101
Semi-urban	97	13
Rural	43	10
Domicile of parents	[P = 0.058]*	
Urban	669	77
Semi-urban	193	21
Rural	199	37
Occupation of father	[P = 0.734]	
Health professionals	87	13
Other professionals	409	47
Others or non-professionals	523	64
Occupation of mother	[P=0.604]	
Health professionals	106	17
Other professionals	329	40
Others or non-professionals	587	71
Education of father	[P=0.401]	
Below bachelor/diploma	353	39
Bachelor degree/diploma or above	703	92
Education of mother	[P=0.667]	
Below bachelor/diploma	384	46
Bachelor degree/diploma or above	684	89
Admission mode	[P=0.423]	
Normal track	645	76
Special track	432	59

Note: * Statistical significance over 90% level of confidence

Table 3.2.15 Factors associated with confidence in inter-professional skills (univariate analysis)

Factors	Inter-professional skills	
	Yes	No
Sex	[P = 0.536]	
Male	441	71
Female	600	107
Domicile during childhood	[P = 0.156]	
Urban	613	100
Semi-urban	162	21
Rural	187	41
Domicile during high school	[P = 0.001]*	
Urban	832	127
Semi-urban	93	17
Rural	36	17
Domicile of parents	[P = 0.034]*	
Urban	642	104
Semi-urban	190	24
Rural	190	46
Occupation of father	[P = 0.772]	
Health professionals	85	15
Other professionals	386	70
Others or non-professionals	506	81
Occupation of mother	[P=0.182]	
Health professionals	100	23
Other professionals	309	60
Others or non-professionals	571	87
Education of father	[P=0.058]*	
Below bachelor/diploma	380	50
Bachelor degree/diploma or above	646	127
Education of mother	[P=0.024]*	
Below bachelor/diploma	380	50
Bachelor degree/diploma or above	646	127
Admission mode	[P=0.539]	
Normal track	620	101
Special track	416	75

Note: * Statistical significance over 90% level of confidence

Table 3.2.16 Factors associated with confidence in overall clinical competency (univariate analysis)

Factors	Overall clinical competency	
	Yes	No
Sex	[P = 0.000]*	
Male	371	141
Female	420	287
Domicile during childhood	[P = 0.440]	
Urban	455	258
Semi-urban	126	57
Rural	149	79
Domicile during high school	[P = 0.335]	
Urban	623	336
Semi-urban	77	33
Rural	31	22
Domicile of parents	[P = 0.392]	
Urban	482	264
Semi-urban	147	67
Rural	148	88
Occupation of father	[P = 0.241]	
Health professionals	59	41
Other professionals	308	148
Others or non-professionals	380	207
Occupation of mother	[P=0.114]	
Health professionals	71	52
Other professionals	251	118
Others or non-professionals	427	231
Education of father	[P=0.522]	
Below bachelor/diploma	250	142
Bachelor degree/diploma or above	522	273
Education of mother	[P=0.820]	
Below bachelor/diploma	277	153
Bachelor degree/diploma or above	503	270
Admission mode	[P=0.675]	
Normal track	471	250
Special track	315	176

Note: * Statistical significance over 90% level of confidence

Table 3.2.17 Factors associated with confidence in overall public health competency (univariate analysis)

Factors	Overall public health competency	
	Yes	No
Sex	[P = 0.002]*	
Male	328	184
Female	391	316
Domicile during childhood	[P = 0.048]*	
Urban	403	310
Semi-urban	120	63
Rural	142	86
Domicile during high school	[P = 0.178]	
Urban	564	395
Semi-urban	74	36
Rural	29	24
Domicile of parents	[P = 0.199]	
Urban	430	316
Semi-urban	138	76
Rural	139	97
Occupation of father	[P = 0.288]	
Health professionals	54	46
Other professionals	282	174
Others or non-professionals	344	243
Occupation of mother	[P=0.569]	
Health professionals	69	54
Other professionals	226	143
Others or non-professionals	388	270
Education of father	[P=0.983]	
Below bachelor/diploma	231	161
Bachelor degree/diploma or above	469	326
Education of mother	[P=0.959]	
Below bachelor/diploma	253	177
Bachelor degree/diploma or above	456	317
Admission mode	[P=0.781]	
Normal track	423	298
Special track	292	199

Note: * Statistical significance over 90% level of confidence

Key findings

1. Most students inhabited in rural area during childhood 713 (63.4 %) compared with a rural domicile during high school period 53 (4.7 %) while only 19.7% of their parents claimed to have a rural domicile.
2. Eighty-five percent of the students were more likely to have a positive attitude to work in rural, remote or hardship areas.
3. Ninety-two percent of students preferred working in public sector. However, the percentage of students preferring working in public sector was reduced to 85% in the next five-year work.
4. Normal track admission had an influence on pro-public work more than the special track for both the immediate and next five-year job preference.
5. Factors found to be associated with immediate job preference in public sector include male gender (OR 0.55, 95%CI 0.33, 0.93), maternal education (OR 0.41, 95%CI 0.19, 0.87) and admission by special track (OR 1.90, 95%CI 1.03, 3.51).
6. No factors were found to be associated with next-five year job preference in public sectors.
7. The confidence of last year medical students on their administrative, communication, Inter-professional, overall clinical, overall public competencies were 21.4%, 88.8%, 84.5%, 64.9% and 60.0% respectively.
8. Factors associated with competency in administrative work included male gender (OR 2.53, 95%CI 1.83, 3.50), living in urban areas during childhood (OR 0.38, 95% CI 0.19, 0.76) and parents living in semi-urban (OR 2.44, 95% CI 1.02, 5.86) or urban areas (OR 2.78, 95% CI 1.33, 5.81)
9. Factors associated with competency in inter-professional included domicile during high school.
10. Factors associated with overall clinical competency included male gender and domi cile of parents.
11. Factors associated with overall PH competency included male gender, domicile during childhood and domicile of parents.

3.2.3 Medical Graduates

Personal profiles

The survey was executed between June 2012 and July 2013. The total number of respondents was 570. Most of the respondents were working in the public sector and were residing in Bangkok, Table 3.2.18.

Table 3.2.18 Provincial area of respondent

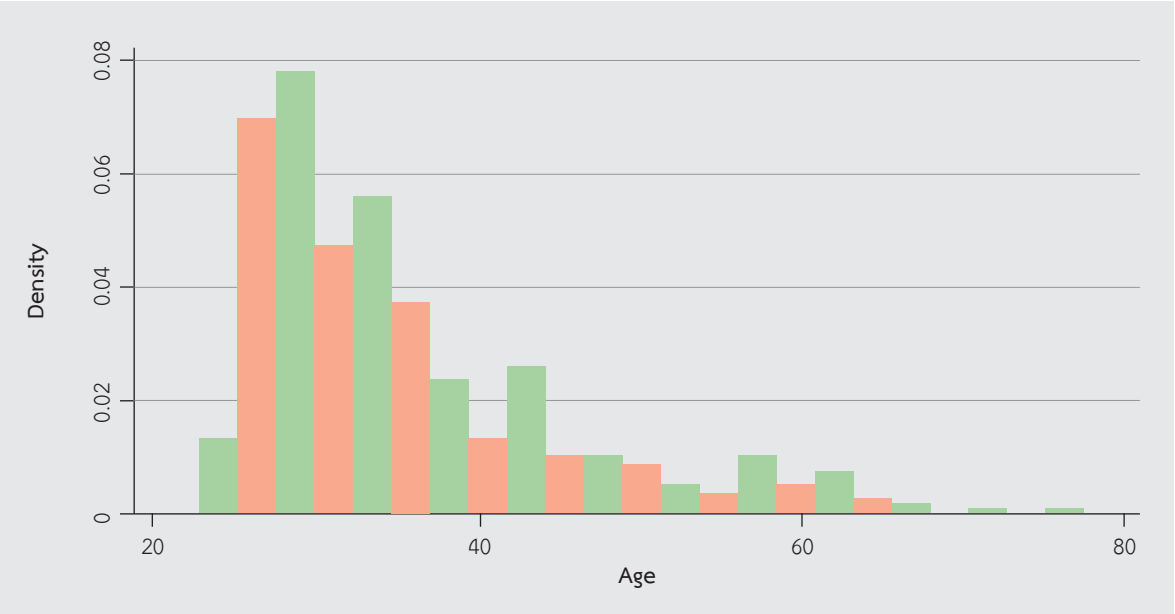
Province	Freq.	Percent
Bangkok	271	47.5
Pitsanulok	106	18.6
Nakornsrithammaraj	70	12.3
Ubolratchathani	52	9.1
Chainat	29	5.1
Nongbualumpoo	16	2.8
Pangna	12	2.1
Pathumthani	8	1.4
Mahasarakarm	6	1.1
Total	570	100

Females marginally outnumber males, Table 3.2.19. Mean age of respondents was 34.9 while median age was 33. Distribution of age was skewed to the right, Figure 3.1.

Table 3.2.19 Gender of respondents

Gender	Freq.	Percent
Male	249	43.7
Female	321	56.3
Total	570	100

Figure 3.1 Distribution of age



Data about residential areas of respondents suggested that about three-quarter of respondents spent their early life (0-15 years old) in urban areas, corresponding to the figure of residential areas of their parents. Over 90% of respondents studied high school level in urban areas. It should be noted that 'urban' referred to 'Bangkok' and 'municipality area in other provinces', 'semi-urban' referred to 'outside municipality area but inside Tambon (sub-district) administrative area', while 'rural' referred to 'outside sub-district area', Table 3.2.20.

Table 3.2.20 Residential areas

Early life	Freq.	Percent
Rural	64	11.3
Semi-urban	81	14.3
Urban	422	74.4
Total	567	100
Parents	**Freq.**	**Percent**
Rural	76	13.7
Semi-urban	87	15.7
Urban	392	70.6
Total	555	100
High schools	**Freq.**	**Percent**
Rural	12	2.1
Semi-urban	39	6.9
Urban	517	91.0
Total	568	100

Father and mother profiles were pretty similar. About one-third of either father or mother held bachelor degree and used to work in professional sector. More specifically, almost 10% of graduates' parents used to work as health professionals, Table 3.2.21.

Table 3.2.21 Profiles of parents

Father's occupation	Freq.	Percent
Other jobs	346	61.0
Other professionals	171	30.2
Health professionals	50	8.8
Total	567	100
Mother's occupation	**Freq.**	**Percent**
Other jobs	389	68.5
Other professionals	127	22.4
Health professionals	52	9.1
Total	568	100
Father's education	**Freq.**	**Percent**
Bachelor degree	176	32.0
Post-bachelor degree	103	18.7
Primary school	101	18.3
Secondary education	86	15.6
Diploma/vocational	65	11.8
Never attended	20	3.6
Total	551	100
Mother's education	**Freq.**	**Percent**
Bachelor degree	177	31.7
Primary school	145	25.9
Secondary education	81	14.5
Post-bachelor degree	79	14.1
Diploma/vocational	52	9.3
Never attended	25	4.5
Total	559	100

Respondents' attitudes

Respondents tended to have positive attitudes towards working in rural areas, in particular, for the statements describing that 'Work in hospital in these areas provide opportunities for real-life problem solving' and 'Work as a medical doctor in hospitals in these areas is the most important contribution to health of population'. It should be noted that '5' reflected 'strongly agree' whereas '1' referred to 'strongly disagree', Table 3.2.22.

Table 3.2.22 Attitudes toward working in rural areas

Variable	No	Mean	Std. Dev.	Min	Max
1. Work in these areas provides opportunities to use various skills	568	3.9	0.9	1	5
2. There are supportive environment when working in these areas	565	2.8	1.0	1	5
3. Work in these areas limits communications with professional peers	562	2.8	1.1	1	5
4. Work in these areas provides opportunities to work independently	565	3.5	1.0	1	5
5. There are lack of amenities and entertainment in these areas	564	3.2	1.1	1	5
6. People in these areas are friendly	564	4.2	0.8	1	5
7. Work in these areas results in "isolation" from friend and family	566	3.6	1.2	1	5
8. Work as a medical doctor in hospitals in these areas is the most important contribution to health of population	567	4.2	0.8	1	5
9. Medical college/institute prepared me well to work in these areas	567	3.2	1.1	1	5
10. Medical education inspires me to work in hospitals in these areas	564	2.9	1.0	1	5
11. There are abundant amenities and entertainment in these areas	565	2.3	1.0	1	5
12. Work in hospitals in these areas is most challenging	567	3.8	0.9	1	5
13. Work in hospital in these areas provide opportunities for real-life problem solving	567	4.2	0.8	1	5

Working and education profiles

Approximately half of the respondents joined medical schools through national entrance examination (55.5%). Significant proportion of respondents were recruited either through CPIRD/ODOD program[12] (23.4%) or regional quota of each individual medical school (18.1%), Table 3.2.23.

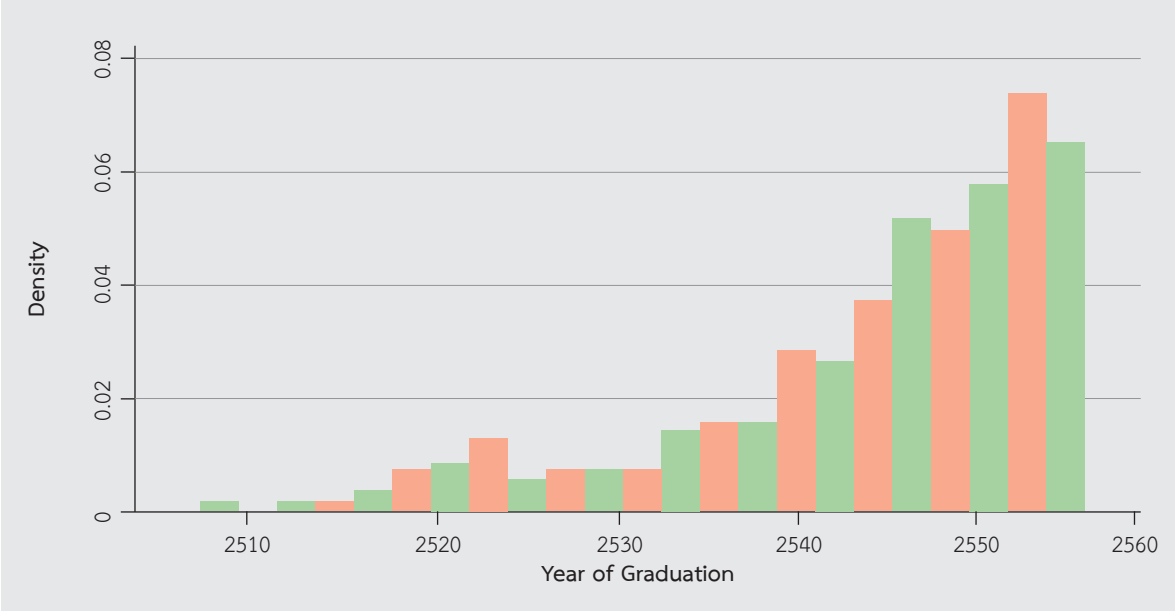
Table 3.2.23 Admission mode into medical schools

Mode of admission	Freq.	Percent
National entrance	313	55.5
CPIRD/ODOD plus direct admission	132	23.4
Regional quota of specific university	102	18.1
Other	17	3.0
Total	564	100

[12] CPIRD/ODOD = Collaborative Project for Increasing Production of Rural Doctors/One Doctor One District

More than 80% of respondents graduated after 1997 (2540 BE). The earliest graduated year was 1964 (2507 BE), Figure 3.2.

Figure 3.2 Distribution of graduated year



Approximately two-third of respondents graduated from medical schools inside Bangkok and vicinity, Table 3.2.24.

Table 3.2.24 Location of medical school

Location	Freq.	Percent
Inside Bangkok & vicinity	368	65.1
Outside Bangkok & vicinity	197	34.9
Total	565	100

Forty percent of respondents experienced only one workplace. The equivalent figure was found among respondents who passed two working places. Only 1% of respondents had ever experienced at least 4 workplaces, Table 3.2.25.

Table 3.2.25 Number of workplaces

Number	Freq.	Percent
1	147	40.9
2	145	40.4
3	63	17.6
4	4	1.1
Total	359	100

Note: Number of work places in this case was counted only those work places containing complete records of starting and ending dates. Observations in the second, third and fourth work place shown in the following tables therefore varied significantly since some respondents gave information about their work places without describing starting date and duration.

Respondents spent about 24 months on average (in this case, referring to median) in the first workplace. For the second and third workplace, the median working months were 36. Besides, the median working months of the fourth work place was 55, Table 3.2.26.

Table 3.2.26 Duration (months) of each workplace

Duration (months)	Mean	median	standard deviation	min	max	Inter-quartile range
1st working place	51.7	24	70.3	1	420	36
2nd working place	57.8	36	65.3	2	348	56
3rd working place	72.0	36	77.9	10	312	60
4th working place	58.0	55	52.9	12	111	91

The more workplaces respondents ever experienced was associated with a tendency to move from 'rural' to 'urban', from 'public' to 'private', from 'service' to 'non-service' sector, and from 'different area from hometown' to 'within the same area with hometown'. Almost all respondents were full-time workers regardless of the number and sequence of workplaces, Table 3.2.27 and 3.2.28.

Table 3.2.27 Workplace characteristics (1)

Type of work (1)	Freq.	Per cent
Service	504	92.7
Academia	35	6.4
Others	5	0.9
Total	544	100

Work affiliation (1)	Freq.	Per cent
Public	542	98.37
Private	9	1.63
NGOs	0	0.00
Total	551	100

Location of workplace (1)	Freq.	Per cent
Urban area	397	72.3
Rural/remote area	151	27.5
Outside country	1	0.2
Total	549	100

Type of work (2)	Freq.	Per cent
Service	313	79.8
Academia	74	18.9
Others	5	1.3
Total	392	100

Work affiliation (2)	Freq.	Per cent
Public	376	94.0
Private	24	6.0
NGOs	0	0.0
Total	400	100

Location of workplace (2)	Freq.	Per cent
Urban area	229	56.3
Rural/remote area	176	43.2
Outside country	2	0.5
Total	407	100

Type of work (3)	Freq.	Per cent
Service	166	77.6
Academia	44	20.5
Others	4	1.9
Total	214	100

Work affiliation (3)	Freq.	Per cent
Public	201	91.4
Private	17	7.7
NGOs	2	0.9
Total	220	100

Location of workplace (3)	Freq.	Per cent
Urban area	168	75.3
Rural/remote area	51	22.9
Outside country	4	1.8
Total	223	100

Type of work (4)	Freq.	Per cent
Service	93	74.4
Academia	31	24.8
Others	1	0.8
Total	125	100

Work affiliation (4)	Freq.	Per cent
Public	89	71.8
Private	31	25.0
NGOs	4	3.2
Total	124	100

Location of workplace (4)	Freq.	Per cent
Urban area	100	86.2
Rural/remote area	15	12.9
Outside country	1	0.9
Total	116	100

Table 3.2.28 Work characteristics (2)

Location of workplace in relation to hometown (1)	Freq.	Per cent	Full time or part time (1)	Freq.	Per cent
Within the same area with hometown	174	32.1	Full-time	530	99.6
Different area from hometown	368	67.9	Part-time	2	0.4
Total	542	100	Total	532	100

Location of workplace in relation to hometown (2)	Freq.	Per cent	Full time or part time (2)	Freq.	Per cent
Within the same area with hometown	155	39.2	Full-time	390	98.7
Different area from hometown	240	60.8	Part-time	5	1.3
Total	395	100	Total	395	100

Location of workplace in relation to hometown (3)	Freq.	Per cent	Full time or part time (3)	Freq.	Per cent
Within the same area with hometown	96	44.7	Full-time	213	98.2
Different area from hometown	119	55.3	Part-time	4	1.8
Total	215	100	Total	217	100

Location of workplace in relation to hometown (4)	Freq.	Per cent	Full time or part time (4)	Freq.	Per cent
Within the same area with hometown	44	43.6	Full-time	107	99.1
Different area from hometown	57	56.4	Part-time	1	0.9
Total	101	100	Total	108	100

During the inception phase, more than half of respondents worked more than 60 hours per week. However, working hours reduced when respondents had more job experiences, Table 3.2.29.

Table 3.2.29 Working hours (per week)

average working hours (1)	Freq.	Percent
<20 hours	10	1.8
20-39 hours	30	5.5
40-49 hours	119	21.8
50-59 hours	85	15.6
>=60 hours	301	55.2
Total	545	100

average working hours (2)	Freq.	Percent
<20 hours	11	2.7
20-39 hours	21	5.2
40-49 hours	115	28.3
50-59 hours	72	17.7
>=60 hours	188	46.2
Total	407	100

average working hours (3)	Freq.	Percent
<20 hours	10	4.4
20-39 hours	9	3.9
40-49 hours	64	28.2
50-59 hours	41	18.1
>=60 hours	103	45.4
Total	227	100

average working hours (4)	Freq.	Percent
<20 hours	14	11.7
20-39 hours	6	5.0
40-49 hours	36	30.0
50-59 hours	18	15.0
>=60 hours	46	38.3
Total	120	100

Respondents seemed to have higher satisfaction when they moved from one place to the next. The highest level of satisfaction was found in 'Overall job satisfaction' and 'Safe working environment', Table 3.2.30. It should be noted that '1' referred to 'very dissatisfied' and '5' referred to 'very satisfied

Table 3.2.30 Satisfaction of each work place

Variable	No	Mean	Std.Dev.	Min	Max
1. Overall job satisfaction					
1st workplace	542	3.7	0.8	1	5
2nd workplace	400	3.8	0.8	1	5
3rd workplace	227	3.9	0.8	1	5
4th workplace	115	3.9	0.8	1	5
2. Satisfaction on basic salary					
1st workplace	529	3.1	1.0	1	5
2nd workplace	394	3.3	1.0	1	5
3rd workplace	222	3.2	1.0	1	5
4th workplace	113	3.4	1.0	1	5
3. Satisfaction on additional financial incentives					
1st workplace	514	3.0	1.2	1	5
2nd workplace	379	3.2	1.1	1	5
3rd workplace	214	3.2	1.2	1	5
4th workplace	113	3.3	1.2	1	5
4. Satisfaction on housing benefits					
1st workplace	520	3.4	1.0	1	5
2nd workplace	381	3.3	1.2	1	5
3rd workplace	218	3.2	1.2	1	5
4th workplace	117	3.1	1.2	1	5
5. Opportunity for career advancement					
1st workplace	531	3.2	1.0	1	5
2nd workplace	394	3.4	1.0	1	5
3rd workplace	220	3.7	1.0	1	5
4th workplace	118	3.8	1.0	1	5
6. Opportunity for in-service training, or continued education					
1st workplace	534	3.4	1.0	1	5
2nd workplace	395	3.5	1.1	1	5
3rd workplace	221	3.8	1.0	1	5
4th workplace	118	3.8	1.0	1	5

Variable	No	Mean	Std.Dev.	Min	Max
7. Adequacy of equipment and facilities					
1st workplace	531	3.6	0.9	1	5
2nd workplace	393	3.5	1.0	1	5
3rd workplace	222	3.8	0.9	1	5
4th workplace	117	4.0	0.9	2	5
8. Safe working environment					
1st workplace	534	3.6	0.9	1	5
2nd workplace	391	3.7	0.9	1	5
3rd workplace	220	3.9	0.8	2	5
4th workplace	111	4.0	0.8	1	5
9. Satisfaction on workload					
1st workplace	533	3.3	1.1	1	5
2nd workplace	394	3.5	1.0	1	5
3rd workplace	218	3.5	1.0	1	5
4th workplace	103	3.6	1.1	1	5

About one-fifth of the respondents had considered going abroad after graduation. Half of those planning to go abroad wished to go to USA, Table 3.2.31 and 3.2.32.

Table 3.2.31 Intention to go

Plan to go abroad	Freq.	Percent
No	446	80.2
Yes	110	19.8
Total	556	100

Table 3.2.32 Country considered

Country	Freq.	Percent
USA	46	54.8
UK	11	13.1
Canada	8	9.5
Germany	5	6.0
Singapore	4	4.8
Japan	3	3.6
Australia	2	2.4
Laos	2	2.4
Spain	1	1.2
Taiwan	1	1.2
Vietnam	1	1.2
Total	84	100

About working plan in the next five years, over half of respondents planned to stay in the current work place while approximately 5% of respondents wished to move to other private health facilities, Table 3.2.33.

Table 3.2.33 Working plan in the next 5 years

Working plan	Freq.	Percent
Work in the same place	286	50.9
Plan to move to other public health facilities	97	17.3
Continue further education	77	13.7
Others	59	10.5
Plan to move to other private health facilities	28	5.0
Move to academia and research institutes	12	2.1
Move to administrative position in governmental authorities	3	0.5
Total	562	100

Competency

Respondents had highest confidence in inter-professional collaboration and lowest confidence in the management of difficult labour, Table 3.2.34. It should be noted that '1' referred to 'very unconfident' and '5' referred to 'very confident'.

Table 3.2.34 Confidence level in various competency

Variable	No	Mean	Std.Dev.	Min	Max
Public health service	367	3.9	0.7	1	5
Health administration	368	2.7	1.0	1	5
Intra-professional communication	368	4.0	0.7	2	5
Communication with community	368	3.8	0.7	2	5
Inter professional collaboration	367	4.1	0.6	1	5
Internal medicine management	368	3.6	1.0	1	5
OB-GYN management	367	3.0	1.0	1	5
Pediatric management	365	3.0	1.0	1	5
Surgical management	366	3.2	1.0	1	5
General patient management	367	3.6	0.9	1	5
Difficult labour management	367	2.4	1.1	1	5
Referral management	364	3.9	0.9	1	5
Overall clinical competency	367	3.8	0.7	1	5
Overall public health competency	367	3.6	0.8	1	5

About 80% of respondents had ever attended 'Continuous Medical Education (CME)' workshop in the last 5 years. (see table 3.2.36)

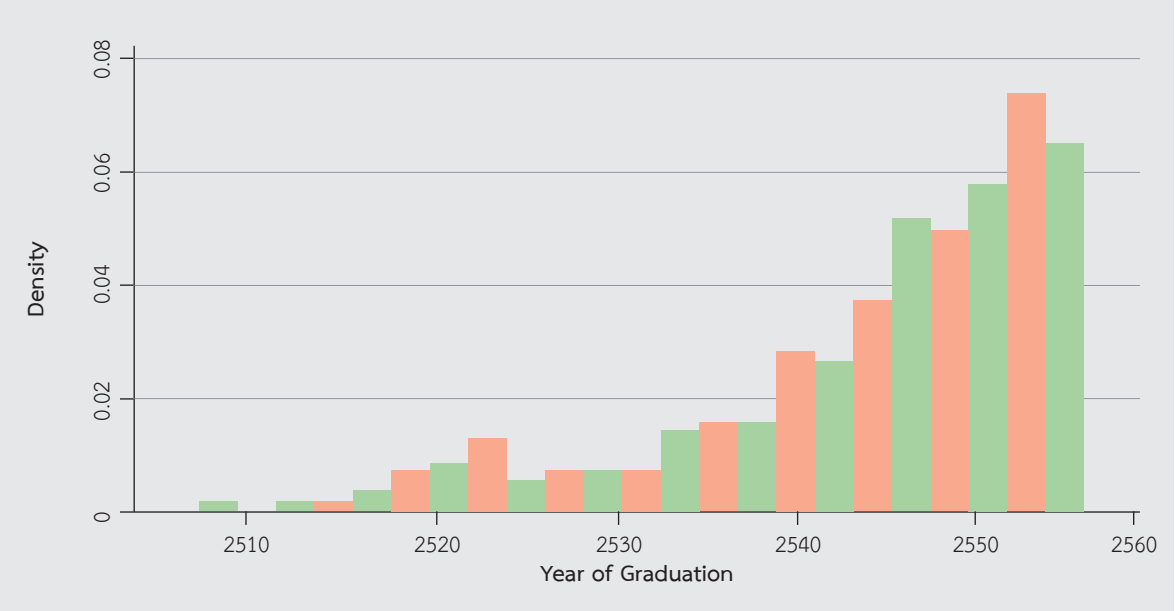
Table 3.2.35 CME

Attended CME in the last 5 years	Freq.	Percent
No	100	18.1
Yes	454	81.9
Total	554	100

Extra-analysis

The median survival time of staying in public sector was about 260 months. However interpretation should be made carefully as the survey was undertaken mostly in public health facilities. The data therefore inevitably faced some extents of information and selection bias, Figure 3.3.

Figure 3.3 Survival analysis of moving from public to private sector



Survival time in rural area tended to be shorter than survival time in public sector, reflecting geographical movement under the same affiliation between different health facilities. The overall survival time was almost 60 months. Little difference of median survival time between those graduated from medical schools in Bangkok and vicinity and those from medical schools in the upcountry was found. This marginal difference however was not statistically significant, p-value = 0.830, Figure 3.4 and 3.5.

Figure 3.4 Survival analysis of moving from rural to urban area

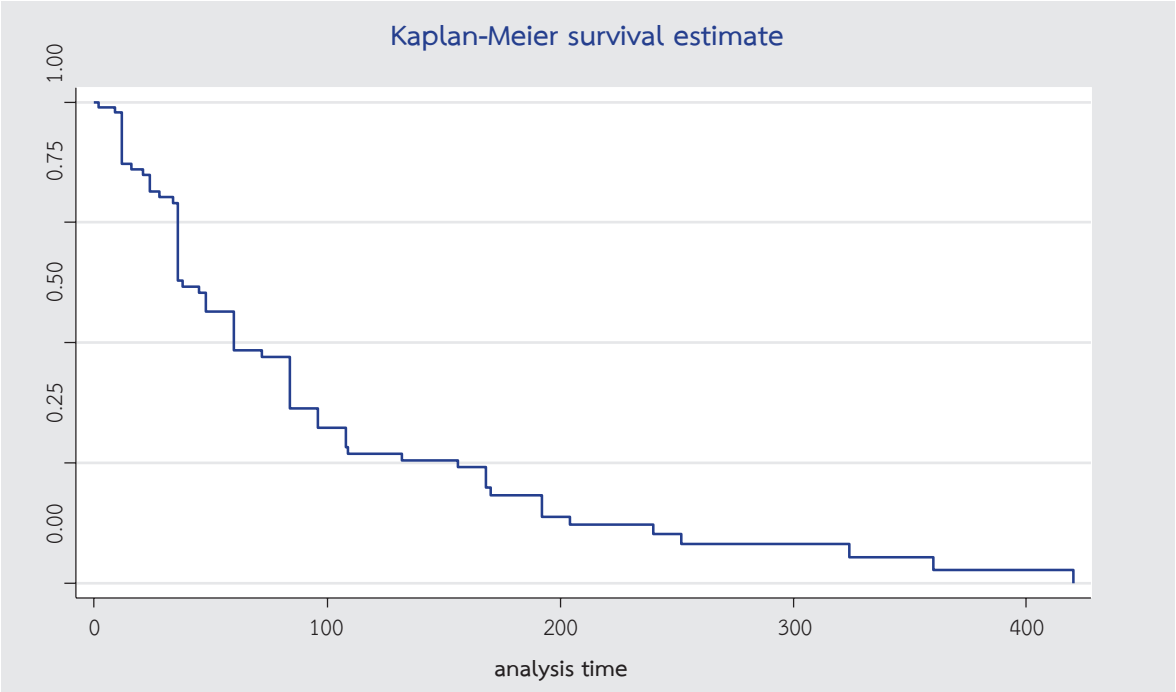
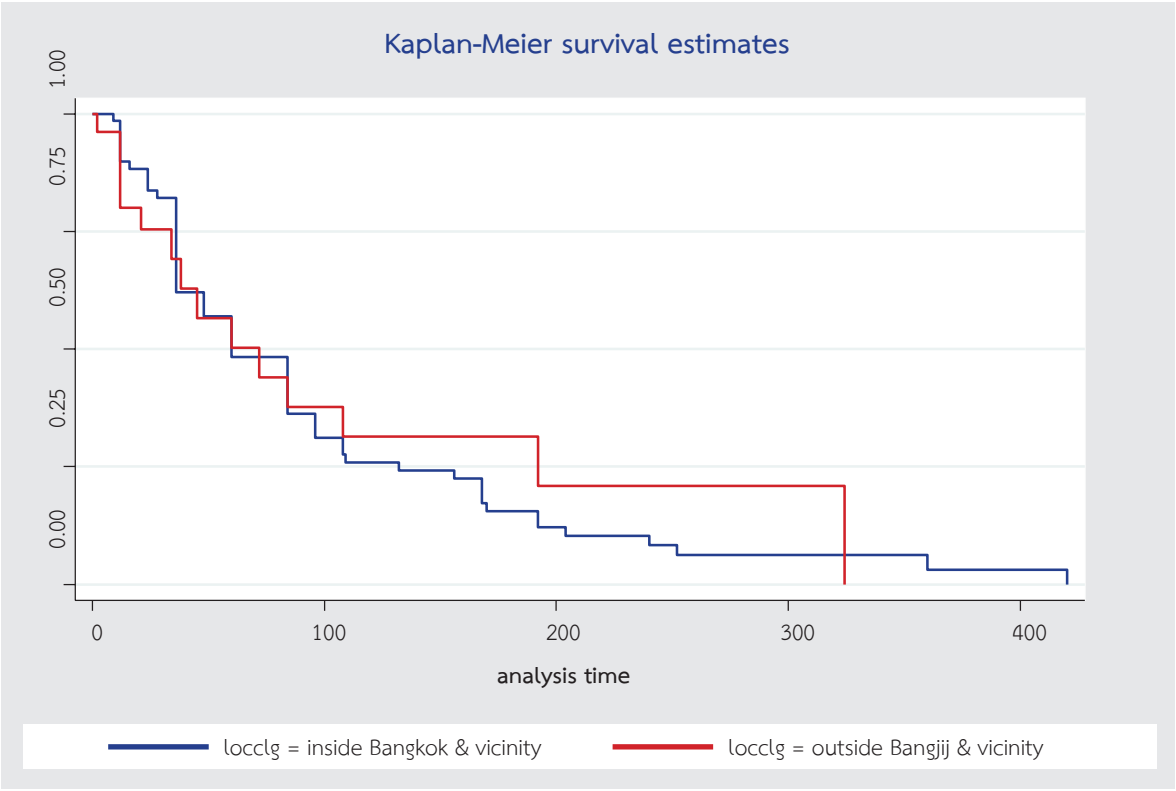


Figure 3.5 Survival analysis of moving from rural to urban area comparing between different locations of medical schools



Key findings

1. Respondents tended to have positive attitudes towards working in rural areas, in particular, for the statements describing that *'Work in hospital in these areas provide opportunities for real-life problem solving' and 'Work as a medical doctor in hospitals in these areas is the most important contribution to health of population'.*
2. Approximately half of the respondents joined medical schools through national entrance examination (55.5%) while 23.4% and 18.1% were through CPIRD/ODOD program and regional quota of each individual medical school respectively.
3. Forty percent of respondents experienced only one workplace, another 40% had passed two working places and about 20% already had three or more workplaces.
4. Median duration of work increased with number of workplaces, 24 months in the first workplace, 36 months for the second and third and 55 months for the fourth work place.
5. Increasing number of workplaces was associated with a tendency to move from 'rural' to 'urban', from 'public' to 'private', from 'service' to 'non-service' sector, and from 'different area from hometown' to 'within the same area with hometown'.
6. Job satisfaction increased with number of workplaces. The highest level of satisfaction was found in *'Overall job satisfaction' and 'Safe working environment'*.
7. Respondents had highest confidence level in inter-professional collaboration and lowest confidence in the management of difficult labour.

3.3 Nursing education assessment

3.3.1 Nursing Institution

This survey was conducted in 40 nursing schools and 36 of which (90.00%) responded to quantitative survey and also 36 deans/directors of 36 schools were interviewed and 90 faculty members and administrators were participated in focus group discussion. They were 15 schools (42.00%) under authorization of the Ministry of Public Health (MOPH) and 11 schools (31.00%) of Ministry of Education (MOE). The other 10 (28.00%) were private schools. Out of 36 schools, 27 (75.00%) were established for more than 15 years and 9 other schools (25.00%) were less than 15 years.

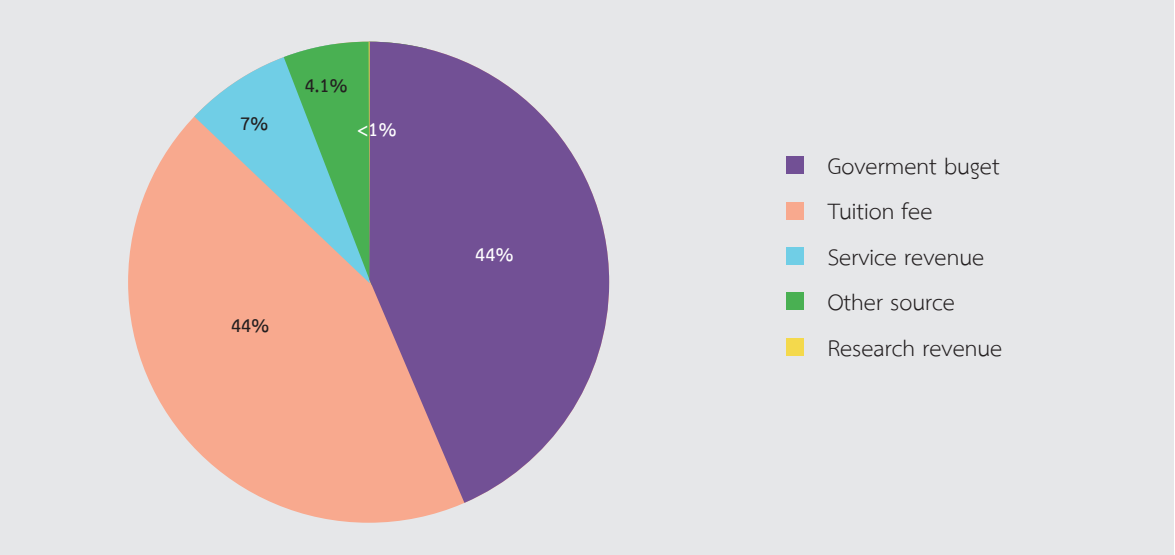
Most schools (27) were located inside major city areas (75.00%). The majority (28 schools) were located in upcountry (77.78%) where 14 schools under MOPH yielded the largest proportion (93.00%), followed by 8 schools under MOE and 6 private schools (73.00% and 60.00%, respectively). Eight schools were located in Bangkok and vicinity where 4 schools (40.00%) were private and 3 schools (27.27%) were under MOE and only one was under MOPH (6.67%).

The school's board of administration in 27 schools (69.00%) was appointed by the director or dean. Those in 11 schools (31.00%) were appointed by the school's president. Regular term of schools' board of administration varied from 2 to 4 years. For a component of administrative board, half of schools (53.00%) did not have representatives from stakeholder from services providers and people who were on demand side.

All schools had specific policy for curricula revision. All schools have mechanisms for re-accreditation every 3-5 years by the Thailand Nursing and Midwifery Council and by Higher Education Commission and Office for National Education Standards and Quality Assessment (ONESQA) every year. The accreditation procedure gives priority to the following aspects on the importance basis: overall performance of a school, curriculum, and infrastructures.

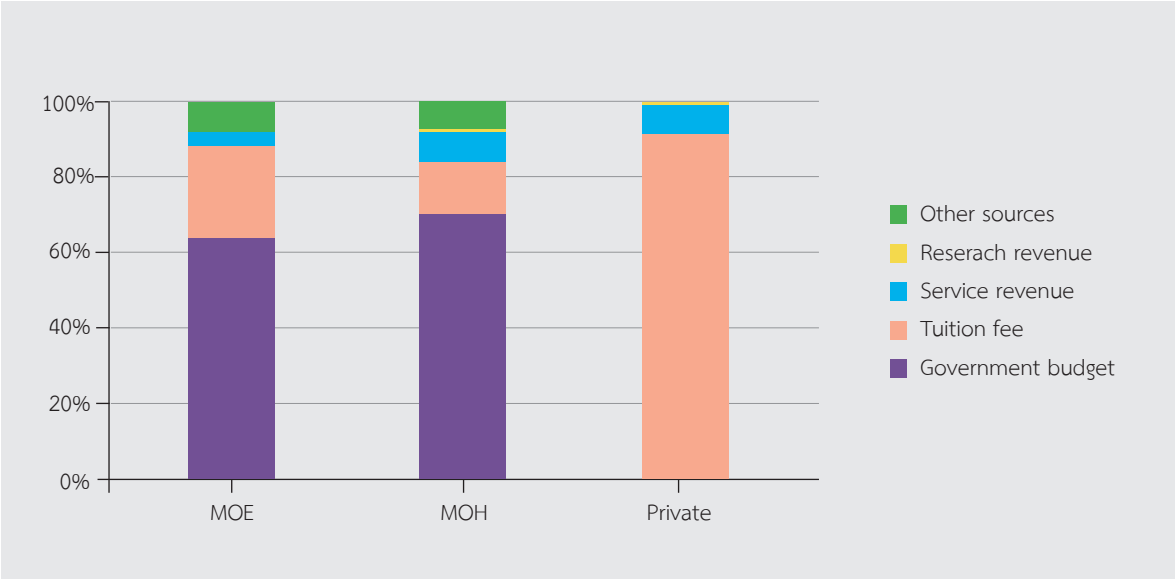
The majority of the budget were equally allocated from the government and tuition fees (44%). Seven percent of the budget was from schools' services and 5% came from other sources (Figure 3.6).

Figure 3.6 Source of school budget (Data available from 25 schools)



Among 16 public schools, seven from MOE, 9 from MOPH, the majority of budget (60-70%) was obtained from government in comparison to the total school budget. Among 8 private schools, most of their budget (92%) was from tuition fees (Figure 3.7).

Figure 3.7 Sources of budget differentiated by school types (Data available from 25 schools)



Most schools had adequate facilities. Supports for field-visit yielded the highest mean score at 4.48. Facilities regarding telemedicine, video and conference call technology were rated as the lowest mean scores (1.26-1.96) (Table 3.3.1).

Table 3.3.1 Adequacy of school facilities

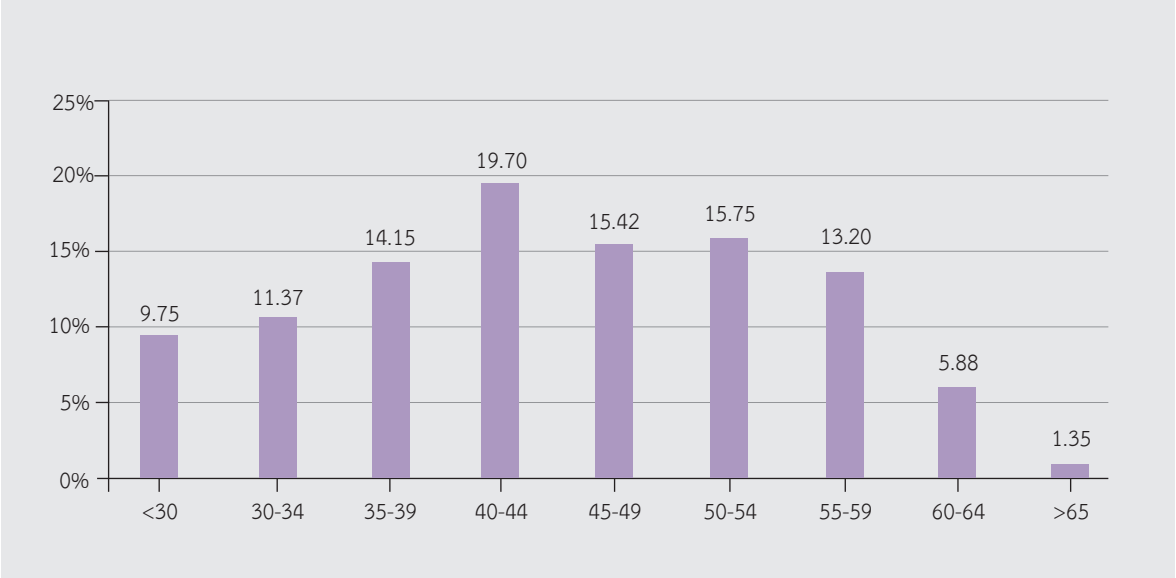
Facilities	Mean	Std. Dev.	Min	Max
Supports for field-visit	4.48	0.94	1	5
Computer	4.37	0.93	2	5
Health care service	4.37	0.88	2	5
In-house library search service	4.33	0.78	2	5
Transportation service	4.33	0.78	3	5
Accommodation	4.22	0.89	2	5
Building	4.19	0.40	4	5
Classroom	4.19	0.88	2	5
Library facilities	4.15	0.66	2	5

Facilities	Mean	Std. Dev.	Min	Max
Laboratory	4.15	0.91	2	5
Internet	4.15	0.91	2	5
Computer training	4.07	1.00	2	5
Learning materials	4.07	0.55	3	5
Amenities	4.04	1.16	1	5
Library search training and support	4.00	1.04	2	5
Sport	3.81	0.79	2	5
Other IT training	3.78	0.93	2	5
Inter-library search service	3.74	0.98	1	5
Skill lab	3.70	1.44	1	5
Telemedicine	1.96	1.45	1	5
Video call technology	1.37	0.88	1	4
Conference call technology	1.26	0.76	1	4

(1 = extremely inadequate .... 5 = abundant)

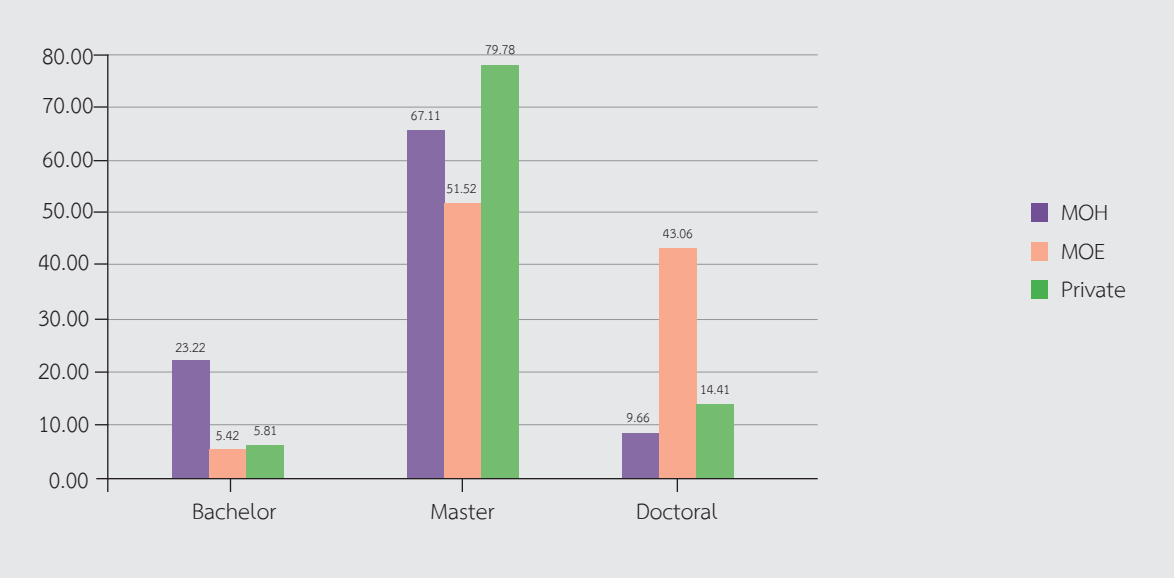
According to staff profile, 50% of schools' teaching staff aged more than 45 (Figure 3.8).

Figure 3.8 Age profile of teaching staff



Most teaching staff completed Master's degree (64%), followed by doctorate (24%), and bachelor's degree (12%). There were more proportion of teaching staffs with bachelor degree in MOPH's nursing schools than others while MOE had more doctoral teaching staff than others (Figure 3.9).

Figure 3.9 Qualification of teaching staff (where data available)



Regarding appointment of teaching staff outside school as adjunct faculty, 24 schools (66.67%) reported that they had the policy while 12 schools (33.33%) had not.

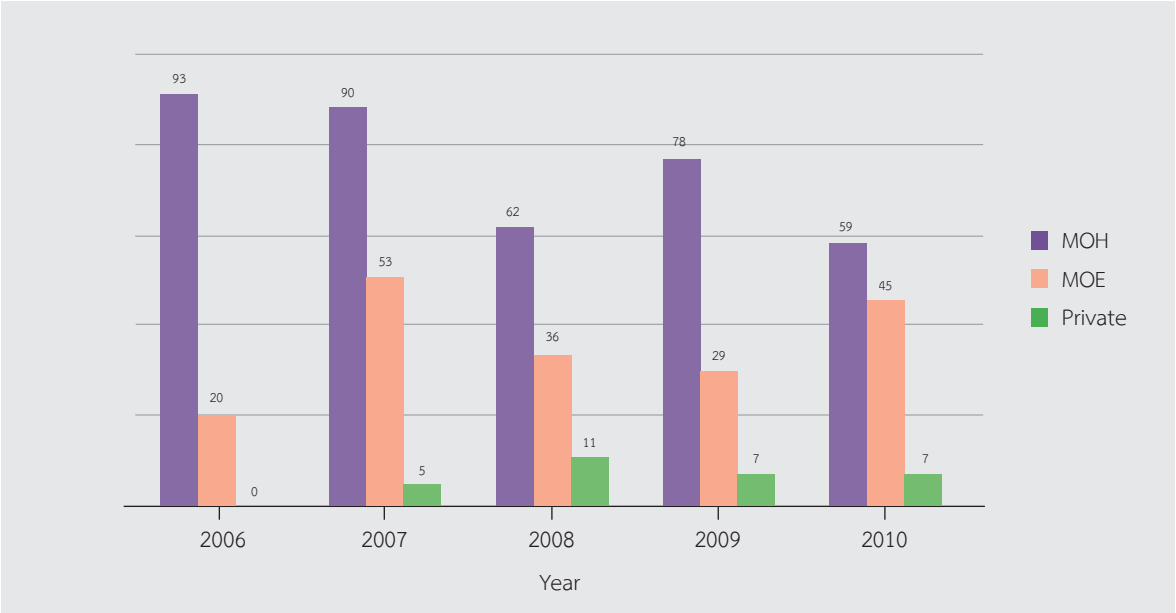
For teaching staff recruitment, having doctoral degree was the most preferable criteria employed by 29 schools (80.56%)followed by demonstrating good teaching skills (58.33%), outstanding academic profile during years of study (41.67%), and secondary language proficiency abilities (33.33%). There were 3 schools (8.33%) that required their staff to have rural experience (Table 3.3.2).

Table 3.3.2 Important criteria for recruiting new teaching staff

Criteria for recruiting new staff	Yes N (%)	No N (%)	Total N (%)
Having doctoral degree	29 (80.56)	7 (19.44)	36 (100.00)
Demonstrating good teaching skills	21 (58.33)	15 (41.67)	36 (100.00)
Outstanding academic profile during years of study	15 (41.67)	21 (58.33)	36 (100.00)
Secondary language proficiency	12 (33.33)	24 (66.67)	36 (100.00)
Rural experience	3 (8.33)	33 (91.67)	36 (100.00)

Pay for performance and scholarship were used to motivate and improve performance in 22 schools (61.11%). From 2006 to 2010, the number of teaching staff recruitment decreased constantly from 93 to 59 posts (36.55%). This is in contrast to the number of resignation and retirement rate that increased from 20% in 2006 up to 88% in 2010 (Figure 3.10).

Figure 3.10 Staff dynamic from 2006 to 2010 (data available from 19 schools)



The most common reasons for faculty member attrition were family reason (41.67%), needed more challenging work (22.22%), economic reason (13.89%), and needed more promising work opportunities (8.33%) (Table 3.3.3).

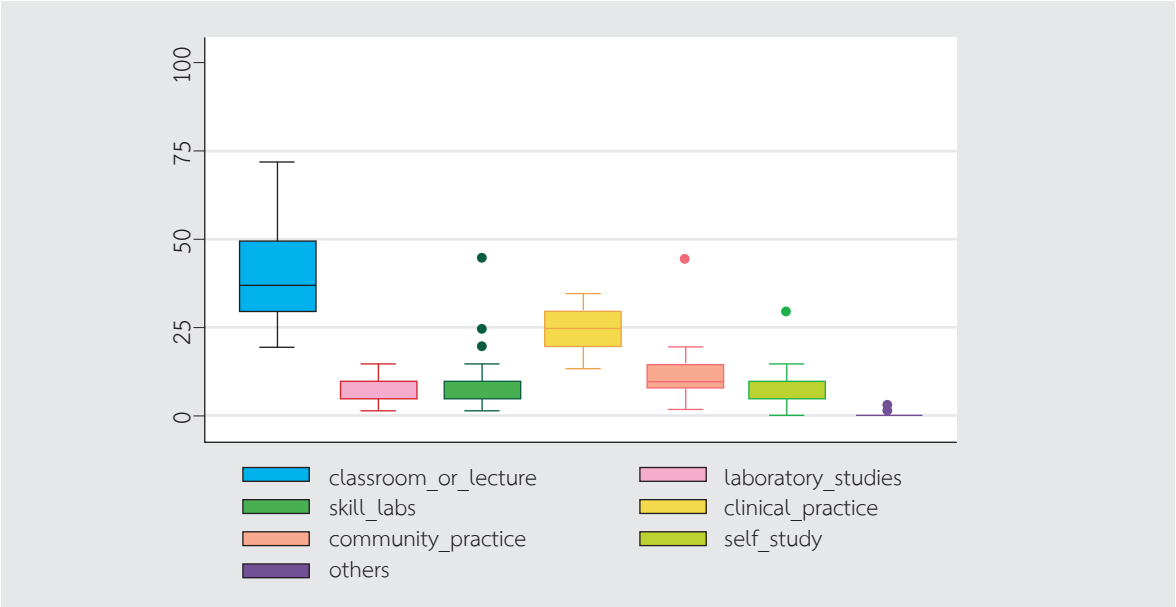
Table 3.3.3 Causes of staff attrition

Reasons for resignation of staff	N	Percent
Family reason	15	41.67
Need more challenging work	8	22.22
Financial reason	5	13.89
Need more promising work opportunities	3	8.33
Heavy workload	2	5.56
Unsatisfactory administration in current workplace	1	2.78
Poor fringe benefit	1	2.78
Other reasons	1	2.78
Total	36	100.00

Regarding teaching method, 31 out of 36 schools (86%) reported that their courses were mainly based on lecture or seminar followed by community-based learning (13.89%), problem-based learning (8.33%), and competency based learning (2.78%). System based learning was less likely to be used, only available in 2 schools (5.56%). Twenty-nine schools (80.56%) provided extra-curricular activities for students; while 7 schools (19.44%) did not.

During four-year curriculum, students spent most of their time in lecture and clinical practice (38% and 25%, respectively). Around 12% were spent in community practice. Time spent for self-study, laboratory studies, and skill labs was equally at 5% (Figure 3.11).

Figure 3.11 Median of time spent in each teaching method in four-year curriculum.



All schools had independent courses of some essential subjects such as professional ethics and laws, health promotion and disease prevention, second language, and research methodology. More than half (21-24 schools) taught some subjects as independent courses such as communication skill (58.00%), leadership and management (64.00%), epidemiology (64.00%), biostatistics (58.00%), and information and technology (67.00%). Around 12-13 schools (33.33-36.11%) taught social determinants of health and diseases, critical mind and synthesis thinking as independent courses. Approximately a quarter (8-9 schools or 22.22-25%) taught five subjects as independent courses such as health policy, health management, public mind and voluntarism, humanities and social justice and cultural sensitivity.

Other subjects such as health equity, evidence-based practice, Clinical decision making and critical thinking were independent courses in only four to seven schools (11.11-19.44%). Comparative national health systems was delivered as an independent course in only one school (2.78%); whereas 29 schools (80.56%) did not have such subject at all. Almost half of schools did not teach health equity. Around one third did not teach health policy, cultural sensitivity, evidence-based practice and critical mind and synthesis thinking (Table 3.3.4).

Table 3.3.4 Coverage of essential subjects in nursing curriculum

	ndependent subject N (%)	Integrated into other subjects N (%)	Not covered N (%)
1. Health Policy	9 (25)	15 (41.67)	12 (33.33)
2. Health Management	9 (25)	24 (66.67)	3 (8.33)
3. Communication skill	21 (58.33)	14 (38.89)	1 (2.78)
4. Leadership and Management	23 (63.89)	13 (36.11)	0 (0)
5. Public mind and Voluntarism	8 (22.22)	20 (55.56)	8 (22.22)
6. Professional ethics and law	36 (100)	0 (0)	0 (0)
7. Epidemiology	23 (63.89)	13 (36.11)	0 (0)
8. Biostatistics	21 (58.33)	15 (41.67)	0 (0)
9. Health promotion and disease prevention	36 (100)	0 (0)	0 (0)
10. Social determinants of health and diseases	12 (33.33)	22 (61.11)	2 (5.56)
11. Humanities and social justice	8 (22.22)	20 (55.56)	8 (22.22)
12. Cultural sensitivity	9 (25)	14 (38.89)	13 (36.11)
13. Health equity	4 (11.11)	17 (47.22)	15 (41.67)
14. Evidenced-based practice	7 (19.44)	19 (52.78)	10 (27.78)
15. Research methodology	36 (100)	0 (0)	0 (0)
16. Clinical decision making and critical thinking	6 (16.67)	27 (75)	3 (8.33)
17. Comparative national health systems	1 (2.78)	6 (16.67)	29 (80.56)
18. Information and technology [IT]	24 (66.67)	11 (30.56)	1 (2.78)
19. Second language	36 (100)	0 (0)	0 (0)
20. Critical mind, Synthesis thinking	13 (36.11)	13 (36.11)	10 (27.78)

Teaching innovations were divided into three categories: 1) intra-professional team based learning, 2) inter-professional learning, and 3) problem-based learning. Most schools (69%-75%) reported that they provided intra-professional team based learning in both pre-clinical and clinical years. Inter-professional team based learning was hardly adopted except some schools delivered it in the form of general education or extra-curricular activities such as summer camp. Problem-based learning was used in most schools (69%-75%).

'Humanized health care' was mostly adopted as teaching innovation by 10 schools (27.78%). Building longitudinal relationship with patients and communities was chosen by six schools (16.67%). On-the-job training and student self center were used in four schools (11.11%). Contemplative education and seminar were used in two schools (5.56%). Six schools (16.67%) had no specific innovation (Table 3.3.5).

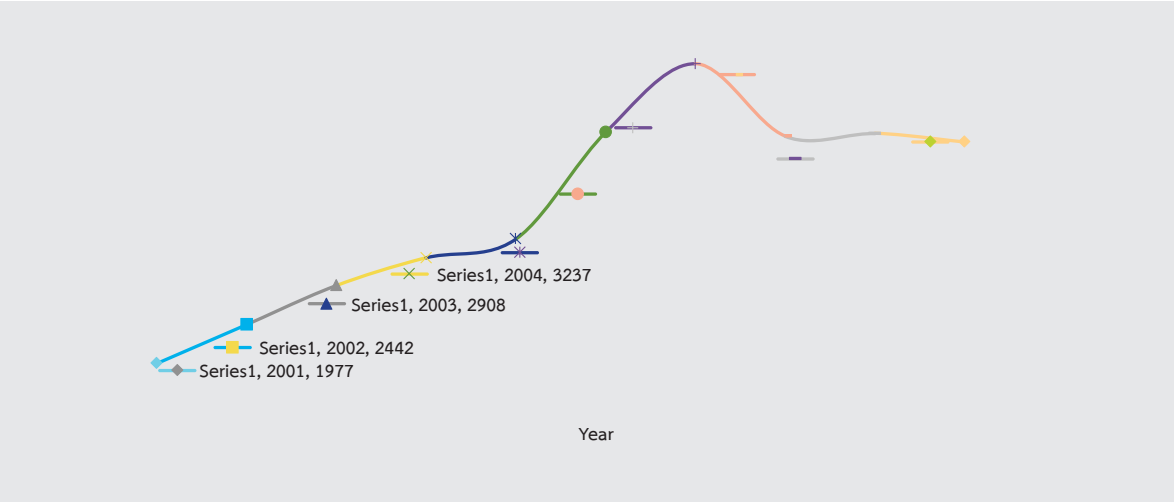
Table 3.3.5 Teaching innovation

Teaching innovation	N	Percent
Humanised health care	10	27.78
Longitudinal relationship with patients and communities	6	16.67
On-the-job training	4	11.11
Student self-center	4	11.11
Contemplative education	2	5.56
Seminar	2	5.56
Early exposure to patients	1	2.78
Problem-based learning	1	2.78
No specific innovations	6	16.67
Total	36	100.00

According to student's admission procedure, most schools did not have policy to enroll students from special tracks. Only 19 schools (52.80%) admitted students based on the student's geographical area. Three (8.30%) admitted students who had special talent. Only one out of 36 (2.90%) had special policy to enroll students who had socioeconomic difficulties and one out of 34 (2.80%) enrolled students based on ethnic preference. None enrolled students based on gender or religious preference.

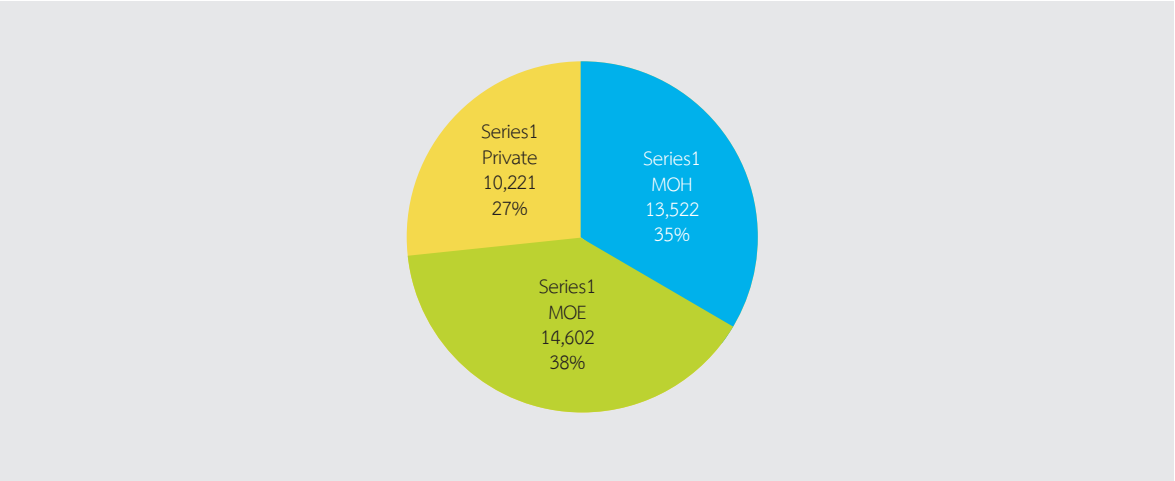
The number of students admitted among 35 schools gradually increased from 2001 and reached its peak in 2007 (5,552 students) before declining to 4,688 in 2008 and remained the same until 2010 (Figure 3.12).

Figure 3.12 Number of students admitted between 2001 and 2010 (one school reported missing data)



Between 2001 and 2010, the Ministry of Education (MOE) had highest admissions (14,602) followed by the Ministry of Public Health (MOH) with 13,522. Private schools admitted up to 10,221 (Figure 2.13).

Figure 3.13 Enrolment between 2001 and 2010, categorised by school types (one school reported missing data)



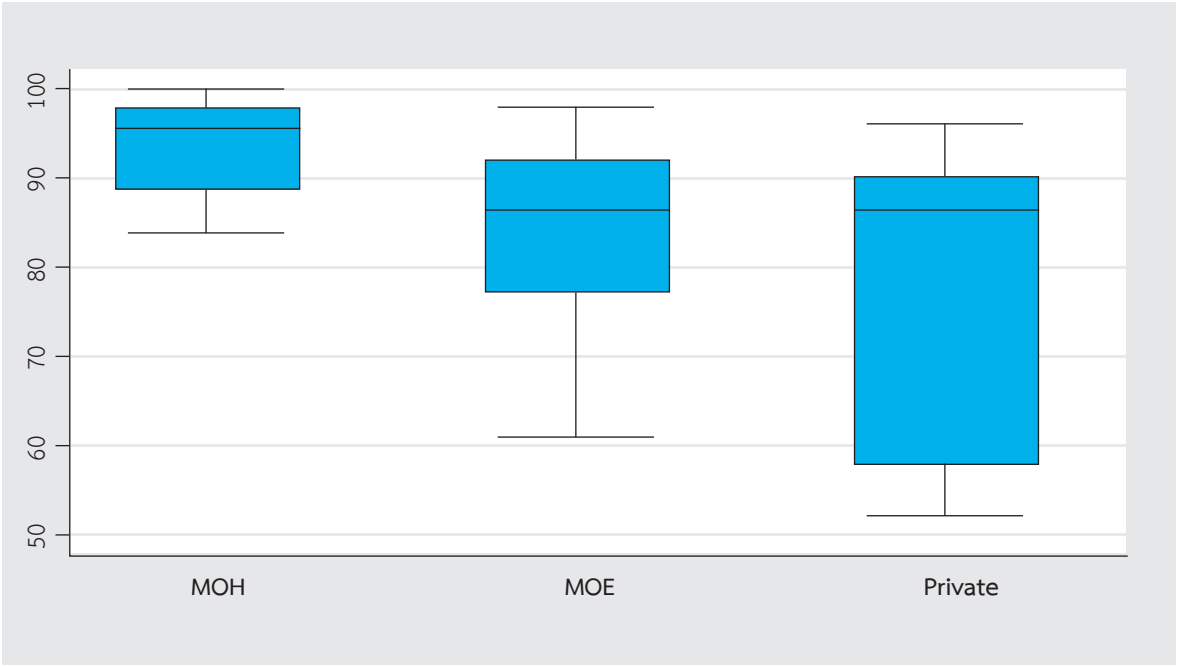
Regarding the student's competency, awareness about dignity and priority of the patients and evidence-based practice were evaluated by approximately one-third of schools (35.71% and 32.14%, respectively). Ethical principle and understanding cultural diversity were equally evaluated by seven schools (25.00%). Understanding of a thorough health system was less likely to perceived as the student's competency (7.14%), Table 3.3.6.

Table 3.36 Student's competency (8 schools reported missing data)

The student's competency	Yes N (%)	No N (%)	Total N (%)
Awareness about dignity and priority of the patient	10 (35.71)	18 (64.29)	28 (100)
Evidence-based practice	9 (32.14)	19 (67.86)	28 (100)
Ethical principle	7 (25.00)	21 (75.00)	28 (100)
Understanding cultural diversity	7 (25.00)	21 (75.00)	28 (100)
Interdisciplinary working competency	6 (21.43)	22 (78.57)	28 (100)
Skills on the use of new informatics	4 (14.29)	24 (85.71)	28 (100)
Integration with public health	4 (14.29)	24 (85.71)	28 (100)
Understanding of a thorough health system	2 (7.14)	26 (92.86)	28 (100)

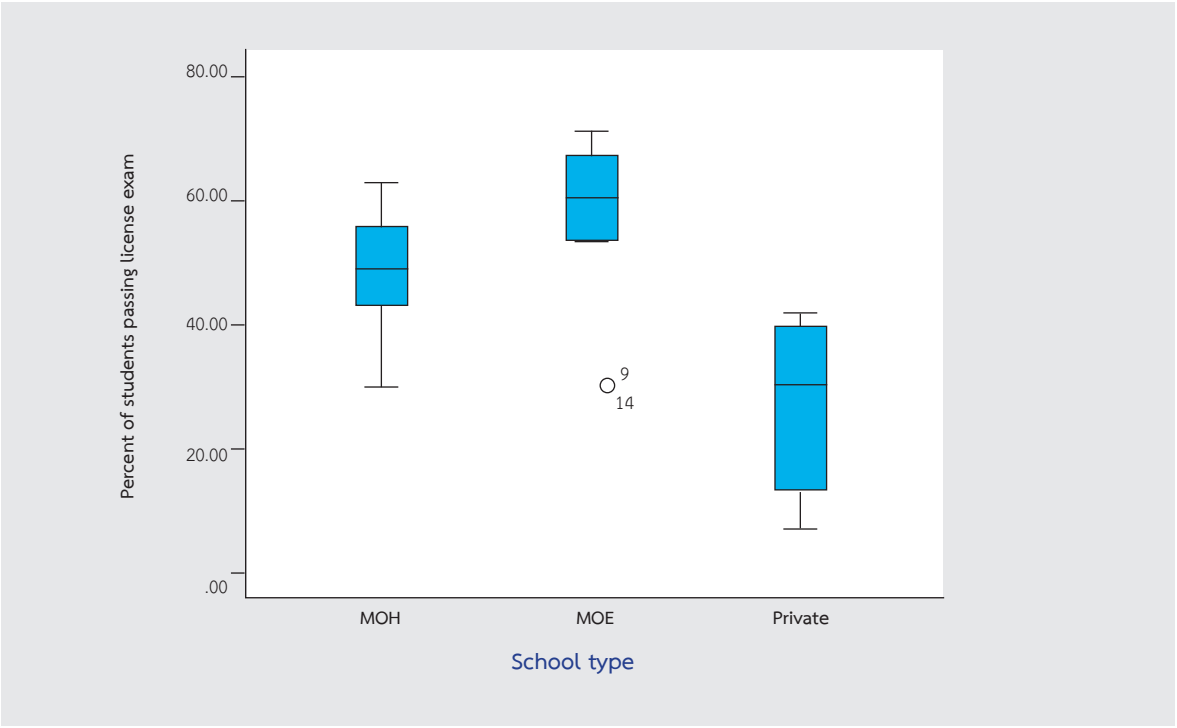
More than 95% of graduates from MOPH could pass the last year exam while about 88% of students from MOE and private schools could, Figure 3.14. Of note is that percent of passing has a widest range in private schools.

Figure 3.14 Percent of graduates passing the last year exam, categorised by school type



Approximately 60% of students in the MOE schools could pass the national license exam in the first time; whereas 49% of those from the MOH and 30% from private schools could (Figure 3.15).

Figure 3.15 Median of percentage of students passing national license exam in the first time, by school type



Regarding reasons for leaving school before graduation, 55.56% of schools reported that their students transferred to other fields of study, 33.33% reported that their students had poor academic performance, and 11.11% reported that their students had health problems.

Key findings

1. About half of nursing school did not have stakeholders in administrative board.
2. Most nursing schools were located in major city areas in upcountry (77.78%). Only MOPH nursing schools admit students based on geographical areas.
3. There is more workload for educational institutes related to accreditation by many regulatory bodies.
4. Only MOE and MOPH schools obtain budget from governments, but the private schools received only tuition fee.
5. Schools' facilities, especially information technology, are limited.
6. All types of nursing schools have faced with many challenges, including aging workforce, limitation in recruitment, and high attrition.
7. Proportion of qualification of faculties in MOPH schools does not meet the criteria of educational standards.
8. Criteria to recruit faculty focused on doctoral degree, but the rural experiences is less important.
9. Most of teaching and learning were lecture and classroom based.
10. Some of important topics related to health system and nursing competencies did not focus in nursing curricula such as health equity, health policy, cultural sensitivity, and evidence-based practice.
11. Inter-professional learning (IPE) is still limited.

2.3.2 Nursing Students

A survey of final year nursing students in 40 nursing school was conducted. There were 3,349 respondents out of 3,353 samples (99.88 %response rate)

Demographic and Educational Characteristics of Respondents and Parents' Respondents

Age of respondents ranged between 19 and 44 years with mean 22.9 years (SD = 1.22). Majority of respondents were women (94.8 %). About 40% of respondents studied in schools under the Ministry of Public Health. Central and direct admission through specific university were main modes of admission (44.87%, 44.78 %, respectively), as shown in Table 3.3.7.

Table 3.3.7 Frequencies and Percentages of Demographic and Educational Characteristics of the Respondents

Demographic and Educational Characteristics	Number (%)
Sex	
Male	174 (5.2)
Female	3,161 (94.8)
Mean age (sd) [Range]	22.9 (0.7) [19-44]
Admission mode	
Central admission (national entrance)	1,497 (44.87)
Direct admission through specific university	1,494 (44.78)
Regional quota on local demand	263 (7.85)
Special quota (talent/sport)	95 (2.85)
Type of nursing institute	
Ministry of Health	1,308 (39.06)
Ministry of Education	1,139 (29.77)
Private	902 (26.93)

Majority of parents achieved primary education (about 40 – 50%). 15-19% of them received some degrees of higher education, Table 5). Regarding career of parents, 2-5% of parents were health professional; 10-18% of parents were other professional; however, other occupations accounted for 80-85%, as shown in Table 3.3.8.

Table 3.3.8 Demographic characteristics of the Respondents' parents

Demographic Characteristics	Father		Mother	
	N	%	N	%
Education				
Never attended school	32	0.97	55	1.65
Primary school	1,317	39.93	1,664	49.95
Secondary school	884	26.8	804	24.14
Diploma/vocational	422	12.8	290	8.71
Bachelor degree	499	15.13	460	13.81
Master degree	125	3.79	55	1.65
Doctoral degree	5	0.15	2	0.06
Unknown	14	0.42	1	0.03
Total	3,298	100	3,331	100
Occupation				
Health professionals	78	2.42	159	4.89
Other professionals	596	18.5	321	9.88
Other jobs	2,548	79.08	2,769	85.23
Total	3,222	100	3,249	100

Residential areas of respondents and respondents

Half of respondents' parents resided in rural areas while one third of them resided in semi-urban area; and about 20 % of them lived in urban area. These figures corresponded to residential areas of respondents when they were childhood. However, the figures during high school were opposite. During high school, only 12% of respondents still lived in rural areas, but about 55% of respondents resided in urban area (see Table 3.3.9).

Table 3.3.9 Frequencies and Percentages of Residential Areas of the Parents' Respondents and Respondents

Residential Area of Parents	Residential Area		Residential Area of Respondents During Age 0-15 Years Old		High School	
	N	%	N	%	N	%
Rural	1,642	49.24	1,640	49.62	392	11.86
Semi-urban	1,051	31.51	985	29.8	1,088	32.93
Urban	642	19.25	680	20.57	1,824	55.21
Total	3,335	100	3,305	100	3,304	100

* 'urban' referred to 'Bangkok' and 'municipality area in other provinces', 'semi-urban' referred to 'outside municipality area but inside Tambon administrative area', while 'rural' referred to 'outside municipality area.'

School facilities and Educational expenses

Respondents rated low to moderate scores on school's facilities. Subject that received lowest scores was about schools' technologies such as teleconference/video conference and telemedicine, as shown in Table 3.3.10.

Table 3.3.10 Mean, Standard Deviation, and Range of Opinions towards School's Facilities of Respondents

Items	N	Mean	SD	Range
Field works	3,225	4.00	0.93	1-5
Transportation service	3,330	3.78	0.98	1-5
Libraries	3,337	3.70	0.95	1-5
Buildings	3,334	3.68	0.94	1-5
Classrooms	3,329	3.68	0.89	1-5
Teaching materials	3,325	3.65	0.90	1-5
Book search service	3,332	3.63	0.92	1-5
Dormitories	3,319	3.62	1.04	1-5
Health service for students	3,326	3.60	0.95	1-5
Skill labs	3,328	3.59	0.93	1-5
Inter-library service	3,327	3.56	1.00	1-5
Laboratories	3,331	3.51	0.94	1-5
Restaurants, canteen, shopping store	3,331	3.48	1.01	1-5
Sports and amenities	3,335	3.42	0.97	1-5
Number of computers	3,327	3.40	0.98	1-5
Internet service	3,331	3.28	1.04	1-5
Internet search teaching courses	3,327	3.24	1.02	1-5
Other IT courses	3,330	3.23	1.01	1-5
Computer skill teachings	3,332	3.21	1.02	1-5
Telemedicine	3,306	2.72	1.16	1-5
Video conference technology	3,333	2.58	1.16	1-5
Conference call technology	3,329	2.54	1.14	1-5

Note: Reordering by the highest mean to the lowest mean; (1 = very scarce or none, 5 = highly adequate, numerous)

About tuition fee and expense, study expenses in nursing schools varied greatly. They ranged from 100,000 to 1,000,000 Baht with an average of 342,637.2 Baht throughout the study. Students from private nursing schools spent about 570,000 Baht for the whole curriculum, approximately doubled their counterparts, with the Red Cross come after. Ministry of Public Health students spent least amongst all students (about 200,000 Baht). Students with rural background report that they spent the same amount as others. Only those who were enrolled in schools under Ministry of Public Health and Ministry of Education paid less than others' maximum amounts (see Table 3.3.11).

Table 3.3.11 Total expenses for study throughout the whole nursing curriculum*

Type of school	Mean	SD	Min	Max	p50	Interquartile range
All students						
Ministry of Public Health	225,278.8	147,754.7	100,000	1,000,000	199,000	130,000
Ministry of Education	285,049.7	198,824.4	100,000	1,000,000	200,000	270,000
Private	569,613.8	172,655	140,000	1,000,000	500,000	200,000
Total	342,637.2	223,036.7	100,000	1,000,000	270,000	350,000
Only students with rural background						
Ministry of Public Health	214,071.6	133,736.3	100,000	1,000,000	160,000	120,000
Ministry of Education	282,517.6	188,777.8	100,000	1,000,000	200,000	264,800
Private	570,613.2	174,576.5	200,000	1,000,000	500,000	200,000
Red Cross	460,573.4	139,415	200,000	816,240	400,000	100,000
Total	330,663.1	219,048	100,000	1,000,000	250,000	350,000

*the analysis dropped observations answering less than 100,000 Baht or more than 1,000,000 Baht since they were likely to be outliers

Half of respondents were self-funded, while 26% received scholarship and 24% make a loan to pay for their tuition fees. When breaking down into types of school, 37% private nursing students sought financial support from self-loaning, almost double the corresponding figure found in those graduating from schools under Ministry of Public Health. Majority of Red Cross students had education subsidy. Such association holds statistical significance regardless of their living background. For students from rural background, loaning was a little bit higher than all students in all type of schools and student subsidy was lower than all students in all type of schools, except the Red Cross (see Table 3.3.12).

Table 3.3.12 Sources of Money by Type of Schools of Respondents

School type	Education subsidy		Self-subsidy		Loan		Total	
	N	%	N	%	N	%	N	%
All students								
Ministry of Public Health	458	38.75	563	47.6	161	13.6	1,182	100
Ministry of Education	309	27.74	544	48.83	261	23.41	1,114	100
Private	104	12.82	405	49.4	302	37.24	811	100
Total	792	26.16	1,512	49.9	724	23.91	3,028	100
Only students with rural background								
Ministry of Public Health	229	39.46	290	46.18	109	17.36	628	100
Ministry of Education	85	18.81	230	50.88	137	30.31	452	100
Private	53	13.95	181	47.63	146	38.42	380	100
Total	367	25.14	701	48.01	392	26.85	1,460	100

Most respondents paid their tuition fees in lump sum (94%) while six % paid by installments. Majority of respondent reported no difficulties paying their tuition fees (71.28%), however, some of them had experienced difficulties to pay tuition fee (28.27 %). For those who experienced difficulties, 90% never thought about quitting school, only 1% resigned, as shown in Table 3.3.13.

Table 3.3.13 Mode of payment and difficulties in payment of respondents

Payment	N	Percent (%)
Mode of payment		
lump sum	3,109	93.73
installment	203	6.12
Others	5	0.15
Total	3,317	100
Ever had difficulties in paying tuition fee		
Never	2,370	71.28
Ever	955	28.72
Total	3,325	100
Thinking of study leave or quitting school (only for respondents experiencing difficulties in paying tuition fee)		
never thought of resigning/quitting	64	90.14
ever thought of resigning/quitting	6	8.45
ever resigned/quit	1	1.41
Total	71	100

Job preference after graduation

Working in health service in a public sector was the most favorable destination immediately after graduation (64.45%) followed by working in the private (24.10%) In the next five years, higher proportion of respondents preferred working in health service of public sector (56.66%) although the proportion was less compared to immediately after graduation. Lower proportion of them wanted to work in the private sector (13.48%). Figures of going aboard increased from 5% after graduation to 10% at the next five years. In addition, about 4 % of respondents plan to quit nursing profession and change their jobs to not relate with nursing profession in over next five years, as shown in Table 3.3.14.

Table 3.3.14 Respondents' job preference after graduation

Job preferences	Immediately after graduation		Next 5 Years	
	N	%	N	%
Health service in public sector	2,110	64.45	1,858	56.66
Health service in private sector	789	24.10	442	13.48
Going abroad	164	5.01	352	10.73
Academic works in public sector	108	3.30	166	5.06
NGOs or charitable works	48	1.47	46	1.40
Research centers	32	0.98	131	4.00
Own business	11	0.34	29	0.88
Academic works in private sector	10	0.31	55	1.68
Continue further education	2	0.06	60	1.83
Quit nursing profession	-	-	124	3.78
Other works unrelated to nurses	-	-	5	0.15
Not yet decided	-	-	11	0.34
Total	3,274	100	3,279	100

When respondents were asked if they had a plan to go aboard immediately after graduation, 95% of them planned to stay in the country. Almost half of those planning to go abroad graduated from nursing schools under the Ministry of Public Health, as did 40% of those refusing to go abroad. However, the numbers of respondents who plan and not plan to go abroad after graduation were not different (χ^2 = 7.009, p-value >0.05), as shown in Table 3.3.15.

Table 3.3.15 Intention to go abroad after graduation by type of nursing schools

School affiliation	Plan to go abroad immediately after graduation				Total	
	No		Yes			
	N	%	N	%	N	%
Ministry of Education	941	30.26	36	21.95	977	29.84
Ministry of Health	1,203	38.68	77	46.95	1,280	39.10
Private	835	26.85	42	25.61	877	26.79
Red Cross	131	4.21	9	5.49	140	4.27
Total	3,110	95.79	164	100	3,274	100

Pearson Chi-square (3) = 7.009 P-value = 0.072

At five years after graduation, it was obviously seen that proportion of having a plan to go aboard increased. The proportion of those planning to go abroad increased in private graduates, when comparing with going abroad immediately after graduation. However, the numbers of respondents who plan and not plan to go abroad in the next five years were not different (χ^2 = 6.43, p-value >0.05), as shown in Table 3.3.16.

Table 3.3.16 Intention to go abroad in the next five years by type of nursing schools

School affiliation	Plan to go abroad in the next 5 years				Total	
	No		Yes			
	N	%	N	%	N	%
Ministry of Education	896	30.61	88	25.00	984	30.01
Ministry of Public Health	1,145	39.12	138	39.20	1,283	39.13
Private	764	26.10	108	30.68	872	26.59
Red Cross	122	4.17	18	5.12	140	4.27
Total	2,927	100	352	100	3,279	100

Pearson chi2 (3) = 6.4341 P-value = 0.092

The top reason for selecting workplaces among respondents was high salary; second most reason was good career prospect. Other popular reasons were good welfare and opportunity for further training (see Table 3.3.17).

Table 3.3.17 Reasons for selecting workplaces*

Reasons	Selected 1st Rank		Selected 2nd Rank		Selected 3rd Rank		Total	
	N	%	N	%	N	%	N	%
High salary	402	20.96	523	27.27	993	51.77	1,918	100
Good career prospects	508	31.87	606	38.02	480	30.11	1,594	100
Good welfare	464	38.57	446	37.07	293	24.36	1,203	100
Opportunity for further training	492	40.9	455	37.82	256	21.28	1,203	100
Live close to parents/ families	311	27.74	409	36.49	401	35.77	1,121	100
Return to hometown	219	22.21	304	30.83	463	46.96	986	100
My own conception of social accountability	387	45.64	237	27.95	224	26.42	848	100
Nice place to live	191	39.87	197	41.13	91	19	479	100
Work environment	249	54.85	135	29.74	70	15.42	454	100
Independent from parents	44	57.89	20	26.32	12	15.79	76	100
Other reasons	22	23.4	12	12.77	60	63.83	94	100

*respondents were asked to rank the most three important reasons in workplace selection out of eleven choices

Attitude towards Working in Rural Areas

From statistical results, students had positive attitude in overall (scored 4 out of 5) on working in rural areas (Mean = 4.02, SD = 0.78). Students agreed the most that people in rural areas are friendly (Mean = 4.67, SD = 0.61) and working as a medical professional in hospital in these areas is the most important contribution to health of population (M = 4.37, SD = 0.77). Other striking positive attitudes were that working in hospital in these areas provides opportunities for real-life problem solving (M = 3.95, SD = 0.81) and is challenge (M = 3.94, SD = 0.86). Only a negative attitude was given for adequacies of amenities and entertainment in rural areas provides opportunities for real-life problem solving (M = 3.30, SD = 1.10), as shown in Table 3.3.18.

Table 3.3.18 Attitudes towards working in rural areas *

	Items	N	Mean	SD
1.	Working in these areas provides opportunities to use various skills	3,341	3.75	0.88
2.	There are supportive environment when working in these areas	3,341	3.09	0.89
3.	Working in these areas limits communications with professional peers**	3,337	3.04	1.11
4.	Working in these areas provides opportunities to work independently	3,336	3.67	0.93
5.	There are lack of amenities and entertainment in these areas**	3,340	3.30	1.10
6.	People in these areas are friendly	3,339	4.67	0.61
7.	Working in these areas results in “isolation” from friend and family**	3,337	3.00	1.18
8.	Working as medical doctor in hospitals in these areas is the most important contribution to health of population	3,338	4.37	0.77
9.	Medical school prepared me well to work in these areas	3,338	3.88	0.86
10.	Medical education inspires me to work in hospitals in these areas	3,335	3.42	0.88
11.	There are abundant amenities and entertainment in these areas	3,339	2.38	0.89
12.	Working in hospitals in these areas is most challenging	3,338	3.94	0.86
13.	Working in hospital in these areas provide opportunities for real-life problem solving	3,339	3.95	0.81
14.	Overall, you have positive attitudes towards working in rural areas	3,340	4.02	0.78

* '5' reflected 'strongly agree', where '1' referred to 'strongly disagree'; Interpretation should be made heedfully as some questions contained negative statement (item 3, 5, and 7).

Competencies of Nursing Students

Respondents had good perception on their competencies on most aspects, such as collaboration with clients and other health care professionals, capacity to engage, mobilize, and create partnership with communities, professional judgment and ethical standards, as well as capacity in continuing life-long learning and professional development. However, the respondents rated their competencies low in emerging health needs and evidence-based nursing practice (see Table 3.3.19).

Table 3.3.19 Confidence in competency

	Items	N	Mean	SD
1.	Capacity to collaborate with clients and members of the health-care team	3,340	4.34	0.61
2.	Capacity to engage, mobilize and create partnership with communities in diverse social and cultural situations	3,342	4.31	0.66
3.	Professional judgment and ethical standards in addressing a wide range of health issues and quality assurance	3,342	4.25	0.58
4.	Capacity in continuing life-long learning and professional development	3,340	4.23	0.61
5	Capacity in promoting a safe environment for clients, yourself and other health-care workers that addresses the unique needs of clients within the context of care	3,340	4.19	0.60
6	Capacity in applying appropriate information technology and computer skills effectively	3,342	4.15	0.64
7	Competency in the provision of health promotion, prevention and population health	3,341	4.08	0.55
8	Capacity in using a culturally competent approach to nursing care	3,341	4.06	0.67
9	Competency in the provision of nursing care	3,342	3.96	0.54
10.	Critical thinking and capacity of problem solving	3,341	3.92	0.63
11.	Capacity in managing population health and population-based care	3,341	3.86	0.59
12.	Capacity for leading and participating in effective team effort	3,341	3.82	0.69
13.	Evidence-based nursing practice	3,341	3.76	0.67
14.	Competencies related to emerging health needs	3,340	3.55	0.66

Note: Reordering by the highest mean to the lowest mean; (1 = least confidence, 5 = most confidence)

Key findings

1. Most nursing students were female (94.8%).
2. School's technologies such as teleconference/video conference and telemedicine were rated as inadequate.
3. Educational expenses of students in private schools were twice higher than students in public schools. About 37% of nursing students in private schools had financial support from self loan.
4. One third of students from private schools planned to work in public sector after their graduation and the proportion increased in the next 5- year plan (44.04%).
5. After graduation for 5 years, about 4% of graduates tended to quit nursing profession and about 10% planned to go aboard.
6. Main reasons for selecting workplaces were high salary, good career prospect, good welfare, and opportunity for further education.
7. The respondents rated their competencies as low in emerging health needs and evidence-based nursing practice.

2.3.3 Nursing Graduates

This survey was conducted with 680 nurses in 8 provinces of Thailand. Data were retrieved from 475 respondents (69.85 % response rate). Mean age of respondents was 35.7 while median age was 36. Most of them were female. About half had rural background and spent their early life (0-15 years old) in rural area, but more than 53% of them studied high school in urban setting.

Attitudes towards working in rural areas

Respondents tended to have positive attitudes towards working in rural areas, in particular, for the statements describing that 'People in these areas are friendly' and 'Work as a nurse in hospitals in these areas is the most important contribution to health of population'.

Table 3.3.20 Attitudes toward working in rural areas

Variable	Obs	Mean	Std.Dev.
1. Work in these areas provides opportunities to use various skills	474	3.85	0.85
2. There are supportive environment when working in these areas	474	3.01	0.97
3. Work in these areas limits communications with professional peers	474	3.03	1.08
4. Work in these areas provides opportunities to work independently	473	3.58	0.91
5. There are lack of amenities and entertainment in these areas	474	3.23	1.10
6. People in these areas are friendly	473	4.42	0.73
7. Work in these areas results in “isolation” from friend and family	474	2.80	1.10
8. Work as a nurse in hospitals in these areas is the most important contribution to health of population	472	4.38	0.72
9. Nursing college/institute prepared me well to work in these areas	472	3.78	0.85
10. Nursing education inspires me to work in hospitals in these areas	469	3.39	0.84
11. There are abundant amenities and entertainment in these areas	472	2.39	0.92
12. Work in hospitals in these areas is most challenging	467	3.94	0.80
13. Work in hospital in these areas provide opportunities for real-life problem solving	472	4.07	0.79

Working and education profiles

'Direct admission' was the most common mode of admission (39.2%), followed by 'quota in response to local demand' (30.1%) and 'national entrance' (26.7%) respectively, see table 3.3.21.

Table 3.3.21 Admission mode of graduate nurses

Admission mode	Freq.	Percent
direct admission	184	39.23
quota in response to local demand	141	30.06
national entrance	125	26.65
special quota/talent	16	3.41
Others	3	0.64
Total	469	100

Approximately, 85% of respondents graduated from nursing schools outside Bangkok and vicinity, and about two-third of respondents graduated from nursing schools under the Ministry of Public Health

Table 3.3.22 Type of nursing schools where respondents graduated from

Affiliation of nursing schools	Freq.	Percent
Ministry of Public Health	312	66.67
Ministry of Education	142	30.34
Private	9	1.92
Red-cross	5	1.07
Total	468	100

Workforce dynamics

About 58.8% of respondents never changed their workplace over their life time. 26.2% ever changed their workplace two times and only 6.4% of respondents had ever experienced at least 4 workplaces. Almost all respondents were working in public sector and in health service area regardless of the sequence or number of work places. The proportion of respondents working in urban area did not obviously change when change of workplace took place, ranging between 53.3-59.5%. Almost all of respondents practiced clinically as full-time job. Nevertheless, a quarter of them had other jobs outside working hours. Majority of respondents spent clinical work between 41-60 hours per week. About one-fifth of the respondents had attention to go abroad after graduation. USA was the most preferred destination, followed by Australia. Moreover, nurses aged between 30-39 years old had higher intention to work abroad more than those in other age groups. However, this difference was not statistically significant; neither did the relation between intention to go abroad and school type.

Table 3.3.23 Working hours per week of graduate nurses

Mean working hours per week	Freq.	Percent
<20	13	2.81
20-40	115	24.89
41-60	225	48.7
>60	109	23.59
Total	462	100

Table 3.3.24 Intention to go abroad and age group of graduate nurses

age group	Never thought of going abroad (%)	Ever thought of going abroad (%)	Total (%)
20-29	144 (40.34)	33 (39.29)	177 (40.14)
30-39	70 (19.61)	21 (25.00)	91 (20.63)
40-49	101 (28.29)	22 (26.19)	123 (27.89)
> 50	42 (11.76)	8 (9.52)	50 (11.34)
Total	357 (100.00)	84 (100.00)	441 (100.00)

Pearson Chi-square P-value = 0.709

Table 3.3.25 Intention to work abroad and school type of graduate nurses

Graduated from	Never thought of going abroad (%)	Ever thought of going abroad (%)	Total (%)
Ministry of Education	113 (30.96)	27 (31.76)	140 (31.11)
Ministry of Public Health	241 (66.03)	55 (64.71)	296 (65.78)
Private	7 (1.91)	2 (2.35)	9 (2.00)
Red-Cross	4 (1.10)	1 (1.18)	5 (1.11)
Total	365 (100.00)	85 (100.00)	450 (100.00)

Fisher's exact P-value = 0.947

Competency

Respondents had highest confidence level in *maintaining 'Professional judgment and ethical standards in addressing a wide range of health issues and quality assurance'. Whereas 'Competencies related to emerging health needs'* was reported with the lowest confidence level.

Table 3.3.26 Self evaluation about competency of graduate nurses

Competency	Obs	Mean	SD	Min	Max
1. Professional judgment and ethical standards in addressing a wide range of health issues and quality assurance	463	4.31	0.58	2	5
2. Competency in the provision of nursing care.	464	4.10	0.53	2	5
3. Competency in the provision of health promotion, prevention and population health	461	4.04	0.60	2	5
4. Competencies related to emerging health needs	468	3.57	0.72	1	5
5. Evidence-based nursing practice	466	3.83	0.63	2	5
6. Critical thinking and capacity of problem solving	468	4.00	0.58	2	5
7. Capacity to engage, mobilize and create partnership with communities in diverse social and cultural situations	467	4.01	0.64	1	5
8. Capacity in managing population health and population-based care	468	3.71	0.58	1	5
9. Capacity to collaborate with clients and members of the health-care team	468	4.20	0.56	2	5
10. Capacity for leading and participating in effective team effort	468	3.82	0.64	1	5
11. Capacity in promoting a safe environment for clients, yourself and other health-care workers that addresses the unique needs of clients within the context of care	468	4.04	0.54	2	5
12. Capacity in using a culturally competent approach to nursing care.	465	3.79	0.66	2	5
13. Capacity in applying appropriate information technology and computer skills effectively	462	3.89	0.68	1	5
14. Capacity in continuing life-long learning and professional development	464	4.08	0.60	2	5

Key findings

1. More than half of respondents who worked in provincial upcountry graduated from MOPH located in provincial upcountry via “direct admission” and” quota in response to local demand.” Most of them had rural background and had high attitude toward working in rural areas.
2. Most respondents started working in health services of public sector and about half of them had never changed their workplaces in the first 5 years.
3. More than 70 % of nurses work more than 40 hour per week, half of them worked more than 60 hours per week.

PART IV:
DISCUSSION AND RECOMMENDATIONS

Part IV: Discussion and Recommendations

This study assessed current Thailand health professional education system focusing on medical and nursing education systems. Our main findings and challenges of national context, medical education, and nursing education is respectively described against the eleven WHO recommendations for transforming and scaling up health professional education and training which offers guiding principles for transformative education, provide sound policy and technical guidance throughout the whole range of health workforce development, from pre-service education to continuous professional development. Based on findings and guideline, we then provide policy recommendation of Thai system on how best to achieve the goal of producing graduates who are responsive to health needs of the populations.

National Context

Table 4.1 Key findings of national context and recommendations on transforming and scaling up health professionals' education and training, WHO 2013

	Key findings	Gap and challenges
I. Faculty Development		
1. Design and implement continuous development programmes for faculty, teaching staff relevant to the evolving health-care needs of their communities.	• Neither national policy nor information on effective faculty development programmes are available.	
2. Mandatory faculty development programmes that are relevant to the evolving health care needs of their communities.	• No national policy address mandatory of faculty development; it is voluntary practice by each institute depending on organizational culture and policy	
3. Innovative expansion of faculty through recruitment of community-based clinicians and health workers as educators.	• No national policy addresses community based faculty, only voluntary practice by each institute. However, based on quality assurance ratio of PhD is explicitly one important indicator, not community based faculty	

	Key findings	Gap and challenges
II. Curriculum Development		
4. Adapt curricula to the evolving health-care needs of the communities.	• Concerned in policy and strategies and discussed at national level through conference and consortium meeting in collaboration among education sectors, health, and other sectors. • There are special track of rural recruitment in medical, nursing , and other professional such as CPIRD, ODOD program using local learning and practice that reflects community needs	• Nature of collaboration is only the use of hospitals to serve for clinical training using curricula mainly developed by medical schools.
III. Simulation methods		
5. Apply simulation methods of contextually appropriate fidelity levels in the education of health professionals.	Not assess at national level	
IV. Direct entry of graduates		
6. Direct entry of graduates from relevant undergraduate, postgraduate or other educational programmes into different or other levels of professional studies.	• no national policy, depends on institute policy	
V. Admission procedures		
7. Targeted admission policies to increase the socio-economic, ethnic and geographical diversity of students.	• Only obvious collaboration at national level between MOE and MOPH is CPIRD and ODOD program in medical education. • Special rural recruitment program such as CPIRD/ODOD potentially is driver for improved geographical mal-distribution of physicians nationwide, and especially three southern provinces	• Need to review, improve and scaling up the recruitment management to improve distributions in specific underserved areas,

	Key findings	Gap and challenges
VI. Streamlined educational pathways and ladder programmes		
8. Streamline educational pathways, or ladder programmes, for the advancement of practicing health professionals.	Not assess at national level	
VII. Inter-professional education		
9. Inter-professional education (IPE) in both undergraduate and postgraduate programmes.	• No national policy, depends on institute policy • Need clear statements of IPE competencies: value/ethics, mutual respects; role and responsibilities; inter-professional communications; and team works	
VIII. Accreditation		
10. Accreditation of health professionals' education where it does not exist and strengthen it where it does exist.	• Strong mechanism for quality assurance and standardization. Office of the Higher Education Commission, Office for National Education Standards and Quality Assessment, school consortium, and professional councils play active role for approving curricula and license. However, there is no specific outcome assessment for quality of care by these graduates. • Application for international accreditation (WFME) • Strong mechanism for quality assurance and standardization from many regulatory bodies	• No specific outcome assessment for quality of care by these graduates and burden of these paper work processes.

	Key findings	Gap and challenges
IX. Continuous professional development (CPD) for health professionals		
11. CPD and in-service training of health professionals relevant to the evolving health-care needs of their communities.	Not assess at national level	
Other issues		
o Information system	• Health information system is very important for decision making, but there is a limitation of data completeness, timely and adequacy.	• Need national authority body/ institute to produce and update HRH information

From our assessment we found some key cross cutting challenges throughout most professionals especially, unclear political commitments, interrupted, incoherence across different government. Faculties play more important and sustainable role for the implementation of the transformative scaling up health professional education.

Additionally, our national context tool cannot provide any current situation on simulation, streamline education and CPD in-service training.

Recommendations for national level policy

1. To ensure community need responsiveness, establish clear mechanism and support for implementing this written policy and strategy through better collaboration between health professional education and systems include implementation of programs particularly, incorporation of health policy and system needs in the curricula.
2. Better coordination among key actors for accreditation and quality assurance is required to minimize redundancy and unnecessary work.
3. National HRH Commission, chaired by Dr Mongkol Na Songkhla, should be a responsible body for
   - National HIS in term of completeness, timeliness, and utilization
   - Keep maintain current production plan for both professionals until 2030 with condition of increase retention through WHO 2010 recommendations to increase retention such as rural recruitment, local training, compulsory and hometown placement. [HRH supply projection, Thailand will meet the target of doctor to population ratio 1:1,500 in 2020 and 1:1,100 in 2030. Nursing supply side projection estimated to reach 1 nurse per 459 population in 2022]
   - Keep regular adjustment of projection, at least every 5 years, taking account of dynamic context in term of technology, labor market, socio-demographic, epidemiological, environmental change, ratio of generalist- specialist, task shifting.

Medical Education System

Table 4.2 Key findings of medical education system and recommendations on transforming and scaling up health professionals' education and training, WHO 2013

WHO Recommendation	Key findings	Gap and challenges
I. Faculty Development		
1. Design and implement continuous development programmes for faculty, teaching staff relevant to the evolving health-care needs of their communities.	• No medical school had continuous development programs for faculty, teaching staff relevant to the evolving health-care needs of their communities.	• Currently, CPD for faculty members does not focus on evolving health-care needs of their communities.
2. Mandatory faculty development programmes that are relevant to the evolving health care needs of their communities.	• No medical schools has mandatory faculty development program that are relevant to the evolving health care needs of their communities.	• No medical schools has mandatory faculty development program that are relevant to the evolving health care needs of their communities.
3. Innovative expansion of faculty through recruitment of community-based clinicians and health workers as educators.	• The three most common criteria used for faculty recruitment were doctoral degree or equivalent, outstanding academic performance and pedagogic competency; no clearly evidence on community skilled recruitment	• Organization culture, preconception that a PhD is more important criteria than community based clinicians.
II. Curriculum Development		
4. Adapt curricula to the evolving health-care needs of the communities.	• Comparative national health systems, second language, health equity, humanities and social justice and cultural sensitivity were rarely covered in medical school curricula.	• Very limited contents in the curriculum related to population health care need.

WHO Recommendation	Key findings	Gap and challenges
III. Simulation methods		
5. Apply simulation methods of contextually appropriate fidelity levels in the education of health professionals.	No formal evaluation in this survey	
IV. Direct entry of graduates		
6. Direct entry of graduates from relevant undergraduate, postgraduate or other educational programmes into different or other levels of professional studies.	No formal evaluation in this survey	
V. Admission procedures		
7. Targeted admissions policies to increase the socio-economic, ethnic and geographical diversity of students.	• Almost half of the students (40.5%) were admitted through the 'collaborative project for increasing production of rural doctors (CPIRD)' and 'one district one doctor (ODOD)' compared to 59.5% thru the original 'national entrance examination' tract.	• Inadequate National health manpower planning • Only obvious collaboration at national level between MOE and MOPH is CPIRD and ODOD program in medical education.
VI. Streamlined educational pathways and ladder programmes		
8. Streamline educational pathways, or ladder programmes, for the advancement of practicing health professionals.	No formal evaluation in this survey	
VII. Inter-professional education		
9. Inter-professional education (IPE) in both undergraduate and postgraduate programmes.	• Of 16 medical schools, 13 medical schools (81%) reported that they had subjects with some form of inter-professional education.	• Not all medical schools had curriculum with inter-professional education.

WHO Recommendation Key findings Gap and challenges

WHO Recommendation	Key findings	Gap and challenges
VIII. Accreditation		
10. Accreditation of health professionals' education where it does not exist and strengthen it where it does exist.	• Medical schools were externally evaluated by many organizations.	• Not well organized and time consuming accreditation processes.
IX. Continuous professional development (CPD) for health professionals		
11. CPD and in-service training of health professionals relevant to the evolving health-care needs of their communities.	No formal evaluation in this survey	Lack of information
Other issues		
o Governing body	• Only 3 (15%) schools had their governing body selected from various groups.	• Inadequate members of institute governing body from various stakeholders
o Competency based learning.	• Only five out of 19 medical schools used competency based learning approach.	• Only small number of medical schools used competency based learning approach.
o Instructional design	• Students spent about 30% of their time on lecture, 25% on clinical practices, 16% on self-study, 10% on community practices, 10% on basic science laboratory and 5% on skilled lab.	• Lecture is still the most common learning process.
o Student evaluation	• The four most common methods of student evaluation were Multiple Choice Question (MCQ), Objective Structure Clinical Examination (OSCE), Modified Essay Question (MEQ) and long case examination.	• What is the appropriate mix of methods of student evaluation?
o Faculty member attrition	• The three most common reasons for faculty member attrition were family reasons, inadequate financial support and poor fringe benefits.	• Significant number of faculty members move out from

WHO Recommendation	Key findings	Gap and challenges
o Information communication technology	• Most medical schools had reasonably adequate to highly adequate facilities except conference call, video conferences and telemedicine	• IT changes so rapidly.
o Student attitude towards public work	• Ninety-two percent of students preferred working in public sector. Admission by special track was found to be associated with immediate job preference in public sector.	• There is still a mal-distribution of doctors working in rural areas.
o The administrative, communication, Inter-professional, overall clinical, overall public competencies	• The confidence of last year medical students on their administrative, communication, Inter-professional, overall clinical, overall public competencies were 21.4%, 88.8%, 84.5%, 64.9% and 60.0% respectively.	• Students have low confidence in administrative competency.
o Physician working hours	• More than 90% of physician work more than 40 hours per week. Sixty to seventy percent work more than 50 hours per week.	• Workload of physicians especially those newly graduated is very heavy. This might impair quality of health services.
o Workplace	• Increasing number of workplaces was associated with a tendency to move from 'rural' to 'urban', from 'public' to 'private', from 'service' to 'non-service' sector, and from 'different area from hometown' to 'within the same area with hometown'.	

From these findings of medical education we would like to propose the following recommendations:

1. All medical schools should design and implement mandatory continuous development program for faculty, teaching staff relevant to the evolving health-care needs of their communities.
2. Rural experience should be one of the important faculty member recruitment criteria. Provision of appropriate incentives and fringe benefits for these faculty members
3. Medical schools should have comparative national health systems, second language, health equity, humanities and social justice and cultural sensitivity in their curricula. Curriculum should focus more on competency based learning.
4. Long term national health manpower planning should be established, implemented and periodically and comprehensively updated.
5. All medical schools should implement inter-professional education in their curriculum systematically.
6. Accreditation process should be continued but better coordinated to avoid redundancy and time consuming.
7. Institute governing body of medical schools should have members from various stakeholders.
8. Lecture should be modified to be a more interactive.
9. Skilled lab should be more implemented.
10. Appropriate mix of student assessment methods to have adequate formative evaluation.
11. IT based learning model should be implemented more extensively and appropriately.
12. Special track admission should be maintained to promote public job preference.
13. Medical school should provide more learning experience for administrative competency in medical curriculum.
14. Implement effective interventions to balance working hours, health and quality of life of physician to ensure patient safety and quality of care
15. The consortium of Thai Medical school and Thai Medical Council should consider conducting physician cohort study to assess workforce dynamic and understand natural history of medical doctor

Nursing Education System

Table 4.3 Key findings of nursing education system and recommendations on transforming and scaling up health professionals' education and training, WHO 2013

	Key findings	Gap and challenges
I. Faculty Development		
1. Design and implement continuous development programmes for faculty, teaching staff relevant to the evolving health-care needs of their communities.	• No nursing school had continuous development programs for faculty, teaching staff relevant to the evolving health-care needs of their communities • Continuous development programs for faculty mostly focus on teaching methods	• Currently, choice of programs relevant to health care needs of their communities is based on personal interest.
2. Mandatory faculty development programmes that are relevant to the evolving health care needs of their communities.	• Mandatory faculty development programs focus on pedagogy and nursing education are required by Thailand Nursing and Midwifery Council.	• No nursing school had continuous development programmes for faculty, teaching staff relevant to the evolving health-care needs of their communities
3. Innovative expansion of faculty through recruitment of community-based clinicians and health workers as educators.	• The three most common criteria used for faculty recruitment were doctoral degree or equivalent, demonstrating good teaching skills, and outstanding academic profile during years of study. • There were 3 out of 36 schools that required their staff to have rural experience.	• Accreditation standards are more focusing on proportion of Bachelor: Master: Doctoral degree of teaching staff than community experiences. • What is appropriate proportion of staffs recruited from community based clinician and health worker
II. Curriculum Development		
4. Adapt curricula to the evolving health-care needs of the communities.	• Some of important topics related to health-care needs of the communities contain in some subjects such as health equity, health policy, cultural sensitivity, Health promotion and disease	• Very limited contents in the curriculum related to population health care need.

	Key findings	Gap and challenges
	prevention, Social determinants of health and diseases, and evidence-based practice. • Based on student survey, the respondents rated their low competencies in emerging health needs and evidence-based nursing practice.	
III. Simulation methods		
5. Apply simulation methods of contextually appropriate fidelity levels in the education of health professionals.	• All nursing schools have simulation laboratory. • There is no clear evidence how many nursing faculties are using high fidelity simulation. • Most of teaching and learning focus on lecture and classroom based.	• Teaching and learning methods need to be transformed. Various strategies that promote critical thinking and practice in real situations need to be considered.
IV. Direct entry of graduates		
6. Direct entry of graduates from relevant undergraduate, postgraduate or other educational programmes into different or other levels of professional studies.	No formal evaluation in this survey	
V. Admission procedures		
7. Targeted admissions policies to increase the socio-economic, ethnic and geographical diversity of students.	• Most schools did not have policy to enroll students from special tracks. Only schools under MOPH admitted students based on the student's geographical area.	• Increase the proportion of targeted admission of total admissions should be combined with hometown replacement policy to increase retention of nurse in rural areas.
VI. Streamlined educational pathways and ladder programmes		
8. Streamline educational pathways, or ladder programmes, for the advancement of practicing health professionals.	No formal evaluation in this survey	

	Key findings	Gap and challenges
VII. Inter-professional education		
9. Inter-professional education (IPE) in both undergraduate and postgraduate programmes.	• Applications of IPE, not yet in a systematic way. • Extra-curriculum activities naturally apply IPE but no assessment. • Inter-professional learning (IPE) is still limited.	• Need clear statements of IPE competencies: value/ethics, mutual respects; role and responsibilities; inter-professional communications; and team works • Role model of inter-professional among faculty staffs and team works is important contributions for IPE among students
VIII. Accreditation		
10. Accreditation of health professionals' education where it does not exist and strengthen it where it does exist.	• Strong mechanism for quality assurance and standardization. Office of the Higher Education Commission, Office for National Education Standards and Quality Assessment, school consortium, and professional councils play active role for approving curricula and license. • There is more workload for educational institutes related to accreditation from many regulation bodies.	• There is no specific outcome assessment for quality of care by these graduates.
IX. Continuous professional development (CPD) for health professionals		
11. CPD and in-service training of health professionals relevant to the evolving health-care needs of their communities.	No formal evaluation in this survey	
Other issues		
o Governing body	• About half of nursing school did not have stakeholders in administrative board.	• Inadequate members of institute governing body from various stakeholders
o Adequacy of teaching staff	• Proportion of qualification of faculties of MOPH does not meet the criteria of educational standards.	• Planning and retention of teaching staff among MOE, MOPH, and private sectors need to be implemented

	Key findings	Gap and challenges
	• All types of nursing schools have faced with many challenges, including aging workforce, limitation in recruitment, and high attrition. • The most common reasons for faculty member attrition were family reasons, needed more challenging work, economic reason, and need more promising work opportunities	to reduce attrition rate.
o Adequacy of school facilities	• Most nursing schools had reasonably adequate facilities except information technology, teleconference/video conference and telemedicine were rated as inadequate.	• IT for education, e-learning, distant learning must be improved.
o Instructional design	• Most of teaching and learning focus on lecture and classroom based. • Students spent most of their time in lecture and clinical practice	• Lecture is still the most common learning process.
o Financing for education	• Only MOE and MOPH schools obtain budget from governments, but the private schools received only tuition fee. • Educational expenses of students in private schools were twice higher than students in public schools. About 37% of nursing students in private schools had financial support from self-loan.	• Financial risk management plan to avoid consequences to students • Financial burden of students

	Key findings	Gap and challenges
o Link education to health system	• Most nursing schools were located in major city areas in upcountry (77.78%). Only MOPH nursing schools admit students based on geographical areas. • More than half of respondents in graduate survey graduated from MOPH located in provincial upcountry. Most of them had rural background and positive attitude toward working in rural areas. • After graduation for 5 years, about 4% of graduates tended to quit nursing profession and about 10% plan to go aboard. • One third of students from private schools plan to work in public sector after their graduation and the number increases in next 5 years (44.04%). • Main reasons for selecting workplaces among respondents were high salary, good career prospect, good welfare, and opportunity for further education.	• Equitable distribution and retention of nurses
o Workload of nursing staff and quality of care	• More than 70 % of nurses worked more than 40 hours per week, half of them worked more than 60 hours per week.	• Quality of care • Work life balance and retention in nursing career

From these findings of nursing education we would like to propose the following

Recommendations:

1. National health workforce planning should be developed and implemented very soon.
2. All nursing schools should design and implement mandatory continuous development program for faculty, teaching staff relevant to the evolving health-care needs of their communities.
3. Rural and community practice experience should be one of the important faculty member recruitment criteria.
4. Curriculum should be competency based and need to be revised to include important topics related to health system.
5. Teaching and learning methods need to be transformed. Various strategies that promote critical thinking and practice in real situations need to be considered.
6. Consortiums of all health professional education should create task force for mandating IPE in the curricula.
7. Standardization and quality assurance processes should minimize workload and move toward collaborated accreditation from all regulatory bodies.
8. Institute governing body of nursing schools should have members from various stakeholders especially from user agency and community.
9. Promote optimized utilization of nursing laboratory and simulation in all faculties and need seamless integration into the curriculum
10. Faculty development program needs to be strengthened especially in MOPH.
11. IT based learning model should be implemented more extensively and appropriately.
12. Rural background, local training, and hometown placement with secured position in public health services should be maintained and promoted to retain nurses in rural areas.
13. Direct entry of graduates into nursing education programs should be promoted and close monitoring and assessment are needed.
14. Government should provide scholarship for students in private nursing schools with compulsory to work in rural areas.
15. Need to review and improve the target recruitment management to improve distributions in specific underserved areas to increase accessibility to nursing education.
16. The regulation for opening new private schools should consider financial risk management plan to avoid consequences to students.
17. Implement effective interventions to promote work-life balance, health and quality of life of nurses to ensure patient safety and quality of care and nurses cohort study should be promoted to better understanding health quality of life and workforce dynamic of Thai nurses

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ANNEX 1

The Health Professional Education Foundation (NHPE) wishes to express warm thanks and deeply grateful appreciation to all those who generously gave their time and provided technical input, participated in the report and in particular to relevant organizations:

Medical Schools

College of Medicine Rangsit University
College of medicine and Public Health Ubon Ratchathani University
Faculty of Medicine Siriraj Hospital, Mahidol University
Faculty of Medicine, Chulalongkorn University
Faculty of Medicine Chiang Mai University
Faculty of Medicine Ramathibodi Hospital, Mahidol University
Faculty of Medicine, Khon Kaen University
Faculty of Medicine Prince of Songkla University
Faculty of Medicine Srinakharinwirot University
Faculty of Medicine, Thammasat University
Faculty of Medicine Vajitra Hospital, Navamindradhiraj University
Faculty of Medicine Naresuan University
Faculty of Medicine Mahasarakham University
Faculty of Medicine Burapha University
Faculty of Medicine, Princess of Naradhiwas University
Institute of Medicine Suranaree University of Technology
Phramongkutklao College of Medicine
School of Medicine University of Phayao
School of Medicine Walailak University

Nursing Schools

Boromarajonani College of Nursing, Bangkok
Boromarajonani College of Nursing Buddhachinaraj
Boromarajonani College of Nursing Chon Buri
Boromarajonani College of Nursing, Chiang Mai
Boromarajonani College of Nursing, Chakriraj
Boromarajonani College of Nursing Changwat Nonthaburi
Boromarajonani College of Nursing, Khon Kaen
Boromarajonani College of Nursing, Lampang
Boromarajonani College of Nursing Nakornratchasima
Boromarajonani College of Nursing, Nakhonphanom Nakhon Phanom University
Boromarajonani College of Nursing Sanpasithiprasong
Boromarajonani College of Nursing Songkhla
Boromarajonani College of Nursing, Trang
Boromarajonani College of Nursing Yala
College of Nursing Christian University of Thailand
Faculty of Medicine Ramathibodi Hospital, School of Nursing Ramathibodi Hospital
Faculty of Nursing Science, Assumption University of Thailand
Faculty of Nursing, Burapha University
Faculty of Nursing Huachiew Chalermprakiet University
Faculty of Nursing, Chiang Mai University
Faculty of Nursing Chiang Rai College
Faculty of Nursing Mahasarakham University
Faculty of Nursing, Mahidol University
Faculty of Nursing Naresuan University
Faculty of Nursing Khon Kaen University
Faculty of Nursing, Pathumthani University
Faculty of Nursing, Prince of Songkla University
Faculty of Nursing, Ratchathani University Udon Thani Campus
Faculty of Nursing Science, Rangsit University
Faculty of Nursing, Thammasat University
Faculty of Nursing, Vongchvalitkul University
McCormick Faculty of Nursing, Payap University
Missions Faculty of Nursing, Asia-Pacific International University
Phrapokklao Nursing College, Chanthaburi
Saint Louis College
School of Nursing, Mae Fah Luang University
School of Nursing, Siam University
School of Nursing Walailak University
Srimahasarakham Nursing College
The Thai Red Cross College of Nursing.

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