Published in final edited form as:
ASEAN J Open Distance Learn. 2012 December 21; 4(1): .

A large national Thai Cohort Study of the Health-Risk Transition based on Sukhothai Thammathirat Open University students

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Abstract

Thailand 's dynamic economic development has been accompanied by great changes in cultural, social, environmental and other forces that shape population health in ways that are poorly understood. To study Thailand's health-risk transition we began to follow a large cohort of students enrolled at Sukhothai Thammathirat Open University (STOU) - an accessible transitional group. STOU students are not affluent but are aspiring to modernize. Our Thai Cohort Study (TCS) started at baseline with 87,134 cohort members in 2005, with over 60,000 successfully being followed up in 2009; the next round of follow-up is scheduled for 2013.

Here we show that the Thai population, the STOU student body and the TCS cohort are comparable for social geography and socio-economic status. Productive results make us sure the project can have substantial long-term impacts on regional population health by enabling Thailand and similar middle-income countries to understand and mitigate emerging disease trends. Our study shows that Open University students are able and willing to represent their source populations for a variety of useful social and health research.

INTRODUCTION

Distance-Learning Open Universities (DLOU) create higher education opportunities for adults of all ages. Benficiaries include persons unable to attend full-time on campus because of incomplete or low quality high school education, insufficient funds, or family or work commitments. Thus we can expect that the student body at an Open University is socio-demographically closer to the general population than students studying on-campus at a normal selective university. Furthermore, the Open University student age range is broad, another factor making the students similar to the general (adult) population. Recognising the

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above characteristics of DLOU students, in 2005 we began a long-term observational study of health and risks among a large group of Sukhothai Thammathirat Open University (STOU) students in Thailand. STOU enrols a wide range of students including full-time workers, housewives, monks, ethnic hill tribes, and detainees (STOU. 2008; Sungkatavat 2009). Many STOU students are already employed in the workforce and continue their education for various reasons including to improve their skills for career promotion or to further expand their knowledge in particular fields.

Ongoing observation of this group of STOU students residing all over Thailand constitutes the Thai Cohort Study (TCS) of the Health-Risk Transition project – aimed at monitoring and characterising emergence of chronic disease and injury as dominant health burdens as the Thai population becomes 'modern'. We expect this large group of STOU students will constitute an informative national cohort and we have already followed them over 4 years and expect to do so at least until 2013 (eight years after the study began). Here we inform the DLOU community and scholars of our experiences with this landmark study and we formally compare the TCS members to the STOU student body at the time of recruitment in 2005. We also compare both of these to the Thai population and aim to demonstrate the similarities of the thee groups. We also wish to alert others to the great potential for social and health research among DLOU students as they represent national adult populations and are capable and motivated to cooperate.

The purpose of the TCS described here is to document changes in health risk and disease patterns over time and get information to enable feasible interventions to reduce disease burdens. The TCS baseline questionnaire was mailed in 2005-6 to approximately 200,000 STOU students; 87,134 responded (44%) (Sleigh et al. 2008). The 20-page questionnaire generated over 500 variables covering seven domains: 1) socioeconomic status, ethnicity and the domestic environment, present and past, 2) occupation, income, work stress and safety, 3) height and weight, size at birth, whether breast fed, doctor-diagnosed diseases, self-assessed health, injury and health service use over the past year, 4) social networks and trust, religion, spiritual health, sense of well-being and satisfaction, 5) food sources, preferences and intake, exercise and physical activity, 6) tobacco and alcohol use, use of transport, and safety risks, 7) family health background (parents and children).

In 2009, a 4-year cohort follow-up of a wide array of exposures and outcomes was gathered through a 12-page questionnaire. The 2009 follow-up also covered the main domains of the 2005 baseline but with increased emphasis on injuries, fractures, mental health, personal wellbeing and overall health. The project has reached a response rate of 70% (n≥60,000). The 2013 follow-up questionnaire will be created in 2011-2012 to reflect information emerging from the 2005-2009 cohort analysis.

OBJECTIVE OF PAPER

The main objectives of this paper are as follows: (1) compare the profile of TCS cohort members with the general Thai population and the STOU student body in 2005 by demographic, socioeconomic and geographic characteristics; (2) describe and compare study disciplines and years of enrolment for the cohort and the STOU population in 2005; 3) demonstrate utility of the study for DLOU students; 4) report on our findings to enrich the learning experience of the STOU student body.

METHODOLOGY

Data for the Thai population, STOU students and TCS members

In an earlier paper, we have compared the Thai population and the TCS cohort using the 2000 Thai Population Housing and Census (Sleigh et al. 2008). In this paper we broaden the comparison to include the STOU student body and use a different population data source.

Thus the Thai population data are derived from the Health and Welfare Survey 2005 conducted and reported by the Thai National Statistical Office (NSO). Descriptive analyses were calculated based on 52,011 respondents (excluding those less than 15 years) then weighed as calculated by the NSO to represent the Thai population.

The STOU student body data were derived from the annual report of enrolled students in 2005 issued by the Office of Registration, Records and Evaluation. The data for TCS members derived from the 87,134 respondents for the 2005 baseline study. Data scanning and editing were conducted using Thai Scandevet software and further edited by SQL and SPSS softwares. Individuals with missing data for any of the analyses presented here were excluded so totals vary a little according to the information available.

Demographic, socioeconomic and geographic characteristics

The main characteristics for comparisons were: sex, age in years (<21, 21-30, 31-40, 41-50, and 50+), marital status (not married, married, divorced/widowed), highest obtained education (up to high school, diploma, university degree), monthly income in Thai Baht (1 USD = 40 baht in 2005), and residence (Bangkok, Central region, North, Northeast, South). Some variables will be stratified by age group to facilitate the comparison.

Comparisons of faculties enrolled by STOU and TCS students

STOU offers 12 main areas of study. One fundamental aspect of the University's policy is to provide educational services to the general public in the form of continuing education including one-year Certificate. Bachelor degrees are normally awarded after completion of a 4-year program; some take longer due to other commitments. Those already possessing a certificate, diploma or bachelor's degree in another discipline could complete their studies in shorter timeframes. Master degree programs are also available in many areas but a doctoral degree is currently only available in the field of education. Below is a list of the study areas and a brief description of the topic arrays:

- School of Liberal Arts: language studies, office information services
- School of Educational Studies: elementary and secondary education
- School of Management Science: business and governmental administration
- School of Law
- School of Health Science: public health administration, occupational health and safety, hospital administration
- School of Economics: economics and business economics
- School of Human Ecology: community nutrition, child and family development, food business, hotel and restaurant studies
- School of Political Science: governments, politics
- School of Agricultural Extension and Cooperatives: forestry extension, crop and animal production management, agribusiness

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- School of Communication Arts: journalism, public relations, advertising

- School of Science and Technology: industrial technology, commercial technology, business information technology

- School of Nursing

Ethical issues

Student contact details were provided by STOU administration. All participants were assured by STOU and project investigators that their participation was voluntary, that it would not affect their academic progress, that they could withdraw at any time, and that the information they provide would never be revealed to others at the individual level. Informed written consent was obtained from all participants.

Ethics approval was obtained from Sukhothai Thammathirat Open University Research and Development Institute (protocol 0522/10) and the Australian National University Human Research Ethics Committee (protocol 2004344). Informed written consent was obtained from all participants.

RESULTS

Table 1 presents a comparison of the Thai population, STOU students, and the TCS cohort members. We note a close to even sex distribution within the Thai population but a slightly higher proportion of females in both the STOU (46.8% vs. 53.2%) and the TCS populations (45.3 vs. 54.7%). For age distribution, the STOU student body and the TCS cohort tended to include proportionally more young adults than the general population with 56.2% and 51.5% in the 21-30 year age range compared to 23.9% in the general Thai population. These differences were also reflected in a much higher proportion of general Thais being older than 50 years (24.7%) compared to STOU (1.2%) and TCS cohort (2.0%).

Over 60% of the Thai population reported being married compared to 63.1% of STOU and 43.4% of the TCS cohort. However, when broken down by age groups, it was the 20-30 year-olds in the TCS who were less likely to be married (26.2% compared to 49.1% among the general population). Among the general Thais, 56.6% had lower than junior higher school education but almost all TCS and STOU members had more school education than that. However, distributions of highest education obtained before entering STOU were comparable between STOU and TCS cohort members. Another socioeconomic measure reported here is monthly income in Baht. Close to 19% of Thais reported income less than 3000 Baht per month compared to 14.7% among STOU and 11.0% among cohort members, we note slightly different categories of income are reported which makes direct comparison difficult but the overall similarity of socioeconomic status of the three groups is readily apparent.

Geographically, Bangkok and the Central region were most represented across the three groups: 37.1%, 40.8%, and 41.4% among Thai, STOU, and TCS respectively. Proportions assigned to Bangkok for STOU include surrounding peripheral areas and thus appear to be larger than proportions for other groups. East and Northeast residents made up of 32% of the general Thai population, 25.7% of STOU and 26.8% of the TCS cohort. The overall impression is that all three groups are remarkably similar for geographic representation of populations included.

Table 2 presents a comparison of the STOU student body and TCS cohort members by faculty enrollments as of 2005. Very similar distributions were found among the two, for example 38.0% and 33.8% were enrolled in the School of Management Science; followed

by 22.2% and 19.5% in the School of Law; and 12.4% and 13.5% in the School of Political Science.

Figure 1 shows TCS cohort members by years of enrolments. We note that 12.6% was enrolled between 1995 and 2000, the highest proportions were 21.9% enrolled in 2004 and 22.2% were enrolled in 2005.

DISCUSSION

In the foreground of our multi-level Thai study of the health-risk transition is the large national Sukhothai Thammathirat Open University cohort under observation since 2005, with its first follow-up completed in 2009. With initial ages ranging from 15-87 years, and a socioeconomic status close to that of the bulk of the Thai population, the cohort is revealing the key proximal drivers of changing patterns of health and well-being as Thailand undergoes middle-income modernization. The drivers encountered so far include demographic transition with falling birth and death rates (Carmichael 2008), progressive urbanisation (Lim et al. 2009), and physical inactivity associated with diets with more refined carbohydrates and fats (Banwell et al. 2009). Some changes are both risks and protectors, such as smaller family size and increasing stature; these body size changes are risks for breast cancer (Jordan et al. 2009) and are also protectors against many other chronic diseases (Seubsman and Sleigh 2009) and are likely to associate with increased longevity, better cognition and greater lifetime productivity.

Other manifestations of modernization include personal wellbeing in the cohort which is beginning to assume a developed country pattern with scores generally rising above those expected for Asia (Yiengprugsawan et al. 2009a). Overarching all the health-risk drivers and outcomes are the modifying influences of gender and socio-economic status (Seubsman et.al.2011; Seubsman et.al.2009) and the profound influence of rising levels of education, for example influencing smoking patterns (Pachanee et.al. 2011). Reacting to these profound health-risk changes Thai health services have evolved and developed steadily and finally became accessible to the whole population in 2001, when universal health insurance was made available by law (Yiengprugsawan et al. 2009b). This is likely to accelerate health-risk changes now that medical knowledge and technology is being deployed on a population-wide basis. The completion of the 4-year TCS longitudinal follow-up in 2009 will provide deeper insight into the dynamics of health-risk changes underway in the Thai population (http://nceph.anu.edu.au/Thai_Cohort_Study/).

Contact with the cohort from 2005 to 2009 was maintained through a series of newspaper articles, reports in periodic STOU student newsletters and a health almanac containing some key results and other health information relevant to the health-risk transition sent as a booklet (Figure 2) posted to all cohort members (Seubsman 2007). To date, the Thai Health-Risk Transition Project has been very productive with 3 books and 60 published peer-reviewed papers.

CONCLUSION

We have demonstrated that a large informative prospective study of health and risks is possible among DLOU students in Thailand. Not only were the students willing to participate in a very large numbers (N = 87,134) but their participation has continued already over four years and is expected to continue in the future. Furthermore, the students included in the study represented well the social geography of the Open University student body and the adult Thai population. It is especially noteworthy that the distribution of

socioeconomic status among participating students was very similar to that of the general Thai population.

Many important health trends have been accessible and interpretable by this study method. We believe it would be applicable in many national settings where Open Universities operate. By building our study around an Open University cohort, we have ensured large national representation of citizens capable of response to sophisticated questionnaires while minimizing contact costs and ensuring high cooperation. Perhaps most important is the observation that DLOU students represent future trends for the population as a whole. Many of those trends are driven by rising education levels which are already operating among the DLOU students.

Acknowledgments

This study was supported by the International Collaborative Research Grants Scheme with joint grants from the Wellcome Trust UK (GR0587MA) and the Australian NHMRC (268055). We thank the staff at Sukhothai Thammathirat Open University (STOU) who assisted with student contact and the STOU students who are participating in the cohort study. We also thank Dr Bandit Thinkamrop and his team from Khon Kaen University for guiding us successfully through the complex data processing.

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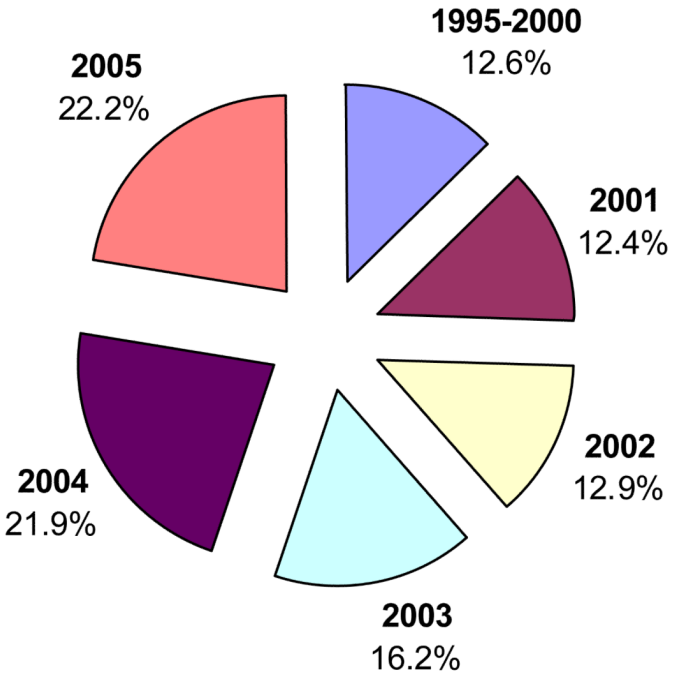

Figure 1.
TCS cohort members by years of enrolment

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Figure 2.
"Maintaining your health with the Thai Health-Risk Transition project" book sent to TCS cohort members in 2007

Table 1

Comparisons of Thai population, STOU student body and TCS cohort members in 2005

Attribute	Distribution (%)			
	Thai population	STOU	TCS cohort	
Demographic characteristics				
Sex				
Male	49.5	46.8	45.3	
Female	50.5	53.2	54.7	
Age (years)				
<21	13.3	16.3	6.2	
21-30	23.9	56.2	51.5	
31-40	21.6	19.6	29.3	
41-50	17.5	6.7	11.0	
50+	24.7	1.2	2.0	
Marital status				
Overall population				
Married (age groups)	63.1	30.3	43.4	
20-30	49.1		26.2	
31-40	79.7		67.5	
41-50	81.6		77.7	
50+	86.3		80.6	
Divorced/widowed	9.6	2.6	3.1	
Socioeconomic status				
Education				
Lower than junior high school	56.6			
Junior to high school	30.9	44.9	48.9	
Diploma	3.7	32.7	27.0	
University	8.4	22.4	24.2	
Monthly income (Baht/month)				
No income/ not report	41.6			
≤ 3,000	18.9	14.7	11.0	≤3,000
3,001-6,000	19.7	23.9	30.9	3,001-7,000
6,001-9,000	7.6	24.7	23.3	7,001-10,000
9,001-12,000	4.0	13.7	24.2	10,001-20,000
≥12,001	8.2	23.1	10.5	≥20,001
Geographic residence				
Bangkok and Central *	37.1	40.8	41.4	
Bangkok	13.5	30.7	17.1	
Central (not Bangkok)	23.6	10.1	24.3	
North	18.6	18.1	18.1	
East and Northeast	32.0	25.7	26.8	
South	12.3	15.1	13.0	

* Bangkok includes up to 5 provinces and definitions varied for the 3 data sources hence Bangkok and Central are best evaluated as a combined figure.

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Table 2

Comparisons of STOU student body and TCS cohort members by Faculty enrolments in 2005

Faculty	STOU (%)	TCS cohort (%)
School of Liberal Arts	4.4	5.2
School of Educational Studies	3.2	6.9
School of Management Science	38.0	33.8
School of Law	22.2	19.5
School of Health Science	4.2	4.1
School of Economics	1.5	1.4
School of Human Ecology	3.1	3.1
School of Political Science	12.4	13.5
School of Agricultural Extension and Cooperatives	4.6	5.3
School of Communication Arts	3.0	3.2
School of Science and Technology	2.1	1.4
School of Nursing	1.4	1.6