Published in final edited form as:

Int Labour Rev. 2010 September ; 149(3): 373–386. doi:10.1111/j.1564-913X.2010.00092.x.

Thailand's Work and Health Transition

Matthew Kelly, B. Asian Studies^{1,*}, Lyndall Strazdins, PhD¹, Tarie Dellora, B. Asian Studies/B. Commerce¹, Suwanee Khamman, MCN², Sam-ang Seubsman, PhD³, and Adrian C Sleight, MD, FRCP¹

¹National Center for Epidemiology and Population Health, the Australian National University, Canberra, Australia ²National Economic and Social Development Board, Bangkok, Thailand

³School of Human Ecology and Thai Health Promotion Centre, Sukhothai Thammathirat Open University, Nonthaburi, Thailand

Abstract

Thailand has experienced a rapid economic transition from agriculture to industry and services, and from informal to formal employment. It has much less state regulation and worker representation relative to developed nations, who underwent these transitions more slowly and sequentially, decades earlier. We examine the strengthening of Thai government policy and legislation affecting worker's health, responding to international norms, a new democratic constitution, fear of foreign importer embargos and several fatal workplace disasters. We identify key challenges remaining for Thai policy makers, including legislation enforcement and the measurement of impacts on worker's mental and physical health.

Keywords

Thailand; occupational health; work transition; health transition policy

Introduction

How people work, and in what conditions, are critical determinants of population health. Much attention has been devoted to interconnections between work and health in affluent and developed nations, but far less is known about transitional economies (Commission for the Social Determinants of Health, 2008). This paper analyses Thailand as a case study of a contemporary work and health transition in a middle income country. We intersperse our description with comparative data from Australia, to illustrate differences and similarities between transitional and developed economies. Finally we identify challenges confronting Thailand as it strives for a healthy and productive workforce.

Economic transitions, work and health

As traditional rural occupations give way to manufacturing, service, and knowledge work population health is affected through rising incomes, changing safety risks and work conditions, and employment insecurity (Benanch, Muntaner, and Santana, 2007). The resulting health transition is marked by shifts in environmental risks and human ecology (McMichael, 2001), diet and nutrition (Drenowski and Popkin, 1997), and disease and

*Corresponding author: Address: NCEPH Building 62, Mills Road, the Australian National University, Canberra, ACT, 0200, Australia. matthew.kelly@anu.edu.au Phone: +61 2 6125 0714 .

longevity (Caldwell and Caldwell, 1991; Frenk et al, 1991; Caldwell, 1993; Jamison et al, 1993).

Jobs affect health due to exposure to work hazards. Risks are greatest in the construction, manufacturing, and industrialized agricultural sectors due to atmospheric pollutants, heart disease caused by emissions or stress, and noise or ergonomic injury. Those least at risk from injury or disease are generally in the service sector, particularly office environments (Ezzati, 2004). But the service and knowledge sectors still pose health risks, especially to mental health, due to work organisation, job insecurity, work pressures, and shift work. In affluent nations the move to a service and knowledge economy widened wage inequity (Goos and Manning, 2007) and this may also affect health outcomes.

In developed nations, the shift to service and knowledge economies has been sequential and relatively gradual and has occurred together with state regulation of working conditions and worker representation. The pace of change in developing and transitional economies is more rapid, limiting capacity for regulation to protect workers' health, and without a history of worker representation. Furthermore, the work transition is occurring in a context of accelerating globalisation meaning that capital can move freely across countries, and labour markets must compete globally, placing downward pressure on wages and conditions (Slaughter and Swagel, 1997). Thus, developing and transitional economies are undergoing economic development at a different tempo and in different contexts to those of the developed world, and it is not clear whether they will reap the same health benefits from development to those observed in the developed world.

The Thai work and health transition

Thailand entered this transformative stage when state regulation for working conditions, social security and employment policies were much less developed than in western nations such as Australia, or they only applied to defined segments of the population such as civil servants. Most Thai workers are still in the informal economy – where work is contingent and conditions are largely outside regulation. Concurrently, unionization rates are low and few workers are aware of their rights. The speed of Thailand's work transition created a 'modern' sector in services and knowledge industries, alongside a sizeable proportion of agricultural and factory workers. Western nations experienced a more sequential shift from one dominant sector through to the next, across several centuries. The coexistence in Thailand of modern and traditional sectors with disparate hazards, pay and conditions is affecting its' health transition, as the 2 sectors experience diverse exposures to work-related risk.

Over the last 50 years, alongside its work transition, Thailand has improved in many measures of population health, including increased longevity and decreased mortality, communicable disease and malnutrition. For example, from 1964 to 2006, Thai life expectancy in years increased from 56 to 70 for males and 62 to 78 for females. From 1962 to 2006 the Thai maternal mortality ratio per 100,000 live births fell from 374.3 to 9.8. From 1980 to 2004 the infant mortality rate in Thailand per 1,000 live births fell from 49 to 21 (Wibulpolprasert, 2008). Over the last 2 decades Thais have begun to experience many of the diseases prevalent in western nations including circulatory disorders, diabetes, obesity, cancer, and traffic injury. This health transition is quite advanced in Thailand and on some indicators Thais are approaching developed country levels, especially for obesity and some other consumption related diseases (Banwell et al, 2008). By 2005 eight of the top ten causes of death in Thailand had strong links to modern aspects of work and life in Thailand (Economic and Social Commission for Asia and the Pacific, 2008).

Structural drivers of the Thai work transition

Trends in workforce composition

Sectoral employment trends for Thailand illustrate the speed of its economic transformation (see Figure 1a). In 1960 agriculture occupied 82% of the workforce; in 1980, just before the pace of Thailand's economic transformation took off, over 70% of workers were still engaged in agriculture; by 2008 this figure had fallen to around 35% (National Statistics Office, 2008a; 2005a). In Australia by comparison (Figure 1b) the proportion of the population working in agriculture had fallen below 20% in 1948 (Organisation for Economic Development and Cooperation, 2008), reflecting the differing structural factors facing policy makers in each country. In Australia the economy has had a majority of workers in one sector in each period, whereas Thailand's workers are fairly evenly distributed across multiple sectors (see Figure 1 a and 1b). As the agricultural workforce fell, employment in the Thai industrial sector from 1980 to 2008 rose from 11% to 24% of the workforce; over the same 28 year period the service sector's share of the workforce grew from 19% to 41% (National Statistics Office, 2008a).

The informal sector

The Thai National Statistics Office defines informal workers as those primarily self employed who are not covered by the existing workplace laws, regulations and protections (National Statistics Office, 1994). Informal work operates at a low level of organisation based mostly on casual employment, kinship, or personal or social relations rather than contractual arrangements with formal guarantees (International Labour Organisation, 1993). Thus work in the informal sector is insecure, unregulated and low wage, with more stress, workplace injury and related ill health (Florey, Galea, and Wilson, 2007). Furthermore when a large proportion of the workforce is informal Government tax revenues are substantially reduced, constraining investment in health infrastructure (Sujjapongse, 2005).

As recently as two decades ago the informal sector made up 80% of Thailand's workforce. This figure fell to 71% in 2000, and 62.7% in 2007 (National Statistics Office, 2007). A little over half of informal workers were agricultural workers, with the remainder running small businesses or market stalls, and working informally in factories or the construction industry. Although the proportion of the workforce employed informally is still high it is falling rapidly with modernization and development. This change is being led by the Bangkok workforce where in 2007 the proportion working informally was only 31.7% (National Statistics Office, 1994, 2005b, 2007). However for the perceivable future an informal labour market will remain an important mechanism for absorbing excess labour in economic bad times and especially for new urban migrants.

Inequity in the labour market

Life expectancy, infant mortality rates, and other health indicators improve as incomes increase but socio-economic inequities mean that not all people experience the same health benefits (Kawachi, 2000; Coburn, 2000). Thailand's work transition has occurred together with an increase in income inequality during its recent rapid economic growth. Using the Gini coefficient Thailand's income inequality rose from 0.410 in 1962 to peak at 0.525 in 2000 before falling again to 0.499 in 2007 (United Nations Public Administration Network, 2003; National Economic and Social Development Board 2007), illustrating these inequalities. In Australia by comparison where this work transition occurred earlier, the Gini coefficient has hovered around 0.448 for approximately the last decade (Australian Bureau of Statistics, 2003).

Improved wages and safer conditions in the service sector can also affect equity and social cohesion. Another facet of equity is gender discrimination in the workplace. Thailand differs from many countries at a similar stage of development in that it has always had a relatively high rate of participation by women in the workplace (Tonguthai, 2002). Throughout the period of Thailand's economic growth and until the present, women's participation rates in the workforce have remained over 60% (National Statistics Office 2009), a level comparable to those found in Western countries. Most women in Thailand enjoy the opportunity to work for pay, but are more likely to be employed in the least rewarding and most hazardous sectors created by economic transformation or to be insecurely employed or perform unregulated, home based work (Tonguthai, 2002). For example in 2005, 76.3% of home workers in Thailand were women (National Statistics Office, 2005c).

Work and family

The changes from a rural agriculture based economy to a rapidly urbanizing one have had an impact on family life, with work located away from the village and extended family, but with few alternative childcare supports (Heymann, 2003). In rural Thailand there has been a trend for men to go to urban areas to work leaving the women responsible for household, childcare and agricultural production (Coyle and Kwong, 2000). This extra work burden is likely to lead to poorer physical and mental health of mothers and children. Furthermore, women working longer hours have increased marital instability in Thailand (Edwards et al, 1992) and this in turn creates psychological distress and related illness for parents and children.

Working conditions in Thailand

Work hours and productivity

Thailand's economic transition is characterised by a persisting, low level of worker productivity, rooted in the low educational attainments of the general work force. At present around 57% of the Thai workforce have primary school or lower education (National Statistics Office, 2008a). In the period of rapid, largely industrial driven growth an uneducated workforce was not a hindrance to the country's economic success. But now the economy is moving to skilled service and knowledge jobs, leaving Thailand with both a shortage of skilled workers and a large pool of unskilled labour lacking good quality jobs.

The Thai government has responded by increasing spending on education and promulgating the 1999 National Education Act which aimed to offer 12 years of free education. The numbers of students proceeding beyond the primary level has increased sharply in recent years, for example in 2006 approximately 59% of students were completing upper secondary school and 24% were going on to tertiary study (National Statistics Office 2008b). However there is likely to be a persisting, lag effect from such a large percentage of the workforce having only primary education (Khoman, 2005).

The low productivity of the labour force creates its own health risks with employers wanting longer working hours at lower pay rates. Consequently Thai workers generally work very long hours; the average working week is 48 hours for industrial sector workers and up to 54 hours for commercial sector employees. At present almost 70% of the workforce spend more than 40 hours a week at work (National Statistics Office, 2008a). In Australia, with some of the longest working hours among developed nations, only around 30% of workers work more than 40 hours (Australian Bureau of Statistics, 2007). Long working hours exacerbate the health risks already being faced by workers in Thailand particularly for women who must combine long work hours with family responsibilities.

Social Security systems in Thailand

Social security safety nets are also important for workers' health. Several schemes operate in Thailand.

1. Civil Servants Medical Benefit Scheme and Government Officials Pension Act – provides generous benefits for government workers and their dependants. (Reisman, 1999).
2. Workman's Compensation Scheme – Employer funded and gives benefits for work related sicknesses (Reisman, 1999).
3. Social Security Scheme – Sickness benefit for non-work related conditions, old age pension, and unemployment benefit. (Kanjaphoomin, 2004; Reisman, 1999).
4. Universal Coverage Scheme – Provides free medical care for a wide range of treatments under a capitation model for the whole population. Operating since 2002 (Tangcharoensathien and Jongudomsuk 2004).

The Thai social security system has therefore progressed towards a universal safety net for Thai workers and their dependents with all Thai people now having access to free health care, thus greatly reducing inequities in health care access. Legally registered foreign workers can also be included in this coverage scheme for a small fee. Other social security system supports still remain out of the reach of those in the informal sector, including sickness benefits for time taken off work and unemployment benefits. Recently a universal pension 500 baht per month has been introduced which will cover even informal workers.

Unionisation in Thailand

Unions play a pivotal role both in securing legislated labor protections and rights such as safety and health, overtime, and family/medical leave and in enforcing those rights on the job (Mishel and Walters, 2003). In general Thailand can be considered to have a very low rate of unionisation. In 2006 less than 4% of the workforce were union members though this figure rose to more than 50% among state enterprise workers. The large percentage of Thai workers informally employed and particularly those who are migrant casual labourers (where the opportunity for unionization doesn't exist), cultural factors and a general lack of support from political leaders for unionization (Brown, 2001) are likely reasons. Many Thai workers are also reluctant to upset traditional familial relationships within workplaces which have provided protection for them.

The right to organise has improved since the mid 1970's, before which unionisation was actively suppressed, and unions now enjoy some legal rights. Since 1975 there has been a Labour Relations Act which regulates the registering of unions and establishes procedures for resolving labour disputes. The Act favors enterprise level unions and limits industry wide organisation (Lawler, 2000). Despite improved legal rights in the period of Thailand's rapid economic transition, union strength may have actually weakened, through a combination of government inaction on enforcing rights to organize and active suppression of unionism by private sector employers (Brown, 2001).

In developed nations unions have been key players in setting work hours and minimum wages, reducing exposures to hazards, and obtaining sick leave, holiday leave and other benefits for workers. Weak Unions may be one reason for the very long work hours and low wages found in Thailand; for example it has been estimated that up to 40% of factories do not honour their minimum wage obligations (Charoenloet, 1998).

National planning on labour and workplace safety

Changes in Labour policy

In the last fifteen years, Thai government policy on workplace conditions and worker's health and safety has strengthened in an era of unprecedented openness in Thai politics. Partly driven by a newly strengthened civil society a "People's Constitution" was promulgated in 1997. The new constitution included numerous clauses setting out the rights of individuals and communities and led to the formation of a National Human Rights Commission (Phongpaichit and Baker, 2005). The reform of workplace legislation can be seen as part of this process.

There are several other reasons behind this policy interest in workplace health and safety. In the 1990's there was a series of terrible workplace accidents exemplified by the Kader toy factory fire in 1993 which led to 188 deaths and almost 500 injured people. This incident drew media, NGO and public attention to the issue of workers' safety, influencing policy makers to take action (Brown, 2001). As with the Triangle Shirt Factory fire that killed 146 poor garment workers in New York in 1911 and led to a raft of new legislation aimed at protecting US workers, (McEvoy, 2006) these Thai accidents also appear to mark a turning point in national attitudes towards worker safety.

A second related driver is the fear of embargoes on Thai exports resulting from international condemnation of Thai labour standards (Brown, 2001). Thailand has been a member of the ILO since 1919 and although it has been cautious and signed few of the more than 180 available conventions it has also hosted the Asia-Pacific regional office of the ILO and developed a close working relationship through the Ministry of Labour.

The five year National Economic and Social Development Plans, formulated by the powerful National Economic and Social Development Board (NESDB), provide one important pathway for implementing this new policy direction. Beginning with the 1997-2002 plan each policy document has emphasised decreasing workplace injuries and illnesses. The plans establish target accident incidence rates and measures to be implemented to achieve these targets. They also aim to register informal workers, especially home workers and recognize informal workers organizations, thus providing greater protection and security. Recent NESDB policy has seen moves towards providing similar social security benefits to informal workers as are available in the formal workforce (NESDB 2004).

The NESDB Labour Development and Welfare plans since 1997 were formulated to address these issues and open avenues for workers to collectively bargain on workplace conditions (Ruphan, 1999). The plans include new safety regulations, a national safety culture campaign, better inspection systems, safety-embedded management systems, improved reporting, and participatory training. These measures address both well known work hazards and newly recognized biological, psychosocial and musculoskeletal risks (Chavalitnitikul, 2005).

Another pathway for change is the 1998 Labour Protection Act, which required safety committees in all (formal) workplaces including representatives of management and workers trained in workplace health and safety. It also established a reporting system for employees to notify suspected breaches of safety rules, which the Ministry is obliged to investigate (Seehavong, 2006). This process has been accompanied by a more rigorous general workplace inspection process (Ministry of Labour and Social Welfare, 2007). The Act also addressed work conditions including maximum working hours and minimum wages and set up a second reporting process for employees to report breaches of these conditions. As well

as this, penalties for breaches were increased and independent third parties were allowed to investigate disputes (Suthamasa and Buayaem, 2001). Since 2005 the Ministry of Labour has openly supported regulation to require organisations employing 50 or more workers to develop an Occupational Safety and Health Management System (Chavalitnitikul, 2005). The necessary reforms and training procedures are still underway but if successful should lead to improved worker safety.

As well as these measures undertaken by the NESDB and the Department of Labour, the Ministry of Public Health has also conducted several national campaigns including an active disease surveillance program. This program is an attempt at a comprehensive occupational health and safety surveillance system combining the resources of the Ministry of Public Health, the Ministry of Labour, and the Ministry of Industry to monitor selected diseases (such as silicosis), identifying high risk groups and developing interventions (Siriruttanapruk, 2004).

Workplace Health and Safety in Thailand

The Ministries of Health and Labour have addressed industrial health risks such as hazardous chemicals and unsafe factory work practices but new hazards remain unregulated. Ergonomic and workplace design, human resource practices, and repetitive work conditions, expose many unskilled or poorly educated workers to potential life long health problems (Tonguthai, 2002; Yingratanasuk, Keifer, and Barnhart, 1998). Again, the size of the informal labour market places limits on the Government's ability to improve occupational health and safety. Workers in this sector are not covered by the laws and regulations and rates of disease and injury are probably underreported (Chavalitsakulchai and Shahnava, 1993).

Never-the-less recorded workplace injuries and deaths have been falling in recent years after reaching a peak in 1990, as have incidences of workplace injury and sicknesses. Statistics available from the Office of the Workmen's Compensation Fund reveal falling rates for death and injury across the period 1994-2004: reported deaths per 100,000 workers fell from 19.20 in 1994, to 17.73 in 1997, 11.60 in 2004 and 9.46 in 2006; there were parallel declines in reported injury rates per 1,000 workers from 43.78 in 1994 to 29.18 in 2004 and 24 in 2007 (Chavalitnitikul, 2005; Wilbulpolprasert 2008; Seehavong, 2006; Ministry of Labour and Social Welfare, 2007).

Role of Globalization in Thailand's Transition

Rapid economic expansion since 1987 has been fueled by a huge growth in direct foreign investment. The Thai government also implemented economic policies promoting export development, reducing trade barriers, privatizing state enterprises and so on aiming to maximise global trade and competitiveness. This growing reliance of Thailand's economy on international investments and trade culminated in the 1997 Asian Financial Crisis, triggered by a massive outflow of foreign capital (Warr, 1993 and 1999). Since then the country has aimed for a more balanced economic system less dependent on foreign capital and exports.

This encounter with globalisation occurred when Thailand's economy was at a very different stage from that of OECD countries such as Australia. Thailand had neither policies nor structures in place to ensure workplace health and safety rules were followed by international companies, nor the economic reserves to protect workers (especially agricultural workers) from new pressures to produce for powerful global buyers. On the positive side global standards on workplace safety developed over long periods of industrial development in the west have been adopted quite rapidly by the Thai government. In

contrast to the deregulation observed in many developed economies, demands for increased workplace safety are coming from the Thai bureaucracy using standards stipulated by the International Labour Organisation (ILO).

But Thailand has not adopted neo-liberal Western ideas uncritically and in full. Since the 1980's there has emerged a Buddhist model of economics, notably connected to Buddhist scholar P.A. Payutto. This approach emphasizes wellbeing, moderation and self-reliance and leads to the concept of a sufficiency economy, advocated by King Bhumiphol and now enshrined in the last 2 national economic development plans (NESDB, United Nations Environment Program, and Thailand Environment Institute, 2008). What this actually means for the interplay between work and health in Thailand is unclear. In rural Thailand there is a movement towards community rights over resources and empowerment coupled with an emphasis on self reliance and a distrust of financial markets and industrialization (Hewison, 2000, Reynolds, 2001).

Implications for a healthy and productive workforce

Thailand is progressing towards a modern, well regulated, labour system as work moves steadily from agriculture towards industry and service sectors. The labour force is formalizing, workplace health and safety are improving and workers have more rights than before. These developments have coincided with increasing globalization increasing external influence on Thai policy making. This is particularly the case with workplace health and safety. As well, growing openness and civil society participation in politics has led to improved legislation, protecting workers and allowing them rights in concurrence with international standards.

Over the last few decades Thailand has experienced a health-transition which is closely bound to the work-transition. Indicators linked to poverty such as infant mortality and low life expectancy show improvements. Thai health statistics do not yet enable us to clearly link changes in injuries and diseases to changes in workplace hazards, but in the context of low unionisation and a large informal workforce, we expect that work related diseases will continue to be a major health burden. Still unknown is the way work organization, workloads, autonomy and job insecurity may affect mental health in the Thai workforce, in both the formal and informal workforce. Mental health problems such as depression are now one of the leading causes of disease burdens in the developed world, and work conditions are important influences (Stansfeld & Candy, 2006).

The changes in Thai government policy on workplace health and safety are relatively recent, with little research on the benefits to workers' health. In Thailand, new academic journals and research alliances are being formed, which may underpin the evidence base needed by policy makers in Thailand and other transitional economies. Indeed the bulk of the world's working population is found in transitional and developing nations. Also there is need for research on the impact of heavy workloads, work intensification, low autonomy, job insecurity, and low work rewards in these countries. In the context of off shoring and economic downturns, these work conditions may become even more widespread and significant to population health in middle-income countries, including Thailand. Developing this evidence base requires large national monitoring arrangements as well as research on representative cohorts of working Thais and their families. Given the importance of work to health, investment in this research is urgent.

Acknowledgments

This study was supported by the Thai Health-Risk Transition project with joint grants from Wellcome Trust UK (GR0587MA); and the Australian National Health and Medical Research Council (268055) under the International

Collaborative Grants Scheme. We acknowledge the helpful advice and encouragement of Dr Chaiyuth Chavalitititkul.

References

- Australian Bureau of Statistics. Measuring Australia's Economy 2003. 2003. Available at: <http://www.abs.gov.au/Ausstats/abs@.nsf/Latestproducts/1360.0Contents12003?opendocument&abname=Summary&prodno=1360.0&issue=2003&num=&view=> (accessed December 1, 2008)
- Australian Bureau of Statistics. Labour Force of Australia, Detailed, July 2007. 2007. Available at: <http://www.census.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.001Jul%202007?OpenDocument> (accessed August 17, 2009)
- Banwell, Cathy; Lim, Lynette; Seubsman, Sam-ang; Bain, Chris; Dixon, Jane; Sleight, Adrian. BMI and health-related behaviours in a national cohort of 87,134 Thai open university students. *Journal of Epidemiology and Community Health*. May.2008 63:366–372. 2009. [PubMed: 19151014]
- Benach, Joan; Muntaner, Carles; Santana, Vilma. Employment conditions and health inequalities: Final report. Employment Conditions Knowledge Network (EMCONET). World Health Organisation; 2007. Available at: http://www.who.int/social_determinants/resources/articles/emconet_who_report.pdf (Accessed January 2009)
- Brown, Andrew. After the Kader fire: Labour organizing for health and safety standards in Thailand. In: Hutchison, J.; Brown, A., editors. *Organising Labour in Globalising Asia*. Routledge; London: 2001.
- Caldwell, John C. Health transition: the cultural, social and behavioural determinants of health in the Third World. *Social Science and Medicine*. 1993; Vol. 36(No. 2):125–35. [PubMed: 8421789]
- Caldwell, John C.; Caldwell, Pat. What have we learnt about the cultural, social and behavioural determinants of health? From Selected Readings to the first Health Transition Workshop. *Health Transition Review*. 1991; Vol. 1(No. 1):3–17. [PubMed: 10148801]
- Charoenloet, Voravidh. Liberalisation and Labour Standards in Thailand. In: Rasiah, R.; Hoffman, N., editors. *Workers on the Brink: Unions Exclusion and Crisis in Southeast Asia*. Fredrich Ebert Stiftung; Singapore: 1998.
- Chavalitititkul, Chaiyuth. Development of occupational safety and health management system in Thailand. *Asian-Pacific Newsletter on Occupational Health and Safety*. 2005; Vol. 12:39–41.
- Chavalitsakulchai P, Shahnava H. Musculoskeletal Disorders of Female Workers and Ergonomics Problems in Five Different Industries of a Developing Country. *Journal of Human Ergology*. 1993; 22(1):29–43. [PubMed: 8064149]
- Coburn, David. Income inequality, social cohesion and the health status of populations: the role of neo-liberalism. *Social Science & Medicine*. 2000; Vol. 51(no. 1):135–146. [PubMed: 10817476]
- Commission on Social Determinants of Health. Closing the gap in a generation: Health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. World Health Organisation; Geneva: 2008.
- Coyle, Saowalee; Kwong, Julia. Women's Work and Social Reproduction in Thailand. *Journal of Contemporary Asia*. 2000; Vol. 30(No. 4):492–506.
- Drewnowski, Adam; Popkin, Barry M. The nutrition transition: new trends in the global diet. *Nutrition Reviews*. 1997; Vol. 55(No. 2):31–34. [PubMed: 9155216]
- Economic and Social Commission for Asia and the Pacific. Improving vital statistics and cause of death statistics: The experience of Thailand. ESCAP; Bangkok: 2008.
- Edwards, John N.; Fuller, Theodore; Vorakitphokatorn, Sairudee; Serm Sri, Santhat. Female Employment and Marital instability: Evidence from Thailand. *Journal of Marriage and the Family*. 1992; Vol. 54(No. 1):59–68.
- Ezzati, Majid. Comparative quantification of health risks: Global and regional burden of disease attributed to major risk factors. World Health Organisation; Geneva: 2004.
- Flore, Lia S.; Galea, Sandro; Wilson, Mark L. Macrosocial Determinants of Population Health in the Context of Globalisation. In: Galea, Sandro, editor. *Macrosocial Determinants of Population Health*. Springer; New York: 2007.

- Frenk, Julio; Bobadilla, Jose Luis; Stern, Claudio; Frejka, Tomas; Lozano, Rafael. Elements for a theory of the health transition. *Health Transition Review*. 1991; Vol. 1(No. 1):21–38. [PubMed: 10148802]
- Goos, Maarten; Manning, Alan. Lousy and lovely jobs: the rising polarization of work in Britain. *The Review of Economics and Statistics*. 2007; Vol. 89(No. 1):118–33.
- Hewison, Kevin. Resisting Globalisation: A study of Localism in Thailand. *The Pacific Review*. 2000; Vol. 13(No. 2):279–296.
- Heymann, Jody. *Global inequalities at work*. Oxford University Press; Oxford: 2003.
- International Labour Organisation. Resolution concerning statistics of employment in the informal sector. 1993. Available at: <http://www.ilo.org/public/english/bureau/stat/download/res/infsec.pdf> (Accessed November 12, 2008)
- Jamison, Dean T. *Disease control priorities of the developing world*. Oxford University Press; New York: 1993.
- Kanjanaphoomin, Niwat. Pension Fund, Provident Fund and Social Security System in Thailand. Presented at Conference: Pensions in Asia, Compliance and Their Role in Asia; Conference Location: Hitotsubashi Collaboration Center, Tokyo, Japan. 23-24 February 2004; 2004.
- Kawachi, Ichiro. Income inequality and health. In: Kawachi, Ichiro; Berkman, Lisa, editors. *Social Epidemiology*. Oxford University Press; Oxford: 2000.
- Khoman, Sirilaksana. Education: the key to long term recovery?. In: Warr, Peter, editor. *Thailand Beyond the Crisis*. Routledge; Oxon: 2005.
- Lawler, John; Suttawet, Choekchai. Labour Unions, Globalization and Deregulation in Thailand. In: Rowley, C.; Benson, J., editors. *Globalization and labour in the Asia Pacific region*. Frank Cass; London: 2000.
- McEvoy AF. The Triangle Shirtwaist Factory Fire of 1911: Social Change, Industrial Accidents, and the Evolution of Commonsense Causality. *Law and Social Enquiry*. 2006; Vol. 20(No. 2):621–651.
- McMichael, Anthony J. *Human frontiers, environments and disease: Past patterns, uncertain futures*. Cambridge University Press; Cambridge: 2001.
- Ministry of Labour and Social Welfare. *Yearbook of Labour Protection and Welfare Statistics*. Department of Labour Protection and Welfare, Ministry of Labour; Bangkok: 2007.
- Mishel, Lawrence; Walters, Matthew. *How Unions Help All Workers*. 2003. Economic Policy institute Briefing Paper #143 Available at: http://www.epi.org/content.cfm/briefingpapers_bp143 (accessed March 3, 2009)
- National Economic and Social Development Board. *Strategies for administering the informal economy*. Conference proceedings. Held at Impact Convention Centre; Bangkok. 24th June 2004; 2004.
- National Economic and Social Development Board. *The Tenth National Economic and Social Development Plan*. NESDB; Bangkok: 2007.
- National Economic and Social Development Board. United Nations Environment Program. *Thailand Environment Institute. National Sustainable Development Strategy for Thailand*. 2008. Available at: http://www.rrcap.unep.org/projects/nsds/meeting/NSDSmanual-Eng_Full%20B.pdf (accessed March 4, 2009)
- National Statistics Office. *Formal and Informal Labour Force Market 1994: Labour Force Survey*. NSO; Bangkok: 1994.
- National Statistics Office. *Labour Force Survey 2001-5*. NSO; Bangkok: 2005a.
- National Statistics Office. *Informal Workers Survey*. NSO; Bangkok: 2005b. (Thai language)
- National Statistics Office. *Homeworkers Survey*. NSO; Bangkok: 2005c. (Thai language)
- National Statistics Office. *Informal Workers Survey 2550*. NSO; Bangkok: 2007.
- National Statistics Office. *Labour Force Survey-Whole Kingdom: Quarter 1*. NSO; Bangkok: 2008a.
- National Statistics Office. *The Core Social Indicators of Thailand 2008*. NSO; Bangkok: 2008b.
- National Statistics Office. *Labour Force Survey 1988-2009*. NSO; Bangkok: 2009.

- Organisation for Economic Cooperation and Development. Labour force statistics database. 2008. Available at: <http://stats.oecd.org/WBOS/Index.aspx?QueryName=252&QueryType=View> (accessed March 4, 2009)
- Phongpaichit, Pasuk; Baker, Chris. A History of Thailand. Cambridge University Press; Cambridge: 2005.
- Reisman D. Payment for health in Thailand. International Journal of Social Economics. 1999; Vol. 26(No. 5):609–641.
- Reynolds, Craig. Globalisers vs Communitarians: Public Intellectuals Debate Thailand's Future. Singapore Journal of Tropical Geography. 2001; Vol. 23(No. 3):252–269.
- Ruphan, Nopharat. Enforcement of the Labour Protection Act B.E.2541: A Case Study of the Settlement of Labour Disputes by the Labour Inspector. Ramkamhaeng University; MLaws. Bangkok: 1999.
- Seehavong, Laksanee. Management Guidelines of Safety Health and environment Committees: Case Study of the Best Safety Manufacturing Award and the 1 000 000 Hours Zero Accident in industrial Estate in Map Ta Phut, Rayong. Sukhothai Thammathirat Open University; MPHealth. Nonthaburi: 2006.
- Siriruttanapruk, Somkiat; Anantagulnathi, Pensri. Occupational Health and Safety Situation and Research Priority in Thailand. Industrial Health. 2004; Vol. 42:135–140. [PubMed: 15128162]
- Slaughter, Matthew; Swagel, Phillip. Does Globalization Lower wages and export jobs?. International Monetary Fund; 1997. Available at: <http://www.imf.org/external/pubs/ft/issues11/> (accessed January 16, 2009)
- Stansfeld, Stephen; Candy, Bridget. Psychosocial work environment and mental health-: a meta-analytic review. Scandinavian Journal of Work, Environment and Health. 2006; Vol. 32(No. 6): 443–462.
- Sujjapongse, Somchai. Tax policy and reform in Asian countries, Thailand's perspective. Journal of Asian Economics. 2005; Vol. 16(No. 6):1012–1028.
- Suthamasa, Sarawut; Buayaem, Suwat. Occupational Health and Safety and Hazardous Waste Management. Sukhothai Thammathirat Open University Press; Nonthaburi: 2001. (Thai Language)
- Tangcharoensathien, V.; Jongudomsuk, P., editors. From policy to implementation: historical events during 2001–2004 of universal coverage in Thailand. National Health Security Office; Nonthaburi: 2004.
- Tonguthai, Pawadee. Gender equality and decent work in Thailand: a country report for ILO/ADB RETA Project: 5887: strengthening the role of labour standards in selected developing member countries. ILO; Bangkok: 2002.
- United Nations Public Administration Network. Thailand Development Indicators. 2003. Available at: <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN015292.pdf> (accessed January 16, 2009)
- Warr, Peter. The Thai Economy in Transition. Cambridge University Press; Cambridge: 1993.
- Warr, Peter. Thailand: Beyond the Crisis. Routledge; Oxon: 2005.
- Wilbulpolprasert, Suwit. Thailand Health Profile 2005–2007. Ministry of Public Health; Bangkok: 2008.
- Yingratanasuk, Tanongsak; Keifer, MC.; Barnhart, S. The Structure and Function of the Occupational Health System in Thailand. International Journal of Environmental Health. 1998; 4(2):121–130.

Figure 1a.
Employment in Thailand by sector (NSO 2008a)

Figure 1b.
Employment in Australia by sector (OECD 2008)