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ปีที่ 8 ฉบับที่ 2 เดือน เมษายน – มิถุนายน 2558

นิพนธ์ต้นฉบับ

ผลลัพธ์และการบริหารจัดการโรคไม่ติดต่อเรื้อรังโดยระบบสุขภาพอำเภอพนม จังหวัดสุราษฎร์ธานี

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บทคัดย่อ

การวิจัยเชิงคุณภาพนี้มีวัตถุประสงค์เพื่อศึกษาผลลัพธ์ และการบริหารจัดการโรคไม่ติดต่อ (เบาหวาน/ความดันโลหิตสูง) ของอำเภอพนม จังหวัดสุราษฎร์ธานี เก็บรวบรวมข้อมูลแบบผสมผสานโดยรวบรวมข้อมูลจากเอกสาร และรายงานที่เกี่ยวข้องในรอบ 3 ปีที่ผ่านมา (2555-2557) สัมภาษณ์เจาะลึกสัมภาษณ์กลุ่มกับผู้บริหาร ผู้ปฏิบัติงานที่เกี่ยวข้อง ทั้งในระดับจังหวัด อำเภอ และเขตตำบล รวมทั้งผู้มารับบริการ และจัดประชุมเชิงปฏิบัติการกับหน่วยงาน องค์กรและบุคคลที่มีส่วนได้ส่วนเสีย เพื่อรับฟังเสียงสะท้อนเกี่ยวกับข้อมูลทั้งหมด รวมทั้งตรวจสอบข้อมูลกับผู้ที่มีส่วนเกี่ยวข้องเพื่อความถูกต้องและเที่ยงตรง

ผลการศึกษาพบว่า นโยบายและมาตรการต่าง ๆในการดำเนินงานโรคไม่ติดต่อเรื้อรังของอำเภอพนมมาจากหน่วยงานระดับประเทศ ได้แก่ กระทรวงสาธารณสุข (สธ.) สำนักงานหลักประกันสุขภาพแห่งชาติ (สปสช.) และ สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ (สสส.) เป็นส่วนใหญ่ โดย สธ. และ สปสช. เป็นหน่วยงานหลักที่มีระบบการจัดทำยุทธศาสตร์ แผนงานโครงการที่มีความชัดเจน สปสช. มีการจัดระบบการดำเนินการ การประเมินผลและการสนับสนุนงบประมาณตามเกณฑ์คุณภาพมาตรฐานการบริการที่ชัดเจน สสส. สนับสนุนการดำเนินกิจกรรมด้านส่งเสริมป้องกันโรค ในระดับเขตและจังหวัด แยกเป็นแผนงานโครงการตามภารกิจของแต่ละกรม และแยกภารกิจไปตามโครงสร้างบทบาทหน้าที่รับชอบของแต่ละฝ่าย โดยฝ่ายควบคุมโรครับผิดชอบโครงการด้านการดูแลรักษา งานสุขศึกษารับผิดชอบงานด้านโครงการหมู่บ้านปรับเปลี่ยนพฤติกรรมลดโรคไม่ติดต่อเรื้อรัง และงานส่งแสริมสุขภาพรับผิดชอบโครงการคลินิกไร้พุง (Diet & Physical Activity Clinic: DPAC) ซึ่งขาดการผสมผสานในการดำเนินกิจกรรมในทางปฏิบัติให้มีความต่อเนื่องและสอดคล้องกันอย่างชัดเจนเชื่อมโยงกับหน่วยบริการระดับอำเภอ โดยเครือข่ายบริหารงานสาธารณสุขระดับอำเภอประกอบด้วยโรงพยาบาลพนม สำนักงานสาธารณสุขอำเภอพนม โรงพยาบาลส่งเสริมสุขภาพตำบล ภาคีเครือข่ายและภาคประสังคม ในอำเภอพนม เป็นหน่วยงานหลักในการดำเนินการแปลงนโยบายลงสู่การปฏิบัติต่อประชาชนกลุ่มเป้าหมายในชุมชน ผ่านกลไกระบบสุขอำเภอ ด้วยยุทธศาสตร์ PHANOM Project มีคณะกรรมการโรคเรื้อรังระดับอำเภอและกำหนดแผนงานและกิจกรรมในภาพรวม แต่การดำเนินมาตรการ กิจกรรมด้านการเฝ้าระวังส่งเสริมสุขภาพและควบคุมโรคเรื้อรังแต่ยังขาดความครอบคลุม เข้มข้นและต่อเนื่อง รวมถึงขาดการติดตามประเมินผลที่ชัดเจน ส่วนการดำเนินกิจกรรมด้านการดูแลรักษาผู้ป่วยโรคเรื้อรังมีการดำเนินการ NCD Clinic คุณภาพ ที่ผ่านเกณฑ์การประเมินมาตรฐานในระดับดี ดังนั้น การพัฒนาระบบสุขภาพอำเภอควรมีการมุ่งเน้นที่งานด้านป้องกันควบคุมโรคมากขึ้น รวมทั้งพัฒนาตัวชี้วัดร่วมกันเพื่อทำให้การทำงานด้านนี้ในพื้นที่มีเป้าหมายที่ชัดเจน ความเข้มข้น และต่อเนื่องมากขึ้น

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Original Article

Outcomes and Management of Chronic Non-communicable Disease by the Health System of Panom District, Surat Thani Province

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Abstract

This qualitative research aims to study the outcomes and management of chronic non-communicable diseases (e.g., diabetes, hypertension) of Phanom District, Surat Thani Province, Thailand. The data were collected using documents review (2012-14), in-depth interviews and groups interviews with managers and relevant staff at the provincial, district and sub-district levels as well as the clients. The preliminary findings were presented to stakeholders at a workshop to solicit input and validation. The formulation of policy and measures to address the challenge of non-communicable disease (NCD) is primarily a function of national agencies such as the Ministry of Public Health (MOPH), the National Health Security Office (NHSO) and the Thai Health Promotion Foundation (THPF). The MOPH and NHSO develop the strategies and project plans. The NHSO focuses on implementation systems, evaluation and financial support in accordance with quality standards of management. The THPF supports disease prevention activities at the sub-regional and provincial levels, stratified by departmental specialties and sectional roles and responsibilities. The disease control sector manages projects on treatment, health education and behavior change interventions to reduce NCD. The health promotion sector manages the DPAC clinic activity. These two sectors operate somewhat independently of each other. At the sub-provincial level, the district health system consists of the Phanom Community Hospital, the District Health Office (DHO) and Tambon health promotion hospitals (THPH) in the districts. The district health system work corporately with partners such as local administration organization, other ministry offices, communities, and civil society groups. The wide range of activities to address the NCD challenge have been organized by the district health system under the PHANOM Project strategy. Oversight is provided by the NCD CUP Board which also issues guidelines for action plan evaluation and surveillance. Case management of the NCD Clinic already meets quality standards; thus, the focus of the district is on NCD prevention and control, with challenges indicators, targets and intensified implementation.

Keywords: *Outcome, Management, Non-communicable Disease, District Health System*

Introduction

As a group, non-communicable diseases (NCD) are becoming the top global health challenge of the 21st Century for, and Thailand, both in terms of mortality and morbidity. (World Health Organization, 2011, 2013, 2014) Globally, death from NCD out number of deaths from all other causes combined. NCD were the cause of premature death for an estimated 36 million persons per year, or 63% of total mortality in 2008 (WHO, 2014). Data for Thailand in 2009 show that NCD were the cause of 314,340 deaths, or 73% of total (premature) mortality. (MoPH, 2013). The trend for NCD mortality has increased steadily, and is the major cause of death in most age groups. (Pinit, 2014; Taksapol, 2014; Research Network Group, 2014). However, there is a gender differential in mortality as NCD is the cause of death for 68.2% of males and 79.2% of females (International Health Policy Program, 2011). While NCD comprise a large number of conditions, the major causes of global morbidity and mortality due to NCD can be grouped into four categories: diseases of the heart and vascular system, cancer, diabetes (DM), and chronic lung disease (Hanchaiphiboolkul, 2011; Wichai, 2010; Ram, 2012; MoPH, 2009, 2013, 2014). It is projected that NCD mortality will increase from 36 million persons globally in 2008 to 44 million by 2020 (National Economic and Social Development Board, MOPH, Mahidol University, 2014).

When, In Phanom District, Surat Thani Province, death from DM and complications was about 34.6 per 100,000 population, while the comparable mortality for hypertension (HT) was 21.6 per 100,000 population. NCD case management comprises about one-third of the cost of all medicines and two-thirds of the cost of all diagnostics. This represents an annual cost of over 3.5 million baht per year (MoPH, 2013). Based on the available data for Phanom District, DM and HT are the principal causes of disability and premature death, and this takes a tremendous burden on daily life, economic status, and quality of life of those with NCD and their families. Phanom District has a population of 38,061, two municipalities, four Tambon administration organizations, one community hospital (30 beds), nine THPH, and one primary care center. The system is managed by the district-level CUP Board. One of the researchers is the chairperson of the CUP Board and has observed that, despite the existence of a strategy, plan and implementation network for addressing the NCD challenge, interventions in Phanom District are not properly unified under a shared set of indicators and targets. There is no overall framework for evaluating NCD prevention and control, and there is a lack of collaborative advocacy for the NCD program. There is a need for mutually-reinforcing and intensification of implementation in order to have significant impact. It is well-recognized that combating NCD requires the collective effort of many sectors, yet the burden of the task generally falls on the public health sector. (Nolte, 2008; Kobayashi, 2008; Tsai, 2005) Thus, this research was conducted to attempt to assess a system for addressing these shortcomings in Phanom District.

Objectives

The overall objective of this research was to study the management of chronic NCD and its outcome by the health system of Phanom District, Surat Thani Province. The specific objectives were as follows:

1) To analyze the development of policy on NCD and health systems management of Phanom District, and the outcomes of management and health services system in the district;

2) To compare the Phanom District health system with the Theoretical District System;

3) To propose health policy recommendations on NCD management for improving district health systems in Thailand

Methodology

For this research, a mixed method was used to collect both quantitative and qualitative information to identify both the past and anticipated health outcomes. Data were collected using review of documents (2012-2014) including the reports of meetings of relevant committees, and policy/planning/strategy documents. Primary data were collected by in-depth interviews and groups interviews with managers and relevant staff at the provincial, district and sub-district levels. Data were also collected on health services (DM and HT) from interviews with clients and review of medical records on risk screening, behavior change interventions, outcomes, degree of quality control of NCD, incidence and mortality. A ‘policy timeline’ methodology was used to portray the introduction of policy, health actions and outcomes in the local context of implementation. The preliminary

findings were presented during a workshop with stakeholders to solicit input and validation. The stakeholders SWOT analysis was conducted to explore opinions of the implementation and outcomes of policy and whether expectations were met.

Results

The population of 38,061 persons of Phanom District included 19,296 males and 18,765 females. The population density is approximately 32 persons per square kilometer. The age groups with the most population are 40-44 years and 35-39 years, respectively, and the age distribution for Phanom is similar to the population of Surat Thani and the nation as a whole. Phanom is entering ageing society, with an increasing proportion of the population in the older age groups, and declining proportion in the working ages. This trend suggests that there will be an increasing health burden on the district in the coming decades. As of 2014, the elderly (age 60 years or older) in Phanom comprised 10% of the total population.

There is a 30-bed community hospital and nine THPH in the district. There is one control of insect-borne disease unit. Quantitatively, there would appear to be the standard number of health workers for the population. However the full-time equivalent of health professionals, especially physicians, dentists, pharmacists, and nurses is insufficient for the workload. There is also rather high turnover of health and medical staff.

1) Management Outcomes

The prevalence of cases of NCD during 2012-14 increased steadily over the three-year period for both Phanom District and Surat Thani Province as a whole and for all stages of the diseases. There were more cases of HT than DM in Phanom. Screening of the Phanom population aged 15 years or older for NCD was in accordance with the targets, and exceeded the performance of the province and the national performances. Prevention and risk reduction through behavioral changes among the higher-risk population met or exceeded the target of >50%, and showed increasing trends over the three-year period. The district also met the standards for screening of diabetes complications cases, incidence of complications, missed check-up appointment, incidence of disease, and mortality. DM patients who effectively managed their illness (i.e., Hb. A1 C<7%) was under the target (>50%) and showed a decreasing trend.

Screening for hypertension of the target population aged 15 years or older in 2013 did not meet the target of 90%, but has increased and exceeded the target since that time. In 2012, prevention and control of HT through behavioral changes among the higher-risk population was slightly under the target of >60% for quality of care, prevalence of HT, and effective control of HT. However, since that time, the district has been able to exceed the target and out-performed the performances of both the province and the nation for these indicators.

Risk assessment for complications of cardio-vascular disease (CVD) is still below the target of >80% but exceeds the province Average. Screening for complications of kidneys and heart of HT cases in 2012 was below the target but, since that year, screening coverage has increased above the target of >60% and has out-performed those of the province and the nation.

Prevalence of improved health status and incidence (incidence or prevalence) of HT, complications and mortality were in accordance with the targets, and incidence (incidence or prevalence) of HT in Phanom was lower than the province and national figures.

2) Analysis of NCD Policy

Since the 10th National Economic and Social Development Plan. policy for NCD has been integrated into the national plan through the Thailand Healthy Lifestyle Strategy. Policy is implemented by the relevant ministries, the NHSO and the THPF. The NHSO and THPF give the financial supports for the program, while the MOPH develops the relevant National Health Service plans for implementation through the relevant agencies (i.e., Health Promotion, Medical Services, Health, and Disease Control Departments). The MOPH develops the strategies, plans, projects and design for the NCD service system, which are then implemented through the eleven sub-regional disease control centers, the provincial health offices (PHO), and the district health system. The MOPH sets national targets for key indicators as a guideline for the sub-national levels, and provides information and up-dates through official correspondence, the Internet web sites and supervisory visits. The strategy gives higher priority to care and treatment than to surveillance and prevention. The NHSO manages a system of implementation, activities, and financial support through the NCD case management fund. The NHSO has

a highly efficient system of evaluation and information management, and a clear system of quality standards.

3) Structure of the NCD Program Implementation

As noted, the MOPH and NHSO have the principal role for NCD policy, strategy, and financing at the national level, while the THPF does not have specific plans or projects which operate at the district levels. The MOPH Departments of Health and Health Promotion support surveillance, health promotion and prevention of NCD through community-based programs of risk behaviors reduction and health maintenance (DPAC Clinic). The Departments of Disease Control and Medical Services promote strategies, plans and projects for care and treatment through NCD clinics, screening of higher-risk populations, and setting up express service lanes for certain NCD conditions such as stroke and STEMI Fast Track. These MOPH departments do not provide direct budget to the periphery. The PHO divides the NCD work by section: The Disease Control Section oversees treatment and care; the Health Education Section oversees community-based behaviors modification and maintenance; and the Health Promotion Section oversees the DPAC clinic program. It is noteworthy that there is a lack of linkage and coordination between these sections and their respective programs at the district level. The district health network consists of the Phanom Community Hospital, the District Health Office (DHO) and various THPH. These are assisted by network partners and Civil Society groups. Combined, these partners comprise the district health system as embodied by the PHANOM Project under management of the NCD CUP Board. The DHO and Community/Family Medicine Section of the district hospital implement surveillance and screening for NCD, while the hospital focuses on treatment and care. There are nurse case managers assigned to manage NCD cases. Under the NCD Quality Clinic project, diagnosed cases from the community hospital and screening service are referred for initial review at the 4 Mum Muang THPH. Those NCD cases with complications or higher risk are referred to the Surat Thani Provincial Hospital to be seen by a specialist. However, the system is not able to track all referral and treatment outcomes. Eventually, NCD cases are referred back to their local THPH for on-going care and monitoring, but these outlets have only three to four full-time staff. However, despite the fact that there are key agencies under the authority of the MOPH, there is variation in control, accountability, and awareness of roles and responsibilities at the district and sub-district levels. This variation can have adverse impact on coordination and efficiency of the NCD program.

4) Measures for Implementing the NCD Program

There are clear central-level policies and measures for surveillance and control of NCD, and also guidelines for implementation and evaluation. However, implementation of these at the periphery lacks intensity, continuity and clear targeting of the higher-risk groups for the various activities. Also, the mechanisms for financial support of these activities is unclear. The MOPH only provides budget for general health promotion, while the Tambon (sub-district) funds for health promotion and disease control vary in their viability and resources. By contrast, the systems, measures, targets and funding for treatment of NCD are more clearly defined. The NHSO provides direct support for outcomes evaluation. However, those assessments lack intensity and continuity. Consequently, there are efforts to define better indicators of achievement as a basis of more rigorous supervision and performance assessment at the sub-regional and provincial levels.

5) NCD Program Management in Phanom District

An effective disease management system will increase quality of care and treatment, improve clinical outcomes, and increase the quality of life of the patients. The most important factors influencing achievement of the district chronic disease management system are the policies and mechanisms of support by the relevant agencies. (Zwar, 2006; Adams, 2007). Despite the existence of the national policies, strategies and plans, these are not effectively linked or integrated at the district level. Programs tended to be implementation in a columnar fashion rather than an integrated network. But all these programs eventually converge at the primary care level of the THPH, whose number of staff is small and capacities are limited. In addition most of the evaluation indicators of the NCD program are quantitative and, thus, do not encourage in-depth follow-up to track qualitative outcomes of case management. (Tatsanavivat, 2012; Chatterjee, 2011). Funding for chronic disease control at the district level mostly relies on funds allocated on a per capita basis from the Universal Coverage (UC) Health Insurance Fund. This amounts of 2,895 baht per registered

resident and does not reflect the real local inhibiting population.

The NHSO fund for chronic disease management is available only for those health outlets and networks which meet quality standards. The Tambon health fund is managed by the local administrative organization and can vary widely in terms of amount of resources and utilization.

Despite these different support mechanisms, the overall funding situation is less than optimal for chronic disease management at the district and sub-district levels. This problem is certain to worsen as costs of referral, diagnosis, treatment and control have increased over time, and as the population ages have increased. Furthermore, the current level of expenditure on treatment is three times the amount spent on prevention. As the need outpaces the ability of the country to respond, shortages of stocks of medicines for treating chronic disease are beginning to emerge in the Government Pharmaceutical Organization and in the drug distribution chain at the provincial and sub-provincial levels. In order to provide quality comprehensive case management of NCD, there needs to be a fully-staffed multi-disciplinary team. Staffing these teams at the district level is a major challenge. Allowable quotas and budget for these teams is based on GIS data and population densities, which do not always reflect local context and the workload. In addition to staff shortages, there is a high rate of turnover, especially among general practitioners who have only average one to two years services in a given district, and NCD nurse practitioners. This impedes continuity of care and erodes client trust in the practitioners. Medical faculties are producing far fewer practitioners to fill in these teams, such as clinical psychologists, and x-ray technicians.

As communication becomes more heavily dependent on rapidly advancing information technology (IT), there is a need to up-grade clinical facilities at the district level and increase competencies of staff in IT and computer technology. There is also a need to unify IT systems at different levels. For example, the Phanom District Hospital uses the 'Hos XP' computer program while the THPH use the 'JHCIS' software. The provincial hospital uses another system altogether and this makes electronic data linkage and exchange are quite difficult, or impossible among outlets and levels. Communication within the province relies heavily on the Internet, and some of these software packages required high-speed connections (e.g., Refer Link and Thai Refer). Often, data are not updated, or there are missing and duplication of the databases. These shortcomings reduce reliability and accuracy of the data.

An important aspect of NCD service delivery at the district level is the screening of the population aged between 15 and 35 years. However the screening coverage is low. There is also a lack of continuity in behaviors modification activities for those with or at-risk of DM and HT. There is little, if any, long-term evaluation of these interventions and in the sustainability of implementing Clinical Practice Guidelines that are consistent with the national and provincial guidance. (MacAdam, 2008; Delon, 2009; Hanchaiphiboolkul, 2011).

Discussion and Conclusion

Thailand has a clear policy to address the increasing challenges of chronic illness among the population, originating with the Thailand Health Lifestyle Strategy, a component of the national 5-year health development plans. The MOPH has taken the lead role in refining the policy, articulating the strategy, designing projects and indicators, and disseminating policy through a system of orientation meetings, Internet websites, official correspondence, and other channels. The information is passed down through the MOPH departments, divisions, sub-national offices, the province and ultimately to the district. The district health system embodies the policy, and implements the operational aspects through plans, sub-projects, measures, surveillance, prevention, care and treatment. The NHSO helps with funding activities to achieve performance standards. Phanom District in Surat Thani is implementing a pilot model of the district health system under the name of the PHANOM Project, managed by the NCD CUP Board. The project is attempting to address shortcomings of the system such as lack of complete coverage of services, the need for intensification and continuity of implementation, and clear monitoring and evaluation of chronic disease case identification and management. One component of the project is the NCD Quality Clinic, and this unit is performing exceptionally well. (Rawdaree, 2006; Nitiyanant, 2007). Screening of higher-risk populations has exceeded the targets, however there is a lack of continuity of behaviors modification

and health behaviors maintenance activities for the risk populations. Screening for complications of NCD is also below target. Part of the challenge is the rapid ageing of the population and associated increased in NCD prevalence. Also, the database systems of the district, sub-district and province are not yet linked in a way to track individual cases as they are referred through the system. Unification of the provincial databases is hampered by the use of different software packages by the hospitals and health offices at the different levels.

Recommendations

1. Policy and District Health Systems Development

1.1 There needs to be better integration of policy and budget in a way that is consistent for the MOPH, NHSO, and THPF.

1.2 There should be a Monitoring and evaluation (M&E) system to assess qualitative outcomes for the target populations. These data should inform budget allocation along with the associated quantitative data.

1.3 The allocation of budget should take into account the capital costs of medical supplies, medicines, and laboratory diagnostics which are increasing at a fast pace. Budget cannot be allocated merely as part of a formula to meet quality standards, but must also take into account local context and constraints. For example, there are problems of staff shortage and turnover, and the degree of this problem varies from district to district. The multi-disciplinary teams for NCD case management need skilled practitioners in such areas a clinical psychology and x-ray technicians. Greater efficiencies can be realized if medicines, medical supplies and diagnostics are procured in bulk. The central level should help in providing a software package for database management which can be used by all agencies and offices at all levels of the MOPH and NHSO in order to help track and compile data on individual cases. This will help in M&E of program outcomes and reduce computer/software costs in the province and district.

1.4 It is a challenge to establish a single management team given the contextual differences among local agencies such as the DHO, the community hospital, and THPH, and this impedes efficient coordination with non-MOPH entities and Civil Society groups.

1.5 In developing an effective district health system for NCD, there should be a greater emphasis on prevention and control. This will require an adjustment in the set of performance indicators, targeting, intensity and continuity of implementation.

2. Future Research

Future research in this area should include population-based surveys, stratified by the different target populations, including the healthier groups of youth and the working-age population, as well as the elderly and specific higher-risk groups.

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References

Adams, S. G., Smith, P. K., Allan, P. F., Anzueto, A., Pugh, J. A., & Cornell, J. E. (2007). Systematic review of the chronic care model in chronic obstructive pulmonary disease prevention and management. **Archives of Internal Medicine**, **167**(6), 551–561.

Aekaplakorn, W. (Ed.). (2008). **Report of the 4th Survey of the Health of the Thai Population by Physical Exam: 2008-2012.** Nonthaburi: The Graphico System.

Bureau of Non-Communicable Disease, Department of Disease Control, MOPH. (2009). **Evaluation report of the project of the Bureau of NCD as part of the project to promote measures to reduce risk factors and improve health behaviors through traditional Thai practices/(P1: Flagship1): Fiscal Year.** Retrieved April 13, 2015, from http://thaincd.com/ information-statistic/document- view.php?id=5654

Bureau of Non-Communicable Disease, Department of Disease Control, MOPH. (2013). **Annual report.** Retrieved April 13, 2015, from http://thaincd.com/good-stories-view.php?id=8372

Chatterjee, S., Riewpaiboon, A., Piyauthakit, P., Riewpaiboon, W., Boupaijit, K., Panpuwong, N., & Archavanuntagul, V. (2011). Cost of diabetes and its complications in Thailand: a complete picture of economic burden. **Health & Social Care in the Community**, **19**(3), 289–298.

Delon, S., Mackinnon, B., & Alberta Health CDM Advisory Committee. (2009). Alberta's systems approach to chronic disease management and prevention utilizing the expanded chronic care model. **Healthcare Quarterly**, **13**, 98–104.

Hanchaiphiboolkul, S., Poungvarin, N., Nidhinandana, S., Suwanwela, N. C., Puthkhao, P., Towanabut, S., et al. (2011). Prevalence of stroke and stroke risk factors in Thailand: Thai Epidemiologic Stroke (TES) Study. **Journal of the Medical Association of Thailand**, **94**(4), 427–436.

Institute for Research and Evaluation of Medical Technology, Department of Medical Services, MOPH. (2014). **Review of literature on the current status and patterns of services for chronic NCD.** Retrieved April 13, 2015, from http://www.dms.moph.go.th/imrta/images/doc20141107.pdf

Institute for Research and Evaluation of Medical Technology, Department of Medical Services, MOPH. (2013). **Statistical report: Status of diabetes/hypertension and complications in Thailand.** Retrieved April 13, 2015, from http://www.dms.moph.go.th/imrta/images/data/doc_dm_ht.pdf

International Health Policy Program. (2009). **Report of disease burden and injury of the Thai population.** Retrieved March 25, 2014, from http://www.thaibod.net/en/report/category/6-2009-.html

Kobayashi, A. (2008). Launch of a national mandatory chronic disease prevention program in Japan. Disease **Management & Health Outcomes, 16**(4), 217-225.

MacAdam M. (2008). **Frameworks of integrated care for the elderly: A systematic review.** Retrieved January 21, 2014, from http://www.cprn.org/documents/49813_EN.pdf

National Economic and Social Development Board, MOPH, Mahidol University. (2014). **Thailand healthy lifestyle strategy for 2011-2020.** Retrieved September 1, 2014, from http://www.moph.go.th/ops/oic/data/20110316100703_1_.pdf

Nitiyanant, W., Chetthakul, T., Sang-A-kad, P., Therakiatkumjorn, C., Kunsuikmengrai, K., & Yeo, J. P. (2007). A survey study on diabetes management and complication status in primary care setting in Thailand. **Journal of the Medical Association of Thailand**, **90**(1), 65–71.

Nolte E, McKee M, Knai C editor. (2008). **Managing chronic conditions: experience in eight countries.** Copenhagen: World Health Organization 2008, on behalf of the European Observatory on Health Systems and Policies.

Office of Policy and Strategy, Office of the Permanent Secretary for Health. (2014). **Statistical report.** Retrieved March 1, 2014, from http://bps.ops.moph.go.th/index.php?mod=bps&doc=5

Pinit Fa-amnuaypon. (2014). **Report of the health status of the nation 2013.** Retrieved April 13, 2015 from https://drive.google.com/file/d/0Bzxm36jsLYGBMkkyQktERW9HODg/edit?pli=1

Potisat, S., Krairittichai, U., Jongsareejit, A., Sattaputh, C., & Arunratanachote, W. (2013). A 4-year prospective study on long-term complications of type 2 diabetic patients: the Thai DMS diabetes complications (DD.Comp.) project. **Journal of the Medical Association of Thailand**, **96**(6), 637–643.

Ram Ransin , Piyatat Tatsanawiwat. (2012). **Evaluation and care of cases of type 2 diabetes and hypertension by hospitals under the management of the MOPH and the Bangkok Metropolitan Administration.** Retrieved September 1, 2014, from http://www.nhso.go.th/downloadfile/fund/CRCN_55/3 Final research report/1. Final research report 2012.pdf

Rawdaree, P., Ngarmukos, C., Deerochanawong, C., Suwanwalaikorn, S., Chetthakul, T., Krittiyawong, S., et al. (2006). Thailand diabetes registry (TDR) project: clinical status and long term vascular complications in diabetic patients. **Journal of the Medical Association of Thailand**, **89(**Suppl 1), S1–9.

Research Network Group. (2014). **Thai Institute of Medicine, Report of the evaluation of care of cases of diabetes type 2 and hypertension hospitals under the management of the MOPH and the Bangkok Metropolitan Administration.** Retrieved April 13, 2015, from http://dmht.thaimedresnet.org/files_2015/57DMHT_2014_ALL_Ontour.pdf

Tammarangsi, T. (Ed.). (2014). **Report of the status of NCDs: Health Crisis; Social Crisis.** [n.p.].

Tatsanavivat, P., Thavornpitak, Y., & Pongchaiyakul, C. (2012).Comparative effectiveness of three national healthcare schemes in Thailand: in-hospital medical expenses for diabetes and hypertension in 2010. **Journal of the Medical Association of Thailand, 95**(Suppl 7), S254-S2561.

Tsai, A.C., Morton, S.C., Mangione, C.M., & Keeler, E.B. (2005). A meta-analysis of interventions to improve care for chronic illnesses. **American Journal of Managed Care, 11**(8), 478-488.

World Health Organization. (2011). **Global status report on non-communicable diseases 2010**. Geneva: World Health Organization.

World Health Organization. (2013). **Global action plan for the prevention and control of non-communicable diseases 2013-2020.** Geneva: World Health Organization.

World Health Organization. (2013). **Thailand: WHO statistical profile 2013.** Retrieved April 13, 2015, from http://www.who.int/country/tha/en

World Health Organization. (2013). **World health statistics 2014.** Retrieved April 13, 2015, from http://apps.who.int/iris/bitstream/10665/112739/1/WHO_HIS_HSI_14.1_eng.pdf

Zwar, N., Harris, M., Griffiths, R., Roland, M., Dennis, S., Powell-Davies, G., et al. (2006). **A systematic review of chronic disease management. UNSW Research Centre for Primary Health Care and Equity.** Canberra: Australian Primary Health Care Research Institute.

Table 1 Outcomes of Management of Diabetes (DM) and Hypertension (HT) by Indicator

Indicator	Target	Outcomes (DM)			Target	Outcomes (HT)		
		Phanom	Surat Thani	Thailand		Phanom	Surat Thani	Thailand
1. Screening rate among the risk population	>90%	91.5%	84.9%	51.7 %	80%	91.1%	84.9%	53.6%
2. Risk population received behavior change interventions	>50%	82.2%	66.2%	-	>50%	84.2%	69.3%	-
3. Evaluation of the Quality NCD Clinic	>80%	100%	80.0%	-	>80%	100%	80.0%	-
4. Rate of DM control at the level of HbA1C <7%/good control of HT	>50%	32.5%	51.5%	20.3%	>60%	63.6%	55.2%	20.5%
5. Rate of missed dosage/check-up appointments	<5%	1.5%	-	-	<5%	5.8%	-	-
6. Rate of screening for complications of the kidney and foot for DM cases/stroke for HT cases	>60%	73.3%	63.5%	63.1%	>80%	63.4%	49.5%	-
7. Incidence	<5%	0.3%	0.2%	1.1%	>60%	86.3%	51.38%	51.3%
8. Prevalence of complications	<5%	1.5%	9.3%	11.2%	<8 %	0.5%	7.9%	9.4%
9. Mortality	<5%	0.4%	0.4%	14.9%	<5%	0.4%	6.9%	9.1%

Source: Surat Thani Provincial Health Office; Department of Disease Control, MOPH

Table 2 Measures for Implementing the NCD Program

Issue	Activity/Project	Target	Coverage	GAP
Prevention	Behavior change for health communities	++	++	Lack of intensity, continuity and clear evaluation
	DPAC clinic	+	+	Lack of intensity, continuity in implementation
Care and Treatment	Risk group screening	+++	+++	Implementation during only parts of the year
	Risk group behavior modification	++	+	Lack of continuity and clarity of evaluation
	Effective disease control	++	++	Increasing NCD caseloads
	Management of complications	+++	++	High cost of laboratory and diagnostics
Health system	District Health System	+++	++	Lack of integrated implementation according to policy; lack of staff; lack of evaluation; linkages of the case database; community participation
	NCD Quality Clinic	+++	+++	Use of evaluation data to improve implementation; participation of the community
	Chronic Disease Clinic: 4 Mum Muan THPH	++	++	Not all THPH are covered

Prevention Measure	coverage	Intensity	Continue	Target
Policy /advocacy	++	+	Throughout 5 years	15 + years
Risk Reduction				All age groups
Food	1 village/Tambon	+	Ad hoc	All age groups
Activities	1 village/Tambon	+	Ad hoc	All age groups
Alcohol	Legal measures	+	Ad hoc	All age groups
Tabaco		+	Ad hoc	All age groups
Health system	+	+	Ad hoc	
Surveillance and Information	-	-	-	-

Treatment measure	coverage	Intensity	Continue	Target
Policy /advocacy	+++	+++	Throughout 10 years	General population/risk groups/ill cases
Risk Reduction	++	++	Non-systematic follow-up	Patients/risk groups
Health system	+++	++	Throughout 3 years	
Surveillance and Information	Patient record card	+++	Throughout 5 years	Patients
Screening	+++ (91.5%, risk groups)	+++	+++	Age 15+ (verbal) Age 35+ (blood)

Table 3 Comparison of the Implementation of the PHANOM Project with the Theoretical District System

PHANOM Project	DHS & 6 Building Blocks	Activity	Outcomes	Gaps
P :Prevention - Community Prevention	- Essential care - Improve Health & Risk Protection	- Community-based behaviors modification - Enforcement of laws on alcohol and cigarette consumption - Campaigns on the 3 Aws and 2 Saws - Support schools to implement the weight control and health promotion programs - Promote restaurants which use healthy menus	- 54/56 communities (96.4%) - Informed community leaders and vendors - Implementation by the agency involved with groups at risk of DM; - No clear outcomes	- Lack of clear definition of the target population - Evaluation based on number of communities with activities but without assessment of outcomes or continuity of the activities - Lack of strict law enforcement
- Primary Prevention		- Screening for DM and HT in the population age 15 years or older - Behavior change for the risk group	- 91%(Target: 90%) - 84% (Target: 50%)	Lack of continuity of activity and evaluation
- Care and Secondary Prevention		- NCD Quality Clinic - NCD Clinic 4 Mum Muang THPH - Training in health behavior and diet for cases and caregivers	- NCD Clinic performs very well according to criteria - Rate of missing drug re-supply visit = 1.5% - Ratio of cases at the district hospital : THPH= 65.5 : 34.5 (Target: 40:60) - Cases of DM with HbA1C< 7%=32.5% (Target: >50%) - Rate of home visits = 22% (Target: 70%)	- Number of cases and tasks increased significantly without increase in staff, with expanding workloads - There is incomplete distribution of cases to the THPH
- Care and Tertiary Prevention		- Screening of cases of complications - Cases with complications referred to a specialist - Rehabilitation for cases of complications resulting in disability	- Screening of complications of DM 73.3%, HT 63.4% (Target: >80%) - 100% compliance with referral protocol	- Linkages of databases for individual cases for comprehensive care
H :Health information center	- Health information system - Community Participation	- Established an NCD reference center at the district and sub-district levels	- There are health information centers at the DHO and district hospital - There is chronic disease data at the THPH	- Different data systems among the hospitals at different levels impedes linkages
A:Agreement	- Essential Care - Community Participation - Medicine &Technology	- Unified standard of care - Agreements among community-level health outlets	- Use CPG for care throughout the network - Use the same standard for examination and diagnostics throughout the network	- Cost of treatment and diagnosis is increasing steadily
N : Non communicable Disease	- Community Participation - Local context	- Community participates in decision making and addressing health challenges based on data from the local health outlets	- Chronic disease management based on principles of the PHANOM Project	- The Project is still being implemented and it is too soon to assess outcomes or sense of local ownership of the Project

Table 3 Comparison of the Implementation of the PHANOM Project with the Theoretical District System (Cont.)

PHANOM Project	DHS & 6 Building Blocks	Activity	Outcomes	Gaps
O:Organization	- Unity District Health Team - Community Participation - Essential Care	- Community modifies behavior/community-based information center - THPH meet PCA standards - District hospital meets NCD Quality Clinic standards/multi-disciplinary team/home visit center - Regional hospital screening of complications of the eye/provides care for cases with complications	- Data centers at the district and Tambon - All THPH meet PCA standards at level 1 - NCD clinic of the hospital meets standards at a high level - Regional hospital supports examination of complications of the eye and accepts referral of cases with complications for care	- System of support for community participation is complete and continuous - Lack of links of databases for individual cases, and comprehensive follow-up of cases
M:Management				
- Man	- Unity of district Health Team - Resource Sharing - Human Resources	- Strong team for disease control - NCD CUP Board	- Multi-disciplinary team cares for cases of chronic disease - NP on staff at the THPH - NCD Nurse Case Manager	- Lack of staff - High turnover of physicians and senior DHO staff - Natural differences among the agencies and lines of administration - Inadequate budget based on the UC allocation system
- Money	- Health Finances	- UC fund - Tambon health fund - Chronic disease fund (NHSO)	- Allocate budget for chronic disease care OP before distribution to the service outlet - Allocate 100 baht per case for chronic disease management	- Budget for care are triple that for prevention - Costs of treatment and diagnostics are increasing to high levels
- Material	- Medicines & Technology	- Use of medical supplies and diagnostics according to standard at all outlets	- Use the same medicines through the network, which are dispensed by the pharmacist for all cases; conduct lab inspections by a medical technician - Use the same drugs as prescribed by the regional hospitals after cases return to the home community	
- Method	- Leadership & Governance	- Apply the strategic map and policy framework for managing chronic disease through a series of meetings on indicators, supervision and evaluation	- In the process of implementing the PHANOM Project plan for 2013-2015	- Evaluation and analysis for on-going implementation

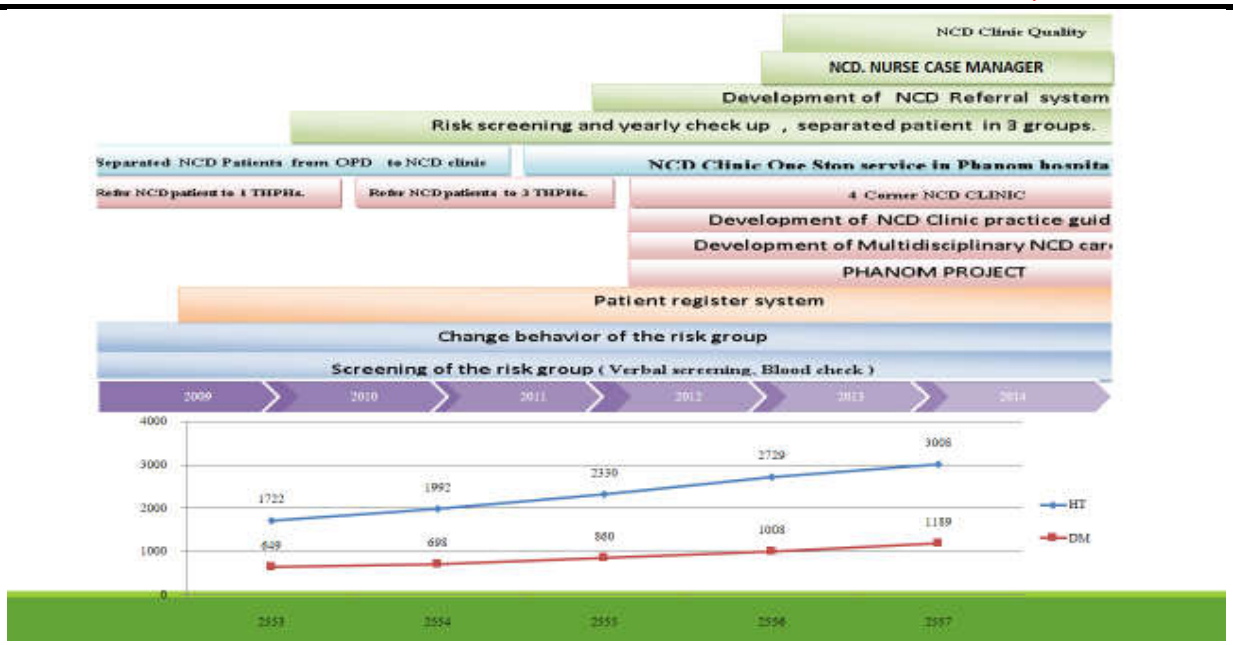

Figure 1 Policy and Measures in Phanom District

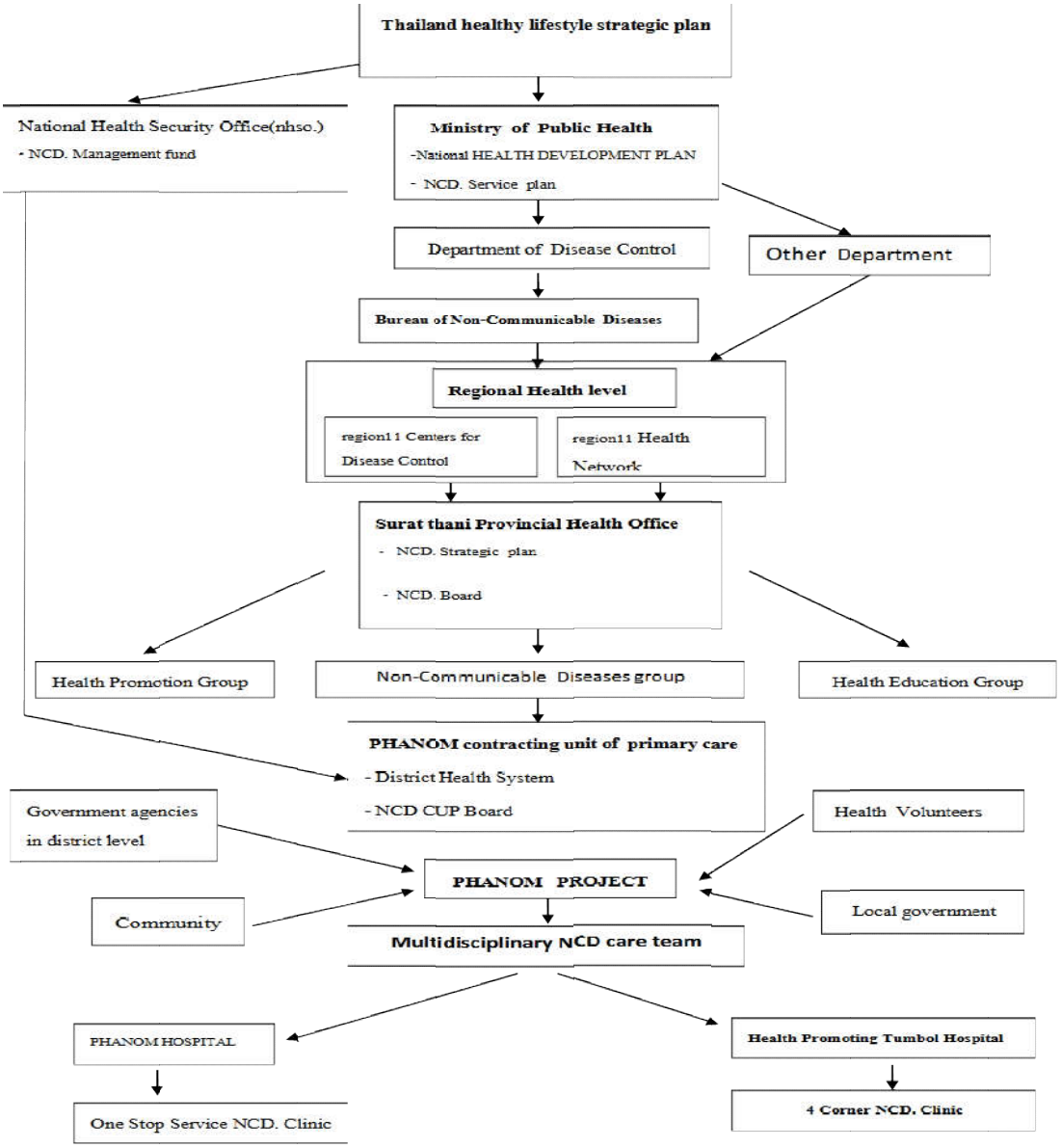

Figure 2 Conceptual Design of the Phanom Network for Management of Chronic NCD

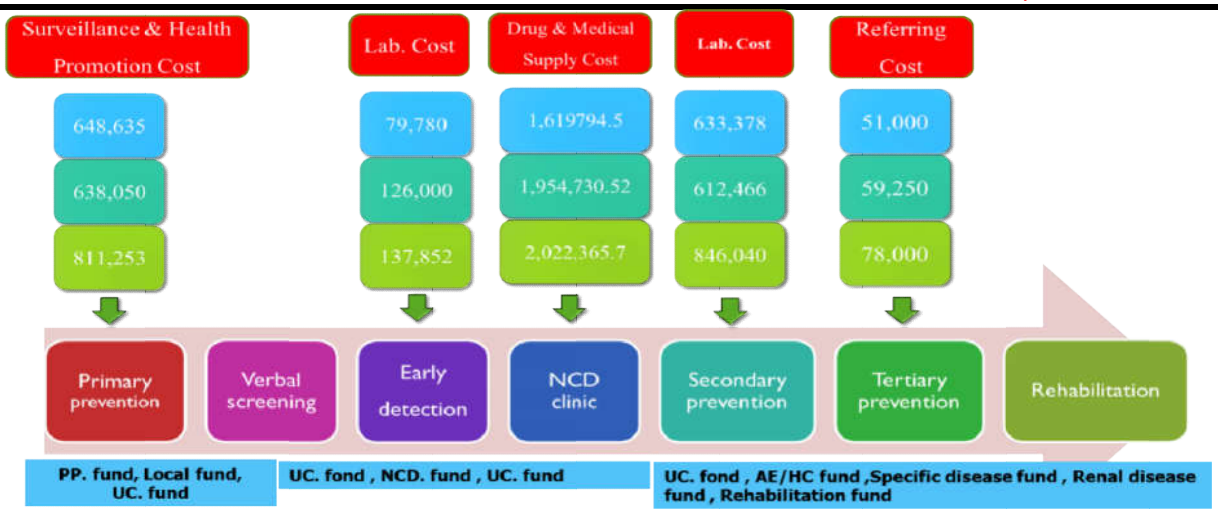

Figure 3 Budget Support over the 2012-14 Period