



**Title:** The Challenge of Escalating Chronic, Non-Communicable Diseases in the Asia Pacific Region

**Lead:** Carl Anderson Johnson  
Dean & Professor  
School of Community and Global Health  
Claremont Graduate University

Paula Palmer  
Associate Professor  
Director, Global Programs  
School of Community and Global Health  
Claremont Graduate University

**Participating Universities:**

Claremont Graduate University, Chinese University of Hong Kong, Hanoi School Public Health, Johns Hopkins University, University of Indonesia, United Nations University, University of Tokyo, Zhejiang University, National University of Singapore, Stanford University, (Nanjing University)

**Introduction/Problem Statement:**

Chronic, non-communicable diseases (NCDs) of lifestyle and circumstance account for the largest burden of mortality and morbidity in the Asia Pacific region. The staggering increase of NCDs threatens the quality of life among people throughout countries in the region, in addition to posing an unprecedented challenge to healthcare systems many of which are unprepared and in transition. There is inconsistent health risk behavior data available on adults and almost none available on youth in the Asia Pacific region, thus thwarting our knowledge of the determinants of NCDs and ability to develop prevention strategies.

**Objective:**

Investigate the role of rapid social, economic and cultural change on health risk behaviors, including substance use, poor diet and sedentary behavior; mental health and life stressors, and health practices and outcomes in communities in low-, middle-, and high income countries in the Asia Pacific region to inform the development of effective family and community interventions and policies for the control and prevention of NCDs.

**Methodology:**

Develop and administer a common school-based health behavior risk survey instrument in participating countries for the collection of youth and parent data. In conjunction with local education and health departments, a stratified sampling plan will be used to select middle- and high schools in low-, middle-, and high income districts in each designated project city. Classrooms in each school will be randomly selected and students and their parents invited to participate. Student and parent participants will fill out a paper-and-pencil questionnaire with the following constructs: demographics, economic changes and job security, health status, neighborhood and family environments, insurance and access to medical care, health risk

behaviors (tobacco, alcohol use, diet, activity, etc.), psychological variables (depression, stress, quality of life, etc.), etc. To ensure that survey items capture the proper idiomatic language, each item will be reviewed by in-country researchers and pilot tested, as necessary. The study and survey instruments will be approved by local institutional review boards, and all participants will provide consent prior to entering the study.

**Analysis:**

Due to the complexity of the study design and the measures to be collected containing multilevel structure (e.g., students nested within schools nested within cities and across countries), various statistical approaches will be used for hypotheses testing. These include linear regression, logistic regression, structural equation models, multilevel models, and growth curve models.

**Impact:**

The ability to collect common health behavior data for youth and adults across Asia Pacific countries in varying stages of economic development and social change provides the unique opportunity to study the unique determinants of NCDs across countries and cultures and contribute to strategies and policies to control and prevent their escalation. *This project will work in conjunction with the other proposed projects in the AWI consortium, thus contributing to the larger effort to improve health and well being and contain healthcare costs throughout the Asia Pacific region.*



**Title:** Comparative Study of Medical Management of Diabetes in Pacific Rim Cities

**Lead:** Karen Eggleston, Centre Fellow & Professor,  
Walter H. Shorenstein Asia-Pacific Research Center  
Stanford University

**Participating Universities:**

Claremont Graduate University, Chinese University of Hong Kong, Peking University, Stanford University, University of Indonesia, United Nations University, Johns Hopkins University, National University of Singapore, (Nanjing University)

**Introduction:**

This comparative study of management of medical care for patients with diabetes in Pacific Rim cities has two primary **research goals:** (1) to assess “value for money” (productivity) of chronic disease management in different settings; and (2) to give evidence-based policy advice to help prepare healthcare systems for aging populations with greater need for coordinated chronic disease management.

**Rationale:**

Diabetes mellitus (DM) and its complications represent an important public health and health system financing challenge in many Pacific Rim countries. DM prevalence has grown along with demographic and epidemiological transitions. The rapid increase in DM prevalence implies increased morbidity and premature mortality as well as a large rise in healthcare expenditures for complications such as cardiovascular disease, diabetic nephropathy, retinopathy, and neuropathy. Diabetes, thus, is not only a major health challenge in its own right, but also offers an important window into the overall healthcare system challenges that Pacific Rim countries face as they confront growing burdens of chronic non-communicable disease and aging populations.

Our research seeks to provide an evidence base for policies to **improve access to timely, effective, and affordable care, coordinated across outpatient and inpatient settings to deliver quality, cost-effective diabetes management.** For example, the study will examine questions such as the following: Are providers financially rewarded for excellent management of patients with diabetes? Who bears the risk if a patient develops complications that require treatment? Who saves money if complications are avoided? Studies like ours can help to quantify the value of prevention (through avoiding or delaying complications and hospitalizations) and to elucidate how policymakers can enhance “value for money” in caring for the growing number of patients with diabetes in these countries.

**Methodology:**

Each country collaborating team will assemble a patient-level data set on resource use and quality. To be eligible for the Stanford collaboration, the threshold is at least 700 patients for at least 12 months (but preferably many more patients over many years), with the data fields listed

in Appendix A at least once per patient per year of data. We will apply methods from health economics (e.g. cost-effectiveness, econometric analysis of trends in spending and quality, and productivity assessment).

We seek collaborators with data on patients with diabetes treated in both inpatient and outpatient settings. The project will include at least three separate studies:

- (a) Descriptive, comparative analysis of inpatient treatment;
- (b) Descriptive, comparative analysis of outpatient treatment;
- (c) Patient-level analysis of “value for money” in management of diabetes (inpatient and outpatient settings), and if possible, evaluation of cost-effectiveness of different treatment settings.

The specific research questions and methods will be tailored to each question. For example, for (a), the primary questions are as follows:

- (1) What is the clinical presentation of patients for diabetes-related admissions?
- (2) What is the average total spending for a diabetes-related hospitalization, compared to per capita income? How does spending differ for patients with and without complications?
- (3) Does spending differ for insured and uninsured patients?
- (4) What share of diabetic hospitalizations represents an initial diagnosis of diabetes, and to what extent are complications already manifest at first hospitalization?

The analytic methods will vary according to the availability of data fields, institutional setting, and each collaborating Center’s own complementary research questions. Some collaborators will be able to do (a) only; others may participate in (a), (b) and (c). For (c), ideally the analysis should include the average and distribution (e.g. by quintile) of total resource use per patient; the percentage spending on medications, outpatient services, inpatients services, etc., as available; the average and distribution of the UKPDS predicted cardiovascular risk of the patients, at the beginning and end of the sample period; and the mean and distribution of “modifiable” risk holding patient age and duration of diabetes constant (either at the individual patient level, or adjusted for the distribution in a sample of patients, controlling for complications and co-morbidities). Include analysis of process measures of quality where possible (e.g. frequency of testing for HbA1c, complications, etc). Multivariate regression of total resource use per patient can be used to analyze how incremental spending is associated with better control (lower cardiovascular risk) as well as with specific co-morbidities and complications. We will furnish more specifics about making these calculations for all collaborating Centers, tailoring the analytic method to the datafields available, the institutional setting, and the other complementary research questions that each Center may wish to study.

Other topics that research teams have expressed an interest in studying include the following:

- Which patients choose to participate in patient education about diabetes self-management, and what is the impact of patient education on health outcomes?
- How are process measures of quality of care changing over time? How do they differ according to practice setting, patient characteristics, specialist vs. primary care, etc?
- Do uninsured and insured patients differ in access to primary care, reasons for hospital admission, severity at admission, development of complications, total spending and economics burden?

- Assessing the impact of a payment system reform, such as implementation of global budgeting or introduction of case-based payment.
- The impact of better management of diabetes on quality of life and enhanced productivity at work.

**Timeline:**

**Spring 2009:**

Recruit additional participating centers, determine data availability and interest in specific sub-components of the broader analysis (e.g. inpatient or outpatient spending only; aggregated spending only or patient-level multivariate analyses).

**June 2009:**

Eggleston communicates research protocol of all participating centers, with customization for the data and research interests of each center.

**Summer 2009:**

Centers obtain IRB approval for their studies and begin analysis of data; Eggleston meets with researchers at iHEA meetings in Beijing in July (for those able to attend).

**October 2009:**

Centers share preliminary results; Eggleston assembles results into paper(s).

**December 2009:**

Refine analytic methods for each Center, based on comparison of results and specific data fields available at each collaborating Center. Each Center performs final statistical analyses of the data with revised analytic protocol.

**February 2010:**

Final analyses shared and assembled by Eggleston in paper(s).

**April 2010:**

Final paper(s) completed and submitted for peer review; Eggleston leads collaborators in developing proposal for external funding.

**June 2010:**

Proposal for external funding completed.

**Budget:**

Each participating center would be expected to self-fund their data collection and analysis to participate in the study until we can apply for external funding [target 2011].

**DATA FIELDS**

Patient identification number (to link across admissions and/or outpatient visits, if possible) – otherwise de-identified data only for research purposes

Age

Sex

Insured or uninsured

Patient city/residence (city name, or urban/rural)

Date of diagnosis of DM (or duration of diabetes)

Smoking status (current smoker, former smoker, never smoked)

Patient clinical information (at as many time points as possible)

HbA1c

systolic blood pressure

cholesterol (Total cholesterol/HDL cholesterol)

co-morbidities and complications (renal function, diabetic neuropathy, etc -- see detailed list from our Mayo Clinic study, below Appendix B);

Healthcare spending

Inpatient treatment

Outpatient treatment

Medications

Labs

Inpatient length of stay (including dates, primary diagnosis)

Outpatient visits (including dates, primary reason)

If feasible, the database may also include

More detailed treatment information;

height;

weight; (BMI)

Family history of DM and others

Education level and/or occupation;

alcohol consumption

smoking intensity (cigarettes per day)

Fasting glucose (two hours postprandial)

Blood from vein vs. finger test (indicator variable)

other clinical information;

which doctor(s) treated that patient;

Received patient education or not



**Title:** A Brief Proposal for a Multi-Centre Collaborative Program to Reduce Morbidity from Cardiovascular Disease (CVD)

**Lead:** Steven Leeder  
Director & Professor  
Australian Health Policy Institute  
University of Sydney

George Rubin  
Director & Professor  
Centre for Health Service and Workforce Research  
University of Sydney

**Participating Universities:**

Claremont Graduate University, Chinese University of Hong Kong, Hanoi School Public Health, Johns Hopkins University, Peking University, Stanford University, University of Indonesia, University of Sydney, University of Tokyo, National University of Singapore

**Purpose:**

Cardiovascular disease accounts for more deaths in the Asian and Pacific region than any other cause. We know a lot about how to prevent and treat it. Consequently our proposal is for a research collaboration that would enable participating universities of APRU to work with in-country health systems to reduce cardiovascular mortality. Each country's experience would be shared with all others throughout the entire project. The development of the project could commence with a budget of \$US 151,992.

**Goal:**

To reduce by 20%, cardiovascular deaths over five years among collaborating nations.

**Background:**

At the June 2008 APRU meeting in Tokyo, participants were invited to present ideas for a public health collaborative project for participating universities within APRU. Participants were exhorted to ensure that university-based research led directly to community health benefit (Nazem 2008).

In November 2008, Professor Stephen Leeder (University of Sydney) in Singapore presented a proposal to undertake a study in participating countries to reduce cardiovascular disease deaths and disability using multi-institution collaborative improvement methods. The University of Sydney was subsequently invited to expand on this proposal at the February meeting of the APRU World Institute at Stanford University. The proposal was received with enthusiasm and a proposal for a pilot study to test the methodology was requested.

**Evidence:**

Population-based prevention (less fatty food, decreased salt in processed food, taxes on tobacco, city design that encourages physical activity) have huge potential to reduce the incidence of heart disease. As well, and the object of this study, better treatment of people who suffer heart attacks, with simple medications, can cut mortality substantially. Indeed, studies have shown that improving the treatment of patients leaving hospital after having a heart attack can decrease their patients' risk of death from subsequent AMI by 25%. This evidence is not widely used: evidence supports the view that it is used in only 30-60% of patients. This study will explore ways of improving the uptake of this preventive medicine approach to heart disease.

CVD mortality in middle aged people in less economically advanced countries is increasingly rapidly. It affects much younger people than in western countries. It diminishes a country's economic wellbeing (*A Race against Time* Leeder et al. [www.earth.columbia.edu/news/2004/images/raceagainsttime\\_FINAL\\_051104.pdf](http://www.earth.columbia.edu/news/2004/images/raceagainsttime_FINAL_051104.pdf))

To get better care for heart attack patients requires change in hospital practice – no easy task! But collaborative methods for achieving dramatic changes in organisations have worked in healthcare since the late 1980s. We propose one for APRU-AWI.

A collaborative (as these methods in aggregate have been termed) brings together groups of practitioners from different healthcare organisations together to improve an aspect of the quality of their service. Collaborative programs, particularly the method of "Breakthrough" methodology, are playing a major role in spreading best practice (Ovretveit J et al. *Qual Saf Health Care* 2002; 11:345-351)

In a series of meetings staged throughout the project – face to face and using information technology – they learn about best practice and about ways to change entrenched ideas. They share their experiences in making changes in their local setting. Collaboratives have been used successfully in improving management of asthma and cancer care; caesarean section; end of life care; HIV/AIDS; intensive and neonatal care; mental health, hip replacement; waits and delays in hospitalisation and implementing models for chronic care. Now we have a chance to do the same, through translational, clinical research, for the major public health killer in the Asian and Pacific Region.

A systematic review of quality improvement collaboratives reports small positive effects. So, while promising, further theoretical research is required to evaluate which components of collaborative research are effective, their cost effectiveness and the factors that predict success. (Schouten LM et al. *BMJ* 2009; 336:1491-1494).

**Methods:**

This pilot study will develop collaborative learning in one teaching hospital from each of the countries whose universities have expressed an interest in the project (7 including Australia—Claremont Graduate University, Chinese University of Hong Kong, Hanoi School of Public Health, University of Tokyo, Peking University, National University of Singapore, and the University of Sydney).

Breakthrough Collaborative methods developed by the Institute of Healthcare Improvement (IHI) (*op cit* Ovretveit 2002) will be used. Participating university units will each identify one teaching hospital to participate in the project and each university and

hospital will nominate a project lead person. The overall project coordination will be conducted by the Menzies Centre at the University of Sydney.

The seven lead universities will establish a steering group to which will be added external experts in cardiology with specialist content knowledge.

At the start-up face to face meeting of all lead persons and the steering group, they will decide on study populations, the clinical interventions to be applied (clinical guidelines), the data collection methods and communication, reporting and evaluation timeframes. The coordination centre will present options and take steps to minimise paperwork for the other participating centres and will include the drafting of proposals that can be used by participating centres to generate research/project funding within their own countries. Additional funding will be sought from health care provider organisations which will likely have an interest in sponsoring the development of improved standards of care.

Learning sessions will be conducted by videoconference and email with participating centres sharing their experience with various interventions to enhance the use of the clinical guidelines in practice. The change management strategies to increase the use of the agreed clinical practice guidelines will be continuously monitored and evaluated and shared with all collaborators. The pilot will run for a period of 12 months from the first learning session and the results will be presented at the next meeting of APRUWI, appropriate international conferences and in peer reviewed journals.

**Budget (AUD):**

Associate Prof level epidemiologist. \$112,500 x 0.3FTE x 15months	\$42,188
Admin/research assistant - \$61,366 x 0.6FTE x 15 months	\$46,023
Communications	\$15,000
Travel	\$30,000
Consumables	\$10,000
Contribution to participating countries to get started	\$30,000
On costs - \$173,211 x 35	\$60,624
<b>TOTAL</b>	<b>\$AUD233,835</b>

\$AUD 233,835 = \$US 151,992

**Benefits to APRU World Institute (AWI):**

The project would enhance AWI collaboration. Each unit would publish its own data and healthcare in participating countries will likely be improved and lead to improved outcomes for cardiac patients. Expansion of the project would enable creation of networks which would serve to improve healthcare in a wide variety of health problem areas and to form a basis for an international program of implementation research.



**Title:** Challenges and Opportunities for Overcoming Health Workforce Shortage against NCD Threats in the Asia-Pacific Region

**Lead:** Masamine Jimba  
Professor, International Community Health  
Graduate School of Medicine  
University of Tokyo

**Participating Universities:**

Claremont Graduate University, Chinese University of Hong Kong, Hanoi School Public Health, Johns Hopkins University, Stanford University, University of Indonesia, University of Tokyo, National University of Singapore, Zhejiang University

**Introduction/Problem Statement:**

To overcome non-communicable diseases (NCDs) threats, it is necessary to strengthen health system, by which each country can prevent theoretically preventable NCDs such as cardiovascular disease, stroke and diabetes mellitus. In all health systems, health workers command a significant share of health budgets, in some cases more than 75%. However, in many developing countries, the health workforce is used for communicable disease control and not so much for NCDs

**Objective:**

To identify the challenges and opportunities for overcoming NCDs with particular focus on health workforce in developing countries in the Asia-Pacific Region

**Methodology:**

1. Analyze health workforce policy and government readiness to cope with NCDs by taking a multiple case-study approach
2. Analyze existing health workers in each country for NCD prevention, treatment, and rehabilitation
3. Conduct pilot studies about task shifting possibilities to control NCDs
4. Conduct pilot studies about NCD patients' health care seeking behaviour
5. Identify innovative solutions for well-balanced migration strategy

**Impact**

Identify specific actions for strengthening health workforce to cope with NCD threats in the developing countries in the Asia-Pacific Region