

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

**Monitoring Environmental Change,
Dispositional Characteristics, and
Chronic Disease Risk Behavior**

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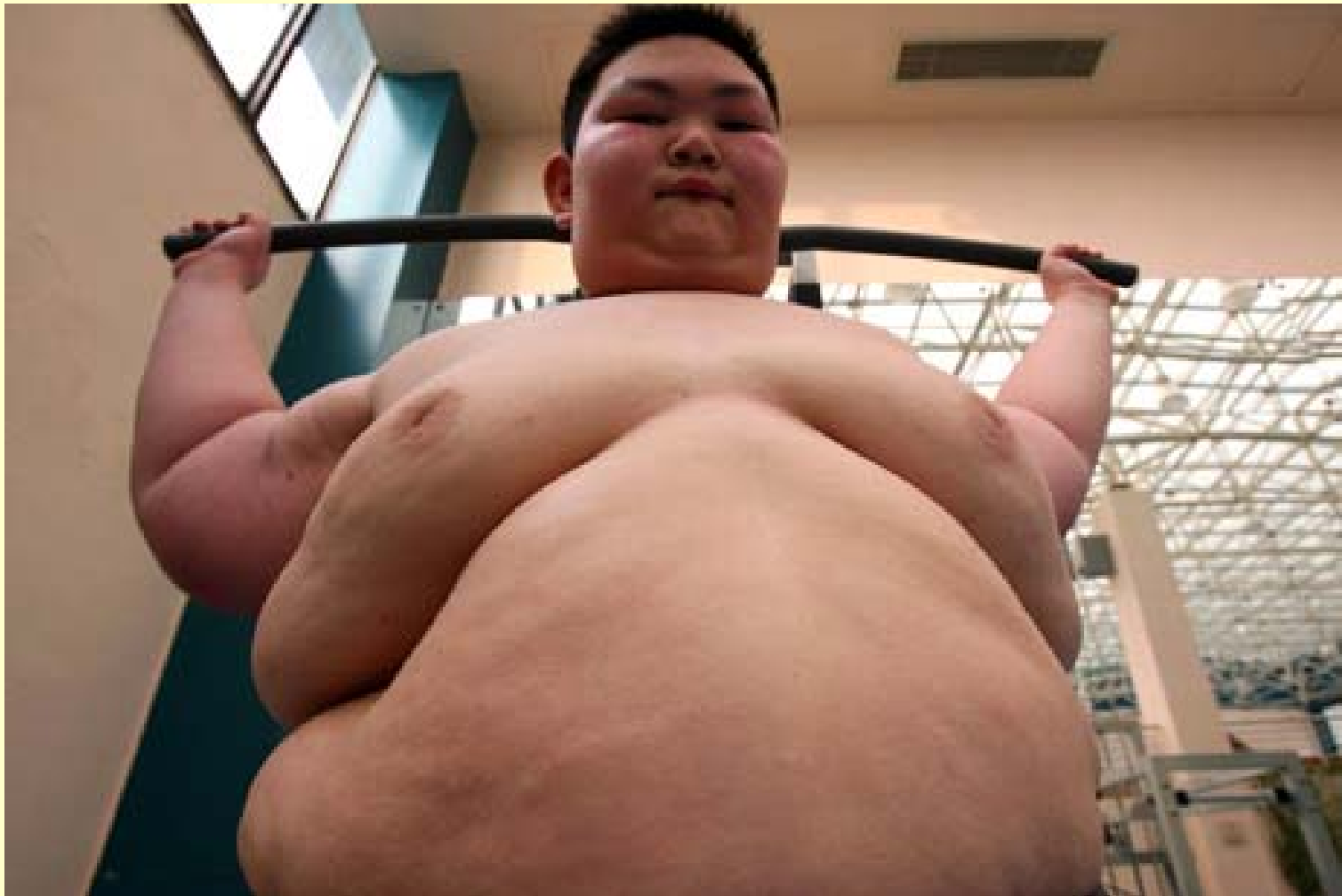
Introduction – Problem statement

- ◆ NCDs account for the largest burden of mortality and morbidity in the Asia Pacific region.
- ◆ Quality of life suffers
- ◆ CNCDs pose an unprecedented challenge to healthcare systems most of which are unprepared and in transition
- ◆ Monitoring and prevention are key to control
- ◆ Inadequate comprehensive, comparable data on the environment, personal characteristics, and risk behavior data available for adults across countries of the region or within countries over time, and virtually none for youth in the region

Introduction

- ◆ This lack of locality and time specific data adversely affects our knowledge of the determinants of CNCs and ability to develop prevention strategies.
- ◆ Monitoring of trends and assessment of environmental influences are key to developing effective community interventions for reducing dysfunctionality in lifestyle practices that put people at risk for chronic disease
- ◆ An AWI program of research on prevention of dysfunctional appetitive behavior associated with economic change: The CSCS/SC model

**The China Seven Cities Study as a
Model for an AWI Multi-City
CNCD Monitoring System**



15-year-old Huang Jiabin exercises during treatment for obesity at the Aimin Slimming Centre in Wuhan in China's central Hubei Province on March 20, 2006.



- ◆ In the past decade, China has undergone rapid social and economic changes that contribute to
 - Increased rate of smoking in females and earlier onset in males
 - Increase in nutrition-related non-communicable disease
 - Increase in mental disorders
- ◆ As a result rates of adult overweight and obesity increased 40.7% and 97.2% between 1992 and 2002 (Chen, et al., 2008)
- ◆ Smoking is 8x higher among today's college women than the previous generation (Palmer, et al., 2009)
- ◆ Rate of clinical depression in early and middle adolescent youth (ages 11-17) is greater than 30% (Johnson, 2009)

Objectives of the China Seven Cities Study

have been to

- ◆ Investigate the role of rapid social, economic and cultural change on health risk behaviors:
 - including tobacco and alcohol abuse use
 - unhealthful diet and sedentary behavior
 - mental health status and life stressors
 - health practices and outcomes in communities of different characteristics
- ◆ Inform the development of effective family and community interventions and policies for the control and prevention of NCDs
- ◆ Engender international collaboration: municipal CDCs and Health Bureaus, Education Committees and Schools, local universities in the 7 cities

CSCS School survey samples

Middle School 7th grade (follow through grade 9)

- Child
- Parents

High School 10th grade (follow through grade 12)

- Child
- Parents

Professional/Technical School 10th grade (follow through grade 12)

- Child
- Parents

College 1st and 3rd year

Workers: Age 18-65

$N \leq 58,000$

Other associated studies in the 7 cities

- ◆ Two community based prevention trials (tobacco and alcohol)
- ◆ Twin study
- ◆ Gene-Environment study relative to prevention program effectiveness
- ◆ Study of neurocognitive mechanisms relevant to prevention

Things we have learned

- ◆ Growth in obesity has been associated with newly acquired affluence
 - greater in the cities than rural areas
 - greater in the more developed coastal cities
 - more prevalent among those with higher incomes
- ◆ Smoking is increasing among females and is occurring at younger ages for both males and females
- ◆ Metabolic syndrome is associated with tobacco smoke exposure (especially ETS) as well as obesity

Environmental Tobacco Smoke Exposure and Metabolic Syndrome in Qingdao Adults

GEE Models \$	ETS 5-7 days/week vs. ETS ≤4 days/week		
	OR	95% CI	p value
Metabolic Syndrome	2.8	1.2 - 6.6	0.01
Components			
Impaired Glucose	1.1	0.3 - 4.1	0.8
High Blood Pressure	1.1	0.6 - 1.9	0.7
Hypertriglyceridemia	2.1	1.1 - 3.9	0.02
Reduced HDL-C	1.9	1.1 - 3.1	0.02
Central Obesity	2.7	1.6 - 4.5	<.0001

#Covariates controlled in mixed-effect models: age, gender, education, income, alcohol drinking, and active smoking status.

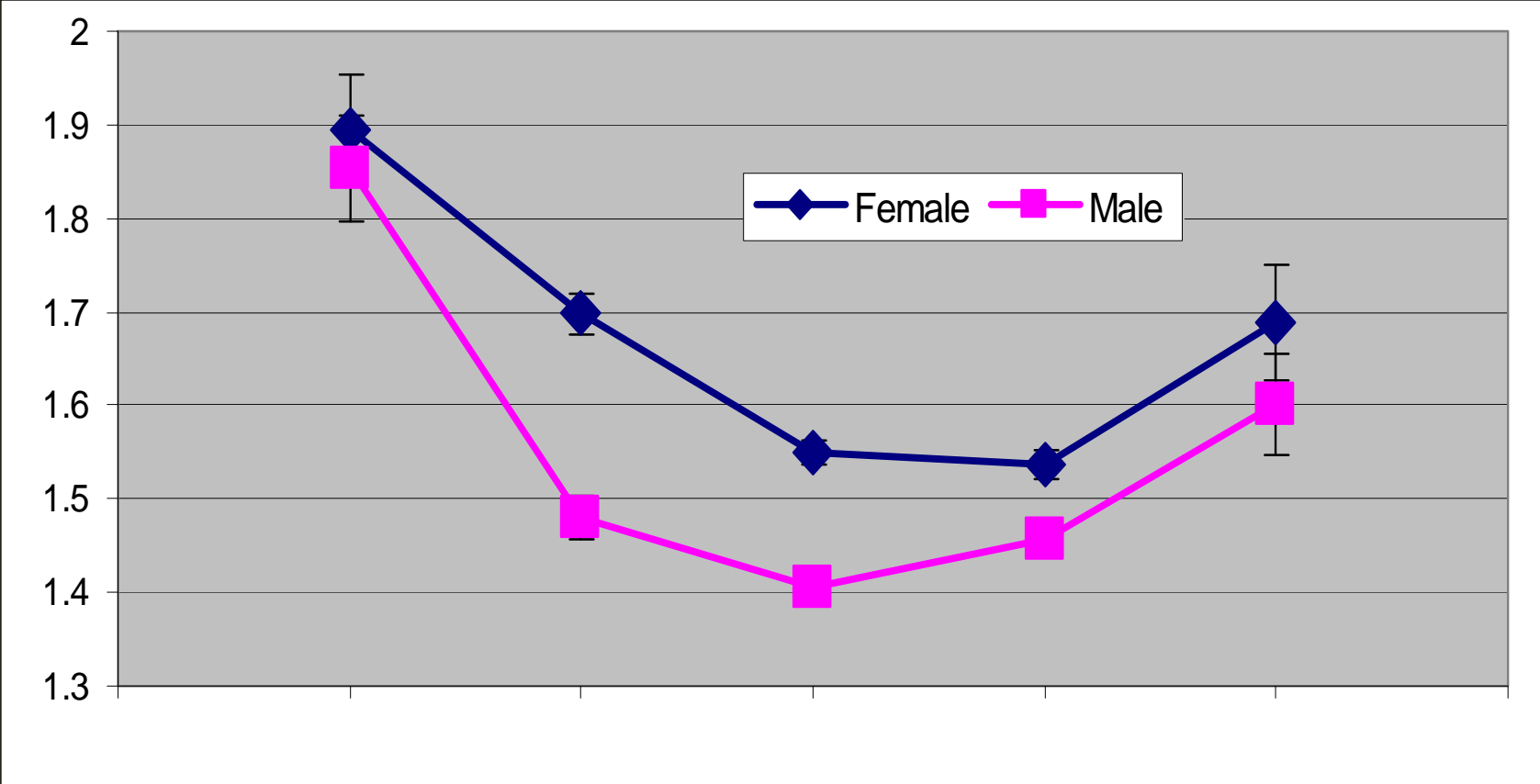
\$Covariates controlled in GEE models: age, gender, education, income, alcohol drinking and active smoking status. Reference group for odds ratio (OR): ETS ≤4 days/week.

(Xie, Palmer, Pang, Sun, Duan, and Johnson, NTR, 2010)

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- ◆ Depression rates are high among youth and depression is associated with economic change

Depression (抑郁) by Income relative to the past in Youth



Much Less Less Same More Much More
Adjusted for perceived income relative to others, parents' income and education, city, district type
Grade, and school type.

**Prevention program effectiveness depends
on both individual and community
characteristics**

Prevention program effectiveness depends on community characteristics:

In a trial carried out in Southern California, two different programs (collectivist or individually oriented) were differentially effective depending on cultural mix of the community (Johnson, et al., 2006)

Prevention program effectiveness depends on individual characteristics (Wuhan Trial)
(Odds Ratios (Program: Control) for past 30-day smoking 2 years after school/family intervention)

Phenotype	OR (CI)
Without smoking - depression comorbidity	0.74 (0.37-1.48)
With Smoking-Depression Comorbidity	0.18 (0.06-0.55)

Sun, et al., 2007

Summary and implications for future A WI research

- ◆ Dysfunctional appetitive behaviors (smoking, poorly regulated dietary/activity behavior, alcohol abuse, etc.) drive the CNCD epidemic
- ◆ Dysfunctional appetitive behavior *is driven by* economic, social, & cultural conditions, especially rapid change, in interaction with individual dispositional characteristics
- ◆ Effectiveness of programs to control dysfunctional appetitive behaviors depends on both social environmental circumstances and dispositional characteristics of individuals
- ◆ In order to inform prevention and health promotion policy, research is needed to assess and track the social and economic circumstances that are driving dysfunctional appetitive behaviors - *these may differ by locale & culture*

The planned AWI CNCD study of behavioral risk factors and environmental circumstances will be carried out in one or more cities in multiple countries

- to assess the impact of economic and social change on CNCD in the region and
- to facilitate development of community based interventions to mitigate the negative impact of emerging economic and social influences

AWI Survey samples in multiple cities/counties

Middle School 7th grade (follow through grade 9)

- Child
- Parents

High School 10th grade (follow through grade 12)

- Child
- Parents

Professional/Technical School 10th grade (follow through grade 12)

- Child
- Parents

College 1st and 3rd year

Special populations: e.g., migrants, marginally-unemployed, etc.

Stratification for all by social, economic, and geographic factors

Overlapping cohorts with new cohort initiated every 2-3 years

Survey Measures

- ◆ **GENDER**
- ◆ **AGE**
- ◆ **ETHNICITY**
- ◆ **BIRTHPLACE & RESIDENCE**
- ◆ **MARITAL STATUS**
- ◆ **EDUCATION**
- ◆ **SCHOOL ACADEMIC PERFORMANCE**
- ◆ **NEIGHBORHOOD ENVIRONMENT**
- ◆ **INCOME**
- ◆ **OCCUPATION**
- ◆ **EMPLOYMENT STATUS**
- ◆ **POVERTY INDEX**
- ◆ **RELATIVE DEPRIVATION**
- ◆ **CONSUMER ITEMS**
- ◆ **FAMILY ENVIRONMENT**
- ◆ **WESTERNIZATION INFLUENCES**
- ◆ **PREVENTION MESSAGES**
- ◆ **HEALTH INSURANCE & ACCESS TO MEDICAL CARE**
- ◆ **USUAL TRANSPORTATION MODE**
- ◆ **MATURATION (Tanner)**
- ◆ **BODY IMAGE**
- ◆ **ADHD**
- ◆ **SENSATION SEEKING**
- ◆ **IRRITABILITY (BUSS-DURKEE)**
- ◆ **IMPULSIVITY**
- ◆ **PERCEIVED STRESS (COHEN)**
- ◆ **DEPRESSION (CES-D)**
- ◆ **STRESS**
- ◆ **PERCEPTION JOB SECURITY**
- ◆ **QUALITY OF LIFE /OPTIMISM)**
- ◆ **SUSCEPTIBILITY REFUSAL**
- ◆ **SELF-EFFICACY**
- ◆ **DIETARY HABITS**
- ◆ **SMOKING STATUS**
- ◆ **TOBACCO DEPENDENCE**
- ◆ **TOBACCO SMOKE EXPOSURE**
- ◆ **ALCOHOL USE/ABUSE**
- ◆ **OTHER DRUG USE**
- ◆ **PHYSICAL ACTIVITY**
- ◆ **CENTRAL ADIPOSITY**
- ◆ **HEALTH STATUS**

Progression in the study of individual risk factors and environmental circumstance

- ◆ Start with a pilot study in 8 cities
- ◆ Leading to a multi-country, multi-city longitudinal study
- ◆ To engender international collaboration, additional research of local, international, and scientific importance
- ◆ In order to influence local and regional public health policy and practice

Cities participating in pilot study

- ◆ Taipei
- ◆ Hanoi
- ◆ Nanjing
- ◆ Kuala Lumpur
- ◆ Laos
- ◆ Cambodia
- ◆ Nepal
- ◆ Inland Empire (California)

Timeline

- ◆ Protocol & questionnaire translation - Feb 2010
- ◆ IRB review and approval - Mar
- ◆ Staff training - Mar
- ◆ Recruitment of schools/communities - Feb
- ◆ Data collection - Mar-Apr
- ◆ Data management and analysis - May-July
- ◆ Paper submission - Sept
- ◆ Grant proposal - Feb 2011
- ◆ Longitudinal study begins - Dec

This study will provide data for public health action attuned to the local situation, and will serve as a platform for future collaborative international research on the causes and prevention of chronic non-communicable diseases