

China's Risk Transition

H. Keith Florig

Dept. of Engineering and Public Policy

Center for the Integrated Study of the Human

Dimensions of Global Change

Carnegie Mellon University

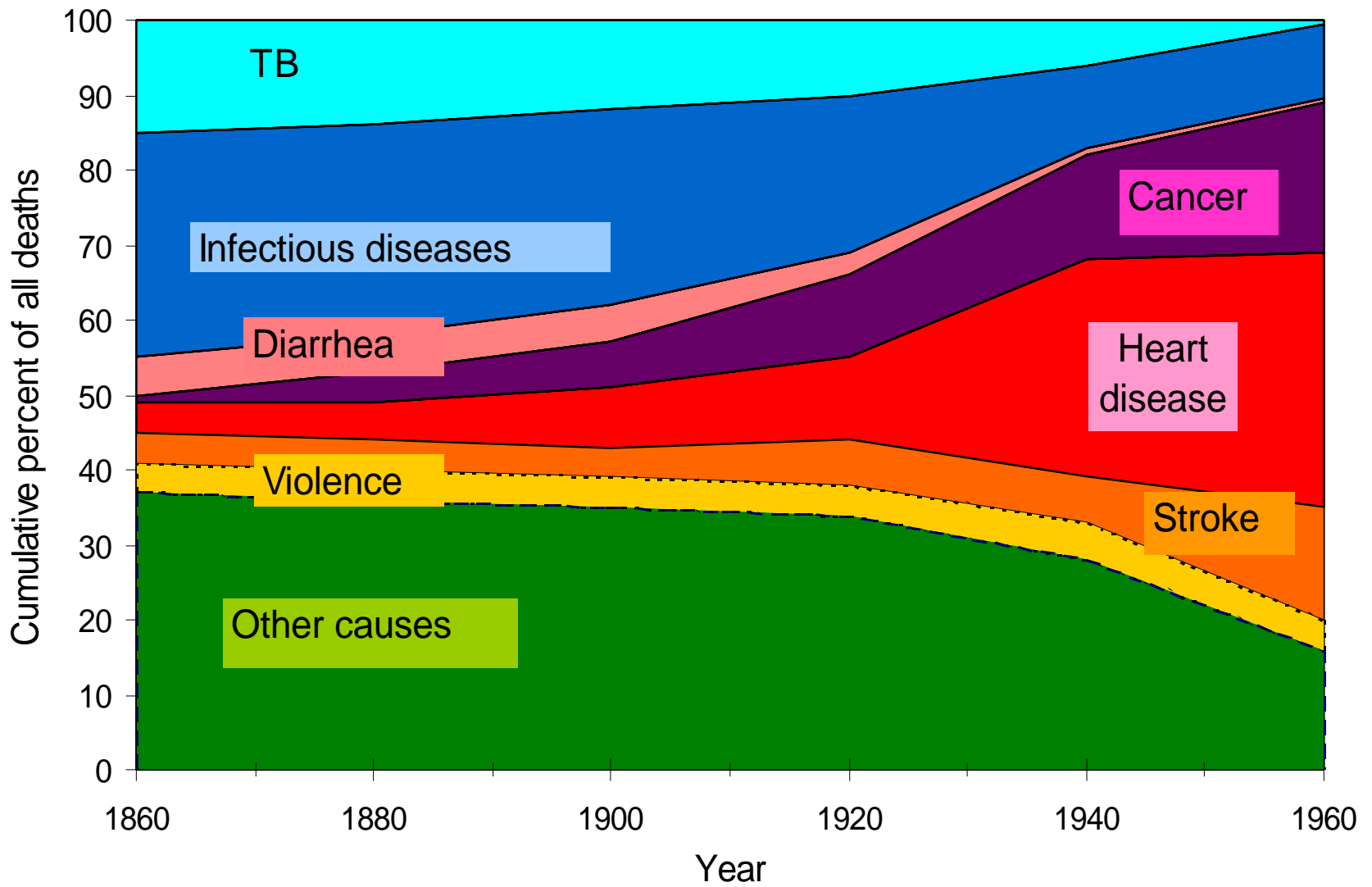
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Outline

- What is the risk transition?
- China's current risk patterns and trends
- Income effects
- Integrated assessment
- Indoor air pollution risks

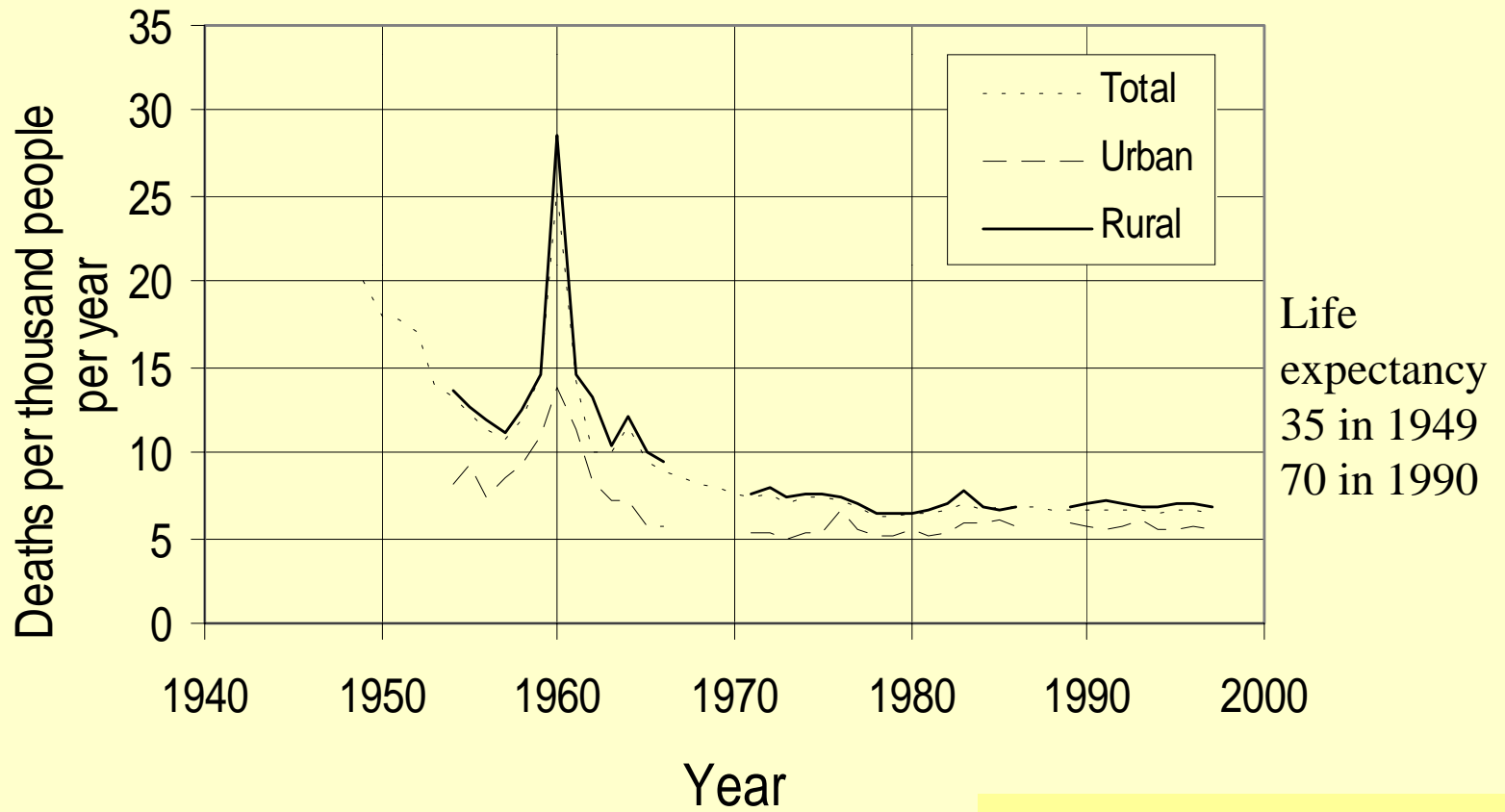
Cause of death ratios in England and Wales, 1860-1960

(from Omran, 1971)



Disease levels and trends

Crude death rate in China, 1949-1997



Leading disease burdens in China, 1990

Disease	% of deaths	% of DALYs
COPD	16.1	8.7
Heart disease	14.6	5.2
Stroke	14.3	5.9
Cancer, exc liver & lung	10.7	6.5
Accidents, exc traffic	5.5	11.8
Childhood pneumonia	5.3	7.3
Suicide	3.9	4.1
Liver cancer, hep B & aflatox	3.3	2.1
Tuberculosis	3.1	2.1
Infant mortality	3.1	7.0
Lung cancer	2.5	1.2
Hepatitis-induced cirrhosis	2.1	1.5
Traffic accidents	1.5	2.1
Kidney disease	1.1	0.9
Diarrheal diseases	1.0	1.9
Malnutrition	0.9	3.7
Diabetes	0.7	0.5

From Murray & Lopez, Global Burden of Disease

Mortality in China vs. U.S.

Cause of death	Approximate number of deaths per year, 1997	Approximate ratio of age-adjusted mortality rates, China / U.S.
COPD	1,300,000	4.2
Heart disease	1,200,000	0.3
Stroke	1,100,000	1.3
Childhood pneumonia	300,000	40.
Liver cancer	250,000	5.5
Falls and drowning	200,000	3.0
Suicide	100,000	1.6
Motor vehicle accidents	150,000	0.7
Homicide	50,000	0.2
Fires and burns	24,000	0.8
Coal mining accidents	5,000	70. *
All causes	8,000,000	1.1

* Mortality rate ratio for miners only

Most significant trends in China

Increasing risks

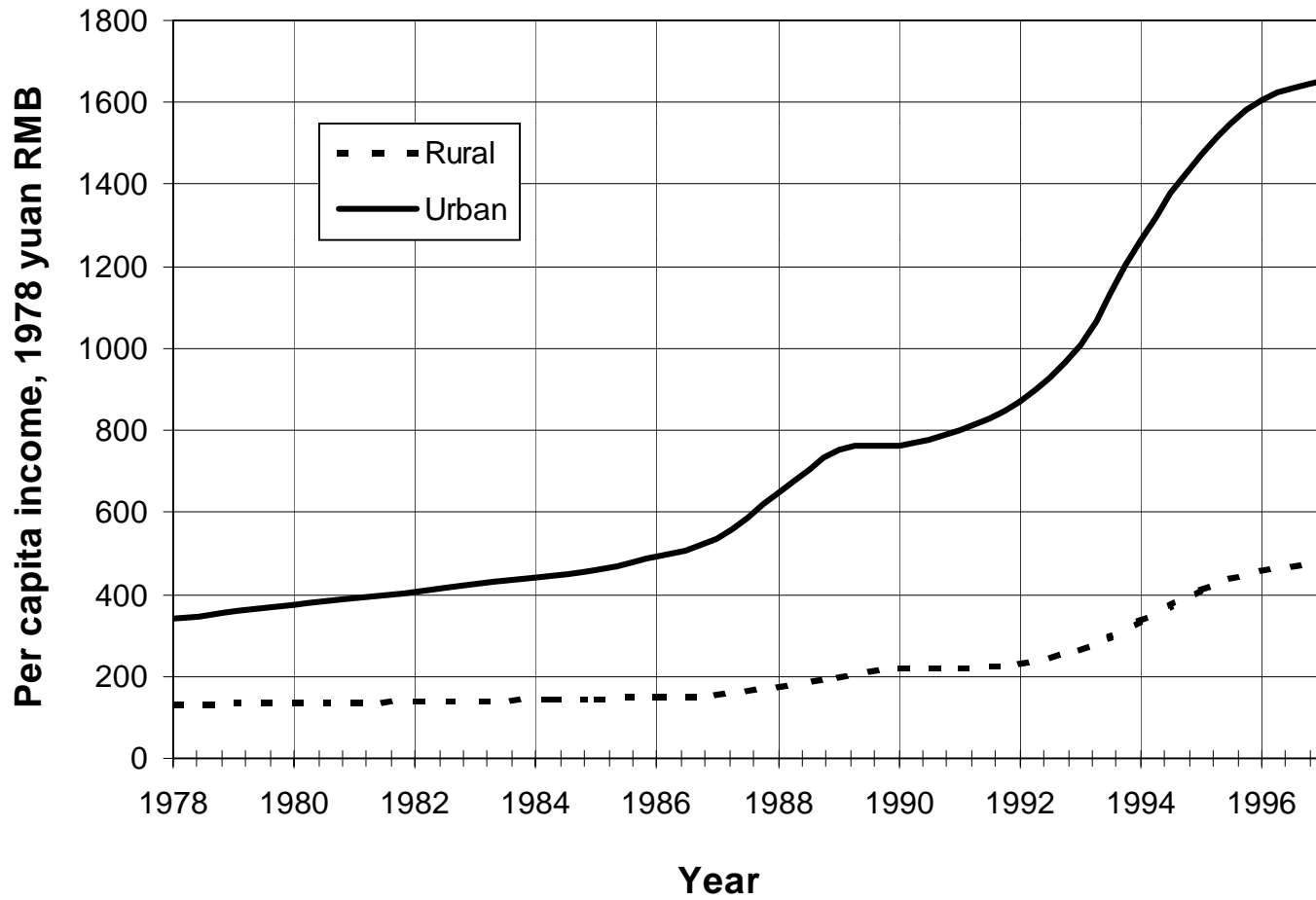
Old-age diseases (population aging)
Smoking-related illness, esp men
Female breast cancer (diet, weight)
Urban heart disease
(diet, smoking, exercise)
Urban and rural stroke
(health care access)
Transport accidents
Some occupational risks

Decreasing risks

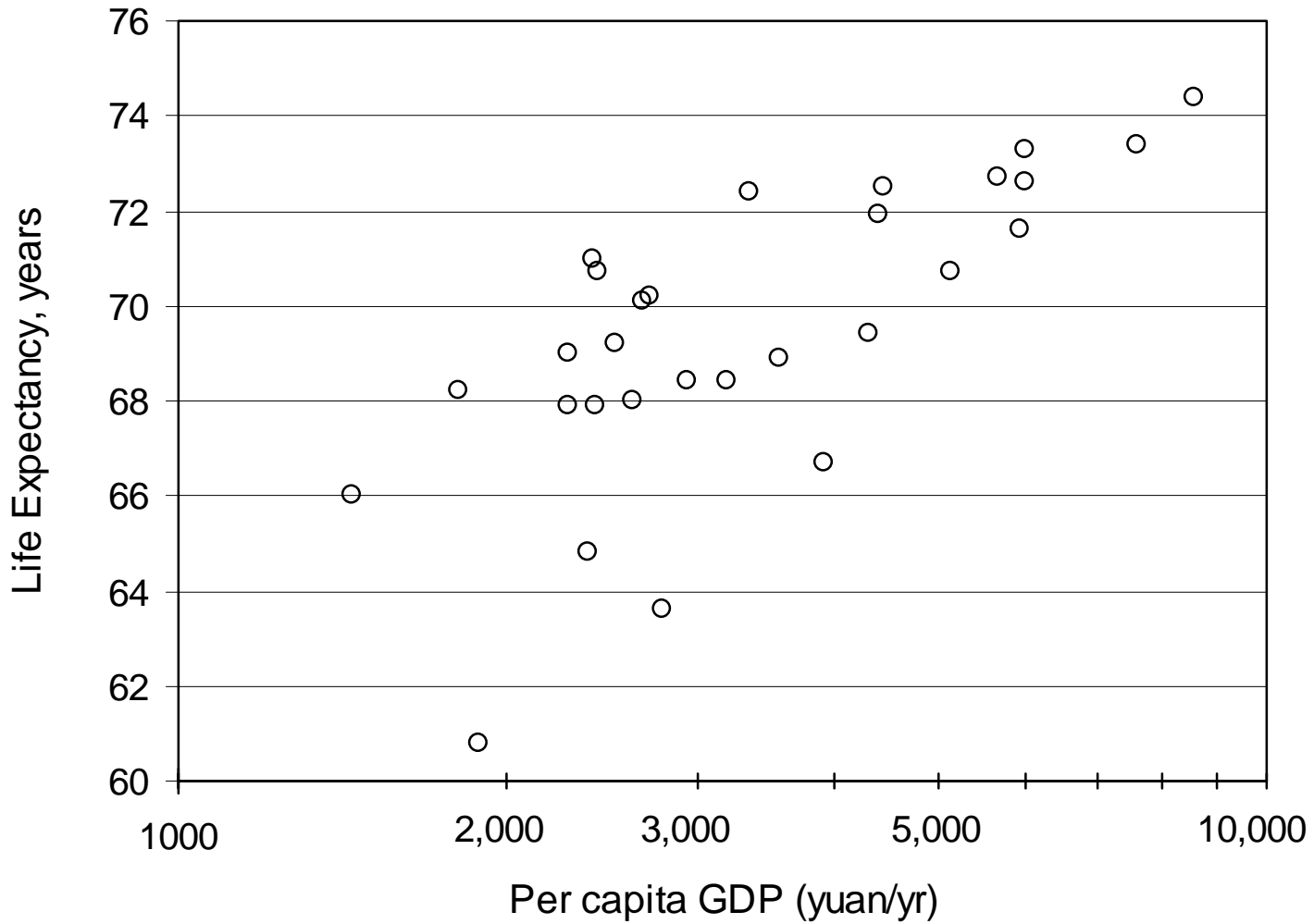
Infant deaths from low birth weight,
diarrhea (mother's diet)
Stomach, esophagus cancer (diet)
Liver cancer (Hep B, aflatoxin)
Cervical cancer (health care access)
Viral hepatitis (living space)
Tuberculosis (vaccine, living space)
Malaria, 3.3 million cases in 1980,
36,000 cases today

Income effects

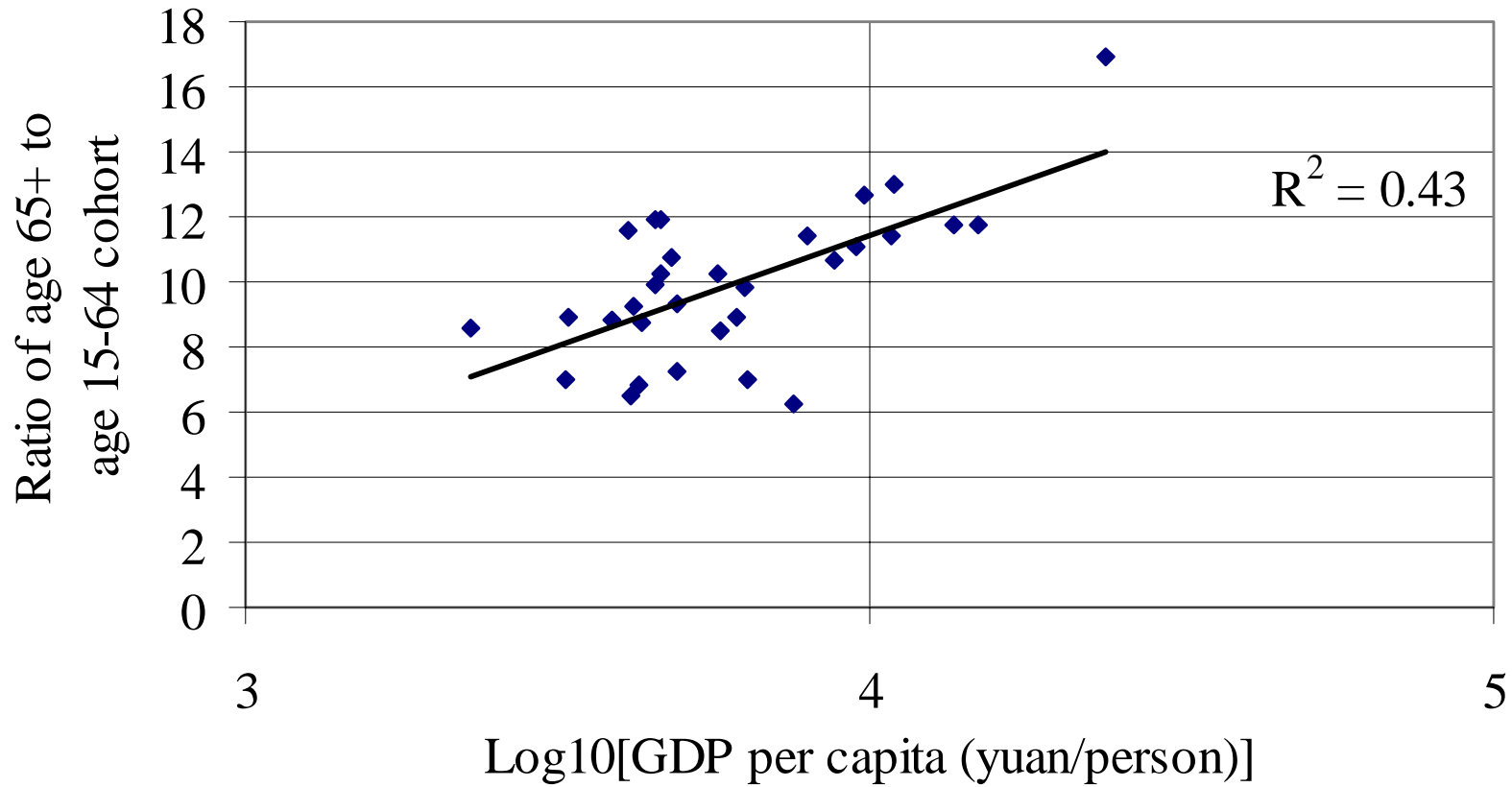
Per Capita Income vs Time, Constant 1978 Yuan



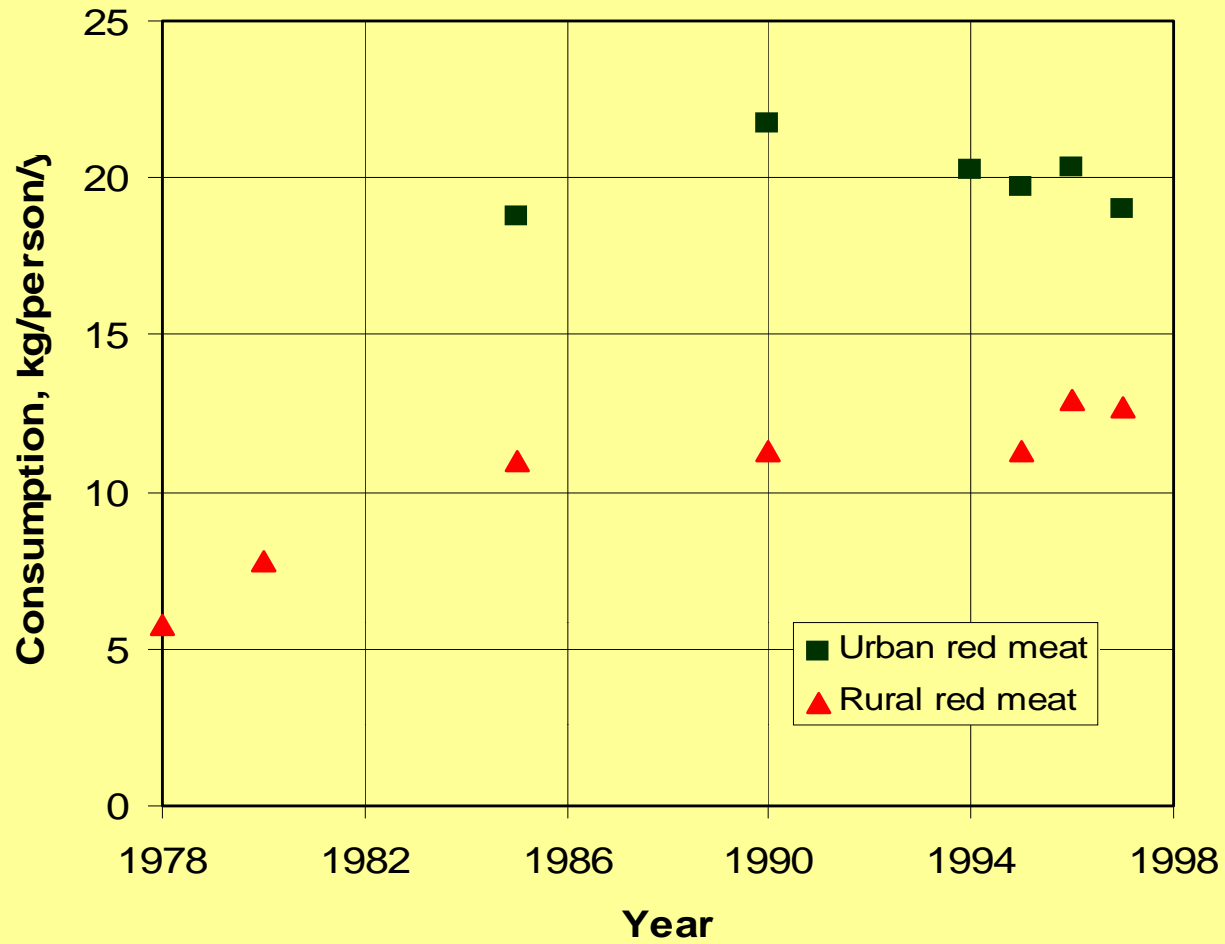
Life Expectancy by Province vs per capita GDP, 1990



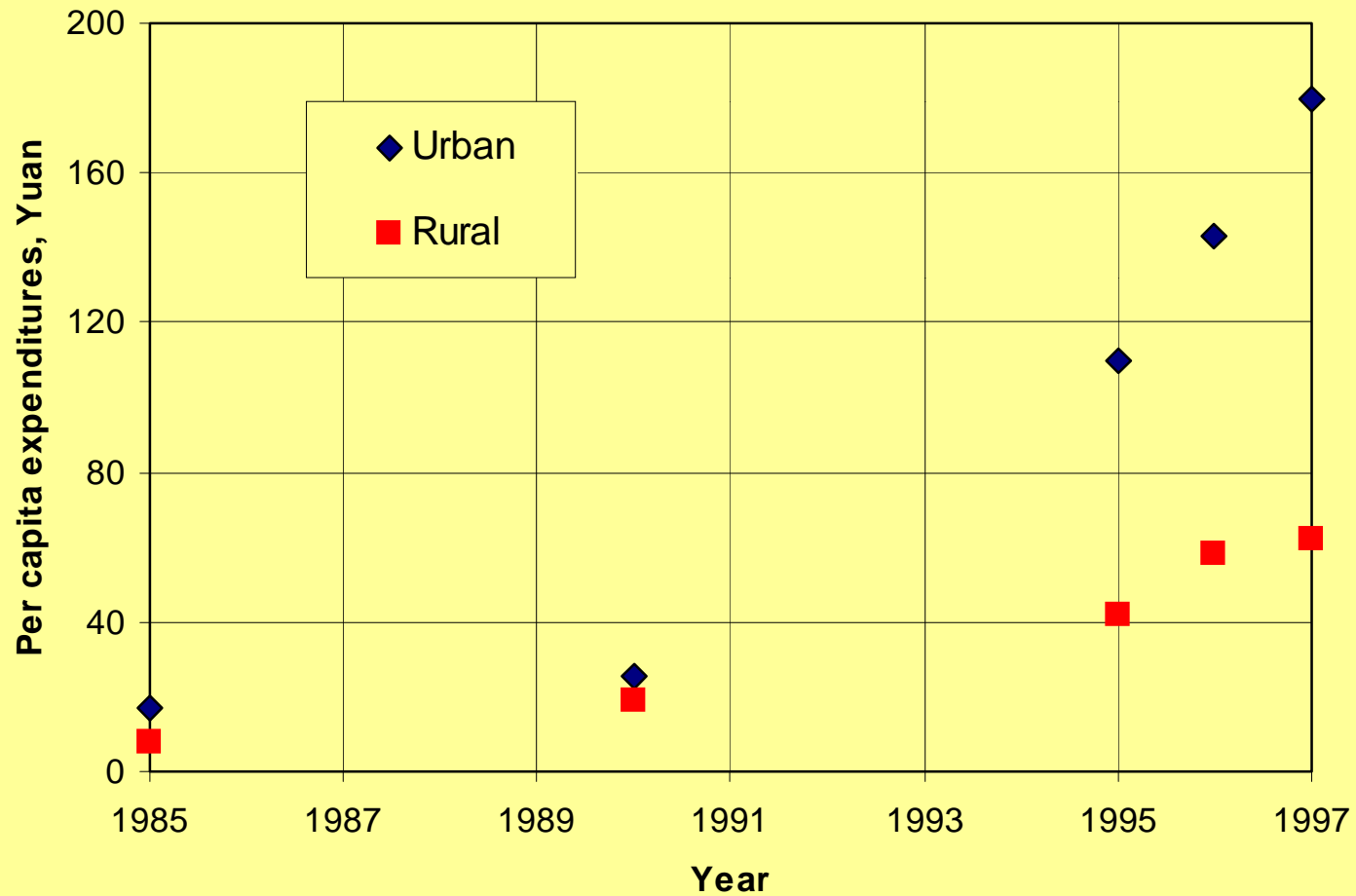
Aged dependency ratio versus GDP per capita by province



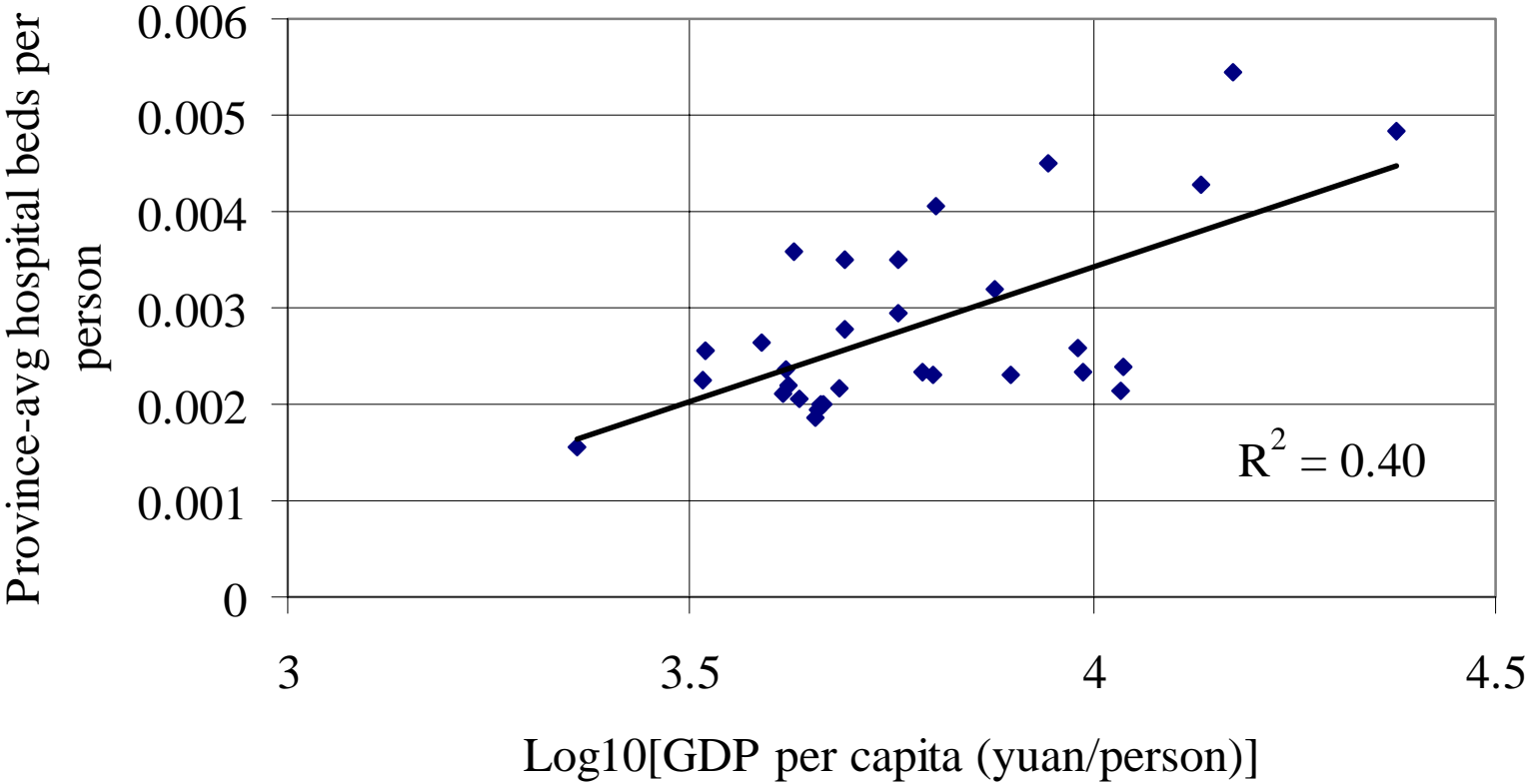
Per capita consumption of red meat, 1978-1997



Per capita expenditures on medicine & medical services



Hospital beds per capita vs. GDP per capita, by province



Integrated assessment

Web of risk influences

Systemic	Sectoral	Proximal	Endpoints
Property rights	Economic & agric policy	Health care access	Stroke
Demographic stock	Population policy	Diet	Heart
Societal values & attitudes	Education and propaganda policy	Exercise	COPD
	Health care policy	Envir quality	Trauma
	Environmental policy	Occup envir	Cancer
	Foreign trade and investment policy	Personal support network	Suicide
		Tobacco use	

Indoor air pollution (IAP) impacts in China

with Kirk Smith, UC Berkeley

Major problems applying MDC exposure-response to IAP exposure in China

- Pollutant mixtures different (biomass, coal)
- Exposure patterns different (cooking)
- Time use different
- Exposure levels different (1 mg/m³ common)
- Exposed populations different (pre-stressed by prior lung infection, malnutrition)
- Health care access different

Chinese epidemiologic studies have found relationships between IAP and...

- Chronic obstructive lung disease
- Acute respiratory infection in children
- Children's lung function
- Lung cancer
- Heart disease
- Low birth weight

Indoor air pollution may be China's largest health problem

- Household solid fuel burning is largest contributor to population PM10 exposure.
- IAP-related COPD, mostly in rural elderly, accounts for 8-10% of the national disease burden. High COPD rates in non-smoking women suggest IAP is the cause.
- Pollution-related respiratory infection, mostly in rural children, accounts for 6% of national disease burden.