

International Council for Science (ICSU)

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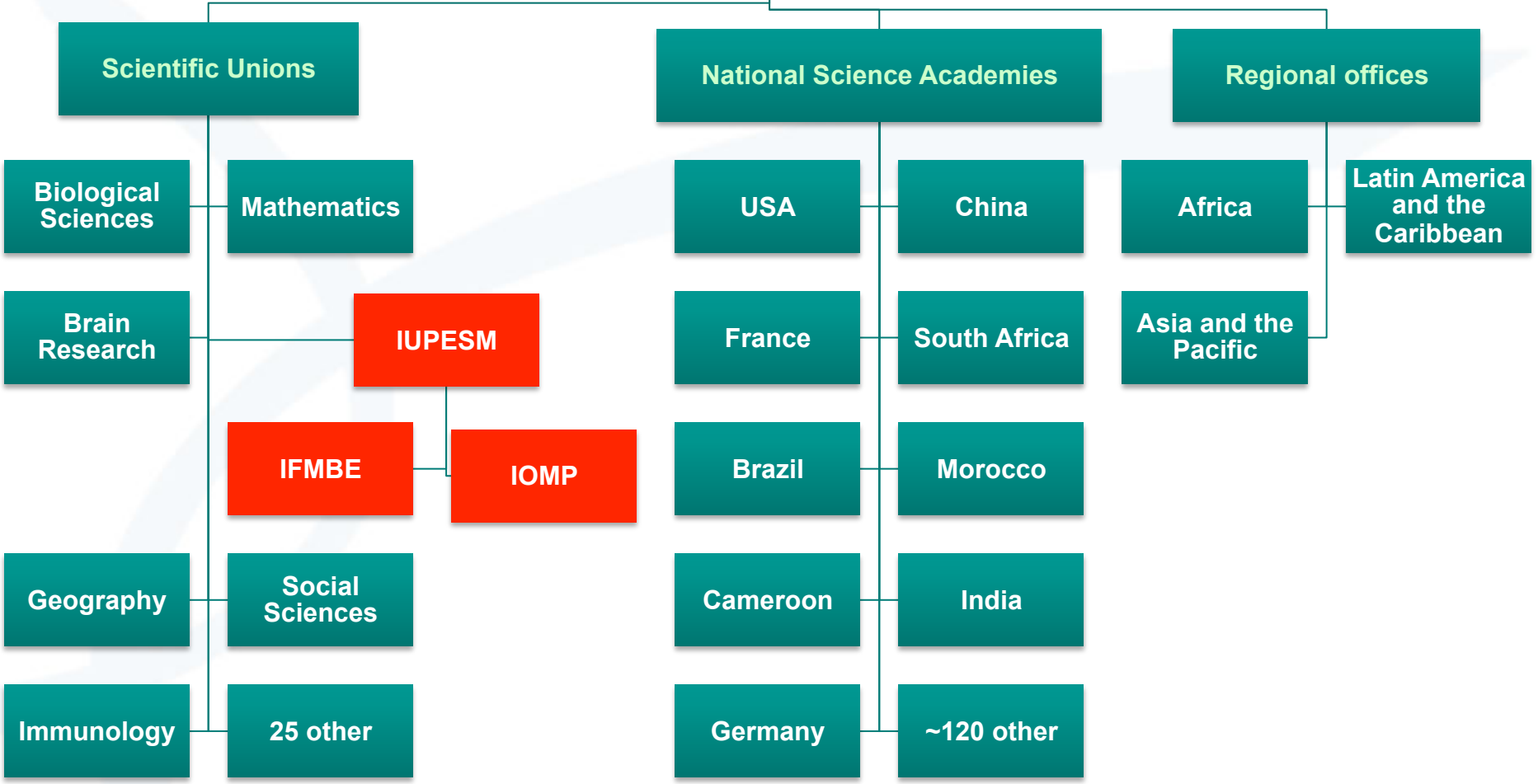
Mission:

**Strengthening International
Science for the Benefit of
Society**

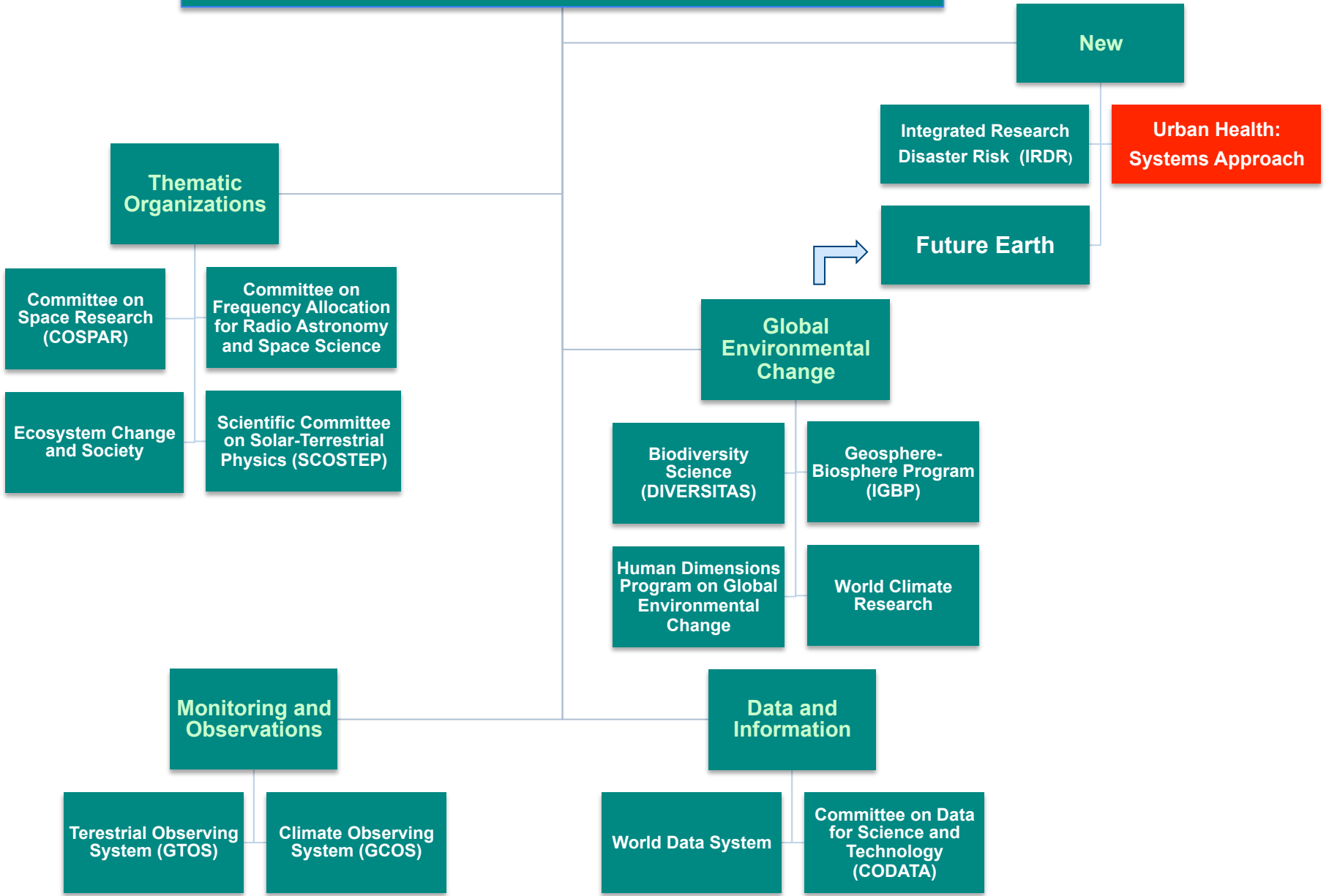
ICSU: Who and what?

- Founded in 1931
- A membership organization with:
120 National Members, and
31 International Scientific Unions
- Interdisciplinary bodies in key areas
- Limited finances but unique worldwide access to intellectual resources

International Council for Science



International Interdisciplinary Programs



Strategic themes

Three integrated themes:



Research: Recent and new initiatives

New

- Future Earth (Global sustainability)
- **Health and Wellbeing in the Urban Environment**

Recent

- Disaster risk (IRDR, 2009-)

Rio+20 (global sustainability)



- 5-day Forum on Science, Technology and Innovation for Sustainable Development at Rio+20
 - Themes: Food security, Water security, Energy, Climate and environmental change, **Urban wellbeing**, Disasters, Ecosystem services and biodiversity, Traditional Knowledge, Green economy, Human wellbeing and population trends, Sustainable consumption and waste reduction.

Key messages to Rio+20:

- Planetary boundaries and the urgent need to move humanity to a **sustainable path of development**
- Commitments to **large-scale investments in targeted trans-disciplinary research**
- Need **science advisory mechanisms** at all levels of decision-making and governance
- **Health is a critical determinant for sustainable development and poverty eradication**
- **Biomedical sciences and engineering are central in the realization of a healthy world**

Common features of ICSU Science programs & activities



- **Complex** scientific challenges
- **New knowledge** and new approaches necessary
- **Trans-disciplinary**: natural and social sciences working together
- Many **stakeholders outside of science** involved
- Critical links between **local and global** challenges and solutions
- **Low budget, wide engagement** of scientists

Science for Policy

- Ensure that **international research programs address key policy issues**
- Participate in major international assessments
- Produce authoritative statements
- **Speak as the voice of international science in policy formulation**

Universality of Science

- *Promote the **freedom and responsibilities of scientists and access to data and information** as a critical contribution to strengthening the global science community*
 - Stipulates non-discrimination and equity in the conduct of science
 - Shared responsibility for all scientists in promoting and upholding the principle
 - Freedoms also imply responsibilities

**Health and Wellbeing
in the
Changing Urban Environment:
a Systems Analysis Approach**

Why Urban Environment?

- Cities are expanding rapidly in size and population
- New **social hierarchies** and cultural rules
- Changing patterns of health risks
 - **Different diseases**
- Changing perceptions of well-being
 - With increased wealth
- The proposed approach is novel
 - Multi- and interdisciplinary approach
 - **Input from many scientific disciplines**
 - Should help understand interactions
 - Should help provide guidelines for improved health and well-being

Percent of Population Living in Urban Environments

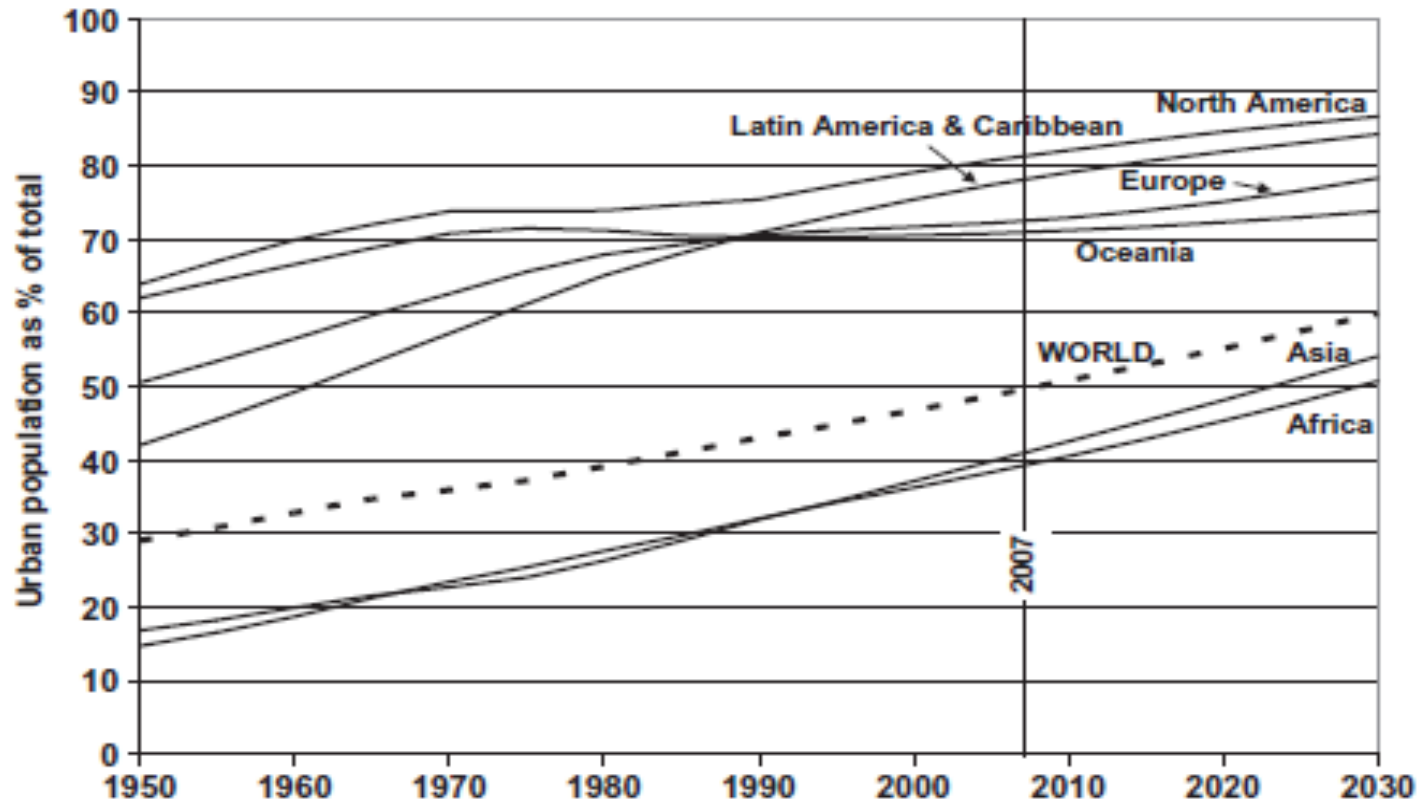


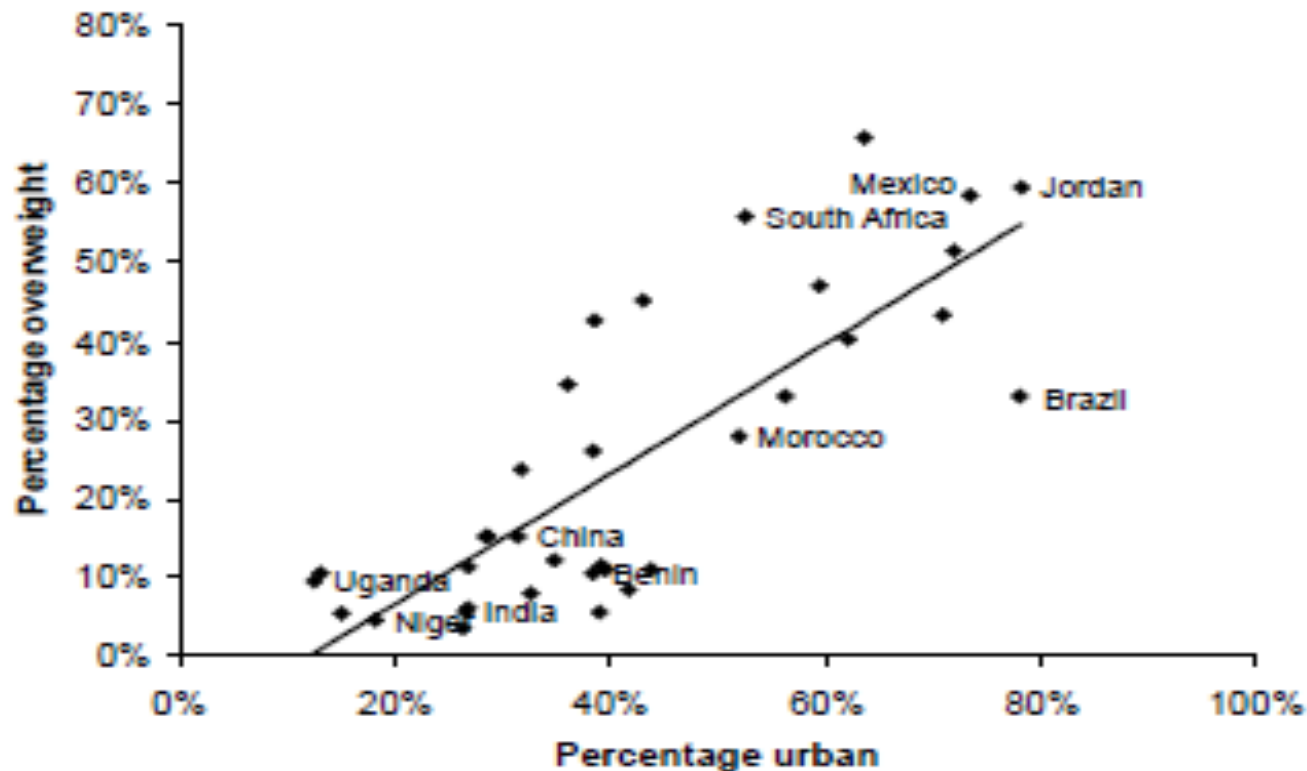
Figure 1 Trends and projections in urban population as a percentage of total population by world region

Disadvantages in Urban Environment

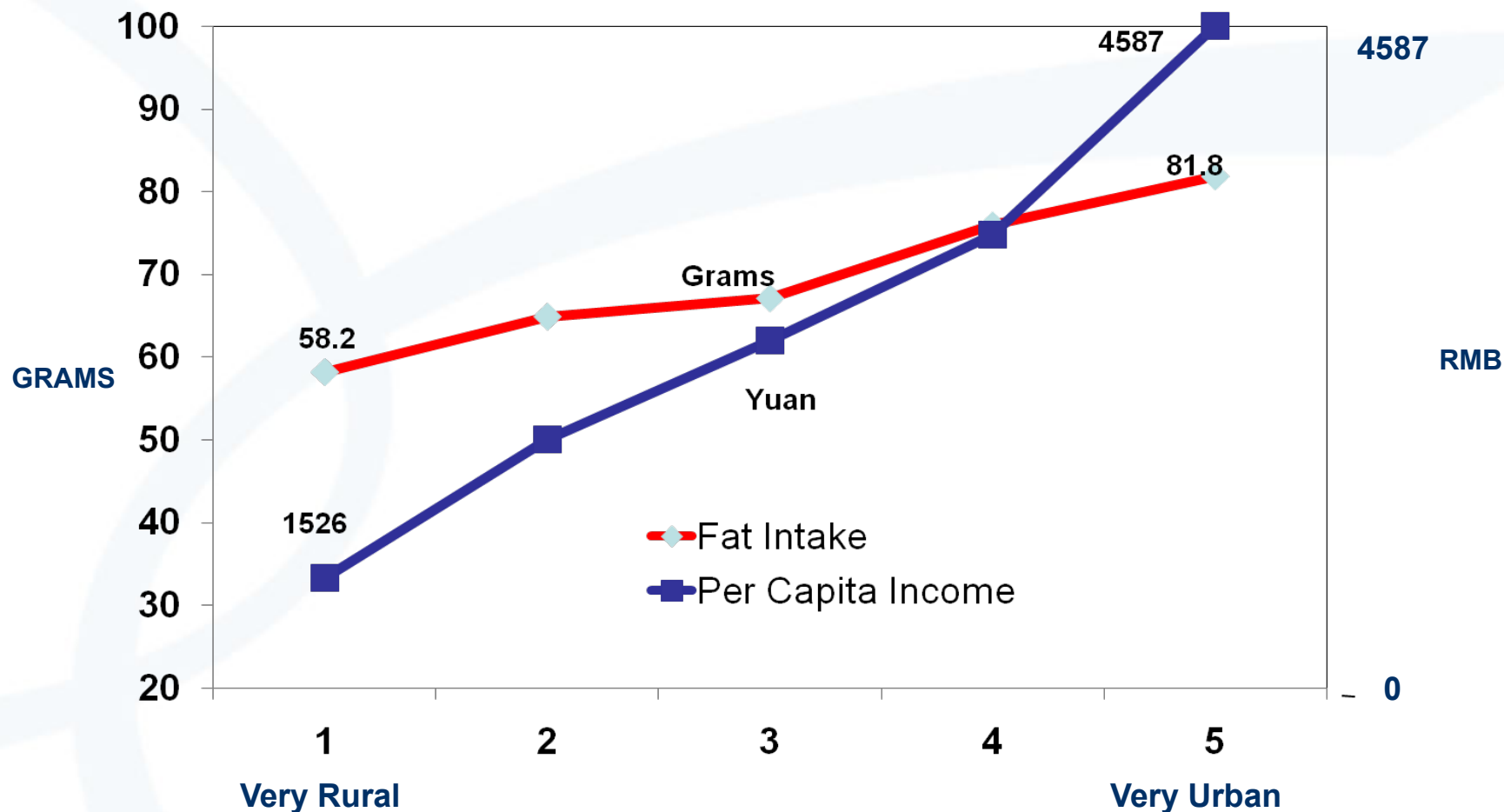
- **General Risks**
 - Megacities with deteriorating infrastructure
 - Greater exposure to **air pollution**
 - Greater exposure to infectious diseases
 - Violence and crime
 - **Increased stress**
 - **Social isolation**
 - **Sedentary life**
 - Overweight with implications to:
 - Diabetes; heart disease; Stroke; Cancer
- **Conditions adverse to health among poor**
 - Inadequate housing and sanitation
 - Lack of running water
 - Under nutrition
 - Overcrowding and indoor pollution
 - Substance abuse and violence
 - **Lack of social support**
 - Lack of participation in decision making
 - **Poor access to health care**
 - Benefits usually greater for rich
 - Leading to greater health inequities

Urbanization is Associated with Increased Obesity

B. Overweight Prevalence in Rural Areas vs. Urbanization



Daily Fat Intake and Annual Per Capita Income as a Function of Urbanicity in China



Why Systems Analysis

- Allows **integration** rather than reduction
 - (separate analysis of individual elements cannot predict output)
- **Interdisciplinary**
 - Sciences, engineering, health
- Provides understanding of **interactions**
- Eliminates unimportant factors
- A tool for making informed **predictions**
- Proposes changes, and remediation to influence health
- Addresses unmet need
- Unique approach

Project criteria

Characteristics

- Interdisciplinary approach,
- Collaboration with stakeholders
- Systems analysis methodology
- Multiple determinants of health and wellbeing
- Data requirements can feasibly be addressed
- Projects should actively involve decision or policy-makers

Products/outcomes:

- Useful narratives for decision or policy-makers
- Sustainable partnerships between scientists and stakeholders
- New shared data bases.

Physical and Engineering Sciences and Urban Health



Communicable diseases

- Sensors, portable detectors
- Surveillance
- Rapid and reliable detection and identification

Information and Communication

- Bioinformatics and Medical informatics
- Data bases
- Data processing
- Remote diagnosis

Health delivery

- eHealth
- Low tech, low cost devices

Deployment of existing technologies

Systems integration

- System identification
- Modeling

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