

# Role of Science and technology in China's Health Sector

Piyush Ahuja 2008MT50454

Shitij Chohan 2008TT10705

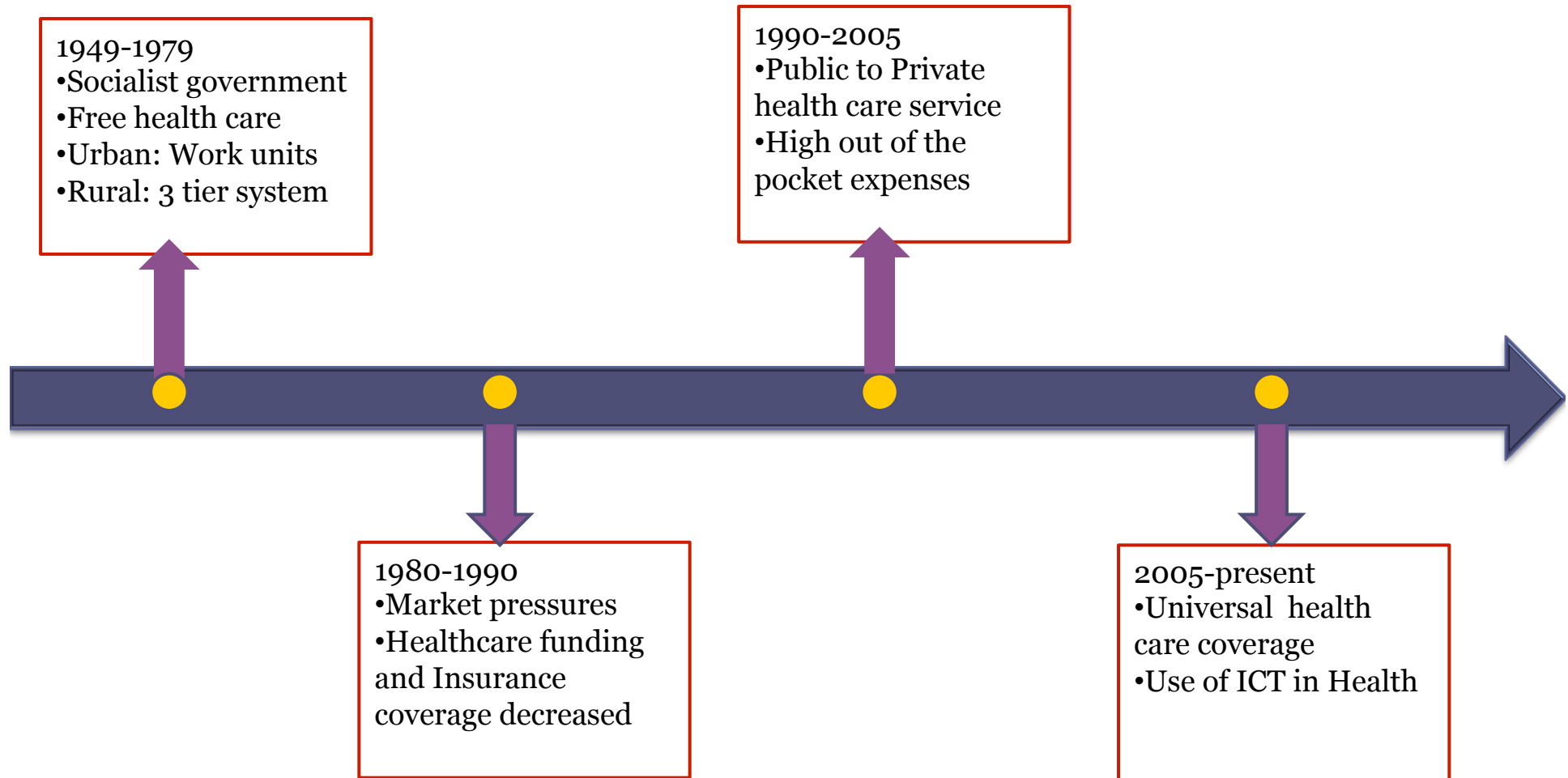
Seema Chauhan 2009CH70191



# Outline

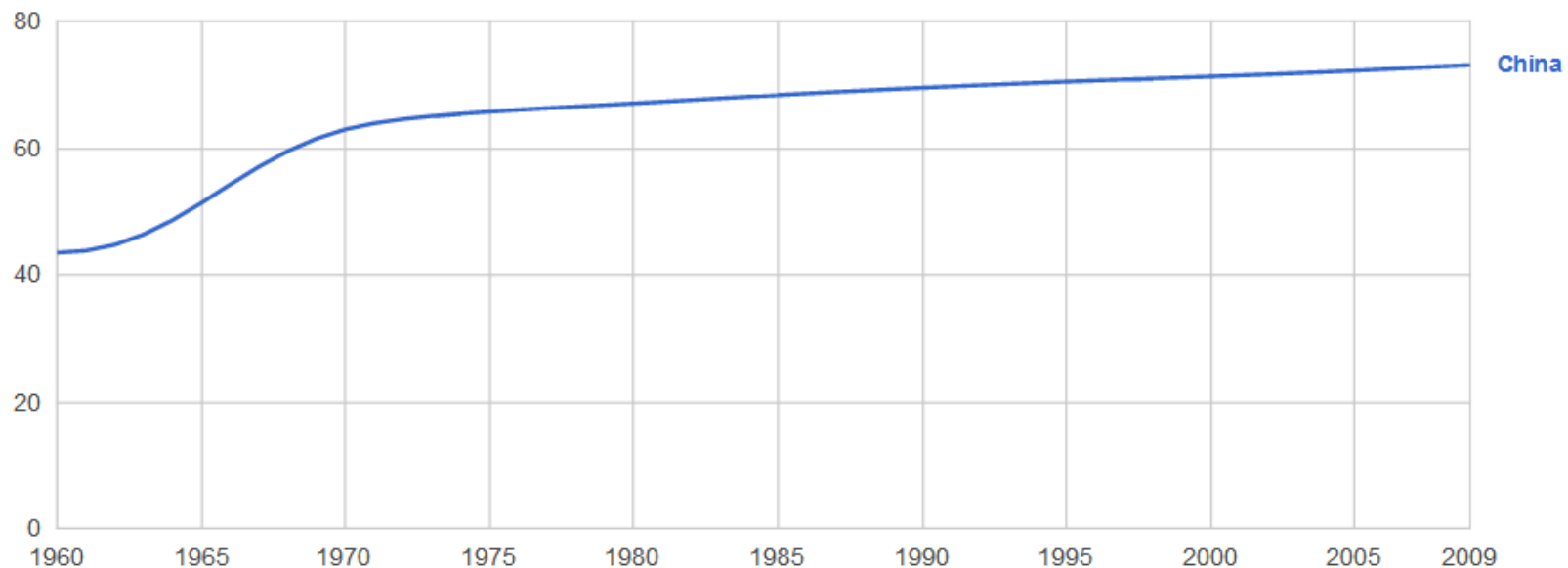
- Overview of Chinese Health Sector
- Historical Perspective and Challenges
- Reform and role of Science and Technology
- e-Healthcare
- Pharmaceutical Sector
- Medical Equipments
- Distribution Systems
- Future Challenges
- References

# Overview of Chinese Health Sector



# Historical Perspective and Challenges

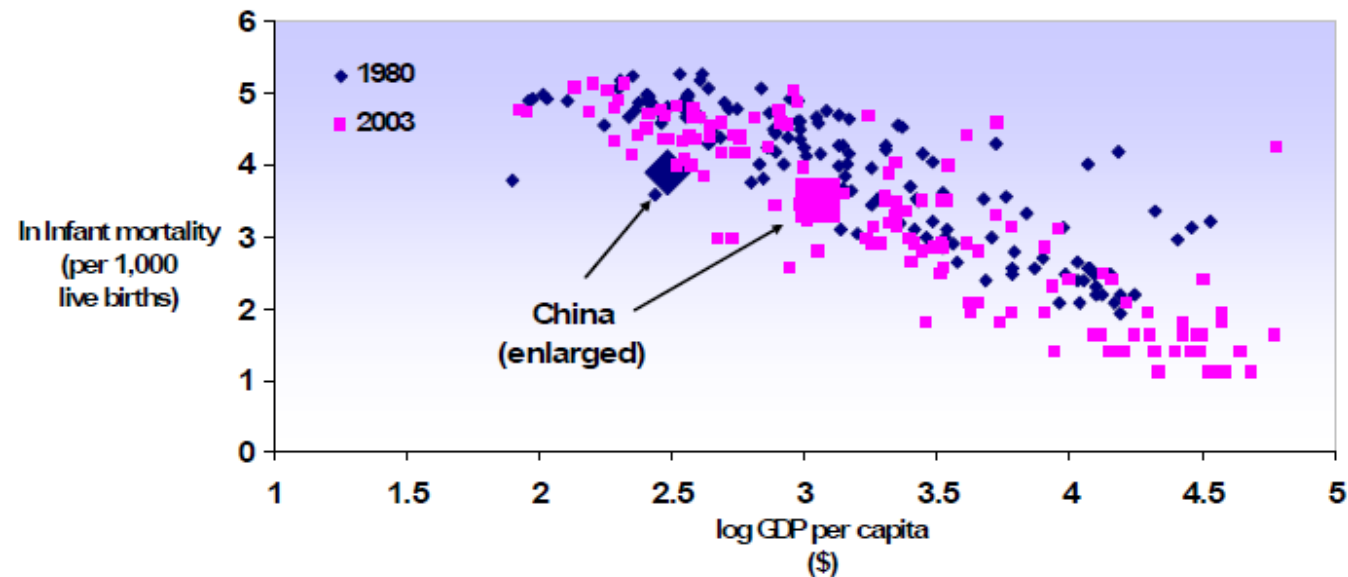
- Beginning in 1949 – state owned
- Enormous improvements in health despite slow economic growth
  - Life expectancy almost doubled (from 35 to 68)
  - dramatic drop in infant mortality(falling from 200 to 34 per 1,000 live births)
- Investments in public health through a highly centralized government agency



# Historical Perspective and Challenges

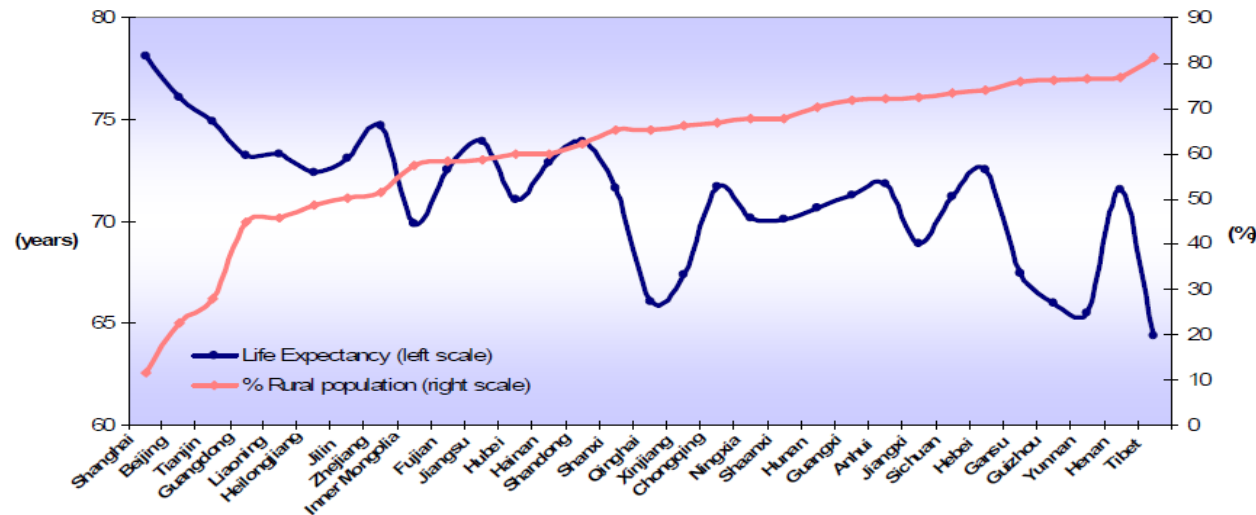
- Launched market-oriented reforms in 1979
- Indicators at the end of 70s compared well with countries at a similar per capita income level

Infant mortality and per capita GDP across countries, 1980 and 2003



Source: WHO

# Historical Perspective and Challenges



Source: China Statistical Yearbook (2003) and Chinese Health Statistical Digest (2003)

Source: WHO

- Collapse of the CMS system in rural areas
- Inequality and disparities in health outcomes – a critical challenge
- Problems like black market, overprovision of profitable high-tech services, overuse of prescription drugs



# Reforms and the role of Science and Technology

- Government has acknowledged the need for reform
- Plans to achieve equal access to public healthcare by 2020
  - Extend basic medical insurance coverage
  - Government sponsored training
  - Promote price-competitive generic medicines
  - Consolidate pharmaceutical distribution channels
  - Construction of Community hospitals and clinics
- Extensive focus on using science and technology in the reformation process, especially in the following areas:
  - E-Healthcare
  - Pharmaceutical Sector
  - Medical Equipments

# e-Healthcare

Use of information technology and modern networked communication infrastructure to manage health care related processes

## Information Systems

Hospital Management information

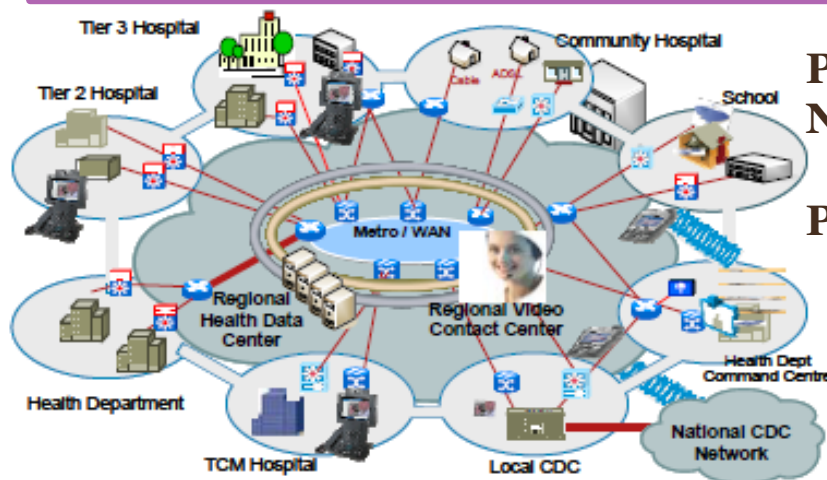
Hospital clinical information

Geographic management Information

Finance/Administration related functions

Clinical/Diagnostic functions

Information sharing functions



**Provincial Govt :** RHIN and HIT in public hospital  
**National Govt :** IT infrastructure development and standardization of EMR and EHR  
**Private Hospital:** HMIS and HCIS

Electronic Medical Record (EMR)  
Electronic Health Record (EHR)  
Regional Health Information Network (RHIN )  
Health Information Technology( HIT)



# e-Healthcare

It is a very fast growing area in China with Compound annual growth for 2007-2012 is estimated at 21.2%.

## Policy and Infrastructure

- Increasing number of health care facilities
- Establishment of universal health care insurance
- Central procurement and distribution of drugs

## Technological and Process Improvement

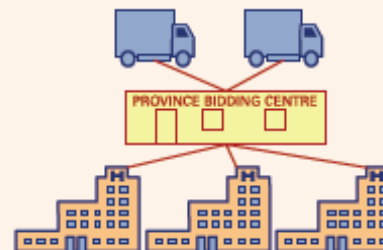
- Improved infectious disease surveillance ( Chinese CDC)
- Remote clinical and diagnostic facilities
- RHIN to manage information between Departments, Hospitals, Medical insurance and Health administration
- ERP and inventory software to improve procurement process

### Pre-reform



Piecemeal acquisition of pharmaceutical needs on a hospital-by-hospital basis from a large number of distributors

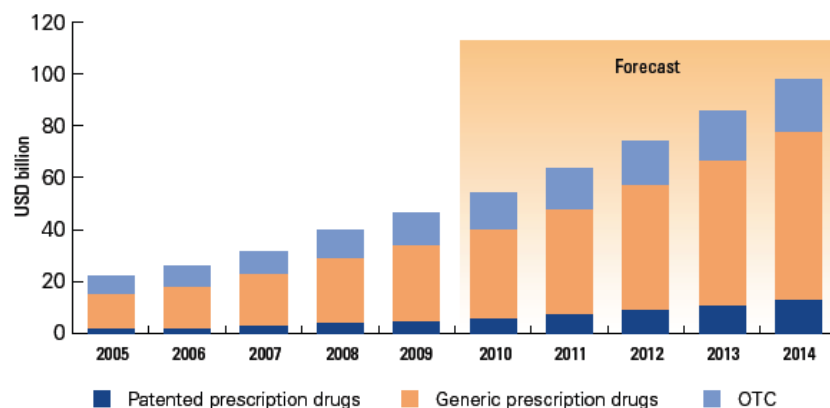
### Post-reform



Centralised provincial negotiation for larger pharmaceutical order volumes from a smaller number of distributors

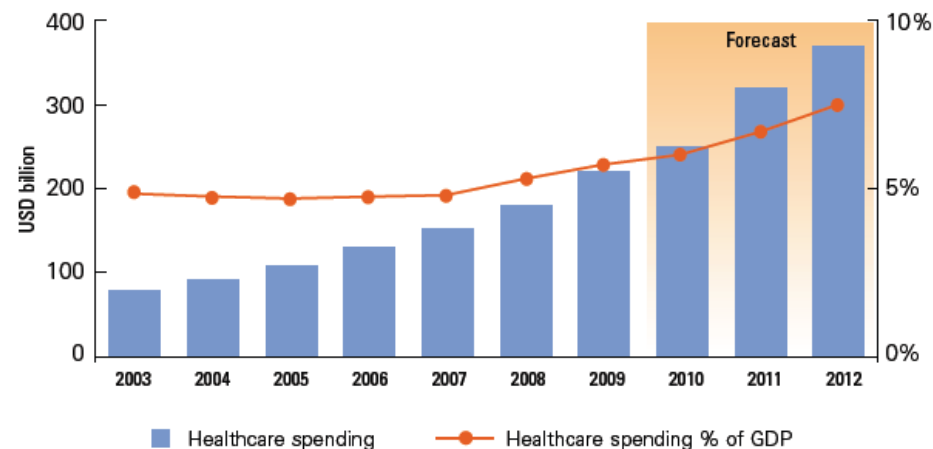
# Effect of Policy and IT on Healthcare

Sales revenue of China's pharmaceutical market



Note: OTC includes both patented and generic over-the-counter pharmaceuticals  
Source: "China Pharmaceuticals & Healthcare Report Q2 2010", Business Monitor International, March 2010

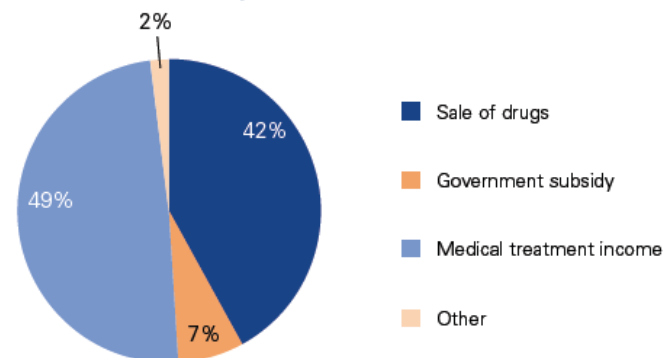
Healthcare spending in China



Source: Economist Intelligence Unit, 2010

- Consolidation in drug manufacturers
- Differentiation between Public and Private hospitals
- Growth of medical equipment, HIT and infrastructure
- Increase in OTC drugs

Hospital income structure



Source: Ministry of Health, 2009

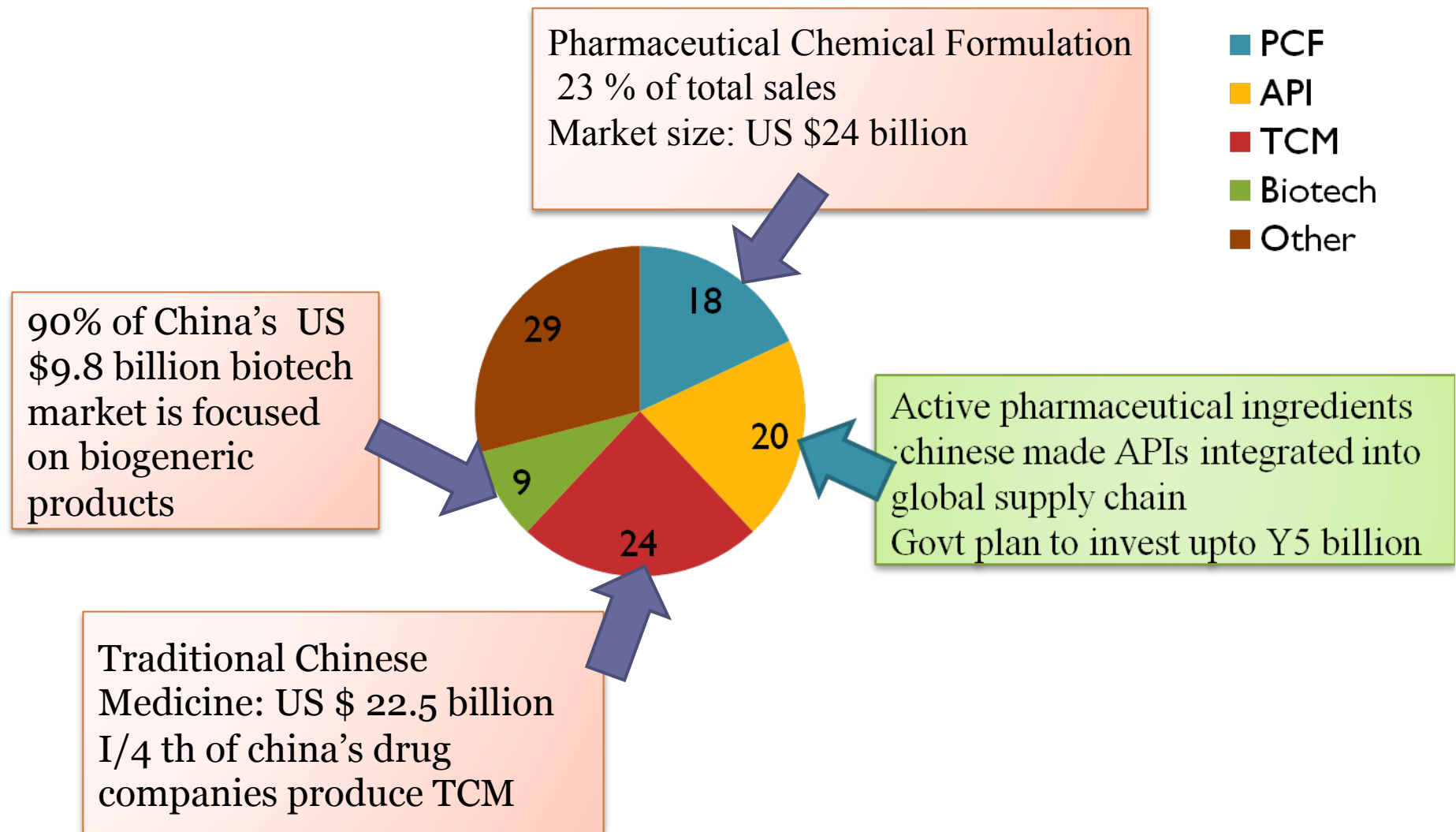
Source: KPMG

	No. of companies in 2007	Concentration Top 3's share	Typical net profit margins
USA	70	96%	1.5-2.5%
Japan	130	70%	1.0-1.5%
China	13,000	21%	0.60%

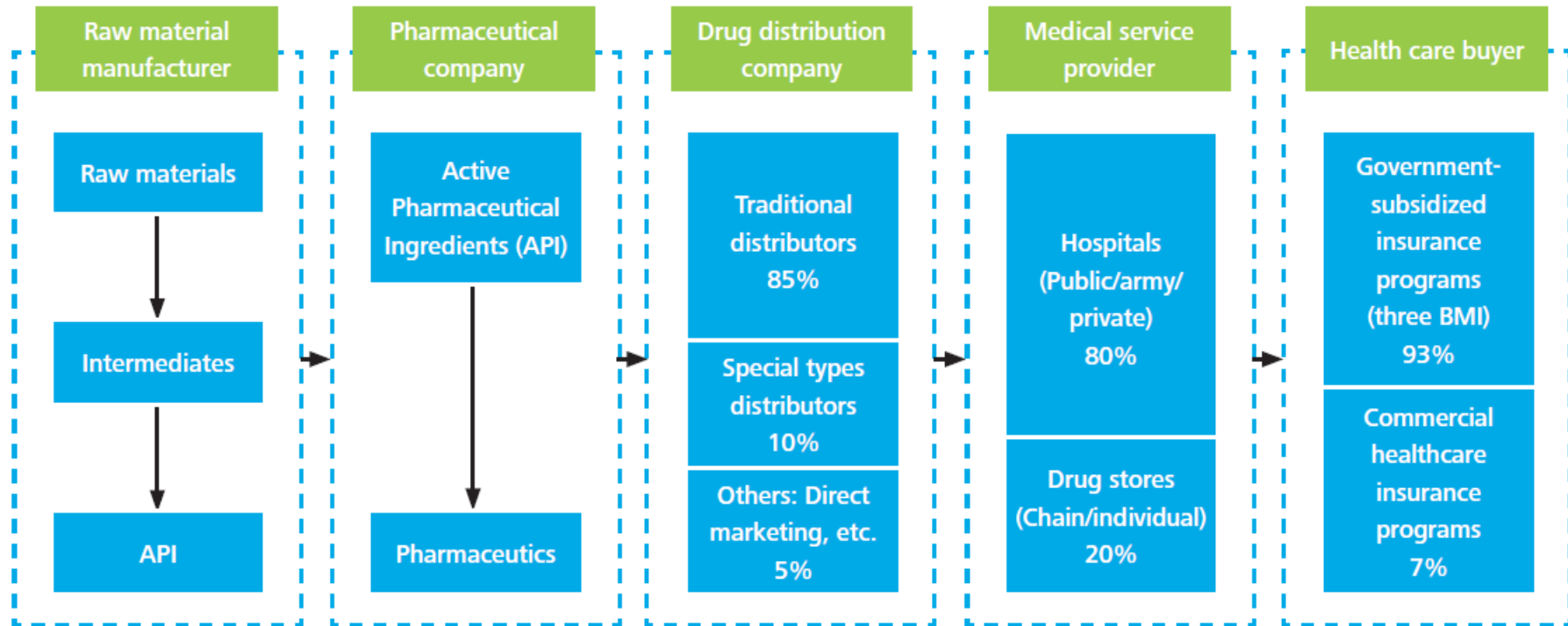
Source: "China Healthcare Industry Research", CITIC, August 2007



# Current Composition of China's Pharmaceutical Market



# Chinese Pharmaceutical Industry Value Chain

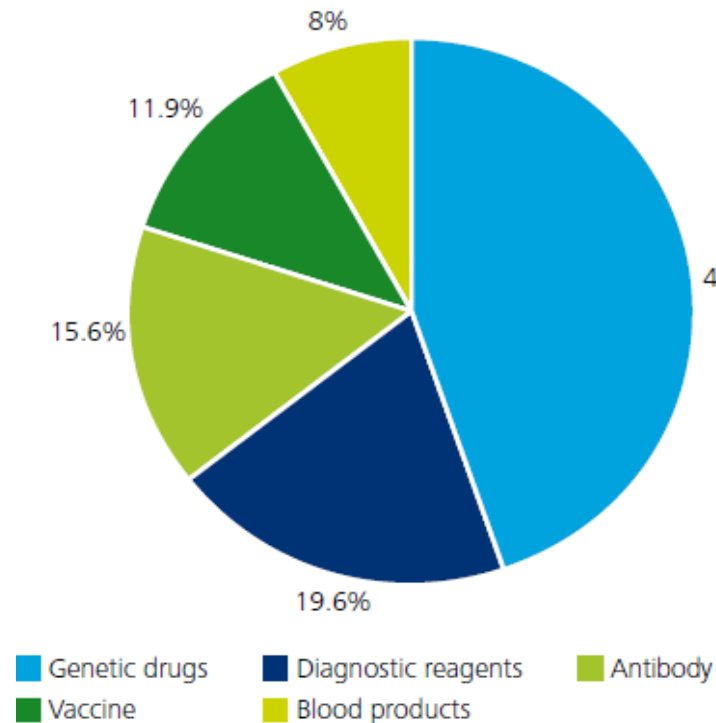


- Dominated by domestic generic pharmaceuticals
- Vertically integrated distribution channels for pharmacy products
- Less indigenous patents
- Growing at an average annual rate of 16.72% over the last few decades.
- Drug administration departments are established at both central and regional governmental level

# Biotech Sector

Investment of RMB10 billion to support drug innovation

strong domestic pharmaceutical capacity



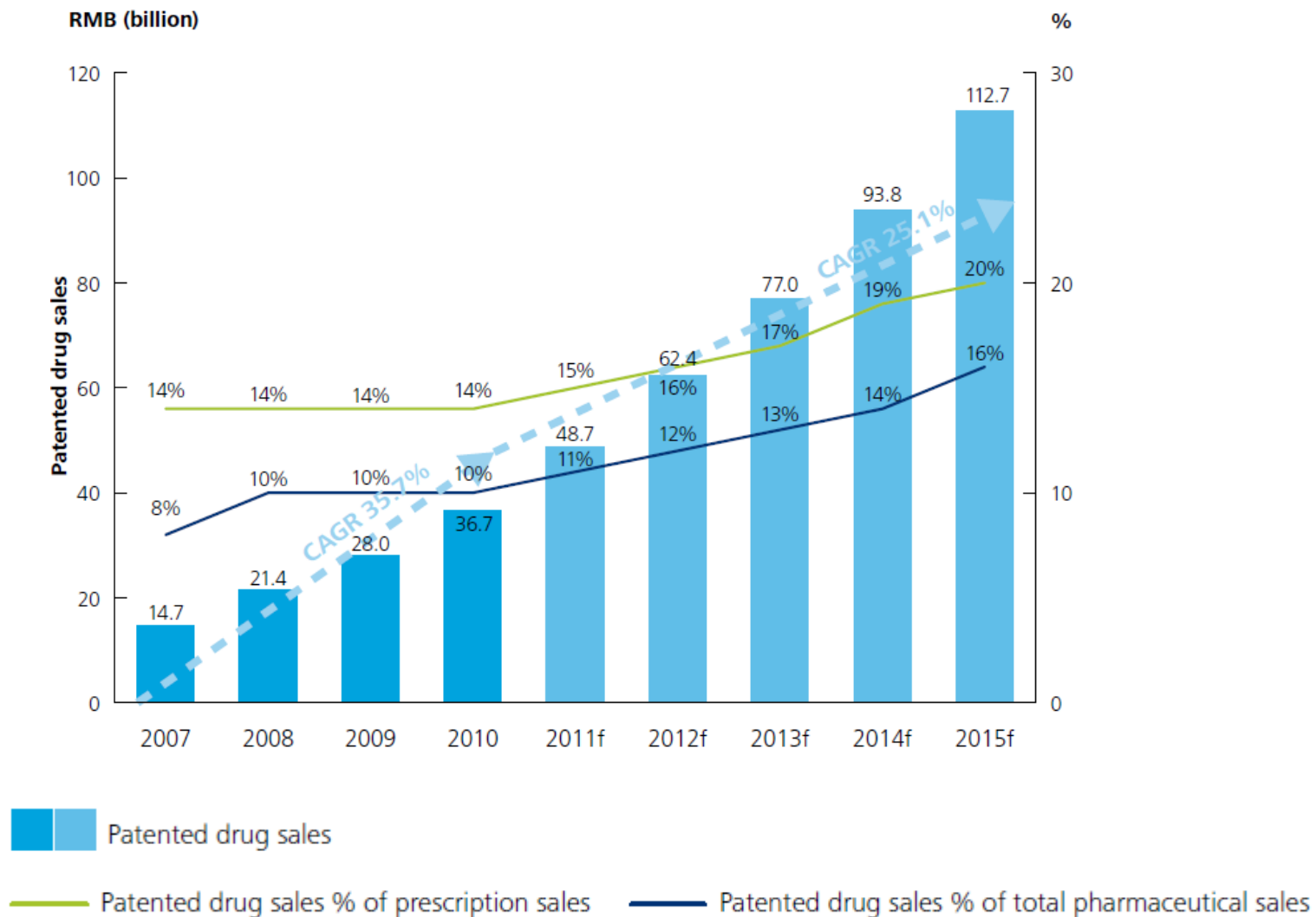
**Biologics and biosimilars in china, market shares by sales,2010**

account for 10 % of total pharmaceuticals market in China

recent annual growth rate of 32.2 percent

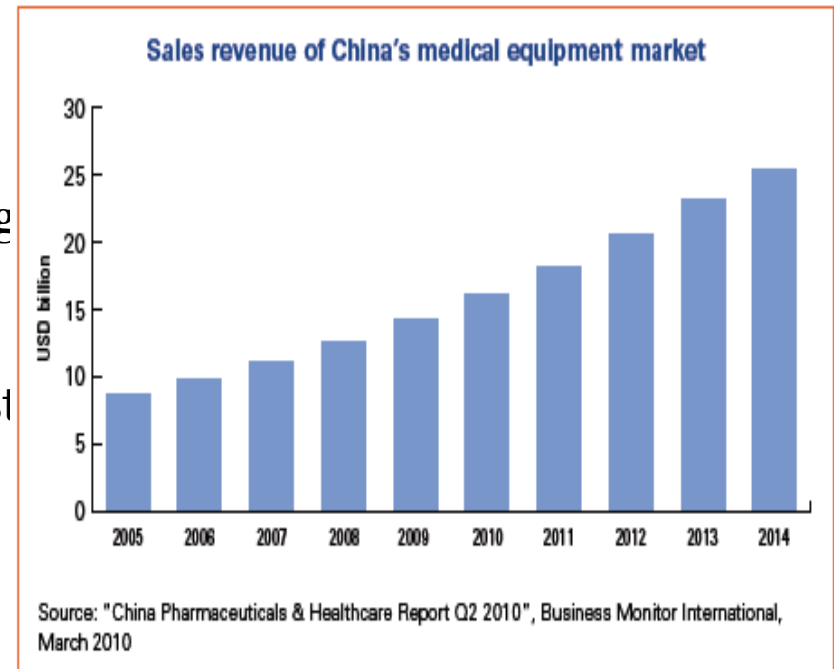
20 biotech zones nationwide

# Patented drug sales in China, 2007–2015



# Medical Equipments

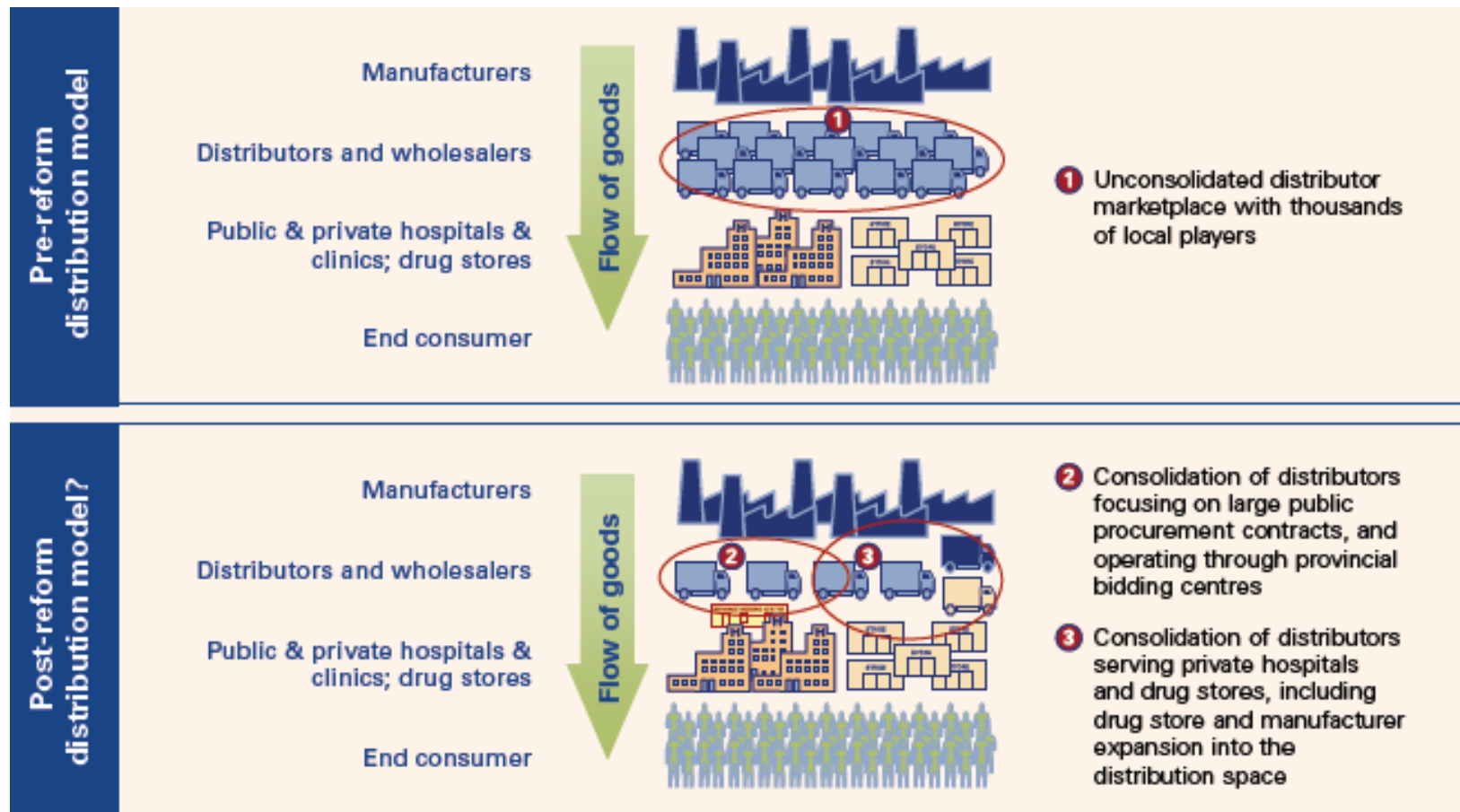
- Investment in rural hospitals and clinics driving demand for low and mid range medical equipment
- Government pushing “indigenous innovation” (favouring local firms in tendering procurement and so on...)
- “Frugal innovation” + leapfrogging to the latest technologies (miniaturization, mobile communications and advanced materials)
- Reformed public procurement process with a renewed emphasis on enforcing existing regulation triggering consolidation amongst equipment manufacturers
- Domestic equipment manufacturer moving quickly up the value chain



Source: KPMG



# Distribution of Equipments and Pharmaceuticals



Source: KPMG

# Future Challenges

Leading Causes of Deaths and DALYs Attributable to Selected Risk Factors, China, 2001

Mortality	
Cause	Percent of total deaths
1 High blood pressure	14.7%
2 Tobacco	8.2%
3 Alcohol	5.4%
4 Indoor smoke from solid fuels	5.0%
5 Low fruit and vegetable intake	4.2%
6 High cholesterol	3.5%
7 Urban outdoor air pollution	3.4%
8 Physical inactivity	2.5%
9 Overweight and obesity	2.2%
10 Contaminated injections in health care settings	2.0%

Source: Mathers, C. D., A.D. Lopez, and C. J. L. Murray. 2006.

- The burden of disease in China is now dominated by premature adult mortality from chronic diseases such as cancers, cardiovascular disease and chronic obstructive lung disease
- Changing demography – graying population

Country	Population, 1994	1994–2004 (%)	Dependence Ratio, 1994 <sup>a</sup>	Dependence Ratio, 2004 <sup>a</sup>	Rate, 1994 <sup>b</sup>	Rate, 2004 <sup>b</sup>	<15	15–64	>64
China	1,315,409,000	0.8	48	42	1.9	1.7	20	72	8

SOURCES: WHO, 2006,

# References

- China Healthcare ICT: Reinventing China's national healthcare system through electronic medical records, telecom networks and advanced IT services by Ken Zita, 2009
- China HIT Case Study by Grace Yu, 2005
- Changing face of Healthcare in China: changing public policy and resulting opportunity by KPMG
- Life science and Healthcare in China: opportunities, challenges and implications by Deloitte
- A comparison of health Systems in China and India by Sai Ma, Neeraj Sood, Centre for Asia Pacific Policy, Rand Occasional Paper, 2007
- The challenges of public health education with a particular reference to China by S.M. Griffiths,, L.M. Li, J.L. Tang ,X.Ma , Y.H. Hu , Q.Y. Meng , H.Fu, Journal of Public Health, 2009