



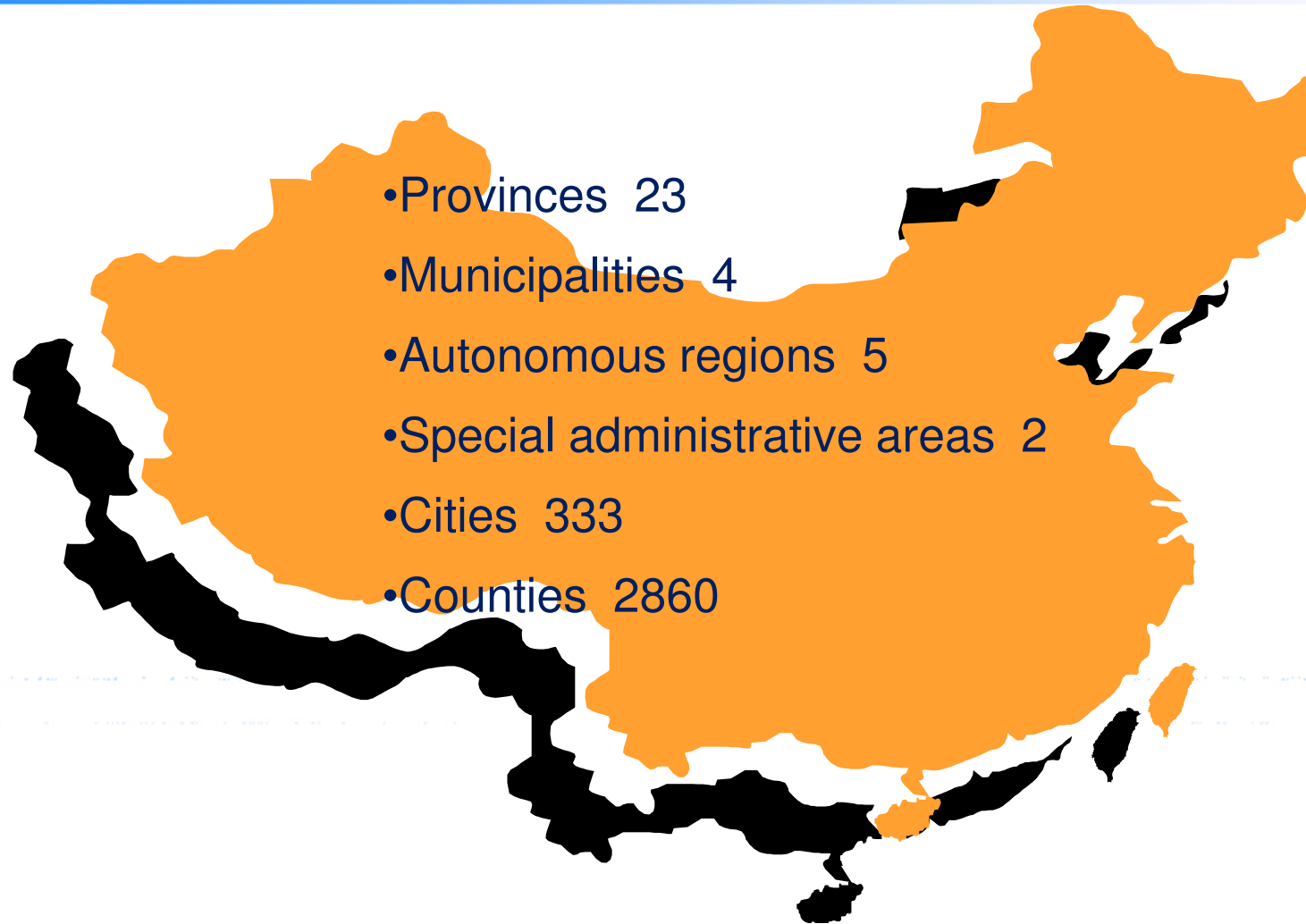
HTA experience and impact on health delivery system in China

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China Health Technology Assessment Center
National Health Development Research Center, MOH

01/07/ 2013 Singapore

Basic Administration of China



Population structure of China in 2011

Index	Quantity (million)	%
Total population	1,347.35	100.0
Urban population	690.79	51.27
Rural population	656.56	48.73

Gender	%
Male	51.26
Female	48.74

Age	%
Above 60	13.71
Above 65	9.12

Data source: National Bureau of Statistics; 2012 Statistics Bulletin of the
National Economic and Social Development



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The total Health Expenditure(THE) in 2010

The Gross Domestic Product (GDP)	6368.2b\$
THE	295.1b\$
Percentage of GDP	5.13%
Per capita health expenditure	220\$

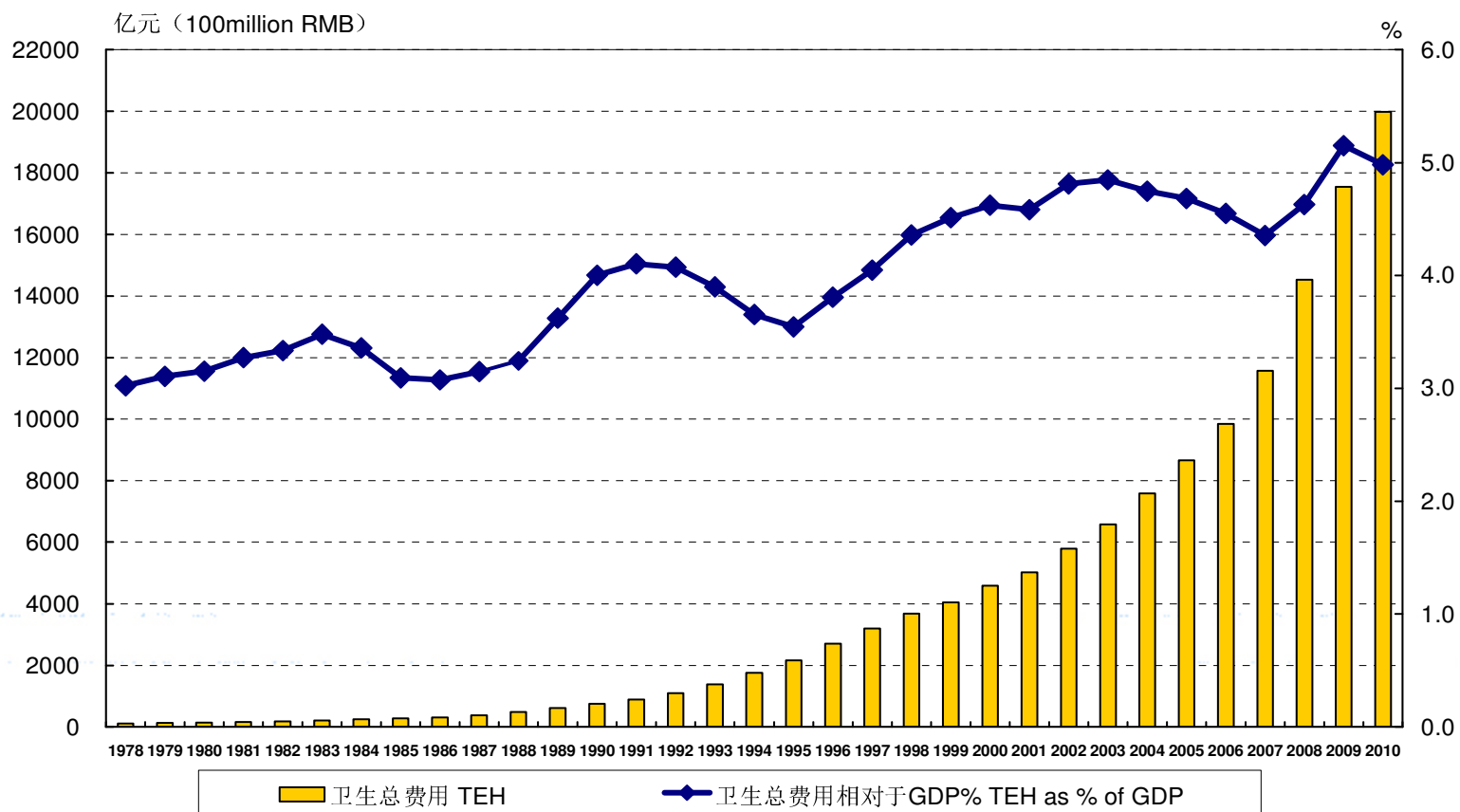
Note :Data in this table are calculated at current prices.

Data source : National Bureau of Statistics of china.



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Total expenditure of health (TEH) and TEH as % of GDP

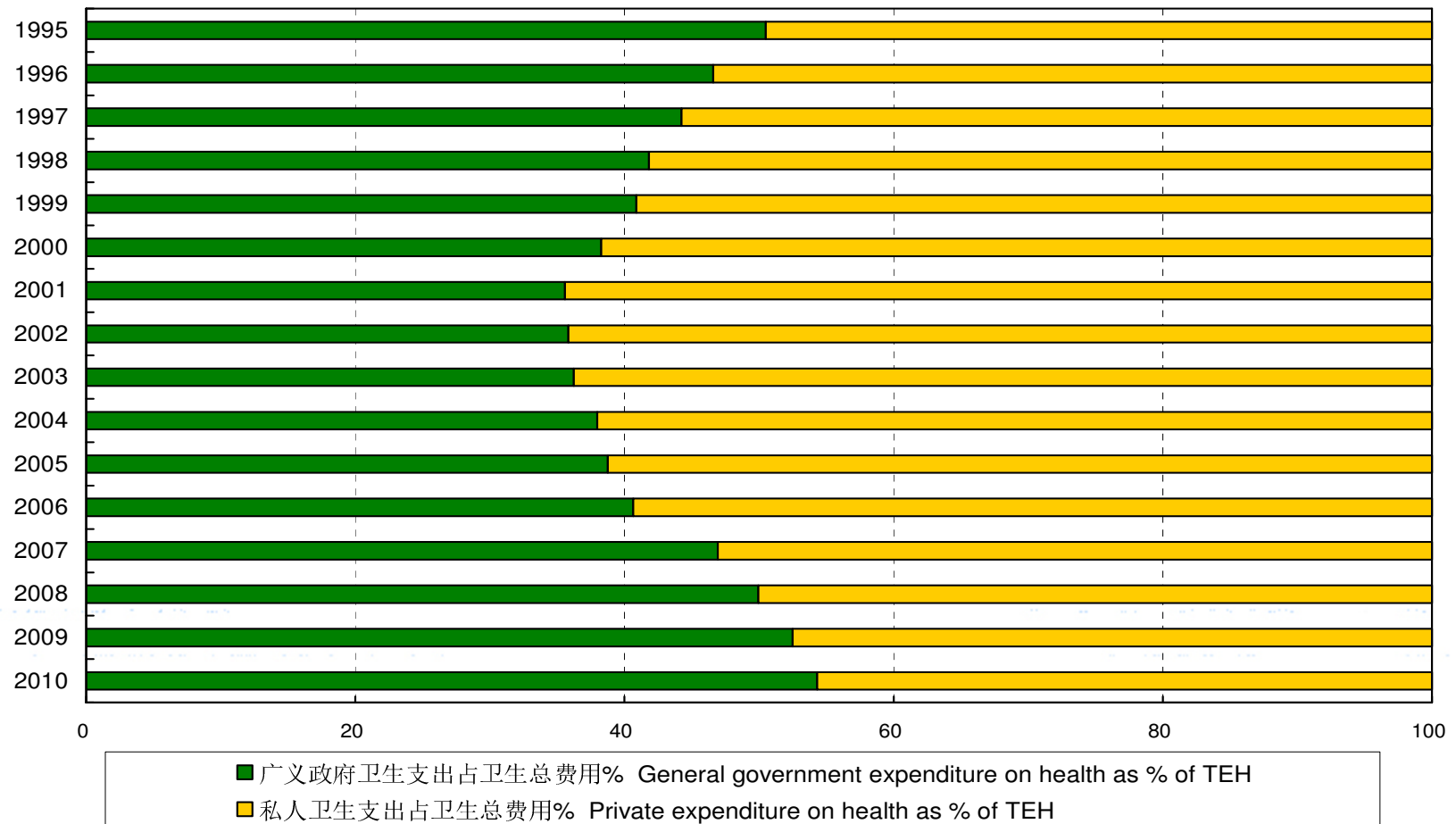


Data source: China National Health Development Research Center



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Composition of Total Health Expenditure



Composition of drug expenditure in China 2000-2010

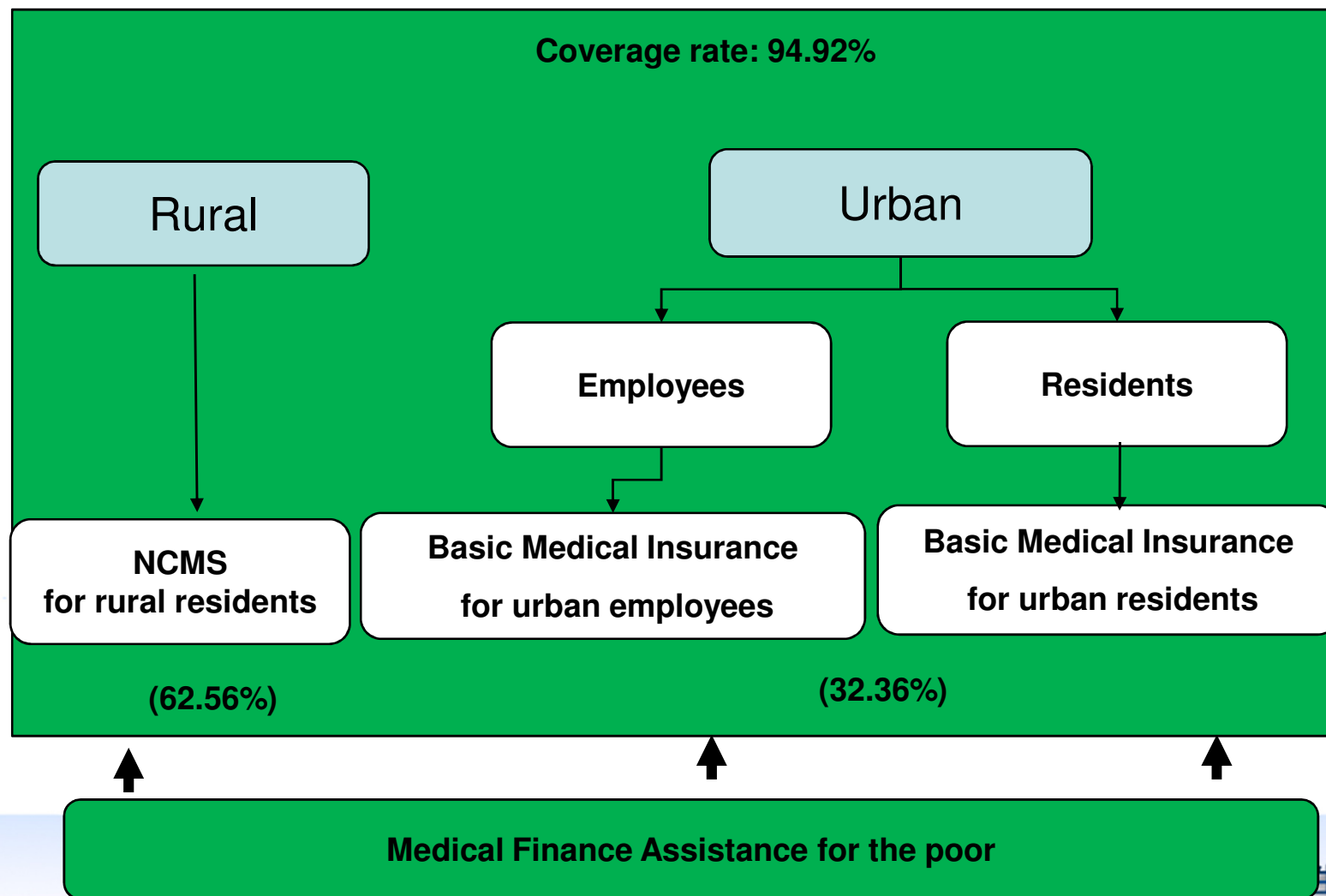
Index	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total drug Exp (0.1 b¥)	2211	2303	2677	2904	3621	4142	4486	4903	6202	7458	8373
outpatient drugs	1211	1247	1371	1450	1656	1910	2073	2119	2534	3047	3270
%	55	54	51	50	46	46	46	43	41	41	39
inpatient drugs	690	709	844	959	1156	1348	1446	1670	2155	2751	3054
%	31	31	32	33	32	33	32	34	35	37	36
Exp of retail drugs	310	347	461	495	810	884	967	1115	1513	1659	2049
%	14	15	17	17	22	21	22	23	24	22	24
per-capita drug Exp (¥)	174	180	208	225	279	317	341	371	467	559	624
% of drug exp in TEH	45	44	46	45	46	45	44	41	42	40	40

Data source: China National Health Development Research Center

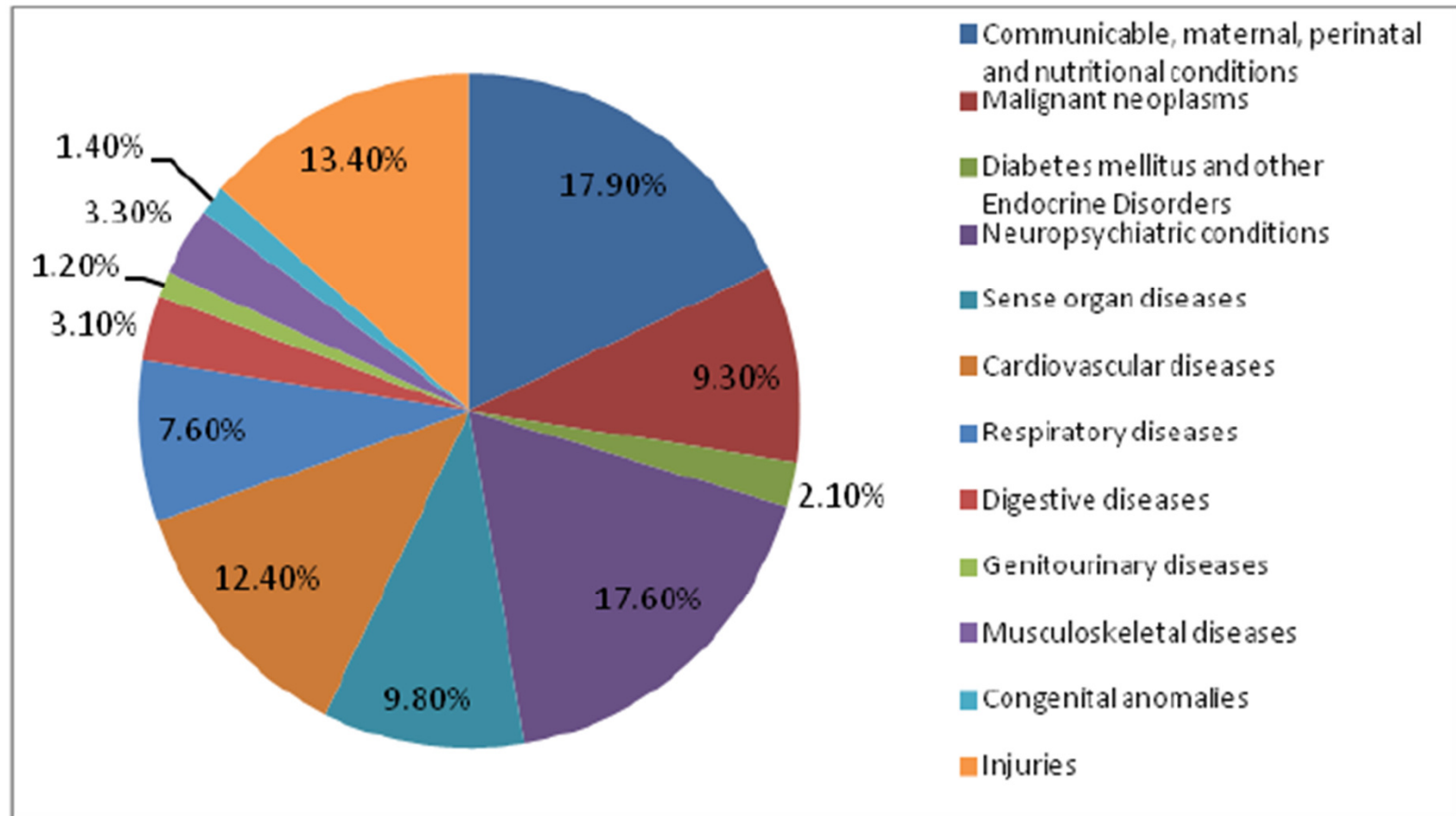


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Medical Insurance Scheme (3 + 1 model)



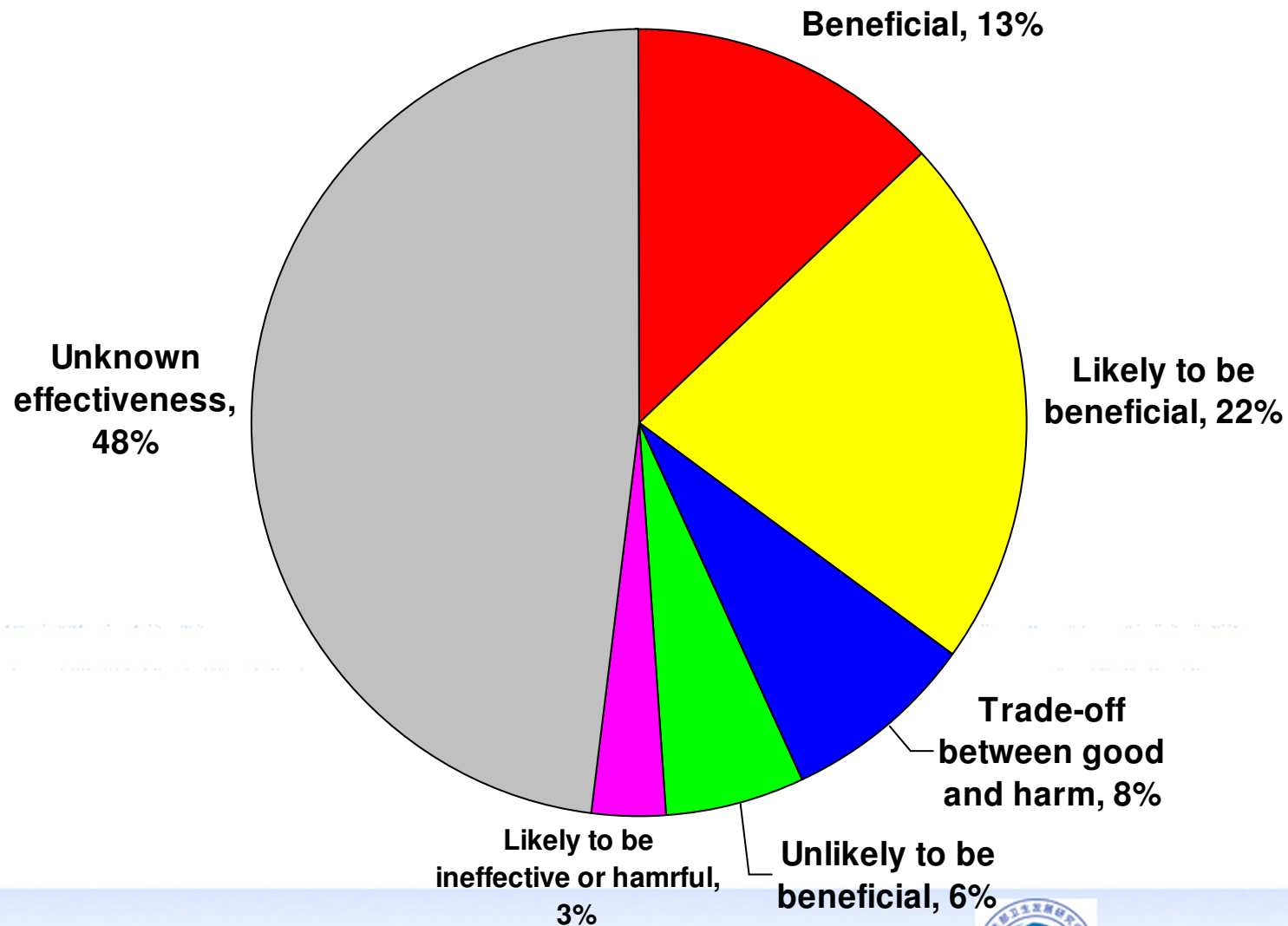
China burden of disease in 2009



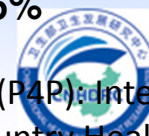
Source: WHO BOD 2009



Uncertainty of Clinical Effectiveness



SOURCE: Data from *BMJ*, 2007 in Alan Maynard, "Payment for Performance (P4P): international experience and a cautionary proposal for Estonia", Health Financing Policy Paper, Division of Country Health Systems, WHO, 2008. P. 6.



HTA projects assigned by MOH and local governments (2009-2012)

Tech application	Clinical treatment (drug, procedure, device)	Public intervention	Interventional health policy
Facility level	pharmacoeconomic assessment on neurotropic treatment	cost calculation and research of medical institutions with cooperative development of tuberculosis control project	
	health economic assessment on drug of Anti-hypertensive No. 0	monitoring on medical costs of cardiovascular diseases	
	assessment on antidiabetic drug therapy in China, CEA on stroke unit treatment in Beijing	HTA on acute myocardial infarction standardized treatment project in China	
	HTA on peritoneal dialysis and hemodialysis for terminal-stage kidney diseases		
Regional level	construction of wards with characteristics of traditional Chinese medicine and demonstration research	economic assessment and research on appropriate census method for cervical cancer population in Beijing	Optimizing the diagnosis and treatment in rural China
		multi-disciplinary systematic research on early prevention and rehabilitation of cerebrovascular diseases in Beijing	
		HTA on pneumonia vaccine for prevent from acute COPD	
		CBA of flour fortification project in four provinces	
National level	Rapid HTA on Da Vinci surgical robots	cost-effectiveness analysis of influenza A H1N1 joint prevention and control	CEA on pilot work of rehabilitation medical project
	Rapid HTA on high-tech device of radiology treatment (cyber knife, true beam, Tomo therapy)		CEA on pilot work of clinical pathway management project
	Assessment effectiveness & impact of essential drug list		CBA on key projects in “12.5” health planning

Information needed by DM/PMs

Tech application	Clinical treatment	Public intervention	New health policy
Facility level	Safety, efficacy	Effect size	
	Clinical effectiveness	CEA/CBA	
	Cost, CEA	Applicable, acceptable	
	Applicable, acceptable		
Regional level	Clinical effectiveness Clinical indication	Effect size, targets	Outcome/impact (effectiveness, cost)
	Cost effectiveness	Cost effectiveness	
	Applicable, acceptable affordable, equity	Applicable, acceptable affordable	Applicable, acceptable Equity
	Safety, efficacy	Effect size, targets	Accessibility
National level	Clinical effectiveness Clinical indication	Cost effectiveness	Outcome/impact (effectiveness, cost)
	Cost, CEA	Applicable, acceptable affordable	Sustainability
	Applicable, acceptable		Equity
	Budget impact analysis	Budget impact analysis	Budget impact analysis

Case I: HTA of peritoneal dialysis and hemodialysis

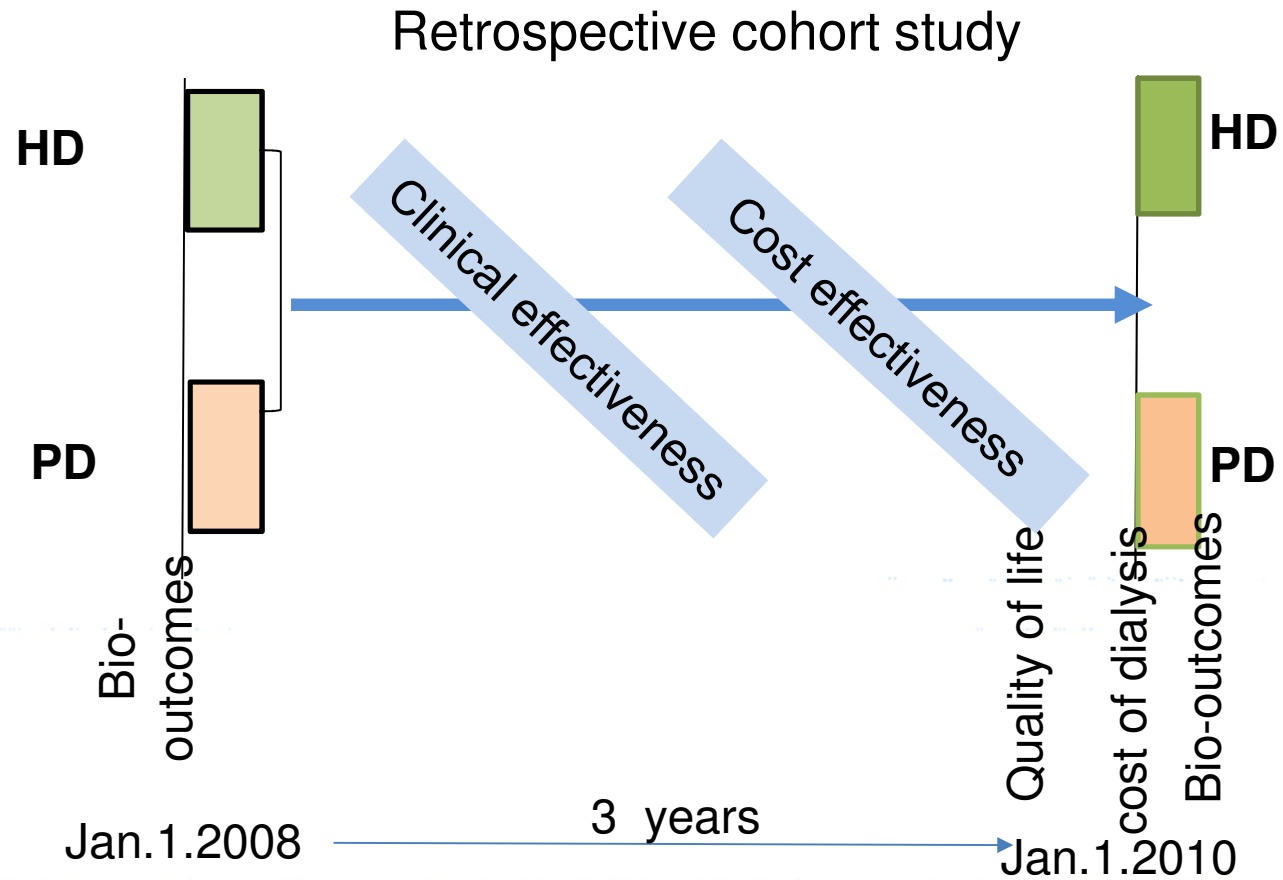


HD



PD

Design



*

Result (1): key performance indicators

Standard Attainment Rate of key performance indicators in HD and PD group

KPIs	Standard attainment rate (% ,n)		χ^2	P value
	PD	HD		
KT/V	96.5%(16)	93.2%(158)	3.67	0.089
HB	30.2%(65)	32.5%(39)	0.185	0.378
ALB	73.2%(156)	89.6%(103)	11.983	0.000

*

Result(2): QoL

QoL of PD and HD patients

indicators	PD	HD	t	p value
Overall health	54.56 ± 8.46	49.63 ± 19.78	3.984	0.000**
Physical health status	38.76 ± 8.05	37.96 ± 8.59	1.919	0.055
Mental health status	42.66 ± 9.84	42.41 ± 10.94	0.232	0.817

*

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Result(3): cost

Propensity-score-matched dialysis costs

Type of cost	PD(n=129)	HD(n=129)	P value
Direct medical cost	14248.5	15780.6	0.007
Total cost	15586.7	17236.0	0.005

Note:

Direct medical cost : dialysis/drug/test/consultation costs, etc.

Indirect medical cost : patient/family work time loss, transportation cost, cost for nutrition supplements

Discount rate :3%

*

Result (4): cost effectiveness analysis

Cost Effectiveness Ratio and ICER

	Total cost(¥)	QoL*(score)	C-E ratio (¥/score)	ICER
HD	95089.60	49.63	1742.84	-14664.4/4.93
PD	80425.20	54.56	1474.07	=-2974.52

*Overall health

*

Conclusion and Discussion

- PD clinical effectiveness and quality of life are significantly better than HD in the first 2 years of dialysis
- PD cost is significantly lower than HD cost
- If PD market proportion is increased by 40%, the dialysis cost goes down by 0.28 billion per year, OOP of ESRD patients will go down by 0.29 billion per year when insurance expense is held constant.

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Knowledge to policy on medical service delivery

---Knowledge from HTA of PD/HD

- Added PD item into national fee schedule
- Set up 22 PD training bases across the country
- Changed dialysis benefit package at the provincial level, in some provinces, PD benefit package is the same as HD; some provinces rose the reimbursement rate of PD treatment
- Exempted PD drugs from the restriction list of drug revenue of hospital (ceiling 30%)



Case II: HTA of piloting project of clinical pathway in rural China



Signing MOU btw NICE & CNHDRC

Witness by health minister Dr Zhu

Chen Oct 15th 2009

Priority diseases of Implementing CPs in 2 piloted county hospitals

Gallbladder Benign Lesions	Vaginal Spontaneous Labour
Indirect Inguinal Hernia (simple and unilateral)	Community-acquired Pneumonia
Acute Simple Appendicitis	Stable Angina
Planned Cesarean Section	Acute Myocardial Infarction with ST-segment Elevation
Benign Ovarian Cysts	Cerebral Hemorrhage
Hysteromyoma	Cerebral Infarction

The intervention – Clinical Pathway for C-section

[1] 剖宫产临床路径表单

疾病: ICD-9-CM-3: 74.1

最短住院天数: 0

最长住院天数: 9

时间	[1]住院第 1 天	[2]住院第 2 天 (手术日)
主 要 诊 疗 工 作	[1]询问孕期情况、既往病史与体格检查(必选) [2]完成产科入院记录(必选) [3]常规辅助检查(必选) [4]上级医师查房与分娩方式评估(必选) [5]确定诊断和手术时间(必选) [6]完成上级医师查房记录、术前小结(必选) [7]与孕妇及其家属做好沟通(必选) [8]签署各项知情同意书(必选) [9]完成“术前准备”(必选) [10]向孕妇及家属交代术前注意事项(必选)	[1]手术(剖宫产术)(必选) [2]完成手术记录(必选) [3]上级医师查房(必选) [4]完成手术日病程记录和上级医师查房(必选) [5]向孕妇及家属交代术后注意事项(必选) [6]确定有无手术并发症(必选) [7]确定有无麻醉并发症(麻醉科医师随访)(必选)
重 点 医 嘱	[1]必选项: [2]产科常规护理, II 级护理(必选) [3]普食(必选) [4]听胎心 1 次/4-6 小时(必选) [5]拟明日上午在连续硬膜外或腰硬联合麻醉下行子宫下段剖宫产术(必选) [6]清晨禁食水(必选) [7]清晨留置尿管(必选) [8]常规备皮(必选) [9]抗菌素皮试(必选) [10]心电图、产科 B 超(一周内做过的可以不查)、胎心监护 1 次/日(必选) [11]可选项: [12]血常规、尿常规、血型、血糖(视情况而定)(可选)	[1]必选项: [2]连续硬膜外麻醉、剖宫产后常规护理, I 级护理(必选) [3]禁食水(必选) [4]监测生命体征(必选) [5]留置导尿(必选) [6]会阴擦洗 2/日(必选) [7]静脉输液(必选) [8]抗菌素(必选) [9]缩宫药物(必选) [10]新生儿护理常规(必选) [11]母婴同室(必选) [12]母乳喂养(必选) [13]脐部护理(必选) [14]补液(必选)

Change the payment ---case payment

Estimate minimum and maximum (incl. additional interventions to account for patient variation) cost based on evidence-informed clinical pathway

Establish cut-off for covering 80% of procedure per case for past 3 years, based on historical data in each hospital

Adjust for NCMS and Urban Insurance Scheme –no threshold, patient reimbursement rate increased

Negotiate with relevant stakeholders (professionals, administrators) to account for local costs and patient variation

Ceiling reimbursement price established
If savings: shared by hospital and doctors
OOP costs capped @ lower levels

NICE Training in the process of clinical pathway development



Clinical effectiveness



Cost effectiveness



Results: vaginal delivery

Provinces	Study Group	Total Cost (RMB) Before ^a	LOS (days) Before ^a	Total Cost (RMB) After ^a	LOS (days) After ^a
ShaanXi	I	981	3.74	867	3.25
	C	778	1.53	891	1.78

a: Bootstrapped means
b: Regression

Provinces	DiD (TC) ^b	DiD (LOS) ^b
ShaanXi ^a	-227; p<0.0001	-0.73; p<0.0001

Quality of care

- Curative & recovery rate covered by CP compared to that no-CP covered increases by 3.8%; in which, the most ones are cerebral hemorrhage, cerebral infarction, coronary heart disease. The fatality rate in CP is 0.
- In-hospital infection rate covered by CP is 0.18% which is lower than total level (1.34%) . Reduction is by 1.16%.
- Readdmission within 14 days and 30 days is 0.
- Rate of antibiotic utilization for surgery is 18%, , Rate of antibiotics use is 51% , which are significant reduction compared to conditions covered by non-CP,
- Non any law suit and medical dispute since implemented CP.

Scale up

Scaling up of implementing clinical pathway		
hospitals	No. disease	No. case
No 1. county hospital	47	5967
No 2. county hospital	39	3202
No 3. county hospital	39	2857
Total		12026

Note: data is at end of 2012

Knowledge to policy on clinical treatment procedure

---Knowledge from HTA of clinical pathway piloting project in rural China

重庆市黔江区卫生局
重庆市黔江区财政局
重庆市黔江区人力资源和社会保障局
重庆市黔江区民政局

文件

黔江卫发〔2010〕40号

关于对急性单纯性阑尾炎等十个单病种 按临床路径实行单病种医疗费定额结算试点（试行）的 通 知

各街道办事处，各镇、乡人民政府，区政府各部门，各区属国有重点企业：

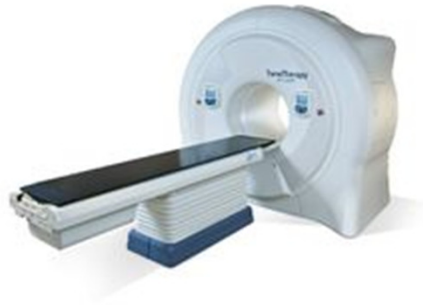
为贯彻《中共中央、国务院关于深化医药卫生体制改革的意

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Case III: HTA of sophisticated technology

Tomo therapy



Da Vinci Surgical robot



Cyper Knife



True Beam



Rapid HTA

With consideration of the newness of the device and the specific policy-making context in China, CNHDRC researchers decided to develop an approach based on the 8-step approach proposed by the OHRI :

- Step 1 Needs assessment (week 1)
- Step 2 Question development and refinement (week 1)
- Step 3 Proposal development and approval (week 1 & 2)
- Step 4 Literature search **and consultation with HTA organizations and policy-makers in other countries** (week 2-4)
- Step 5 Screening and selection of studies **and feedbacks from experts and policy makers** (week 3-4)
- Step 6 Narrative synthesis of included studies **and experts' options** (week 5)
- **Step 6.5 Field evaluation and budget impact analysis based on data on epi., costs, and payment in the Chinese context** (Week 5)
- Step 7 Report production (week 6)
- Step 8 Ongoing follow-up with end users (after week 6)



Methodological framework for conducting the rapid review

perspectives	contents	methods
<p>Clinical efficacy & safety</p>	<ul style="list-style-type: none"> •RCTs •Observational studies •Case studies 	<ul style="list-style-type: none"> • systematic review: done by the Chinese Cochrane Center
<p>Cost-effectiveness/relative cost-effectiveness/cost-benefit</p>	<ul style="list-style-type: none"> •Cost analysis; •Cost-effectiveness; •Cost-benefit analysis 	<ul style="list-style-type: none"> •Literature review on costs, comparative , cost-benefit; •Expert consultation: international experts in HTA organizations and decision-making agencies;
<p>Implications of technology use on health sector and society (inc. social and ethical considerations)</p>	<ul style="list-style-type: none"> •International experiences concerning management and use of the tech.; •Social and ethical analysis; •Budget impact analysis; 	<ul style="list-style-type: none"> •Literature review: technological appropriateness; introduction, application, supervision and management of the technology in other countries; indicated patients, their distribution and characteristics in China; technology diffusion and use of alternative technology in China; costing and budgetary implication analysis; •Expert consultation: domestic and international experts in related fields; •Modeling and budgetary analysis

Consultation

national and international experts consulted



Goodman Clifford
HTAi



Vivian Coates
ECRI



Jonas Lindblom
SBU



Les Levin
Ontario Ministry of Health and
Long-term Care



Kalipso Chalkidou
NICE



Ming Dai
Oncology Institute of the
Chinese Academy of Science

institutions involved

HTAi
ECRI, USA
SBU, Sweden
NICE, UK
Ontario Ministry of Health and Long-term
Care, Canada
Dutch Public Health and Medical Service
Institute, Holland
NECA, Korea
HITAP, Thailand
MoH of Singapore
Center for Drug Evaluation, Taiwan
China
Oncology Institute of the Chinese
Academy of Science, P. R. China
Peking University Hospital, Beijing,
China
No. 1 Teaching Hospital of Peking Uni.,
Beijing, China
No. 3 Teaching Hospital of Peking Uni.,
Beijing, China



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Knowledge synthesis-- Da Vinci surgical robots

- **Evidence extraction.** Two group of researchers (2 in each group) independently extracted data on clinical effectiveness, cost-effectiveness, social and ethical implications from those studies included and from feedbacks from the experts consulted. An independent judge was invited to intervene when disputations rose between the two groups;
- **Evidence ranking and assessment.** Compiled evidence tables. Applied GRADE criteria and AMSTAR evidence ranking tool to evaluate the quality and strength of the evidence;
- **Budget impact analysis.** Built model by using incidence rate of prostate cancer and radical prostatectomy in China, costing data and institutional operation data from local tertiary hospitals in Beijing, current pricing and reimbursement data in Beijing, and analyzed costing impact on individual patients, local health insurance schemes, and the total health input by the local government.



Findings

1. clinical effectiveness

- There was a large body of evidences on clinical effectiveness of surgical robots, but of low quality and weak recommendation.
- Most studies included are observational studies, and there are few RCTs and almost no evidence on long-term outcomes.
- For different conditions, da Vinci surgical robots have different clinical effectiveness in terms of varied clinical safety and effectiveness. At time of the review, most evidence existed with robotic-assisted radical prostatectomy, hysterectomy, nephrectomy, and colorectal surgery.
- Evidence that was available at the time of this review indicated that robot-assisted prostatectomy and hysterectomy procedures were superior to open procedures across a range of outcomes evaluated, including shortened length of stay, less blood loss and fewer transfusion during operation.
- The available evidence indicates that the benefits of robot-assisted prostatectomy and hysterectomy over conventional laparoscopic approaches are minor. Long-term outcome data were absent.



2. Costs and cost-effectiveness

- Surgical robots were a lot more expensive in terms of purchasing and maintenance costs.
- There were a lot of evidences on cost-effectiveness of surgical robots, which were of low quality and unable to demonstrate the da Vinci robots were superior than conventional surgeries in-terms of cost-effectiveness.
- Main factors influencing CE included purchase and maintenance costs, length of hospital stay and complications.
- Costs of robotic surgeries were much bigger than open and laparoscopic surgeries ; however, with increase of case-load, per case costs will decrease fast.
- Compared with conventional surgeries, da Vinci surgical robots could help to reduce length of stay, so as to have a positive impact on inpatient costs.



Conclusions

- Procure a large number of da Vinci surgical robots is not wise investment, given the undefined clinical effectiveness and cost-effectiveness.
- Capital funding plan shall be developed based on number of patients and health budget, and specifications, quantity, and standards of devices should also be clearly defined with the help of relevant experts.
- Full debates and discussions over patients' number, health financing capacity, affordability and social, economic implications of device use shall be pursued.
- Clinical guideline on device use shall be developed to provide technical guidance and standard procedures, and define requirement for skills and training. This is to strengthen clinical supervision of device use and prevent abuse and excessive use of the technology.
- Clinical studies are called for to define clinical effectiveness of the technology. If possible, multi-centered studies shall be done to find out safety, effectiveness and comparative effectiveness of the device.



Knowledge translation on high-tech device imported

---Knowledge from Rapid HTA of Da Vinci surgical robot

- HTA reports were reviewed and discussed by officials in the Division of Medical Equipment and Device (DMED), formal MoH (MFPC) and their expert groups.
- Presented to the Expert Panel on Large and New Medical Device and collected experts' comments of the formal MoH on Jan. 25 2013.
- A capital-funding proposal developed by DMED and debated on ministerial working meeting of formal MoH on Feb. 28, 2013.

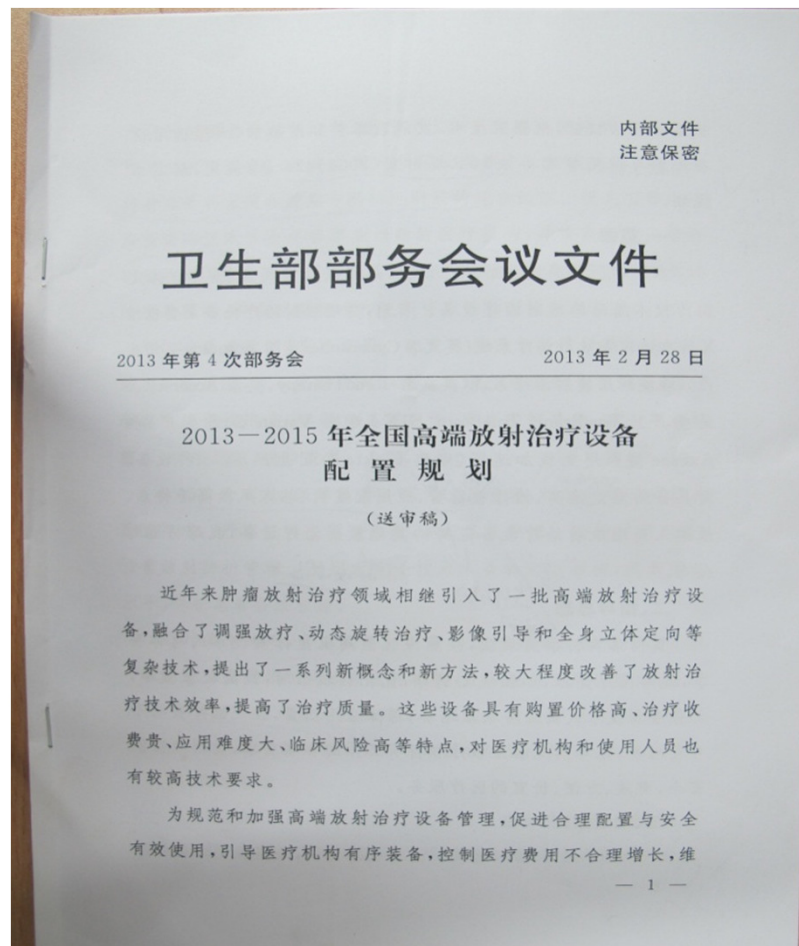


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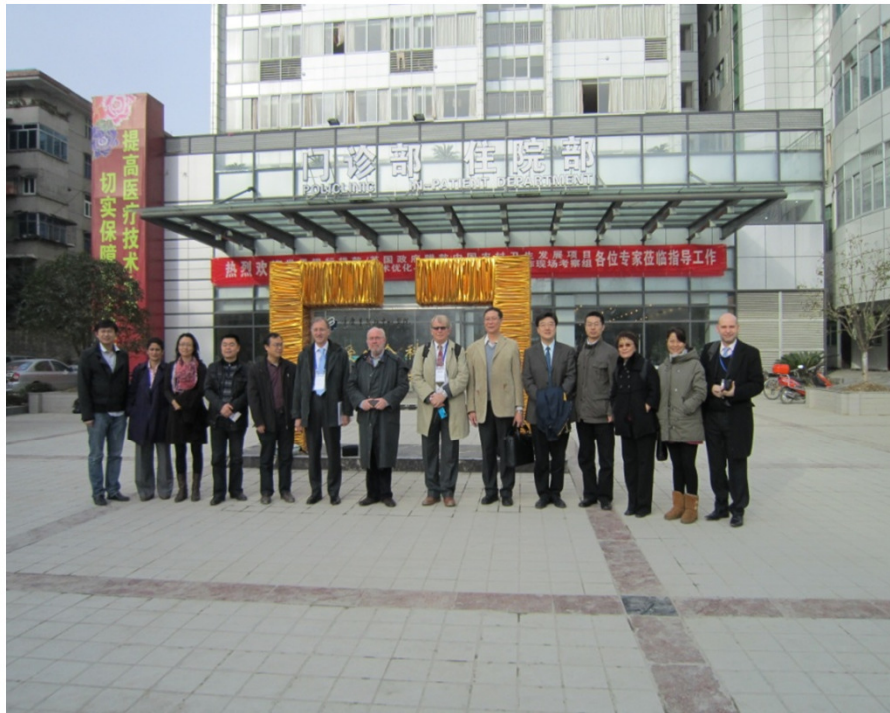
Knowledge to policy on high-tech device imported

---Knowledge from Rapid HTA of Da Vinci surgical robot



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Capacity building in decision makers in China



HTA capacity building in policy makers in China



Health minister Dr.Chen Zhu met HTA workshop HTAi experts

Deputy health minister spoke in 1st and 2nd HTA capacity building workshops



CNHDRC partnership & membership building in HTA

I. Foreign research institutes/associations:

- National Institute for Health and Clinical Excellence (NICE)
- Ontario Health Technology Assessment Cooperating Team (THETA)
- International Health Technology Assessment Cooperation Organization (HTAi)
- HTAsiaLink
- Society of Medical Decision Making (SMDM)

II. Chinese universities/institutes

- ◆ Beijing Normal University
- ◆ Capital Medical University
- ◆ Zhongshan University
- ◆ Nanjing University of Traditional Chinese Medicine
- ◆ China Medical University
- ◆ Dalian Medical University
- ◆ China Disease Prevention and Control Center



III. Chinses General hospitals

- Peking University Hospital
- Beijing People's Hospital
- Third Hospital of Peking University
- China-Japan Friendship Hospital
- Beijing Tiantan Hospital
- Beijing Maternity Hospital
- Dalian Central Hospital
- Shengjing Hospital of China Medical University
- Shaanxi Hanbin District People's Hospital
- Chongqing Qianjiang District People's Hospital

IV. Local governmental departments

- Shaanxi Health Department
- Liaoning Health Department
- Shandong Health Department
- Jiangsu Health Department
- Hubei Health Department
- Chongqing Health Bureau
- Shaanxi Hanbin District Health Bureau
- Chongqing Qianjiang District Health Bureau and Social Security Bureau
- Shandong Jiaonan Health Bureau

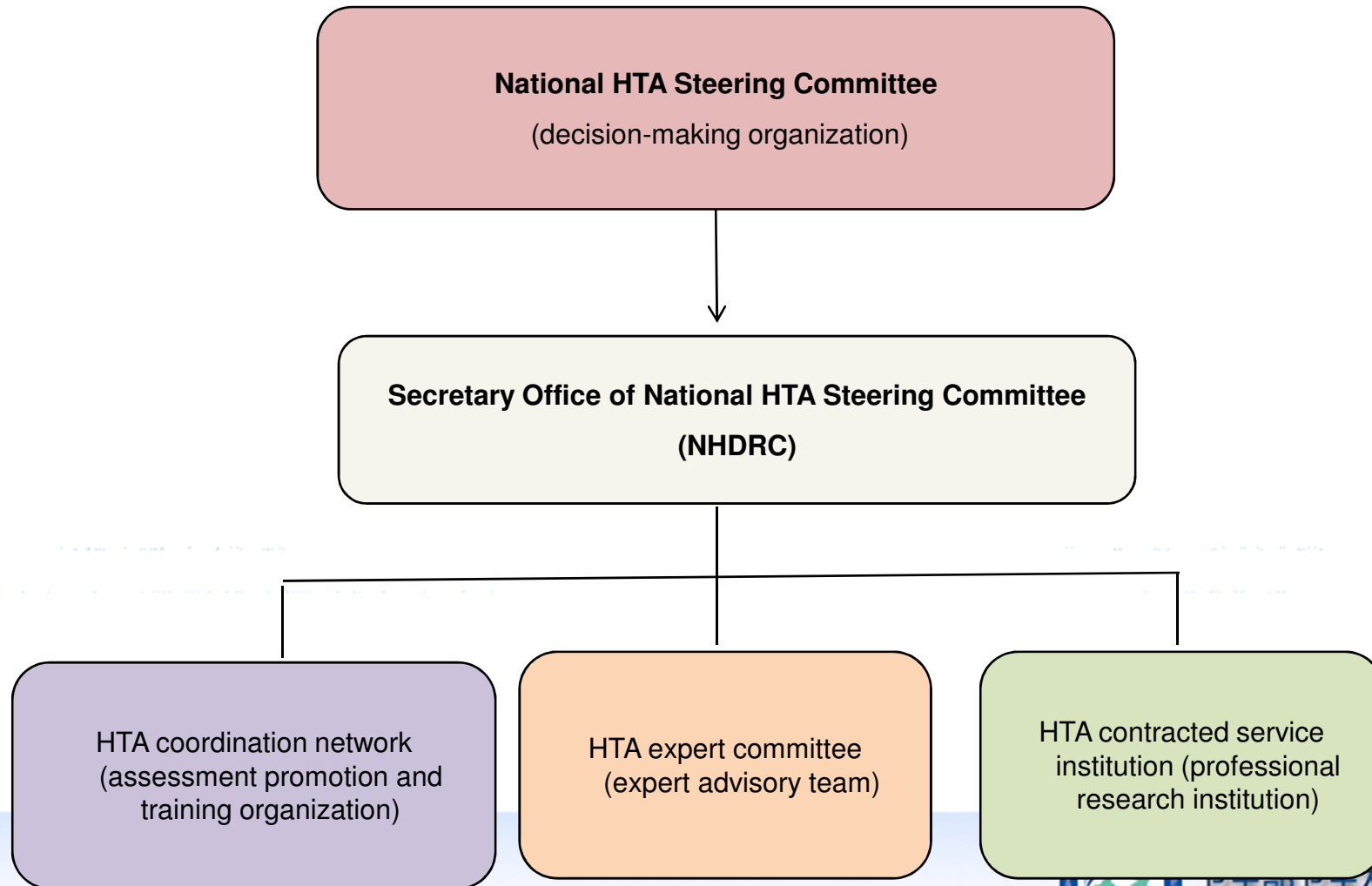


“NICER” preparation in 2010



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HTA system building in China



Thank you !



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