



**SAFHE 2009**  
NATIONAL BIENNIAL CONFERENCE & EXHIBITION  
in collaboration with CEASA

**SUSTAINABLE AND COST EFFECTIVE  
Healthcare Services in South Africa**

**TOWARDS AN AFFORDABLE PUBLIC  
HEALTH ESTATE:**

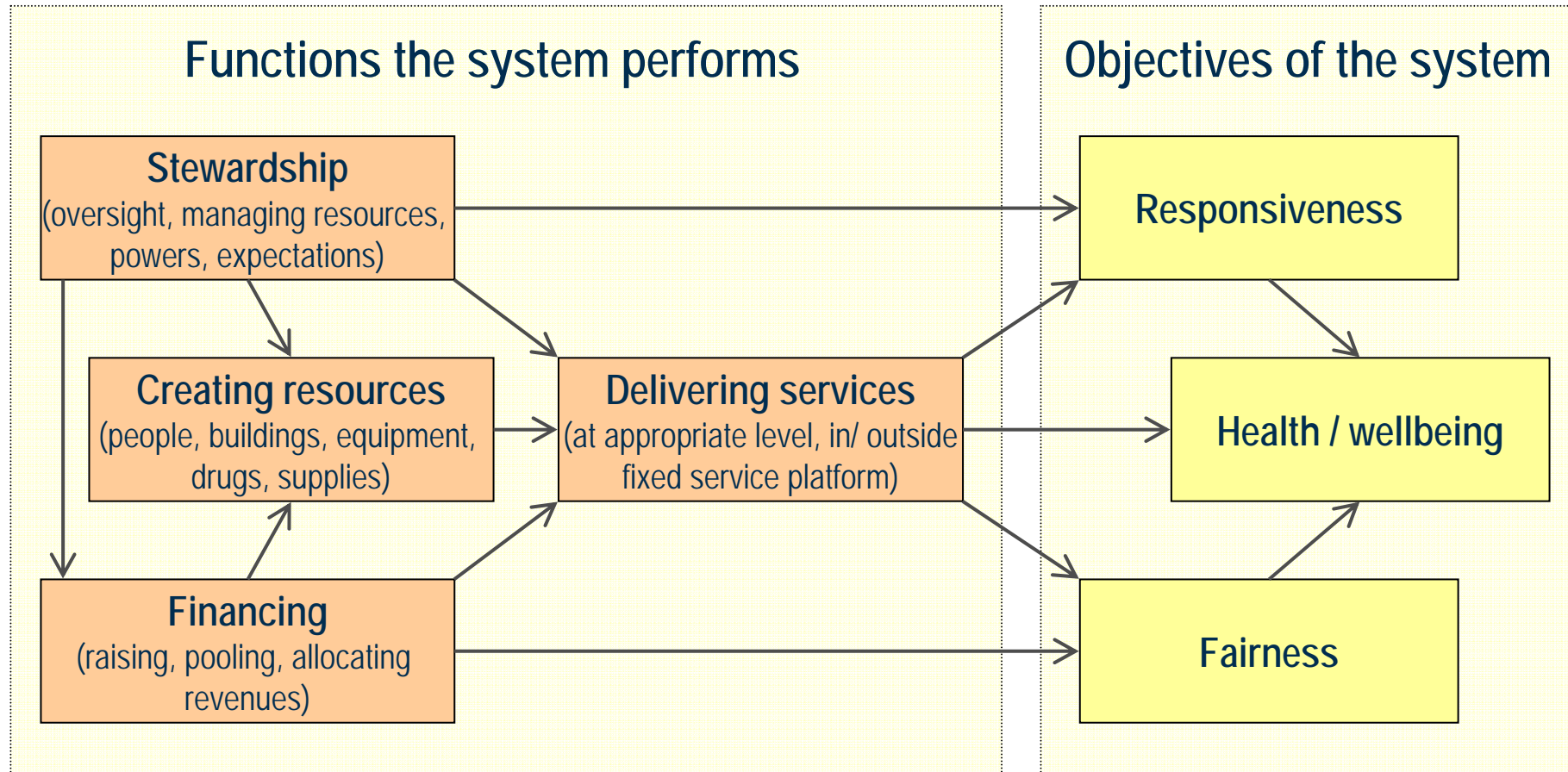
**A REVIEW OF THE 2008 HEALTH  
INFRASTRUCTURE BAROMETER**

*Geoff Abbott, Peta de Jager – CSIR Built Environment  
Nolwazi Gaza – Development Bank of South Africa*

*Cape Town, 20 May 2009*



# Health System Performance Framework



# ***Infrastructure Barometer Overview***

- **Context and Need for Health Care Infrastructure**
  - Disease burden, population and the existing health estate
- **Budget Allocations to Health Infrastructure**
  - Benchmarking expenditure, capital allocations and spending outcome, maintenance, strategic planning, ...
- **Health Infrastructure Delivery – Constraints and Enabling Mechanisms**
  - Underspensing, personnel, IDIP, PPP's, ...
- **Consolidation**





**1** Context and Need for Health Care Infrastructure

# ***Determinants of Health Status and Impact on and of Infrastructure***

- South Africa's triple burden of disease
  - Infectious diseases characteristic of a developing society
  - Chronic lifestyle diseases characteristic of an emerging developed society
  - High rates of trauma
- HIV / AIDS and Tuberculosis
- Rural / urban divide
- Environment related diseases – pollution resulting from uncontrolled rapid urbanisation and industrialisation
- Impact of climate change on vector and water borne diseases
- HAI's – contribution of health facilities





## How big is the problem?

- **USA** 44,000-98,000 deaths annually (“To Err is Human...”, other sources, i.e. VA - 180,000)
- **UK** around 10% of admissions or at a rate of 850,000 adverse events a year
- **Australia** 250,000 adverse events  
50,000 permanent disability  
10,000 deaths
- **N.Z.** confirmed 10% of admissions
- **Denmark** confirmed 9% of admissions
- **EU** every tenth patient

# Population

	2001	2006	2011	2016
Population (millions)	44.74	48.01	50.29	51.77
Rate of natural increase (%)		1.42	0.93	0.58
Life expectancy at birth		57.2	50.1	48.0
Age distribution: %<15 years	31.9	29.3	27.2	
Age distribution: % 65+ years	4.7	4.6	4.6	

Source: Pelsler 2004

- Growth rate = additional services and facilities to keep pace with existing service levels
- Urbanisation from 53,9% (1999) to 63% 2025 – additional 10m new urban dwellers – shift in service location and service need













*Little Company of Mary Hospital, Pretoria  
Architects: ... Casjeri & Baker*



*Springs Parkland Clinic  
Architects: Ronga & Steyn*



# Existing Health Estate in SA

## Public and Private Health Facilities

<i>Public Health Care Facilities</i>		Total – RSA	High	Low
Fixed PHC facilities	Total	3 390	EC 715	NC 138
Public hospitals	Total	428	EC 89	NC 29
<i>Usable public beds</i>	<i>Total</i>	<i>87 870</i>	<i>KZN 23 833</i>	<i>NC 1 988</i>
<i>Average usable beds</i>	<i>All provs</i>	<i>205</i>	<i>GP 438</i>	<i>NC 69</i>

Source: DHIS, June 2007

Excludes nursing colleges, forensic mortuaries, offices, emergency services...

### *Private Hospitals*

All Hospitals	Total	211	EC 82	NC 4
<i>Private hospital beds</i>	<i>Total</i>	<i>23 834</i>	<i>GP 13 558</i>	<i>NC 325</i>
<i>Average beds</i>	<i>Total</i>	<i>137</i>	<i>FS 168</i>	<i>LP 65</i>

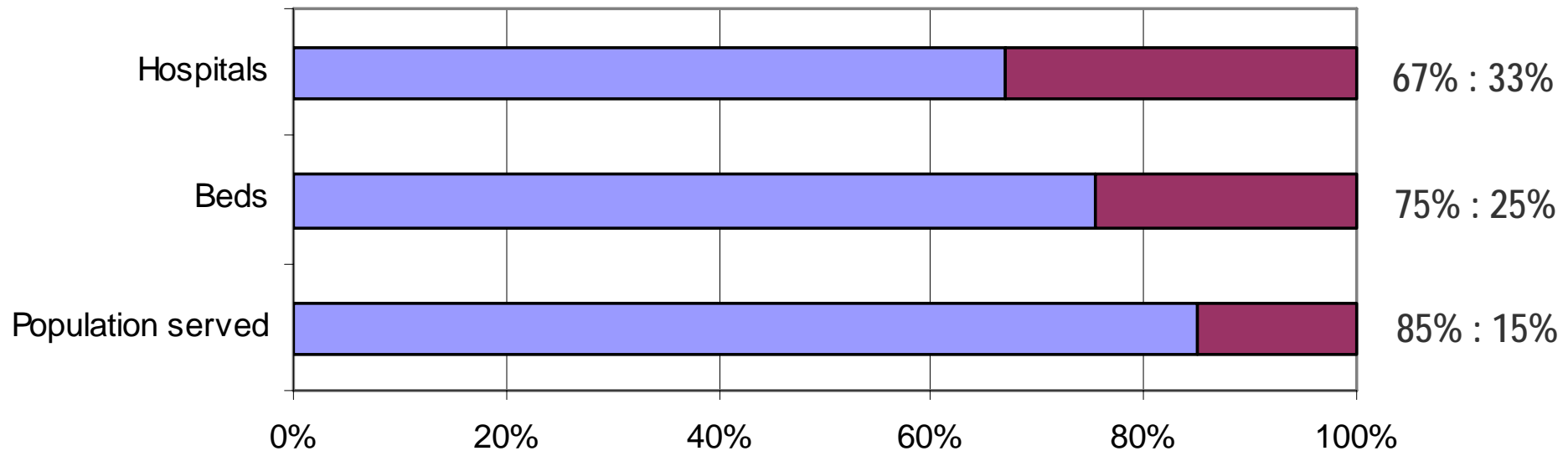
Source: Wilbury & Claymore Database, 2007

### *All Hospitals*

<i>Beds / 1000 population</i>	<i>2.47</i>	<i>WCP 3.11</i>	<i>MP 1.64</i>
<i>% private hospital beds</i>	<i>25%</i>	<i>GP 47%</i>	<i>LP 5%</i>



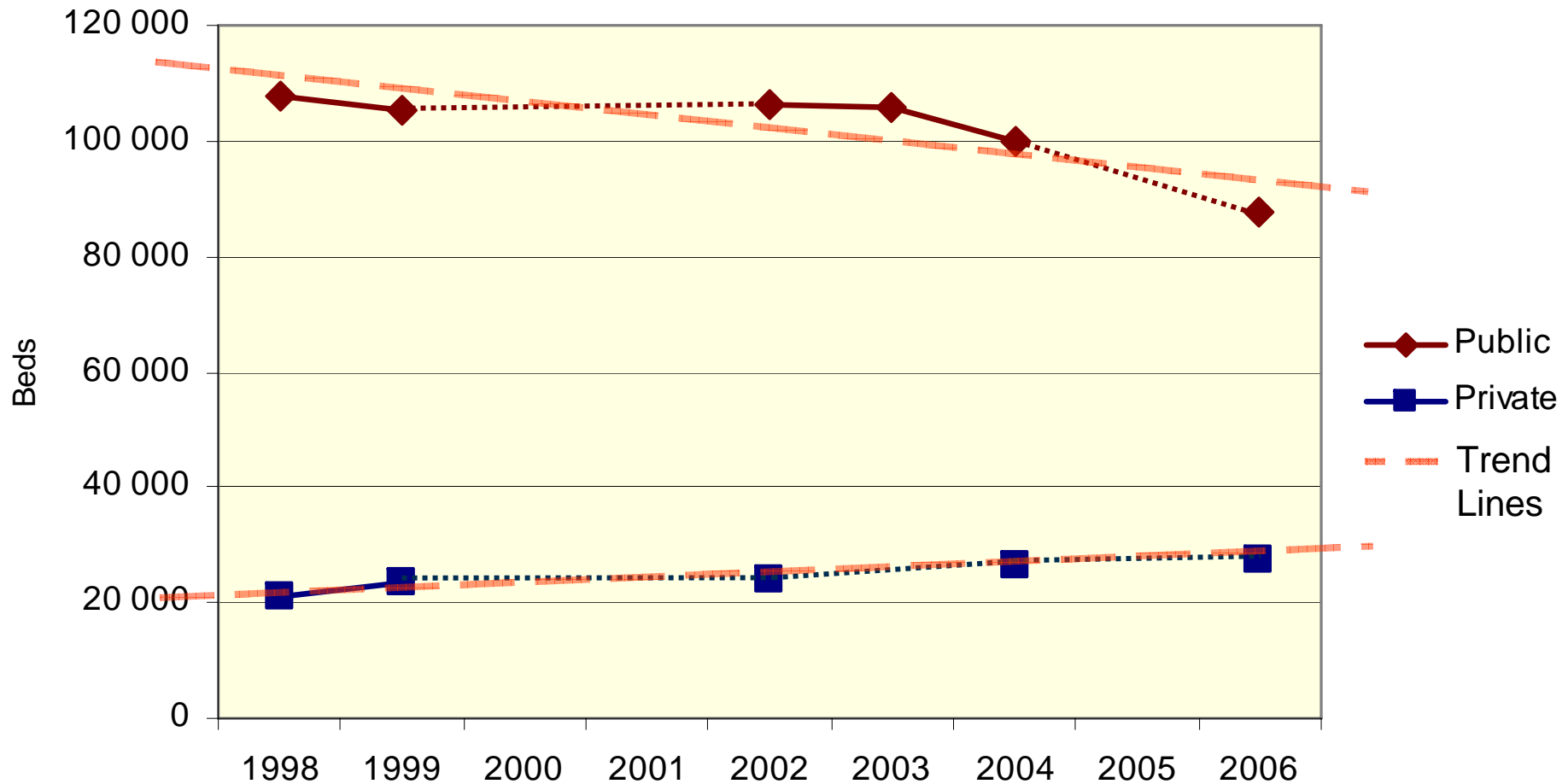
# SA Public : Private sector ratios for Hospitals, Beds and Population served



Public Hospitals 2,1 beds / 1000 population served

Private Hospitals 4,0 beds / 1000 population served

# Usable Bed Trends: SA Public & Private Hospitals 1998-2006



# Existing Public Health Estate in SA Estimated Replacement Cost

## Public Health Care Facilities Replacement Cost (MEA) - 2007

		Total – RSA	High	Low
Fixed PHC facilities	Total	R 19 522	EC R3 115	NC R805
Public hospitals	Total	R 104 587	KZN R27 456	NC R1 789
Equipment	Total	R 37 232	KZN R1 928	NC R778
<b>Total capital assets</b>		<b>R 161 341</b>	See note 5	

Source: CSIR, 2007 using DHIS facility and bed data

- Notes
- 1 MEA = Modern Equivalent Asset value
  - 2 All figures Rm; including VAT, professional fees
  - 3 Based on planning area/functional unit; rates/m<sup>2</sup> for different facility types
  - 4 Estimated 30% of MEA for all movable assets include medical devices information systems and furniture
  - 5 Excludes nursing colleges, forensic mortuaries, offices, emergency services...

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**Total capital assets** ± R **180 000** Including all Health Infrastructure

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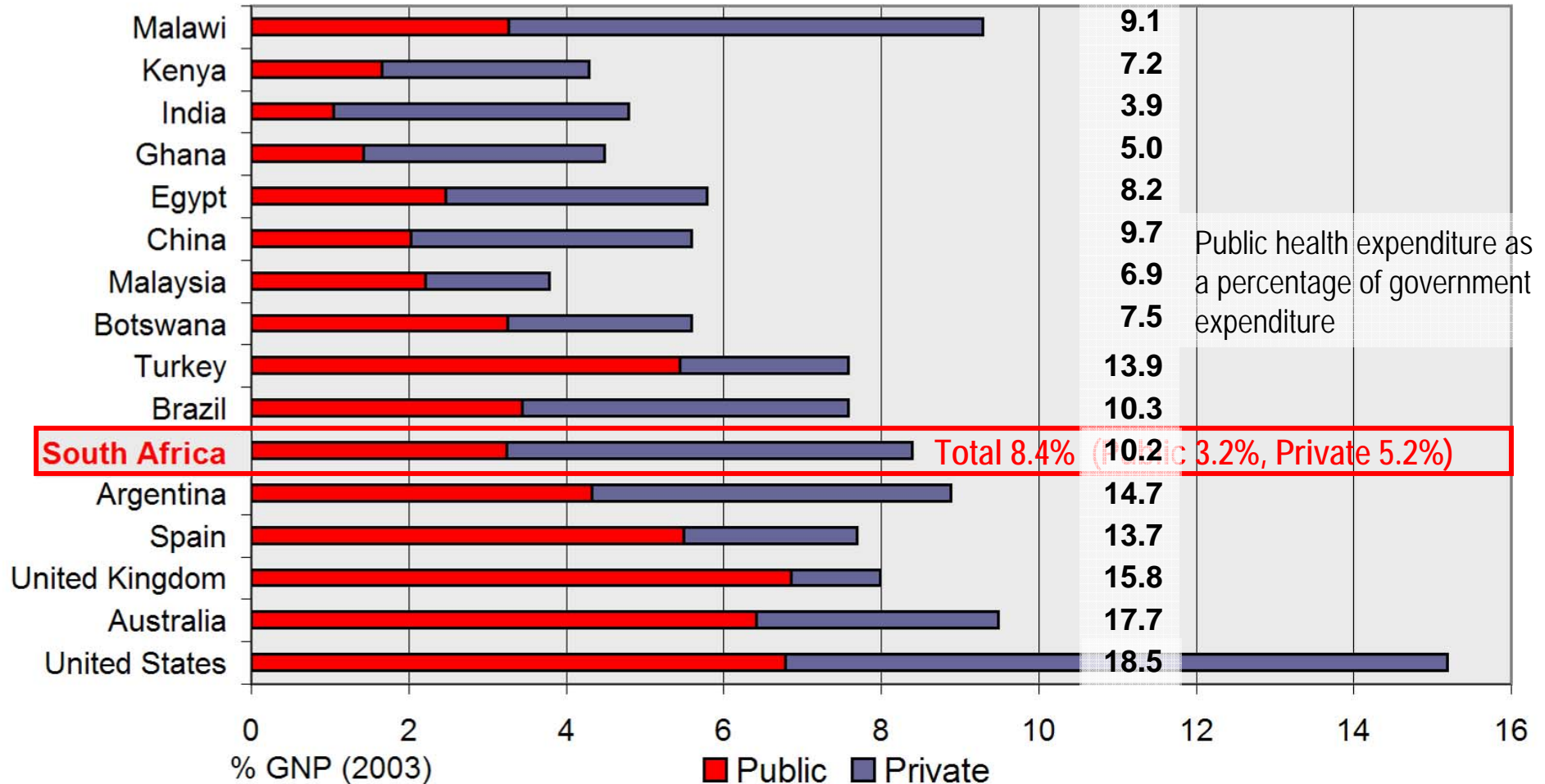




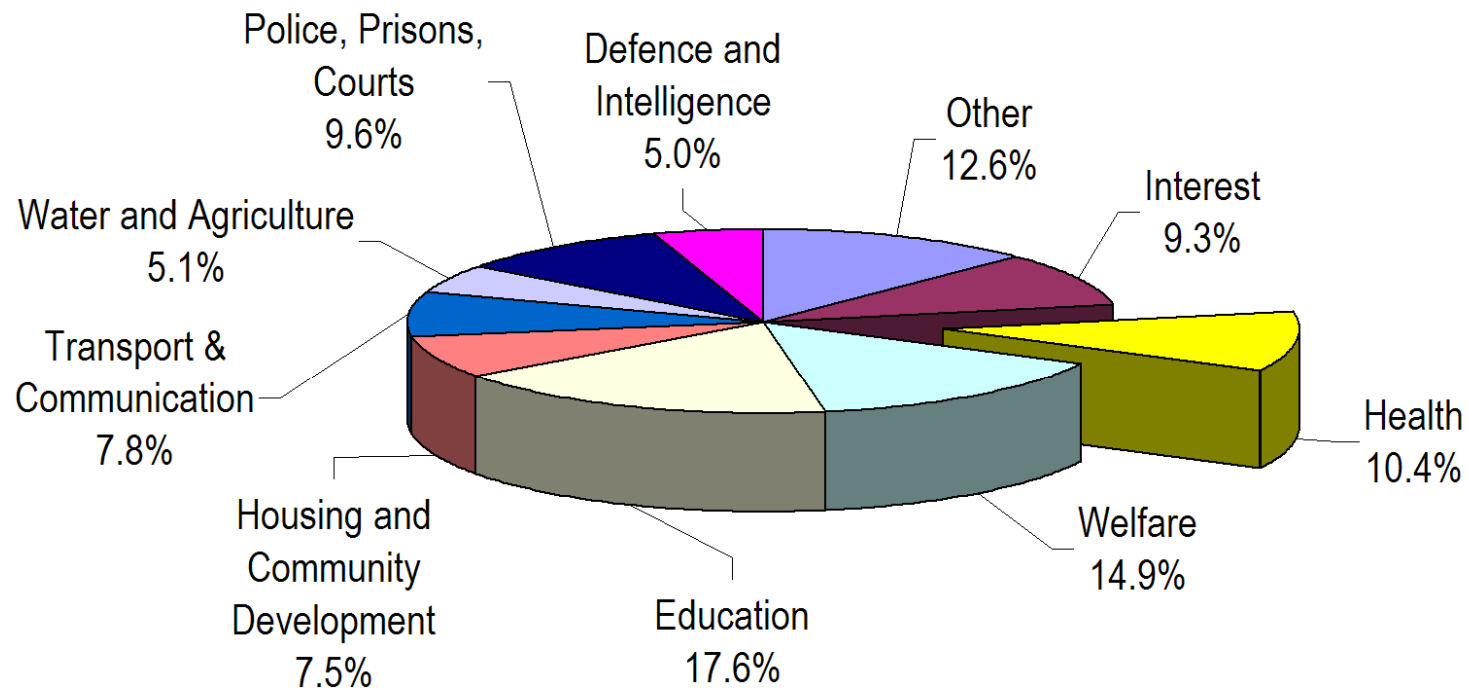
# 2 Budget Allocations to Health Infrastructure

*Nelson Mandela Academic Hospital, Umtata  
Architects: Bartsch van der Hoven*

# Benchmarking Health Expenditure: as a percentage of GNP

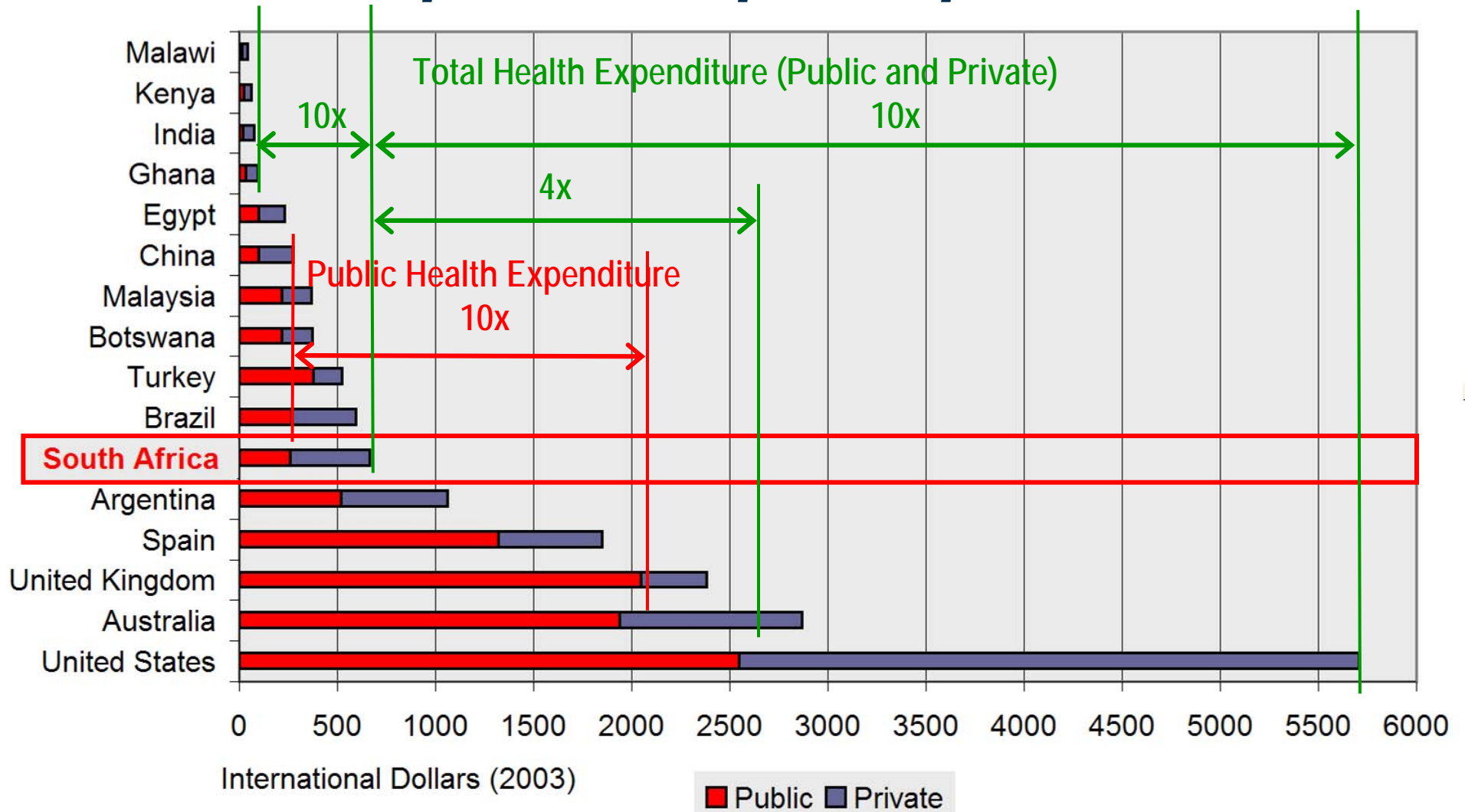


# ***Benchmarking Health Expenditure: as a % Government Expenditure 2007/08***



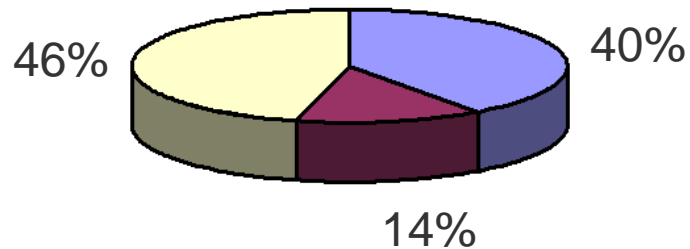


# Benchmarking Health Expenditure: Health Expenditure per Capita



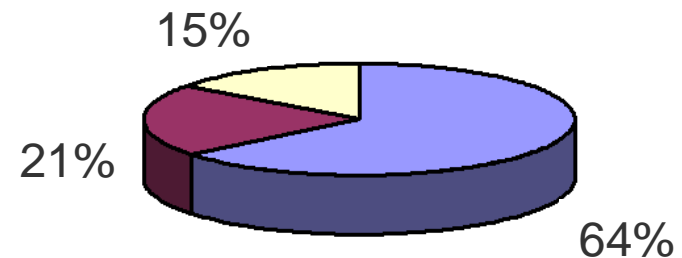
# Public / Private Health Expenditure and Acquisition in South Africa

**Health Expenditure in South Africa**  
(Percentage of total expenditure)



- Public sector health care
- Out-of-pocket primary care (private)
- Private sector health care (Medical Schemes)

**Health Service Acquisition**  
(Percentage of population)



- Public health care services
- Mostly private PHC, public hospitalisation
- Medical scheme health services

Source: SA Health Review 2007, Health Systems Trust

# Public Sector Capital Budget in relation to National / Provincial

	2006/07*	2007/08	2008/09	2009/10	Av Growth
<b>National Budget</b>	<b>R 474 230</b>	<b>R 533 873</b>	<b>R 594 198</b>	<b>R 650 301</b>	<b>12.38%</b>
Total Health	<b>R 54 798</b>	<b>R 60 586</b>	<b>R 66 340</b>	<b>R 72 656</b>	<b>10.86%</b>
Provincial Health	<b>R 53 648</b>	<b>R 59 252</b>	<b>R 64 939</b>	<b>R 71 182</b>	<b>10.89%</b>
Capital Assets	<b>R 4 685</b>	<b>R 5 496</b>	<b>R 5 971</b>	<b>R 6 662</b>	<b>14.07%</b>
Buildings, other fixed structures	<b>R 2 992</b>	<b>R 3 320</b>	<b>R 3 751</b>	<b>R 4 134</b>	<b>12.72%</b>
Machinery and equipment	<b>R 1 665</b>	<b>R 2 146</b>	<b>R 2 190</b>	<b>R 2 494</b>	<b>16.60%</b>

Ratios:

Total Health: National Budget	<b>11.6%</b>	11.3%	11.2%	11.2%
Capital: Provincial Health	<b>8.7%</b>	9.3%	9.2%	9.4%
Buildings: Capital Assets	<b>63.9%</b>	60.4%	62.8%	62.1%



Excludes municipal health





# Capital Funding Source

- Provincial Capital Funding

- **Equitable Share** – provincial discretionary capital allocation
- **Provincial Infrastructure Grant** – provincial grant – targeted specifically for general capital work

- **Revitalisation** – national grant – targeted at specific facilities identified for upgrading through strategic plan.

Includes provision for

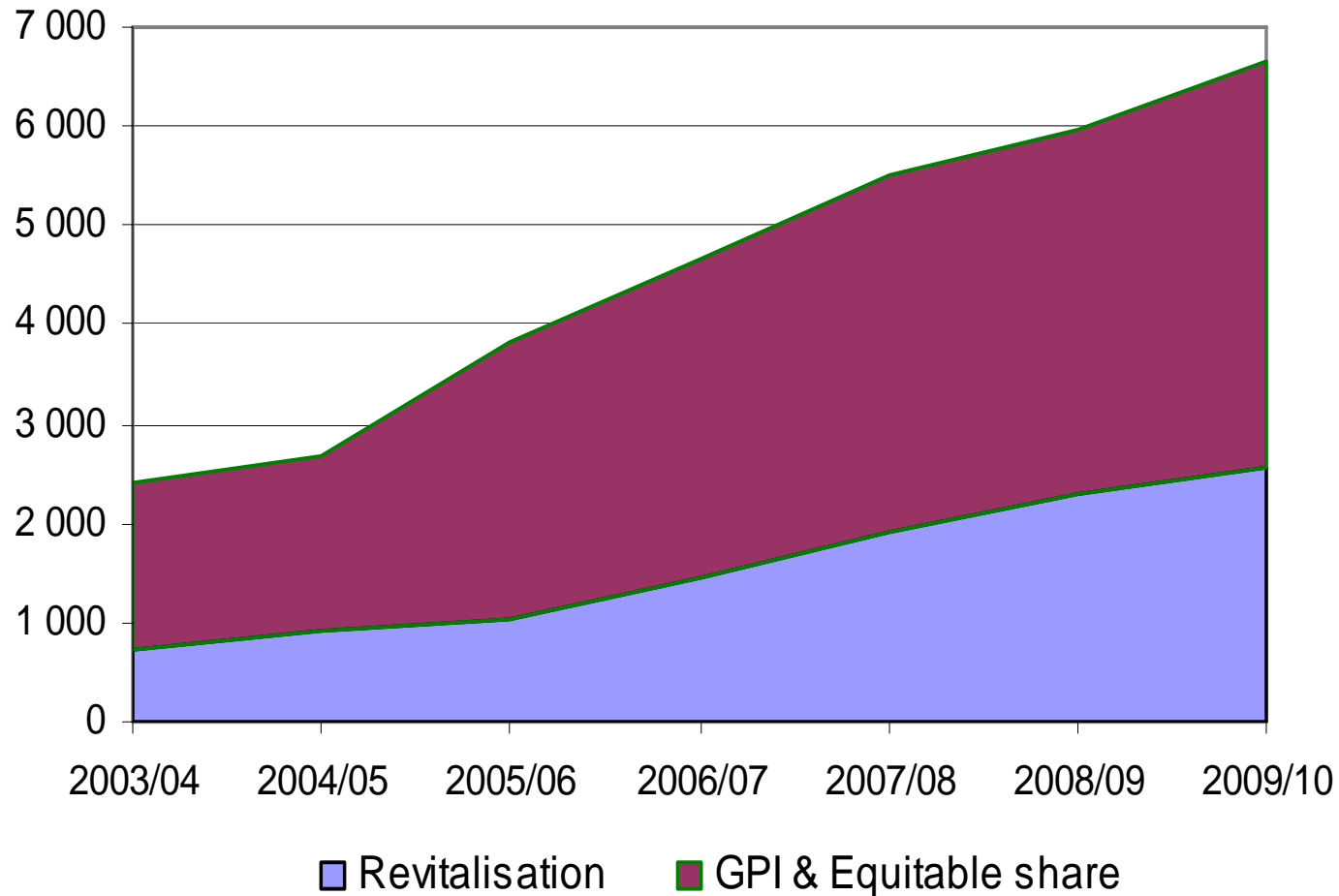
- *Infrastructure*
- *Health technology*
- *Organisational development and management*
- *Quality assurance*

“**Business as usual**” – provision, upgrading, maintenance

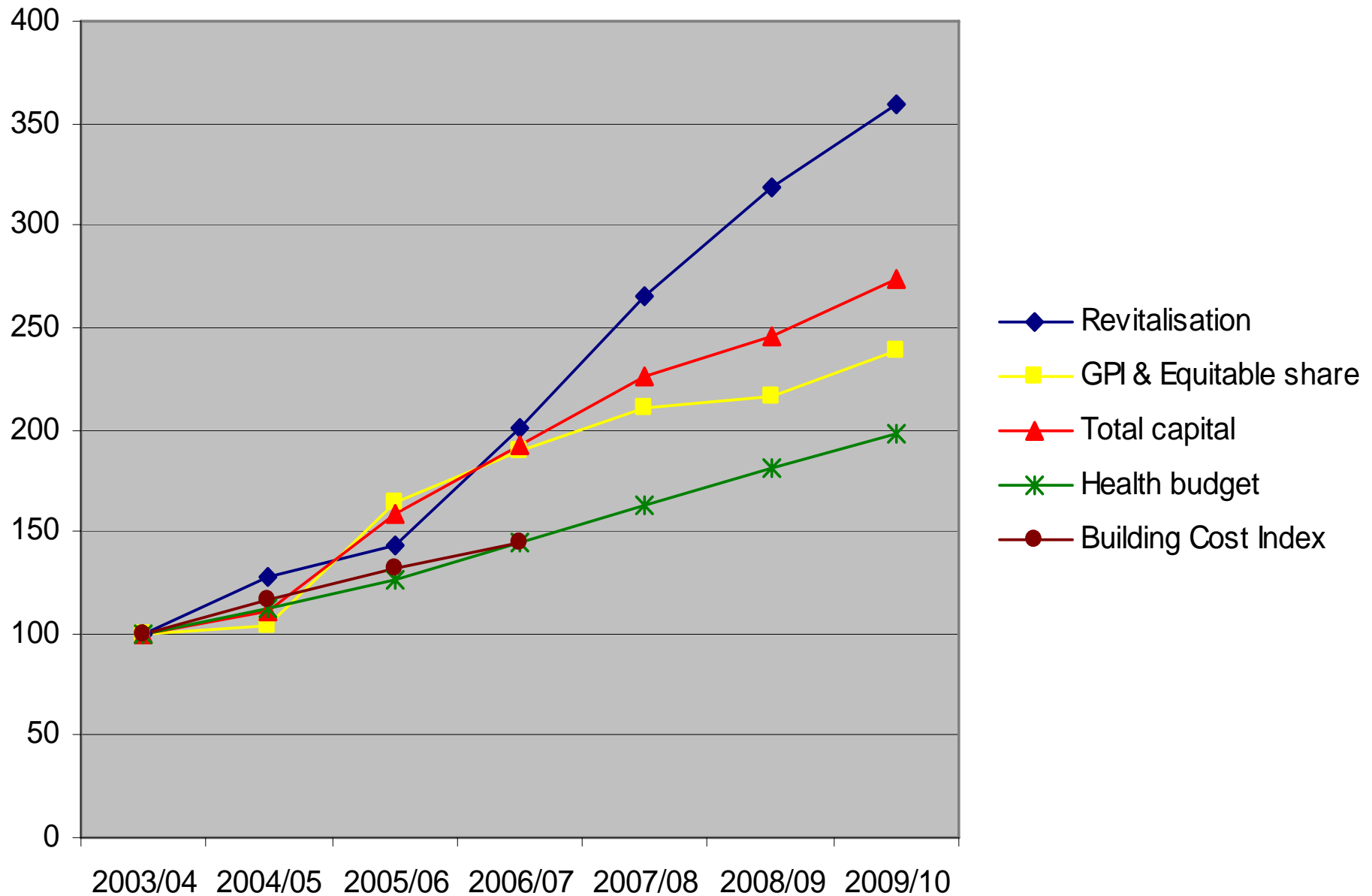
“**Over and above**” – allocation to transform and modernise infrastructure, equipment and systems



# Revitalisation in relation to total Capital



# Relative Growth – Capital Components





# *Capital Funding Allocation*

- Capital Funding provides for
  - Capital projects
    - *New facilities, upgrading, major rehabilitation and major repairs*
    - *Equipment*
  - Maintenance
    - *Planned preventive and unplanned maintenance*
    - *Minor repairs, rehabilitation, replacement*
    - *Backlog maintenance*
  - “Day-to-day maintenance” often includes minor capital work and clouds allocation

# ***Maintenance***

- Critical to service delivery
- Poorly maintained facilities ...
  - impede service delivery
  - increase the level of risk to patients and staff
  - raise service costs
  - reduce the service life of buildings and equipment
- Specifically recognised in SA that maintenance of the health estate is a real concern
- How much is / should be budgeted for and spent on maintenance?
  - National target framework **3-5%** of hospital operating budget
  - Maintenance budgets set at provincial level

# Maintenance Budgeting

- “4% Guideline” – variously interpreted to be of...
  - hospital operating expenditure
  - Primary Appropriation for health services
  - replacement cost (MEA) of health care facilities
- International industry standard for facilities (US, UK, Australia...) = 4% of **replacement cost**
- Applicable to facilities in **good condition**
- SA budgets provide also for equipment maintenance
- Recommended minimum standard for facilities and equipment in good condition:
  - 4% buildings replacement value plus
  - 5% of equipment replacement value
  - = aggregate **4,23%** of all capital assets



# Maintenance Budget Requirement

Condition Rating	Condition	Action required	Maintenance type	Budget required as % MEA	Provision for unplanned maintenance if maintenance deferred
5	Very good	Preventive maintenance	Normal maintenance	2 - 3%	0.75 - 1.25%
4	Good	Condition based maintenance		4 - 6%	1.5 - 2.5%
<b>Estimated Average Condition of Estate</b>					
3	Fair	Repairs	Backlog maintenance (primarily capital)	20 - 30%	3 - 5%
2	Bad	Rehabilitation		50 - 60%	6 - 10%
1	Very bad	Replacement		100 - 110%	10 - 20%

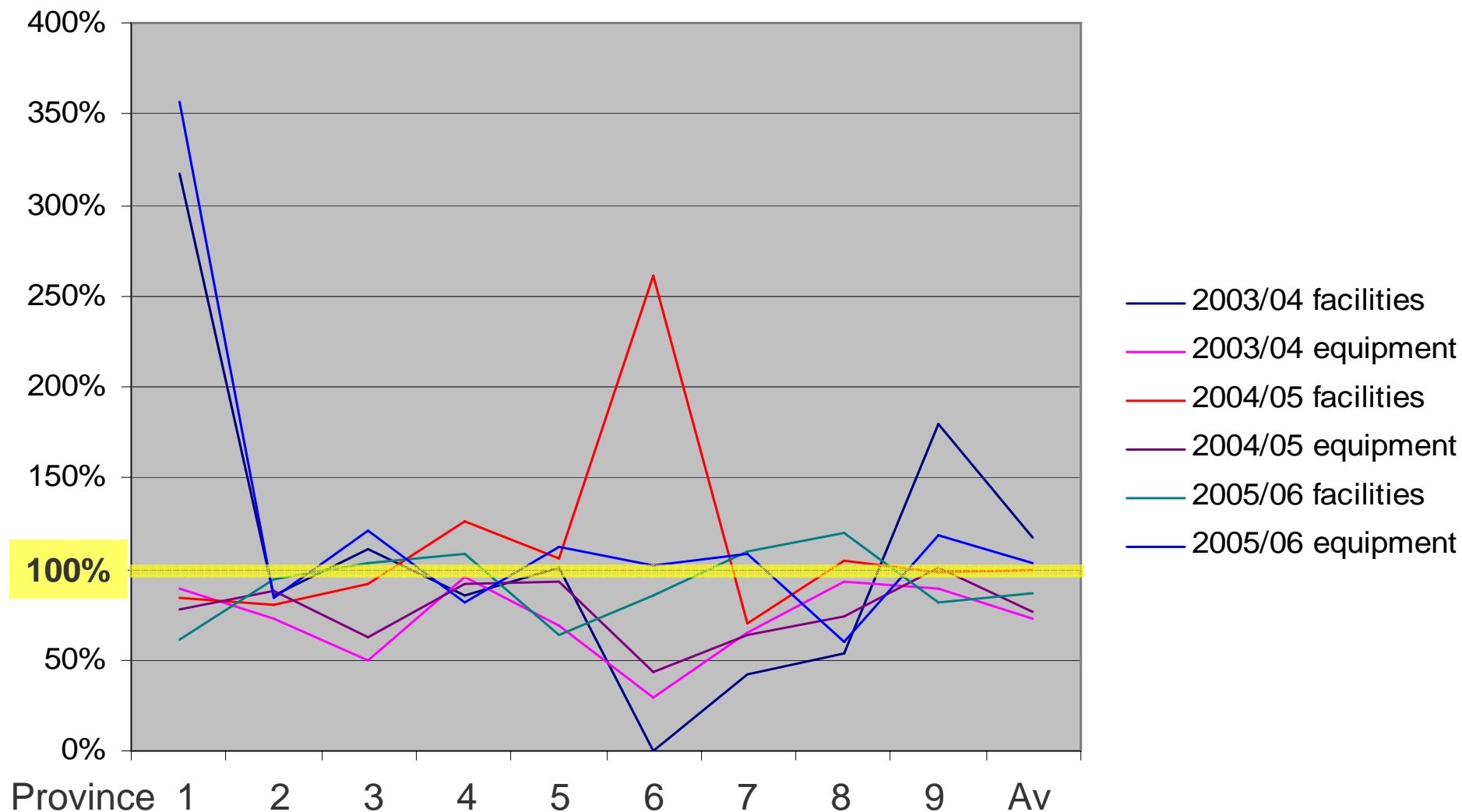
Source: Mc Duling 2005, NHFA 1996

# Maintenance Budgeting: Provincial Health Facilities Budgets 2007/08

<i>Maintenance as % Primary Appropriation</i>	SA Average	High	Low
Maintenance from Programmes 7.2 (Engineering Services) and 8 (Capital)	2.0%	3.2%	0.5%
Total including maintenance estimate from 2.9, 4 and 5 (PHC and hospitals)	3.1%	4.4%	1.6%
<i>Maintenance as % Replacement Cost</i>			
Maintenance from Programmes 2.9, 4, 5, 7.2 and 8	1.1%	1.7%	0.7%

- Maintenance budgeting well below national and international benchmarks

# Capital Expenditure Variance from Budget Allocation: Facilities and Equipment 2003/04 - 2005/06

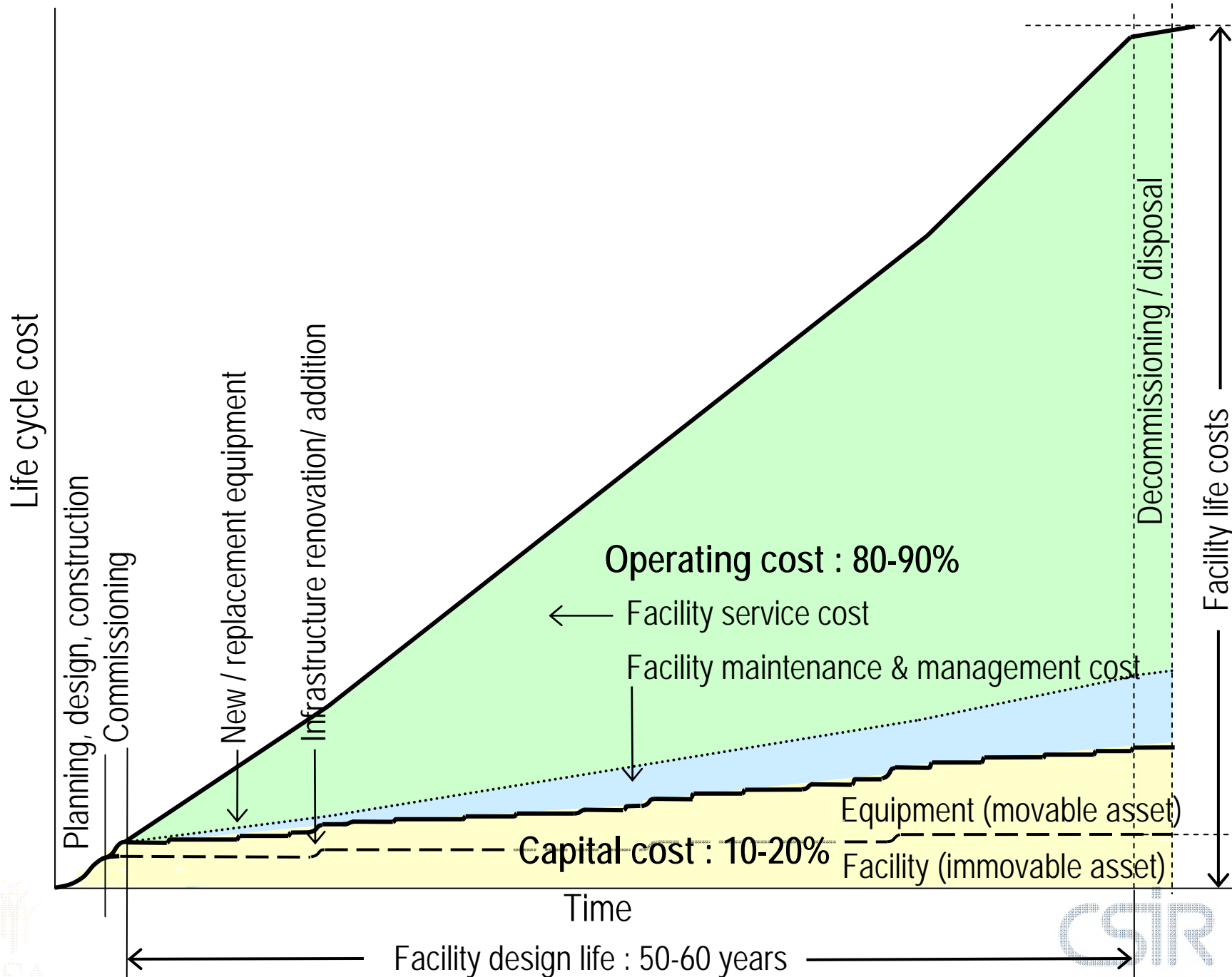




# Required Capital Funding to Retain Estate

<i>Buildings</i>	Estate MEA	% MEA	Funding required	Funding available	Shortfall/excess	Assumptions
Replacement	R 138 460	2.0%	R 2 769			50 year average life cycle
Growth	R 138 460	1.0%	R 1 385			Constant growth rate
Maintenance	R 138 460	4.0%	R 5 538			All facilities in good condition Backlog worked into growth and replacement
<b>Total Buildings</b>	<b>R 138 460</b>		<b>R 9 692</b>	<b>R 3 320</b>	<b>(R 6 372)</b>	Current platform acceptable
<i>Equipment</i>						
Replacement	R 41 540	6.7%	R 2 771			15 year average life cycle
Growth	R 41 540	1.0%	R 415			Constant growth rate
Maintenance	R 41 540	5.0%	R 2 077			As for Buildings maintenance
<b>Total Equipment</b>	<b>R 41 540</b>		<b>R 5 263</b>	<b>R 2 146</b>	<b>(R 3 117)</b>	Current platform acceptable
<b>Total all Capital</b>	<b>R 180 000</b>		<b>R 14 955</b>	<b>R 5 466</b>	<b>(R 9 489)</b>	

All figures Rm; 2007 base



# Reducing Usable Beds FM / Maintenance Budget Implications

	1996 NHFA	2007 DHIS*	2005 Current	2010 2010 Plan
<b>Hospitals</b>	<b>59</b>	<b>61</b>	<b>42</b>	<b>44</b>
Gross area	1 509 294	1 252 625	1 401 997	1 436 497
Planned beds	15 010			12 190
<b>Gross area/bed</b>	<b>101</b>			<b>118</b>
Usable beds	12 957	10 021	8 672	9 003
% Reduction: Usable beds	100%	77%	67%	69%
Gross area/bed	116	125	162	160
% Increase: Area/bed	100%	107%	139%	137%

Sources: NHFA 1996; Western Cape 2010 Plan

\* estimated area

- Rationalise, reduce number of hospitals and beds
  - 31% decrease in number of usable beds (19% planned bed reduction) = reduced service cost
  - No equivalent FM / maintenance cost savings - 37% increase in area per bed = increased cost / bed





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## Health Infrastructure Delivery – Constraints & Enabling Mechanisms

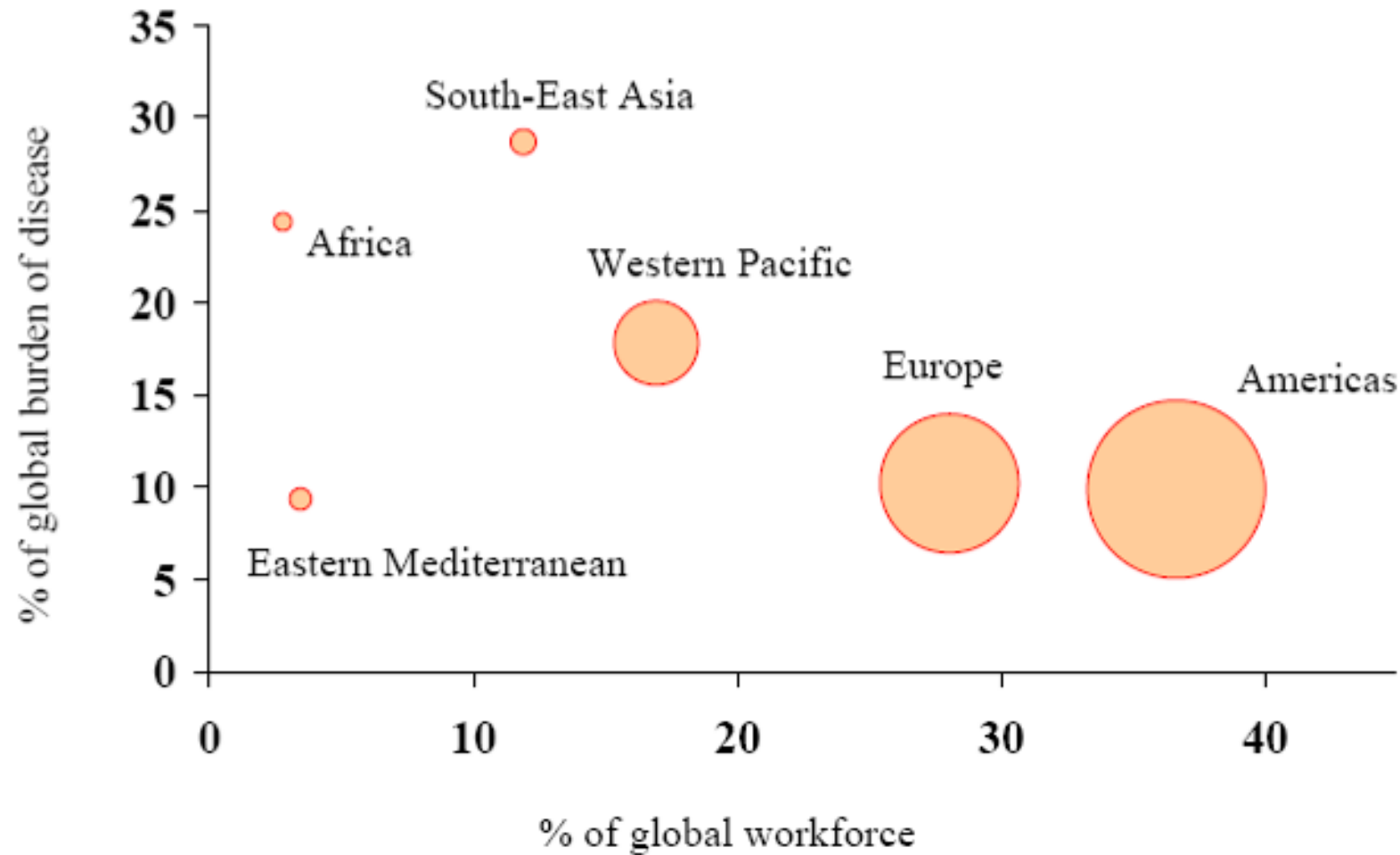
# ***Constraints and Enabling Mechanisms***

- Current capital funding inadequate to maintain or replace existing infrastructure platform
- Budget underspending limits budget growth
- Budget underspending impacted by
  - Discrepancies between project plans and spending due to poor project planning
  - Impact of frequent cost overruns on other projects and budget
  - Lack of predictability for budgeting purposes
  - Inflation based rather than project based budgeting
  - Lack of alignment between the infrastructure delivery cycle and either the budget or strategic planning cycle.
  - The practise of committing budgets for large multi-year projects to one year instead of being spread over the MTEF cycle

# ***Constraints and Enabling Mechanisms***

- Staffing and capacity constraints
- Construction industry capacity and transformation
- IDIP
- PPP's
- Information to support infrastructure planning, design and management – consolidated current infrastructure database, norms, regulations, standards...
- Local infrastructure research base

# ***Distribution of Health Care Workers by level of Health Expenditure and Burden of Disease***





## ***Province A – Vacant Technical Service Posts: Health Care Facilities & Equipment***

	Posts	Filled	Vacant	% vacancies
Professional Engineers	11	3	8	72.7%
Industrial Technicians	75	53	22	29.3%
Artisans	228	164	64	28.1%
Tradesmen	174	125	49	28.2%
Handymen	157	107	50	31.8%
Foremen	17	16	1	5.9%
Groundsmen, Gen. Workers	17	14	3	17.6%
<i>Total</i>	679	482	197	29.0%





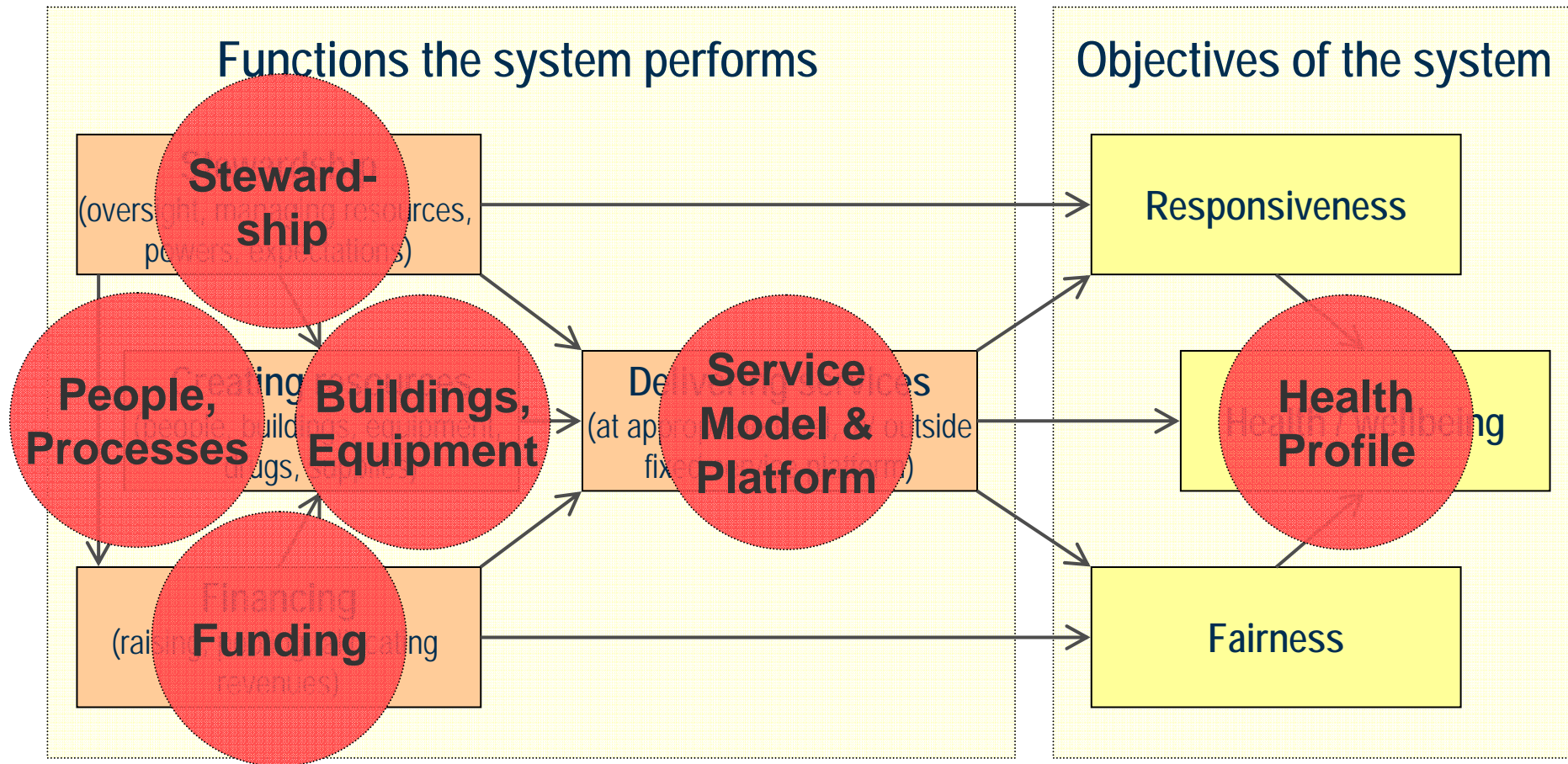


**4**

## **Consolidation and Recommendations for the Future**



# Health System Performance Framework





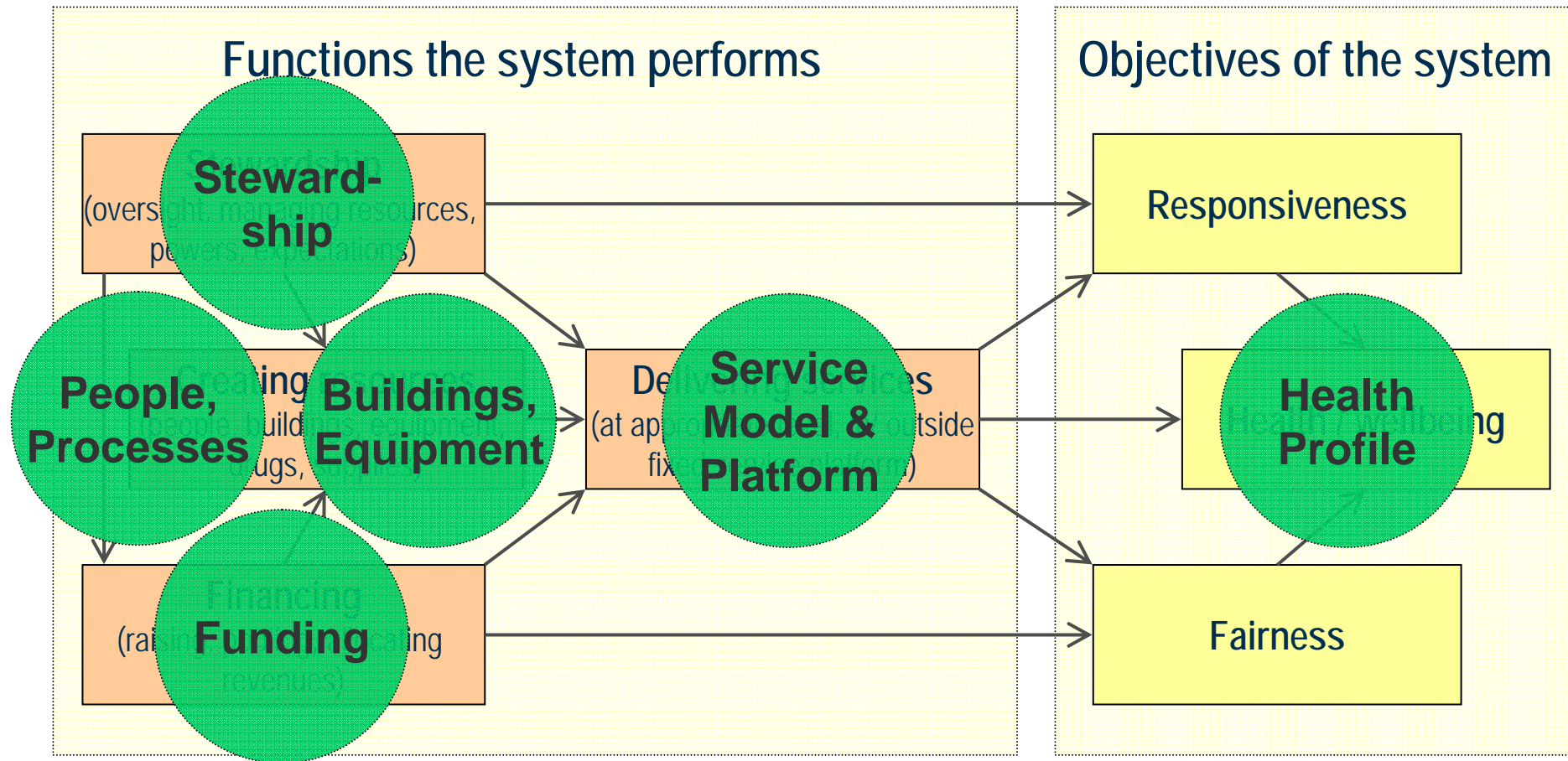
# Consolidation

- **Infrastructure** a key resource for health service delivery; often not recognised as a priority in health departments
  - Part of an integrated, balanced, managed, resourced system  
Infrastructure platform → Health service delivery → Health status
  - Distribution, functionality and standard (fit for purpose and fit for service) of current facilities questionable
- Current **funding** inadequate to retain, develop or to maintain current infrastructure
  - Acknowledge success of Revitalisation, IDIP programmes, but is it enough on its own?
- Affordability, suitability and sustainability of current **integrated service and infrastructure platform** questionable – critical strategic review, develop alternative options...
  - Hub and spoke, patient transfer, shared mode - PPP's,

## ***Consolidation – 2***

- Integration of **strategic planning across tiers of government** underpinned by **common processes** and **current datasets**
- Updated contextually appropriate **guidelines, norms and standards**
- **Capacity development** to address current skills gaps in the industry across the board but particularly in professional management and technical levels
- Interim processes - acknowledge inertia in system
  - Short term wins
  - Recognise and multiply pockets of excellence
- Acknowledge dedication and role of many **unsung heroes** in the health care sector in SA who are striving to make a real difference

# Health System Performance Framework





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## **SUSTAINABLE AND COST EFFECTIVE Healthcare Services in South Africa**

### Acknowledgements

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