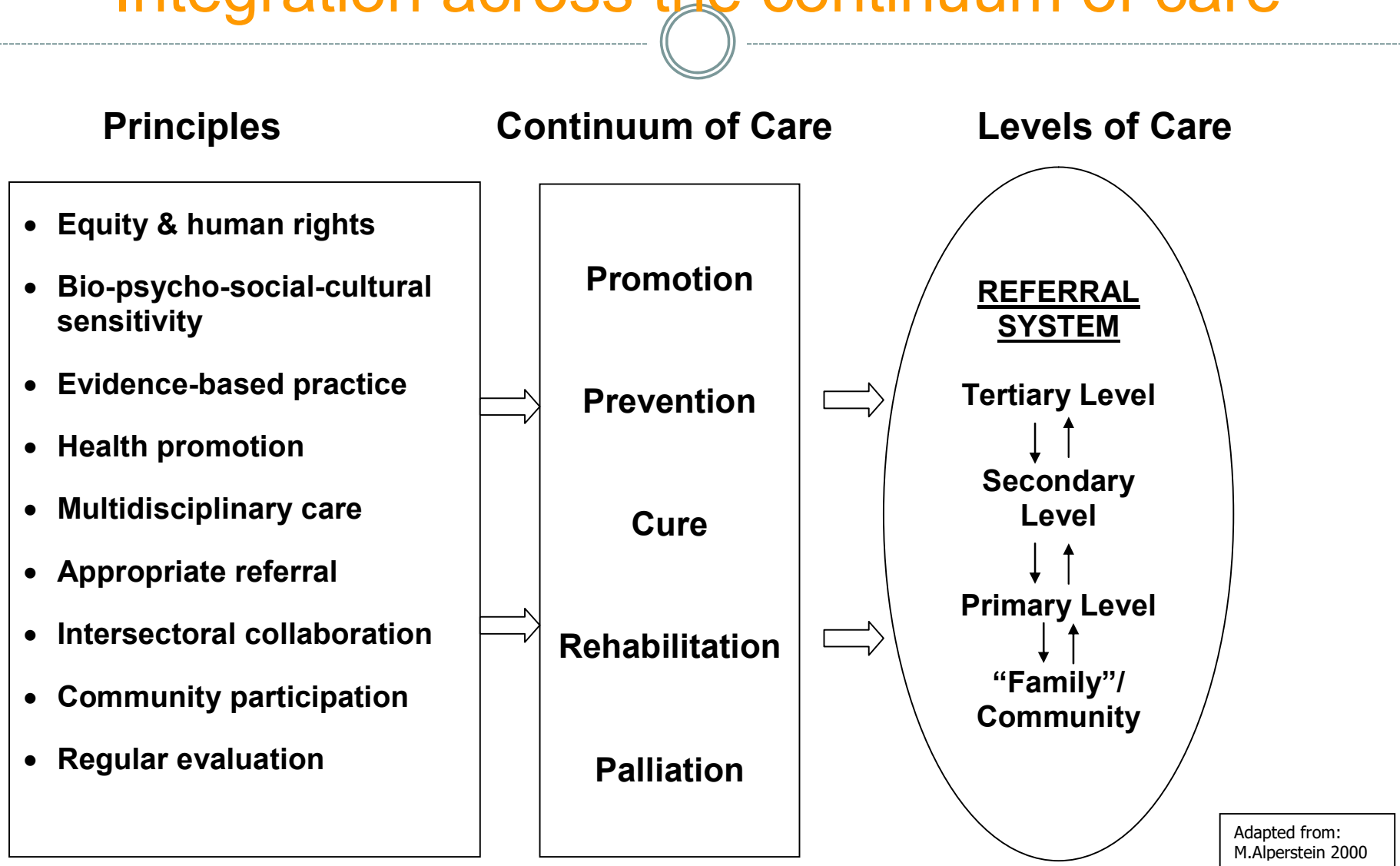
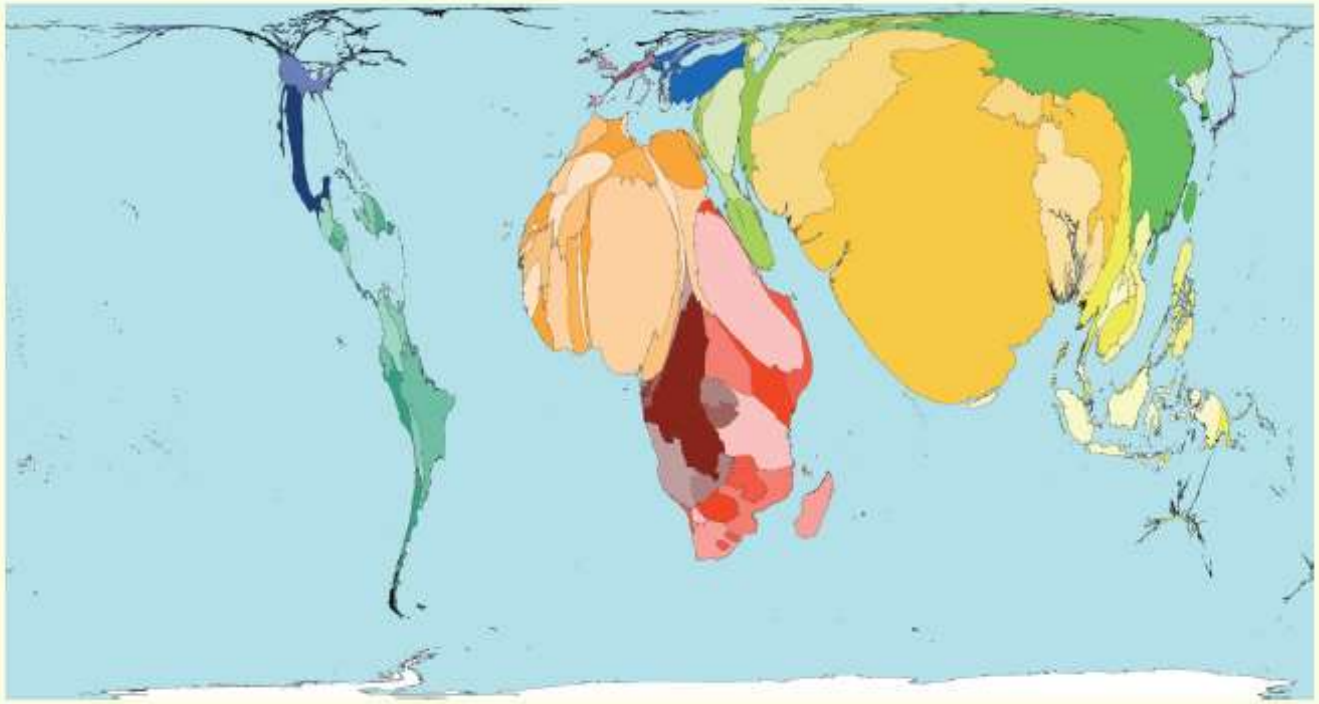
The Comprehensive PHC Approach

Integration across the continuum of care



Early Neo-Natal Mortality

Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



An early neo-natal death is when a child dies during the first week of his or her life. In 2000 there were 3 million such deaths. Worldwide, 2.3% of children that were born alive died during the following week.

The rate of deaths in the first week of life ranges from 1 in a thousand in Japan, to 1 in 20 in Mauritania.

According to the World Health Organisation, worldwide the three main causes of neo-natal deaths are asphyxia at birth; low birth weight including prematurity; and infections. Access to healthcare can reduce these deaths.

Territory size shows the proportion of early neo-natal deaths worldwide, that occurred there in 2000. Early neo-natal deaths are those deaths within the first week of life.

Land area

Technical notes

- Data are from the World Health Organisation's 2005 World Health Report.
- *14 territories reported 2 early neo-natal deaths per 1000 live births (Austria, Norway, Finland, Iceland, Monaco and San Marino are not shown); 4 reported 38 deaths per 1000 births (Ethiopia, Guinea and the Central African Republic are not shown). Those with the most births are shown.
- See website for further information.

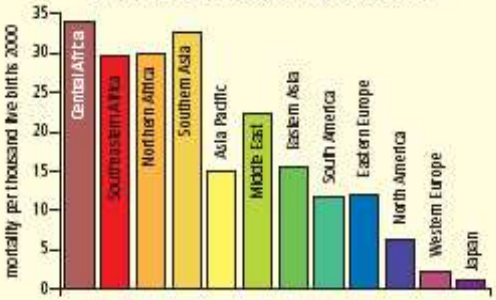
HIGHEST AND LOWEST EARLY NEO-NATAL MORTALITY RATES

Rank	Territory	Value
1	Mauritania	52
2	Liberia	48
3	Iraq	46
4	Afghanistan	45
5	Cote d'Ivoire	44
6	Sierra Leone	42
7	Nigeria	40
7	Mali	40
7	Angola	40
10	Pakistan	38

Rank	Territory	Value
185	France	2
185	Germany	2
185	Republic of Korea	2
185	Italy	2
185	Spain	2
185	Belgium	2
185	Sweden	2
185	Czech Republic	2
199	Singapore	1
199	Japan	1

*deaths in the first week of life per thousand live births 2000**

EARLY NEO-NATAL MORTALITY

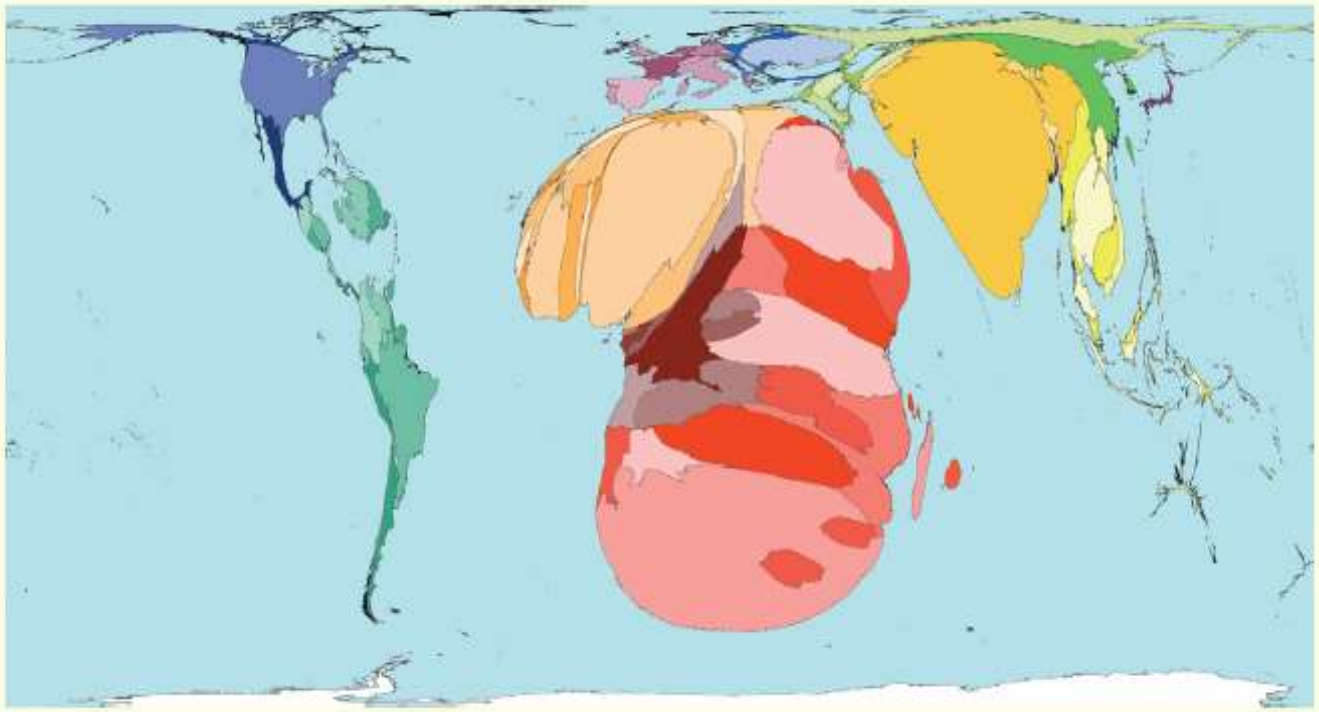


"We must count newborn deaths and make them count, instead of accepting these deaths as inevitable."

Francisco Songane, 2006

HIV Prevalence

Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



HIV, or Human Immunodeficiency Virus Infection, attacks the immune system. It eventually causes AIDS, which stands for Acquired Immune Deficiency Syndrome. With cases first recognised in the United States in 1981, AIDS increases the risk of many infections and tumours.

In 2003, the highest HIV prevalence was Swaziland, where 38%, or almost 4 in every 10 people aged 15 to 49 years, were HIV positive. All ten territories with the highest prevalence of HIV are in Central and Southeastern Africa.

Transmission of HIV is through sex, using infected needles and in the womb. Infected children are not shown here. HIV/AIDS often has an acquired social stigma.

Territory size shows the proportion of all people aged 15-49 with HIV (Human Immunodeficiency Virus) worldwide, living there.

Land area

Technical notes

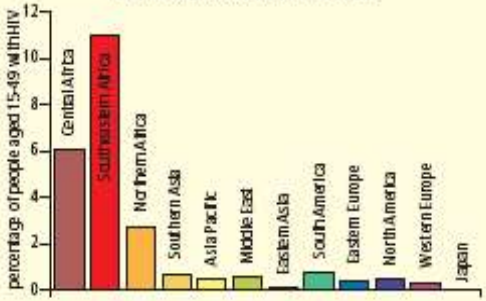
- Data are from the United Nations Development Programme's 2004 Human Development Report.
- *Territories whose data has been estimated from regional averages have not been included in the table, other than through their absence by rank.
- See website for further information.

MOST PEOPLE WITH WITH HIV

Rank	Territory	Value	Rank	Territory	Value
1	Swaziland	38	16	United Republic of Tanzania	8.8
2	Botswana	37	17	Gabon	8.1
3	Lesotho	28	18	Cote d'Ivoire	7.0
4	Zimbabwe	24	19	Cameroon	6.9
5	South Africa	21	20	Kenya	6.7
6	Namibia	21	21	Ethiopia	6.2
7	Zambia	16	24	Burundi	6.0
8	Malawi	14	25	Haiti	5.6
9	Central African Republic	13	26	Nigeria	5.4
10	Mozambique	12	27	Rwanda	5.1

*percentage of people aged 15 to 49 living with HIV**

HIV PREVALENCE IN 2003

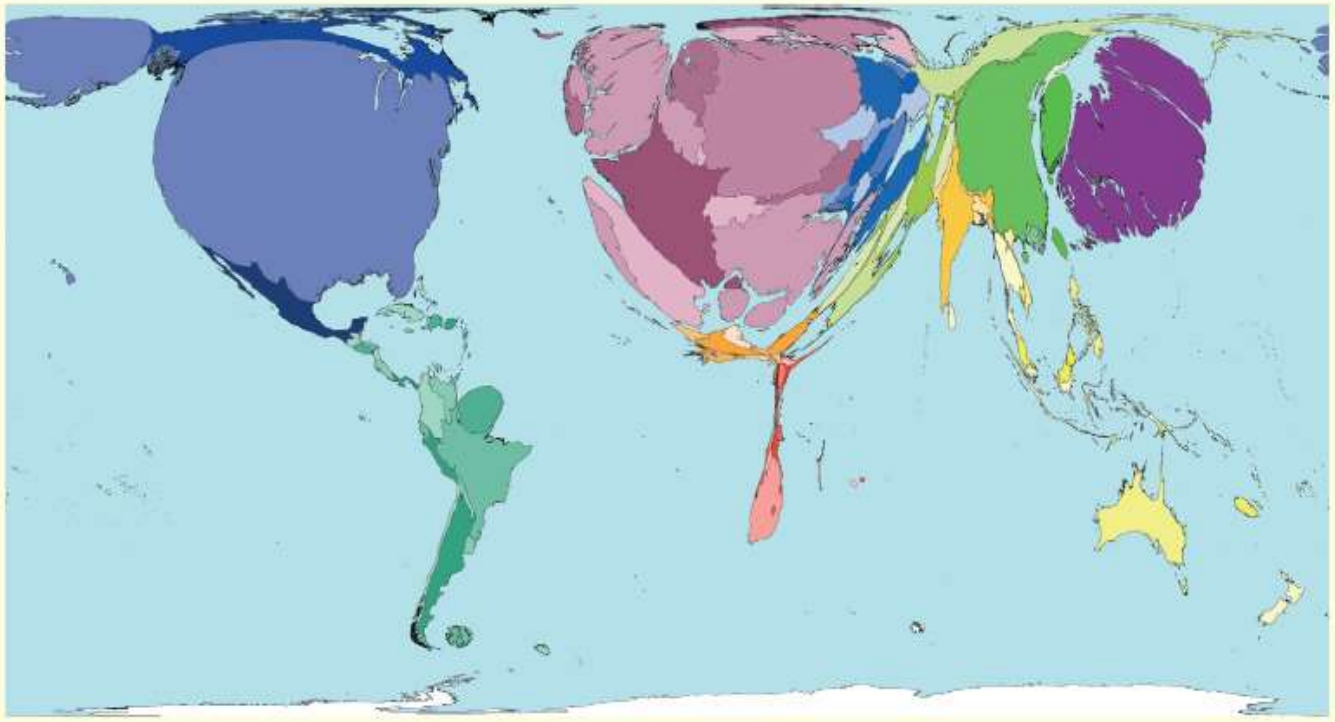


"I have come to the conclusion that HIV/AIDS is not entirely about death. People die and will continue to die for one reason or the other. AIDS is also about the living."

Kiiza Ngonzi, 2004

Public Health Spending

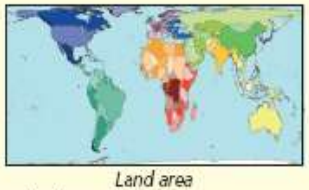
The University Of Sheffield. The Leverhulme Trust. Geographical Association
Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



Public health spending is all government spending on health care, plus money from grants, social insurance and non-governmental organisations. Public health spending reduces, or even eliminates, the direct cost of health care to an individual.

The highest public health care spending per person is in the regions of Western Europe, North America and Japan. Luxembourg, Norway and Iceland are the territories with the highest per person spending. As this map of spending is adjusted for purchasing power parity, the size of a territory compares more directly what can actually be funded by this spending. However costs will still vary.

Territory size shows the proportion of worldwide spending on public health services that is spent there. This spending is measured in purchasing power parity.



Land area

Technical notes

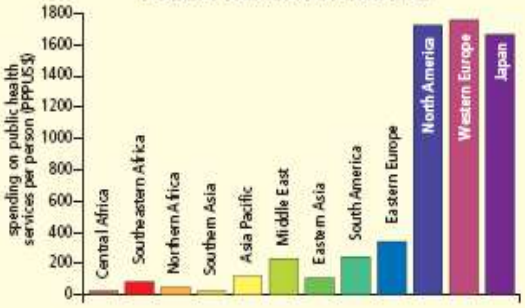
- Data are from the United Nations Development Programme, 2004, Human Development Report.
- Spending is measured in Purchasing Power Parity (PPP) US$. One dollar refers to the purchasing power equivalent of $1 in the United States.
- See website for further information.

MOST AND LEAST PUBLIC HEALTH SPENDING

Rank	Territory	Value	Rank	Territory	Value
1	Luxembourg	3304	191	Burundi	13
2	Norway	2525	192	Sudan	13
3	Iceland	2261	193	United Republic of Tanzania	12
4	United States	2217	194	Niger	11
5	Germany	2195	195	Ethiopia	11
6	Denmark	2166	196	Tajikistan	10
7	Canada	2005	197	Democratic Republic Congo	10
8	France	1965	198	Madagascar	10
9	Sweden	1954	199	Nigeria	7
10	Switzerland	1891	200	Myanmar	4

*spending in 2001 on public health services per person US$ purchasing power parity**

PUBLIC HEALTH SPENDING

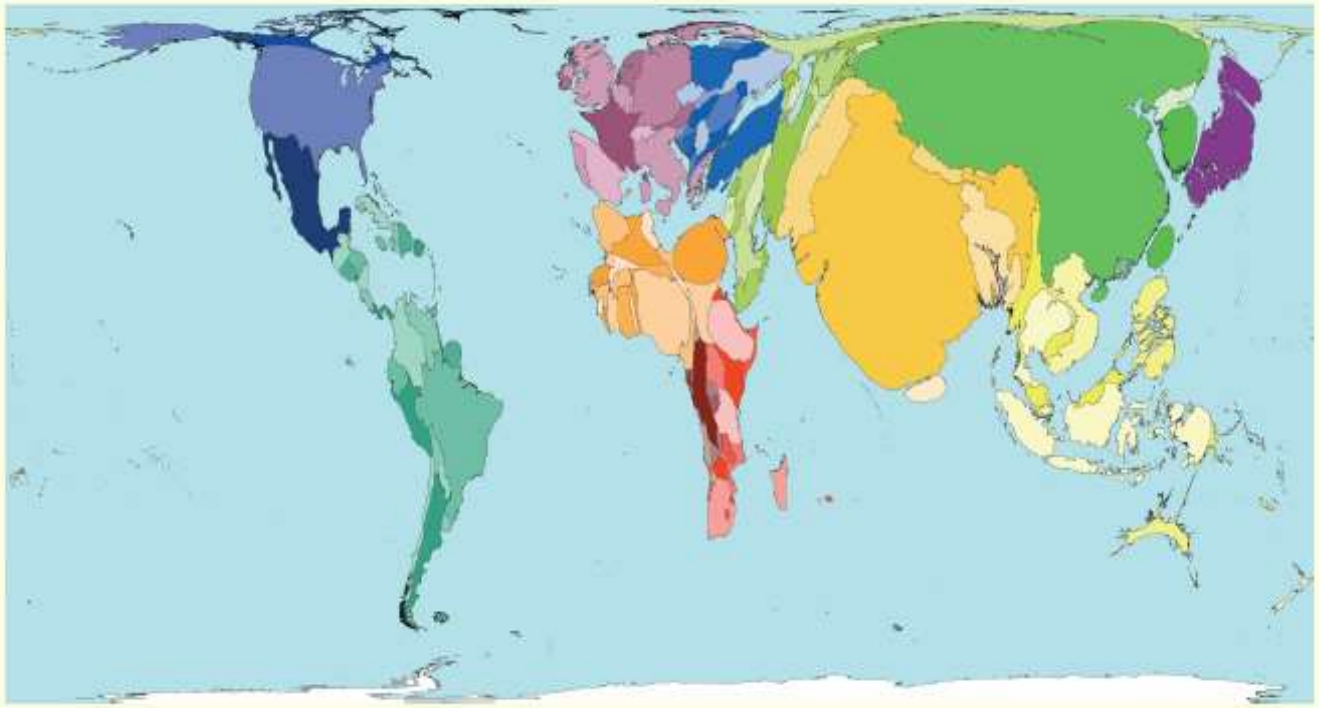


"...I brought my little girl to the health center in my district in the south of Bujumbura. But the nurse wouldn't see us as I didn't have any money to pay for the consultation."

Simeon, 2004

Life Expectancy

Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



This map shows the total years of life expected to be lived by the current population, based on the life expectancy of children born in 2002. Life expectancy is calculated on the assumption that prevailing trends will continue. It is usually different for men and women. As you get older your whole life expectancy increases from that at your birth because you have survived so far.

The longest life expectancy at birth is in Japan, at 81 years 6 months. The shortest life expectancy is in Zambia, at 32 years 8 months. The world average life expectancy is 67 years.

Territory size shows the proportion of all the years expected to be lived by the current populations based on the projected life expectancies at birth of those born there in 2002.

Land area

Technical notes

- Data are from the United Nations Development Programme's 2004 Human Development Report.
- See website for further information.

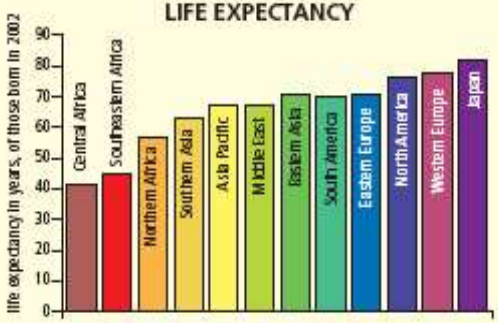
LONGEST AND SHORTEST LIFE EXPECTANCY

Rank	Territory	Value
1	Japan	81.5
2	Monaco	81.2
3	San Marino	80.6
4	Andorra	80.3
5	Sweden	80.0
6	Hong Kong (China)	79.9
7	Iceland	79.7
8	Canada	79.3
9	Spain	79.2
10	Australia	79.1

Rank	Territory	Value
191	Angola	40.1
192	Central African Republic	39.8
193	Rwanda	38.9
194	Mozambique	38.5
195	Malawi	37.8
196	Lesotho	36.3
197	Swaziland	35.7
198	Sierra Leone	34.3
199	Zimbabwe	33.9
200	Zambia	32.7

projected life expectancy at birth in years, for children born in 2002

LIFE EXPECTANCY



"The adult mortality rate [in Zambia] has increased in the last decade ... an adult has lost about 11 years of survival due to the AIDS problem ..."

Buleti Nsemukila, 2003

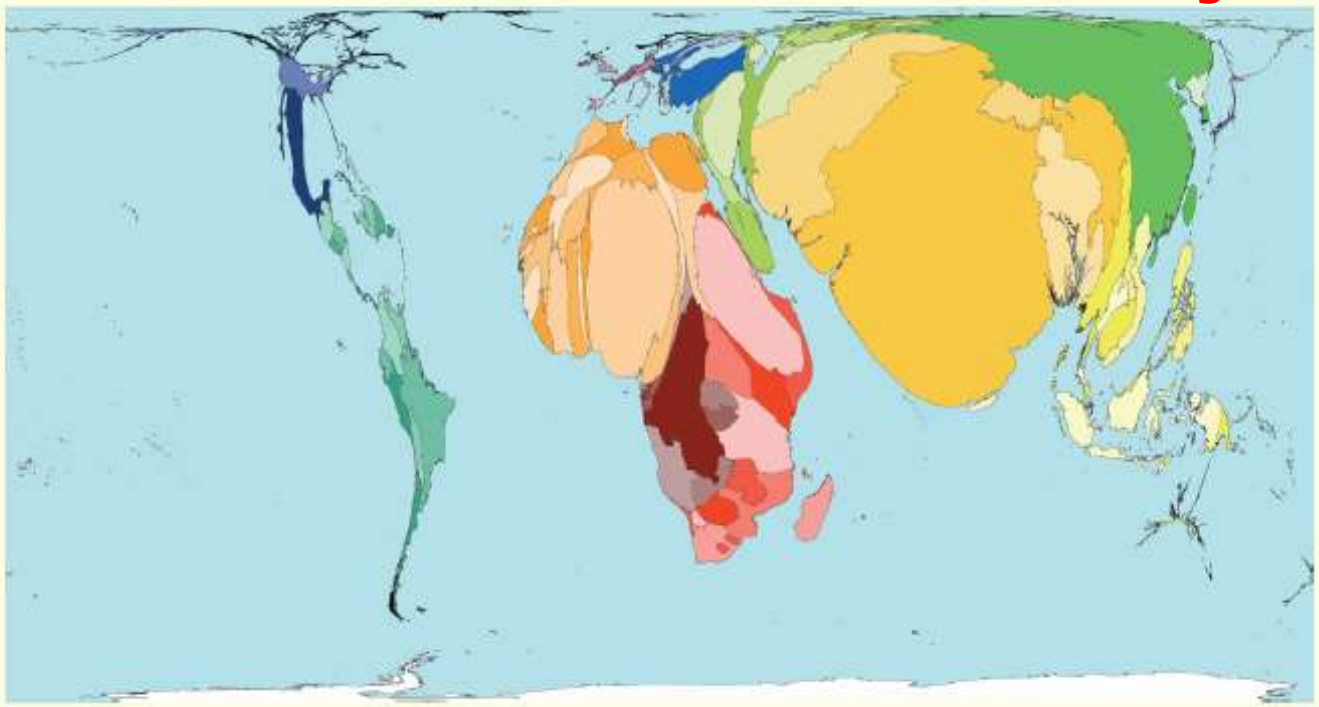
>90% Fail in the First 5 years

95% of all medical equipment in resource-limited settings are donated

Source: Malkin, R. Design of Health Care Technologies in the Developing World. Annu. Rev. Biomed. Eng. 2007.

Early stage Mortality of health technologies

Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



An early neo-natal death is when a child dies during the first week of his or her life. In 2000 there were 3 million such deaths. Worldwide, 2.3% of children that were born alive died during the following week.

The rate of deaths in the first week of life ranges from 1 in a thousand in Japan, to 1 in 20 in Mauritania.

According to the World Health Organisation, worldwide the three main causes of neo-natal deaths are asphyxia at birth; low birth weight including prematurity; and infections. Access to healthcare can reduce these deaths.

Territory size shows the proportion of early neo-natal deaths worldwide, that occurred there in 2000. Early neo-natal deaths are those deaths within the first week of life.

Land area

Technical notes

- Data are from the World Health Organisation's 2005 World Health Report.
- *14 territories reported 2 early neo-natal deaths per 1000 live births (Austria, Norway, Finland, Iceland, Monaco and San Marino are not shown); 4 reported 38 deaths per 1000 births (Ethiopia, Guinea and the Central African Republic are not shown). Those with the most births are shown.
- See website for further information.

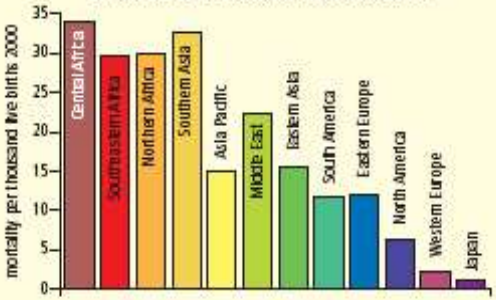
HIGHEST AND LOWEST EARLY NEO-NATAL MORTALITY RATES

Rank	Territory	Value
1	Mauritania	52
2	Liberia	48
3	Iraq	46
4	Afghanistan	45
5	Cote d'Ivoire	44
6	Sierra Leone	42
7	Nigeria	40
7	Mali	40
7	Angola	40
10	Pakistan	38

Rank	Territory	Value
185	France	2
185	Germany	2
185	Republic of Korea	2
185	Italy	2
185	Spain	2
185	Belgium	2
185	Sweden	2
185	Czech Republic	2
199	Singapore	1
199	Japan	1

*deaths in the first week of life per thousand live births 2000**

EARLY NEO-NATAL MORTALITY

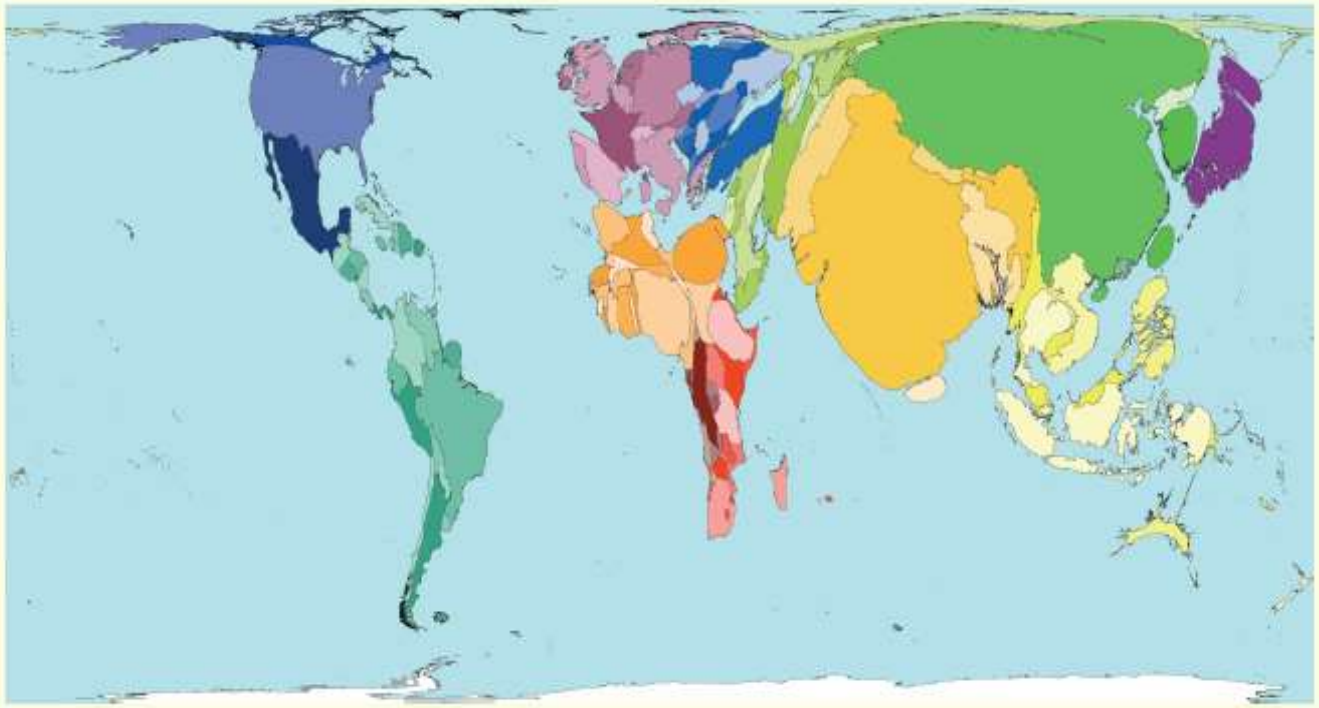


"We must count newborn deaths and make them count, instead of accepting these deaths as inevitable."

Francisco Songane, 2006

Life Expectancy of health technologies

Produced by the SASI group (Sheffield) and Mark Newman (Michigan)



This map shows the total years of life expected to be lived by the current population, based on the life expectancy of children born in 2002. Life expectancy is calculated on the assumption that prevailing trends will continue. It is usually different for men and women. As you get older your whole life expectancy increases from that at your birth because you have survived so far.

The longest life expectancy at birth is in Japan, at 81 years 6 months. The shortest life expectancy is in Zambia, at 32 years 8 months. The world average life expectancy is 67 years.

Territory size shows the proportion of all the years expected to be lived by the current populations based on the projected life expectancies at birth of those born there in 2002.

Land area

Technical notes

- Data are from the United Nations Development Programme's 2004 Human Development Report.
- See website for further information.

LONGEST AND SHORTEST LIFE EXPECTANCY

Rank	Territory	Value
1	Japan	81.5
2	Monaco	81.2
3	San Marino	80.6
4	Andorra	80.3
5	Sweden	80.0
6	Hong Kong (China)	79.9
7	Iceland	79.7
8	Canada	79.3
9	Spain	79.2
10	Australia	79.1

Rank	Territory	Value
191	Angola	40.1
192	Central African Republic	39.8
193	Rwanda	38.9
194	Mozambique	38.5
195	Malawi	37.8
196	Lesotho	36.3
197	Swaziland	35.7
198	Sierra Leone	34.3
199	Zimbabwe	33.9
200	Zambia	32.7

projected life expectancy at birth in years, for children born in 2002

LIFE EXPECTANCY

"The adult mortality rate [in Zambia] has increased in the last decade ... an adult has lost about 11 years of survival due to the AIDS problem ..."

Buleti Nsemukila, 2003

Performance Indicators

AGGREGATED PARAMETERS: \ HOSPITAL:	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	Total / *Avg.*
No. of Devices Audited	583	32	89	320	876	241	1,538	236	1,199	1,137	622	692	7,565
No. of Generic Device Types	97	12	17	86	128	61	185	73	88	133	95	100	*90*
% of Devices in New or Good Condition (COND)	*74	63	71	77	66	58	72	76	35	70	56	50	*64*
% of Devices Fully Functional	*72	75	71	76	63	59	70	74	35	68	54	52	*64*
% of Devices NOT USED	*34	60	48	27	61	55	34	29	71	44	55	65	*49*
% of Devices in GOOD COND & FULL FUNC but NOT USED	*15	22	22	8	21	19	10	8	11	18	12	18	*16*
% of Devices Partly Functional	*13	3	2	10	12	8	8	8	9	9	13	5	*8*
% of Devices Waiting for Repair	*9	22	19	8	16	17	16	11	51	13	14	41	*20*

Required Capital Funding to Retain Estate

Buildings		Estate 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
Total Buildings	**R 138 460**		**R 9 692**	**R 3 320**	**(R 6 372)**	Current platform acceptable
Equipment						
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
Total Equipment	**R 41 540**		**R 5 263**	**R 2 146**	**(R 3 117)**	Current platform acceptable
Total all Capital	**R 180 000**		**R 14 955**	**R 5 466**	**(R 9 489)**	

All figures Rm; 2007 base

Tackling wastage and inefficiency in the health sector

Problems are not new

David Parker & William Newbrander

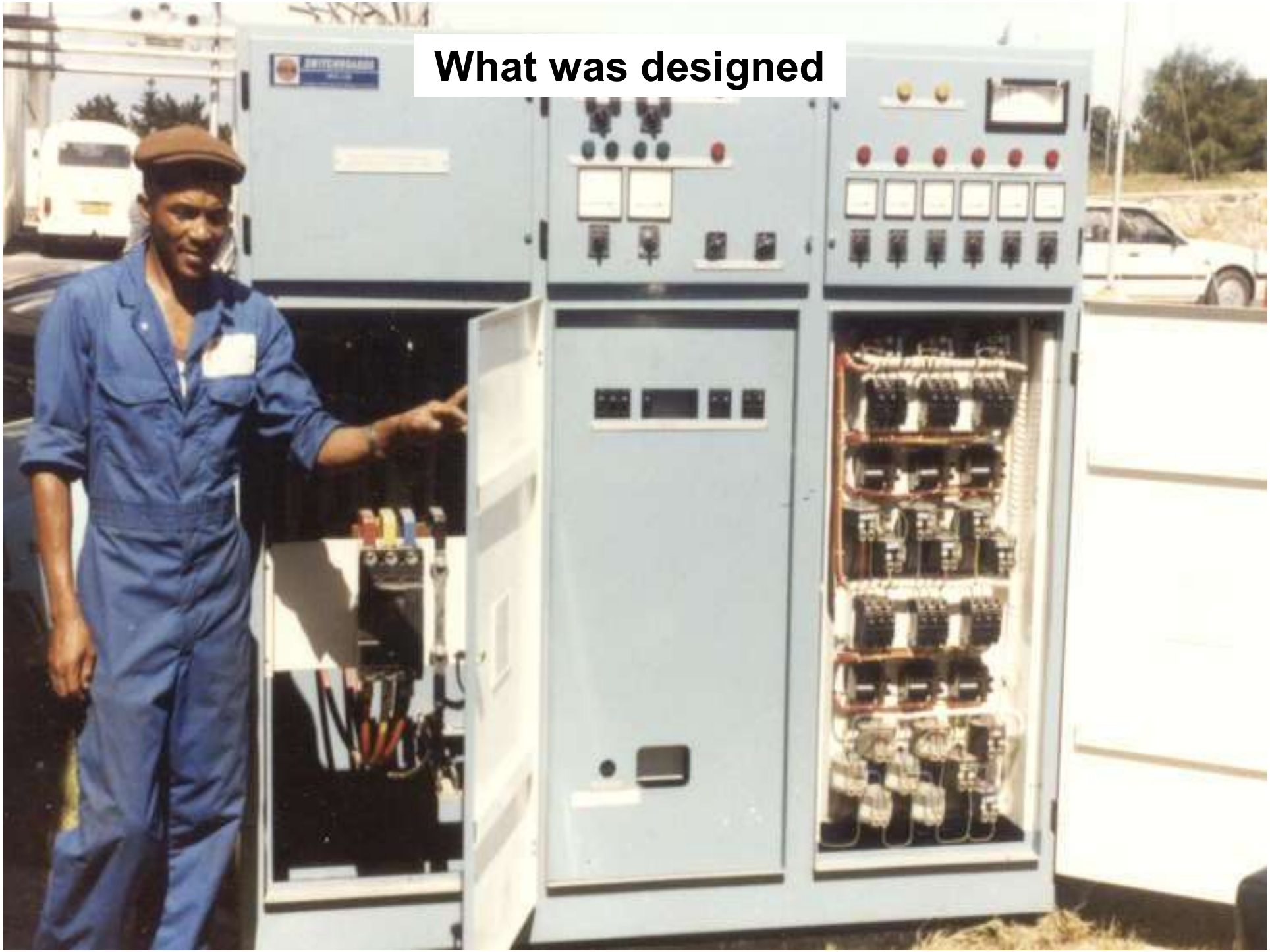
Governments and the public are concerned ab… …cy in the health sector. Although th… causes, wastag… …

"Raising sufficient money for health is imperative, but just having the money will not ensure universal coverage. Nor will removing financial barriers to access through prepayment and pooling. The final requirement is to ***ensure resources are used efficiently****."*

WHR 2010: HEALTH SYSTEMS FINANCING - The path to universal coverage

…ource health …d actively combat wastage …, and then make corresponding changes in …anagement and technical procedures.

Round Table - World Health Forum, Vol. 15 (1994)


What was designed

What we needed

Integrated Resource Management

Health Workers

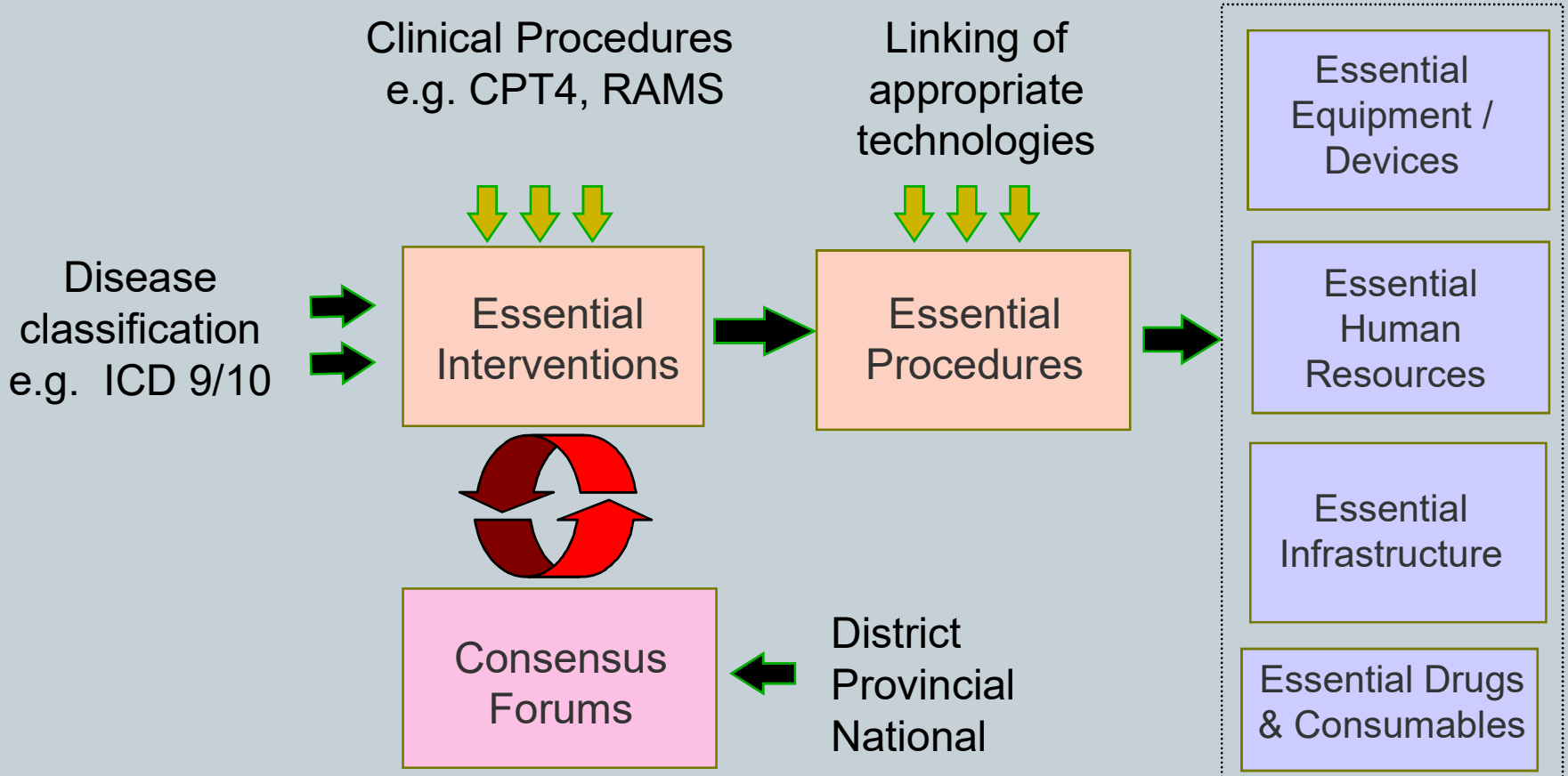
Medical Devices
& Disposables

INTERVENTION

Infrastructure

Drugs

Integrated Healthcare Resource Package



Healthcare Technology Management

HTM defined as "…optimising the acquisition and utilisation of healthcare technologies to achieve *maximum* beneficial impact on health outcomes."

[Rakich et al]

(Physical) Asset Management

The process of guiding the acquisition, use, safeguarding and disposal of assets to make the most of their service delivery potential and manage the related risks and costs over their entire life.

Asset Management Guide
NATIONAL TREASURY (South Africa)

HTM = Applied AM!

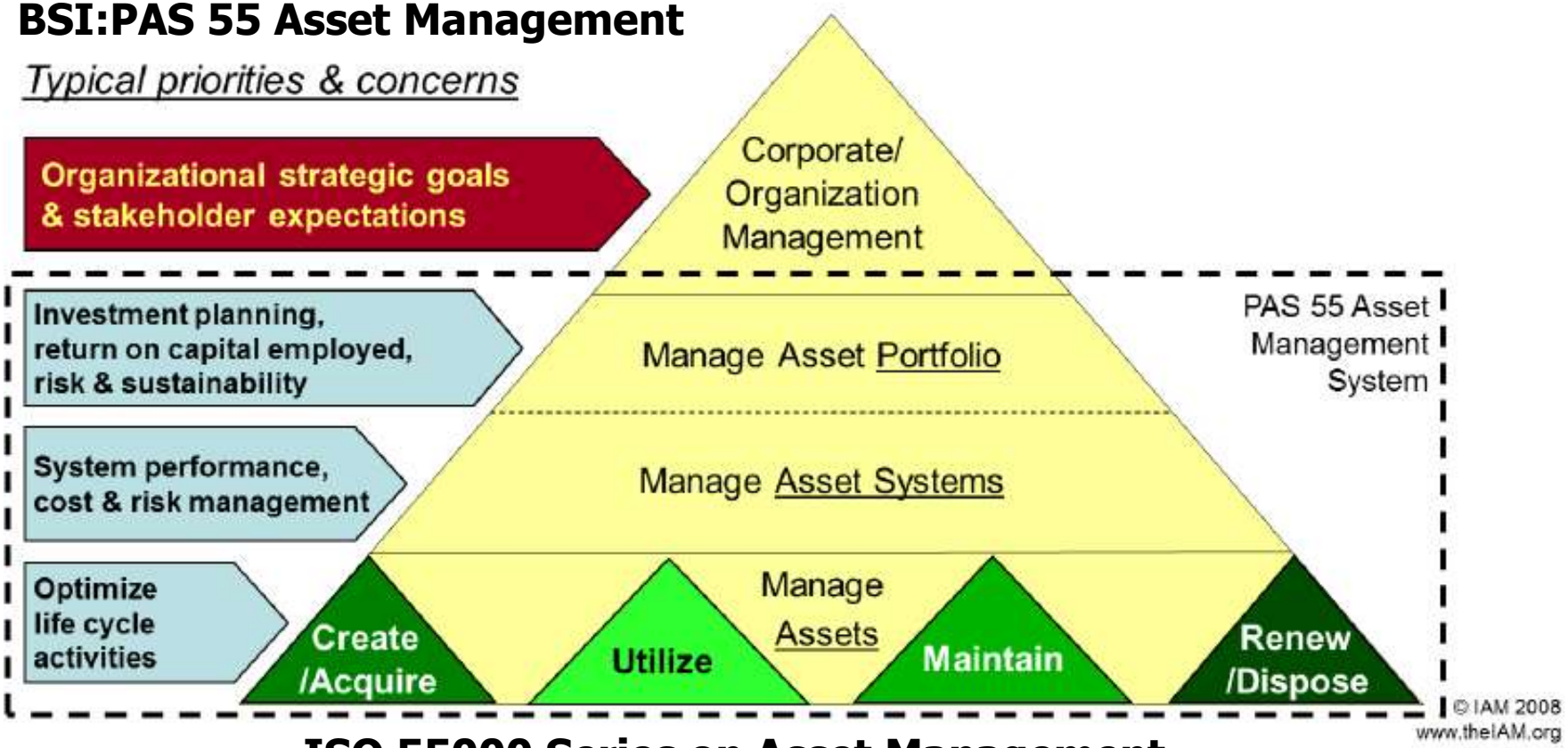
What is Asset Management?

Asset Management is the process of guiding the acquisition, use, safeguarding and disposal of assets to make the most of their service delivery potential and manage the related risks and costs over their entire life.

Asset Management Guide
NATIONAL TREASURY

Engineering Asset Management

BSI:PAS 55 Asset Management



ISO 55000 Series on Asset Management

HTM = Applied EAM!

Asset Management

The ISO 55000 series of Asset Management standards, similarly, comprise the following:

- ISO 55000:2014 (overview and standard terms and definitions)
- ISO 55001:2014 (requirements specification for an integrated and effective asset management system)
- ISO 55002:2018 (guidance for implementation of such a system).

Two other international standards that have bearing on this section are:

- ISO 14001:2015 Environmental Management Systems (part of the ISO 14000 series)
- ISO 45001:2018 Occupational Health and Safety Management Systems

Facility Management

- EN 15221 defines *facility management* (also referred to as "Facilities Management") broadly as "*the integration of processes within an organization to maintain and develop the agreed services, which support and improve the effectiveness of its primary activities*".
- An essential component of the enabling environment for effective and safe healthcare delivery in health facilities (Cram, 2004).
- Facility management (FM) services are usefully considered to fall into one of two categories:
  - '**hard**' services refer to management and maintenance of HIT
  - '**soft**' services include catering, cleaning, waste management (both general & healthcare risk waste), security, linen and laundry services, pest control and landscaping.

Facility Management

- The ISO 41000 standards series on Facility Management comprise the following:
- ISO 41001:2018 Facilities management systems
- ISO 41011:2017 Facility management - Vocabulary
- ISO 41012:2017 Facility management — Guidance on strategic sourcing and the development of agreements
- ISO 41013:2017 Facility management — Scope, key concepts and benefits.

Health(care) System Performance

- **Coverage**: probability of receiving an effective health-related intervention when needed
- **Effective coverage**: ratio of actual health gain from health-related interventions to maximum potential health gain achievable from the same interventions.

Elements: **access** (availability, accessibility, affordability and acceptability), **utilisation**, and **effectiveness**.

WHR 2000 (WHO): Measuring Health Systems Performance

Comprehensive Primary Health Care

Delivery

Principles

- Equity & human rights
- Bio-psycho-social-cultural sensitivity
- Evidence-based practice
- Health promotion
- Multidisciplinary care
- Appropriate referral
- Intersectoral collaboration
- Community participation
- Regular evaluation

Continuum of Care

Promotion

Prevention

Cure

Rehabilitation

Palliation

Levels of Care

REFERRAL SYSTEM

Tertiary Level

↓ ↑

Secondary Level

↓ ↑

Primary Level

↓ ↑

"Family"/ Community

UHC/UHA

Adapted from:
M.Alperstein 2000

Elements of Essential Health Care

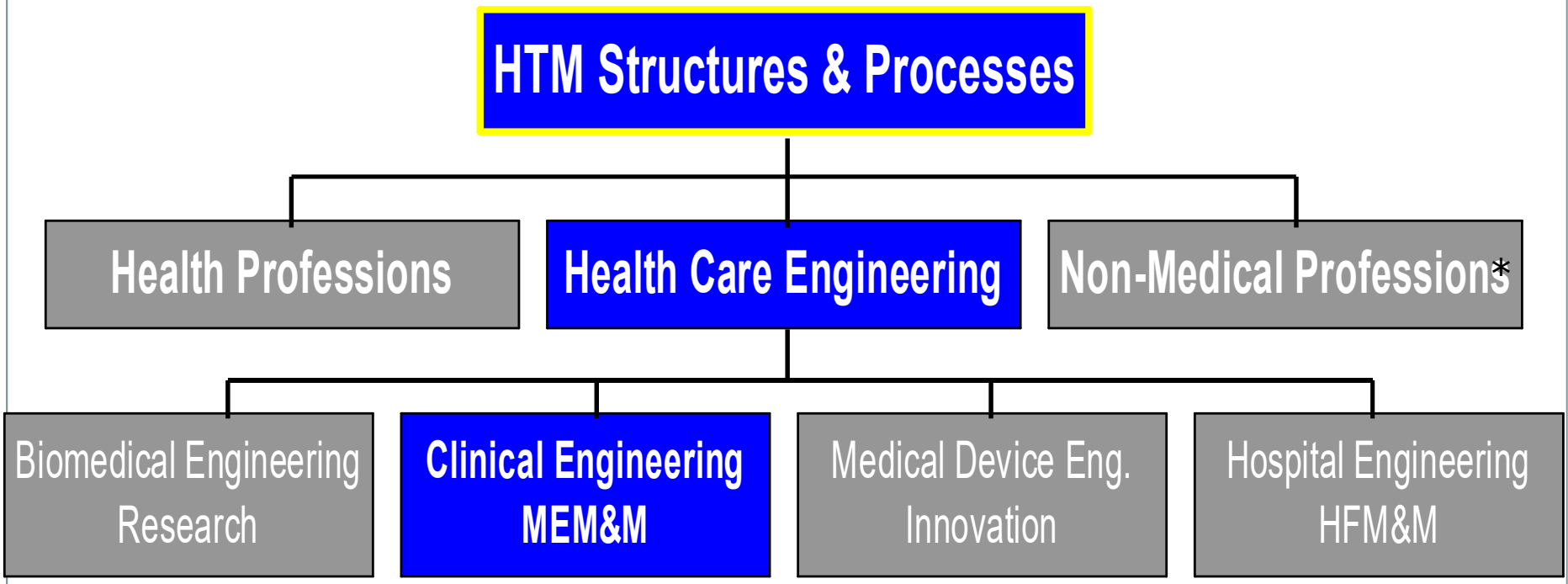
Alma-Ata Declaration, Article VII

PHC includes at least:

- health promotion;
- prevention and control of locally endemic disease;
- promotion of food supply and adequate nutrition;
- safe water and basic sanitation;
- maternal & child healthcare, incl. family planning;
- immunisation;
- appropriate treatment of common diseases & injuries, and
- provision of essential drugs

(WHO, UNICEF 1978)

AIM HIT - Role of Healthcare Engineering



* **Medical Physicists, Clinical Technologists/Technicians, Radiographers, etc.**

A **Clinical engineer** is "a professional who supports and advances patient care by applying engineering and managerial skills to healthcare technology". [ACCE]

Staffing

Provincial health department - Maintenance

R16,5bn estate

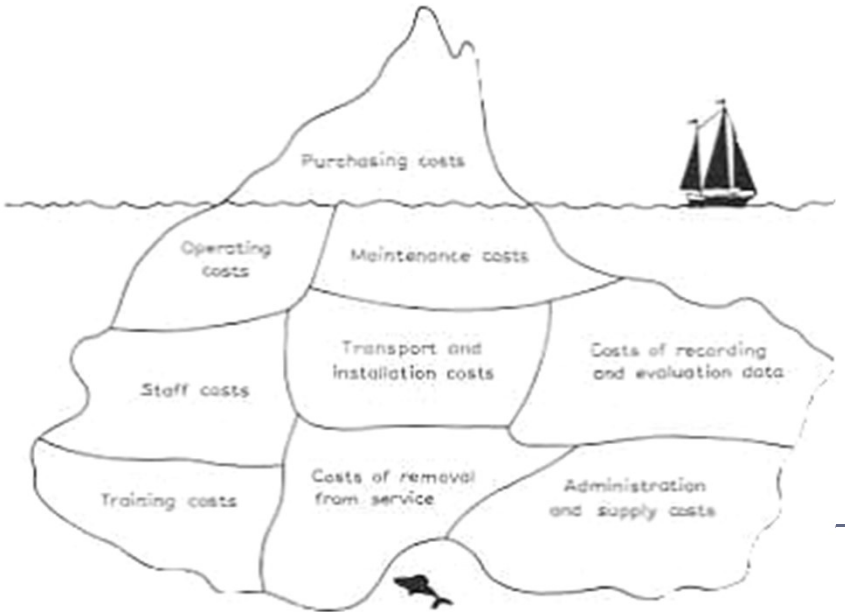
59 hospitals, 291 PHC, 75 other facilities

10 021 beds

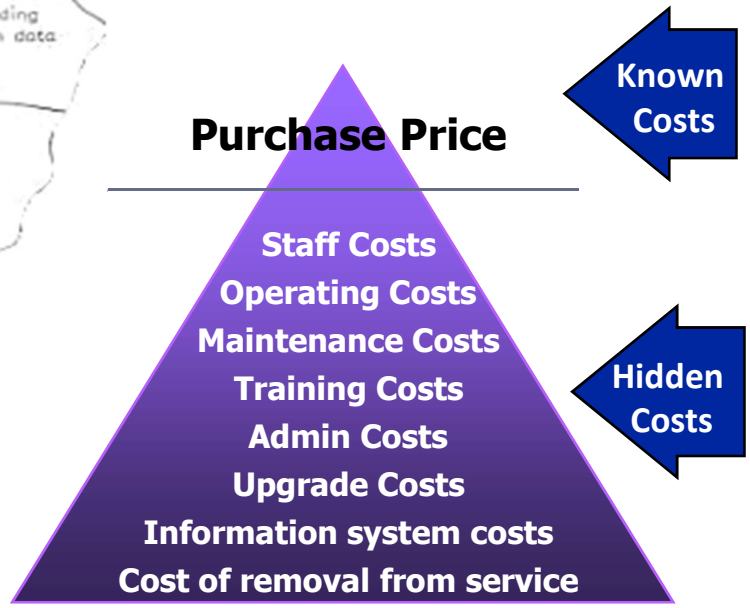
	Filled	Vacant	**Total**	% vacant
Management	4	2	**6**	33%
Engineers	3	8	**11**	73%
Technical (indust)	50	20	**70**	29%
Artisans	164	86	**250**	34%
Tradesmen	125	49	**174**	28%
Handymen	107	50	**157**	32%
Groundsmen	12	2	**14**	14%
Other	18	2	**20**	10%
Total	**479**	**217**	**696**	**31%**

Life-cycle Cost / Total Cost of Ownership

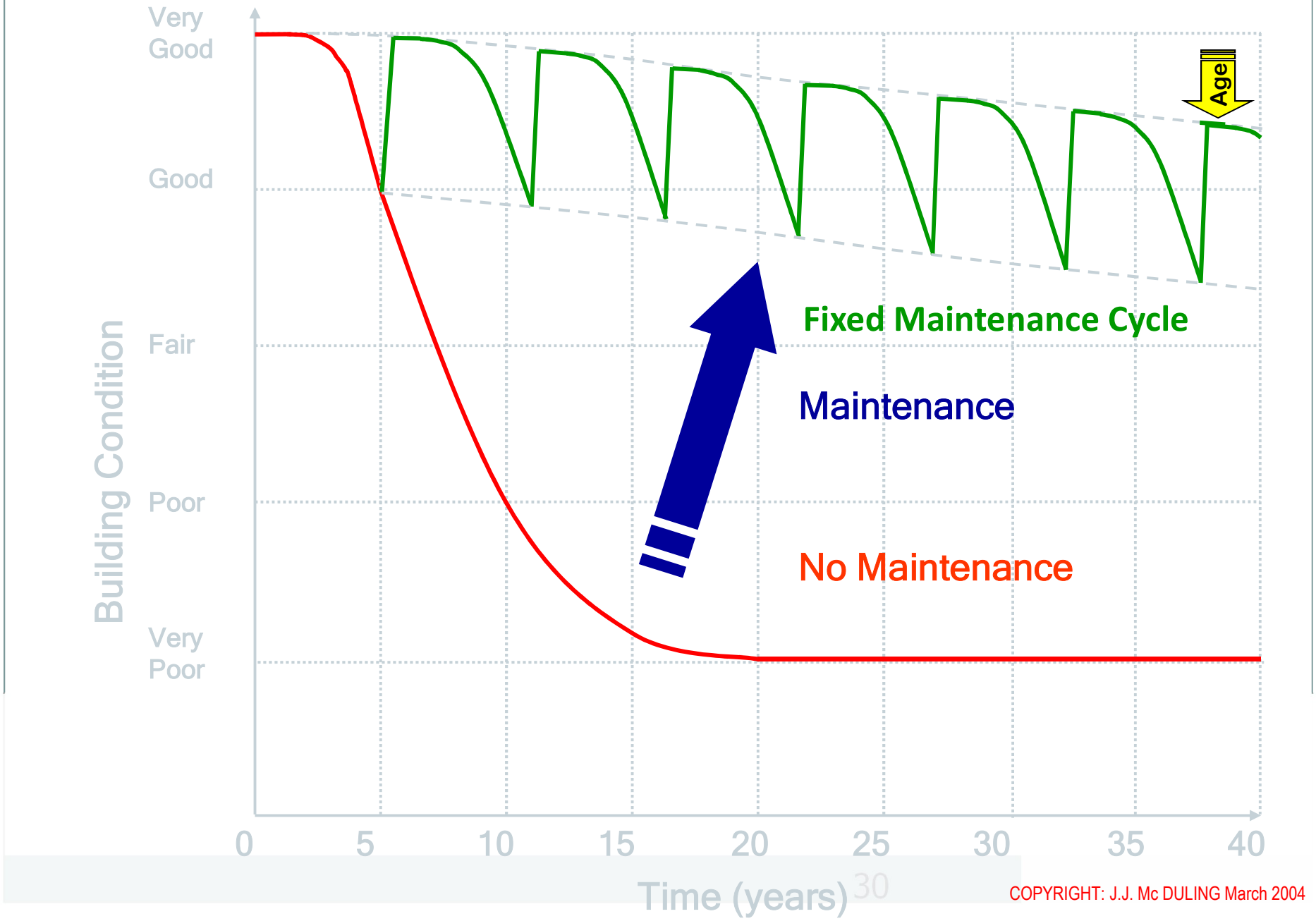
Iceberg Model



Blanchard, WHO, ...



Condition Based Maintenance



Systemic Inefficiencies - IV

No Maintenance

Asset Condition

Very Good
Good
Fair
Poor
Very Poor

0 5 10 15 20 25 30 35 40

Time (years)

Asset Management (NHS Scotland)

Exhibit 3

Effective asset management

Good practice suggests that there are three key questions that NHS bodies need to be able to answer if they are to manage their assets effectively.

- What is the current position? NHS bodies should establish a baseline position that identifies their current assets and how well these are contributing to supporting service delivery. For example, what condition the assets are in and how suitable they are.
- What are the plans for healthcare in the future and what assets are needed to support current and future service needs?
- Is there a strategy that outlines how the NHS body will move from its current position to its future position? This means developing an action plan that covers future asset acquisitions, disposals and maintenance.[7]

Source: Adapted from *Towards Better Management of Public Sector Assets*, Sir Michael Lyon, 2004

Asset Management (NHS Scotland)

Exhibit 8

The role of asset strategies within the wider organisation

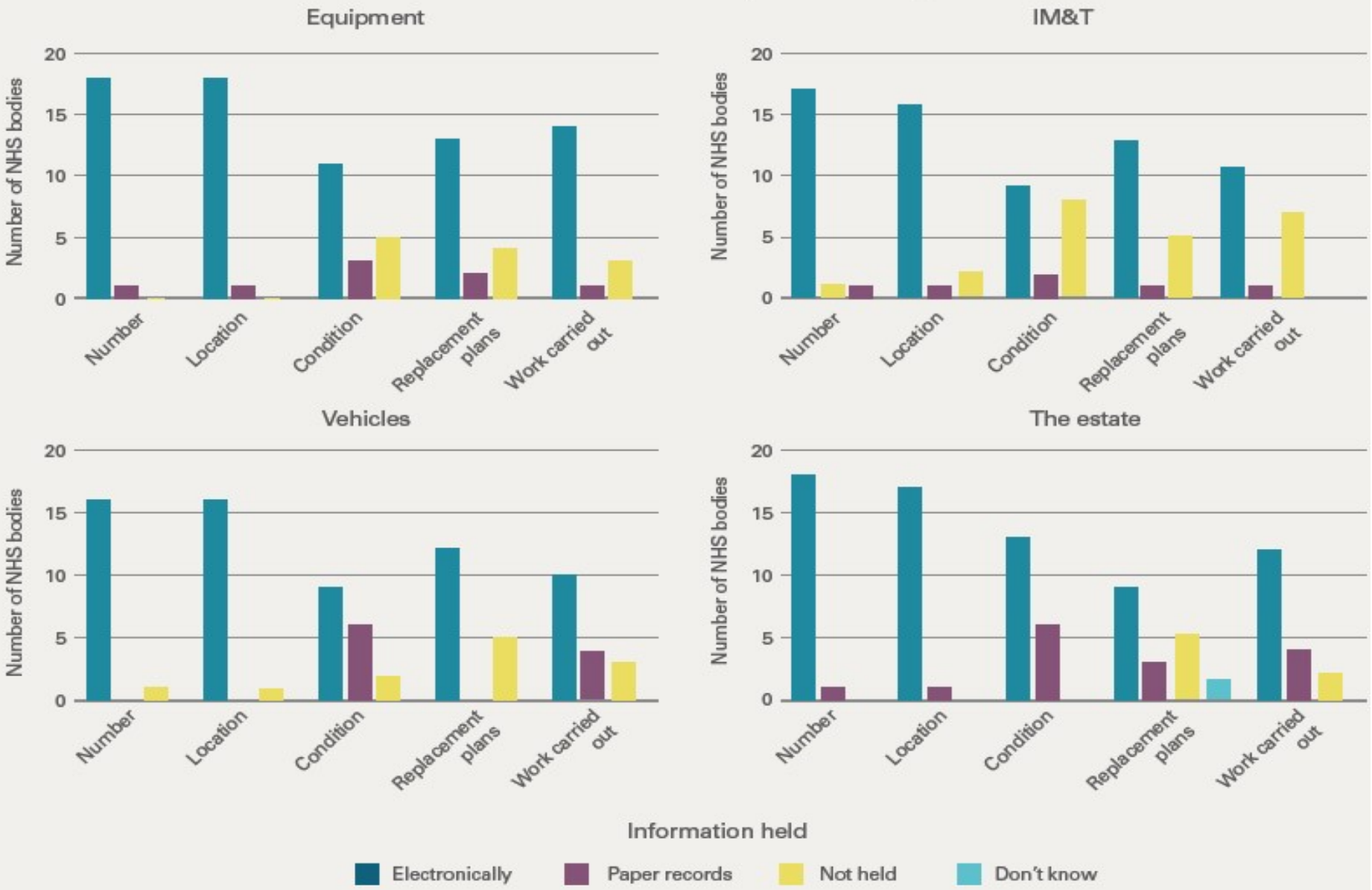
Asset strategies should link directly to corporate aims and objectives.

Source: Audit Scotland adapted from *Introductory Guide to Asset Management*, CIPFA

Exhibit 10

Asset information arrangements

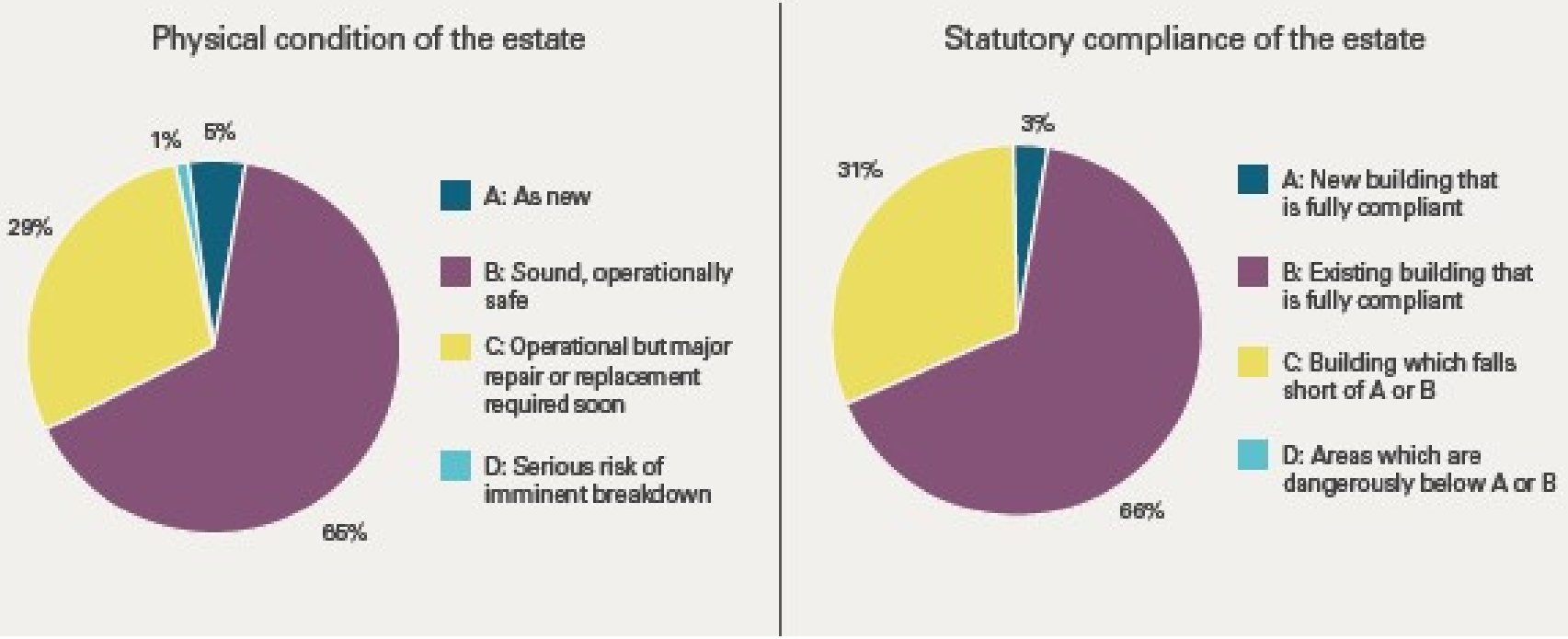
Most NHS bodies hold basic information on assets but not all keep it electronically.



Asset Management (NHS Scotland)

Exhibit 14
The quality of the essential estate 2008[37]

A partial picture shows that the majority of the estate is of satisfactory quality.



Inadequate airflow &

Courtesy of V Lipke

Connecting the Dots

- "It is not enough to:
  - build health clinics if there are no roads for mothers to gain access to them
  - train teachers or provide textbooks if children have to struggle with homework at night in the dark.
- People do not live their lives in health sectors, education sectors or infrastructure sectors, arranged in tidy compartments.
- People live in families, villages, communities, countries, where all the issues of everyday life merge.
- We need to connect the dots."

World Bank President Robert Zoellick (UN 2010 Summit)

Source: Armin H. Fidler. Connecting global health with other parts of development strategy. *In*: Creating a global health policy worthy of the name. Friends of Europe Development Policy Forum (DPF) discussion paper, 2010.

Health-related Infrastructure & Technology

(as part of the Health System)

Community Focus

Protection

Housing, STI control, security & policing, flood control,…

Prevention

Vaccination, sanitation/hygiene, waste management, sewerage disposal, airborne infection control ….

Promotion (Enabling)

Water, electricity, fuels, telecommunications, transport systems, roads, schools, parks ….

Preservation (Sustaining)

Nutrition, food production, green buildings, behaviour, culture, conservation ….

Environmental Health

Climate, pollution (outdoor/indoor), pesticides, weapons, toxic waste, ….

Occupational Health

Worker safety, legislative compliance, education, advocacy …

Individual Focus

Clinical Services

Medical Equipment/ Devices

Pharmaceuticals & Other Consumables

Clinical Procedures

eH, mH, community-/ home-based care

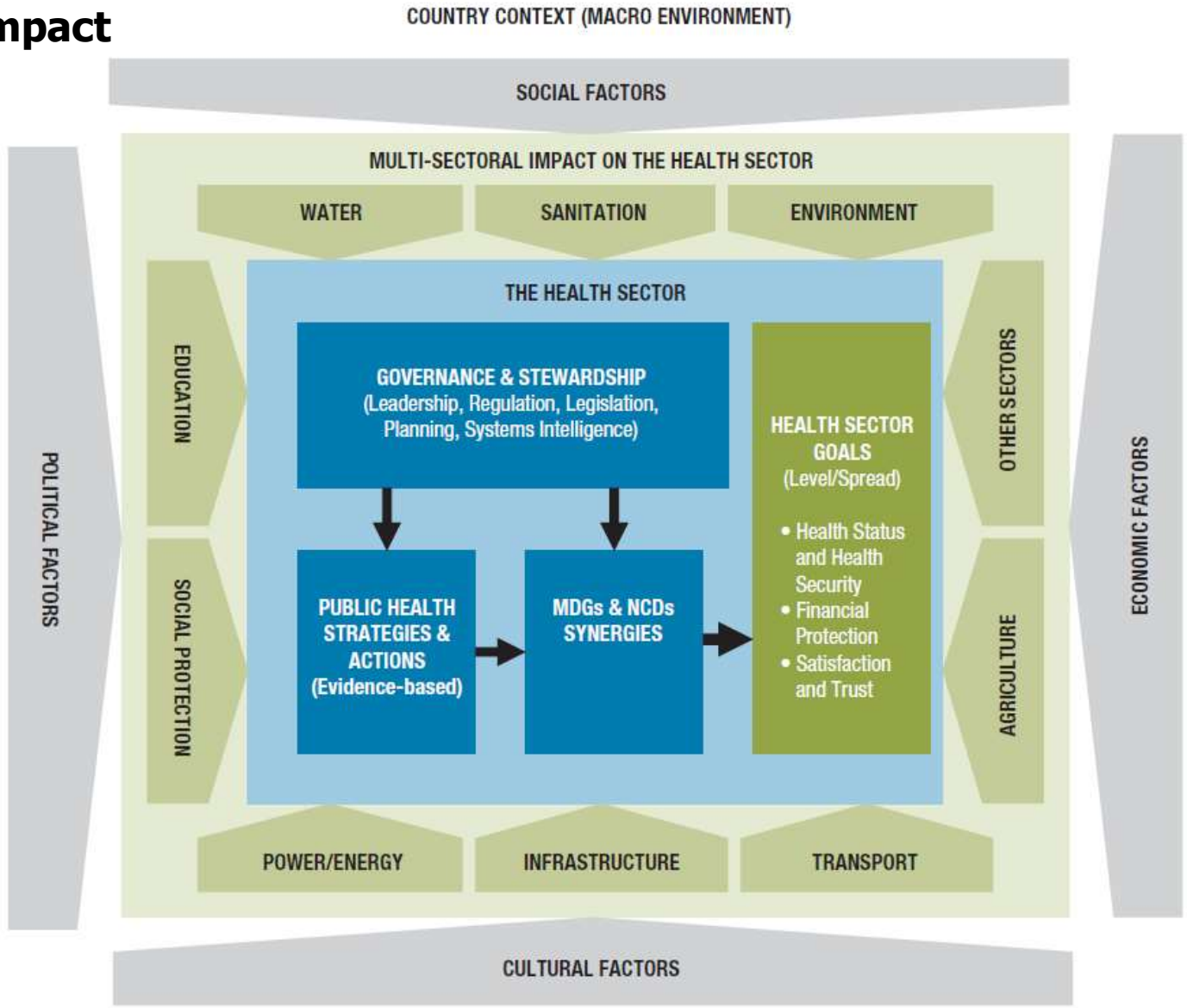
Supporting Services

ICTs

Facilities & Plant, Hospital Equipment, Emergency Vehicles

Organisational & Management Systems
(incl. logistics, SCM, waste management)

Multi-sectoral impact on health



Connecting Sectors and Systems for Health Results. World Bank Health Nutrition and Population Public Health Policy Note (2012)

Health(care) System Performance

- **Coverage**: probability of receiving an effective health-related intervention when needed
- **Effective coverage**: ratio of actual health gain from health-related interventions to maximum potential health gain achievable from the same interventions.

Elements: **access** (availability, accessibility, affordability and acceptability), **utilisation**, and **effectiveness**.

WHR 2000 (WHO): Measuring Health Systems Performance