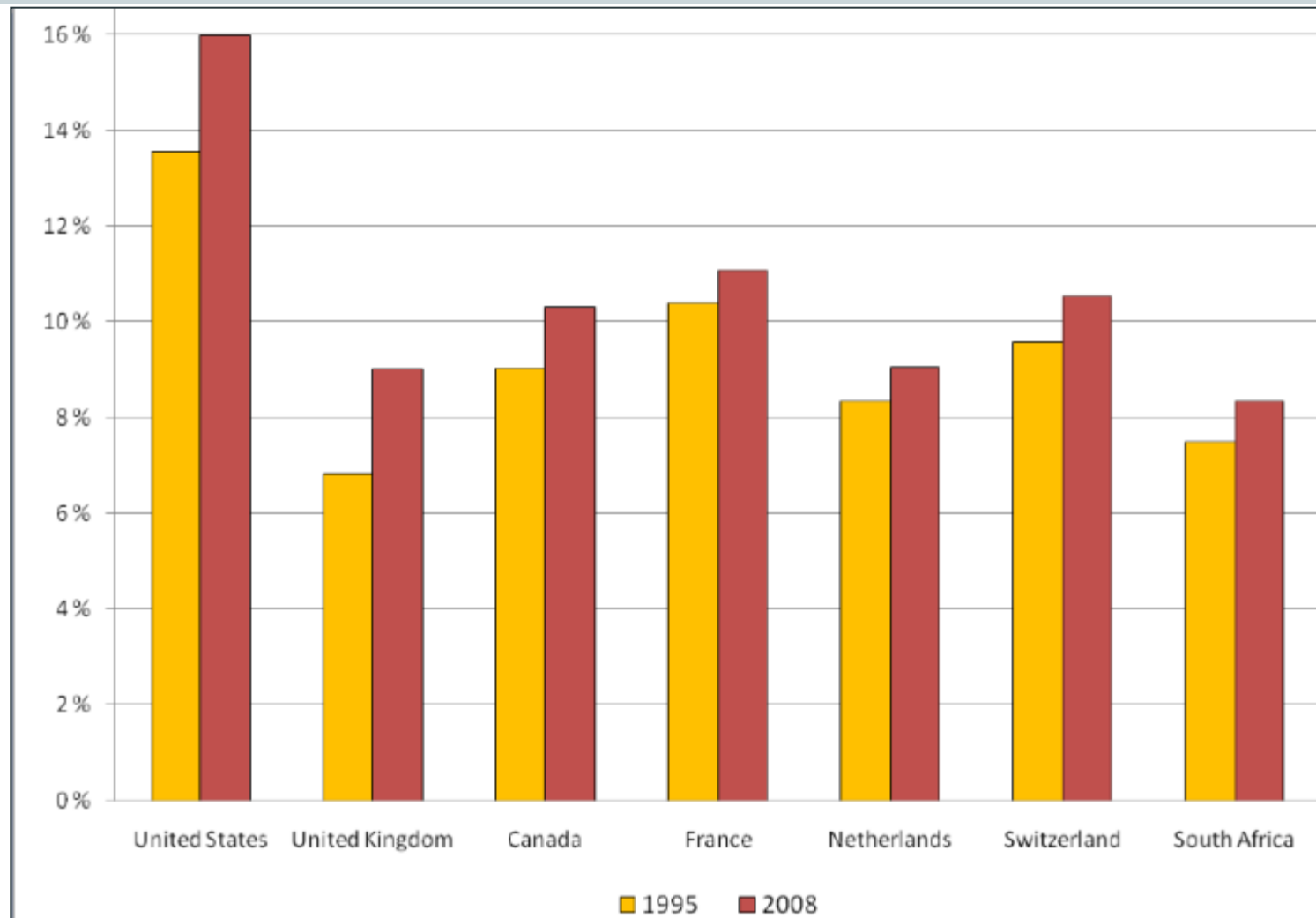


# **Medical Technology: The effect on the quality and cost of healthcare**





**By: James Herbert**

# Health expenditure as percentage of GDP







Source: WHO 2010

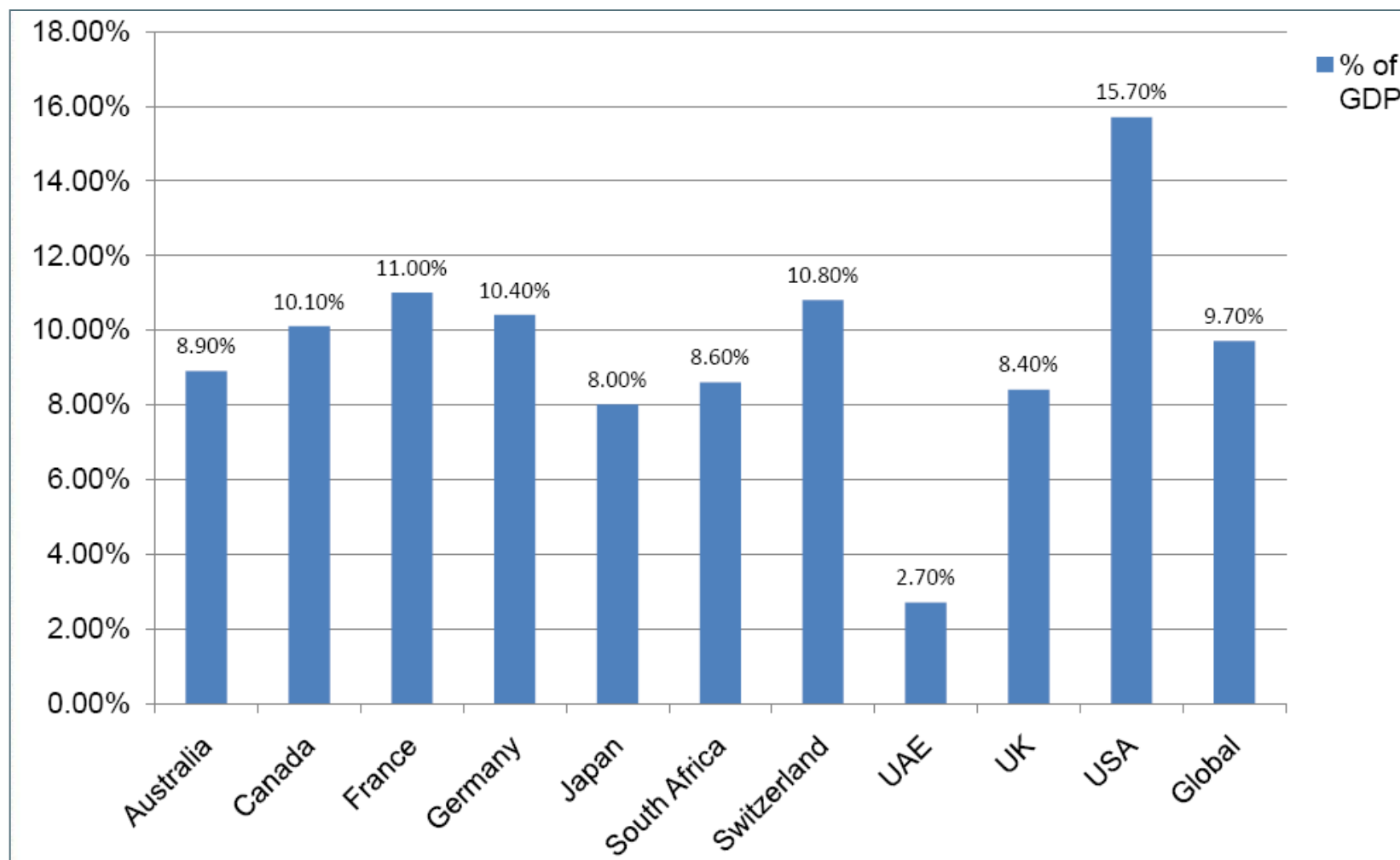
# International healthcare spend

				
	South Africa	Australia	U.K	U.S.A.
% of GDP on health	8.8%	8.8%	9.2%	15.3%
Per capita health expenditure	\$455	\$3,302	\$3,332	\$6,719
Beds per 1000 population	2.5	4.0	3.9	3.1
Nurses per 1000 population	3.3	9.7	12.8	9.4
Doctors per 1000 population	0.6	2.5	2.3	2.6





# Local healthcare spend

				
	South Africa	Brazil	Mexico	Thailand
% of GDP on health	8.8%	7.9%	6.6%	3.5%
Per capita health expenditure	\$455	\$463	\$527	\$114
Beds per 1000 population	2.5	2.6	1.6	2.2
Nurses per 1000 population	3.3	3.8	0.9	2.8
Doctors per 1000 population	0.6	1.2	2.0	0.4





# Health expenditure as percentage of GDP



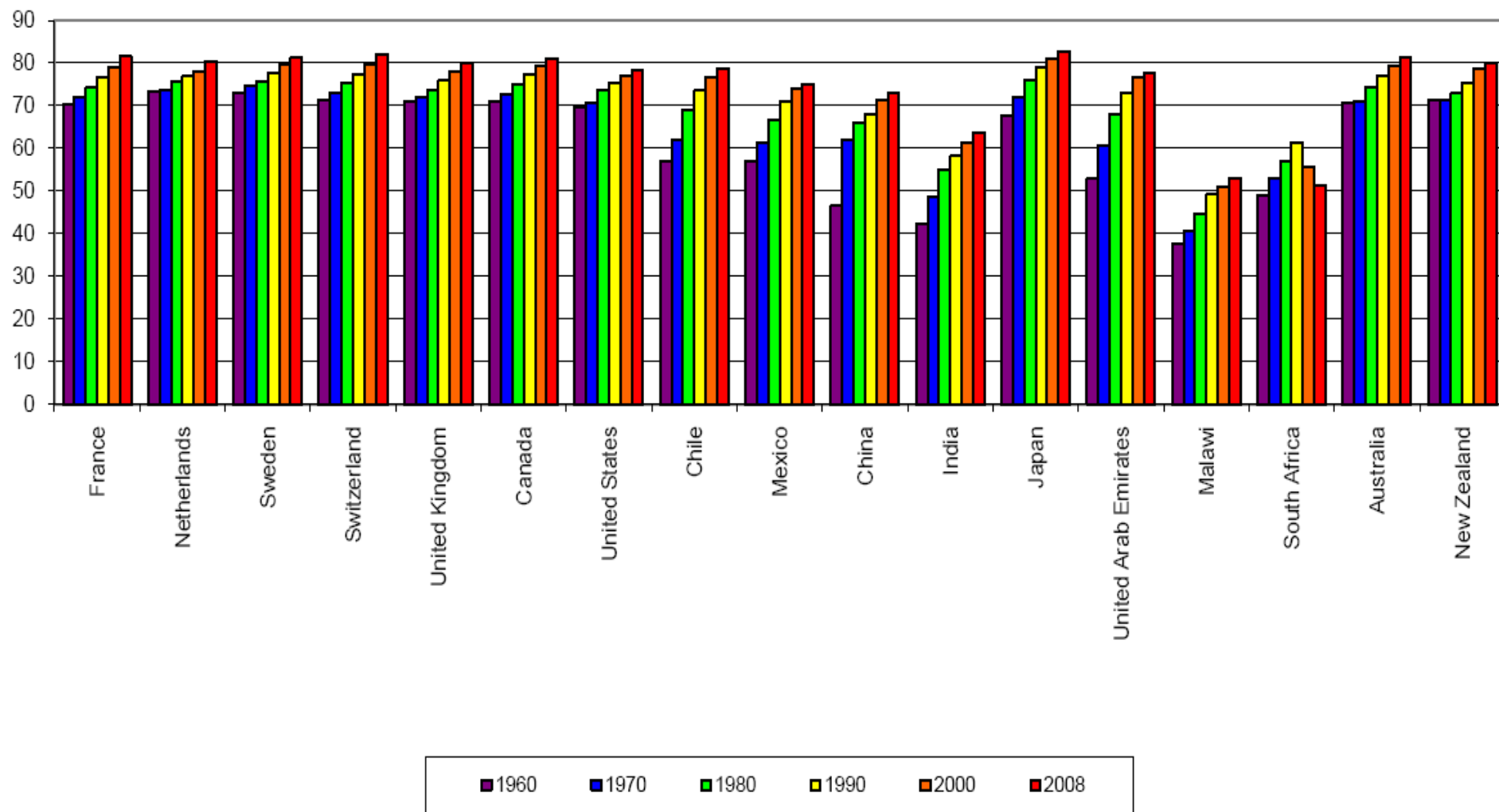
# Results not so good

				
	South Africa	Australia	U.K	U.S.A.
Life expectancy	54	82	80	78
Neonatal mortality rate	1.7%	0.3%	0.3%	0.4%

# Results not so good

				
	South Africa	Brazil	Mexico	Thailand
Life expectancy	54	73	76	70
Neonatal mortality rate	1.7%	1.3%	1.1%	0.9%

# Life expectancy at birth

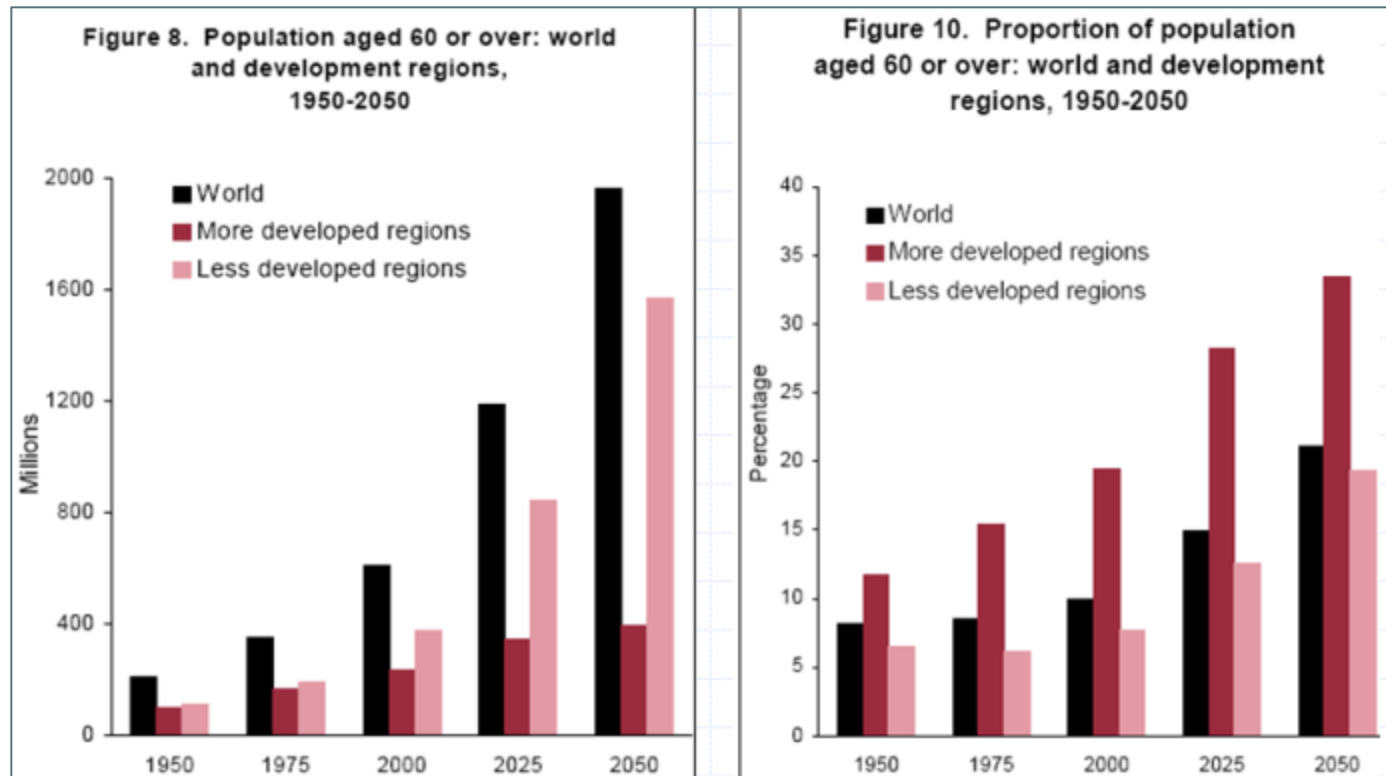




# Life expectancy increase

- “USA average life expectancy increased by 7 years during 1960 and 2000 – 3,5 years attributed to the improvements in healthcare”

Source: David M. Cutler “The value of Medical Spending in the United States”



Source: [www.un.org](http://www.un.org)

# Factors influencing healthcare spend

- Ageing population
- Drugs – Pharmaceuticals and vaccines
- Medical consumables
- Skills shortage - Nursing costs
- Consumer demands
- Healthcare legislation
- Building costs
- Administrative systems
- **Medical technology (Medical devices / equipment)**



# Factors influencing healthcare spend

Technology defined as the drugs (pharmaceuticals and vaccines), medical equipment, healthcare procedures, supportive systems and administrative systems are considered as the main driver of healthcare costs in today's developed societies



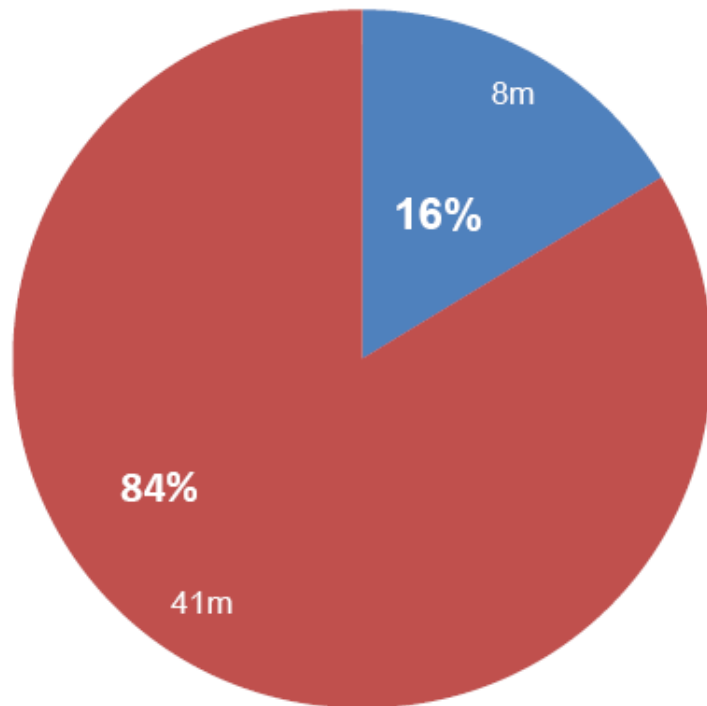
# SA Healthcare Model

- Unique in many ways
- Two totally different worlds
  - private and public
- Does it motivate optimal patient care?
- Does it enhance cost effective healthcare?

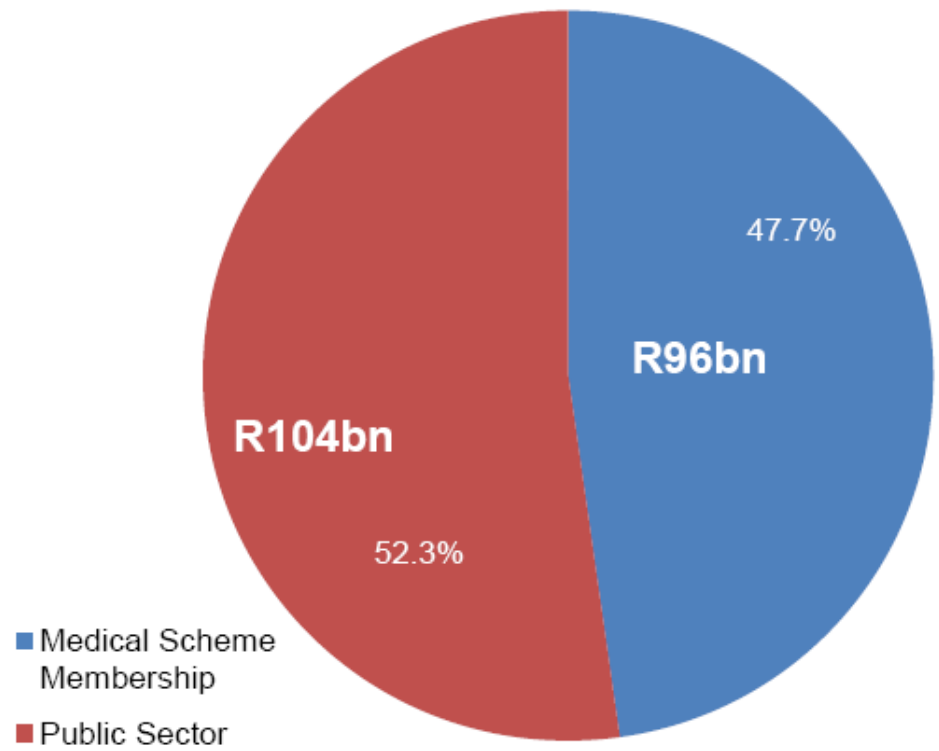


# SA Healthcare Model

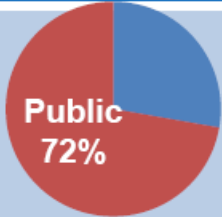
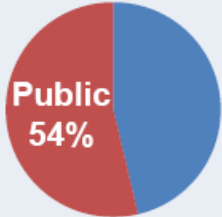
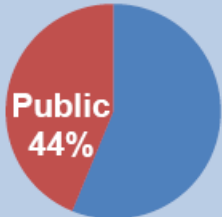
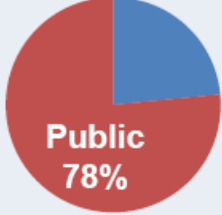
Split of the population



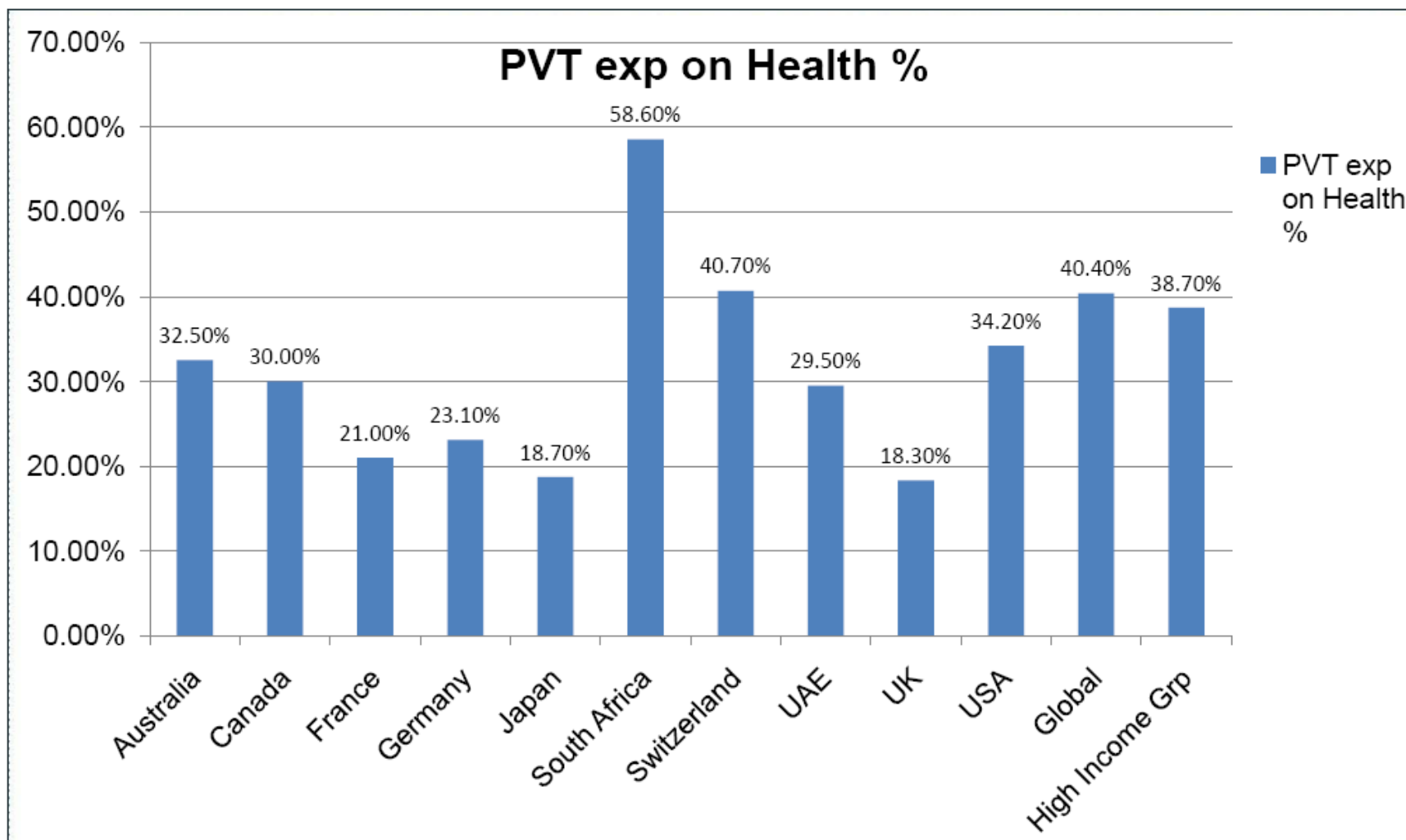
Split of the expected 2010 funds



# SA Healthcare Model

		Public per 1000	Private per 1000
Nurses		3.38	5.08
GPs		0.26	0.38
Specialists		0.13	0.66
Beds		2.1	3.3

# Private expenditure on health as % of total expenditure on health



# Minimally invasive surgery

## Open surgery versus laparoscopic hysterectomy

- Shorter hospital stay, faster recovery
- Less pain for patient
- Lower cost – lower income?





# Biplane versus Single plane Cathlab

- Difference in capital costs approximately R 3mil.
- New software reduces the need for biplane
- Worldwide 25% biplane, 75% in SA
- Doctors trained on Biplane



# New technology introduced into the SA market



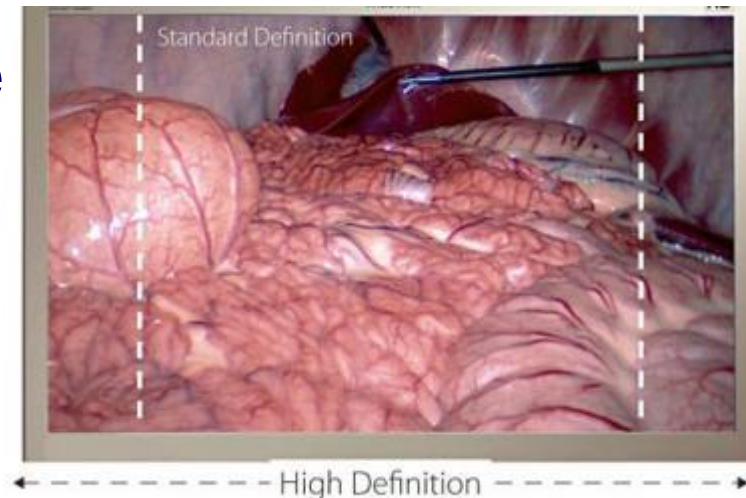
# Cost impact of HD technology



- By using 720 or 1080 lines to plot a TV picture. Conventional television systems use 625 lines.
- HD utilizes more colours than SD ensuring that everything you watch is richer and more intense.
- Most HD movies use the widescreen 16:9 format to replicate the theatre experience and;
- feature cinema-like surround sound which subscribers can experience with a compatible sound system.

# Cost impact of HD technology

- Shortened life expectancy of a camera and scope systems from 10 years + to no more than 5 to 7 years
- Fully functional equipment became obsolete
  - 4:3 monitors no longer available
- Equipment became incompatible
- How much did we really gain?



# Digital Operating Room - MMT

- Improved ergonomics
- Increased access to information
- Happy doctors
- Better patient care?
- Increased cost!





# Increased use of diagnostic ultrasound

- Emergency medical services – diagnose and treat
- Anesthesia - Spinal block, epidural
- ICU – hemodynamic, vascular, pulmonary, etc.



# Video Laryngoscope

- Difficult intubations
- Good training tool
- Lower skills required
- Increased cost



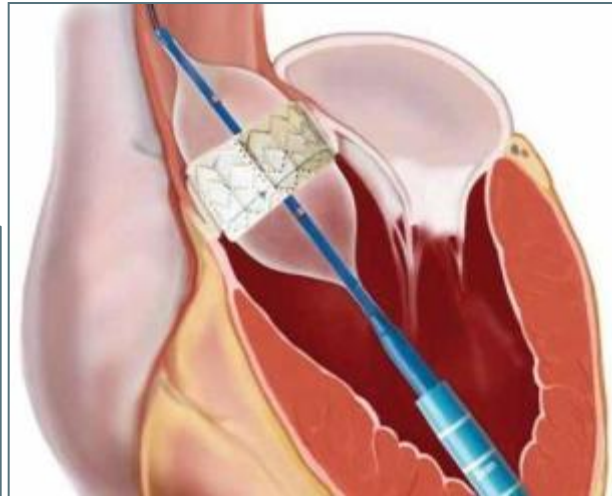
**Study:** *Emerg Med J* 2010;27:380-382 doi:10.1136/emj.2009.073460

**Endotracheal intubation using a video laryngoscope by emergency physicians: a multicentre analysis of 345 attempts in adult patients**

**Results** The GVL was used in 345 (10.7%) of 3233 intubation attempts by EPs. The overall success rate of the GVL was not higher than a CL (79.1% vs 77.6%,  $p=0.538$ ). The success rate for the patients with difficult airway was higher in the GVL than a CL (80.0% vs 50.4%,  $p<0.001$ ).

# Open heart surgery vs TAVI

- TAVI - Transcatheter aortic-valve implantation
- Increased application
- Double cost
- Moral issues





# Navigation and Robotic technology

## Navigation equipment

- Increase patient safety
- Better clinical outcomes
- Learning curve and cost



## Da Vinci robot

- Increase patient safety
- Shorter training period for doctors
- Cost



## Hansen robot

- Less radiation for doctor, patient and staff
- Cost



# Two trains headed towards each other

➔ Growing number of treatment available to prolong life

➔ Growing costs associated with such treatment



- At the collision point - How much is another day with grandma worth?
- What if you are grandma (grandpa)

# Drivers of new technology

## Manufacturers

- Business to sell



## Doctors

- Clinical terminology
- Some unrealistic demands



## Patients

- More informed
- Demand best possible care



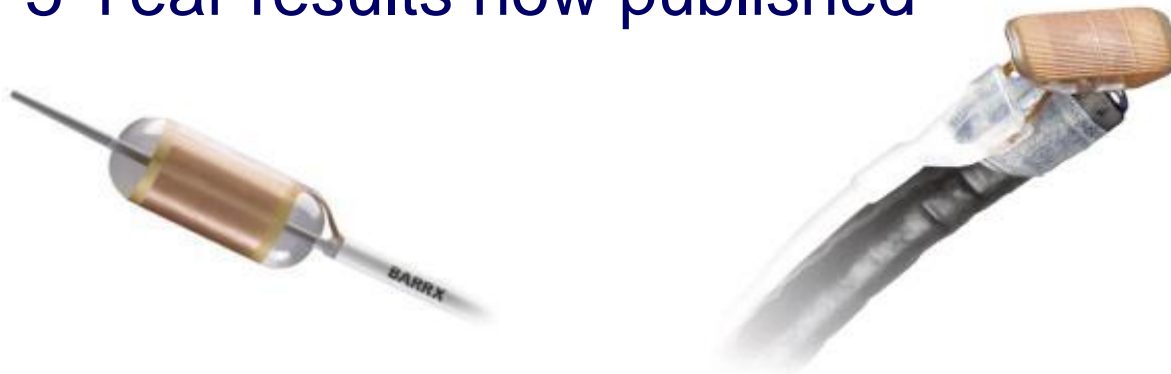
# Will technology increase or decrease costs?

- Is the new technology life extending or will it provide a permanent cure for the specific illness?
- Does the new technology supplement existing treatment, or is it a full or partial substitute?
- Does the new technology extend treatment to a broader population?
- Does the new technology provide earlier diagnosis?



# Proven technology - Barrx Technology

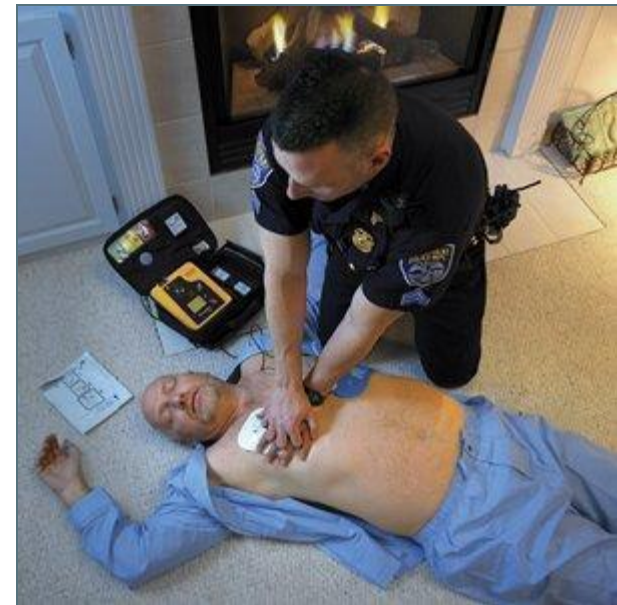
- “Treatment of Barrett's esophagus in order to improve the quality of life of patients diagnosed with the disease”
- Cost versus benefit
- 5 Year results now published





# Proved technology - AED defibrillators

- AED – Automated External Defibrillator
- Gold standard American Heart Association
- Thousands of defibrillators replaced all over the world
- Result from a recent study funded by the AHA



# Technology leading to lower costs

- How can we maximise the value of technologies to reduce costs while improving quality and safety?
- How can we advance the needed evidence to assure we only select truly effective technologies?
- How can we stimulate doctors to only recommend cost effective procedures for their patients?
- How can we influence patient behaviour wrt. management of their health plans?



# Solution - Manufacturers

- Take responsibility to ensure sustainable future for all
- Partnership – do not create expectations
- Support provision of appropriate technology in SA





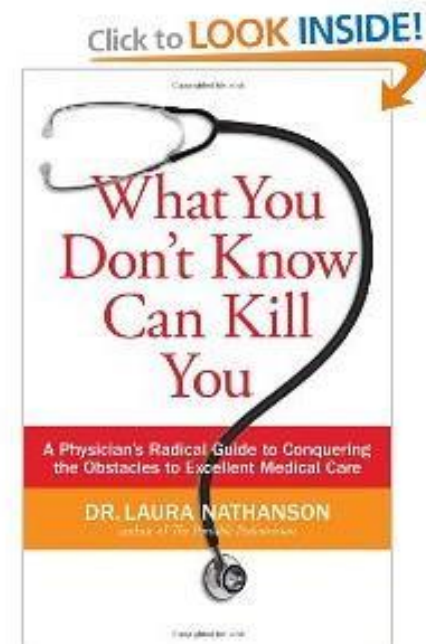
# Solution – doctors and surgeons

- Desire to find better treatment for their patients
- Patient testing and re-testing
- Partnership – ensure sustainable future for all
- Involve the more in long term strategies



# Consumer demand - patients

- Make responsible and informed decisions
- Increased awareness of technology and costs
- Moral and ethical matters
- Responsible lifestyle



# Procurement philosophy

- Ultimately buyers play an important role in the final decision
- Be more informed as to what money is spent on
- Procurement philosophy:
  - Leading and “bleeding” edge
  - Appropriate technology
  - Supplier relationships / partnerships
  - Standardisation



# National authority to evaluate technology

- Non-biased, well controlled studies of technology benefits and costs
- Transparent dissemination of findings to ensure clinical application
- Monitor over utilisation of technology
- Possible private / public partnership



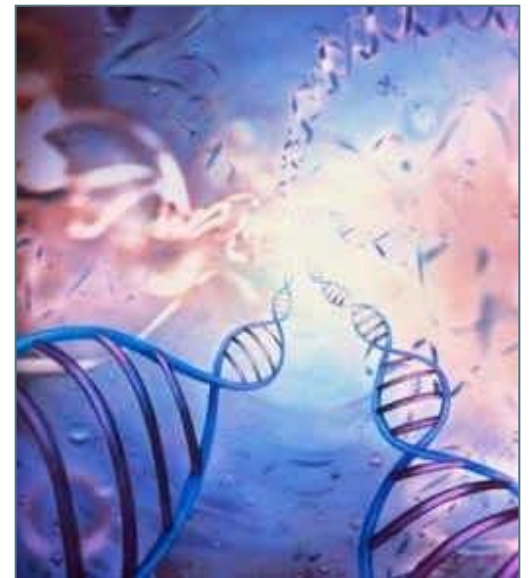
# Short term - Every man for himself

- Clinical evaluation – doctor input
- New technology committee – expertise represented:
  - Clinical
  - Financial
  - Operations
  - Pharmacy
  - Funder relations
  - Technical
  - Procurement



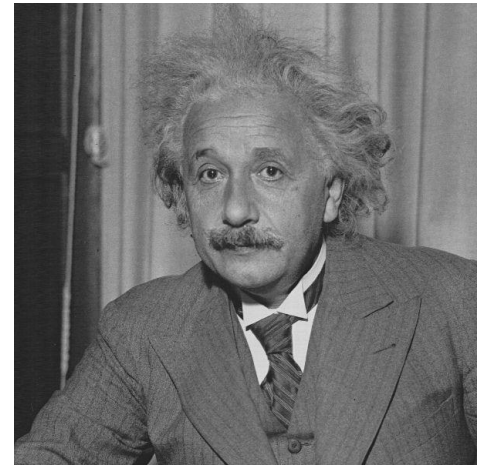
# Conclusion

- Technology can and should play a positive role in improving quality and cost of healthcare
- Studies comparing new technology's costs and benefits should be more available to ensure cost effective treatment
- Partnerships required to identify appropriate technology – suitable to the SA market
- Aware of challenges due to moral and ethical issues



# Thank You

**“The significant problems we  
face cannot be solved at the  
same level of thinking we were  
at when we created them.”**



**Albert Einstein**