Health-e-Child

Towards Personalised Healthcare through Health-e-Child clinical and technological innovation

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Aging and living longer

Current world population of 6,6 billion will grow

- by 1.3 billion in 2025
- and 2.5 billion in 2050

Healthcare spending

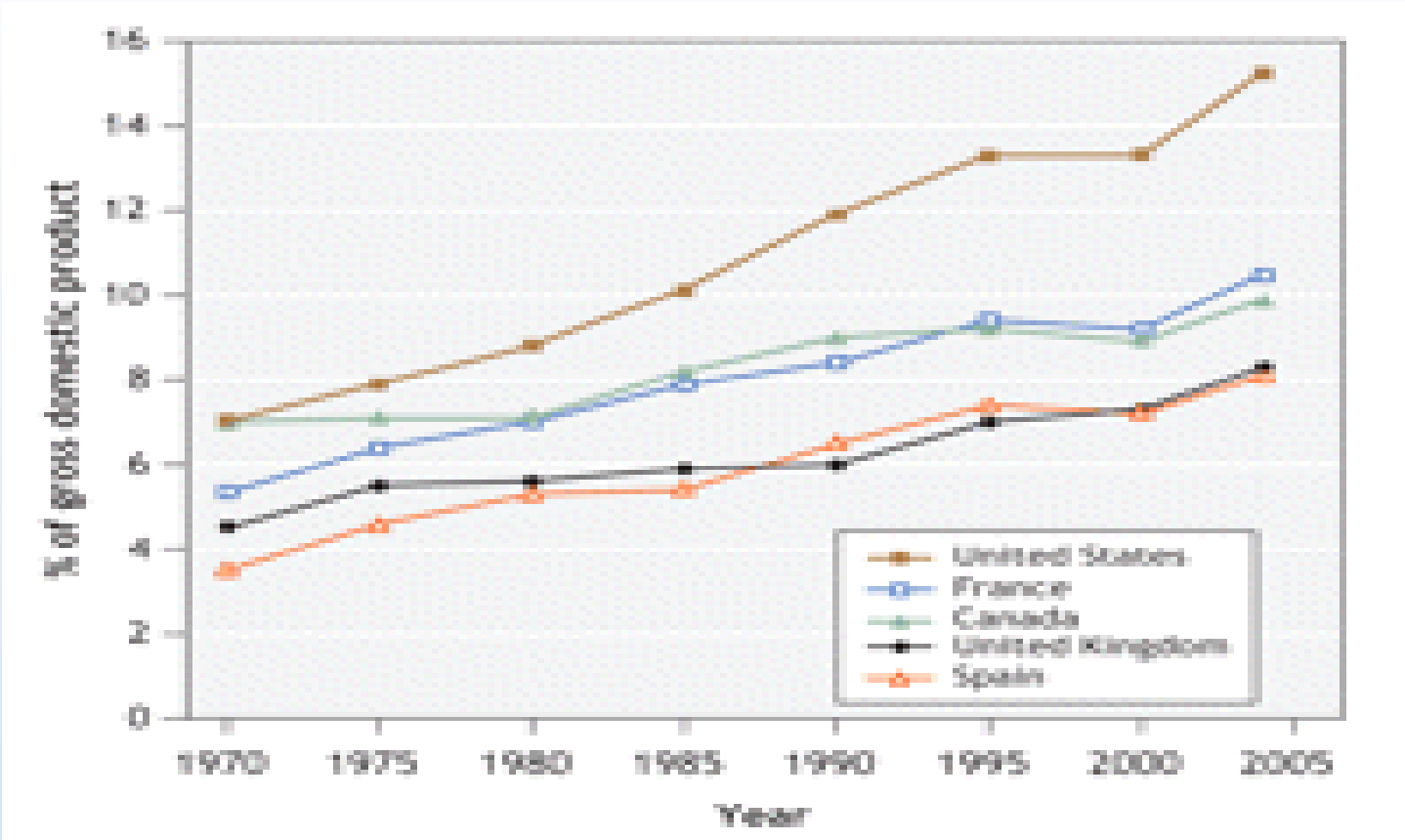
A Pricewaterhouse Coopers forecast:

- healthcare spending is expected to triple to $10 trillion (€7.15 trillion) by 2020
- comprising 20% of the US's GDP and 16% of the EU GDP

Welfare limits

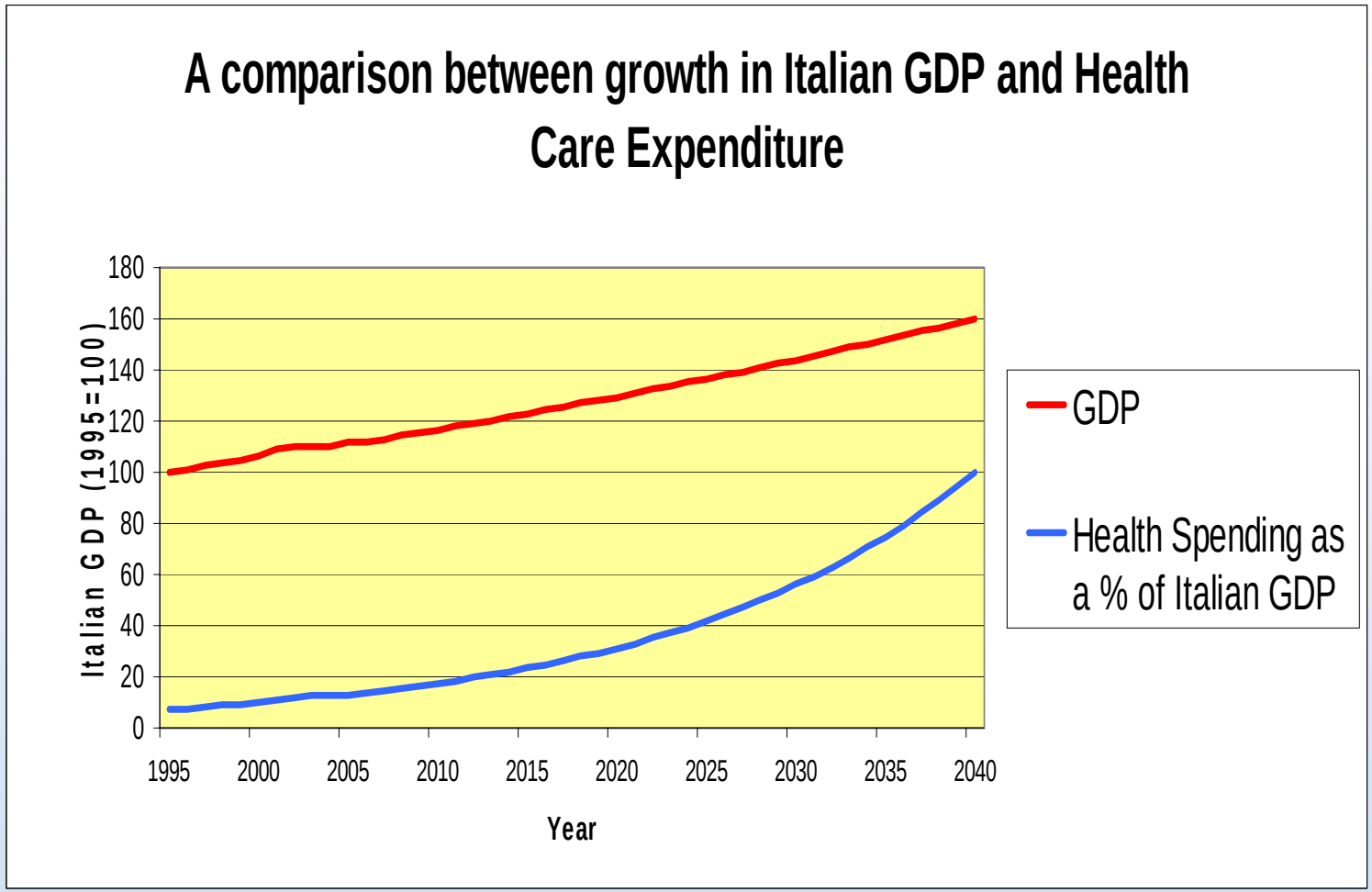
- **Personal services' paradox**
  - productivity growth is structurally much lower than in other sectors: taking care of people cannot be automated as easily
- **Information paradox**
  - technologically more and more possible to provide personalized services, but this implies much higher information costs
- **Medicine paradox**
  - the more it succeeds, the more it costs
- **Fiscal paradox**
  - welfare grows at a faster rate than GDP

Healthcare expenditures as a percentage of the GDP in 5 selected countries

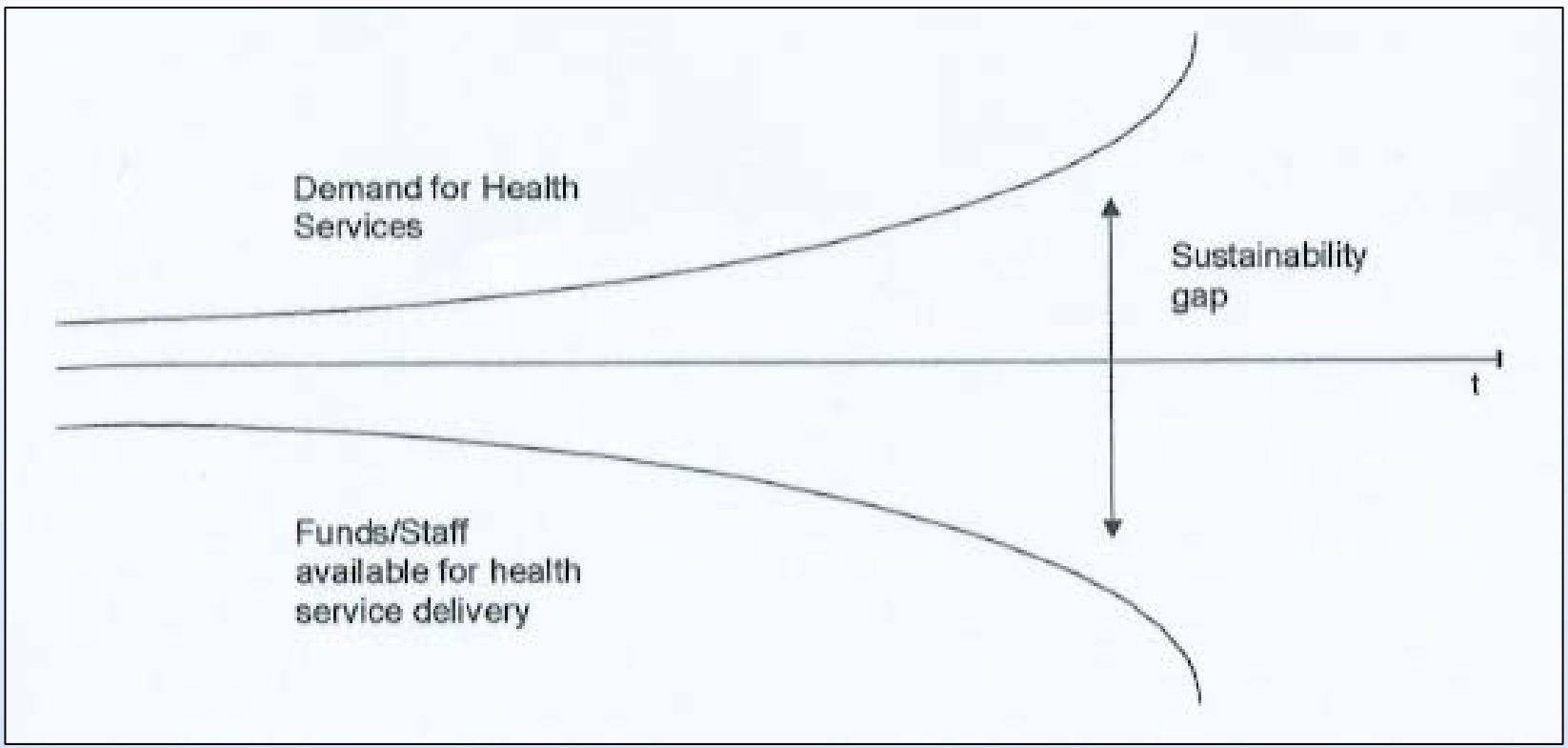


Source: I. Dhalla, *The Sustainability Paradox*, CMAJ • July 3, 2007

Healthcare spending in Italy



The sustainability funnel



Source: *The Natural Step*, 2000

By 2020 healthcare systems will either have somehow substantially transformed or failed

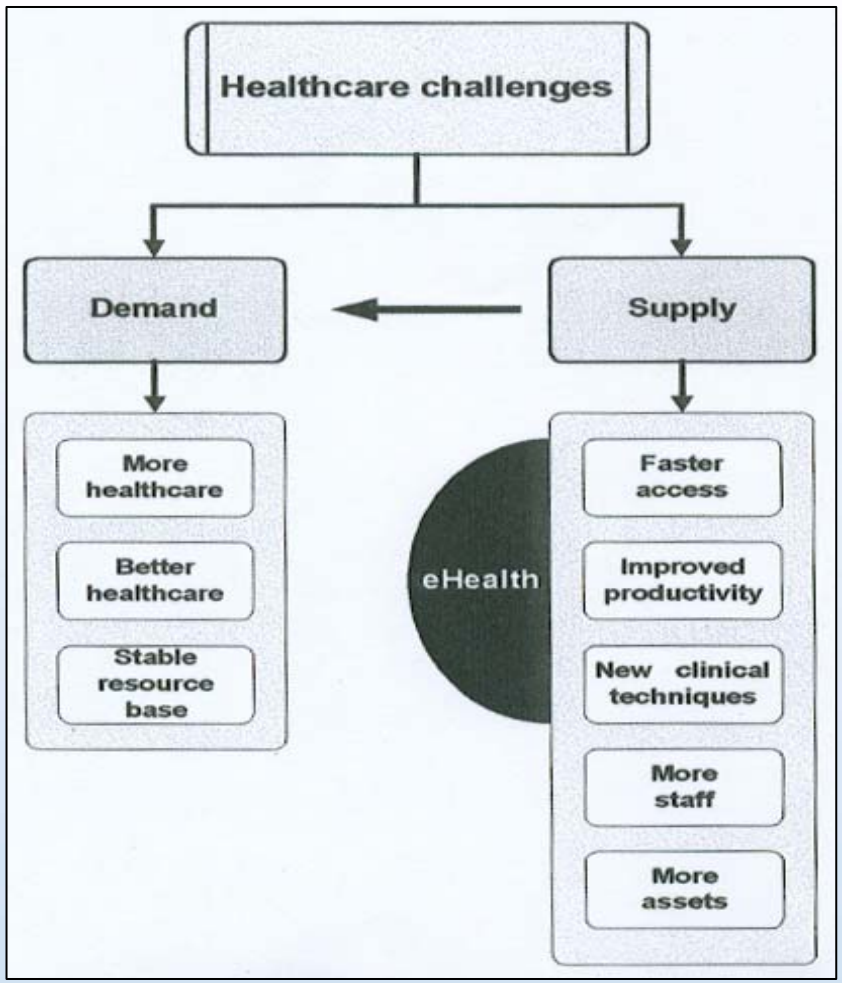
" nearly everyone agrees that the way we manage health today is unsustainable – it costs more than we can afford and delivers less than we expect"

(World Business Council for Sustainable development)

Sustainability challenges

- Sustainability requires biomedical informatics to move from modelling and managing the care of individuals, to managing the totality of the organization
- Sustainability requires us to look widely at organisational processes, and identify bottlenecks and inefficiencies wherever they might arise, not just at the moment of clinical care
- “if you can’t measure it, you can’t manage it”

Supply and demand in modern healthcare systems



Source: *eHealth Impact*, EC 2006

eHealth spending

The health sector is information intensive

eHealth spending is predicted to account for around 5% of the total health budget by 2010

3 medical scientific-technological breakthroughs

- Imaging
- “Omics”
- Molecular medicine

Personalised healthcare

- Shift in focus towards preventive measures
  - to reduce the cost burden by avoiding the occurrence of disease and associated treatment costs
- Patient pre-disposition-tailored medicine
  - the disease is unique in each patient, the treatment must be unique to the individual
- Patient-specific, real-time diagnosis and treatment

Examples of areas of urgent technological upgrade

- Medical errors
  - “kill yearly more people than jointly breast tumours, AIDS and car accidents”
- An aging population implies the spread of chronic diseases:
  - population over 65 will increase from 20% to 28% between now and 2025
  - the 20% of the population with one or more long-term conditions account for 80% of all medical consultations and 60% of hospitals bed-stays
  - if average health expenditure is 1 for those under 65, it gets 3 for those aged 65-75 and 9 for those being 85+ years old
- An explosion in the volume of medical images and research data
  - coping with an over 50% annual storage growth rate, with storage needs almost doubling every 18 months

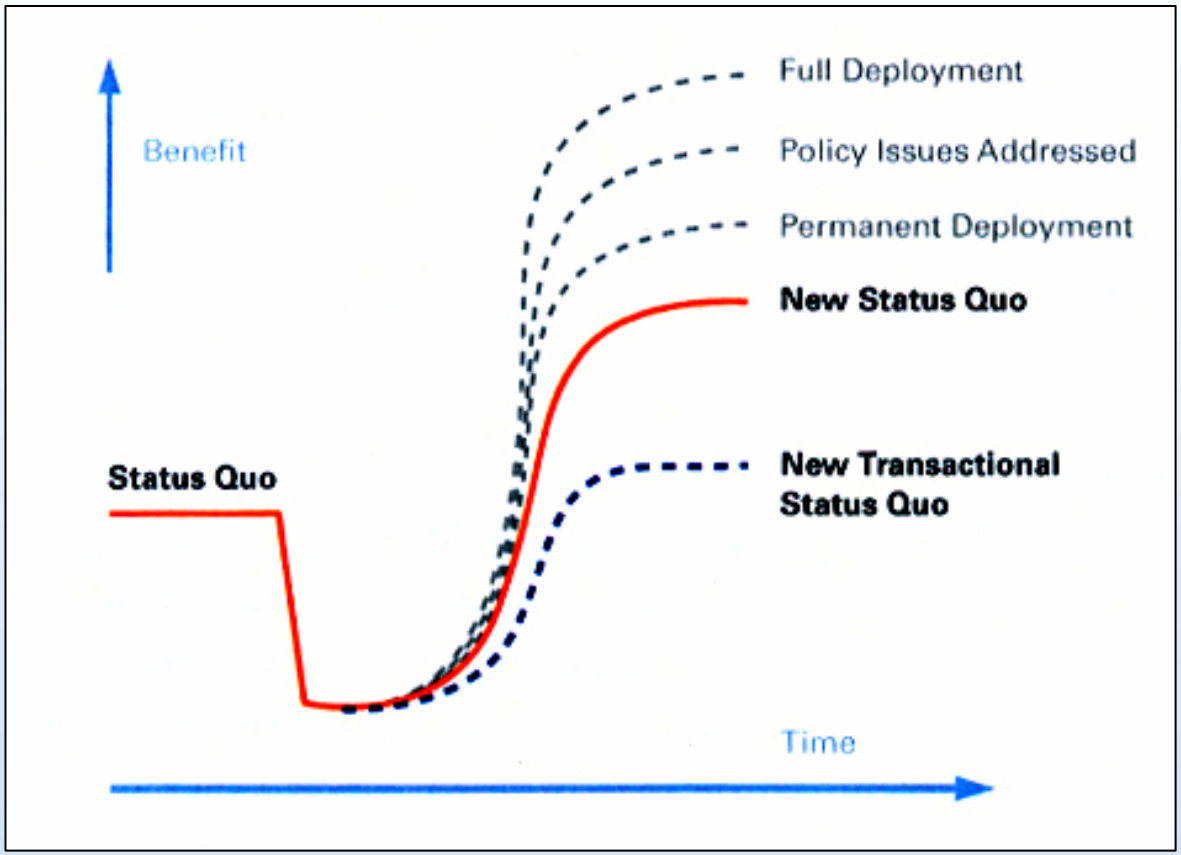
Some eHealth tools

- E-prescribing
- DSS (evidence-based medicine)
- EHR (Izip, HealthVault)
- Workflow-based systems
- Hugely increased computational capacity (GRID)
- Semantic interoperability
- Virtual Physiological Human (e-child)

Health-e-Child tools

- Vertically integrated databases
- Disease modelling
- Knowledge discovery
- Clinical decision support systems
- Grid connectivity

A sobering reminder on Innovation impact



Where to start from
if not from children?