

# ***eHealth is Worth it - assessing the (economic) benefits of eHealth solutions***

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***Incentives for Implementation of ICT in the Health Sector***

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## eHealth: an enabler for better health?

- “For over thirty years, there have been **predictions** that the widespread clinical use of computers was imminent. Yet **the ‘wave’ has never broken.**”
- eHealth has a history of more than 40 years of **high-flying expectations** and billions of euros invested in unsuccessful or only marginally ‘profitable’ ventures worldwide
- “To date, HIT [health information technology] has been **mostly the realm of enthusiasts**. Practitioners have generally regarded EHRs as costly, cumbersome, and offering little help for tasks at hand.”

## eHealth: an enabler for better health?

- The scope for **increase in demand** for health services is unlimited
- The scope for increase in **supply is restricted**
- Evidence suggests that **eHealth has the potential** to support healthcare providers in meeting growing demand
- However, what may be **technologically feasible**, or even desirable, **will not necessarily be economically viable or organisationally realised**

## The eHealth IMPACT study

- Development of a generic **methodology** for the economic evaluation of today's eHealth applications
- Detailed **evaluation of 2** (to validate the methodology) plus 8 **routine eHealth applications**
- **Synthesis, vision, and policy recommendations** to encourage appropriate future eHealth investments
- **Further case studies** applying the same methodology
- Development towards an investment analysis method for **realistically assessing** the business perspective of investments in tomorrow's eHealth services

## Structure of an eHealth IMPACT assessment

- An **economic perspective**
  - Benefits and costs - BCAnalysis
  - All stakeholders considered
- **Three analysis periods:**
  - Planning and development
  - Implementation
  - Routine operation

## Measuring the impact of eHealth – the approach

1. Identify **scope and borders** of an eHealth-supported *routine* service
2. Describe **eHealth solution**, measure its **utilisation**
3. Identify **timeline**
4. Estimate known and expected **costs**
5. Estimate **benefits**
6. **Analyse data**, adjust for **optimism bias** and **contingency**, perform sensitivity analysis
7. **Review** with research team and sites
8. **Report** on past and expected performance

## Estimating benefits

- According to **stakeholders**:
  - Citizens
  - Healthcare provider organisations (HPO)
  - Third party payers
- Benefits - improvement of:
  - **Quality**: five factors
  - **Access**: spatial, social inclusion, other barriers
  - Overall **economic** efficiency



## Estimating benefits – *quality* of healthcare

- Better informed citizens and carers
- Information designed to streamline healthcare processes
- Improved timeliness of care
- Patient safety - risk management
- Improved effectiveness of care service

## Estimating **benefits** to all stakeholders, e.g.

- **Citizens:**
  - **Control** over medical record, better information
  - More **appropriate treatment** (avoidance of unnecessary interventions, adverse events etc.)
  - **Time savings** - faster treatment and recovery
- **Healthcare Provider Organisations** (incl. GPs):
  - **Improved effectiveness** - better results of care
  - **time saved** – preparation, information search, more clients
  - **reductions in avoidable errors**, e.g. from illegible handwriting
- **Third party payers:**
  - **Avoided unnecessary visits** and examinations
  - Better and more targeted **drug prescriptions**
  - More **transparency** in the health system, quality control

## Estimating costs

- eHealth **investment**
  - **Direct investment** and re-investment in ICT: hardware, software, licences
  - **Changes** to process and organisation: procurement, project management and change management, training
- **Operational costs** of health service supported by ICT
  - Internal costs – personnel, IT, management, marketing, back office support
  - Where applicable, costs to other stakeholders like third party payers (e.g. reimbursement fees)

## Supporting Tools

- Assigning **monetary values** to benefits
  - Actual prices or proxies
  - Time savings and costs of Full Time Equivalent (FTE)
  - Willingness to pay approach
- **Adjustment for contingencies** for unaccounted costs and optimism bias
- **Time value of money**: Present value / discounted cash flow
- **Sensitivity analysis** (by overvaluing costs, undervaluing benefits) to test for robustness

## Example of a data summary sheet

Name of site	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	€000	€000	€000	€000	€000	€000	€000	€000	€000	€000
<b>Estimated COSTS</b>										
<b>eHEALTH INVESTMENT</b>										
ICT application	0	0	0	250	562	936	1,560	2,496	4,056	6,240
Organisational activities										
<b>ANNUAL OPERATING COSTS of service</b>	130	260	520	1,073	2,646	4,801	8,640	14,585	25,030	40,901
<b>Total estimated costs</b>	<b>130</b>	<b>260</b>	<b>520</b>	<b>1,323</b>	<b>3,207</b>	<b>5,737</b>	<b>10,200</b>	<b>17,081</b>	<b>29,086</b>	<b>47,141</b>
<b>PV of total costs</b>	<b>130</b>	<b>251</b>	<b>520</b>	<b>1,193</b>	<b>2,795</b>	<b>4,830</b>	<b>8,298</b>	<b>13,425</b>	<b>22,088</b>	<b>34,589</b>
<b>PV of cumulative costs</b>	<b>130</b>	<b>381</b>	<b>901</b>	<b>2,095</b>	<b>4,890</b>	<b>9,720</b>	<b>18,018</b>	<b>31,443</b>	<b>53,531</b>	<b>88,120</b>
<b>Estimated BENEFITS</b>										
Citizens	0	0	0	30	285	840	1,860	3,698	6,783	11,773
HPOs	0	0	0	-	731	1,624	4,548	10,409	23,869	49,716
3rd party payers	0	0	0	-	1,052	2,338	6,545	14,981	34,354	71,554
eHealth provider (if not 1 of the above)										
<b>Total Estimated Benefits</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>2,068</b>	<b>4,802</b>	<b>12,953</b>	<b>29,088</b>	<b>65,006</b>	<b>133,043</b>
<b>PV of benefits</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>1,802</b>	<b>4,043</b>	<b>10,537</b>	<b>22,863</b>	<b>49,366</b>	<b>97,618</b>
<b>PV of cumulative benefits</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>1,829</b>	<b>5,872</b>	<b>16,409</b>	<b>39,272</b>	<b>88,638</b>	<b>186,256</b>
<b>NET BENEFITS</b>										
<b>Net benefits not discounted</b>	<b>-130</b>	<b>-260</b>	<b>-520</b>	<b>-1,293</b>	<b>-1,140</b>	<b>-935</b>	<b>2,752</b>	<b>12,007</b>	<b>35,920</b>	<b>85,902</b>
<b>PV of net benefits</b>	<b>-130</b>	<b>-251</b>	<b>-520</b>	<b>-1,166</b>	<b>-993</b>	<b>-787</b>	<b>2,239</b>	<b>9,437</b>	<b>27,278</b>	<b>63,029</b>
<b>PV of cumulative net benefits</b>	<b>-130</b>	<b>-381</b>	<b>-901</b>	<b>-2,067</b>	<b>-3,061</b>	<b>-3,848</b>	<b>-1,609</b>	<b>7,829</b>	<b>35,106</b>	<b>98,136</b>
<b>Unit costs - cost per download</b>					10.87	9.72	6.43	4.91	3.64	2.88
<b>Service utilisation - Nr. of downloads</b>	0	0	0	0	450,000	1,000,000	2,800,000	6,409,000	14,696,500	30,610,710

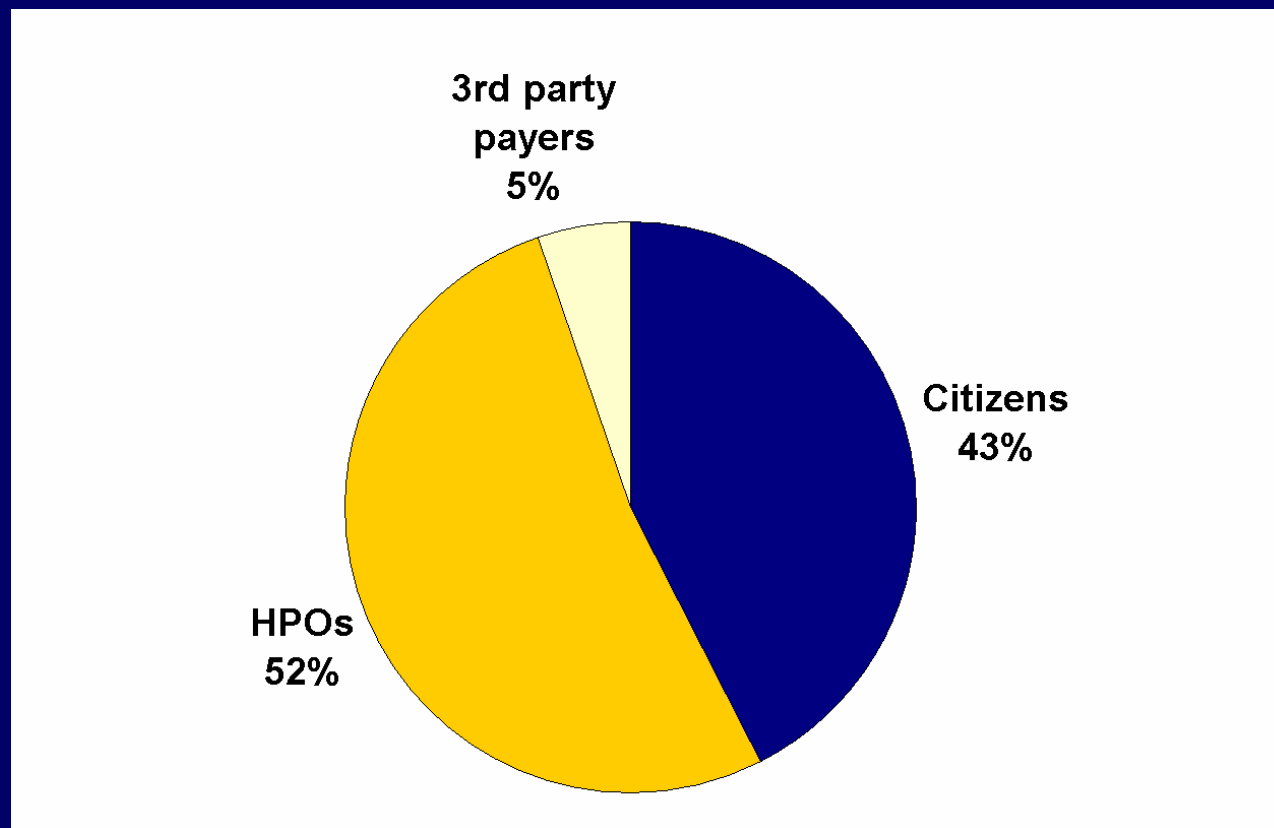
- 1) AOK Rheinland, Germany – **GesundheitsCard Europa (GCE)**, access to healthcare abroad DE/NL/BE
- 2) Apoteket and Stockholm County Council, Sweden – **eRecept**, an ePrescribing application
- 3) City of Bucharest **Ambulance Service**, Romania – DISPEC tele triage and dispatch system
- 4) Institut Curie, Paris, France – Elios, a comprehensive **hospital EPR system**, and Prométhée, a sophisticated search meta-engine
- 5) IZIP, Czech Republic – a **nationwide web based electronic health record**
- 6) Kind en Gezin, Flanders, Belgium – Flemish vaccination database (FVD) and Vaccinnet, facilitating **vaccination programmes for children**
- 7) MedCom, Denmark – Danish Health Data & **Messages Network**
- 8) MedicalORDER®center Ahlen (MOC) and St. Franziskus Hospital Münster – **supply chain** optimisation, Germany
- 9) NHS Direct, UK – NHS Direct Online (NHSDO) **information service**
- 10) Sollefteå and Borås hospitals; Sjunet, Sweden – **radiology consultations** between Sweden and Spain

## eHealth needs a **medium-term** perspective (average values form 10 sites)

- **Year 4** – first year that annual benefits exceed costs, on average
- **Year 5** – first year that cumulative benefits exceed cumulative costs

***Key health policy message: eHealth can support more, better, and safer healthcare, within available resources***

## Average distribution of direct benefits from eHealth - 1994 to 2008



*HPO: Health Provider Organisation*

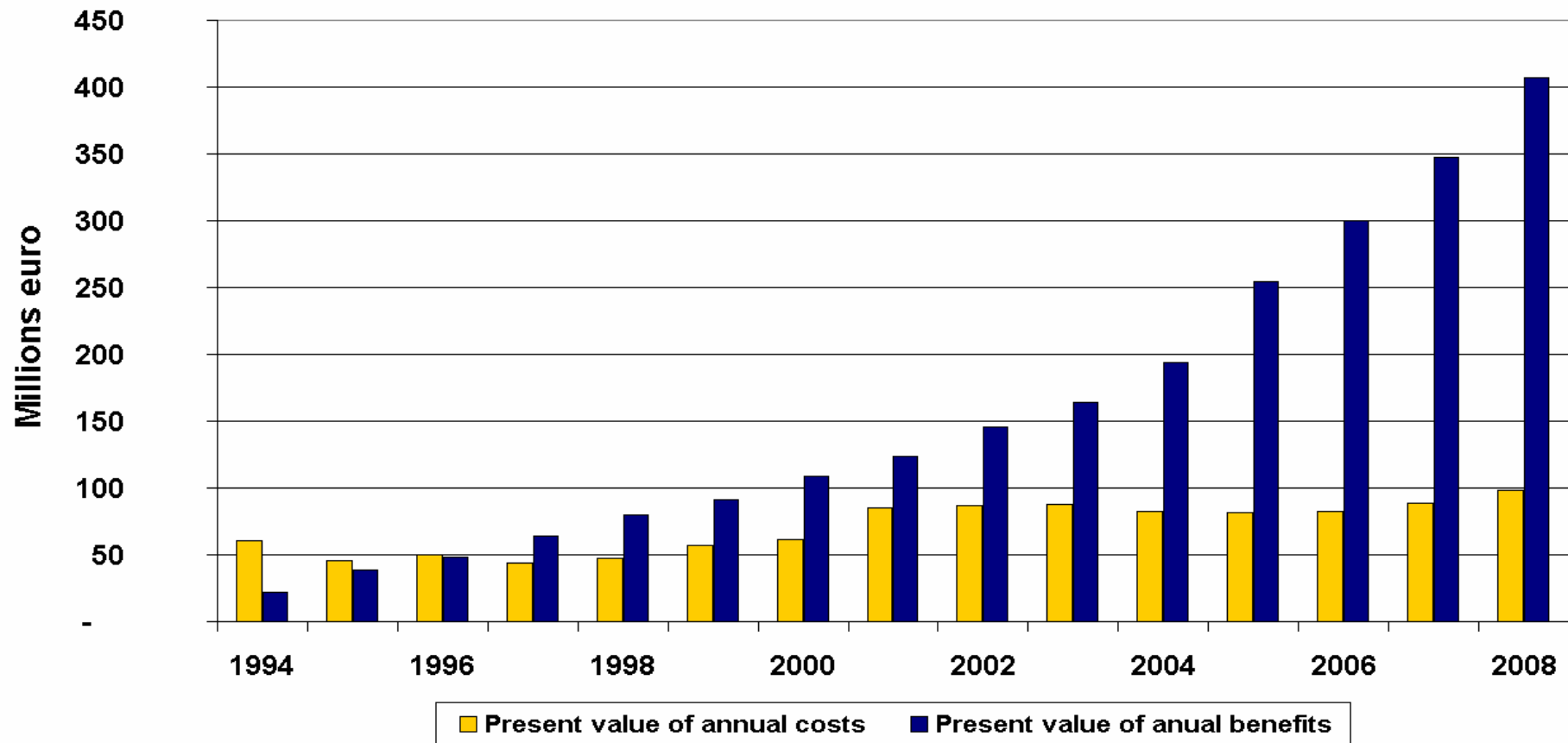


## eHealth benefits distribution range

	Max	Min	Mean
Citizens	96%	1%	43%
HPOs	99%	4%	52%
Third party payers	53%	0%	5%

Distribution depends heavily on the specific nature of the eHealth investment

### Estimated costs and benefits p.a. in a virtual health economy with 10 proven eHealth applications



## How to make a reliable assessment of the future impact of concrete eHealth solutions?

Combine a strategic foresight analysis with an economic perspective:

Is eHealth worth it?



eHealth IMPACT methodology

Is it going to pay?



Cash flow analysis

Where to take the money from?



Affordability check

Account for the uncertainty of the future



Risk analysis



**Business case for new eHealth investment**

- A **vision**, combined with a (highly) **flexible** (i.e. **pragmatic**, not a fixed) longer-term strategy
- Effective *clinical* leadership
- A step-by-step **process approach** that enables risk to be managed
- Effective ventures are a series of investments with an underlying **eHealth dynamic**

- Effective applications **meet concrete health(care) needs** (i.e. not technology-driven)
- Successful applications are driven by **multidisciplinary** teams, with multidisciplinary people
- Strong focus on **change management** needs and resources
- **Clinical research** can offer firm foundations for benefits realisation (outcomes)

- Challenges of economic evaluation of eHealth: it is **not an exact science**
- Comparability and representativeness of results
  - Different settings across many countries
  - Proven (not "average" performing) eHealth applications
  - No analysis of failures
- The health policy value of eHI findings:  
**They demonstrate both the economic viability and the potential of eHealth**
- Next steps
  - Gain more experience
  - Use eHI knowledge for improved investment outcomes
  - Develop financing and business models

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### Foreword



Healthcare is one of the most information-intensive sectors of European economies and can greatly profit from recent advances in information and communications technology. Given that the health sector currently lags behind other sectors in the use of this technology - eHealth - there is great potential for rapid, sustained growth.

The eHealth market is currently some 2% of total healthcare expenditure in Europe, but has the potential to more than double in size, almost reaching the volume of the market for medical devices or half the size of the pharmaceuticals market. However, unlike the products from these two other healthcare industries, eHealth applications are not yet routinely assessed for their impact, benefits and safety.

This study shows across a wide range of eHealth applications that clear evidence can be provided of the benefits of information and communication technology in routine healthcare settings. The benefits range from improvements in quality and better access of all citizens to care, to avoidance of unnecessary cost to the public purse. The methods used point the way to more formal certification of eHealth in future, and can support current efforts on both sides of the Atlantic to establish official certification mechanisms for electronic health record systems.

The European Commission Directorate General Information Society and Media supported this important contribution to methods for advanced evaluation and the collection of reliable evidence. The information gathered from 10 sites across Europe clearly shows that eHealth does matter, that it is well worth the investment, and can lead to very substantial benefits. An important lesson is that deployment of eHealth must be combined with appropriate changes in processes and organisation, and must be guided by appropriately skilled people.

I hope that this document will prove useful to all those with responsibility for health in Europe and will give courage to those who hesitate to invest in eHealth. The advice is simple: do not postpone innovation, but equally, do not take a leap into the dark; take small steps, carefully, and be guided by evidence now available of the successes and failures of others.

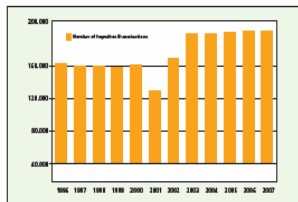
Brussels, September 2006

Viviane Reding  
European Commissioner  
Information Society and Media





Chart 3: Kind en Gezin hepatitis B vaccinations



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## World Summit on the Information Society Tunis 2005

### The beneficial impact of eHealth A European case study

Health systems and services are increasingly sensitive of both the chronic, but also the more dramatic and worrying health threats and challenges throughout the globe. Preparing for both foreseen and unforeseen health (and other) emergencies - which may nevertheless have a health impact - can be strongly supported by the use of eHealth (through applications such as databases, records, interoperable systems and services).

#### Outlook

The Kind en Gezin case study underlines that eHealth will increasingly permeate all aspects and levels of our health care systems, and benefits will grow as eHealth infrastructures are implemented and services expanded, in developed, and perhaps even more, in less developed or rural regions.

Vaccinating regionally can improve the health of populations in regions. But such a model can also be modified to fit smaller areas or nations. The benefits and effects accumulated will be seen in any country independent of its development stage.

Technology transfer is not uniquely one-way. Good practice can always be thoughtfully transferred from situation to situation. It is anticipated that the information on the benefit-cost results of the eHealth Impact study can be shared in as wide a context as possible, not only within Europe, but also in situations more geographically spread. Likewise, international organisations may collaborate creatively in terms of leading insightful eHealth initiatives developed in different parts of the globe.

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# Thank you for your attention

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