EU eHealth Agenda & Interoperability initiatives

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http://europa.eu.int/information_society/activities/health/index_en.htm

eHealth
All inclusive terms

1. **Clinical information systems**
   a) Specialised tools for health professionals within care institutions
   b) Tools for primary care and/or for outside the care institutions

2. **Telemedicine systems and services**

3. **Regional / national health information networks** and distributed electronic health record systems and associated services

4. **Secondary usage / non-clinical systems**
   a) Health education and health promotion of patients/citizens
   b) Specialised systems for research, public health

*Definition agreed with the eHealth Industry Stakholders Group reporting to the i2010 sub group on eHealth

eHealth works
when combined with proper organisation and skills

- **National and Regional Health information Networks** improve quality, efficiency, and will save next year € 80 Mil/year in Denmark (Medcom) and € 60 Mil/y in Czech republic (IZIP)
- **ePrescription** improves patient safety, saves € 70 Mil/y in Sweden
- **Personal Health Systems and Telemonitoring** can provide care at the point of need, reduce length of hospitalisation (by 20 - 40% for heart patient in UK)
- **Direct Online information Services** such as NHS Direct online– empower patients, avoid unnecessary hospitalisation, support lifestyle choices, save € 110 Mil/year

www.good-ehealth.org www.eHealth-impact.org

http://www.epractice.eu

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eHealth in EU

1) Individual Member States' strategies

22+ countries have explicit eHealth policy strategies

www.ehealth-era.org

2) EU wide strategy

- Research (FP) and Demonstration (eTEN/CIP) programmes (1989 -)
- eHealth Action plan (2004)
- Lead Market Initiative (2007)
- EC Recommendation on EHR Interoperability (2008)
- Telemedicine Action Plan (2008)

ec.europa.eu/information_society/activities/health/policy/index_en.htm

National Priorities: Preliminary Analysis

Priorities in national eHealth Strategies	# of Countries	Examples
Electronic Health Records EHR, EPR, Medical Records, Patient Summary, Emergency Data Set	17	DMP - Dossier Médical Personnel (FR) BEHR - Basic Structure for the EHR (DK) NHS Care Records Service / Spine (UK), Patient summary (SE, FI) SumEHR (BE), eGP file (NL)
Infrastructures & Networks Broadband communication networks and associated technology and basic services	12	MedCom – the Danish Healthcare Data Nework (DK) Sjunet (SE) National Health Network (NO) National eHealth VPN (DE, AT)
ePrescription Management and implementation of ePrescribing	16	Apotheket (SE) ePrescription (DK, NL, SI) eRezept (DE)

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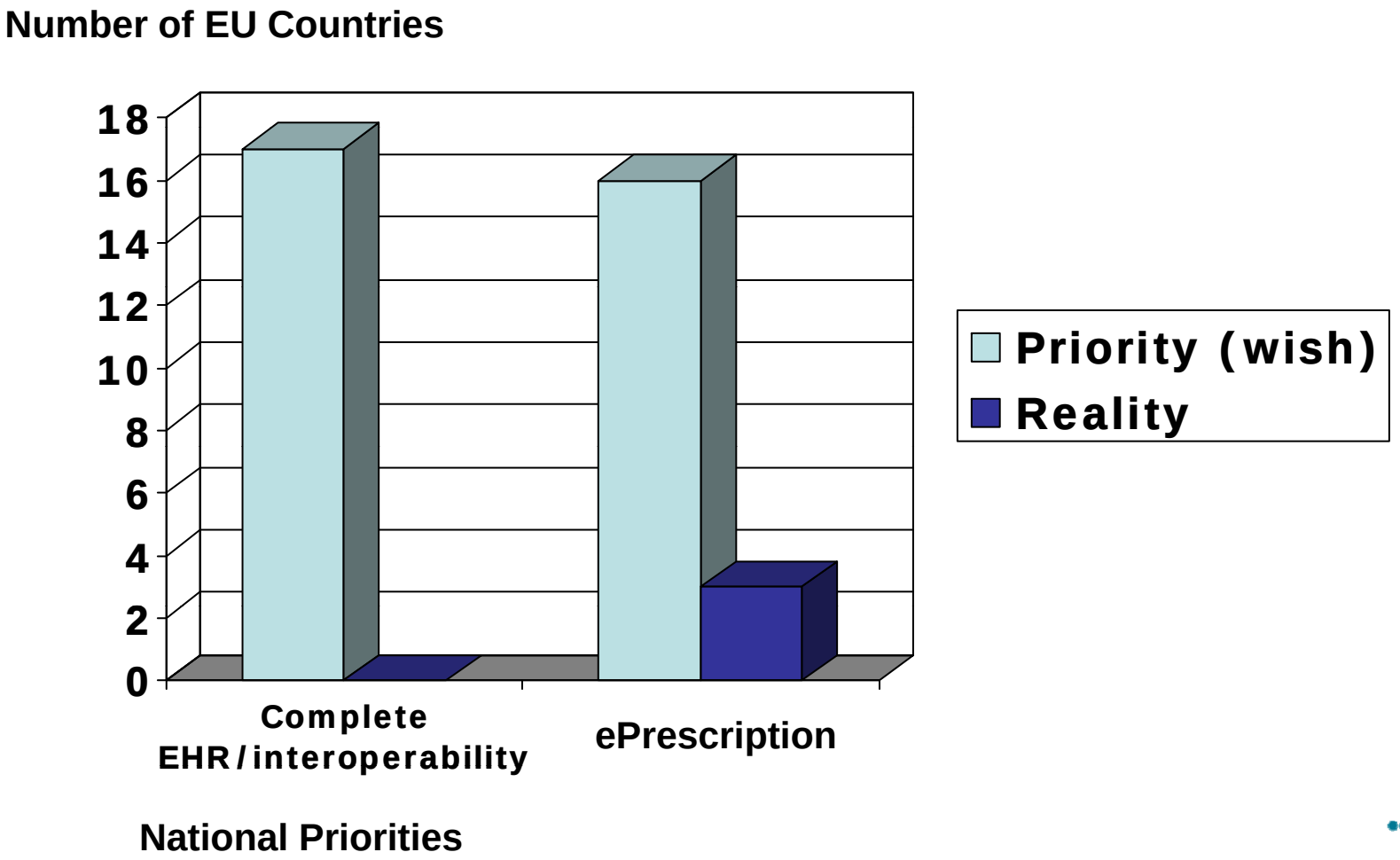
http://www.ehealth-

Wishes vs. Reality



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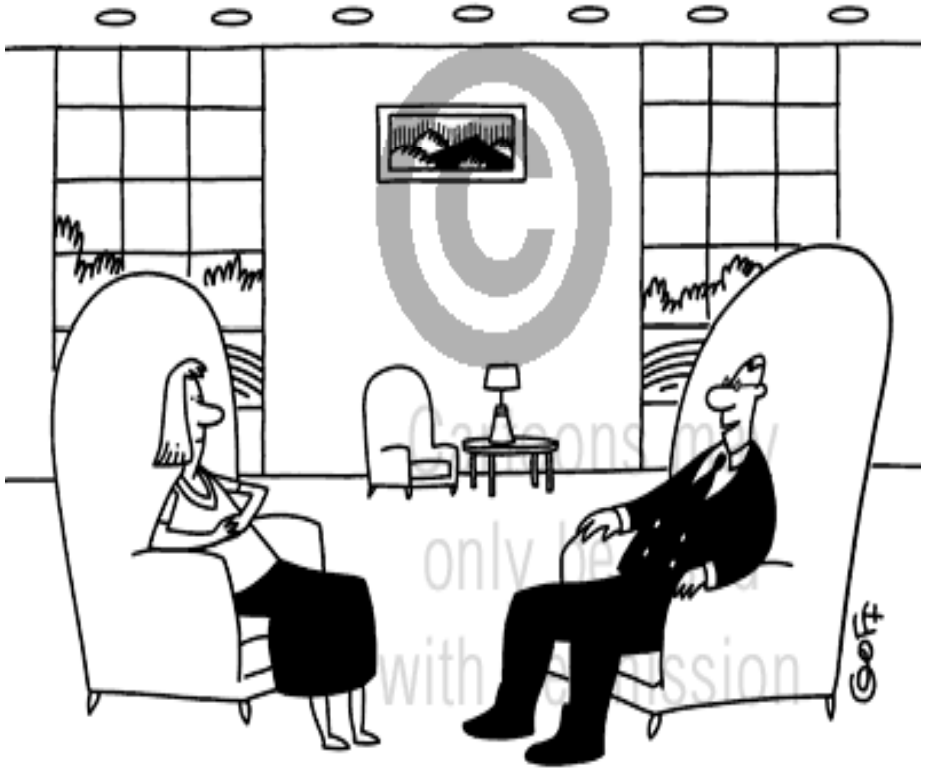
Factors Driving eHealth Investments	DE	FR	UK/ EIRE	IT	ES	BE	ND	AU	CH	NO	SW	DK	FIN	EU
Meet legal requirements	16,6	15,9	6,17	8,79	5,16	15,1	16,0	5,89	13,59	8,67	14,5	10,00	15,3	11,7
Reduce avoidable medical errors					13,5	11,62	9,32			13,67	11,88	11,43		7,81
Facilitate sharing of patient information						14,05	11,82	9,33	10,29		10,83			7,76
Comply with government funded policies	8,01		12,0			8,51	9,43		14,26			10,71	10,83	7,57
Improve security and privacy provisions		13,01		11,6				14,80		11,00				7,11
Increase clinical capacity and productivity	10,06							13,33		10,00				6,72
Improve overall quality of care					13,03					11,00				6,37
Improve control of costs	11,74											0,00	0,00	5,77

(Some of the) Stakeholders of National EHR pilots

Can all these people communicate/cooperate?

Take home messages: #1

Evidence& best practices: Basis for good rollout plans



"Our bureaucracy is so vast, we no longer need reality."

Support Authorities to keep in touch with reality!

It is a job of **all stakeholders (**authorities, users, industry) to contribute to a realistic roadmap

Discussions take place easier around **convincing evidence**

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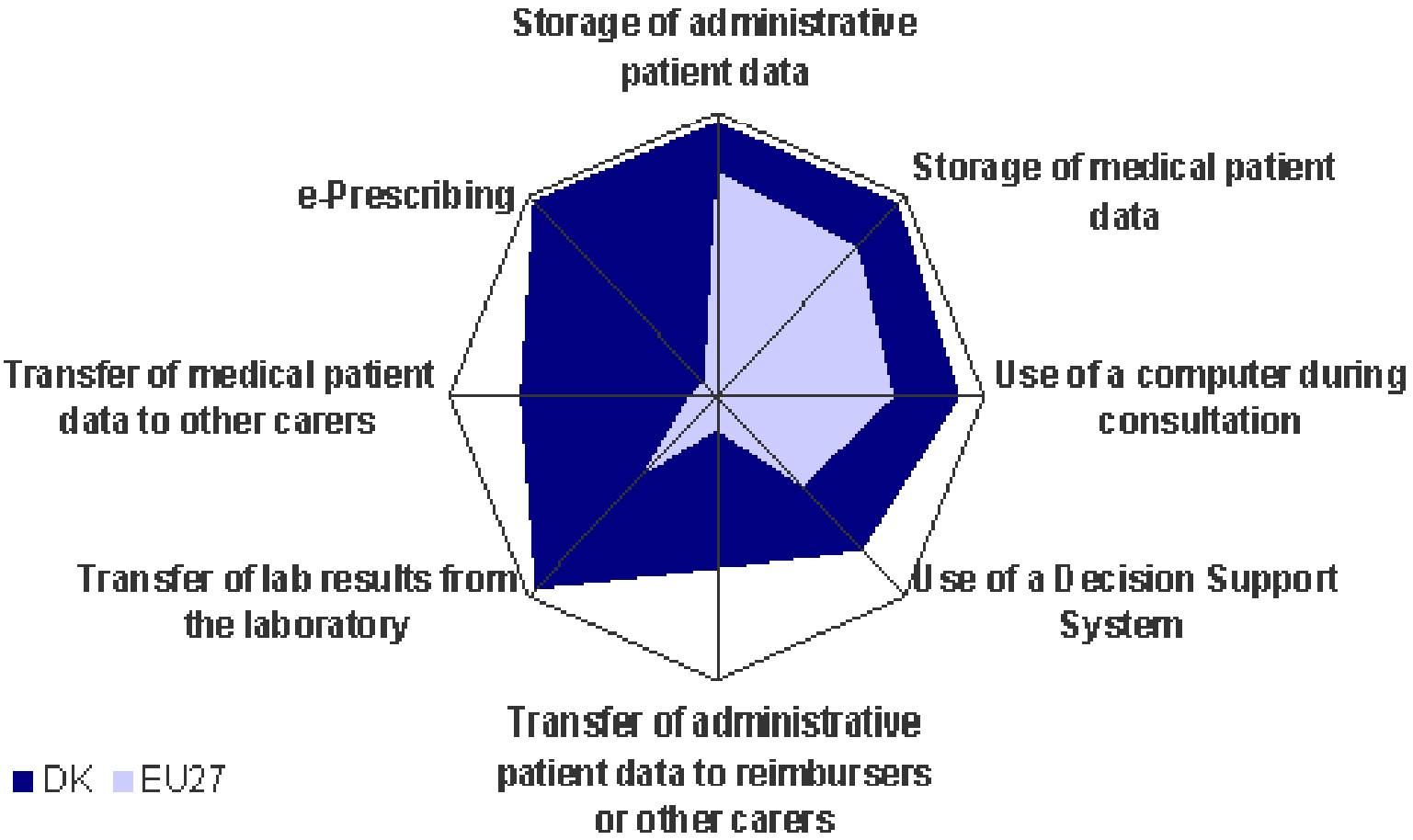
eHealth use in Denmark: Frontrunner

See more details in the Nordic Track and ES46



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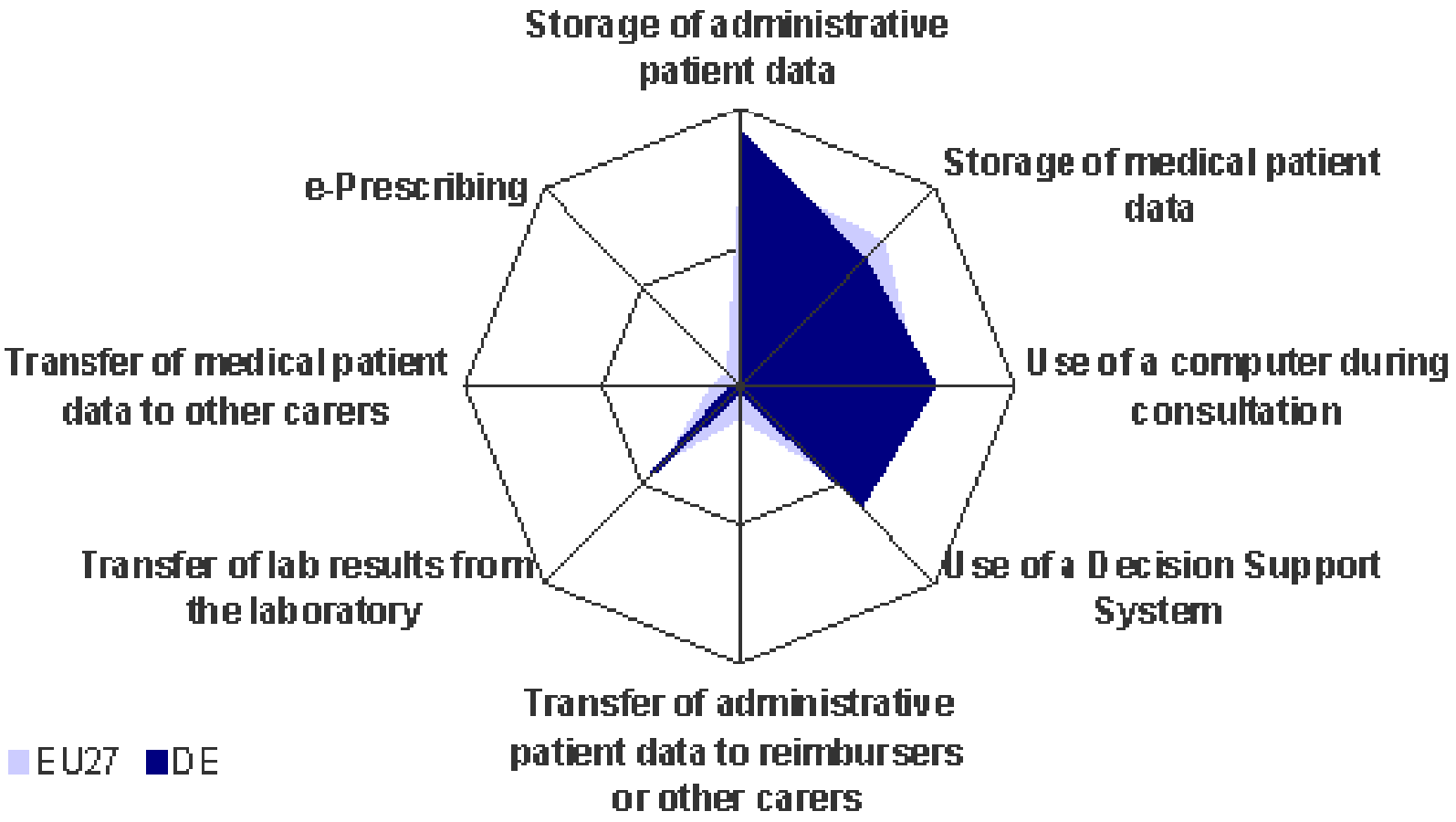
eHealth use in Germany: Average



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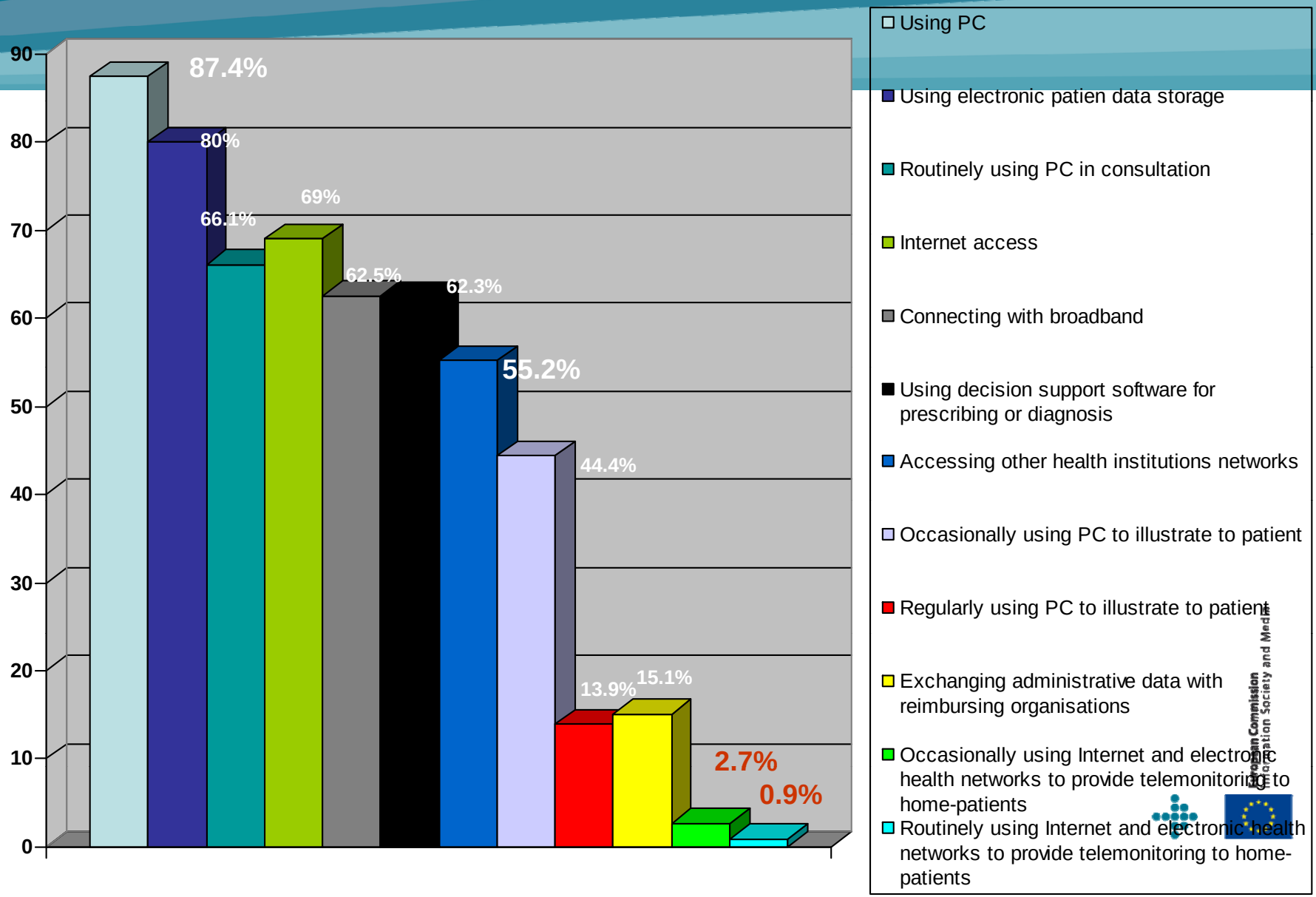
eHealth in EU – situation on the ground

GP Survey - 3rd quarter 2007

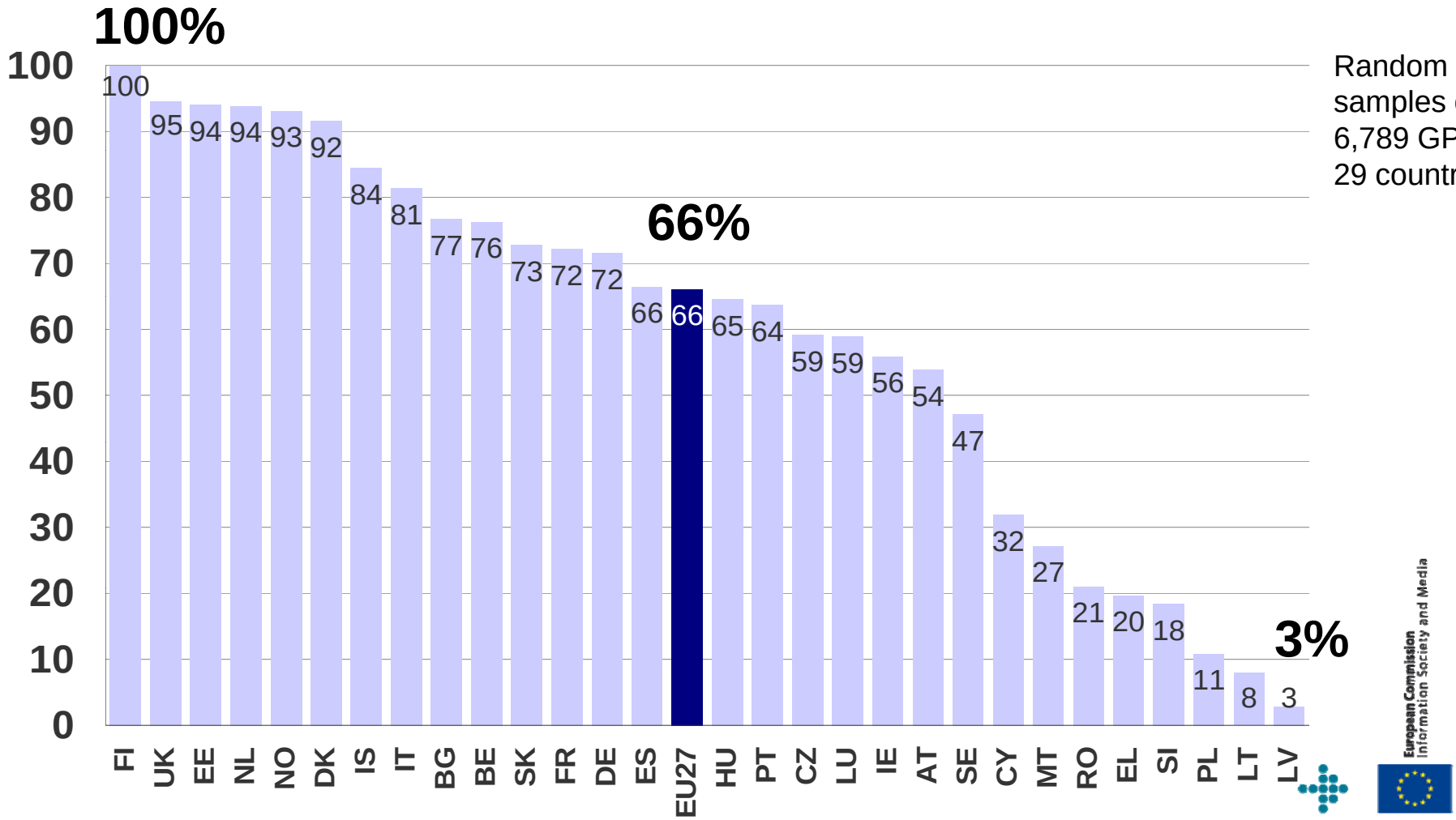
- 6789 interviews with GPs (max 318 inter./country);
- Coverage of 29 countries: EU27, Norway, Iceland;
- Sampling ensuring representativeness / country;
- Stratification by region to enable comparison between groups of similar regions using settlement types like metropolitan/urban/rural;
- Survey organisation: IPSOS

EU World Leader in deployment in primary care

(EC Study 2007)



EU GPs using a computer during consultation, in % (EC Study 2007)



Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008

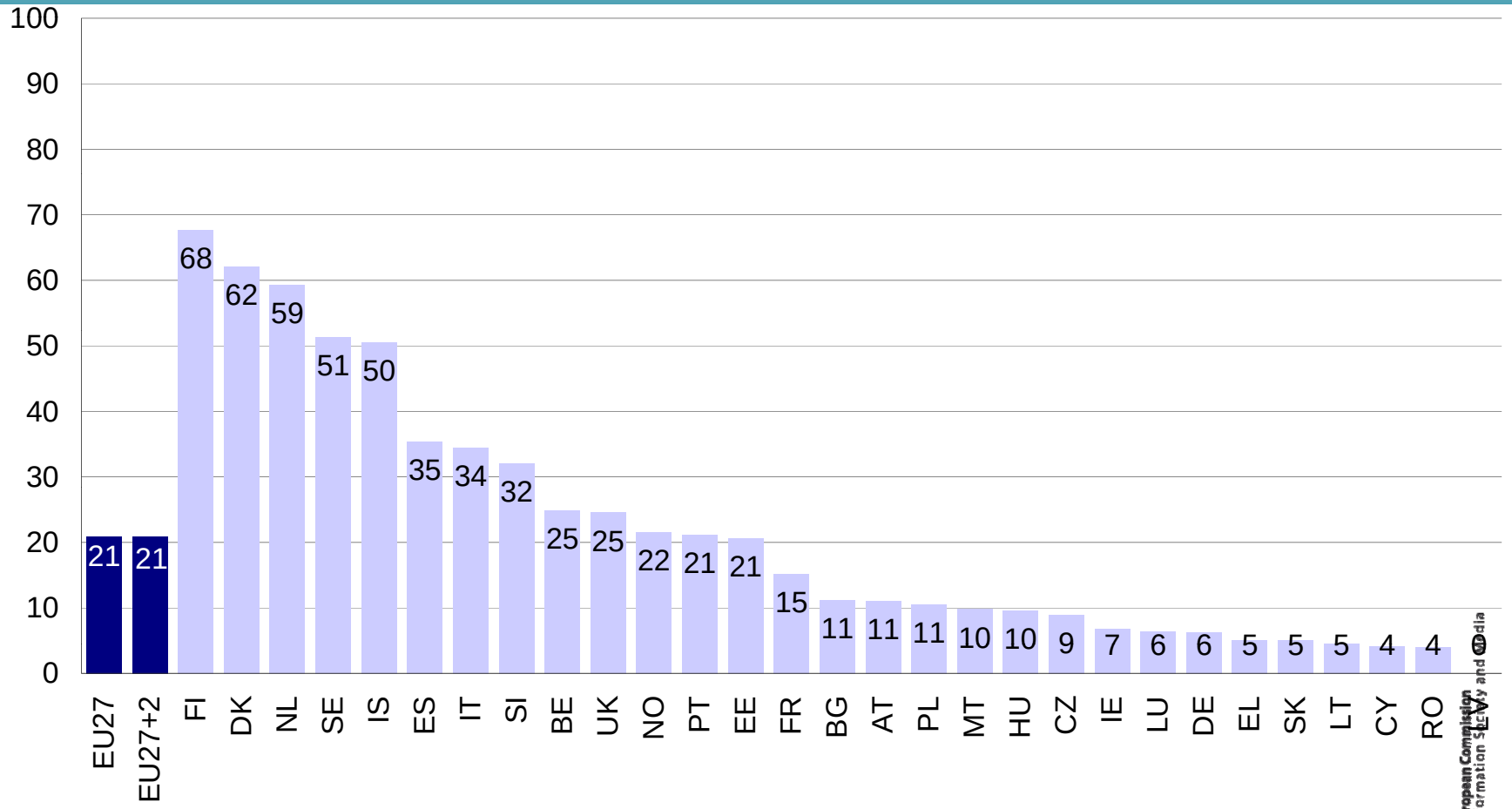
GPs: Electronic exchange of patient data by purpose (selected countries)

	Lab results from laboratories	Admin data to reimbursers	Medical data to care providers / professionals	Admin data to other care providers	Prescription to pharmacies	Medical data cross border
EU27	39.8	15.1	10.3	9.7	6.3	0.7
BE	73.5	2.5	12.9	12.9	1.6	0.9
BG	5.3	9.7	3.4	5.8	2.4	1.0
DK	96.2	47.9	73.6	74.0	97.3	1.9
EE	39.3	5.3	1.3	1.3	0.7	0.0
NL	83.8	45.4	26.0	27.5	71.0	4.7
FI	90.0	7.6	54.8	20.8	0.4	0.4
SE	82.4	8.2	13.1	15.7	80.9	1.5
UK	84.9	43.2	26.5	31.5	5.1	0.4
NO	88.2	18.6	34.8	25.5	2.9	0.5

Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008

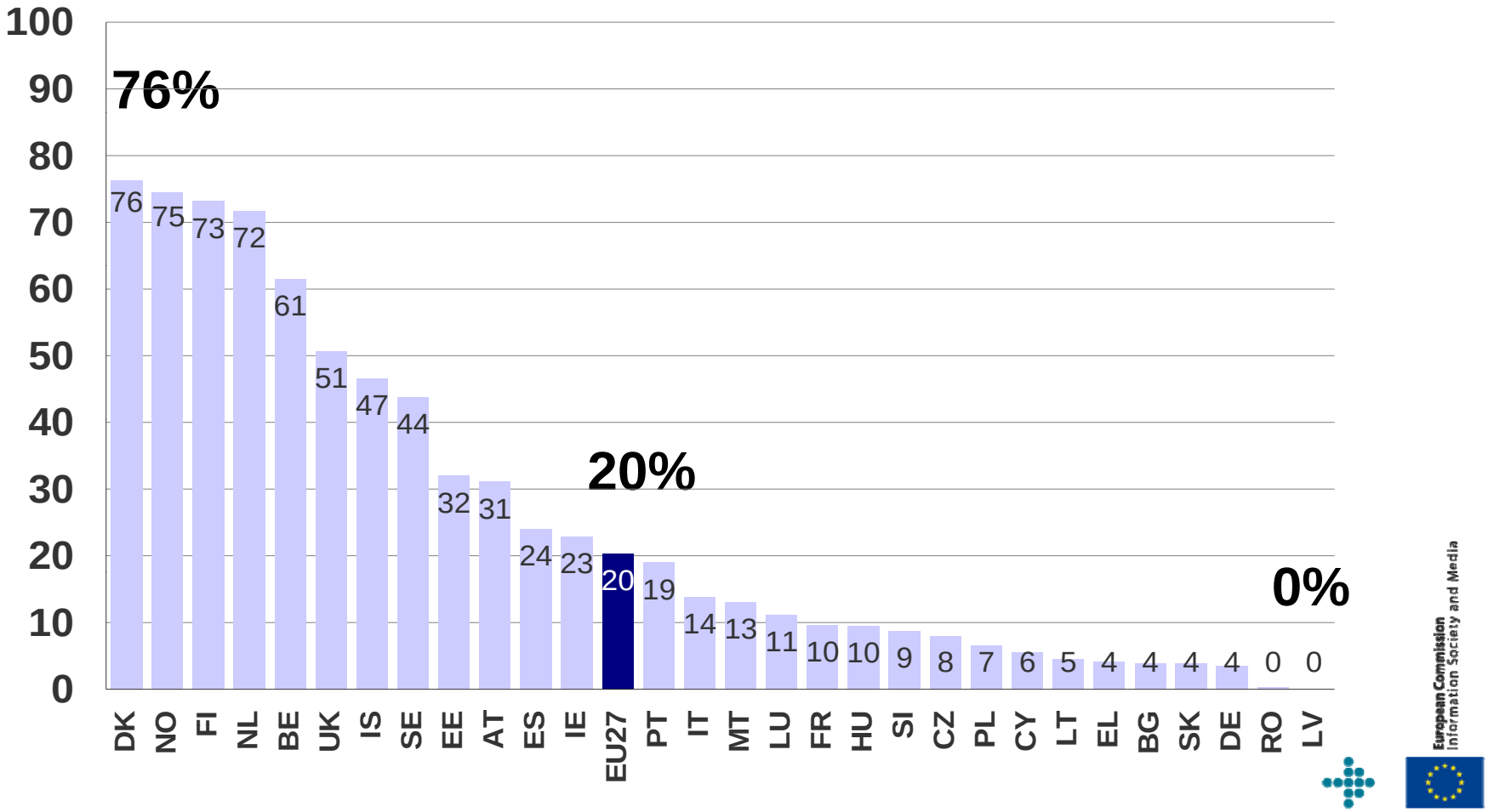
Connectivity: to other GPs

Access to electronic systems of other health actors: GPs



Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008

GPs data exchange with hospitals



Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008

Take home messages: #2

ICT will not do better what doesn't need to be done

- Sharing/exchanging data is not common practice
- Deployment of Health IT will not induce reorganisation
- Organisational changes are more effective when decided & implemented based on **convincing evidence** of benefits

Three step strategy for successful eHealth deployment:

i) Get over the fear (dialogue, evidence, involvement)

ii) Support existing way of working (although you think is inefficient)

iii) Be there to continuously support the changing way of working (long term contracts and patience when users take in charge)

eHealth Market in EU

POTENTIAL

- eHealth is currently the **fastest** growing industry of health sector, estimated at € 20 Billion, 2% of Health expenditure

Other EU markets: Pharma € 205 Bill., Medical Technology € 64 Bill.

- By 2010, a double digit growth rate of up to 11% is foreseen for eHealth, driven by a search for more productivity and performance (source: Datamonitor 2007 – Trends to watch: Healthcare Technology).

CHALLENGES

- Standardisation
- Interoperability

} EU Market fragmentation

- Business model & financing

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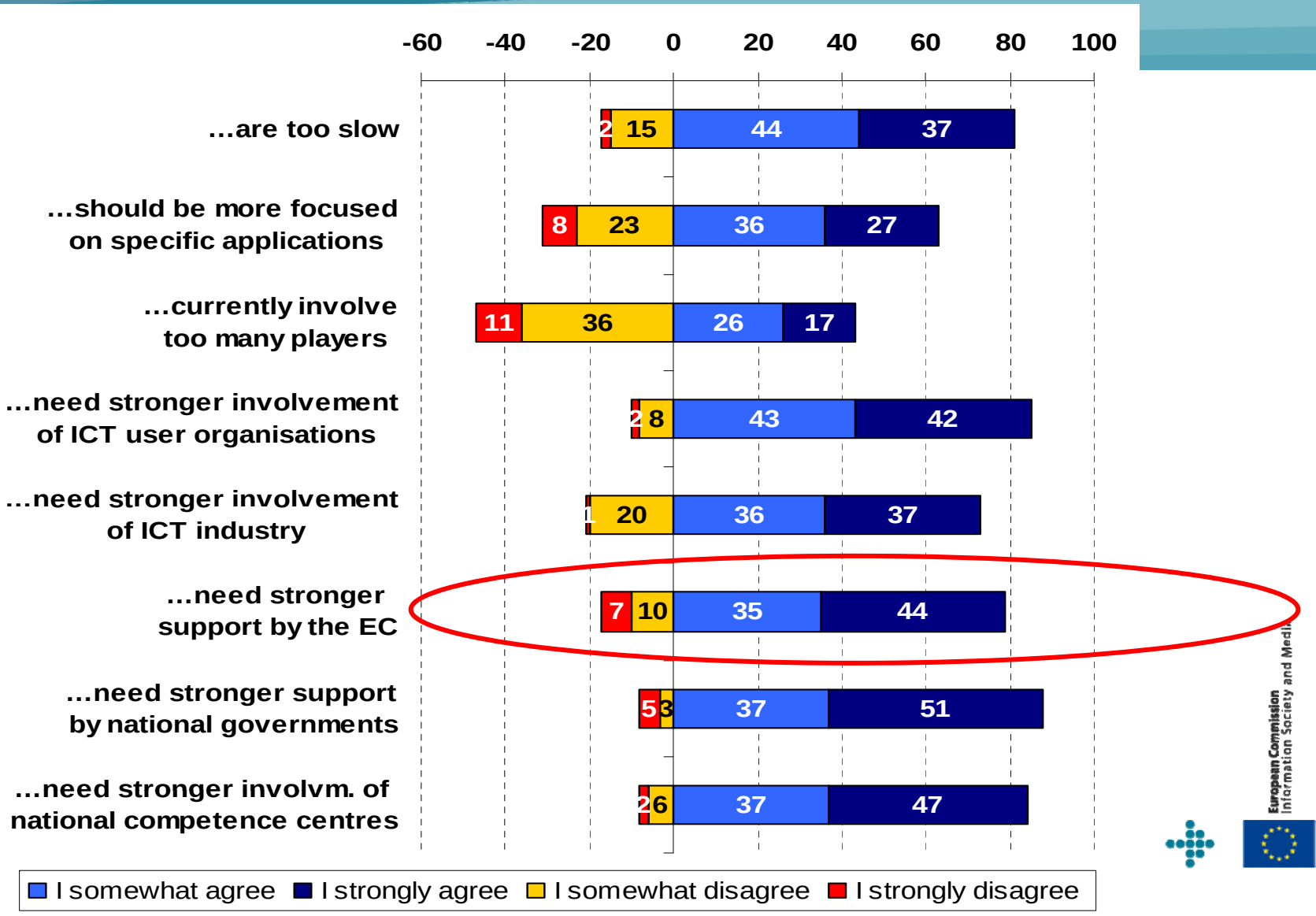
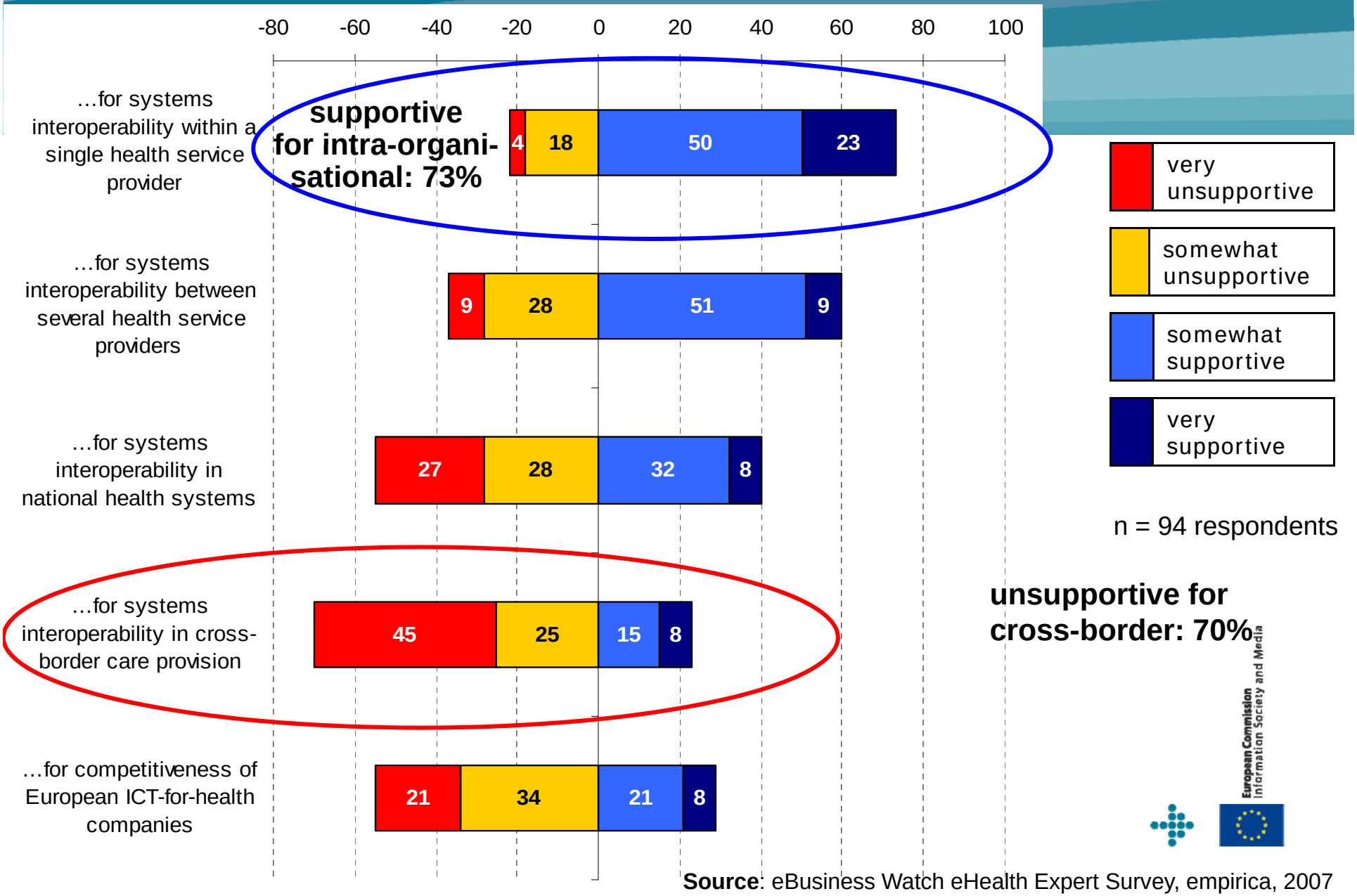
Current eHealth standardisation processes...



The current eHealth standards situation is...



n = 94 respondents

unsupportive for cross-border: 70%

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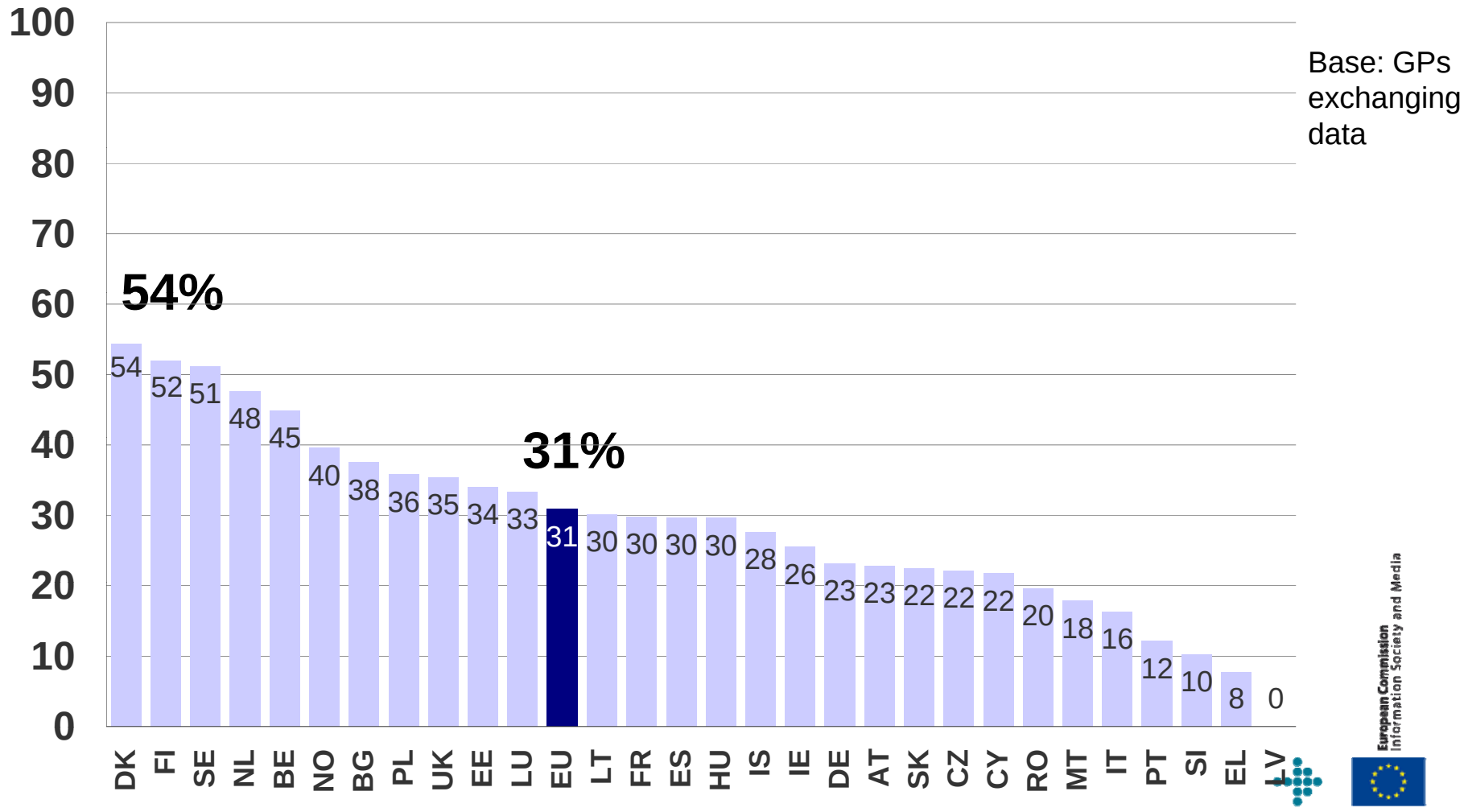
Source: eBusiness Watch eHealth Expert Survey, empirica, 2007

GPs: interoperability problems



Base: GPs exchanging data

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Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008

Interoperability
of Electronic Health Record (EHR) Systems

- the ability of two or more EHR systems to exchange
  - computer interpretable data and information
  - human interpretable meaning and knowledge.

This definition recognises the need for *connecting people* and health service providers to support their *collaboration* for the optimal delivery of health-related services to citizens.

Interoperability
Some thoughts..

- Concept with vast scope and many facets with no unique or easy solution
- Many international efforts with US, CA, and AUS
- Major technical aspects are common with other areas
- The semantic interoperability needs domain experts

Are we focusing all these years on technical interoperabilit to avoid dealing with the real problem?

EC places emphasis on Interoperability

- EC Recommendation on (cross border) EHR Interoperability
- Gives mandates (M 403) to CEN, CENELEC, ETSI to provide standards on (http://www.ehealth-interop.nen.nl)
  1) patient and health practitioner identifiers;
  2) the patient summary;
  3) an emergency data set
- Large Scale Pilot epSOS
- Supports projects and workshops on semantic interoperability

Call for proposals:

- EHR certification (CIP June 08)
- Conformance testing (FP7-Call 4 Nov 08)
- PHS (wearable, portables) interoperability (FP7-Call 4 Nov 08)

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Recommendation on cross-border interoperability of EHR systems

JO L 190 du 18.7.2008, p. 37–43

- *Aim:* guidelines_for national and cross-border interoperability of EHR systems
- *Scope:* incl. also patient summaries, emergency data sets, medication records / ePrescription
- *Actions* at four levels:
  - (1) political
  - (2) organisational
  - (3) technical
  - (4) semantic
- Monitoring, evaluation & awareness rising
- Compliance with national & EU laws

EC and Member States cooperation in eHealth deployment

- **Large Scale Pilot on cross border interoperability (epSOS = Smart Open Services for European patients)**
  - **12 EU member states, € 22m, 2008-2011**
  - **Cross-border services – safe treatment for citizens when in another MS**
    - ***European Patient Summary*** **(emergency treatment, unplanned care)**
    - ***ePrescription*** **across the EU (continuity of care)**

- **EU Interoperability Network CALLIOPE**
  - ***Community building*****, exchange of experience**
  - ***All*** **member states**

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Take home messages #3

No wide deployment, no interoperability without involvement/commitment of all stakeholders

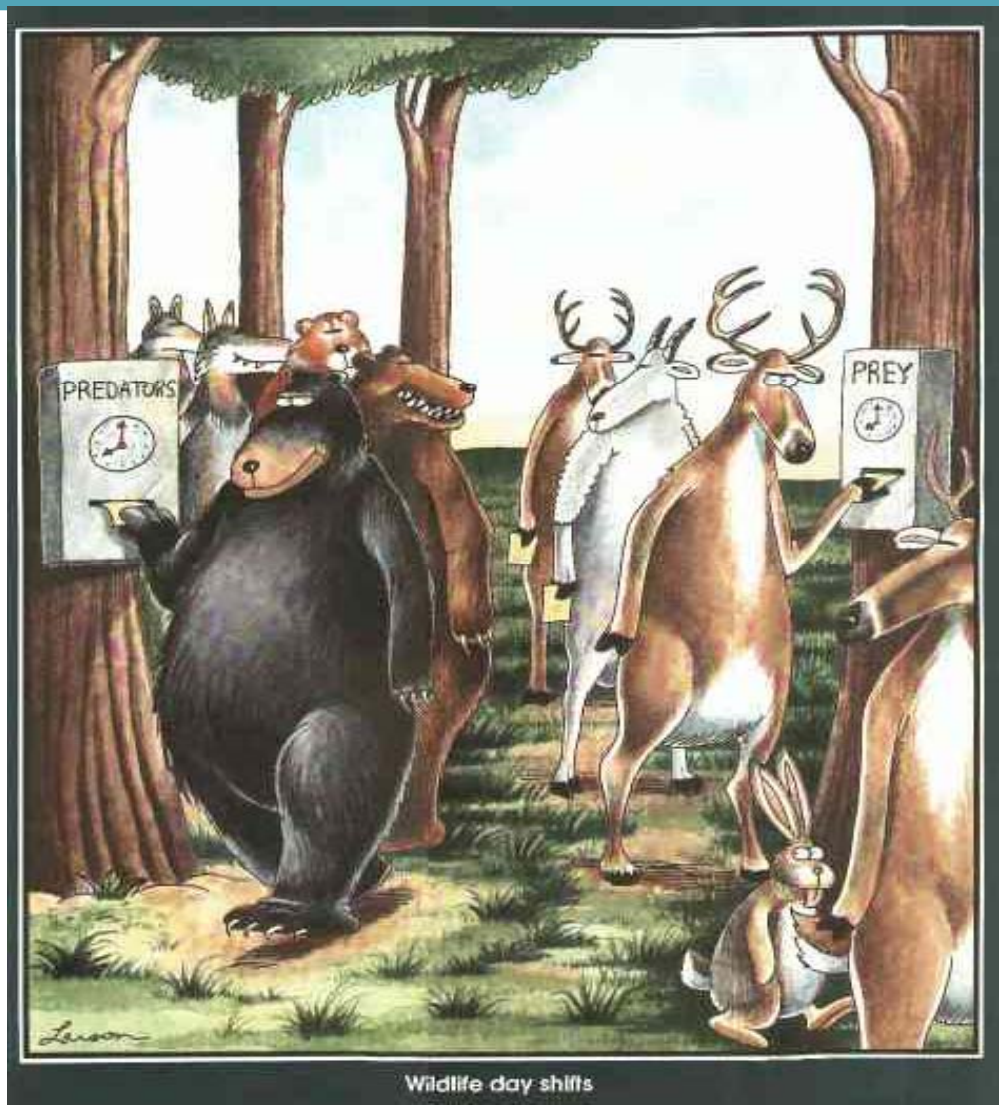
eHealth market is lacking the bottom line for every business: **TRUST** among the stakeholders

What can we do about that?

Idea: Structure the dialogue around a convincing evidence of benefits for

Patients,

Health System, Economy



EU eHealth Agenda

more details available in the presentation of session ES28

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WHO ARE WE

ICT for Health (eHealth), European Commission Information Society and Media DG

Supported > 500 eHealth projects with > €1 Billion since 1989
Current support (ca € 100 Mil/year)

Major focus in 90's: Regional Health Information Networks, Electronic Health Records, Homecare/telemedicine

Today's focus:

I) Research

- Personal health systems (wearable, portable monitoring)
- Patient safety (Clinical information systems for safer outcomes)
- Modelling and Simulation of diseases (Virtual Physiological Human)

II) Policy and support to deployment

eHealth Action plan, Lead market initiative,
Recommendation on Interoperability, Deployment of telemedicine
Large Scale Pilots, certification of Electronic Health Record Systems

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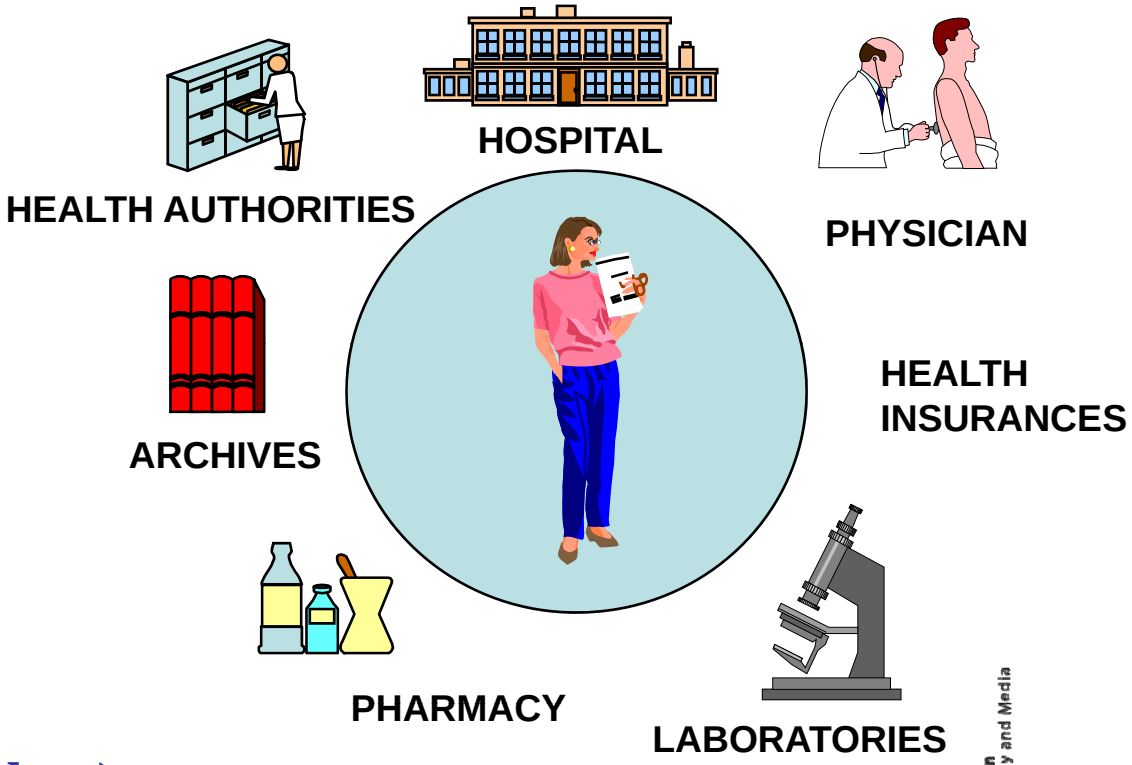
EU eHealth Vision (since early 90's)
Continuity of care enabled by eHealth

Through all the stages

Across all the points of care

Prevention
Diagnosis
Care
Rehabilitation



How: Sharing information (within or across borders)

Tools: Electronic health records, Regional health information networks

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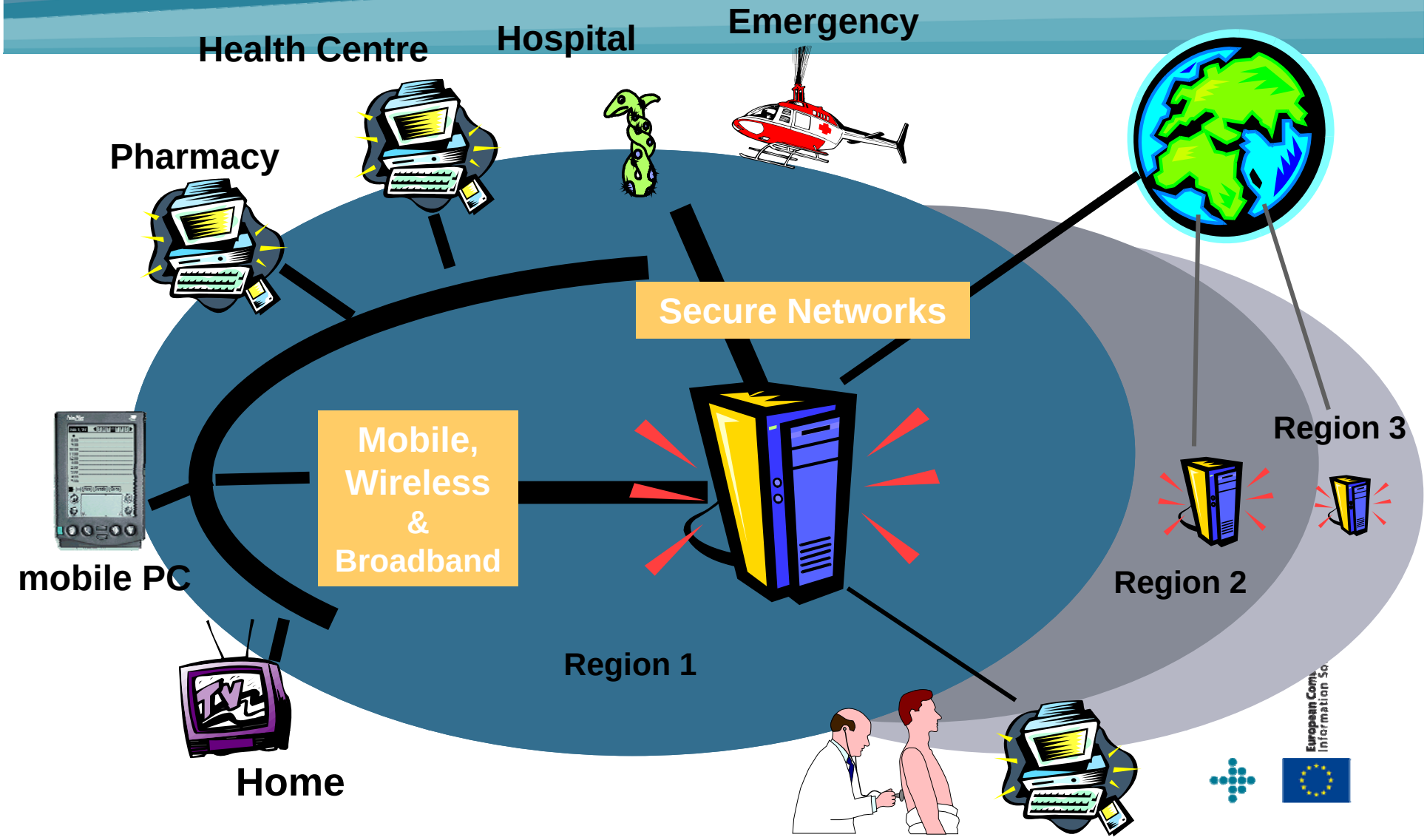
Interoperability for continuity of care

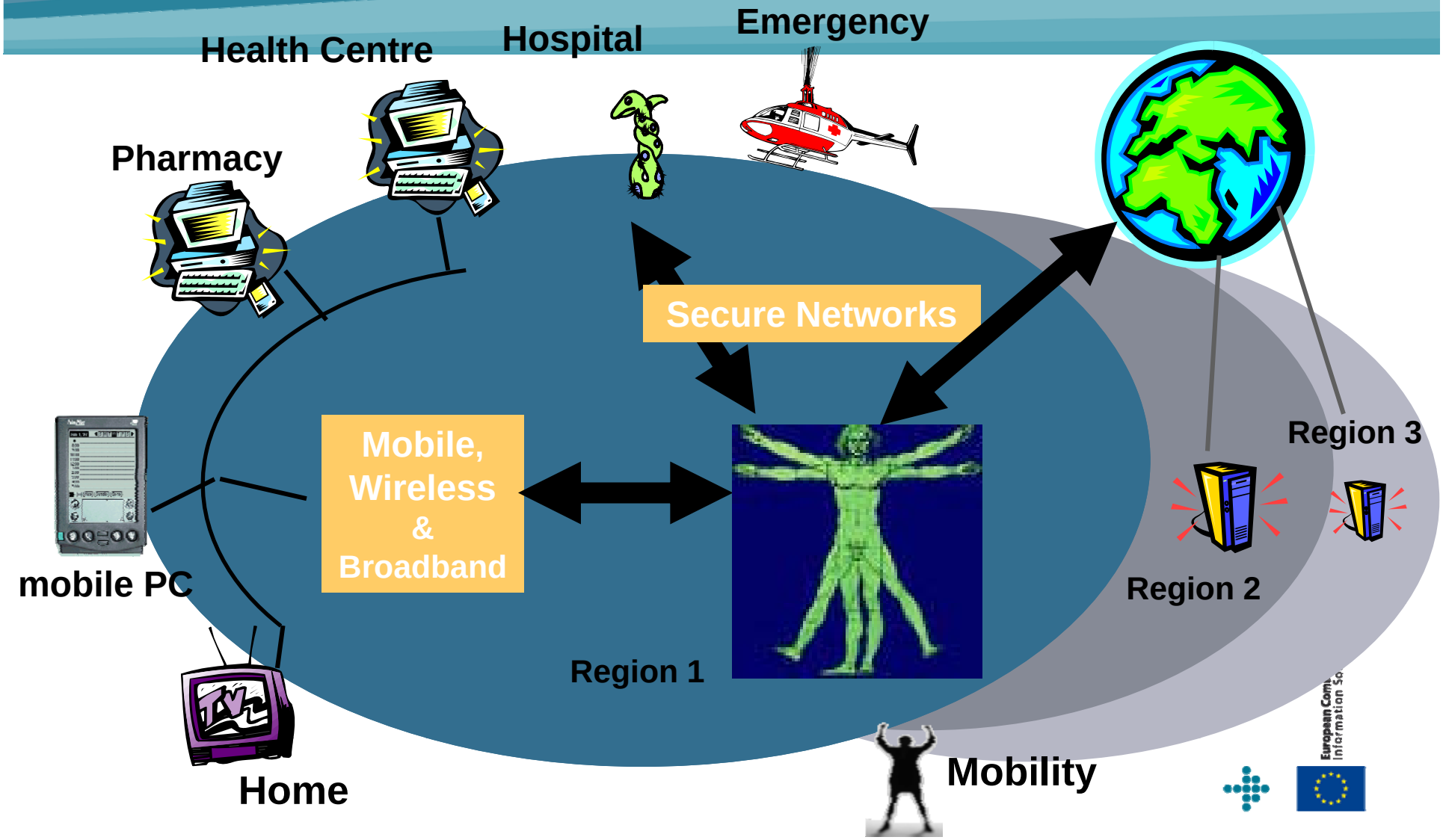
Linking all the point of care within a region/country



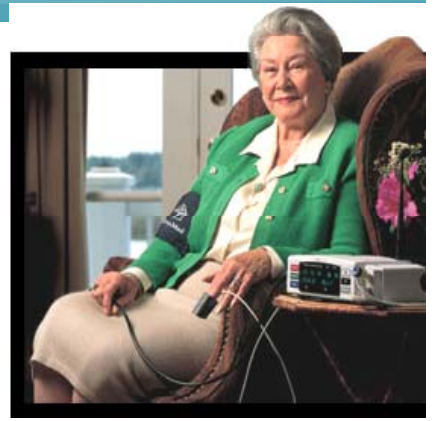
Current focus

Connecting individuals with Health Information Networks

Health monitoring, health information / promotion



Personal Health Systems - Characteristics



Realised as:

- **Wearable**, **implantable**, **portable** systems
- Integration of various components and technologies
  - *e.g., sensors, implants, signal processing algorithms, user interfaces, mobile and wireless communications*
- Used by the patient or healthy individual
- Coupled with telemedicine platforms to provide personalised services

Non-/minimally-invasive health monitoring and management

- Remote & continuous health status monitoring, early diagnosis and disease management
- Personalised medical advice, recommendations & treatment
- Adapted to the circumstances of the individual user
- Available at anytime and location beyond hospitals

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A Communication on Telemedicine:

'Telemedicine for the benefit of patients, healthcare systems and society' November 2008

Set of actions aiming at:

- Confidence and acceptance
  - assessment methodologies, convincing body of evidence
- Legal certainty at EU and national levels
- Technical issues and facilitation of market development.
  - Interoperability of monitoring devices, certification & testing?

Relevant studies:

- Business models for eHealth
- Monitoring eHealth strategies: lessons, trends and good practices
- Methodology to Assess Telemedicine applications

Bottom line: why and how to reimburse telemedicine

Factors determining a health status of an individual & population

-Quality/Efficacy of Healthcare services } Health delivery system

- Lifestyle: what we eat, drink, breath, …
- Physical and social environment } Exogenous Determinants (Nurture)

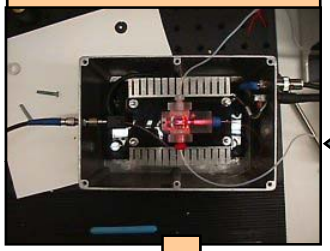
- Genetic “blueprint” /profile at birth
- Acquired genetic changes } Endogenous Determinants (Nature)

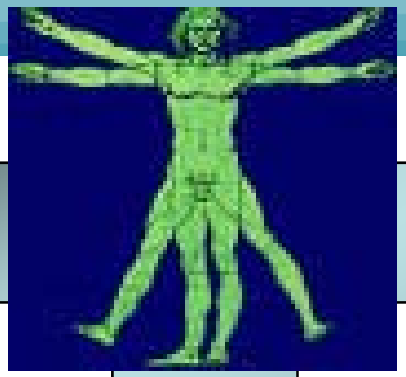
WHAT can ICT contribute

New R&D Activities

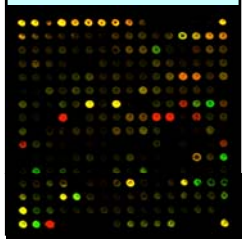
Towards full picture of individual's health status
Genomics-based personalized medicine

Biosensors



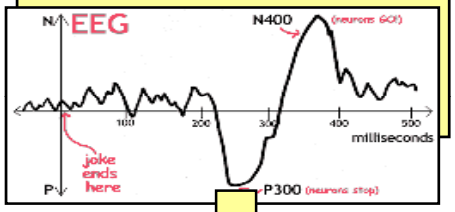


Biochips

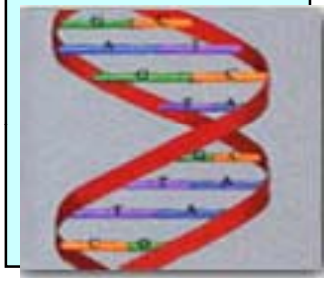


Environmental Data

Phenomic data



Genomic data



Integrated Health Records

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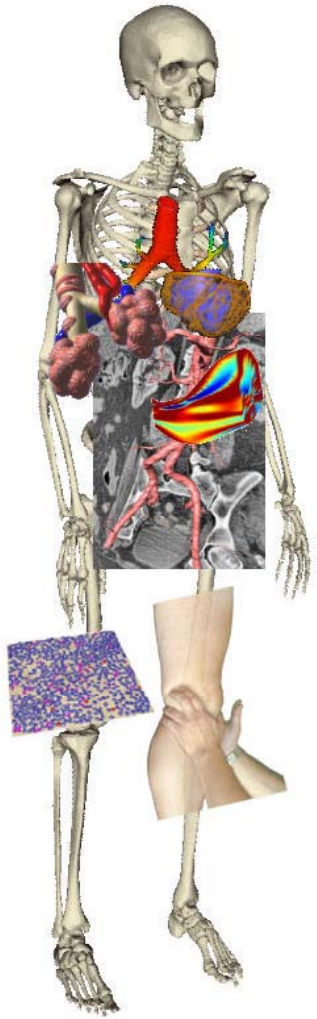
Virtual Physiological Human (VPH)
The aim

Based on the ideas of the International Physiome project



VPH constitutes effort towards

Multi-scale Patient specific models for

- Personalised (Patient-specific) healthcare solution

- Early diagnostics & Predictive medicine

- Understanding diseases for the first time and across several biological levels

The VPH research roadmap (2007)

www.europhysiome.org

developed by the EC project STEP

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ICT for Health Unit support for Research & development (FP7)

- **Personalisation of Healthcare**
  - Personal health system

  € 72 Million (M) in 2007, (€ 63 M in 2009)

- **Patient safety-avoiding medical errors**

  € 30 M in 2007, (€ 30 M in 2009)

- **Predictive Medicine – Virtual Human**
  - Modelling/simulation of diseases

  € 72 M in 2007, (€ 68 M in 2009)

Objective 5.1 – Personal Health Systems

Budget: €63M FP7 ICT Call 4 Deadline April 1, 2009

(a) Minimally invasive systems and ICT-enabled artificial organs

- **Remote** monitoring and care, **closed-loop** approaches
- **wearable**, **portable** or **implantable devices**
- **4 application domains**: Cardiovascular diseases, Diabetes, Renal failure (artificial kidney), Liver failure (artificial liver support)

(b) Mental Health

- Focusing on **stress**, **depression** or **bipolar disorders**
- **Multi-parametric monitoring** systems
- Facilitate self-treatment and cognitive behavioural therapy

(c) Support Actions on:

1) **R&D roadmap for Prevention of diseases**
2) **Interoperability of Personal Health Systems**

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Objective 5.2 – ICT for Patient Safety

Budget: €30M FP7 ICT Call 4 Deadline April 1, 2009

(a) ICT for safer surgery

- to predict clinico-functional outcome of surgical interventions
- Tools for training, pre-operative planning, and computer-aided interventions

(b) ICT for integration of clinical research and clinical care

- integration/linking of clinical care information in electronic health records (EHR) with information in clinical research information system
- Standardised link between clinical research systems and EHR repositories

(c) ICT-enabled early detection of public health events

- Enhanced health security through innovative event-based surveillance tools
- natural language processing, intelligent text mining, free text interpretation

(d) Support Actions *State-of-the-art and research roadmaps*

- (d1) Accelerated adoption of electronic health record systems supported by more user-friendly interfaces
- (d2) Improved patient safety through framework for interoperability testing of solutions for exchange of healthcare information

Objective 5.3 –Virtual Physiological Human

Budget: €63M FP7 ICT Call 6 Deadline April, 2010

(a) Patient-specific computer based models and simulation

- Multiscale models and simulation of **organs / systems targeting specific clinical needs**
- Better understanding of the functioning of the organs and its pathologies aiming at **prediction / early diagnosis**

(b) ICT tools, services and infrastructures for bio-medical researchers to support at least 2 of the 3 activities:

- Share data and knowledge
- Jointly develop and share models/simulators
- Create collaborative environments

(c) Support action on evaluation and assessment of VPH projects

- Shared tools/infrastructure
- Clinical achievements
- Market potential / penetration

(d) Coordination or Support Actions in Biomedical Informatics

- Sustaining cross-collaboration among different fields

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Obj. 5.4 – International Cooperation on VPH

Budget: €5M FP7 ICT Call 4 Deadline April 1, 2009

(a) Interoperability

- Joint development of interfaces between scientific databases, web services, mark-up languages, meta-data, ontologies

(b) Tools and services for global cooperation

- For modelling/simulation, curated models, interconnected libraries and data repositories

(c) Contribution to global validation framework

- Joint verification and validation of models wit reference to tools developed for clinical applications.

Additional requirements:

- Eligibility: Only on-going VPH related EU projects and to on-going international projects that address one or more of the target outcomes a) b) c)

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Ideas for Action

Commission, National/Regional authorities, Health Professionals associations, Industry

- Collect and promote the **evidence** of eHealth benefits
- Demonstrate Scalability of solutions focusing on the **interoperability, reliability, speed and security** (privacy enhancing technologies).
- Create conditions for global **market development** and innovation e.g.
  - **Business models, user incentives, skills development**
  - **legal and regulatory framework**
  - **financing and procurement - towards innovation friendly eHealth market**

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For further information

- **INFSO H1 Policy site:**

http://ec.europa.eu/information_society/activities/health/index_en.htm

- **Research site:**

http://cordis.europa.eu/ist/health/index.html

- **eHealth Task Force report:**

http://ec.europa.eu/information_society/activities/health/docs/lmi-report-final-2007dec.pdf

- **Interactive Portal:**

http://www.epractice.eu

eHealth use in Europe 2002 - 2007

- GPs engaging in patient data went up from 17% to 63%.
- Transfer of laboratory results (blood, ECG) from 11% to 54%.
- Transfer of administrative patient data to reimbursing organisations went up to 22% from 6% in 2002.
- Transfer of medical patient data increased from 8% to 28%.
- e-Prescribing was done by about 3%, now by about 11%.
- A comparison with the 2007 results for all 27 EU Member States shows that the enlargement of the Union did not have much impact — neither positive nor negative — on the developments in the past five years.

IT use among primary care physicians in seven countries

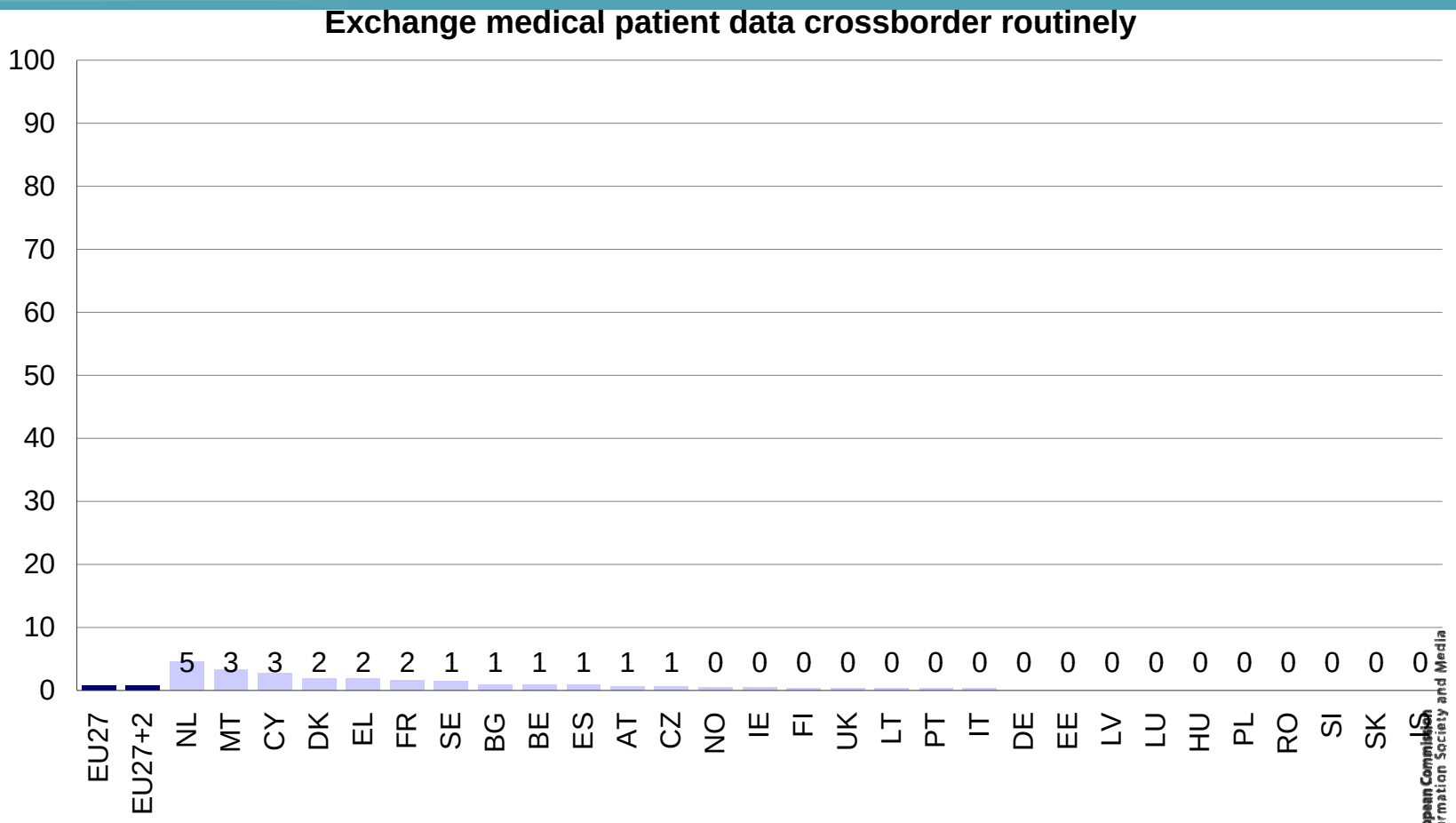
	AUS (%)	CAN (%)	GER (%)	NET (%)	NZ (%)	UK (%)	US (%)
Electronic medical record (EMR) system							
Do you currently use EMRs in your practice?							
Yes	79[b,c,d,e,f,g]	23[c,d,e,f,g]	42[d,e,f,g]	98[e,f,g]	92[g]	89[g]	28
Does your EMR system allow you to (base: all doctors; percent yes)							
Share records electronically with clinicians outside your practice	10[b,d,e,f]	6[c,d,e,f,g]	9[d,e,f,g]	45[e,f,g]	17[g]	15	12
Are the following tasks routinely performed in your practice?							
Doctor receives alert or prompt about a potential problem with drug dose or interaction							
Yes, using computerized system	80[b,c,d,e,f,g]	10[c,d,e,f,g]	40[d,e,f,g]	93[e,g]	87[g]	91[g]	23
Yes, using manual system	10[b,c,d,e,f,g]	31[c,d,e,f]	33[d,e,f,g]	2[e,f,g]	6[g]	6[g]	28
No	11[b,c,d,f,g]	56[c,d,e,f,g]	27[d,e,f,g]	4[g]	7[f,g]	3[g]	47

SOURCE: Commonwealth Fund International Health Policy Survey of Primary Care Physicians, 2006.

NOTES: Reading from left to right starting with Australia (AUS), the letter indicates significant differences with the country or countries to the right, as indicated ($p < .05$).

[b] Different from Canada.
[c] Different from Germany.
[d] Different from the Netherlands.
[e] Different from New Zealand.
[f] Different from the United Kingdom.
[g] Different from the United States.

Networking: cross-border



Source: empirica: ICT and eHealth use among GPs in Europe 2007, Bonn April 2008