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Innovation in eHealth & sustainability

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Some of the Challenges for European Health Systems

- **Pressure on healthcare systems**
 - Citizens' expectations for high-quality care
 - Demographic changes
 - more people will require prolonged care
 - Increased prevalence of chronic diseases
 - substantial part of the overall healthcare costs
 - Medical accidents/errors
 - Staff shortages
 - Reactive model of healthcare delivery
 - after appearance of symptoms
 - Rising healthcare costs
 - faster than the economic growth itself
- **How to offer high-quality & affordable care?**



ICT for Health (eHealth) for sustainability

- **Efficiency & productivity – to do more with less**
- **From 'hospital-based' to 'patient-centred' care**
- **From 'late disease' to 'early health'**
- **Two main areas:**
 - **Preventive medicine:**
 - *Chronic disease management*
 - *Empowering the patient (training, monitoring ..)*
 - **Predictive medicine:**
 - *Molecular medicine*
- **eHealth for the economy – Lead Market sector**



Invention & Innovation

Invention

€ → ideas

Success factors:

education, bright individuals
groups/centers of excellence
research infrastructure
(public and private/industrial)

Innovation

ideas → € and/or
social benefits

Success factors:

Policy & political will
Financing/business models
Market / Industry readiness
Legal FW and trust
User acceptance

DG INFSO - R&D Framework Programmes
Contribution: - EU Research Area

next slide →



EC – DG information Society and Media Contribution to Innovation in eHealth

- **Policy Documents and Political initiatives**
 - **eHealth Action plan ('04),**
 - **Lead Market Initiative ('07),**
 - **EC Recommendation on EHR Interoperability ('08)**
 - **Communication on Telemedicine ('08)**

 - **Support to EU eHealth Governance - State Secretaries group (2009)**

- **Funding**
 - **Structural funds**
 - **Competitiveness and innovation (CIP) programmes**
 - **epSOS Large Scale Action, Calliope Network**
 - **Telemedicine Large Scale Action**



EC – DG information Society and Media Contribution to Innovation in eHealth

- **Market Issues**
 - **development and support to new business models, standardization, certification, technical & semantic interoperability**
- **Legal Framework**
 - **Directive on personal data protection**
 - **Directive on Info. Society Services and Elec. commerce**
 - **Privacy enhancing technologies**
- **User Acceptance**
 - **Dissemination, user involvement in FP and CIP**





AMON

Example 1



MYHEART

- **Innovating in the way Healthcare is delivered**
 - Remote monitoring and teleconsultations
- **Tools:**
 - wearable, portable health systems, GSM, broadband
- **Legal requirements**
 - teleconsultation to be considered a medical (= reimbursable act)
 - privacy of the patient doctor relationship to be assured and correct patient consent prepared
- **Business model**
 - patient utilizes less the hospital and travels less
 - the price of the telemonitoring recovered by keeping the patient away from expensive care (e.g intensive care units)
 - Doctors getting paid a percentage of the normal visit payment
 - Hospitals manage beds for the people really in need of hospitalization (which are also patients that bring more revenue to hospital)



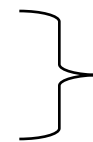
Telemedicine Benefits

- **Boario telecardiology (Italy):**
 - 35-47% reduction in hospital admissions (in various studies)
 - 12% reduction in outpatient visits
- **UK studies:**
 - Wireless Healthcare (2004): Early discharge from hospitals -> up to 85% reduction in weekly care costs
 - Cost of telecare at home with 24 hours response = 1/3 of the cost of a nursing home place
- **Potential of Mobile Monitoring in Germany**
 - Up to €1.5 billion/year savings through early patient discharge
 - (Assuming 3 days less hospital stay for 20% of patients) ●●● 8



Factors determining a health status of an individual & population

-Quality/Efficacy of Healthcare services



Health delivery system

- Lifestyle: what we eat, drink, breath, ...

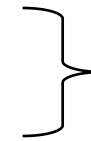
- Physical and social environment



Exogenous
Determinants
(Nurture)

- Genetic “blueprint” /profile at birth

- Acquired genetic changes



Endogenous
Determinants
(Nature)

**ICT has a role in all aspects-
Huge potential for innovation!**



EXAMPLE 2 – towards personalised and predictive healthcare

euHeart – Patient-Specific Cardiovascular Modelling

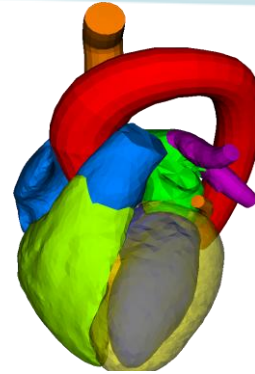
Development, personalization and validation of computational models of the heart to improve:

- Heart Failure
- Coronary Artery Diseases
- Valves and Aorta
- Resynchronization Therapy
- Radiofrequency Ablation

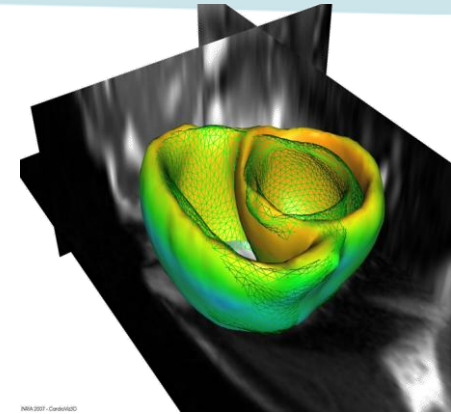
Project coord.: **Philips Research**
Scientific coord.: **Univ. of Oxford**

17 partners (6 companies, 6 universities, 5 clinics)

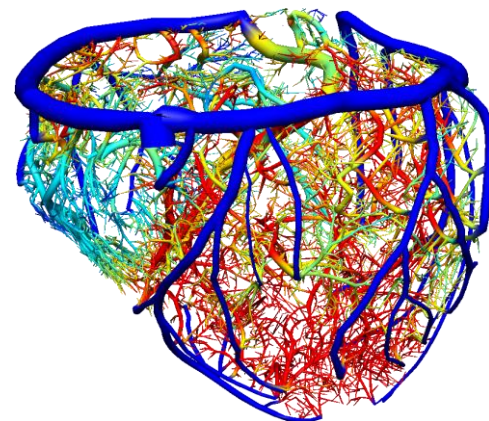
Budget ~19M€ EC funding: ~14M€



© Philips Research



© INRIA



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Conclusions



- eHealth is among the top objectives of health systems & authorities – it brings benefits to patients, health systems and economy when combined with proper organisation and skills
- EC promotes invention and innovation in eHealth/ICT for Health
 - FP and CIP programmes,
 - Policy actions and documents such as post i2010, LMI
 - cooperation with Member states and other stakeholders
 - works with experts on the business models
- The new frontier for EC: *ICT for personalised and predictive healthcare*, bringing all factors / information related to health of individual consistently together.

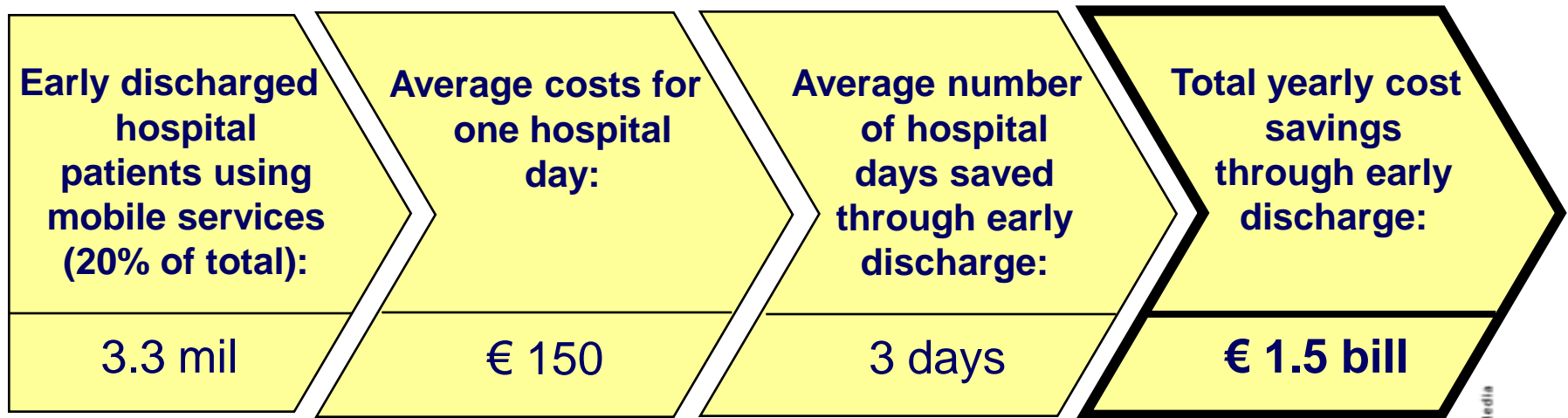


Annex



Evidence of cost savings in patient care

- Hospitals in Germany can save up to € 1.5 bill per year through early discharge of patients made possible by mobile monitoring services**



Source: GesundheitScout 24 GmbH and Bayerisches Rotes Kreuz

Example for an e-health “driving hub” in Germany

- German health insurer „Taunus BKK“ carried through a remote patient management pilot study for heart failure patients (TAUNUS-Zertiva)
- Overall 3000 patients (NYHA II-IV) had been included (600 intervention group, 2400 control group)
- The study was running for 1 year
- Parameters remotely monitored: ECG, blood pressure, weight
- Results:

- Overall costs were 52% lower in the intervention group (€ 3.065 vs. € 6.397)
- Overall hospitalisation rate was 11% vs. 35%
- Average hospitalisation time was 49 days vs. 379 days (per 100 patients)

eHealth works

Optimal results when eHealth tools 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)
- **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>



Health sector in EU

- **Employs 9.3 % of workforce, > 15 M people (retail 13.0 M, business services 13.3m)**
- **Health expenditure > 8,5 % of GDP, growth at 4% a year (faster than EU economic growth), potential to reach 16% of GDP in EU by 2020** (Healthcast 2020, PWC)
- **Health care is information intensive sector but ICT penetration is low compare to other sectors.**
- **There is great potential for benefits for individuals, society and economy when **ICT, leadership and skills come together****



Health sector – some observations

- **HC organised around disease / organ systems not around human conditions (one clinical expertise vs shared care)**
- **Governments struggle to identify/implement priorities (often contradictory)**
 - **productivity (equity in access to health system activities)**
 - **health outcome (avoiding disparities in health status)**
- **Whatever the choice there is need for data to manage properly**
 - **need for quality information that is captured at the point of care**
- **Individuals could be better supported in their “health journeys”**



eHealth Market in EU

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

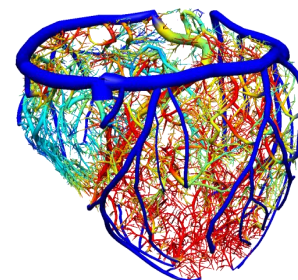
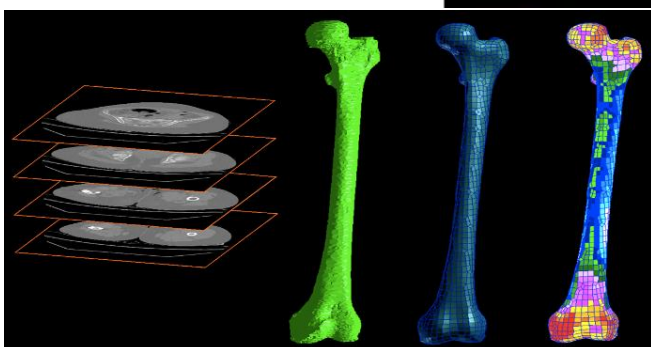
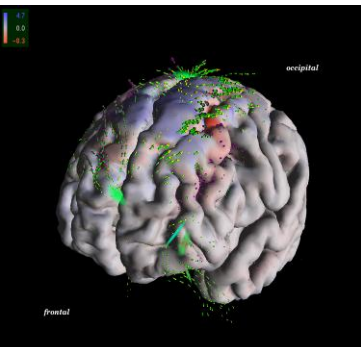
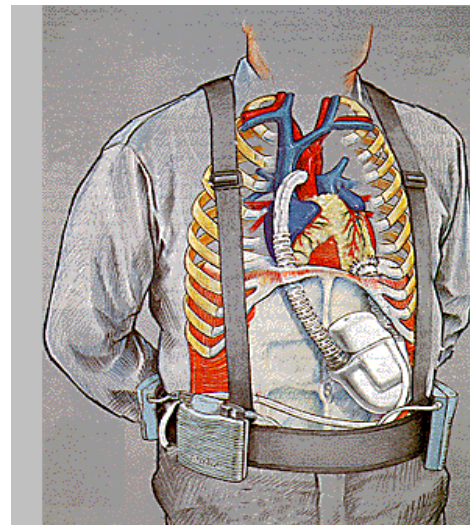
Other EU markets: Pharma € 205 Bill., Medical Technology € 64 Bill.

- 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
 - Business model & financing
- } EU Market fragmentation





eHealth (ICT for Health)

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



National Priorities: Preliminary Analysis

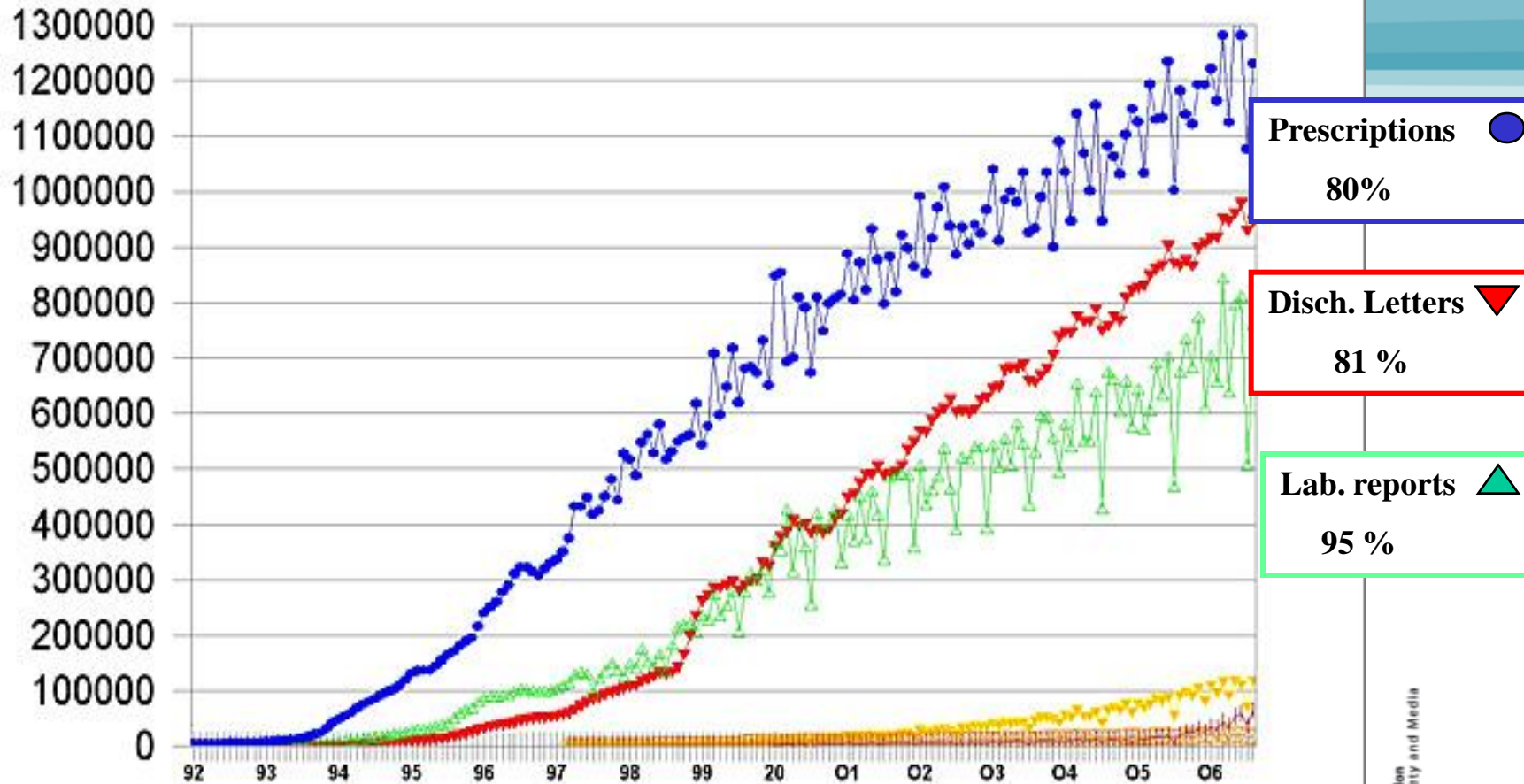
Priorities in national eHealth Strategies	# of Countries	Examples
<p>Electronic Health Records</p> <p>EHR, EPR, Medical Records, Patient Summary, Emergency Data Set</p>	<p>17</p>	<p>DMP - Dossier Médical Personnel (FR) BEHR - Basic Structure for the EHR (DK) NHS Care Records Service / Spine (UK), Patient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



MedCom -The Danish Health Data Network

Messages/Month

www.medcom.dk



Estimated cumulative benefit by 2008: ~ € 1.4 bil.

Reimbursement
13290 = 95 %

Referrals
40113 = 80%



2008: Emphasis on Interoperability

- Support to projects, events, education on interoperability
- Mandate (M 403) given 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.
- Launch of Large Scale Pilots on interoperability of emergency and medication data – CIP (7/08)
- Calls for proposals:
 - EHR certification (HER-Q-TN see www.eurorec.org)
 - Conformance testing (currently under negotiation with IHE, ETSI)
 - PHS interoperability (currently under negotiations with CONTNUA)



Competitiveness Innovation Programme Policy Support Programme (CIP ICT PSP)

- **Large Scale Pilot (epSOS)**

23 beneficiaries, 12 countries

6 national Ministries of Health

15 Competence Centers

31 companies through IHE-Eur

11 Million EC funding

36 months

- **Thematic Network on
eHealth Interoperability
(CALLIOPE)**

– 27 beneficiaries

– 30 months

– 500k EC funding



Implementation, support to policies epSOS: Approach and Expected Outcome

- **One large Scale Pilot**
 - Patient summary for unexpected care
 - ePrescription/medication records
- **With a common architecture**
- **Built on Member States' solutions and users' needs ('bottom up')**
- **Thought as long lasting solution at European level**
- **Scalable and sustainable, adaptable to new situations**



A Communication on Telemedicine: October 2008

- Telemedicine experiences exist nation and Europe wide
- Increasing deployment due to:
 - Technical reasons: Broadband, personal health systems
 - Financial reasons: Moving patients from hospitals to home; solutions for chronic disease management
 - Other reasons:
 - Geographical, Patient empowerment, Involving family in care process, Elderly people, Skill shortage
- Challenges: legal environment, reimbursement, business models, evidence, acceptance, awareness, technical



Hospitals – overview

- **Hospitals in the EU seem well connected: 98% have internet access, 78% broadband**
- **Main applications: Hospital Information Systems**
 - administration
 - ePrescription & eMedication (treatment support)
 - imaging (diagnosis support)
- **Integration of eHealth application components: lacking**
 - no ICT plans within the organisation
 - lack of reliable providers (34%)
 - no set standards



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

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

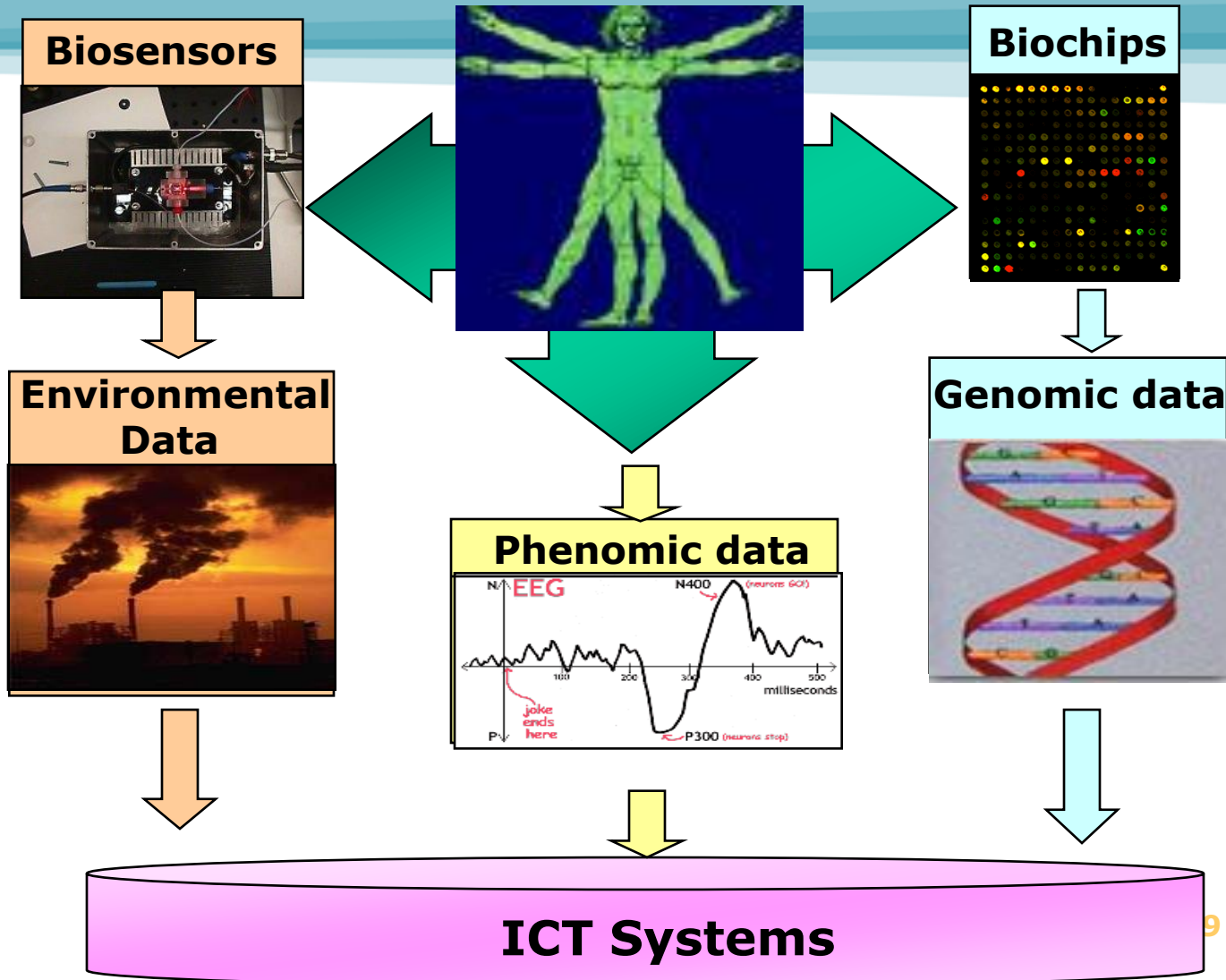
€ 72 Million (M) in 2007, € 63 M in 2009
- **Patient safety-avoiding medical errors**

€ 30 M in 2007, € 30 M in 2009
- **Predictive Medicine – Virtual Human**
 - Modelling/simulation of diseases

€ 72 M in 2007, € 68 M in 2009

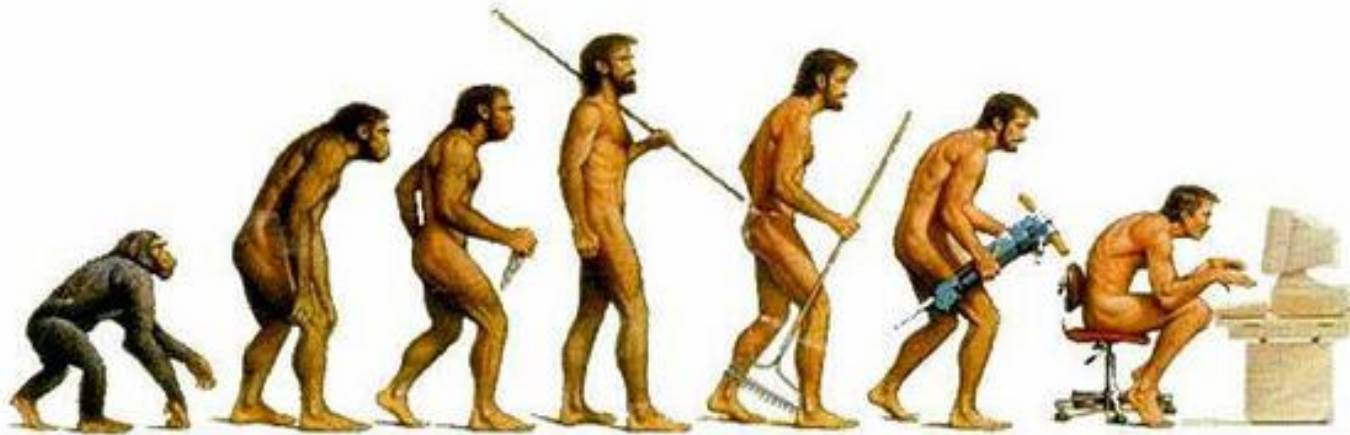


New and Future Activities Towards full picture of individual's health status "Omics"-based personalized medicine



and some new challenges for healthcare...

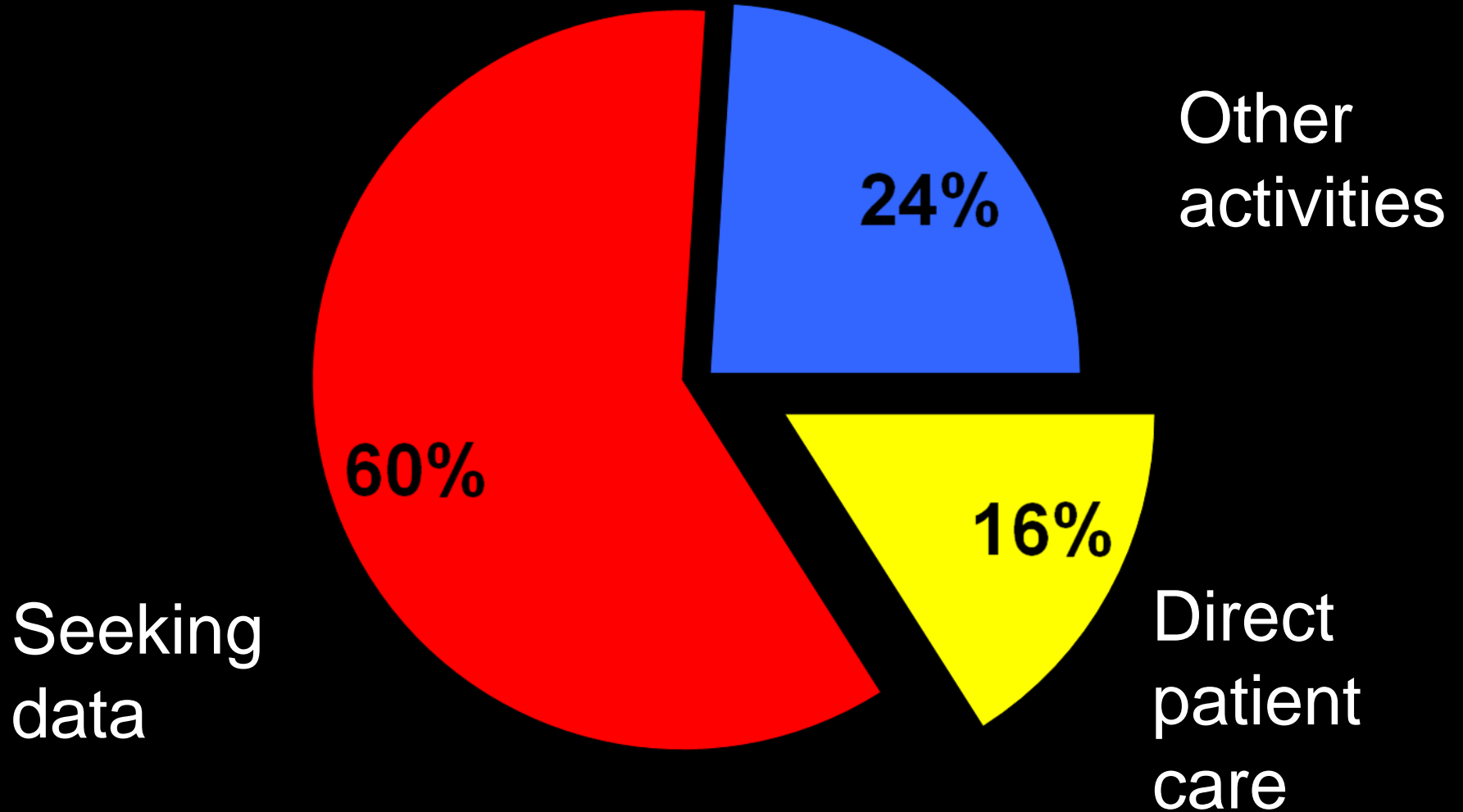
It took 3 million years to stand up, but only 30 years to sit down...



- Obesity
- Mouse arm
- neck & back problems
- etc..



How clinicians spend time



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>

- **Interactive Portal:**

<http://www.epractice.eu>

