ITU/BDT Regional Economic and Financial Forum of Telecommunications/ICTs for Arab States

Session 3:
ICTs and e-health services

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Oscar González Soto
ITU Consultant Expert
Spain
oscar.gso@gmail.com

ICT and e-health services

- E-health objectives and challenges
- Main e- health domains and systems
- E-health cases and benefits

ICT and e-health services: Objectives

- To provide better health service and quality to the community
- To improve health care efficiency and accuracy
- To provide health services in difficult to reach areas
- To reduce need for Health care workforce and waiting times
- To update data and knowledge sharing
- To reduce costs per patient

ICT and e-health services: Challenges (I)

- How to reach cross-border healthcare, health security, solidarity, universality and equity
- How to provide better support to chronic disease and multimorbidity
- How to encourage organisational changes by promoting innovation, patient/citizen-centric care and citizen empowerment
- How to improve legal and market conditions for developing e-Health products and services
- How to remove inertial behavior on the health chain

ICT and e-health services: Challenges (II)

- How to Reduce high child and maternal mortality Rates
- How to solve lack of access to safe water supply and insufficient sanitation facilities
- How to reduce Infectious Diseases spread (HIV/AIDS, Tuberculosis,…)
- How to solve lack of personnel, institutions and medications in public health and medical systems
- How to facilitate difficult access to health care institutions

ICT and e-health services: Involved Organizations

- State (Ministry of social affairs)
- Health care professionals organisations
- Patients organisations
- Health care legislation
- Privacy legislation
- Social sector organisation
- Private sector (health insurance)
- Pharmacies

ICT and e-health services

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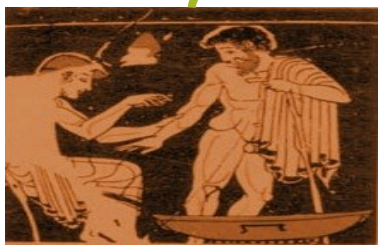
ICT and e-health services: Evolution of health services



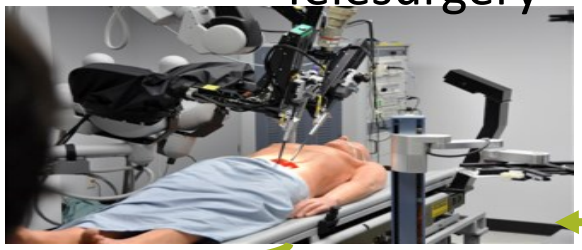
Healthcare

eHealth

Telemedicine

Store&Forward

Telehomecare



Telesurgery

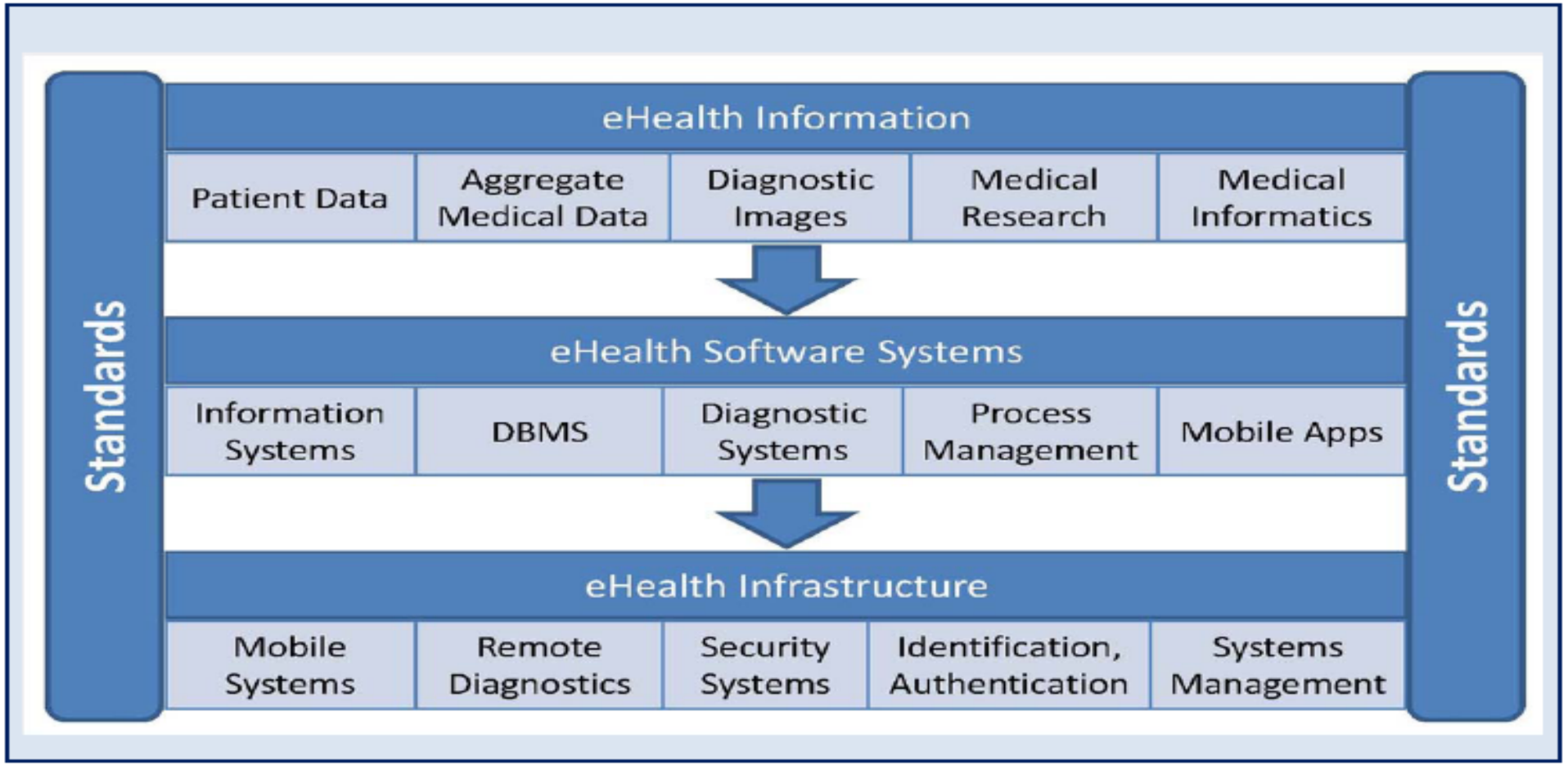
First limited projects started at the 60s

Important advances at the 80s with participation of NASA

ICT and e-health services: ICT involvement

- Communication networks, connectivity, Internet, mobile terminals, wearables and applications
- Healthcare telematics
- Medical records and data bases
- Telemedicine
- Digital imaging
- Re-organisation of the healthcare activities

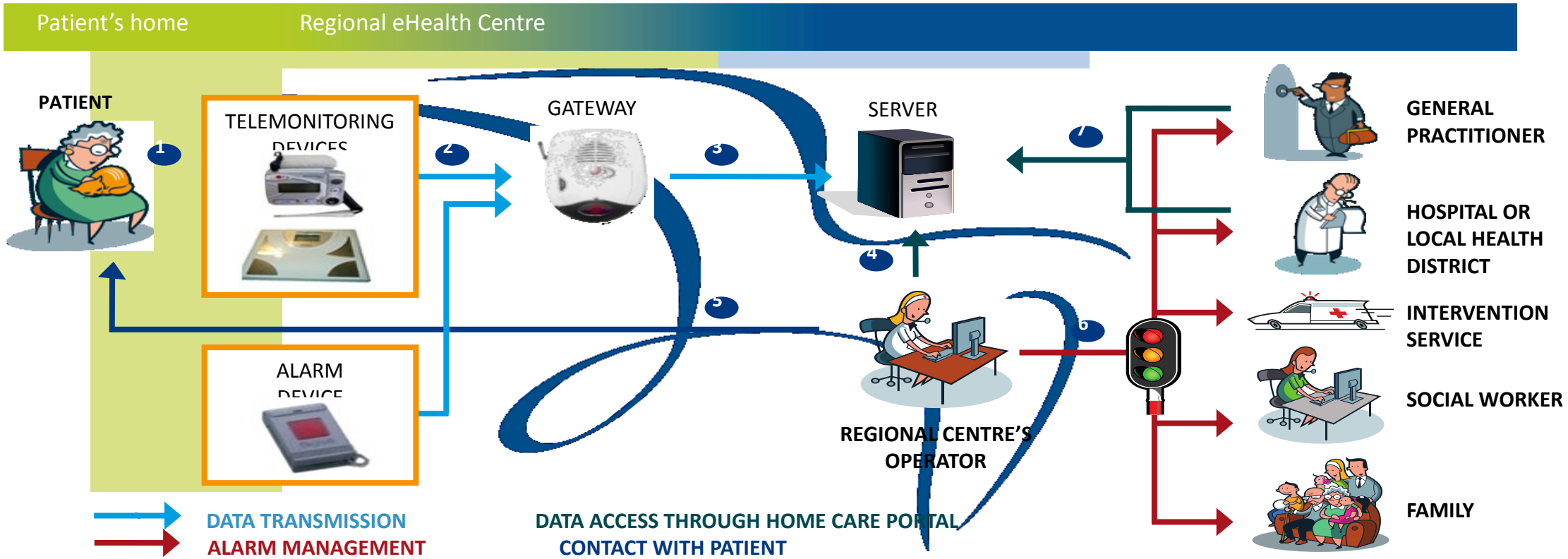
ICT and e-health services: Domains and standards focus



DBMS: Data Base Management Systems **Source:** ITU-T Technology Watch, Standards and e-Health

ICT and e-health services: Telemonitoring of chronic patients

Example of an ICT Network that allows physician to manage the chronic patient (COPD, Diabetes, CVD) in remote way



COPD: Chronic Obstructive Pulmonary Disease
CVD: Cardio Vascular Disease

Source: CESI- Confédération Européenne des Syndicats, Academy

ICT and e-health services: Technical subsystems

- Connectivity
- Security and en encryption with PKI
- Authentication
- Databases (certified sources)
- Naming systems/ defining terms, codes, ...
- Portal site
  1. a search engine
  2. integrated users- and access management
  3. a content management system
  4. managing logins
  5. personal electronic mailbox for each health care worker
  6. time stamping

ICT and e-health services: Legal aspects

Laws and regulations now based on paper

- Progressively more understanding for electronic documents
- Protection of the individual´s privacy
- Electronic signature
- Specific laws required, otherwise: blocked

(i.e.: telemedicine vs. recognised intervention requiring physical presence)

ICT and e-health services

- E-health objectives and challenges
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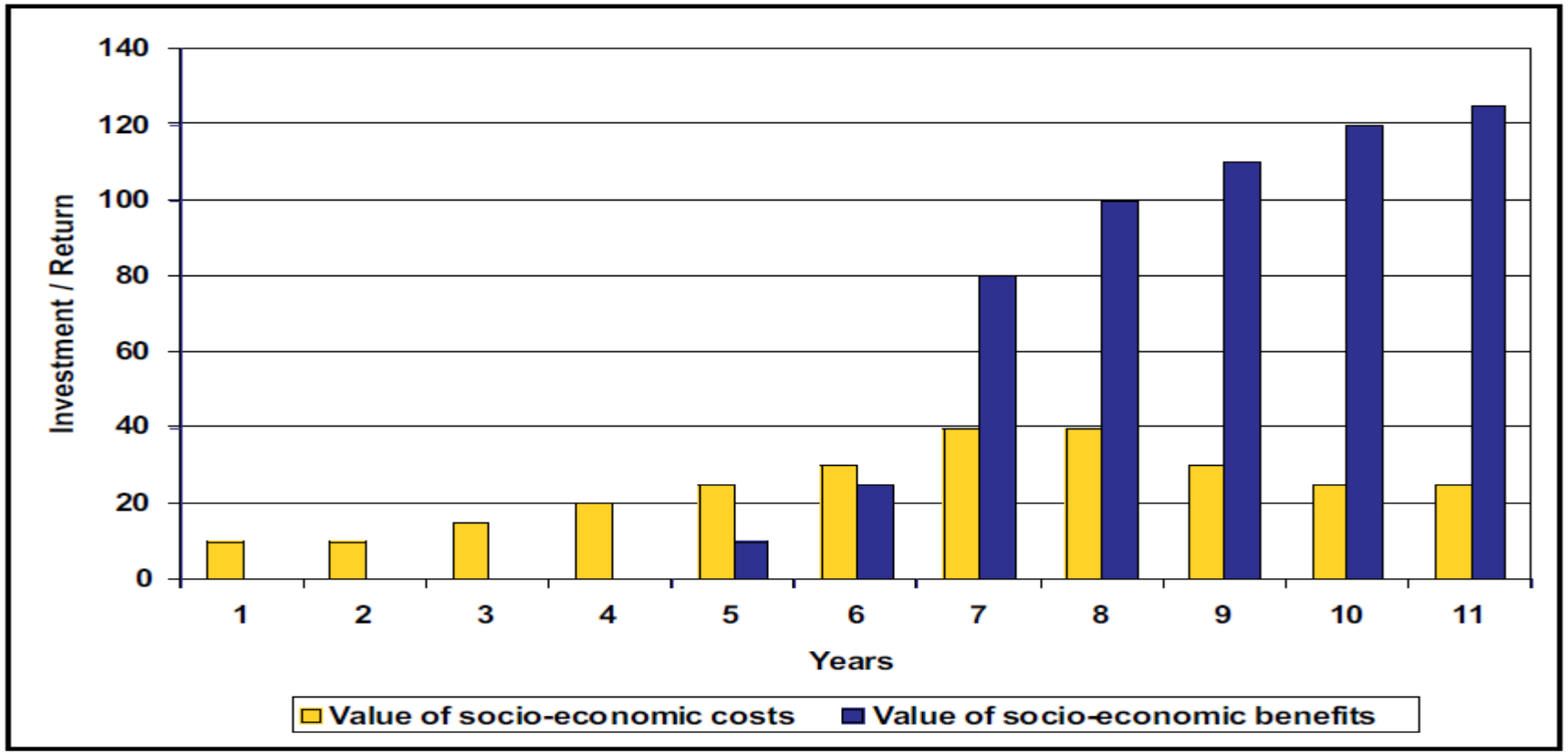
ICT and e-health services: E-health in Europe

- E-health included on the Ministerial agenda
- Activity on research
- Participating on the European and International Standards
- Effective field realisations
- Transnational projects:
  - *European Patients Smart Open Services ep*SOS (prescriptions and summary records)

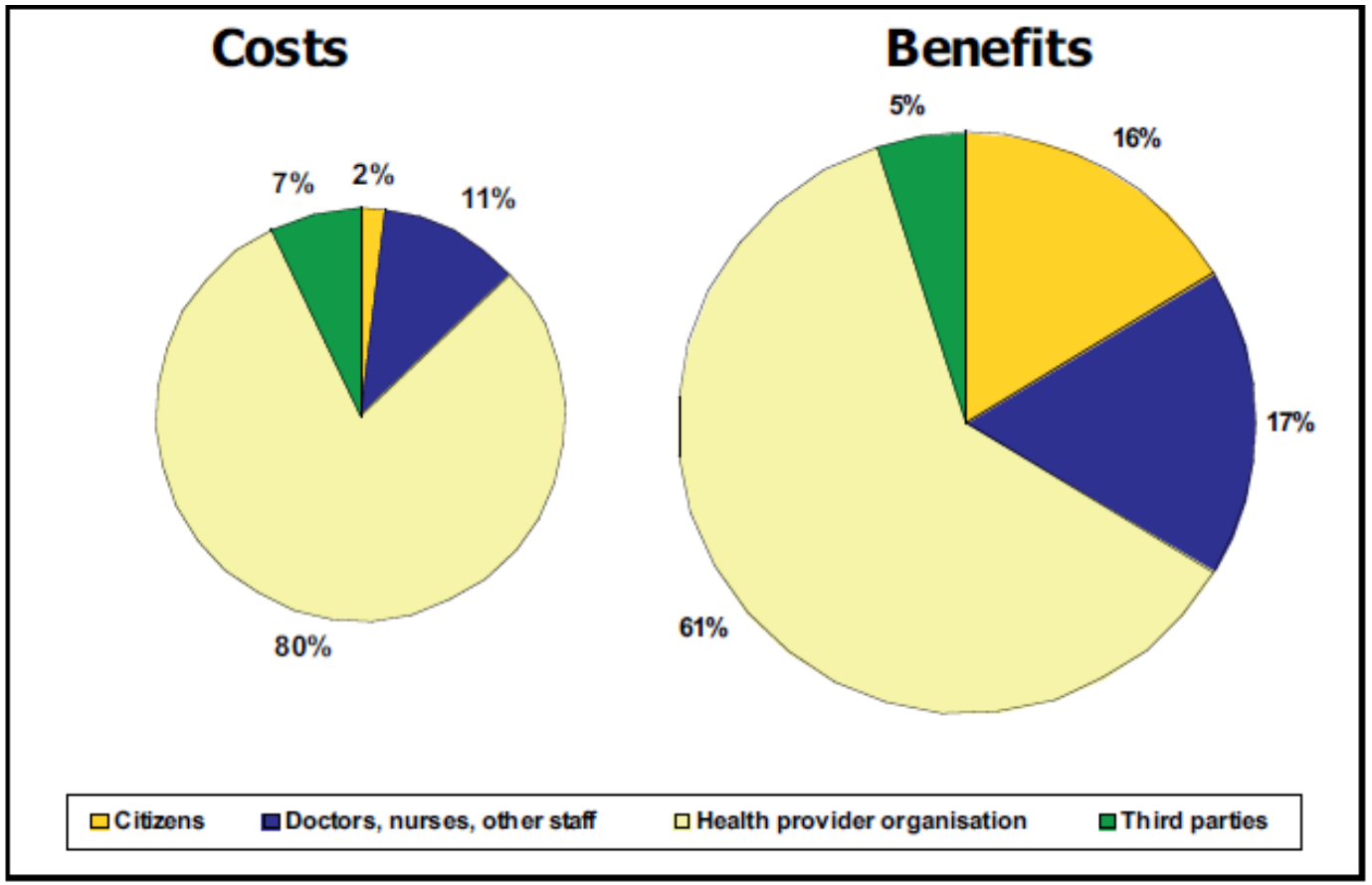
ICT and e-health services: E-health in Europe: Benefits

The economic benefits of implemented e-Health Records (EHR) at ten European sites



Source: European Commission: EHR IMPACT study, 2010

ICT and e-health services: E-health in Europe: Benefits

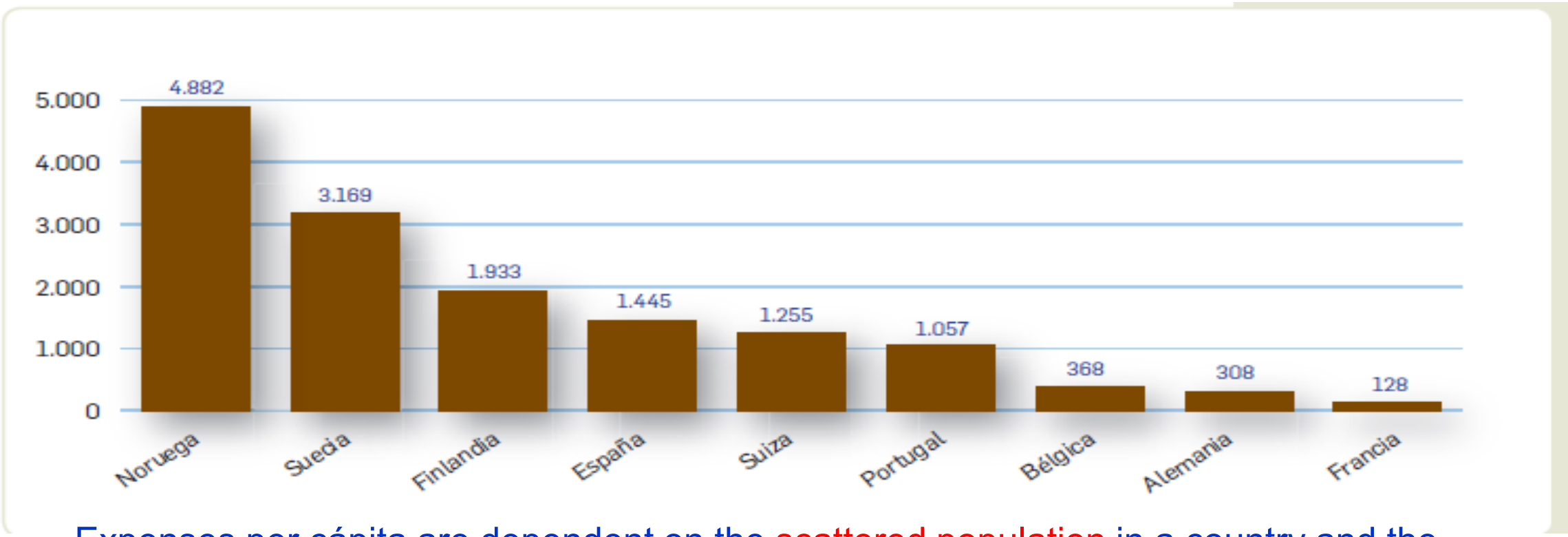


Average distribution of costs and benefits per involved group in the implemented e-Health at ten European sites

Source: European Commission: EHR IMPACT study, 2010

ICT and e-health services: E-health in Europe: Expenses

E-health expenses per cápita in 2011 (euros) by Eurostat (EU)



Expenses per cápita are dependent on the scattered population in a country and the degree of systems modernization

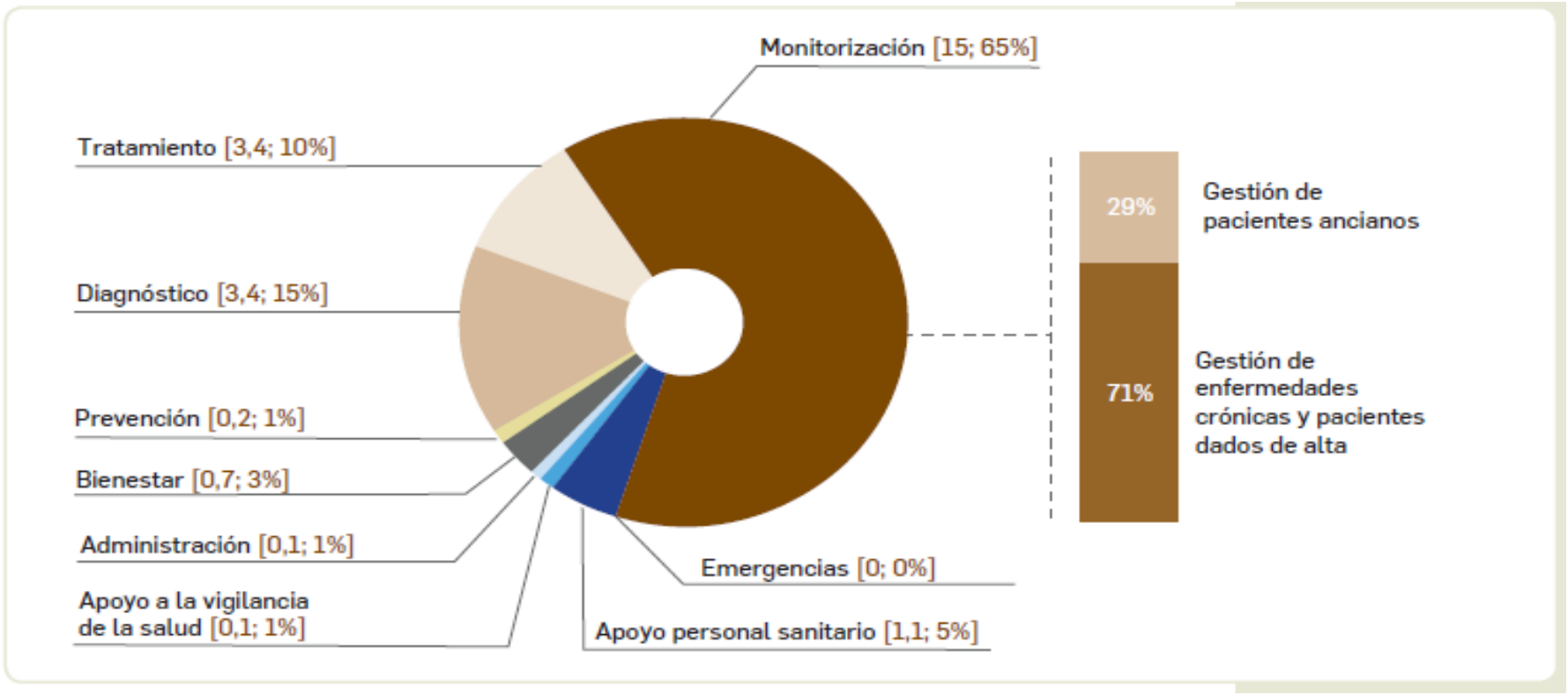
Source: Eurostat

ICT and e-health services: World

- World head Organization (WHO): Report and working group
- World wide initiatives
  - Open Clinic vs Open Medical Record System (MRS)
  - Réseau en Afrique Francophone pour la Télémédecine), (Geneva Univ. Hospital + Africa)
  - Eb@le-santé at République Démocratique du Congo
- Activity on Standards
- Effective field realizations versus national policies

ICT and e-health services: World

m-health overall global market distribution of expenses per service type in billions of dollars. PWC report for the EU



Source: PWC socioeconomic impact of mHealth. Assessment for the EU, 2017

ICT and e-health services: Case in Italy-Veneto region

Digitalization and Management of clinical reports

ICT allows to eliminate paper for clinical report, guaranteed legal validity (signature, certification, storage, distribution, extraction, conservation, delivery via on line)

Results:

- Less trips: 120 M€/years saved for citizens
- Reuse of human resource (33)
- Opportunity to process or share data in order to better treat the patient
- 60% of downloaded clinical reports

ICT and e-health services: Case in Italy-Veneto region

Telemonitoring of chronic patients

- 3,332 enrolled patients in Veneto Region
- Over 7,000 enrolled patients at European level
- From 10 to 23 involved LHA in Veneto Region
- Clinical Staff involved:
  - Cardiologists
  - Electro physiologists
  - Pulmonologists
  - Diabetologists
  - Nurses
  - GPs

LHA: Local Health Authority

ICT and e-health services: Case of Tunisia telecom

Tunisia Telecom started in 1996 and has focused on the preparation of data centers to host many TT and customers' platforms

- **Kasbah Data Center (First TT DC)**
  - Area: 280 m², 92 42U Racks
  - Redundant power and redundant air conditioning
  - Hosts TT **SaaS platform** and **Cloud Platform** (nearly)
  - Used for Corporate Housing TT offers
- **Carthage Data Center**
  - A second Data Center (For load balancing) : Ready since October 2013
- **Kairouan Data Center**
  - Data Centre for «Disaster Recovery»

ICT and e-health services: Case of Tunisia telecom

- **Many services are provided within the current technical solutions**
  - Voice supplementary services
  - Directory
  - Virtual mobility
- **e-health solution is scalable and able to support more VAS**
  - One unified number
  - Telepresence
  - Webex for healthcare
  - Audio and video Conference
  - WiFi - RFID

ICT and e-health services: Case of Spain

- Medical infrastructure with high capillarity reaching all the provinces and villages at three levels: Specialized centers, Hospitals, Primary health centers with a total of more than 4000 centers

- Started with Telemedicine at 1996 for military projects by Videoconference
- Major services with priority to

  Electronic prescription

  Chronic patients follow-up

  Remote Monitorization for Diabetes and heart care

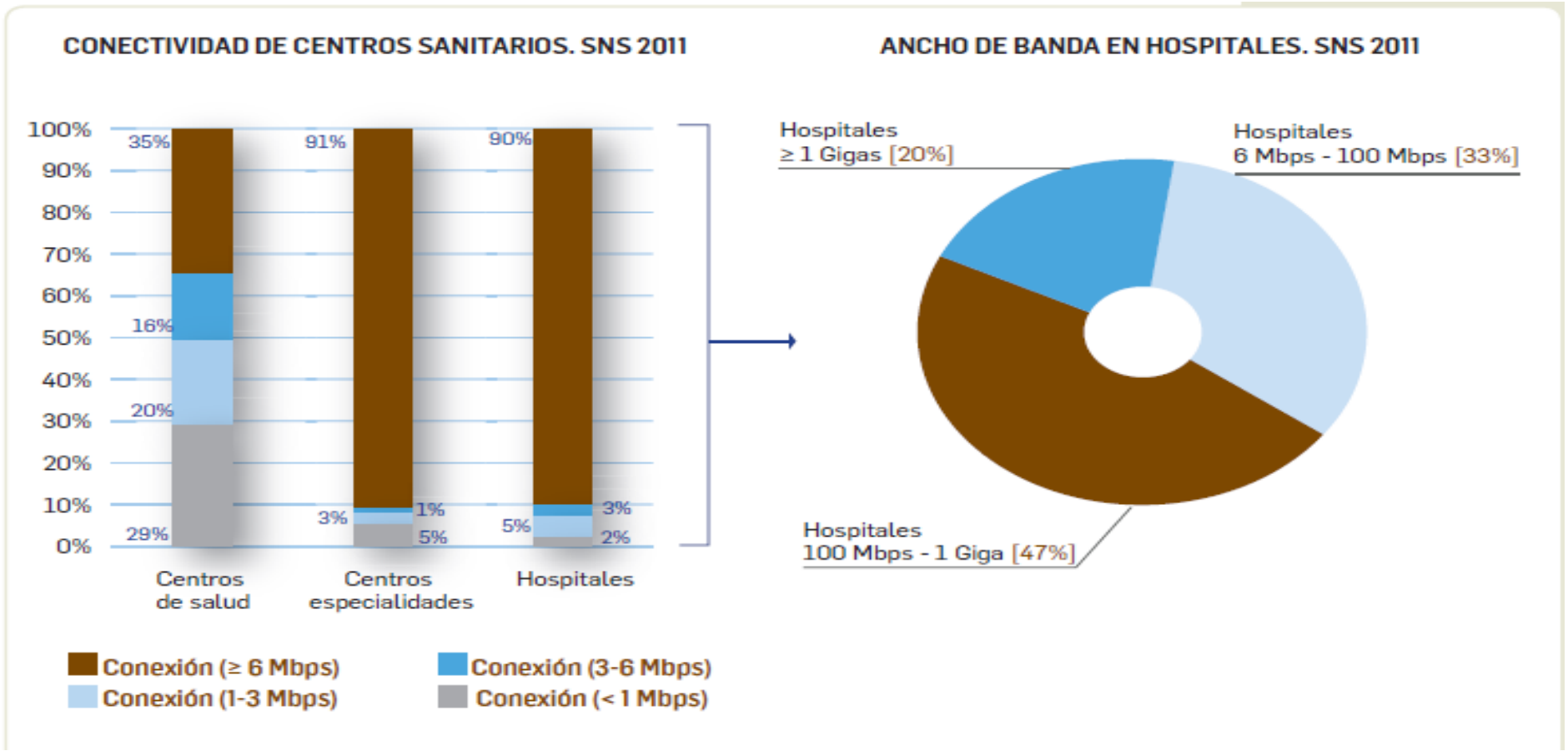
  Intercenters access to patients databases

  Diagnosis

  Emergency medical aid

  Support to health professionals

ICT and e-health services: Case of Spain



Today bandwidth has increased by on order of magnitude

Source: Informe red.es, las TIC en el sistema nacional de salud

ICT and e-health services: Case of Spain

Innovative Project SAVANA (directed to professionals)

- Medical information and diagnosis duplicating every 5 years (200 times the doctors capability to follow-up)

- **Savana** gather, analyze, resume and presents medical information based on a large set of clinic histories for a further reutilization

- Standard terminology and trained statistics with medical know-how and evolution of treatments applied to real time support

- Advanced research on Artificial Intelligence (AI) and Analytics applied to the Big Data processing on the health sector to help robust diagnosis based on thousand of cases: access to important information in 15 seconds

ICT and e-health services: Case of Spain

Innovative Project Mediktor (directed to patients)

- Artificial Intelligence applied to the prediction of illness pre-diagnosis to help patients in identifying potential problems, focus on specialist to be addressed and advance information while waiting for attention .

- Presented this year at the Mobile Worldwide Congress by the collaboration of two hospitals in Barcelona and Madrid

- Applied up to now to more than 1,3 million evaluations with a success rate higher that 90% in the performed diagnosis .

ICT and e-health services: Benefits

-**Benefits on Personal Access by any device:** Smartphone, tablet or computer

-**Benefits on Errors reduction** with electronic records, you can check to make sure all information is correct

- **Benefits on communications** by Patient Portals to medications, doctor notes, test, etc.

- **Benefits on access to Doctors** from anywhere and remote areas particularly in emergency situations

- **Benefits on Information Exchange** for all of your health information to be in the same place

- **Benefits on Maintenance Reminders** can help the doctor and office staff keep track of when you are due for preventive and periodical examinations services

-**Benefits on Medication Interaction** by quick scan of the the medications a person is taking and determine if there are any potential drug interactions

-**Benefits on Big Data Analytics** by the great potential for this data to look at a broader population of people or Big Data

- **Benefits on Health Care Savings** electronic health records may translate to cost savings for the health care system as a whole and eliminate duplications at various doctor offices

ICT and e-health services: Standards benefits

Ensure interoperability among healthcare systems

➔facilitate information exchange

➔avoid single vendor lock-in

Decrease the risks related to new technologies development

Minimize costs by stimulating market competition and eliminating expensive and personalized solutions

Widen the spread of solutions' adoption

Address specific concerns about e-Health issues (privacy, security, patient recognition,...)

ICT and e-health services: Outcome

- **E-health systems and applications are the natural evolution of current processes in order to:**

- Benefit from the ICT capabilities
- Reduce high child and maternal mortality rates
- Provide important services to scattered and remote populations
- Apply the latest health advances to anybody
- Reduce health provision services costs