



# Telemedicine via Satellite

Themen einer Programmlinie der  
Europäischen Weltraumorganisation  
ESA zu Telemedizin und Satellit

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# [ Agenda ]

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- Hintergrundinformationen
- ESA Telemed Working Group
- Arbeitsgruppen & Aktivitäten
- ESA Programme Book
- Statements
- Ziele
- Zusammenfassung

# Hintergrundinformationen

ESA is an inter-governmental organisation with a mission to provide and promote - for exclusively peaceful purposes - the exploitation of :

- space science, research & technology
- space applications

ESA achieves this through:

- space activities and programmes
- long term space policy
- a specific industrial policy
- coordinating European with national space programmes

# Hintergrundinformationen

All Member States participate in activities and a common set of programmes related to space science (mandatory programmes)



In addition, members chose the level of participation in

optional programmes:

▪ **Manned Space Flight**



▪ **Microgravity Research**



▪ **Earth Observation**



▪ **Telecommunications**



▪ **Navigation**



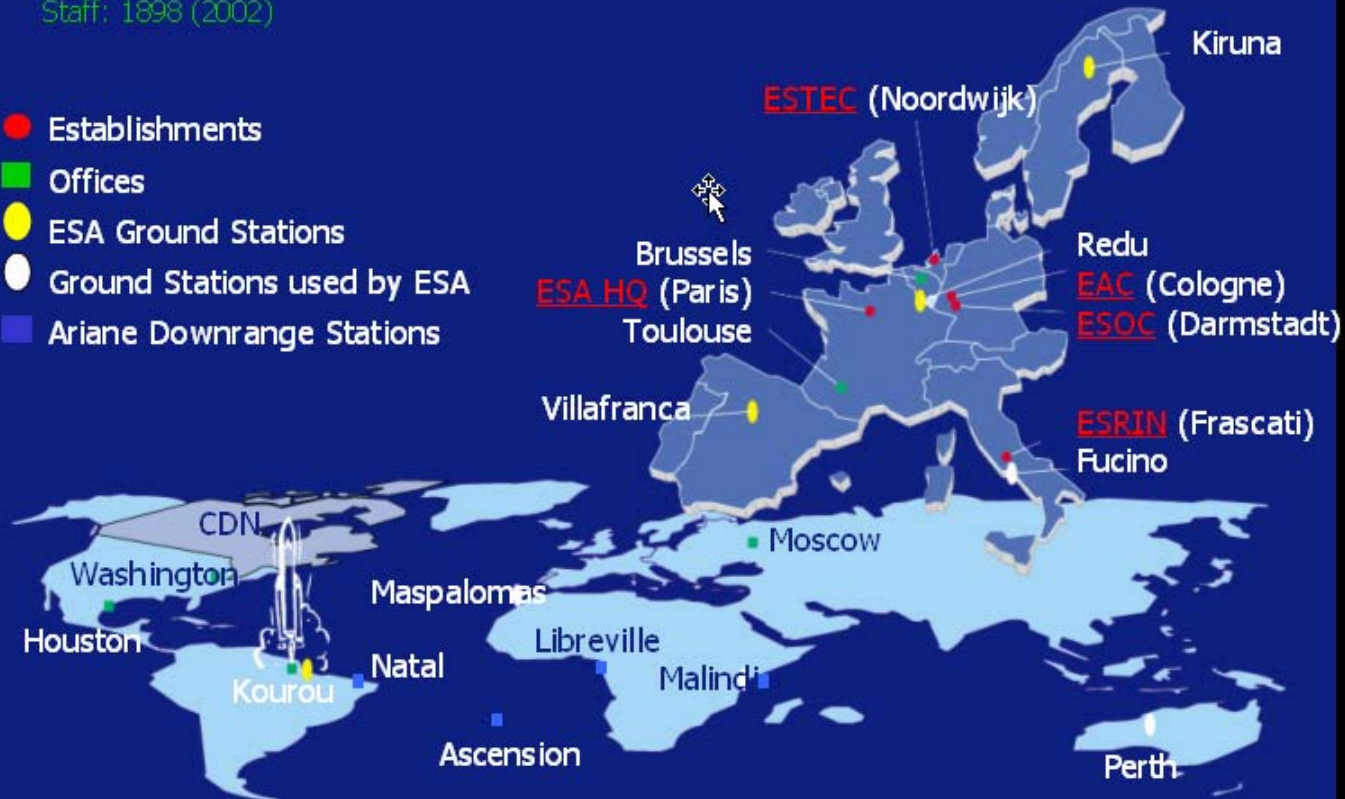
▪ **Launcher Development**



# Hintergrundinformationen

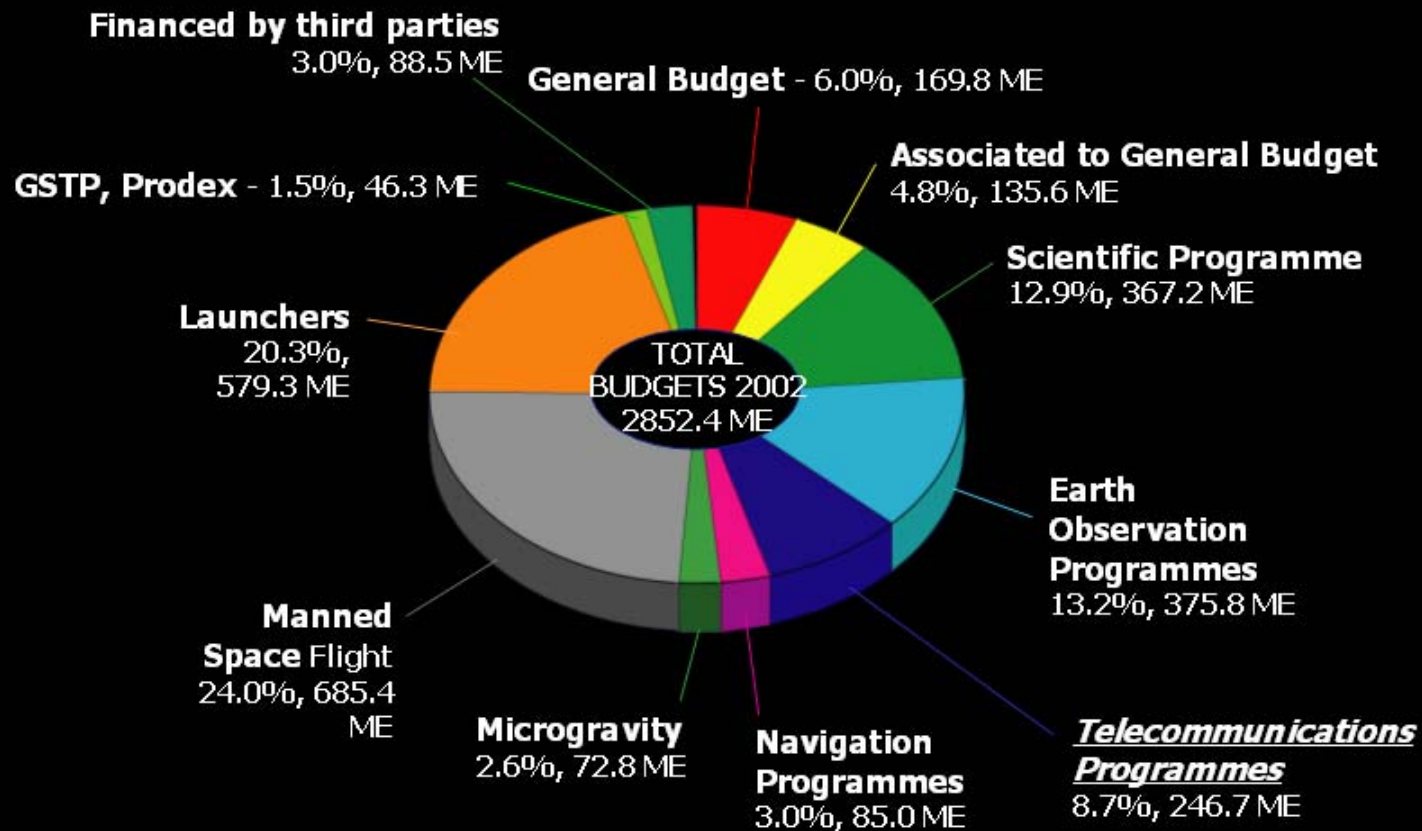
Staff: 1898 (2002)

- Establishments
- Offices
- ESA Ground Stations
- Ground Stations used by ESA
- Ariane Downrange Stations

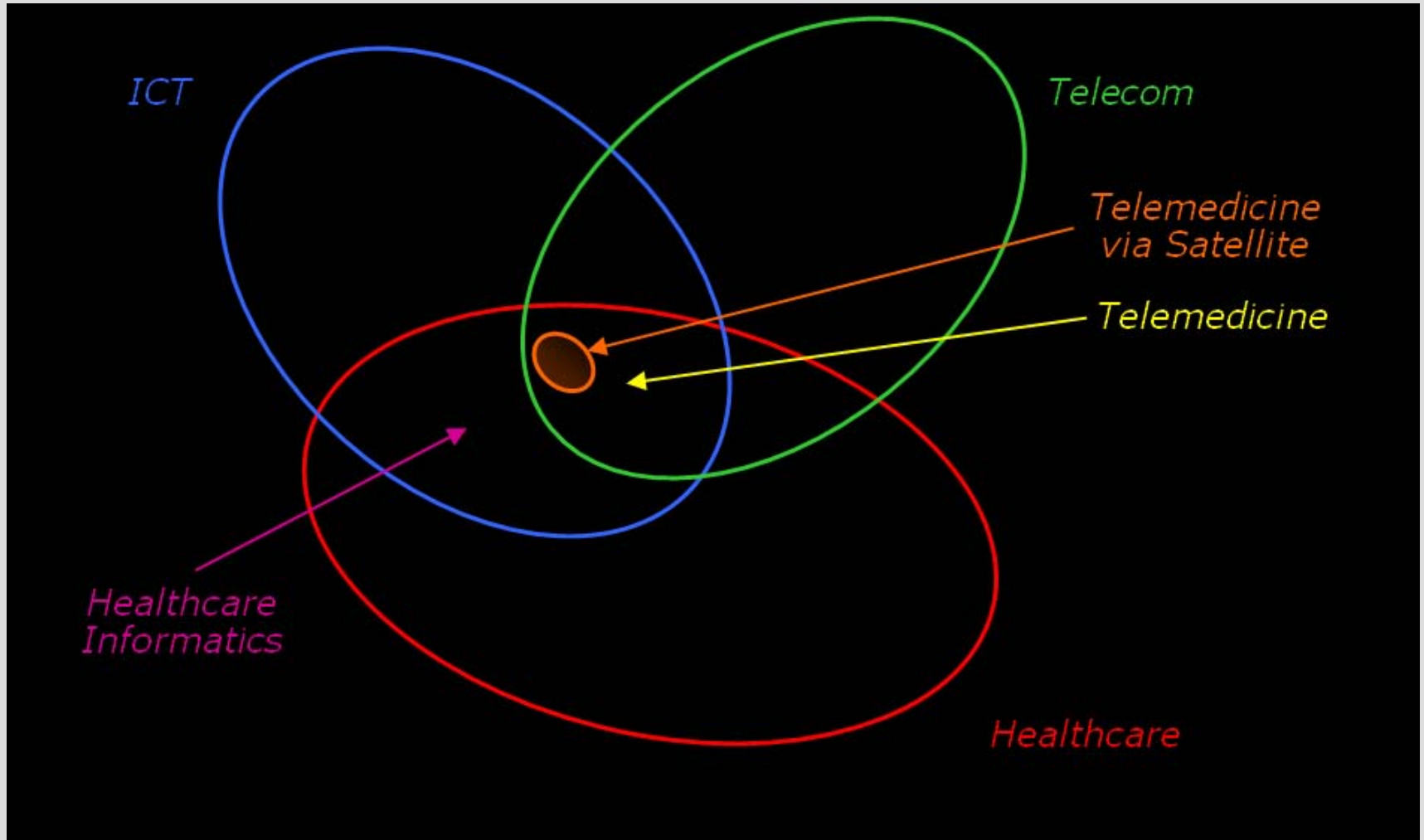


ELDO (1962), ESRO (1962), ESA (1973)

# Hintergrundinformationen



# Hintergrundinformationen





# Hintergrundinformationen

- **Medical Associations:** UEMS (F), GIMEMA (I), RCoS (UK), AOGOI (I)
- **Hospitals:** OP2000 (D), San Raffaele (I), ISMETT (I), Bristol Medical Simulation Centre (UK), Clinical University Centre of Sarajevo (BH), Reparto Sanità Centrauro (I), Deutsche Bundeswehr (D), IDI (I), Victor Bebes Hospital (R), Aziende Sanitarie Locali (I)
- **Pharmaceutical Companies:** Bayer (I), Pfizer (I)
- **Telemedicine Service Providers:** Telbios (I), TETRA (CDN)
- **Healthcare Content Providers:** EMN (CH), Healthtrack (UK), Real Media (D), Professional TV (D), SMM (I), University of Perugia (I)
- **Communication in the Healthcare Sector:** Sudler & Hennessey (UK)
- **Research Centres:** JR (A), Padova Ricerche (I), MEDES (F), NST (N), CRC (CDN)
- **Manufacturers of Medical Device:** Medtronic (I), Ortivus (S)
- **Manufacturers of Telemedicine HW/SW Solutions:** March Networks (CDN), Kell (I), ColabNet (CDN), MS&I (F)
- **Telecom Operators:** Fantastic (CH), Telecom Italia (I), Telespazio (I), Deutsche Telekom (D), Telesat (CDN), Elsacom (I), NDSatcom (D)
- **Satcom Industry:** Alenia (I), Alcatel (I), EADS (F), EADS (D)
- **Consultancies in Satcom:** ESYS (UK)



# Hintergrundinformationen

| Satcom Peculiarities →<br>Telemedicine Areas ↓       | High Mobility,<br>Communications<br>in Emergency and<br>Disaster<br>Situations | Broadband<br>Access from<br>Underserved<br>Areas | Multicasting/<br>Dissemination<br>of Multimedia<br>Contents | High Capacity /<br>Fast<br>Deployment for<br>Temporary Use |
|--|--|--|---|--|
| Hi-End   |  | +  | +   | ++   |
| Distributed<br>Environment for<br>Medical Simulation |  |  | ++  | ++   |
| Emergency<br>Consultation                            | ++   | +  |   |  |
| Teleconsultation                                     |  | ++   |   | ++   |
| Clinical Research                                    |  |  | +   |  |
| Access to Patient<br>Multimedia DBs                  | +  | ++   |   |  |
| Continuing Medical<br>Education                      |  | +  | ++  |  |

# Hintergrundinformationen



## Great potentials in terms of:

- **better utilisation of healthcare system resources**  
(infrastructures, assets, people)
- **improve reach of healthcare services**  
(e.g. Tele-assistance for elderly people)
- **reduce indirect cost for patients**  
(e.g. avoiding cost incurred by patients to move into the healthcare structure when not strictly needed)
- **opportunity of CME**  
(e.g. the guidelines of the Italian ministry of health foresees that 80% of CME will be based on distance learning, 20% on traditional on site event like congresses)

**HOWEVER .....**

# Hintergrundinformationen

## Huge barriers exist in terms of:



- **lack of awareness**

(Telemedicine is still largely an untapped area, where the immaturity of the demand and the lack of a consolidated offer get often stuck in a vicious cycle)

- **resistance to changes in the healthcare organisation** (lack of incentives, conservatory approach of healthcare professionals, chronic lack of resources and time, patients sometime perceive Telemedicine as a “surrogate”)

- **difficulty in providing evidence of Telemedicine benefits**

(Telemedicine is not healing in itself; its effectiveness is influenced by a number of external dependencies that have nothing to do with the Telemedicine)

- **lack of a reimbursement scheme**

(partly linked to the previous point)

- **tight dependencies with generic healthcare informatics policy**

(Telemedicine becomes fully exploitable only when associated to an integrated informatics healthcare system)

- **lack of a coordinated approach**

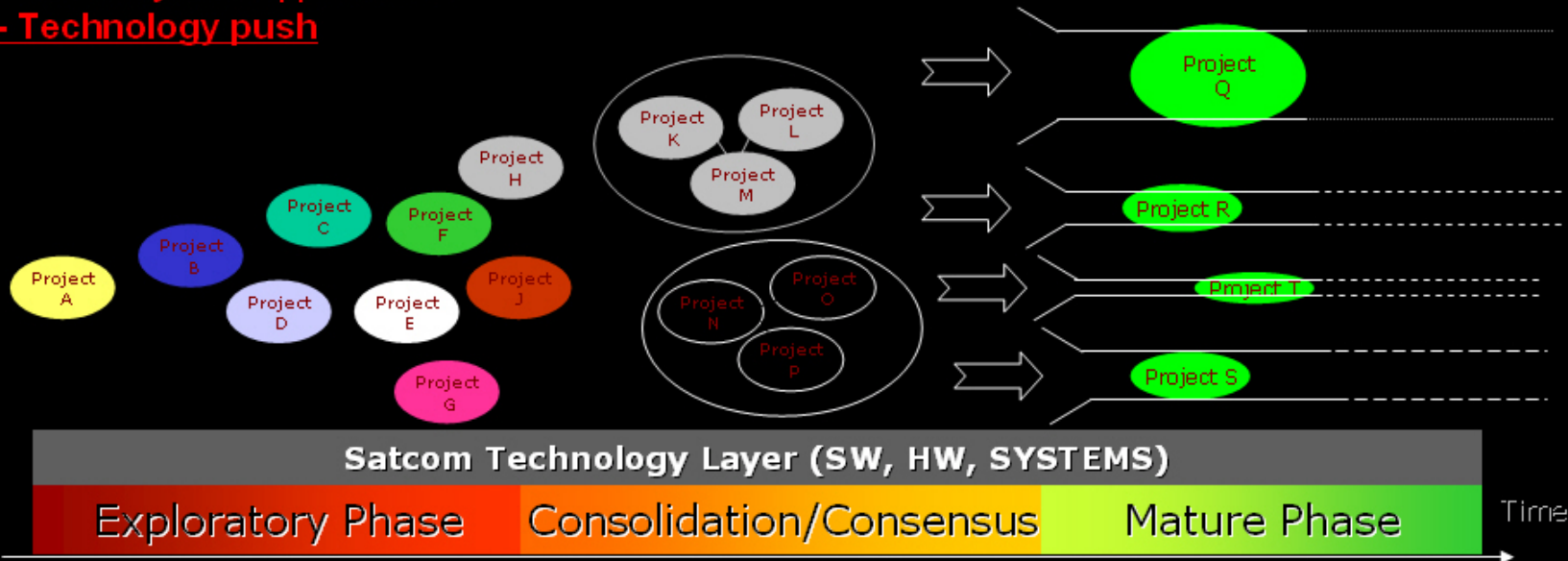
(the many barriers make extremely difficult the uptake of initiatives beyond exploratory pilot projects with local characterisation)

# Hintergrundinformationen

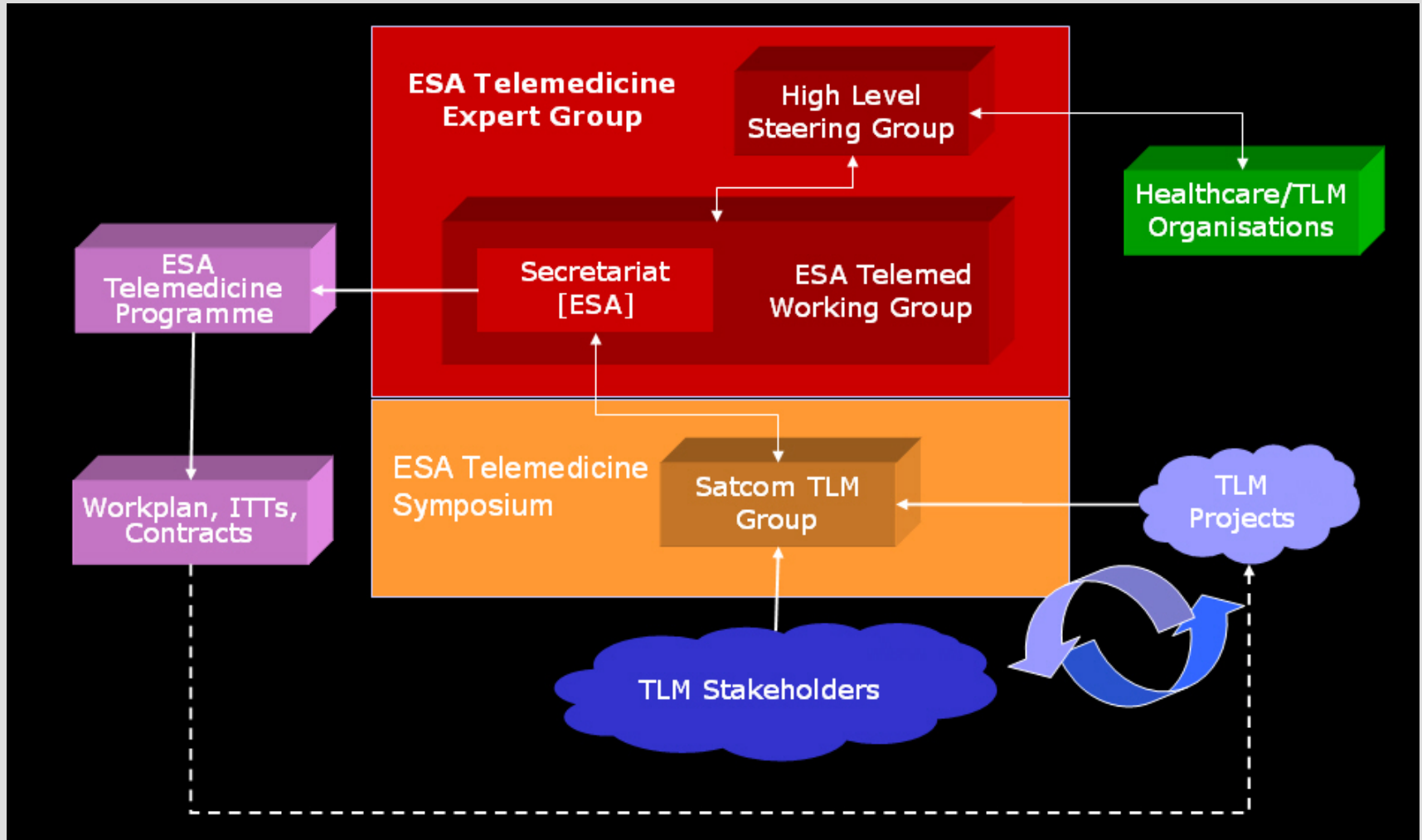
- Small projects
- Nationally oriented
- Moderate risks
- Awareness building
- Technology not fully mature
- Small user community of "champions"
- Mainly working in isolation
- Driven by new opportunities
- **Technology push**

- Thematic areas consolidation
- Common Specifications
- International reach
- Larger Scale -> Critical Mass
- Operation building
- ESA recognised as key role
- Driven by users needs
- **Demand Pull**

- Programmatic guidelines
- Less technical options
- Stable consortia
- Large user basis
- Environment building
- Competitive price policy
- Driven by Industry strategy and market



# Hintergrundinformationen























# ESA Telemed Working Group

Team Members 1 - 21 of 21

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Show last names containing  from organizations containing

|  Name ▲                    | Organization  | Email  | Phone            | Last Logon         |
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# ESA Telemed Working Group

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- Claudio Dario - Italien
- Georgi Graschew - Deutschland
- Angela Dunbar - WHO
- Francesco Feliciani - ESA-ESTEC
- Mila Garcia Barbero - WHO
- Silvia Giovanetti - Italien
- Antonio Guell - CNES

# ESA Telemed Working Group

Members (2/3)

- Alexander Horsch - Deutschland
- Line Kleinebreil - Frankreich
- Rifat Latifi - USA
- Maria del Mar Lleo - Italien
- Pierluigi Mancini - ESA HQ
- Markus Mohr - Deutschland
- Pedro Ortiz - Spanien

# ESA Telemed Working Group

Members (3/3)

- Steinar Pedersen - Norwegen
- José-Maria Perez Sastre - Spanien
- Alexandre Rey - Schweiz
- Nathalie Ricard - ESA

# Arbeitsgruppen & Aktivitäten

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# ESA Programme Book

- Kapitel 1:  
eHealth and Telemedicine Opportunities  
+  
Glossar
- Kapitel 2:  
The Needs for ESA Actions  
+  
Global Health Over Satellites (GHOS)

# Statements

Background (1/4)

- ***eHealth can play a very important role in service provision through eCare***
  - *by improving access and equity and quality and accountability and*
  - *by connecting health care facilities and health care professionals and diminishing geographical or physical barriers (e. g. home monitoring and second opinion).*



# Statements

Background (2/4)

- ***eHealth*** can provide an important impact on health system **financing** through **eAdministration**
  - *by improvement of information systems to support more effective resource allocation and purchasing (electronic pooling and purchasing where physical infrastructure does not exist will support transparency and efficiency - **eGovernance**).*

# Statements

Background (3/4)

- ***eHealth** has the potential to provide an important impact on health system **resource generation***
  - *through **eLearning** and*
  - *by overcoming the lack of facilities through connectivity with existing resources in countries where infrastructure is unstable or does not exist.*

# Statements

Background (4/4)

- ***eHealth** has the potential to provide an important impact on health system **stewardship***
  - *through **eSurveillance** and **eGovernance** improving information systems for decision making and early response in emergency situations.*

# Statements

## Interconnectivity for Healthcare Services (1/2)

- ***Interconnectivity for Healthcare Services*** has many aspects (technical, organization, psychological, social and socio-cultural, financial, legal, political, security-associated) which play a substantial intertwined role (**network**).
- Only this network texture enables both an efficient and efficacious performance of exchanging medical data through terrestrial and satellite communication structures.

# Statements

## Interconnectivity for Healthcare Services (2/2)

- *With adequate definitions of both **existing demand** and **available technology** software applications and thereupon established services can be used to minimize efforts and redundancy and to maximize output and efficiency in medical data handling.*

# Statements

## Management of Trauma, Emergencies, and Disasters

- *Satellites are the most promising technological instruments to enable **mandatory ad-hoc broadband communication** in case of medical trauma, emergencies, and disaster situations.*
- *Care must be applied, however, for the underlying software applications and services to enable a “real-time” placement for injured persons.*



# Statements

## Health Early Warning for Environmental Risks (1/2)

- *The **use of satellites is mandatory** to create in Europe an Early Warning System capable of predicting communicable disease diffusion patterns, risk of disease outbreaks, and extreme meteorological event related health threats on the basis of an enlarging database constructed by continuously monitoring the environment.*

# Statements

## Health Early Warning for Environmental Risks (2/2)

- *Moreover, the **transmission, in real time, of alarming data via satellite** would allow prediction to occur in times compatible with the setup of adequate protective measures for the safeguard of the citizens' health.*

# Statements

## Healthcare at Home (1/2)

- *Satellites offer the unique opportunity to incorporate **homes in isolated areas** into the development of healthcare at home tele-services on the background of a new integrated care approach for the whole population.*
- *A comprehensive health network gaining 100% coverage by **bridging gaps** of the terrestrial networks can prevent the exclusion of parts of the population from telematics-enhanced healthcare at home.*

# Statements

## Healthcare at Home (2/2)

- ***Positioning services*** provided by satellites (like GPS) are an indispensable component of healthcare at home, extending 'home' to the mobility radius of the respective citizen while keeping the smooth access help in an emergency case.

# Statements

Mobility (1/5)

- ***eHealth can play a very important role in service provision through eCare for citizens who move***
  - *by improving access to records and to their own physicians and diminishing language and cultural barriers.*

# Statements

## Mobility (2/5)

- ***eHealth and Telemedicine** have the potential to provide an important impact on facilitating the mobility of European citizens.*
- *eHealth offers the underlying tools to support all 4 recommendations of the EC communication on Mobility through ...*

# Statements

Mobility (3/5)

- ***European cooperation to enable better use of resources***
  - *eAdministration for managing and planning*
  - *eLearning for dissemination of information*
- ***Information requirements for patients, professionals, and policy makers***
  - *eSurveillance for monitoring and coordinating health system*

# Statements

Mobility (4/5)

- ***European contribution to health objectives***
  - *eCare provision for ensuring fair access, quality, solidarity, and fair financing*
- ***Responding to enlargement through investment in health and health infrastructure***
  - *eAdministration for managing and planning*



# Statements

Mobility (5/5)

- ***eHealth and Telemedicine** may improve substantially the delivery of health care to **citizens on the move** by air, sea, or ground.*
- *Better diagnosis, treatment, and management either to health or sick passengers identifying whether or not to divert no matter the location and transport system be.*

# Ziele

- Europa-weite Zustimmung zur Umsetzung von telemedizinischen Projekten via Satellit
- Harmonisierung auf der Ebene der Europa-weiten Interkonnektivität (technisch, politisch, juristisch, psychologisch, organisatorisch ...)
- Verbreitung von eHealth-Services für jeden (unabhängig von Geographie und Situation)

# Zusammenfassung (1/3)

- eHealth-Services:
  - eCare
  - eAdministration
  - eGovernance
  - eLearning
  - eSurveillance
- Breite, länderübergreifende Interkonnektivität

# Zusammenfassung (2/3)

- Hauptanwendungen:
  - Steigerung der Bürger-Mobilität (z. B. Telemedizin bei Schiff / Flugzeug)
  - „Health Early Warning Systems“ (HEWS)
  - Ad-hoc-Netzwerke bei medizinischen Massenunfällen / Katastrophen
  - „Virtuelle Ambulanz / Poliklinik“

# Zusammenfassung (3/3)

- Satelliten in Deutschland?
  - Ad-hoc-Netzwerke bei medizinischen Massenunfällen / Katastrophen (z. B. Eschede, 9/11 etc.)
  - Geographische Grenzregionen (z. B. ArgeAlp, Osterweiterung etc.)
  - Maritime / aeriare Telemedizin
  - GPS-Safety für alte / kranke Menschen (z. B. Notfallmelder, BAN etc.)

[ Ende und Aus ]

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