



## **TMF – A Common Platform for Medical Research Networks in Germany**

Improving the Organisation and Infrastructure  
of Medical Research in Cooperative Structures

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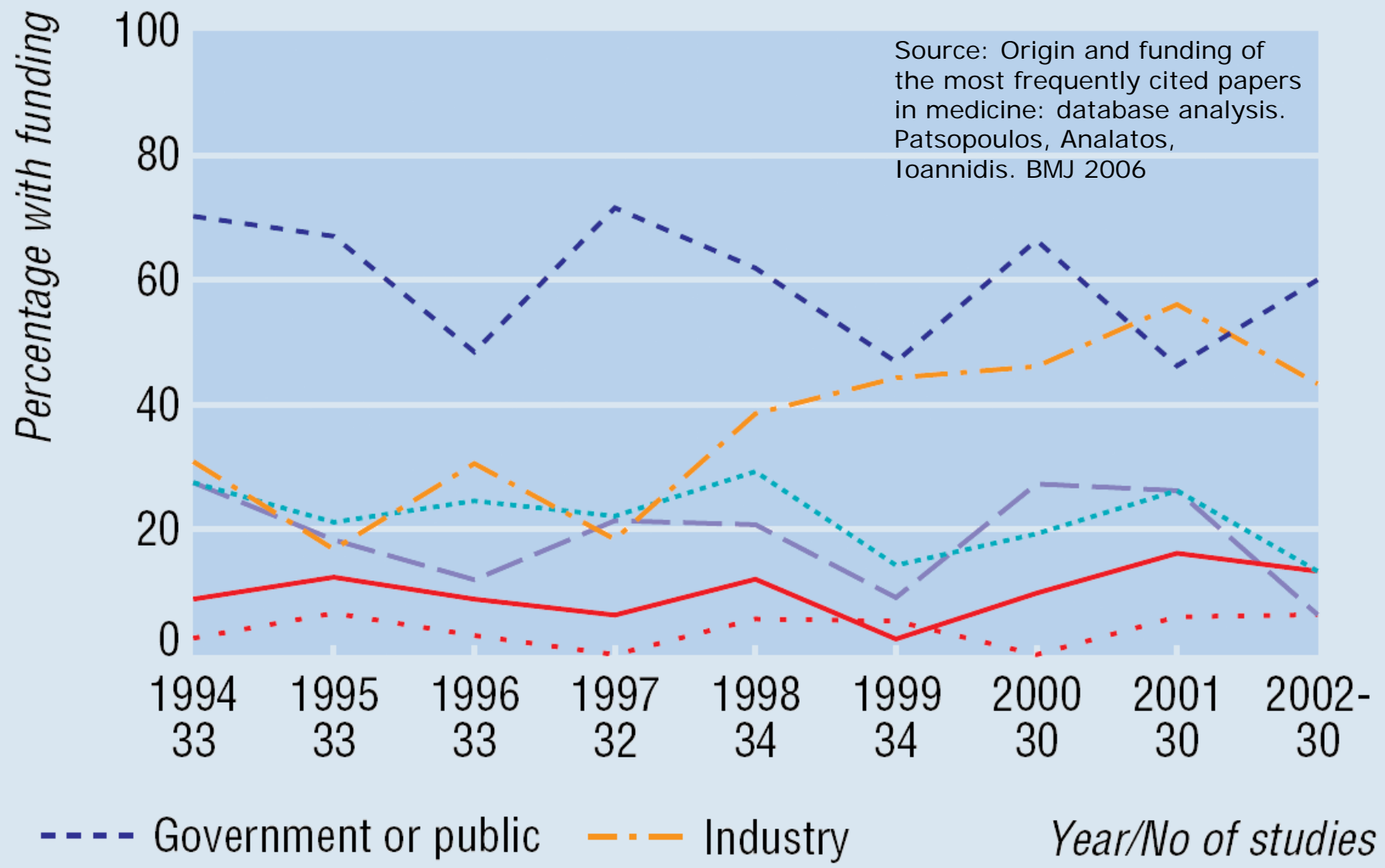
ELN Workshop on Information Technology II  
Heidelberg, 28-01-2008

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Telematikplattform für Medizinische Forschungsnetze (TMF) e.V.  
TMF-Office, Berlin

- ↪ Changes in framework conditions for clinical research
- ↪ Structure, programme and aims of TMF
- ↪ IT-Support for clinical trials
- ↪ From tools to infrastructure

- ↪ Regulations for clinical research ↗
- ↪ Complexity of demands and solutions ↗
- ↪ Cost pressure ↗
- ↪ Standardization in medical research and health care ↗
- ↪ European and international research projects ↗
- ↪ Public funding ↘

Source: Origin and funding of the most frequently cited papers in medicine: database analysis. Patsopoulos, Analatos, Ioannidis. BMJ 2006

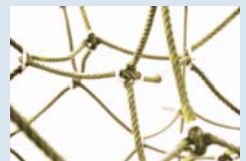
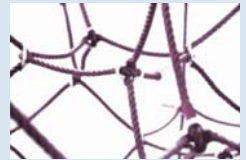


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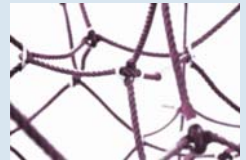
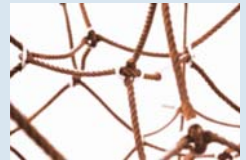


## Meta-organisation TMF

- ↪ Networked research: common demands and problems (technical, legal, organisational)
  - ↪ central nation-wide acting partner for issues of networked medical research
  - ↪ broad focus: technical platform and communication broker within the community
  - ↪ one of the few national central institutions for telematics in health care in Germany



- ↪ to improve medical research in terms of quality, organisation and cooperation
- ↪ to develop high-performance **IT infrastructures**, implementation in interconnected structures
- ↪ to solve common questions of networked medical research (e.g. collecting, processing and exchanging research data)
- ↪ to clarify the **legal and ethical framework** for conducting medical research
- ↪ to contribute to sustainable and efficient health research by improved translation of research findings into health care





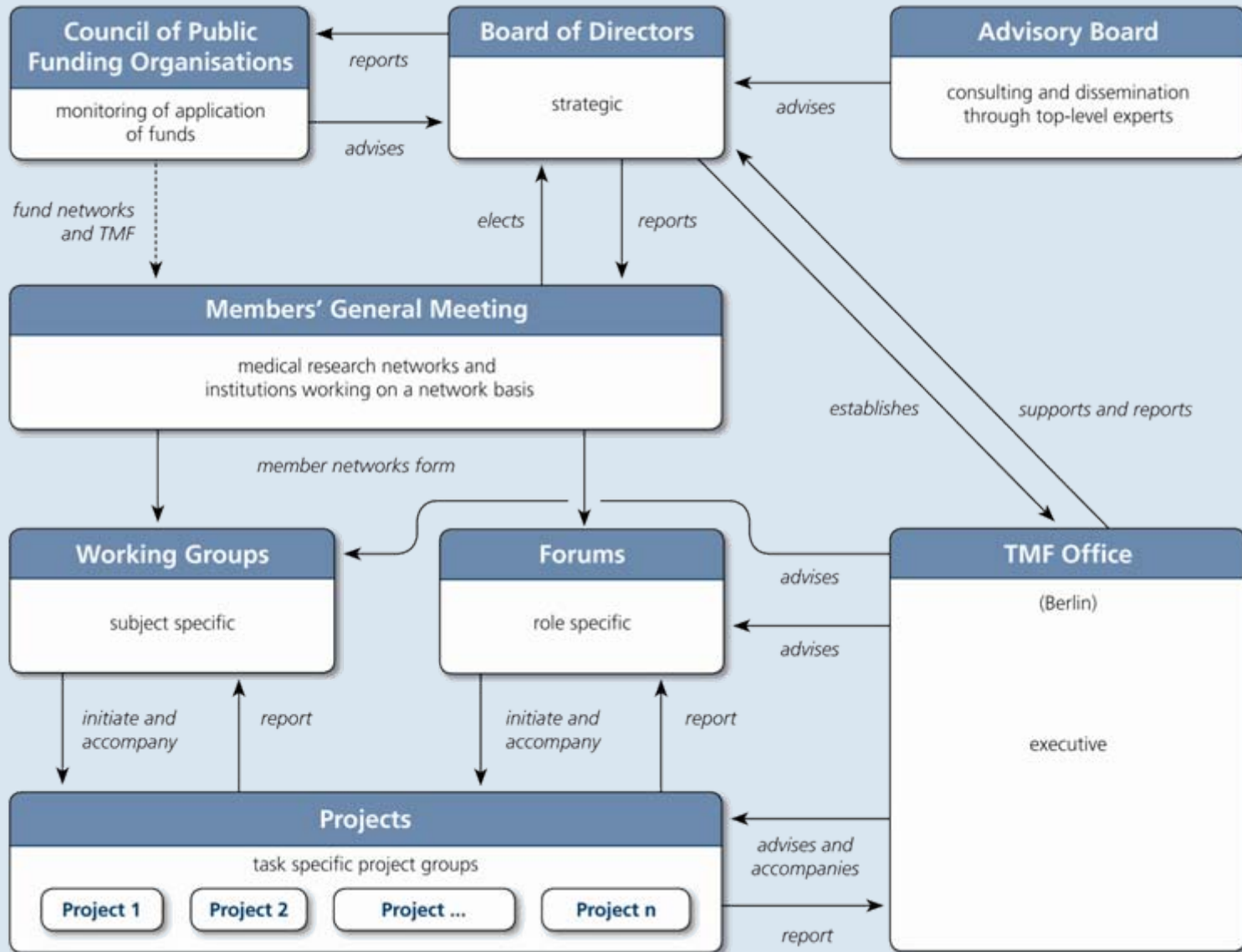
## Members

national networks and institutions

- ↪ Competence Networks in Medicine
- ↪ Coordinating Centres for Clinical Trials
- ↪ Networks for Rare Diseases
- ↪ German National Genome Research Network
- ↪ Fraunhofer Institute for Toxicology and experimental Medicine
- ↪ Academic Institutes
- ↪ Patient Organisations
- ↪ Zoonosis Research Networks
- ↪ and others



2007: ca 60 members (2003: 30 members)



## Working groups

- ↪ IT infrastructure and Quality management
- ↪ Data protection, privacy and security
- ↪ Biobanks
- ↪ Management of clinical trials
- ↪ Molecular Medicine



## Forums

- ↪ 3 role-specific forums:  
Network speakers, CEOs, PR officers
- ↪ Rare Diseases Networks
- ↪ **NEW:** Forum Grid





## TMF Projects

- ↪ bottom-up approach
- ↪ scientist-defined needs and projects, funded by BMBF (via TMF)

## Main topics

- ↪ Legal and ethical framework conditions
- ↪ Quality management
- ↪ Interconnection of research and health care
- ↪ Standards and terminology
- ↪ IT infrastructure for clinical research

# Legal and ethical framework conditions

## Projects

- ↪ generic data protection strategies
- ↪ patients' informed consent
- ↪ biobanks
- ↪ ...



## Quality management

### Projects:

- ↪ validation of IT systems
- ↪ Standard Operating Procedures
- ↪ alternative monitoring strategies for IITs
- ↪ ...

# Interconnection of research and health care - vertical and horizontal integration



## Projects:

- ↪ electronic health card / health professional card
- ↪ IT support for clinical guidelines
- ↪ interfaces between documentation systems in health care and research
- ↪ ...

- ↪ Changes in framework conditions for clinical research
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## 1. Evaluation & delivery of software systems

- ↪ clinical trial management software
- ↪ content management systems (CMS)

## 2. Software development (where no adequate systems available)

- ↪ pseudonymisation suite
- ↪ data converting tools (CDISC based)

## 3. Establishing of services via TMF

- ↪ electronic SAE management
- ↪ online assistant for informed consent forms ([www.tmf-ev.de/pew](http://www.tmf-ev.de/pew))
- ↪ pseudonymisation service (work in progress)
- ↪ electronic data custodianship services (work in progress)
- ↪ ...

**Problem:** To set up standardized SAE-Management including functions for electronic communication with authorities in accordance with national regulations for clinical trials

↪ 2005:

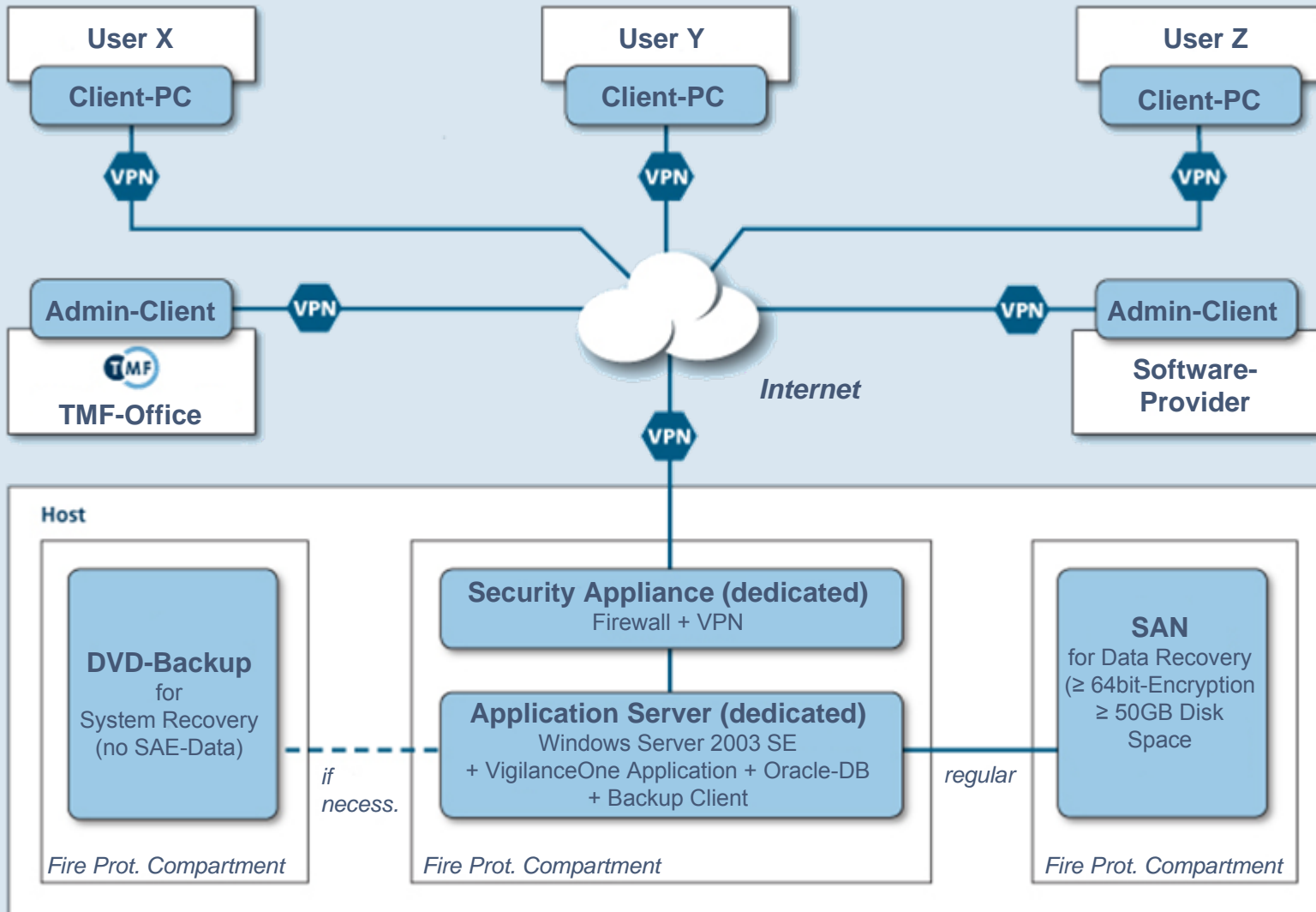
- ↪ Requirements analysis
- ↪ Evaluation of vendors and software

↪ 2006:

- ↪ Decision for one product
- ↪ Contracts between Vendor, TMF, Hosting-Provider and Users
- ↪ Building SAE-User-Group in the TMF, incl. Web-Forum

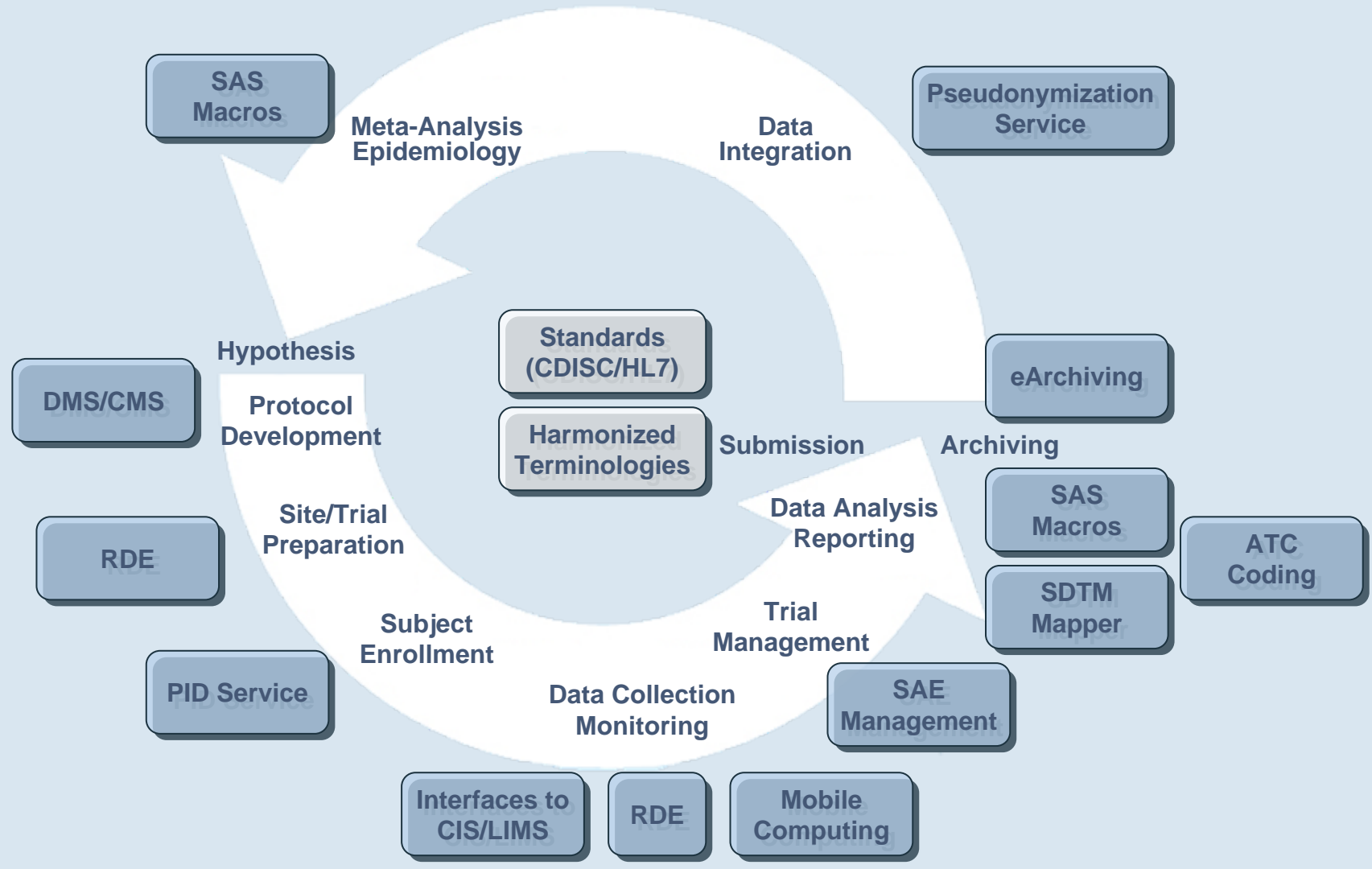
↪ 2007:

- ↪ 10 Research Institutions with over 20 client installations
- ↪ Customizing the software (reports etc.)
- ↪ Registration for electronic reporting of SAEs

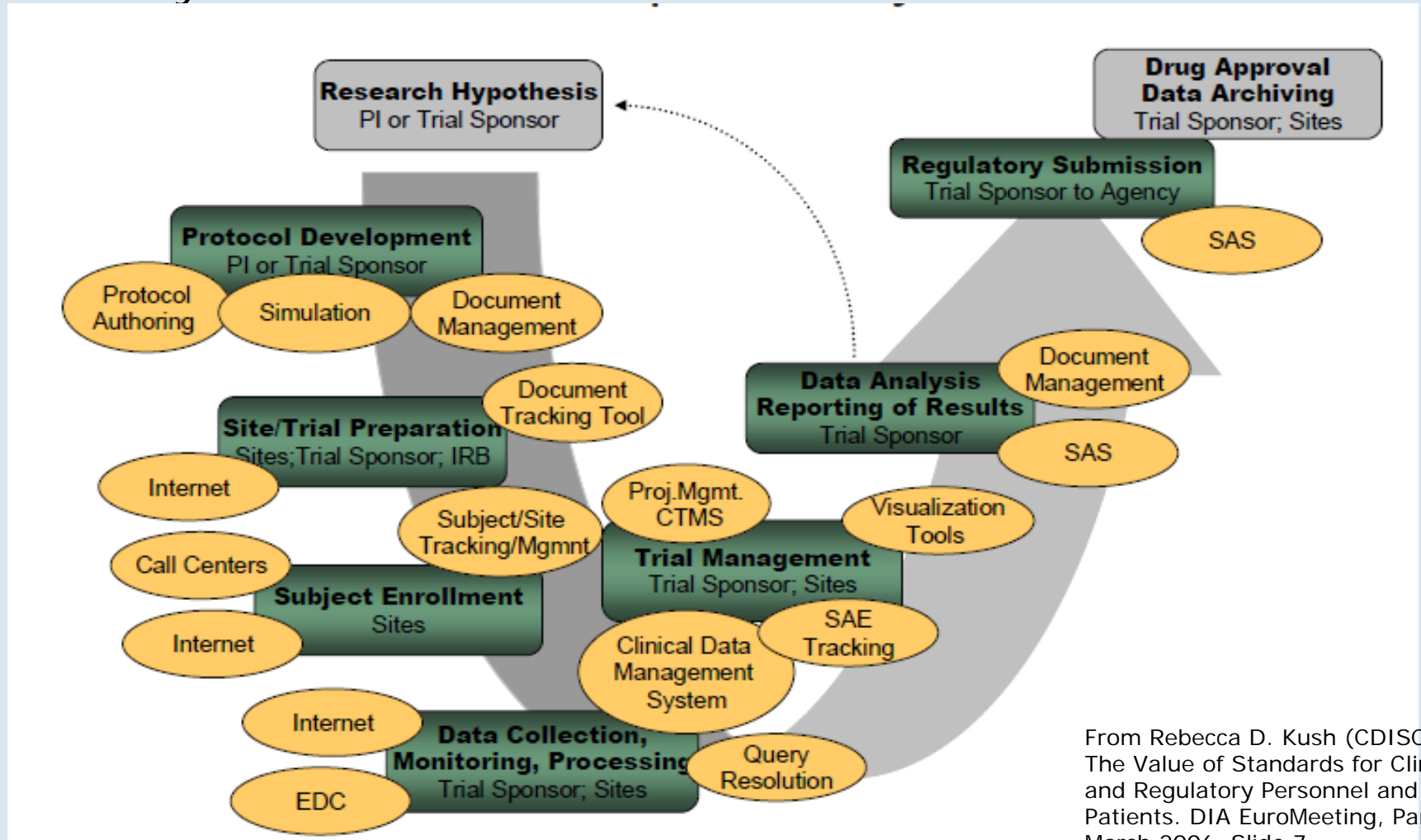




# Life Cycle of Clinical Trials and supporting Projects and Tools



## The half cycle:



From Rebecca D. Kush (CDISC):  
 The Value of Standards for Clinical and Regulatory Personnel and Patients. DIA EuroMeeting, Paris, March 2006, Slide 7

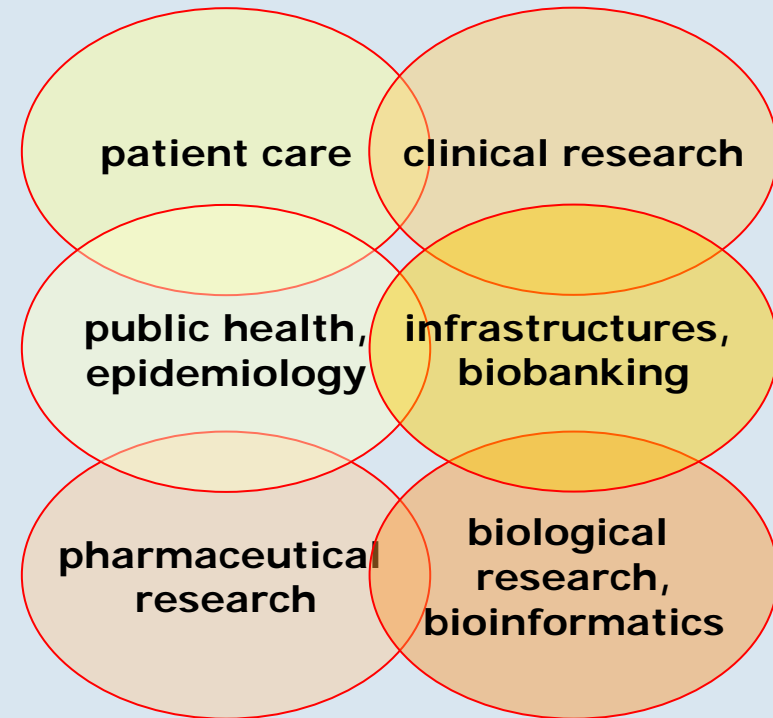
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## Standards and terminology

Projects and aims:

- ↪ evaluation of CDISC standards
- ↪ CDISC-SDTM based SAS-Macros
- ↪ harmonisation of documentation and ontologies, data dictionaries of clinical values
- ↪ contributions to harmonize standards from patient care (HL7/CDA, CCR, ...) and clinical research (CDISC) to epidemiology and bioinformatics
- ↪ ...



TMF memberships: HL7, CDISC, HealthGrid, D-Grid (via MediGRID), Gematik advisory Board



## SDTM-Mapper:

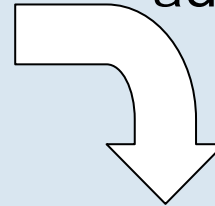
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```

↳ converts XML-based CDISC-ODM into tabular format CDISC-SDTM

↳ supports interactive or automatic transformation



	USUBJID (USUBJID)	VSOTC (VSOTC)	VSTESTCD (VSTESTCD)	VSTEST (VSTEST)	VSORRES (VSORRES)	VSSEQ (VSSEQ)	VISIT (VISIT)	VISITNUM (VISITNUM)	VSORRESU (VSORRESU)	VSSSTRESC (VSSSTRESC)	VSSSTRESN (VSSSTRESN)	VSSSTRESU (VSSSTRESU)	
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2	001/0001	2001-04-1	HEIGHT	Height	93	2	BASELINE	1	kg	93		93	kg
3	001/0002	2001-01-0	HEIGHT	Height	154	1	BASELINE	1	cm	154		154	cm
4	001/0002	2001-01-0	HEIGHT	Height	60	2	BASELINE	1	kg	60		60	kg
5	001/0003	2001-11-2	HEIGHT	Height	164	1	BASELINE	1	cm	164		164	cm
6	001/0003	2001-11-2	HEIGHT	Height	69	2	BASELINE	1	kg	69		69	kg
7	001/0004	2001-04-1	HEIGHT	Height	193	1	BASELINE	1	cm	193		193	cm
8	001/0004	2001-04-1	HEIGHT	Height	98	2	BASELINE	1	kg	98		98	kg
9	001/0005	2001-11-0	HEIGHT	Height	163	1	BASELINE	1	cm	163		163	cm
10	001/0005	2001-11-0	HEIGHT	Height	76	2	BASELINE	1	kg	76		76	kg
11	001/0006	2001-06-1	HEIGHT	Height	168	1	BASELINE	1	cm	168		168	cm
12	001/0006	2001-06-1	HEIGHT	Height	67	2	BASELINE	1	kg	67		67	kg
13	001/0007	2001-10-2	HEIGHT	Height	173	1	BASELINE	1	cm	173		173	cm
14	001/0007	2001-10-2	HEIGHT	Height	79	2	BASELINE	1	kg	79		79	kg
15	001/0008	2001-11-0	HEIGHT	Height	169	1	BASELINE	1	cm	169		169	cm
16	001/0008	2001-11-0	HEIGHT	Height	74	2	BASELINE	1	kg	74		74	kg
17	001/0009	2001-02-0	HEIGHT	Height	171	1	BASELINE	1	cm	171		171	cm
18	001/0009	2001-02-0	HEIGHT	Height	78	2	BASELINE	1	kg	78		78	kg
19	001/0010	2001-12-1	HEIGHT	Height	171	1	BASELINE	1	cm	171		171	cm
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21	001/0011	2001-06-2	HEIGHT	Height	150	1	BASELINE	1	cm	150		150	cm
22	001/0011	2001-06-2	HEIGHT	Height	53	2	BASELINE	1	kg	53		53	kg
23	001/0012	2001-01-2	HEIGHT	Height	138	1	BASELINE	1	cm	138		138	cm
24	001/0012	2001-01-2	HEIGHT	Height	72	2	BASELINE	1	kg	72		72	kg
25	001/0013	2001-08-1	HEIGHT	Height	162	1	BASELINE	1	cm	162		162	cm
26	001/0013	2001-08-1	HEIGHT	Height	78	2	BASELINE	1	kg	78		78	kg
27	001/0014	2001-06-0	HEIGHT	Height	164	1	BASELINE	1	cm	164		164	cm



## SAS macros for SDTM based clinical data

↪ 35 macros for production of standard tables and listings about

↪ inclusion/exclusion exceptions

↪ demographics

↪ medical history

↪ physical examination

↪ disposition

↪ exposure to study treatment

↪ concomitant medication

↪ laboratory data

↪ findings

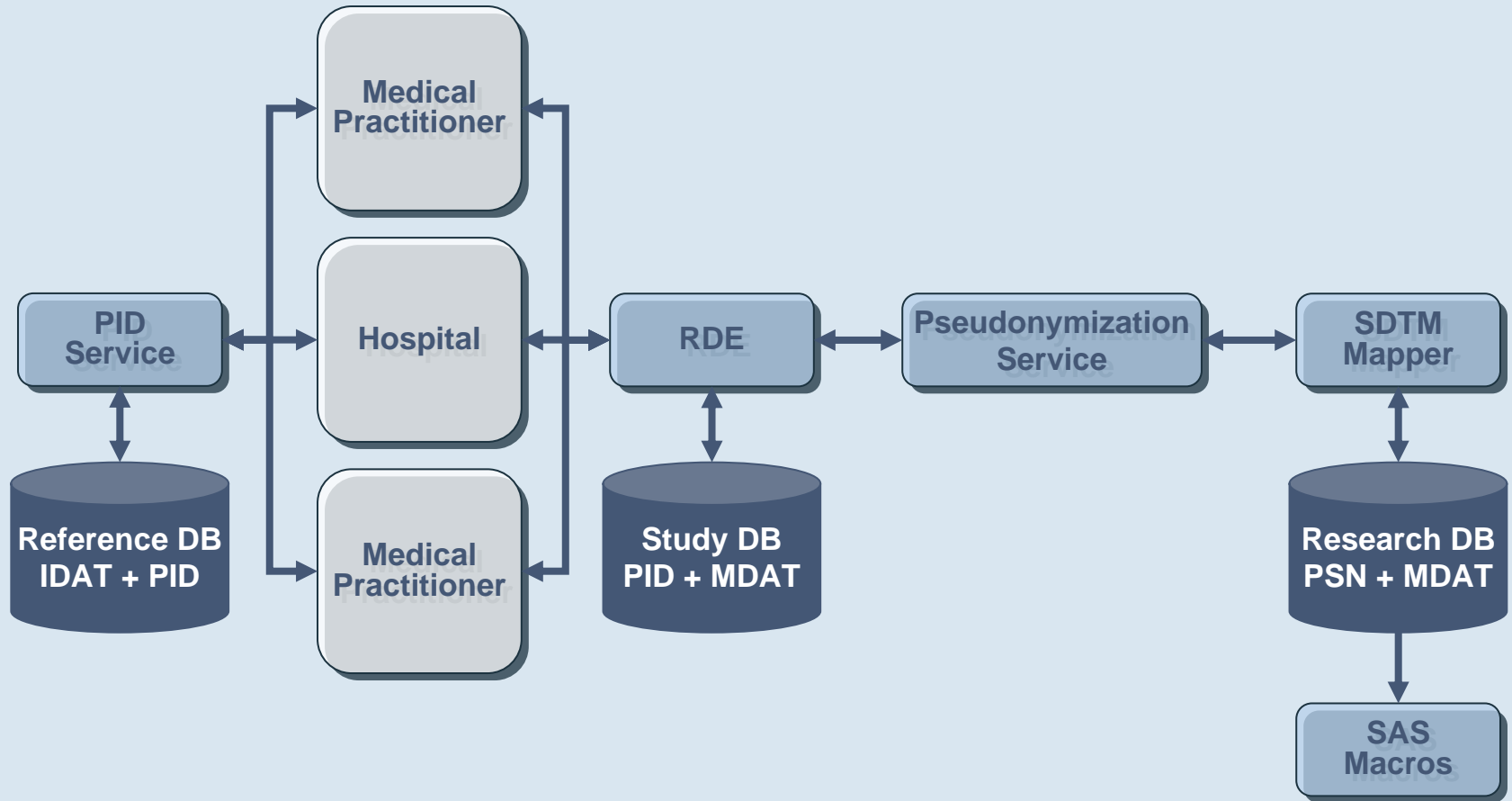
↪ adverse events

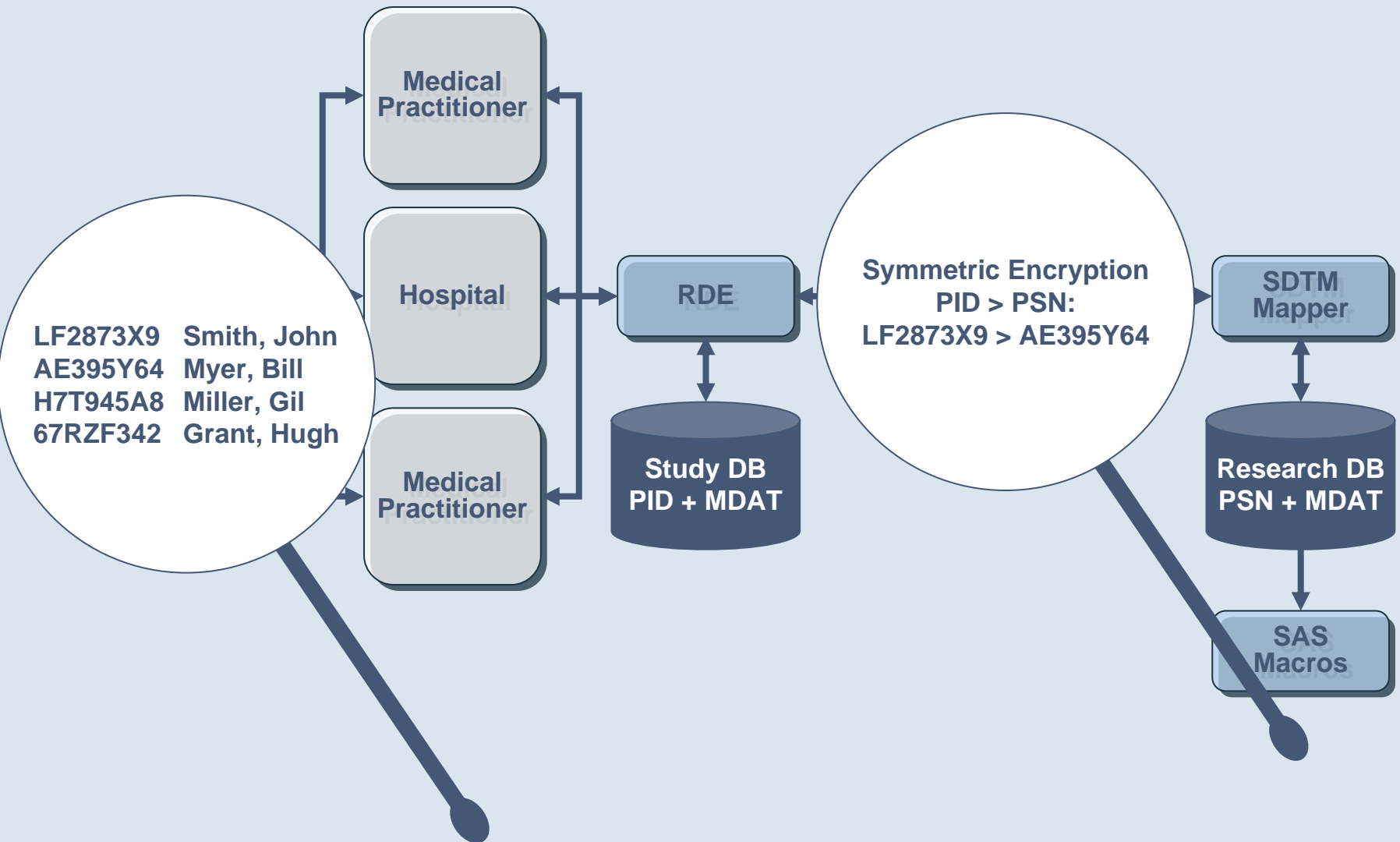
↪ also available:

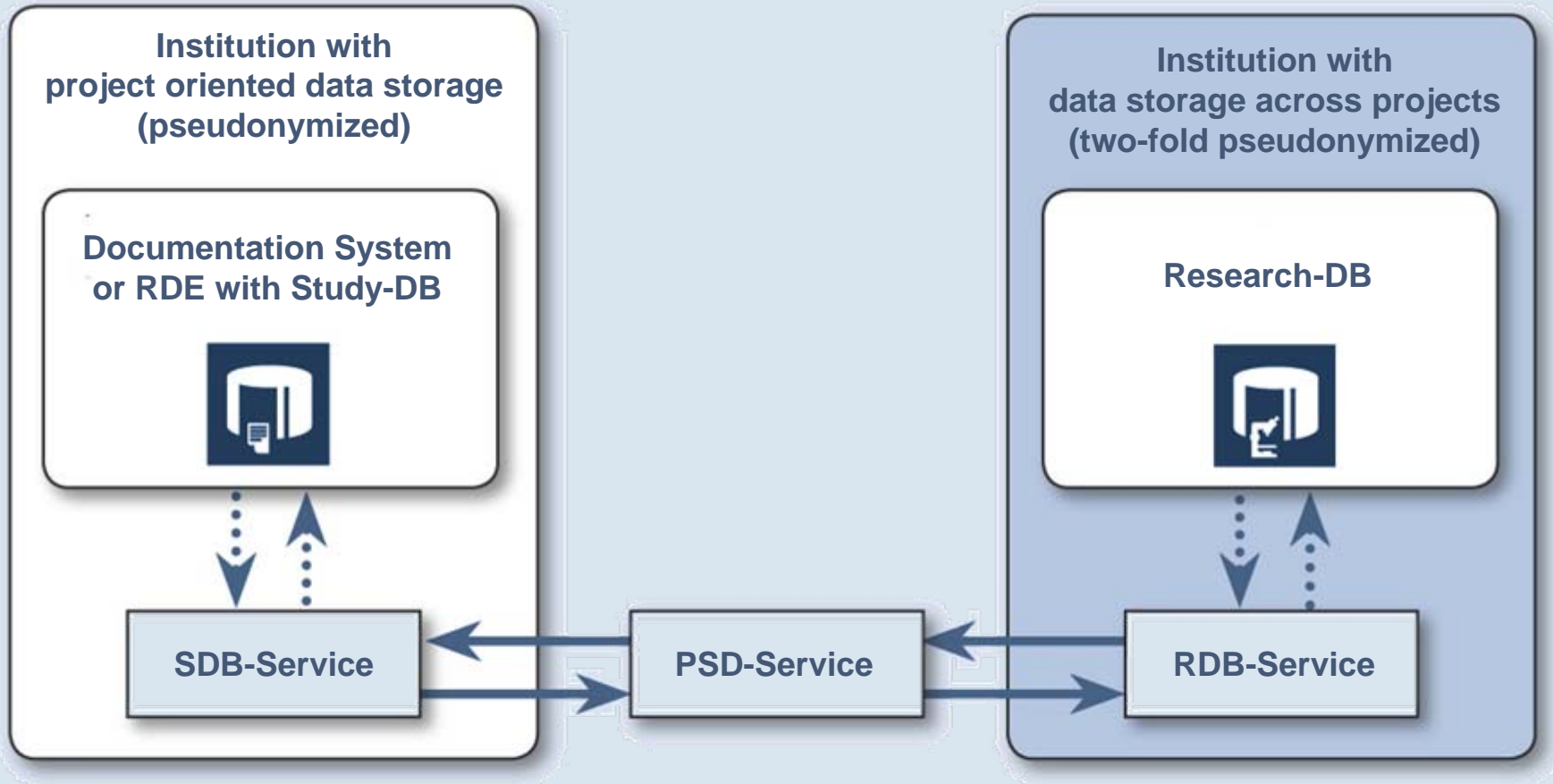
↪ example outputs, validation plan, dummy study data, ...



Table 1.2: Summary of Baseline Characteristics  
 Beispiel 2  
 Analysis Set - SAFETY

Variable	Median N=100	Non-med N=100
<b>Age (yr)</b>		
N	88	88
Mean	39.0	38.4
SD	11.2	10.3
Median	39.0	37.0
Min	19	19
Max	64	67
Q1	31.5	32.0
Q3	46.0	43.0
Missing	4	1
<b>Race</b>		
WHITE	87 ( 87%)	85 ( 85%)
ASIAN	9 ( 9%)	10 ( 10%)
NEGROID	4 ( 4%)	5 ( 5%)
Missing	0	0
<b>Sex</b>		
Male	12 ( 13%)	19 ( 19%)
Female	84 ( 88%)	81 ( 81%)
Missing	4	0
<b>Height (cm)</b>		
N	88	88
Mean	167.18	168.89
Min	76	150
Max	194	187
Q1	164.00	164.00
Q3	171.00	174.00
Missing	2	2
<b>Weight (kg)</b>		
N	88	88
Mean	71.704	69.776
SD	17.586	13.251
Median	69.000	66.500
Min	43	47
Max	166	105
Missing	2	2







-  Webservice-Integration (SOAP) or XML-based Filesystem-Connection
-  Webservice-Communication (SOAP) by https with client certificates

- ↪ Federal structures and distributed responsibilities in Germany
- ↪ Political segmentation of health care and medical research
  - ↪ Drawback for projects with dependencies on the patient care sector
- ↪ How to motivate for
  - ↪ (time consuming) structured documentation ?
  - ↪ using (powerful, but complicated) data and IT standards ?
  - ↪ building up and harmonizing cross-sector data and IT standards ?
  - ↪ using quality standards ?
  - ↪ using of and working on *one* common IT infrastructure ?
- ↪ Moving from project-driven approach to sustainable support and services



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Thank you.

More ...

<http://www.tmf-ev.de/>  
[info@tmf-ev.de](mailto:info@tmf-ev.de)