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Etude suisse sur la santé (Swiss Health Study): établir des bases de données

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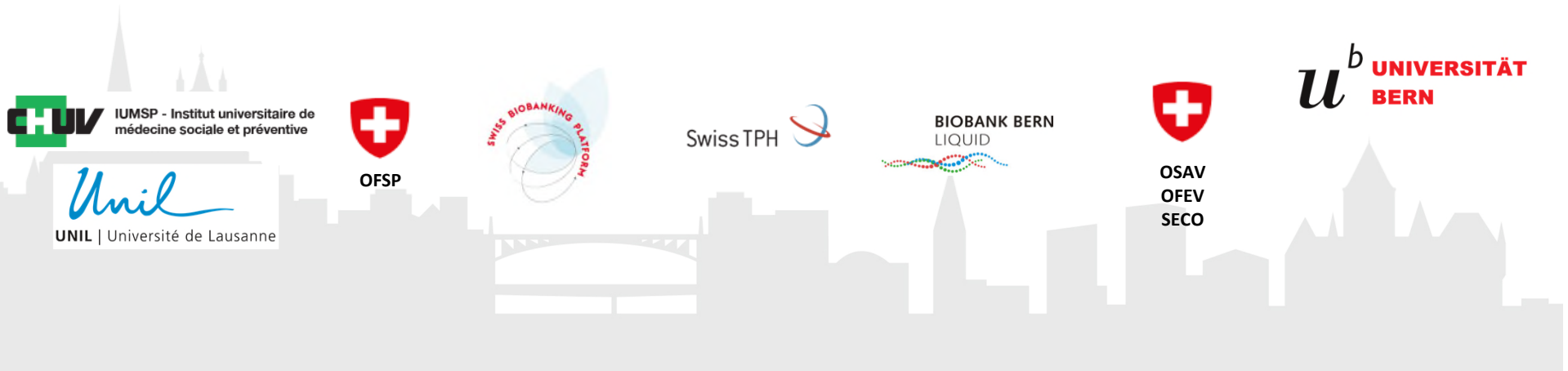
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Für mich. Für alle.
Schweizer Gesundheitsstudie

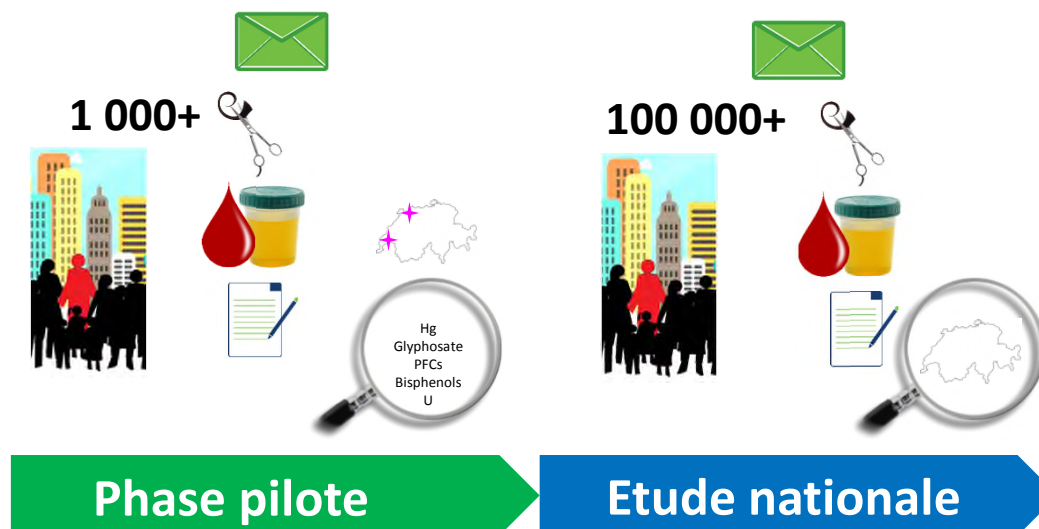


Pour moi. Pour tous.
Étude suisse sur la santé

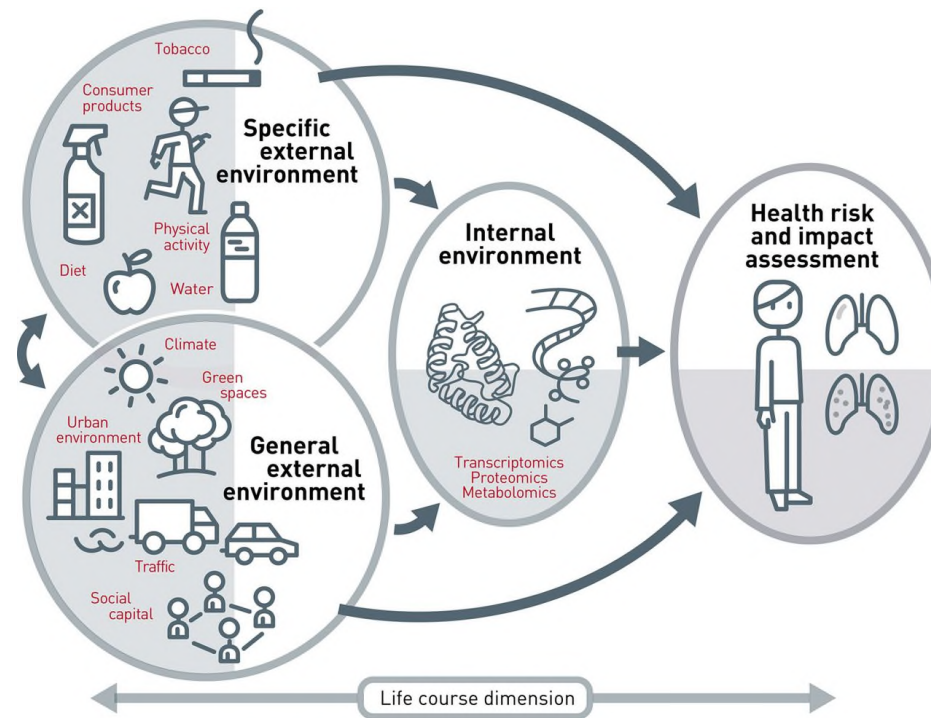




Swiss Health Study (SHeS) phase pilote

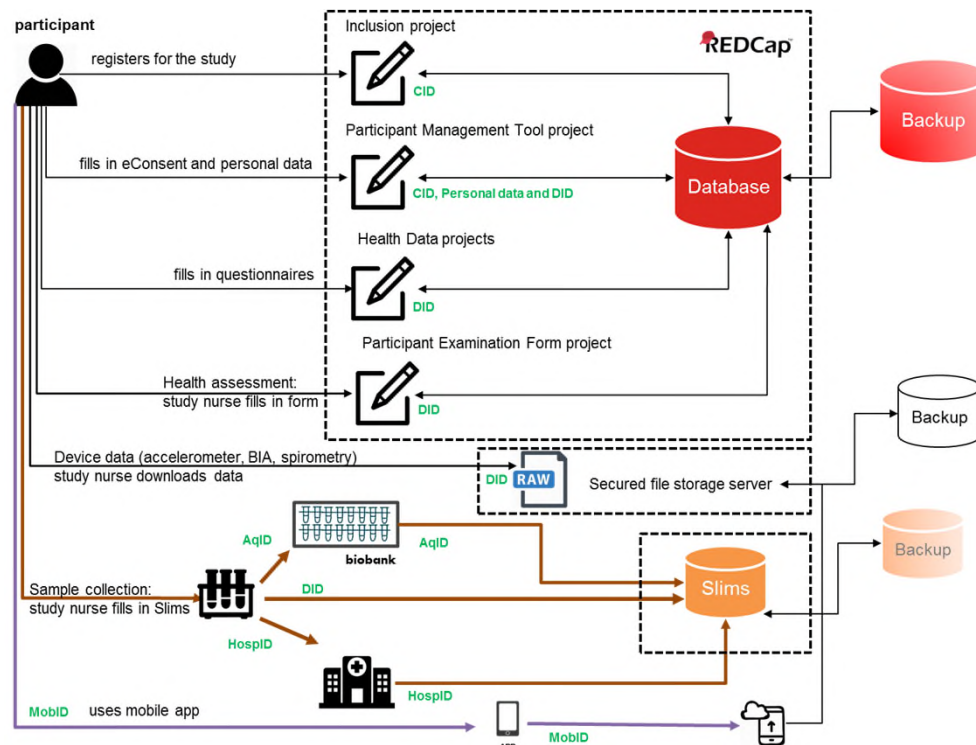


Public health importance of understanding the exposure of the Swiss population



Vrijheid M, Thorax 2014, 69(9):876-8, 2017

Database, data management and protection

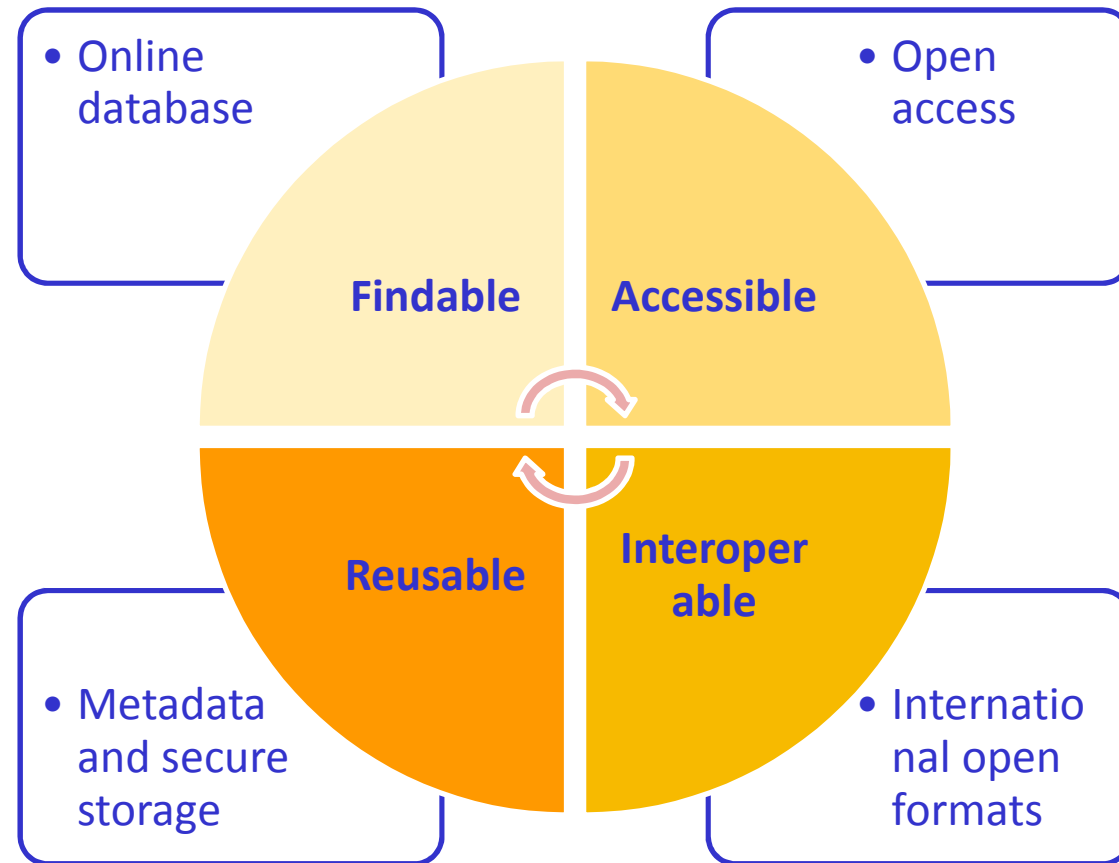


REDCap (Research Electronic Data Capture) is a secure web application for building and managing online surveys and databases. Created in 2004, over 700'000 users worldwide in 126 countries.

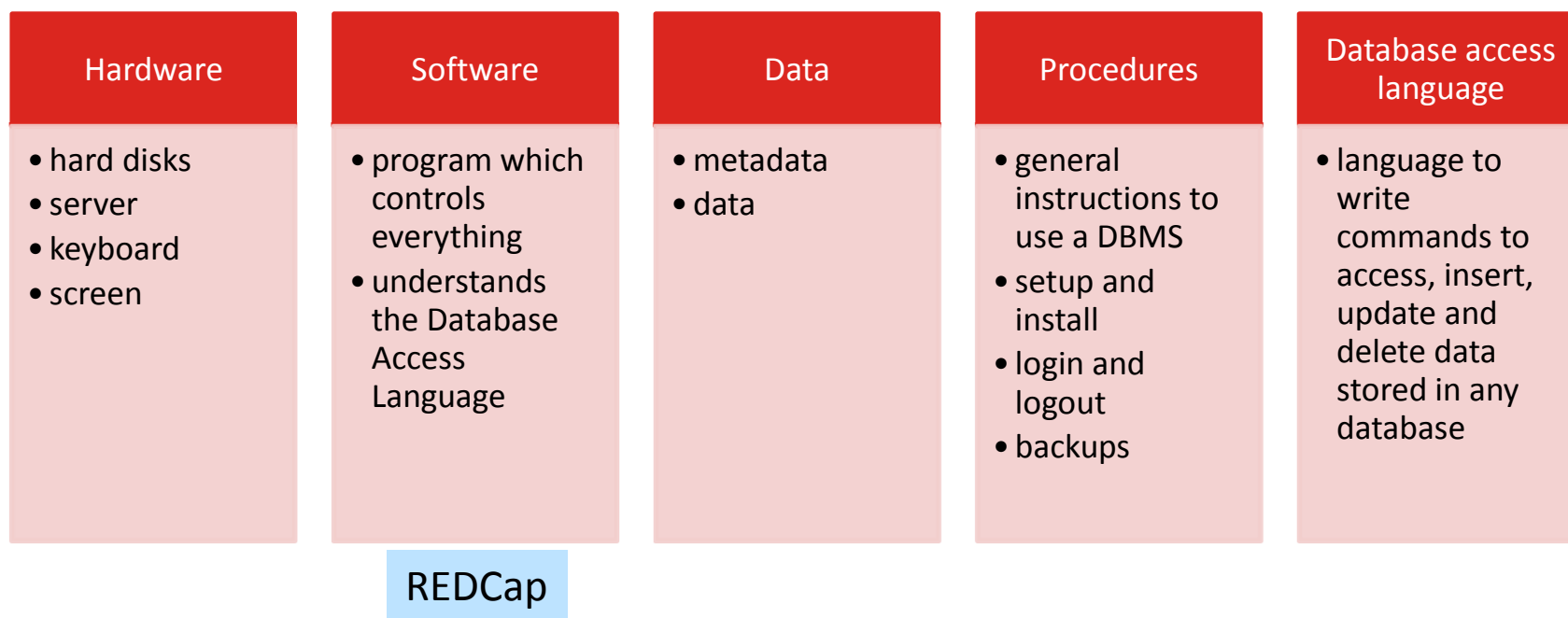
SLIMS combines a laboratory information management system (LIMS) and an electronic laboratory notebook (ELN)



Adoption of FAIR principles



Five major components of a database management system (DBMS)



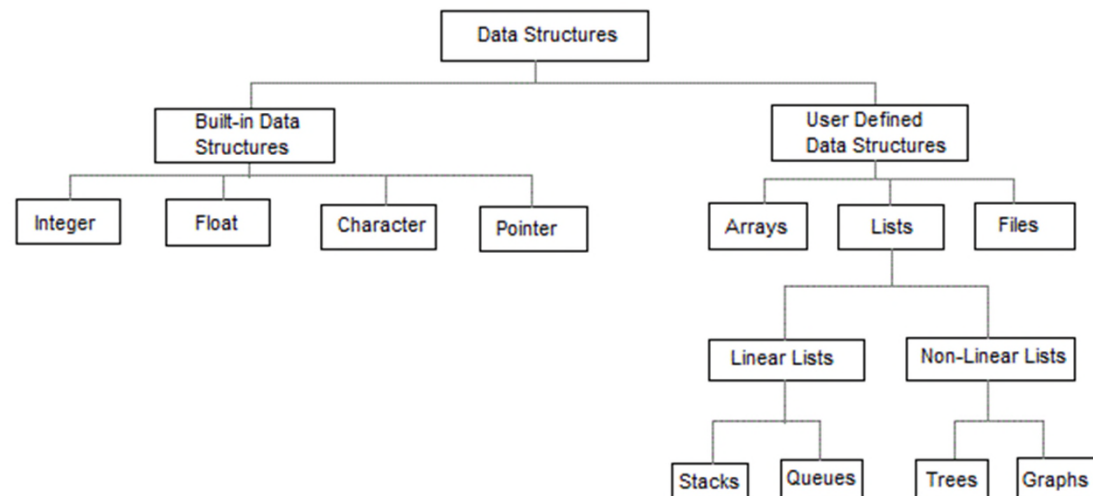
Functions of a DBMS

- Data storage, retrieval and update
- User accessible catalog or data dictionary describing the metadata
- Support for transactions and concurrency
- Facilities for recovering the database should it become damaged
- Support for authorization of access and update of data
- Access support from remote locations
- Enforcing constraints to ensure data in the database abides by certain rules

Data structures

- **Primitive Data Structures:** integer, float, character, pointer
- **Abstract Data Structure:** linked lists, tree, graph, stack, queue

Data structures allow performing operations on data



INTRODUCTION TO DATA STRUCTURES

SPHN-Data coordination center



https://sphn.ch/wp-content/uploads/2020/03/Icon_DCC-extended___w-Text.jpg

Metadata =
"data about the data"

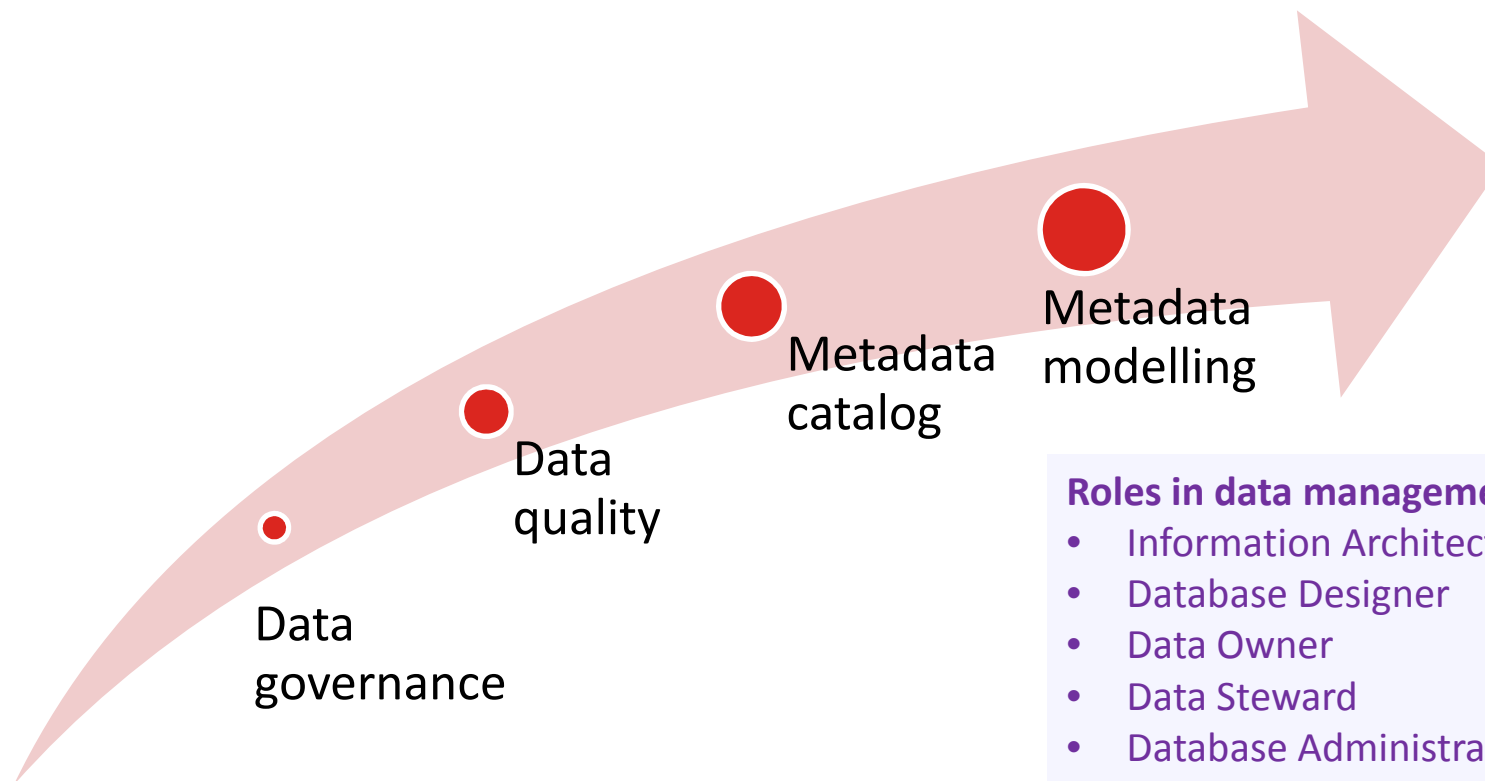


Metatata catalogs

Metadata catalog of UK biobank

Name	Label	Annotations	Type	Study	Population	DCE	Dataset
n_46_0_0	Hand grip strength (left)	•Muscles, skeleton and mobility	Collected	UK Biobank	UK Biobank - Population	UK Biobank - Baseline assessment	UKB MainPhase
n_47_0_0	Hand grip strength (right)	•Muscles, skeleton and mobility	Collected	UK Biobank	UK Biobank - Population	UK Biobank - Baseline assessment	UKB MainPhase
n_48_0_0	Waist circumference	•Anthropometry	Collected	UK Biobank	UK Biobank - Population	UK Biobank - Baseline assessment	UKB MainPhase

Data management requires a complex set of expertises



Roles in data management:

- Information Architect
- Database Designer
- Data Owner
- Data Steward
- Database Administrator
- Data Scientist

Conclusions

- Database and data management for a large-scale population-based cohort is a complex task.
- It takes expertise and resources to manage data.
- The choice of a database system needs to be made by IT-specialist in collaboration with the researchers.
- Data security and privacy need to be ensured at all steps in the process and be compliant with current legal framework (CH + Europe).
- Swiss Health Study (Etude suisse sur la santé): a secure web-based REDCap database interoperable with SPHN-principles has been put in place at the CHUV.