



INSTITUTE OF APPLIED BIOSCIENCES  
ΙΝΣΤΙΤΟΥΤΟ ΕΦΑΡΜΟΣΜΕΝΩΝ ΒΙΟΕΠΙΣΤΗΜΩΝ  
CENTRE for RESEARCH and TECHNOLOGY-HELLAS

# Real-World Data Management Systems

Development of **standardized** and **centralized** data repositories and management systems for **Real World Evidence**

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enabling multi-center projects on clinical association studies

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## Web-based applications

Provide data availability and security in a user friendly way

Simplicity, data reliability, easiness in use and flexibility as necessary conditions

*User – friendly, adjusted to user requirements*

# RWD management systems

## OBJECTIVES

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- A. collect and transform clinically relevant RWD into evidence
- B. correlate data in order to provide accurate information about the diagnosis, prognostic assessment and management
- C. facilitate biological, translational and clinical research

Organize and analyze clinically relevant data from the **daily practice**, by gathering **homogenized high-quality datasets**, thus Improving the **quality and delivery of medical care**

# RWD management systems

## APPROACH

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### 1. Standardization & Harmonization

Agreement on common policies and procedures with standards-based approaches, paving the way for standardized registration of RWD

### 2. Simplicity & Flexibility

Design in expandable modules allowing the rapid introduction of additional data categories and extension of data domain when and if needed

### 3. Data Availability & Usability

Unified access to clinically relevant structured data while fulfilling the data quality assurance requirements

### 4. Data Protection

EU General Data Protection Regulation (GDPR)  
Technical and Organizational measurements for data protection and data security

# RWD management systems

## APPROACH

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Combine information into a data integration framework

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Data integrity, data accuracy and quality assessment

User-friendly integration of ontologies, terminologies and standards

Data correlations and statistical analysis

Quality control and curation mechanisms

Data analytics, Data mining and knowledge discovery

Data protection, security, privacy and availability

# RWD management systems

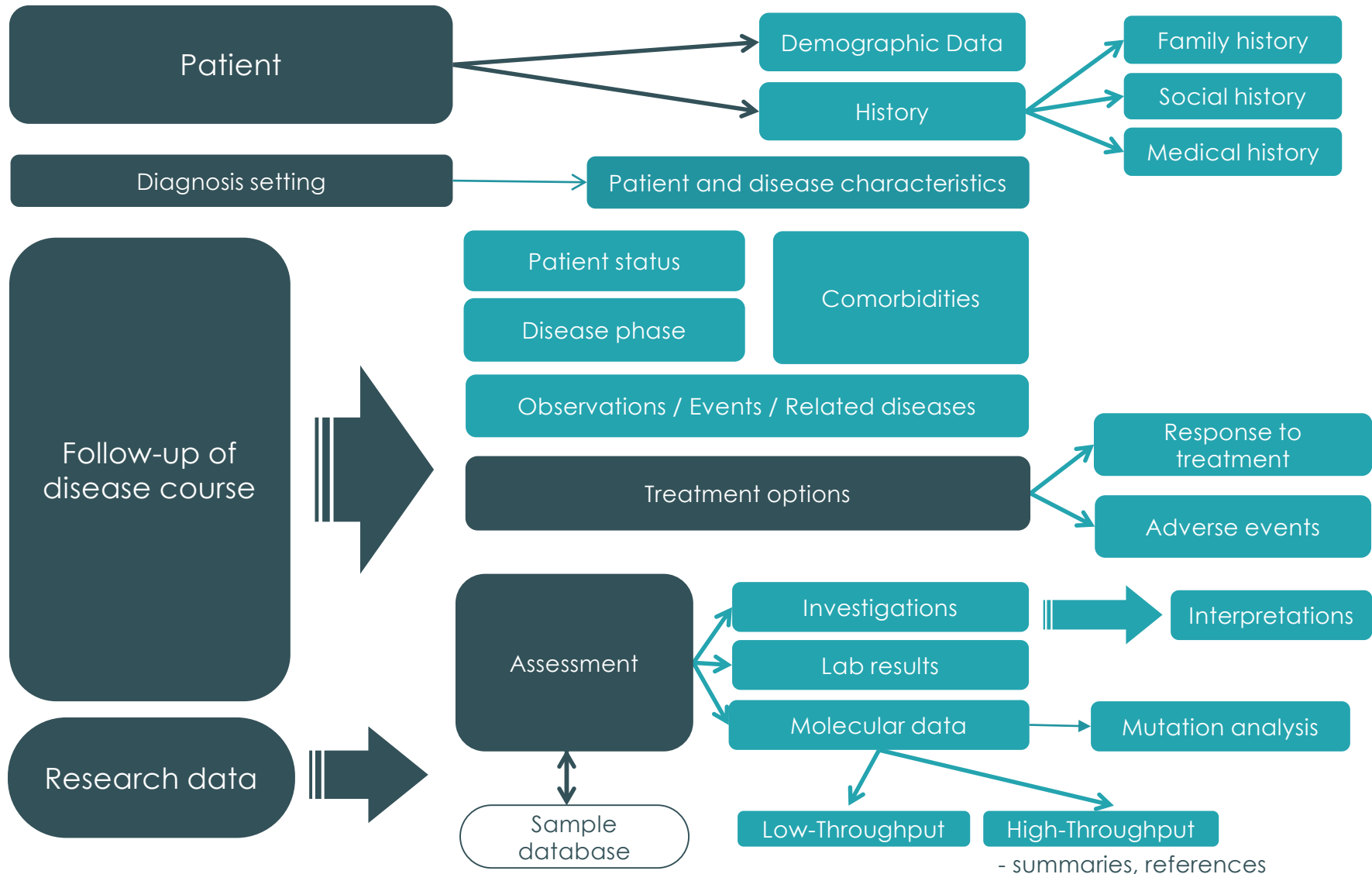
## DATA MODEL

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Describe all the relevant information to form an accurate and complete representation of patient diagnosis and disease course

# RWD management systems

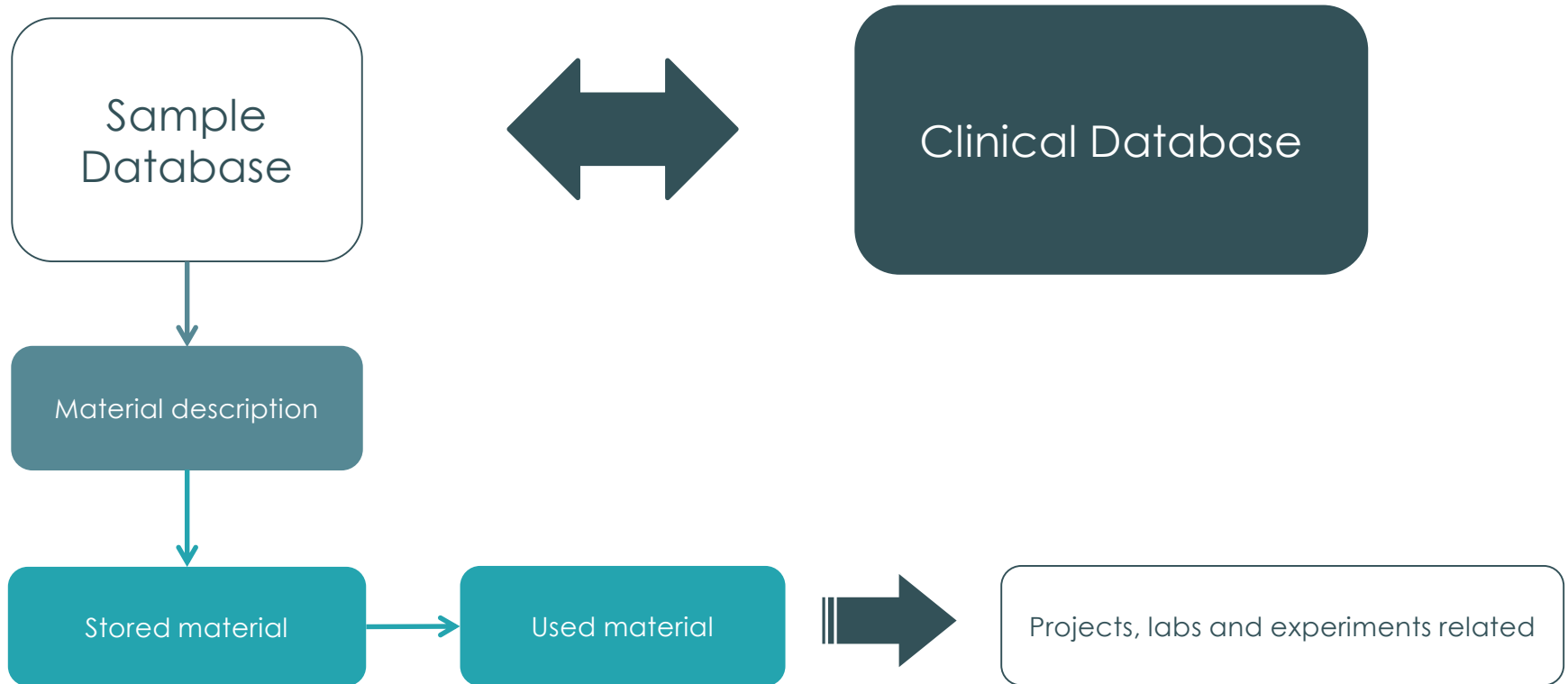
## DATA MODEL



# RWD management systems

DATA MODEL

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# RWD management systems

## DATA MODEL

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### — Characteristics

- ☐ Meet the requirements for an accurate description of diagnosis, prognostic assessment and management of patients
- ☐ Adjusted to project-based requirements (extended / expanded)
- ☐ Expressing the complexity of disease

# RWD management systems

## DATA MODEL

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### — Data Requirements

Collect all information about the data that will be stored in the database.

- What are the types of data and the data categories of the different data entities?
- Which fields will be included in each data category?
- What is the data type and format of each field that will be stored in the database?
- Are there specific values allowed for the defined fields?
- What are the rules and relationships among different types of data?
- Which data are required?
- How will the data be assessed?

—————> User scenarios and workflows



### Detailed description of data

- ☐ Detailed list of data categories, entities, terminologies
- ☐ Definition of data types, data format and allowed values
- ☐ Configuration of data relationships and rules
- ☐ Consistency and integrity constraints

# RWD management systems

## DATA MODEL

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### 1. Detailed list of data categories, entities, terminologies

#### — Main data

Data category	Column name
Registration data	Patient id
	Registration center
	Hospital
	Physician
Demographic data	Gender
	Year of birth
	Age
Diagnosis data	Date of diagnosis
	Age at diagnosis
	Diagnosis
	PS at time of diagnosis

#### — Treatment data

Treatment data	Date of first treatment
	First treatment type
	Response to first treatment

#### — Lab data

Data category	Column name
Blood test	Blood test date
	Haemoglobin (g/dL)
	WBC
	ANC
	Platelets
	Serum albumin (g/dL)
	Serum creatinine
	Alkaline phosphatase
	Alkaline phosphatase (ULN)
	Serum urea
	Serum calcium
	Peripheral Blood plasma cells %
	Date of bone marrow test
Bone marrow test	Aspirate method
	BM infiltration in aspirate
	Trephine method
	BM infiltration in trephine
	BM Flow examination

# RWD management systems

## DATA MODEL

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### 2. Definition of data types, data format and allowed values

Field	Data type	Data format	Unit	Value constraints
Diagnosis	text	List		CLL,MBL,SLL
Date of diagnosis	date	DD/MM/YYYY		>1980
Rai stage at diagnosis	text	List		0,I,II,III,IV
Binet stage at diagnosis	Text	List		A,B,C
Comorbidities at diagnosis	text	List		YES,NO
Blood count date	date	DD/MM/YYYY		less than or equal to current date
Hb	decimal	#0.0-100.0	g/dL	0.0-100.0
WBC (x10 <sup>9</sup> /l)	decimal	#0.00-1000.00	(x10 <sup>9</sup> /l)	0.00-1000.00
Treatment status	Text	List		Treated,Untreated
Response to first treatment	Text	List		CR,CRI,Nodular PR,PR,PR with lymphocytosis,Progressive,Stable
Date of last follow-up	Date	DD/MM/YYYY		less than or equal to current date
Survival status	Text	List		Alive,Dead

# RWD management systems

## DATA MODEL

### 3. Configuration of data relationships and rules

#### Request additional information

❑ Example: Treatment description

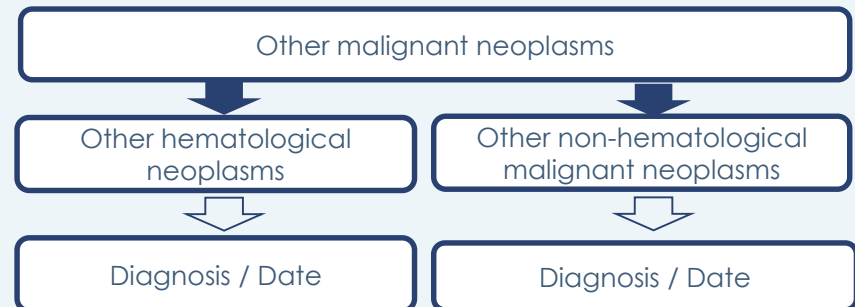
##### Treatment type list

Ibrutinib - single
Ibrutinib - combination
Acalabrutinib - single
Acalabrutinib - combination
Venetoclax - single
Venetoclax - combination
...
...
...
Other

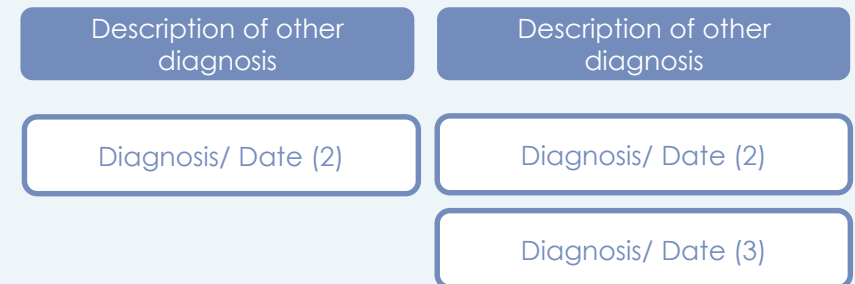
Description of other  
type of first treatment  
(free text)

#### Request additional information

❑ Example: Report other malignancies



#### + Report multiple events



# RWD management systems

## DATA MODEL

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### 4. Consistency and integrity constraints

#### Required information

Field
Patient ID
Diagnosis
Date of diagnosis
Rai stage at diagnosis
Binet stage at diagnosis
Treatment status

#### Data **redundancy** control

*Examples:*

The Patient id must uniquely characterize one patient

A patient has only 1 RAI stage at diagnosis time

A patient cannot have 2 visits with the same date

#### Depended / Essential information

*Examples:*

If patient is reported DEAD, then Date of death is a required field

If patient is reported Treated, then Start date of treatment and treatment type are required fields

#### Additional constraints and rules for the **comparison of related fields**

*Examples*

Start date of treatment cannot be before Date of diagnosis

Treatment-related data are not applicable for Untreated patients

A patient with enlarged lymph nodes at time of diagnosis cannot be reported with RAI stage: 0

# RWD management systems

## DATA PROTECTION

### GDPR compliance



- Data are collected solely for specific and legitimate purposes
- Data are adequate and related to the purpose of collection
- Data are processed and treated lawfully and fairly in a transparent manner

### Data anonymization procedures

Pseudonymized identifier for each patient

The correspondence  
with original records will be stored  
only at the local level.

Fully anonymized data used for statistical  
analysis, Aggregated results are reported.



**ISO 27001:2013**

for Information Security  
Management System



**ISO 22301:2019**

for Business Continuity  
Management System

## Appropriate technical and organizational measures

- data confidentiality, availability and integrity
- data protection and security

# RWD management systems

## SYSTEM DESIGN

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### Database development



Database system specifically designed for clinical and biological data

### Main characteristics

- Data Integrity
- Data Consistency
- Redundancy Control
- Data Availability
- Data Correlations



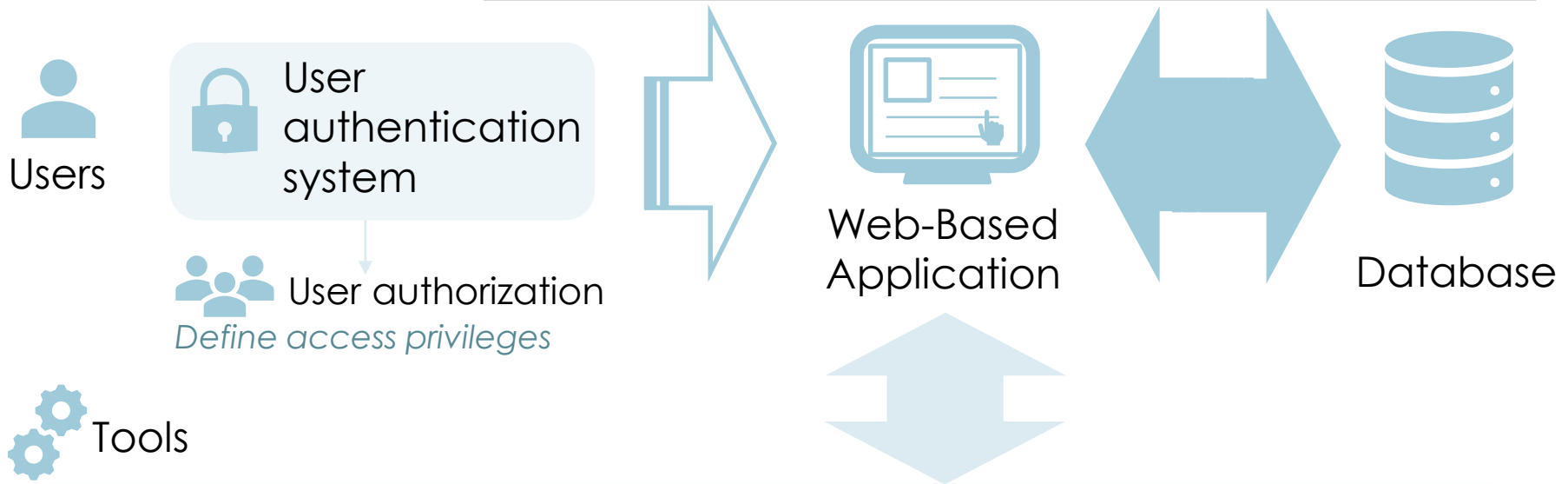
### Data security

- ☐ User management
- ☐ Project Management
- ☐ Activity Logs
- ☐ Back up mechanisms
- ☐ Maintenance procedures
- ☐ Reporting system



# RWD management systems


## SYSTEM DESIGN






### Data management tools

-  Data registration
-  Data import
-  Data validation
- Data update

### Data retrieval tools

-  Search
-  Filter
-  Preview
-  Download

### Data analysis tools

- 
- 
- 
- Visualization and Export modules

# RWD management systems

## USER MANAGEMENT

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**Center - based access**



**Project - based access**



**Lab-based access**

Controlled access to data of the registration center

### ✓ **Role-based access**

Role assignment: Restricted or Extended Access Privileges

# RWD management systems

## USER MANAGEMENT

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**User role** examples of **center-based** access

### Principal investigator of center (PI)

Overall access, review registration and management procedures

### Data administrator (DA)

Overall read & write privileges

### Data moderator (DM)

Restricted read & write permissions to selected data categories

### Read - only user

Restricted read permissions to selected features

**Role-assignment** example

### Cytogenetics-lab User

Access only to cytogenetic data

**User role** example of **project-based** access

### General PI

Read-only access to data from all centers in a project

# RWD management systems

## USER MANAGEMENT

### User Authentication

## CLLdb

The INAB database for Chronic Lymphocytic Leukemia

### Login



Let me in →

In case you cannot login, contact us at  
✉ [biodb@inab.certh.gr](mailto:biodb@inab.certh.gr)

— developed and hosted in  
Institute of Applied Biosciences (INAB) | Centre for Research and Technology Hellas (CERTH)



**CERTH**  
CENTRE FOR  
RESEARCH & TECHNOLOGY  
HELLAS

**Strictly personal user accounts - credentials**

Login Page

# RWD management systems

## USER MANAGEMENT

### User Account Activation

#### Login Credentials

Username

Temporary Password

- ✓ Terms and Policies agreement
- ✓ Set up new password



Confirmation email

The USER agrees that all of the above terms are essential. The continuation of the activation process means the unconditional acceptance of the above terms of use.

☐ I have read and accepted the terms of use

Continue

Dear Eva Minga, your password has expired.

Set up your new password:

Enter your old password:

Old password

Enter a new password:

New Password

Verify new password:

Verify Password

Change password

☐ I have also read the [institutes acceptable use policy](#) and [data protection policy](#) and I agree.

\* Follow the link and read the policies in order to proceed

#### — Procedure

1. Enter your credentials and set a new password
2. Click the link to view and read institutes policies in order to proceed
3. Confirm you have read and agree with the policies
4. Click **change password** to submit changes

#### — Password instructions

- ✓ New password must be different than the previous one
- ✓ The length of new password must be at least 6 characters
- ✓ The length of new password must be less than 20 characters
- ✓ New password must contain at least 1 uppercase character [A-Z]
- ✓ New password must contain at least 1 lowercase character [a-z]
- ✓ New password must contain at least 1 numeric character [0-9]
- ✓ New password must contain at least 1 of the **allowed** symbols [-\_!@#]

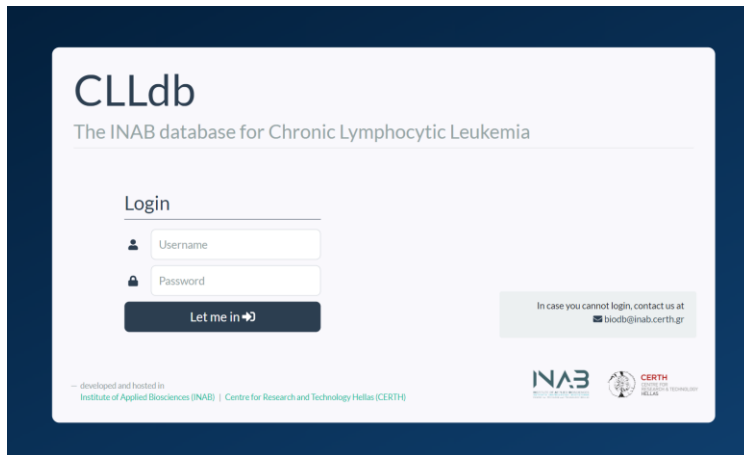
Set up Password

# RWD management systems

## USER MANAGEMENT

### User Account Activation

Confirm and login to activate account:



CLLdb  
The INAB database for Chronic Lymphocytic Leukemia

Login

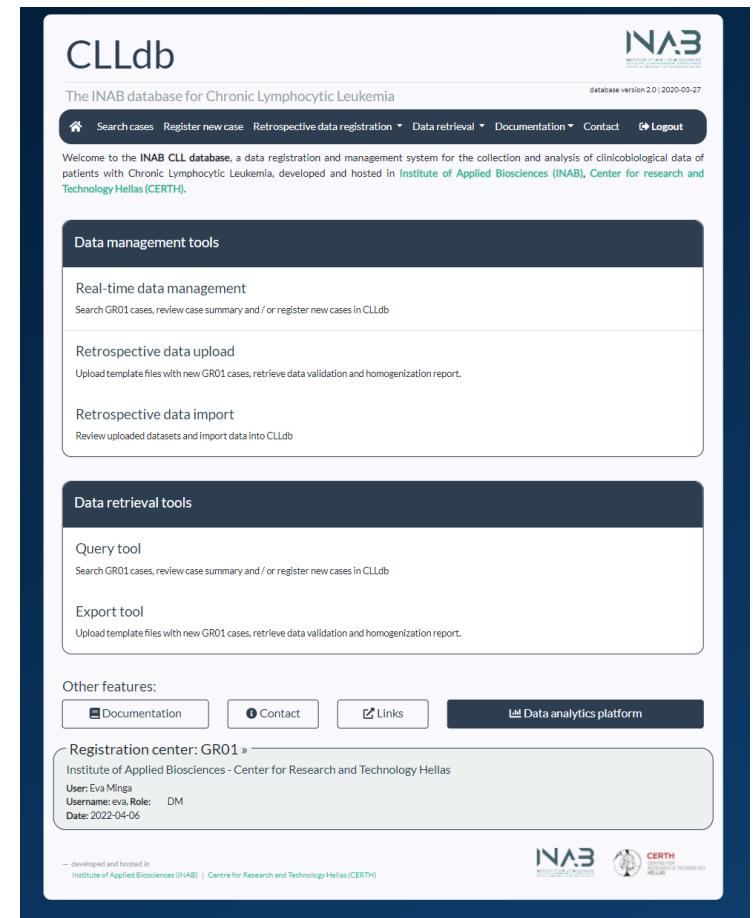
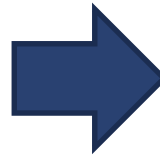
Username

Password

Let me in

In case you cannot login, contact us at [biobd@inab.certh.gr](mailto:biobd@inab.certh.gr)

— developed and hosted in  
Institute of Applied Biosciences (INAB) | Centre for Research and Technology Hellas (CERTH)



CLLdb  
The INAB database for Chronic Lymphocytic Leukemia

Search cases Register new case Retrospective data registration Data retrieval Documentation Contact Logout

Welcome to the INAB CLL database, a data registration and management system for the collection and analysis of clinicobiological data of patients with Chronic Lymphocytic Leukemia, developed and hosted in Institute of Applied Biosciences (INAB), Center for research and Technology Hellas (CERTH).

Data management tools

Real-time data management  
Search GR01 cases, review case summary and / or register new cases in CLLdb

Retrospective data upload  
Upload template files with new GR01 cases, retrieve data validation and homogenization report.

Retrospective data import  
Review uploaded datasets and import data into CLLdb

Data retrieval tools

Query tool  
Search GR01 cases, review case summary and / or register new cases in CLLdb

Export tool  
Upload template files with new GR01 cases, retrieve data validation and homogenization report.

Other features:

Documentation Contact Links Data analytics platform

Registration center: GR01 »  
Institute of Applied Biosciences - Center for Research and Technology Hellas

User: Eva Minga  
Username: eva, Role: DM  
Date: 2022-04-06

— developed and hosted in  
Institute of Applied Biosciences (INAB) | Centre for Research and Technology Hellas (CERTH)



Change of password  
is periodically required

# RWD management systems

## DATA COLLECTION METHODS

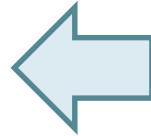
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### Real-time registration systems

#### **Prospective** data registration

##### Online web forms

- ✓ Register new record
- ✓ Search for existing record
- ✓ Overview record data
- ✓ Update record



#### **Retrospective** data registration

##### Data registration tools

- ✓ Massive import of patient retrospective data
- ✓ Transform and upload data exports from other sources
- ✓ Data homogenization and integration

- ✓ Available for edit online

### **Integration and validation mechanisms**

elimination of data inconsistency and redundancy  
enhanced data management and organization

# RWD management systems

## DATA COLLECTION METHODS

### Real-time registration systems

#### A. Online web forms for prospective data registration

The screenshot shows the CLLdb web interface for registering a new GR01 case. The form is titled "Register new GR01 case" and includes a navigation bar with links: Home page, Retrospective data registration, Data retrieval, Documentation, and Contact. The form is organized into several sections: Registration data (Patient id, Referral hospital information, Referral physician), Demographic data (Gender, Year of birth, Age, Country, Ethnic origin), Diagnosis data (Diagnosis, Date of diagnosis, Age at diagnosis, Diagnosis comment), Treatment status (Treated, Untreated, Start date of treatment, Date of last follow-up), and Current status (Survival status, Date of last known alive). The form includes input fields, dropdown menus, and radio buttons for data entry. At the bottom, there are buttons for "Cancel registration" and "Save patient data". The NAB logo and "Institute of Applied Biosciences (INAB), CERTH" are visible in the footer.

- ✓ Organize data in order to facilitate data registration and improve data management
  - separate categories
  - multiple timepoints
- ✓ Create different types of forms for controlled access to data management according to user roles and access privileges
- ✓ Design dynamically adjusted forms based on selected criteria



# RWD management systems

## DATA COLLECTION METHODS

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### Real-time registration systems

#### A. Online web forms for prospective data registration

*Data that are requested only under specific conditions:*


Treatment status

Treatment status ☐ Treated ☒ Untreated



Treatment status

Treatment status ☒ Treated ☐ Untreated

Start date of treatment \*  

Front-line treatment type  

## DATA COLLECTION METHODS

## B. Retrospective data registration tools

**facilitate** data  
collection in a  
retrospective way

*\* adjusted to local necessities and project-specific data collection*

- 

**integrate** multi -  
originated data from  
different sources into a  
central repository

# RWD management systems

## DATA COLLECTION METHODS

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### Data Validation and Integration

- **translation** of terms / **conversion** of data
- **validation** of data formats
- detection of **data redundancy**
- additional constraints and rules for the **comparison of related fields**

# RWD management systems

## DATA COLLECTION METHODS

---

### Data Validation and Integration

#### Examples of reported errors

##### **Data format errors**

- del11q date: '2014., 2017.04.12.', error in date - NOTE: date must be in 'DD/MM/YYYY' format
- Hg: 'Low' is invalid for numeric field Hg.
- b2-microglobulin:'130', value violates numeric limits (0.1-100)

##### **Data redundancy errors**

- Patient id: X2 already exists
- Date of blood test: 2016-04-03', There is another blood test for this patient with the same date.

##### **Predefined values**

- Type of first treatment: 'FC', value is not included in the list of predefined values.
- Response to first treatment: 'CR, MRD negative', value is not included in the list of predefined values.

# RWD management systems

## DATA COLLECTION METHODS

---

### Data Validation and Integration

#### Required Data

- Missing patient data: Start date of treatment is a required field for treated patients.
- Date of diagnosis of non-hematological neoplasm: Information is required when Other non-hematological malignant neoplasms=YES

#### Data inconsistency

- Rai stage at diagnosis: 'II' is not a valid value for Diagnosis 'SLL'
- Description of hematological adverse events at 1st-line treatment is not applied when depended information is missing: Adverse events at 1st-line treatment is empty

#### Date compare

- Date of diagnosis: '30/04/2015' cannot be more than 15 days greater than Date of first treatment: '05/02/2015'
- Start date of 3<sup>rd</sup>-line treatment: '10/01/2016' cannot be earlier than Start date of treatment – 2nd line of treatment: '11/02/2016'
- Date of death: '19/02/1997' cannot be less than del17p date: '13/11/2002'

# RWD management systems

## DATA COLLECTION METHODS

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### Data Validation and Integration

#### Examples of reported warnings

##### **Warnings on missing data**

- Further treatment at relapse / progression is essential for analysis (missing data)

##### **Warnings on missing data for depended fields**

- Missing ULN for b2-microglobulin is required for b2-microglobulin='3.49'

##### **Warnings on data transformation**

- Date of best response to treatment='27/04/20' has been auto-converted into '2020', please correct file if necessary and upload again (required format: 'DD/MM/YYYY')
- Tissue type: BM has been replaced with 'Bone Marrow'

# RWD management systems

## DATA COLLECTION METHODS

---

### Data Validation and Integration

- **translation** of terms / **conversion** of data
- **validation** of data formats
- detection of **data redundancy**
- additional constraints and rules for the **comparison of related fields**

Prospective data registration → Data rules and constraints are implemented in the forms

- ✓ Form cannot be saved if required fields are empty
- ✓ Form input fields are restricted to the defined data format.
- ✓ Multiple choice or single choice options and drop down lists ensure data consistency
  - *restricting input to the list of allowed values* -
- ✓ Fields are dynamically displayed in order to avoid data inconsistency
  - *only if applicable based on user's input* -
- ✓ Required Fields are dynamically added based on user's input
- ✓ Duplicate records cannot be saved

# RWD management systems

## DATA COLLECTION METHODS

### Data Validation and Integration

- **translation** of terms / **conversion** of data
- **validation** of data formats
- detection of **data redundancy**
- additional constraints and rules for the **comparison of related fields**

### Retrospective data registration

Data validation procedure



Data validation reports

#### Data validation report

Upload of Amsterdam dataset

Amsterdam data have been successfully uploaded!

File: ERIC\_CLL\_db\_TretSeqAmsterdam

✓ Verified sheet: Main data

✓ Verified sheet: Subsequent lines of treatment

#### Dataset status

Center code: Amsterdam

Number of uploaded cases: 43

Number of validated cases: 11 / 43 (Number of cases with errors: 32)

❌ Error [Data curation is required]

Total number of errors: 56

#### Data validation report

Main data (43 rows)

15 / 43 processed rows with data have been validated.

⚠️ Number of rows with errors in sheet: 28

⚠️ There are warnings (40) to review in this sheet

Subsequent lines of treatment (8 rows)

3 / 8 processed rows with data have been validated.

⚠️ Number of rows with errors in sheet: 5

⚠️ There are warnings (3) to review in this sheet

❌ Reference exists in this sheet for 6 / 43 (13.95%) cases

Download data validation report in a tab-delimited text file.



# RWD management systems

## DATA COLLECTION METHODS

### Data Validation and Integration

- **translation** of terms / **conversion** of data
- **validation** of data formats
- detection of **data redundancy**
- additional constraints and rules for the **comparison of related fields**

### Retrospective data registration

Data validation procedure

Data validation reports

Data validation report  
Upload of Amsterdam dataset

Re-upload



Corrected  
dataset

Amsterdam data have been successfully uploaded!

File: ERIC\_CLLdb\_TretSeqAmsterdam  
✓ Verified sheet: Main data  
✓ Verified sheet: Subsequent lines of treatment

#### Dataset status

Center code: Amsterdam

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# RWD management systems

## DATA COLLECTION METHODS

### Data Validation and Integration

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- **validation** of data formats
- detection of **data redundancy**
- additional constraints and rules for the **comparison of related fields**

### Retrospective data registration

Data validation procedure



Data validation reports

Data validation report

Upload of Amsterdam dataset



Data curation

Data organization  
Data homogenization



Data import



PostgreSQL

Central  
Database

Amsterdam data have been successfully uploaded!

File: ERIC\_CLL.db\_TretSeqAmsterdam

✓ Verified sheet: Main data

✓ Verified sheet: Subsequent lines of treatment

Dataset status

Center code: Amsterdam

Number of uploaded cases: 43

Number of validated cases: 11 / 43 (Number of cases with errors: 32)

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📄 Download data validation report in a tab-delimited text file.

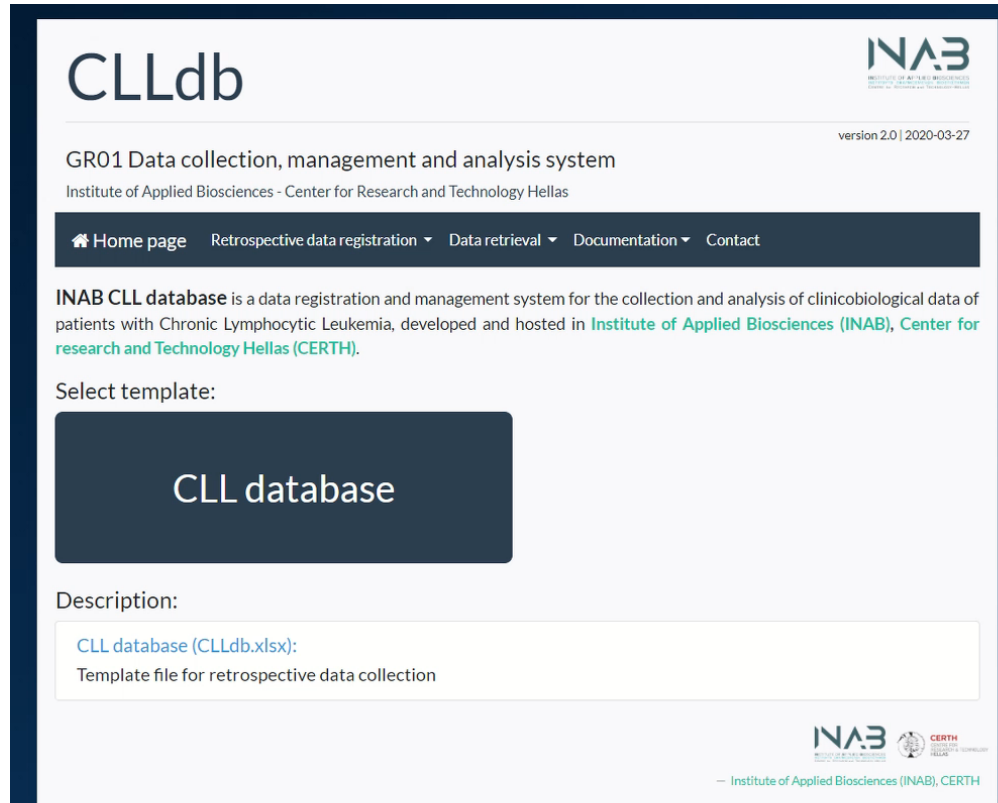
# RWD management systems

## DATA COLLECTION METHODS

Example of retrospective data registration system for the INAB CLL database:

### Upload of new dataset

- Upload template file
- Wait for the system to process excel data:
  - Organize information
  - Validate data types
  - Check rules and constraints
- Retrieve data validation report
  - *Errors in dataset*
  - *Review warnings*



The screenshot shows the CLLdb web interface. At the top, the title 'CLLdb' is displayed next to the INAB logo. Below the title, it says 'GR01 Data collection, management and analysis system' and 'Institute of Applied Biosciences - Center for Research and Technology Hellas'. A navigation bar contains links: Home page, Retrospective data registration, Data retrieval, Documentation, and Contact. The main content area describes the 'INAB CLL database' as a system for collecting and analyzing clinicobiological data for Chronic Lymphocytic Leukemia. It mentions it is developed and hosted by the Institute of Applied Biosciences (INAB) and the Center for Research and Technology Hellas (CERTH). A 'Select template:' section features a large button labeled 'CLL database'. Below this, a 'Description:' section shows a link to 'CLL database (CLLdb.xlsx)' and notes it is a 'Template file for retrospective data collection'. The footer includes the INAB and CERTH logos and the text 'Institute of Applied Biosciences (INAB), CERTH'.

CLLdb

INAB  
INSTITUTE OF APPLIED BIOSCIENCES  
CENTER FOR RESEARCH AND TECHNOLOGY HELLAS

version 2.0 | 2020-03-27

GR01 Data collection, management and analysis system  
Institute of Applied Biosciences - Center for Research and Technology Hellas

Home page Retrospective data registration Data retrieval Documentation Contact

INAB CLL database is a data registration and management system for the collection and analysis of clinicobiological data of patients with Chronic Lymphocytic Leukemia, developed and hosted in [Institute of Applied Biosciences \(INAB\)](#), [Center for research and Technology Hellas \(CERTH\)](#).

Select template:

CLL database

Description:

[CLL database \(CLLdb.xlsx\)](#):  
Template file for retrospective data collection

INAB  
INSTITUTE OF APPLIED BIOSCIENCES  
CERTH  
CENTER FOR RESEARCH AND TECHNOLOGY HELLAS

— Institute of Applied Biosciences (INAB), CERTH

# RWD management systems

## DATA COLLECTION METHODS

Example of retrospective data registration system for the INAB CLL database:

### Upload of new dataset

- Upload template file
- Wait for the system to process excel data:
  - Organize information
  - Validate data types
  - Check rules and constraints
- Retrieve data validation report
  - *Errors in dataset*
  - *Review warnings*

### Data curation process

- Update data in the template file according to the report
- Upload the updated version

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D
	Patient id	Patient lab identifier	Other lab identifiers	Gender
5	GR01-P1659	P1659		F
6	GR01-P20443	P20443		F
7	GR01-P34780	P34780		F
8	GR01-P2805	P2805		M
9	GR01-P3492	P3492		M

The spreadsheet is part of a presentation slide. The slide features the INAB logo (Institute of Applied Biosciences) and text indicating it is version 2.0 from 2020-03-27. It also mentions 'Microbiological data of s (INAB), Center for' and 'Biosciences (INAB), CERTH'.

# RWD management systems

## DATA RETRIEVAL AND ANALYSIS

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**Tools** for data retrieval and analysis, based on user access privileges

### Query tools

- allowing for dynamic definition of selection filters in order to retrieve data



Data retrieval  
and overview

### Export modules

- report generation (patient summary)
- selected data download (authorized - anonymized)
- retrieve anonymized data



Download data  
options

### Statistic and Visualization tools

- statistical analysis
- visualization (diagrams)

# RWD management systems

## DATA RETRIEVAL AND ANALYSIS

### 1. data selection

- *Query / Search tools*



### 2. data retrieval

Preview results for selected set of cases - *Including data visualization modules*



### 3. data analysis

Load data to statistical analysis tool



### 4. data export options



# RWD management systems

## DATA RETRIEVAL AND ANALYSIS

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### Data Retrieval

#### Data filtering

##### **Query tool**

supporting  
dynamic definition  
of selection filters.

Query tool

Demographic Data

Treatment Status

Survival Status

1st Line Treatment

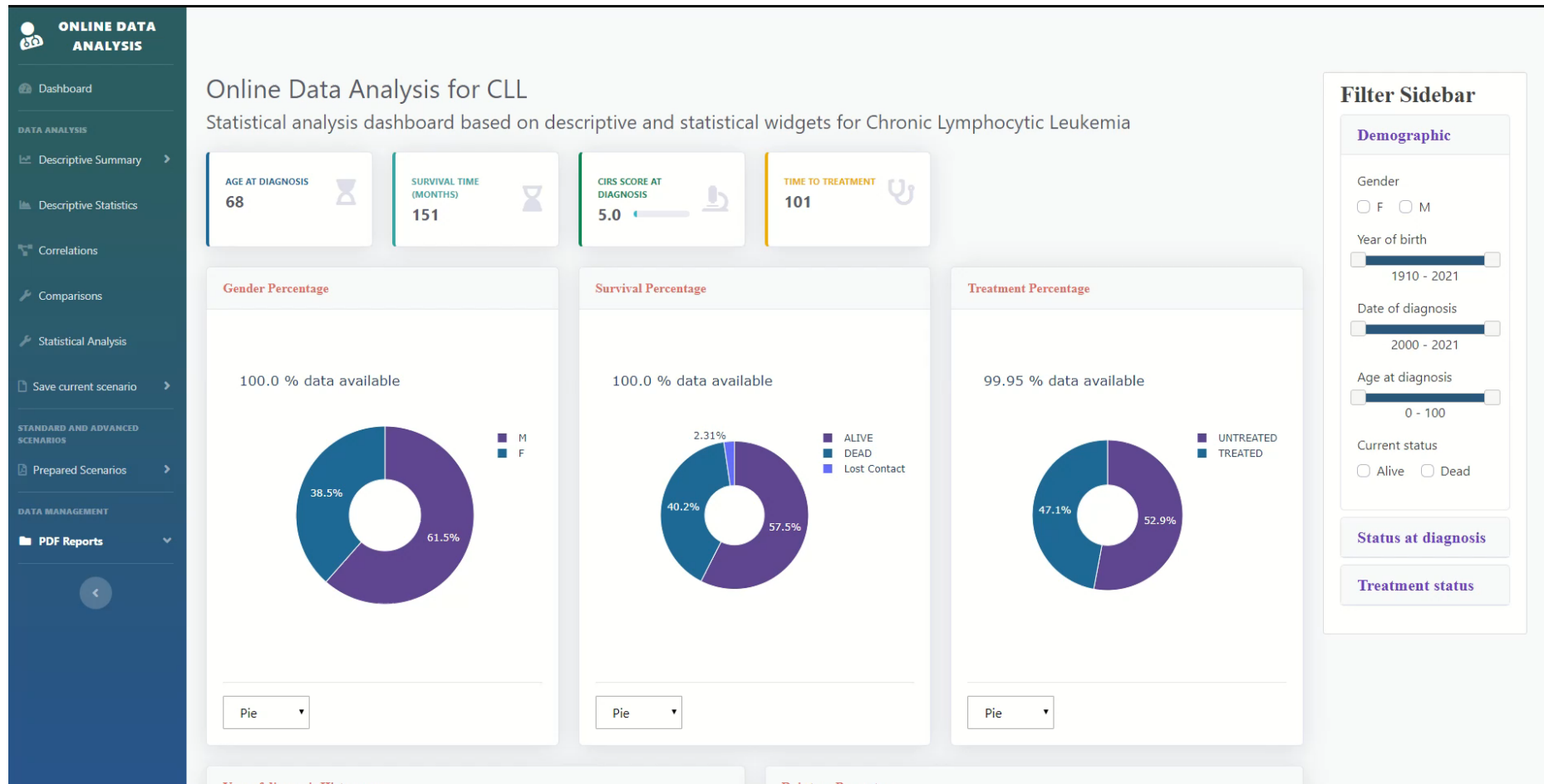
Submit Query

# RWD management systems

## DATA RETRIEVAL AND ANALYSIS

### A web-based application for online statistical analysis

✓ Project-based configuration





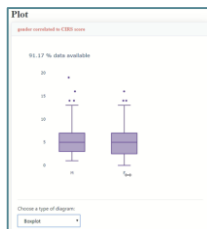
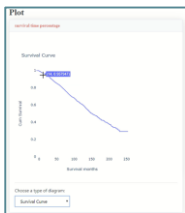
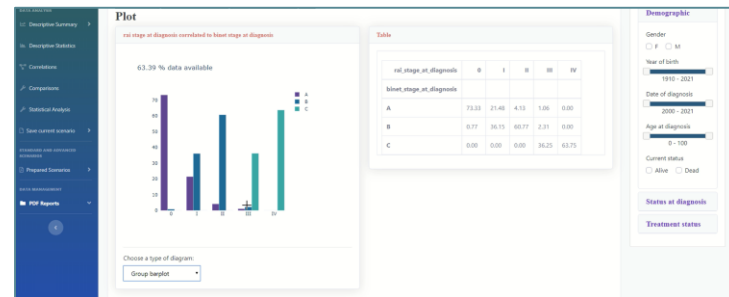
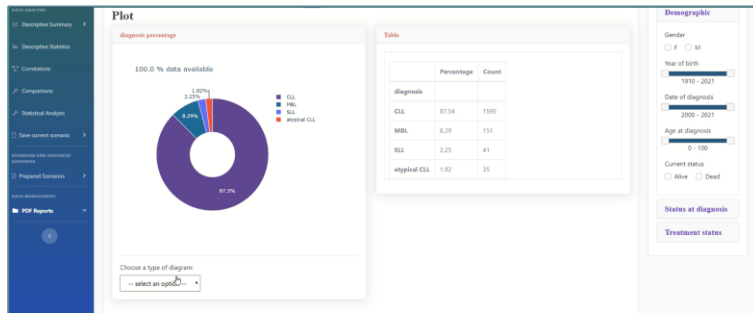
# RWD management systems

## DATA RETRIEVAL AND ANALYSIS

### A web-based application for online statistical analysis

Data descriptive statistics and correlations

1. **Dynamic preview** and **edit** in real-time
2. **Correlations** between variables
3. **Comparisons** in different sub-groups and datasets
4. **Advanced statistical** analysis based on personalized prediction model



Prepared scenarios for statistical analysis  
Automatically generated **pdf report**



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