(1246425N) Unlocking the potential of real-world data to timely acquire evidence on medication safety in pregnancy: the leverage of a versatile and international registration instrument (BELpREG) Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects …) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

Personal and health-related data will be collected in the BELpREG database, created by REDCap software, and hosted on KU Leuven servers. BELpREG data will be compared with medical records data that will be registered by clinicians and midwives using digital registration forms. Quantitative and qualitative data will be obtained from individuals, HCPs, and researchers by using surveys/forms and interviews/thinking aloud conversations. For data pooling initiatives, datasets will be received from partners, if needed with the help from a trusted third party, but without personal data (only pseudonymized or anonymous). The project will lead to several (inter)national peer-reviewed publications.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

The applicant is responsible for good data management, including data collection, processing, and storage. If the applicant leaves the KU Leuven in the next five years, the promotor will take over these responsibilities. The BELpREG database is stored on separate KU Leuven (back-up) servers, both during and after the project. This has been agreed with the head of the IT department of the Biomedical Sciences Group. Interview data will only be accessible to the applicant and promotor and will be stored on secured KU Leuven servers. Recently, KU Leuven has adopted a new security policy, implying multifactor authenticator procedures for KU Leuven staff members.

What's the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

There is no reason to deviate from the minimum data preservation term of 5 years.

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

Not applicable.

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

BELpREG steering committee members will only have access to pseudonymized data, as described in the BELpREG protocol approved by the local Ethics Committee. More information on how the collected data will be treated, can be found in the privacy statement on the BELpREG website. The applicable guidelines with regard to authorship will be applied throughout the entire FWO project.

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FWO DMP (Flemish Standard DMP)

1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

	Only for digital data	*Only for digital data*	*Only for digital data*	*Only for physical data*			
Dataset Name	Description	New or Reused	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
BELpREG dataset on perinatal medication use and mother-infant outcomes (Dataset 1)	Pregnant woman prospectively register data on maternal medication use and mother-infant outcomes using online data registration forms in REDCap. They are followed up during pregnancy and in the first 8 weeks postpartum, and at 6, 12 and 24 months postpartum.	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☒ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☒ other: REDCap ☐ NA	☐ < 100 MB ☐ < 1 GB ☐ < 100 GB ☒ < 1 TB (100GB) ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA The volume of the 'infrastructure' included (i.e. the REDCap data registration system).	
Maternal, pregnancy, delivery and neonatal data (WP 1) (Dataset 2)	For a maximum set of 200 BELpREG participants pregnancy and fetal-maternal outcome and other health data will be registered in Qualtrics by their physicians and/or midwives as part of the first validation study (WP 1).	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☒ < 100 MB ☐ < 1 GB ☐ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

Data on birth defects, and neonatal and infant data (WP 1) (Dataset 3)	For a maximum set of 100 infants born from BELpREG participants, data from medical records from neonatologists and pediatricians will be collected using LimeSurvey as part of the second validation study (WP 1).	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☒ < 100 MB ☐ < 1 GB ☐ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	
Consensus method IMID variables to be included in BELpREG (WP 2) (Dataset 4)	Documents of the consensus method involving (inter)national experts	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☐ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☒ other: .docx ☐ NA	☒ < 100 MB ☐ < 1 GB ☐ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	
BELpREG dataset on long-term infant outcomes (WP 2) (Dataset 5)	BELpREG data extracted (pseudonomized) from the BELpREG database, and sent to UK colleagues for international data pooling	☐ Generate new data ☒ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	
BELpREG dataset for the drug utilisation study (WP 3) (Dataset 6)	BELpREG data extracted (pseudonomyzed) from the BELpREG database and assessed internally (within our research group)	☐ Generate new data ☒ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

Pooled dataset for a collaborative perinatal pharmacoepidemiologic study (WP 3) (Dataset 7)	BELpREG data (pseudonomyzed) pooled as part of an international safety study within the European Network of Teratology Information Services	☐ Generate new data ☒ Reuse existing data	☒ Digital ☐ Physical	☒ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☒ .csv ☐ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

Reuse of BELpREG data for datasets 5, 6 and 7. Each participant in BELpREG has a specific record ID.

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

The BELpREG project has been approved by the ethics committee UZ / KU Leuven (S66464), and to which amendments will be submitted if needed.

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes

The BELpREG registry collects the following data from pregnant women: Contact information (e-mail address), Sociodemographic characteristics, Maternal-obstetric history data, Data on medication use and use of other substances, Data on the current pregnancy, Pregnancy and Neonatal outcomes, Infant Development.
A privacy check was performed as part of the ethical approval and registered with number G-2022-4692 in the PRET registry. Further, the BELpREG privacy statement can be found on the study website: https://belpreg.be/privacyverklaring/. The informed consent for participation in the BELpREG register can be downloaded from the study website: https://belpreg.be/informatie-voor-deelnemers/.
Personal data such as contact details of healthcare professionals participating in the validation studies and/or the consensus method will be collected (datasets 2 and 3). The validation studies will ask healthcare professionals to report data for the following variables which are also collected by dataset 1: course of the pregnancy, delivery, maternal and child health and development.

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- Yes

The BELpREG data (datasets 1 and 6) have the potential to be shared, on an aggregated level, with for-profit organizations

(contract research, fee-for-service): data collection by BELpREG can offer pharmaceutical companies a less expensive/time-consuming alternative to setting up (regulator-mandated) drug utilisation and/or safety studies, thereby reducing companies' burden. When data are shared, this will always be done in line with an agreement framework in which the recipient agrees never to try to find out which individual may be behind the data. This will be handled by KU Leuven Research and Development.
See our privacy statement on the study website: https://belpreg.be/privacyverklaring/

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- Yes

Data sharing agreements will be shared with other institutions providing data for the studies using datasets 5 and 7.

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

The BELpREG data (dataset 1) are collected using REDCap software. In REDCap, the data dictionary can be found: this is a spreadsheet in CSV format representing the structure of the database, allowing the reproduction of the data collection instruments. Further, when extracting data (without identifiers) from REDCap, the codebook will also be extracted to link the variable names with the 'field labels' and 'choice labels'. When the data in REDCap need to be edited, this is only done in accordance with the data manipulation standards as defined by and shared within the research team. The manipulation standards are stored on the KU Leuven One Drive for Business service. Our team has also published a paper describing the design and development of the BELpREG system, including a list of all BELpREG variables as supplementary material (https://doi.org/10.1101/2023.03.01.23286625)

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

In the BELpREG register (dataset 1), some variables are collected using metadata standards. This is the case for names of medicinal products (ATC classification, through the SAM database), underlying medical conditions and indications of medication use (ICD-11 and MedDRA) and some sociodemographic variables (postal and NATO codes). For the other variables, the codebook will be used as metadata. For dataset 5, a metafile is being developed in collaboration with colleagues from UK, the Netherlands and Norway, with whom dataset 5 will be eventually shared.

3. Data storage & back-up during the research project

Where will the data be stored?

To ensure the security of the BELpREG data collected in REDCap (dataset 1), the BELpREG database (and backup) are being hosted on a separate KU Leuven server (separate from other REDCap projects). Only pseudonymised data (no identifiers) will be extracted from REDCap and stored on KU Leuven Business One Drive cloud services.

As part of the validation studies (datasets 2 and 3), the responses from healthcare professionals will be collected using Limesurvey, as the proposed system by KU Leuven. At the end of the data collection, the data will be extracted and removed from Limesurvey and will be stored on KU Leuven Business One Drive cloud services.

Anonymised / pseudonymised datasets (datasets 2-7) will be stored on secured KU Leuven Business One Drive cloud services. For datasets 2 and 3, the documents with the key for the study codes will be password protected and saved on the personal One Drive storage of the researcher.

How will the data be backed up?

The BELpREG data (dataset 1) that are collected in REDCap follow the standard back-up procedures of KU Leuven gbiomed ICTS (with Gert Goos as REDCap administrator). For all other data, which are stored on KU Leuven Business One Drive cloud services, automated backups are made by KU Leuven ICTS following their standard procedures.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

The KU Leuven Business One Drive cloud storages allow storage of data up till 250 GB, the BELpREG server currently allows up till 100GB (which can be enlarged when needed).

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

BELpREG data are stored using REDCap, which is compliant with KU Leuven data security standards, and requires a multi-factor authentication procedure to gain access. Only authorized users with fixed roles (user rights) have access to the database. The BELpREG user rights are managed by the Clinical Trial Center (CTC). Access to REDCap (records) is automatically logged and changes to the data are stored in independent audit trails. The BELpREG server and REDCap software are frequently upgraded according to the procedures of ICTS gbiomed.

The validation study data (pseudonymized - datasets 2 and 3) are collected using Limesurvey, which also requires a login to gain access. In the validation studies, physicians and/or midwives will receive patient identifiers and study code via the Belnet Filesender (encrypted) and will register data in Limesurvey by using the BELpREG study code of patients.

Datasets 2, 3, 5, 6 and 7 will be stored on the password protected cloud service of KU Leuven Business One Drive; computers will be used which can only be accessed by using a login and password. A clean desk policy will be followed: no papers potentially containing personal data will be left unattended and visible. Screens of laptops will be locked when left unattended.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

The cost for the virtual REDCap server, including the server storage (100GB), is €287 + €50,37 / year. This cost is covered by the available project funding of the BELpREG project. KU Leuven Business One Drive cloud services are free for KU Leuven employees.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

The collected data are stored for 25 years, as recommended by EC UZ / KU Leuven for studies that fall under under the Belgian Law of 7 May 2004 on Experiments on the Human Person. After this period, the data will be destroyed if it is no longer needed for research purposes.

Where will these data be archived (stored and curated for the long-term)?

The BELpREG data will stay on the secured REDCap server as long as the BELpREG project continues. The generated research data, metadata and documentation necessary to reuse the data will eventually be transferred to the K-drive for long-term data archiving, managed by KU Leuven gbiomed ICTS.

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

The price of the K-drive (100Gb) is €11,38 per year, but the Group Biomedical Sciences sponsors 50% of this cost price. The cost for the storage of the BELpREG data is €287 + €50,37 / year (cost for the virtual server including the server storage (100GB)). Costs are covered by the research team.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- No (closed access)

If access is restricted, please specify who will be able to access the data and under what conditions.

Not applicable.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- Yes, Privacy aspects
- Yes, Intellectual Property Rights
- Yes, Ethical aspects

Sharing of the data can only be done in accordance to the privacy statement and informed consent, these can be found on the study website: https://belpreg.be/privacyverklaring/ and https://belpreg.be/informatie-voor-deelnemers/.
According to the privacy statement and informed consent, the coded BELpREG data may be shared with 3rd parties such as Belgian or other regulatory authorities, and with the ethics committees and/or institutions and organizations collaborating with the researchers. The BELpREG data can also be shared in aggregated form with for-profit organizations. When data are shared, this will always be done in line with an agreement framework, in collaboration with KU Leuven LRD, and will be tailored to the type of data sharing (i.e., non-profit or for-profit organization). For collaborative research projects (dataset 7), data sharing will only be done in line with the applicable agreements.

Where will the data be made available? If already known, please provide a repository per dataset or data type.

The researchers will publish the findings resulting from the BELPREG research in national and/or international (specialist) journals, which will be highlighted on www.belpreg.be, including the reference of the publication (see Publications: https://belpreg.be/publicaties/). Data as part of published results will be shared (when applicable) using the supplementary material.
In case of collaborative research studies (dataset 7), further agreements on the sharing of the joint research data will be made.

When will the data be made available?

Upon publication of the research results.

Which data usage licenses are you going to provide? If none, please explain why.

The BELpREG data as such will not be shared in a repository. In case of a publication, the licence for access of the data (as part of the supplementary material or appendices) will correspond to the licence of the related publication. Open access publications will be pursued as much as possible.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

All publications will have a DOI. The DOI will also refer to the shared data as part of the supplementary material or appendices of the publication.

What are the expected costs for data sharing? How will these costs be covered?

No (large) costs are expected for data sharing.

6. Responsibilities

Who will manage data documentation and metadata during the research project?

The postdoc researcher (Michael Ceulemans) will be responsible for day-to-day data management.

Who will manage data storage and backup during the research project?

The postdoc researcher (Michael Ceulemans) will be responsible for day-to-day data management.

Who will manage data preservation and sharing?

Prof Veerle Foulon (PI) and postdoc Michael Ceulemans will be responsible for data preservation and sharing.

Who will update and implement this DMP?

The postdoc researcher (Michael Ceulemans) will be responsible for updating and implementing this DMP.

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GDPR

GDPR

Have you registered personal data processing activities for this project?

- Yes

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DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Yes