

## FWO DMP Template - Flemish Standard Data Management Plan

### Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO's e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following [link](#).

1. General Project Information	
Name Grant Holder & ORCID	<b>Melissa Lee (0000-0002-3967-303X)</b>
Contributor name(s) (+ ORCID) & roles	<b>Ben Somers (0000-0002-7875-107X) – Promotor</b> <b>Raf Aerts (0000-0003-4018-0790) – Co-promotor</b> <b>Jos Van Orshoven (0000-0001-5756-7188) – Co-promotor</b>
Project number <sup>1</sup> & title	1SH0G24N - Green space in relation to human health: assessing the impact of improved green exposure indicators on multiple health outcomes in Flanders
Funder(s) GrantID <sup>2</sup>	1SH0G24N
Affiliation(s)	<input checked="" type="checkbox"/> KU Leuven <input type="checkbox"/> Universiteit Antwerpen <input type="checkbox"/> Universiteit Gent <input type="checkbox"/> Universiteit Hasselt <input type="checkbox"/> Vrije Universiteit Brussel <input type="checkbox"/> Other: ROR identifier KU Leuven: 05f950310
Please provide a short project description	The general objective of this research is to improve methods for quantifying green space exposure in environmental epidemiology studies by considering a more comprehensive approach to how residential green can affect the three main aspects of health – physical, mental and social well-being. We aim to improve upon current environmental health methods by examining the effect of specific characteristics of green space, as well as multiple dimensions of green space interactions, on relevant health outcomes. We will further evaluate these proposed exposure methods in a case study with health data from the Flemish population.

<sup>1</sup> “Project number” refers to the institutional project number. This question is optional. Applicants can only provide one project number.

<sup>2</sup> Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used.

## 2. 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.

### WP1 – Obtaining human health data and characterizing relevant health outcomes in Flanders

#### Input data

Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	ONLY FOR DIGITAL DATA Digital Data Type	ONLY FOR DIGITAL DATA Digital Data Format	ONLY FOR DIGITAL DATA Digital Data Volume (MB, GB, TB)
Belgian Health Interview Survey (HIS)	Anonymized survey data from the 2018 national health survey regarding an individual's health experiences, behaviours and health service use	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Sciensano	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	sas7bdat	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 30MB
Coordinate locations HIS2018 respondents	Anonymous XY coordinate locations of all Flemish HIS2018 respondents	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Sciensano	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	sas7bdat	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: < 5MB

Input data will be processed using R scripts.

#### Output data

Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	ONLY FOR DIGITAL DATA Digital Data Type	ONLY FOR DIGITAL DATA Digital Data Format	ONLY FOR DIGITAL DATA Digital Data Volume (MB, GB, TB)
Residential location map	Spatial explicit map of HIS2018 XY locations	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Output from HIS2018 coordinate locations	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual	shapefile, csv	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB

					<input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:		<input type="checkbox"/> NA  Estimated: < 5MB
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**WP2 – Characterizing different dimensions of green space and calculating environmental exposure at an individual level**

*Input data*

Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	ONLY FOR DIGITAL DATA Digital Data Type	ONLY FOR DIGITAL DATA Digital Data Format	ONLY FOR DIGITAL DATA Digital Data Volume (MB, GB, TB)
Normalized Difference Vegetation Index (NDVI)	Calculated greenness based on phytosynthetic vegetation	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Sentinel-2 available through Copernicus	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	tif	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: < 5MB
Green Map Flanders	Classification of vegetation heights from summer flight orthophotos	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Geopunt	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	tiff	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 1GB
Garden Map Flanders	Map of private gardens located in Flanders	<input type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Geopunt	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile	<input type="checkbox"/> < 1 GB <input checked="" type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 2GB
Landuse Map Flanders	Map of land use for Flanders (10m) for 2019	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Geopunt	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 1GB
Streetview images	Streetview	<input type="checkbox"/> Generate new data	Google Earth	<input checked="" type="checkbox"/> Digital	<input type="checkbox"/> Audiovisual	jpg	<input type="checkbox"/> < 1 GB

	panoramas from residential coordinates of WP1	<input checked="" type="checkbox"/> Reuse existing data		<input type="checkbox"/> Physical	<input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:		<input checked="" type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 50GB
Accessible green map	OpenStreetMap query of accessible green spaces in Flanders	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Extracted from OpenStreetMaps	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input checked="" type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 500MB

Input data will be processed using Python, R, and QGIS.

<i>Output data</i>					<i>ONLY FOR DIGITAL DATA</i>	<i>ONLY FOR DIGITAL DATA</i>	<i>ONLY FOR DIGITAL DATA</i>
Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)
Tree detection model	Deep learning computer vision model trained on manually labelled streetview images	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Google streetview images and Ultralytics in python	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input type="checkbox"/> Numerical <input type="checkbox"/> Textual <input checked="" type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	pt	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: <5MB
Green exposures per residential location	Spatial explicit green indicators calculated within buffers around each residential location from WP1	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Output from green exposure data processing	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile, csv	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA  Estimated: 50MB

### WP3 – Quantifying influence of green exposure on selected health outcomes and evaluating improved methodology

<i>Input data</i>	<i>ONLY FOR DIGITAL DATA</i>	<i>ONLY FOR DIGITAL DATA</i>	<i>ONLY FOR DIGITAL DATA</i>
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Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)
HIS2018 data	Health data from WP1	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Output from WP1	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	csv	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 30MB
Green exposure data	Spatial explicit green exposure from WP2	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Output from WP2	<input type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile, csv	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 50MB
Flemish statistical sector data	Spatial explicit information for statistical sector (census tract) delineation	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Statbel	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile, xlsx	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 200MB

Input data will be processed using generalized linear mixed-effects models in R.

*Output data*

Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	ONLY FOR DIGITAL DATA Digital Data Type	ONLY FOR DIGITAL DATA Digital Data Format	ONLY FOR DIGITAL DATA Digital Data Volume (MB, GB, TB)
Health and green associations	Relationships between health outcomes and green exposures	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Output from statistical models	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	csv	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 50MB

## WP4 – Providing recommendations for urban green policy

### Input data

					ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA
Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)
Land use change scenarios	3 urban sprawl and land use change scenarios for Belgium	<input type="checkbox"/> Generate new data <input checked="" type="checkbox"/> Reuse existing data	Flemish Institute for Technological Research (VITO)	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input checked="" type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	tiff	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 1GB

### Output data

					ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA
Dataset Name	Description	New or Reused	Origin of Data	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)
Future impact maps	Maps created to model effects of urbanization on green space and health	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	Application of land use change scenarios on results of WP3	<input checked="" type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input checked="" type="checkbox"/> Images <input type="checkbox"/> Sound <input checked="" type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:	shapefile or tiff	<input checked="" type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA Estimated: 30MB

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.

HIS data: <https://www.sciensano.be/en/projects/health-interview-survey>  
 Green Map: <https://www.vlaanderen.be/datavindplaats/catalogus/groenkaart-vlaanderen-2018>  
 Garden Map: <https://omgeving.vlaanderen.be/nl/tuinmonitor-garmon>  
 Landuse Map Flanders: <https://www.vlaanderen.be/datavindplaats/catalogus/landgebruik-vlaanderen-toestand-2019>  
 Flemish Statistical Sector data: <https://statbel.fgov.be/en/open-data/population-statistical-sector-11>  
 Land Use Change Scenarios: <https://doi.org/10.1016/j.landusepol.2021.105902>

<p>Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.</p>	<p><input checked="" type="checkbox"/> Yes, human subject data; SMEC: G-2022-5437-R2(MIN)  <input type="checkbox"/> Yes, animal data; provide ECD reference number:  <input type="checkbox"/> Yes, dual use; provide approval number:  <input type="checkbox"/> No  Additional information:  Anonymous human health outcome data from Sciensano's Health Interview Survey (HIS) 2018 will be used under agreement with Sciensano and SMEC PRET: G-2022-5437-R2(MIN).</p>
<p>Will you process personal data<sup>3</sup>? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).</p>	<p><input checked="" type="checkbox"/> Yes  <input type="checkbox"/> No  Additional information:  Human health data provided by Sciensano will be used following previously stated agreements and PRET: G-2022-5437-R2(MIN)</p>
<p>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.</p>	<p><input type="checkbox"/> Yes  <input checked="" type="checkbox"/> No  If yes, please comment:</p>
<p>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 to what data they relate and what restrictions are in place.</p>	<p><input checked="" type="checkbox"/> Yes  <input type="checkbox"/> No  If yes, please explain:  A formal agreement with Sciensano allows the use of the requested HIS2018 data with proper confidentiality and storage protocols for the intended project. A data linkage procedure is in place for linking KU Leuven green exposure data with Sciensano non-anonymous HIS data. Results of the project shall be reported in a way that the HIS data is properly anonymized with correct citation of the dataset as well as approval of manuscripts before submission for publishing.</p>

<sup>3</sup> See Glossary Flemish Standard Data Management Plan



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 to what data they relate and which restrictions will be asserted.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, please explain: The HIS2018 dataset may be used within our research though Sciensano remains the provider and owner of the dataset.
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### 3. Documentation and Metadata

<p>Clearly describe what approach will be followed to capture the accompanying information necessary to keep <b>data understandable and usable</b>, 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).</p> <p><a href="#"><i>RDM guidance on documentation and metadata.</i></a></p>	<p>Per work package, all input, output data, and scripts will be collected. Specific folders will be created to contain (1) input data, (2) processing files, and (3) output data. Included in the Input Data folder will be a text file with a clear description of what the data within the folder represent, including the type, format, source of each dataset, and dates acquired. Any scripts or intermediate data used to generate output data will be kept in the Processing folder with a corresponding text file describing applied tools and methodology used to process the data, as well as explanations of the file names. The Output data folder will house all final processing outputs to be used in further work packages and will also have a text file describing each output data as well as how they were generated.</p>
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<p>Will a metadata standard be used to make it easier to <b>find and reuse the data</b>?</p> <p>If so, please specify which metadata standard will be used. If not, please specify which metadata will be created to make the data easier to find and reuse.</p> <p><i>REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.</i></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If no, please specify (where appropriate per dataset or data type) which metadata will be created:</p> <p>For all input data, a text file will be made as described previously (above). For R scripts, RMarkdown will be used to maintain metadata within the script including the date the script was made, developer of the script, a short explanation of the target of the script, necessary packages, necessary input data and explanation of the output, reference to data to which the script was applied and user rights and acknowledgements. A single text file will combine metadata from all R scripts for easier reference. For Python scripts, markdown fields will be used to maintain metadata within the script, with information similar to the R scripts. For generated results, a text file will be made containing the date that the results were obtained, the coordinates and/or study area, the author of the data, a short description of the results, a reference to the script used to generate the results (if available), the file format, and the user rights and acknowledgements. See output data described previously (above).</p>
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4. Data Storage & Back-up during the Research Project	
<p>Where will the data be stored?</p> <p><i>Consult the <a href="#">interactive KU Leuven storage guide</a> to find the most suitable storage solution for your data.</i></p>	<p><input type="checkbox"/> Shared network drive (J-drive)  <input checked="" type="checkbox"/> Personal network drive (I-drive)  <input checked="" type="checkbox"/> OneDrive (KU Leuven)  <input type="checkbox"/> Sharepoint online  <input type="checkbox"/> Sharepoint on-premis  <input type="checkbox"/> Large Volume Storage  <input type="checkbox"/> Digital Vault  <input type="checkbox"/> Other:</p>

<p>How will the data be backed up?</p> <p><i>WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?</i></p>	<p><input checked="" type="checkbox"/> Standard back-up provided by KU Leuven ICTS for my storage solution</p> <p><input checked="" type="checkbox"/> Personal back-ups I make (specify)</p> <p><input type="checkbox"/> Other (specify)</p> <p>Large unprocessed data will be stored on an external hard-drive. Original versions of data needing privacy requirements will be stored on the KU Leuven OneDrive and Personal network drive (I-drive) only accessible by the main researcher. Scripts and processed data will be stored on OneDrive. A back-up of the processed data stored on OneDrive will be made monthly on an external hard drive.</p>
<p>Is there currently sufficient storage &amp; 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.</p>	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Enough cloud storage is available on the server of the Division Forest, Nature and Landscape in KU Leuven's secure OneDrive. An external hard drive of 5TB is also available for this project.</p>
<p>How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?</p> <p><i>CLEARLY DESCRIBE THE MEASURES (IN TERMS OF PHYSICAL SECURITY, NETWORK SECURITY, AND SECURITY OF COMPUTER SYSTEMS AND FILES) THAT WILL BE TAKEN TO ENSURE THAT STORED AND TRANSFERRED DATA ARE SAFE.</i></p> <p><a href="#">Guidance on security for research data</a></p>	<p>The data will be stored on OneDrive, which is a secure, enterprise cloud storage service equipped with multifactor authentication from the KU Leuven (KU Leuven Authenticator).</p>
<p>What are the expected costs for data storage and backup during the research project? How will these costs be covered?</p>	<p>The data storage volumes for cloud storage provided by the Department will suffice. Additional offline backups will be done on external hard drives (estimated cost €200 for 5TB).</p>

## 5. Data Preservation after the end of the Research Project

<p>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...).</p> <p><a href="#">Guidance on data preservation</a></p>	<p><input checked="" type="checkbox"/> All data will be preserved for 10 years according to KU Leuven RDM policy</p> <p><input type="checkbox"/> All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans</p> <p><input checked="" type="checkbox"/> Certain data cannot be kept for 10 years (explain)</p> <p>The data provided by Sciensano will not be retained after the end of the project as we only have the right to use it and not share it. All other data created during this project will be retained for the expected 10 year period.</p>
<p>Where will these data be archived (stored and curated for the long-term)?</p> <p><i><a href="#">Dedicated data repositories</a> are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the <a href="#">interactive KU Leuven storage guide</a>.</i></p>	<p><input checked="" type="checkbox"/> KU Leuven RDR</p> <p><input type="checkbox"/> Large Volume Storage (longterm for large volumes)</p> <p><input type="checkbox"/> Shared network drive (J-drive)</p> <p><input type="checkbox"/> Other (specify):</p>
<p>What are the expected costs for data preservation during the expected retention period? How will these costs be covered?</p>	<p>The unprocessed input data will not be preserved during the retention period. Therefore, the size of the data is expected to be less than 100GB. The data will be stored on the university's central servers. The expected cost for preserving this data is €13 per year. This cost will be covered by the working budget of Ben Somers, the main promotor.</p>

## 6. Data Sharing and Reuse

<p>Will the data (or part of the data) be made available for reuse after/during the project? Please explain per dataset or data type which data will be made available.</p> <p><i>NOTE THAT 'AVAILABLE' DOES NOT NECESSARILY MEAN THAT THE DATA SET BECOMES OPENLY AVAILABLE, CONDITIONS FOR ACCESS AND USE MAY APPLY. AVAILABILITY IN THIS QUESTION THUS ENTAILS BOTH OPEN &amp; RESTRICTED ACCESS. FOR MORE INFORMATION: <a href="https://wiki.surfnet.nl/display/STANDARDS/INFO-EU-REPO/#INFO-EU-REPO-ACCESSRIGHTS">HTTPS://WIKI.SURFNET.NL/DISPLAY/STANDARDS/INFO-EU-REPO/#INFO-EU-REPO-ACCESSRIGHTS</a></i></p>	<p> <input checked="" type="checkbox"/> Yes, as open data  <input type="checkbox"/> Yes, as embargoed data (temporary restriction)  <input type="checkbox"/> Yes, as restricted data (upon approval, or institutional access only)  <input type="checkbox"/> No (closed access)  <input type="checkbox"/> Other, please specify:         </p> <p>All created output on environmental exposure will be made available, including documented scripts and simulated output required to generate this data. Outputs of environmental exposure and health data can be shared only when no data allows to identify individuals of households of HIS data.</p>
<p>If access is restricted, please specify who will be able to access the data and under what conditions.</p>	
<p>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 per dataset or data type where appropriate.</p>	<p> <input checked="" type="checkbox"/> Yes, privacy aspects  <input checked="" type="checkbox"/> Yes, intellectual property rights  <input type="checkbox"/> Yes, ethical aspects  <input type="checkbox"/> Yes, aspects of dual use  <input type="checkbox"/> Yes, other  <input type="checkbox"/> No         </p> <p>If yes, please specify: All health outcome data from the HIS2018 is property of Sciensano. We have the right to use these data with the explicit agreement that these are not to be shared beyond the project collaborators. Outputs of environmental exposure and health data can be shared only when no data allows to identify individuals of households of HIS data.</p>
<p>Where will the data be made available? If already known, please provide a repository per dataset or data type.</p>	<p> <input checked="" type="checkbox"/> KU Leuven RDR  <input type="checkbox"/> Other data repository (specify)  <input type="checkbox"/> Other (specify)         </p>

When will the data be made available?	<input checked="" type="checkbox"/> Upon publication of research results <input type="checkbox"/> Specific date (specify) <input type="checkbox"/> Other (specify)
Which data usage licenses are you going to provide? If none, please explain why.  <i>A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENSE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENCE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENCE THAT MIGHT PROHIBIT THAT.</i> Check the <a href="#">RDR guidance on licences</a> for data and software sources code or consult the <a href="#">License selector tool</a> to help you choose.	<input checked="" type="checkbox"/> CC-BY 4.0 (data) <input type="checkbox"/> Data Transfer Agreement (restricted data) <input type="checkbox"/> MIT licence (code) <input type="checkbox"/> GNU GPL-3.0 (code) <input type="checkbox"/> Other (specify)
Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here.  <i>INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.</i>	<input checked="" type="checkbox"/> Yes, a PID will be added upon deposit in a data repository <input type="checkbox"/> My dataset already has a PID <input type="checkbox"/> No
What are the expected costs for data sharing? How will these costs be covered?	There are no expected costs related to data sharing.

## 7. Responsibilities

Who will manage data documentation and metadata during the research project?	The PhD researcher will be responsible for data documentation and metadata.
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Who will manage data storage and backup during the research project?	The PhD researcher will be responsible for data storage and backup during the project.
Who will manage data preservation and sharing?	The PhD researcher will be responsible for compiling a folder with all data and corresponding metadata that needs to be preserved. Our division's data storage team will be responsible for storing the data thereafter, with the supervision of the promoters.
Who will update and implement this DMP?	The promoters bear the end responsibility of updating and implementing this DMP.