



URBANOME

Urban Observatory for Multi-participatory Enhancement of
Health and Wellbeing



WP10 Project and Consortium management

D10.1: Data Management Plan – first version

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Table of contents

List of Acronyms	3
1. Executive summary.....	4
2. Research data types in URBANOME.....	5
3. Methodology	7
3.1. Data set reference and name.....	8
3.2. Data set description.....	8
3.3. Standards and metadata	8
3.4. Data sharing.....	8
3.5. Archiving and preservation (including storage and backup).....	9
4. URBANOME data repository.....	11
4.1. Data archiving after project’s lifetime.....	12
4.2. Public availability.....	12
4.3. Architecture.....	12
5. DMP components.....	13
5.1. Data summary	13
5.1.1. What is the purpose of the data collection/generation and its relation to the objectives of the project?	13
5.1.2. What types and formats of data will the project generate/collect?.....	14
5.1.3. Will you re-use any existing data and how?.....	15
5.1.4. What is the origin of the data?.....	15
5.1.5. What is the expected size of the data?	15
5.1.6. To whom might it be useful ('data utility')?	15
5.2. FAIR data.....	16
5.2.1. Making data findable, including provisions for metadata.....	16
5.2.2. Making data openly accessible.....	16
5.2.3. Making data interoperable.....	17
5.2.4. Allocation of resources.....	18
5.2.5. Data security.....	19
5.2.6. Ethical aspects	19
6. Description of the URBANOME Datasets	21

6.1.	Datasets in WP2 - Urban Living Labs for participatory planning and pilot interventions	21
6.1.1.	Pre-existing experiences dataset with Urban Living Labs	21
6.1.2.	Intervention catalogue	21
6.2.	Datasets in WP3 - Development of Big Data ecosystem	21
6.3.	Datasets in WP4 - Exposure analysis focusing on patterns of socio-spatial environmental inequality	22
6.3.1.	Emission inventory for the URBANOME ULLs	22
6.3.2.	Atmospheric dispersion modelling results for the ULLs	22
6.3.3.	Noise levels in the ULLs	23
6.3.4.	Indoor air quality levels in the ULLs	23
6.3.5.	Multi-sensor data for personal exposure monitoring in the ULLs	24
6.3.6.	Exposure modelling results in the ULLs	25
6.4.	Datasets in WP5 - Assessment of physical and mental health and sleep quality	25
6.4.1.	Physical Health Assessment	25
6.4.2.	Mental Health Assessment	26
6.4.3.	Quality of life	27
6.4.4.	Cardiorespiratory Clinical Assessment	29
6.4.5.	Sleep quality	30
6.5.	Datasets in WP6 - Assessment of personalised interventions and proposed policies	31
6.5.1.	Integrated assessment of personal benefits	31
6.5.2.	Integrated health and wellbeing assessment	32
6.5.3.	Policy cost-benefit and cost-effectiveness assessment	33
6.6.	Datasets in WP7 - Innovative and co-creation governance: Targeted policy development and implementation	34
6.6.1.	Interviews and surveys results on policy learning in the ULLs	34
6.7.	Datasets in WP8 - Evidence-based feedback to the policy makers	34
6.8.	Datasets in WP9 - Dissemination, communication, training and exploitation	35
6.8.1.	Stakeholders List	35
6.8.2.	Scientific publications	35
6.8.3.	Dissemination and Communication Activities Monitoring	36
7.	Plan Maintenance	37
	References	38
	Acknowledgments	38

List of Acronyms

accdb	MS Access database format
CSV	Comma separated Value
DMP	Data Management Plan
DOI	Digital Object Identifier
FAIR	Findability, Accessibility, Interoperability, and Reusability
FTP	File Transfer Protocol
GA	Grant Agreement
GDPR	General Data Protection Regulation
GIS	Geographic Information System
HTTP	HyperText Transfer Protocol
NCD	Non-Communicable Diseases
netCDF	Network Common Data Form
OA	Open Access
PDF	Adobe Portable Document Format
ULL	Urban Living Lab
WP	Work Package
XLS	MS Excel format

1. Executive summary

This Data Management Plan (DMP) is a continuously updated document that describes data generated in the URBANOME project, its type, format and structure, the arrangements for its storage and security, and its potential for being used by others outside of the URBANOME Consortium. The structure of this DMP is based on the EC's *Guidelines on Data Management in Horizon 2020 (EC, 2016)* following the FAIR principles.

The URBANOME project participates in the Pilot on Open Research Data launched by the European Commission along with the H2020 programme. The use of a Data Management Plan is required for all participating projects and the development of this DMP has been done to facilitate the release of the data generated within the project through storage in research data repositories.

The URBANOME Data Management plan is a document that is submitted to the EU as project deliverable D10.1. It is important to note however that the document will evolve and further develop during the project's life cycle. It can be identified by a version number and a date. Updated versions will be uploaded by Aristotle University of Thessaloniki (AUTH), which is the primary responsible for data management. URBANOME partners can forward questions and suggestions, as to (additions to) the contents and use of the data management plan to AUTH, and will be informed when a new version will be uploaded in the URBANOME web site (<http://URBANOME.eu>).

This document is the first version of the DMP, delivered in Month 6 of the project. It includes preliminary information about the datasets produced by the project according to the FAIR principles to make the data findable, accessible, interoperable and reusable.

The next versions of the DMP will get into more detail and describe the practical data management procedures implemented by the URBANOME project. At a minimum, the DMP will be updated for mid-term (M24) and final review of the project (M48), in order to update it in accordance with the data generated from the studies and potential changes to the initially expected data production and use and to reflect the evolving needs of URBANOME.

2. Research data types in URBANOME

For this first release of DMP, the data types that will be produced during the project are focused on the Description of the Action (DoA) and on the results obtained in the first months of the project.

According to the above, the table below reports on a list of indicative types of research data that URBANOME will generate. This list may be adapted with the addition or removal of datasets in the next versions of the DMP to take into consideration the project developments. A detailed description of each dataset is given in the following sections of this document.

#	Dataset	Lead partner	Related WP(s)
1	Pre-existing experiences dataset with Urban Living Labs	ENoLL	WP2
2	Intervention catalogue	CIEMAT	WP2
3	Emission inventory for the URBANOME ULLs	USTUTT	WP4
4	Atmospheric dispersion modelling results for the ULLs	CIEMAT	WP4
5	Noise levels in the ULLs	AUTH	WP4
6	Indoor air quality levels in the ULLs	JSI	WP4
7	Multi-sensor data for personal exposure monitoring in the ULLs	ENVE.X	WP4
8	Exposure modelling results in the ULLs	AUTH	WP4
9	Physical Health Assessment	INSERM	WP5
10	Mental Health Assessment	AUTH	WP5
11	Quality of life	AUTH	WP5
12	Cardiorespiratory clinical assessment	AUTH/INSERM	WP5
13	Sleep quality	AUTH	WP5
14	Integrated assessment of personal benefits	ISCIH	WP6
15	Integrated health and wellbeing assessment	USTUTT	WP6
16	Policy cost-benefit and cost-effectiveness assessment	CIEMAT	WP6
17	Interviews and surveys results on policy learning in the ULLs	AU	WP7
18	Stakeholders List	CdM	WP9

19	Scientific publications	AUTH	WP9
20	Dissemination and Communication Activities Monitoring Database	VIL	WP9

Research data linked to exploitable results has not been put into the open domain if they compromise its commercialization prospects or have inadequate protection, which is a H2020 obligation. The rest of research data have been deposited in an Open Access repository as described in Chapter 4.

3. Methodology

The methodological approach that has been used for the compilation of D10.1 follows the updated version of the “Guidelines on Data Management in Horizon 2020” released by the European Commission Directorate - General for Research & Innovation. Taking into account the proposed methodology, this first version of the URBANOME DMP addresses the following points below on a dataset-by-dataset basis:

- Data set reference and name
- Data set description
- Standards and metadata
- Data sharing
- Archiving and preservation (including storage and backup).

The DMP covers the complete research data life cycle. It describes the types of research data that has been generated or collected during the project, the standards used, how the research data will be preserved and what parts of the datasets will be shared for verification or reuse (Figure 1).

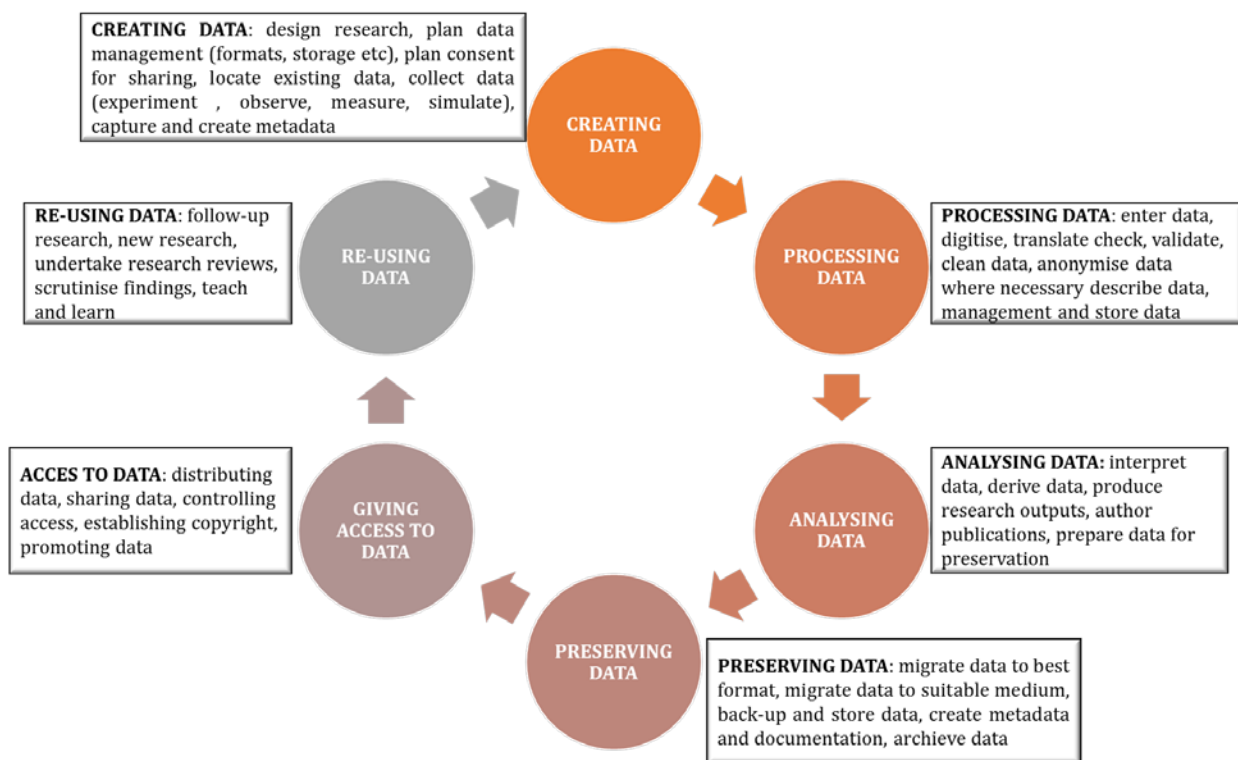


Figure 1: Research data life cycle (adapted from UK data archive <https://www.ukdataservice.ac.uk/manage-data/lifecycle>)

Data scientists from each URBANOME partner will form a committee that will be responsible for the proper data management throughout the aforementioned research data lifecycle. More specifically, its main duties will be: a) data archiving and preservation, b) data security, c) data protection and d) defining a policy setting standard retention period to comply with documentation requirements. These will be analyzed in more detail in the following subsections.

3.1. Data set reference and name

This point is the identifier for the dataset to be produced. The URBANOME dataset identification follows the naming:

<WPn°>_<serial number of dataset>_<dataset_title>.

Example: Data_WP2_1_ *dataset_title*.

3.2. Data set description

In this point the data that will be generated is described, including references on their origin (in case it is collected), nature and scale and to whom it could be useful. Where applicable, information on the existence (or not) of similar data and the possibilities for integration and reuse, are mentioned.

3.3. Standards and metadata

This point refers to existing suitable standards of the discipline, as well as an outline on how and what metadata will be created. Therefore, at this stage, the available data standards (if any) accompany the description of the data that will be generated, including the description on how the data will be organised during the project, mentioning for example naming conventions and version control.

As far as the metadata are concerned, the way the consortium will capture and store this information will be described.

3.4. Data sharing

This point will describe how data will be shared, including access procedures, embargo periods (if any) and will define whether access will be widely open or restricted to specific groups. Identification of the repository where data will be stored, if already existing and identified, indicating in particular the type of repository (institutional, standard repository for the discipline, etc.). In case the dataset cannot be shared, the reasons for this will be mentioned (e.g. ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related).

This section will also contain information on the license under which the data can be used by third parties. In compliance with the commitments of the consortium, this license should allow them to use the data free of charge provided they make any derivative work is available under the same license and mentions the data origin. The exact terms of the one or more licenses for data sharing are to be defined in a later version of the DMP.

Within URBANOME all personal data used in the project will be protected, while the informed consent of all participants will be a prerequisite for their participation in the project activities. Finally, it is expected that the URBANOME project will result in a number of publications in scientific, peer-reviewed journals. Project partners are committed to collaborate with each other and jointly prepare publications relevant to the URBANOME project. Scientific journals that provide Open Access (OA) to all their publications will be strongly preferred, as it is required by the European Commission.

3.5. Archiving and preservation (including storage and backup)

According to the GDPR Principle “e”, the consortium will define the maximum period for data archiving and preservation. In this point the procedures that will be put in place for long-term preservation of the data will be described, along with the indication of how long the data should be preserved. This point emphasizes in the long-term preservation and curation of data, beyond the lifetime of the URBANOME project. Where dedicated resources may be needed, these should be outlined and justified, including any relevant technical expertise, support and training that is likely to be required and how it will be acquired. More specifically, this decision will be justified according to how much beyond the project’s scope, consortium members need to analyze the data. This period will not exceed the maximum of a decade over the project’s finalization. According to initial discussions among the URBANOME consortium, this period is estimated at least five (5) years beyond the project’s end (see Section 4.1). The committee will be also responsible for dealing with any other challenges related with the archiving and data preservation such as the user requests regarding their individual data and also data maintenance and preparation for scientific research studies, presentations, publications, joint analyses, etc. The committee will also decide whether and how the retention period will be extended for those purposes. Apart from the retention period, the committee will be also responsible of periodically reviewing the data, securing their anonymization and proper protection and also erasing it when the retention period expires.

In particular, storage and backup activities will be carefully designed so as to address the following questions:

1. What features should the URBANOME storage system have in order to be GDPR-compliant?
2. How is GDPR-compliance expected to affect the performance of the various components of the storage system?
3. Which are the technical challenges need to be addressed in order to achieve strict GDPR-compliance without performance degradation?

This initial DMP version has identified a series of GDPR articles that describe how a storage system could address the aforementioned questions. Each article is associated with a specific key requirement, which should be implemented by a storage feature. However, there are two articles (5.2 & 5.13) that involve the entire URBANOME storage system.

Table 1 Description of the GDPR articles which have a significant impact on the design, interfacing and performance of the URBANOME storage system. The article key requirements and their mapping to the URBANOME storage system features are also reported. Adjusted version by Aashaka Shah et al (2019).

Article No.	Article Title	Key Requirement	URBANOME Storage Feature
5.1	Purpose limitation	Data must be collected and used for specific purposes	Metadata indexing
5.1	Storage limitation	Data should not be stored beyond its purpose	Timely deletion
5.2	Accountability	Controller must be able to demonstrate compliance	All
13	Data collection conditions	Get user consent on how their data would be managed	All
15	Right of access by users	Provide users a timely access to all their data	Metadata indexing
17	Right to be forgotten	Find and delete groups of data	Timely deletion

20	Right to data portability	Transfer data to other controllers upon request	Metadata indexing
21	Right to object	Data should not be used for any objected reasons	Metadata indexing
25	Protection by design and by default	Safeguard and restrict data access	Access control & Encryption
32	Data security	Implement appropriate data security measures	Access control & Encryption
33 & 34	Data breaches notification	Share insights and audit trails from concerned systems	Monitoring
46	Transfers subject to safeguards	Control where the data resides	Manage data location

The current DMP version identifies the following six (6) key features that the URBANOME storage system must support in order to be GDPR-compliant:

- 1) **Timely deletion:** Personal data cannot be retained for an indefinite time period. The URBANOME storage system should define a personal data retention period and develop the appropriate mechanism which associate time-to-live (TTL) counters for personal data. These TTL counters will automatically erase personal data from all internal URBANOME subsystems in a timely manner. The counters could be either a static time or a policy criterion which would be objectively evaluated by the URBANOME data management committee.
- 2) **Monitoring & logging:** The URBANOME storage system will be able to demonstrate its GDPR compliance by developing an audit trail of both its internal actions and their interaction with the other components of the URBANOME ecosystem. This will facilitate the monitoring and logging of every operation either inside the data path (read/write actions) or inside the control path (metadata alterations, access control).
- 3) **Indexing via metadata:** A data analytics interface will be developed within the URBANOME storage system in order to provide quick and efficient access of data groups to the URBANOME researchers. This interface will be also employed so as to quickly retrieve or delete large data amounts meeting specific query criteria.
- 4) **Access control:** The URBANOME storage system will support data access roles in order to support fine-grained and dynamic access control to only permitted entities, for established purposes and for predefined time duration.
- 5) **Encryption:** The URBANOME storage system will develop encryption mechanisms to the personal data it will manage. This obligation will be mandatory either for processing data “at rest” or “in transit”. Data encryption will be implemented beyond data pseudonymization which will take place at a previous step.
- 6) **Data location management:** Since the URBANOME projects involves several partners from various European countries, the URBANOME storage system should be equipped with the ability to detect and control the physical location of the personal data at all times.

4. URBANOME data repository

To share data between URBANOME partners and make them publicly available, two secure platforms will be established: the URBANOME global open-data repository and the Zenodo repository. Regarding the global open-data repository, it will be hosted in a secure and maintained FTP server at the Aristotle University of Thessaloniki and will be openly accessible to the public without a login requirement. With regard to the Zenodo repository, a project page (community) has been setup for easy upload and download of project datasets <https://zenodo.org/communities/urbanome/?page=1&size=20>. Both the repositories will include the totality of the project generated data that will be made finally public.

Creating and maintaining a global data repository is very important for the normal evolution of the project, as well as for fulfilling the commitments made in the proposal for FAIR data. To this end, building the repository aims to cover the need for data sharing and data archiving after the project's lifetime and making data available to the public.

The global open-data repository will be built using the infrastructure of Aristotle University of Thessaloniki (AUTH). It offers management and data retrieval functionalities and supports data exchange through an FTP server. The global open-data repository will contain all the project-generated datasets and free access will be provided (no need for a username/password).

Zenodo is a research output publication and archival service built and developed by researchers from the CERN IT department, to ensure that everyone can join in Open Science. Based on the open source Invenio digital library framework, Zenodo was created through the OpenAIRE project and is hosted at CERN. Zenodo is open, free, searchable and structured with flexible licensing allowing for storing all types of data: datasets, images, presentations, publications and software. In addition, Zenodo allows researchers to deposit both publications and data, while providing tools to link them.

The use of Zenodo ensures data management procedures are unified across the project. Moreover, as a European Commission supported initiative and technically supported by CERN we trust this as the best way to ensure access to the generated data remains long after the project ends.

A DOI will be assigned to datasets for effective and persistent citation when it is uploaded to the Zenodo repository. This DOI can be used in any relevant publications to direct readers to the underlying dataset

Search keywords will be provided when the dataset is uploaded to Zenodo which will optimise possibilities for re-use. Zenodo follows the minimum Data Cite metadata standards.

Data objects will be deposited in ZENODO under:

- Open access to data files and metadata and data files provided over standard protocols such as HTTP and OAI-PMH.
- Use and reuse of data permitted.
- Privacy of its users protected.

All open data files will be stored along with a MD5 checksum of the file content. Regular checks of files against their checksums will be made.

The datasets in Zenodo will be preserved in line with the European Commission Data Deposit Policy. The data will be preserved indefinitely (minimum of 5 years) and there are currently no costs for archiving data in this repository.

If datasets are updated, the partner that possesses the data has the responsibility to manage the different versions and to make sure that the latest version is available in the case of publicly available data. Quality control of the data is the responsibility of the relevant responsible partner generating the data.

Details of how to access the data will be available on the project web-site

Research data will be stored in the Zenodo repository and in the global open-data repository as soon as possible unless a decision has been taken to protect results. Specifically, research data needed to validate the results in the scientific publications will be deposited in the open data repository at the same time as publication (GA Art. 29.3).

4.1. Data archiving after project's lifetime

Most of the data generated during the project needs to be persisted and archived even after its completion. This is to enable consortium members, stakeholders and third-party researchers to retrieve and use the data in the future. The repositories cover this need by providing an organized structure for data storage. Both the URBANOME global open-data repository and the Zenodo community will remain operational for at least 5 years after the project's end.

4.2. Public availability

It is a commitment of the consortium to make any data generated via the use of public funding as available as possible unless this is contradictory to personal or corporate privacy requirements or could be harmful to the commercialization of the project. These data must be available to the public during and after the project's lifetime. Another aim is to ease the procedure of data search and retrieval (i.e. making them Findable and Accessible) by archiving them all in the same place and under a clear and concrete structure.

4.3. Architecture

The URBANOME global open-data repository is used only for storing and archiving data, as well as for making them available to the public. It will not be used as an online database to retrieve data for processing or for storing generated data directly. Consequently, there is no need for it to contain any database management systems. To simplify the process and make it easily accessible to every user, a very simple architecture will be followed (Figure 2).

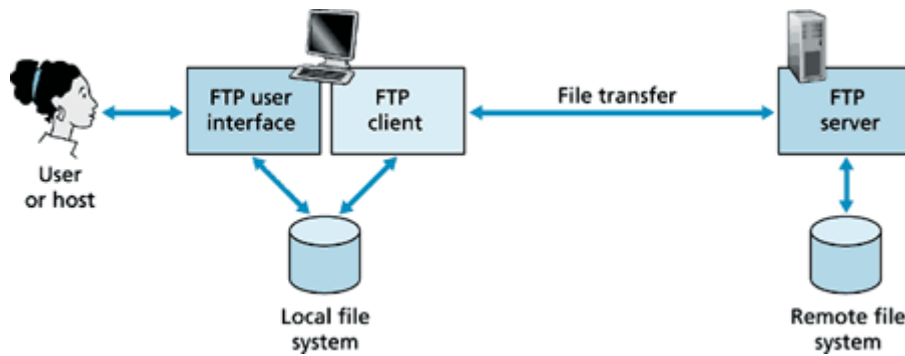


Figure 2: URBANOME global open-data repository architecture

The project data will be uploaded to a secure FTP server which will be hosted by the Aristotle University of Thessaloniki. Users will be able to access the project data via a standard FTP client or via a web browser interface. Since no UAC (User Access Control) method will be implemented, users that access the FTP server will be granted with Read rights only.

5. DMP components

Considering the proposed methodology and according to the FAIR principles, this chapter describes the following DMP components.

5.1. Data summary

Points to be addressed:

Provide a summary of the data, addressing the following issues

- *State the purpose of the data collection/generation*
- *Explain the relation to the objectives of the project*
- *Specify the types and formats of data generated/collected*
- *Specify if existing data is being re-used (if any)*
- *Specify the origin of the data*
- *State the expected size of the data (if known)*
- *Outline the data utility: to whom will it be useful*

5.1.1. What is the purpose of the data collection/generation and its relation to the objectives of the project?

The purpose is to produce different datasets across Europe to quantitatively assess the impact of current and alternative national and local policies on improving air quality, human health and wellbeing eventually leading to the design and implementation of appropriate environmental and health strategies in European cities. Access to use these data is needed to address the different URBANOME objectives as specified in the grant agreement and summarized below.

- ✓ Develop an integrated methodological framework and a big data computational ecosystem and

decision support system accounting for the physical, mental, socio-economic, operational, and structural characteristics of a city which affect human health.

- ✓ Provide an accurate spatial and temporal resolution of environmental exposures in a personalized manner and identify the patterns of socio-spatial environmental inequalities finally leading to social cohesion improvement.
- ✓ Investigate the impact of environmental stressors on mental, cognitive, social, and physical wellbeing particularly on vulnerable population groups, including hard-to reach citizens, and considering gender differences.
- ✓ Raise public awareness regarding urban health and wellbeing and engage urban citizens through Urban Living Labs (ULLs), including big data collection and citizen science-led participatory governance.
- ✓ Alleviate environmental health injustice in cities.
- ✓ Build solid partnerships with other relevant parties in urban health, including policy makers, experts, local authorities, business and local communities to better connect research to practical needs and user demands.
- ✓ Develop and promote effective, innovative, and inclusive governance and planning adapted to local urban contexts which foster long-term health and wellbeing in cities.
- ✓ Provide prognostic markers regarding the effect of environmental stressors in the main non-communicable diseases (NCDs).
- ✓ Establish an evaluation framework to assess cost-effectiveness as well as barriers and facilitators to the implementation of identified policy actions aiming to support urban development and city planning towards improved urban health and wellbeing as well as social cohesion.
- ✓ Creation of new business opportunities (in mobility, entertainment, culture, etc.) aimed at enhancing urban health and wellbeing through co-creation and co-maintenance of sustainable, egalitarian, and healthy cities.

5.1.2. What types and formats of data will the project generate/collect?

5.1.2.1 Types of the data

At the time of drafting this initial Data Management Plan the following data types are expected to be generated during the project life. The following list may be updated in the next versions of the DMP in accordance with the data generated from the studies and potential changes to the initially expected data production and use and to reflect the evolving needs of URBANOME.

1. Pre-existing experiences dataset with Urban Living Labs
2. Intervention catalogue
3. Emission inventory for the URBANOME ULLs
4. Atmospheric dispersion modelling results for the ULLs
5. Noise levels in the ULLs
6. Indoor air quality levels in the ULLs
7. Multi-sensor data for personal exposure monitoring in the ULLs

8. Exposure modelling results in the ULLs
9. Physical health assessment
10. Mental health assessment
11. Quality of life
12. Cardiorespiratory clinical assessment
13. Sleep quality
14. Integrated assessment of personal benefits
15. Integrated health and wellbeing assessment
16. Policy cost-benefit and cost-effectiveness assessment
17. Interviews and surveys results on policy learning in the ULLs
18. Stakeholders List
19. Scientific publications
20. Dissemination and Communication Activities Monitoring Database

5.1.2.1 Formats of the data:

Several formats will be used based on the data type. Hereinafter are summarized some of the most common formats used. More details are provided in Chapter 6 “Datasets of URBANOME”

- MS Excel compatible files including comma separated CSV, txt and xls(x).
- Standard GIS format (e.g. raster, shapefile)
- Database format (e.g. accdb)
- MS Word (doc/docx) and/or Adobe Portable Document Format (PDF) format
- R data format (e.g. RDS file, R file)
- Image: JPEG, PNG, TIFF
- European Data Format (EDF files) for storing raw polysomnographic (PSG) files for sleep related data

5.1.3. Will you re-use any existing data and how?

Yes, it is encouraged to make existing data available for research. These may include for example environmental and health data collected in the frame of the other past and/or ongoing research projects.

5.1.4. What is the origin of the data?

Dataset generated by the URBANOME project and to lesser extent data from previous research projects in which, for example, climate data or emission data have been collected across Europe.

5.1.5. What is the expected size of the data?

The expected size depends on the extent and the nature of the data that is made available. The estimated size of the URBANOME Global Data Repository is 1 TB.

5.1.6. To whom might it be useful ('data utility')?

- URBANOME consortium;
- Public Authorities at National, Regional and Local level responsible for Air quality and Public Health;

- City planners, environmental and health professionals;
- European Commission services and European Agencies;
- EU National Bodies;
- The general public including the broader scientific community.

5.2. FAIR data

Points to be addressed:

In general terms, your research data should be 'FAIR' that is findable, accessible, interoperable and re-usable. These principles precede implementation choices and do not necessarily suggest any specific technology, standard or implementation-solution.

5.2.1. Making data findable, including provisions for metadata

Points to be addressed:

- *Outline the discoverability of data (metadata provision)*
- *Outline the identifiability of data and refer to standard identification mechanism. Do you make use of persistent and unique identifiers such as Digital Object Identifiers?*
- *Outline the approach for clear versioning*

5.2.1.1 Metadata provision

URBANOME data will always include metadata. To ensure the project data is made available using the same standards towards consistency and usability all the datasets provide as far as possible the following metadata according to the DataCite Metadata Schema¹.

- Digital Object Identifier (DOI)
- Publication date
- Title
- Description

5.2.1.2 Standards for metadata creation

See point above.

Spatial data follows the INSPIRE metadata elements for spatial data sets and services².

5.2.1.3 Naming conventions used

The URBANOME dataset identification follows the naming:

<WPn°>_<serial number of dataset>_<dataset_title>.

Example: Data_WP2_1_dataset_title.

5.2.2. Making data openly accessible

Points to be addressed:

¹ DataCite Website <http://schema.datacite.org/>

² INSPIRE Metadata Regulation: <http://data.europa.eu/eli/reg/2008/1205/oj#d1e600-14-1>

- *Specify which data will be made openly available? If some data is kept closed provide rationale for doing so*
- *Specify how the data will be made available*
- *Specify what methods or software tools are needed to access the data? Is documentation about the software needed to access the data included? Is it possible to include the relevant software (e.g. in open source code)?*
- *Specify where the data and associated metadata, documentation and code are deposited*
- *Specify how access will be provided in case there are any restrictions*

5.2.2.1 Data are accessible via URBANOME repository to URBANOME consortium partners

Most data generated in URBANOME will be made openly available. Some exceptions are relevant to the personal data collected in the frame of the sensor's campaigns which cannot be made available to the public due to privacy and confidentiality issues. Full details are provided in Chapter 6 for each dataset identified.

The URBANOME global open-data repositories will be set up for this project as it:

- Is a platform that facilitates sharing of data, intermediate results, and results
- Is needed to enable the analysis of the impact of current and alternative national and local policies on improving air quality, human health, and well-being policies, but also of accessory external exposure data and health data to meet the goals of URBANOME.
- Enables data users to work with selected quality-controlled data sets and versions approved by the Data Owners/Data Providers.
- Aims to reach the highest level of GDPR compliancy, amongst others by:
 - Relying on the EU authentication platform and security protocols for data sharing.
 - Logging of user identity during data access, download, and upload, including version control. This enables to restore the availability and access to the data in a timely manner in the event of a physical or technical incident.

5.2.3. Making data interoperable

Points to be addressed:

- *Assess the interoperability of your data. Specify what data and metadata vocabularies, standards or methodologies you will follow to facilitate interoperability.*
- *Specify whether you will be using standard vocabulary for all data types present in your data set, to allow inter-disciplinary interoperability? If not, will you provide mapping to more commonly used ontologies?*

Strong focus will be given to interoperability of the data produced. In URBANOME we will use the established European and international standards for the storage, exchange, and dissemination of project data. INSPIRE (the European Directive on Infrastructure for Spatial Information) compliance has been used wherever possible (spatial dataset). Maps are made available for use by others as standard GIS files (raster and vector) usable by GIS systems including OpenGIS.

Other dataset produced are in common format (e.g. xls(x), csv, txt, AccDb, netCDF) which assures full interoperability allowing easy parsing and information exchange.

5.2.4. Allocation of resources

5.2.4.1 Estimation of costs

Costs for establishing and maintaining the URBANOME global open-data repository are covered by the AUTH budget for URBANOME.

5.2.4.2 Responsibilities

Each URBANOME partner has to respect the policies set out in this DMP. Datasets have to be created, managed and stored appropriately and in line with applicable legislation.

The Project Coordinator has a particular responsibility to ensure that data shared are easily available, but also that backups are performed, and that proprietary data are secured.

AUTH, as WP10 leader, will ensure dataset integrity and compatibility for its use during the project lifetime and beyond by different users.

Validation and registration of datasets is the responsibility of the partner that generates the data in the WP.

Backing up data for sharing through open access repositories is the responsibility of the partner possessing the data. Quality control of this data is the responsibility of the relevant WP leader, supported by the Project Coordinator.

If datasets are updated, the partner that possesses the data has the responsibility to manage the different versions and to make sure that the latest version is available in the case of publicly available data. WP10 will provide naming and version conventions.

Finally, all partners must consult the concerned partner(s) before publishing data in the open domain that can be associated to an exploitable result.

5.2.4.3 Responsibilities for data management

AUTH will be the data repository manager. It will be assisted by UPCOM for the implementation and maintenance of the data repository, with these specific responsibilities:

UPCOM is responsible for:

- Initial set-up of the hardware and software components of the data repositories
- Maintenance of the hardware and software components of the data repositories
- Carrying out the initial security assessment of the repositories
- Perform Security Assessment on a regular basis (e.g., one year) in order to guarantee the agreed security level
- Reporting and blocking any possible security threat, taking appropriate measures accordingly.

UPCOM responsibilities include:

- setting up and upgrading, when needed, the hardware and software components of the repositories
- creation, maintenance and upgrading of the User Group Account database
- co-creation, under specific instructions provided by Aristotle University of Thessaloniki (AUTH), of the data repository folders/sub-folders for each user group and document types
- Capacity management of hardware and software components.

AUTH is responsible for:

- Supervising the user requests for access to and downloading of data
- The content (of data and documents) reported into the data repositories
- Definition, creation, updating of the data repository structures, i.e.: structure of folders and subfolders, names, contents and access, upload, download rights
- Co-creation with UPCOM of the data repository folders/sub-folders for and document types
- Providing instructions to the UPCOM about the data repository structure

Each member of the URBANOME consortium is responsible for transferring and updating their data on the global open-data repository. The data must conform to the standards defined by the present document including but not limited to naming, structure, and anonymization. When storing publicly available data, the publisher is responsible to ensure that these do not infringe personal or corporate privacy and that they don't jeopardize the commercialization of the project's products.

5.2.5. Data security

Points to be addressed:

- *Address data recovery as well as secure storage and transfer of sensitive data*

With respect to Privacy and Data Protection, the so-called "GDPR" EU-legislation (i.e. the General Data Protection Regulation) imposes several new obligations upon the consortium partners being data processors. Moreover, several new rights are granted to data subjects and significant fines are introduced in case of a data breach.

Apart from this legislation, the consortium partners regard privacy and data protection as a fundamental principle and hence apply a strict policy on this matter.

5.2.5.1 Data confidentiality and integrity

Data stored in the frame of the URBANOME sensor campaigns will be protected against unauthorised access by means of standard login procedure. Access to data will be granted only to authenticated users. Users can be authenticated by their username and password. Authentication credentials must be exchanged over SSL to ensure they are kept private. Appropriate access levels may be granted by the creation of groups.

5.2.6. Ethical aspects

The transfer of data on human subjects to the URBANOME repository is only considered when: informed consents, ethics approval and – when applicable - approval by local data protection authorities cover the purpose that the data are envisaged to be used within URBANOME and allow transfer of individual or aggregated data to the URBANOME repositories.

All data that have been transferred and stored into the URBANOME repositories are either pseudonymised or completely anonymized. The Data Owner/Data Provider was responsible for the anonymization or pseudonymity process and for ensuring that identifiable variables are not transferred to the URBANOME repository. Directly identifiable variables include - but are not limited to - national ID number, name, phone number, ZIP-code, e-mail address, address, geographical coordinates (at a resolution that risks identification). One shall also be aware that a combination of just of few indirect identifying variables (such as birth data, gender, and zip-code) can be used to identify a large portion of individuals on any dataset. In

this context, the Data Owner/Data Provider shall only provide such variables at the lowest possible resolution that is necessary to for analysis, e.g. district instead of zip-code; year of birth or age instead of birth date.

The GDPR is an expansive set of regulations which cover the entire lifecycle of personal data. It consists of 99 articles that describe its legal requirements and 173 recitals that provide additional context and clarifications to the articles. More specifically, there are four (4) articles that codify the URBANOME participant rights in terms of their personal data and how these are related with the data storage. These articles have been already taken into consideration by the URBANOME community and are highlighted within the current DMP version:

1. **Access rights by URBANOME participants** (Article 15): URBANOME participants are allowed to obtain detailed information about their data usage in terms of a) processing purposes, b) any disclosed data recipients, c) storage period duration and d) how their data will be used within automated decision-making approaches. So, the URBANOME storage system will be designed to store these metadata and to provide a timely access to them.
2. **Right to be forgotten** (Article 17): URBANOME participants are constantly granted with the right to require the deletion of their personal data without any undue delay. Therefore, the URBANOME storage system should be designed so as to be able to delete the requested data in a timely manner (e.g. 72 hours). This obligation is also valid for any backup files or replicas.
3. **Data portability right** (Article 20): URBANOME participants have the right to ask to obtain in a commonly used format all their personal information being stored by the system. They can also have the right to request the direct transmission/dissemination of their data to another health expert or a third party. So, the URBANOME storage system should be capable to access and transmit all their personal data in a timely manner.
4. **Objection rights by URBANOME participants** (Article 21): URBANOME participants have the right to decline at any time the use of their personal data for any research, publication, historical archiving or profiling purposes. So, the URBANOME DMP and storage system must be able to know both white/black-listed purposed associated with the URBANOME datasets at all times and being able to dynamically control their access.

6. Description of the URBANOME Datasets

Datasets in the URBANOME global open-data repository will be stored according to the Work-Package from where they have been generated.

6.1. Datasets in WP2 - Urban Living Labs for participatory planning and pilot interventions

6.1.1. Pre-existing experiences dataset with Urban Living Labs

Data set reference and name	WP2_1_Pre-existing_experiences_dataset_with_Urban_Living_Labs
Data set description	This dataset includes previously gathered information and research on Urban Living Labs compiled by ENOLL. The dataset will be used for planning, training and handbook purposes.
Standards and metadata	The dataset will be stored in docx and pdf format.
Data sharing	The data used for the training purpose will be shared internally with all project partners. Excerpts of the data used for training in addition to other data on Urban Living Labs components and management for the “Good Practice guidelines for setting up and managing Urban Living Labs” will be shared publicly on the project website.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.1.2. Intervention catalogue

Data set reference and name	WP2_2_Intervention_catalogue
Data set description	Interventions related to individual lifestyle and on the urban scale will be collected in each city and compiled in a catalogue which will be shared with all project partners.
Standards and metadata	The catalogue will be stored in docx and pdf format
Data sharing	The catalogue will be made freely available to all project participants, partners and stakeholders in each city.
Archiving and preservation	The catalogue will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.2. Datasets in WP3 - Development of Big Data ecosystem

No datasets are currently expected to be generated in WP3.

6.3. Datasets in WP4 - Exposure analysis focusing on patterns of socio-spatial environmental inequality

6.3.1. Emission inventory for the URBANOME ULLs

Data set reference and name	WP4_1_Emission_inventory_for_the_URBANOME_ULLs
Data set description	<p>The dataset will include model-ready gridded sector-specific emissions at a high spatial resolution (at least 1 km x 1 km) for six air pollutants (NH₃, NMVOC, NO_x, PM₁₀, PM_{2.5}, SO₂). With regard to climate mitigation, the inventory will cover the three major greenhouse gases CO₂, N₂O and CH₄.</p> <p>The sites targeted will cover the pilot cities addressed in URBANOME (i.e., Aarhus, Aberdeen, Athens, Thessaloniki, Milan, Madrid, Ljubljana, Paris and Stuttgart). These emission inventories will be used as input for the atmospheric pollution models applied in WP4.</p>
Standards and metadata	For each city the dataset will be available in csv format as it is best suited for project internal use (especially as input for the atmospheric pollution models applied in WP4). Requirements of the INSPIRE standards will be considered.
Data sharing	The dataset with emission inventory will be publicly freely available with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited. The non-sensitive nature of these data means that there are no concerns regarding data protection or ethics.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.3.2. Atmospheric dispersion modelling results for the ULLs

Data set reference and name	WP4_2_Atmospheric_dispersion_modelling_results_for_the_ULLs
Data set description	<p>This dataset is operationally produced by the atmospheric dispersion models applied in URBANOME. More specifically they will be derived from the application of Eulerian models in the 9 ULLs addressed in URBANOME i.e. Aarhus, Aberdeen, Athens, Ljubljana, Madrid, Milan, Paris, Stuttgart and Thessaloniki. The dataset will be used within WP4 to support the data fusion approach.</p>
Standards and metadata	The dataset will be available in the standard GIS raster grid format following the INSPIRE standards.
Data sharing	The data will be in the form of GIS grid maps shared with interested users by means of individual requests made to the Project Coordinator with the expectation that both the

	URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited. The non-sensitive nature of these data means that there are no concerns regarding data protection or ethics in doing so.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.3.3. Noise levels in the ULLs

Data set reference and name	WP4_3_Noise_levels_in_the_ULLs
Data set description	Available data sets of noise level modelled and /or measured in those cities with network stations managed by local authorities will be collected. Additionally, data obtained in those cities whose ULLs propose activities that include in situ measurements of noise levels at sites of interest will be included.
Standards and metadata	For each city the dataset will be available in MS-Excel xls and xlsx as well as csv formats to maximise the potential for use with a variety of analytical software. Requirements of the INSPIRE standards will be considered.
Data sharing	Datasets with noise levels registered at monitoring stations managed by local authorities will be publicly freely available. Datasets obtained from ULL activities (measured or modelled) will be publicly freely available with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.3.4. Indoor air quality levels in the ULLs

Data set reference and name	WP4_4_Indoor_air_quality_levels_in_the_ULLs
Data set description	Due to the general lack of available data series measuring indoor air pollutant levels, a literature review will be carried out to collect data published in scientific journals. Additionally, data obtained in those cities whose ULLs propose activities that include in situ measurements of indoor air quality levels at sites of interest will be included.
Standards and metadata	Data from literature review will be available in csv format and in docx and pdf format for providing a detailed description of the specific place and conditions under which they were obtained. Data sets obtained from ULLs activities will be available in MS-

	Excel xls and xlsx as well as csv formats.
Data sharing	Data from literature review as well as obtained from ULL activities will be publicly freely available with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited. Depending on the location of the ULLs activities, such as public schools or private houses, there could some restrictions regarding data protection or ethics, in relation with the diffusion of the data sets obtained. In these case, any information that might permit identification of the individuals will be removed or obfuscated.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.3.5. Multi-sensor data for personal exposure monitoring in the ULLs

Data set reference and name	WP4_5_Multi_sensor_data_for_personal_exposure_monitoring_in_the_ULLs
Data set description	This dataset will include data collected by personal sensors worn by each participant, and static sensors located in each household of the city campaigns in Aarhus, Aberdeen, Athens, Ljubljana, Madrid, Milan, Paris, Stuttgart, and Thessaloniki. All the data measured by these sensors will be stored in the URBANOME open repository as well as in the ZENODO repository in different subfolders named according to the city where the data were collected and in further subfolders named according to device used and the season (i.e. Winter, Summer). Single files encompassing the data measured are named according to the following scheme: City_Season_ParticipantID.xlsx (e.g. ATH_S_P039.xlsx).
Standards and metadata	The data will be stored in MS-Excel xls and xlsx formats to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.
Data sharing	The multi-sensor data for personal exposure monitoring will be freely available to anyone as Open Data in anonymous format. Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited. Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants and its tracking (GPS coordinates) will be removed.

Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.
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6.3.6. Exposure modelling results in the ULLs

Data set reference and name	WP4_5_Exposure_modelling_results_in_the_ULLs
Data set description	The dataset will contain time dynamic personal exposure levels derived from the application of ABM model informed by personal sensors data and information from surveys. Personal exposure levels will be calculated as inhaled adjusted exposure to air pollutants by assigning pollutant concentrations to a person depending on different coordinates, different activities, the level of intensity and the corresponding inhalation rate.
Standards and metadata	The data will be available either in csv or xls to maximise potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets
Data sharing	After quality control and cleaning, the data set will be made available to other URBANOME partners. The exposure profiles will be made available as Open Data. Interested researchers may apply to make use of the data from the Project Coordinator, who may grant access at his/her discretion with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited. Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of the individuals will be removed or obfuscated.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.4. Datasets in WP5 - Assessment of physical and mental health and sleep quality

6.4.1. Physical Health Assessment

Data set reference and name	Data_WP5_1_Physical_Health_Assessment
Data set description	This dataset will include data collected by the (a) Fullerton Senior Fitness Test (Rikli and Jones, 2013) which contains six

	<p>domains: chair Stand (assessed lower body strength), 8 Foot Up and Go (assessed complex coordination, agility and dynamic balance), Back Scratch (assessed flexibility of upper body), Chair Sit and Reach (assessed flexibility of the lower back and hamstring muscles), Arm Curl (assessed upper body strength) and 2 Min Step (assessed aerobic capacity; Jones and Rikli, 2002); (ii) Berg Balance Scale which assesses balance and risk of falls (Berg et al., 2009); (iii) Tinetti Test which assesses walking and risk of falls (Tinetti, 1986); and (iv) Stork Balance Stand Test which assesses balance when standing on one leg (Johnson and Nelson, 1969), (v) 6-Minute Walking Distance (6MWD) (Hernandes, N. et al, 2011), (vi) Handgrip Strength Test (Norman, K., et al., 2011), (vii) Short Physical Performance Battery Protocol (Guralnik, J. et al. 1994), (viii) Body Mass Index (BMI) and body composition will be also computed.</p>
Standards and metadata	<p>The data will be stored in MS-Excel xls and xlsx as well as csv formats to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.</p> <p>The same data will be also stored as backup copy in the Zenodo repository.</p>
Data sharing	<p>The physical condition features will be freely available to anyone as Open Data in anonymous format.</p> <p>Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.</p> <p>Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants will be removed.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.4.2. Mental Health Assessment

Data set reference and name	WP5_2_Mental_Health_Assessment
Data set description	<p>This dataset aims to estimate anxiety, depressive or mood disorders even at a preclinical stage. Therefore, it targets the general population focusing on the identification of vulnerable groups. It consists of the following tests:</p> <ol style="list-style-type: none"> 1) State-Trait Anxiety Inventory (STAI): It is a commonly used measure of trait and state anxiety. It can be used in clinical

	<p>settings to diagnose anxiety and to distinguish it from depressive syndromes. It also is often used in research as an indicator of caregiver distress.</p> <p>2) Beck’s Depression Inventory (BDI): It is a 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression. The BDI has been widely used as an assessment instrument in gauging the intensity of depression in patients who meet clinical diagnostic criteria for depressive syndromes. However, the BDI has also found a place in research with normal populations, where the focus of use has been on detecting depression or depressive ideation. The 21 symptoms and attitudes contained in the BDI reflect the intensity of the depression; items receive a rating of zero to three to reflect their intensity and are summed linearly to create a score which ranges from 0 to 63. The 21 items included reflect a variety of symptoms and attitudes commonly found among clinically depressed individuals (e.g., Mood, Self-dislike, Social Withdrawal, Sleep Disturbance).</p>
Standards and metadata	<p>The data will be stored in MS-Excel xls and xlsx as well as csv formats to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.</p> <p>The same data will be also stored as backup copy in the Zenodo repository.</p>
Data sharing	<p>The mental health features will be freely available to anyone as Open Data in anonymous format.</p> <p>Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.</p> <p>Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants will be removed.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.4.3. Quality of life

Data set reference and name	WP5_3_Quality_of_Life
Data set description	This dataset aims to provide quantifiable indices of quality of life and how they are related to participants’ health. Therefore,

	<p>it targets the general population aiming to identify early pathological signs. It consists of the following tests:</p> <ol style="list-style-type: none"> 1) SF-12v2: It is a health-related quality-of-life questionnaire consisting of twelve questions that measure eight health domains to assess physical and mental health. Physical health-related domains include General Health (GH), Physical Functioning (PF), Role Physical (RP), and Body Pain (BP). 2) 28-Item General Health Questionnaire: It is a screening device for identifying minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients. Suitable for all ages from adolescent upwards (but not children), it assesses the respondent's current state and asks if that differs from his or her usual state. It is therefore sensitive to short-term psychiatric disorders but not to long-standing attributes of the respondent. 3) WHOQL-BREF: It is a quality of life assessment developed by the WHOQOL Group with fifteen international field centres, simultaneously, in an attempt to develop a quality of life assessment that would be applicable cross-culturally.
Standards and metadata	<p>The data will be stored in MS-Excel xls and xlsx as well as csv formats to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.</p> <p>The same data will be also stored as backup copy in the Zenodo repository.</p>
Data sharing	<p>The quality of life dataset will be freely available to anyone as Open Data in anonymous format.</p> <p>Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited.</p> <p>Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants will be removed.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.4.4. Cardiorespiratory Clinical Assessment

Data set reference and name	WP5_4_Cardiorespiratory_clinical_assessment
Data set description	<p>This dataset aims to provide quantifiable clinical outcomes of participants cardiorespiratory health. Therefore, it targets the URBANOME participants aiming to identify risk factors that may degrade their cardiorespiratory health. It consists of the following examination and tests:</p> <ol style="list-style-type: none"> 1) Exhaled nitric oxide level measured through non-invasive breath testing with a portable device. It is an established marker of airway inflammation. It relies on the fact that NO is a gaseous molecule produced in a type of inflammatory response. The exhaled nitric oxide fraction (FeNO) has been associated with both short-term and long-term exposure to air pollution. The sampling will be performed in morning hours with the NIOX device. 2) Spirometric evaluation involving the measurement of lung function (FEV1, FVC, FEF 25-75 as well as vital capacity). The recordings will be performed measured on a monthly basis with a spirometer Spirobank Smart by MIR capable to provide remote assessments of lung function. 3) Quantification of CO carbon monoxide levels after binding with hemoglobin in the lungs and forming carboxyhemoglobin (COHb), which impairs the transport of oxygen. 4) Cardiometabolic assessment will be performed through an incremental maximal cycle ergometer test started with two (2) minutes of seated rest followed by three (3) minutes of unloaded cycling. Then, the workload protocol would be increased with incremental steps of 10, 15 or 20 Watts each minute according to the participant's height, weight and age. They will be instructed to cycle at a speed of 60-70 rpm and would be encouraged to continue cycling until exhaustion. During the test participants will breathe through a facemask connected to a calibrated metabolic cart, while the expired gases pass through a flow metre, oxygen (O2) and carbon dioxide (CO2) analyzers. Both the flow metre and the analyzers would be connected to a computer for estimating breath-by-breath minute ventilation (VE), oxygen uptake (VO2), carbon dioxide output (VCO2) and the respiratory exchange ratio calculated as: $RER = VCO2/VO2$. Peak oxygen consumption (VO2peak) will be calculated as the average value over the last 30 seconds before subjective exhaustion. 5) The heart rate would be continuously measured during the

	<p>exercise through 2 leads electrocardiography (ECG). R-R intervals and spectral heart rate variability (HRV) features would be extracted through the Lomb-Scargle periodogram analysis as in Chriskos et al., 2018. The HRV analysis assesses the energy expenditure and the interplay among the sympathetic and the parasympathetic branch of the autonomic nervous system</p>
Standards and metadata	<p>Cardiorespiratory features will be stored in csv and xls/xlsx format so as to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more metadata (e.g. data type of variable) about datasets.</p>
Data sharing	<p>The cardiorespiratory features dataset will be freely available to anyone as Open Data in anonymous format.</p> <p>Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.</p> <p>Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants will be removed.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.4.5. Sleep quality

Data set reference and name	WP5_5_Sleep_Quality
Data set description	<p>This dataset aims to provide quantifiable indices of sleep quality and how they are related to participants’ health. Therefore, it targets the general population aiming to assess sleep macro-architecture, sleep disorders (insomnia, restless leg syndrome, micro-arousals, wakes after sleep onset), sleep-related breathing disorders (hypopnea, apnea, oxygen desaturation). It consists of the following examination and tests:</p> <ol style="list-style-type: none"> 1) Actigraphy studies for several nights (approximately 20 per participant) 2) Polysomnographic studies during entire sleep (four (4) per participant on two (2) different season intervals) 3) Pittsburgh Sleep Quality Index (PSQI): Self-rated, assesses sleep quality and disturbances over the last month. 4) Epworth Sleepiness Scale (ESS): Self-administered questionnaire with 8 questions. The total ESS score (the sum of 8 item-scores) gives an estimate of a more general

	<p>characteristic, the person’s ‘average sleep propensity’ or ASP, across a wide range of activities in their daily lives. The reference range of ‘normal’ ESS scores is zero to 10. Sleep disordered breathing and depression contribute to the total ESS score.</p> <p>5) Berlin Questionnaire (Sleep Apnea): It reliably identifies middle-aged and older persons in the community who are at high-risk for obstructive sleep apnea (OSA)</p>
Standards and metadata	<p>Raw sleep data will be stored either in EDF format for PSG or in mat & txt format for actigraphy studies.</p> <p>Sleep macro-architecture features will be stored in csv and xls/xlsx format so as to maximise the potential for use with a variety of analytical software. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.</p> <p>The same data will be also stored as backup copy in the Zenodo repository.</p>
Data sharing	<p>The sleep quality dataset will be freely available to anyone as Open Data in anonymous format.</p> <p>Data will be freely downloaded and used with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.</p> <p>Due to the sensitive nature of these data which implies data protection and ethical concerns, any information that might permit identification of individual participants will be removed.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.5. Datasets in WP6 - Assessment of personalised interventions and proposed policies

6.5.1. Integrated assessment of personal benefits

Data set reference and name	WP6_1_Integrated_assessment_of_personal_benefits
Data set description	<p>The dataset contains the final outcomes of the integrated assessment of personal benefits of interventions in the pilot cities addressed in URBANOME (i.e., Aarhus, Aberdeen, Athens, Thessaloniki, Milan, Madrid, Ljubljana, Paris and Stuttgart).</p> <p>The dataset will include, from those cities where the methods were deemed appropriate to each of the city ULLs, data from physical and biochemical examinations collected in work package 5.</p>

	<p>The dataset will include, where undertaken, qualitative data from questionnaires and interviews with participants.</p> <p>All data at the level of the individual will be fully anonymised, and presented in such a way that meaning can be derived at the population, rather than the individual, level.</p>
Standards and metadata	<p>The dataset will be made available in MS-Excel xls(x) format to ensure interoperability allowing easy parsing and information exchange. There will be one MS-Excel file for each pilot city. Storing data as RMD files will also be considered to preserve more meta data (e.g. data type of variable) about datasets.</p>
Data sharing	<p>The dataset with results on the integrated health and wellbeing assessment will be publicly freely available with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited. The non-sensitive nature of these data means that there are no concerns regarding data protection or ethics.</p>
Archiving and preservation	<p>The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.5.2. Integrated health and wellbeing assessment

Data set reference and name	WP6_2_Integrated_health_and_wellbeing_assessment
Data set description	<p>The dataset contains the final outcomes of the integrated health and wellbeing assessment of the selected interventions and policies in the pilot cities addressed in URBANOME (i.e., Aarhus, Aberdeen, Athens, Thessaloniki, Milan, Madrid, Ljubljana, Paris and Stuttgart).</p> <p>The dataset will include, where undertaken, the quantitative assessment of health impacts at the population level as well as on vulnerable population subgroups (e.g. children and elderly).</p> <p>The dataset will include, where undertaken, qualitative assessment and indicators regarding perceived livability and well-being, and the effects of the interventions undertaken.</p> <p>Additionally, the dataset will include the quantitative assessment of climate change mitigation in the form of mitigated greenhouse gases.</p>
Standards and metadata	<p>The dataset will be made available in MS-Excel xls(x) format to ensure interoperability allowing easy parsing and information exchange. There will be one MS-Excel file for each pilot city.</p>
Data sharing	<p>The dataset with results on the integrated health and wellbeing assessment will be publicly freely available with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are</p>

	properly cited. The non-sensitive nature of these data means that there are no concerns regarding data protection or ethics.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.5.3. Policy cost-benefit and cost-effectiveness assessment

Data set reference and name	WP6_3_Policy_cost-benefit_and_cost-effectiveness_assessment
Data set description	<p>The dataset contains the final outcomes of the assessment of cost-benefit and cost-effectiveness of the policies developed in WP7. These will relate the pilot cities addressed in URBANOME (i.e., Aarhus, Aberdeen, Athens, Thessaloniki, Milan, Madrid, Ljubljana, Paris and Stuttgart).</p> <p>The dataset will include both data concerning the tangible and intangible factors which are judged to affect the policies. The data will also include the outcomes of the benefit-transfer modelling in relation to policy options.</p> <p>The dataset will include a cost-benefit analysis for each of the interventions applied in the ULLs, identifying predicted and modelled benefits, costs, risks and uncertainties.</p> <p>Additionally, the dataset will include an assessment of the impact of the policy options in relation to the UN SDGs (including qualitative assessment of impact on health, energy, emissions and climate).</p>
Standards and metadata	The dataset will be made available in MS-Excel xls(x) format to ensure interoperability allowing easy parsing and information exchange. There will be one MS-Excel file for each pilot city.
Data sharing	The dataset with results on the integrated health and wellbeing assessment will be publicly freely available with the expectation that both the URBANOME project and the European Commission's Horizon 2020 as the funding program are properly cited. The non-sensitive nature of these data means that there are no concerns regarding data protection or ethics.
Archiving and preservation	The data will be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.

6.6. Datasets in WP7 - Innovative and co-creation governance: Targeted policy development and implementation

6.6.1. Interviews and surveys results on policy learning in the ULLs

Data set reference and name	Interviews_and_surveys_results_on_policy_learning_in_the_ULLs
Data set description	<p>Two types of data are generated in WP7. Firstly, data that generated through qualitative interviews which is recorded and transcribed, in total or parts thereof, and stored safely and in anonymous forms. This data informs the analysis of how different idealized engagements can lead to policy learning in the URBANOME ULLs and prompt novel forms and practices of policy making.</p> <p>Secondly, data is generated through a survey among cities. The aggregated dataset covers different types of cities, based on the findings from the interviews and engagement with the URBANOME ULLs.</p>
Standards and metadata	<p>The data will in aggregated form and paying due respect to GDPR be available in .docx and/or in .pdf format. This sustains transparency of the analysis and enables reproducible use of data, thus enhancing the validity of the URBANOME findings.</p>
Data sharing	<p>The data from the interviews will be kept confidential, due to confidentiality and GDPR. In addition, the interview data may be shared with the interviewees. When GDPR and confidentiality allows, the data from the survey will be accessible for partners in URBANOME. Furthermore, the data from the qualitative interviews and the survey will, as meta-data and as input to the analyses, be integrated in deliverables, scientific articles, and public dissemination. Aggregated data to preserve anonymities may be shared publicly with the expectation that both the URBANOME project and the European Commission’s Horizon 2020 as the funding program are properly cited.</p>
Archiving and preservation	<p>The aggregated data will, when confidentiality and GDPR allows, be stored in the URBANOME Global Data Repository and in Zenodo which will remain operational for 5 years after the project.</p>

6.7. Datasets in WP8 - Evidence-based feedback to the policy makers

No datasets are currently expected to be generated in WP8.

6.8. Datasets in WP9 - Dissemination, communication, training and exploitation

6.8.1. Stakeholders List

Data set reference and name	WP9_1_Stakeholders_list
Data set description	The dataset consists of the identified URBANOME stakeholders
Standards and metadata	<p>The dataset will be available in xls(x) format. For each stakeholder identified the following metadata information will be provided in the concise dataset:</p> <ul style="list-style-type: none"> • Organization name • Field of activity • Type of stakeholder <p>Full details including:</p> <ul style="list-style-type: none"> • Name and Surname • Role in the Organization • Job title <p>Contact details (i.e. email address, phone number, etc.) will be not shared for privacy issues and will be included only in the extended version kept by the project for internal use.</p>
Data sharing	The concise dataset will be publicly freely available to anyone. The extended dataset cannot be shared for privacy issues. Nonetheless, all the details are stored in an excel file for internal use only and may be shared upon written request to the Project Coordinator.
Archiving and preservation	The concise dataset has been stored in the URBANOME Global Data Repository and in the ZENODO repository, which will remain operational for 5 years after the project end.

6.8.2. Scientific publications

Data set reference and name	WP9_2_Scientific_Publications
Data set description	The dataset consists of all the URBANOME scientific publications produced during the project life.
Standards and metadata	<p>Metadata maximise the discoverability of publications and ensure the acknowledgment of EU funding. The inclusion of metadata is necessary for adequate monitoring, production of statistics, and assessment of the impact of H2020. In addition to basic bibliographic information about deposited publications the following metadata information are provided:</p> <ul style="list-style-type: none"> • EU funding acknowledgement: <ul style="list-style-type: none"> • Contributor: "European Union (EU)" & "Horizon

	<p>2020"</p> <ul style="list-style-type: none"> • Project Information: <ul style="list-style-type: none"> • Grant number: "945391" • Project Acronym: "URBANOME" • Project Name: "Urban Observatory for Multi-participatory Enhancement of Health and Wellbeing" • Publication Date. • Journal name • DOI (if any) • Keywords • Authors and Contributors
Data sharing	URBANOME scientists committed themselves to follow the 'Open Access Publishing Model', meaning that the scientific articles are provided in open access (either Gold or Green) mode by the scientific publisher.
Archiving and preservation	Publications are freely available through the ZENODO repository as well as in the URBANOME website

6.8.3. Dissemination and Communication Activities Monitoring

Data set reference and name	WP9_3_Dissemination_and_Communication_Activities
Data set description	<p>The dataset aggregates all the actions performed by URBANOME partners to disseminate and/or communicate the project towards the target stakeholder groups.</p> <p>The dataset will draw input from an online reporting form created for this purpose https://ec.europa.eu/eusurvey/runner/urbanomedissrep</p>
Standards and metadata	<p>The dataset will be available in xls(x) format. Basic information regarding the performed activity will be featured in respective fields:</p> <ul style="list-style-type: none"> • Name of Organisation • Type of activity • Title of activity / slogan • Title of the event (if applicable) • Venue (if applicable) • Date • Title of the presentation (if applicable) • URL of the activity (if applicable) • Type and number of audiences reached
Data sharing	The dataset will have a unified form and it will be accessible by dissemination leading partner (AUTH) and overall WP9 leading partner (VIL)

Archiving and preservation	The dataset will be stored in the URBANOME Global Data Repository which will remain operational for 5 years after the project end.
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7. Plan Maintenance

The Data Management Plan will be updated regularly by the Data Manager (AUTH) and reviewed by WP-leads with the purpose of supporting the data management life cycle for all data that will be collected, processed or generated by the project

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