Milestone M8 (M2.1/2.3)

Multi-year datasets of daily air pollution and health, and of oxidative potential

RI-URBANS

Research Infrastructures Services Reinforcing Air Quality Monitoring Capacities in European Urban & Industrial AreaS

By

ISGlobal

ISGlobal **Barcelona Institute for Global Health**

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Milestone M8 (M2.1/2.3): Multi-year datasets of daily air pollution and health, and of oxidative potential

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Comments	This document describes the current status of the collection of multi-year datasets of daily air pollution and health for RI-URBANS for WP2's analysis

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1. About this document

This document describes the current status of the collection of multi-year datasets of daily air pollution and health for RI-URBANS to be used in WP2 for studies on the impact of advanced air quality parameters on health.

This is a public document, available in the RI-URBANS website (https://riurbans.eu/work-package-2/#milestones-wp2). The document will be distributed to all RI-URBANS partners for their use and submitted to European Commission as an RI-URBANS milestone M8 (M2.1/2.3).

2. Health data

2.1. Progress of the health datasets collection

A total of 28 cities were evaluated for being included in the RI-URBANS epidemiological studies. From these cities, 11 were excluded (see section on excluded cities), leaving 17 cities to be included in the study (Table 1). Exclusions were due to the low population of the cities, the lack of availability of health data or absence or incompleteness of datasets of the advanced air quality parameters being evaluated in the project (Table 2).

At the moment a total of 17 health datasets were collected from 11 European cities and are ready to use (table 1, green cells). Thirteen datasets (7 for mortality and 5 for hospitalization) are still pending (Table 1, orange cells). These datasets are either being requested by RI-URBANS internal/external partners, or the request is still being processed by the authorities. Seven hospital admissions datasets were classified as unsuccessful mostly due to unresponsive authorities, lack of centralized information (i.e., data should be collected directly from hospitals) or data access restrictions (i.e., countries that only allow in-situs data access) (Table 1, red cells).

Table 1: Description of the current status of health data collection for RI-URBANS. The green cells indicate datasets that were received and ready to use. Orange cells indicate data that was requested but has not arrived yet. Red cells indicate datasets that were impossible to obtain.

Country	City	Mortality	Hospitalization
Spain	Barcelona	Data received	Data received
	Granada	Data received	Data received
	Madrid	Data received	Data received
Greece	Athens	Data received	Unsuccessful
UK	London	Data received (6 years of data available from previous projects + a colleague in London will carry out the analysis in-situ)	Data received (10 years of data available from previous projects)
Germany	Mülheim an der Ruhr	Request in progress	Unsuccessful
	Dresden	Request in progress	Unsuccessful
	Leipzig	Request in progress	Unsuccessful
France	Paris	Request in progress	Request in progress
	Grenoble	Request in progress	Request in progress
	Lille	Request in progress	Request in progress

Switzerland	Zurich	Data received	Data received
Hungary	Budapest	Data received	Unsuccessful
Finland	Helsinki	Data received	Request in progress
USA	Rochester	Request in progress	Request in progress
Czech Republic	Prague	Data received	Unsuccessful
Sweden	Stockholm	Data received	Data received
Romania	Bucharest*	Data Received	Unsuccessful

* Notes: Although health data were requested or collected for Bucharest, the city was **excluded** from the study due to unavailable air quality data.

Table 2: List of cities that were excluded from the study and the reason behind exclusion. UFP: ultrafine particles; BC: black carbon; PM: particulate matter; AQ: air quality

Excluded cities	Reason for exclusion
Birmingham (GB)	Short period for ultrafine particles data (06/2019 – present); Short period for BC data (19/03/2019 -present)
Langen (DE)	Small population size (< 50 000 inhabitants)
Augsburg (DE)	No source for AQ data
Lugano (CH)	Small population size (< 100 000 inhabitants); Only BC data available
Bern (CH)	Traffic station; Only BC data available; Short period for BC data (11/2018 – present);
Beijing (CN)	Local partner unable to obtain health data; Unresponsive health data authority; Short period for UFP data (2018-present)
Moscow (RU)	Exclusion of Russian partners
Saint Petersburg (RU)	
Coimbra (PT)	Only PM speciation available; Short period for PM data (01/12/2018 -19/06/2019);
Bucharest (RO)	Unavailable AQ data; Short period for AQ data (2019 – present)
Marseille (FR)	Short period for AQ data (2018 – 2019) Data quality issues

2.2. Summary of health datasets

The health datasets available and those expected to arrive soon are described in detail in the Tables 3-10.

Table 3: Details of the currently available health datasets: Helsinki (Finland).

HELSINKI		
	MORTALITY	**EMERGENCY HOSPITAL ADMISSIONS**
DATE OF DATA REQUEST	15.02.2022	28.04.2022
DATE OF DATA ARRIVAL	03.05.2022	**Coming soon**
PERIOD	2001 - 2020	2001 - 2020
AGE GROUPS	0-74; 75+	0-74; 75+
SEX GROUPS	YES	YES
CAUSE	Natural causes (A00 – R99) Circulatory diseases (I00 – I99) Respiratory diseases (J00 – J99)	Circulatory diseases (I00 – I99) Respiratory diseases (J00 – J99)
REGION	Helsinki metropolitan area (Espoo, Helsinki, Vantaa, Kauniainen)	Helsinki metropolitan area (Espoo, Helsinki, Vantaa, Kauniainen)
INDIVIDUAL / TABULATION	Tabulation	Tabulation
SUPPRESSION	NO	Possibly
PROVIDER	Statistics Finland (www.stat.fi)	National Institute for Health and Welfare (THL) - through FINDATA (www.findata.fi)
AGREEMENT END DATE	NO	?
NOTE	The data can be used by other projects	-

Table 4: Details of the currently available health datasets: Zurich (Switzerland).

ZURICH		
	MORTALITY	**EMERGENCY HOSPITAL ADMISSIONS**
DATE OF DATA REQUEST	16.02.2022	23.05.2022
DATE OF DATA ARRIVAL	29.04.2022	30.06.2022
Period	01.01.1995 – 31.12.2019	01.01.2008 - 31.12.2020
AGE GROUPS	< 65, 65-74, 75-84, >=85	0-74; 75+
SEX GROUP	YES	YES
CAUSE (ICD10)	Natural causes (A00 – R99) External causes (V01 - Y98) Circulatory diseases (I00 – I99) Respiratory diseases (J00 – J99)	All-cause () Circulatory diseases (I00 – I99) Respiratory diseases (J00 – J99)
REGION	Zurich city: BFS community numbers (community of residence): 2, 3, 4, 5, 6, 6, 7, 8, 9, 10, 11, 12, 13, 14, 52, 54, 62, 64, 66, 69, 82, 83, 84, 85, 87, 94, 96, 97, 115, 116, 119, 121, 131, 134, 135, 136, 137, 138, 139, 140, 141, 142, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 172, 176, 177, 178, 180, 182, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 213, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 261, 295, 296, 4021, 4027, 4030, 4034, 4040, 4045	ZH01 - ZH42, ZH45, ZH47-ZH54, ZH56, ZH58, ZH63, ZH65, ZH66, ZH68, ZH69, ZH70, ZH85, ZH86, ZH88, ZH89, ZH92, ZH93
INDIVIDUAL / TABULATION	Tabulation	Tabulation
SUPRESSION	NO	NO
PROVIDER	Swiss Federal Statistical Office https://www.bfs.admin.ch/bfs/en/home.html	Swiss Federal Statistical Office https://www.bfs.admin.ch/bfs/en/home.html
AGREEMENT END DATE	NO	NO
DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS and Early-Adapt	Not mentioned
OTHER REMARKS		- Locations were defined differently before 2008, therefore before 2008 data is not comparable; - Residents of Zurich hospitalized within Zurich; - Emergency admissions; - As the final diagnosis is provided at discharge, complications with long-term hospital admissions may arise. Patients may be admitted in one year and leave the hospital several years later.

Table 5: *Details of the currently available health datasets: Stockholm (Sweden).*

STOCKHOLM		
	MORTALITY	**EMERGENCY HOSPITAL ADMISSIONS**
DATE OF DATA REQUEST	17/02/2022	17/02/2022
DATE OF DATA ARRIVAL	12/07/2022	12/07/2022
Period	01/01/1998 – 31/12/2021	01/01/2008 - 29/12/2021
AGE GROUPS	0-74; 75+	0-74; 75+
SEX GROUP	NO	YES
CAUSE (ICD10)	Natural causes (A00 – R99)	Circulatory diseases (I00 – I99) Respiratory diseases (J00 – J99)
REGION	Stockholm Metropolitan area	Stockholm Metropolitan area (Region Stockholm)
INDIVIDUAL / TABULATION	Tabulation	Tabulation
SUPRESSION	< 4	< 5
PROVIDER	Swedish National Board of Health and Welfare (socialstyrelsen)	Swedish National Board of Health and Welfare (socialstyrelsen)
AGREEMENT END DATE	-	-
DATA USAGE LIMITATIONS	-	-
OTHER REMARKS	-	• The dataset of respiratory diseases includes the variable "year of survey - AR". This variable must be carefully considered as AR tells if a group of patients' admissions was reported more than once. • Hospitalizations of the same patient for the same diagnosis within 28 days were excluded.

Table 6: *Details of the currently available health datasets: Barcelona, Madrid and Granada (Spain).*

BARCELONA		
	MORTALITY	**EMERGENCY HOSPITAL ADMISSIONS**
DATE OF DATA REQUEST	-	11.04.2022
DATE OF DATA ARRIVAL	-	22.07.2022 22.09.2022
Period	01.01.2009 – 31.12.2019	10.12.2008 – 31.12.2021
AGE GROUPS	0-74; 75+	0-74; 75+; not specified
SEX GROUP	Male / Female	Male / Female / other
CAUSE (ICD10)	Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)	Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	BCN city (10 districts: Ciutat viella, Sant Martí, Gracia, Horta, Nou Barris, Eixample, Sant-montjuic, Sant Andreu, Sarriá-San Gervasi and Les Corts)	Barcelona; Cornellà De Llobregat; Esplugues De Llobregat; L'hospitalet De Llobregat; Sant Feliu De Llobregat; Sant Joan Despí; Sant Just Desvern
INDIVIDUAL / TABULATION	Tabulation	Tabulation
SUPRESSION	NO	NO
PROVIDER	Instituto Nacional de Estadística, INE (https://www.ine.es/)	Observatorio de salud de Catalunya (https://observatorisalut.gencat.cat/)
AGREEMENT END DATE	-	-
DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS	Not Mentioned
OTHER REMARKS	"All publications must refer to INE as the source of the primary data, it must be stated that the degree of accuracy or reliability of the quantitative or qualitative information is derived from the team's own work on the datasets, and is the sole responsibility of the researchers." • This dataset was obtained from another ISGlobal project.	• The data includes subgroups of respiratory and circulatory diseases and is also divided by hospital area. • Repeated hospitalizations within 28 days were not excluded.
MADRID		
	MORTALITY	**EMERGENCY HOSPITAL ADMISSIONS**
DATE OF DATA REQUEST	-	22.07.2022
DATE OF DATA ARRIVAL	-	28.07.2022
PERIOD	01.01.2009 – 31.12.2019	2009 – 2019; 2021 (city level) 2009-2021 (Province level)
AGE GROUPS	0-74; 75+	0-74; 75+
SEX GROUP	Male / Female	Male / Female
CAUSE (ICD10)	All-cause; Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99);	Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)

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	Respiratory diseases (J00 - J99)	
REGION	City of Madrid	City of Madrid (Centro, Arganzuela, Retiro, Salamanca, Chamartín, Tetuán, Chamberí, Fuencarral-El Pardo, Moncloa-Aravaca, Latina, Carabanchel, Usera, Puente, Vallecas, Moratalaz, Ciudad Lineal, Hortaleza, Villaverde, Villa de Vallecas, Vicálvaro, San Blas-Canillejas, Barajas)
INDIVIDUAL / TABULATION	TABULATION	TABULATION
SUPRESSION	NO	NO
PROVIDER	Instituto Nacional de Estadística, INE (https://www.ine.es/)	Instituto de Estadística de la Comunidad de Madrid (https://www.madrid.org/iestadis/)
AGREEMENT END DATE	-	-
DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS	Not mentioned
OTHER REMARKS	"All publications must refer to INE as the source of the primary data, it must be stated that the degree of accuracy or reliability of the quantitative or qualitative information is derived from the team's own work on the datasets, and is the sole responsibility of the researchers." • This dataset was obtained from another ISGlobal project.	- Contains dataset at city and at province levels. - The authority remarks that the year of 2020 at city level may be unreliable due to a large amount of missing data. For that year, the authority recommends the use of data at province level. - Repeated hospitalizations within 28 days were not excluded.

GRANADA

	MORTALITY	EMERGENCY HOSPITAL ADMISSIONS
DATE OF DATA REQUEST	-	06.2022
DATE OF DATA ARRIVAL	-	23.09.2022
PERIOD	01.01.2005-31.12.2019	01.01.2009 – 31.01.2021
AGE GROUPS	0-74; 75+	0-74; 75+
SEX GROUP	Male / Female	Male / Female
CAUSE (ICD10)	All-cause; Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)	Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	City of Granada	City of Granada
INDIVIDUAL / TABULATION	TABULATION	TABULATION
SUPRESSION	NO	NO
PROVIDER	Instituto Nacional de Estadística, INE (https://www.ine.es/)	Servicio Andaluz de Salud (https://www.sspa.juntadeandalucia.es/servicioandaluzdesalud/)
AGREEMENT END DATE	-	-

DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS	The usage of this data is limited to RI-URBANS
OTHER REMARKS	"All publications must refer to INE as the source of the primary data, it must be stated that the degree of accuracy or reliability of the quantitative or qualitative information is derived from the team's own work on the datasets, and is the sole responsibility of the researchers." • This dataset was obtained from another ISGlobal project.	Data should be destroyed after usage and there are regulations concerning publications. Please see the data contract for more information.

Table 7: *Details of the currently available health datasets: Bucharest (Romania).*

BUCHAREST	
	MORTALITY
DATE OF DATA REQUEST	-
DATE OF DATA ARRIVAL	-
PERIOD	01.01.2013 – 31.12.2020
AGE GROUPS	0-74; 75+
SEX GROUP	Male / Female
CAUSE (ICD10)	All-cause; Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	City of Bucharest
INDIVIDUAL / TABULATION	TABULATION
SUPPRESSION	NO
PROVIDER	National Institute of Statistics Romania (NIS Romania; www.insse.ro)
AGREEMENT END DATE	-
DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS
OTHER REMARKS	National Institute of Statistics Romania (NIS Romania): "Statistical Survey on Mortality". Every publication must insert a note according to which NIS Romania does not have any responsibility for the results and conclusions of the research." • This dataset was obtained from another ISGlobal project.

Table 8: *Details of the currently available health datasets: Athens (Greece).*

ATHENS	
	MORTALITY
DATE OF DATA REQUEST	-
DATE OF DATA ARRIVAL	-
PERIOD	01.01.2007 – 31.12.2018
AGE GROUPS	0-74; 75+
SEX GROUP	Male / Female
CAUSE (ICD10)	All-cause; Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	City of Athens
INDIVIDUAL / TABULATION	TABULATION
SUPRESSION	NO
PROVIDER	Hellenic Statistical Authority (ELSTAT) (https://www.statistics.gr/en/home)
AGREEMENT END DATE	-
DATA USAGE LIMITATIONS	The usage of this data is limited to RI-URBANS
OTHER REMARKS	Hellenic Statistical Authority (ELSTAT): "Each publication must state clearly to the end user of the information that the results and conclusions are those of the research entity/researcher and that ELSTAT bears no responsibility for these."

Table 9: *Details of the currently available health datasets: Prague (Czech Republic).*

PRAGUE	
	MORTALITY
DATE OF DATA REQUEST	21.02.2022
DATE OF DATA ARRIVAL	14.09.2022
PERIOD	01.01.2009 – 31.12.2019
AGE GROUPS	0-74; 75+
SEX GROUP	Male / Female
CAUSE (ICD10)	All-cause; Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	City of Athens
INDIVIDUAL / TABULATION	TABULATION
SUPRESSION	NO
PROVIDER	National Statistics Institute (www.czso.cz)
AGREEMENT END DATE	-
DATA USAGE LIMITATIONS	-
OTHER REMARKS	-

Table 10: *Details of the currently available health datasets: Budapest (Hungary).*

BUDAPEST	
	MORTALITY
DATE OF DATA REQUEST	02.2022
DATE OF DATA ARRIVAL	10.2022
PERIOD	1990 - 2020
AGE GROUPS	0-74; 75+
SEX GROUP	Male / Female
CAUSE (ICD10)	Natural cause (A00 - R99); Cardiovascular diseases (I00 - I99); Respiratory diseases (J00 - J99)
REGION	City of Budapest
INDIVIDUAL / TABULATION	TABULATION
SUPPRESSION	<= 2 (Respiratory causes)
PROVIDER	Hungarian Central Statistics Office (KSH: https://www.ksh.hu)
AGREEMENT END DATE	-
DATA USAGE LIMITATIONS	Data usage is limited to RI-URBANS.
OTHER REMARKS	- Only natural mortality includes information on sex and age. - Respiratory mortality contains suppression of numbers <= 2.

3. Air quality data

3.1. Availability of air quality data

Currently, 13 air quality datasets have been collected from 10 European cities. The list of cities and respective air quality datasets available are described in Table 11, and a specific Table 12 was created for oxidative potential availability (shorter time period)

Table 11: Air quality data availability.

City (country)	Station Name	Station Type	Period	UFP-PNSD	BC	PMx	Gases	Meteorology
Barcelona (ES)	Palau Reial	Urban	2013-2019	✓	✓	10, 2.5, 1	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD, RAIN
Granada (ES)	UGR	Urban	2017-2019	✓	✓	10	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD
Madrid (ES)	CIEMAT-Moncloa	Urban	2009-2019	✓	✓	10, 2.5	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD, RAIN
Budapest (HU)	CAAG	Urban	2013-2019	✓	No	10, 2.5	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD
Helsinki (FI)	Kumpula Campus	Urban	2009-2019	✓	✓	10, 2.5	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD
Helsinki (FI)	Mäkelänkatu	Traffic	2015-2019	✓	✓	10, 2.5	NO, NO_2, O_3, CO	T, RH, P, WS, WD
London (GB)	North Kensington	Urban	2009-2019	✓	✓	10, 2.5, 1	SO_2, NO, NO_2, O_3, CO	T, RH, P
London (GB)	Honor Oak Park	Urban	2018-2019	✓	✓	10, 2.5, 1	NO, NO_2, O_3	T, RH, P
London (GB)	Marylebone Road	Traffic	2010-2019	✓	✓	10, 2.5, 1	SO_2, NO, NO_2, O_3, CO	T, RH, WS, WD
Birmingham (GB)	BAQS	Urban	2019	✓	✓	10, 2.5, 1	SO_2, NO, NO_2, O_3	T, RH, P, RAD
Marseille (FR)	Longchamp	Urban	2018-2019	✓	✓	10, 2.5, 1	SO_2, NO, NO_2, O_3	T, WS, WD
Lille (FR)	Villeneuve d'Ascq	SubUrban	2017-2019	✓	✓	10, 2.5	NO, NO_2, O_3	T, RH, P, RAD, WS, WD, RAIN
Zurich (CH)	Kaserne	Urban	2010-2019	✓	✓	10, 2.5	SO_2, NO, NO_2, O_3, CO	T, RH, P, RAD, WS, WD, RAIN

Table 12: Oxidative Potential data availability.

City (country)	Station Name	Station Type	Period	OP_{PM1}	$OP_{PM2.5}$	OP_{PM10}
Barcelona (ES)	Palau Reial	Urban	2018-Avr 2019	✓	✓	✓
Athens (GR)	Thissio	Urban	2017-2022	no	no	✓
Grenoble (FR)	Les Frenes	Urban	2013-2022	no	no	✓
Paris (FR)	Les Halles	Urban	2020-2021	no	✓	no
Zurich (CH)	Kaserne	Urban	June 2018-June 2019	no	✓	✓
Bern (CH)	Bern-Bollwerk	Traffic	June 2018-2020	no	✓	✓

3.2 Air quality data under request

Thirteen air quality **datasets are currently under request with the compromise of the research teams involved of providing data, and are described in Table 13.**

Table 13: Air quality data currently under request.

City (Country)	Station Name	Station type	Period	UFP	BC	PM	Gases	Meteorology
Athens (GR)	Thissio	Urban	2015-2019	request	request	request	request	request
Athens (GR)	Demokritos	Suburban	2009-2019	request	request	request	request	request
Dresden (DE)	Winckelmann-straβe	Urban	2010-2019	✓	request	request	request	request
Dresden (DE)	North	Traffic	2009-2019	✓	request	request	request	request
Ispra (IT)	JRC	Regional Background	2009-2019	✓	request	request	request	request
Langen (DE)	UBA	Urban	2011-2019	request	ND	request	request	request
Leipzig (DE)	TROPOS	Urban	2010-2019	✓	✓	request	request	request
Leipzig (DE)	Mitte	Traffic	2010-2019	✓	✓	request	request	request
Leipzig (DE)	Eisenbahn-straβe	Traffic	2011-2019	✓	✓	request	request	request
Mülheim an der Ruhr (DE)	Mülheim an der Ruhr	-	2009 -2019	request	request	request	request	request
Paris (FR)	SIRTA	SubUrban	2012-2019	request	request	request	request	request
Prague (CZ)	Schudol	SubUrban	2009-2019	request	ND	10,2.5	NO, NO_2, NO_X, SO_2, O_3, CO	request
Rochester NY (US)	NYS DEC	Urban	2009-2019	request	request	request	request	request
Stockholm (SE)	Hornsgatan	Traffic	2010-2019	Only CPC,	request	10,2.5,1	NO, NO_2, CO	request

4. Data availability for epidemiological studies

4.1. Current status of air quality - health data availability

We aimed to obtain datasets containing at least **10 years (2009 – 2019) of data** from cities taking part in the RI-URBANS epidemiological studies. However, due to issues concerning air quality data availability and data quality, only three cities, **Madrid, London and Helsinki,** contain both health and air quality data for the period of 2009 – 2019.

When considering air quality and health datasets that are still under request, and a period of **at least 5 years of data** (2014 – 2019), data from 14 cities are expected to be available in the coming months: **Barcelona (ES), Madrid (ES), Budapest (HU), Helsinki (FI), London (GB), Paris (FR), Dresden (DE), Leipzig (DE), Mülheim an der Ruhr (DE), Rochester (US), Zurich (CH), Stockholm (SE), Prague (CZ) and Athens (GR)** (Table 14).

It is important to note that although we are expecting to receive datasets from a total of 14 cities with at least 5 years of AQ available data, this number may decrease in the future depending on the quality of the datasets.

***Table 14**: Health and air quality data availability per city.*

City (Country)	Station Name	Station Type	Population (2018)	Period	UFP PNSD	BC	PMx	Gases	OP	Meteorology	Mortality	Hospitalization	Lower size DL (nm)	PNSD Data avail. (%)
Barcelona (ES)	Palau Reial	Urban	1.620.343	**2013-2019**	✓	✓	10, 2.5, 1	SO₂, NO, NO₂, O₃, CO	10,2.5,1 (2018-19)	T, RH, P, RAD, WS, WD, RAIN	✓	✓	12.2	80
Madrid (ES)	CIEMAT-Moncloa	Urban	3.223.334	**2009-2019**	✓	✓	10, 2.5	SO₂, NO, NO₂, O₃, CO		T, RH, P, RAD, WS, WD, RAIN	✓	✓	15.1	53
Granada (ES)	UGR	Urban	232.208	**2017-2019**	✓	✓	10	SO₂, NO, NO₂, O₃, CO		T, RH, P, RAD, WS, WD	✓	✓	10.9	82
Budapest (HU)	CAAG	Urban	1.749.734	**2013-2019**	✓	No	10, 2.5	SO₂, NO, NO₂, O₃, CO		T, RH, P, RAD, WS, WD	✓	unavailable	10 (6)	88
Helsinki (FI)	Kumpula Campus	Urban	635.181	**2009-2019**	✓	✓	10, 2.5	SO₂, NO, NO₂, O₃, CO		T, RH, P, RAD, WS, WD	✓	request	10 (3)	98
	Mäkelänkatu	Traffic		2015-2019	✓	✓	10, 2.5	NO, NO₂, O₃, CO		T, RH, P, WS, WD			10 (6)	83
London (GB)	North Kensington	Urban	8.866.541[a]	**2009-2019**	✓	✓	10, 2.5, 1	SO₂, NO, NO₂, O₃, CO		T, RH, P	✓	✓	17	66
	Honor Oak Park	Urban		2018-2019	✓	✓	10, 2.5, 1	NO, NO₂, O₃		T, RH, P			17	31
	Marylebone Road	Traffic		2010-2019	✓	✓	10, 2.5, 1	SO₂, NO, NO₂, O₃, CO		T, RH, WS, WD			17	68
Zurich (CH)	Kaserne	Urban	402.762	**2010-2019**	✓	✓	10, 25	SO₂, NO, NO₂, O₃, CO	10, 2.5 (2018-19)	T, RH, P, RAD, WS, WD, RAIN	✓	✓	16.8	57
Marseille (FR)	Longchamp	Urban	862.211	**2018-2019**	✓	✓	10, 2.5, 1	SO₂, NO, NO₂, O₃		T, WS, WD	request	request	15.1	26
Lille (FR)	Villeneuve d'Ascq	SubUrban	232.440	**2017-2019**	✓	✓	10, 2.5	NO, NO₂, O₃		T, RH, P, RAD, WS, WD, RAIN	request	request	20.2	51
Grenoble (FR)	Les Frenes	Urban	433.000	**2017-2020**		✓	10,5	SO₂, NO₂, O₃	10		request	request		
Mülheim an der Ruhr (DE)	Mülheim an der Ruhr	Urban	171.265	**2009-2019**	✓	✓	10, 1	NO, NO₂		T, RH, RAD, WS, WD, RAIN	request	request	14.1	89
Paris (FR)	SIRTA	SubUrban	2.190.327	**2012-2019**	request	request	request	request		request	request	request	10.9	92*
Dresden (DE)	Winckelmannstraße	Urban	551.072	2010-2019	✓	request	request	request		request	request	unavailable	10	74
	North	Traffic		**2009-2019**	✓	request	request	request		request			10 (5)	79
Leipzig (DE)	Mitte	Traffic	581.980	2010-2019	✓	✓	request	request		request	request	unavailable	10	77
	Eisenbahnstraße	Traffic		2011-2019	✓	✓	request	request		request			10	76

	TROPOS	Urban		**2010-2019**	✓	✓	request	request		request			10	84
Rochester NY (US)	NYS DEC	Urban	210.606	**2009-2019**	request	request	request	request		request	request	request	11.1	90*
Stockholm (SE)	Hornsgatan	Traffic	949.761	**2010-2019**	Only CPC	request	10, 2.5, 1	NO, NO₂, CO		request	✓	✓	10	47*
Prague (CZ)	Schudol	SubUrban	1.294.513	**2009-2019**	request	ND	10, 2.5	NO, NO₂, NOₓ, SO₂, O₃, CO		request	✓	unavailable	10	86*
Athens (GR)	Thissio	Urban	664.046	2015-2019	request	request	request	request	2.5 (2017-20)	request	✓	unavailable	10	64*
	Demokritos	Suburban		**2009-2019**	request	request	request	request		request			10	74*

Color code:

AQ data available; Health data available	AQ data available; Health data under request	Both AQ and health data under request	Health data available; AQ data under request

Notes for the Table 14:

Datasets that contain less than 5 years and only one station are marked in red;

Datasets that contain 5 - 10 years (2009 - 2019) in at least one station are marked in black bold letters;

Cities that contained AQ data but were not on the health data list were removed from the table;

Source of population data: source: Eurostat, dataset: EU-28-LAU-2018-NUTS-2016;

Rochester: https://www.census.gov/;

[a]London (2018): Eurostat, dataset: URB_CPOP1;

[*]Based on 2017-2019 datasets (we didn't receive long datasets yet)