Data in Brief 57 (2024) 111070

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Dataset on concentrations of volatile organic compounds in indoor environments of offices, educational and residential buildings in the European Union between 2010 and 2023

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ARTICLE INFO

Article history:
Received 24 July 2024
Revised 27 September 2024
Accepted 17 October 2024
Available online 28 October 2024

Dataset link: The concentrations of volatile organic compounds in residential, office, and educational buildings in the Member States of the European Union between 2010 and 2023 (Reference data)

Keywords:
Indoor air quality
Indoor air pollution
Volatile organic compounds
European Union
Concentrations

ABSTRACT

Indoor air pollutants, such as volatile organic compounds (VOCs), include a range of hazardous substances that can accumulate in the indoor environments. As individuals spend 80–90 % of their daily time indoors, chronic exposure to VOCs has been recognised as an important public health concern. Therefore, measuring the concentration of indoor air pollutants is essential for improving indoor air quality and thereby reducing the associated burden of disease. Our objective was to generate a dataset on concentrations of VOCs measured in offices and in educational and residential buildings in the member states of the European Union between 2010 and 2023. Data were collected by means of systematic literature searches, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The search was carried out in the PubMed, Web of Science, and Scopus databases. In addition to data on VOC levels, information on types of buildings, seasons when the measurements

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https://doi.org/10.1016/j.dib.2024.111070

were performed, heating and ventilation systems, humidity and temperature at the sampling points, and methods used for sampling and analysis was collected. The dataset contains information on 18 VOCs and total volatile organic compounds (TVOC) from 101 original research papers. It consists of 19 worksheets, each with 46 columns, and the number of rows varies depending on the number of articles per VOC/TVOC, ranging from 11 to 576 rows. This dataset will be of use to public health professionals interested in using systematically collected data on VOC levels and corresponding reference concentrations to estimate the health risks associated with exposure to VOCs.

Specifications Table

Subject	Health and Medical Sciences; Environmental Science
Specific subject area	Public Health and Health Policy; Pollution
Type of data	Raw, Table, Filtered
Data collection	Data on the concentrations of 18 volatile organic compounds (VOCs) and total volatile organic compounds (TVOCs) in offices and in residential and educational buildings in the 27 member states of the European Union were extracted from studies reported between 2010 and 2023. Information on sampling and analytical methods used to determine VOCs were also collected. The data collected from the original articles are reported in a Microsoft Excel table.
Data source location	Department of Public Health and Epidemiology, Faculty of Medicine, University of Debrecen, Debrecen, Hungary, H-4028 Debrecen, Kassai Street 26 Latitude: 47.544062, 21° 38′ 25″ E Longitude: 21.64283, 47° 32′ 33″ N
Data accessibility	DOI: 10.17632/x4887snd8j.1 https://data.mendeley.com/datasets/x4887snd8j/1
Related research article	Pál L, Lovas S, McKee M, Diószegi J, Kovács N, Szűcs S. Exposure to volatile organic compounds in offices and in residential and educational buildings in the European Union between 2010 and 2023: A systematic review and health risk assessment. *Sci. Total Environ*. 2024; 945:173,965. 10.1016/j.scitotenv.2024.173965

1. Value of the Data

- This article presents data on the concentrations of various VOCs that contribute to indoor air pollution in offices, educational and residential buildings in the 27 member states of the European Union.
- The data can be used in further studies on indoor air quality and for researchers, architectural engineers, public health and environmental health professionals interested in designing and implementing more effective measures to improve indoor air quality.
- The data on VOC concentrations can be compared with results of past and future studies and with those carried out outside the European Union.
- The dataset can be useful for public health professionals as the systematically collected data can be used to compare VOC levels with the corresponding reference concentrations and estimate the health risks associated with exposure to VOCs.

2. Background

Indoor air quality (IAQ) refers to the condition of the air inside homes, educational buildings, offices, and other indoor environments. Factors such as outdoor weather conditions and occupants' habits can influence IAQ [1]. The outdoor conditions affect windows operation and use equipment including air conditioners, humidifiers, or heaters, all of which affect IAQ [2]. If ventilation or air conditioning is inadequate, certain weather conditions can increase the risk of excess moisture and mould growth indoors [3]. The main contributors to IAQ problems are pollutant sources that release gases or particles into the indoor air [4]. These pollutants can originate from numerous sources including cooking, smoking, construction materials, automobile exhaust from outside, household cleaning products as well as dust mites and various pets [5]. Proper ventilation is crucial for ensuring good IAQ in both residential and public buildings [6,7]. However, mechanical ventilation systems are often costly and, as a result, are frequently lacking in homes, small offices, meeting rooms, classrooms, and even in hospital outpatient areas and wards. In such environments, natural ventilation is typically used to manage IAQ, achieved by opening windows and doors [8,9].

Indoor air pollutants, such as volatile organic compounds (VOCs), include a range of hazardous substances that can accumulate in indoor environments [10]. VOCs are present in numerous everyday products, such as paints, varnishes, waxes, and various cleaning, degreasing, and cosmetic products [11]. VOCs comprise a substantial portion of indoor air pollutants, consisting primarily of aromatic and aliphatic hydrocarbons along with alcohols, aldehydes, ketones, and esters [12]. Exposure to high indoor concentrations of VOCs can cause a variety of adverse health effects such as headaches and nausea, and can lead to increased susceptibility to respiratory infections, development of allergic diseases and asthma [13]. In addition, some of these compounds, including benzene and formaldehyde, are known human carcinogens [14].

As individuals spend 80–90 % of their time indoors, chronic exposure to VOCs is recognised as an important public health concern [15]. Indoor air pollution is estimated to cause more than two million disability-adjusted life years in Europe annually [16]. Over the past decade, research on air quality control has increasingly focused on the indoor environments, reflecting lifestyle changes associated with rising levels of urbanization [17]. Therefore, knowledge of concentrations of indoor air pollutants is essential for improving indoor air quality and thereby reducing the associated burden of disease [18].

Research has shown that indoor concentrations of VOCs are typically 2 to 5 times higher than those found outdoors [19,20]. In certain cases, such as during paint stripping and for several hours afterwards, VOC levels can reach up to 1000 times the typical outdoor background levels [19,20]. Based on their public health significance, our primary objective was to generate a dataset on concentrations of VOCs measured in offices and in educational and residential buildings in the member states of the European Union between 2010 and 2023. This was undertaken to provide researchers working on indoor air pollution with a comprehensive and transparent database suitable for further analysis and health risk assessment. The dataset encompasses all relevant indoor air quality parameters derived from the original research articles.

3. Data Description

The database contains information on total volatile organic compounds (TVOCs) and 18 specific VOCs and is summarized in a 46-column Excel table. The data for the individual VOCs are presented in separate worksheets. In addition to the name of the individual VOCs, columns 1 to 8 of the Excel table provide an overview of the countries and publications from which data on VOC concentrations were extracted (Table 1A).

Columns 9 to 17 of the table report information on the time and season of sampling, the type of environment and building, and the number of buildings where VOC concentrations were measured (Table 1B).

Table 1A
Overview of the countries and publications from which data on VOC concentrations were extracted.

1. Pollutant	2. Country	3. Region	4. Settlement	5. Author	6. Title of the article	7. Date of publishing	8. Digital Object Identifier (DOI)
benzene	France			Ramalho et al.	Association of carbon dioxide with indoor air pollutants and exceedance of health guideline values	2015	10.1016/j.buildenv.2015.03.019
benzene	Poland	Upper Silesia	Gliwice	Kozielska et al.	Investigation of indoor air quality in offices and residential homes in an urban area of Poland	2020	10.1007/s11869-019-00777-7
formaldehyde	Croatia	Baranya County	Osijek	Brdarić et al.	Indoor air pollution with benzene, formaldehyde, and nitrogen dioxide in schools in Osijek, Croatia	2019	10.1007/s11869-019-00715-7
hexane	Italy		Milan, Florence	Mandin et al.	Assessment of indoor air quality in office buildings across Europe – The OFFICAIR study	2017	10.1016/j.scitotenv.2016.10.238
toluene	Italy	Rezzoaglio	Villanoce Village	Piccardo et al.	Indoor pollution and burning practices in wood stove management	2014	10.1080/10962247.2014.943353

Table 1B
Information on the sampling, environment and building types, and number of buildings investigated.

9. Year of sampling	10. Season	11.	12.	13.	14.	15. Type of building	16. Specific type of building	17. Number of buildings investigated
		Environment						
		Urban	Suburban	Rural	Not specified			
	Heating season				x	Educational building	Nursery	
2017	Spring	x				Office		6
2012	Spring	x				Educational building		2
2012–2013	Summer				x	Office		4
2007–2008	Summer			x		Residential building	Family house	9

Columns 18 to 26 of the table present information on the heating and ventilation systems, heating fuel type, temperature and humidity at the sampling point, year of construction or renovation of the building examined, and the number of samples analyzed (Table 1C).

The table shows the mean, median, minimum, maximum and percentile values of the VOC concentrations in columns 27–40 (Table 1D).

Finally, the table lists the sampling methods, sampling period, and analytical method used to determine the concentration of VOCs in columns 41–45 (Table 1E).

3.1. Characterization of the dataset

To provide insight into the dataset, we collected data on temperatures at sampling points (Table 2), VOCs measured in EU Member States (Tables 3A–E) and the number of publications reporting VOC concentrations between 2010 and 2023 (Table 4).

4. Experimental Design, Materials and Methods

4.1. Literature search

Systematic literature searches were carried out according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines in PubMed, Web of Science, and Scopus databases [21]. The search strategy incorporated the chemical names of VOCs commonly found in indoor environments including benzene, toluene, ethylbenzene, xylenes, styrene, acetaldehyde and formaldehyde [22,23]. In addition to these VOCs, butadiene, butanone, butylacetate, carbon tetrachloride, chloroform, cyclohexane, dichlorobenzene, dichloroethane, hexane, tetrachloroethylene, and trichloroethylene were selected for the literature review as they have been reported to cause at least one of the following adverse health effects: respiratory toxicity, cardiovascular toxicity, neurological toxicity, irritation, and increased carcinogenic risk [24–28]. Additionally, our search strings included the names of the 27 countries that were part of the European Union in 2023, terms such as indoor, indoor air, and indoor air quality and words related to different types of buildings, such as educational building, office, house, and their synonyms. Key words used in the systematic literature searches are presented in Fig. 1.

4.2. Screening and selection studies for data extraction

The systematic literature searches yielded 1783 articles. Following the removal of duplicates, the titles and abstracts of 984 papers were independently reviewed by two authors using Zotero reference management software (version 6.0.30) to identify relevant articles. Disagreements between reviewers were resolved by discussion, until consensus was reached. Articles found to be relevant were read in full text and were selected for data extraction if they were published in English between January 2010 and January 2023 and reported data on concentrations of the selected indoor VOCs in residential, educational, or office buildings. Papers were excluded if they reported concentrations of outdoor air pollutants or indoor VOCs that were not included in our search strategy. Additionally, papers were excluded if they presented concentrations of VOCs in indoor environments other than residential, educational, or office buildings. To ensure comparability between studies, only those using active or passive samplers and gas chromatography (GC) or high-performance liquid chromatography (HPLC) with various detectors were included. The reference lists of the review articles were manually searched for additional relevant papers. A further 11 studies were identified in this way (Fig. 2).

Table 1C
Information on the type of heating and ventilation systems, indoor climate parameters at the sampling point, age of the building and the number of samples analyzed.

18. Heating system	19. Type of heating fuel	20. Ventilation	21. Temperature at sampling point [°C]	22. Relative humidity at sampling point	23. Absolute humidity at sampling point [g/kg]	24. Year of construction	25. Year of renovation	26. Number of samples analyzed
			21.7	40.8				171
		natural ventilation	22.0			2014		
centralized heating system		natural ventilation				older than 50 years	renovated in the last 5 years	
		mechanical ventilation	24.7	43.4				16
stove	wood	natural ventilation	19.6			before 1945		18

Table 1D
Data collected on the concentrations of volatile organic compounds indoors.

27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
Concentration [µg/m^3]					Percentiles								
Mean	SD	Median	Min	Max	5th	10th	25th	50th	75th	90th	95th	98th	99th
3	1	2.8	1.2	6.5		1.7	2.2	2.8	3.6	4.3			
1.13	0.66		0.17	2.56									
10.7													
1.2	0.4												
30.38	41.77		4.19	130.53									

Table 1E
Information on the sampling and analytical methods used to determine the concentration of volatile organic compounds.

41. Note	42.	43. Sampling methods	44.	45. Analytical method
	active/passive	location of sampling point	duration of sampling	
	passive	playrooms	4.5 days	gas chromatography/flame ionization detector; gas chromatography/mass spectrometry
	active	1.5 m above the floor	8 h	gas chromatography/flame ionization detector
School A - Classroom A1 (ground floor)	passive	classroom	78 h (one school week)	high-performance liquid chromatography and UV absorption detector
	passive	at the height of the breathing zone of seated occupants, i.e., approximately 110 cm	5 days	gas chromatography/mass spectrometry
room 1	passive	center of the room, fixed under the swing lamp	8 days	gas chromatography/flame ionization detector

4.3. Extraction of data from the selected articles

Five authors extracted data on the concentrations of VOCs in office, educational and residential buildings using a standardised data extraction form. Furthermore, the supplementary material of the selected papers was also accessed to obtain additional data. Minimum, maximum, median, percentile values and standard deviations of VOCs concentrations were recorded. The following information were also entered into the database: the first author's name, the article title, the country and specific region of the study, publication and sampling dates, the type of environment (urban, suburban, rural), the number of buildings investigated, sampling conditions (air temperature and humidity), and the methods used for sampling and analysis. Concentrations reported in ppm were converted to µg/m^3 except for TVOCs, where this conversion was not possible.

To ensure the quality of the database, three authors reviewed the extracted data for any potential inconsistencies and regular meetings were held to resolve any conflicting records.

Table 2
Minimum and maximum indoor temperatures at sampling points.

indoor air pollutant	residential buildings [min-max* °C]	offices [min-max °C]	educational buildings [min-max °C]
acetaldehyde	15.9–25.3	22.0–31.2	20.4–25.9
benzene	15.9–25.3	21.7–31.2	18.5–23.7
butadiene	23.2–25.5	ND+	ND
butanone	22.0	ND	ND
butylacetate	15.9–25.3	21.7–24.9	ND
carbon tetrachloride	22.0	ND	ND
chloroform	22.0	ND	ND
cyclohexane	ND	ND	ND
dichlorobenzene	18.5–22.0	ND	18.5–23.0
dichloroethane	ND	ND	ND
ethylbenzene	15.9–25.3	21.0–31.2	18.5–25.9
formaldehyde	15.9–25.3	22.0–31.2	15.5–27.0
hexane	ND	22.9–25.9	20.4–23.0
styrene	17.5–25.3	21.0–26.6	18.5–25.9
tetrachloroethylene	16.7–22.0	19.3–30.2	18.5–25.9
toluene	15.9–25.3	21.0–31.2	18.5–25.9
trichloroethylene	18.5–22.0	23.9–26.6	18.5–25.9
TVOC+	17.5–22.5	22.5–24.7	13.1–25.9
xylenes	15.9–25.3	21.0–31.2	18.5–25.9

* Values shown are average or minimum and maximum temperatures obtained from those articles in which data on temperature at sampling point was reported.
+ ND: no data; TVOC: Total Volatile Organic Compounds.

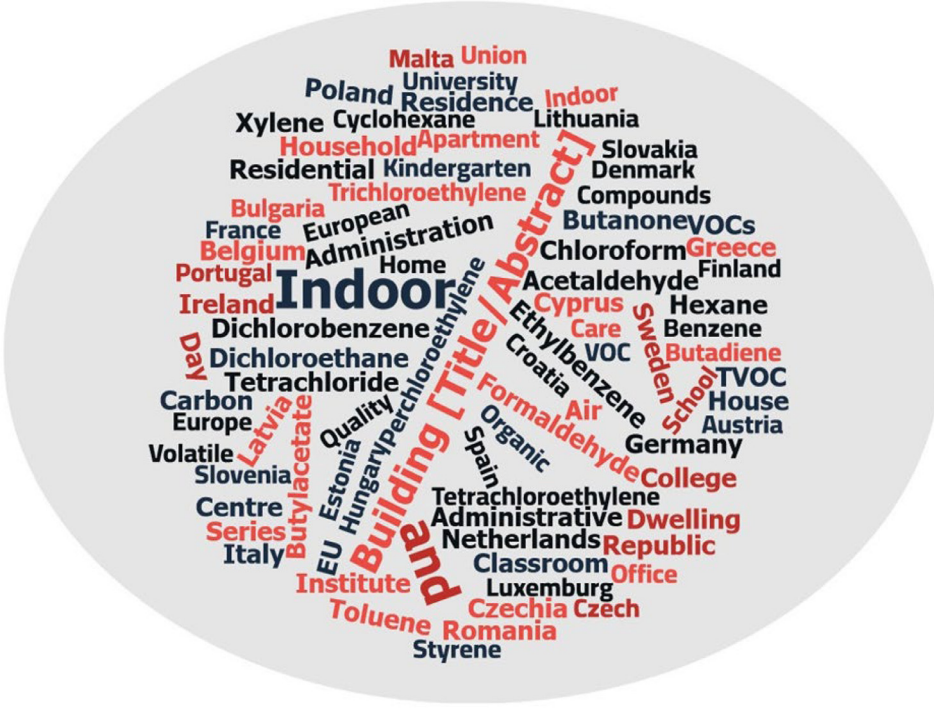

Fig. 1. Keywords used in search strings for systematic literature searches. The detailed search strategy can be found in the supplementary material of the related research article (doi:10.1016/j.scitotenv.2024.173965).

Table 3A
Volatile organic compounds analyzed in the member states of the European Union by building types between 2010 and 2023.

indoor air pollutant	type of building	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
acetaldehyde	residential building		x		x		x			x	x	x	x		x	x	x					x	x	x	x			
	office		x		x	x	x			x	x	x	x		x	x	x					x		x	x			
	educational building		x		x	x	x			x	x	x	x		x	x	x					x	x	x			x	
benzene	residential building		x		x		x			x	x	x	x		x	x	x	x				x	x	x	x	x		x
	office		x		x	x	x			x	x	x	x		x	x	x					x	x	x	x			
	educational building		x		x	x	x			x	x	x	x	x	x	x	x					x	x	x			x	
butadiene	residential building																								x			
	office																											
	educational building										x																	
butanone	residential building																								x			
	office																											
	educational building										x		x															

The “X” indicates the EU country where the concentration of the indoor air pollutant in concern was measured. Abbreviations: AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DE: Germany, DK: Denmark, EE: Estonia, EL: Greece, ES: Spain, FI: Finland, FR: France, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxemburg, LV: Latvia, MT: Malta, NL: Netherlands, PL: Poland, RO: Romania, SE: Sweden, SI: Slovenia, SK: Slovakia.

Table 3B
Volatile organic compounds analysed in the member states of the European Union by building types between 2010 and 2023.

indoor air pollutant	type of building	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
butylacetate	residential building						x						x											x	x			
	office											x												x			
	educational building																x											
carbon tetrachloride	residential building						x																		x			
	office																											
	educational building										x																	
chloroform	residential building										x														x			
	office																											
	educational building										x																	
cyclohexane	residential building						x																					
	office																											
	educational building										x																	

The “X” indicates the EU country where the concentration of the particular indoor air pollutant was measured. Abbreviations: AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DE: Germany, DK: Denmark, EE: Estonia, EL: Greece, ES: Spain, FI: Finland, FR: France, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxemburg, LV: Latvia, MT: Malta, NL: Netherlands, PL: Poland, RO: Romania, SE: Sweden, SI: Slovenia, SK: Slovakia.

Table 3C
Volatile organic compounds analyzed in the member states of the European Union by building types between 2010 and 2023.

indoor air pollutant	type of building	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
dichlorobenzene	residential building										x		x										x		x			
	office																											
	educational building										x		x				x											
dichloroethane	residential building																											
	office																											
	educational building										x																	
ethylbenzene	residential building		x		x		x			x	x	x	x		x	x	x	x				x	x	x	x			x
	office		x		x	x	x			x	x	x	x		x	x	x					x	x	x				
	educational building	x	x		x	x	x			x	x	x	x		x	x	x					x	x	x	x		x	
formaldehyde	residential building	x	x		x		x	x		x	x	x	x		x	x	x	x				x	x	x	x	x		x
	office		x		x	x	x			x	x	x	x		x	x	x					x		x	x			
	educational building	x	x		x	x	x			x	x	x	x	x	x	x	x					x	x	x	x	x	x	
hexane	residential building		x		x		x			x		x			x	x	x					x						
	office		x		x		x			x	x	x	x		x	x	x					x		x				
	educational building		x		x		x			x	x	x			x	x	x					x		x				

The “X” indicates the EU country where the concentration of the indoor air pollutant in concern was measured. Abbreviations: AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DE: Germany, DK: Denmark, EE: Estonia, EL: Greece, ES: Spain, FI: Finland, FR: France, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxemburg, LV: Latvia, MT: Malta, NL: Netherlands, PL: Poland, RO: Romania, SE: Sweden, SI: Slovenia, SK: Slovakia.

Table 3D
Volatile organic compounds analysed in the member states of the European Union by building types between 2010 and 2023.

indoor air pollutant	type of building	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
styrene	residential building		x		x		x			x	x	x	x		x	x	x	x				x	x	x	x			
	office				x		x			x	x	x	x		x	x	x					x	x	x				
	educational building		x		x	x	x			x	x	x	x		x	x	x					x	x	x	x		x	
tetrachloroethylene	residential building										x		x					x						x	x			
	office												x		x		x							x	x			
	educational building					x					x		x		x		x						x	x	x		x	
toluene	residential building		x		x		x			x	x	x	x		x	x	x	x				x	x	x	x	x		x
	office		x		x	x	x			x	x	x	x		x	x	x					x	x	x				
	educational building		x		x	x	x			x	x	x	x		x	x	x					x	x	x	x		x	
trichloroethylene	residential building						x				x		x					x							x			
	office									x			x															
	educational building					x					x		x	x			x						x		x		x	

The “X” indicates the EU country where the concentration of the particular indoor air pollutant was measured. Abbreviations: AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DE: Germany, DK: Denmark, EE: Estonia, EL: Greece, ES: Spain, FI: Finland, FR: France, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxemburg, LV: Latvia, MT: Malta, NL: Netherlands, PL: Poland, RO: Romania, SE: Sweden, SI: Slovenia, SK: Slovakia.

Table 3E
Volatile organic compounds analysed in the member states of the European Union by building types between 2010 and 2023.

indoor air pollutant	type of building	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
TVOC	residential building	x	x							x						x								x	x	x		x
	office											x										x						
	educational building									x	x	x											x	x		x		
xylenes	residential building		x		x		x			x	x	x	x		x	x	x	x				x	x		x	x		x
	office		x		x	x	x			x	x	x	x		x	x	x					x	x	x				
	educational building	x	x		x	x	x			x	x	x	x		x	x	x					x	x		x		x	

The “X” indicates the EU country where the concentration of the indoor air pollutant in concern was measured. Abbreviations: TVOC: total volatile organic compounds, AT: Austria, BE: Belgium, BG: Bulgaria, CY: Cyprus, CZ: Czech Republic, DE: Germany, DK: Denmark, EE: Estonia, EL: Greece, ES: Spain, FI: Finland, FR: France, HR: Croatia, HU: Hungary, IE: Ireland, IT: Italy, LT: Lithuania, LU: Luxemburg, LV: Latvia, MT: Malta, NL: Netherlands, PL: Poland, RO: Romania, SE: Sweden, SI: Slovenia, SK: Slovakia.

Table 4
Number of papers reporting data on the concentrations of volatile organic compounds in indoor environments.

indoor air pollutant	residential buildings	offices	educational buildings
acetaldehyde	16	7	11
benzene	7	10	10
butadiene	1	0	1
butanone	1	0	2
butyl-acetate	4	2	1
carbon tetrachloride	2	0	2
chloroform	2	0	2
cyclohexane	1	0	1
dichlorobenzene	6	0	3
dichloroethane	0	0	2
ethylbenzene	26	9	20
formaldehyde	31	9	26
hexane	3	3	6
styrene	15	5	15
tetrachloroethylene	8	2	7
toluene	31	9	21
trichloroethylene	7	1	4
TVOC[a]	11	2	17
xylenes	29	9	22

[a] TVOC: Total Volatile Organic Compounds.

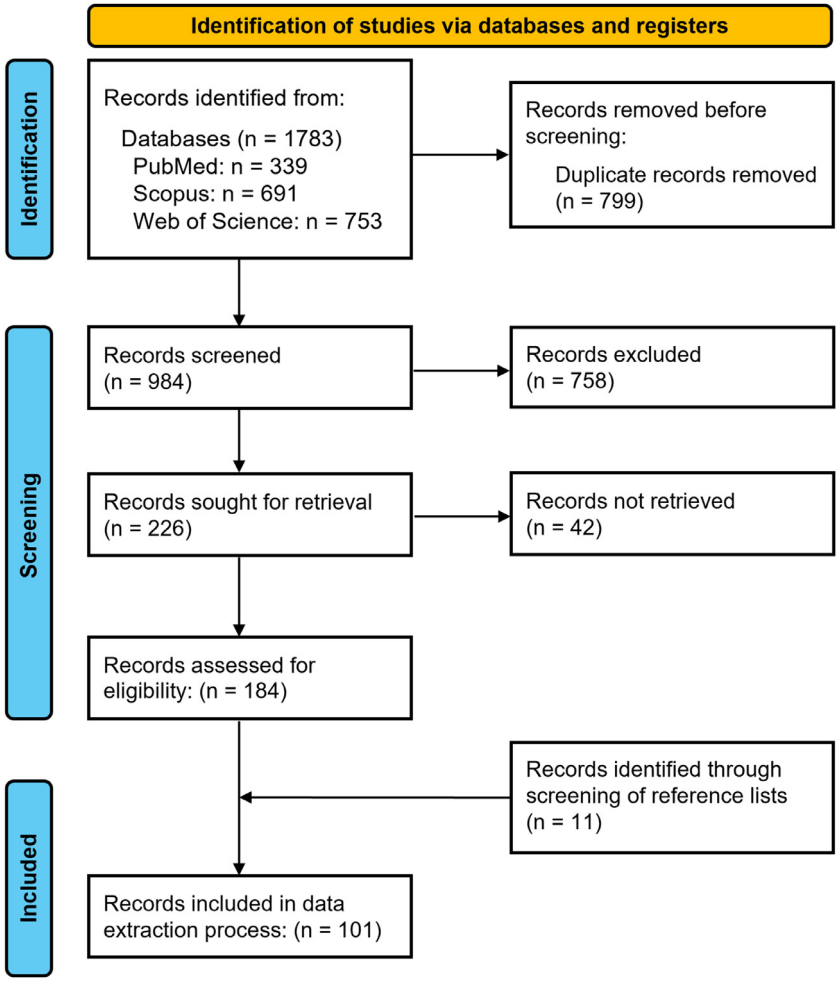

Fig. 2. PRISMA flowchart of literature search to identify papers for data extraction.

Limitations

The selected articles reported the sampling conditions in different levels of detail. Only some provided information on the type of heating and ventilation, temperature and humidity at the sampling point. Data on the concentration of VOCs were reported in different manners. Several articles only reported the mean VOC concentrations, while others presented additional parameters such as standard deviation, median, minimum, maximum, and percentile values.

Ethics Statement

The authors have read and follow the ethical requirements for publication in Data in Brief and confirming that the current work does not involve human subjects, animal experiments, or any data collected from social media platforms.

Credit Author Statement

Szabolcs Lovas: Conceptualization, Data Curation, Investigation, Formal analysis, Software, Writing – original draft; **László Pál:** Conceptualization, Data Curation, Investigation, Methodology, Software, Supervision, Writing – review & editing; **Nóra Kovács:** Data Curation, Investigation, Software; **Judit Diószegi:** Data Curation, Investigation, Software; **Martin McKee:** Writing – review & editing; **Sándor Szűcs:** Conceptualization, Data Curation, Investigation, Methodology, Software, Supervision, Writing – review & editing.

Data Availability

The concentrations of volatile organic compounds in residential, office, and educational buildings in the Member States of the European Union between 2010 and 2023 (Reference data) (Mendeley Data).

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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