8.41 Ambient pollen concentration

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Ambient pollen concentration	**Green Space Management** **Air Quality**
Description and justification	Urban green spaces frequently have a limited number of plant species, including a higher proportion of non-native species in comparison with rural areas (McKinney, 2002). The low species diversity in many urban areas is directly linked to the formation of concentrated pollen emission sources. In particular, large-scale use of a small number of roadside tree species results in production of large quantities of a single species of pollen. Areas of concentrated pollen may not be readily dispersed by air currents. Some studies indicate that urban citizens are 20% more likely to suffer airborne pollen allergies than people living in rural areas, largely due to the uniformity of green spaces, where a small number of species that have proved highly suited to urban environmental conditions are overwhelmingly used, and the interaction of pollen with air pollutants (Cariñanos & Casares-Porcel, 2011).
Definition	Number of grains of pollen per cubic metre of air (pollen grains/m^3)
Strengths and weaknesses	The method of identifying and characterising trapped pollen and spores is time-consuming and requires considerable expertise, but the results are widely accepted and known to be consistent.
Measurement procedure and tool	The volumetric Hirst-type pollen and spore trap designed in 1952 remains one of the devices most commonly used for pollen and spore monitoring (Buters et al., 2018). The Hirst-type trap is standard in pollen monitoring networks in Europe. The Hirst-type pollen and spore trap uses a vacuum pump to continuously draw air at a known rate (e.g., 10 L/min). A wind vane attached to the sampler head ensures that the trap inlet is always facing the prevailing wind. Depending on the configuration of the trap, pollen and spores are captured on adhesive coated transparent plastic tape (Melinex) or on a microscope slide coated with an adhesive. Adhesive tapes are attached to a metal drum that rotates with time.

	Pollen traps can be fitted with a drum specific to a 24-h or a 7-day sampling period. At the conclusion of the sampling period, the tape with adhered pollen and spores is cut into pieces representing 24-h periods of time and mounted on a microscope slide. Where the pollen and spores are captured directly on a microscope slide, the slide must be changed every 24 h. These slides are examined by microscopy for counting and identification of pollen and spores.
Scale of measurement	Plot to neighbourhood scale
Data source	
Required data	Pollen measurement data
Data input type	Quantitative
Data collection frequency	Continuous collection with a 24 h or a 7-day sampling period
Level of expertise required	Moderate
Synergies with other indicators	Synergies with *Distribution of public green space*, *Accessibility of urban green spaces,* and *Proportion of natural area,* and *Availability and equitable distribution of blue-green space* indicators
Connection with SDGs	SDG 3 Good health and well-being, SDG 15 Life on land
Opportunities for participatory data collection	No opportunities identified
Additional information	
References	Buters, J.T.M., Antunes, C., Galveias, A., Bergmann, K.C., Thibaudon, M., Galán, C. … & Oteros, J. (2018). Pollen and spore monitoring in the world. Clinical and Translational Allergy, 8, 9. Cariñanos, P., & Casares-Porcel, M. (2011). Urban green zones and related pollen allergy: A review. Some guidelines for designing spaces with low allergy impact. Landscape and Urban Planning, 101(3), 205-214. McKinney, M. (2002). Urbanization, Biodiversity, and Conservation: The impacts of urbanization on native species are poorly studied, but educating a highly urbanized human population about these impacts can greatly improve species conservation in all ecosystems. BioScience, 52(10), 883-890.