Need for an EU one health-in-all-policies approach: Addressing the allergy and asthma epidemic

Report

European Allergy and Asthma Youth Parliament

Co-hosted by MEP Sirpa Pietikäinen (EPP, Finland) and MEP Juozas Olekas (S&D, Lithuania)

EFA
European Federation of Allergy and Airways Diseases Patients' Associations

Allergy Asthma
European Parliament Interest Group

‘Need for an EU One Health-in-all-policies approach: addressing the allergy and asthma epidemic’ event at the European Parliament.

Context

On 4 July 2023, the European Parliament Interest Group on Allergy & Asthma held the policy event ‘Need for an EU One Health-in-all-policies approach: addressing the allergy and asthma epidemic’, co-hosted by the Chair of the Group MEP Sirpa Pietikäinen (EPP, Finland) and Vice-Chair MEP Juozas Olekas (S&D, Lithuania). The event took place in hybrid format, with over 60 participants joining in-person and online.

The event examined the huge impact of bioaerosols on human health. Bioaerosols are airborne particles or droplets that contain living organisms or their byproduct, such as pollen, fungi, moulds, bacteria or viruses. They are dispersed into the air through various natural and human activities, playing a significant role in environmental and public health.

Bioaerosols are typically linked with major chronic diseases such as allergy and asthma. With over 100 million Europeans living with allergic rhinitis and/or asthma, those are the most common non-communicable disease among children and the second most common among adults. The direct and indirect costs of the disease are calculated between €50 and150 billion annually.

Introduction

The focus of the meeting was to update on the innovative ways to study, monitor and communicate about the presence of bioaerosols in the air. Speakers discussed about and how to translate the high-level scientific results and technologies into to daily and regulatory tools to benefit human health.

MEP Juozas Olekas, in his opening remarks, "Bioaerosols have a huge impact on human health not only impacting lives of allergy and asthma patients but also agriculture, destroying crops and causing environmental damage. Climate change has already influenced the lives of allergy patients contributing to earlier and longer pollen seasons and increased aeroallergy concentration".

This phenomenon is expected to only increase in the upcoming years and, as pollen increases, so it will the social demand for information on aeroallergens. The situation provides an impetus for improved monitoring and communication tools. Including bioaerosols in relevant European legislation would entail multiple benefits: better information, improved quality of life, the protection of biodiversity but also millions of euros that are paid in healthcare per year.

EU One Health-in-all policies, allergy and asthma

Ms **Isabella Annesi-Maesano**, Professor of respiratory epidemiology at the University of Montpellier, set the scene of how bioaerosols, especially allergenic ones, are an integral part of the One Health approach (where human health is tightly connected to the health of animals and the environment). Bioaerosols are essential in nature as they serve biological reproduction and participate in the process of cloud formation and precipitations. However, exposure to bioaerosols undermine our immune systems, leading to allergy, respiratory diseases, infections, fatigue, etc.

Prof **Annesi-Maesano** used two examples to show the effects of climate change on health through the proliferation of bioaerosols. Firstly, there are strong associations between asthma attacks and asthma-related emergency hospitalisations and the increase in grass pollen concentration, which are a direct effect of the higher temperatures experienced. Secondly, people with asthma experience asthma and even hospitalisations just before a thunderstorm, as this meteorological phenomenon revolves the air and increases pollen dispersion. Such symptoms are known as “thunderstorm asthma” and they can be become more frequent as thunderstorms are expected to increase to climate change.

According to Prof. Annesi-Maesano, addressing the challenges associated with bioaerosols requires a comprehensive and interdisciplinary One Health approach, instilling collaboration between public health officials, environmental scientists, veterinarians, and other relevant stakeholders. The key measures should focus on monitoring and surveillance, risk assessment, control and mitigating strategies, education and awareness, as well as research and innovation.

One Health in the air: the case of bioaerosols

Mr **Vicent-Henri Peuch**, Head of the Copernicus Atmosphere Monitoring Service (CAMS) discussed the use of atmospheric data to support novel services to improve health. Environmental data has become much more ubiquitous in recent years, a development that has enabled the assessment of environmental effects on health.

For example, the monitoring of pollutants from the space was one of the first sources of information showing the implications of lockdown measures everywhere on the planet. Moreover, geostationary observation of air quality is becoming a reality, which is set to be a major game changer in the monitoring of environmental trends. Mr Peuch explained that, to monitor bioaerosols, the model needs to be adapted according to the emission, in order to see how different plant species bloom, and the intensity of flowering, as well as other aspects such as the travelling of bioaerosols in the atmosphere.

Today, Copernicus disseminates daily forecasts for six pollens (birch, grass, olive, ragweed, alder, mugwort) up to four days in advance, based on projections from 11 individual models developed and operated across Europe. Copernicus has launched a 'Health Hub', to share relevant data on pollen and other environmental aspects to support expand knowledge on the environmental impact on health.

Scanning bioaerosols: state-of-the-art on detection technologies

Mr **Carsten Ambelas Skjøth**, Professor at the Department of Environmental Science at the Aarhus University presented the state-of-the-art on detection technologies for bioaerosols. Bioaerosols are complex to measure, as only a few instruments have been designed to date to capture the full-size range, and the efficiency varies according to on the particle size. At the backbone of European pollen and spore monitoring networks lies the Impactor, an instrument that is simple in its functioning but requires laboratory work, and is therefore time-consuming.

Another method is the DNA method, which requires a collection of bioaerosol material using a range of instruments but has similar results as the impactor in terms of advantages and disadvantages. There are also real-time methods of monitoring, which use image recognition, laser scattering, holograms recognition, together with artificial intelligence (AI). Their main advantage is that data is provided real-time, which improves forecasting accuracy.

Better prevention: bioaerosols forecasting and dissemination

Mr **Mikhail Sofiev**, research professor of atmospheric composition modelling at the Finnish Meteorological Institute, discussed the potential for better prevention through the use of bioaerosol forecasting and dissemination. Prof. Sofiev presented the models that in the last 15 years have evolved from research studies to comprehensive tools suitable to have bioaerosols operations.

There are several models that coexist at the moment such as Copernicus, SILAM and COSMO-ART. Several pollen forecast applications have also developed and cover the Alpine region, Northern Europe, and specific countries.

Several pollen forecast applications have also developed and cover the Alpine region, Northern Europe, and specific countries. Due to climate change and the changing environment, there is now also the first European Pollen Reanalysis (1980-2022), which is based on pollen information collected in the last 40 years. Prof. Sofiev stressed that models, together with observations, work: in 2020, ragweed pollen blown towards Finland was predicted by SILAM four days in advance.

Allergy and asthma patients' viewpoint: disease prevention, burden, and information gaps

Bringing the patients' perspective, Ms Isabel Proaño highlighted the impact bioaerosols have on the European population, due to increasing allergy and asthma prevalence, ever rising temperatures, and the expansion of allergenic species. As pollen allergy often starts in childhood, it has a debilitating impact, affecting the quality of life as a whole during the life course. Moreover, pollen is linked with increased socioeconomic costs, leading to overall costs of approximately 7.4 billion EUR per year in Europe. Such a burden and prevalence projections calls for EU-wide action.

While there are various initiatives that contribute to bringing forward evidence and increase awareness on the effects of bioaerosols on health, there is a need to reinforce the breathing chapter of the EU One Health approach, connecting the dots between climate change, plant health and human health. Ms Proaño shared that patients would like the EU to adopt a holistic framework for air quality, moving from the partial regulation of industrial emission sources to a truly public health approach to air quality, one that fully embeds bioaerosols, and provides with pollen monitoring, evaluation, information, and ultimately leads to better prevention and care.

Patients' needs: opportunities to improve disease prevention

Mr **Thanos Damialis**, Associate Professor of Terrestrial Ecology and Climate Change at the Aristotle University of Thessaloniki, discussed the patients' needs, through the eyes of an asthmatic researcher. Prof. Damialis explained that pollen seasons are shifting earlier, coinciding with viruses' season. This coexistence and the fact that pollen counts are increasing is weakening our innate defence against respiratory viruses, and increasing the infection rate in some viruses.

With such developments, it is important for the EU to support the current and future generations' health and well-being by integrating bioaerosols monitoring in urban planning and by having standard air quality campaigns.

Joint Statement

Need for an EU One Health-in-all-policies approach: addressing the allergy and asthma epidemic

As part of the One-Health-in-all-Policies approach event, the organisers launched a Joint Statement on the need to address the allergy and asthma pandemic. Presented by Prof. Dr. Ingrida Šaulienė,Vilnius University, Lithuania, the statement summarised the interventions of the speakers, referring to the impact of aeroallergens and the overall global warming on health, and highlighting the significant gap in European legislation addressing the developments.

The co-signatories of the Joint Statement recommend EU policymakers the following:

- To improve the legislative framework to include monitoring of semi-natural pollutants such as aeroallergens (pollen and fungal spores) in the EU legislation;
- To develop open and trusted communication channels (e.g. through CAMS), that provide reliable, accurate and timely information about aeroallergen concentrations in real time;
- To encourage further research on the effects of pollen and spores on health, including in the presence of other pollutants, based on the new data these efforts will provide;
- To facilitate the development of technology and infrastructure to further extend agricultural applications of bioaerosols monitoring and forecasting.

Such measures will help to reduce the disease burden and health inequalities, reduce agricultural losses and environmental damage, and improve our understanding of the complex relationship between exposure, climate, and One Health.

Q&A session

During the discussion with the audience, one participant asked whether Europe can have thunderstorm asthma. Ms Annesi-Maesano explained that this is a phenomenon that happens when the pollens before the thunderstorm go up because of the turbulence of the air, and these small pieces of pollen can be breathed by people. The phenomenon, which is particularly dangerous for people who have allergic predisposition, or for asthmatics, and number of thunderstorms has been increasing in Europe too, due to climate change. Mr Damialis added that thunderstorm asthma exists in Europe, but it became more prevalent in the last couple of years. Thunderstorms are especially present now, as we changed the climate radically, with the Mediterranean area predicted to have a sub-tropical climate by 2050 by IPCC, which means the number of thunderstorms will be increasing.

Another participant inquired about whether there is critical coverage of measurement stations across Europe that will allow us to rely on bioaerosol forecast models as we do in case meteorology forecasts. Mr Sofiev mentioned that there are around 50 stations at the moment, but the models are not using the data in real time for now. However, this is the next step, and once it will change, it will be a game changer.

Closing remarks

In his closing remarks, MEP Olekas thanked all the participants for joining the event, and welcomed the productive discussion, which paves the way for further discussion in the newly launched sub-committee on public health (SANT Committee), with the possibility of changing the policy at the European level.

Read the full joint statement here.
Watch the recording of the event here.

The European Parliament Interest Group on Allergy and Asthma was launched on 25 March 2015 as a result of a long-standing collaboration between the European Academy of Allergy and Clinical Immunology (EAACI), the European Federation of Allergy and Airways Diseases Patients' Associations (EFA), and a group of forward-thinking Members of the European Parliament (MEPs), who are committed to fight against allergy and asthma in Europe.

To find out more about the European Parliament Interest Group, contact:
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