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**Steering Body to the Cooperative Programme for
Monitoring and Evaluation of the Long-range
Transmission of Air Pollutants in Europe**

Working Group on Effects

First joint session*

Geneva, 14–18 September 2015

Item 15 of the provisional agenda

**Progress in activities in 2015 and further development
of effects-oriented activities**

Effects of air pollution on health**

Report by the Joint* Task Force on the Health Aspects of Air
Pollution on its eighteenth meeting**

Summary

The present report is being submitted for the consideration of the first joint session of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) Steering Body and the Working Group on Effects in accordance with the request of the Executive Body for the Convention on Long-range Transboundary Air Pollution in the 2014–2015 workplan for the implementation of the Convention (ECE/EB.AIR/122/Add.2, items 1.1.0, 1.2.3 and 1.2.4).

* The Executive Body to the Convention agreed that, as of 2015, the Working Group on Effects and the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe should meet jointly, to achieve enhanced integration and cooperation between the Convention's two scientific subsidiary bodies (ECE/EB.AIR/122, para. 47 (b)).

** The present document is being issued without formal editing.

*** The Task Force is a joint body of the World Health Organization (WHO)/European Centre for Environment and Health (ECEH) and the Executive Body for the Convention on Long-range Transboundary Air Pollution



The report presents the results of the discussions on the health impacts of ambient air pollution as well as a summary of progress on the other workplan items discussed at the Task Force's eighteenth meeting (Bonn, Germany, 14 and 15 April 2015).

I. Introduction

1. This report on the eighteenth meeting of the Joint Task Force on the Health Aspects of Air Pollution (Task Force on Health) of the World Health Organization (WHO)/European Centre for Environment and Health (ECEH) and the United Nations Economic Commission for Europe (UNECE) Executive Body for the Convention on Long-Range Transboundary Air Pollution (CLRTAP) presents the results of the discussion on the health impacts of ambient air pollution. It also provides a summary of progress on other workplan items discussed at the meeting, i.e. items 1.1.10, 1.2.3 and 1.2.4 of the 2014-2015 workplan for the implementation of the Convention (ECE/EB.AIR/122/Add.2) adopted by the Executive Body for the Convention at its thirty-second session in December 2013.

2. The eighteenth meeting of the Task Force on Health Aspects of Air Pollution was held in Bonn, Germany, on 14 and 15 April 2015. Altogether, 53 experts from 36 Parties to the Convention attended the meeting, in addition to a representative of the secretariat of the UNECE CLRTAP. The European Union (EU), a Party to the Convention, was represented by the European Commission (EC). The meeting was chaired by M.-E. Héroux (WHO/ECEH) and co-chaired by L. Van Bree (The Netherlands). N. Vilahur (WHO/ECEH) acted as a rapporteur. The International Institute for Applied Systems Analysis (IIASA, Austria), the National Institute for Public Health and the Environment (RIVM, The Netherlands), and the European Federation of Allergies and Airways Diseases Patients' Associations (EFA, Belgium) were also represented by three temporary advisers. Twelve observers, including from Health and Environment Alliance (HEAL), the Swiss Tropical and Public Health Institute (Swiss TPH), and the European Topic Centre on Air Pollution and Climate change mitigation (ETC/ACM) among others, in addition to staff members of WHO also attended the meeting. Financial support of the Swiss and German Governments to the meeting is acknowledged.

3. An update on progress of WHO activities related to the Task Force was presented by WHO. This included the recent launch of the WHO publication "Residential heating with wood and coal: health impacts and policy options in Europe and North America", available online both in English and in Russian¹, and the online release of the Russian version of the WHO HRAPIE project report² providing concentration-response functions for the cost-benefit analysis of particulate matter (PM), ozone and nitrogen dioxide (NO₂). The Task Force was also informed on the current preparation of the WHO publication "Health risk assessment of air pollution – general principles for policy makers", mainly targeted to policy makers and health risk assessment practitioners at different levels, in addition to other stakeholders, and the plans for a proposed resolution on air quality and health to be adopted at the upcoming 68th World Health Assembly to be held in Geneva in May 2015. In addition, as a starting activity to the update of the WHO Global Air Quality Guidelines, WHO will host an expert consultation meeting in Bonn during September 2015 to discuss new health evidence on air pollutants and methodological issues in order to identify main priorities for guidelines development.

4. A representative of the Convention's secretariat presented the main highlights from the thirty-third session of the Executive Body held in December 2014 and the recent developments in the meetings of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) Steering Body and the Working Group on Effects. An overview on capacity building activities conducted in countries of Eastern Europe, the Caucasus and Central Asia was provided, to

¹ <http://www.euro.who.int/residential-heating>.

² http://www.euro.who.int/__data/assets/pdf_file/0008/271943/Health-risks-of-air-pollution-in-Europe-HRAPIE-project_rus.pdf?ua=1.

be continued until 2017. Finally, the 8th Environment for Europe Ministerial Conference, to be held in Batumi, Georgia, in June 2016, was announced. The high-level Conference will revolve around two main themes: greening the economy in the pan-European region and improving air quality for a better environment and human health.

II. Health impacts of particulate matter and ozone

A. Update on WHO activities on health, economics and air pollution

5. The Task Force was informed on a joint publication from WHO and the Organisation for Economic Co-operation and Development (OECD) on “Economic cost of the health impact of air pollution in Europe: Clean air, health and wealth”³ prior to its official launching at the Mid Term Review Meeting of the European Environment and Health Process end of April 2015 in Haifa, Israel, which provides updated estimates on the high economic cost of the health-associated impacts of ambient and household air pollution for the 53 Member States of the WHO European Region. This publication describes and discusses the topic of air pollution from a Health in All Policies perspective, reflecting the best available evidence from a health, economics and policy angle and identifies future research areas and policy options.

6. Within the framework of the European funded FP7 project Reconciling Adaptation, Mitigation and Sustainable Development for citiES (RAMSES), aiming to quantify the evidence of the impacts of climate change and the costs and benefits of a wide range of adaptation measures mainly focusing on cities; WHO presented to the Task Force preliminary results of the case study developed in the city of Skopje, former Yugoslav Republic of Macedonia. Different scenarios leading to a reduction of particulate matter (PM₁₀ and PM_{2.5}) and ozone concentrations were considered (WHO air quality guidelines, EU standards, or a reduction of concentration of 10 per cent) to calculate avoidable mortality and morbidity. Diagnosis related groups (DRG), which enable the estimation of full hospital inpatient costs, were used to provide an associated economic evaluation. Preliminary results show that the burden of disease and economic cost of air pollution is large in Skopje, with significant associated healthcare costs. The need to improve air quality, most especially with regards to particulate matter, was emphasized.

B. Review of the progress in air pollution research, policy and management strategies

7. The Task Force was updated on the evidence on quantification of impacts associated with long term exposure to average NO₂ concentrations. Since the publication of the WHO HRAPIE project report in late 2013, three studies reporting smaller effect estimates for mortality have been published. As already stated in the HRAPIE report, for health risk assessment purposes for mortality effects for NO₂ it is recommended to use concentration-response functions from cohort studies with effect estimates adjusted at least for PM mass, since there is evidence that PM could account for up to 33 per cent of the effect attributed to long-term exposure to NO₂. The selection of the lower limit for quantification of the mortality impacts of long term exposure leads to significant differences. Future health risk assessment exercises for NO₂ should take into account the new scientific evidence.

³ http://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf?ua=1.

8. The long-term targets for air pollution policy in the Netherlands were presented to the Task Force. Although national and local policies have contributed to improve air quality in the Netherlands over the past years, these alone will not be sufficient for the cities to meet the WHO air quality guideline values for PM, since air quality remains a transboundary issue. In this regard, 60 per cent of the PM_{2.5} concentrations in the Netherlands come from abroad, mostly as secondary particles from emissions derived from traffic, industry and agriculture sources. Additionally, black carbon (BC) arises as a major health concern in cities. Regarding future perspectives, a 50 per cent reduction of emissions would be possible by 2030 in the Netherlands if several policies were applied in the whole EU (e.g. ammonia reductions or maintaining emission standards for domestic wood burning), combined with climate and “healthy diet” policies.

9. The majority of countries in Europe present levels of air pollutants above current WHO Guidelines. The need for a stronger public-health oriented air quality policy was raised, since compliance with air quality legislations is not necessarily synonym of full health protection; with health effects often occurring below the standards imbedded in current national and EU legislation. In this sense, a change towards healthier urban living policies and spatial planning was proposed, and a transition towards smart urbanism and resource efficient, green and circular economy, with substantial co-benefits in increasing human well-being and reducing ambient air pollution.

III. Communication and public health messages for air pollution

10. At its last meeting in 2014, the Task Force proposed to add an agenda item at the 2015 Task Force on Health meeting on communication and public health messages related to air pollution within the Parties to the Convention. This is also a request in follow-up to a 2011 Task Force session on the review of methods of communication on health significance of air quality and assessment of feasibility for harmonization of the information. The session at the 2015 Task Force meeting therefore highlighted main principles for communicating of environmental health risks; reported on a recent survey conducted by WHO during summer 2014 on the availability of public health messages for ambient air pollution in Parties to the Convention; presented selected case studies and experiences in Parties to the Convention; and discussed general conclusions and next steps.

11. The main principles for communicating environmental health risks were recently summarized in a WHO publication.⁴ The need of a shift in how to communicate environmental, and in particular air pollution risks, was raised at the Task Force meeting. The communication should ideally move from the traditional informative and paternalistic approach towards a more transparent model of information exchange, empowering users to individually engage in collective responses. The importance of reaching an adequate perception of risk due to air pollution in the population, by finding a balance between measurable health hazard and perceived outrage (i.e. sense of injustice or that something is morally wrong) was discussed. As well, the different players involved in communicating complex environmental health risks to the general public were discussed, on the one hand the media sector, wanting new statements, breaking news and rather focussing on the number of victims; and the scientific community on the other hand, being more cautious and dealing with uncertainties and population-wide effects.

12. The Task Force was informed on the activities of the European Federation of Allergy and Airways Diseases Patients’ Associations (EFA), a European network of 40 patient organisations covering allergy, asthma and chronic obstructive pulmonary disease in

⁴ <http://www.euro.who.int/en/publications/abstracts/health-and-environment-communicating-the-risks>.

24 European countries representing 400,000 patients. EFA raised the importance of delivering transparent, accessible and tailored messages to vulnerable groups, which need to be consistent across public services and ideally allow for feedback from patients. EFA also highlighted the patients' need to have real-time information on pollen concentrations to reduce their symptoms and adapt their daily activities. The Task Force was informed about EFA internal and external communication procedures and some examples were provided of EFA members' communication campaigns on air pollution risks in Ireland, the Netherlands, Poland and the United Kingdom of Great Britain and Northern Ireland.

13. There is a link between climate change, air pollution and health, with subsequent common mitigation co-benefits. Key communication messages and the channels used to deliver information to the public in the event of heat waves and wild fires were presented to the Task Force, including a WHO publication from 2013, available both in English and Russian, providing public-health advice for heat-waves, targeting different audiences ranging from the general public to health authorities, general practitioners, employers or city planners.⁵ Regarding the occurrence of wildfires, such as the events which took place in the Russian Federation during summer 2010, no specific WHO guidelines are available, although a number of messages were provided to the general public, including the recommendation for susceptible populations to use personal protective measures (i.e. respirators or masks).⁶

14. As a response to the 2014 Task Force meeting, where the need for effective communication on air pollution both in general and during high pollution episodes was raised as a priority, a short web-based survey was developed by the WHO Regional Office for Europe in 2014, consisting of 8 questions, to collect input from national representatives to the Task Force on what communication systems are in place or available in the different countries, and how air pollution risks are communicated to the general population as well as to vulnerable subgroups. Results were obtained for 14 parties plus the EC and showed that, although information systems are in place in all of these parties, there is varying geographical coverage and differences in pollutants covered, as well as differences in the frequency and detail of reporting. Dissemination of information occurs either (only) when air quality limits are exceeded and, in some cases, on a general basis. In general, separate messages are developed for general population and groups at risk.

15. The Canadian Air Quality Health Index (AQHI) was presented to the Task Force as an example of a public health intervention aiming at changing population behavior and exposure to outdoor air pollutants through providing understandable and reliable information. The AQHI, based on the combined health impacts of NO₂, ozone, PM_{2.5} and PM₁₀, is represented on a simple numeric scale with values ranging from 1 to 10 (with an extra 10+ category for extreme rare conditions such as wild fires), that are linked to specific health messages ranging from low to very high risk. The AQHI is designed to educate individuals on the impact of air quality on health, and to advise specific risk reduction actions. Therefore, effective communication strategies have been conducted to disseminate the AQHI, such as the collaboration with the television channel "The Weather Network", which makes the information easily accessible and available to a wider range of target audiences.

16. Two consecutive periods of poor air quality were registered in the United Kingdom during March and April 2014, both driven by high levels of particulate matter, as measured using the UK Daily Air Quality Index (DAQI), which indicates the levels of air pollution

⁵ http://www.euro.who.int/__data/assets/pdf_file/0011/233759/e96930.pdf?ua=1.

⁶ <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/news/news/2010/08/extreme-heat-wave-and-wildfires-cause-public-health-concerns-in-the-russian-federation>.

and provides recommended actions and health advice to the public. The index is numbered 1–10 and divided into four bands ranging from low risk to very high risk and is determined by the highest concentration of five pollutants (NO₂, sulphur dioxide, ozone, PM_{2.5} and PM₁₀). A real-time syndromic surveillance system was conducted throughout the high pollution episodes, providing continuous monitoring of health care seeking behaviour for a suite of systems, including remote health advice (through the telephone line NHS 111) and in and out of hours general practitioners (GP) or sentinel emergency department visits, among others. This resulted in data available to evaluate the impact on the health care system of the air pollution episodes in real-time and provided an estimate of its acute health impacts. The study revealed a significant increase in general practitioner consultations for wheeze and breathlessness as well as an estimated excess of 500 severe cases of asthma during the whole duration of the two episodes.

17. The representative of the French Ministry of Health presented the new risk management actions for air pollution episodes in France since 2014, with an update on the existing health recommendations and the implementation of a new action plan in 2015, which reinforces the role of sanitary authorities (Ministry of Health together with regional health agencies) and includes national surveillance of health indicators, broadcasting of health recommendations and provision of information to health professionals. This is supported by a strong management role of air pollution episodes at the local level within French “departments” (which can occasionally extend to national level). The importance of the information on airborne pollen concentration was mentioned. Several representatives underlined the importance of such information in order to lower or prevent the allergic and asthmatic symptoms in the population. The EC representative underlined that biological airborne contaminants cannot be controlled; however their risk communication is of high importance. Some representatives mentioned the EU Regulation 1143/2014 on Invasive Alien Species, with special regard to ragweed. The high airborne concentration of ragweed displays a major problem in Eastern Europe, as well as in Northern Italy and in some part of France and due to climate change the problem will be greater. It is therefore recommended to strengthen the communication on the health effects of pollen exposure based on timely reports and forecast of airborne pollen concentrations.

18. The main conclusions of the discussion held by the Task Force attendees in relation to the topic of communication of health hazards of air pollution are as follows. As contrary to what is often reported by the media and perceived by the general public, the most important health impact of air pollution occurs due to long-term exposure rather than to peaks. According to the French National Institute for Health Surveillance, only 5 per cent of the premature deaths due to cardio-vascular causes and 7 per cent of the hospitalisations due to cardio-vascular causes from the total attributable to particulate air pollution in Paris between 2007 and 2010 could be associated to peaks (episodes when alert PM₁₀ threshold was exceeded). In this regard, the need to raise public awareness about the risks of long-term exposure to air pollution along with providing individual measures that can be taken in order to reduce exposure on a daily basis (besides the occurrence of peaks), remains a very important public health goal.

19. Information channels used to disseminate air pollution and health messages need to be carefully chosen, in order to reach the majority of the target population, including susceptible and/or vulnerable population groups such as elderly, sick or children. In this regard, delivery of information should be diversified and cover a wide range of channels (i.e. not restricted to digital or web-based information systems only), while at the same time ensuring that coherence is maintained in the messages delivered, not only across public services but also in the occurrence of overlapping events such as for example heat waves, wildfires and air pollution peaks.

20. The importance of carefully choosing the appropriate group that is delivering the message (i.e. parliamentary politicians, medical practitioners, scientists, patients

associations) in order to gain the trust of the general population or specific target audience (different age groups, vulnerable subgroups or even policy makers) was pointed out. Ideally, information provided by the authorities, either ministries, health agencies or local governments, should allow for feed-back from the recipients. This might empower individual engagement and increase people's willingness to change to healthier behaviours.

21. Air Quality Indices have developed differently in different countries, and the harmonization of the different scales and messages is therefore not always possible or a straightforward process. This can partially be because air pollutant sources and levels differ across geographical areas; but might also be influenced by cultural and social determinants and/or the particular organizational structure of the government administrative services and the respective roles and responsibility of different organizations in issues related to air quality management. However, the Task Force acknowledged that both Canada and the UK scaled the associated messages derived from their respective indices from low to high risk, implying the presence of a certain health risk at any level of air pollution.

22. Improvements are needed in air quality monitoring as a pre-requisite to implementing effective communication strategies (and evaluating health impacts of air pollution). The Task Force concluded that this remains a main goal overall in many Parties to the Convention, and more especially to the Member States in the eastern part of the European Region and manifested interest in being updated at next year's meeting on the topic of best communication practices of health risks associated to short and long term air pollution exposure, not only during pollution peaks but also in relation to chronic exposure. In addition, the 2014 WHO survey on communication messages will be reopened as several countries expressed their wish to provide input, and an update on the results will be presented to the nineteenth Task Force meeting in 2016.

IV. Monitoring and modelling of air pollution and its health impacts in countries of Eastern Europe, the Caucasus and Central Asia

23. A number of Member States were invited by the Task Force to provide an overview of the situation in their respective countries in relation to air pollution monitoring. Representatives from Belarus, the Czech Republic, Hungary, Kazakhstan, Latvia, Montenegro, the Republic of Moldova and Uzbekistan presented the air quality monitoring coverage in their countries (i.e. number and location of stations), the main sources of air pollution and the levels measured, together with limitations and advances encountered and achieved over the past years. Results were heterogeneous across the different countries. Some countries presented a denser network of monitoring stations, while in others monitoring was more limited, or it had only been established relatively recently. The limited data showed particulate matter concentrations often exceeding the WHO recommendations, and highlighted the need to improve monitoring in many countries to assess population exposure and assist local authorities in establishing plans for improving air quality. In addition, the majority of countries conveyed in that residential heating (household burning of solid fuels), especially during the winter months, remains an urgent problem in the central and eastern part of Europe and a main source of PM₁₀ and PM_{2.5} emissions. During this session, Belarus specifically manifested its will in strengthening bilateral relations with WHO, by increasing collaboration and participating in training activities in relation to air quality.

24. Finally, the meeting attendees declared their interest in these short informative presentations from selected Member States and pointed out that, for some countries in the European Region, this was the first time that air quality data were shared in the context of a

Task Force meeting; and encouraged the Task Force to maintain this session format and to invite other Member States to present in the future Task Force meetings.

V. Update on the revision of the EU air policy

25. The representative of the EU provided an update on the implementation of the 2013 Clean Air Policy Package of the EU. The proposal for a Directive on Medium-Scale Combustion Installations has made significant progress in the decision-making procedure. The technical basis for the proposal for a Directive on new National Emission Ceilings (NECD), in particular the 2005 national emission inventories, was reviewed in depth in 2014, and has been strengthened, so that the proposal is now more robust and the decision-making process is continuing. The EC may later amend its proposal for a new NECD, as part of the regulatory process, in order to maintain coherence with the updated EU Climate and Energy Policy. Other actions under existing legislation will significantly reduce pollution emissions, such as the implementation of Best Available Technique in the Large Combustion Plants and in manufacturing industry as specified in the BREF Conclusions under the Industrial Emissions Directive as well as the full and correct implementation of the EURO 6 emission standards for diesel personal cars and light duty vehicles. The European Commission has now also proposed that the EU ratifies the latest amendments to the Protocol on Heavy Metals; and the Protocol on Persistent Organic Pollutants and the Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone (Gothenburg Protocol). The EC will continue to refine the assessment tools used in air pollution policy, including improved methods for NO₂ exposure assessment used for health impact analysis, and to continue taking science advice from the WHO and other relevant organisations on health aspects of air pollution.

26. Additionally, an overview of the recent Thematic Strategy on Air Pollution (TSAP) report⁷ on updated cost-effectiveness analyses for the EU Clean Air Policy Package was presented by IIASA to the Task Force. The TSAP report, relying on the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model Health Impact Assessment methodology and strictly following the HRAPIE project recommendations, contains a new updated EC proposal for National Emission Ceilings (NECs) in 2030, which would result in substantial gains in life expectancy, economic health benefits and additional natural areas protected against eutrophication. Agricultural ammonia emission was highlighted as one of the key measures for achieving the proposed NECs in addition to reducing solid fuel combustion in households. While public health stands as the central entry point for the revision of the EU clean air policy, communication of (health) benefits remains an essential scope.

VI. Current activities and workplan for Task Force on Health for 2016–2017

27. WHO Regional Office is currently working on an update of the existing AirQ2.2 software for health impact assessment of air quality. This software performs calculations that allow the quantification of the health effects of exposure to air pollution, including estimates of the life expectancy reduction. The Task Force was informed on the status and estimated timeline of the project development during 2015, which will also include a testing phase followed by a number of dissemination activities. A scientific advisory board

⁷ http://www.iiasa.ac.at/web/home/research/researchPrograms/MitigationofAirPollutionandGreenhousegases/TSAP_CBA_corresponding_to_IIASA11_v2.pdf.

has been assembled to prioritize pollutants and health-endpoints for inclusion in the software, select the technological platform (e.g. programming language) and discuss other methodological specificities.

28. Finally, two draft reports were presented by WHO, conceived as a contribution from the Task Force to be included in the two Convention reports that will be published in the beginning of 2016, both in English and in Russian. The *2016 Assessment Report* is mainly targeted to politicians and policy makers and presents achievements to date, remaining challenges and knowledge gaps, benefits of further abatement measures and synergies with other policy areas; while the *Trends Report* focuses on the scientific evidence on trends in air pollution effects on health, population exposure and number of monitoring stations. These reports were discussed at the Task Force meeting and will be revised thereafter to incorporate comments received from attendees to the meeting.

29. The proposed Task Force workplan for 2016-2017 includes the following main activities: (a) the review of the progress in research on health impacts of air pollution, including the presentation of important research findings and reporting on the progress achieved in the revision of the WHO Air quality Guidelines; and (b) the monitoring and modelling of air pollution and its health impacts in countries, with a focus on Eastern Europe, the Caucasus and Central Asia, the development of the AirQ tool for quantification of effects of air pollution the presentation of the results of the communication survey developed by WHO Regional Office and the finalization of WHO publications (i.e. general principles of health risk assessment of air pollution for policy makers, and the contribution to the Convention assessment and trends reports).

VII. Cross-cutting issues

30. The Task Force continued to support WHO and others to provide recent reports and scientific information in Russian, also including the electronic versions available through their websites; and encouraged that technical information on health is made available to policy and other decision-makers for use in major upcoming political processes and events related to air pollution.
