

Report on the Committee on Assessment of the Health Effects of Fine Particulate Matter on Public Health

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The Ministry of the Environment set up the Committee on Assessment of the Health Effects of Fine Particulate Matter on Public Health (Chairman: Iwao Uchiyama, Professor of the Graduate School of Engineering of Kyoto University) in May 2007. After eleven meetings, the Committee discussed the health effects of fine particulate matter (PM_{2.5}) and compiled a report on April 3, 2008.

1. Background

The Committee had held 11 meetings since May 29, 2007 and discussed the health effects of fine particulate matter (diameter $\leq 2.5 \mu\text{m}$) contained in suspended particulate matter (diameter $\leq 10 \mu\text{m}$) on the respiratory and circulatory systems, with reference to domestic and foreign findings.

The Committee also established working groups on exposure, toxicity, and epidemiology and, with reference to findings obtained by the working groups, conducted a qualitative investigation: i.e., whether epidemiological findings were supported by the mechanism of health effects suggested by toxicological findings.

2. Summary of report

(1) Health effects of fine particulate matter

- Considering epidemiological findings of increase in the risk of mortality, changes in symptoms and functions, and the increasing numbers of patients hospitalized or visiting hospitals from disorders of the respiratory and circulatory systems, fine particulate matter appears to exhibit health-related effects on the respiratory system, like particulate matter. In addition, fine particulate matter appears to exhibit health-related effects on the circulatory system and to be associated with the occurrence of lung cancer.

- It should be noted that the conclusions noted above feature the following uncertainties.
 - Differences in diseases between Japan and the US/Europe due to differences in living habits
 - Differentiation of the health effects of fine particulate matter and coarse particulate matter
 - Health effects of other coexisting pollutants (air pollutants including NO₂)

- Despite these uncertainties, epidemiological and toxicological findings suggest that fine particulate matter affects public health to a certain extent.

Although the relative risk of exposure to suspended particulate matter is smaller than to other exposure factors, since the public health effects of fine particulate matter cannot be ignored, they also need to be considered in quantitative fashion.

(2) Issues to be discussed

- For quantitative investigation, it will be difficult to establish threshold values for the health effects of particulate matter (values below which exposure is without health effects). Existing quantitative methods probably cannot be used for this type of investigation. To establish target environmental values, methods of risk assessment need to be considered.

- Concerning exposure, the issues below need to be discussed.
 - Improvement of the precision of methods of weighing and of automatic measurement
 - Investigation of the mechanism of formation of fine particulate matter and its composition in the air and sorting of information on various sources of emission

*This report can be viewed on the website in Japanese.

<http://www.env.go.jp/air/report/h20-01/index.html>

Table 1 Members of the Committee on Assessment of the Health Effects of Fine Particulate Matter on Public Health

	Name	Professional Affiliation
Member	Shuichi Adachi	Professor of Public Hygiene, Food Division, Liberal Arts Department, Sagami Women's University
Member	Hirotsugu Ueshima	Professor of Community Health and Epidemiology, Department of Health Science, Shiga University of Medical Science
Chairman	Iwao Uchiyama	Professor of Department of Urban and Environmental Engineering, Graduate School of Engineering, Kyoto University
Member	Jun Kagawa	Emeritus Professor of Tokyo Women's Medical University
Member	Toshihiro Kawamoto	Professor of Environmental Health, School of Medicine, University of Occupational and Environmental Health, Japan
Member	Shoji Kudo	Chief Professor of Department of Pulmonary Medicine/ Infection and Oncology, Nippon Medical School
Member	Takahiro Kobayashi	Professor of Center for Innovation Systems Research, Integrated Research Institute, Tokyo Institute of Technology
Member	Kazuhiko Sakamoto	Professor of Graduate School of Science and Engineering, Saitama University
Member	Hiroshi Sato	Professor of Tohoku University School of Medicine
Member	Masayuki Shima	Professor of Public Hygiene Department, Hyogo College of Medicine
Member	Tomotaka Sobue	Manager of Center for Cancer Control and Information Services, National Cancer Center
Member	Hirohisa Takano	Director of Environmental Health Sciences Division, National Institute for Environmental Studies
Member	Suketami Tominaga	Honorary Chairman of Aichi Cancer Center
Member	Hiroshi Nitta	Manager of Environmental Epidemiology Section, Environmental Health Division, National Institute for Environmental Studies
Member	Akira Mizohata	Director of Frontier Science Innovation Center, Organization for Industry, University, and Government Cooperation, Osaka Prefecture University
Member	Masatoshi Morita	Professor of Environmental Analytical Chemistry, Department of Bioresources, Faculty of Agriculture, Ehime University
Member	Eiji Yokoyama	Former President of National Institute of Public Health
Member	Shinji Wakamatsu	Professor of Atmospheric Environmental Science, Department of Bioresources, Faculty of Agriculture, Ehime University

*In order of Japanese syllabary, as of March 2008

Table 2 Members of the Working Groups of the Committee on Assessment of the Health Effects of Fine Particulate Matter on Public Health

	Name	Professional Affiliation
Exposure Working Group	Toshimasa Ohara	Manager of Regional Atmospheric Modeling Section, Asian Environment Research Group, National Institute for Environmental Studies
	Shinji Kobayashi	Manager of Transportation and Urban Environment Section, Social and Environmental Systems Division, National Institute for Environmental Studies
	⊙Kazuhiko Sakamoto	Professor of Graduate School of Science and Engineering, Saitama University
	Kenji Tamura	Chief Researcher of Integrated Health Risk Assessment Section, Environmental Health Sciences Division, National Institute for Environmental Studies
	Masataka Nishikawa	Manager of Environmental Analytical Chemistry Laboratory, Laboratory of Intellectual Fundamentals for Environmental Studies, National Institute for Environmental Studies
	Akira Mizohata	Director of Frontier Science Innovation Center, Organization for Industry, University, and Government Cooperation, Osaka Prefecture University
	Shinji Wakamatsu	Professor of Department of Bioresources, Faculty of Agriculture, Ehime University
Toxicity Working Group	Shinji Abe	Lecturer of Professor of Department of pulmonary Medicine/ Infection and Oncology, Nippon Medical School
	Shuichi Adachi	Professor of Public Hygiene, Food Division, Liberal Arts Department, Sagami Women's University
	Toshihiro Kawamoto	Professor of Environmental Health, School of Medicine, University of Occupational and Environmental Health, Japan
	Takahiro Kobayashi	Professor of Center for Innovation Systems Research, Integrated Research Institute, Tokyo Institute of Technology
	⊙ Hirohisa Takano	Director of Environmental Health Sciences Division, National Institute for Environmental Studies
	Kazutetsu Aoshiba	Professor of Respiratory Pathology, Graduate School of Medicine, Tokyo Women's Medical University
	Hirokazu Tsubone	Professor of Comparative Pathophysiology, Graduate School of Agricultural and Life Sciences, The University of Tokyo
	Hidekazu Fujimaki	Manager of Environmental Sensitivity Research Section, Research Center for Environmental Risk, National Institute for Environmental Studies
	Aki Matsumoto	Department of pulmonary Medicine/ Infection and Oncology, Nippon Medical School
Epidemiology Working Group	Hiroyasu Iso	Professor of Public Health, Division of Preventive and Environmental Medicine, Faculty of Medicine, Graduate School of Medicine, Osaka University
	Masashi Ono	Manager of Integrated Health Risk Assessment Section, Environmental Health Sciences Division, National Institute for Environmental Studies
	Toshiya Sato	Professor of Department of Epidemiology and Biostatistics, School of Public Health, Graduate School of Medicine, Kyoto University
	Masayuki Shima	Professor of Public Hygiene Department, Hyogo College of Medicine
	Tomotaka Sobue	Manager of Center for Cancer Control and Information Services, National Cancer Center
	Satoshi Nakai	Professor of Graduate School of Environment and Information Sciences, Yokohama National University
	Toshio Nakadate	Professor of Department of Hygiene and Preventive Medicine, School of Medicine, Showa University
	Hiroshi Nitta	Manager of Environmental Epidemiology Laboratories, Environmental Health Sciences Division, National Institute for Environmental Studies

⊙: Head of the working group; *In order of Japanese syllabary, as of March 2008

1. PM_{2.5}

PM_{2.5} is referred to as suspended particulate matter with a diameter of $\leq 2.5 \mu\text{m}$. The connection between exposure to fine particulate matter and adverse health effects is under increasing scrutiny, because of the deeper penetration of this type of matter into the gas-exchanging region of the lung.

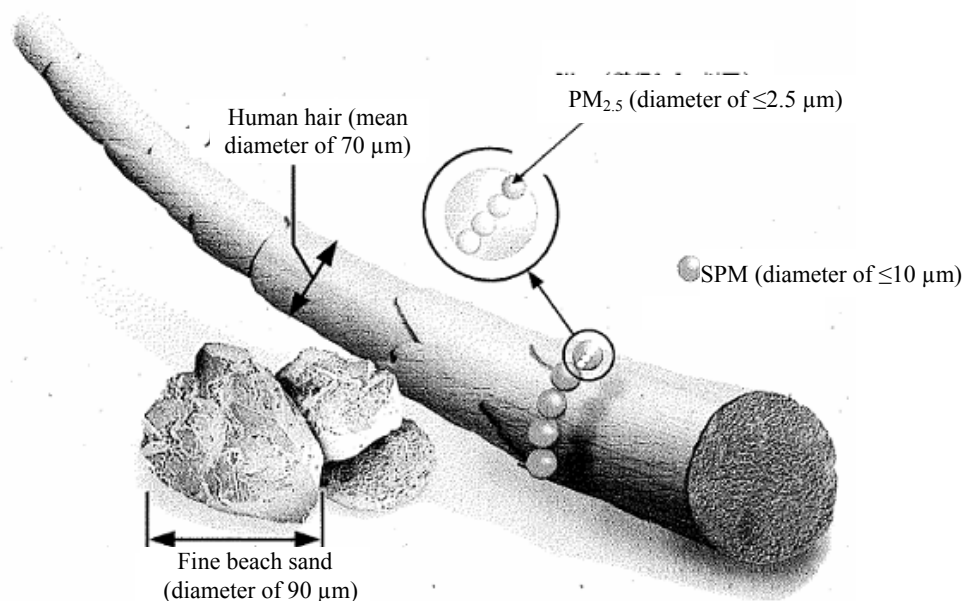


Figure: Size of PM (comparisons with human hair and beach sand) (conceptual diagram)

2. Previous meetings

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| First: | May 29, 2007 | (regarding plans and procedures for meetings) |
| Second: | July 24, 2007 | (regarding domestic research results) |
| Third: | September 25, 2007 | (regarding results of domestic and foreign literature search) |
| Fourth: | October 30, 2007 | (regarding policies for preparation of investigational reports) |
| Fifth: | December 25, 2007 | (regarding discussion of items of investigation) |
| Sixth: | January 22, 2008 | (regarding discussion of items of investigation) |
| Seventh: | January 28, 2008 | (regarding discussion of items of investigation) |
| Eighth: | February 21, 2008 | (regarding discussion of items of investigation) |
| Ninth: | March 11, 2008 | (regarding discussion of items of investigation) |
| Tenth: | March 24, 2008 | (regarding the investigation of health effects) |
| Eleventh: | April 3, 2008 | (regarding the draft report) |