

ASEAN CENTER OF MILITARY MEDICINE

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Weekly report : PM 2.5 Crisis situation

What has happened about PM 2.5 crisis situation?

Even though it is not the first time that Thai people are exposed to smog. The concentration of PM 2.5 is continuously rising in Bangkok and the metropolitan area during January 2019 until now; extremely high levels of PM 2.5 in Chiang Mai Province. These waking up the city to aware of pollution along with finding ways to protect themselves and their family members.



What is PM 2.5?

Particulate Matter (PM) is a common proxy indicator for air pollution. It affects more people than any other pollutant. The major components of PM are sulfate, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water. It consists of a complex mixture of solid and liquid particles of organic and inorganic substances suspended in the air. While particles with a diameter of 10 microns or less, (\leq PM10) can penetrate and lodge deep inside the lungs, the even more health-damaging particles are those with a diameter of 2.5 microns or less, (\leq PM2.5).



PM 2.5 can penetrate the lung barrier and enter the circulation system. Chronic exposure to particles contributes to the risk of developing cardiovascular and respiratory diseases, as well as of lung cancer. These particles are formed as a result of burning fuel and chemical reactions that take place in the atmosphere. Natural processes such as forest fires also contribute to PM 2.5 in the air. These particles are also the primary reason for occurrence of smog.

Why should we concern about PM 2.5?

Exposure to PM 2.5 has multiple short term and long term health impacts. Short term include irritation in the eyes, nose and throat, coughing, sneezing and shortness of breath. A prolonged exposure to PM2.5 can cause permanent respiratory problems such as asthma, chronic bronchitis and heart disease. PM 10 and PM 2.5 include inhalable particles that are small enough to penetrate the thoracic region of the respiratory system. The health effects of inhalable PM are well

documented. They are due to exposure over both the short term (hours, days) and long term (months, years) and include respiratory and cardiovascular morbidity, such as aggravation of asthma, respiratory symptoms and an increase in hospital admissions ; mortality from cardiovascular and respiratory diseases and from lung cancer.

What is the standard levels of PM 2.5?

The World Health Organization sets the standard 24 hour average and the annual average of PM 2.5 dust at 25 and 10 micrograms per cubic meter respectively. And also targeting 3 specific interim targets (Interim Target: IT) divided into

- Standard 24-hour average, number 75 (IT-1), 50 (IT-2) and 37.5 (IT-3), micrograms per cubic meter
- Annual average standard Determine numbers 35 (IT-1), 25 (IT-2), 15 (IT-3), micrograms per cubic meter.

Board of The National Environment in Thailand sets the standard 24-hour average and the annual average of PM 2.5 is not more than 50 and 25 micrograms per cubic meter.

Malaysia and Singapore are the two countries that plan to reduce the PM 2.5 standard ceiling for both 24-hour averages and annual averages continuously.

Malaysia aims to reduce the average 24 hours from 75 micrograms per cubic meter to 50 and 35 micrograms per cubic meter in 2018 and 2020 respectively and reduce the annual average from 35 micrograms per cubic meter to 25 And 15 micrograms per cubic meter in 2018 and 2020 respectively as well. While Singapore is more strict Because the target is to shift the average 24 hours from 40 micrograms per cubic meter to 37.5 micrograms per cubic meter. And reduce the annual average from 15 micrograms per cubic meter to 12 micrograms per cubic meter by the year 2020 and also long-term plans to enforce the standards set by the World Health Organization.

Medical measures to response the impact of PM 2.5

1. Following the situation, monitoring and assessment of risk areas every day.
2. Surveillance for health impacts, especially at risk groups, including the elderly, young children, pregnant women, patients with chronic diseases such as asthma, Chronic Obstructive Pulmonary Disease and Cardiovascular disease etc.
3. Communicate the public about air pollution and health (what can we do to reduce our exposure to fine particle pollution when levels are extremely high?)
4. Acknowledge on awareness and self-protection in risk groups at various places, including early childhood development schools Elderly Care Center Including publicizing media support Knowledge set for preventing health effects from PM 2.5
5. Prepared medical facilities, special clinics and consultation hotline.

Conclusions

- PM is a widespread air pollutant, present wherever people live.
- The health effects of PM10 and PM2.5 are well documented. There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur.
- Since even at relatively low concentrations the burden of air pollution on health is significant, effective management of air quality aiming to achieve WHO AQG levels is necessary to reduce health risks to a minimum.
- Monitoring of PM10 and/or PM2.5 needs to be improved in many countries to assess population exposure and to assist local authorities in establishing plans for improving air quality.
- There is evidence that decreased levels of particulate air pollution following a sustained intervention result in health benefits for the population assessed. These benefits can be seen with almost any decrease in level of PM. The health and economic impacts of inaction should be assessed.
- Particulate air pollution can be reduced using current technologies.
- Interventions resulting in a reduction in the health effects of air pollution range from regulatory measures (stricter air quality standards, limits for emissions from various sources), structural changes (such as reducing energy consumption, especially that based on combustion sources, changing modes of transport, land use planning) as well as behavioral changes by individuals by, for example, using cleaner modes of transport or household energy sources.
- There are important potential co-benefits of integrating climate change and air pollution management strategies, as evidenced by the importance of the PM indicator and climate change contributor black carbon.

Severity ranking of the concerns effect in the ASEAN region.

<i>Section</i>	<i>Ranking</i>	<i>Issues identified</i>	<i>Recommendations</i>
<i>PM 2.5 crisis situation</i>	Y	Air pollution	This air pollution makes people awake. It is a good opportunity to help push the pressure on relevant agencies in both the public and private sectors to move to perform their duties intensively to solve problems with various measures.

Remarks:

R: Severe Situation: Urgent intervention required.

Y: Situation of concern: Surveillance or assistance may or may not require, intensive monitoring

G: Relative normal situation or local Government can cope with the crisis, monitoring and no action required.

N/A: Lack of /unreliable data: Further assessment required.

ACMM Recommendations,

ACMM will continue to monitor the situation for providing medical information and its update to member countries. Because of the good air quality is one of the fundamental rights of everyone. We should do more than just distribute the N95 masks in this period and let the toxic dust problems fade away with the arrival of summer.

References:

1. www.airveda.com/blog/what-is-pm2-5
2. [www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](http://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)
3. <https://themomentum.co/pm-2-5-air-quality-index/>
4. <http://www.greenpeace.org/seasia/th/news/blog1/pm25/>
5. <https://pr.moph.go.th/?url=pr/detail/2/04/122437/>
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