Air Pollution and its Health Effects in the Eastern Mediterranean Region
Challenges and Gaps

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Many EM countries are dealing with negative impacts of air pollution.

Air Pollution is increasing at an alarming rate, the annual average concentrations of some pollutants in the EM countries is much higher than the WHO recommended levels.

Air Pollution is estimated to kill about 500,000 people annually in this region (1 out of every 10 deaths).

At least half of air pollution in the region occurs from natural sources, pollutants such as sand, dust and sea salt, and the rest is generated from human activities (transport and industry).

The economic cost of air pollution is extremely high in the EMR and should not be overlooked. *(World Bank Report)*
Dust storms

- Sudan, Iraq, Saudi Arabia and Iran are the countries that have reported the highest occurrence of dust storms.

- PM reaches >60 times permissible levels in some cities (eg Zabol, Iran)

- Reduced visibility, increased traffic accidents, increase in respiratory diseases, cough, rhinitis, pulmonary wheeze, acute asthmatic attack, eye irritation, headache, body ache, sleep and psychological disturbances.

- Carcinogenic elements such as lead, cadmium, nickel, and radioactivity have been reported among PM.
Studies conducted about air pollution and health in the EMR

Over 400 studies published in international journals.

More than 90% of the papers published ≥2012.

The countries with the highest number of publications are Iran, Pakistan and Saudi Arabia.
Reported Health Outcomes for Air Pollution in the EM Region

- Increased incidence of various cancers. Scientists think part of the increase in non-smoker lung cancer in the EM is related to air pollution.
- Increase respiratory disease (asthma, ...) admissions and mortality. Increased human immune system reactions, and allergic diseases.
- Increased admissions due to cardiac diseases and stroke; cardiosascular mortality, accelerated atherosclerosis, inflammation and increased coagulation markers, decline in cardiovascular function and changes in hematological parameters.
- Increased prevalence, severity and remission of MS, T2 Diabetes, MetS, hyperglycemia and hypertension.
- Tuberculosis treatment failure, and the development of multidrug resistant TB and relapse. Threats to Anti-TB programs.
- Strong association reported between AP and LBW, spontaneous abortion and premature birth, changes in gene expression and chromosome aberration in polluted air. *Gains obtained in infant mortality and life expectancy at birth through the improvement in socio-economic conditions in the EMR can be canceled by AP.*
- AP was related to vitamin D deficiency.
- A negative impact on sleep and causes general and physical fatigue
- **These were only some of the known effects of AP in the EMR.**
Knowledge Gaps (Only a few)

• Few studies about air pollution from specific countries, limits our ability to quantify the health and economic damage.

• Available studies suffer from methodological limitations.

• Lack of methods for retrospective estimation of long-term exposure to air pollutants should be developed.

• Individual pollutants are highly correlated. We are unable to estimate the contributions of specific pollutants or sources.

• Lack of knowledge about the interaction of ambient air pollution with other health risk factors, i.e., smoking, occupation, and diet.

• Lack of data on the effectiveness of mitigation plans and health benefits of reducing air pollution in the EMR.
Challenges for controlling air pollution in the EMR (Just a few)

• Low insight into the severity of the condition, low budgets allocated for research and control. Lack of capacity (and willingness) to monitor exposure to air pollution and report its health impacts.

• Increasing population, increased traffic, increased industries, increase in non-environmental friendly jobs. Sacrificing the environment for economic development.

• Poverty: People using not well maintained motorcycles, cars, buses and ...

• Lack of sufficient and good quality data, lack of international research collaborations and partnerships and lack of multidisciplinary research.

• 50% of countries of the region are facing emergencies which is affecting their prioritizations. Resources are being focused on emergencies and not on air pollution.
A roadmap for an enhanced global response to the adverse health effects of air pollution has been developed by the WHO in 2016.

- Producing and Disseminating Knowledge about the negative effects of AP.
- Training Experts, Conducting Standardized Data Collection and Research.
- Communicating to the Public and NGOs through national media and ...
- Tailoring Control Strategies to national situations and needs: Working from long distance (online), Consulting Environmental Specialists before intervening; eg Lake Urmia, Lake Hamoon, Tigris-Euphrates Rivers. Increasing specific vegetation, Further Developing Public Transport.
Final message:

The Middle East has suffered enough from war, violence and instability; yet now air pollution is further devastating the people residing in this region.

ME leaders should work closely with environmental scientist to alleviate the situation.

“Let the Middle East breathe”