CLIMATE CHANGE AND CANCER

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INTRODUCTION

Cancer is the second leading cause of death globally after cardiovascular disease.

Climate change has an impact on chronic diseases including cancer.

Environmental exposures that are risk factors include Ultraviolet Rays, Air pollution and environmental toxicants.
ACTIVITIES IMPACTING THE ENVIRONMENT
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<table>
<thead>
<tr>
<th>Climate Change Variables</th>
<th>North</th>
<th>Dengue</th>
<th>Lung</th>
<th>Stomach</th>
<th>Liver</th>
<th>Colorectum</th>
<th>Breast</th>
<th>Cervix</th>
<th>Bladder</th>
<th>Skin</th>
<th>Thyroid</th>
<th>Brain</th>
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</thead>
</table>
| **Figure 2.** Potential associations between climate-change-related risk factors and cancer. Source: Yu, P., Xu, R., Yang, Z., Ye, T., Liu, Y., Li, S., ... & Guo, Y. (2022). Cancer and Ongoing Climate Change: Who Are the Most Affected?. *ACS Environmental Au.*
CLIMATE AND SKIN CANCER
The loss of the ozone layer due to the production of chlorofluorocarbons (CFC’s).

These are released from solvents, spray aerosols, refrigerators, air-conditioners etc.

Ozone is a molecule that absorbs all levels of ultraviolet radiation.

The molecules of chlorofluorocarbons in the stratosphere are broken down by ultraviolet radiations and release chlorine atoms. These atoms react with ozone and destroy it.

In particular, the harmful Ultraviolet B (UVB) type rays increase the risk of skin cancer.
RISK FACTOR FOR SKIN CANCER

MOST SKIN CANCERS ARE CAUSED BY THE SUN’S UVA AND UVB ULTRAVIOLET (UV) RAYS

UVA RAYS
- skin surface
- epidermis
- dark patches
- wrinkles
- loose skin
- premature aging
- DNA damage
- sunburns
- eye problems

UVB RAYS

UVA and UVB rays cause DNA damage, which greatly increases skin cancer risk.

https://emwaveslifeorharm.wordpress.com/good-vs-bad/
CLIMATE AND SKIN CANCER

• Basal Cell Carcinoma
  • Basal cell carcinoma usually occurs in sun-exposed areas of your body, such as your neck or face.

  • Basal cell carcinoma may appear as:
  • A pearly or waxy bump
  • A flat, flesh-colored or brown scar-like lesion
  • A bleeding or scabbing sore that heals and returns.
CLIMATE AND SKIN CANCER

• Squamous Cell Carcinoma
• Facts & Features
• Second most common human cancer
• Arise on sun exposed skin or lips
• Pink or red growths or bumps
• Locally destructive and can be fatal
• 90% or greater cure rate if caught early

PREVENTION OF OZONE DEPLETION

• Reduce of ozone depleting substances.
• Minimize the use of vehicles that emit carcinogenic substances.
• Car pooling where possible.
• Use of Ecofriendly cleaning products.
• Policies that reduce harmful emissions in industry.
Prevention of Skin Cancer

Use of protective clothing to prevent excess sun exposure.

Wear long sleeve shirts, long pants, sun hats with broad rims, and sunglasses, when outdoors.

Application of Sunscreen with SPF 15 or higher if UV index is 3 or greater.

Stop smoking.

**Figure 1** The complex interactions between air pollution and climate change, and their impacts on respiratory health and lung cancer. Solid arrows indicate a direct relationship or strong association; dashed arrows indicate a weaker or indirect relationship. SO$_2$: sulfur dioxide; O$_3$: ozone; PM: particulate matter; NO$_2$: nitrogen dioxide; VOCs: volatile organic compounds.
Lung Cancer is the leading cause of death in the US and the Caribbean.

Air pollution affects respiratory health resulting in asthma and COPD exacerbations.

Lung Cancer incidence and mortality have been elevated in subjects more heavily exposed to ambient and household air pollution.

Smoking is the leading cause of lung cancer and a contributor to carcinogenesis. Exposure to radon gas. Radon is produced by the natural breakdown of uranium in soil, rock and water that eventually becomes part of the air you breathe. Unsafe levels of radon can accumulate in any building, including homes.

Chronic exposure to PM$_{2.5}$ can result in lung cancer development.
LUNG CANCER SYMPTOMS

• A new cough that doesn’t go away
• Coughing up blood, even a small amount (Hemoptysis)
• Shortness of breath
• Chest pain
• Hoarseness
• Losing weight without trying
• Bone pain
• Headache
# Prevention of Lung Cancer

**Table 1** Summary of recommendations to combat the impact of air pollution on respiratory health

<table>
<thead>
<tr>
<th>Key recommendations</th>
<th>Examples of practical actions</th>
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<tbody>
<tr>
<td><strong>At personal/public/population level</strong></td>
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<tr>
<td>Appropriate level of personal protection equipment</td>
<td>Appropriate use of face masks and hand hygiene in relevant risk areas</td>
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<td>Life-style modifications</td>
<td>Smoking cessation</td>
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<td></td>
<td>Healthy diet</td>
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<td>Regular exercise</td>
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<td>Indoor ventilation</td>
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<td>Adoption of an environmentally friendly driving style if needed</td>
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<td></td>
<td>Adoption of a clean energy approach as far as possible</td>
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<td>Keep up to date on latest local air pollution levels</td>
<td>Awareness of and education about the need to fight local pollution</td>
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<tr>
<td>Management of chronic cardiorespiratory diseases</td>
<td>Primary healthcare with regular health checks for cardiorespiratory diseases</td>
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<tr>
<td></td>
<td>Early diagnosis and management of chronic respiratory diseases</td>
</tr>
</tbody>
</table>
LUNG CANCER PREVENTION
REFERENCES


- https://byjus.com/biology/ozone-layer-depletion/


- https://news.cancerresearchuk.org/2017/03/03/commuting-and-polluting-whos-health-is-losing-out/