Influence of Globalization on Ecosystem Health

Risks to our Global Ecosystem

- Healthy environments are essential to maintain balance within the ecosystem, collectively shared by humans, animals, and plants.

- WHO global estimates:
  - 12.6M deaths (1 in 4) associated with residing or working in unhealthy environments
  - 6.5M deaths (1 in 9) attributed to air pollution
  - 96M cases and 700,000 deaths linked to VBD transmission (>17% of all infectious diseases)

Credit: NASA, 2018: https://visibleearth.nasa.gov/view.php?id=57723
“Collaborative, multisectoral, and trans-disciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment”
“Approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes”

Credit: CDC, 2019: https://www.cdc.gov/onehealth/basics/index.html

Benefits of One Health Collaborations

- Fostering teamwork
- Strengthening communication across sectors
- Coordinating disease surveillance
- Increasing public awareness through dissemination

“When we try to pick out anything by itself, we find it hitched to everything else in the Universe” (John Muir)

CDC, 2018: https://www.cdc.gov/onehealth/multimedia/factsheet.html
“To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science”

(Albert Einstein)
Integrating our Data and Technology Sources

Where is the data?

Where is the data?

Grand Unification of Sciences

Field Observation Data

- Direct Observation Techniques
- Semi-structured Interviews
- Focus Groups


Water samples
Georgia Urban Sprawl (USA)

Precipitation Rates (Globe)

Integrated Multi-satellitE Retrievals for GPM (IMERG) data products (July/August 2014)

Data from 12-satellite network by NASA/Japan Aerospace Exploration Agency

Using Satellite and Ground-based Data to Develop Malaria Risk Maps (Peru)

PI Dr. William Pan (Duke University)

Land Data Assimilation System (LDAS) data sets (precipitation, soil moisture, air temperature, humidity) are combined with public health data.
Enhancing Public Health Initiatives

Integration of Earth observation data into the public health applications

- Provide information to achieve program objectives (e.g., HP2020, SDGs)
- Enhance communication between stakeholders and other decision-makers
- Support training of the global health workforce for their preparedness and response measures

Future Considerations

Build new and strengthen existing collaborations with new communities

Establish links within divisions or departments within the institution

Identify research gaps to highlight future research and practice activities

CDC, 2019: [https://www.cdc.gov/onehealth/basics/index.html](https://www.cdc.gov/onehealth/basics/index.html)
Connections with New Stakeholders

Credit: AMCA, 2019
Credit: ALA, 2019
Credit: ASPPH, 2019

Air Pollution from Wildfires
AUGUST
Year of Air Pollution & Health 2019

Promoting Lung Health by Reducing Pollution
NOVEMBER
Year of Air Pollution & Health 2019

Credit: ALA, 2019
Publication Opportunities

Enhances the integration of animal, human, and environmental health for the benefit of all by demonstrating One Health in practice

- Quarterly publications with specific themes
- Submissions include brief research communications or reviews, field applications, perspectives on One Health topics, and book reviews

One Health Newsletter, 2019: [http://www.vet.k-state.edu/OneHealth/](http://www.vet.k-state.edu/OneHealth/)
Together, we can strengthen One Health connections!

Earth observation data can strengthen the human-environment link of the **One Health toolkit** for community practitioners, scientists, educators, and decision-makers in environmental health applications.

Credit: NASA, 2018: https://visibleearth.nasa.gov/view.php?id=57723
Thank you for your attention!

Credit: One Health Commission

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