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Urbanization and Slums: New Transmission Pathways of Infectious Diseases in the Built Environment – A Workshop

Agenda

DECEMBER 12-13, 2017

The National Academies Keck Building
500 Fifth Street NW - Room 100
Washington, DC 20001

Abbreviated Statement of Task:

This 1.5 day public workshop will examine new transmission pathways of microbes in the urban built environment[1] that affect human health. This workshop will feature invited presentations and discussions on topics including:

- The current state of science of the formation, function, and interactions of microbial communities in the urban built environment that impact human health.
- Specific urban built environment characteristics, spatial heterogeneity, and land-use patterns, as well as social and behavioral factors (host and vector movement) that may alter vector distribution, and increase or facilitate transmission of infectious diseases.
- Critical opportunities, challenges, and knowledge gaps relevant to translating research findings into practical application of shaping urban environments that prevent and mitigate infectious disease outbreaks.
- Innovative strategies, interventions, and policies for creating sustainable and health-promoting urban built environments that consider structural and socioeconomic determinants of diseases.
- Obtaining valid and reliable data to monitor and evaluate implementation and progress of programs and policies.
- Collaboration and coordination mechanisms among various stakeholders and across sectors in urban planning, public policy, public health, animal health, environmental health, microbiology, and social and behavioral sciences.

Workshop speakers and discussants will contribute perspectives from government, academia, private, and nonprofit sectors.

[1] The urban built environment includes all of the physical parts of where we live and work in a city, such as homes, buildings, streets, open spaces, and infrastructure.

DAY 1 – TUESDAY, December 12, 2017

1:00 pm ET **Opening Remarks**
DAVID RELMAN, *Chair of the Forum on Microbial Threats*
Professor of Medicine and of Microbiology and Immunology
Stanford University

Current Challenges and Opportunities for the Prevention and Control of Infectious Diseases in an Increasingly Urban and Interconnected World

Global Perspective:
CHRISTOPHER DYE
Director of Strategy, Policy, and Information, Office of the Director-General
World Health Organization

Local Perspective:
ALEX EZEH
Former Executive Director
African Population and Health Research Center, Kenya

Workshop Overview and Goals
JAMES HUGHES, *Workshop Co-Chair*
Professor of Medicine and Public Health
Emory University

MARY WILSON, *Workshop Co-Chair*
Clinical Professor of Epidemiology and Biostatistics
University of California, San Francisco

Session I: Social, Physical, Environmental, and Political Drivers of Infectious Disease Transmission in the Urban Built Environment

2:00 pm **Part A: Current State of Science and Knowledge Gaps in an Evolving Landscape**
Objectives:

- Characterize components of the built environment in connection to urban settings and their effect on population health
- Understand the mechanism of urbanization facilitating the development of enclosed dwellings and increasing risk of human exposure to microbial communities and potential pathogens
- Explore interactions of multiple drivers that increase risk of transmission of infectious diseases within, into, and out of urban centers via humans, animals (e.g., pets, rodents, wildlife, and food animals), urban agriculture, and vectors
- Discuss research gaps, opportunities, and barriers for understanding microbial communities and transmission dynamics in urban built environments

Moderator: Maria Gloria Dominguez-Bello, New York University School of Medicine

The Influence of Cities, Urban Environments, and Informal Settlements on Population Health and Microbial Communities
LEE W. RILEY
Professor and Head, Division of Infectious Diseases and Vaccinology
University of California, Berkeley, School of Public Health

Understanding Mechanisms and Implications of Human Exposure to Microbes in Urban Buildings: Research Gaps, Opportunities, and Barriers
YUGUO LI
Professor and Associate Dean, Faculty of Engineering
University of Hong Kong

Migration and Movement: Pathways of Pathogens Within, Into, and Out of Urban Centers
DAVID L. SMITH
Professor of Global Health
Institute for Health Metrics and Evaluation, University of Washington

2:45 pm **Discussion**

3:30pm **Break**

3:45 pm **Part B: Translating Conceptual Models into Practice**
Objectives:

- Draw lessons learned from recent infectious disease outbreaks in slums and informal settlements worldwide caused by emerging and reemerging pathogens that have adapted to urban built environments, identify best practices, and improve methods for slowing transmissions
- Characterize the drivers in urban centers and informal settlements that serve as reservoirs and amplifiers of diseases
- Assess how the multiple drivers and exposures in these settings may increase disease susceptibility and comorbidities and place a disproportionate burden on some populations such as women and children
- Describe challenges and opportunities for improving data collection, sampling methods, analysis, and interpretation for capturing the interaction of drivers and transmissions in the urban built environment

Moderator: Marcos Espinal, Pan American Health Organization

The Impact of the West Africa Ebola Virus Disease Outbreak on the Epidemiology of Other Infectious Diseases
FRANK MAHONEY
Senior Immunization Officer
International Federation of Red Cross and Red Crescent Societies

Water-Borne Diseases in Dhaka, Bangladesh
EMILY GURLEY
Associate Scientist, Infectious Disease Epidemiology Division
Johns Hopkins Bloomberg School of Public Health

Emerging Vector-Borne and Zoonotic Diseases in the Urban Landscape: Zika and Leptospirosis in Brazilian Slum Settlements
ALBERT ICKSANG KO
Professor and Chair, Department of Epidemiology of Microbial Diseases
Yale School of Public Health

Tuberculosis and HIV in South Africa
ROBIN WOOD
Director and Chief Executive Officer, Desmond Tutu HIV Centre and Foundation
University of Cape Town, South Africa

4:45 pm **Discussion**

5:25 pm **Wrap-up**
MARY WILSON, *Workshop Co-Chair*
Clinical Professor of Epidemiology and Biostatistics
University of California, San Francisco

5:30pm **Adjourn**

5:35pm **Reception**

DAY 2 – WEDNESDAY, December 13, 2017

8:30 am ET **Welcome**
JAMES HUGHES, *Workshop Co-Chair*
Professor of Medicine and Public Health
Emory University

8:35 am **Tackling Health Inequalities Through Informal Settlements Upgrading and City Planning and Policy**
SHEELA PATEL
Founder Director, Society for Promotion of Area Resource Centres, India
Chair, Shack/Slum Dwellers International

Session II: Effective Interventions and Policies – Achieving Sustainable and Health-Promoting Urban Built Environments

8:55 am Objectives:

- Review current global initiatives that offer guidance and approaches to shape health-promoting urban settings that would help curb infectious disease transmissions
- Explore surveillance methods that can capture accurate and precise data in real-time and distinguish different types of residence, locations, socioeconomic strata, among other variables to reveal varied effects of infectious disease transmissions in the urban built environment and be translated to targeted policies and interventions
- Discuss evidence-based interventions and policies that address structural and social determinants of diseases to control transmissions in urban settings
- Assess integrated strategies that promote comprehensive planning process for health and health equity, such as health impact assessments, which may help reduce outbreaks especially in informal settlements/slums
- Examine community-based interventions and participatory approaches and ways to effectively develop and deliver care and services for hard to reach communities

Moderator: Jason Corburn, University of California, Berkeley

Building an Investment Case for Slum Upgrading and Health-Promoting Urban Environments
SIDDHARTH AGARWAL
Director
Urban Health Resource Centre, India

Global Efforts for Leveraging the Sustainable Development Goals and Promoting Healthy Lives
STEVE LINDSAY (*joining remotely)
Professor in Biosciences
Durham University, England

Physical and Engineering Interventions Fit for Context: A Focus on Water, Sanitation, and Hygiene
DANIELE LANTAGNE
Associate Professor of Civil and Environmental Engineering
Tufts University

Engaging Communities from Surveillance to Policy
EVA HARRIS
Professor of Infectious Diseases and Director, Center for Global Public Health
University of California, Berkeley

9:45 am **Discussion**

10:30 am **Break**

Session III: Exploring Research Gaps to Bridge Drivers and Interventions and Scaling Up Successful Practices

Objectives:

- Discuss strategies to close the gap between conceptual models and practical application
- Identify knowledge gaps and research priorities to advance the field
- Examine approaches for collaboration and coordination among various sectors and actors to implement the interventions

10:45 am **Introduction to Session**
ERIC MINTZ
Team Lead, Global Epidemiology, Waterborne Diseases Prevention Branch
U.S. Centers for Disease Control and Prevention

10:55 am (mobilize to breakout rooms)

11:00 am **Breakout Session**
The purpose of this breakout session is to identify priorities for research and concrete next steps to advance the field.

Group 1 (room 100): **Integrated Strategies that Promote Health and Health Equity on the National and Local Levels in Low-income Urban Settings**
Moderator: Jason Corburn, University of California, Berkeley

Group 2 (room 101): **Scaling Up Successful Practices – From Research to Practice in Local Communities**
Moderator: Thomas Scott, University of California, Davis

Group 3 (room 105): **The Business Case for Investing in Health-Promoting Urban Environments and the Link to the Sustainable Development Goals**
Moderator: Christopher Dye, World Health Organization

12:30 pm **Lunch**

1:30 pm **Breakout Group Reports**
Moderator:
KATHERINE BOWMAN
Senior Program Officer, Board on Life Sciences
The National Academies of Sciences, Engineering, and Medicine

JASON CORBURN
Professor of Public Health and of City and Regional Planning
Director, Institute of Urban and Regional Development, Center for Global Healthy Cities
University of California, Berkeley

THOMAS SCOTT
Distinguished Professor, Department of Entomology and Nematology
University of California, Davis

CHRISTOPHER DYE
Director of Strategy, Policy, and Information, Office of the Director-General
World Health Organization

2:00 pm **Synthesis and General Discussion**
Moderator:
KATHERINE BOWMAN
Senior Program Officer, Board on Life Sciences
The National Academies of Sciences, Engineering, and Medicine

3:15 pm **Closing Remarks**
JAMES HUGHES, *Workshop Co-Chair*
Professor of Medicine and Public Health
Emory University

MARY WILSON, *Workshop Co-Chair*
Clinical Professor of Epidemiology and Biostatistics
University of California, San Francisco

DAVID RELMAN, *Chair of the Forum on Microbial Threats*
Professor of Medicine and of Microbiology and Immunology
Stanford University

3:30 pm **Adjourn**