

# Cities' COVID Mitigation and Mapping (C2M2) Virtual Symposium



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*What can geospatial data reveal about the second-order impacts of the COVID-19 pandemic? Through panel discussions, lightning talks, and keynote speeches by global experts, we will examine the pandemic's second-order impacts through the lenses of migration, livelihoods, and gender. A hands-on workshop day is included.*



Center for  
Geographic Analysis  
Harvard University



MAP  GIVE  
Cities' COVID-19 Mitigation Mapping (C2M2)

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# Welcome to the C2M2 Virtual Symposium!

The C2M2 Program is a global set of urban projects with the goal to build capacity for enabling mitigation strategies through the application of geospatial approaches (tools, training, and technology) to address the second-order impacts of the COVID-19 pandemic. This symposium focuses on mapping for the mitigation of second-order impacts by exploring geospatial outcomes to inform data-driven decision-making. We will hear from experts who have been at the forefront of monitoring the pandemic, producing critical data on local economies, and providing an understanding of critical needs for societies to adapt to the conditions imposed by pandemic strategies.

Over three consecutive days, we will focus on different themes that have emerged from the pandemic: migration, livelihoods, and gender. These three themes reflect the general topics of economy, society, and well-being. We will discuss how the pandemic influences information needs, data sharing, and requirements for long-lasting sustainable projects and partnerships. To accomplish these goals, we will focus on current projects in selected cities, consider the role of accelerated science in defining and describing second-order impacts, and assess the outcomes of geospatial analyses to inform data-driven decision-making.

The outcome of this dialogue is to create a network of geospatial experts, policymakers, and funders to build on the important lessons learned from the COVID-19 pandemic. We are excited to partner with the Center for Geographic Analysis (Harvard University) in making this symposium possible.

Sincerely,  
The C2M2 Program

Laura Cline, C2M2 Program Director

U.S. Department of State's Office of the Geographer and Global Issues

Dr. Melinda Laituri, Principal Investigator, Colorado State University

Dr. Junghwan Kim, Postdoctoral Fellow, Harvard University

## About Us: The C2M2 Program

The [Cities' COVID Mitigation Mapping \(C2M2\) program](#) is part of the MapGive Initiative in the Office of the Geographer at the U.S. Department of State that builds partnerships to enhance geospatial capacity, generate data, and share maps to support planning for mitigating COVID-19 second-order impacts.

Our project is one of 12 city-based projects connected regionally and globally through the Cities' COVID Mitigation Mapping (C2M2) program supported by the U.S. Department of State. In each city, C2M2 project partners focus on key themes such as food security, the informal economy, tourism, health, and mobility to understand the second-order impacts of COVID-19.

Each project is facilitated by one of three regional hubs assisted by the American Association of Geographers to build local capacity for using geospatial technologies, strengthen partnerships, and create new data and analysis to understand resource distribution and gaps.

Projects generate data and analytic products to share openly within the community to support data-driven decision-making for economic and social needs (such as health, water, and education services).

## What are second-order impacts of the pandemic?

Second-order impacts have specific repercussions and tangible outcomes that stem from human responses to the pandemic, rather than from the virus itself. Many of these second-order impacts have spatial characteristics that can be mapped and analyzed.

Identifying the spatial outcomes of the second-order impacts expose the locations of inequitable distribution of basic services, newly emerging vulnerable populations, and changing patterns of mobility and migration.

This symposium focuses on three specific aspects of second order impacts: migration, livelihoods, and gender. Border closures have impacted the mobility of migrants influencing labor markets dependent upon seasonal and lower paying jobs. Internal mobility patterns have also changed as populations in cities shift to rural areas with people returning to traditional homelands. Livelihoods have been transformed where loss of employment spans both the formal and informal economic sectors. Vulnerable populations have increased and exposure to the spread of COVID-19 expanded where small, informal businesses have closed and areas dependent on tourism have laid off employees.

Women, children, and the elderly are at particular risk from COVID-19. With stay-at-home orders, incidences of domestic violence have increased; and women in precarious economic situations have turned to prostitution and other means to provide for families.



## Overview

In late 2019, the outbreak of the novel coronavirus (SARS-CoV-2) and resulting illness, COVID-19, in Wuhan, China rapidly expanded across the globe resulting in the declaration of a global pandemic by WHO in early 2020. A highly contagious disease, the rapid transmission of the virus resulted in immediate first-order impacts, which included increasing numbers of cases and case fatalities, stressing hospital capacity, and generating government responses in the form of border restrictions, lockdowns, quarantines, and public health guidance.

The worldwide scale of second-order impacts soon became evident, including a global economic crisis impacting all aspects of society, exacerbating chronic conditions of food insecurity, limited access to health services, and loss of livelihoods.

This pandemic crisis magnifies fundamental inequities that require measures to plan for and adapt to the longer-term impacts of COVID-19. These implications highlight the need to generate robust data to track the impacts of the virus, identify vulnerable populations, and monitor mitigation plans that integrate information from diverse sources and multiple scales.

# Agenda

- Schedule Overview

	<i>Migration</i> June 22 (Tue)	<i>Livelihoods</i> June 23 (Wed)	<i>Gender</i> June 24 (Thu)	<i>Workshop</i> June 25 (Fri)
8:30 AM	Check-in	Check-in	Check-in	Workshops 1-4 (8:30-10:10)
9:00 AM	Welcome & Introductions	Welcome & Introductions	Welcome & Introductions	
9:15 AM	Panel Session (9:15-9:45)	Panel Session (9:15-9:45)	Panel Session (9:15-9:45)	
10:00 AM	Q&A (9:45-10:00)	Q&A (9:45-10:00)	Q&A (9:45-10:00)	
10:10 AM	Coffee Break	Coffee Break	Coffee Break	Coffee Break (10:10-10:20)
10:40 AM	Lightning Talks (C2M2 Projects/Pre-recorded Videos)	Lightning Talks (C2M2 Projects/Pre-recorded Videos)	Lightning Talks (C2M2 Projects/Pre-recorded Videos)	Workshop 5 (10:20-10:45)
11:10 AM	Keynote Speech (Lars Nissen)	Keynote Speech (Francis Koti)	Keynote Speech (Julie Gamble)	Student Poster Presentation (10:45-11:20)
11:30 AM	Discussion & Questions	Discussion & Questions	Discussion & Questions	Discussion & Questions

\* All times are in Eastern Daylight Time (EDT).

- Zoom Access Link

**Link:** <https://harvard.zoom.us/j/94638500603>

**YouTube Live:** <https://www.youtube.com/user/HarvardCGA>

- **Day 1 (June 22, Tuesday)**

**Theme: Adapting to impacts on migration and tourism**

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- 8:30 - **Check-in**  
9:00 AM *Moderator: Nama Budhathoki, Kathmandu Living Labs and HOT*
- 9:00 - **Welcome and introductions**  
9:15 AM *Lee Schwartz, U.S. Department of State*
- 9:15 - **Panel session**  
10:00 AM \* Each panelist provides a short presentation (8-mins), followed by a short Q/A session (2-mins). Time (15-mins) is scheduled for Q/A and general discussion after all presentations.  
*Moderator: Lee Schwartz, U.S. Department of State*  
*Panelists: Nuno Nunes and Ivona Zakoska-Todorovska, IOM*  
*Lu Wang, Ryerson University*  
*Nama Budhathoki, Kathmandu Living Labs and HOT*
- 10:00 - **Coffee break**  
10:10 AM
- 10:10 - **Lightning talks (C2M2 projects/Pre-recorded videos)**  
10:40 AM *Presenters: Kathmandu, Nepal*  
*Santiago, Chile*  
*Galapagos, Ecuador*  
*Ouro Preto, Brazil*
- 10:40 - **Keynote speech**  
11:10 AM *Lars Peter Nissen, ACAPS*
- 11:10 - **Discussion and questions**  
11:30 AM *Moderator: Melinda Laituri, Colorado State University*
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\* All times are in Eastern Daylight Time (EDT).

- **Day 2 (June 23, Wednesday)**

**Theme: New barriers and drivers of livelihoods, and the economy**

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- 8:30 - **Check-in**  
9:00 AM *Moderator: Gaston Mbonglou, UASG Advisors*
- 9:00 - **Welcome and introductions**  
9:15 AM *Laura Cline, U.S. Department of State*
- 9:15 - **Panel session**  
10:00 AM \* Each panelist provides a short presentation (8-mins), followed by a short Q/A session (2-mins). Time (15-mins) is scheduled for Q/A and general discussion after all presentations.  
*Moderator: Laura Cline, U.S. Department of State*  
*Panelists: Robert B. Richardson, Michigan State University*  
*Fikriyah Winata, University of Illinois at Urbana-Champaign*  
*Gaston Mbonglou, UASG*
- 10:00 - **Coffee break**  
10:10 AM
- 10:10 - **Lightning talks (C2M2 projects/Pre-recorded videos)**  
10:40 AM *Presenters: Nairobi, Kenya*  
*Dhaka, Bangladesh*  
*Ulaanbaatar, Mongolia*  
*Lima, Peru*
- 10:40 - **Keynote speech**  
11:10 AM *Francis T. Koti, Middle Tennessee State University*
- 11:10 - **Discussion and questions**  
11:30 AM *Moderator: Laura Cline, U.S. Department of State*
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\* All times are in Eastern Daylight Time (EDT).

- **Day 3 (June 24, Thursday)**

**Theme: Adaptations to social challenges: poverty, education, and gender**

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- 8:30 - **Check-in**  
9:00 AM *Moderator: Carlos Mena, Universidad San Francisco de Quito*
- 9:00 - **Welcome and introductions**  
9:15 AM *Melinda Laituri, Colorado State University*
- 9:15 - **Panel session**  
10:00 AM \* Each panelist provides a short presentation (8-mins), followed by a short Q/A session (2-mins). Time (15-mins) is scheduled for Q/A and general discussion after all presentations.  
*Moderator: Melinda Laituri, Colorado State University*  
*Panelists: Kevin Nelson, USAID*  
*Matthew Lorenzen, National Autonomous University of Mexico*  
*Carlos Mena, Universidad San Francisco de Quito*
- 10:00 - **Coffee break**  
10:10 AM
- 10:10 - **Lightning talks (C2M2 projects/Pre-recorded videos)**  
10:40 AM *Presenters: Bukavu, Democratic Republic of the Congo*  
*Pemba, Mozambique*  
*Cusco, Peru*  
*Quito, Ecuador*
- 10:40 - **Keynote speech**  
11:10 AM *Julie C. Gamble, Trinity College and Universidad San Francisco de Quito*
- 11:10 - **Discussion and questions**  
11:30 AM *Moderator: Melinda Laituri, Colorado State University*
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- **Day 4 (June 25, Friday, Workshops/Showcases)**

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- 8:30 - **Welcome and introductions**  
8:30 AM *Junghwan Kim, Harvard University*
- 8:30 - **Workshop 1 (Mongolia Health Portal)**  
8:55 AM *Enkhtungalag Chuluunbaatar, Hel Nershing Thapa, and Ichchha Moktan  
Public Lab Mongolia and Kathmandu Living Labs*
- 8:55 - **Workshop 2 (Icons for Recovery)**  
9:20 AM *Wendy E. Brawer, Green Map System*
- 9:20 - **Workshop 3 (TripAdvisor data collection and analysis)**  
9:45 AM *Braulio Silva, Universidade Federal de Minas Gerais*
- 9:45 - **Workshop 4 (Cities Navigator)**  
10:10 AM *Ranjit John, Haw kai Data*
- 10:10 - **Coffee break**  
10:20 AM
- 10:20 - **Workshop 5 (Building an interactive data dashboard)**  
10:45 AM *Akhil Kumar, CVT*
- 10:45 - **Harvard CGA-CVT Student Poster Presentation**  
11:20 AM *Sadhana Kumar, Liberal Arts and Science Academy  
Sofia Khugaeva, Conestoga High School  
Genevieve Chin, University of California, Los Angeles  
Eden Brunner, Harriton High School  
Kashika Bharol, University of California, Berkeley  
Sampath Rapuri, St. Mark's School of Texas  
Kevin Wang, University of California, Berkeley  
Roselyn Chin, Mark Keppel High School*
- 11:20 - **Discussion and questions**  
11:30 AM *Junghwan Kim, Harvard University*
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\* All times are in Eastern Daylight Time (EDT).

- **Day 1 (June 22, Tuesday)**

- **[Keynote Speech] Precisely Wrong**

**by Lars Peter Nissen**

**Director, ACAPS**

The second-order effects of the Covid-19 Pandemic are still unfolding and our understanding of these effects remains embryonic. Relying too heavily on existing analytical frameworks and preconceived ideas creates the risk of analysis being “precisely wrong.” To mitigate this risk we have to take a step back, ask the fundamental questions and adopt an iterative, good enough approach. ACAPS ([www.acaps.org](http://www.acaps.org)) is an independent, humanitarian organization specialized in analysis. During the early days of the pandemic, ACAPS published a number of analysis products, which were instrumental in gaining an initial understanding of how the pandemic impacted crisis-affected populations and humanitarian action.

- **[Panel Session] Monitoring Mobility Restrictions and COVID-19 Impact on Migrants**

**by Nuno Nunes and Ivona Zakoska-Todorovska**

**International Organization for Migration (IOM)**

The International Organization for Migration (IOM) through its Displacement Tracking Matrix has been tracking the surge in travel restrictions, border closures, and health-related travel requirements imposed by governments and authorities since the onset of the pandemic. Through its network of field offices, IOM has been monitoring the impact of COVID-19 related mobility restrictions on different categories of the population on the move such as labor migrants, international students, migrants in camps and camp-like settings and whether and how these restrictions have exacerbated existing migrants vulnerabilities and created new ones. These data are essential to understand how the pandemic has reshaped border management and human mobility – and what the lasting ramifications maybe for the future of mobility. The presentation will aim to give a snapshot of IOMs work and discuss some of the main findings and challenges encountered in data collection and in particular standardization of the different categories of mobility restrictions.

- **[Panel Session] COVID-19, neighborhood health and prevention behavior in Toronto, Canada**

**by Dr. Lu Wang**

**Professor, Department of Geography and Environmental Studies, Ryerson University**

The presentation draws from an ongoing CIHR (Canadian Institute for Health Research)-funded research project that explores COVID-19, neighborhood health, and prevention behavior in the Toronto Area. Toronto is the most populous urban center and the largest COVID-19 hotspot in Canada. The research focuses on the spatial and social patterning of COVID-19 within Toronto neighborhoods. The online survey conducted has shown evolving prevention practices at an individual level that are shaped by risk perceptions towards COVID-19, individual characteristics, and public health interventions across key timelines during the pandemic. Discussions will include COVID-19’s impacts on migration in the health domain, use of geospatial data, geospatial tools and spatial-quantitative methods in research on COVID-19, and potential areas for collaboration.

- **Day 1 (June 22, Tuesday)**

- **[Panel Session] Secondary impacts of COVID-19 on tourism: Initial learning from Nepal**

**by Dr. Nama Raj Budhathoki**

**Executive Chairman, Kathmandu Living Labs and HOT**

COVID-19 pandemic has created a global crisis affecting almost all sectors of society. Asia is no exception to it. Tourism is one of the worst-hit sectors in the Asian region. Over the last several months, Kathmandu Living Labs (KLL) has been exploring the secondary impacts of the pandemic on the tourism sector. The project team has used a mix of surveys, qualitative interviews, and geospatial analysis to understand how the pandemic has affected Nepal's most popular tourist hubs namely Thamel, Pokhara, and Chitwan. In this panel, we will share preliminary findings of the study with highlights on the secondary impacts and most crucial issues that need to be addressed to revive the sector. In addition to the impacts, we will also share the sector's preparedness and needs in the short and medium terms. We will also talk about our efforts in connecting these needs to immediate stakeholders from the government and different civil society stakeholders in the tourism sector. Finally, we will discuss the opportunities for collaboration among stakeholders.

- **[Lightning Talk-C2M2 Projects] Echoes of tourism: People, Process, Plights by Deepak Raj Joshi and Sazal Sthapit (C2M2 Partner, Nepal)**

Tourism was one of the first sectors to be affected by the pandemic in Nepal. It will be one of the last to recover. Meanwhile, more than a million people's livelihoods that depend on tourism will continue to hang in the balance. In this talk, we will share voices of this deeply troubled sector, and most of all, the people who are at the end of it. We will show how the pandemic has affected them, and how we tried to understand and communicate their levels of preparedness and needs to the stakeholders who could help them. You will also hear from the tourism entrepreneurs and workers who, after spending a lifetime in the sector, were staring at difficult choices as they stood at the brink of a second wave. Finally, we will showcase some of our experimental geo-analysis products that are aimed at helping the government take informed steps around addressing the COVID-induced plights of these people.

- **[Lightning Talk-C2M2 Projects] Covid-19 and territorial dynamics of crime in Santiago, Chile**

**by Juan Pablo Luna and Bryan Castillo (C2M2 partner, Chile)**

The presentation analyzes the territorial distribution of different crimes in the Santiago Metropolitan Region, before and after two critical events: the social outbreak of October and November 2019, and the arrival of the COVID-19 pandemic in March 2020. The information we have at the municipal level also allows us to make comparative comparisons according to the incidence of COVID-19 at the municipal level, and the effect of the dynamic quarantine system and its impacts on the mobility patterns implemented by the Government of Chile, also at a municipal level.

- **Day 1 (June 22, Tuesday)**

- **[Lightning Talk-C2M2 Projects] Inside view of the secondary effects of COVID19 in touristic cities, the case of Puerto Ayora Galapagos by Indira Espin (C2M2 partner, Ecuador)**

This research analyzes the secondary effects caused due to the Covid 19, and the collapse of touristic cities like Puerto Ayora on the Galapagos Island. An overview of migration and economic facts. According to the Tourist Chamber, 80% of the Galapagos economy is related to tourism. According to the Institute of Statistics and Census, 1,800 employees were fired due to the pandemic. This represents a decrease of 21% informal jobs from last year. In 2020, around 72,519 tourists arrived in the Galapagos Islands, a figure that denotes a 73% decline in national and international visitors, considering that in 2019 the number of tourists entering the Islands was 271,238. Through this research, we will learn how the Covid-19 has impacted migration, economy, and other secondary effects, related to the pandemic.

- **[Lightning Talk-C2M2 Projects] Covid-19 Lockdown effect, touristic demand and criminal dynamic: a microscale geostatistical analysis of the historic center of Ouro Preto, Brazil by Braulio Figueiredo A. da Silva (C2M2 partner, Brazil)**

The main goal of this study is to evaluate if the decrease in the flow of passersby due to the COVID-19 pandemic has affected the spatial pattern of crime in the city of Ouro Preto, located in the state of Minas Gerais, Brazil. By employing restaurants' customers' review as a proxy of urban mobility, the study tests the hypothesis that changes in the population mobility due to the implementation of the COVID-19 lockdown has influenced the spatial distribution of crime, particularly in the historical center of Ouro Preto. The study uses crime data provided by the local police and compares the variation on the spatial pattern of crime (1) before the outburst of COVID 19; (2) during the implementation of the COVID 19 lockdown policies; (3) at the end of the COVID-19 lockdown; and (4) the period of tourism recovery. The main hypothesis is that the outburst of the COVID-19 interrupted the tourism demand with great impact on the individuals' routine activity and consequently has influenced the spatial distribution of crime by creating new opportunities for offending. The research results show that the spatial mean center of crime incidence in the study area has a significant spatial displacement in comparison to the period before and after the COVID-19 lockdown. The results also indicate that the spatial mean center of crime incidence returns to its original position during the period of tourism recovery.

- **Day 2 (June 23, Wednesday)**
- **[Keynote Speech] Resilience amid uncertainty: COVID-19 pandemic, the informal sector, and livelihoods in African cities**

**by Dr. Francis Koti**

**Professor, Department of Global Studies and Human Geography, Middle Tennessee State University**

The contribution of the informal sector to national economies and livelihoods in low-income countries cannot be overstated. Unfortunately, this sector is highly vulnerable to political, economic, and social uncertainties such as those presented by the Covid-19 pandemic in 2020. For instance, containment and mitigation measures employed in large African cities at the beginning of the global health crisis in 2020 included guidelines that threatened the existence of the informal sector – the very sector employing well over 70% of city populations across the continent. In this study, we ask: What explains the relative resilience of the informal sector in African cities in the face of Covid-19-imposed closures? In what ways will the Covid-19 pandemic impact the informal sector as a key source of livelihood in large African cities? What adaptations will be needed in the informal sector to respond to the impacts of the Covid-19 pandemic and how might geospatial technologies enhance local community adaptations to the new socio-economic and spatial realities of the post-Covid-19 era? Preliminary results indicate a high resilience and potential for expansion of the informal sector despite limited government support. This expanded framework is likely to comprise an array of new activities and actors not previously seen in the informal sector. We argue that embracing technology, expanding social networks, rethinking accessibility, and increasing mobility – are some of the adaptations that will become necessary in order to respond to the impacts of the Covid-19 pandemic. Creating a strategic infrastructure to support a more robust, community-oriented, and readily accessible informal sector may hold the key to sustaining African urban economies and livelihoods.

- **[Panel Session] COVID-19: Barriers and Drivers of Livelihoods and the Economy**  
**by Dr. Robert B. Richardson**

**Professor, Department of Community Sustainability, Michigan State University**

The rapid transmission of the novel coronavirus (SARS-CoV-2) and resulting illness, COVID-19 resulted in immediate first-order impacts, which included increasing numbers of cases and case fatalities, stressing hospital capacity, and generating government responses in the form of border restrictions, lockdowns, quarantines, and public health guidance. The worldwide scale of second-order impacts soon became evident, including a global economic crisis impacting all aspects of society, exacerbating chronic conditions of food insecurity, limited access to health services, and loss of livelihoods. Livelihoods have been transformed where the loss of employment spans both the formal and informal economic sectors. Many individuals around the world turned to livelihood coping strategies in order to make up for insufficient food consumption and difficulty accessing markets because of COVID-19. Vulnerable populations have increased and exposure to the spread of COVID-19 expanded where small, informal businesses have closed and areas dependent on tourism have laid off employees.

- **Day 2 (June 23, Wednesday)**

- **[Panel Session] Therapeutic Landscapes and Networks amongst Indonesian Female Domestic Workers in Hong Kong during the COVID-19 Pandemic**  
**by Fikriyah Winata**

Ph.D. Candidate, Department of Geography and GIScience, University of Illinois at Urbana-Champaign

Female domestic workers (FDWs) are highly vulnerable due to intensive work responsibilities and demanding daily tasks that limit women's social interactions and wellbeing. In Hong Kong, the government requires that employers provide a mandated day off after seven days of working. Typically, FDWs use the rest day for non-work-related activities, including social gatherings and visits to therapeutic landscapes. However, due to the COVID-19 pandemic, FDWs' access to places and social networks decreased. I collected quantitative and qualitative data for Indonesian FDWs in Hong Kong from activity diaries (N= 42), a health and wellbeing survey (N=190), and in-depth interviews via Zoom (N=31). I used GIS, spatial, statistical analyses, and narrative analysis to understand the role of therapeutic landscapes and networks in FDWs' everyday lives within the restrictive space-time constraints of domestic work as magnified by the COVID-19 pandemic. The results show that the pandemic and associated lockdowns limited FDWs' use of places; many FDWs spent their rest day at home even after Hong Kong reopened. On the other hand, their social therapeutic networks became stronger as FDWs needed more supports to cope with the pandemic stress and anxiety.

- **[Panel Session] Using geospatial data to understand and mitigate 2nd order impact of COVID-19 on education, healthcare, and the economy**  
**by Dr. Gaston Mbonglou**

Principal, UASG

Since the beginning of the COVID-19 Pandemic, African countries have grappled with how to keep a balance between the implementation of restrictive measures to reduce the spread of the disease and minimize the impact on the economy and social sectors (like healthcare and education) while respecting local customs and traditional beliefs. In the Africa hub, working with local communities, we used geospatial data to understand and quantify second-order impacts on the education, health, and the local economy in Bukavu (DRC), Nairobi (Kenya), and Pemba (Mozambique). The goal is to use the data analysis to compile recommendations that will enable local officials and civil society to better understand and mitigate second-order impact.

- **Day 2 (June 23, Wednesday)**
- **[Lightning Talk-C2M2 Projects] The second-order impacts on the economy by Erica Hagen (C2M2 Partner, Nairobi)**

Nairobi's C2M2 team has been mapping water points, sanitation features, and waste dumpsites in the large urban informal settlements of Kibera and Mathare, as well as interviewing residents about water and toilet access second-order impacts from the Covid 19 pandemic. The team has also surveyed residents about impacts on education and mapped school changes. This lightning talk will share midpoint findings such as critical water shortages, pandemic lockdown impacts around access to sanitation facilities, and economic impacts on families related to school closures. Mapping these sectors shows uneven impacts with slums being most impacted and uneven impacts within the slums which should guide policymakers to direct resources to the most affected areas.

- **[Lightning Talk-C2M2 Projects] A displaced city: An aftermath/impact of COVID 19 on livelihood at Dhaka, Bangladesh by Tasauf A Baki Billah (C2M2 Partner, Bangladesh)**

While the outbreak of the COVID-19 virus has impacted the entire world severely, developing countries such as Bangladesh, are struggling in not only the health sector but also other areas of development and livelihood. BOIL's "Cities COVID mitigation Mapping" Project in Bangladesh aims to detect the disruption of livelihood in low & middle-income communities along with its potential relationship with the internal migration induced during the different phases of lockdown in Bangladesh. The analysis of the collected & collated data sourced through this project, which has both social and geospatial component, aims to indicate whether the secondary impact of the COVID-19 pandemic on the local livelihood has any influence on the internal migration of the low-income communities(LIC) from big cities, mainly the capital, Dhaka. The chosen study area of the research, Mirpur, adequately represents the situation of the LICs of Dhaka along with the identical demographic distribution. The result of the analysis based on this area can constitute the entire scenario while creating a base for further research on mitigation & preparedness for academics, NGOs, CSOs, and Policymakers. At the same time, the project engages the youth in the overall process to ensure their voices are heard and they become the flagbearer to the solution pathway in the near future.

- **Day 2 (June 23, Wednesday)**
- **[Lightning Talk-C2M2 Projects] The case of health and essential service access in Mongolia's capital amid the Covid-19 pandemic by Enkhtungalag Chuluunbaatar (C2M2 Partner, Mongolia)**

Mongolia is a country of extremes. While one half of the population lives scattered across the vast lands in small settlements or as nomadic herders, the other half lives in the rapidly urbanizing and ever-expanding capital city, Ulaanbaatar. There, half of the residents live in sprawling, informal settlements without access to running water or central heating, while the rest inhabit apartment complexes with modern amenities. The Covid-19 pandemic has highlighted the challenges of extremes that render certain communities vulnerable due to inadequate access to essential urban services and provides an opportunity to re-examine Mongolia's stark inequalities. In this lightning talk, we will provide the context of the capital city's settlement types, discuss the different sets of challenges in ger area residents and illustrate the potential and existing vulnerabilities during the Covid-19 pandemic.

- **[Lightning Talk-C2M2 Projects] Domestic Violence during the Covid-19 pandemic in Lima, Peru by Laura Orellana Cuellar (C2M2 Partner, Lima-Peru)**

During the pandemic, women have been affected by limited access to help and protection services. In this sense, it is estimated that cases of domestic violence have increased, mainly violence by men towards women and their children, as they are particularly vulnerable in the context of the state of emergency. Our objectives to visualize and analyze the information on domestic violence for which we use the complaints of physical, sexual, psychological, and economic violence registered in the National Program for the Prevention and Eradication of Violence against Women and Family Members - AURORA, implemented by the Ministry of Women and Vulnerable Populations. We show that during 2020 in Metropolitan Lima, 8,100 fewer cases of domestic violence were reported and registered compared to 2019. Likewise, a uniform decrease in the number of reports was observed during the first 3 months after the start of confinement by Covid-19 (April, May, and June), this result is the underreporting generated by the limited access to help services. The number of reports increased to pre-pandemic levels after restrictions were lifted (July). The information will be presented in heat maps, which will allow us to identify the help centers where there is a higher density of cases according to sociodemographic characteristics.

- **Day 3 (June 24, Thursday)**

- **[Keynote Speech] Cycling for the Future Feminist City  
by Julie Gamble**

**Professor, Trinity College and Universidad San Francisco de Quito**

COVID-19 has and continues to generate diverse and complex impacts on cities, which urban researchers and institutions are still grappling with globally. The pandemic has been particularly impactful for women and girls as the increased periods of time spent in domestic spaces under quarantine, a lack of safe transport options, insecure public spaces, unstable employment, complex care obligations, and increased barriers to education, have exacerbated entrenched gender inequality. To address some of these challenges, municipal governments have turned toward the bicycle as a means to create a safe and healthy urban mobility option for residents. This talk will focus on the potential short and long-term role that increased cycling and cycling facilities can have on improving conditions for women and girls within the city. Using the case study of female cycling in Quito, Ecuador that relies on geo-coded photo-diaries and GPS trajectories, the talk will discuss emergent outcomes of the realities of cycling in the city under the pandemic. Research results indicate the importance of creating respected spaces for cycling, but also focus on measures to improve safety and security like cycling schools for women and girls.

- **[Panel Session] Reclaiming Their Mark: Women's Empowerment in Civic Spaces  
During Time of COVID**

**by Kevin M. Nelson**

**Urban Team Lead, Office of Land and Urban, USAID**

This session will focus on how women have reclaimed and influenced the development of public open spaces and land titles in a variety of contexts, from Tunisia, Honduras, and Tanzania. Examples will showcase how Covid-19 has forced community leaders to rethink its outreach and public uses so that a wider range of stakeholders can benefit from municipal services and resources. Examples will highlight women who are helping to redesign Tunis' urban parks, community leaders who better understand security issues for women and children in Honduran secondary cities, and the use of technology to aid in geospatial mapping to support women's rights and tenure security.

- **[Panel Session] Cascading Second-Order Effects of COVID-19 in Ecuador: Spatial  
Patterns and Potential Scenarios**

**by Dr. Carlos Mena**

**Professor, Department of Geography and Ecology, Universidad San Francisco de Quito**

The COVID-19 pandemic has created a set of cascading effects on the Ecuadorian socioeconomic system. Different hypotheses point out the increased levels of intra-family violence, lack of access to education, and, in general, increased levels of poverty. But, what really spatial data tell us? What are the spatial or temporal patterns associated with second-order effects of COVID-19? We will examine the cases of Quito and Galápagos, cities of the C2M2 project to illustrate the complexities of using spatial data for COVID research and determine vulnerable populations and vulnerable neighborhoods.

- **Day 3 (June 24, Thursday)**

- **[Panel Session] The gendered social and economic impacts of the COVID-19 pandemic and rural women's livelihood strategies in Mexico's Mixteca Alta region by Dr. Matthew Lorenzen**

**Associate Researcher, National Autonomous University of Mexico (UNAM)**

The literature on the social and economic effects of the COVID-19 pandemic has shown that women have been harshly affected, as lockdowns expanded violence against women and girls, increased the household workload mainly affecting women, and devastated predominantly female occupations, especially in retail and the service sector. The literature has also explored some of the responses of individuals and households to the crisis, although the focus has been on negative coping strategies that may jeopardize livelihoods, such as using up savings, consuming seed stocks, and selling assets. Surprisingly, as of the writing of this article, very little has been published on the construction of livelihood strategies to offset the impacts of the pandemic. This paper helps fill this gap in the literature by analyzing the livelihood strategies implemented by women in response to the gendered impacts of the pandemic, focusing on two municipalities of Mexico's Mixteca Alta region. Women in our study area have implemented three groups of livelihood strategies: increased use of local natural resources, backyard farming, and local trade. Our results highlight the importance of considering the agency of individuals and households to implement strategies to maintain livelihoods in response to shocks such as the COVID-19 pandemic.

- **[Lightning Talk-C2M2 Projects] The second-order impacts on the education by Euroflim Jesus Meque Pombo das Dividas (C2M2 Partner, Democratic Republic of the Congo)**

Bukavu is the capital and largest city in South Kivu Province. South Kivu is one of the 23 Provinces in DRC affected by the COVID-19 pandemic since it surfaced in March 2020. From the beginning of the pandemic, surveillance and response teams have been working to stop the spread of the disease. While the measure helped reduce the spread of the disease, they have also impacted the cities' ability to keep schools open and hence the life of all key players along the value chain including students (K-12 and college), parents, teachers, and school owners. In fact, before the Covid-19 Pandemic, the education offering in Bukavu was well respected and parents were able to send their children to school without fear. In addition, there were no handwashing requirements, hydro-alcoholic solutions, masks, or social distancing required. This lightning talk will share how Covid-19 impacted the education system including teachers' pay, teachers' demotivation, economic distress for parents that lost their jobs.

- **Day 3 (June 24, Thursday)**

- **[Lightning Talk-C2M2 Projects] The impacts of the COVID-19 pandemic on Pemba, Mozambique**

**by Dr. Mulongaibalu Mbalassa (C2M2 Partner, Mozambique)**

In Mozambique, the first case of COVID-19 was officially registered in March 2020 in the city of Maputo, and with 7 diagnosed cases, Mozambique declared the State of Emergency and adopted various measures to combat the pandemic which came into force from March 2020 in order to prevent the health system from collapsing due to its fragility and deficiency. However, in the city of Pemba, these measures have had an impact on households to the extent that some heads of household have seen their salaries reduced, which has influenced their purchasing power, placing them in a situation of social vulnerability, this associated with the water crisis, which is fundamental to the process of sanitation at this time. On the other hand, the closure of schools caused food consumption to increase, which led to food shortages in these households and more care for the children, as they did not realize that the closure was a measure to reduce the spread of COVID19 and kept circulating in the streets and markets. In addition, households had to go through the stress of living with the whole family at home, which was unusual before the pandemic, requiring more patience and tolerance from them. The lightning talk will highlight the above-mentioned secondary impacts.

- **[Lightning Talk-C2M2 Projects] Evidence of the side effect of the COVID-19 pandemic in the educational field in the Cusco region, Peru**

**by Delia Ramos & Santos Mera (C2M2 Partner, Cusco-Peru)**

This work shows the conditions in which the Education sector finds itself and the population dynamics after a year of health emergency in the Cusco Region. Due to the measures taken at the national level, many people who lived in the city returned to the countryside, as a consequence of the loss of jobs, the start of remote work (certain sectors), and virtual classes; causing the migration of 12% of the student population, from urban to rural schools. This population represents 29.96% of the total inhabitants, who had to adapt quickly to the challenges of virtual education. The concentration of remote work and virtual classes caused an increase in the number of internet connections by 83% (Claro Comm Company) according to previous years, being Cusco where we found the concentration of the highest number of connections (20,148 at year 2020).

- **[Lightning Talk-C2M2 Projects] Domestic violence in Quito (Ecuador) during the COVID-19 pandemic**

**by Byron Lozada & Patricia Martínez (C2M2 Partner, Ecuador)**

This study is to determine the factors that explain the changes in domestic violence in the city of Quito, before, during, and after the confinement caused by the COVID-19 pandemic. Intrafamily violence refers to violence that occurs within a home and is exercised by one of the members against another or against all of them (Mora, 2008). Therefore, domestic violence can be classified according to the type of violence carried out by a family member or according to the victim. The different types of violence include physical, psychological, sexual violence, and the murder of women as an extreme result of gender violence (femicide). Through the analysis and comparison of temporal-spatial patterns, it will be possible to determine whether the quarantine caused by the pandemic affects the increase or decrease of domestic violence in the city.

- **Day 4 (June 25, Friday, Workshops)**
- **[Workshop] Creating a digital health information infrastructure in Mongolia by Enkhtungalag Chuluunbaatar, Hel Nershing Thapa, and Ichchha Moktan**  
**Public Lab Mongolia and Kathmandu Living Labs**

One of the major challenges with health service access in Mongolia is the lack of one-stop information resources. This has led the people to difficulty accessing various public health services, what public and private specialist health service providers exist, and key information such as contact and address of the service providers. With the pandemic in full swing, these challenges are exacerbated, especially when the non-coronavirus-related health services are becoming limited. The World Bank (2021) reports that one in three Mongolians were not able to get the health and medical services they needed. This is largely due to the lack of readily accessible information. We have a developed health portal that works both on the web and mobile. It aims to facilitate access to information about available health and medical services and mitigate secondary health impacts of the Covid-19 pandemic. It is the first of its kind in the country. We hope to develop it towards a health information infrastructure for the people in Mongolia. In the workshop, we will present our core ideas, demonstrate the portal and the mobile app, and share some of the interesting conversations going on with the government and the prospective citizen users.

- **[Workshop] Icons for Recovery**  
**by Wendy Brawer**  
**Green Map System**

During 2020, Green Map System created a new set of icons, designed to help communities advance as they recover from the Pandemic. Based upon the sustainability-oriented set of Green Map Icons, the Recover Icons set is available on an open-source basis for use on maps, apps, signage, and more. Designed to expand the potential to recuperate in a healthier, more inclusive, and regenerative way, the Recovery Icons localize the profound truths laid bare by Covid-19 and offer new pathways forward that benefit the community and climate. With the second-order impacts unfolding for years to come, this workshop will provide a new lexicon for professionals and community mappers alike. OGM2, Green Map's second mapping platform ([new.opengreenmap.org](http://new.opengreenmap.org)) inspired the Recovery Icons. When OGM2's open-source developers, the GIS Collective, enabled user-added sets of icons in spring 2020, recovery was an obvious theme. Designed with the support of the Green Map network, these icons have been used as an inventory tool on map projects ranging from interactive to hand-drawn. This workshop will focus on using the icons on OGM2, and how to use its new Campaign tool to engage a cross-section of viewpoints on your Recovery Green Map.

- **Day 4 (June 25, Friday, Workshops)**

- **[Workshop] TripAdvisor data collection and analysis**

**by Dr. Braulio Figueiredo Alves da Silva**

**Universidade Federal de Minas Gerais**

The main goal of this study is to develop a web scraper using Python to collect data from TripAdvisor, which will be used as a proxy for urban mobility. TripAdvisor is a platform where customers of different services can post their reviews based on their experiences. Specifically in this study, information about restaurants, hotels, and tourism attractions was collected. The database was used to evaluate the spatial and temporal trends before and after the COVID-19 pandemic. We assume that this information is a reliable source of tourism demand that reflects the leisure activity of individuals. The research results show that the COVID-19 pandemic has reduced the number of reviews, confirming the retraction in tourist demand, the lag in its recovery, as well as its return from October 2020.

- **[Workshop] Cities Navigator - Using local data to enable local services**

**by Dr. Ranjit John**

**Hawkai Data**

Cities Navigator is a digital platform that enables cities and governments to enhance service resiliency and emergency preparedness. It allows city administrators to plan, prepare and effectively manage emergencies and provides citizens access to information, critical goods, and the availability of services. Disasters are inherently discriminatory where the socially disadvantaged, the economically disadvantaged, and even the informationally disadvantaged are disproportionately affected. Broader adoption of the Cities Navigator platform can enable equitable access to products and social services, keep communities informed, and help mitigate the impacts of disasters. The data collected can be aggregated and analyzed to measure and quantify the impact of a city or region's spend on social initiatives and also provides a way for regions to measure the longer-term effects of natural disasters, climate change, conflicts, and epidemics.

- **[Workshop] Learning How to Build an Interactive Data Dashboard Using Power BI**

**by Akhil Kumar (Student)**

**Turner Fenton Secondary School**

Data is everywhere! It's all around us, from the weather app on your phone or from the tweet you just sent. Making sense of data is hard and data visualization helps make that process easier. In this hands-on workshop, you will learn how to query COVID-19 data for every county in the USA, learn how to join the tabular data with spatial data, and learn how to put it all together within Power BI so your dashboard updates every day automatically for the world to see! Your end product will look something like this: <http://tiny.cc/USCountyDashboard>.

- **Day 4 (June 25, Friday, Workshops)**
- **[Student Poster] Using word clouds to compare second-order impacts of COVID-19 between three C2M2 hubs**  
by Sadhana Kumar\* (Liberal Arts and Science Academy) and Sofia Khugaeva\* (Conestoga High School)  
\* S. Kumar and S. Khugaeva contributed equally to this work.
- **[Student Poster] COVID-19's impact on developing countries: Economy**  
by Genevieve Chin (Department of Computer Science, University of California, Los Angeles)
- **[Student Poster] Understanding the impact of the COVID-19 pandemic on the environment**  
by Eden Brunner (Harriton High School)
- **[Student Poster] Impacts of the COVID-19 pandemic on global psychological well-being and related sociodemographic factors**  
by Kashika Bharol (Department of Molecular & Cell Biology, University of California, Berkeley)
- **[Student Poster] Impacts of the COVID-19 pandemic on global psychological well-being: A text-analysis approach**  
by Sampath Rapuri (St. Mark's School of Texas)
- **[Student Poster] Analyzing the state of geospatial analysis in COVID-19 research**  
by Kevin Wang (Department of Electrical Engineering and Computer Sciences, University of California, Berkeley)
- **[Student Poster] The principles of ethics of geospatial analysis in COVID-19 research**  
by Roselyn Chin (Mark Keppel High School)

Please see the work of the next generation of data scientists and geographers on COVID-19's second-order impacts.

Student posters can be accessed via this [link](#).

# Biography

- **Wendy E. Brawer ([web@greenmap.org](mailto:web@greenmap.org))**



**(Day 4, Workshop Presenter)** Wendy Brawer is an interpreter of progress toward sustainability. As founder and director of the nonprofit Green Map System, she has helped increase capacity for change in 65 countries. The locally-led movement shares co-designed iconography, engagement, and map-making tools that are used by agencies, academics, nonprofits, grassroots, and youth groups. Open source since 2018 to address the urgency of climate change, see [GreenMap.org](http://GreenMap.org) for resources and to access the OGM2 mapping platform. Involved locally on climate health and preparedness, during the first year of the Pandemic, Wendy initiated the Recovery Icons. She also joined NYC's first community-led Open Streets project, pitched in on a soup kitchen farm, and co-started a neighborhood air quality project, LES Breathe. Wendy presented at the 2021 International Society of Participatory Mapping and Open Data Day. Honors include being a TED Resident, a Designer in Residence at the Smithsonian National Design Museum, and an LES Hero.

- **Nama Raj Budhathoki**  
**([nama.budhathoki@kathmandulivinglabs.org](mailto:nama.budhathoki@kathmandulivinglabs.org))**



**(Day 1, Panelist)** Dr. Nama Budhathoki founded and developed Kathmandu Living Labs (KLL) as one of the exemplary institutions working in the areas of OpenStreetMap, open data, and civic technology. Some of the works he led at KLL have been covered in major news outlets, e.g. [The New York Times](#), [BBC](#), [MyRepublica](#), [GovInsider](#), [theguardian](#), [Setopati](#), [Nepali Times](#). At KLL, Nama has been leading the Secondary Cities Project since 2016 and is also guiding the C2M2 Projects in Asia. Before founding KLL, Nama successfully led the World Bank's Open Cities Project in Nepal in its inception phase. Currently, Nama serves the Open Mapping Hub for the Asia-Pacific region as the inaugural Regional Director where he works closely with OpenStreetMap communities from 25 countries in the region. Nama earned his doctorate degree from the University of Illinois at Urbana-Champaign with a focus on OpenStreetMap.

- **Enkhtungalag Chuluunbaatar**  
**([enkhtungalag.ch@publiclabmongolia.org](mailto:enkhtungalag.ch@publiclabmongolia.org))**



**(Day 4, Workshop Presenter)** Enkhtungalag Chuluunbaatar is co-founder of Public Lab Mongolia. She has been working in the Mongolian civil society organization with the goal of promoting open data, data-based decision-making, and youth leadership since 2013. She oversees organizational long-term goals, co-manages partnerships; develops long-term programming focused on open-data, public and environmental health, youth participation, and advocacy; and manages organizational capacity building needs and opportunities.

# Biography

- **Dr. Julie C. Gamble ([julie.gamble@trincoll.edu](mailto:julie.gamble@trincoll.edu))**



**(Day 3, Keynote Speaker)** Julie Gamble is an Assistant Professor of Urban Studies at Trinity College and an Assistant Professor of Social Science at Universidad San Francisco de Quito. She holds a Master's in City Planning (2010) and a Ph.D. in City and Regional Planning (2015) with a designated emphasis in Global Metropolitan Studies from the University of California, Berkeley. Julie's research focuses on alternative urban mobilities like cycling and informal transit in Latin American cities and more broadly the critical role of sustainable mobility policy in urban transformations across the global south. Her work has been supported by sources like the American Association of University Women and the Lincoln Institute of Land Policy, and published in diverse urban research journals like the *International Journal of Urban and Regional Research* and the *Journal of Transport Geography*, and regional reporting in NACLA Report on the Americas.

- **Dr. Ranjit John ([ranjit@hawkai.net](mailto:ranjit@hawkai.net))**



**(Day 4, Workshop Presenter)** Dr. Ranjit John is the founder and CEO of Hawkai Data. Hawkai Data is a cloud-based data platform that accelerates enterprise digital transformations and enables new business and customer experiences. Prior to founding Hawkai Data, Ranjit was the SVP Engineering & Operations for Jivox where he was responsible for the Jivox Ad Network and managed the hosted cloud infrastructure that delivered over a billion ad impressions a month. Ranjit has held engineering and operational leadership positions in multiple startups. He has a Ph.D. in Computer Science from the Georgia Institute of Technology.

- **Dr. Francis T. Koti ([Francis.Koti@mtsu.edu](mailto:Francis.Koti@mtsu.edu))**



**(Day 2, Keynote Speaker)** Francis T. Koti is Professor of Global Studies and Human Geography at Middle Tennessee State University (MTSU), Murfreesboro, TN. An urban geographer, Koti holds a Ph.D. in Geography from West Virginia University, Morgantown, WV. Koti's research revolves around the use of geographic information systems (GIS) within participatory methodological frameworks to understand urbanization processes. His regional focus is Africa. His work has been published in the field, particularly related to participatory GIS, African peri-urban development, urban and regional planning, local community resource use and access, and social and spatial exclusion in African cities. Koti has previously held administrative positions as interim associate dean and department chair at the University of North Alabama and more recently as department chair at Middle Tennessee State University. He has previously served as secretary of the US-based Kenya Scholars and Studies Association (KESSA), Secretary of the Southeast Division of the American Association of Geographers (SEDAAG), and guest editor of a special edition of *Africa Today* journal.

# Biography

- **Dr. Matthew Lorenzen ([lorenzen@igg.unam.mx](mailto:lorenzen@igg.unam.mx))**



**(Day 3, Panelist)** Matthew Lorenzen has a Ph.D. in sociology from the Université Paris 1 Panthéon-Sorbonne and is currently an associate researcher at the Unidad Académica de Estudios Territoriales Oaxaca, a research center located in Oaxaca City belonging to the Institute of Geography of the National Autonomous University of Mexico (UNAM). In 2017 he carried out a postdoctoral research stay at the University of Southern California, and he previously worked as a consultant at Mexico's National Population Council (CONAPO). His main lines of research include new ruralities and migration, rural tourism and rural gentrification, the forest transition, and mixed migration from, to, and through Mexico. His current research focuses on rural communities in Mexico's Mixteca Alta region in the southern state of Oaxaca.

- **Dr. Gaston Mbonglou ([gaston.mbonglou@uasgadvisors.com](mailto:gaston.mbonglou@uasgadvisors.com))**



**(Day 2, Panelist)** Gaston is a senior executive with a proven track record in business strategy, operations management, and information technology. He is Principal at UASG Advisors and VP of Operations at the Capstone Strategy Group, a company focusing on process improvement and the use of technology to drive organizational efficiency. Prior to joining Capstone Strategy Group, Gaston held multiple management positions at KPMG. Since 2017, Gaston has provided strategic leadership and project oversight for US State Department's funded projects in Africa and since 2020, he is leading the Africa Hub for geospatial projects. He is co-author of the "Accelerating Business Growth in Emerging Economies framework", a strategy centered around the capacity building through entrepreneurship programs in emerging economies. Gaston has held the position of Adjunct Associate Professor at the University of Maryland University College. He holds a Ph.D. and a Master's Degree in Computer Science from the University of Technology of Dresden, Germany.

- **Dr. Carlos F. Mena ([cmena@usfq.edu.ec](mailto:cmena@usfq.edu.ec))**



**(Day 3, Panelist)** Dr. Carlos F. Mena is a professor of Geography and Ecology at the School of Biological and Environmental Sciences in the Universidad San Francisco de Quito. Dr. Mena is co-Director of the Galapagos Science Center and Director of the Institute of Geography at USFQ. Carlos Mena obtained his Ph.D. in Geography from the University of North Carolina at Chapel Hill, in the United States, and has worked in the Ecuadorian Amazon for several years for his dissertation research. Mena has won several prestigious academic honors, including the Earth Systems Science Fellowship from the US National Aeronautics Space Administration (NASA) and a pre-Doctoral Traineeship from the National Institutes of Health (NIH) Fogarty International Center. Currently, Mena develops projects analyzing the interactions between humans and the environment using GIS, remote sensing, social survey, and political ecology in the Western Amazon and in the Galapagos Islands.

# Biography

- **Ichchha Moktan**

([ichchha.moktan@kathmandulivinglabs.org](mailto:ichchha.moktan@kathmandulivinglabs.org))



**(Day 4, Workshop Presenter)** Ichchha is a software engineer with a passion for designing and developing mobile applications. At KLL, she has been involved in building software tools with civic and social impact. Some of the sample projects include developing an infrastructure mapping portal in India, a health portal in Mongolia, and a maps-based API service based out of Kathmandu. Recently, she was a part of the Regional Tech Camp 2021 winning project CUBES team. Project CUBES leverages technology to solve environmental issues in South Asia. Ichchha is also a Vice-Secretary at Women Leaders in Technology (WLIT), through which she aims to inspire, empower, educate, and mentor young women in the tech field. She received her undergraduate degree in Computer Science from Tribhuvan University, Nepal.

- **Kevin M. Nelson** ([kenelson@usaid.gov](mailto:kenelson@usaid.gov))



**(Day 3, Panelist)** Kevin Nelson is the Urban Governance Lead for the Governance and Financing Self Reliance Team within the Bureau of Development, Democracy and Innovation at USAID. . In this role, he chairs the Urban Expert Working Group, composed of Agency technical experts who focus on urban work. USAID promotes a cross-sectoral systems approach to development connecting urban programming on health, infrastructure, economic development, resilience, water, and sanitation, among other issues. He also coordinates donor engagement and leads efforts to support the New Urban Agenda and the Sustainable Development Goals. Currently, Mr. Nelson is coordinating USAID's strategic thinking about the role of cities that serve as the economic engine of countries, supporting their journey to self-reliance. Mr. Nelson represents USAID as a member of Cities Alliance, a global partner in addressing key issues impacting cities due to rapid urbanization. He also coordinates cross-sector efforts to implement urban-focused solutions in missions as varied as Ethiopia, Jamaica, and India. Mr. Nelson brings over 20 years of direct experience working with local governments, cities, and regional councils of government to identify urban issues and develop relevant solutions that produce expected results and advance opportunities for sustainable living and prosperity. Mr. Nelson earned a master's degree in Urban and Regional Planning from the University of Illinois. He also has a bachelor's degree in Government and International Relations from the University of Notre Dame.

- **Lars Peter Nissen** ([lpn@acaps.org](mailto:lpn@acaps.org))



**(Day 1, Keynote Speaker)** Lars Peter Nissen has worked in the humanitarian sector for more than 20 years and lived at worked for extended periods of time in Latin America, Africa, and South Asia. He is the Director of ACAPS, an organization he helped found in 2009. He teaches Disaster Management at the University of Copenhagen and hosts the weekly podcast Trumanitarian.

# Biography

- **Nuno Nunes (nnunes@iom.int)**



**(Day 1, Panelist)** Nuno is the IOM Displacement Tracking Matrix (DTM) Global Coordinator, leading the team responsible for DTM system development, partnerships, operations, outputs, and data management. Working with IOM country missions and partners at different levels of the private sector, civil society, academia, governments, and international organizations, Nuno works on collaborative approaches in the field of humanitarian data operations. He has been managing the team involved in the design and implementation of mobility tracking operations enabling a more data-driven approach to humanitarian relief and policymaking. DTM became possibly the largest source of primary data on internal displacement in the humanitarian sector. He also leads DTM efforts related to flow monitoring operations. Recent developments include components on ethics in humanitarian data; algorithms and automated quality control in distributed networks; and accountability through responsible use of existing data. Previously Nuno worked as Global Camp Coordination and Camp Management Cluster Coordinator and worked in various positions either as Emergency Coordinator or Cluster Coordinator in-country relief operations. Nuno initiated his humanitarian work as a camp manager.

- **Dr. Robert B. Richardson (rbr@msu.edu)**



**(Day 2, Panelist)** Dr. Robert Richardson is an agricultural economist and professor at Michigan State University. His research interests lie at the nexus of the environment and development, particularly the contribution of ecosystem services to socioeconomic well-being. He has more than 15 years of experience conducting research related to food security and the environment in several countries throughout sub-Saharan Africa, Latin America, and Southeast Asia. Dr. Richardson is currently serving as a Jefferson Science Fellow at the U.S. Department of State in the Office of the Geographer and Global Issues, where he is supporting the Cities' COVID Mitigation Mapping program.

- **Dr. Bráulio Silva (bráulio.fas@gmail.com)**



**(Day 4, Workshop Presenter)** Dr. Bráulio Silva is a professor of sociology and criminal justice in the Dep. of Sociology and senior researcher at the Center of Crime and Public Security Safety Studies (CRISP), both at the Universidade Federal de Minas Gerais. His research is devoted to three topics: neighborhood effects on collective efficacy and crime; victimization and fear of crime; and spatial analysis of crime. He has a comparative study of crime victimization in Brazil and Chile and, actually, he is working in a network analysis of delinquency behavior and social capital in a Metropolitan Region of Belo Horizonte using a school violence survey. His work has been published in journals such as *Social Forces*, *Latin American Research Review*, *Brazilian Journal of Population Studies*, *Brazilian Journal of Epidemiology*, and *Revista de Saúde Pública*.

# Biography

- Hel Nershing Thapa

([helnershing.thapa@kathmandulivinglabs.org](mailto:helnershing.thapa@kathmandulivinglabs.org))



**(Day 4, Workshop Presenter)** Hel is a front-end web developer at Kathmandu Living Labs dedicated to creating and optimizing interactive, user-friendly, and feature-rich web applications. As a graduate in Computer Science, he takes a scientific and practical approach for the conceptualization, design, and development of several web-based civic tech solutions. He has been involved in the implementation of open data portals for local government and information management systems. Currently, he is engaged in the development of web portals for C2M2 Mongolia and Kathmandu to ensure effective communication between project stakeholders.

- Dr. Lu Wang ([luwang@ryerson.ca](mailto:luwang@ryerson.ca))



**(Day 1, Panelist)** Dr. Lu Wang is a Professor in the Department of Geography and Environmental Studies at Ryerson University, Toronto, Canada. Dr. Wang's research interests include neighborhood and health, business geography, immigration and settlement experiences, and transnationalism. Her methodological expertise includes Geographic Information Systems (GIS) and spatial analysis, statistical modeling, and mixed-method approach. Her research has been primarily funded by SSHRC (Social Science and Humanities Research Council), CIHR (Canadian Institute for Health Research), and the RBC Immigrant, Diversity and Inclusion Project. She has published widely in journals such as *The Professional Geographer*, *Papers in Applied Geography*, *Social Science and Medicine*, *Health and Place*, *Can J Public Health*, *Canadian Journal on Aging*, *International Journal of Geo-Information (IJGI)*, *Applied Geography*, *Environment, and Planning A*, *GeoJournal*, *Immigrant and Minority Health*, *Primary Health Care Research* and *Journal of International Migration and Integration*, and contributed chapters to several edited books including *A Research Agenda for Migration and Health* (Elgar), *Immigrant Experiences in North America* (Canadian Scholars' Press), *Immigrants in US and Canadian Cities* (Oxford), and *Wal-Mart World: The World's Biggest Corporation in the Global Economy* (Routledge).

- Fikriyah Winata ([fwinata2@illinois.edu](mailto:fwinata2@illinois.edu))



**(Day 2, Panelist)** Fikriyah Winata (Fik) is a Ph.D. candidate at the University of Illinois at Urbana-Champaign. Her dissertation research focuses on examining the everyday lives of Indonesian female domestic workers in Hong Kong. She draws on the concepts of therapeutic landscapes and networks in health geography to understand the health and wellbeing of women who work in domestic employment, especially their access to places and social networks within the restrictive space-time constraints. Fik also uses GIS, spatial analysis, and statistical methods to examine disparities in access to healthy food in Chicago, Illinois, and the availability and accessibility of primary healthcare services in Indonesia. Prior to attending graduate school, she was a GIS instructor and GIS specialist at Esri Indonesia with multiple GIS certifications.

# Biography

- **Ivona Zakoska-Todorovska (izakoska@iom.int)**



**(Day 1, Panelist)** Ivona Zakoska-Todorovska is the Regional Displacement Tracking Matrix Coordinator for Europe. She coordinates the DTM activities related to the monitoring of mixed-migration flows and migrants' presence monitoring in key countries of first arrival and transit in Europe. She co-chairs the Inter-Agency Information Management Working Group for Europe along with UNHCR and UNICEF. She has co-authored papers on the importance of data-driven responses along the Eastern, Central, and Western Mediterranean Routes and on the use of quantitative and qualitative data methods in detecting migrants' vulnerabilities and their evolving needs at different stages of their journey. In support of the Global DTM Team, she co-leads the recent workstreams on Monitoring Mobility restrictions and the Impact of COVID-19 on Migrants.

# Biography (Students)

- **Kashika Bharol**



**(Day 4, Student Poster Presenter)** Kashika Bharol is an undergraduate Molecular & Cell Biology student and Regents' & Chancellor's Scholar at the University of California, Berkeley. Her research interests include clinical medicine, health equity, and basic needs accessibility.

- **Eden Brunner**



**(Day 4, Student Poster Presenter)** Eden Brunner is a rising senior at Harriton High School. Her research interests include environmental health, human mobility, socioeconomic disparities, and biomedical engineering.

- **Genevieve Chin**



**(Day 4, Student Poster Presenter)** Genevieve Chin is an incoming undergraduate computer science student at the University of California, Los Angeles. Her research interests include data ethics and privacy, education equity, and socioeconomic disparities.

- **Roselyn Chin**



**(Day 4, Student Poster Presenter)** Roselyn Chin is a rising junior at Mark Keppel High School. Her research interests include ethics, privacy, cybersecurity, interdisciplinary learning, and the Asian American diaspora.

- **Sofia Khugaeva**



**(Day 4, Student Poster Presenter)** Sofia Khugaeva is a rising senior at Conestoga High School. Her research interests include genetics, cardiology, bioethics, and GIS application in terms of health equity and access to medicine.

# Biography (Students)

- **Akhil Kumar**



**(Day 4, Student Poster Presenter)** Akhil is a grade 10 student from Toronto, Ontario. Akhil loves making sense of data and trying to explain it, in new creative ways. He has built dashboards, created visualizations, and played around with new tools to create easy-to-understand graphics. He also really loves philosophical talks and books (ie Micheal Sandal) and especially loves exploring new ideas! Aside from data, in his free time, He enjoys playing video games, going out for bike rides, and hanging out with friends.

- **Sadhana Kumar**



**(Day 4, Student Poster Presenter)** Sadhana Kumar is a rising high school senior at the Liberal Arts and Science Academy. Her research interests include neuroanatomy, affective disorders, and using GIS to analyze healthcare access and spatial relationships.

- **Sampath Rapuri**



**(Day 4, Student Poster Presenter)** Sampath Rapuri is a rising high school senior at St. Mark's School of Texas. His interests include synthetic biology and computational biology, which, more broadly speaking, includes any intersection of computer science and biology.

- **Kevin Wang**



**(Day 4, Student Poster Presenter)** Kevin Wang is an undergraduate computer science student at the University of California, Berkeley. His research interests include deep learning and more generally, artificial intelligence and theoretical computer science.

# Symposium Organizers

(in alphabetical order)

- **Laura Cline ([clinelv@state.gov](mailto:clinelv@state.gov))**

**C2M2 Program Director, U.S. Department of State's Office of the Geographer and Global Issues**



Ms. Laura Cline is a Geographer with the U.S. Department of State INR's Office of the Geographer and Global Issues. She joined the office in 2018, as a geographer focusing on humanitarian issues in West Africa and those related to urbanization. She is the Director of Special Programs for the office, currently managing the Cities' COVID Mitigation Mapping (C2M2) program, a field-based initiative to understand COVID-19 second-order impacts through mapping and analysis of human geography in cities around the world. Prior to joining the State Department, she applied her geospatial expertise at the Department of Defense, where she began her career with the US Government in 2006. She received her B.A. in International Affairs and her M.A. in Geography, both from The George Washington University. Ms. Cline is a life-long geographer and lowan and enjoys exploring near and far with her husband and daughter from their current home base in Virginia.

- **Dr. Junghwan Kim ([junghwan\\_kim@fas.harvard.edu](mailto:junghwan_kim@fas.harvard.edu))**

**Postdoctoral Fellow, Center for Geographic Analysis, Harvard University**



Dr. Junghwan Kim is a postdoctoral fellow at CGA. He received his Ph.D. in Geography (2021) from the University of Illinois at Urbana-Champaign (UIUC). He also holds a B.S. in Urban Planning and Engineering (Summa Cum Laude) from Yonsei University (2016) in South Korea and a Master of Urban Planning (MUP) from the UIUC (2018). His research interests include human mobility (e.g., travel behavior and accessibility), environmental health, the application of GIScience methods, geoprivacy, and geoethics. His works have been published in several peer-reviewed journals, including the *Annals of the American Association of Geographers*, *Journal of Transport Geography*, *Cartography and Geographic Information Science*, *Environmental Research*, and *Transactions in GIS*. He has received many prestigious awards, including the American Association of Geographers (AAG) Council Outstanding Graduate Student Paper Award, Peter Gould Student Paper Award from the AAG Health and Medical Geography Specialty Group, John Odland Student Paper Award from the AAG Spatial Analysis and Modeling Specialty Group (First Prize), Student Research Presentation Award from the Race/Ethnicity/Place Conference (First Prize), American Planning Association (APA) Transportation Planning Division Student Paper Award (Third Prize), and APA National Smart Cities Student Design Competition Winner (in Team).

# Symposium Organizers

(in alphabetical order)

- **Dr. Melinda Laituri ([melinda.laituri@gmail.com](mailto:melinda.laituri@gmail.com))**

**Professor Emeritus, Colorado State University**



Dr. Melinda Laituri is Professor emeritus of geography in the Department of Ecosystem Science and Sustainability at Colorado State University. She is the Founding Director of the Geospatial Centroid at CSU that provides support for geospatial research and teaching across the university. As a Fulbright Scholar, she taught GIS at the University of Botswana and conducted research in the Center for Scientific Research, Indigenous Knowledge, and Innovation on participatory mapping and conservation planning. She is a visiting scientist at the Center for Geographic Analysis at Harvard University. Laituri was a Jefferson Science Fellow where she was the principal investigator on the Secondary Cities Initiative, part of the State Department's Office of the Geographer's Humanitarian Information Unit mapping rapidly growing under-examined cities. She is currently the principal investigator of the Department of State's Cities' COVID Mitigation and Mapping program. She received her PhD from the University of Arizona in Geography.

- **Dr. Lee Schwartz ([schwartzlr@aol.com](mailto:schwartzlr@aol.com))**

**Geographer of the United States, U.S. Department of State**



Dr. Lee Schwartz is the Geographer of the United States and Director of the Office of the Geographer and Global Issues, where he directs research and analysis on global issues primarily related to complex humanitarian emergencies and environmental sustainability. Dr. Schwartz is the State Department's 8th Geographer, a position that was established in 1921 and bears the statutory responsibility for providing guidance to all federal agencies on questions of international boundaries and sovereignty claims. He also oversees the Humanitarian Information Unit – a U.S. government interagency organization focused on unclassified data coordination for emergency preparedness, response, and mitigation. He has designed and coordinated fieldwork and applied geography projects in the many of the world's most conflicted countries. His work encompasses ethnic conflict, refugee flows, peacekeeping operations, food and water security, human and wildlife trafficking, and strategic warning – with an emphasis on Geographic Information Systems (GIS), Participatory Mapping, and Remote Sensing information coordination. Among other honors, Dr. Schwartz is a recipient of a 2018 Presidential Rank Award, the Association of American Geographers' Anderson Medal of Honor in Applied Geography, the State Department's Warren Christopher Award for Outstanding Achievement in Global Affairs, and the James Cullum Medal from the American Geographical Society. He has a Ph.D. in geography from Columbia University.

# Symposium Host

- **Dr. Wendy Guan ([wguan@cga.harvard.edu](mailto:wguan@cga.harvard.edu))**

**Executive Director, Center for Geographic Analysis, Harvard University**



Wendy is the Executive Director of the CGA. She has been managing CGA's operations since its establishment in 2006. Prior to joining Harvard, she directed professional services at a GIS consulting firm in Washington; managed the department of geospatial information technology for a multinational forestry corporation; and supervised GIS teams in a Florida government agency. Wendy has extensive experience in designing and implementing enterprise GIS systems. She has a Ph.D. in ecology and GIS, an M.A. and M.S. in geography and natural resource management, and a B.S. in biology. Wendy taught GIS in various universities, including the Harvard Extension School.

- **Center for Geographic Analysis, Harvard University**



Center for  
Geographic Analysis  
Harvard University

The Center for Geographic Analysis (CGA) was established in 2006 to support research and teaching across all disciplines in the University as they relate to geospatial technology and methods. Working with entities across Harvard, the CGA strengthens university-wide geographic information systems (GIS) infrastructure and services; provides a common platform for the integration of spatial data from diverse sources and knowledge from multiple disciplines; enables scholarly research that would use, improve or study geospatial analysis techniques; and improves the ability to teach GIS and geospatial data science at all levels across the University. Combining consultation services, technical training, platform development, and sponsored research, the Center enables a diverse range of research projects involving geospatial analysis. The GIS solutions offered range from general cartography and mapping, geographic data collection, big data processing, and analysis, to spatial visualizations, webmaps, and web services. The CGA also actively promotes geographic reasoning and the use of GIS in the Harvard curriculum.



**Cities' COVID  
Mitigation and Mapping (C2M2)  
Virtual Symposium**

**June 22-25, 2021 | Harvard University**