EVENT PROGRAM

Wed, Feb 27, 2019 – Fri, Mar 1, 2019
San Juan, Puerto Rico

Caribbean Strong: Building Resilience with Equity

SDMPH

Puerto Rico Brain Trust for Tropical Diseases Research & Prevention

Puerto Rico Science, Technology & Research Trust

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Agenda

Program	Feb 27 - Mar 1, 2019	
Wednesday, Feb. 27, 2019 - Caribbean Voices		
7:30 AM Foyer San Felipe & San Cristobal Exhibitor Hall		**Registration** **Continental Breakfast** **Poster Session Opens** **Exhibition Hall Opens**
SJ Ballroom 1,2,3,4, & 5 8:15 AM	Lucy Crespo, CEO Puerto Rico Science, Technology and Research Trust	**Welcome Remarks**
8:30 AM	John Englander Oceanographer	**Rebuilding Higher for Storms, Tides, and Sea Level Rise**
9:30 AM	Lcdo. Omar J. Marrero Executive Director, P3 COR3 PRDCA	**Puerto Rico Response and Recovery**
10:10 AM	Rafael Rodríguez Mercado, MD Secretary of Health of Puerto Rico	**Caribbean Strong: Building Back Better** **Health Infrastructure Challenges and Climate Change Impact**
10:45 AM		**Break**
11:00 AM	Vincent Lafronza, EdD CEO, National Network of Public Health Institutes	**Disaster Response and Public Health**
11:20 AM	Panel Discussion: Francisco Murphy, MD, Director Lic. Ivonne Rivera, HealthProMed Pedro Morales, DBA P.E.C.E.S. Kayon Donaldson-Davis, PhDc, University of the West Indies Marietta Vazquez, MD Yale University	**Caribbean Voices and Lessons Learned** Moderator: José F. Cordero, MD, MPH Adjuntas Federally Qualified Health Center Supply Chain Community Response, Humacao Caribbean Experience: Jamaica's National Strategy for older Popultations During Disasters Diaspora, Bulk Donations Post Maria: A Regional Perspective **Discussion**
SJ Ballroom 1, 2, 3, 4 & 5 12:30 PM 1:00 PM	**A Letter to Puerto Rico : Direct Relief**	**LUNCH** **Andrew MacCalla, Director of International Programs and Emergency Preparedness & Response, Direct Relief**
San Cristobal Room 12:30 PM - 1:30 PM SMDPHP Working Lunch Side Meeting	Moderator: James James, MD, DrP, MHA Exec Director SDMPHP Professor Hou Shike, MD	**Open Meeting of the Society for Disaster Medicine and Public Health and the Journal of Disaster Medicine and Public Health Preparedness** Progress of Disaster Medicine in Tianjin University and China **Discussion:** Future Intiatives and Next Steps

SJ Ballroom 1, 2, 3, 4 & 5 1:30 PM	Panel Discussion: Felix Négron, Vice President, Medtronics Iván Román, PE, MBA PIA Consultant Dharma Vázquez, PhD, Dean, UPR Marla Pérez Lugo PhD, Director INESI Jorge Martel, Vice-President, T-Mobile Kenira Thompson, PhD, VP & President	Moderator: Lucy Crespo, CEO Puerto Rico Science, Technology and Research Trust **Caribbean Voices: An Institutional Perspective** Industry Pharmaceutical Academic Institutions Instituto Nacional de Energía y Sostenibilidad (INESI) Telecommunications Ponce Health Sciences University & Ponce Research Institute **Discussion**
3:00 PM		**Break**
3:15 PM	Panel Discussion: Yanel de Angel and Gautam Sundaram Prinicpal Perkins + Will Samuel González, President and CEO Jon Borschow, Chairman Mariely Rivera, Executive Director Laura López, Executive Director	Moderator: Samuel González, President and CEO, United Way, Puerto Rico **Community Organizations and Lessons Learned** ResilienSEE United Way, Puerto Rico Foundation for Puerto Rico Unidos por Puerto Rico, Ángel Ramos Foundation **Discussion**
4:30 PM SJ Ballroom 1, 2, 3, 4 & 5	Panel Discussion: **Panel I** Alberto Eugenio de la Cruz, CEL, Coca-Cola PR Bottling Co. Alicia Lamboy Mombille, Esq. Golman, Antonetti, & Córdova, LLC Roberto Gabriel Pando Cintrón, President, MCS Waleska Rivera, President, Danosa Caribbean, Inc. Ramon González Simounet, President San Juan Gas Emilio Colón-Zavala, PE, Chairman of PR Builders Association Eduardo L. Pagán Reyes, VP, TOTE Maritime	Moderator: Daneris Fernández, Coordinator of BEOC **FEMA Business Emergency Operations Center of Puerto Rico** Food Commercial/Retail Health Critical Manufacturing Energy Infrastructure Transportation **Discussion**
6:00 PM Exhibitors' Hall		**Welcome Reception and Poster Awards**

Thursday, February 28, 2019 - Hurricane Response & Building Resilience for Future Preparedness

7:30 AM Foyer Exhibitor Hall		**Registration** **Continental Breakfast** **Exhibitor Hall Opens**
SJ Ballroom 1,2,3,4 & 5 8:30 AM	José F. Cordero, MD, MPH Patel Distinguished Prof. of Public Health, Head of Department, Epidemiology & Biostatistics, University of Georgia Richard Besser, MD, MPH CEO, Robert Wood Johnson Foundation	**Welcome Remarks** **To Learn We Must Listen**
9:15 AM	Ada Monzón, Chief Meterologist	**Climate Change Perspectives on Disaster Preparedness**
10:00 AM		**Break**
SJ Ballroom 1, 2, 3, 4 & 5 10:15 AM		Moderator: Dr. José F. Rodríguez-Orengo, Professor, STCE Core Director, PRINBRE, University of Puerto Rico **Agency Response: Lessons Learned, Part 1**
	Mayra Toro, Asst. Secretary	PR Dept of Health, Environmental Health
	Capt. Elizabeth Hastings and Ms. Himilce Veléz	USPHS, Div of Recovery , US Dept Health and Human Services, ASPR
	Waddy González, Director	FEMA, Health and Social Services Division
	Francine Lang, Director	US Virgin Islands Department of Health, Public Health Preparedness
	Sharleen DaBreo, Deputy Director	Disaster Management, British Virgin Islands, Build Back Better
11:10 AM		**Discussion** Moderator: Danny Staley, Association for State and Territorial Health Officers
		Agency Response: Lessons Learned, Part 2
	Walter I. Díaz, Deputy Command Surgeon	US Southern Comm Surgeon, Department of Defense
	Carmen Guerrero, Director	Environmental Protection Agency
	Cosme C. Torres-Sabater, RN, CHCM	Department of Veterans Affairs
	Miguel Cruz, Ph.D., Sr. Public Health Emergency Management Advisor/PRDOH	Federal Perspective, Public Health Branch for Future Joint Operations in Disasters
		Discussion
12:00 PM 12:30 PM	Restoring Safe Water and Sanitation Solutions to Rural Communities in the Aftermath of Hurricane Maria	**LUNCH** **George Green, IV, President and CEO of WATER MISSION**
1:30 PM		**Break Out Session I**
2:35 PM		**Break Out Session II**
3:40 PM		**Break**
3:55 PM		**Break Out Session III**
SJ Ballroom 1, 2, 3, 4 & 5 Plenary Panel Discussion 5:00 PM		Moderator: Philipe Schoene, Editor in Chief, Caribbean Business **"Storm Hardening 2.0—Infrastructure Lessons in the Aftermath of Maria"**
	Panel I	
	Luis Sepúlveda, Pres. Gasoline Retailers Association	Transportation
	Gen. Rafael O'Ferrall, President, MIDA	Food
	Panel 2	
	Eng. Jose Rivera Sanabria, Exec. Director of Infrastructure, PRASA	Water
	Eduardo Batalla,PE, Director, Navigant	Power
	Eng. Fernando Padilla, Executive Directors, PREPA	Power
	Jorge Martel, Vice President, T-Mobile	Telecom
		Discussion
6:30 PM		**Adjournment**

Breakout Session Tracks and Schedule

Thursday, February 28, 2019

	Track 1: Medically Fragile Populations SJ Ballroom 1, 2, 3, 4 & 5	Track 2: Infrastructure SJ Ballroom 6, 7 & 8	Track 3: Resilience & Communications Miramar 1, 2 & 3	Track 4: Public Health Miramar 4
1:00 PM	Medically Fragile Populations I	Infrastructure	Community Resilience	Public Health
2:00 PM	Medically Fragile Populations II	Hospitals	Institutional Resilience	Community Health Response
3:00 PM	Break	Break	Break	Break
3:15 PM	Mental Health	Access to Healthcare, Food and Water	Healthcare Education and Communications	Non-Governmental Organization Panel

Break Out Session I Detail		
SJ Ballroom 1, 2, 3, 4 & 5 **Track One** **Medically Fragile Populations** **1:30 PM**		Moderator: Nilda Morales, SER de PR **Medically Fragile Populations I**
	Wendeline M. Figueroa, MPH University of PR Student	The Impact of Hurricane Maria upon Older Adults in Puerto Rico: An Assessment of Hurricane Stressors and Depression and Anxiety Symptoms
	Mary Rodríguez PsyD, MSc, Assoc. Professor Ponce Health Sciences University	The Impact of Hurricane Maria on Medical Services, Depression and Anxiety in Cancer Patients: Baseline preliminary data
	Guillermo N. Armaiz-Pena, Ph.D., Asst. Professor, Ponce Health Sciences University	Natural Disaster Outcomes, Perceived Stress, and Resilience in Puerto Rican Cancer Patients after Hurricane Maria
	Adam Silverman, MD, Asst. Professor, Univ. of Connecticut School of Medicine	Building a Sustained Response: Lessons Learned from Haiti
SJ Ballroom 6,7,8 **Track Two** **Infrastructure** **1:30 PM**		Moderator: Lionel Orama, Ph.D. INESI, UPR **Infrastructure: Transportation, Access & Power**
	Gabriel Pérez, Manager Caribbean Region	Blue Planet Energy: Changing the way we power the world
	Eng. Mark Baker, Director, Disaster Response	Water Mission: Initiative to Energize Rural Water Systems in PR
	Terry L. Donat MD, FACS, FICS, Sector Chief, FBI InfraGard, Chicago	Plasma Gasification of Agnostic and Medical Waste for Emissionless, Syngas-mediated Power and H2 Generation.
Miramar 1, 2 & 3 **Track Three** **Resilience and Communications** **1:30 PM**		Moderator: Mollie Mahany, Ph.D. Centers for Disease Control and Prevention **Community Risk, Resilience and Mitigation**
	Alexandra Rivera González, Research Coordinator, Mt. Siani Hospital	Individual Resilience in an Eastern Community of PR that Received the First Impact of Hurricane Maria. University of Puerto Rico
	Dr. Mark Keim, CEO Disaster Doc	Pilot in two communities: Disaster Risk Reduction
	Héctor Colón Cruz, PhD, MEP PR Department of Health	Community Mitigation for Health
	Sandra Charles, Deputy Director USVI Department of Health	Community Mitigation for Health
Miramar 4 **Track Four** **Public Health** **1:30 PM**		Moderator: Diego Zavala, PhD Ponce Health Sciences University **Public Health**
	Iris Cardona, MD, Puerto Rico Immunization Program	Routine Immunization Services Disrupted in Puerto Rico After 2017 Hurricane Maria: Restoring Services, PR Dept. of Health
	Heriberto Marín, PhD, Professor, University of Puerto Rico	Brigadas Salubristas
	Chris Maniglier-Poulet, MS	Comprehensive Disaster Assessment and Readiness Tools, CDC
	Laura Adams, DVM, MPH, Dipl, ACYPM Epidemiologist, Dengue Branch, CDC	Implementation and Evaluation of Syndromic Surveillance System after Hurricane Maria in Southern Puerto Rico, Ponce Health Sciences University

		Breakout Session II
SJ Ballroom 1, 2, 3, 4 & 5 Track One Medically Fragile Populations 2:35 PM		Moderator: Nilda Morales, SER de Puerto Rico **Medically Fragile Populations II**
	Michael Welton, PhDc, University of Georgia	PROTECT/CRECE Pregnancy and Hurricanes
	Jose Joaquín Mullineli, Director	Coai, Inc. Proyecto Juracán
	Debbie Figueroa, Elsy Benitez-Vargas, Directors at Project Hope	Diabetes, Cold Chain Storage and Hurricane Maria
	Leyao Wang PhD, MPH, Instructor, School of Medicine	The gut and nasal microbiota of infants who were in utero exposed to Hurricane Maria.
SJ Ballroom 6, 7 & 8 Track Two Infrastructure 2:35 PM		Moderator: Jaime Plá, President of the Puerto Rico Hospital Association **Hospitals**
	Enrique Baquero, Vice President, Puerto Rico Hospital Association	Impact on Hospitals and their Response in Puerto Rico
	Hector Colón, PhD, MEP Community Resilience Domain Manager, PRDoH	Evaluating Disaster Damages & Operational Status of Health Care Facilities During the Emergency Response Phase of Hurricane Maria, PR
	Carene A. Oliveras Garcia, MD, FACEP Assistant Program Director, St. Luke's Hospital	Injury as Reason for Emergency Department Visits in the Aftermath of Hurricane Maria in a Southern Puerto Rican Hospital
	Ray E. Swienton, MD, FACEP Professor Emergency Medicine, Chief, Div. of Emergency and Disaster Global Health, University of Texas Medical Center, Dallas	Dallas Mega-shelters Post Hurricane Harvey
Miramar 1, 2 & 3 Track Three Resilience and Communications 2:35 PM		Moderator: Kenira Thompson, PhD **Institutional Response and Resilience**
	Maribel Campos MD, Msc, MBA, FAAP, Professor, University of Puerto Rico	When Disaster Strikes: Building Resilience Through Research
	Héctor Torres, MPH	PROTECT, A Consortium for Resiliency
	José Lasalde, PhD, Professor, Biology, University of Puerto Rico	Molecular Sciences at University of Puerto Rico
	Lourdes R. Rodríguez Rivera, MD Assistant Professor, San Lucas Hospital, Ponce	Disaster Preparedness Training for Emergency Medicine Residents
	Nicolette Louissaint, PhD, Executive Director, Healthcare Ready	Hurricanes and Severe Secondary Impacts: Shortages of Critical Medical Supplies
Miramar 4 Track Four Public Health 2:35 PM		Moderator: Carmen Vélez Vega, PhD **Community Health Response**
	Héctor Villanueva, MD	HealthProMEd, Inc.
	Gladys Rivera Estela, MD, Executive Director	PryMed, Inc., Ciales Community Health
	Darielys Cordero, MPH, DrPhc, Project Manager, PR Primary Care Association	Community Health Centers as First Line Response to Health and Social Needs of Vulnerable Communities After the Impact of Hurricane Maria in PR
	David de Ángel Sola, MD, Sleep Medicine Fellow, Yale School of Medicine	A model for Grassroots Medical Relief, Yale University
	Jooby Bien Aime, MD, MPH Assistant Medical Director, Heart to Heart, International	Heart to Heart, International in Haiti
3:40 PM		**Break**

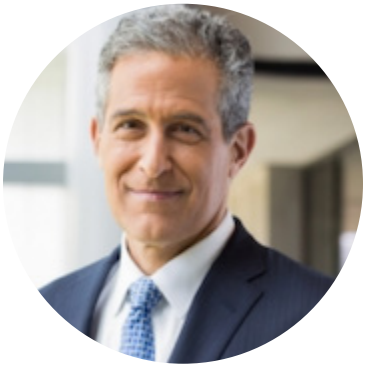
		Breakout Session III
SJ Ballroom 1, 2, 3, 4 & 5 Track One Medically Fragile Populations 3:55 PM		Moderator: José Pons, Carlos Albizu University **Population Mental Health**
	Ligia M. Chávez, Ph.D, Behavior Sciences Research Inst., University of Puerto Rico	Disaster Exposure in a Clinical Sample of Puerto Rican Adolescents Post Hurricane Maria
	Bekah Curtis-Heald, Manager, Clinton Global Initiatve	Clinton Foundation
	E. Anne Peterson, MD, MPH, Sen. Vice President Program	Americares
	Mariveliz Cabán, PhD, Coordinator, Mental Health Response, Emergency & Disaster	Puerto Rico Psychology Association
	Domingo Marqués, PsyD, Associate Professor, Carlos Albizu University	Mental Health Brigades post Hurricane Maria
SJ Ballroom 6, 7 & 8 Track Two Infrastructure 3:55:00 PM		Moderator: Leslie Maas Cortés, MHS Proyecto Agua Limpia **Food & Water Security**
	Pamela Silva, MS Puerto Rico Response Innovation Lab	Disaster Risk Reduction Strategies for Water Sanitation and Hygiene Challenges in Rural Puerto Rico: Lessons Learned from Hurricane
	Kaumudi Joshipura, PhD, NIH Endowed Chair & Director, Center Clinical Research & Health Promotion, UPR	Hurricanes, Drinking Water and Single Use Plastics in Puerto Rico
	José Ruiz, MPH, MSGIS GIS Specialist, PR Science Trust	Water Quality Testing Results in Rural Puerto Rico Post Hurricanes Irma and Maria
	Abigail Harvey, MS, MIT Department of Engineering	Water Quality Testing in Non Prasa Systems in Puerto Rico
	Josiemer Mattei, PhD, Professor Harvard School of Public Health	Food Access, Social Connectedness and Allostatic Load after a Natural Disaster: A mixed methods study
Miramar 1, 2 & 3 Track Three Resilience and Communications 3:55 PM		Moderator: Maria Levis, CEO Impactivo **Healthcare Education & Communications**
	Alexandra Reyes Correa MEd, RDN, University of Puerto Rico	Implementation of an Online Nutrition Education Strategy by the Special Nutrition Program WIC of PR: Challenges that Catastrophic Events Pose on Nutritional Education Compliance, University of PR
	Ashley Andújar, MHSA, Team Lead, Health Promotion and Communication CDC	Communicating without Power, Centers for Disease Control and Prevention
	Julieanne Miranda Bermúdez, DrPHc, MS, Puerto Rico Vector Control Unit	Distributing Vector Control Information
	María Levis, MPH CEO, Impactivo Consulting	Deconstructing Online Content for PR Post Hurricane Maria: Rapid Response Public Health Campaign by the Regional Public Health Training Centers
Miramar 4 Track Four Public Health 3:55 PM		Moderator: Nicolette Louissaint, PhD Healthcare Ready **Non Governmental Organizations**
	Andrea Dunn Sosa, Director	Project Hope
	Diego Zavala, PhD, Professor PHSU	Red Cross
	Jim Mitchum, CEO, Regalox	Heart to Heart, International
	Andrew Maccalla, Director	Direct Relief
	María Concepción, Program Manager	OXFAM
6:30 PM		**Adjournment**

Friday, March 1, 2019 Creating Evidence-based Recommendations for Resilience Post Disaster

7:30 AM Foyer Exhibitor Hall		**Registration** **Continental Breakfast** **Exhibitor Hall Opens**
7:30 AM SJ Ballroom 6,7, & 8	José F. Cordero, MD, MPH James James, MD, DrPh, MHA	**Mandatory Facilitators Breakfast Meeting** Day Three Facilitators
SJ Ballroom 1, 2, 3, 4, & 5 Plenary Session 8:00 AM	Georges C. Benjamin, MD, MPH Executive Director, American Public Health Association	**Long Term Power Outages: Putting Resilience Into Practice**
SJ Ballroom 1,2,3,4, & 5 Plenary Session 9:00 AM		Moderator: Dharma Vázquez, PhD, Dean of School of Public Health, University of Puerto RIco **Morbidity and Mortality Post Disaster**
	Satchit Balsari, MD, MPH Assistant Professor Emergency Medicine, Harvard Medical School & Beth Israel Deaconess Medical Center	Morbidity and Mortality in Puerto Rico after Hurricane Maria. Harvard Study
	Lynn R. Goldman, MD, MS, MPH Michael and Lori Milken Dean of the Milken Institute School of Public Health	Documenting Deaths from Environmental Catastrophe
	Rebecca S. Noe MN, MPH, FNP-BC CAPT, USPHS Capacity Building Branch CDC	Activities to Improve State and Local Fatality Management and Mortality Reporting Practices during Disasters Discussion
10:15 AM	Mark Keim, MD CEO, Disaster Doc	Risk Mitigation and Prevention Oriented Approach to Disaster Management
10:45 AM	Malu Blázquez, Exec Director for ReImagina Puerto Rico	ReImagina Puerto Rico Recommendations
SJ Ballroom 1,2,3,4, & 5 Plenary Session 11:15 AM	ABARCA Representative	Case Study: Lessons Learned from Hurricane María: Continuity of Prescription Benefits Programs During Natural Disasters
11:35 AM	James James MD, DrPH, MHA, Executive Director, SDMPHP Mark Keim, MD, CEO Disaster Doc	**Charge to Groups**
Group 1 SJ Ballroom 1, 2, 3, 4 & 5 Group 2 SJ Ballroom 6, 7 & 8 Group 3 Miramar 1, 2, 3		**Pre-Event: Preparedness, Prevention Mitigation Education, and Training** Facilitators: Mollie Mahany, PhD and Leslie Maas Cortes, MHS **Response: Emergency Management, Critical Care, Search & Rescue** Facilitators: Miguel Cruz, PhD and Eng. Andrés García **Recovery** Facilitators: Carmen Vélez, PhD and Francheska Fernández, Esq.
12:00 PM		**Working Lunch in Small Groups**
SJ Ballroom 1, 2, 3, 4 & 5 2:30 PM		**Recommendations for Building Resilience for the Future** Report from Breakout Groups Moderator: Carmen Velez, PhD and Leslie Maas Cortes, MHS Pre-event: Representative from Group 1 Response: Representative from Group 2 Recovery: Representative from Group 3
4:00 PM	José F. Cordero, MD, MPH Patel Distinguished Prof. of Public Health James J. James, M.D., Dr.P.H., M.H.A. Executive Director, Society for Disaster Medicine and Public Health	**Summary and Next Steps**
5:00 PM		**Adjournment**

Keynote Speaker

Richard Besser, MD, President and CEO of the Robert Wood Johnson Foundation



Richard Besser, MD, is president and CEO of the Robert Wood Johnson Foundation (RWJF), a position he assumed in April 2017. Besser is the former acting director for the Centers for Disease Control and Prevention (CDC), and *ABC News*' former chief health and medical editor.

At RWJF, Besser leads the largest private foundation in the country devoted solely to improving the nation's health. RWJF's work is focused on building a comprehensive Culture of Health that provides everyone in America with the opportunity to live the healthiest life possible, regardless of finances, geographic location, race, ethnicity, or physical challenges. Access to healthy food, safe housing, employment, transportation, education, as well as clean air and water, are all important contributors to health and well-being.

Besser received his Bachelor of Arts degree in economics from Williams College and medical degree from the University of Pennsylvania. He completed a residency and chief residency in pediatrics at Johns Hopkins University Hospital in Baltimore.

Besser and his wife Jeanne, a food writer, have two sons, Alex and Jack.

Vincent Lafronza, Chief Executive Officer of the National Network of Public Health Institutes

Vincent Lafronza, EdD, and Chief Executive Officer of the National Network of Public Health Institutes (NNPHI), provides leadership and direction on all NNPHI initiatives, and develops collaborative efforts with NNPHI's numerous public health institutes and partners throughout the nation. Dedicated to the vision of improving the public's health through innovation, NNPHI is the national membership network committed to helping public health institutes promote and sustain improved health and wellness for all. Beginning his career in health and human services in 1985, Dr. Lafronza has held health policy and programming positions in government, nonprofit, and university sectors to advance population health at multiple levels of intervention, including community, state, federal, national, and tribal spheres of influence. Prior

to his current NNPHI appointment, Dr. Lafronza convened a winning team of colleagues to establish two nonprofit organizations, CommonHealth ACTION and the Institute for Public Health Innovation (IPHi), a public health institute serving the Washington, DC, Maryland, and Virginia region. Previous appointments included a ten-year appointment with the National Association of County and City Health Officials (NACCHO) where he served as the program director for the Turning Point National Program Office and senior advisor to NACCHO programs, executing program portfolios in excess of $14 million. Before joining NACCHO, Dr. Lafronza held an appointment with the Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry in Atlanta, Georgia that involved providing technical assistance to U.S. communities affected by hazardous waste. Dr. Lafronza's background in the fields of gerontology, behavioral health, community environmental health intervention, and public health systems development in communities, states, and American Indian/Alaska Native nations inform his perspectives and approaches.

Dr. Lafronza holds a doctorate of adult education, Master of Science, and certificate of gerontology. He also completed an Oak Ridge Institute for Science and Engineering Postgraduate Research Fellowship in Public Health, as well as two Salzburg Fellowships focused on the social and economic determinants of public health. He is an active member of the American Public Health Association (APHA), and serves on the board of directors for Education, Training, and Research Associates (ETR).

Ada Monzon, Meteorologist

Adan Monzon is the Chief Meteorologist for WIPR-TV, WKAQ 580 am and Noticel. Monzón is the first woman in Puerto Rico to be named a fellow of the American Meteorological Society (AMS). Separately, she is the Founder and President of EcoExploratorio: Science Museum of Puerto Rico.

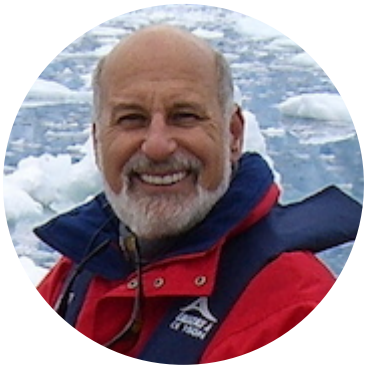
Monzón was named 2018 National Weatherperson of the Year by the Federal Alliance for Safe Homes. Monzón is also the recipient of The Department of Commerce Silver Medal and the Joanne Simpson Mentorship Award.

She is a member of the NASA Space Grant Consortium and is an American Meteorological Society Fellow.

Dr. Georges Benjamin, Executive Director of the American Public Health Association (APHA)

Dr. Georges Benjamin is known as one of the nation's most influential physician leaders because he speaks passionately and eloquently about the health issues having the most impact on our nation today. From his firsthand experience as a physician, he knows what happens when preventive care is not available and when the healthy choice is not the easy choice. As executive director of APHA since 2002, he is leading the Association's push to make America the healthiest nation in one generation. He came to APHA from his position as secretary of the Maryland Department of Health and Mental Hygiene. Benjamin became secretary of health in Maryland in April 1999, following four years as its deputy secretary for public health services. As secretary, Benjamin oversaw the expansion and improvement of the state's Medicaid program.

John Englander, Oceanographer



John Englander is an oceanographer, consultant and leading expert on sea level rise. His broad marine science background coupled with explorations to Greenland and Antarctica allows him to see the big picture of sea level rise and its revolutionary impacts.

He brings the diverse points of view of an industry scientist, entrepreneur and CEO. For over thirty years, he has been a leader in the private and non-profit sectors, serving as CEO for The International SeaKeepers and The Cousteau Society.

John is Founder and President of the International Sea Level Institute, a new non-profit organization focused on explaining the latest science about long-term rising sea level. The institute's focus is on adaptation to higher ocean levels, but also addresses the connection with various efforts at "sustainability" to slow the warming that may slow the rate of ocean rise. The institute will teach professionals in engineering, architecture, finance, law and planning to prepare for the challenging era ahead including explaining the financial risks of increased flooding advocating for "intelligent adaptation."

Englander's acclaimed book, *High Tide On Main Street: Rising Sea Level and the Coming Coastal Crisis*, clearly explains the science, the impending devastating economic effects and the opportunity to design for a more resilient future. *Politico* listed it as one of the top 50 books to read.

John is a sought-after public speaker and media expert with appearances on MSNBC, Fox Business, ABC, CBS, PBS, The Weather Channel, CCTV (China), CBC (Canada), NPR and SkyNews TV (UK).
He is a Research Fellow at the Institute of Marine Sciences – UC Santa Cruz; a Fellow of the Institute of Marine Engineering, Science and Technology (IMarEST), a Fellow of the Explorers Club, and a member of several professional societies. Englander holds dual degrees in Geology and Economics.

Lynn R. Goldman, MD, MS, MPH

Michael and Lori Milken Dean of the Milken Institute School of Public Health; Professor of Environmental and Occupational Health
As the Michael and Lori Milken Dean at Milken Institute School of Public Health at the George Washington University, Dr. Goldman's responsibilities are informed by her broad and deep public policy and academic experience. Prior to joining GW in August 2010, she was professor of environmental health sciences at The Johns Hopkins Bloomberg School of Public Health.
Dr. Goldman was Assistant Administrator for Toxic Substances in the U.S. Environmental Protection Agency (EPA) from 1993 through 1998 under President Bill Clinton. Under her watch, the EPA overhauled the nation's pesticide laws, expanded right-to-know requirements for toxin release, reached consensus on an approach to testing chemicals with endocrine-disrupting potential, developed standards to implement lead screening legislation and promoted children's health and global chemical safety. Prior to joining the EPA, Dr. Goldman worked in environmental health for the California Department of Public Health.
A member of the National Academy of Medicine, she has chaired or served on numerous committees and forums. She currently serves on the National Academy of Medicine Council and the Governing Board of the National Academy of Sciences. She serves as a member of the Advisory Committee to the Director of the U.S. Centers for Disease Control and Prevention and a member of the Food and Drug Administration Science Board.
Among many accolades, Dean Goldman received a 2009 Heinz Award, given to innovators addressing global change caused by the impact of human activities. She was awarded alumna of the year by the UC Berkeley School of Public Health, received the Woodrow Wilson Award for Excellence in Government from Johns Hopkins University and was named one of 150 outstanding alumni by the University of California San Francisco. She also received an honorary doctorate from Örebro University in Sweden for her contributions to chemical legislation in the U.S. and Sweden and her influence on the research conducted at the university's Man Technology Environment Research Centre.

Satchit Balsari, MD, MPH

Dr. Satchit Balsari is assistant professor in emergency medicine at Harvard Medical School and Beth Israel Deaconess Medical Center. Since 2009, he has been a fellow at Harvard FXB, where his research has contributed to advocacy on behalf of vulnerable populations affected by disasters and humanitarian crises. Until March 2017, he served as Director of the Global Emergency Medicine Program at Weill Cornell Medical College/NewYork-Presbyterian Hospital.

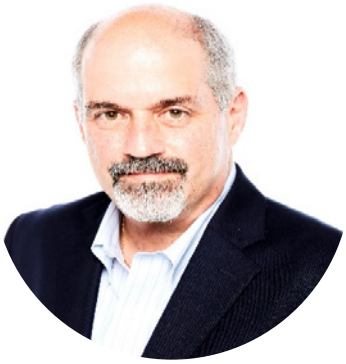
His interdisciplinary interests in mobile technology, disaster response, and population health have been informed by his clinical practice in New York City and his field work around the world. His research has resulted in innovative applications of mobile, cloud-based technology to address public health challenges in mass gatherings, disasters, and humanitarian crises. Balsari's signature initiatives include project EMcounter (a customizable, portable digital surveillance tool, the latest iteration of which was used at the world's largest mass gathering, the Kumbh Mela in India) and Voices, a crowd-sourced, online disaster response analysis tool. In 2018, in collaboration with Professor Caroline Buckee (Epidemiology), he co-led the Hurricane Maria Mortality Study.

At Harvard, Dr. Balsari co-teaches a university-wide course "Entrepreneurial Solutions to Intractable Social and Economic Problems," led by Professor Tarun Khanna, director of Harvard's Mittal Institute; and "Societal Response to Disaster and War," with Professor Leaning at the Harvard T.H Chan School of Public Health. Dr. Balsari also currently leads a university-wide initiative, the India Health Data Net, funded by a seed grant from the Provost's office.
In March 2017, Pranab Mukherjee, President of India, awarded him India's highest honor in medicine, the Dr B.C. Roy National Award for "outstanding services in the field of sociomedical relief." Dr. Balsari has also been an Aspen Ideas Scholar (2016) and an Asia 21 Fellow of the Asia Society.

Dr. Balsari received his medical degree from Grant Medical College in Mumbai, India and his public health degree from Harvard; he completed his emergency medicine residency at Columbia and Cornell's NewYork-Presbyterian Hospital.

Moderator

Philipe Schoene Roura



Philipe Schoene Roura is an award-winning journalist with more than 30 years' experience in the news business. Schoene Roura has covered Puerto Rico's politics and public finance, both on the island and in the federal realm. As the Executive Editor of Caribbean Business, his reporting on Puerto Rico's debt crisis has also been a point of reference for Bloomberg, the Bond Guyer, Politico, Debtwire and Reuters. His most recent work on the state of Puerto Rico Electric Power Authority's energy grid has been quoted in print and broadcast reports on NBC News, CNBC, MSNBC and the Congressional Quarterly.

Other Speakers

Lucy Crespo

Ms. Crespo is the CEO of the Trust. For over 30 years she held several positions in Hewlett-Packard PR, the latest as general manager of the Business Enterprise division. She developed, implemented and managed activities such as product launches, research and development, manufacturing, customer services, re-engineering processes, business planning and delivery service. She provided support to the operations of the supply chain in Europe and Mexico and managed the Latin-American operation Unix. Under her leadership, HP-PR received the Presidential Award for Quality HP. Crespo was the first woman president of the PRMA, winner of the Hector Jiménez Juarbe prize and has been recognized by various institutions, including the Chamber of Commerce, SME, AIHE, ASQ and Illustrious College. She served on advisory roles under the administrations of former PR governors. She has BS-IE from the UPR-Mayaguez and is member of their Honor Society and studied Executive Development in Kellogg's Graduate School of Management at Northwestern University.

Leslie Maas Cortes, MHS

Ms. Leslie Maas Cortes is the Director of the Hurricane Response Hub Technical Assistantance Center for Puerto Rico (PR-HRHTAC)and Director, Founder and Director of Proyecto Agua Limpia (PAL) and a Program Manager at the Puerto Rico Science, Technology and Research Trust. Proyecto Agua Limpia was developed following Hurricane Maria's devastation of Puerto Rico to bring clean and safe drinking water to Puerto Rico's more remote communities. She has worked at the Science Trust since December of 2014. She served as the Assistant Director of the CDC Funded Region Injury Control Research Center (ICRC) at the Medical College of Wisconsin from 1999 until 2003. She was responsible for operations at the ICRC, and their mission was to reduce the burden of illness and death from injury related causes. Her specific research focused on water safety, injury risk to international travelers and patient safety efforts. In these roles Leslie has contributed to several peer reviewed scientific publications, including the Harvard Mortality Study conducted in Puerto Rico after Hurricane Maria.

Before beginning her career, Leslie completed her graduate work in the area of International Health and applied nutrition at the Johns Hopkins Bloomberg School of Public Health. This work involved conducting extensive anthropometric data collection and nutritional surveys, qualitative field work and intervention development to reduce obesity and diabetes in the Republic of the Marshall Islands.

Dr. Jose F. Cordero, BRAIN TRUST Executive Director

Dr. Jose F. Cordero is the Patel Distinguished Professor of Public Health and Chair, of the Department of Epidemiology and Biostatistics in the College of Public Health at the University of Georgia. He joined the UGA on August 2015. He served for 27 years in the US Public Health Service at the Centers for Disease Control and Prevention (CDC). During his years at CDC he was appointed Assistant Surgeon General of the Public Health Service and held positions focused on improving the health of mothers, children and adults in programs such as immunizations, birth defects and disabilities. In 1994, he was appointed Deputy Director of the National Immunization Program and in 2001 he was selected as the founding Director of the National Center on Birth Defects and Developmental Disabilities, the position that he held until his retirement.

He served as the Dean of the School of Public Health in the University of Puerto Rico from 2006-2015. A former President of Teratology Society, he is Co-Principal investigator of the Puerto Rico Test site for Exploring Contamination Threats (PROTECT) a Superfund Research Program that examines environmental risks for preterm births, and CRECE (Center for Research on Early Childhood Exposure and Development in Puerto Rico) that examines prenatal exposures and their impact on neurodevelopment in the first five years of life. Dr. Cordero serves as advisor of the Americas Dengue Board and is member of the International Data Monitoring Committee for the Sanofi Pasteur Dengue Vaccine. He is the Principal Investigator of the Brain Trust for Tropical Disease Research and Prevention, a group that seeks to facilitate and accelerate the development of rapid tests for diseases like Zika, Dengue, Chikungunya and others. He also serves as the National Trustee of the March of Dimes, a foundation with a mission of helping mothers have healthy pregnancies and to fund research on the problems that threaten the health of babies.

José Lasalde Dominicci, former Acting President of the University of Puerto Rico (UPR) and former Vice President of Research and Technology.

Dr. Lasalde is the former Acting President of the University of Puerto Rico (UPR). He is also the UPR's Vice President of Research and Technology, as well as a Professor in its Biology Department, the Comparative Medicine Department, and the Institute of Neurobiology of the UPR's School of Medicine. He has extensive postdoctoral training from Stanford University, University of Puerto Rico, and the University of California-Davis.

Rabih Torbay President, Project HOPE

Rabih Torbay is the President of Project HOPE. Since joining in February of 2017, he has played an integral role in advancing HOPE's international development strategy and maximizing the impact of HOPE's global health teams worldwide in over 27 countries.
Rabih previously served as Senior Vice President of International Operations at International Medical Corps, leading all global programs and a staff of over 10,000 in 37 countries. During his 17-year tenure at IMC, Rabih worked hand in hand with local

governments, health officials and health care providers to create and expand programs to advance health care solutions in several leadership positions.
He has served as a policy advisor to members of Congress, the U.S. State Department and the U.S. Special Representative to the UN on sensitive issues including Syria, Yemen, Libya, Iraq, Afghanistan and Lebanon. He also advised the world body on the West Africa Ebola response.
Rabih started his humanitarian work in the field, working in Sierra Leone, Afghanistan, Iraq, Darfur, Libya, Syria and many other crises.
Rabih holds a degree in civil engineering and is the recipient of the Grace Humanitarian Award from Thomas Jefferson University.

Dr. Kenira Thompson

Dr. Kenira Thompson obtained a BS Degree from Interamerican Univ.-San Germán, a MS and Ph,D. in Behavioral Neuroscience at the Univ. of Wisconsin-Milwaukee. She completed postdoctoral training in the Cajal Neuroscience Research Institute of the Univ. of Texas-San Antonio. She joined the faculty of the Ponce School of Medicine (PSM) in 2005. During her academic career at PSM she has held important roles such as Dean of Research, Chair of the Basic Sciences Curriculum Committee for the Medical Education Program, and Associate Director of the Behavioral Neuroscience Core Facility. She serves as co-PD for the Puerto Rico Consortium for Clinical and Translational Research. In addition, she sits on various external advisory boards including: Hispanics in Research Capability Partnership (Univ. of PR, SOM), the Public Health Institute of Puerto Rico, the Neuro-ID Graduate Training Research Program, (Univ. of PR-Rio Piedras), the Frontiers in Stem Cells in Cancer Course (Magee Women's Research Institute, Univ. of Pittsburgh SOM), the Hispanics-IN-Research Capability Endowment (HiREC) (UPR-Medical Sciences Campus), and the Post-doctoral Master of Science in Hispanic Clinical and Translational Research Education and Career Development Program. She played a pivotal role in the development of the Puerto Rico Consortium for Clinical Investigation which was developed by the Puerto Rico Science, Research, and Technology Trust to expand the clinical trial capabilities in Puerto Rico. In 2017, she was the first Hispanic woman selected to a three-year term on the American Association of Medical College's Group on Research Advancement Steering Committee. She currently holds the rank of Professor in the Depts. of Basic Sciences, Psychiatry, and the Clinical Psychology at Ponce Health Sciences University (PHSU). Currently, Dr. Thompson is the VP of Research at PHSU, and the President of the Ponce Research Institute. She played a role in increasing the number of R01 investigators in Puerto Rico by 20% in 2015 and has been very influential in recruiting key scientific talent to Puerto Rico. She serves as a role model to young Hispanic female scientists and has implemented various programs to expand the pipeline of students interested in biomedical science careers. Dr. Thompson is focused on developing,

coordinating and stimulating collaborative research in PR, and is recognized for her leadership style based on mutual respect, collegiality, enhanced communication, with well-defined levels of accountability. Following hurricane María on September 2017, Dr. Thompson became a leader in relief efforts for southern Puerto Rico, and to this day, continues to be involved in the rebuild of Puerto Rico.

Dr. Leyao Wang

Dr. Leyao Wang is an asthma epidemiologist and a faculty member in Washington University School of Medicine. Her research focused on the identification of genetic and microbial risk factors for asthma development. Dr. Wang and her collaborators established a cohort of infants who were in-utero exposed to Hurricane Maria in San Juan metropolitan area. Their research team investigated the association between infant gut and nasal microbiota and prenatal exposure to hurricane-related stressors.

James J. James, M.D., Dr.P.H., M.H.A.

Dr. James is board certified in general preventive medicine, earned a doctorate in medicine at the Cincinnati College of Medicine, a doctorate in public health from UCLA's School of Public Health, and a Masters in Healthcare Administration from Baylor University.
Previously, he was Director of the American Medical Association (AMA) Center for Public Health Preparedness and Disaster Response, which oversaw the development and deployment of the National Disaster Life Support (NDLS) suite of courses (over 110,000 medical and public health personnel trained) as well as other innovative mass casualty developments such as the Health Security Smart Card and the Citizen Ready preparedness and recovery training modules.
Dr James has served on many federal and private boards and committees in major policy and research functions in disaster medicine and public health. . Dr James served 26 years with the US Army Medical Department, servicing in a multitude of capacities. His last assignment was as the Commanding General of William Beaumont Army Medical Center in El Paso, Texas. Upon retirement in 1997, he was awarded the Distinguished Service Medal, the military's highest peace-time honor. He went on to join FHC Options in Norfolk, Virginia, where he oversaw the building and management of the FHC Options team responsible for winning several multi-billion-dollar US government managed care contracts. Dr. James also served as Director of the Miami-

Dade County health Department and led the Miami-Dade County Health Department as it investigated and responded to the anthrax attacks of 2001. In 2002 the Miami-Dade County Health Department was awarded the Governor's Sterling Award.

Maria Fernanda Levis-Peralta

Ms. Levis consults to health centers, hospitals, pharmaceuticals, insurance companies and governments in New York, Washington DC and Puerto Rico on issues related to health systems, quality, policy and financing. She has worked with Atrius Health, a pioneer ACO, documenting their practice transformation process, a Blue Cross Blue Shield affiliate to design their clinical, financial and operational quality and performance improvement data systems, and multiple health centers to improve quality, compliance and net income. She has been instrumental in the attainment of millions in federal grants and has designed health needs assessment and strategic planning methodologies used to integrate quality and payment compliance. She has a Master's in Public Administration and a Master of Public Health from Harvard University, is a NCQA Patient Centered Medical Home Certified Content Expert and Robert Wood Johnson Foundation Fellow.

Dr. Lionel Orama Exclusa

Professor in the Electrical Engineering Department of the Mayaguez Campus, University of Puerto Rico. Special Assistant to the President of the UPR in Energy Matters.

George Green

Mr. Greene is President and COO for Water Mission (WM) in Charleston, South Carolina. Water Mission is a nonprofit Christian engineering ministry providing sustainable safe water solutions, through a Christian world view perspective, to people in developing countries and disasters. Water Mission approaches all work with a sense of urgency and a commitment to excellence. The ministry's faith and belief in the sanctity of life compel its staff to develop and implement the best technologies and community development programs so that, through the work, God will be honored and glorified and lives will be transformed for eternity. Water Mission serves all people regardless of age, gender, race or faith. Mr. Greene's responsibilities include oversight of WM's three divisions (including Volunteer and Investor Partnerships, Corporate Services, and Operations). His experience over the years includes time spent working on projects in Afghanistan, Belize, Dominican Republic, Guatemala, Haiti, Honduras, Indonesia, Kenya, Malawi, Pakistan, Peru, Sri Lanka, and Uganda.

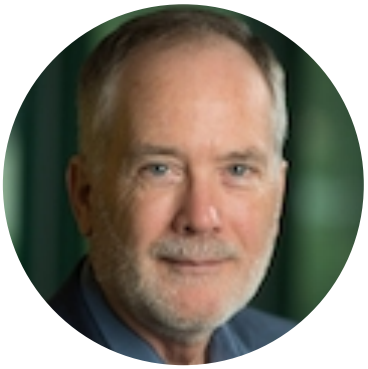
Carmen Velez

Dr. Vélez Vega completed a PhD. in Social Policy Research and Analysis, Graduate School of Social Work, at the University of Puerto Rico Rio Piedras Campus, and a MSW, and BSW from Florida State University School of Social Work. She is Chair of the Social Sciences Department at the University of Puerto Rico, Medical Sciences Campus, School of Public Health, and is a tenured Associate Professor. She has ample experience in community engagement activities and teaches in this area in the Schools MPH and Doctorate programs. She is part of the Faculty of the new Doctorate in Public Health in Social Determinants of Health program, and founding member of the Latin American Center for Sexual Health Promotion. She designs and teaches course in sexual health of LGBTT people for Public Health and other Health professionals.

Miguel Cruz-Feliciano, Ph.D.

Dr. Cruz-Feliciano is a public health professional with specialization in epidemiology, and colleague of the Institute of Research, Education and Services in Addiction (IRESA) at the Universidad Central del Caribe, School of Medicine in Bayamón, Puerto Rico. Currently, Dr. Cruz-Feliciano is assistant professors and research associate with special emphasis in behavioral health epidemiology and evaluation of programs and services. He has been working closely in the areas education and services for federal and state funded projects with emphasis in Alzheimer's, adolescent sexual behavior, criminal justice, homelessness, mental health, substance use, and suicide. His experience over the years working with federal funded programs sponsored by the Substance Abuse and Mental Health Services Administration, provided the opportunity to focus on disparities in service provision and workforce development among Hispanic and Latinos across the United States. His research interest aims to identify and explore factors that impede or facilitate treatment utilization, retention, and completion among vulnerable populations (e.g., older adults, women, Hispanic/Latinos). Its research and efforts are gears towards improvement for health outcomes, wellbeing, and quality of life thus reducing disparities and inequalities among underserved populations.

James Mitchum, CEO Regalo



An accomplished senior executive, Jim Mitchum has a record of building and leading pharmaceutical companies to success in very short periods of time. His experience spans startup, turnaround, and giant multinational companies in domestic and international business environments.

He has lived and worked in the U.S., the U.K., Germany and Japan building successful businesses in the "for profit" world. In September 2014, Jim became the CEO of Heart to Heart International (HHI), a medical humanitarian NGO based in Lenexa, Kansas.

Shortly after taking the helm of HHI, Jim spent nearly three months in Liberia helping establish the organization's first-ever Ebola Treatment Unit. After that intense introduction to HHI's healthcare mission, he led the organization through a period of restructuring and growth. In September and October of 2017, Jim was in Puerto Rico with HHI disaster response clinical teams working in the central mountains.

At the beginning of 2019, Jim stepped down from HHI to launch a start-up non-profit organization called RegaloRX that will bring high-cost pharmaceuticals to those unable to afford those medicines in the U.S. and territories. RegaloRX is a sister organization to HHI.
Jim and his wife, Terry, live in Leawood, Kansas and is a member of the Kansas City Plaza Rotary Club.

Marla Pérez Lugo, PhD

Marla Perez-Lugo is a professor of Sociology at the Department of Social Sciences at the University of Puerto Rico-Mayaguez (UPRM). Her Ph.D. is in environmental sociology, with a special focus on vulnerability to natural hazards and risk/disaster communications, from Rutgers, the State University of New Jersey. She has published her work in peer reviewed journals such as the *Professional Geographer*, *Sociological Inquiry* and *Organizations and the Environment*. Since 2005, her work has been focused on the social aspects of energy, including energy policy, energy justice and public engagement in energy decision-making processes in Puerto Rico. In 2015, in collaboration with Dr. Cecilio Ortiz Garcia and Dr. Lionel Orama Exclusa, she co-founded the National Institute for Energy and Island Sustainability (INESI in Spanish), the only interdisciplinary and Inter-campus institute of the UPR System. INESI is a collaborative platform that identifies and interconnects the resources of the UPR in energy and resilience and insert those resources in the local energy policy arena and in community-based sustainable energy projects. Her participation in INESI also includes the coordination of important capacity building spaces such as the Energy Stakeholder Forum of Puerto Rico and the development of policy tools such as the State of Energy Report for the Puerto Rico Office for Energy Policy. Dr. Perez Lugo is currently a member of INESI's steering committee and a co-developer of RISE-PR, which stands for Resilience through Innovation in Sustainable Energy for Puerto Rico. RISE-PR is an interuniversity collaborative platform that promotes collaborations among more than 20 universities around the issue of community resilience with the leadership of University of Minnesota, the National Council for Science and the Environment, and Arizona State University.

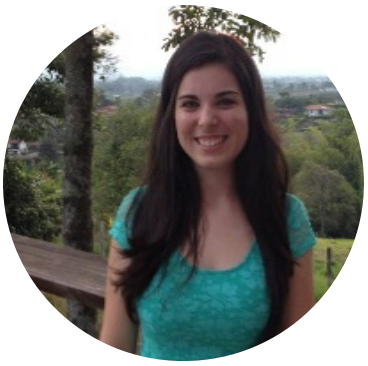
Mariely Rivera-Hernández

Mariely Rivera-Hernández is the executive director of United for Puerto Rico, the only local disaster-relief nonprofit that has raised over 41 million dollars destined for social impact projects in the island after Hurricanes Irma and Maria.

Founder of Estudio Libre Changemaker consulting firm, Rivera-Hernandez is a prominent change-maker and public policy influencer with more than 18 years of experience. Rivera-Hernández has distinguished herself as executive director of two renowned non-profit organizations in Puerto Rico: The Chana and Samuel Levis Foundation and Sapientis. Hernández has ample experience in the areas of educational communications having led Diálogo, the University of Puerto Rico's newspaper. She has also experience in the private sector having worked as Vice President of Student Success and Strategic Planning at Sacred Heart University.

She is currently pursuing a professional certificate (The Health Effects of Climate Change) through the EdX.org online program and working on a new book which aims to document and transform the philanthropic sector in Puerto Rico at the intersection of social impact, change-making and best consulting practices.

Pamela C. Silva Díaz



Pamela Cristina Silva Díaz received her B.S. in Mechanical Engineering from MIT in 2012 and her M.S. in Mechanical Engineering from the University of Michigan in 2014. After the passing of Hurricane Maria in Puerto Rico, she joined the hurricane response and recovery efforts with Oxfam America, focusing on Water Sanitation, and Hygiene (WASH) challenges in rural communities of the island. She is currently working with the Response Innovation Lab in Puerto Rico, designing and leading community interventions aimed at strengthening resilience and Disaster Risk Reduction (DRR). Previously, she performed structural analysis for Pratt and Whitney engines and aircraft structures.

Mark Baker

Mark Baker is Director of Disaster Response at Water Mission, a Christian engineering nonprofit that designs, builds, and implements safe water solutions in developing countries and disaster areas. Having previously served as Project Manager for Water Mission's Latin America and Caribbean programs, he has been leading the organization's efforts in Puerto Rico since November 2017. Mark retired as a Master Sergeant from the United States Air Force ANG after more than 20 years as a Crash Rescue Firefighter and multiple deployments to the Middle East before and after 9/11. He also has more than 20 years of project management experience in the private sector. In addition to supporting "Build Back Better" initiatives in Puerto Rico, Mark and his team at Water Mission are focused on strengthening non-PRASA communities in regard to the compliance and monitoring of their community-managed water systems.

Iris Cardona, MD

Dr. Iris Cardona is Pediatric Infectious Diseases Specialist in Puerto Rico. Is a faculty member in the Department of Pediatrics at University of Puerto Rico School of Medicine, at San Jorge Children and Woman Hospital, and Medical Consultant for the Puerto Rico Immunization Program of the Puerto Rico Department of Health. She also works as physician in the CC Pediatric Center.

In her role as medical consultant for the Immunization Program, she has been able to apply the principles of immunization and preventive medicine to improve the coordination of immunization services for children and adolescents in Puerto Rico. She joined the PRHD Immunization Program in 2003 and spent the last 15 years working to improve immunization services and prevent the occurrence of vaccine preventable diseases in Puerto Rico.

She completed a Residency in Pediatrics and fellowship in Pediatric Infectious Diseases. Her clinical practice mainly involves the care of children and adolescents in both the outpatient and inpatient clinical setting.

Capt. Betty Hastings

CAPT Betty Hastings has served in the U.S. Public Health Service under the U.S. Dept. of Health and Human Services for over 21 years responding to numerous disasters as a Recovery Liaison and Federal Field Coordinator. Her deployments in leadership positions include the World Trade Center terrorist attack, multiple hurricanes, floods and six suicide cluster response in tribal communities. Most recently she served as the Federal Health and Social Services Recovery Field Coordinator for the 2016 catastrophic floods in Louisiana, in Texas for Hurricane Harvey recovery operations and is currently the Recovery Field Coordinator for hurricane Puerto Rico's recovery from Hurricane Maria.

Prior to CAPT Hastings federal service, she completed her social work residency at the National Institute of Health's, Neurological Disorders and Stroke Institute, while also providing clinical services at the R. Adams Cowley, Shock Trauma Center in Baltimore City, Maryland. CAPT Hastings graduated from the Louis Kaplan School of Social Work, University of Maryland with a concentration in behavioral and emergency health.

Dr. Kaumudi Joshipura Jinraj

Dr. Joshipura is the NIH Endowed Chair & Director of the Center for Clinical Research and Health Promotion at UPR Medical Sciences Campus, and an Adjunct Professor of Epidemiology at Harvard T. H. Chan School of Public Health (HSPH). Her research has focused on evaluating lifestyle, microbial, and inflammatory modifiable risk factors for cardio-metabolic and other non-communicable disease. Dr. Joshipura has been continuously funded by NIH including several R01 level research grants, training and mentoring grants. She led SOALS: San Juan Overweight Adults Longitudinal Study), launched to evaluate the bi-directional association between progression of periodontal inflammation and glucose abnormalities, and expanded with questions on water and food intake, additional biospecimens, outcomes and ancillary grants. Her SOALS publication suggesting that over the counter mouthwash use may be a risk factor for pre-diabetes/diabetes, has been portrayed in global media including Newsweek and Forbes magazine. She is also PI of PEARLS: Pregnancy and Early Lifestyle improvement Study, evaluating the effect of diet and physical activity interventions during pregnancy and early life, on cardiometabolic outcomes in overweight/obese mothers and their offspring, and is a Steering Committee member of the LIFE-Moms consortium. She has served as an advisor/consultant to

the Centers for Disease Control and Prevention (CDC), the American Association of Periodontology (AAP), the American Dental Association and the World Health Organization (WHO). She is the UPR liaison for the HSPH Fogarty Global Health Training consortium. Dr. Joshipura's health promotion efforts focus on promoting preventive measures that are cost-saving, free or low-cost, and can be adopted widely and globally. To this end, she founded a global public movement "VMove" (www.vmovement.org) launched at a TEDx talk, to help individuals and organizations incorporate physical activity throughout the day in creative resource-free ways and reduce risk of several chronic disease. VMove aims to change the norms and increase the visibility of physical activity in different settings, to enable people to overcome barriers to exercise and engage in physical activity more frequently in a fun manner. Her latest NIH funded study "PREPARE: Preparedness to Reduce Exposures and diseases Post-hurricanes & Augment Resilience" aims to help individuals and organizations better prepare for disasters.

Rafael Cortes Dapena

Rafael Cortes Dapena is the Chairman of the Board of Angel Ramos Foundation.

María O. Concepción Díaz

Maria is Oxfam America's Program Manager in Puerto Rico. She leads a multidisciplinary, cross-sectoral team of national staff, and is responsible for the development and implementation of Oxfam's program strategy in Puerto Rico, including policy and program design.

Maria has over 15 years of experience working in the nonprofit sector and with governmental organizations in the United States and the Caribbean, focusing on public policy and strategic planning, as well as working with academia. Her previous work has included technical assessments, project design, major gift campaigns, program monitoring and evaluation, and capacity building.

Maria is a PhD Candidate in history and her research includes the development of Caribbean scientific institutions, informal science learning, uneven development in communities, and the creation of gendered policy and gender-sensitive learning environments. When Maria is not busy with work, she enjoys spending time with her family, practicing yoga and walking around the island.

David Enrique De Angel Sola

David Enrique is a physician undergoing training at Yale University. He pursued his degree in Medicine at the University of Puerto Rico (2012) and completed his Pediatrics training at the San Juan City Hospital (2015). After residency, he joined the Yale team as a Fellow for Pediatric Respiratory Medicine. He completed his pulmonology fellowship in 2018 and is now pursuing further training in Sleep Medicine at the same institution. He has done bench and clinical research in asthma. Through his investigation he has explored topics in treatment adherence, perceptions of disease, epigenetics, and the airway microbiome. Dr. De Angel actively participated in grassroots disaster response in the wake of Hurricane Maria, helping organize the Puerto Rican diaspora in CT and across the United States. He has also participated in research on the effects of hurricane disaster on the development of the infant microbiome.
David was raised the youngest of six children and now lives with his wife and son in Hamden, CT. He loves traveling, water sports, numismatics, and being a dad.

Debbie Figueroa, MPH, JD

Debbie Figueroa is the Puerto Rico Senior Program Manager (Country Director). Lawyer and experienced public health epidemiologist, joined Project HOPE, July 2018. She has been working for the Government of Puerto Rico, Control for Disease Control Centers (CDC) and ONG's for the past 15 years. Debbie has played an integral role in advancing HOPE's Puerto Rico development strategy, implementing new programs, strengthening relationships between the government and non-governmental organizations with health officials and health care providers to create and expand programs to advance health care solutions for Puerto Rico population after Hurricane Maria strike on 2017.

Debbie previously served as the Executive Director and Senior Public Health Policy Advisor to the Health Committee and the Vice-President and other members of the Senate of Puerto Rico for more than 6 years. During her years in the Senate she was liaison between the Senate and the Department of Health, Mental Health Services Administration (ASSMCA), Puerto Rico Insurance Plan Administration (ASES) and other community based organizations. She led Public Hearings, Health Ministries confirmations, health conferences, and manage hundreds of senatorial public health investigations. Likewise, she put forward, wrote, guided, assisted and advocated for more than 50 health laws and hundreds health bills during her time in the Senate. She also advised on the Dengue, Chikungunya and most recently Zika response as a CDC Public Health Advisor/Analyst. Debbie started her humanitarian work in the field during Pandemic H1N1 Flu response in 2009.

During her tenure as Epidemiologist in the Department of Health, Debbie worked for the State Epidemiologist as the Lead of the Communicable Diseases Surveillance System and as a Regional Epidemiologist, giving support to all health care providers and hospitals of the island. Likewise, served as principal investigator and collaborator for several epidemiology researches. As well, she worked as a Conference Professor of Biostatistics, Clinical Investigation, Patient Navigation and Health Sciences for more than 10 years.

Debbie holds a law juris doctor, public health in epidemiology master's and biology bachelor's degree and received the Youth Community Service Award from the Governor of Puerto Rico.

Rafael O'Ferrall, MBA

Rafael O'Ferrall es el actual presidente de la prestigiosa organización que reúne a todos los componentes de la industria de alimentos, la Cámara de Mercadeo y Distribución de Alimentos (CMIDA). Simultáneamente, se desempeña como gerente general de la exitosa empresa de distribución Imperial Dade.

Su trasfondo educativo es tan diverso como su carrera profesional. Obtuvo un bachillerato en Biología en la Universidad de Puerto Rico y un grado de Maestría en Administración de Empresas en la Universidad Ana G. Méndez. Su extraordinario desempeño en la milicia y liderato, le ganó ser el primer puertorriqueño seleccionado para participar en el prestigioso programa National Security Fellow (War Collegue) de la Universidad de Harvard. Allí cursó estudios en áreas de gobierno, milicia y política pública, entre otras ramas. Además, ha sido autor de varias publicaciones académicas y trabajos de investigación.

Para O'Ferrall, asumir diversos roles de manera simultánea ha sido una constante en su extensa carrera profesional de sobre 30 años. A su actual cargo de gerente general de Imperial Dade, se suma el haberse desempeñado en posiciones de la más alta gerencia en empresas como PAC-TECH, INC., la farmacéutica Baxter, Caribe Gasket & Supply y Millipore Corporation, así como consultor de la gerencia de JOHNSON & JOHNSON Pharmaceuticals, asumiendo la

responsabilidad de liderar a grandes equipos humanos, presupuestos millonarios y exitosas metas de ventas.

A la par con su trayectoria gerencial, O'Ferrall se ha distinguido por haber acumulado una intachable y ejemplar carrera militar. Su liderato junto a la formación adquirida en los diferentes ámbitos de la milicia, le han llevado a ocupar las posiciones y rangos de mayor prestigio que puede ostentar un militar. A través de los más de 38 años que le ha servido al Ejército de los Estados Unidos y a la Guardia Nacional, O'Ferrall ha fungido como:

Task Force Deputy Commander Guardian Mariner

Deputy Commanding General, Joint Task Force, Guantánamo

Assistant Adjutant General, Puerto Rico National Guard de las fuerzas armadas combinadas, integrada por más de 9,000 soldados y ciudadanos.

Appointed by Congress to be Major General PN 688 114th (2015-2016) US Army

El compromiso, la disciplina y el rigor con el que ha ejercido cada una de sus responsabilidades, le ha ganado a este descendiente de padres puertorriqueños sobre 20 prestigiosos premios y medallas en el ámbito militar y 5 reconocimientos a nivel profe

Wendeline Figueroa Hernandez

Wendeline Marie Figueroa Hernandez graduated from the University of Puerto Rico, Rio Piedras Campus with a Bachelor's degree in Cellular Molecular Sciences on 2017. She continued her graduated studies at the Graduated School of Public Health from the University of Puerto Rico, pursuing a master's degree in epidemiology. In 2018 she collaborated with the Puerto Rico Recovery Plan Project, which collected information about the hurricane response in each municipality of Puerto Rico. This information has been used by the government of Puerto Rico to develop an appropriate response protocol for future disasters, such as Hurricane Maria. Currently, she is working as Regional Level- Epidemiologist for the region of Caguas-Fajardo in the Puerto Rico Department of Health.

Ligia M. Chavez, Ph.D.

Ligia M. Chavez, Ph.D. is a Social Experimental Psychologist with experience in methodological, psychometric and multi-site research. At present she is Associate Professor at the University of Puerto Rico, Behavioral Sciences Research Institute. Her interests include: adapting instruments for use among diverse Latino populations; health services research methods, quality of life, and cross-cultural comparisons. Dr. Chavez is the Principal Investigator of an SC1 NIH-NIGMS SCORE grant titled "Assessing the AQOL-MHS: Longitudinal Change and Clinical Applicability" (GM109326). Dr. Chavez also was the Training Core Co-Director of the UPR-CHA Research Center of Excellence (P60 MD002261) and the Director of the UPR training component to the Comparative Effectiveness Research for Eliminating Disparities (CERED) for Latinos, a supplement to the P60 parent grant. Throughout her career she has worked on the development, implementation and management of complex data for collaborative research across multiple sites. She also worked as QC Supervisor on the International Latino Research Partnership collaborative grant (R01 DA034952) with sites in Boston, Madrid and Barcelona. In the past year she has started the implementation of a Peer-Administered Asthma Self-Management Intervention in Urban Middle-Schools, a large-scaled Randomized Control Trial with the goal of evaluating asthma in Schools funded by NIMHD (R01MD01222), to be tested in urban school setting in both Rhode Island and Puerto Rico. This work trajectory has resulted in the improvement of the reliability and content validity of several instruments, the development of a toolkit on the methodology of translation and adaption, and the publication of various articles in the area of child and adult mental health, psychometrics and minority disparities research.

Dr. Jooby Bien Aime

Dr. Jooby Bien Aime graduated from Med School in CUBA, and a degree in Emergency medicine and MPH(Master in Public Health) From Quisqueya University and Hopital universitaire de Mirebalais.I've been working in the health area for more than a decade,as an Urgentiste then with The NGO's(Non governmental organization) since 2011 after the earthquake.in the Northwestern area in Haiti i worked as an epidemiologist for WHO(World health organisation): Maintain a surveillance system to monitor epidemiological trends in epidemic-prone diseases. Guide the activities of medical personnel for surveillance and / or research of new cases. Ensure understanding of the need for case definitions and data collection consistent.

Manage data systems and ensure accuracy and quality of databases. Then Save the children: Diagnose and assess patient needs. Coordinate patient care. Ensure continuity of patient care. Identify risk behaviors and initiate individual and collective prevention actions. Identify new homes and notify central office. Collaborate with medico-social partners. Participate in epidemiological collection actions. joined HHI (heart to heart international)in 2016 and 2017 specially for the hurricane Matthew : Ensure the implementation of projects and propose new intervention. Monitoring and evaluation of projects deployed in the field. Monitoring project quality indicators. Prepare reports for financial partners. Prepare condensed reports for HHI-USAID and MSPP Participate in the of recruiting, supervising and training staff in the project. Participate in the logistical and administrative management of projects. Participating in setting up Heart to heart new country office. Support the establishment and follow-up of procedures in accordance with the requirements of the financial partners. Support the health cluster of MSPP and another NGO's. Participate in the process of identifying new financial partners.

Elsy Benitez-Vargas RN, BSN, BA, Diabetes Program Manager, Project Hope Puerto Rico

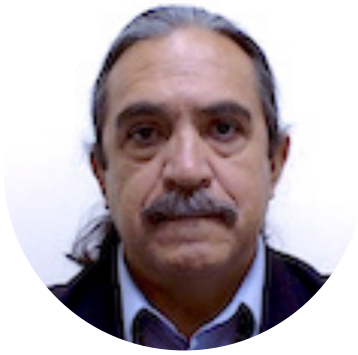
Nurse Benitez-Vargas joined Project Hope in February of 2018. Her current work focuses on Implementing Project Hope's Sustainable Diabetes education program centered on patient self-management throughout Puerto Rico, as well as other emergency preparedness programs.

Prior to joining the Hurricane Maria recovery efforts in Puerto Rico, she managed a 102-bed rehabilitation center facility in Connecticut that offered acute care, long and short-term services.

She is a dedicated, highly motivated, detail oriented, and compassionate Registered Nurse with extensive experience in chronic disease management, and care coordination/case management in the community/primary care settings. In her first nursing position she implemented an RN Care Coordination Program through an interdisciplinary team-based approach that she led in CT as part of a 3-state research study. Prior work with the CT Department of Children and Families gives her a decade of experience in child behavioral/mental health, child development, education, and social work.

As a Robert Wood Johnson Scholar, she completed her nursing studies at Quinnipiac University's Holistic Nursing Program in 2012. Her first undergraduate degree at Wesleyan University focused on the science of medicine from a sociological perspective in a system based anthropological approach.

Dr. Diego Zavala, Professor, Ponce Health Sciences University



The most significant contributions to science have been my work on gastric cancer precursor lesions. I participated in a NIH funded gastric cancer etiology program in Colombia for 13 years. The initial analytical epidemiological studies carried out in the region of Nariño, Colombia led to the implementation of a clinical trial testing for the potential for reversion of gastric cancer precursor lesions (chronic atrophic gastritis, intestinal metaplasia and dysplasia) in the presence of antioxidants and clearance of H. Pylori infection. Although I left LSU Medical Center before the conclusion of the three-year clinical trial, I was involved in all phases of implementation of the clinical trial including the estimation of sample size, selection of cases and follow up of treatments in Colombia. By the time final report on the clinical trial was published I was no longer at LSU Medical Center (see: Pelayo Correa, et.al. Chemoprevention of Gastric Dysplasia: Randomized Trial of Antioxidant Supplements and Anti-Helicobacter pylori Therapy. J Natl Cancer Inst 2000;92: 1881–8).

Domingo J. Marqués, Psy.D.

Director of the Dialectical Behavioral Therapy and Research Program. Domingo Marqués is Associate Professor of Clinical Psychology at Carlos Albizu University. He currently serves as the director of the Dialectical Behavioral Therapy and Research Program. Dr. Marqués has served on the board of several professional organizations and editorial boards. He conducts research and publishes papers on BPD and its evidence-based treatments. His current research interests include understanding the effectiveness of empirically-supported treatments in the Latino communities, self-harm, suicide, and emotion regulation and family processes. His publications include Mortality in Puerto Rico after Hurricane Maria (2018), Stigmatization Experiences among People Living with Borderline Personality Disorder in Puerto Rico (2014), Knowledge of the Relatives of Patients about Borderline Personality Disorder in a Sample of Puerto Rican Families (2014), and Religion and HIV/AIDS stigma in Puerto Rico: A cultural challenge for training future physicians (2013). Marqués received his PsyD in Clinical Psychology from Ponce Health Sciences University where he received the Distinguished Student Award and his Bachelor's in Social Sciences from the University of Puerto Rico in Mayagüez. He has received the Mentor of the Year Award (2015) and the Psychologist of the Year Award from

the Puerto Rico Psychological Association (2018), the Researcher of the Year Award (2018) from the Behavioral Sciences Journal, and the Distinguished Faculty Member of the Year Award from CAU (2018).

Rebecca Noe, Epidemiologist at CDC

CAPT Rebecca S. Noe worked for approximately 12 years as an Emergency Department nurse before joining CDC as an Epidemic Intelligence Service Officer (EISO) in 2004. Her assigned location for EIS was in Alaska where she did injury prevention research and deployed for 6 weeks to New Orleans for the Katrina response. From 2009-2017, CAPT Noe worked as a disaster epidemiologist at the National Center for Environmental Health (CDC-NCEH) where she led CDC's internal Disaster Surveillance Work Group (DSWG), developed several disaster morbidity and mortality tools, and conducted research after numerous disasters. Her current position is an (acting) team lead epidemiologist in CDC's Office of Public Health Preparedness and Response where she works on identifying or developing evidence-based preparedness and response tools for state and local health departments. Ms. Noe is the author of 15 scientific articles in the area of disaster epidemiology and regularly presents at professional conferences on a wide range of disaster response topics.

Luis A. Sepúlveda Pérez

Luis A. Sepúlveda Pérez is an experienced and well-rounded licensed Electrical Engineer, PE 8546, currently presiding the local Gas Station Owners Association, Asociación de Detallistas de Gasolina de Puerto Rico (ASDGPR), in a second term. During his long and productive career, he held several positions in national and multinational companies like Digital Equipment Corp., ACI de Puerto Rico, Westinghouse de Puerto Rico, and Productos Circuitos de Puerto Rico, Inc. among others, in a diversity of roles including Plant Engineer, Quality Manager, Operations Director and Plant Manager, all the way to President and General Manager. Since 2000, Sepúlveda has remained mainly self-employed and providing consulting services in an independent basis.

As President of the ADGPR, he has consistently supported the organization in strengthening membership numbers and benefits, defending the best interests of its members against unfair legislation that undermines the growth, earnings and stability of the industry, and is currently in

the process of moving the organization's headquarters as well as an ambitious administrative reorganization. Under his presidency, the executive has also maintained a healthy and open relationship with government agencies, hoping to promote better preparedness and collaboration in the event of another hurricane or emergency like Maria. Sepúlveda is married, has four children and seven grandchildren. He holds a B.S. in Electrical Engineering from the University of Puerto Rico, Mayaguez Campus.

Eduardo Batalla

Ed Batalla is a Director in Navigant's Energy practice. He is part of a team within Navigant's Energy practice that delivers full lifecycle solutions to transform energy markets, system operations and infrastructure, assets, and technologies for a more sustainable, resilient and secure energy system. Ed assists utility and governmental clients in crafting their Smart Grid and Energy System Transformation strategy, vision and mission, leveraging the integration of new technologies to transform the business and organization, as well as in developing their energy vision. Ed is currently the Technical Program Manager for Navigant's contract with the Puerto Rico Public Private Partnership Authority (P3A) on behalf of the Central Recovery and Reconstruction Office of Puerto Rico (COR3) for the disaster recovery energy mission optimization and program management services after Hurricanes Irma and María.

Ed's professional career spans more than 30 years in the electric utility and energy industry environments and associated technologies. His career experience include transmission and distribution (T&D) grid management and operations, T&D grid control (real-time) systems, systems dispatch (generation resource management), Smart Grid program implementation, transmission planning and services, FERC Open Access Transmission Tariff (OATT) and NERC Standards (Operations, Planning and Critical Infrastructure Protection) regulatory compliance, wind energy business development, wind predictive maintenance, technology (IT/OT) development, architecture and integration, substation automation and field area network (FAN) communications infrastructure, cybersecurity program and assessments, Artificial Intelligence (AI) initiatives, and corporate/enterprise strategy formulation. Prior to consulting, Ed worked more than 28 years at various business areas within NextEra Energy, Inc., in which the primary subsidiaries are Florida Power and Light (FPL) and NextEra Energy Resources. He has been part of management teams at various business areas within NextEra Energy primarily in T&D, Wind Energy Development, and Power Generation.

José J. Rivera Sanabria

José J. Rivera Sanabria is the Executive Director of Infrastructure for the Puerto Rico Aqueduct and Sewer Authority. He has a Bachelor of Science in Civil Engineering from Bradley University in Peoria, Illinois and a Master of Engineering in Civil Engineering with concentrations in water resources and geotechnical engineering from the University of Florida in Gainesville. He has 20 years of experience including work as a consultant and as a public employee

Cosme C. Torres-Sabater

Mr. Torres has a bachelor's degree in Science of Nursing from Pontifical Catholic University of Puerto Rico in addition with a Certification as Hazard Control Manager (CHCM). He has been an area emergency manager (AEM) for VA Healthcare Administration Office of Emergency Management (VHAOEM) since 2002. During the last 17 years, he has served as liaison between the Department of Veterans Affairs at PR and US Virgin Islands and local, state and federal level agencies as well as coordinator for National Disaster Medical System (NDMS) Federal Coordination Center (FCC) at San Juan, PR. Furthermore, he served 30 years in the US Army Reserve, under the branch of Logistics and retired with the rank of Colonel. Mr. Torres has experience in the field of Hospital Incident Command System (HICS), First Receiver Decontamination Program, Continuity of Operations Program (COOP), and is a Master Exercise Practitioner from the Emergency Management Institute.

Mr. Torres has responded to several national incidents that include, Hurricanes: Katrina, Sandy, Mathews, recently Florence and Michael, Orlando Mass Shooting Family Assistance and Emergency Operations Center as well as Hurricanes Irma, Maria, Florence and Michael VA response and recovery operations. For these incidents, Mr. Torres served on multiple incident management teams as liaison officer and logistics chief as well as deputy incident commander at VA Medical Center.

Alexandra Reyes Rivera, MEd, RDN, LND

Alexandra Reyes Rivera is a Registered Dietitian with 18 years of experience. Her Master Degree is in Nutrition Education with a special focus on nutritional counseling and behavior modification therapy. Currently, she works in the Puerto Rico WIC Program as a community nutritionist. She is the community partner in a community-based participatory research project of the Interdisciplinary Research Leaders Program Cohort 1 of the Robert Wood Johnson Foundation in collaboration with UPR-Medical Sciences Campus and FIU researchers. The main focus of his work is in nutrition education, pediatric obesity prevention, infant feeding practices and breastfeeding.

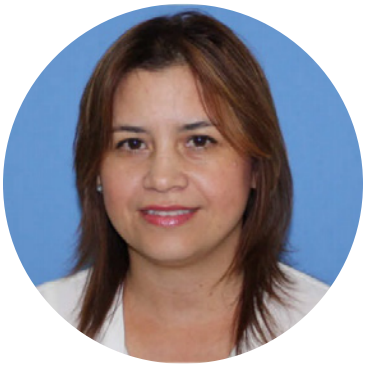
Raymond E. Swienton, MD, FACEP

Raymond E. Swienton, MD, FACEP is a Professor of Emergency Medicine, Chief of the Division and Fellowship Director of Emergency and Disaster Global Health in the Department of Emergency Medicine at the University of Texas Southwestern Medical Center in Dallas, Texas USA. Dr. Swienton is one of the original creators, editors and a founding Board member of the National Disaster Life Support™ (NDLS™) Foundation series of courses, including Advanced Disaster Life Support™ (ADLS®), Basic Disaster Life Support™ (BDLS®) and Core Disaster Life Support®, (CDLS®) courses. He is a senior editor on multiple textbooks, well published author, and an associate editor for the Journal of Disaster Medicine and Public Health Preparedness. His aim and work in health security and multinational collaborations continues to advance and unite those dedicated to the discipline of disaster medicine and public health preparedness globally. His commitment to medical education and passion for teaching is conveyed in the phrase “See one, do one, teach….many”.

Dr. Guillermo N. Armaiz-Pena

Dr. Guillermo N. Armaiz-Pena is an Assistant Professor of Pharmacology at Ponce Health Sciences University (PHSU) and a member of the Cancer Biology and Women's Health Divisions at the Ponce Research Institute. As a translational scientist, his research efforts aim to identify gaps in current knowledge and translate discoveries into clinically meaningful holistic approaches to diagnose and treat women's cancer patients of Hispanic/Latino origin. Throughout his career, he has focused on understanding the biochemical, cellular and molecular mechanisms that explain how biobehavioral disorders can promote cancer growth and metastasis.

Dr. Mary Rodríguez-Rabassa



Dr. Mary Rodríguez-Rabassa is an associate professor and researcher at Ponce Health Sciences University-Ponce Research Institute. Her research activities focus on the association between chronic inflammatory responses and microbiome with mental disorders in children and adults. In particular, her research includes neuropsychological assessment (e.g., cognition, depression and anxiety symptomatology) of patients with chronic diseases or at higher risk to develop chronic diseases and their association with inflammatory biomarkers and microbiome.

Nicolette A. Louissaint, Ph.D

Nicolette A. Louissaint, Ph.D. serves as the Executive Director of Healthcare Ready), a nonprofit organization set up in the wake of Hurricane Katrina to ensure that the catastrophic breakdowns in patient access to healthcare would never happen again. In this role, she leads the organizations efforts to build greater healthcare preparedness and response efforts in coordination with the public and private sectors. Her particular areas of interest are biosecurity (especially infectious and emerging diseases) and supply chain complexities. During the height of the Ebola Epidemic of 2014, Nicolette served as the Senior Advisor to the State Department's

Special Coordinator for Ebola. In this role, she was responsible for coordinating international efforts as the U.S. Department of State's Ebola Coordination Unit jumpstarted the diplomatic response to the epidemic. She contributed to efforts to raise more than $1 billion in donations to the United Nations Multi-Partner Trust Fund from stakeholders around the world towards the response. Nicolette holds Bachelors of Science degrees in Chemical Engineering and Biological Sciences from Carnegie Mellon University. She earned a Ph.D. in Pharmacology and Molecular Sciences, specializing in HIV Clinical Pharmacology from Johns Hopkins University School of Medicine. She completed post-doctoral fellowships at the Johns Hopkins University and the American Association for the Advancement of Science. She was recognized in 2016 as a "40 under 40 leader in minority health" by the National Minority Quality Forum by the Congressional Black Caucus, in 2017 as a "Leading Woman in Maryland" by The Daily Record, in 2018 a finalist for Disaster Program Leader of the Year from Disaster Recovery International, and named as a 2018 VIP list awardee by The Daily Record.

Héctor Colón Cruz, Ph.D.-MEP

Héctor Colón has a BS in Chemistry and a MS in Chemsitry form University of Puerto Rico and a Ph.D. in Analytical Chemistry from SUNY at Buffalo NY. Héctor Colón has several publications on chromatography, chemical education and chromatographic techniques in pharmaceutical industry applications. He has lead chemistry projects as a consultant in Puerto Rico, the US and England.

Dr. Colón joined the Puerto Rico Department of Health as the Lead Chemist for the Chemical and Biological Emergencies Laboratory. He was certified in 2015 as a Master Exercise Practitioner by FEMA and has been in charge of the development, conduct and evaluation of over 40 exercises for the Puerto Rico Department of Health as well as other agencies in the Island. He has also collaborated as the Deputy Director of the Office of Public Health Preparedness and Response of the Puerto Rico Department of Health. He has been certified by FEMA as instructor for the ICS specific positions Logistics and Finance and Administration, Emergency Management Basic Academy and Communications Leader. He was certified as an Emergency Manager by the Emergency Management Accreditation Program.

Currently, Dr. Colón, as the Community Resilience Domain Manager for the Office of Public Health Preparedness and Response is leading the development and preparedness of the seven healthcare coalitions in Puerto Rico. During the Hurricanes Irma and María, he has been involved with all seven coalitions in the response and recovery of them.

Ashley Ann Andújar Rodríguez, MHSA

Ashley Ann Andújar Rodríguez is a communications specialist with over 10 years of experience in the areas of emergency response, strategic communications, marketing, and message development. Ms. Andújar obtained a Master's Degree in Health Services Administration from the Graduate School of Public Health at the University of Puerto Rico and a Bachelor's Degree in Marketing from the University of Puerto Rico in the Rio Piedras Campus.
Ms. Andújar is currently the team lead for the Health Promotion and Communication team within the Waterborne Disease Prevention Branch in the Division of Foodborne, Waterborne, and Environmental Diseases at the Centers for Disease Control and Prevention. Since joining CDC in 2015, she has deployed 4 times as Health Communication Specialist in support of the Zika response in Puerto Rico, and most recently to Puerto Rico's Hurricane María response in providing health communication and promotion, and content development expertise to the Puerto Rico Department of Health. In addition, Ms. Andújar has prior public health experience working in HIV prevention.

Prior to joining CDC, Ms. Andújar worked for 6 years as an External Affairs Reservist with the Federal Emergency Management Agency (FEMA) where she deployed as a public affairs specialist, video producer, and photographer in over 9 emergency disaster declarations across the U.S and Puerto Rico, including tornadoes, wildfires, floods, and hurricanes. Ms. Andújar is also a licensed healthcare and hospital administrator in Puerto Rico.

Raisa Lisette Ugarte

Raisa Lisette is a Public Relations and Advertising expert. Graduated from the University of Puerto Rico Río Piedras Campus and the Autonomous University of Barcelona where she completed her masters in Direction of Public Relations and Communication Agencies. Her passion is investigating tendencies in social media. Ugarte has participated at the National Communication Congress speaking about the Development of Influencers in Puerto Rico. As an ex-member of the Honor Program of the University of Puerto Rico she collaborates with other ex-alumni in community work and stays in touch with the college community. Former intern at Synapse Social where she managed restaurants and hotels' social media accounts. She is the former Social Media Manager of the Asociación de Publicistas y Relacionistas Universitarios (APRU) where she

– along with the other board members of the APRU – managed to reestablish the association in the School of Communications. Currently working at Impactivo as Dissemination Assistant / Social Media and Marketing.

Dr. Heidi Parrilla

Dr. Heidi Parrilla López de Victoria received a bachelor's degree in Communal Health Education from the University of Puerto Rico and a Doctorate Degree in Public Health from Walden University. Dr. Parrilla has over 10 years of experience in the health care services arena. She's an innovative strategic leader, with experience in: program and project management, quality improvement, disease management, health education, Medicare and NCQA requirements. Demonstrated results in the identification of strategies to positively impact a Medicare Advantage health plan Star Rating; resulting in the increase of a health plan's rating by a full Star in one year. Dr. Parrilla has been a leader in the development of health promotion and education programs, which have surpassed patient engagement and satisfaction. She has a passion for health promotion and prevention, leading to the implementation of a Case in Point Award-nominated program which targeted patient compliance with preventive health measures. She also led teams in the process of NCQA accreditation for a Puerto Rico health plan which was able to achieve a Commendable accreditation from the first submission.

Josiemer Mattei, PhD, MPH

Dr. Mattei is an Assistant Professor of Nutrition at the Department of Nutrition, Harvard T.H. Chan School of Public Health. She investigates genetic, dietary, and psychosocial determinants of cardiometabolic diseases and allostatic load in racial/ethnic groups and underserved populations, as a framework to explain health disparities. Dr. Mattei combines epidemiological research with culturally-tailored community interventions, both through collaborations and new studies in the United States, Puerto Rico and Latin America. Her ultimate goal is to help Latinos and minority and underserved populations eat healthier and be healthy. Her productive body of work was recognized with the Mark Bieber Award for Outstanding Nutrition-related Research by the American Heart Association, of which she is a Fellow.

Alexandra C. Rivera González, MPH

After completing her bachelor's degree in Human Biology (BSc) at the University of Puerto Rico in Bayamón (UPRB), Alexandra went on to earn a Master's in Public Health (MPH) from the School of Public Health at the University of Puerto Rico, Medical Sciences Campus (UPR MSC). As part of her thesis, she studied the individual resilience of members of the Mambiche Blanco community in Humacao, one of the most devastated municipalities from the passing of hurricane Maria, seeking possible associations of this trait with the information, motivation, and behavioral skills of the interviewed group. Shortly after, Alexandra served as a Research Assistant at the Center for Clinical Research and Health Promotion of the UPR MSC, researching areas such as dental health, diabetes, physical exercise, and mental health post-hurricane Maria. Currently, she works at Mount Sinai Hospital as a Clinical Research Coordinator for studies mainly on asthma, PTSD, and depression on WTC survivors. In September 2019, Ms. Rivera will begin her PhD in Health Services Research and Policy at Drexel University, Philadelphia, aiming to focus on mental health in Puerto Rico.

Marietta Vázquez, MD

Dr. Marietta Vázquez is a Pediatric Infectious Diseases specialist at the Yale University School of Medicine. Dr. Vázquez graduated Cum Laude from Yale University in 1990. She attended the University of Puerto Rico School of Medicine and returned to Yale. She completed a Pediatric Internship and Residency at the Yale-New Haven Children's Hospital and a Post-Doctoral Fellowship in Pediatric Infectious Diseases, also at Yale. Currently, she is Associate Residency Program Director in Pediatrics, Director of the Yale Pediatrics Global Health Track and Director of the Yale-Children's Hospital Hispanic Clinic. Dr Vázquez was the first Latina to be appointed by the Secretary of the U.S. Department of Health and Human Services (DHHS) to be a voting member of the Advisory Committee on Immunization Practices (ACIP). Elected as a voting member of the CDC to the Advisory Committee on Immunization Practices (ACIP).

Dr Vazquez has authored many scientific papers and has been an active spokesperson for the CDC in both Spanish and English media campaigns in vaccines, measles outbreaks, pertussis outbreaks and more recently in zika virus prevention campaigns. She has lectured on vaccines across the US and worldwide—Spain, Greece Egypt, Dominican Republic, Mexico, Colombia.

Dr. Vázquez directs the Yale Pediatrics Global Health track (a training track for pediatrics residents and fellows) and conducts collaborative studies internationally. She has developed and directs collaborative projects with the Dominican Republic for the past 7 years.

In September 2017 , Dr. Vazquez was integral part of starting and organizing a grass roots movement of post-disaster humanitarian medical relief for Puerto Rico.Uniting a small group of medical Puerto Rican diaspora at Yale, exactly one week after Hurricane Maria, her institution YNHH became the first US medical center to send a large medical relief directly to the doorstep of a hospital. Since then she and her team (PR Rising CT) have been working on assisting medical centers and universities in over 17 states across the US to follow suit. She has been involved in educational campaigns, outbreak control, vaccine policy and resource allocation.

Adam Silverman, MD

Dr. Silverman provides clinical care in both the Pediatric Intensive Care Unit and the Emergency Department. He is the co-founder and director of the hospital's Center for Global Health and collaborates on multiple programs in Haiti to increase the local capacity for pediatric care through innovative collaborative educational activities. Dr. Silverman has served as the Membership Chair of the AAP Section on International Child Health, organizes educational events to increase awareness and appreciation for Global Health issues and lectures regionally, nationally and internationally. Dr. Silverman is the Coordinator of the Pediatric Residency Global Health Pathway, takes residents on Global Health electives to Haiti and has been honored with multiple teaching awards.

Dr. E. Anne Peterson, MD, MPH

Dr. E. Anne Peterson, MD, MPH, was previously Assistant Administrator of the USAID's Global Health Bureau, Virginia State Health Commissioner, consultant for CDC and WHO, research professor at George Washington University and Vice Dean for the Ponce Health Sciences University.
She currently directs all AmeriCares health programs, increasing access to quality clinical care and building transforming health programs in mental health, chronic disease and health systems globally. The Emergency Response Program and Access to Medicine

Program, supplied almost $900 million worth of lifesaving medicines and medical supplies to more than 90 countries in FY16.
Americares has been responding to Hurricane Maria from before Maria reached the island, coordinating with local and national authorities, providing more than $40m worth of medicines and supplies, transporting patients, mobilizing mobile medical teams in remote areas and conducting large scale preparedness training for health facilities. In the mental health psycho social services, Americares has provided “Healing for Health Workers: Building Mental Health Capacity in Post-Maria Puerto Rico” training for more than 2000 health care workers across the island to help health providers both cope with their own traumas and have the resiliency to better serve their patients emotional needs.

Himilce Velez

Professor Velez has served as the Healthcare Systems Branch Director for the Health and Human Services Recovery Support Function (HSS RSF) since May 2018. Under her leadership, the Healthcare Systems Team developed the Regional Resilience and Recovery Network Project and the Municipality Joint Initiative Project to support Puerto Rico preparedness and recovery activities at the regional and municipal level.
Ms. Velez holds a master's degree in Epidemiology, a certification in Gerontology and is a DrPh candidate in the Health Systems Analysis and Management Program at the University Of Puerto Rico School Of Public Health.
She has stood out professionally as a researcher, consultant and university academic chair in courses related to epidemiology, research methods and statistical analysis in the University of Puerto Rico, Medical Sciences Campus and the Ponce School of Medicine.
Her publications include works on cancer, senior health, and evaluation and methodologies related to public health and environmental epidemiology.
Ms. Velez holds the Delta Omega award of the Honorary Public Health Society and a Senate Resolution of Congratulations for her leadership on the Advice Committee for Early Childhood Policy Development. She has also been recognized for her dedication to volunteer organizations for children with mobility disabilities and support for community groups.

Terry Donat, MD

Terry Donat, MD, is a dual-board certified Facial Plastic and Reconstructive Surgeon/OHNS and Medical Investigator practicing in Northern Illinois and greater metropolitan Chicago for the past 19 years. Dr. Donat was trained in Biochemistry at the Pennsylvania State University and received his Medical Degree from Hahnemann University School of Medicine in Philadelphia in 1991. Terry is a written-exam reviewer and oral board examiner of U.S. and Canadian surgeons for the American Board of Facial Plastic and Reconstructive Surgery. He has extensive experience in facial reconstruction and managing blunt/penetrating head and neck trauma. Terry is the first physician certified as an Illinois Professional Emergency Manager. He is trained in acute Radiation Emergency Medicine, the Medical Management of Chemical and Biological Casualties and as a past National Disaster Life Support Instructor. He was appointed IEMA RACES Regional Radio Officer on the State Team for IEMA Region 2. Terry is the first physician to complete the graduate program in Veterinary Homeland Security from Purdue University – National Biosecurity Resource Center. He serves as an external resource to the FBI Chicago Field Office WMD Coordinator and the FBI WMD Directorate Biological Countermeasure Unit. He also served as a biosecurity and medical intelligence subject matter expert for the Underwriters Laboratory Security Council. He is a lifetime member of the Special Operations Medial Association (SOMA) and is currently researching his novel, patented means for mitigating heat stress in austere thermally-hazardous environments.

Emma Fernández-Repollet, Ph.D.

Dr. Emma Fernández-Repollet received her B.A. in Education from the University of Puerto Rico Rio Piedras Campus, her M.S. and Ph.D. in Physiology from the University of Puerto Rico Medical Sciences Campus (UPR-MSC), and a postdoctoral training in renal physiology at Duke University and the University of North Carolina at Chapel Hill. She joined the faculty of the Department of Pharmacology at the University of Puerto Rico Medical School in 1982. Her research interests relate to the areas of renal hemodynamics, protein malnutrition, and flow cytometry. Her academic experience includes conducting teaching medical,

graduate and dental students, as well as directing an active Research Center in Minority Institutions (RCMI) program, focusing on health disparities affecting the Puerto Rican population. Dr. Fernández-Repollet served as Vice President for Research and Technology at the University of Puerto Rico from 2003-2009. She has also served on a number of review groups and advisory committees of the National Institutes of Health, including the National Research Resources Advisory Council. Dr. Fernández-Repollet is currently the President of the National Research Centers in Minority Institutions (RCMI) Program Directors Association and Secretary of the Board of Directors of the Center for Quantitative Cytometry. She was also a member the Board of Directors of the Puerto Rico Science, Technology and Research Trust and the Alliance for the Economic Development of Puerto Rico. She served as Vice President of INDUNIV, an industry-university research consortium from 2003-2009 and as President of the Puerto Rico Healthcare Council from 2010-2011. In 2007 she was recognized as Distinguished Ex-Alumni Graduate of the School of Biomedical Sciences University of Puerto Rico Medical Sciences Campus and in 2008 she received the Fred Greenwood Award for her contributions in the area of research administration and health disparities. Recently, she has been recognized as a Distinguished Puerto Rican Women in STEM. Dr. Fernández-Repollet is currently Principal Investigator and Executive Director of the Center for collaborative Research in Health Disparities at the University of Puerto Rico Medical Sciences Campus, Chair of the Steering Committee of the RCMI Translational Research Network (RTRN), and member of the RCMI Advisory Committees of Meharry Medical College (chair), Hunter College and Florida International University.

Jorge E. Martel; VP & General Manager T-Mobile Puerto Rico

Jorge Martel is the Vice President & General Manager of T-Mobile Puerto Rico, responsible for the management and administration of all the company's functional business areas including: Finance, Engineering, Marketing, Customer Service, Corporate Communications, Information Technology and Sales.

Martel led the T-Mobile Puerto Rico local operations during the impact and aftermath of Hurricane Maria, simultaneously ensuring the welfare and wellbeing of over 600 employees, supporting the restauration of the network, the renewal of commercial operations, communications and servicing of a customer base of over 500K. The T-Mobile Puerto Rico Operation restored its network and commercial operations in record time. In December 2017, T-Mobile Puerto Rico recorded its best growth month in its history and recently revalidated in an independent engagement index survey conducted by Aon Hewitt survey as one of Puerto Rico's Top Employers in 2017.

Martel joined T-Mobile's predecessor, TeleCorp Communications Inc., as Marketing Director in 1999.Prior to working at T-Mobile, he held various marketing and advertising positions at RJ

Reynolds and Leo Burnett. He graduated from Boston College, where he earned a BA in Economics.

Maria de Lourdes (Malu) Blázquez Arsuaga

Malu Blázquez Arsuaga is an Executive Professional with vast experience and knowledge in operations management, program and project management, and process and performance improvement. Malu has a B.S. and M.S. in Industrial and Management Engineering from Rensselaer Polytechnic Institute in Troy, NY and has over 24 years of professional work experience that includes managing various types of development opportunities from the planning and permitting phase of concept through execution and build-out, and leading complicated development opportunities. Malu served as Project Manager for CSA Group, Inc. during 8 years in important government projects, such as the master planning and permitting of San Juan Waterfront Development (Bahía Urbana) and the design and buildout of Piers 6, 7 & 8, and Eastern Gateway of Bahía Urbana.

She recently led the Roosevelt Roads Local Redevelopment Authority from 2013 through 2016 as Executive Director in managing the public corporation and the redevelopment efforts of over 3,000 acres of Former Naval Station Roosevelt Roads (FNSRR) in Ceiba and Naguabo, PR. As of January 2018, Malu is the Executive Director of a non-profit organization, ReImagina Puerto Rico, which developed 97 recommendations in June of 2018 for the reconstruction and rebuilding of a stronger and more resilient Puerto Rico by integrating and engaging multiple voices and sectors from and on Puerto Rico during the outreach and engagement process.

Ivan Roma, P.E., MBA

Ivan has a Bachelor in Science – Industrial Engineering and a Master in Business Administration from the University of Puerto Rico. Ivan is an active member of College of Engineers and Surveyors of Puerto Rico (CIAPR). In 2006, he was selected as distinguished engineer by the CIAPR. During his more than 30 years in the Pharmaceutical Industry with GSK, MOVA and Pfizer, Ivan occupied several Management, Senior Leadership, and Executive positions. For several years, Ivan served as member of the Board of Directors of the Pharmaceutical Industry Association of Puerto Rico (PIA-PR). Ivan is currently Advisor to the Board of Directors of the Pharmaceutical Industry Association of Puerto Rico (PIA-PR).

Michael Welton

Dr. Welton is currently a post-doctoral research fellow working with the University of Georgia. He completed his PhD in 2016 at the University of Georgia. Prior to the University of Georgia he worked for 5 years as an epidemiologist with the California Department of Public Health's Office of Binational Border Health. He received his Masters of Public Health and Masters in Latin American Studies from San Diego State University. He has been working for 3 years in Puerto Rico with ongoing Maternal and Child Health cohorts in collaboration with the University of Puerto Rico's College of Public Health.

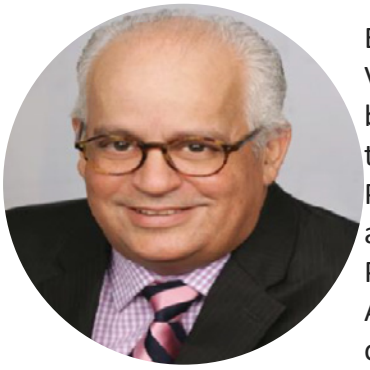
Laura López Torres

Laura López-Torres is executive director of Fundación Ángel Ramos, a local grant making foundation established over 60 years ago with the mission to improve Puerto Rico's quality of life by supporting nonprofit organizations that promote arts and culture, education and human services. In its six decades of philanthropic work, the Foundation has invested over $100 million through a variety of organizations across the island.

Lourdes R. Rodriguez

Dr. Lourdes R. Rodriguez Rivera is an Emergency Physician and Assistant Professor at San Lucas Episcopal Hospital in Ponce, Puerto Rico (Ponce Health Sciences University) and at Brooksville Hospital in Spring Hill, Florida. She recently obtained a Master's in Public Health with an Advanced Certificate in Emergency Preparedness from New York Medical College. Her research is focused on developing emergency preparedness training modules that employ simulations and novel teaching techniques to improve disaster preparedness at the physician level.

Eduardo Pagan, VP & GM Caribbean Services, TOTE Maritime Puerto Rico



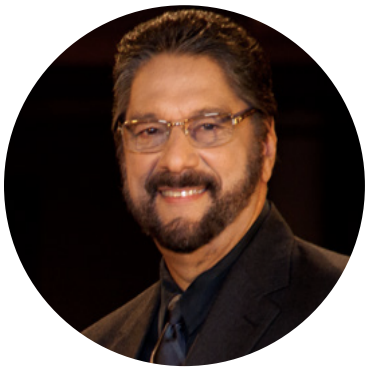
Eduardo Pagan joined TOTE Maritime in November of 2010 as the Vice President and General Manager of Caribbean Services. He brings more than 30 years of management consulting and transportation industry experience. Prior to joining TOTE Maritime, Pagan led his own consulting firm (Caribbean Solutions Partners) assisting organizations with Business Development and Strategic Planning. He played a pivotal role with the Puerto Rico Water Authority Revenue Optimization Program and work on the design of the private / public partnership strategy.

Pagan also worked at Unilever for 21 years in key roles including manufacturing, distribution, and international sales. He was deeply involved with Total Quality Management (TQM), Total Productivity Management (TPM), and Lean Manufacturing. In addition to the development and improvement of overall business practices, Pagan used these tools and skills to improve performance in areas such as operational productivity, safety, environmental impact and led the Competitiveness Team and Strategy for the Puerto Rico Manufacturing Association. He was also the General Manager for C.R. Bard operations in Puerto Rico(medical device)

He holds a degree in Industrial Engineering from the University of Puerto Rico and a master's degree in Business Administration.

Pagan is also an active board member of the following organizations: Puerto Rico Boys & Girls Club (President), Puerto Rico Shipping Association (President), American Maritime Partnership, Caribbean Shipping Association (Council Member), B.E.O.C. (Executive Board Member), Enactus and others.

José Pons-Madera, PhD



Dr. Pons is the fifth president of Albizu University in San Juan, Mayaguez, and Miami. He obtained a BA in Psychology from Salem State University in Massachusetts, and an MS and a Ph.D. in Clinical Psychology from the Caribbean Center for Advanced Studies, now Albizu University (AU). Dr. Pons has post-doctoral training in clinical neuropsychology, in community mental health, and specializes in higher education administration. Dr. Pons was the founder of the School of Behavioral and Brain Sciences of Ponce Health Sciences University where he was Full Professor of Clinical Psychology, Neuroscience of Learning, Couples, and Family Therapy, and Psychiatry.

As a licensed Clinical Psychologist in Massachusetts and Puerto Rico, Dr. Pons has over 30-years of clinical experience working with acute and chronic conditions including trauma related to interpersonal experiences, accidents and natural disasters. He has published on intelligence and emotional intelligence, autism, forensic family psychology, and on graduate training and regulation of the psychology profession, in Puerto Rico. He reviews articles for various professional and scientific journals including Professional Psychology: Theory and Practice; Training and Education in Professional Psychology; Revista Puertorriqueña de Psicología; Revista de Medicina y Salud Pública; and Science of Learning (a Nature journal).

Emilio Colón Zavala, PE, AP

Born in Troy, New York, Graduated from University of PR High School and pursued a bachelors degree of Science in Civil Engineering, at the Mayagüez campus of the UPR, graduating with honors.

Interned at the NASA's Center for Space Construction at the University of Colorado program, researching structural design for a long-term lunar base. Licensed to practice engineering in Puerto Rico since 1992. His career began with Redondo Construction, where he was responsible for projects for the PR Highway Authority.

In 1994, began working at Quality Engineers & Contractors, serving as project manager, becoming vice president and member of the Board of Directors. He was responsible for the development

of over 1,500 housing units and commercial projects. His project Villas del Bosque, was awarded the social interest project of the year 2000, by the Association of Home Builders.

In 2008 started his own companies, ECZ Group and Endeavor Construction Group, dedicated to engineering and construction services, providing a wide scope of services on projects such as; The Humacao Fine Arts Center, Pier 6 in San Juan, Port of Las Americas and Paseo de la Real Marina in Aguadilla amongst others. Has been involved in initiatives to dehydrate fuel grade ethanol and establish a anaerobic digestion plant to produce gas.

In 2010 was named as a member of the PR Building Code Adoption Committee representing the PR Builders Association. Also obtained a designation of Authorized Professional with OGPe to issue certain permits as per Act 161-2009.

Mr Colón-Zavala is a member of the engineering honor society Tau Beta Pi. In 2006 was named emerging leader under 40 by the CIAPR's Institute of Civil Engineering. Also has participated in professional associations such as: Associated General Contractors in PR and at the National level, the National Society of Professional Engineers, where he served as chairman for the PR Chapter in 2010.

Currently serves as Chairman of the PR Builders Association (local chapter for NAHB and ULI), PR State Representative and Executive Board Member of the National Association of Home Builders (NAHB), also a member of Puerto Rico's Construction Codes Adoption Committee and the permits reform committee. In 2018 was named to ENLACE Project's Board of Directors. Serves in the PR Chamber of Commerce's Board of Directors representing the PR Builders Association and was invited into Lambda Alpha International as an at large member.

Mark Keim, MD, MBA

Dr. Keim is the Chief Executive Officer for DisasterDoc International, specializing in consultation, education and research related to public health emergencies.
He is also an adjunct Associate Professor at Emory University, Rollins School of Public Health; and Faculty at Beth Israel Deaconess Harvard Medical School, Disaster Medicine Fellowship.
Mark is residency-trained in Emergency Medicine (Albany, NY) and fellowship-trained in Disaster Medicine (Emory University). He most recently earned an MBA degree at Emory University Goizueta Business School in 2014.

Mark is retired from a career at the US Centers for Disease Prevention and Control (CDC), where he served as Associate Director for Science for the CDC Office for Environmental Health Emergencies.

He was twice commended with the US Secretary of Health "Secretary's Award for Distinguished Service" as CDC's incident manager for both the Anthrax letter emergency and Hurricane Katrina. He also received the CDC Special Service Award for leading field response after the Indonesia tsunami.

In 2015, he received the prestigious United Nations Sasakawa Certificate of Merit recognizing global impact on Disaster Risk Reduction. Dr. Keim is the author of 52 journal publications and 23 book chapters. He has served as a peer review consultant for 21 scientific journals and on the editorial board of 4 scientific journals. His press interviews have appeared on CNN, PBS, USA Today, Chicago Tribune, LA Times, Washington Post, The Lancet and Scientific American.

Omar J. Marrero, Esq.

Omar J. Marrero obtained a B.B.A. with a double major in Accounting and Finance from the University of Dayton (Ohio). He earned a Juris Doctor from the Inter American University of Puerto Rico, where he graduated Summa Cum Laude. After completing his law degree and passing the bar with one of the most outstanding scores, he went on to obtain an L.L.M. in Corporate Law from New York University. Marrero is also admitted to the New York State bar.

During the course of his professional career; Marrero has worked with local and international banks, and has served in the Government, Academia and law firms.

During the past ten years, Marrero has acted as a transactional and regulatory attorney in the areas of corporate and finance law, capital markets, real estate and infrastructure; and government affairs. His experience includes participating in the financing of the six-star hotel in Puerto Rico, multiple corporate reorganizations, complex financing transactions, and public-private partnerships, as well as providing advice to several governments entities.

Marrero served as Secretary of the Department of Consumers Affairs of Puerto Rico under the administration of former Governor Luis Fortuño. In addition, during the past seven years he has also served as adjunct professor of the School of Law of the Inter American University of Puerto Rico, teaching corporate law courses.

In January 2017, Governor Ricardo Rosselló appointed Marrero Executive Director of the Puerto Rico Ports Authority, the Executive Director of the Puerto Rico Conventions District Authority; and the Executive Director of Puerto Rico Public Private Partnerships. He also served as Vice President of the Board of Directors of the Puerto Rico Electric Power Authority. In February 2018, he was appointed as the Governor's Authorized Representative (GAR) before FEMA and Executive Director of the effort of the Central Office of Recovery and Reconstruction (COR3).

Mayra Toro Tirado, BS, MS

Mayra Toro Tirado, BS MS - Actualmente es la Secretaria Auxiliar para Salud Ambiental, Laboratorio Salud y Oficina de Bioseguridad del Departamento de Salud. La Sra. Toro tiene un Bachillerato en Pre-Medica y un Minor en Química de la Universidad Interamericana de PR, una Maestría en Salud Publica con concentración en Salud Ambiental de la Escuela de Salud Pública de la Universidad de PR y cuenta con 21 años de experiencia como servidora pública en el Departamento de Salud ocupando diferentes posiciones en el Programa de Salud Ambiental donde ha fungido como Oficial de Salud Ambiental, Directora de la Oficina Local de San Juan Rio-Piedras, Sub Directora de la Región Metropolitana de Salud Ambiental, Directora de la División de Salud Radiológica, Directora del Programa de Higiene de Leche y Directora Auxiliar del Programa de Salud Ambiental. En el área de respuestas a emergencias fungió por 5 años como Coordinadora de Manejo de Emergencias del Departamento de Salud y luego por un periodo de 4 años como Directora de la Oficina de Manejo de Emergencias del Departamento de Salud. Actualmente la Sra. Toro esta Comisionada por la "Food and Drug Administration" (FDA) para la realización de inspecciones federales en el área de alimentos, es miembro de la "Association of State and Territorial Health Officials (ASTHO), miembro de la "Society for Environment and Human Development" (SEHD), miembro del "Insular Climate and Health Group from — ASTHO" y miembro de la "National Environmental Health Association"

Durante la respuesta a la emergencia del Huracán María la Sra. Toro tuvo la responsabilidad de coordinar los trabajos de Salud Ambiental a nivel de isla en conjunto con las agencias federales y entidades privadas como los NGO's para atender las tres áreas de mayor relevancia: agua potable, alimentos y vectores.

En este momento la Sra. Toro tiene a su cargo los proyectos de recuperación del área de Salud Ambiental que se están trabajando en conjunto con el "Center for Desease Control" (CDC).

Mrs. Darielys Cordero, MPH, DrPhc

Mrs. Cordero holds a master's degree in Public Health with a concentration in Epidemiology, from the University of Puerto Rico, Medical Sciences Campus. She completed a Fellowship in Applied Field Epidemiology (Field Epidemiology and Training Program) granted by the University of Puerto Rico and the Puerto Rico Department of Health. Mrs. Cordero is certified as a Public Health Leader by the National Leadership Academy for the Public Health, of United States. At this point, she is currently completing a dissertation for obtain her doctoral degree in Public Health- Health Systems Analysis and Management, also from the University of Puerto Rico, Medical Sciences Campus.

Her professional experience includes more than seven years in the Puerto Rico Department of Health, where she held various positions such as Program Coordinator of the State- Level Hospitals Acquired Infections Surveillance System in Puerto Rico. Also, she worked as a Project Manager developing the Public Health Organizational Improvement Project of the Assistant Secretary of Planning and Development of the PRDoH. She also performed as the Director of the Puerto Rico Primary Care Office (PR-PCO), being able to increase opportunities for accessing primary care services with emphasis on the underserved communities in PR. In this position, she was enriched of knowledge about the community health centers model, with in combination to her determination to contribute to primary health as the foundation of any health care system, this has become her passion.

Since 2016, she has worked as Project Manager for the Puerto Rico Primary Care Association. Among the biggest challenges has been to leader most recent public health disasters as the Zika Virus Response and the Natural Disasters Emergency Responses. Among its main functions, Mrs. Cordero has designed a strategic and coordinated response across the network. With a high-level structure and commitment, she supports Community Health Centers through coordination, guidance and direction for implementing a strategic, coordinated and sustainable response. Also, to keep their goal of increase expansion of services and their capacities to address emergent viruses and other public health emergencies. In addition, she has a crucial role as a liaison with federal, state and non-governmental organizations for the alignment of the primary care strategic response to state and federal goals.

MRS. SANDRA I. CHARLES, BHS

Sandra I. Charles is a native of St. Croix, U.S. Virgin Islands. Mrs. Charles obtained an Associate of Science degree in Nursing from the University of the Virgin Islands; and a Bachelor of Health Science Degree from Nova Southeastern University in Fort Lauderdale Florida. Mrs. Charles has worked in the field of Public Health for over 17 years; and has several years of experience in emergency management. She has also been very active in the St. Croix Lions Club for many years. Currently, Mrs. Charles is the Deputy Director of Planning & Preparedness of the Division of Public Health Preparedness (PHP) at the Virgin Islands Department of Health (VIDOH). In her capacity she assists, in overseeing two federal grants - Public Health Emergency Preparedness (PHEP) and Hospital Preparedness Program (HPP). These federally funded programs are intended to build capacity for the public health and healthcare systems to be able to respond to the health and medical needs of the community during and after a disaster. Additionally, Mrs. Charles was assigned the role of the Incident Commander for hurricanes Irma & Maria under ESF#8 Public Health & Medical Services for the Department of Health on St. Croix, US Virgin Islands. In this capacity Mrs. Charles had the opportunity to work on the emergency response and recovery efforts for the US. Virgin Islands in partnership with many local and federal partners. Additionally, Mrs. Charles is the Project Lead for Project 2.2 – Community Risk Mitigation for Health under the CDC-funded Hurricane Crisis Cooperative Agreement that was awarded to VIDOH in 2018. Mrs. Charles continues to work on recovery efforts for the US Virgin Islands.

Francine E. Lang, BS, BA, MS

Francine E. Lang is a native of St. Croix, U.S. Virgin Islands. Ms. Lang obtained an Associate of Arts degree from Bradford College in Massachusetts; Bachelor of Science Degree (Environmental Science) and Bachelor of Arts (Spanish) degrees from Purdue University in Indiana; and Master of Science degree (Environmental Science) from the University of Texas at Dallas. Ms. Lang has worked in the field on Environmental, Safety and Health for over 30 years (public, private and non-profit sectors); and has experience in hazardous materials transportation planning and emergency management. She has also been active in several volunteer organizations over the years, including the V.I. Conservation Society, the St. Croix Foundation for Community Development, and the Committee for Local Government. Ms. Lang is currently on the Board of Directors of the League of Women Voters of the Virgin Islands, and the

St. Croix Friends of Denmark. Currently, Ms. Lang is the Director of the Division of Public Health Preparedness (PHP) at the Virgin Islands Department of Health (VIDOH). In her capacity as the PHP Director, Ms. Lang oversees two federal grants - Public Health Emergency Preparedness (PHEP) and Hospital Preparedness Program (HPP). These federally funded programs are intended to build capacity for the public health and healthcare systems to be able to respond to the health and medical needs of the community during and after a disaster. This is done through collaboration with public health and healthcare partners to identify gaps and providing training and exercising opportunities to test these capabilities. Additionally, Ms. Lang is the Principal Investigator for the CDC-funded Hurricane Crisis Cooperative Agreement that was awarded to VIDOH in 2018.

Carmen Guerrero Pérez

Carmen Guerrero Pérez is currently the Director of the Caribbean Environmental Protection Division (CEPD) at the US Environmental Protection Agency (EPA). Carmen served as Secretary of the Puerto Rico Department of Natural and Environmental Resources (DNER) from 2013 to 2016. Prior to her tenure at DNER, she worked as an environmental planner and consultant to numerous non-government organizations and universities in Puerto Rico and the Caribbean. She completed studies in environmental planning and environmental management in the University of Puerto Rico, the University of Michigan, and Yale University.

Waddy González

Mr. Waddy González is the Director of the Health and Social Services Sector in the Caribbean Area Division Office in Puerto Rico. He has over 32 years of experience working and coordinating disaster assistance for the U.S. Federal Government and the American Red Cross, including relief operations in five foreign countries.

As Branch Chief of Mass Care/ Emergency Assistance for the Individual Assistance Division of FEMA, he created doctrine and standard operating procedures for the function. A native of Puerto Rico, he has worked in more than 11 federally declared operations in the island and led the Mass Care response for Hurricane María.

Among the accomplishments of his nearly four decade career in disaster and emergency operations are: co-editor and writer of Emergency Support Function # 6 for the National Response Framework (2012 version) and author/editor of the mass care sections of FEMA's Biological Incident Annex, Nuclear Radiological Incident Annex, Mass Care/ Emergency Assistance Pandemic Planning Guide, and Ebola Virus Disease Response Plan.

González holds a Bachelor of Science degree from the University of Puerto Rico, and continued graduate studies in Microbiology at McNeese University in Lake Charles, Louisiana.

Maria del Carmen (Menchu) Agueros

Menchu has been part of The Big Think Group since 2005, after serving as business developer in various special events agencies such as Milestone Events and PromoAge. She is a logistical mastermind responsible for orchestrating many of the firm's most challenging grand scale events for our clients including El Cantante Premiere (with Jennifer Lopez and Marc Anthony), World Baseball Classic (2006, 2009), 2010 Central American Games, Puerto Rico Heineken JazzFest and Susan G. Komen Race for the Cure, among others.

She also has experience with network TV production, having worked as Contestant Director for Telemundo US "La Voz Kids" and Univision's "Pequeños Gigantes" where she was responsible for all contestants and legal guardians including scheduling, transportation, accommodations and other logistical details.
Menchu has a Bachelor's Degree in Hispanic Studies with a minor in History from the University of Puerto Rico, and a Master's Degree in Communications from the University of Sacred Heart.

Samuel González Cardona, president of United Way of Puerto Rico

Samuel González Cardona is the president of United Way of Puerto Rico since October 3, 2005. His arrival marked the beginning of an organizational transition in the process of achieving greater community impact by advancing the common good to create opportunities of better life for all in Puerto Rico.

The evolution of United Way of Puerto Rico centers its principles on the fact that in order to achieve a fulfilling life, every human being deserves a quality education that leads them to have a stable job, with sufficient income to support their family until their retirement, and enjoy good health. It is a change of focus towards the causes of the problems, using prevention as a mechanism to obtain long-lasting changes.

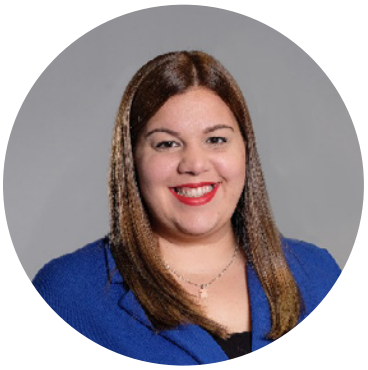
Led by González Cardona, the Organization took the first steps in this direction by consulting the community on the most pressing social problems and by training the professional team in the new work model. Along with a group of volunteers, González Cardona continues to work on the consolidation of a community agenda that maximizes coalitions that allow sharing and reaching a common goal. Since 2010, the Organization focuses an important part of its efforts towards creating resources to support Early Childhood in the area of Education. Projects such as Compaz, in collaboration with Taller Salud (NPO affiliated organization) and the Puerto Rico Open, aimed at preventing violent behavior among youngsters in the Loíza municipality, the initial early childhood community impact project in the municipalities of Dorado, Cataño and Toa Baja, as well as the relaunch of the Born LearningTM program and its promotional components, such as collateral materials (posters, brochures and table tents) and the installation of over 20 educational parks in different municipalities. Born Learning was consolidated during 2013, when the successful activation of the brand was achieved, supported by a highly creative advertising campaign, publicity and experiential marketing with the creation of a virtual educational park in the main shopping mall of the country. As part of the new approach, the Organization also developed a program aimed at preventing pediatric obesity, led by the Department of Health of Puerto Rico, among other strategic partners.

González has over 30 years of experience in business management, sales and marketing in multinational companies such as: Unilever, Quaker Oats and Monsanto. On the other hand, his high sense of social responsibility is evidenced in the work he carried out as president of the Board of Directors of the Diabetes Association of Puerto Rico, member of the Board of the American Red Cross, presided the Puerto Rico Volunteers State Commission and served as Director of the Board of the Puerto Rico Chamber of Commerce. Also, together with the San Jorge Children's Hospital, he supported the founding process of the Pediatric Diabetes Center in Puerto Rico and offered his voluntary support to the Gosen Orphanage in the Dominican Republic. He was also a volunteer of the Chapel of the Holy Christ of Health in Old San Juan.

José J. Ruiz-Valcárcel, MPH, MSGIS

José have a master's in Public Health from the University of Puerto Rico and a master in Geographic Information Systems from the University of Redlands, California. With ten years of experience in the research field as chief data analyst and data manager in the Center for Evaluation and Sociomedical Research from the University of Puerto Rico, Medical Science Campus. His work was addressed in providing statistical analysis in the areas of Mixture Modelling, Structural Equation Models, and Psychometric in the drug abuse research field with the criminal justice population, HIV, and health services. His research is relevant to engaging and retaining in treatment inmates with stories of a substance use disorder and inform health and social policies in Puerto Rico. José is currently working in the Puerto Rico Science and Technology Trust in Proyecto Agua Limpia and the Puerto Rico Vector Control Unit as a GIS Specialist.

Julieanne Miranda Bermúdez



Julieanne Miranda Bermúdez, has a master degree in Public Health from the University of Puerto Rico, Medical Science Campus, and candidate to a DrPH from the same institution. She has more than ten years working in the research field, community work and outreach, and program evaluation in non-profit organizations and governmental and federal institutions. At present, she works as the Supervisor of the Community Mobilization Program in the Puerto Rico Vector Control Unit (PRVCU) division of the Puerto Rico Science, Technology, and Research Trust. The objective is to provide orientation, empower communities, and promote healthy environments in Puerto Rico in order to reduce the mosquito *Aedes aegypti*, a vector that carries Dengue, Zika, and Chikungunya virus.

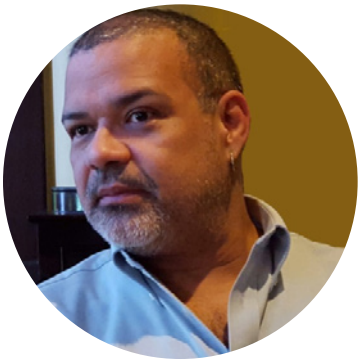
DR. RAFAEL RODRÍGUEZ MERCADO

Dr. Rafael Rodríguez Mercado is the Secretary of the Department of Health of Puerto Rico, charge in which he has the mission to design and implement the public health policy as encompassed in the government platform of the current administration. His agenda is based on three strategic pillars: A patient-centered health system, fair and accessible health services and an emphasis on primary care and prevention.

He serves as Director for a renowned Endovascular Surgery Program and was Chancellor of the Medical Sciences Campus of the University of Puerto Rico. Prior to his current position, he was performance as professor of Neurosurgery at the School of Medicine and director of the Endovascular Surgery Program of this institution.

Dr. Rodríguez Mercado obtained a Bachelor of Science degree in Chemistry and a Doctor of Medicine from the University of Puerto Rico. As a student, he received the research and student awards, as well as the recognition of the House of Representatives in 1988. He completed his specialty in Neurosurgery after seven years of traineeship at the University of Puerto Rico, School of Medicine. Then, he obtained a subspecialty in endovascular neurosurgery from the State University of New York at Buffalo, NY.

Jose Joaquin Mulinelli Rodriguez



Jose Joaquin Mulinelli Rodriguez is a Puerto Rican, gay, black, and married man (in Palm Desert, California).

He graduated from the Business Administration Faculty at UPR - Rio Piedras Campus on 1990.

Since 1989 has been a volunteer of the LGBTTQQI communities in and outside PR been part of Rainbow Pride Coalition, Gay and Lesbian Puerto Rican Coalition, co-host for radio program Saliendo del Closet, columnist for newsletter PR Breeze, co-host for the internet program ReTorxid@s, among other organizations.

Started in 1989 as a volunteer for the Aids Foundation in PR.

Annie Mayol

Annie Mayol is President and COO of Foundation for Puerto Rico. Previously, Mayol served as Chief Administrative Office of MSO of Puerto Rico, where she managed the daily operations of one of the top health insurance companies on the island.

Mayol is an experienced Chief Operating Officer with a demonstrated history of working in the non-profit and health care industry. She is skilled in government management, healthcare, leadership and policy analysis.

She has served as Senior Advisor and Chief of Staff for the Secretary of Puerto Rico Department of Health (PRDOH). As Senior Advisor, Mayol oversaw all administrative issues at the PRDOH and supported the implementations of policy directives from the Secretary. In addition, Mayol worked as an advisor on Federal Affairs and National Policy to the Governor of Puerto Rico, Hon. Luis Fortuño, from 2009 through 2010. As Advisor, Mayol oversaw all federal affairs issue on behalf of the Governor and supervised federal programs in the various state government agencies. Mayol also advised the Governor on all national policy issues such as the federal healthcare reform.

During the administration of President George W. Bush, Mrs. Mayol was appointed as Regional Political Director at the White House Office of Political Affairs, overseeing the Northeast region. As Regional Political Director, she served as the liaison between local elected officials and Republican activists in the Northeast states and the White House. In 2002, Mayol served as Director of Hispanic Outreach for the National Republican Senatorial Committee (NRSC), under then-Senator Bill Frist. Mayol provided advice to all Republican Senatorial campaigns regarding Hispanic voters and acted as the key spokesperson for the NRSC in the Hispanic media. Annie Mayol was born and raised in Puerto Rico. She has a B.A. in Political Science from American University and a Master in Public Policy from the John F. Kennedy School of Government at Harvard University.

Panel Descriptions

Wednesday, Feb. 27, 2019 Day One – Caribbean Voices

Panel I Caribbean Voices and Lessons Learned

This panel is comprised of community health experts from the Caribbean with representation from Humacao, Adjuntas and Jamaica. Areas of focus will be community-based primary healthcare services, rural health care response, preparedness for resiliency, the insuring of a quality supply chain of needed medicines and supplies for the Caribbean Region. It will highlight the importance of a building a resilient network of healthcare services. This will feature Dr. Francisco Murphy, from Adjuntas Federally Qualified Health Center, Lic. Ivonne Rivera from HealthProMed, Dr. Pedro Morales from PECES in Humacao, Dr. Kayon Donaldson from University of the West Indies in Jamaica and Dr. Marietta Vázquez from Yale University. This session will be moderated by Dr. José F. Cordero, an expert on primary healthcare and public health.

Panel II Caribbean Voices, An Institutional Perspective:

This panel will focus on an institutional response to disasters and will generate ideas for enhanced future preparedness and resilience at the institutional level. The presenters will be representing a variety of key organizations like pharmaceutical industry, academic institutions, sustainable energy, telecommunications and research. Leaders will be speaking on their lessons learned and recommendations for enhancing preparedness. This panel will feature Félix Negrón from Medtronic, Iván Román from PIA, Dr. Dharma Vázquez from the University of Puerto Rico, Dr. Marla Pérez Lugo from INESI, Jorge Martel from T-Mobile and Dr. Kenira Thompson from Ponce Health Sciences University. This panel will be moderated by Ms. Lucy Crespo, CEO of the PRSTRT, who is also a leader for innovation in Puerto Rico.

Panel III Community Organizations and Lessons Learned

This panel will be moderated by Mr. Samuel González, President and CEO of United Way of Puerto Rico. Discussion will focus on the important role of the community-based organizations in the Caribbean in the response to Hurricanes Irma and María. Presenter, Yanel de Angel from the ResilienSEE group at Will and Perkins will showcase a multi-lens framework for resilience planning at the community level. In addition, Jon Borschow from the Foundation for Puerto Rico will discuss their role in leading community response post María, Mariely Rivera will present on efforts achieved by Unidos por Puerto Rico and Laura López will represent the role and effort put forth by the Angel Ramos Foundation.

Panel IV – Special Feature Panel of Business Emergency Operating Center (BEOC) Appointed by FEMA

This panel will be done in two sessions, both moderated by Ms. Daneris Fernández, the coordinator of the BEOC group. Commercial/ Retail sector will be represented by Ms. Alicia Lamboy Mombille, Critical Manufacturing will be represented by Ms.Waleska Rivera, Financial Services will be represented by Ms.

Zoime Álvarez Rubio, Food Security will be discussed by Mr. Alberto Eugenio de la Cruz, Energy by Mr. Ramón González Simounet, Healthcare System will be represented by Mr. Roberto Gabriel Pando Cintrón, Infrastructure by Mr. Emilio Colón-Zavala, Commercial Industry and Tourism will be represented by Mr. Fredrick Harold Newman, Transportation will be represented by Mr. Eduardo L. Pagán Reyes. Panelists will discuss critical role in the BEOC, and how their respective industries and sectors can take important steps for enhanced resilience.

Abstracts

1) Individual Resilience in an Eastern Community of Puerto Rico that Received the First Impact of Hurricane

Authors:
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Background:
Hurricanes Irma and Maria unleashed a severe public health problem in Puerto Rico, generating a humanitarian crisis island wide. The vulnerability resulting from disasters generally plays a negative role in survivor resilience, slowing the recovery rate of the affected area.

Objective:
To assess the individual resilience in a community which received the first impact of hurricane Maria.

Methods:
A non-probabilistic convenience sample of one-hundred persons participated in a survey conducted to characterize the individual resilience in the community of Mambiche Blanco in

Humacao, Puerto Rico; community that lived over eight months without electricity due to the hurricanes' impact. The questionnaire explored individual resilience (measured using the CD-RISC-10 scale), demographic characteristics, emergency preparedness, access to disaster information, previous exposition to disasters, family support, coping strategies, general health before and after hurricanes, perceived risk to hazards, and economical losses due to the hurricanes.

Results:

Individual resilience mean score (μ=29.18) shows moderate level of resilience; 19.0% of the participants reported low resilience levels, 55.0% moderate resilience, and 26.0% high resilience. Factors such as household income, family support, coping strategies, and high levels of preparedness showed associations with statistical significance ($p<0.05$) with resilience. Even though all participants experienced the hurricane impact, 34.0% still believed their community was not threatened by natural disasters. Only 51.0% had an emergency plan and materials to deal again with a possible impending dangerous hurricane, although 91.0% felt prepared for another disaster.

Conclusion:

Individual perception contrasted with reality needs to be addressed in order to ensure better preparedness in the future. Puerto Rico's location makes it highly susceptible to natural disasters, making it imperative to promote individual resilience within local communities. Furthermore, the development of interventions that promote resilience will allow the strengthening of our individuals and communities against future natural events.

Funding:

This project was part of the culminating experience of the students of the Master in Public Health General Program.

IRB:

This project was approved by RCM IRB, protocol number B1000218, May 3, 2018.

1) Impact of Hurricane Maria on Parents and Health Care Personnel at a Neonatal Intensive Care Unit in Puerto Rico

Authors:

Liza C. Sánchez-Plazas MD FAAP, Inés García-García MD FAAP, Lourdes García-Fragoso MD FAAP. University of Puerto Rico School of Medicine, Department of Pediatrics, Neonatology Section. San Juan, PR.

Introduction:

On September 20th, 2017 Puerto Rico received the impact of catastrophic category 4 hurricane Maria. The island was unprepared, severely affecting basic services and healthcare. This study explored the experiences of parents and healthcare providers of our NICU during Maria to help improve the preparation in the event of another natural disaster.

Methods:

Cross-sectional study. After Hurricane Maria a survey was given to the parents of infants who were admitted in the University Pediatric Hospital Neonatal Intensive Care Unit (NICU) to assess social/psychological needs and make referrals as needed. A similar survey was provided to health care providers working in the NICU before, during and after the hurricane to explore their experience during the storm. We retrospectively analyzed those surveys.

Results:

Thirty-four parents answered the survey (66% females; 34% males). Parents' biggest fears were NICU windows would break (91%) and baby's supporting machines not working (86%). Median days until parents were able to visit were 4 days (1-9 days). Parents reported problems sleeping (30%), lack of concentration (24%), feeling tense (21%), and feeling helpless (26%). Eighty health care providers completed the survey (81% females; 19% males). Around 40% stayed in the hospital during the storm and 9% lost their homes. Most providers stayed in the hospital for at least 2 days (44%), but some stayed as long as a week (3%) without seeing their families. Most workers (63%) thought the hospital was not prepared to provide adequate support to the NICU staff after the hurricane.

Conclusions:

Hurricane Maria exposed our weaknesses and lack of preparedness in the event of a major disaster. Preparedness plans should be elaborated with anticipation. Disaster preparedness plans for our NICU should include how to support parents and health care providers before, during and after the storm.

2) Experiences of people living with HIV in the aftermath of Hurricane Maria in Puerto Rico: Adherence, Accessibility to Health Services and Food Security

Tania de Jesús Espinosa RN-BSN, MSNs, Lareishka Otero Jiménez RN-BSN, MSNs, Marta Rivero Méndez RN, DNS, GCG

Background:

The passage of Hurricane Maria through Puerto Rico was an experience that distressed the lives of everyone on the island. The hurricane left a nation-wide supply chain crisis and health services were disrupted during its aftermath, which increased the vulnerability of people living with HIV (PLWH). The purpose of this study was to explore the experiences of PLWH in the areas of adherence, health services access, and food security; before, during and after the hurricane.

Methods:

A phenomenological-descriptive study with 15 participants were recruited from 3 clinics in the north and east of Puerto Rico. Interviews and concurrent content analysis were conducted using thematic analysis and Colaizzi's method involving line-by-line coding, categorization and theme extraction.

Results:

Three themes emerged through the data interpretation process: (a) "Preparedness for hurricane", (b) "Living the hurricane", and (c) "After the hurricane". According to 12 of the participants, their health care providers acted in advance and prescribed medications and refills, however for 10 of them, access to health cares services was hindered for a period 2 to 6 months. At personal level some participants were not well prepared because they were uncertain about the arrival of the phenomenon or didn't expect the extent of it. Some described it as a monster and reported feelings of desolation, martyrdom and loneliness during the experience. After the event, 11 participants were able to keep adherence to treatment, however just women reported adherence problem. Of the participants, 13 experienced drastic changes in their food intake, with diet based on products of low nutritional value.

Conclusion:

Facing a collective struggle, the health services and food security of PLWHIV were in jeopardy. Nonetheless, the overall resilience and compromise of the participants and their healthcare providers with their well-being made them adhere to their treatment even in the most delicate circumstances.

Topics:

1. Vulnerable Populations 2. Food security 3. Individual and Community Resilience

3) Pediatric Environmental Health Hurricane Recovery Campaign (PEHHRC) of the Federal Region 2 Pediatric Environmental Health Specialty Unit

Teresa Herrera, MPH Mount Sinai School of Medicine, New York ,NY
Perry Elizabeth Sheffield, MD, MPH Federal Region 2 Pediatric Environmental Health Specialty Unit Icahn School of Medicine at Mount Sinai, New York, NY

Introduction:

Children are especially vulnerable to the environmental health risks posed by hurricanes. Environmental health issues exacerbated or triggered by hurricanes can have immediate, secondary, and long term impacts on the well-being of a child. In order to reduce disaster-related mortalities, morbidities, and exposures, it is imperative that caretakers and pediatricians know how to identify and intervene on environmental health concerns occurring both during and after a hurricane and related events such as flooding.

Methods:

The Pediatric Environmental Health Hurricane Recovery Campaign (PEHHRC) is a capacity-building project organized by health professionals from the Federal Region 2 Pediatric Environmental Health Specialty Unit. It aims provide training for and bolster childcare provider and clinicians' ability to link patients and their families to appropriate resources related to Pediatric Environmental Health issues exacerbated by the 2017 hurricane season in the U.S. Virgin Islands and Puerto Rico. Our team will conduct a public health detailing campaign through a network of health clinics and child-care centers in the region.

Results:

Results will include new resources and training to child care professionals in order to improve prevention/detection/intervention of environmental health related diseases and reduce exposure to environmental hazards related to the 2017 hurricanes. Other deliverables from this project will include public service announcement videos and a mobile app resource guide.

Conclusions:

Through knowledge dissemination this project empowers childcare providers and pediatricians to identify and act on children's environmental health issues.

4) The gendered impacts of Hurricane María on Water, Sanitation and Hygiene (WASH) practices in rural Puerto Rico

Christiana Smyrilli, Pamela Silva Díaz, Lenulisy Rosado, Martha Thompson

In September 2017, Hurricane María hit Puerto Rico with disastrous impacts on the island's electricity, water and communications services. A two-week long study was carried out to identify and understand the impacts related to water, sanitation and hygiene in rural communities in Puerto Rico, from a gender perspective. Data was collected through Focus Group Discussions and individual interviews with 119 participants from 8 municipalities, representing 20 districts. The problems identified by the participants were classified into 9 thematic categories, facilitating qualitative and quantitative analysis. The most frequently mentioned problem categories overall were found to be 'health and hygiene' issues, due to the challenges of cleaning the home and flushing the toilet, doing 'laundry', and the 'physical effort' required to transport water containers. Other challenges include 'food and kitchen activities', 'water sourcing and availability', 'bathing', and 'mental health'. Evidence suggests that women tend to have a more prominent role within the household in terms of caregiving responsibilities, water resource control, and fulfilling household tasks. A higher percentage of female participants prioritized the physical effort required to perform domestic tasks during a water outage, such as carrying water containers and doing laundry manually, as well as the mental strain associated with lack of water. The results indicate that the prolonged failure of infrastructure and household technologies has caused an increased burden on affected residents, and women and men are impacted in different ways. Humanitarian response and preparedness measures could thus focus on household and caregiving challenges to offset impacts on women specifically.

5) Disaster Risk Reduction strategies for Water Sanitation and Hygiene (WASH) challenges in rural Puerto Rico: lessons from Hurricane María

Christiana Smyrilli, Pamela Silva Díaz, Lenulisy Rosado, Martha Thompson

Hurricane María hit the island of Puerto Rico in 2017, causing severe damage to the island's electricity, water and communications services. A two-week long study was carried out to identify and understand the impacts related to water, sanitation and hygiene in rural communities in Puerto Rico. The study also aimed to identify potential innovations and interventions, and prepare recommendations on disaster response and preparedness for both local and international organizations. Data was collected through Focus Group Discussions (FGDs) and individual interviews, as well as sketch modeling activities which were carried out during FGDs. The problems identified by the participants themselves were classified into thematic categories. The most frequently mentioned problem categories overall were found to be 'health and hygiene' issues, due to the challenges of cleaning the home and flushing the toilet, doing 'laundry', and the 'physical effort' required to transport water containers. Other

challenges include ‘food and kitchen activities’, ‘water sourcing and availability’, ‘bathing’, and ‘mental health’. Nevertheless, inventive home-made solutions to these problems were commonly created by community members. Therefore, recommendations for disaster response and risk reduction include focusing on household activities, provision of off-grid technologies, and fostering community resourcefulness and innovation through community trainings and dissemination of locally created solutions.

6) Zika Contraception Access Network Program: Use of Contraception as a Medical Countermeasure to Reduce Adverse Outcomes Associated with Zika Virus Infection in Puerto Rico

Authors:

Edna Acosta Perez, PhD, MSc, Darielys Cordero, MPH, DrPHc, Pierina Cordero Senior, MPH, Eva Lathrop, MD, MPH, Zipatly V. Mendoza, MPH, Lisa M. Romero, DrPH, MPH, Alicia Suarez, Yari Vale, MD

Panel Discussion:

1.The Zika Contraception Access Network - The critical role of public-private partnerships during emergency response efforts
2.Zika Contraception Access Network: Increasing access to contraception as a medical Countermeasure during the 2016 Zika Virus Outbreak in Puerto Rico
3.Ante La Duda, Pregunta, Z-CAN’s health communications campaign during the 2016 Zika Virus Outbreak in Puerto Rico
4.Zika Contraception Access Network – The importance of monitoring and evaluation during an emergency response

Introduction:

During the 2016-2017 Zika virus outbreak, threat of severe birth defects associated with Zika virus infection during pregnancy intensified the need for access to contraception among women who choose to delay or avoid pregnancy during the Zika outbreak. Puerto Rico reported the highest number of Zika virus infections in the United States, a high proportion of unintended pregnancies and limited access to contraception, including long-acting reversible contraception. To address these immediate needs, the National Foundation for the Centers for Disease Control and Prevention, with technical assistance from the Centers for Disease Control and Prevention and in collaboration with a diverse group of stakeholders in Puerto Rico and philanthropy, established the Zika Contraception Access Network (Z-CAN). Z-CAN was a short-term emergency response for rapid implementation of reversible contraceptive services during the Zika outbreak.

Methods and Results:

Z-CAN established a network of trained physicians across Puerto Rico to provide client-centered contraceptive counseling and offered women same-day access to the full range of FDA-approved reversible contraceptive methods at no cost. Contraception was used as a medical countermeasure to reduce adverse Zika-related outcomes during the outbreak. This proposed panel will describe the development and rapid scale-up of the Z-CAN program, public-private partnerships, health communications campaign, program monitoring and evaluation; and characteristics of approximately 29,000 women served between May 2016 and September 2017 in Puerto Rico.

Conclusion:

Z-CAN strategies and lessons learned can be replicated or adapted in other emergency preparedness and response efforts that pose a risk to pregnant women and their infants. Z-CAN strategies can also be replicated or adapted in non-emergency settings in which the goal is to increase access to contraception and improve health outcomes.

7) Puerto Rico Deaf Strong; Audiologic Disaster Protocol for the Hearing-Impaired Citizens

Dr. Soami Santiago De Snyder, Ph.D., CCC-A Dr. Wanda Lugo, Au.D, FAAA, CCC-A
Affiliations: Medical Sciences Campus, University of Puerto RIco Doctoral Program in Audiology

ABSTRACT:

The Puerto Rican Culturally Deaf community and the Hearing-impaired citizens were severely impacted by Hurricanes Maria and Irma. Although all the population in Puerto Rico had their basic infrastructure severed, for citizens with hearing impairment the lack of power meant also cutting access to information that can protect them of further health and safety hazards. Their access to assistive technology, hearing aids and to sign language communication was interrupted due to the lack of power specially during night time. Shelters, government agencies and hospitals need to be better prepared to care for this sector of the special needs population. A protocol and specific recommendations to address their needs will be discussed as an effort to strategically plan for their welfare in the event of future natural disasters.

8) When Disaster Strikes: Building Resilience Through Research

Maribel Campos1, Mary Hellen Mays1, Jeremy Pomeroy2 and Cristina Palacios3
1 University of Puerto Rico Medical Sciences Campus, 2 Marshfield Research Institute, 3 Florida International University

Abstract

Purpose:
The Baby Act Trial is a study designed to address infant obesity through the adoption of healthy behaviors among participants of the WIC Program. The objective is to address this health disparity in Puerto Rico using distance learning modalities and communication platforms to disseminate educational activities via text messages. Implementation was jeopardized by the direct impact of the hurricanes that affected Puerto Rico.

Objective:
Document the activities our research team incorporated in collaboration with our community partner, to address the effects of the hurricanes on our research implementation and the effects of our collaboration on the program social capital. Feasibility of healthy lifestyle interventions is essential at times when fetal and nutritional programming are expected.

Design Method:
As a community based project, we underwent a series of meetings with our partners to identify projected changes in the current services infrastructure, difficulties to maintain communications with program participants, among others. Once the barriers to study implementation and service continuity were documented, we proceeded to identify mechanisms to address them.

Results:
In spite of advances made to improve the status of the power grid and reliability of communication services across the Island, there is still significant instability. We have incorporated the provision of text message replicators, and solar charged power banks to make sure that the current status of the communication services does not hinder the intensity of the intervention. We have provided internet services to community based clinics which enabled documentation access to the educational platform. We provided a self-care workshop for Nutritionists to strengthen their capacity to provide services under strenuous conditions.

Conclusion:
Community based research projects can make significant contributions in disaster stricken populations by contributing to their social capital.

Acknowledgement:
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National Institutes of Health". The authors would also like to recognize Lic. Jeannette Canino and the work of Mr. Iván Delgado.

Theme:
Communications/Community based interdisciplinary work.

9)Implementation of an online nutrition education strategy by the special nutrition program women infants and children of Puerto Rico: challenges that catastrophic events pose on nutritional education compliance.

Alexandra Reyes, MEd RDN 1,3, Cristina Palacios, PhD, MSc2, Maribel Campos, MD MSc MBA1
1 Universidad de Puerto Rico, Recinto de Ciencias Médicas; 2 Florida International University; 3 Programa WIC de Puerto Rico

Background and aims:
The PRWIC has the obligation to fulfill a minimum of education contacts among participants. There significant loss of participants when they reach 2 years of age.

Methods and aims:
We established an alliance between the PRWIC and researchers from the Medical Sciences Campus to increase the retention of eligible children to the program, by developing a new nutrition education strategy. Through the alliance we were able to integrate the input of program participants and mentors that facilitated the evaluation of the preferences of the community and the integration of the theoretical framework of persuasive technology for the adoption of healthy habits. Both the research staff and nutritionists of the program completed the training to develop the content. 35 educational modules were developed, aimed at different participant categories. A pilot study was launched in May 2017in 20 clinics (10 intervention 10 cotrol) to evaluate the effect on retention and program compliance.

Results:
The implementation process was slow but progressive until it faced the impact of Hurricanes Irma and Maria on the country's infrastructure. Up to the month of June 1, 2018 a total of 982 participants had been registered, with the majority falling under the children above 2 years category. Despite the catastrophic damages caused by the hurricanes, contacts completed by participants were be documented in the days after the events, even in municipalities where the clinics had been displaced due to loss of essential services.

Conclusion:

Despite the instability of face-to-face services due to hurricanes, this new strategy remained available to provide essential information to program participants and facilitate compliance with national standards. Acknowledgment: This work was subsidized in part by the Robert Wood Johnson Foundation and its Interdisciplinary Research Leaders Program, in addition to the United States Food and Nutrition Service Special Projects Program.

10) Women's Voices: Mutual Support and Survival Strategies in the wake of Hurricanes Irma and María

Inter Mujeres Puerto Rico (María Dolores Fernós, Marilucy González Báez, Yanira Reyes Gil and Esther Vicente, law professors at Interamerican University of Puerto Rico)

ABSTRACT

Introduction:

In Puerto Rico, a state of emergency was declared after two powerful storms devastated the island, destroying its energy and water supply infrastructure and communication towers. As food became scarce, Puerto Rico's vulnerable populations, mostly poor women, were left on their own by a disorganized and non-respondent government. Our research, Women's Voices: Mutual Support and Survival Strategies in the wake of Hurricanes Irma and María, identified the gendered specific ways in which women were affected and how they reacted to these catastrophic events.

Method:

Using qualitative methodology, the research team held several focus groups in which women, mostly from rural, isolated and poverty-stricken areas, participated and openly expressed their experiences as to how the storms affected their lives, how they struggled to deal with the impact at home and within their communities, and the strategies they developed to survive.

Results:

The results confirm the gender-differentiated ways in which men and women react in critical moments, and more specifically, the survival mechanisms women developed individually and as members of their communities to provide for their own, their families and to their communities' subsistence. This work presents a clear understanding of the support these women received and the failure of the Puerto Rico and United States governmental entities in providing essential aid in such dire circumstances. Almost one year after the hurricanes, the government belatedly acknowledged that 2,975 people died as a consequence of, untimely assistance. The researchers will present women's recommendations to empower other women and lessen the impact in case of future devastating events. They will also present the study's

findings, conclusions and policy recommendations to bring women's perspectives to the policies discussions and provide them with an empowering tool in the reconstruction processes.
Possible Categories: Communities/Neighborhood response Vulnerable Populations

11) Natural disasters and criminality: a space-time analysis of the distribution of crime in the metropolitan area of Puerto Rico before and after Hurricanes Irma and María

Lorena Belise Hernández Fradera, B.Sc. Natural Sciences Graduate student, University of Puerto Rico-Medical Sciences Campus, M.S. Epidemiology Email: lorena.hernandez2@upr.edu
On September 20th, 2017, Hurricane María, a category 4 storm, plowed through Puerto Rico, just two weeks after Hurricane Irma had also caused widespread destruction. Both destroyed foliage, cell towers, and power lines and caused extensive flooding throughout the island. Outbreaks of communicable diseases, population displacements, food shortages, disruptions to the power and water supply, and the interruption of health services, including mental health, were all direct consequences of the disasters. Of interest to this study, however, is something the media also highlighted: changing crime patterns, specifically an increase in homicide rates. In studies, fear of crime has been associated with poorer mental health, reduced physical functioning and lower quality of life. The anxiety over possible victimization takes a toll in the lives of people, forcing them to modify their behavior. It can also be a stressor, having direct physiological and behavioral consequences for health. After a disaster, when stress increases and physical health might be in jeopardy, people might be especially vulnerable to any additional stressors, such as crime. Given that it's been proven that crime and fear of crime are causes of ill public health, this study through the use of space-time analysis, seeks to assess the impact of both hurricanes on the geographical and temporal distribution of crime in the metropolitan area of Puerto Rico. Using weekly crime reports from the Police Department, specifically the variables of violent and property crime, we will perform an analysis with Bayesian spatio-temporal models including hierarchical structures, which will allow us to assess the relationship among our outcome variables and predictors in several levels and interactions. This statistical analysis will be performed during the following two months as part of my Master's Degree thesis and as a graduation requisite.
Conference theme and sub-theme: Serial hurricanes: Security and law enforcement

12) The Potential Role of Educational Neuroscience in Times of Disasters

Laura Miranda Olivera – miranda.neuropsy@gmail.com
Emmanuel Figueroa Rosado – emmanuelfr15@gmail.com
Interamerican University of Puerto Rico Education and Behavior Professions Faculty San Juan, Puerto Rico Educational Neuroscience has emerged as an action field that strives to bring

solutions to the problems the educational system currently faces. This discipline seeks integrating the discoveries of cognitive neuroscience to the pedagogy practice. Currently, there is still debate if its reach brings innovation to the considerations already explored by school psychology and 21st century pedagogy, or if the gap from the neuroscientific lab to the pedagogic practice is still too big. Still, the applications neuroeducation in different contexts throughout the world have brought innovative solutions, this being reason for proposing researching a pertinent solution for our Puerto Rican context. After Hurricane Maria and the immense interruption it brought to learning environments, it was made clear the need to explore what the brain science taught of effective learning in times of disasters. In this literature review, recollections of both theory and practice were studied. Additionally, the implications of the specific duties to the different disaster stages were evaluated, these being: Preparedness, Response, Recovery, Mitigation. In line with the consulted scientific production, it was drawn to conclusion that the Educational Neuroscience field already has the adequate suggested tasks for a time of disaster, but the general public outside of academia does not know these. This is why what started as a literature review transformed into a practical guide written for parents, teachers, and caregivers. These guidelines were distributed in ten municipalities, categorized as the most affected by the hurricanes, according to the metrics of evaluation that were used. This guide could be the start of the implementation of vanguard programs that serve as support to communities that seek the protection of their children's learning processes.

Key Words:
Educational Neuroscience, Neuroeducation, Disasters, Education, Health, Prevention

14) What contributes to the resilience of organizations in disaster situations?

Vilmary Camacho-Martínez, BA1, Graciela del Mar Vega-Debién, PhD1, Carmen E. Albizu-García, MD1
1Center for Evaluation and Sociomedical Research (CIES), Graduate School of Public Health, University of Puerto Rico, Medical Sciences Campus

Introduction:
Puerto Rico, as well as the world, have recently experienced major crisis and disruptive shocks. The hurricanes from 2017 exacerbated vulnerabilities among service organizations and its clients, in particular those who are historically underserved. We examined the concept of organizational resilience to derive its research and practical implications.

Methods:

We conducted an exhaustive review of the scientific literature on the concept of organizational resilience and its factors. This review was done to inform an NIH-funded study on social vulnerability and resilience among criminal justice programs after the hurricanes. Identified factors will serve as a conceptual framework for the development of contextual measures and interpretations of findings; and recommendations for resilience capacity building in disaster planning and response.

Results:

The most recent literature is based on the Theory of Complex and Adaptive Systems, a multidisciplinary approach that focuses on complex, emergent and macroscopic properties of a system. Organizational resilience is conceptualized as the capacity of an organization to absorb disturbances or challenges; and adapt and transform in the face of new challenges. The key factors for organizational resilience are: 1) Organizational Culture, 2) Human Capital, 3) Leadership Practices, 4) Governance Processes, 5) Social Networks, 4) Collateral Pathways and Redundancy, 6) Information Management, 7) Preparation and Planning and 8) Material Resources. The abilities of leaders and staff to innovate and flexible internal and external processes, acquire greater importance in post-disaster settings.

Conclusion:

The factors that foster the organizational resilience capacity are presented as an alternative to develop better processes and practices to prepare and adapt to acute disruptions in order to facilitate the continuity of operations in post-disaster situations. However, resilience is a key instrumental capacity for organizations to face everyday stressors associated with the climatic, fiscal, legal, economic and social challenges faced in Puerto Rico.

Categories:

Individual and community resilience, Communications, Vulnerable Populations.

15) Disaster exposure in a Clinical Sample of Puerto Rican Adolescents Post Hurricane Maria

Ligia M. Chavez, Ph.D., Keilyn M. Vale, M.S., Nyrma Y. Ortiz Vargas, Ph.D., Paola C. Andino, M.P.H., & Pedro García, M.A. Behavioral Sciences Research Institute, University of Puerto Rico

Introduction:

The emergence and persistence of psychological reactions in response to a disaster are clinically important and have been associated with increased symptomatology, decreased quality of Life, and mostly with having post-traumatic stress disorder (PTSD). Children and adolescents are a

particularly vulnerable population. In this study we examine PTSD and other psychopathology in relation to other known risk factors in a clinical sample of Puerto Rican adolescents.

Methods:

A sample of 100 adolescents (12-18 years) and their primary caretakers participated as part of a study on the development of the AQOL-MHS, a quality of life instrument. Youths were required to be receiving clinical services for at least one of five mental health disorders: Depression, Anxiety, Attention Deficit and Hyperactivity Disorder, Oppositional Defiant Disorder, and Conduct Disorder. Information was collected on disaster exposure, PTSD, psychopathology, physical health and quality of life, as well as other sociodemographic information.

Results:

Probable PTSD was reported by 38% of the caregivers and by 19% of the adolescents. Fifty-one percent of our sample had at least one psychiatric disorder with impairment, 24% an internalizing disorder and 39% an externalizing disorder. Substantial impact from Hurricane Maria was experienced by 76% of our sample. Reported perception of poverty was significantly associated to Impact of the hurricane. Living poorly, a known risk factor, was associated with almost 4 times greater probability of having PTSD (OR=3.83, $p \leq .02$).

Conclusion:

PTSD and other internalizing disorders can outlast the initial trauma experienced following a devastating disaster and give rise to sustained effects on children's mental health. This is true especially in cases of a prolonged recovery process. Given the level of impact, psychopathology and trauma in our sample, the development and implementation of interventions to addressing these issues and the ability of adolescents to cope with adversity is a worthy target.

Funding Sources: NIH Research Grant # GM109326

16) Routine Immunization Services Disrupted in Puerto Rico After 2017 Hurricane Maria: Restoring Services and Preparing for the Next Disaster

S. Carolina Luna-Pinto, Angel Rivera, Iris Cardona, Candelaria Rijo, Veronica Alvarez, Jesus Rodriguez, Japhet Rivera, Craig Shapiro, Anita Patel

Introduction:

In September 2017, hurricanes Maria and Irma severely damaged the electrical grid and fuel distribution in Puerto Rico, substantially affecting the immunization system. Vaccines were lost due to cold chain failures (falling out of adequate temperature ranges) from power outages,

limited or no access to backup power, and damage to equipment or facilities. Telecommunication and transportation disruptions made it difficult to assess the impact to the 224 clinics of the federally funded Vaccines for Children (VFC) Program. In the weeks after the hurricane, the Puerto Rico Department of Health (PRDH) made initial in-person assessments of VFC clinic operations.

Methods:

Beginning November 21, 2017, CDC and other partners provided surge staff and technical assistance to PRDH. They 1) assessed all 224 VFC providers and 2) implemented the rapid restoration effort. Strategies included arranging for generators, refrigerators, data loggers, and replacement vaccines.

Results:

Ten days after Hurricane Maria hit, only 7% of the 224 VFC providers were operational and able to provide critical childhood vaccines, according to PRDH's initial assessment. The teams developed tools to track and map the operational status of the VFC providers using the colors in a "stop-light." At least 10 VFC sites received generators, 1 received a refrigerator, and 5 received data loggers. By December 18, 2017, 55% of VFC clinics were operational. By May 7, 2018, 86% were operational; the remainder were still recovering.

Conclusion:

Most VFC clinics were not prepared for widespread, long-lasting power outages. Future recovery plans include mitigation strategies such as reinforcing VFC clinics with contingency plans and resources to maintain cold chain and keep equipment (backup generators, cisterns, radios, and refrigerators) operational for weeks to months in a power outage. The approach will cover all regions and aim to prepare the immunization system to withstand the next disaster involving extended power outages.

17) Initial Impacts of Hurricane María on Migratory Bird Diversity on Punta Cucharas Nature Reserve, Ponce, Puerto Rico

Eduardo M. Llegus Santiago1, Ian L. Maldonado Ortiz2, José G. Rodríguez Ramírez2, Gilmarie Rivera Castellar3 Department of Environmental Health, University of Puerto Rico–Medical Sciences Campus1, Department of Biology, University of Puerto Rico-Ponce Campus2, USDA Forest Service - International Institute of Tropical Forestry3

Populations of birds all over the world migrate to Puerto Rico during winter season to look for food resources, and breeding sites. Migratory birds have an important role as bioindicators of environmental conditions, pollination, seed dispersal and the trophic structure of Punta Cucharas Natural Reserve, yet habitat loss threatens their population. Punta Cucharas located

in Ponce Municipality, Puerto Rico has an area of 35 hectares that includes mangroves, xerophytic forest, lagoons, salty plains, sandy beach, and a century-old fishermen settlement. The reserve provides habitat and stopover sites for over 80 species birds, endemic and migratory, including the endangered species White-cheeked Pintail. In September 20, 2017, Hurricane Maria's compelling winds and rainfall defoliated trees and flooded the breeding grounds of Punta Cucharas. The objectives of this study were to compare the estimated population size of bird species before and after Hurricane Maria and to evaluate habitat conditions. To determine the effect of Hurricane Maria on the avian diversity during the migration season before and after Hurricane Maria we conducted 10-minute bird counts in six different habitats from September to December during years 2016 and 2017. We performed the Krustal-Wallis test (α=0.05) to compare bird species diversity between habitats and years. The test determined the presence of significant difference in diversity of bird species (P=0.01, dF=1) between both years. In addition, bird individuals declined in 52% from population afore the impact from María, however, we sighted new species not seen before. This assessment provides an initial information that will help to identify where post-Hurricane recovery efforts must be focused relative to conservation and land management decisions within Punta Cucharas Reserve. Our surveys inform us about changes in search for food supplies and habitat use by migratory birds, as well may serve as a post-hurricane baseline to monitor avian population responses over time.

Three categories:

18) Disaster Preparedness in Community Health Centers: Assessing Community Risk and Vulnerability, and Analyzing Strengths and Weaknesses of Emergency Response Plans in Two Centers in Rural Puerto Rico

Authors and Affiliations:

Pagán Santana, Marysel1; Liebman, Amy1; Galván, Alma1; Rodríguez, José2; Legarreta, Arnaldo3 1Migrant Clinicians Network 2Hospital General Castañer, Lares PR 3Corporación de Servicios Médicos

Background and Objective(s):

Community Health Centers (CHCs) are federally funded health care sites delivering essential emergency, primary and secondary care to the Puerto Rico's poorest, most vulnerable, and hardest to reach residents. On September 2017, Hurricane Irma and Maria made landfall in the island. These storms exposed several systemic problems which made it difficult to meet basic needs of the island's population. Although many CHCs had disaster plans in place, they were not designed for such large-scale disasters. In many of the affected communities, CHCs became

a central hub of immediate aid and continue to play a critical role in long-term recovery. The main objective of the project is to examine two CHCs capacity, resources, strengths and limitations when responding to natural disasters.

Methods:

Two Community Health Centers were selected for this project base on their population, location and quality of service. Strategic teams of each Center will carry out a risk and vulnerability assessment, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and a system mapping analysis.

Results:

The list and maps of risks and vulnerabilities of each Center will be presented. The SWOT analysis will provide the opportunities and gaps within the Center's response plan. Lastly, the system mapping will allow the identification of resources in order to strengthen and sustain their plans. The analysis carried out in this project will allow the Centers to recognize their capabilities and identify priorities in their way to empower CHCs and communities to find long-term strategies to address the needs of all community members.

Conclusions:

Community Health Centers are key component of the emergency preparedness process and planning. Using the results along with a community mobilization framework for emergency preparedness, will allow them to improve health outcomes of vulnerable populations before, during and after a disaster.

Categories:

Individual and Community Resilience, Vulnerable Populations and Hospitals and Clinics

19) Risk of PTSD and other Psychopathology in a Clinical Sample of Puerto Rican Adolescents Post Hurricane Maria

Ligia Chavez, Ph.D., Keilyn Vale, M.S., Nyrma Ortiz, Ph.D. and Pedro García, M.A.
Behavioral Sciences Research Institute, University of Puerto Rico

Introduction:

The emergence and persistence of psychological reactions in response to a disaster are clinically important and have been associated with increased symptomatology, decreased quality of Life, mostly with having post-traumatic stress disorder (PTSD). Children and adolescents are a particularly vulnerable population. In this study we examine PTSD and other psychopathology in relation to other known risk factors in a clinical sample of Puerto Rican adolescents.

Methods:

A sample of 100 adolescents (12-18 years) and their primary caretakers participated as part of a study on the development of the AQOL-MHS, a quality of life instrument. Youths were required to be receiving clinical services for at least one of five mental health disorders: Depression, Anxiety, Attention Deficit and Hyperactivity Disorder, Oppositional Defiant Disorder, and Conduct Disorder. Information was collected on disaster exposure, PTSD, psychopathology, physical health and quality of life, as well as other sociodemographic information.

Results:

Probable PTSD was reported by 38% of the caregivers and by 19% of the adolescents. Fifty-one percent of our sample had at least one psychiatric disorder with impairment, 24% an internalizing disorder and 39% an externalizing disorder. Substantial impact from Hurricane Maria was experienced by 76% of our sample. Reported perception of poverty was significantly associated to Impact of the hurricane. Living poorly, a known risk factor, was associated with almost 4 times greater probability of having PTSD (OR=3.83, $p \leq .02$).

Conclusion:

PTSD and other internalizing disorders can outlast the initial trauma experienced following a devastating disaster and give rise to sustained effects on children's mental health. This is true especially in cases of a prolonged recovery process. Given the level of impact, psychopathology and trauma in our sample, the development and implementation of interventions to addressing these issues and the ability of adolescents to cope with adversity is a worthy target.

Funding Sources:

NIH Research Grant # GM109326

20) Hurricanes' Irma and Maria Impact on the Physical and Mental Health of Youth Receiving Clinical Services

Keilyn Vale, M.S., Nyrma Ortiz, Ph.D., Pedro García, M.S. and Ligia M. Chavez, Ph.D.
Behavioral Sciences Research Institute, University of Puerto Rico

Introduction:

Hurricanes cause long lasting damage not only to infrastructure, but also to humans. Those that experience trauma related to the disaster are adversely affected in their physical and mental health. Prior studies of post-disaster impact have demonstrated that these effects are also experienced by children and youth. We assessed the influence of Hurricanes Irma and Maria on physical and mental health problems in a clinical sample of Puerto Rican adolescents.

Methods:

A clinical sample of adolescents between 12 to 18 years old (n=42) and their primary caretakers were interviewed in the San Juan metropolitan area. Youths were required to be receiving clinical services for specific disorders (Depression, Anxiety, Attention Deficit and Hyperactivity Disorder, Oppositional Defiant Disorder or Conduct Disorder). Participants completed a questionnaire about disaster exposure, psychopathology, physical health and quality of life, as well as other sociodemographic information. Data recollection is still ongoing.

Results:

Of those adolescents who had been diagnosed with a serious physical health condition before the hurricanes, 25% of their parents reported their condition worsened post Maria. Fifty-five percent of our sample had at least one psychiatric disorder with impairment, 21% an internalizing psychopathology, and 33% an externalizing psychopathology. There was a significant association between perceived poverty and parents reporting their children experiencing medical problems ($p \leq .03$). Adolescents with medical problems were three times more likely to have internalizing psychopathology in the past 12-months (OR=3.23, $p \leq .04$).

Conclusion:

Hurricane exposure was negatively associated with adolescents' physical health as reported by their parents. After being exposed to traumatic events, an increase in physical health conditions is experienced and significantly associated with mental health symptoms. Our recent results show that Puerto Rican adolescents experienced this adverse impact after both hurricanes. This important information will aid us in providing the needed services to these youth.

Funding Sources:

NIH Research Grant # GM109326

21) Shining Light in the Shadows: Mental Health Assessment of Puerto Rico's Homeless in the Aftermath of Hurricane Maria

Andy Vega,Yonatan Carl, Kiara Ortiz-Camacho, Benjamin Gonzalez-Burgos, Brian J. Torres-Mercado, Xiomara Molina- Perez, Gerardo Collazo-Malavé, Raul Ferrer-Burgos MD

The present study's aim is to document the prevalence of Anxiety disorder, Psychological distress, Depression, and Post-Traumatic Stress Disorder (PTSD) in the high-risk homeless population of Puerto Rico, compared to the general population of the island (Control), in the months following hurricane Maria. Additionally, difference in prevalence of PTSD in those previously homeless when the storm struck (pre-storm homeless), versus those who became homeless after the storm (post-storm homeless) is shown. As current demographic profile of this population is non-existent, we report prevalence of physical abuse, and substance use, as well changes in thereof

resultant to the storm. The Generalized Anxiety Disorder 7 (GAD7), Kessler K6, Patient Health Questionnaire-9 (PHQ-9), PTSD Checklist for DSM-5 (PCL-5), and a developed demographic assessment, were distributed to the homeless and general population of Puerto Rico using a multi-stage sampling method. A total of 194 control and 97 homeless individuals from approximately 30 municipalities completed the questionnaire packet. Comparing prevalence using Fisher's Exact Test, the homeless demographic demonstrates a significantly higher risk profile for all tested mental disorders, when compared to the general population of Puerto Rico. The homeless population showed a decrease in intake of alcoholic beverages, and an increase in the use of illicit drugs and tobacco. In the general population, increase in drug use was solely prescribed medications. Furthermore, group-wise comparison using Fisher's Exact Test demonstrates significantly higher risk of depression (PHQ-9) in pre-storm homeless, when compared to post-storm homeless. This study highlights the need to focus our attention to build resilience in the face of continued adversity in the aftermath of the storm, and awareness of adverse mental health risks in future natural disasters. Hurricane preparedness initiatives are needed for this oft-overlooked economic stratum within Puerto Rican society, identified to have been disproportionately adversely affected in the aftermath of the storm.

Categories:

Vulnerable Populations, Individual and Community Resilience, Emergency Response and Trauma Systems

22) Punto de Esperanza Clinic, a Different Approach to Medical Education through Compassionate Service to the Underserved Communities in Santurce, Puerto Rico

Laura Franqui Domínguez BS, Alessandro A. Ávila BA

Abstract:

Background and Objectives:

Punto de Esperanza Clinic is a preventive health care project for underserved people run by medical students who, after Hurricane María, noticed the need for medical guidance in the community of Santurce.

Methods:

Students from San Juan Bautista School of Medicine have led the effort of providing basic health services for members of vulnerable communities by carrying out monthly clinics since

January 2018. Fourth year medical students teach clinical skills to first and second year medical students who all work together to attend to the health concerns of participants and work to develop a more humanistic doctor-patient relationship to bring about their rehabilitation under the supervision of emergency medicine specialist, Dr. Ninci Llanos. A sustainable model for providing health care to people who are commonly rejected by society (immigrants, intravenous drug-users and homeless people) is the purpose and goal of this clinic.

Results:

In this alternative and compassionate scenario, the students have had the opportunity to learn about ethics in medicine and the complexity of the social, emotional and physical aspects of patients. The patients have received the benefit of being oriented on their healthcare options, female patients are assessed for safety at home and have been provided a way out of abusive relationships. Patients are encouraged to see a primary healthcare provider while being educated on their current conditions, medications and how to make adjustments toward a healthier lifestyle avoiding the use of drugs, alcohol and tobacco.

Conclusion:

This project has provided new experiences for the students and has empowered the community through medical education and guidance. Our goal is to inspire others in the academy and the community and to be a clinic that can work through the years and through national disasters to bring rehabilitation to the underserved.

23) Mayor Depressive Disorder, General Anxiety Disorders and Post Traumatic Stress Disorder in Puerto Ricans through a Year after Hurricane María

Authors: Laura Franqui-Domínguez BS, Alessandro A. Ávila BA, Marisela Irizarry MSc, Niurka Rosado MD

Abstract:

Natural disasters increase the rate of mental disorders in the population that suffers the atmospheric event. Mental disorders such as anxiety and depression have been found to be predictors for poor physical health. In our study we aimed to describe the population of the psychiatric patients receiving services in COSSMA clinics during a year after hurricane Maria. The data of 1,986 patients with the diagnostics of mayor depressive disorder (MDD), anxiety disorders and adjustment disorder was collected. The female to male ratio was found to be 2:1 (66.92% vs 33.08%). The majority of the patients were married (54.2%) and identified themselves as Hispanic (98.79%). The most common comorbidities among the patients studied were hypertension (26.8%), obesity (24.1%) and hyperlipidemia (19.5%). Patients with adjustment disorder had a higher prevalence of diabetes mellitus (17.60%) and hypercholesterolemia

(29.40%) in comparison with MDD and anxiety disorders. It is important to understand the comorbidities found in these groups of patients to better approach the treatment and management of these diseases that could be affecting their functioning and quality of life. Future studies to assess for the level of disability and cognitive impairment among these patients could further explain how these comorbidities are affecting their daily life activities.

Methods:

Every day, a group of healthcare professionals from different disciplines reached out to communities affected in different municipalities. Upon completion of each visit the team performed a debriefing procedure

Results:

Time investments to establish and sustain a deployment process and steady supply of resources are needed to provide timely response. In this emotionally intense scenario, we heal not only through medicine, but we also heal through the psychological, social and emotional aspects. A sense of abandonment was a recurrent complaint and the steadiest resource was community based.

Conclusions:

The accounts of providers and receivers of the services channeled through this effort should encourage partnerships between the private and public sector and the willingness from both sectors to assist with funding for training, and logistical support for healthcare professionals on how to prepare and respond to other disasters events.

Acknowledgements:

This was achieved thanks to the efforts of Professional Colleges and Associations, volunteer groups, students, and information from the Department of Health.

24) The Impact of Hurricane Maria upon Older Adults in Puerto Rico: An Assessment of Hurricane Stressors and Depression and Anxiety Symptoms

by Wendeline M. Figueroa

25) Professional Volunteer Teams Help Communities After the Hurricane María

Yarí Valle Moro 1, Iván Delgado López 2, Gipsie Rodríguez 3, Lisbeth Rodríguez 3, Leslynette Ramos Irizarry, María Victoria García Cingolani, Ralph Reyes Ventura 4 and Maribel Campos

Rivera 2. 1 University of Puerto Rico, Medical Sciences Campus, School of Public Health, San Juan, Puerto Rico; 2University of Puerto Rico, Medical Sciences Campus, San Juan, Puerto Rico; 3 San Juan Bautista School of Medicine, 4 National University College.

Background & Objectives:

Loss of essential services post hurricane Maria affected the health services infrastructure hindering the capacity to provide care for both acute and emerging health conditi(ons as well as continuity of care of established chronic diseases. Healthcare professionals from different backgrounds met to establish multidisciplinary groups and set out to offer medical assistance to help the communities affected by the hurricane in response to a call to action disseminated through professional organizations on the behalf of the Puerto Rico Department of Health. Beyond the impact on resource availability and established infrastructure on the routine delivery of services, a more humane approach is required considering the impact of the event on social determinants of health. The objectives of this project are: 1) Document the experience of a team of providers who participated of this volunteer effort.

26) Deconstructing Online Content for Puerto Rico Post-Hurricane Maria: Rapid Response Public Health Campaign by the Regional Public Health Training Centers

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To meet urgent public health needs in Puerto Rico after Hurricane Maria, the Public Health Learning Network (PHLN) identified, deconstructed, translated, and distributed priority public health information despite severely limited power and telecommunications. Within the PHLN, the Region 2 Public Health Training Center (PHTC), located at Columbia University Mailman School of Public Health, and its partner in Puerto Rico, Impactivo, were responsible for identifying high-priority public health needs on the island and managing communication between response partners.

Additionally, The Region 1 New England PHTC, located at Boston University School of Public Health, was responsible for identifying available preparedness materials. When materials were

unavailable, additional regional PHTCs in the PHLN offered additional subject matter expertise. Using this framework, the PHLN and its partnerships launched a three-week workplan which resulted in 17 Spanish-translated factsheets on public health content related to hurricane response and recovery. These factsheets became the basis of a paper, radio, and internet-based public health media campaign in Puerto Rico managed by the Puerto Rico Department of Health and Centers for Disease Control and Prevention via Impactivo. Despite the quick response, there were challenges to developing and delivering public health content in this austere situation. There was a notable shortage of non-internet based, Spanish-language training. Furthermore, this process demonstrated that the national movement towards online training may be disadvantageous in some disaster recovery situations where there is limited power and communication. Overall, this collaboration presents a potentially replicable short-term response after natural disasters for creating readily accessible non-internet-based information.

Topic of Interest:

Response in research institutions, How did academic centers respond to community needs? Evaluation and Innovation

27) Community Engagement using a Media Campaign and Outreach events after Hurricane Maria passed through Puerto Rico

Angela I. Perez-Toro1 ; Julieanne Miranda-Bermúdez1 ; Gabriela Algarín-Zayas1 ; Marianyoly OrtizOrtiz1 ; Natasha DeLeon-Rodriguez1 ; Angela F. Harris2 ; Luz A. Crespo-Valentín1 1 Puerto Rico Vector Control Unit, Puerto Rico Science, Technology, and Research Trust (PRSTRT) 2 Centers for Disease Control and Prevention (CDC)

After the hurricanes Irma and Maria, the Puerto Rico Vector Control Unit (PRVCU) had to adapt to Puerto Rico's new reality, no electricity, no water, and no telecommunications. Reaching the public and creating awareness about health problems at that time was challenging. Nonetheless, since media campaigns help expand the audience reach, the PRVCU launched a media campaign that promoted three key messages: appropriate management of water reservoirs, water removal from debris, and personal protection. The PRVCU used mostly newspaper and radio, in addition to door-to-door interventions, providing information, and mosquito repellent in order to protect individuals from the spread of diseases transmitted by the Aedes aegypti mosquito. The PRVCU was established by PRSTRT through a cooperative agreement with the CDC, to monitor and control the Aedes aegypti mosquito. The PRVCU developed an educational outreach plan that aligned with the mass media campaign with content tailored directly to the specific problems posed by the passing of hurricane Maria and the priority actions citizens should take to avoid creating mosquito breeding sites. October to December 2017, 63,356 educational flyers have reached the citizens across 68 out of the 78 municipalities in Puerto Rico. The PRCVU participated in 29 information distribution events and distributed 1,570 mosquito repellents. These activities supported the media campaign that was

present in 272 radio spots, 14 full/half page newspapers ads, and 6 radio/TV interviews. The use of a media campaign after these natural disasters was key to disseminate health information in order to engage communities in protecting themselves from mosquitoes. However, limited electricity and internet required the PRVCU to diversify the methods it used to carry out such a crucial media campaign. Natural disasters have highlighted the great importance in being able to understand and create new and innovative methods to develop risk communication campaigns after natural disasters. Funding provided by the CDC grant #NU50CK000481

Categories:

Individual and Community Resilience, Communications, Vulnerable Populations

28) Food access, social connectedness, and allostatic load after a natural disaster: a mixed-methods study

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Introduction:

A major stressor during natural disasters is privation in access to adequate quantity and quality of food and water. The allostatic load model posits that brain stimuli (e.g. memories) from such stressors overloads multi-system physiological stress responses. Yet, adaptive mechanisms may occur as the brain-body adjusts to this new post-disaster stress, as an afflicted society recovers together through social connectedness. It remains unclear how food-related stress response/adaptation mechanisms operate post disaster.

Aim:

We aimed to identify levels of influence on which food/water privation operated as stressor after Hurricane Maria in Puerto Rico (PR), the domains of influence where social connectedness strategies moderated such stressor, and how these trigger time-sensitive adverse or adaptive allostatic responses.

Methods:

We are using a concurrent transformative mixed-methods design combining quantitative data collected from the island-wide PROSPECT cohort, with narrative interviews among adults and food establishment stakeholders. In a subset of 1,000 adults 30-75y, PROSPECT is collecting data on access to food pre- and post-Maria; social network, coping, and coherence; and 20

allostatic load biomarkers in 9 different physiological systems. Biomarkers of stress are being measured pre-post narrative interviews (n=130) to assess acute stress responses.

Results:

Expected results include estimates of access to food/water and association with allostatic load post-Maria; evaluation of the moderating role of social connectedness on the association of food/water privations and allostatic load; and qualitative assessment of memories of food/water privation and coping through social connectedness in individuals and food establishment stakeholders, and their association with acute physiological stress. Findings will be triangulated, and narrative interviews will be used to raise advocacy for better food access.

Conclusions:

This project will identify priority needs and timely best-practices for adequate post-disaster access to food and water, and concomitant social coping strategies that will sustain optimal physiological well-being in PR and disaster-prone areas.

Topics:

Food Security, Individual and Community Resilience, Vulnerable Populations

29) Philanthropic Response to Disaster and Strengthening Public Health in Puerto Rico

Mariely Rivera, Debora Aponte

Introduction:

United for Puerto Rico (UFPR) was incorporated in response to the disaster caused by hurricanes Irma and María. A private sector-led nonprofit, UFPR received and distributed $40.1 million in emergency funds in 11 months, along with 5 million pounds of goods. UFPR engaged community-based nonprofits who could lead relief efforts at the local level. Half of the relief funds were provided to address and mitigate public health risks and concerns.

Methods:

UFPR was led by a strongly committed board of directors and administered by a highly experienced team that in a matter of 6 weeks set-up an effective fundraising strategy and an efficient grant-making process at less than 6% of the cost to the total fund. Key to UFPR's success was its ability to provide up to 10 different technologically-enabled channels to receive donations. Donations were then distributed through an intermediary model, which included technical assistance, proposal submission, grant evaluation, and compliance and monitoring.

Results:

UFPR's relief efforts impacted Puerto Rico's 78 municipalities and reached over 1.5 million individuals. Over 135,000 donations were distributed to 193 organizations as grants for 220 relief and recovery projects. In addition to these grants, 2,500 generators and 5 million pounds of supplies were distributed in communities throughout the island including Vieques and Culebra. Overall, relief efforts impacted thousands of communities and helped avert and alleviate the public health emergency caused by the hurricanes of 2017.

Conclusion:

Approximately 39% of the proposals received by UFPR were approved. Of the total funds granted, 51% were destined for projects dealing with Food and Water, Health, and Social Well-being. UFPR was keen to match grant amounts to organizational capacity and was able to develop "business intelligence" on Puerto Rico's First Responder Organizations. This information is crucial to relief efforts in the future.

30) Inter-Relationships Between hurricanes and Single Use Plastic in Puerto Rico

Kaumudi Joshipura)

31) National Rural Water Association's Assessment of 237 Non-PRASA Community Water Systems

Rita Clary
National Rural Water Association (NRWA)

The National Rural Water Association (NRWA) located in Duncan, Oklahoma began sending Disaster Recovery and Relief Teams to Puerto Rico in early January 2018 through a Disaster Relief grant from USDA Rural Development. The initial visit assessed the needs of Puerto Rico's 237 island wide non-Prasa smaller water systems located throughout the island and established logistical support for future assistance.

More than 150 Puerto Rican systems have been assessed by NRWA Teams and its State Rural Water Associations. These teams aided individual non-Prasa water systems in recognizing their disaster damage and needed repairs. Coordinated workshops with USDA Rural Development educated communities on available funding options and continue to help non-Prasa systems apply for this funding.

Teams from NRWA and its State Associations have helped with disaster recovery and relief every time the need has arisen. Last year hurricanes Harvey, Irma and Maria brought widespread destruction to the Texas, Florida, Puerto Rico and the U.S. Virgin Islands. This year, hurricanes Florence and Michael devastated the southern U.S. Once again State Rural Water Associations were there to help systems that provide reliable water resources to Rural America.

NRWA and its State Associations are the leaders when it comes to emergency/disaster response in the water/ wastewater systems.
NRWA and State Associations provide U.S. and Puerto Rico non-Prasa systems Sustainability Management training, which consists of Managerial, Financial and Technical training along with Emergency Response and Risk Assessment Planning. All water operations specialists and board members are encouraged to attend the trainings to aid these systems in providing safe, clean potable water and to make their systems more sustainable.

32) An island in blackout: How individuals leveraged Twitter to communicate after Hurricane Maria

Omar Pérez Figueroa; University of California, Irvine Department of Urban Planning and Public Policy

On September 22, 2017, category four Hurricane Maria hit the island of Puerto Rico. The hurricane left the island in bad shape, with no power, no water and virtually no communication. As the island was isolated from the world, Social Media played a critical role. Literature has highlighted that during disasters social media provides an important source of information, including nature of the disaster, affected people feelings and emotions (Seety & Shekar, 2015). For instance, individuals sent around 20 million Twitter posts or tweets related to Hurricane Sandy (Guskin & Hitlin, 2012). This research aims to uncover how Puerto Ricans living on and off the island leveraged Twitter to relay vital information. To understand the role Twitter played after Hurricane Maria, I a) identify the main themes communicated in tweets about the hurricane and b) identify the geographic distribution of these tweets. I use the Twitter text extraction tool Texera, a system created by the Computer Engineering Department at the University of California, Irvine to support cloud-based text analytics using declarative and GUI-based workflows. To extract tweets, I will use the “hose approach”, in which one extracts 1% of the total tweets (Young, S. D., Rivers, C., & Lewis, B., 2014). The twitter data reveals that during the month following Hurricane Maria’s landfall, the category with the most tweets were “Hurricane info post,” which includes post regarding hurricane location, summary of the hurricane losses (both economical and lives lost) and how and where to donate aid. The second category with most tweets was “solidarity expressions”, which include tweets such as “prayer for Puerto Rico”. However, if we combine all categories that critiqued the government response (local, federal and the U.S executive branch), they become the category with most tweets. The data also highlight how U.S states with higher Puerto Rican demographic played a key role on states with higher tweets counts. Understanding the main categories of Tweets can shed light on where there were problems in recovery efforts and suggest places to build resilience for future events. Furthermore, it could bring insight on how vital messages where being relay when mass media communications where down.

33) Citizen Science and a Collaborative Community Effort to Confront a Public Health Crisis- The Post- Maria Sampling Program (PMSP)

Steve Tamar, Vice-chair, Surfrider Foundation Rincón chapter, Coordinator, Blue Water Task Force (BWTF) Rincón water quality program.

The most immediately pressing public health threat in the wake of hurricane Maria was the wide spread and protracted loss of formal water supply for household purposes (drinking, bathing, washing etc), resulting many PR communities being forced to use local their springs, streams and wells for several months. A vast majority of those informal water sources had never been previously tested for any water quality (WQ) parameters, creating high risk epidemiological conditions potentially overwhelming already stressed emergency medical services. In Rincón, a unique collaboration between the largest citizen science program in PR, a local non-profit health center, and a Hastily Formed Network of volunteer relief workers was quickly able to successfully respond to this potential crisis by conducting WQ tests and informing local communities regarding the safety of these informal sources, within three weeks after the storm – and this program continues to the present as part of resiliency efforts..

The BWTF Rincón has been conducting weekly beach water quality testing in northwest PR (Jobos to Añasco) for 11 years, primarily by detecting levels of fecal bacteria contamination. After the hurricane, volunteers from the RBC Maria Relief (RBCMR) center asked if the BWTF program could be modified to assess informal household water sources, and with the hosting and logistical support of the Costa Salud Community Health Center, the PMSP was created and immediately operational. Community members from RBCMR were trained - equipped for proper bacteriological collection protocols and field test techniques, and assessment results were physically posted at the Costa Salud, RBCMR center, public plaza etc. also signage installed at specific source sites in Rincón/Aguada area when possible (eventually also via social media). A 'remote' pilot project was also conducted in Maricao in collaboration with the Urban High School students and staff. Other volunteer relief workers were also trained for water sample collection/field testing during convoys to remote communities, and a water filter distribution / education campaign was developed for the Maricao and Utuado efforts.

34) Building Community-Based Resilience in an Age of Accelerating Change

Dr. Linton Wells II

35) The Power of Resilience – Public health's role in disrupting colonial power dynamics and building power with social justice movements

Jesús Vázquez, Organización Boricuá de Agricultura Ecológica de Puerto Rico Julian Drix, Rhode Island Department of Health, Johns Hopkins Bloomberg School of Public Health

Introduction:

Hurricanes expose and amplify underlying crises - socioeconomic inequities and environmental injustices created by systems rooted in colonialism. The concept of 'resilience' draws from engineering, psychology, ecology and other fields. It offers potential to identify root causes, responding to disasters while addressing underlying structural determinants. But there is also potential for resilience to reinforce inequities – bouncing back to the status quo, or using crisis to push neoliberal transformations that further marginalize impacted communities. Resilience is a contested space that depends on who has the power to define it. Public health efforts to advance equity require analyzing the power dynamics of resilience.

Methods:

A literature review of resilience theory identifies both harmful and beneficial applied resilience practices. Grassroots climate justice resilience strategies include agroecology, food sovereignty, decentralized mutual aid, and collective brigades for (re)building agroecology.

Results:

Featuring voices from frontline climate justice organizations, this panel will highlight resilience strategies from frontline communities that transform systems and result in multi-level benefits for health equity. Decentralized mutual aid provides food, water, solar energy, and emotional support. Collective brigades for agroecology build social and ecological systems that are culturally and geographically rooted, use renewable energy, remove dependencies on industrial production, and restores the health and integrity of the land. Food sovereignty is the fundamental right to control food systems and policies to ensure everyone has

Conclusion:

Public health has a critical role in resilience, moving beyond incident response and using health equity frameworks of social determinants to address root causes. This cannot be done by replicating top-down approaches but by collaborating with, learning from, and supporting climate justice movements. Partnerships between public health and climate justice efforts within frontline communities must use methods framed by the Jemez Principles for Democratic Organizingii.

Themes:
Individual and Community Resilience, Infrastructure, Vulnerable Populations

36) Proyecto Agua Limpia: Exploring water drinking behavior from public and communal water systems and private wells.

José J. Ruiz-Valcárcel, MPH, MSGIS
Leslie Maas Cortés, MHS
Melanie Zoe Rodríguez-Rivera, MS
Lizmariel Tirado-Rouco, MA

Proyecto Agua Limpia(PAL) was created after Hurricane María landfall in Puerto Rico. The event has brought to the forefront several communities that are more vulnerable to water contamination, water poverty and intermittent service of potable water and electricity. The objective of PAL is to provide potable drinking water to households in communities at risk in Puerto Rico through the distribution of home water filters, take water quality samples to measure total coliforms and Escherechia Coli (*E.coli*), and a community-based intervention that aims to encourage citizens to prevent water-borne illnesses by addressing water and sanitation issues. More than thirty-three thousand (33,756) water filters were deliver to families in communities with an independent aqueduct system(non-PRASA) and communities with intermittent water and electricity utilities. Thirty-six percent of households that drinks water from non-PRASA communities report to have at least one family with gastrointestinal conditions during the past four weeks. PAL also assess water quality samples to measure count of *E-coli* colonies in different non-PRASA communities, streams, water retention tanks, private wells, and residences. From forty-five (n=45) water quality sample sites, fifteen percent(n=7) test positive to *E-coli* and nine percent(n=4) was in the mountainous region of the island. A sample of 256 participants were randomly selected to evaluate water filter use, satisfaction and evaluate water drinking behavior during a hurricane crisis. During hurricane crisis twenty-two percent report drink water from communal water systems, springs or private wells. These findings inform emergency planners the need to provide water filter cartridges for emergency purposes. The results also suggest the need to provide orientations about waterborne diseases in communities with poor water treatment but also in communities with intermittent water services from the public water aqueduct system with access to private wells to promote healthy communities during disaster events.

37) Metals Testing in non-PRASA drinking water systems: A Pilot Study

Abigail Harvey, Massachusetts Institute of Technology Department of Civil and Environmental Engineering. Tchelet Segev, Massachusetts Institute of Technology Department of Civil and Environmental Engineering. Susan Murcott, Massachusetts Institute of Technology Development Laboratory.

In order to quantify the levels of metals in drinking water in Puerto Rico, household drinking water from communities in nine municipalities were tested for a suite of metals. One community was selected from each of the following municipalities: Aguado, Anasco, Barranquitas, Caguas, Corozal, Las Piedras, Penuelas, San Lorenzo, and Yabucoa. In each community, drinking water was collected from four homes of a variety of ages.

Methods Two samples were collected per house: a running and a standing sample. For the standing sample, water was collected from a tap that was unused for at least six hours. For the running sample, the same tap was flushed for two minutes before sample collection. Approximately 2 liters were collected per sample. Indoor taps were used when possible. Samples were also collected from the source water of each community's water system if feasible.

Samples were analyzed on an Inductively-Coupled Plasma Mass Spectrometer (ICP-MS) at the Massachusetts Institute of Technology for a suite of metals: lead, arsenic, aluminum, chromium, manganese, iron, cobalt, nickel, copper, zinc, and cadmium.

Results In total, 75 samples from homes, community storage tanks, and community wells were collected and analyzed. Thirty-six homes were represented in the study. Of these, nine homes exceeded the EPA action levels for both lead and copper, in their standing samples only. Five homes exceeded the EPA guideline of 10 parts per billion for arsenic, four of which are from Añasco.

Conclusions Lead is present above the EPA action level only in standing samples; flushing the water in these homes will reduce lead levels. Arsenic is near or above the EPA guideline in certain municipalities: Añasco, Palmarito, and Oquendo. Further lead and arsenic testing needs to be conducted throughout Puerto Rico to determine the extent of lead and arsenic contamination in the island's drinking water.

Water Quality Testing in Puerto Rico Non-PRASA systems

Abigail Harvey, Massachusetts Institute of Technology Department of Civil and Environmental Engineering

Tchelet Segev, Massachusetts Institute of Technology Department of Civil and Environmental Engineering

Susan Murcott, Massachusetts Institute of Technology Development Laboratory

Post-disaster, communities often lack capabilities for water extraction and treatment, and may rely on unassessed and potentially unsafe water sources for drinking water. Drinking water testing can be costly and require days to weeks to receive results. Use of the EC-kit created by Susan Murcott at the Massachusetts Institute of Technology can provide quick, inexpensive testing of basic drinking water quality parameters: e. Coli and total coliform. The two tests

included in the kit, Colilert and Petrifilm, are incubated for 24 hours using only body heat. Results for e. Coli and total coliform and health risk ranges can be established for the water source after reading results from the two tests.
The EC-kit was deployed in Puerto Rico non-PRASA systems in June-December 2018 following Hurricane Maria. Forty-five non-PRASA systems were tested using the kit and seven non-PRASA systems were identified to contain e. Coli.
Further EC-kit training throughout Puerto Rico and other Caribbean islands may allow these kits to be deployed immediately following any future disasters and provide results about drinking water quality, reducing spread of waterborne diseases post-hurricane.

38) The Impact of Hurricane Maria on Medical Services, Depression and Anxiety in Cancer Patients: Baseline Preliminary Data

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39) Natural Disaster Outcomes, Perceived Stress, and Resilience in Puerto Rican Cancer Patients after Hurricane Maria

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40) Geographic Information Systems (GIS) Analysis of a National Assessment of Nursing School Readiness for Radiation Emergencies and Nuclear Events in the United States

Authors:

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Abstract:

As part of the National Health Security Strategy, it is crucial that public health infrastructure be prepared to address emergencies resulting from nuclear war and other large-scale radiation events in the environment. Nurses play an important, front-line role in disaster response of this kind, and it is the responsibility of Schools of Nursing (SONs) across the country to develop a competent and prepared nursing workforce. This is achieved by offering student nurses specific content and training regarding appropriate response to nuclear and/or radiation emergencies. However, empirical evidence focusing on SONs' capacity to prepare nursing students for

emergencies of this kind and the associated perception of risk is lacking. This study employed Geographic Information Systems (GIS) analysis of a cross-sectional survey administered to a nationwide population of SON administrators and faculty to assess content, faculty expertise, planning, and perception of risk related to radiation emergencies and nuclear events. Survey results were analyzed using GIS in order to ascertain the geographic risk and proximity of respondents who were located within emergency planning zones (EPZ) with a radius of 50 miles from sources of nuclear radiation (reactors and waste sites). Of the 605 survey respondents who provided a school ZIP code for mapping, 295 were located within an EPZ. 121 incorrectly reported the proximity (<50 miles) of their school to a nuclear reactor, and 15% of these responded that there was "no perceived risk" to explain a lack of radiation emergency curriculum. GIS analysis of FEMA regions revealed high concentrations of schools of nursing and radiation sources, and examination of fault lines indicated significant geographic risk to SONs located in these areas. 12.5% of respondents reported having a radiation emergency operations plan in place. GIS analysis allows for spatial context of the results of this survey and emphasizes the importance of the findings.

Categories:

'Emergency Response and Trauma Systems'; 'Infrastructure'; 'Vulnerable Populations'

41) Impact of Hurricanes Irma and María on stressors, oncology care and outcomes of gynecologic cancer patients receiving services in Puerto Rico.

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Objective:

Cancer patients have increased risk of complications after disasters. We describe the stressors and experiences of gynecologic cancer patients and of providers/organizations involved in the delivery of gynecologic oncology care in Puerto Rico (PR), after Hurricanes Irma and María.

Methods:

We conducted two focus groups (November 2018-January 2019) among women ≥21 years with gynecologic cancer (n=12) and nine key-informant interviews among providers/stakeholders.

Interviews' addressed stressors, responses and health concerns in the aftermath of the hurricanes.

Results:

All patients experienced environmental stressors, as well as lasting difficulties having a healthy diet, and with transportation, communication, electricity and water services. Women under the Government Health Plan (GHP) faced longer time without essential services and were less prepared for the hurricanes than those with private health insurance. All women experienced delay in cancer treatment, but patients in the GHP had longer delays, as most public hospitals were saturated or inoperable. Key-informants expressed that clinics/organizations did not have an emergency plan in place, services were saturated because of the collapse of many facilities, and that some patients decided to interrupt their treatments, and others experienced recurrence. Difficulties in accessing and maintaining chemotherapy drugs also resulted in interruptions and delays in treatment. Meanwhile, although some cancer patients were moved to the US with the intent to provide them with oncology care, this was not always successful due to lack of health coverage in the US. Ineffective communication between the government and the private health services was also an obstacle.

Conclusion:

All components of disaster management (planning, preparedness, response and recovery) failed after the hurricanes. Disparities in preparedness and healthcare interruption in patients in the GHP could affect their health outcomes. Study results will be of relevance for the development of a much needed disaster management plan for cancer patients in PR. NCI Grant #R21CA239457.

Overall Theme:

Disaster Science Informing Public Policy Vulnerable Populations

42) Burnout and self-perceived stress among workers of essential services after the impact of hurricanes Irma and Maria

Authors:

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C. Rosario Medina, MPH, José C. Salamán De Jesús, MPH, Annette M. Santiago Díaz, JD, MPH, Liza I. Millán Pérez Ph.D., Marisol Peña-Orellana MSc, Ed.D, Ruth Ríos Motta, Ph.D.

Background:

Major disasters are traumatic events that may result in a wide range of mental and physical health consequences. Previous research has indicated that the severity of disaster damage has a negative influence on the health and that the risk factors associated with stress differ depending on the degree of damage that workers experienced. **Objective**: To examine the levels of burnout and self-perceived stress among workers from the Puerto Rico Electric Power Authority, who experienced major disasters: hurricanes Irma and María. **Methods**: A cross-sectional study with a non-probabilistic convenience sample of one-hundred sixty-three (n=163) eligible participants from the Electric Power Authority was conducted using a structured survey. We examined the relationships between burnout, with individual characteristics, years of employment service, health conditions and copping strategies, before and after the hurricanes. Burnout was assessed with Gil-Montes Spanish Scale and self-perceived stress was evaluated by a question asking: How would you describe your stress level at work before/after Hurricanes Irma and Maria? in a likert scale format from nothing stressful to extremely stressful.

Results:

Before the hurricanes, 16.6% of the workers reported a high level of burnout syndrome, while after the hurricanes it increased to one fifth (20.9%). Self-perceived stress before hurricane was reported by more than one-fourth (23.4%) of the sample as extremely stressful, while after hurricanes extremely self-perceived stress augmented to 55.0%. Factors such as years of employment service, counseling, self-perceived stress showed significant statistical associations ($p<0.05$) with burnout. **Conclusion**: Electric power workers are in charge of an essential resource for the whole society. A public health priority should be given to this population in order to prevent workers' burnout and other health effects due to the long time in the response, recovery and reconstruction processes after these major disaster events.

43) What Contributes to Resilience of Organizations in Disasters?

Carmen Albizu Garcia carmen.albizu@upr.edu

44) Recuperación Agrícola: Growing Sustainability in the Puerto Rico Agricultural Sector

Ernesto Cruz and Bárbara Rivera-Chinea from the Puerto Rico Science, Technology and Research Trust

Puerto Rico is challenged by an agricultural sector that has been characterized as small, which has forced the Island to import more than 85% of its food consumption. Albeit small, the

Island's agricultural production is diverse, and, if properly organized, it may well supply a substantially larger portion of the Island's food demand. Food security sits at the top of the priority items to ensure the health and wellbeing of all on the Island. Post-hurricanes Irma and María, it is an even more critical issue to address, since there is a shared urgency to recover, restore and expand production of affected farms, while building awareness to promote consumption habits that increase consumer access to fresh farm products and increase economic development. In October 2018, the American Red Cross teamed up with the PRSTRT to create and manage Recuperación Agrícola, an 18-months micro-grant program that impacts 450 underserved farmers to recover and become more sustainable, by helping them return to pre-storm productivity levels, thus minimizing the risk of food deserts, while increasing self-employment and entrepreneurial opportunities. Application is open to local farmers; however, we are prioritizing targeted groups such as women, veterans, agroecological farms, and small farms (20-acre or less). Program benefits includes: an initial cash donation of $1,000 p/p, farm tools & equipment, clean-up & recovery work, as well as, education, and professional technical support. Established objectives intent to generate changes in beneficiaries' condition, behavior, and knowledge. Measurable program outcomes include increase in farms production (recovered acreage & crop yields) and revenues; and job generation. Besides all the above, generating relevant and accurate data of the agricultural sector in Puerto Rico is a critical contribution to partners, collaborators and industry stakeholders considered a catalytic factor for the development of future projects, investments and grant awards.

45) Research Teams in Academic-Community Partnerships for Post Hurricane Relief and Recuperation: Transition to Community Engagement

Carmen M. Vélez-Vega, Irene Lafarga-Previdi, Emma Fernández-Repollet. Research Centers in Minority Institution (RCMI) Center for Collaborative Research in Health Disparities- University of Puerto Rico, Medical Sciences Campus

In September 2017 hurricanes Irma and María devastated Puerto Rico. Hurricane María was considered the most powerful storm to hit the island in eighty years and made landfall just days after hurricane Irma, another powerful storm. The infrastructure (electric grid, communications system) collapsed and thus essential services were compromised. As a result of a slow disaster response from the local and federal government thousands of people died of preventable diseases and inhumane living conditions, including contaminated water sources. A collaborative effort between different projects within the Medical Sciences Campus of the University of Puerto Rico visited various communities severely affected by the hurricanes. The Puerto Rico Test Site to Explore Contamination Threats (PROTECT) along with the RCMI pilot project "Risk Communication and Community Engagement Strategies to Enhance Behavior Change for Zika Virus Prevention and Control" and Community Engagement Core coordinated community outreach educational activities. They visited the Villa Calma Sector community in Toa Baja

where the activity focused on prevention strategies for the transmission of the Zika virus at home. Mosquito nets, insect repellent and informational material were distributed to the 40 participants. They also visited the Manuel A. Pérez public housing in San Juan to provide training in the use of family and community water filters to residents, the director of the Nursing Center, the recreational leader, social workers, administrators and maintenance workers. A community water filter was donated to each community. These efforts are an example of the importance of community engagement from academic institutions in disaster situations. Sharing scientific knowledge and providing necessary materials are important actions that can contribute to the recovery efforts and empowerment of communities, as well as support the reinstatement of research recruitment activities.

Topics:
Morbidity and Mortality Investigation and Reporting, Hospitals and Clinics

46) A Rapid Needs Assessment on Health and Community Wellbeing in Six Municipalities in Puerto Rico Affected by Hurricanes Irma and María

Carmen M Vélez Vega, Francheska Fernández, Zaira Rosario, Héctor R. Torres, Ishwara Ayala, Natacha Guillioty, Zulmarie Díaz, and Lilliana González, José F. Cordero,
Hurricanes Maria and Irma devastated Puerto Rico during September 2018. A rapid needs assessment was conducted in selected areas focusing on community health and well-being pre and post hurricanes. The study was aimed to determine what was needed to stabilize and improve health and well-being.
Data were collected from key informants through interviews and focus groups with a diverse representation of stakeholders. Data were supplemented with reports published as a result of other assessments conducted in Puerto Rico following the hurricanes.
We found a general state of vulnerability in housing, food security, communications, access to health care, transportation, employment, and public safety that exacerbated following the hurricanes and severely impacted response and recovery. Transportation, became a top priority, but examining underlying reasons, we found limited access to medications and medical care were major barriers. The resiliency of local community health centers was key, as they were prepared with adequate backup generators and water reserves, becoming the central community location to access health care, social services, emergency response, and public safety. It was quite evident the numerous individuals in these communities with chronic conditions raised the need for local registries of people with disabilities and medically-fragile for planning and post-event response and recovery.
Resilience of community health centers (CHC) in the face of a disaster is critical for pre-disaster planning, operations during the emergency, post-disaster response and long-term recovery. Health care services in each municipality must be included in disaster planning where CHC's

may serve as a one-stop for relief and recovery. The numerous medically fragile individuals in these communities shows the need to train community health promoters that may link health care providers and patients and promote health literacy that ensures they know how to manage their condition, respond to complications and prepare for the next hurricane.

47) Health Care Accessibility for Puerto Ricans and Immigrants Living in Santurce, Puerto Rico

Authors: Laura C. Franqui-Domínguez BS, Marcos Roche Miranda, Natalia Roa Vidal, Alondra Marrero Cabrera, Ashley Torres Clara, Zulmarie Maisonet Feliciano, Franchely Soto Rivera, Alessandro Avila BA, Heileene Torres-Colberg MD

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Background & Objectives:

During the past decades of the Puerto Rican economic crisis, the community of Santurce has been known for its multiple obstacles with regard to equal access to primary resources. The objective of our study is to determine the health care accessibility for the residents of Santurce.

Methods:

The data for our study was collected through a convenience sampling in the neighborhoods that compose the area of Santurce. An oral survey of 50 questions regarding the perception of physical and emotional health, past and current medical history, preventive medicine availability, personal security and epidemiology was answered by 195 participants.

Results:

Puerto Ricans were more likely to report their physical health as “bad” or “very bad” in comparison to immigrants (17.03% vs 7.4%). When describing emotional health, a higher number of immigrants responded “good” and “very good” (80.9%) in comparison with Puerto Ricans (67.5%). When evaluating the use of medical services in the last 6 months, immigrants presented a higher positive response (67.6% vs 60.5%). A higher percent of Puerto Ricans reported availability of medical insurance (86.0% vs 63.2%). Immigrants reported difficulty of having medical insurance due to absence of legal residency and money to afford it or due to no necessity of visiting a doctor. Some of the causes for not visiting the doctor among the Puerto Rican males were the absence of time, the wait time, poor service of the doctors and addiction while among the immigrants the most prevalent answer was that they do not visit a doctor because they have not experienced any sickness.

Conclusions:

Future studies will focus on gathering more information about the perception of physical and emotional health of the residents of Santurce and work on development of a model of services to improve the access to medical care for the community.

48) The pattern of colonial neglect and human rights violations by the United States exacerbates humanitarian crisis in Puerto Rico

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The state of humanitarian crisis that was revealed as a result of devastating Hurricanes Irma and Maria demonstrates a long history of United States colonial neglect and human rights violations against Puerto Rico. This reality has made Puerto Rico particularly vulnerable and especially difficult to overcome the catastrophic natural disasters. The impacts are pervasive, resulting in disparities in Puerto Rican health - including water access and quality, wealth - including economic loss and disinvestment, and sustainability of the island's resources. As a result of failed governmental protection and support, public health issues related to access to care, a failing infrastructure, and discrimination all contributed to the impact of Hurricane Maria on the island. A human rights framework is necessary to assess the chronic and acute human rights violations on the health and quality of life to support 3.7 million Americans on the island. This presentation summarizes the state of historical disenfranchisement of Puerto Rico prior to the storms and identifies the specific human rights violations as a result of the U.S. lack of emergency responsiveness. A process of truth and reconciliation is essential to restore the rights and dignity in Puerto Rico. Puerto Ricans are rightfully entitled to preventative resilience building and equitable relief and recovery assistance as a United States territory. This presentation outlines the demands of an accountable, efficient, effective process to rebuild the island and reconcile all that has been lost.

49) Disaster Preparedness among Older Adults in Jamaica

Kayon Donaldson-Davis, Julian McKoy-Davis, Douladel Willie-Tyndale, Kenneth James, Denise Eldemire-Shearer from the Mona Ageing and Wellness Centre Faculty of Medical Sciences University of the West Indies, Mona Jamaica

Background:

Natural disasters are recurrent due to Jamaica's geography and topography. The most significant hazards are hurricanes and floods. Older persons (≥60 years) account for 12.4% of

the population (339,434 persons). The impact of natural disasters has been significant; in the flood rains of March – June 2017, 2,474,535 persons across 11 parishes were affected, representing 90.6% of the population.

Objective:

This paper describes strategies for hurricane preparedness and sources of assistance used by older adults in Jamaica and identifies variations by age, sex and place of residence.

Method:

This is a secondary analysis of data from a nationally-representative survey conducted in 2012. Data were analyzed for 2,307 older persons who reported on pre-hurricane preparations and sources of help. Chi-square analyses were used to identify differences in preparation strategies and help sources by sex, age, and place of residence.

Results:

Preparation strategies included battening down (61.2%), getting supplies (53.1%) and moving to safe locations (6.8%). More females than males "got supplies". A greater proportion of the young and middle-old reported battening down. Likewise, more rural residents than urban reported battening down. More rural residents reported moving to safety, while more urban dwellers reported getting supplies. Children were the most commonly reported source of help (29.6%), followed by other relatives (26.6%) and spouses (13.1%). More females got help from family with battening down ($p<0.001$). The likelihood of getting help with supplies from family increased with age (67.1% young-old; 69.1% middle-old; 77.3% old-old) ($p=0.013$). Significantly more urban persons reported getting help from family to move. Nearly 15% reported receiving no help.

Conclusion:

Interventions are needed to support older persons in disaster preparation. Family provides significant assistance however organized community support is needed for those with limited/no support.

*Category:

Disaster Science Informing Public Policy, Pre-Event – Vulnerable Populations

50) SHAPING A BALANCE OF ENVIRONMENTAL AND ECONOMIC SUSTAINABILITY FOR POPULATION HEALTH

Abstract by Dr. Edna L. Negrón Martínez
Attention: LMASS@PRSCIENCETRUST.ORG

Our time's global challenges and trends—like those associated with climate change, demographics displacements, growing health inequalities, and increasing burden of diseases—have complex connections to the social, environmental, and economic determinants of health.

For instance, there is an increasing consensus that burden of disease generates substantial costs, consumes essential resources, limits the attainment of healthier people, and undermines societal and economic development. Information on the burden of disease causes and prevention is fundamental for public health actions, like preparedness and responses for disasters, and recovery resources after the event.

The purpose of the present research and writing project is to be comprehensive of the fundamental connections between social, environmental, and economic influences on health. These connections are explained by addressing the core curriculum of multi-disciplinary areas—as urban design, energy, housing, and economy—as well as in the health system itself.

51) Development of a Recovery and Resilience Health Care Systems Network

Authors:

Lorinet Martell, MPH; Maya Mendez, MPH; Hector Garcia, MPH; and Himilce Vélez, MS

Introduction:

Hurricane Maria was an unprecedented disaster event that resulted in significant damages throughout the Island. To that extent the Federal Emergency Management Agency (FEMA) provided assistance to the Commonwealth of Puerto Rico during the response phase in the aftermath. The Assistant Secretary for Preparedness and Response (ASPR), an affiliated agency of the U.S. Department of Health and Human Services (HHS) provided the resources and tools under the Health and Social Services Recovery Support Function (HSS-RSF) to address a planning process considering a Hubs-and-Spokes model.

Methods:

The HSS-RSF through its Healthcare Systems Branch (HSB) provided a team to tackle the following planning components: identification of regional stakeholders, assessment of the capacity and capability of healthcare facilities in Puerto Rico, development and review of the regional plans, participation signage, and delivery of the regional plans to the PRDOH. Specific planning activities were data collection, interviews with emergency managers, and meetings with regional stakeholders.

Results:

The HSB planning team were able to collect capacity and capability data from 300+ healthcare facilities in addition to information from 7 regional stakeholders meeting, 7 pre-conference meetings, a conference gathering all healthcare sectors Island-wide and titled as *Recovery and Resilient Healthcare Services in Puerto Rico: An approach on Coalitions and Regional Planning*, and 7 regional planning review meetings.

Conclusion:

The planning process resulted in the development of 7 Emergency Regional Response Healthcare Networks plans. The relationships between the hub and spoke facilities are memorialized in each plan as a network of mutual support for communications, transportation, workforce and mutual aid/outside assistance. Through the development of each regional plan the region, taken as a whole, is better prepared to respond to and recover from emergencies. The seven plans working in concert, with support from PRDOH, will ensure a greater level of healthcare services preparedness.

52) Municipal Preparedness Joint Initiative

Authors:

Himilce Vélez, MSc; Belmari Díaz, MP, BHE; Addison Hesslink, CEM, MS; and Weston K. Szymanski

The Municipal Preparedness Joint Initiative (MPJI) arose out of the need to promote enhanced emergency readiness in all municipalities in Puerto Rico as part of the Health and Social Services Recovery Support Function (HSS RSF).

The MPJI is a discussion-based exercise (workshop) of a simulated emergency scenario among various sectors of the municipality to identify capacities and opportunities of collaboration in emergency planning.

With the cooperation of eight sectors to include local government, Incident Command Center, health, social services, education, housing, environmental and volunteers, Moca Municipality hosted the first workshop on August 28, 2018. With 39 persons in attendance, ideas were exchanged, resulting in the development of an emergency response inventory resource guide, directory listing healthcare professionals for emergency use, and registry to identify bedridden individuals.

Resilience, humanity, empathy, learning, expectations, teams, communication, tool, productive– words used during the workshop session. After the workshop in Moca, the eight sectors who participated, tackled and accomplished a significant portion of the objectives given, with the Health Sector achieving 11 of the 12 objectives set before them.

Additionally, on September 25-28, 2018, there were four train-the-trainer (TTT) sessions held in the regions of Arecibo, San Juan, Mayaguez and Ponce, which 78 individuals participated to ready themselves in emergency preparedness and to train other health professions and communities in emergency management. Fifty-six of the TTT participants agreed to attend future workshops and to replicate the training to interested parties.

53) Skills for Psychological Recovery Workshop

Authors:

Judith Torres-Kilgore, Brittany Kovacs, Melanie Deal, Grace Viñas Joy and Irma Torres Rivera

Skills for Psychological Recovery (SPR) is an evidence-based intervention that includes skills to help community members better cope with disaster related trauma. This document reports on an evaluation of the first part of a training and support project for SPR, following the passage of Hurricane Maria in Puerto Rico. The project sought to recruit two behavioral health professionals to train and support the first and second responders by offering SPR workshops. The trainings were offered through systematic method, to improve the confidence and encourage the use of SPR by practitioners with members of the community. In the first part of the Project, the trainers recruited for the project facilitated five (5) sessions with a total of 119 participants, of which, 57 were part of the Department of the Family staff and 62 to the Puerto Rico Chaplains Corp. The practitioners reported greater confidence in the use of each SPR intervention after the training. According to the available data, 85% of the participants strongly agree to consider that the training had educational value and 52% of the participants strongly agree with the answer feel confident in facilitating the intervention. The most frequent barrier was the amount of time used for the training, were 13% of the participant's answer were neutral, disagree or strongly disagree that the time for the training was appropriate. For trainers, the psychology background and the orientation of cognitive-behavioral therapy (CBT) were related to their competencies to facilitate a training session for professionals. For the participants, having a background in behavioral health, gave them greater confidence to use the interventions. In summary, this study offers an idea of an assessment of large-scale mental health support and training program to improve the response to meet the mental health needs of people affected by a disaster.

54) Hurricane Maria Children and Youth Task Force Regionalization

Author:

Brittany Kovacs

Affiliations:

HSS RSF, ASPR

To address the needs of children and youth in Puerto Rico following the hurricane, the U.S. Department of Health and Human Services (HHS), through the Health and Social Services (HSS) Recovery Support Function (RSF), supported the regionalization of the Puerto Rico Children and Youth Task Force (CYTF). Through this project, the CYTF expanded from a single centralized task force in San Juan to multiple regional CYTFs in order to prioritize and address the needs of minors throughout the whole island.

The HSS RSF and the San Juan CYTF facilitator jointly developed the workshop content. Each regional workshop followed the same format in Spanish – an overview of the CYTF model and the tools and steps necessary to create a similar group, followed by a facilitated discussion to encourage interchange and relationship-building among participants. The formal presentation lasted about 40 minutes, and the remainder of the two-hour workshop was devoted to the facilitated discussion and time for the group to make decisions and plans about how to establish a CYTF in their region. Participants were encouraged to network with their peers after the workshop.

The facilitated discussion revealed several common challenges and gaps in services affecting children and youth across Puerto Rico such as lack of mental health services and public spaces or recreational/enrichment activities, negative impacts of societal issues and gaps in services by region.

These workshops were a successful first step in establishing regional CYTFs in Bayamón, Aguadilla, Mayagüez, Ponce, Arecibo, Caguas, and Humacao. They provided the first impetus for child- and youth-focused entities in each region to identify priorities in their regions and find the best strategies to work on them. In the future, these collaborative groups have the potential to address some of the most pressing issues facing Puerto Rican children and youth following Hurricane María.

Categories: **Children, Youth, Recovery**

55) Puerto Rico Department of Education Comprehensive Emergency Operations Planning Project

Authors:

C.J. Huff, Ed.D. and Carol Rivera

Hurricane Maria has provided an opportunity for reflection on current emergency operations and leadership practices across the island. In response, the Puerto Rico Department of Education (PRDE) requested technical assistance from the Health and Social Services (HSS)

Recover Support Function (RSF) to build capacity across the education system to ensure a safe and secure learning environment for children and the entire school community through peer mentorship, programmatic support and provision of technical assistance (TA). In response, the HSS RSF collaborated with relevant federal and commonwealth agencies to provide training and resources to create a comprehensive Emergency Operations Plan (EOP) inclusive of access and functional needs. The objective was to equip school leaders with the skills needed to facilitate the development of EOPs in every school, and to provide technical expertise to build leadership capacity of those responsible for leading recovery efforts. Thirteen introductory Emergency Operations Planning workshops occurred across PRDE's seven regions to approximately 753 school directors/principals. In addition to the basic training, the HSS RSF coordinated a Train the Trainer training through the Readiness and Emergency Management for Schools Technical Assistance Center. This training resulted in the training of nearly 75 trainers and 13 Master Trainers. As a result, leaders across the PRDE system will have the skills and tools needed to prepare, respond and recover from current and future disasters. At the request of Secretary Keleher, the HSS RSF also took the lead on collaborating with Federal and commonwealth partners in the development of an EOP Guide for Individuals with Access and Functional Needs to insure all populations were taken into consideration in the EOP planning process. The HSS RSF continues to work with relevant federal and commonwealth agencies to support the development of EOPs in every school by March 31, 2019.

56) Information Management: Supporting Hurricane Maria Recovery

Authors:
Priscilla Báez Merced, MPH; Diego A. Olivarez Chavez, MBA; and Scott Kaiser, MUEP

The Information Management Branch (IMB) supports the Health and Human Services (HHS) Health and Social Services Recovery Support Function (HSS RSF) by centralizing information and data collected through various activities related to impacts on the health and social service systems in Puerto Rico post-hurricane Maria. Utilizing a variety of data collection methods, including surveys, assessments, and interviews with health care facilities, schools, and elderly and day care centers across Puerto Rico, the IMB has been able to develop a library of data. Using qualitative and quantitative analysis the IMB team influences effective decision making and helps to identify gaps in response and recovery operations. The IMB is also a source for analyzing, maintaining, and sharing data and information from across the recovery mission. By integrating information gathered from a variety of datasets with Geographic Information Systems (GIS), the IMB has also developed maps to aid in planning and understanding of recovery efforts. By integrating with the Federal Emergency Management Agency (FEMA) the IMB has been able to effectively ensure valid data collection and dissemination and has enabled the HSS recovery efforts to be more effective. The IMB also works closely with the Puerto Rico Department of Health (PRDoH) on several projects, including development of databases and preparedness tools. Through effective data management and analysis, the Information

Management Branch has helped to develop a structured response effort and a foundation for disaster relief in Puerto Rico.

57) Disaster Preparedness Training for Emergency Medicine Residents.

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Introduction:

Emergency physicians play a front-line role in hospital disaster responses and as such require appropriate training. The aim of the current study was to pilot and compare the effectiveness of two disaster preparedness teaching interventions: the first employing traditional lecture-based instruction (LEC) and the second utilizing interactive simulation/game-based teaching (SIM).

Methods:

A two-group randomized pre- and post-test design was implemented into the didactic curriculum of the Emergency Medicine (EM) Residency Training Program at the San Lucas Episcopal Hospital in Ponce, Puerto Rico. Residents (n=23) completed either a LEC (control) or SIM custom teaching module (single day, one- to two-hours) focusing on emergency preparedness concepts, disaster related clinical decision-making and physician responsibilities during hospital disaster protocols. Knowledge-based multiple-choice exams and scenario-based competency exams were administered at three different time points: one-week pre-intervention, immediately post-training and two-weeks post-training. Test scores were compared between groups at each time point using the Mann-Whitney U test.

Results:

Following the teaching interventions, no significant differences were found between the LEC group versus the SIM group in knowledge-based exam performance (LEC 81.1%[9.4] vs. SIM 74.9%[12.1]; U=42.50, p=0.15) and scenario-based exam performance (LEC 80.0%[9.7] vs. SIM 80.2%[9.2]; U=62.00, p=0.83) suggesting both teaching methods were similarly effective. Indeed, knowledge-based exam scores improved two-fold and scenario-based exam scores improved by over 50% immediately following training relative to baseline exam scores. Two-weeks post-training, a significant decrease in scenario-based exam performance was found in the LEC group relative to the SIM group (LEC 63.1%[11.6] vs. SIM 75.4%[11.5]; U=91.50, p=0.036) suggesting

residents who train with simulations show greater retention of disaster scenario-based concepts versus those who train with lecture-based training alone.

Discussion:

The current study highlights the potential value of incorporating simulation training in EM disaster preparedness curriculums in improving knowledge and concept retention of critical physician responsibilities within disaster-related hospital protocols.

58) Epigenetic and Microbial Profiles Related to Hurricane Maria Prenatal Stressors

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The Developmental Origins of Health and Disease theory-DOHaD theory postulates that exposure to prenatal stressors during critical periods of early development could lead to permanent alterations of the developing tissues, which may increase the risk for future cardiometabolic and psychiatric disorders. Although the biological mechanisms that mediate these effects are not completely understood, recent studies indicate that epigenetic mechanisms and early life microbiome could be important mechanistic mediators in the DOHaD. On September 20, 2017, Puerto Rico (PR) was completely devastated by Hurricane Maria, a Category 4 storm wiped out electric power, water and food supplies, health care services and communications for several weeks up to months in the entire island. Threat to life and the loss associated with this hurricane are a source of increased prenatal maternal stress (PNMS) that could lead to significant mental health problems in the mother. Our general hypothesis is that children who were prenatally exposed to psychosocial and environmental stressors associated with Hurricane Maria in PR could have a higher risk for cardiometabolic and psychological health outcomes later in life, which could be partially due to early-life biological modifications in the epigenetic and/or microbiome profiles in response to these stressors. To begin testing this hypothesis we proposed a cross-sectional study to recruit a prospective birth cohort of 200 infants 12-15 months of age who were prenatally exposed to Hurricane Maria and their mothers and to collect detailed baseline data regarding potential hurricane-related prenatal stressors, as well as biological samples and clinical assessments. We will evaluate PNMS, defined as the presence of post-disaster maternal depression and/or PTSD, as well as hurricane experiences, living conditions, and nutrition, and evaluate associations with perinatal and early-life health outcomes. We will also compare the epigenetic and microbiome profiles between infants born to mothers with high vs. low PNMS.

*These authors have contributed equally to this project.

Categories:

- Individual and Community Resilience
- Vulnerable Populations
- Morbidity and Mortality Investigation and Reporting

59)A Mixed Methods Study To Explore The Effect Of Hurricanes Irma And Maria On Cancer Care In Puerto Rico

Vivian Colón-López1,2; Karen Ortiz-Ortiz1,2,3; Marievelisse Soto-Salgado1,4; Laura Zayas2,5; Yara Sánchez2,5; Eliezer Santos León5; Camiled Quirindongo2,6; Anndra Gonzalez7; Maria E. Fernandez8; Troy Quast9 and Eric Suarez5

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Hurricane Maria devastated the Caribbean region, particularly Puerto Rico (PR) causing widespread destruction and resulting in massive resource losses and economics costs. Critical acute issues raised during this catastrophe include collapse of the power and communications systems, sanitation and hygiene, water safety and infection control. It remains uncertain the impact of natural disasters on cancer, and how such a disruption will affect access to treatment especially those patients with breast and colorectal cancer (CRC), two of the most common cancers in incidence and mortality in PR. Studying the effects of Hurricane Maria on cancer treatment is relevant and of prominent importance for public health since it will have significant consequences to the health care system, since delay in cancer treatment might result in a poorer quality of life, spreading of the tumor, the need for more extensive therapy and ultimately poorer survival. A mixed-methods study to explore the individual and system-level factors related to disruption of cancer care is currently underway. In-depth interviews (n=40) with key staff at different levels (government, healthcare providers, community, professional and humanitarian organizations) as well as focus groups with patients (n=40) diagnosed 6 months prior the hurricane, will provide qualitative data on barriers and facilitators related to disruption and continuation of cancer care. Additionally, a cross-sectional telephone interview with 600 breast

and CRC patients will aid in the identification of factors associated with treatment disruption. We will collaborate with the the PR Central Cancer Registry, which for the first time will implement a rapid case ascertainment protocol for patient identification and recruitment, using population-based data from the registry. This project will serve to inform governmental health agencies in the island, emergency responders and clinicians how best to support and potentially mitigate the burden of cancer patients on treatment after a future major natural disaster.

Categories:

1. Vulnerable populations
2. Individual and community resilience

60) Geographic Information Systems (GIS) Analysis of a National Assessment of Nursing School Readiness for Radiation Emergencies and Nuclear Events in the United States

Authors:

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Abstract:

As part of the National Health Security Strategy, it is crucial that public health infrastructure be prepared to address emergencies resulting from nuclear war and other large-scale radiation events in the environment. Nurses play an important, front-line role in disaster response of this kind, and it is the responsibility of Schools of Nursing (SONs) across the country to develop a competent and prepared nursing workforce. This is achieved by offering student nurses specific content and training regarding appropriate response to nuclear and/or radiation emergencies. However, empirical evidence focusing on SONs' capacity to prepare nursing students for emergencies of this kind and the associated perception of risk is lacking. This study employed Geographic Information Systems (GIS) analysis of a cross-sectional survey administered to a nationwide population of SON administrators and faculty to assess content, faculty expertise, planning, and perception of risk related to radiation emergencies and nuclear events. Survey results were analyzed using GIS in order to ascertain the geographic risk and proximity of respondents who were located within emergency planning zones (EPZ) with a radius of 50 miles from sources of nuclear radiation (reactors and waste sites). Of the 605 survey respondents who provided a school ZIP code for mapping, 295 were located within an EPZ. 121 incorrectly reported the proximity (<50 miles) of their school to a nuclear reactor, and 15% of these responded that there was "no perceived risk" to explain a lack of radiation emergency curriculum. GIS analysis of

FEMA regions revealed high concentrations of schools of nursing and radiation sources, and examination of fault lines indicated significant geographic risk to SONs located in these areas. 12.5% of respondents reported having a radiation emergency operations plan in place. GIS analysis allows for spatial context of the results of this survey and emphasizes the importance of the findings.

Categories:

'Emergency Response and Trauma Systems'; 'Infrastructure'; 'Vulnerable Populations'

Crisis and Emergency Risk Communication (CERC) Training in Puerto Rico
Authors: Yvonne Cruz, Lisa Briseño, Belén Moran Bradley, Gilbert Ovalle, Christy Forrester

Communication during an emergency can determine the success of a response, affect the reputation of an agency, and inform the decisions and health behaviors of the public. The Health and Social Services Recovery Support Function (HSS-RSF) and Americares joined the Puerto Rico Department of Health (PRDOH) to host a series of Crisis and Emergency Risk Communication (CERC) workshops reaching 142 individuals. The CERC training enhanced crisis and emergency communication knowledge and skills among key Commonwealth and municipal government leaders and spokespersons in Puerto Rico. The PRDOH Office of Public Health Emergency Preparedness and Response was provided with the baseline knowledge and practical experience to train others in CERC principles and practice. The initial trainings reached communications directors, commonwealth leaders, mayors and municipal directors of emergency preparedness. An additional training was requested for the medical and organizational leadership of Commonwealth federally qualified health centers (FQHCs).

61) The Impact of Hurricane María upon Older Adults in Puerto Rico: an Assessment of Hurricane Stressors and Depression and Anxiety Symptoms

Wendeline M. Figueroa Hernández1,2; Aixa de Jesús Espinosa1,2; Maureen M. Canario de la Torre1,2; Sandra I. García Camacho1,2; Karen Martínez González, MD, MS3; Israel Almodóvar--Rivera1, PhD, MS; Cynthia M. Pérez Cardona, PhD, MS1

Introduction:

In less than two weeks, Puerto Rico suffered the impact of two hurricanes that caused catastrophic damage to the island's infrastructure and health care system. Previous literature suggest that natural disasters can be harmful for mental health. Thus, we expect an increase in the prevalence of depression and anxiety symptoms in the elderly population, given exposure to

hurricane related stressors. Current studies on mental health of older adults are scarce, and after a catastrophic event the importance for this information is greater.

Objective:

To estimate the prevalence of depression and anxiety symptoms in older adults and examine its associations with hurricane stressors.

Methods:

A household survxey using a probability sample of 168 non-institutionalized individuals aged ≥60 residing near the Puerto Rico Medical Center was conducted nine months after Hurricane Maria. The survey assessed hurricane stressors and screened for depressive and anxiety symptoms using the Patient Health Questionnaire-9 and Anxiety Sensitivity Index, respectively. Prevalence was estimated using marginal standardization following a logistic regression. Multivariable logistic regression models determined the associations of hurricane stressors with depression and anxiety symptoms while controlling for possible confounders.

Results: Weighted prevalence of depression (25.6%) and anxiety (13.1%) symptoms was elevated. Only the perception that life was threatened was significantly associated with increased odds of both symptoms of depression (OR=3.31) and anxiety (OR=2.78). Stressors significantly associated with depression symptoms also included: property damage (OR=3.24), shortage of hygiene products (OR=2.39) and shortage of medications (OR=7.12).

Conclusion: The high prevalence levels of depression and anxiety symptoms, along with the strong associated hurricane stressors suggest the need to improve our mental health services. Communities with a quality health care service will to reduce the long-term consequences of mental health following a natural disaster.

62) Metals Testing in non-PRASA drinking water systems: A Pilot Study

Abigail Harvey, Massachusetts Institute of Technology Department of Civil and Environmental Engineering. Tchelet Segev, Massachusetts Institute of Technology Department of Civil and Environmental Engineering. Susan Murcott, Massachusetts Institute of Technology Development Laboratory.

In order to quantify the levels of metals in drinking water in Puerto Rico, household drinking water from communities in nine municipalities were tested for a suite of metals. One community was selected from each of the following municipalities: Aguado, Anasco, Barranquitas, Caguas, Corozal, Las Piedras, Penuelas, San Lorenzo, and Yabucoa. In each community, drinking water was collected from four homes of a variety of ages.

Methods Two samples were collected per house: a running and a standing sample. For the standing sample, water was collected from a tap that was unused for at least six hours. For the

running sample, the same tap was flushed for two minutes before sample collection. Approximately 2 liters were collected per sample. Indoor taps were used when possible. Samples were also collected from the source water of each community's water system if feasible.
Samples were analyzed on an Inductively-Coupled Plasma Mass Spectrometer (ICP-MS) at the Massachusetts Institute of Technology for a suite of metals: lead, arsenic, aluminum, chromium, manganese, iron, cobalt, nickel, copper, zinc, and cadmium.
Results In total, 75 samples from homes, community storage tanks, and community wells were collected and analyzed. Thirty-six homes were represented in the study. Of these, nine homes exceeded the EPA action levels for both lead and copper, in their standing samples only. Five homes exceeded the EPA guideline of 10 parts per billion for arsenic, four of which are from Añasco.
Conclusions Lead is present above the EPA action level only in standing samples; flushing the water in these homes will reduce lead levels. Arsenic is near or above the EPA guideline in certain municipalities: Añasco, Palmarito, and Oquendo. Further lead and arsenic testing needs to be conducted throughout Puerto Rico to determine the extent of lead and arsenic contamination in the island's drinking water.

63) Water Quality Testing in Puerto Rico Non-PRASA systems

Abigail Harvey, Massachusetts Institute of Technology Department of Civil and Environmental Engineering Tchelet Segev, Massachusetts Institute of Technology Department of Civil and Environmental Engineering Susan Murcott, Massachusetts Institute of Technology Development Laboratory Post-disaster, communities often lack capabilities for water extraction and treatment, and may rely on unassessed and potentially unsafe water sources for drinking water. Drinking water testing can be costly and require days to weeks to receive results. Use of the EC-kit created by Susan Murcott at the Massachusetts Institute of Technology can provide quick, inexpensive testing of basic drinking water quality parameters: E. coli and total coliform. The two tests included in the kit, Colilert and Petrifilm, are incubated for 24 hours using only body heat. Results for e. Coli and total coliform and health risk ranges can be established for the water source after reading results from the two tests.
The EC-kit was deployed in Puerto Rico non-PRASA systems in June-December 2018 following Hurricane Maria. Forty-five non-PRASA systems were tested using the kit and seven non-PRASA systems were identified to contain e. Coli.
Further EC-kit training throughout Puerto Rico and other Caribbean islands may allow these kits to be deployed immediately following any future disasters and provide results about drinking water quality, reducing spread of waterborne diseases post-hurricane.

64) The medical, public health, and emergency response to the impact of 2017 Hurricane Irma in Cuba

Tanya L. Zakrison, MHSc MD FRCSC FACS MPH
Davel Milian Valdés MD
James M. Shultz MS PhD

Abstract

In 2017, Cuba was pummeled by Hurricane Irma, one of the strongest and most devastating Atlantic basin hurricanes in history. Hitting 12 of 15 provinces, Irma impacted 90% of the population and causing the total collapse of the National Electric Generation System. Despite the significant damage, Cuba's recovery was precipitous given their unique response system, despite ongoing economic hardships. Electrical power was restored to the capital city Havana, within 72 hours, with 87% nation-wide coverage within 9 days. Cuba also dispatched medical and energy brigades to assist neighboring Caribbean populations while local recovery continued. This response is unique in terms of Cuba's internal and external response to natural disasters. Cuba's disaster self-sufficiency and timely response to Hurricane Irma was grounded on five decades of disaster planning coupled with ongoing evolution of disaster risk reduction and management strategies. Five defining characteristics were evident in the response to Irma: 1) learning and incorporating lessons from past disaster events, 2) integrating healthcare and public health professionals on the frontlines of disaster response, 3) actively engaging the public in disaster preparedness, 4) incorporating technology into disaster risk reduction, and 5) infusing science into risk planning. A centralized command center with local dispatch response teams, a model unique to Cuba, allowed for this rapid recovery.

65) Initial Impacts of Hurricane Maria on Migratory Bird Diversity on Punta Cucharas Nature Reserve, Ponce, Puerto Rico

Authors: Eduardo M. Llegus Santiago1,4, Ian L. Maldonado Ortiz2,4, Gilmarie Rivera Castellar3,4,5, José G. Rodríguez Ramírez, PhD2

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ABSTRACT Introductions: Populations of birds all over the world migrate to Puerto Rico during winter season to look for food resources, and breeding sites. Migratory birds have an important

role as bioindicators of environmental conditions, pollination, seed dispersal and the trophic structure of Punta Cucharas Natural Reserve, yet habitat loss threatens their population. Punta Cucharas located in Ponce Municipality, Puerto Rico has an area of 35 hectares that includes mangroves, xerophytic forest, lagoons, salty plains, sandy beach, and a century-old fishermen settlement. The reserve provides habitat and stopover sites for over 80 species birds, endemic and migratory, including the endangered species White-cheeked Pintail. In September 20, 2017, Hurricane Maria's compelling winds and rainfall defoliated trees and flooded the breeding grounds of Punta Cucharas. Aim: The objectives of this study were to compare the estimated population size of bird species before and after Hurricane Maria and to evaluate habitat conditions. Methods: To determine the effect of Hurricane Maria on the avian diversity during the migration season before and after Hurricane Maria we conducted 10-minute bird counts in six different habitats from September to December during years 2016 and 2017. We performed the Krustal- Wallis test (α=0.05) to compare bird species diversity between habitats and years. Results: The test provided statistical evidence to determine significant difference in diversity of bird species (P=0.01, dF=1) between both years, and forest/mangrove habitats. In addition, bird individuals declined in 52% from population afore the impact from María, however, we sighted new species not seen before. Conclusion: This assessment provides an initial information that will help to identify where post-Hurricane recovery efforts must be focused relative to conservation and land management decisions within Punta Cucharas Natural Protected Area. Our surveys inform us about changes in search for food supplies and habitat use by migratory birds, as well may serve as a post-hurricane baseline to monitor avian population responses over time.
Categories: Serial Hurricanes; Vulnerable Populations; Infrastructure
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66) Proyecto Juracán: Necesidades de la población trans en Puerto Rico luego del impacto del Huracán María

Autores:

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El bienestar psicológico, físico y social de las comunidades y los individuos podría verse impactado significativamente ante el impacto de desastres naturales. Poblaciones vulnerables, como personas transgénero (trans), están más susceptibles a sufrir mayores impactos por el paso de un huracán y a requerir múltiples apoyos para recuperarse. Esto debido a condiciones sociales pre-existentes incluyendo la pobreza y el estigma social. En septiembre de 2017, el

Huracán María tocó tierra en Puerto Rico (PR) causando daños físicos, limitando servicios de primera necesidad. Esta situación se vio agravada con el limitado apoyo recibido en algunos sectores poblacionales para una recuperación exitosa. El objetivo de este análisis fue explorar las necesidades de la población trans luego del Huracán María en PR.

Se utilizó una encuesta exploratoria, prospectiva y transversal para la recopilación de datos creada por Coaí, Inc., organización de base comunitaria que le brindó servicios de primera necesidad a participantes que se auto-identificaron como personas trans. Se utilizó SPSS v.22 para analizar los datos.

La edad promedio de los participantes (n=49) fue de 35 años. La mayoría (76.6%) se identificó como mujeres trans y más de la mitad (59.2%) residían en el Área Metropolitana de San Juan. Un 95.5% de los participantes informó encontrase sin acceso o con acceso limitado a alimentos y 86.7% no tenia acceso a servicios de agua potable. Cerca de la mitad (49.3%) informó tener: necesidades relacionadas a la salud, poco o ningún acceso a medicamentos, incluyendo hormonas, y necesidades de salud mental o algunas afecciones crónicas no controladas. Por otra parte, 50% no sentían seguridad en sus casas luego del huracán.

Este estudio documenta el estado precario que sufrió la población trans luego del Huracán María. La invisibilidad de ciertos grupos sociales y su exposición a los desastres naturales debe requerir atención especial. Es necesario el desarrollo de futuras investigaciones que aspiren a reducir el discrimen y la vulnerabilidad social para tener un mejor manejo de necesidades durante futuras emergencias.

POSTERS

Title	Authors/Institutional Affiliation	Theme	Poster Presentation Article	Email of Corresponding Author	Abstract Number
Individual Resilience in an Eastern Community of PR that Received the First Impact of Hurricane Maria	Alexandra Rivera Gonzalez, Julio M Cuevas Cruz, Alexandra Claudio Mercano, Alessandra Torres Garcia, Waila Castro Rosado, Javier Cevallos Ramos, Sylvette Garcia Llovet, Valeria Menedez Rosas, Xiomara Mercado Lopez, Gabriela Molina Arroyo, Frances Morales Ramos, Soleil Rivera Figueroa, Dalia Rodriguez Maysonet, Ana Rossado Philippi, Kimberly Velazquez Rodriguez, Marisol Pena Orellana, Ruth Rios Motta, Liza Millan Perez University of Puerto Rico, Masters in Public Health Program	Community Resilience	Presentation	Alexandra.rivera@upr.edu	1
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Pediatric Environmental Health Hurricane	Teresa Herrera, MPH and Perry Elizabeth Sheffield MD, MPH	Capacity building program for	Poster	Teresa Herrera Mtherr828@gmail.com	4

Recovery Campaign of Federal Region 2, Pediatric Environmental Health Specialty Unit	Mount Sinai School of Medicine, New York, NY	pediatricians and caregivers of children for disaster preparedness and flooding.			
The Gendered Impacts of Hurricane Maria on Water, Sanitation and Hygiene Practices	Christiana Smyrilli, Pamela Silva Diaz, Lenulisy Rosado, Martha Thompson OXFAM	Vulnerable populations and Infrastructure	Presentation	Pamela Silva pamcsilva@gmail.com	5
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Initial Impacts of Hurricane Maria on Migratory Bird Diversity on Punata Cucharas Nature Reserve, Ponce Puerto Rico	Eduardo M. Llegus Santiago, Ian Maldonado Ortiz, Jose Rodriguez ramirez, Gilmarie Rivera Castellar Department of Environmental Health, University of Puerto Rico and Medical Sciences Campus at University of Puerto Rico and USDA Forest Service	Infrastructure and Vulnerable Populations in Serial Hurricanes	Poster	Eduardo Llegus Santiago Eduardo.llegus@upr.edu	19
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and Vulnerability and Analyzing Strengths and Weaknesses of Emergency Response Plans in Two Centers in Rural Puerto Rico	Hospital General Castaner, Lares, Puerto Rico and Corporacion de Servicios Medicos	Populations, Hospitals and Clinics			
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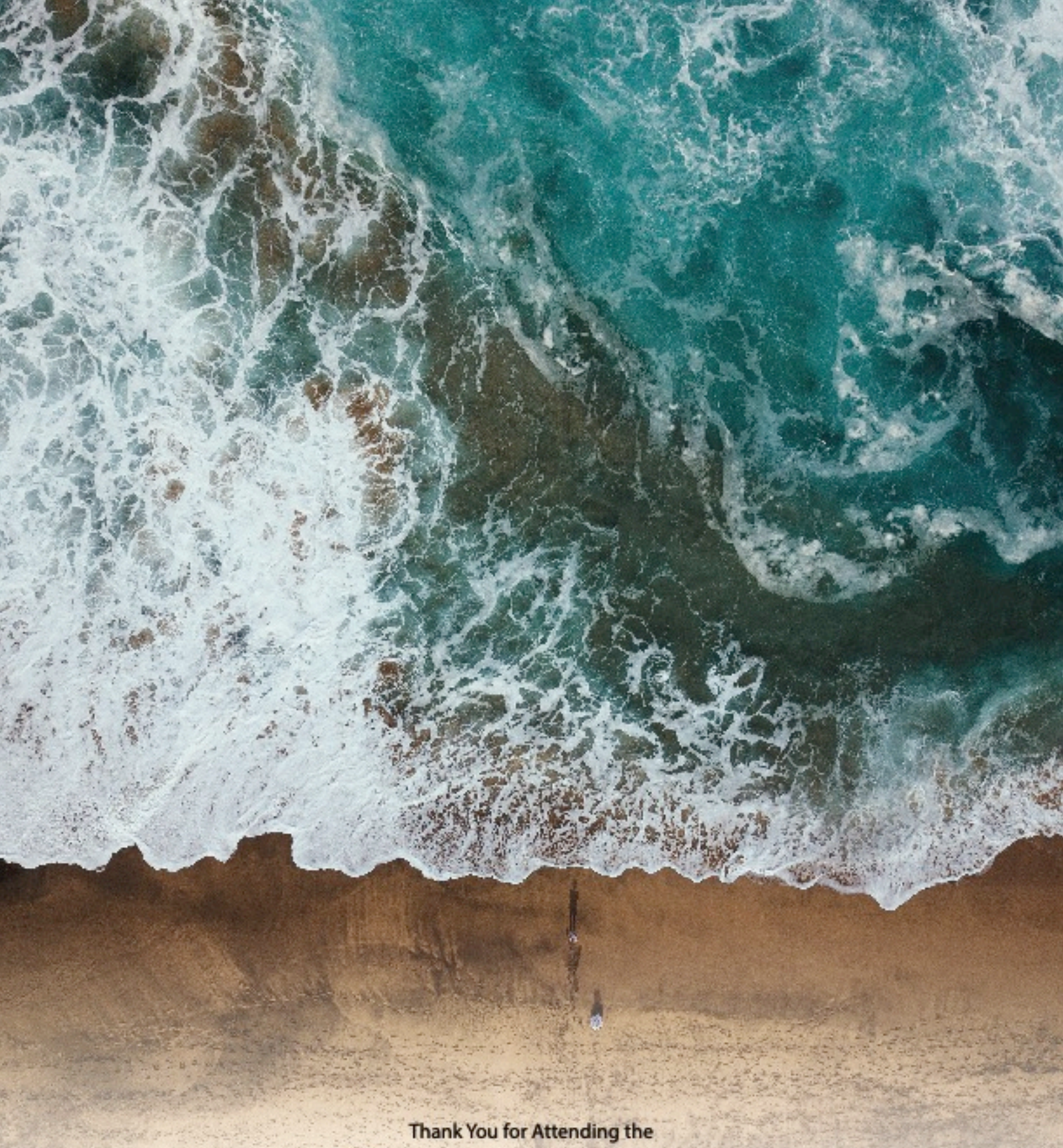
approach to advance the bridge between rhetoric and the implementation of policies. Beyond, health policies should balance social progress; and the environmental, and economic sustainability.



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