

3. Lichtveld M, Covert H, Sherman M. The Gulf Region Health Outreach Program as a model for strengthening the fragile public health infrastructure. *J Public Health Manag Pract.* 2017;23(suppl 6): s8–s10.

4. Merchant Marine Act of 1920. Pub L. No. 66–261, 41 U.S.C. Stat. 988 (1920).


5. Lichtveld M, Kennedy S, Krouse RZ, et al. From design to dissemination: implementing community-based participatory research in postdisaster communities. *Am J Public Health.* 2016;106(7): 1235–1242.

6. Lichtveld M, Wahid FA. Climate change and health: a Caribbean region

imperative. *West Indian Med J.* 2017;66 (suppl 1):1–2.

7. Resilient America Roundtable. Measuring community resilience. 2017. Available at: http://sites.nationalacademies.org/PGA/ResilientAmerica/PGA_178493. Accessed October 2, 2017.

Maria in Puerto Rico: Natural Disaster in a Colonial Archipelago

 See also Zolnikov, p. 27; Lichtveld, p. 28; Dzau et al., p. 32; and Woodward and Samet, p. 33.

The devastation caused by Hurricane Maria exposed the colonial condition of Puerto Rico. If anything has been evidenced in the aftermath of the hurricane, besides the sociopolitical crisis in Puerto Rico, it is the ability of the people of Puerto Rico to overcome adversity. In this process we witnessed solidarity and commitment to the restoration of our communities. I could share many examples, but would like to highlight two, that, to my understanding, best represent this.

First, the Puerto Rican diaspora played a major role in the preparation for and response to the natural disaster. During and after the impact of Hurricane Maria, we witnessed Puerto Ricans not currently living in the islands supporting and organizing aid for those in Puerto Rico. Social media became a place to share their hopes, frustrations, and readiness to assist. In Puerto Rico, there are nearly 3.5 million residents, but there are many more Puerto Ricans not living on the islands. Yet, distance has not curtailed their commitment to Puerto Rico. I and many others are thankful to the Puerto Rican diaspora for the pressure they

exerted upon politicians and in the national and international media. Their interventions made the humanitarian crisis experienced in Puerto Rico visible, helped in the emergency response, and sustained public discussion.

Secondly, community-level actions were fundamental in restoring access to neighborhoods and, ultimately, saving lives. One major failure after the impact of Hurricane Maria was the time it took national and federal authorities to reach rural areas of Puerto Rico. When media were able to reach these areas, most of the images and stories shared showed communities rallying to assist elders in getting drinking water, clearing debris from roads, and organizing shared cooking spaces.

The experience of Puerto Rico is shared with that of other countries in the Caribbean region known to be in the “Hurricane Alley.” Although certain disasters and public health emergencies can be predicted in this region, it is not only their geographical location, but also their colonial or postcolonial status, with chronic financial and public health implications, that increases their vulnerability to such disasters.

AN UNINCORPORATED TERRITORY

Puerto Rico is an organized but unincorporated territory of the United States of America since 1898, after the Spanish–American War. Nearly half of the adults in the United States do not know that Puerto Ricans are fellow citizens,¹ yet Puerto Ricans are US citizens by birth since 1917. As an unincorporated territory of the United States, Puerto Rico lacks self-determination, and Puerto Ricans on the islands do not have full representation in Congress and cannot vote for president. Furthermore, because of Puerto Rico’s territorial status, US federal mandates take precedence over local legislation and policies in all areas of governance.

As a territory, Puerto Rico also contributes to the annual appropriation of funding to the Federal Emergency Management Agency (FEMA), and

relies on its support in case of emergencies. However, the destruction brought by Hurricane Maria exposed colonial laws that limit the scope of actions that Puerto Rico has in response to emergencies. Examples of these laws are The Merchant Marine Act of 1920, also known as the Jones Act, and the Puerto Rico Oversight, Management, and Economic Stability Act or PROMESA. The Jones Act established that the maritime waters and ports of Puerto Rico are controlled by US agencies.² Under this kind of control, the cost of consumer goods arriving to Puerto Rico can be higher than in the continental United States. The Jones Act also restrains the ability of non-US vessels and crews to engage in commercial trade with Puerto Rico. Similarly, in 2016, PROMESA was imposed on Puerto Rico and its inhabitants as a way to deal with the economic crisis.³ PROMESA limits the Puerto Rican government’s disaster response by restricting the amount of resources the state can mobilize locally in attending to the crises brought by the 2017 hurricane season.

ABOUT THE AUTHOR

Carlos E. Rodríguez-Díaz is with the Doctoral Program in Public Health with specialty in Social Determinants of Health and the Center for Evaluation and Sociomedical Research, Graduate School of Public Health, University of Puerto Rico—Medical Sciences Campus, San Juan.

Correspondence should be sent to Carlos E. Rodríguez-Díaz, Associate Professor, Doctoral Program in Public Health with Specialty in Social Determinants of Health and the Center for Evaluation and Sociomedical Research, Graduate School of Public Health, University of Puerto Rico—Medical Sciences Campus, PO Box 365067, San Juan, PR 00936-5067 (e-mail: carlos.rodriguez64@upr.edu). Reprints can be ordered at <http://www.ajph.org> by clicking the “Reprints” link.

This editorial was accepted October 16, 2017.
doi: 10.2105/AJPH.2017.304198

DISASTER IN CONTEXT

Puerto Rico is an archipelago located in the Caribbean basin, 1000 miles southeast of Florida. On September 20, 2017, Hurricane Maria struck Puerto Rico as a category 4 hurricane. This was just 2 weeks after category 5 Hurricane Irma impacted Puerto Rico and caused significant damage to the electric infrastructure, houses, and roads leading to the declaration of disaster zones in nearly 30 municipalities. In early October 2017, it was estimated that the impact of Hurricane Maria in Puerto Rico included nearly 51 confirmed deaths and more than 900 more caused by—allegedly—natural causes, the total destruction of the electric infrastructure, major interruptions in telecommunications, significant damage to highways and roads, and limited access to potable water and food. In the aftermath of Hurricane Maria, issues of governance were evident, as well as limited ability in the implementation of emergency preparedness plans and, perhaps most importantly, the impact of structural determinants of health.

“FINANCIAL CRISIS”

The so-called “financial crisis” that Puerto Rico is facing dates back to 1917. The same law that made Puerto Ricans US citizens empowered the islands to raise money by issuing tax-exempt bonds. That centenary provision helped successive Puerto Rican governments accrue an unmanageable debt as some investors have grown

tax-averse and eager to shelter income. Over time, the socio-political context of Puerto Rico changed; significant transformations in federal laws took place; a substantial amount of professionals, students, and families left the islands; and Congress stripped Puerto Rico of bankruptcy rights.

Currently, Puerto Rico owes more than \$100 billion in bonds and unpaid pension debts. This represents nearly 70% of the territory’s gross domestic product. This debt has not been audited, but under the provisions of the PROMESA law, a Fiscal Oversight and Management Board has been instituted, and under its austerity budget, the Puerto Rican government has already established several measures, including increases in taxes and cuts in public services, to ensure debt obligations see payment.

What Puerto Rico has experienced since September 2017 was a perfect storm caused by the natural disaster of a major hurricane and a human-made financial crisis manufactured by bankers and predatory class of investors. Hurricane Maria was

the first major hurricane of the 21st century to land on Puerto Rican soil. The country had experienced similar atmospheric events in 1928, 1989, and 1998, but Puerto Rico never had to overcome the impact of a major hurricane under the current political and economic constraints. Advances in meteorological sciences facilitate reliable information that is critical for individual and social preparedness in the event of hurricanes. Under the economic and social circumstances imposed by austerity measures in Puerto Rico, it was impossible for individuals and their government to be prepared for hurricanes and their aftermath.

PUBLIC HEALTH PROBLEMS

Puerto Rico is also burdened with major public health problems. When compared with US states and territories, Puerto Rico has the highest prevalence rates of premature births,⁴ one of the highest incidence rates of HIV,⁵ and was the focal point of the Zika virus epidemic.⁶ The potential implications of the aftermath of Hurricane Maria are severe for public health, when one considers that Puerto Rico is also structurally underresourced. A lack of systematic health and humanitarian disaster relief has led, predictably, to outbreaks of infectious disease (e.g., leptospirosis, scabies), limited access to clean water, and malnutrition, among other problems. The possible implementation of further austerity measures on Puerto Rico’s government budget raises even more concerns about the availability of local resources to address the health care challenges posed by the public health

situation after Hurricane Maria. Moreover, the federal response to the emergency in Puerto Rico has been slow and limited. Poverty has the largest impact in terms of health inequities after the hurricane and magnify the impact of social determinants of Puerto Ricans’ health (e.g., housing, health care services, access to clear water and sanitation).

RESILIENCE? I CALL IT RESISTANCE

The community response in Puerto Rico evidenced fundamental collective competencies that public health workers must nourish. We must continue supporting the development and implementation of evidence-based interventions that use relevant theories. Any such interventions should be aimed not only at the individual, but also, importantly, at the community and structural levels to improve and sustain healthy environments. We have the capacity to develop and respond with grass-root initiatives that might be more culturally relevant than poorly adapted evidence-based interventions developed elsewhere.

Some may call what happened in Puerto Rico after the impact of Hurricane Maria resilience; I call it resistance. We have not been knocked down. In any case, the impact of Hurricane Maria may be providing the evidence needed to recognize colonialism as the ultimate social determinant of health in Puerto Rico. **AJPH**

*Carlos E. Rodríguez-Díaz,
PhD, MPHE, MCHES*

ACKNOWLEDGMENTS

The author is thankful to Enbal Shacham, PhD, Adriana Garriga-López, PhD,



Source. Photo taken by Angelina Ruiz-Lambides in Punta Santiago, Cayo Santiago Biological Field Station, University of Puerto Rico School of Medicine. Printed with permission.


The text says “SOS, We need water/food.”

Alfredo Morabia, MD, PhD, and members of the SexTEAM at the University of Puerto Rico—Medical Sciences Campus for helpful comments on earlier versions of this editorial.

REFERENCES

1. Morning Consult. National tracking poll #170916. Available at: https://morningconsult.com/wp-content/uploads/2017/10/170916_crosstabs_pr_v1_KD.pdf. Accessed October 14, 2017.
2. Merchant Marine Act, Pub L No. 66-261, 41 Stat 988 (1920).
3. Congress of the United States of America – House of Representatives. Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA). Available at: <https://www.congress.gov/bill/114th-congress/house-bill/5278/text>. Accessed October 14, 2017.
4. March of Dimes. 2106 preterm birth report card. Available at: <https://www.marchofdimes.org/materials/premature-birth-report-card-united-states.pdf>. Accessed October 14, 2017.
5. Centers for Disease Control and Prevention. HIV Surveillance Report, 2015; vol. 27. 2016. Available at: <http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Accessed October 14, 2017.
6. Rodríguez-Díaz CE, Garriga-López A, Malavé-Rivera SM, Vargas-Molina RL. Zika virus epidemic in Puerto Rico: health justice too long delayed. *Int J Infect Dis*. In press.

After Harvey, Irma, and Maria, an Opportunity for Better Health—Rebuilding Our Communities as We Want Them

 See also Zolnikov, p. 27; Lichtveld, p. 28; Rodríguez-Díaz, p. 30; and Woodward and Samet, p. 33.

Damage from Hurricanes Harvey, Irma, and Maria is likely to cost hundreds of billions of dollars. Countless homes, schools, hospitals, vehicles, and critical infrastructure have been damaged or wiped out. Rebuilding will take years, even decades. There is no silver lining in this crisis, but there is a once-in-a-lifetime opportunity: to rebuild the affected communities in ways that make Americans safer, healthier, and better prepared for the next challenge and to remind all communities of the importance of engaging in preplanning for disasters so they are more resilient and better able to realize healthier communities.

KATRINA AND NEW ORLEANS

Major disasters—including weather events, disease outbreaks, and terrorist attacks—reveal

both strengths and weaknesses in our communities' ability to respond and recover. They are, thus, important opportunities to learn and improve. After Hurricane Katrina, New Orleans, Louisiana, experienced an 80% reduction in hospital capacity, and more than 75% of safety net clinics closed, leaving hundreds of thousands without access to care. The storm was a catastrophe of unimaginable proportions; yet, in the words of Karen DeSalvo, former acting US Assistant Secretary for Health and former health commissioner of New Orleans, it was “an unprecedented opportunity to redesign a major American health care sector from the ground up.”^{1(p223)}

The fact was that New Orleans and the surrounding region were not very healthy before Katrina struck. A huge percentage of the population was uninsured, and rates of

heart disease, stroke, and diabetes far exceeded the national average. For Medicare patients in the state, quality of care ranked both lowest in quality and highest in expense. So, when Katrina provided a clean slate, the region decided to make the most of it.

The Louisiana Health Care Redesign Collaborative was established to improve health and health care in the state by rebuilding with a focus on four key areas: primary care and prevention, quality of care, use of health information technology, and broader insurance coverage. Within five years of the storm, the region was seeing results. More than 300 000 patients had visited new primary care facilities, and emergency department visits

declined. In 2010, 74% of patients in New Orleans reported satisfaction with care quality, compared with a 39% national average.

SOCIAL DETERMINANTS OF HEALTH

The September supplement of *AJPH* dedicated to preparedness reviews the progress achieved since 2001. However, although access to high-quality health care is an important prerequisite for strong and resilient communities, attending to social determinants of health—such as adequate housing, ample opportunity for recreation and exercise, access to healthy food, and robust social networks—is just as essential. After Katrina, communities revitalized flooded areas as family parks and meeting centers and engineered berms that also serve as walking trails. Just outside the French Quarter, the newly constructed Crescent Park Trail offers a safe place for walking and biking and features a pedestrian bridge with access to shared green

ABOUT THE AUTHORS

Victor J. Dzau is with the National Academy of Medicine, Washington, DC. Nicole Lurie is a former US Assistant Secretary for Preparedness and Response. Reed V. Tuckson is with Tuckson Health Connections, Sandy Springs, GA.

Correspondence should be sent to Reed V. Tuckson, MD, FACP, Managing Director, Tuckson Health Connections, LLC, 227 Sandy Springs Place, Suite D-346, Sandy Springs, GA 30328 (e-mail: rdreed@tucksonhealthconnections.com). Reprints can be ordered at <http://www.ajph.org> by clicking the “Reprints” link.

This editorial was accepted October 15, 2017.
doi: 10.2105/AJPH.2017.304194