Medical and psychosocial needs of the Puerto Rican people after Hurricane Maria

Lilly Ramphal, MD, MPH^{a,b}

^aSchool of Public Health, University of North Texas, Fort Worth, Texas; ^bRetired medical director, Blue Cross Blue Shield of Texas

ABSTRACT

A community clinic in Puerto Rico, the Bantiox Clinic, was developed to serve the medical needs of Toa Baja and the surrounding communities after Hurricanes Irma and Maria in response to an urgent need for medical treatment of the community residents. Within 4 months, the clinic had 4941 total visits. The Toa Baja residents used the clinic more than the offsite residents. Certain offsite towns needed medical care more than others, suggesting a lack of medical access in the mountainous areas. Elderly patients with chronic diseases were served more than younger patients. Hypertension, diabetes, and medication refills appeared to be the primary reasons for treatment. The suicide rate increased 16% from 2016. The unemployment rate and the migration rate in all occupations have continued to increase after Hurricane Maria. Puerto Rico is a human laboratory that shows the medical needs of an island after devastating climate events and provides insight on ways to better prepare for such emergencies.

KEYWORDS Disaster relief; hurricane; Puerto Rico

The Bantiox Clinic was started as a collaborative effort between community and nonprofit organizations to treat homeless and dislocated populations affected by the climate disasters after Hurricanes Irma and Maria in Puerto Rico. Despite its vulnerable location and susceptibility to the Caribbean climate, Puerto Rico did not have a mitigation plan in place for natural disasters prior to Hurricane Maria.¹ Toa Baja, Puerto Rico, was impacted with torrential rainfall and ocean swells that flooded a major river, Rio Plata. The town's storm drainage was overwhelmed with 6- to 12-foot water swells that damaged most of the houses and businesses in the area. Medical professionals became scarce and were not available to care for acute and chronic medical issues affecting the community. In the mountains where most residents' fragile homes and roads were decimated, access to medical care became difficult, especially for the elderly. Public health data were collected to document the Bantiox Clinic's activity subsequent to the hurricanes and reflect the medical needs of a community impacted by these events. Data were collected from existing charts of clinic patients and presented in a collective format.

CLINIC ACTIVITY

During the months of late September, November, and December 2017 and early January 2018, volunteer staff and

physicians treated 4941 patients. Patients were treated and given prescriptions, medicines, and supplies that had been donated to the clinic. As shown in *Table 1*, clinic services were used more by women more than men and more by adults ≥ 51 years than other age groups. The number of onsite visits totaled 3821, with most patients living in the immediate Toa Baja community. Staff traveled weekly to communities in the interior of the island where the damage of the hurricane was great. The number of offsite visits in these communities was 1120 (*Table 1*). The staff saw patients with prearranged appointments on a first-come, first-served basis. *Table 2* shows the distribution of the offsite visits; the areas most in need of medical care included Campanilla, Loisa, and Naranjita. This is important to evaluate in terms of allocation of resources. The need for continued offsite visits is necessary due to lack of access to medical care for these residents. There were numerous transportation challenges to and from the outlying areas, as well as lack of provider availability among the clinic's volunteers to go to the outlying areas.

Figure 1 shows that the care and management of chronic disease, such as hypertension, diabetes, medication refills, and different types of infections including respiratory and skin infections, was the greatest service provided by the clinic. These needs appeared greatest among the elderly.

Corresponding author: Lilly Ramphal, MD, MPH, FACOEM, Independent Consultant in Occupational and Environmental Medicine, 1510 Crowley Rd., Arlington, TX 76012 (e-mail: lramphal14@gmail.com)

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Table 1. Characteristics of 4941 patients and visits at the Bantiox Clinic, Puerto Rico

Category	Variable	N (%)
Sex*	Female	2866 (58%)
	Male	2075 (42%)
Age (years)*	1–10	198 (4%)
	11–20	346 (7%)
	21–30	247 (5%)
	31–40	445 (8%)
	41–50	692 (14%)
	51–60	1087 (22%)
	61–70	939 (19%)
	71–80	642 (13%)
	81–100	355 (7%)
Onsite visits*	September–October 2017	1925 (39%)
	November 2017	1055 (21%)
	December 2017	515 (10%)
	January 1–10, 2018	118 (2%)
	Referred cases	208 (4%)
	Total	3821 (77%)
Offsite visits	September–October 2017	63 (1%)
	November 2017	542 (11%)
	December 2017	423 (9%)
	January 1–10, 2018	92 (2%)
	Total	1120 (23%)

* $P < 0.0001$ for men vs women, age <50 vs ≥ 50 , and onsite vs offsite visit.

Although the clinic's medical intake questionnaire did not routinely screen for depression and anxiety, most of the patients complained of anxiety related to possible future climate events, housing, transportation, and food insecurity. A recommendation was made to the clinic staff and physicians to routinely screen patients for depression. Psychosocial needs were especially evident among elderly residents who had lost homes and had no family support for alternative housing or livelihood. A volunteer clinical psychologist and four social workers were added to the services provided by the clinic shortly after it opened in late September 2017. The most severe cases in the Bantiox Clinic who verbalized suicidal intent were referred for hospital treatment. In the early days of the clinic's opening, three documented patient suicides occurred among two elderly patients and the daughter of one of these senior patients. No suicides were documented after that time, which speaks to the effective intervention of the clinic's treatment for depression.

Once a week, the clinic staff made nighttime excursions to serve the homeless, intravenous drug abusers, and prostitutes. The staff provided medical care, clean syringes, condoms, social services, and psychological counseling. This activity was a public

Table 2. Offsite clinic visit locations

Location	N (%)
Arecibo	34 (3%)
BA Parajos	54 (5%)
Bucarabones	34 (3%)
Bayamon Alegre	41 (3%)
Candelaria	52 (5%)
Campanilla	147 (13%)
Capitullo	35 (3%)
Ciales	48 (4%)
Dorado	40 (3%)
Humacao	65 (6%)
Jayuya	14 (1%)
Lares	59 (5%)
Loisa	137 (12%)
Manati	36 (3%)
Morovis	17 (1%)
Naranjito	89 (8%)
Rio Piedras	63 (6%)
San Jose	30 (3%)
Vietnam	22 (2%)
Villa Calma	41 (3%)
Yabucao	62 (5%)
Total	1120 (100%)

health initiative intended to mitigate the spread of communicable diseases such as HIV and respiratory and blood-borne infections during times of disaster. It would be interesting to measure its impact before and after the events of Hurricane Maria.

DISCUSSION

Psychosocial issues come to the forefront in medical disaster relief efforts. Compared with 2016, the number of suicides in Puerto Rico was 16% higher 4 months after these hurricanes and 26% higher 6 months after Hurricane Maria.

Figure 1. Diagnostic categories of patients seen at clinic visits.

Specifically, 26 people—nearly one a day—took their own lives in November 2017.² The insecurity of housing, food, and utilities after the hurricane has been shown to contribute to the rise in suicide. Krug et al documented that suicide rates increased 31% after hurricanes and other climate events for a period of 2 years before returning to baseline.³ The public health infrastructure needs to be prepared to manage the increase in suicidal attempts that are yet to come, emphasizing the urgent need for a comprehensive emergency response plan for future climate emergencies for the citizens of Puerto Rico. This collaborative effort between the community and the public health system that arose in response to urgent needs may serve as a model for future emergency medical needs.

Medical services are also affected by population flows. Migration away from the island in all occupational categories is well documented by the Bureau of Labor Statistics.⁴ Some medical professionals were forced to leave the island as a result of these storms and the subsequent economic impact. Unemployment rates in Puerto Rico have increased after Hurricane Maria.⁴ The overall deficit of professionals compounds the need for medical care, psychiatric care, and public health interventions. In addition, in the mainland USA, the medical care, unemployment, and elder care burden can overwhelm medical services. If medical care is not provided to the island of Puerto Rico, these psychosocial burdens will most certainly impact the economy of the mainland USA due to the sudden influx of Puerto Rican citizens. Puerto Ricans who migrate to the mainland USA may provide essential labor if the population of migrants is effectively utilized and assimilated to fill labor deficits in the mainland USA. For effective assimilation to occur, medical, psychiatric, and social service professionals need to collaborate to address the medical and psychosocial needs of these climate migrants.

What has occurred on the island of Puerto Rico serves as a human laboratory and demonstrates the impact of climate events, the human sequelae that can occur as a result of climate

disasters, and the emergency response required to meet that need. When such events occur in the mainland USA, relief is in closer proximity, because there are fewer transportation or migration barriers than there are between Puerto Rico and the mainland USA. The impact on human life, property, medical care access, and psychosocial distress demonstrated in this instance provides a roadmap for the need for emergency preparedness and response. The emphasis on treatment of chronic disease and a focus on medical care access to the disadvantaged and those most heavily impacted by disaster is clearly supported by the data. Psychosocial issues such as depression, suicide, and anxiety need to be anticipated, prepared for, and responded to emergently.

More studies need to be done to follow the human impact of what has occurred on the island of Puerto Rico. Recovery will certainly take years. There is no guarantee that this island will not suffer other disastrous climate events as ocean levels continue to increase, beaches continue to erode, and further flooding of beach communities is likely to continue.

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