Challenges and Lessons Learned After Hurricane Maria: Learning Points for the Medical Student Community

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INTRODUCTION

Hurricane Maria, the most destructive natural phenomenon in the recent history of Puerto Rico (PR), made landfall in the morning of September 20 of 2017. With sustained winds of up to 155 miles per hour and massive flooding, the island was declared a state of emergency [1]. According to several studies, the hurricane was responsible for approximately 2975 to 4645 deaths [2,3]. Mental health became a serious health issue in the aftermath; suicide rates spiked 16%, compared to such rates in prior years [4].

The conditions in the aftermath were demanding for everyone. Medical students faced unique challenges because they had the responsibility of acting as first responders while at the same time confronting challenges related to personal losses and ongoing academic responsibilities. Our purpose is to provide a first-hand view of these challenges and the solutions used to overcome them. The overarching goal is to use these experiences as
learning points to better prepare medical schools to face the challenges from future natural disasters.

**THE DAYS BEFORE AND AFTER THE HURRICANE**

**Challenges**

Two weeks before Hurricane Maria struck, PR avoided a direct hit by Irma, a category 5 hurricane that passed to the north of the island. However, the island was left vulnerable: two thirds of the island’s electric customers were without electricity and more than 56,000 customers had no clean water [5]. Luckily, our medical school was able to recover quickly while minimizing the impact on the academic curriculum. Two days before the landfall of Hurricane Maria, our medical school announced the cessation of all activities and urged students, faculty, and employees to seek safe shelter and to prepare for the unprecedented hurricane.

In the aftermath of Hurricane Maria, lack of power, decreased access to clean water, and failure of the telecommunications for an extended period of time created a nearly chaotic island. Determining the whereabouts and status of classmates and relatives after the hurricane was very difficult because of the lack of working communication systems. With almost no communication available, a collaborative effort between our school’s administration and the students became essential for locating the rest of our classmates. In the first days, word of mouth was used to verify the relative safety of students who had been seen but who had not yet been able to communicate with the medical school. A few days later, with communications now working intermittently, students began checking in using social networks (e.g. Facebook™). This information was constantly shared with the administration and allowed them to report on the status of a given student to his or her relatives in the United States (US).

Just days after the hurricane, many medical students returned to their housing near the medical school campus in order to be available to assist as first responders. In the days immediately following the disaster, people who had stocked up on canned food and had a 3- to 5-day supply of water benefited from their preparations. However, given that PR was experiencing a complete blackout and that roads were blocked with debris, acquiring these essential goods became difficult later on due to the damage to many stores and the island-wide collapsed power grid. Fortunately for many medical students, our institution was able to provide canned foods, water, and basic medical supplies until the conditions began to normalize. Furthermore, the cafeteria prepared meals for the students that were on campus. Many students had their first cooked meal after the hurricane in the medical school cafeteria. Our institution also provided students with limited amounts of cash to enable them to buy additional articles of first necessity, such as water and non-perishable food, and replace some of their personal loss given that electronic payment systems were non-functional.

**Lessons Learned**

The need of developing a plan that can be implemented even when all or most means of communication are unavailable arose from this experience. Having a census of the students containing the addresses of the places where they are staying during the disaster event could have allowed our institution’s efforts to assess the safety of all medical students in a shorter period. And thus, promoting a faster and more effective communication with the student’s relatives. This is a simple yet very useful solution that other medical institution should consider using finding themselves in a similar event.

**PERSONAL LOSSES AND EMOTIONAL DISTRESS**

**Challenges**

Hurricane Maria affected two important aspects of every student’s life: Material possessions and emotional well-being. All the students suffered material losses, some to greater degree than others. Considerable damage to apartments and vehicles was common, to the extent that some students were forced to relocate to a temporary housing provided by our institution.

In addition to the material losses, some students saw relatives succumb to health problems. There was a significant emotional impact felt by a few students who suffered the unexpected loss of their loved ones. Given the emotional exhaustion some students experienced after Hurricane Maria, their academic obligations felt difficult to fulfill. Some students even questioned their capacity to resume their academic obligations while under such emotional distress.

**Lessons Learned**

One week after Hurricane Maria, the Wellness Center (ambulatory clinic) of our institution opened its doors and offered free professional counseling to students, many of whom found this to be of great benefit. A medical student’s emotional well-being is a critical part of their preparation and of their livelihood in general. Furthermore, having the necessary emotional and intellectual tools to cope with stressful situations is a critical step to successfully completing their medical training.
RESUMING ACADEMIC OBLIGATIONS IN THE AFTERMATH

Challenges

All medical schools in Puerto Rico suffered damage to their academic infrastructures. Despite the harsh circumstances, our institution was able to resume their academic obligations 3 weeks after the hurricane. Given the wide differences in curricula, each medical class confronted a particular set of challenges. For the students in the preclinical years, classes had to be relocated temporarily to another facility outside the medical school campus due to inadequate conditions of some of the classrooms in the school. Furthermore, standardized patient examinations had to be rescheduled given the telecommunication problems on the island. In order to finish the semester without major delays or cancellations, the schedule was adjusted with longer lecture days and more frequent exams to make up for lost time. The workload was greater and studying had additional challenges because most educational materials are electronically available through the internet, and the slow restoration of power and lack of internet access resulted in inadequate access to these educational resources. By January 3rd (3 months after the hurricane), only 57% of the island’s customers had had their power restored [1].

Second-year students confronted the difficult reality of meeting the same requirements and deadlines that their peers in the US had, regardless of the circumstances, such as studying for the US Medical Licensing Examination (USMLE) Step 1 examination. Anticipating these difficulties, our institution evaluated the possibility of temporarily relocating all preclinical students to another medical school or other facilities in the US. Although that strategy was thought to be ideal, its execution required meticulous planning (needing to be done over a short period of time) and the mobilization of a lot of resources (human, financial, and educational). Fortunately, the institution was able to implement a rapid recovery plan of its current facilities.

Medical students in their clinical years confronted similar problems regarding the difficulty of studying for their respective board examinations, given the conditions on the island at the time. Fortunately, through a collaborative effort with a medical school in Florida, a group of students was allowed to continue their clinical rotations in Florida. This supports the idea that alliances between medical institutions might be beneficial to their students, especially under emergency or extreme circumstances.

For those applying to residency programs, the hurricane generated a series of challenges. The submission of required documents and communications with residency programs were interrupted for several weeks. However, the Association of American Medical Colleges (AAMC) assisted by notifying program directors throughout the nation about the communication challenges that medical students in PR were experiencing. Additionally, the Dean and Associate Deans from our institution were in constant communication with program directors of residencies of interest to the students. Furthermore, the extensive damage generated by the hurricane resulted in an unexpected financial burden for medical students in the midst of paying expenses related to the residency application and interview process. According to several studies, a typical student spends on average of $1000 to $5000 during this process [6,7]. To alleviate some of the financial hardships caused by the hurricane, our institution assisted students by offering travel scholarships to all senior medical students.

Lessons Learned

In an era that is moving more towards technology, the value of hard-copy books sometimes can be underappreciated. During this emergency, many medical students had to rely on their hard-copy books as their only option to continue their education. For this reason, our recommendation to other medical schools that are at risk of similar natural phenomena is to keep hardcopies of the required educational material, including required textbooks and printed lectures, in case these are required during emergencies. Additionally, this experience underscores the importance of creating solutions that can help students affected by natural disasters to be able to continue fulfilling their academic and clinical commitments. Establishing formal alliances among medical institutions that allow them to temporarily exchange students was successfully piloted at our school. In addition, the use of videoconference interviews incorporated in several residency programs turned out to be a convenient and cost-effective solution [8,9]. A broader usage of this technology in other residency programs would have benefited the Puerto Rican medical students that were in the residency interview process. Moreover, having an institutional emergency fund that can help cover the expenses could help alleviate some of the financial burden caused by the hurricane.

AN OATH TO SERVE

It is said that during tough times your inner hero is revealed, and this was the case for medical students in Puerto Rico. Honoring the oath they had sworn and despite all difficult circumstances, many medical students made themselves available as first responders and immediately assisted patients and their communities. After the hurricane, many remained in their hometown, assisting relatives and members in their communities during the
road was tougher since the hurricane dramatically impacted both their personal life and medical training. Nevertheless, many important lessons and values emerged from this disaster that can be shared with other medical students and institutions. Students learned to adapt to the circumstances with creativity, compassion, altruism, and resilience, which are skills that will serve them for the rest of their lives. More importantly, students demonstrated the core values of the profession of medicine by working incessantly and passionately for the well-being of their fellow citizens.

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REFERENCES

1. Hurricanes Maria & Irma: January 3 Event Summary (Report #85). [Internet]. US Department of Energy. 2018 [cited 2018 Dec 10]. Available from: https://www.energy.gov/sites/prod/files/2018/01/f46/Hurricanes Maria and Irma Event Summary January 3, 2018.pdf.

2. Kishore N, Marqués D, Mahmud A, Kiang MV, Rodriguez I, Fuller A, et al. Mortality in Puerto Rico after Hurricane Maria. N Engl J Med. 2018;379(17):162–70.

3. Santos-Burgoa C, Sandberg J, Suárez E, Goldman-Hawes A, Zeger S, Garcia-Meza A, et al. Differential and persistent risk of excess mortality from Hurricane Maria in Puerto Rico: a time-series analysis. Lancet Planet Health. 2018;2(11):478–88.

4. Ramphal L. Medical and psychosocial needs of the Puerto Rican people after Hurricane Maria. Proc (Bayl Univ Med Cent). 2018 Apr 26;31(3):294-296.

5. Hurricane Irma leaves more than 1 million without power in Puerto Rico [Internet]. NBC News. [cited 2018 Dec 15]. Available from: https://www.nbcnews.com/storyline/hurricane-irma/hurricane-irma-skirts-puerto-rico-lashing-it-powerful-winds-flooding-n799086

6. Walling A, Nilsen K, Callaway P, Grothusen J, Gillenwater C, King S, et al. Student Expenses in Residency Interviewing. Kansas J Med. 2017;10(3):50–4.

7. Walling A, Callaway P, Grothusen J, Gillenwater C, King S, et al. Student Expenses in Residency Interviewing. Kansas J Med. 2017;10(3):50–4.

8. Edje L, Miller C, Kiefer J, Oram D. Using Skype as an Alternative for Residency Selection Interviews. J Grad Med Educ. 2013;5(3):503–5.

9. Hariton E, Bortolotto P, Ayogu N. Residency Interviews in the 21st Century. J Grad Med Educ. 2016;8(3):322–4.