

# Application of Illness Scripts Theory to Climate Change Through a Multi-Residency Educational Symposium

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## Setting and Problem

The World Health Organization declared that climate change is the “single biggest health threat facing humanity.”<sup>1</sup> Efforts to combat climate change require collaboration in all sectors, and medical education is key to amplifying endeavors. In 2021, editors of 233 health journals urged international leaders to redesign transport systems, food production, finance, and health sectors to reduce impact of human-driven processes directly affecting the climate.<sup>2</sup> Different lines of action for graduate medical education have been proposed, including transforming curricula, practice improvement, and patient advocacy.<sup>3</sup>

Illness scripts are a tool for developing and teaching clinical reasoning skills. Integrating climate change into medical education is not novel; however, use of illness scripts to accomplish this was not previously described. Given the curricular need, our residency program consulted local family medicine, pediatric, and emergency medicine physicians who had a special interest in climate change and, collectively, developed a series of general medicine cases with newly adapted illness scripts through a climate health equity lens. The feasibility of this educational intervention was assessed using the format of a multi-residency symposium delivered to interested residents across multiple specialties.

## Intervention

A free biennial 3-hour multi-institution climate symposium was launched in 2022 and offered to interested residents in San Diego-based family medicine and emergency medicine programs. Four breakout sessions used case-based teaching with updated illness scripts examining the impact of extreme heat events in 4 different domains: cardiac, respiratory, obstetric, and mental health conditions. Faculty received no honoraria. Breakout sessions were followed by plenaries

on advocacy, health care system initiatives, and plant-based cooking. Attendees were asked to complete a survey by scanning a QR code with their cell phones at the beginning and end of the symposium. The primary outcome of interest was a change in resident knowledge, attitudes, and perceived self-confidence integrating climate health into clinical encounters, as measured by a 7-point Likert scale.

To illustrate an updated illness script, consider a patient presenting with signs and symptoms of acute asthma exacerbation. Epidemiological factors can include knowledge that extreme heat drives higher pollen counts and longer pollen seasons. Patient features may include living in “urban heat islands” (where patients of lower socioeconomic status are disproportionately represented) and lower consumption of electricity due to cost or reduced supply during heat waves. Interventions for such patients may include counseling about reading air quality forecasts, using high-efficiency particulate air filters, performing proper medication storage, and using either cooling centers or financial subsidies.

## Outcomes to Date

A total of 77 residents across multiple programs attended the 2022 symposium, of which 53% (41 of 77) and 35% (27 of 77) completed the pretest and posttest, respectively. Mean survey scores for undertaking advocacy efforts and discussing health impacts of extreme weather on disease processes showed statistically significant changes in resident knowledge and skills (TABLE). Surveyed residents were asked, “During times of extreme weather how often do you anticipate discussing medication dose adjustments?” with 93% (38 of 41) responding “≤10% of the time” on the pretest and 33% (9 of 27) responding “>50% of the time” on the posttest. When asked about the most useful aspect of the symposium, the most common response was awareness of “urban heat islands.” We were unable to measure the degree to which practice change happened following the symposium, given

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TABLE

Resident Perceived Self-Confidence Understanding and Discussing Impact of Extreme Weather on Common Medical Conditions Before and After Attending a Multi-Residency Climate Symposium

| "How confident do you feel in your ability to ..."                    | Mean Score (95% CI) |                     | Mean Difference | P value |
|-----------------------------------------------------------------------|---------------------|---------------------|-----------------|---------|
|                                                                       | Pretest (N=41)      | Posttest (N=27)     |                 |         |
| Advocate for climate, equity, and health topics                       | 2.76<br>(2.38-3.13) | 5<br>(5.55-6.45)    | 2.24            | <.001   |
| Discuss effects of extreme weather on <i>cardiac</i> conditions       | 2.12<br>(1.80-2.45) | 5.07<br>(4.64-5.51) | 2.95            | <.001   |
| Discuss effects of extreme weather on <i>respiratory</i> health       | 2.51<br>(2.09-2.94) | 5.33<br>(4.92-5.74) | 2.82            | <.001   |
| Discuss effects of extreme weather on <i>mental</i> health conditions | 2.51<br>(2.10-2.92) | 5.07<br>(4.60-5.55) | 2.56            | <.001   |
| Discuss effects of extreme weather on <i>obstetric</i> risk           | 2.12<br>(1.80-2.44) | 5.33<br>(4.87-5.80) | 3.21            | <.001   |

Note: Responses measured on 7-point Likert scale (where 1="not at all confident" and 7="extremely confident") and statistical analysis performed using the Kruskal-Wallis test by ranks analysis.

the logistical challenges following up with residents across multiple institutions. In summary, a multi-residency symposium leveraging the collective expertise of local resources and application of adapted illness scripts to clinical case scenarios appears to be a promising strategy for improving education and care delivery for common medical conditions adversely affected by climate change.

## References

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