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Researchers identify impacts of Russia-Ukraine war on health care systems impacted by combat

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Rutgers researchers, aided by international collaborators, have tracked the devastation war has made on Ukraine's hospital system.

Hundreds of hospitals in Ukraine have been forced to close or operate at

a reduced capacity since Russia's invasion of the Eastern European country in February 2022. Damage, destruction and supply shortages caused by the war have impaired the nation's hospital system and taken a serious toll on human health.

In a study published in *JAMA,* Rutgers researchers and collaborators from the United States, Pakistan and Ukraine collected and compared data on hospital services provided both during the period preceding the current conflict (before Feb. 23, 2022) and during the war (Feb. 23, 2022 through May 30, 2023).

Before the invasion, there were about 720 hospitals in Ukraine. By April 2023, 450 hospitals were still operating. Of these 450 hospitals, 74 hospitals from 12 of Ukraine's 24 oblasts (provinces) not under Russian occupation participated in the study.

"The war has devastated Ukraine's hospital system, leaving it ill-equipped to meet the needs of a population in crisis," said Ubydul Haque, an assistant professor at Rutgers Global Health Institute and in the School of Public Health and lead author of the study. "This research helps illuminate the realities facing hospitals in war-affected regions—and their dire need for support."

The researchers found while services related to emergency medical care increased, there were reductions in the number of hospitals offering laboratory testing (13%), tobacco education (13%), cancer screening (24%), gynecological services (26%), rehabilitation services (27%), pharmacy services (25%), and telehealth programs (36%).

Hospitals also reported supply-chain disruptions impacting essential equipment and pharmaceuticals, shortages of laboratory test kits, delayed delivery of crucial medications, medication storage problems caused by power outages, reductions in staff numbers and increased

hours hospital staff were required to work.

Maternal and newborn health were negatively affected, and there was a decrease in the availability of essential services, including ambulances, defibrillators, ventilators and hospital beds, including intensive care unit beds.

Some impacts of the war on hospital functioning, and what those impacts mean for health, remain to be seen. The researchers noted that because some regions in active war zones were inaccessible to the study, the most affected areas may be underrepresented, and the hundreds of hospitals that were destroyed or unable to operate couldn't be represented in the data. In addition, the study found the war reduced access to vaccines, which may lead to higher incidences of infectious diseases.

"The weakening of Ukraine's hospital system means that health care workers not only are struggling to meet emergency needs but also to provide essential preventive care, as well as ongoing care for chronic conditions," said Haque. "This can have many negative long-term implications for the health of the people of Ukraine."

The study's co-authors from Rutgers include Emily S. Barrett and Nancy Fiedler of the School of Public Health and Environmental and Occupational Health Sciences Institute and Miraj Ahmad of the Department of Cell Biology and Neuroscience in the School of Arts and Sciences.

International collaborators who contributed to the study included several institutions in Ukraine: Kharkiv National Medical University, Poltava State Medical University, Overseas Council—United World Mission, National Aerospace University and Sumy State University.

More information: A Comparison of Ukrainian Hospital Services and Functions Before and During the Russia-Ukraine War, *JAMA* (2024). DOI: 10.1001/jamahealthforum.2024.0901

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