

# Acute Kidney Injury and Renal Replacement Therapy in Hospitalized COVID-19 Patients in the United States and Other Geographic Regions

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## BACKGROUND

- The clinical course of severely ill COVID-19 patients may be complicated by acute kidney injury (AKI)
- AKI may be more common in those with underlying conditions, such as chronic kidney disease (CKD)
- Renal replacement therapy (RRT), including continuous RRT (CRRT) may be required by some patients with AKI
- Some U.S. areas have experienced CRRT supply shortages during the COVID-19 pandemic

## OBJECTIVE

- Describe the percent of hospitalized COVID-19 patients who developed AKI or needed RRT to inform patient care and resource planning

## METHODS

- Performed a literature review and identified public health data that described CKD, AKI, and/or RRT in COVID-19 patients from January to May 2020
- Included unpublished data from:
  - An investigation of hospitalized COVID-19 patients in Georgia, March 2020
  - The COVID-19-associated Hospitalization Surveillance Network (COVID-NET), March–May 2020
- Excluded studies if no CKD prevalence or AKI and RRT incidence was reported
- Abstracted the number of COVID-19 patients that were hospitalized or admitted to intensive care units (ICU) and the number who developed AKI, underwent RRT, and/or had underlying CKD
- Pooled data across cohorts by geographic region (U.S., China, or United Kingdom [U.K.])
- Compared proportions using Chi-square tests

## RESULTS

- Of 313 studies and investigations identified, 23 (U.S. n=11; China n=11; U.K. n=1) were included
- Underlying CKD prevalence was higher in U.S. cohorts (10.3%) compared with China (2.5%) or U.K. (1.5%) ( $p<0.0001$ )
- Development of AKI was greater among hospitalized (31.3% vs. 6.4%;  $p<0.001$ ) and ICU patients (55.4% vs. 18.2%;  $p<0.0001$ ) in the U.S. compared to China
- The percent of ICU patients requiring RRT in the U.S. (16.8%) was significantly different from that reported in China (12.5%) and the U.K. (23.9%) ( $p<0.0001$ )

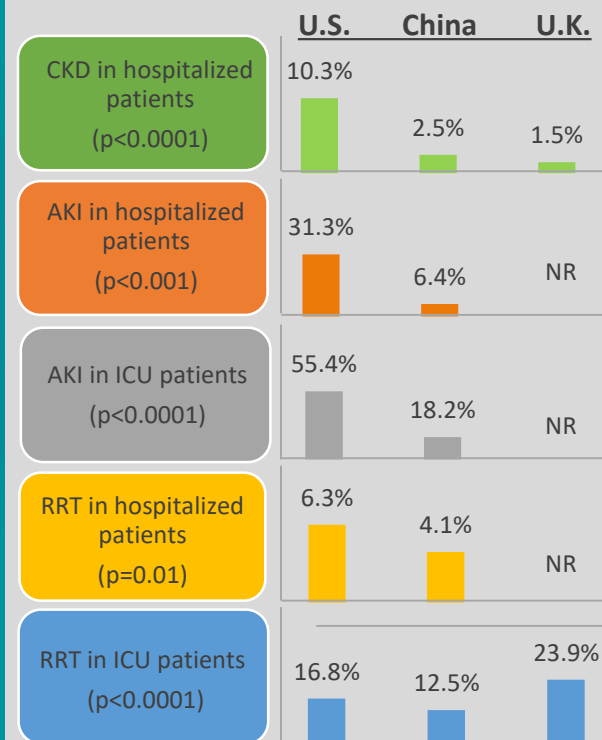
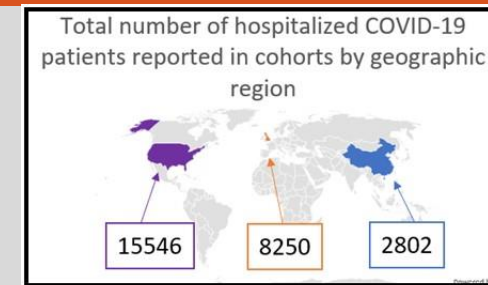
## LIMITATIONS

- Differences in CKD and RRT definitions across studies
- Limited geographic regions with available data
- Unable to assess other comorbidities of interest

In U.S. cohorts, over half of COVID-19 patients in the ICU developed acute kidney injury and one in six received renal replacement therapy.



Understanding the occurrence of kidney-related outcomes among patients with COVID-19 is essential for healthcare systems to successfully plan for renal replacement therapy needs during the pandemic.



NR=not reported



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