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Study provides new perspectives on the current Clostridium difficile epidemic

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More than 80 percent of hospitalized patients who tested positive for *Clostridium difficile* were tested outside the hospital or within the first 72 hours of hospitalization, suggesting that settings outside of the hospital may play key roles in the identification, onset and possible transmission of the disease, according to a new Kaiser Permanente study published today in the journal *Mayo Clinic Proceedings*.

The study provides new insight into the contagious and potentially deadly infection also known as *C. diff*, a bacterium most often associated with hospitals and other in-patient health care settings. It is one of the first to accurately identify a larger population of patients with *C. diff* by examining them in an outpatient setting as well as in the hospital.

"Kaiser Permanente's integrated health care system allowed us to track patients after they left the hospital in both the outpatient health setting and during a readmission which contributed an important new perspective to the current *C. diff* story," said study lead author Sara Y. Tartof, PhD, of the Kaiser Permanente Southern California Department of Research & Evaluation. "Previous studies typically focused on diagnoses during a hospital stay, which tells only part of the story. These findings emphasize how important it is to test for the infection both in the hospital as well as in outpatient settings."

Researchers examined the electronic health records of more than 268,000 Kaiser Permanente patients in Southern California who were

admitted to 14 Kaiser Permanente hospitals between Jan. 1, 2011 and Dec. 31, 2012. Of these patients, 4,286 – or 1.6 percent – tested positive for *C. diff*. Researchers also found that 49 percent of *C. diff* cases were acquired in the community or from an indeterminate source and that 31 percent of cases were associated with a previous hospitalization.

"*C. diff* infection is a major public health concern in the U.S., with infection rates tripling over the last decade," said Tartof. "This study's comprehensive view gives a more complete picture of the extent of health care-associated infections."

According to the Centers for Disease Control and Prevention, *C. diff* is a bacterium that most often affects sicker, older adults who take antibiotics and causes a range of symptoms including diarrhea, fever, loss of appetite and inflammation of the colon. People can become infected with *C. diff* by touching items or surfaces that are contaminated with the bacteria or through physical contact with health care workers who have picked up the bacteria from surfaces or other patients.

The CDC reports that over the past several years, states have noted higher rates of *C. diff* infection and an associated increased risk of death. Studies also show that *C. diff* infection accounts for considerable increases in the length of hospital stays and more than $1.1 billion in health care costs each year in the United States.

"Kaiser Permanente works diligently to prevent *C. diff* infections in both the hospital and ambulatory settings," said Michael Kanter, MD, regional medical director of quality and clinical analysis, Southern California Permanente Medical Group. "We promote judicious use of antibiotics, we make painstaking efforts to ensure our staff and health care providers practice hand hygiene, we prompt testing of symptomatic patients, and we conduct vigorous cleaning of rooms with special cleaning agents known to kill *C. diff* when patients with the infection are identified."

Provided by Kaiser Permanente