Extended Spectrum β-Lactamase Producing Enterobacterales Infections in Bernalillo County, 2020 to 2024

Extended spectrum β-lactamase producing Enterobacterales (ESBL-E) are resistant to common antibiotics and may require complex management or carbapenems to treat these infections. New Mexico Emerging Infections Program (NM EIP) has conducted population-based surveillance of ESBL-E in Bernalillo County beginning in 2019. This report highlights 5 years of findings from 2020 to 2024.

1 Introduction

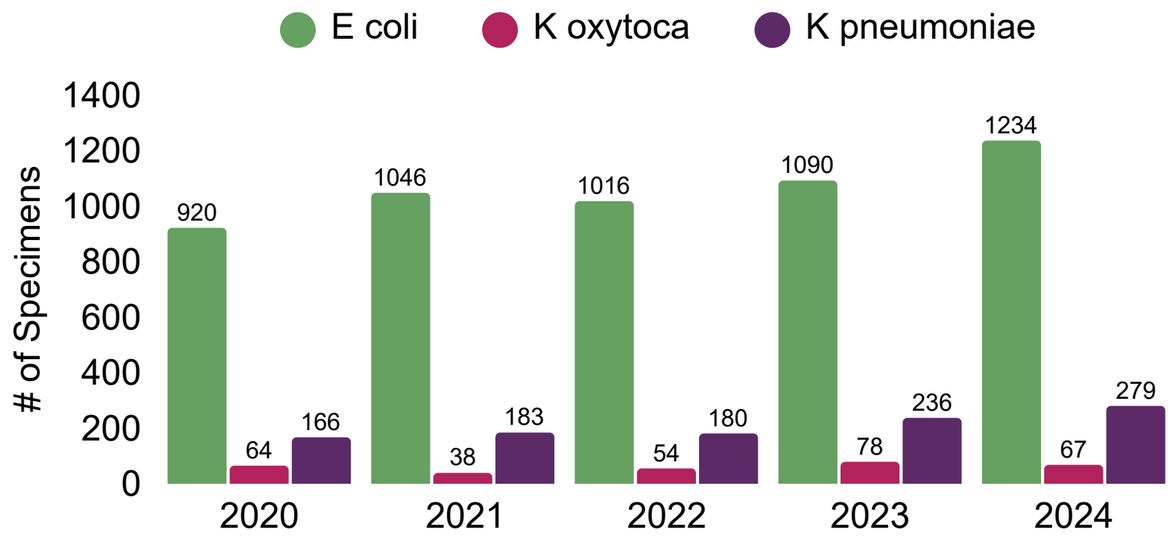
The World Health Organization identified antimicrobial resistance (AMR) as a top global public health threat, placing modern medicine at risk of no longer being able to treat or prevent infections. Enterobacterales, which include gram-negative bacteria such as *Escherichia coli*, *Klebsiella pneumoniae*, and *Klebsiella oxytoca*, can acquire and share AMR genes with other bacteria. These genes can give the bacteria an ability to produce ESBL enzymes that break down the chemical structure in commonly prescribed antibiotics such as penicillins and cephalosporins, rendering them ineffective.

2 Case Definition

E. coli, *Klebsiella pneumoniae*, *Klebsiella variicola*, or *Klebsiella oxytoca* isolated from sterile sites or urine and resistant to at least one extended-spectrum cephalosporin (ceftazidime, cefotaxime, or ceftriaxone) in a Bernalillo County resident.

3 Methodology

Clinical laboratories report queries of antimicrobial susceptibility patterns of each pathogen from testing instruments. Standardized case reports forms are used to collect demographics, clinical factors, and healthcare exposures. Isolates are shipped to the Centers for Disease Control & Prevention (CDC) for characterization.



4 Organisms

Since 2020, the majority of specimens collected were urine (95%), followed by blood (4%) and other sterile sites (1%). *E. coli* was the bacteria identified in 80% of ESBL-E specimens.

E. coli have increased 34% from 920 in 2020 to 1,234 in 2024. ESBL *K. pneumoniae* have increased 68% from 166 in 2020 to 279 in 2024. *K.oxytoca* has remained relatively stable.

5 ESBL-E Incidence Rates per 100,000 Population

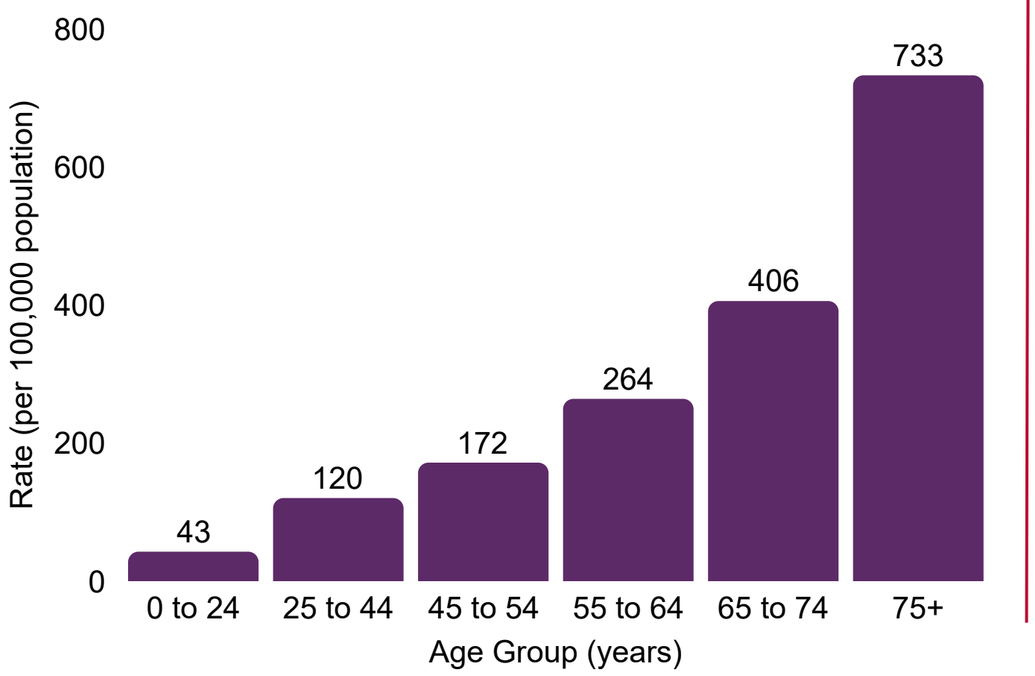
Incidence rates have increased since 2020, regardless of age group, sex, and race/ethnicity [not shown].

CASES AND RATES

Year	NM EIP Cases	NM EIP Rate	US EIP Rate
2020	1,150	170	161
2021	1,267	188	165
2022	1,250	186	172
2023	1,404	209	Not available
2024	1,580	235	Not available

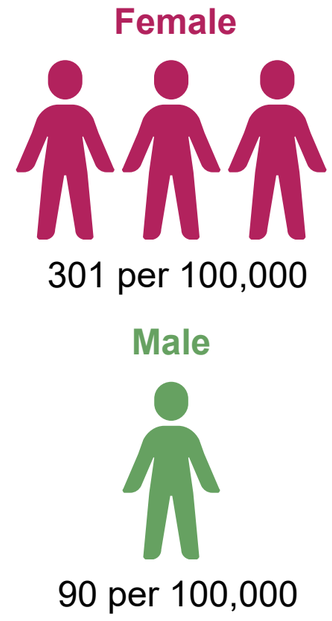
Incidence rates (per 100,000 population) have increased nationally and in Bernalillo County.

BY AGE GROUP



Nearly half (49%) of cases were 65 years or older. Incidence increased with age.

BY SEX



Women had 3.3x higher risk of ESBL-E infection as compared to men.

EMERGING INFECTIONS PROGRAM HEALTHCARE-ASSOCIATED INFECTIONS - COMMUNITY INTERFACE (HAIC)

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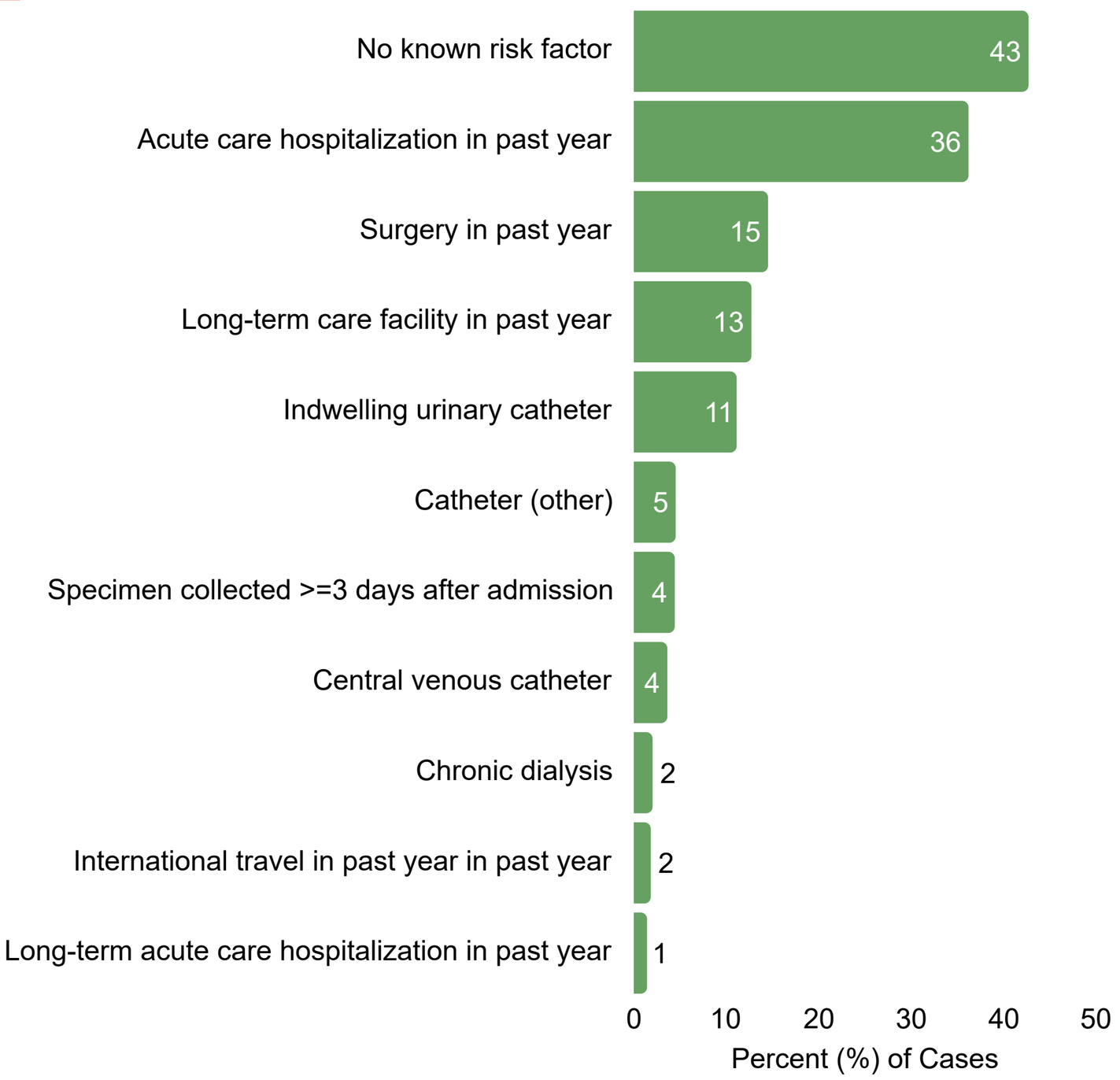
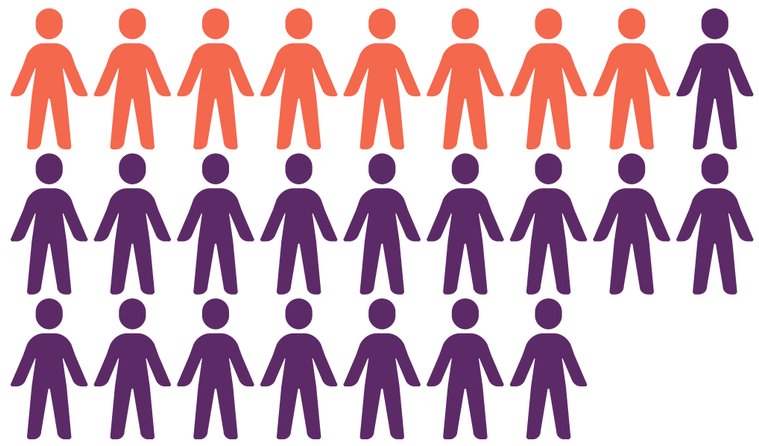
Extended spectrum βeta-lactamase producing Enterobacterales (ESBL-E)

The majority (86%) of patients were residing at their private residence 3 days prior to testing positive for ESBL-E and had underlying medical conditions (76%). The most common infection was urinary tract infections (UTIs) (76%), followed by bacteremia (9%), sepsis (8%) and shock (5%). Less than 3% of patients were colonized.

6 Healthcare Exposures

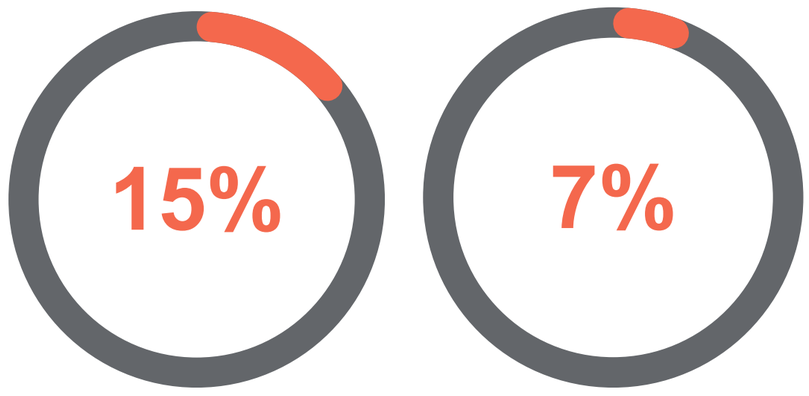


7 Hospitalizations



32% Admitted to a hospital within 29 days of a positive ESBL-E result

8 Outcomes Among Hospitalized Patients



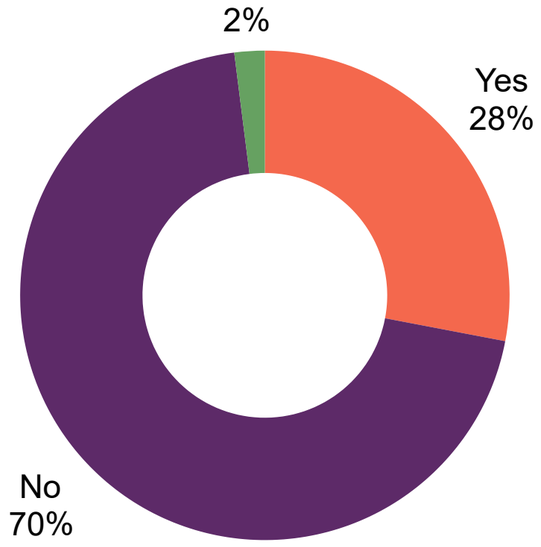
Admitted to intensive care unit

Died during hospitzation

84% of ESBL-E specimen collections occurred in an Emergency Department (ED) or outpatient setting

Emphasizing the importance of infection prevention and control and prescribing practices in ambulatory settings.

8 Antibiotic Use in the Past 30 Days



Prior antibiotic use is a risk factor for ESBL-E infection. Antibiotics were prescribed in the 30 days prior to the ESBL-E infection for 28% of cases.

Cephems were identified as the most prevalent (13%), followed by beta-lactam combination agents (6%) and folate pathway antagonists (4%).

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