The Emerging Infections Program (EIP) was established by the Centers for Disease Control and Prevention (CDC) to perform active, population-based surveillance on infections of public health importance in collaboration with 10 state health departments and academic centers across the US. In 2010, NY EIP began surveillance for *Clostridioides difficile* infections (CDI) in Monroe County. All positive CDI tests are reported to our program by the four in-catchment laboratories.

An incident CDI case is defined as a county resident >= 1 year of age with a positive *C. difficile* test and no positive test in the prior 8 weeks. Recurrence is defined as a positive test within 2 to 8 weeks of a previous positive test.
CDI TRENDS

INCIDENCE

In 2018, 1,113 incident CDI cases were identified compared to 1,566 cases in 2010 (Table 1); the number of cases increased slightly in 2011 due to the use of a more sensitive *C. difficile* assay (nucleic acid amplification tests [NAATs]) by all the labs. The overall CDI incidence since that defining year of 2011 decreased by 38% from 241 per 100,000 population to 151 in 2018. The decrease is mainly driven by a reduction in cases developing in hospitals and long term care facilities (HO and LTCO) with the largest decline noted in LTCO cases; a 70% drop between 2011 and 2018. Presently, the incidence is highest for CA cases accounting for close to half of all CDI cases (Figure 1).

![Figure 1: Incidence Rate of CDI by Epidemiologic Classification and Year](image)

*All labs switched to NAAT testing

When evaluating incidence by age group, a 57% decrease in incidence was noted in the population aged 85 years and older; from 2,020 per 100,000 population in 2011 to 868 in 2018 (Figure 2).

![Figure 2: Incidence Rate of CDI by Age Group and Year](image)

*All labs switched to NAAT testing

### Table 1: Total CDI cases and Incidence 2010-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Incidence (per 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1566</td>
<td>212.7</td>
</tr>
<tr>
<td>2011</td>
<td>1778</td>
<td>241.2</td>
</tr>
<tr>
<td>2012</td>
<td>1737</td>
<td>234.9</td>
</tr>
<tr>
<td>2013</td>
<td>1562</td>
<td>210.7</td>
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<td>2014</td>
<td>1428</td>
<td>192.6</td>
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<td>2015</td>
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<tr>
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<td>174.6</td>
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<tr>
<td>2017</td>
<td>1104</td>
<td>149.5</td>
</tr>
<tr>
<td>2018</td>
<td>1113</td>
<td>150.5</td>
</tr>
</tbody>
</table>

CDI EPIDEMIOLOGIC CLASSIFICATIONS

- **Hospital Onset (HO)** - positive test > 3 days after admission to a hospital.
- **Long-Term Care Onset (LTCO)** - positive test collected at a nursing home (NH) or from NH resident within 3 days of hospitalization.
- **Community-Onset Healthcare Facility Associated (CO-HCFA)** - an overnight stay at a NH or hospital in the 12 weeks prior to a positive test.
- **Community-Associated (CA)** - no overnight stay in a NH or hospital in the 12 weeks prior to a positive test.

38% in CDI in Monroe County, NY between 2011-2018

CDI cases are Community-Associated

When evaluating incidence by age group, a 57% decrease in incidence was noted in the population aged 85 years and older; from 2,020 per 100,000 population in 2011 to 868 in 2018 (Figure 2).
**RECURRENT**
On average, recurrent cases account for 18% of all the positive CDI tests included in surveillance. In 2018, 13% of the incident cases had at least one recurrence.

**HOSPITALIZATION**
Of the 1,113 incident CDI cases that occurred in 2018, 487 (44%) were hospitalized at the time of or within 7 days of their positive test. The highest rate of hospitalization was in cases that developed CDI within 12 weeks of discharge from a hospital or NH (CO-HCFA).

**MORTALITY**
In 2018, 48 of the admitted patients died during hospitalization for a crude in-hospital, all-cause mortality rate of 10%. Almost all (93%) of the deaths were in healthcare associated CDI cases (HO, LTCO, CO-HCFA).

**CDI CLINICAL LABORATORY TESTING**
Three of the catchment laboratories perform a multi-step testing algorithm: glutamate dehydrogenase (GDH) and toxin enzyme immunoassay (EIA) followed by NAAT for the toxin gene, if toxin EIA is negative. One laboratory performs NAAT only, but performs the GDH/toxin EIA upon request.

Figure 3 shows the proportion of CDI cases diagnosed by the different tests. In labs using the multi-step algorithm, 62% of cases were identified by positive GDH/NAAT assays.

**MOLECULAR TESTING**
Between 2010 and 2017, 1,566 randomly selected *C. difficile* samples underwent molecular characterization. In 2012, strain typing shifted from pulse field gel electrophoresis to ribotyping.

In 2010, the epidemic strain type NAP1/ Ribotype 027 was the most prevalent strain responsible for 30% of samples. The prevalence of this strain decreased by 87% to just 4% in 2017 (Figure 4). Of note, the total number of specimens tested over the last 2 years has decreased (Table 2). The distribution of *C. difficile* strains since 2012 is shown in Table 2.
The incidence of CDI in Monroe County has decreased by 38% since 2011. This decline is primarily driven by a reduction in healthcare associated cases, potentially due to local collaborative efforts to reduce CDI in the Rochester hospitals and NH and due to a reduction in the prevalence of the NAP1/027 strain type.

A decrease in the incidence of CDI was noted in adults aged >65 years and in LTCO cases which mirrors national trends (Figure 5). This decline is attributed to a decrease in the prevalence of the NAP1/027 strain and in the use of fluoroquinolones in the hospitals since most of the LTCO cases occur in those recently hospitalized.

**CONCLUSION:**

- The burden of CDI remains high in the CA cases suggesting improvement of antimicrobial use in the outpatient setting are needed.

**Figure 5: Number of LTCO C. difficile Cases in 10 U.S. Sites**