



# Clostridium difficile infection (CDI) treatment practices in San Francisco County, 2012

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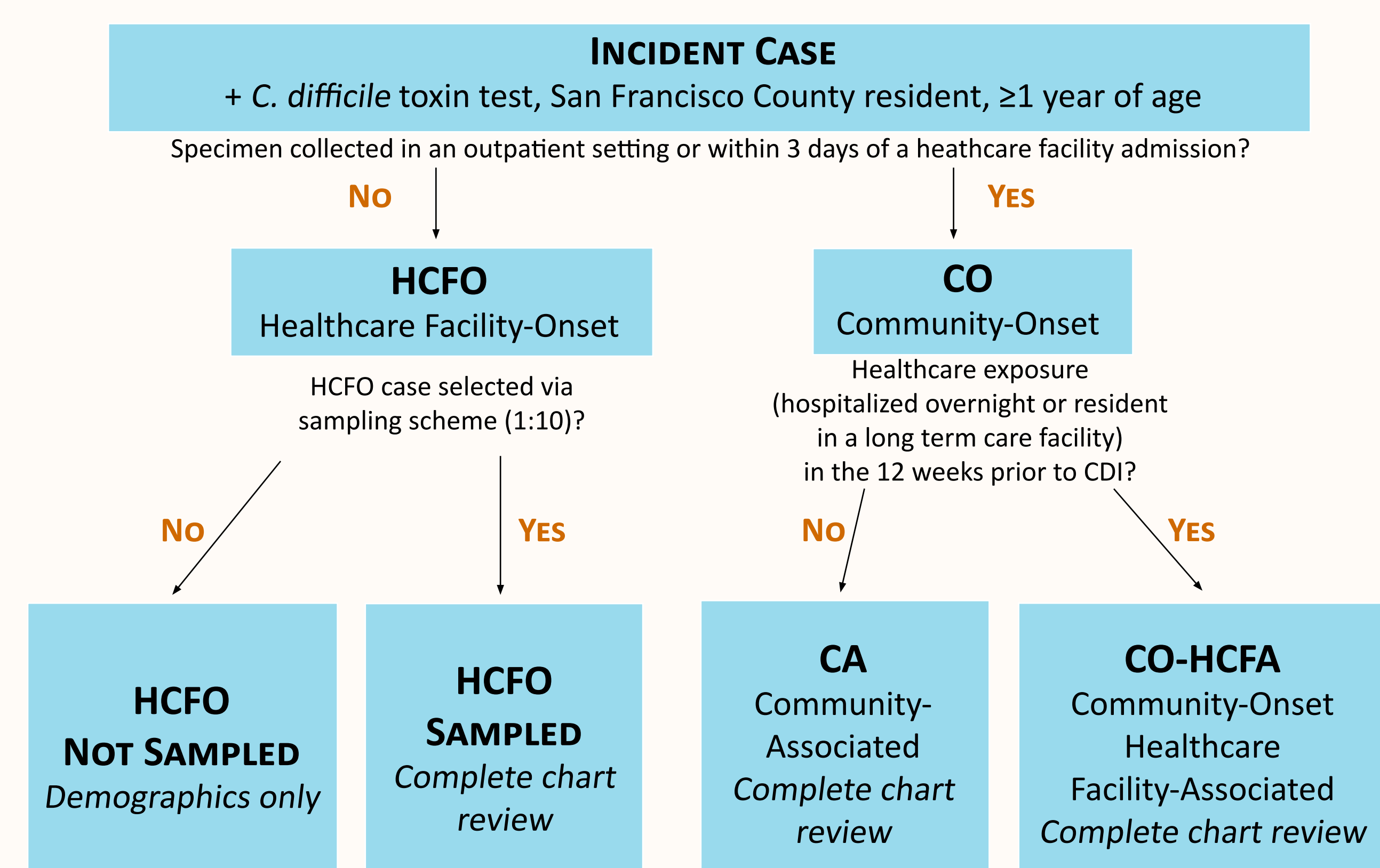
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## BACKGROUND

- *Clostridium difficile* is a spore-forming, gram positive bacillus that can lead to an infection with symptoms ranging from mild diarrhea to pseudomembranous colitis, sepsis and death.
- Treatment recommendations for *Clostridium difficile* infection (CDI) include oral metronidazole for mild to moderate infection and oral vancomycin for severe disease.
- Fidaxomicin is a recently approved treatment that may be associated with lower recurrence risk<sup>1,2</sup>, and fecal transplant therapy is receiving increased attention, especially for recurrent disease.<sup>3</sup>

## METHODS



- Active population-based surveillance for laboratory confirmed CDI was conducted in San Francisco County from January 1 through December 31, 2012 as part of the Centers for Disease Control and Prevention's (CDC) Emerging Infections Program (EIP).
- A CDI case was defined as a *Clostridium difficile*-toxin positive stool collected from a SF resident ≥1 year of age without a positive test in the prior eight weeks.
- Medical records for community-onset (CO) cases and a sample of healthcare facility-onset cases (HCFO) were reviewed for demographic and clinical information.
- CDI treatment information was collected if within seven days of positive stool collection.
- California Department of Finance data were used to calculate incidence. SAS Version 9.3<sup>®</sup> was used for all analyses.

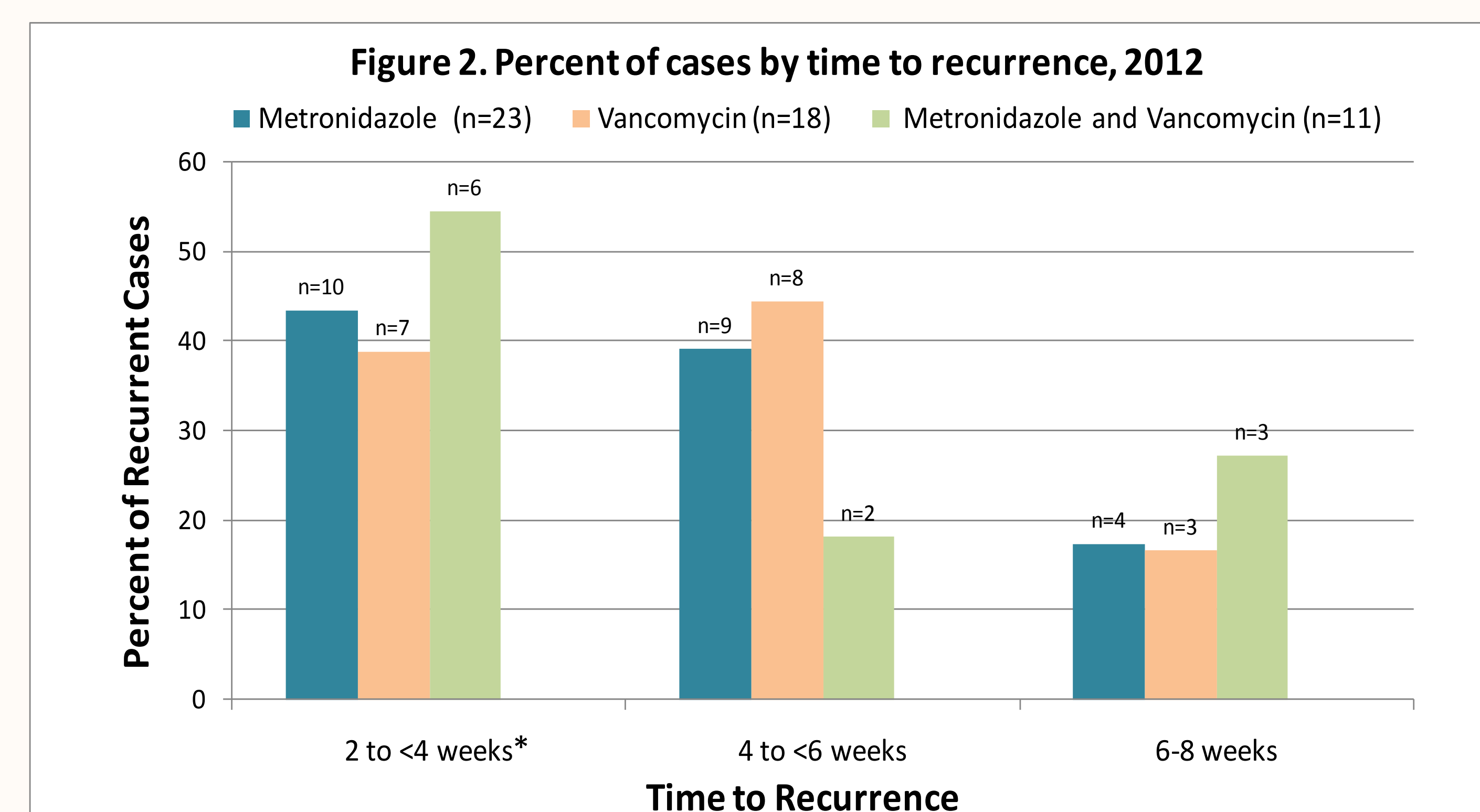
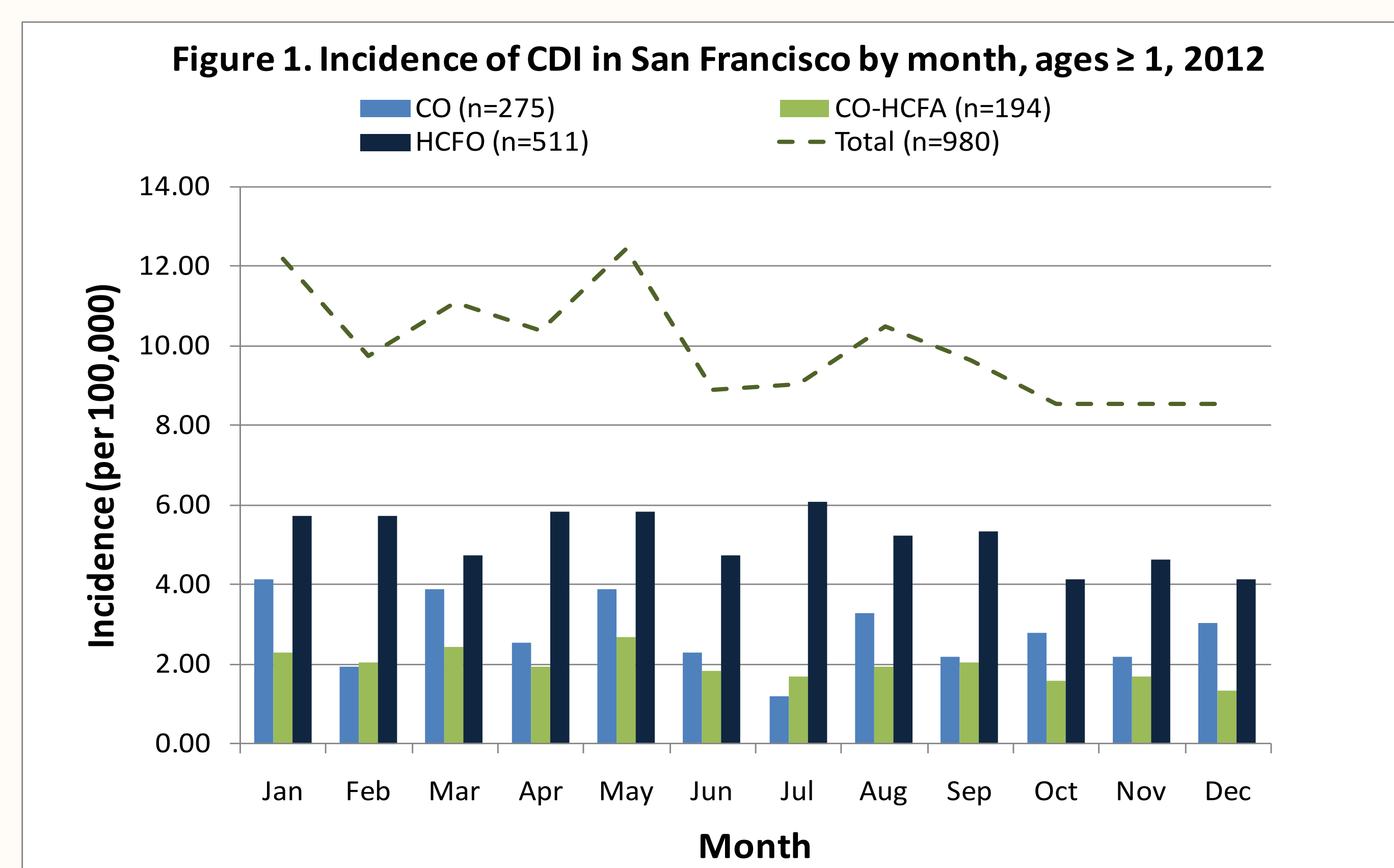
## RESULTS

- In 2012, 980 incident CDI cases were identified. Incidence of CDI was 119 per 100,000 population in San Francisco County. (Figure 1)
- 519 medical records were reviewed; treatment information was available for 401 (41%) cases. Of those with known treatment information, 390 (97%) received antibiotic treatment: 206 (51%) received metronidazole only, 119 (30%) vancomycin only, 3 (1%) fidaxomicin only, 53 (13%) metronidazole + vancomycin, 1 (<1%) metronidazole + fidaxomicin, and 8 (2%) an antibiotic + a probiotic. 20 (11%) patients who received vancomycin were placed on a taper
- All results to follow are for cases with treatment information (N=401):**
- 52% of cases were female. Median age was 63 years (IQR: 47 – 79)
- 58% were hospitalized within seven days after stool collection. Median length of hospital stay for treated cases was seven days (IQR: 5 – 12); 3% were admitted to the ICU. (Table 1)

## RESULTS

### EPIDEMIOLOGIC CLASSIFICATION KEY

HCFO: Healthcare Facility-Onset CO: Community-Onset (CA + CO-HCFA)  
CA: Community Associated CO-HCFA: Community Onset Healthcare-Facility Associated



\*One case who received metronidazole and fidaxomicin had a recurrent positive *C. difficile* in the 2 to 4 weeks after initial positive stool.

Table 1. Severity of CDI among treatment groups, San Francisco, 2012.

	Known treatment status # (%)	Hospitalized # (%)	Admitted to ICU # (%)	Death # (%)	Recurrent Positive <i>C. diff</i> ** # (%)	Diarrhea <sup>^</sup> # (%)	White blood cell count ≥15,000/ $\mu$ L # (%)	Ileus # (%)	Pseudomembranous colitis # (%)	Colectomy # (%)	Previous CDI # (%)
<b>All</b>	401	231 (58)	12 (5)	11 (3)	53 (13)	343 (86)	83 (21)	2 (1)	1 (<1)	2 (1)	68 (17)
<b>Fidaxomicin</b>	3 (1)	2 (67)	0 (0)	0 (0)	0 (0)	3 (100)	1 (33)	0 (0)	0 (0)	0 (0)	2 (67)
<b>Metronidazole</b>	206 (51)	105 (51)	5 (5)	5 (3)	23 (11)	173 (84)	31 (15)	2 (1)	1 (<1)	0 (0)	21 (10)
<b>Vancomycin</b>	119 (30)	76 (64)	3 (4)	4 (3)	18 (15)	101 (85)	34 (29)	0 (0)	0 (0)	1 (1)	29 (24)
<b>Combination therapy</b>											
<b>Metronidazole + Fidaxomicin</b>	1 (<1)	1 (100)	0 (0)	0 (0)	1 (100)	1 (100)	1 (100)	0 (0)	0 (0)	0 (0)	1 (100)
<b>Metronidazole + Vancomycin</b>	53 (13)	41 (77)	4 (10)	1 (2)	11 (21)	49 (92)	13 (25)	0 (0)	0 (0)	1 (2)	10 (19)
<b>Metronidazole + Probiotic</b>	4 (1)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)	1 (25)	0 (0)	0 (0)	0 (0)	1 (25)
<b>Vancomycin + Probiotic</b>	4 (1)	2 (50)	0 (0)	0 (0)	0 (0)	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	2 (50)
<b>No treatment</b>	11 (3)	3 (27)	0 (0)	1 (9)	0 (0)	9 (83)	1 (9)	0 (0)	0 (0)	0 (0)	2 (18)

<sup>^</sup>Percent of hospitalized patients admitted to ICU on or after day of positive test.

\*\*An additional positive *C. difficile* test is considered recurrent if occurring within 2-8 weeks of initial positive test.

<sup>^</sup>By definition (unformed or watery stool, ≥3/day for ≥1 day) or documented, but unable to determine if it is by definition.

## RESULTS CONTINUED

- 68 (17%) cases had a previous unique CDI episode. For treatment of the current CDI episode, 29 (43%) received vancomycin only, 21 (31%) metronidazole only, 2 (3%) fidaxomicin only, 14 (21%) received combination therapy (more than one antibiotic or an antibiotic plus a probiotic), and 2 (3%) did not receive treatment. (Table 1)
- Among those hospitalized (N=231) versus non-hospitalized (N=170): 45% and 59% of cases, respectively, were treated with metronidazole, 33% and 25% with vancomycin, 1% and <1% with fidaxomicin, and 18% and 7% were treated with metronidazole plus vancomycin. <1% of hospitalized cases were treated with metronidazole plus fidaxomicin, 1% of hospitalized and 3% non-hospitalized patients were given a probiotic in combination with an antibiotic, and 1% of hospitalized and 5% non-hospitalized patients did not receive treatment. (Table 1)
- In 2012, there were 11 (3%) deaths, ten of whom received treatment for their CDI. (Table 1)
- 53 (14%) cases had recurrent disease (an additional positive test in the eight weeks following initial test). Median time to recurrence was 28 days (IQR: 21 – 34). There was no significant difference in treatment among those cases with recurrent disease versus those without recurrent disease (p=0.057).
- Diarrhea status was available for 395 (99%) patients. Of these, 343 (87%) of patients were noted to have diarrhea (172 were by definition and 171 had documented diarrhea, but not by definition). (Table 1)
- There were 83 (21%) cases with leukocytosis. Most patients were treated with vancomycin only (N=34), followed by metronidazole (N=31) and a combination of vancomycin and metronidazole (N=13). (Table 1)
- Two (1%) patients were diagnosed with ileus and one (<1%) was found to have pseudomembranous colitis within five days before or after stool collection date. Colectomy related to CDI was performed on two (1%) patients. (Table 1)

## CONCLUSIONS

- In 2012, use of fidaxomicin was limited in San Francisco County. Increased use may be observed in the future, possibly influenced by the approval of add-on payments to acute care hospitals for Medicare inpatients treated with fidaxomicin.<sup>4</sup>
- Medical record review did not identify fecal transplant as therapy for CDI in 2012, but future use of this treatment may be observed given recent positive studies.<sup>5</sup>
- The 14% recurrence rate detected is lower than the 20% rate suggested in the literature.<sup>6-8</sup>
- Continued collection of these data will allow EIP's CDI surveillance program to track changes in treatment patterns and recurrence rates over time.

## LIMITATION

- While the HCFO class represents the majority of cases, the sampling scheme (1:10) limits the number of complete charts abstracted.

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