

Fig. 2.

(EIA) after a positive nucleic acid amplification test (NAAT) in teaching and nonteaching hospitals, and we estimate the impact on standardized infection ratios (SIR). **Methods:** Reporting of all CDI test results, by test method, occurred during April 2018–July 2019 to the Georgia Emerging Infections program (funded by the Centers for Disease Control and Prevention), which conducts active population-based surveillance in an 8-county Atlanta area (population, 4 million). Among facilities starting reflex EIA testing, results were aggregated by test method during months of reflex testing to calculate facility-specific reduction in NHSN CDI events (% reduction; 1-[no. EIA+/no. NAAT+]). Differences in percent reduction between facilities by characteristic were compared using the Kruskal-Wallis test. We simulated expected changes in the SIR for a range of reductions, assuming equal effect on both community-onset (CO) and hospital-onset (HO) tests. Each facility's historical NHSN CDI events prior to reflex testing were used to estimate changes to facility-specific SIRs by reducing values by the corresponding facility's percent reduction. **Results:** Overall, 13 acute-care hospitals (bed size, 52–633; ICU bed size, 6–105) started reflex testing during the study period (mean, 7 months, 15,800 admissions, 66,400 patient days), resulting in 550 +NAAT tests reflexing to 180 +EIA tests (pooled mean 58% reduction). Percent reduction varied (mean, 67%; range, 42%–81%) but did not differ between larger (≥ 217 beds) and smaller hospitals (61 vs 50% reduction; $P > .05$) or by outsourced versus inhouse testing (65% vs 54% reduction; $P > .05$). Simulations identified a threshold reduction at which point effect on HO counteract the effects on CO events enough to reduce the SIR; thresholds for nonteaching and teaching were 26% and 32% reduction, respectively (Fig. 1). The estimated reductions in facility-specific SIRs using measured percent reductions on historic NHSN CDI events closely paralleled the simulation, and the mean estimated change in SIR was -46% (range, -12% to -71%) (Fig. 1). **Conclusions:** Although the magnitude of the effect varied, all 13 facilities experienced dramatic reductions in CDI events reportable to NHSN due to reflex testing; applying these reductions to historical NHSN data illustrates anticipated reductions in their facility-specific SIRs due to this testing change.

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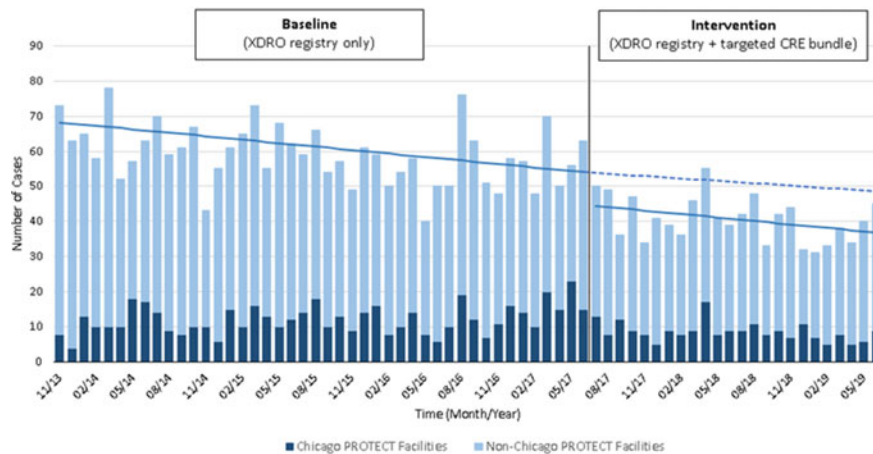
Oral Presentation

Regional Impact of a CRE Intervention Targeting High Risk Postacute Care Facilities (Chicago PROTECT)

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Background: Carbapenem-resistant *Enterobacteriaceae* (CRE) are endemic in the Chicago region. We assessed the regional impact of a CRE control intervention targeting high-prevalence facilities; that is, long-term acute-care hospitals (LTACHs) and ventilator-capable skilled nursing facilities (vSNFs). **Methods:** In July 2017, an academic-public health partnership launched a regional CRE prevention bundle: (1) identifying patient CRE status by querying Illinois' XDRO registry and periodic point-prevalence surveys reported to public health, (2) cohorting or private rooms with contact precautions for CRE patients, (3) combining hand hygiene adherence, monitoring with general infection control education, and guidance by project coordinators and public health, and (4) daily chlorhexidine gluconate (CHG) bathing. Informed by epidemiology and modeling, we targeted LTACHs and vSNFs in a 13-mile radius from the coordinating center. Illinois mandates CRE reporting to the XDRO registry, which can also be manually queried or generate automated alerts to facilitate interfacility communication. The regional intervention promoted increased automation of alerts to hospitals. The prespecified primary outcome was incident clinical CRE culture reported to the XDRO registry in Cook County by month, analyzed by segmented regression modeling. A secondary outcome was colonization prevalence measured by serial point-prevalence surveys for carbapenemase-producing organism colonization in LTACHs and vSNFs. **Results:** All eligible LTACHs ($n = 6$) and

Figure. Trend of Monthly Incident CRE Clinical Cultures (Cook County, Illinois) Reported to Illinois XDRO registry



Note. Total stacked bar = Cook County Incident CRE cases. Chicago PROTECT facilities = LTACHs and vSNFs that participated in the intervention. Solid blue line represents modeled trend of incident CRE clinical cultures (Cook County) during baseline and intervention periods. Dotted blue line represents hypothetical predicted trend in absence of intervention. Vertical black line indicates time that intervention period began. For Cook County CRE clinical cultures, intervention period was associated with fewer cases per month ($P=0.02$); this trend was also seen for PROTECT facilities ($P=0.03$). Clinical CRE cultures in the XDRO registry refer to CRE reported from cultures obtained during routine clinical care (*i.e.*, excluding screening cultures for active surveillance). CRE = carbapenem-resistant *Enterobacteriaceae*. XDRO = extensively drug resistant organism.

Fig. 1.

vSNFs ($n=9$) participated in the intervention. One vSNF declined CHG bathing. vSNFs that implemented CHG bathing typically bathed residents 2–3 times per week instead of daily. Overall, there were significant gaps in infection control practices, especially in vSNFs. Also, 75 Illinois hospitals adopted automated alerts (56 during the intervention period). Mean CRE incidence in Cook County decreased from 59.0 cases per month during baseline to 40.6 cases per month during intervention ($P < .001$). In a segmented regression model, there was an average reduction of 10.56 cases per month during the 24-month intervention period ($P = .02$) (Fig. 1), and an estimated 253 incident CRE cases were averted. Mean CRE incidence also decreased among the stratum of vSNF/LTACH intervention facilities ($P = .03$). However, evidence of ongoing CRE transmission, particularly in vSNFs, persisted, and CRE colonization prevalence remained high at intervention facilities (Table 1). **Conclusions:** A resource-

intensive public health regional CRE intervention was implemented that included enhanced interfacility communication and targeted infection prevention. There was a significant decline in incident CRE clinical cases in Cook County, despite high persistent CRE colonization prevalence in intervention facilities. vSNFs, where understaffing or underresourcing were common and lengths of stay range from months to years, had a major prevalence challenge, underscoring the need for aggressive infection control improvements in these facilities.

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Table. Prevalence of Organisms Carrying Carbapenemase Genes by Point Prevalence Survey, Baseline versus Intervention

	Baseline	Intervention	P value
LTACHs, n/N (%)	234/984 (24)	128/758 (17)	0.08
vSNFs (vent floor), n/N (%)	118/300 (39)	318/751 (42)	0.82

Note: Patient rectal swab cultures were obtained during a one-day survey for each facility during baseline (LTACHs, 3 baseline surveys; vSNFs, 1 baseline survey) and intervention (3 intervention surveys for all). Swabs were tested for the presence of *bla*_{KPC}, *bla*_{NDM}, *bla*_{IMP}, *bla*_{VIM}, *bla*_{OXA-48} using polymerase chain reaction testing. n/N = (patients testing positive for carbapenemase gene) / (all patients tested). Generalized estimating equation modeling controlling for serial surveys was used to compare the difference between baseline and intervention prevalence within each facility type. For this analysis, we did not distinguish *Enterobacteriaceae* from non-*Enterobacteriaceae*; carbapenemase gene detection was used as a surrogate for carbapenem-resistant *Enterobacteriaceae*. LTACHs = Long term acute care hospitals. vSNFs = ventilator skilled nursing facilities.

Fig. 2.