

THE IMPACT OF IMPLEMENTING A CLEARANCE PROTOCOL AMONG CARRIERS ON CRE PREVALENCE AND RISK OF ACQUISITION IN POST-ACUTE CARE HOSPITALS

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Burden of CRE in post acute care hospitals

- Post acute care hospitals (PACH) are facilities that specialize in the treatment of patients with serious medical conditions that require prolonged medical care

skilled nursing and chronically ventilated patients – typical LOS months to years

- In recent years PACH have been identified as a major reservoir of CRE

- Duration of CRE carriage is uncertain

- common practice in many countries- not remove contact precautions
- many CRE carriers are hospitalized under contact precautions for months-years

- Prolonged isolation creates substantial burden on patients and hospital resources

- increase in adverse events

high costs

CRE carriage in PACH in Israel-2008

- A national survey conducted in 12 PACH
rectal screening cultures obtained from 522 patients in randomly selected wards
in skilled nursing care and chronic mechanical ventilation wards
- 80% patients with no CRE history and 20% with CRE history

(93/419)	% positive among patients with no CRE history	22%
(52/103)	% positive among patients with known CRE history	52 %
	screened <3 months from initial CRE culture	70% positive
	screened > 3 months from initial CRE culture	35% positive

Intervention in PACH

- A national intervention implemented in PACH beginning 2009

core components

- national network
 - daily reports from all health care facilities in the country including PACH
 - coordination of inter-facility transfers
- admission CRE screening
- CRE carriers cohorting
- central management of local outbreak
- CRE clearance protocol

National CRE clearance policy

- Attempt to discontinue carrier status by implementation of clearance protocol 3 months following initial positive CRE culture
- To have CRE carrier status discontinued patient must have:
 - 2 negative follow-up rectal screening cultures
 - and
 - 1 negative PCR test for relevant carbapenemase gene

Objective

To assess the impact of implementation of the clearance protocol in post-acute care hospitals

outcomes measured

- prevalence of patients under CRE contact precautions
- risk of CRE acquisition among patients with no CRE history

Setting and Methods

- 15 PACH in Israel

wards included

- chronic mechanical ventilation
- skilled nursing care

- 3 point prevalence surveys

2011 , 2013, 2015

- Rectal screening cultures obtained from all patients in randomly selected wards (greater than 50% of all wards in Israel were included)

3 categories of patients

- no history of CRE carriage
- history of CRE carriage- under contact precautions
- history of CRE carriage- completed clearance protocol and removed from isolation

Methods

Microbiology

- rectal swabs were processed in a central laboratory
- specimens were screened for CRE on selective media
- suspected isolates were tested by PCR for *bla*_{KPC}, *bla*_{NDM} and *bla*_{OXA-48}
- in patients with history of CRE- in case of negative culture, enriched broth was tested using PCR

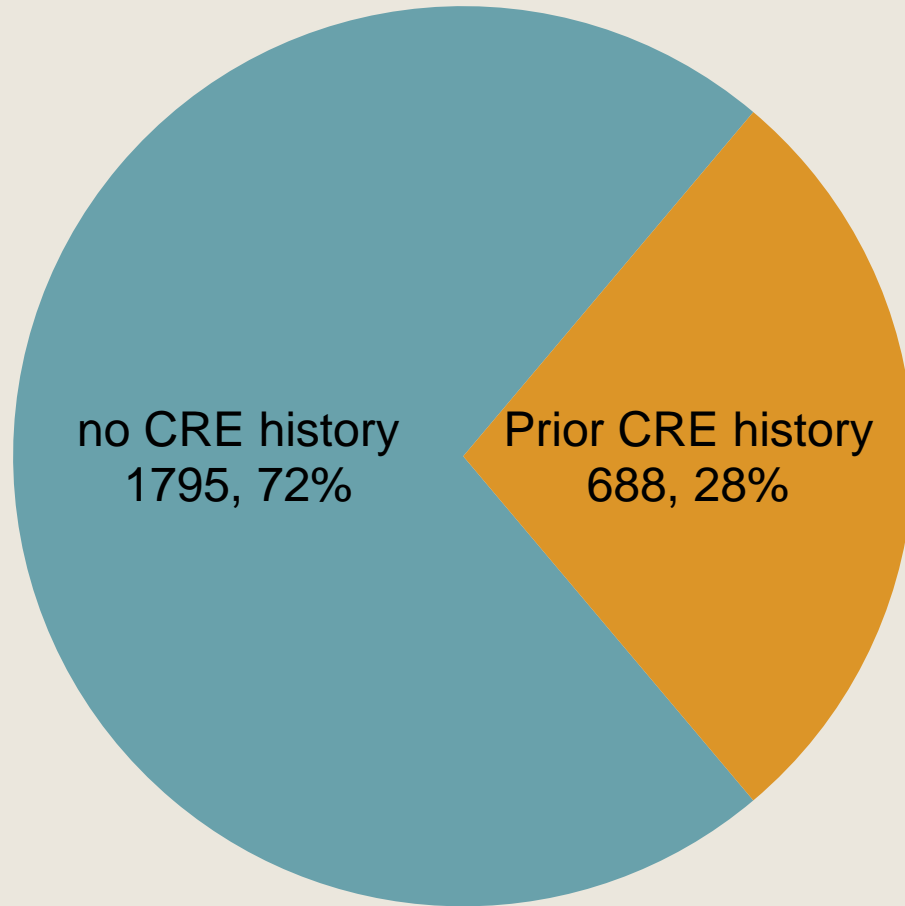
Statistical analysis

Wilcoxon rank-sum tests: differences in prevalence between surveys

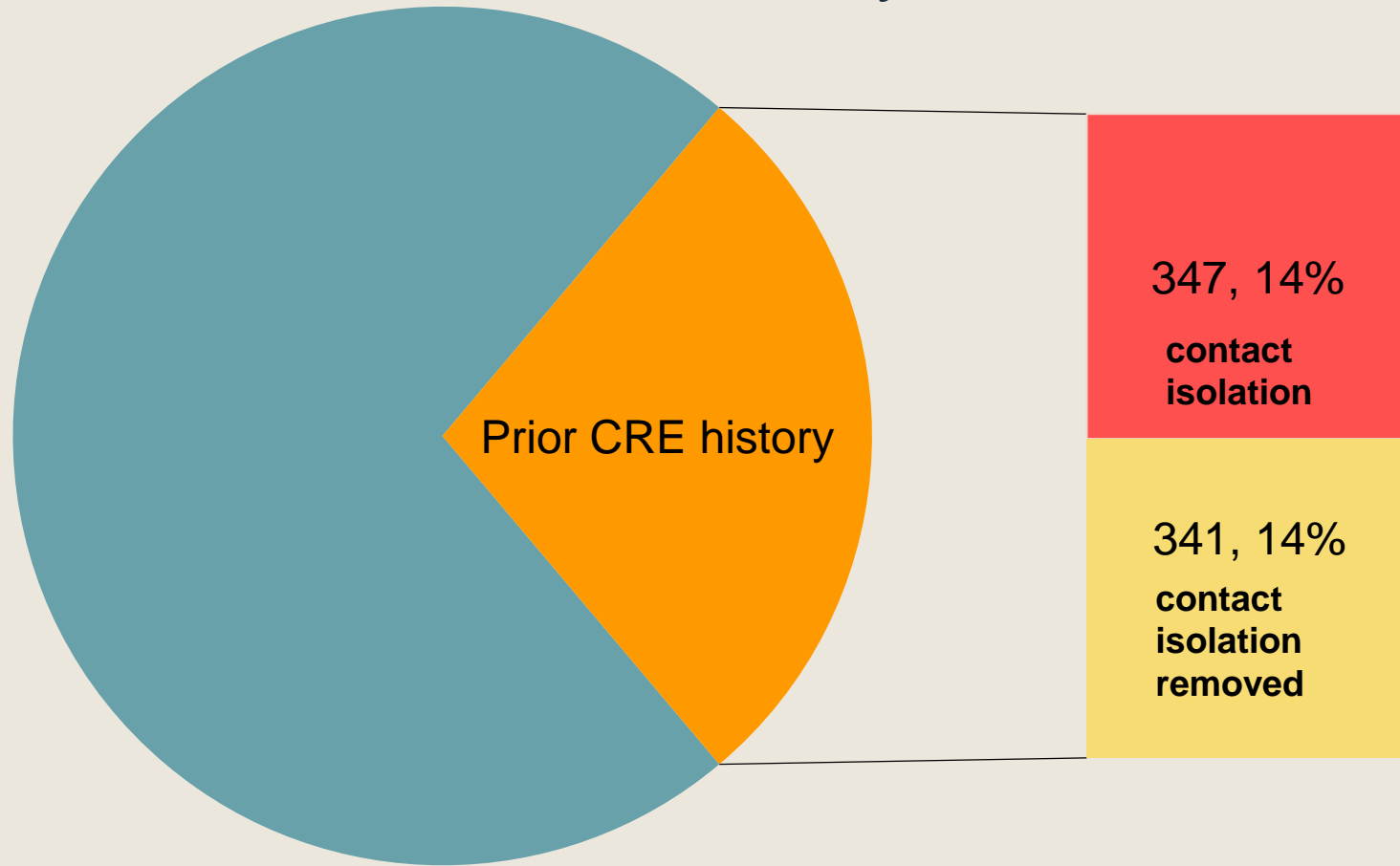
Spearman correlation: correlation between colonization pressure (prevalence of patients with
CRE history) and incident cases (newly detected CRE among
unknown)

Results

Distribution of population
in the 3 surveys



Distribution of population in the 3 surveys

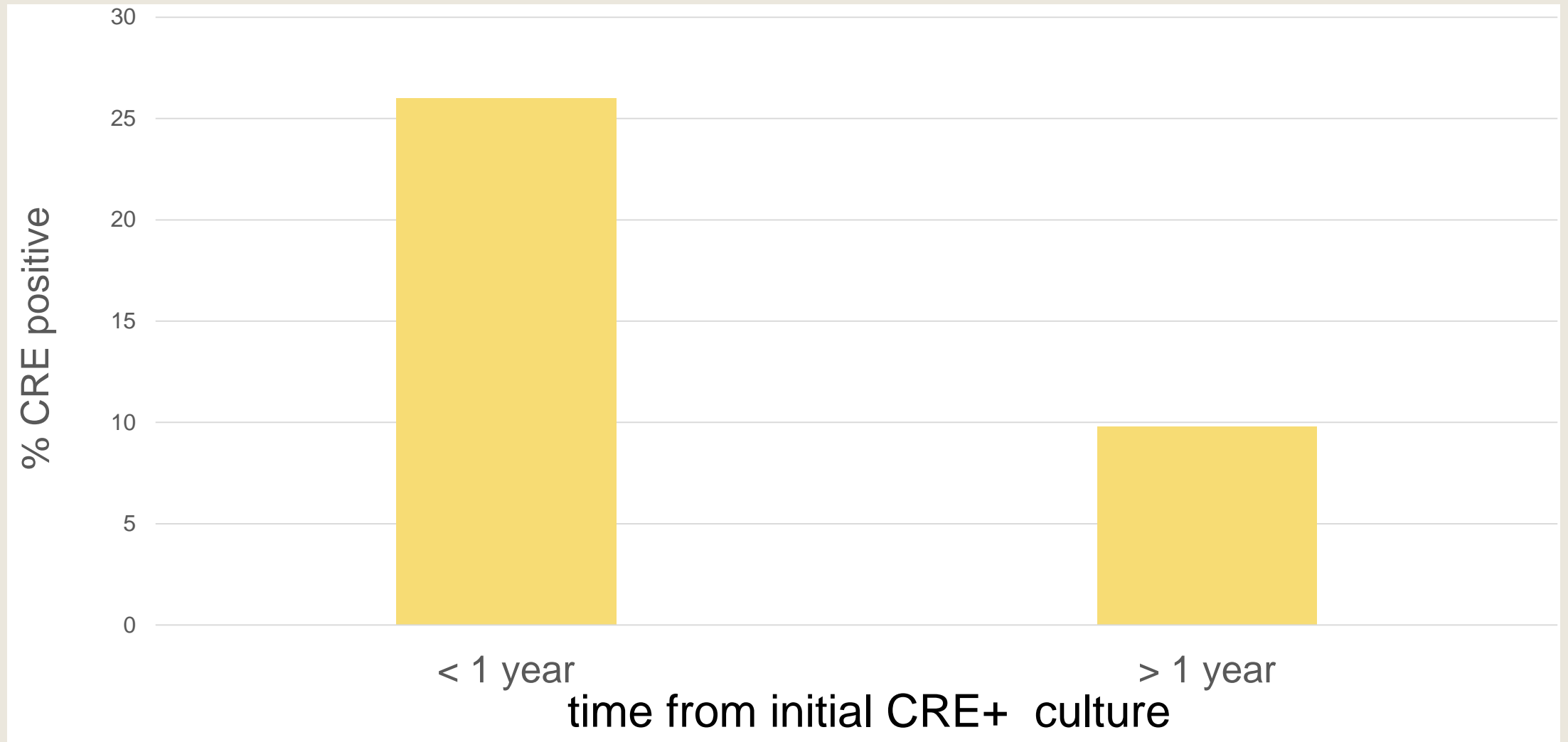


50% of patients with known CRE history had completed clearance protocol and contact isolation had been removed

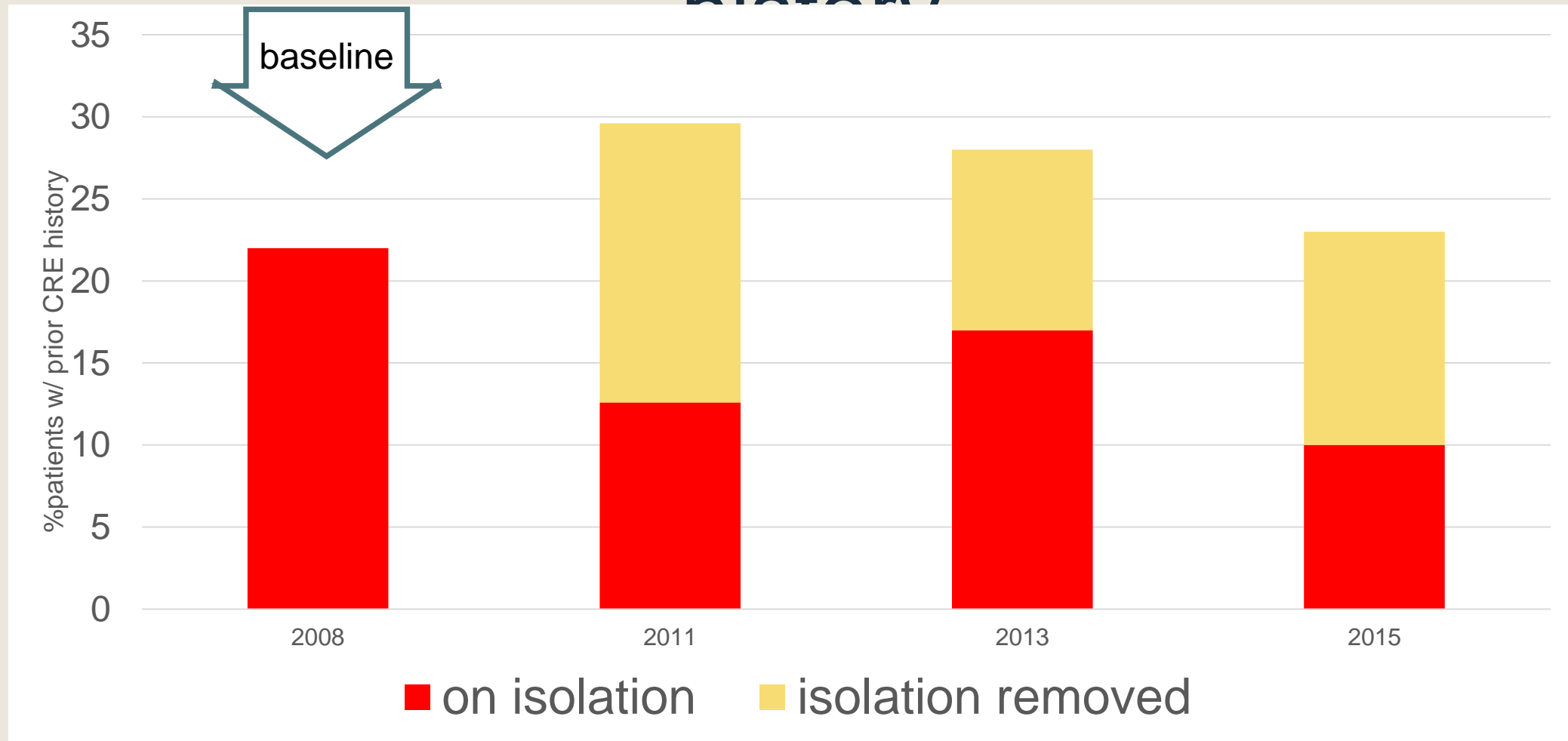
New CRE detection among patients with prior carriage

	On contact isolation	Completed clearance contact isolation removed
N	347	341
% positive	40.1%	13.7%
Median duration from initial CRE positive culture	16 months	29 months

New CRE detection among patients whose CRE carrier status was discontinued

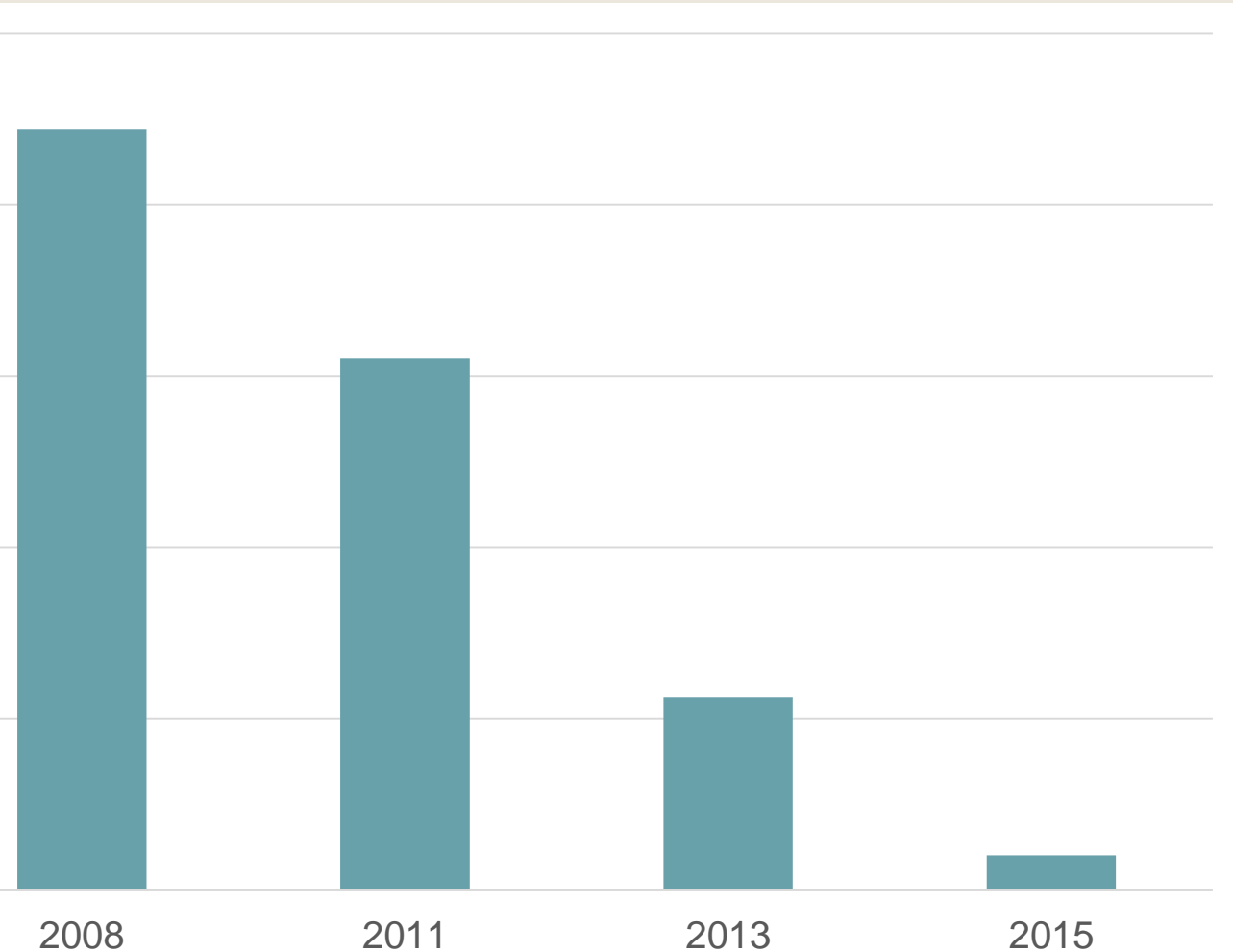


No significant difference in prevalence of patients with CRE history



Newly detected CRE among patients with no CRE history

No correlation was found
between
new acquisitions and
prevalence of isolated CRE
patients
(Spearman correlation 0.19, $p=0.07$)
or
patients who completed
clearance
and not on isolation
(Spearman correlation 0.04, $p=0.68$)



Conclusions

- Implementing a CRE clearance protocol led to a 50% reduction in the burden of isolated patients in PACH
- High proportion of previously cleared CRE patients remained negative
- Periodic assessment is currently recommended to detect CRE recurrence among patients removed from isolation
further studies are needed to identify risk factors for recurrence and differentiate between relapse vs new acquisition
- Following an ongoing intervention, risk of CRE acquisition among patients with no prior history was significantly reduced despite the presence of a large population who were removed from contact isolation