

Welcome to *California*

Carbapenem Resistant Enterobacteriaceae (CRE) in California

Healthcare Associated Infections Advisory Committee

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Objectives

- Describe the background, methods, and results of the California 2012 CRE Prevalence Survey
- Describe the identification of a Target Area for Regional CRE Prevention Efforts

Carbapenem-resistant Enterobacteriaceae (CRE)

- One of 3 bacteria identified by CDC as an urgent threat
- CRE are resistant to the carbapenem class of antibiotics
Carbapenems often used to treat infections caused by bacteria that are resistant to other kinds of antibiotics
- Invasive CRE infections result in up to 50% mortality
- CRE are highly transmissible in healthcare settings
CRE resistance can be transferred between different bacterial species



CDC CRE Surveillance Definition: Complex and Evolving

2014 and prior

Non-susceptible to at least 1 carbapenem:

doripenem, meropenem, or imipenem (*excluding ertapenem*)

- **AND** -

Resistant to all 3rd generation cephalosporins tested:

ceftriaxone, cefotaxime, and ceftazidime

New in 2015

Resistant to at least 1 carbapenem:

doripenem, meropenem, imipenem, or ertapenem

- **OR**-

Identification of carbapenemase*

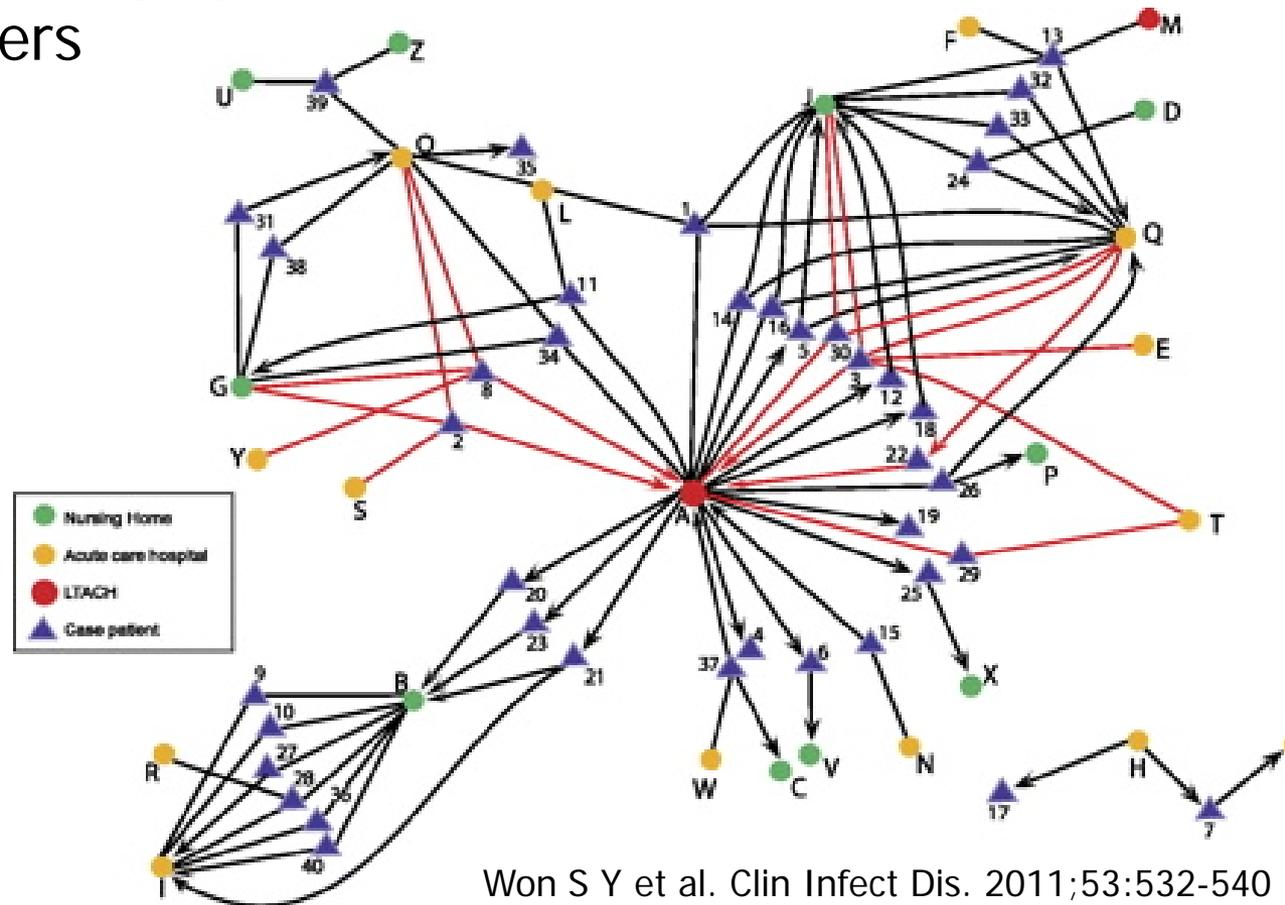
CRE Risk Factors

- Exposure to antimicrobials
 - Carbapenems, cephalosporins, fluoroquinolones, vancomycin
- Exposure to an intensive care unit
- Mechanical ventilation
- Poor functional status

CRE and Long Term Acute Care (LTAC) Hospitals

LTAC hospitals have the greatest numbers of CRE positive patients as a result of caring for **patients with many CRE risk factors**, after lengthy hospitalizations and/or multiple inter-facility transfers

An outbreak of KPC-producing CRE in Indiana and Illinois found that 24 (60%) of cases were linked to one LTAC hospital



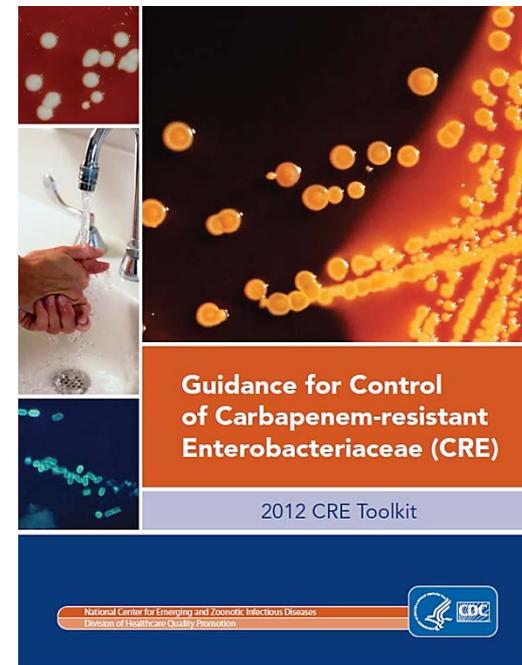
CRE Prevention Strategies for Acute and Long-term Care Facilities

CORE

1. Hand Hygiene
2. Contact Precautions
3. Healthcare Personnel Education
4. Minimize Device Use
5. Patient and Staff Cohorting
6. Laboratory Notification
7. Antimicrobial Stewardship
8. CRE Screening

Supplemental

1. Active Surveillance Testing
2. Chlorhexidine Bathing



California CRE Prevalence Survey – Objectives

1. To educate California hospital infection prevention personnel about CRE
 - Facilitate communication and collaboration between infection prevention and microbiology
2. Determine regional prevalence of CRE in California among general acute care hospitals in 2012
 - Assist local public health and healthcare facilities to better utilize the CDC CRE toolkit

California CRE Prevalence Survey – Methods

- All acute care hospitals including long-term acute care (LTAC) contacted
- To determine hospital prevalence of CRE in 2012 among all *Klebsiella* isolates tested
- Defined CRE as *Klebsiella* spp. that tested non-susceptible to a carbapenem

CRE *Klebsiella* Prevalence in California – 2012

Hospital Type	Responding Hospitals	# CRE	# Isolates Tested	Pooled Mean Prevalence
General Acute Care	297	2,264	72,387	3.1% *
Long Term Acute Care	22	1,152	2,220	51.9%

* More than half of all general acute care hospitals reported **zero** CRE isolates in 2012

Regional Prevalence of CRE *Klebsiella* Species, 2012

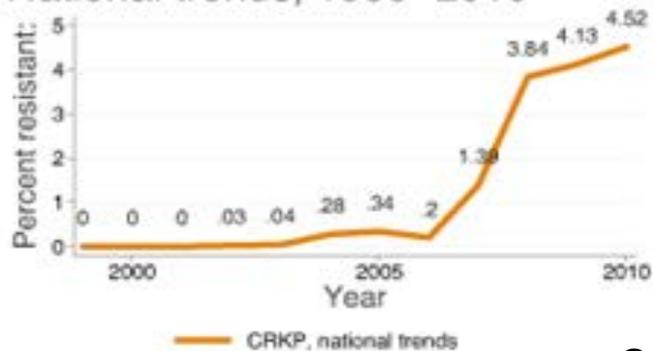
Regions	Number of Hospitals*	CRE <i>Klebsiella</i> Isolates	Total <i>Klebsiella</i> Isolates	CRE Resistance Percentage
Sierras	5	0	467	0.00%
Sacramento Metro	13	2	3,643	0.05%
San Joaquin Valley	36	27	9,102	0.30%
Far North	29	13	4,244	0.31%
Bay Area	49	41	11,596	0.35%
Central Coast	16	13	2,015	0.65%
San Diego	18	230	8,122	2.83%
Inland Empire	31	270	7,472	3.61%
Los Angeles-Orange	100	1668	25,828	6.46%
Total	297	2,264	72,489	3.12%

Carbapenam-resistant *Klebsiella pneumoniae*

US Regions, 2009-2010



National trends, 1999-2010

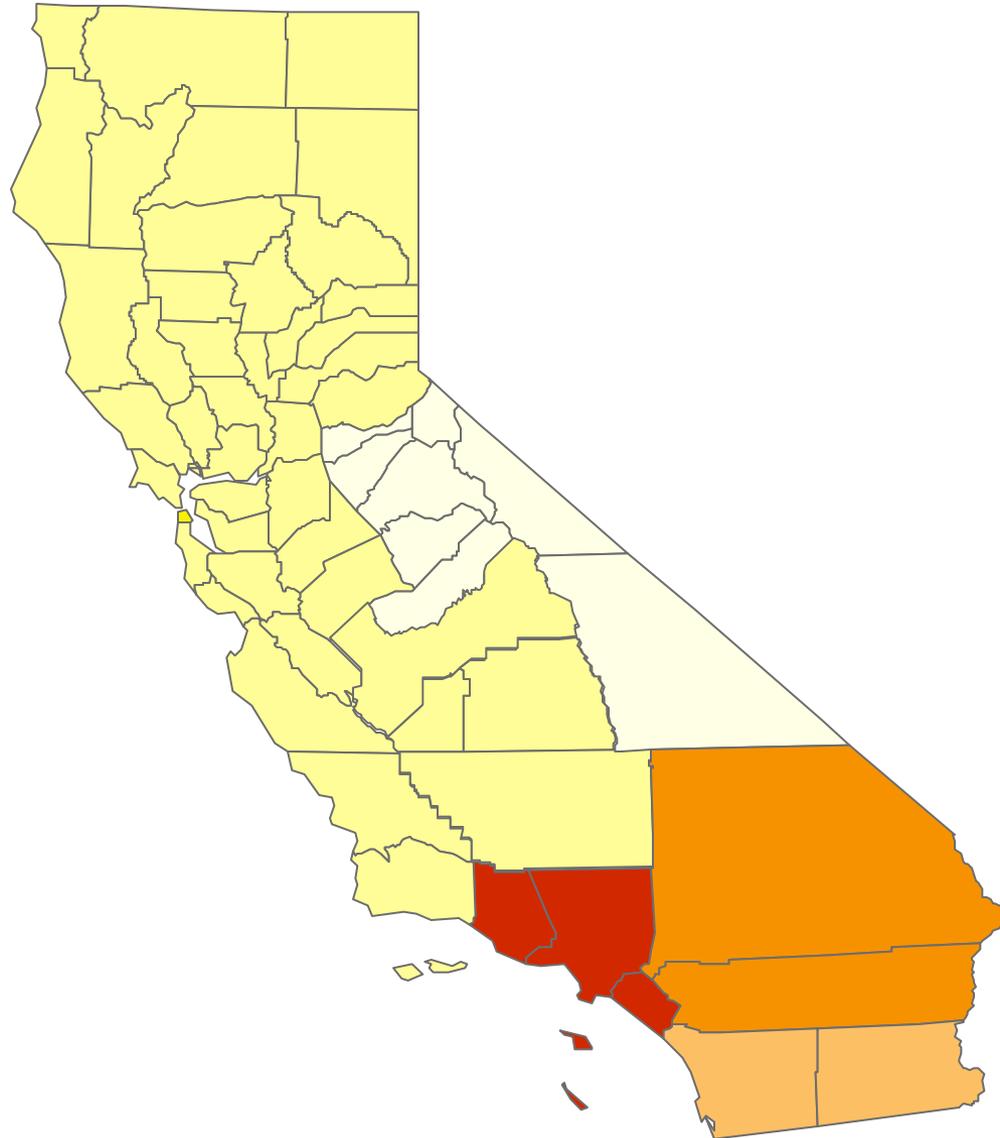


ResistanceMap
cddep.org/map

Courtesy of Arjun Srinivasan, CDC

Regional Prevalence of CRE *Klebsiella* Species, 2012

Proportion of
CRE *Klebsiella*

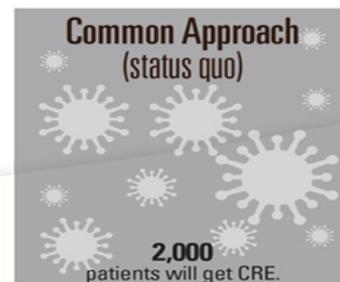


Summary

1. LTAC hospitals have significantly higher prevalence than other general acute care hospitals
2. CRE prevalence is significantly higher in southern California
3. California has a lower prevalence of CRE compared with other US regions
4. Effective CRE prevention will require a coordinated response

More patients get infections when facilities do not work together.

(Example: 5 years after CRE enters 10 facilities in an area sharing patients)



CRE will impact **12%** of patients.



CRE will impact **8%** of patients.



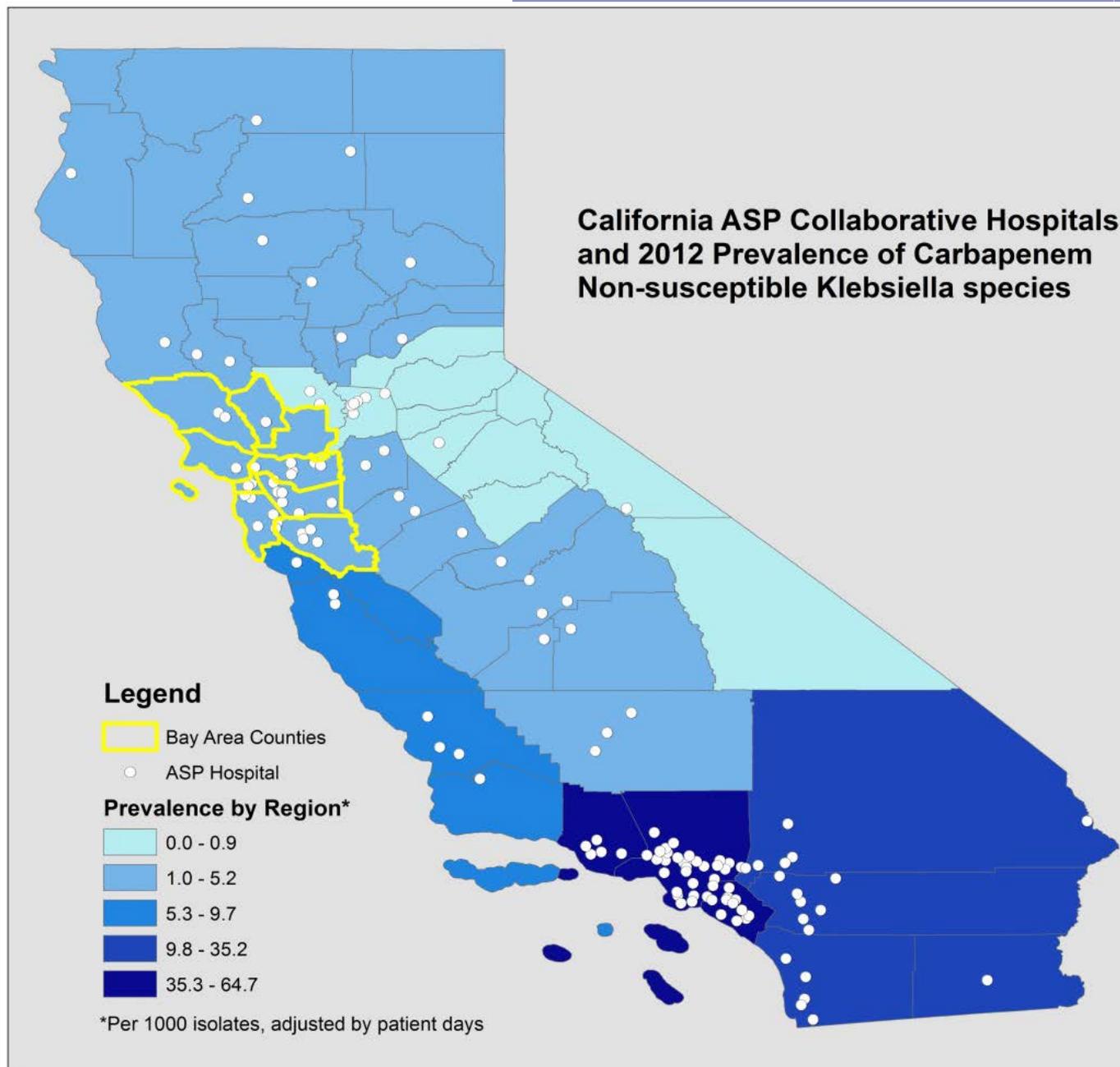
CRE will impact **2%** of patients.



Identification of a Target Area for Regional CRE Prevention Efforts

- “In regions with no or few CRE colonized or infected patients, there may be a **critical opportunity to prevent further emergence of CRE** by taking an aggressive approach early in the process.”
– CDC CRE Toolkit, 2012
- Multiple clusters and outbreaks of CRE during recent years in northern California highlight opportunities to prevent further spread of CRE in California

Identifying Target Area for a Regional CRE Prevention Collaborative



Questions?

For more information, please contact
HAIProgram@cdph.ca.gov

Thank you

