

CRE and LTACHs

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Associate Professor of Medicine
Medical College of Wisconsin

Disclosures

- Speaker for Ecolab

Lake Michigan

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Northwest Indiana

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Illinois

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Dr. Paul Schreckenberger
Loyola Medical Center
First KPC-K *pneumoniae*
Transferred from NW Indiana
December 2007



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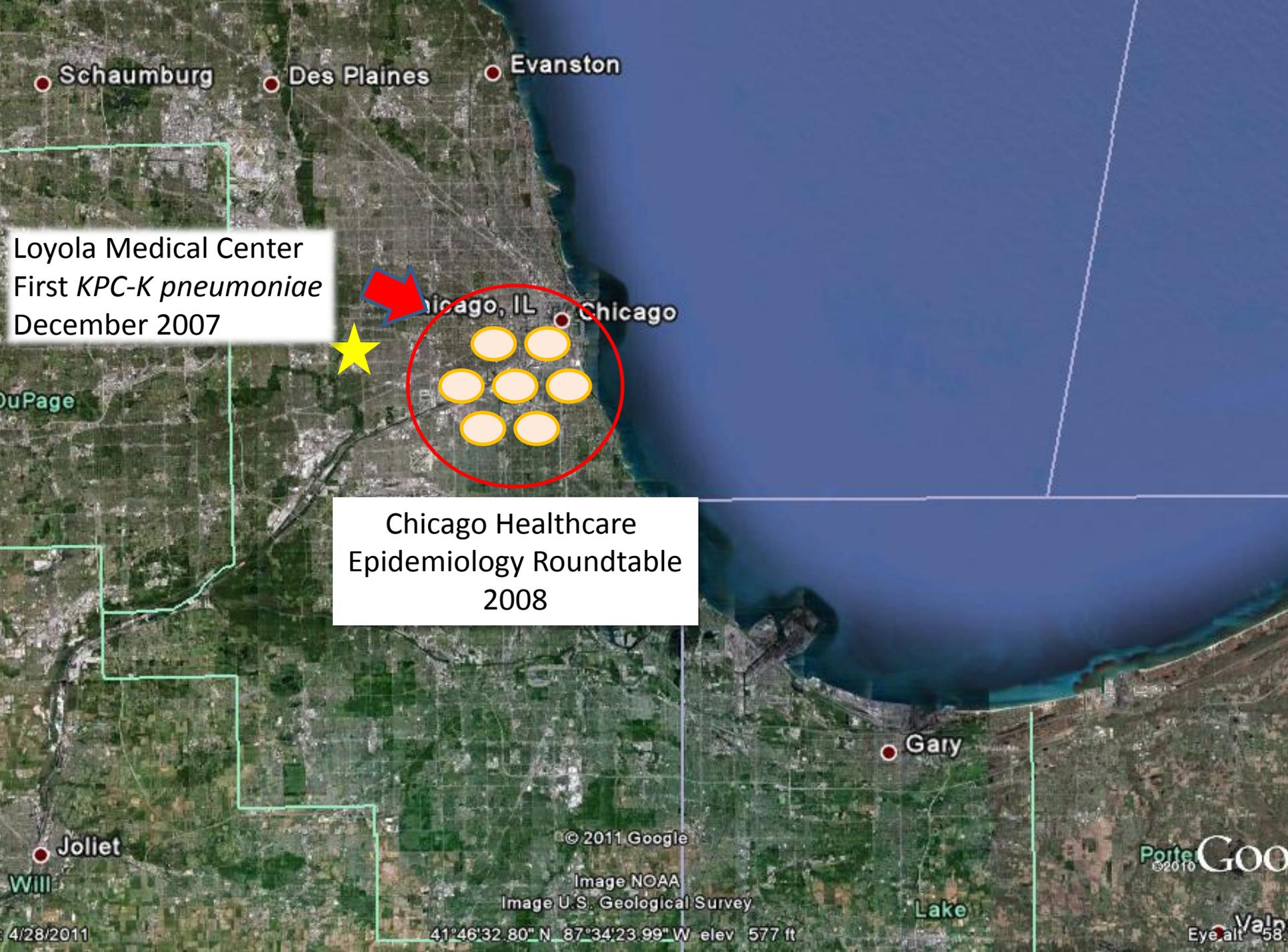
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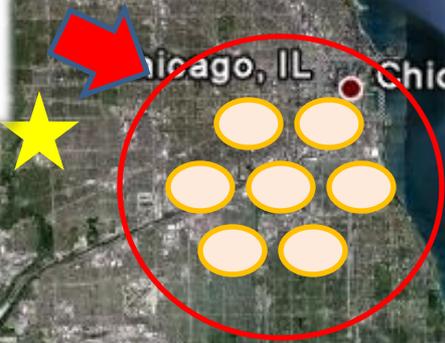
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Loyola Medical Center
First *KPC-K pneumoniae*
December 2007



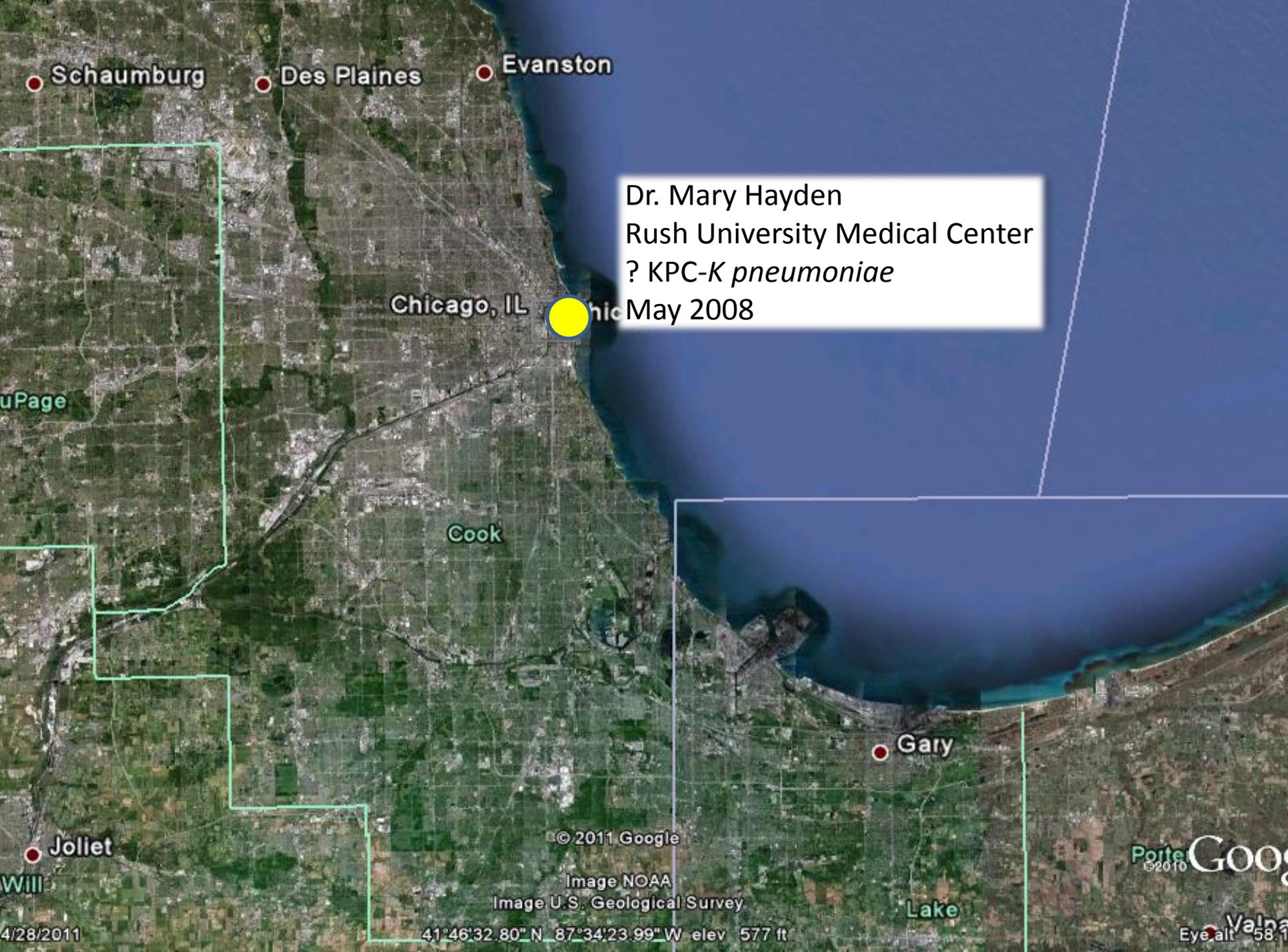
Chicago Healthcare
Epidemiology Roundtable
2008

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Dr. Mary Hayden
Rush University Medical Center
? KPC-K pneumoniae
Chicago May 2008

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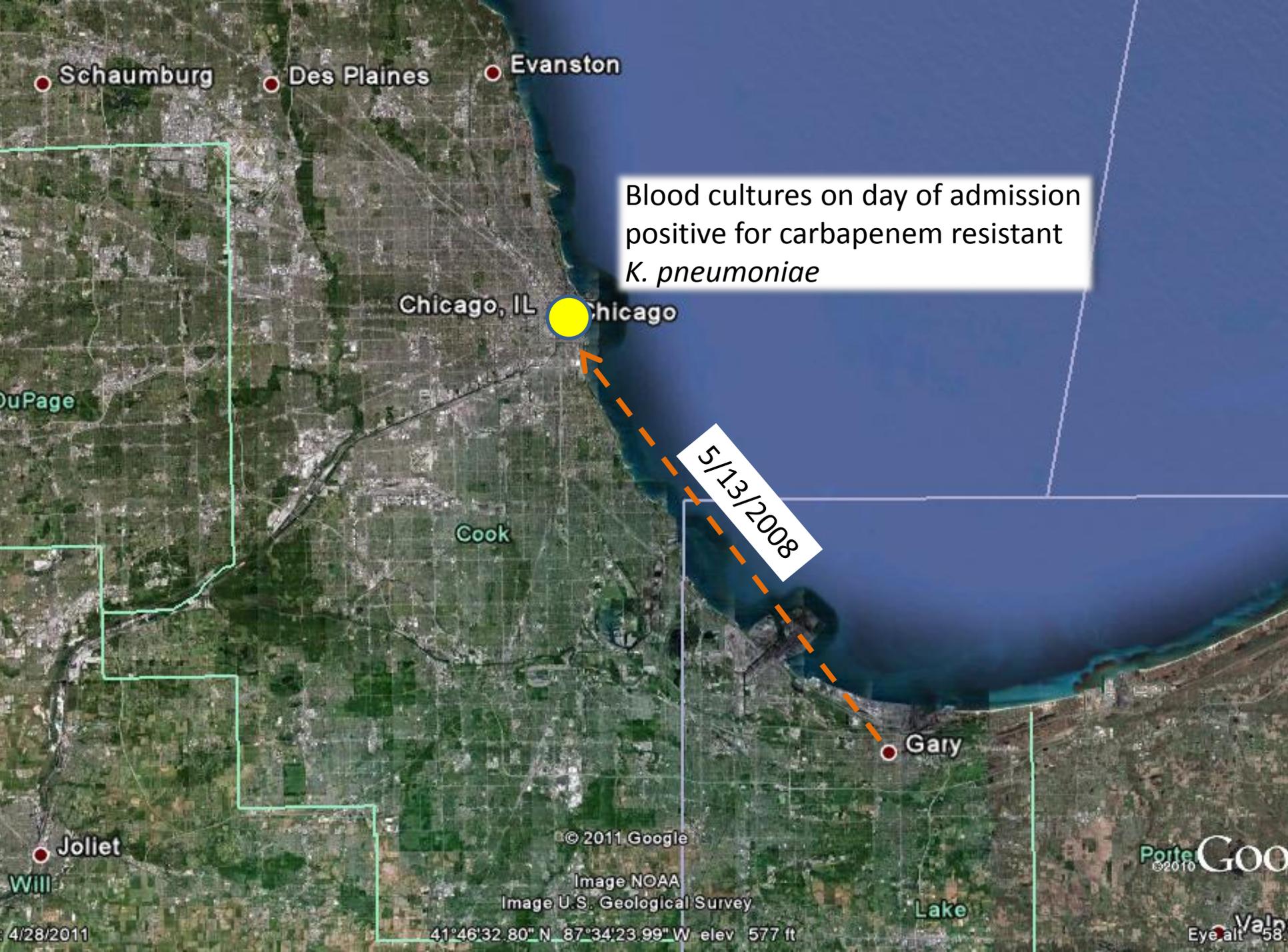
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Blood cultures on day of admission positive for carbapenem resistant *K. pneumoniae*

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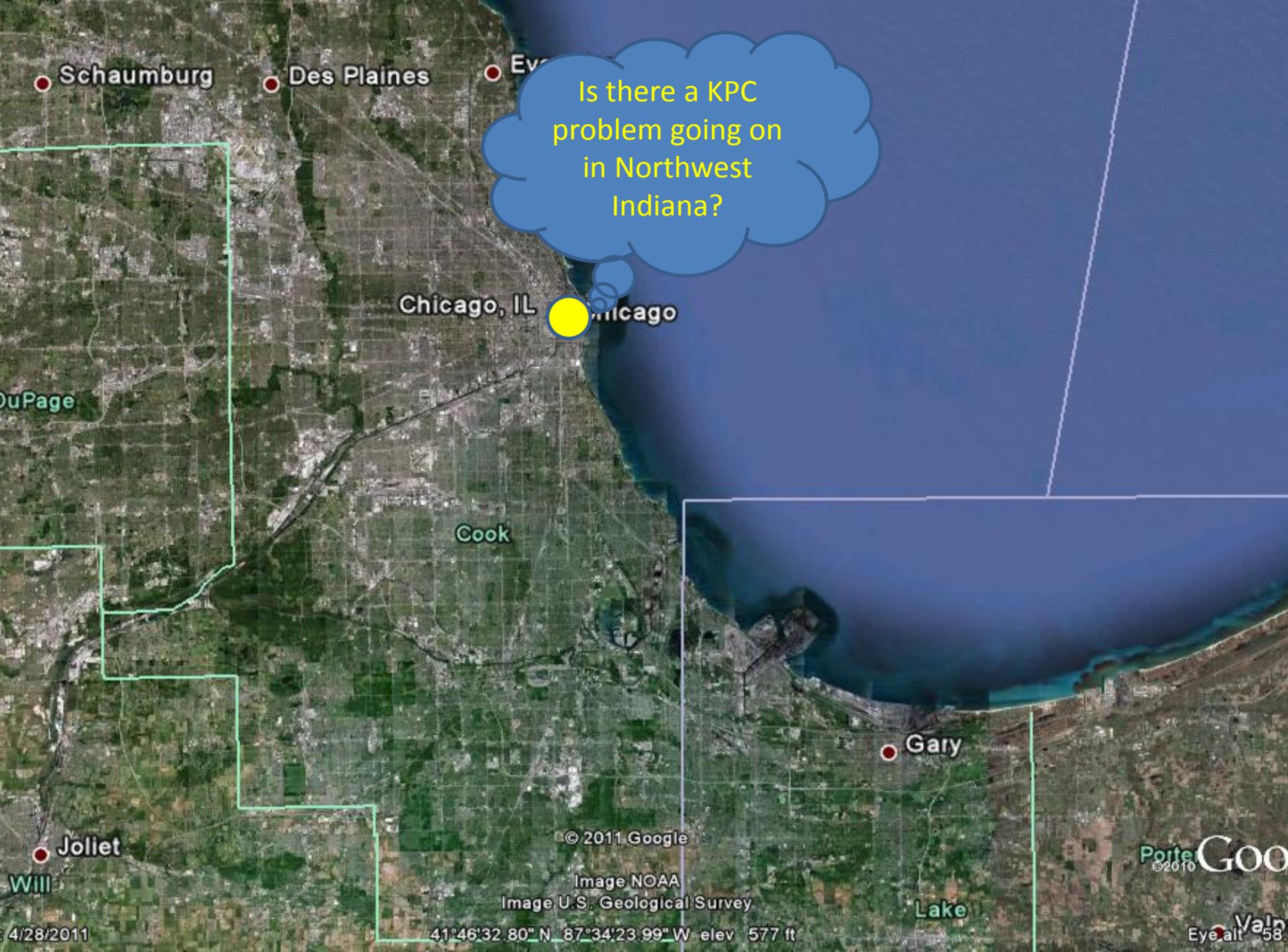
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Is there a KPC problem going on in Northwest Indiana?

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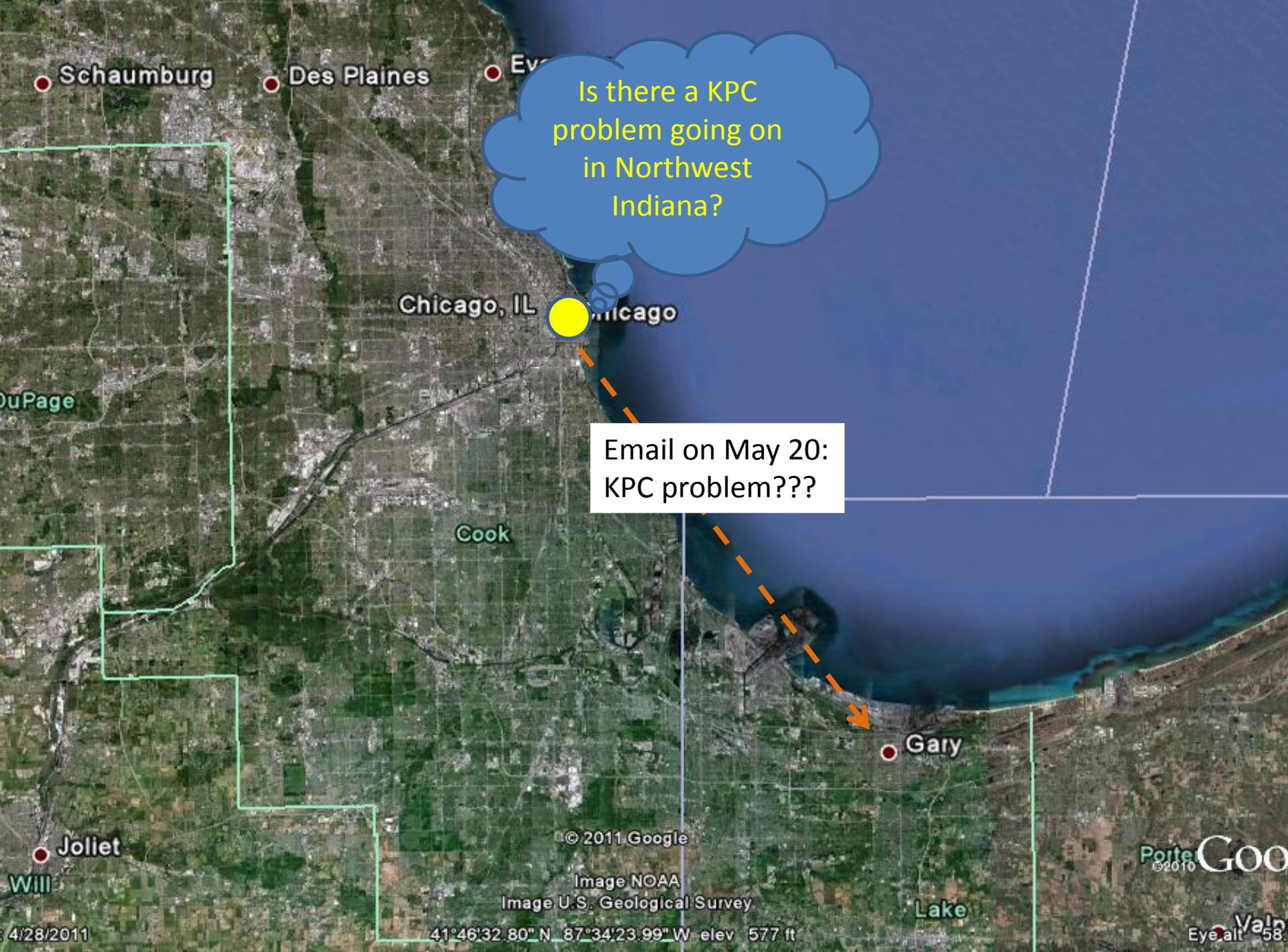
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Is there a KPC problem going on in Northwest Indiana?

Email on May 20: KPC problem???

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ACUTE CARE HOSPITALS

Chicago

NorthShore University HealthSystem

Elgin

VCA Chicago North Animal Hospital

Saints Mary and Elizabeth Medical Center: Saint Mary Campus

West Suburban Medical Center

Brighton Park Animal Hospital

Evangelist Hinsdale Hospital

Holy Cross Hospital

University of Chicago Physicians Group

Providence Holy Family Hospital and Health Care Centers

Advocate Trinity Hospital

Aurora

MetroSouth Medical Center

Jackson Park Hospital and Medical Center

Ingalls Memorial Hospital

St. Catherine Hospital

Community Hospital

Methodist Hospital: Northlake Campus

St James Hospital And Health Centers

Providence Saint Mercy Healthcare Centers: South Campus

I

Methodist Hospitals

Porter Valparaiso Hospital

Saint Anthony Medical Center Emr

E

NORTHWEST INDIANA

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ACUTE CARE HOSPITALS

NorthShore University HealthSystem

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VCA Chicago North Animal Hospital

Saints Mary and Elizabeth Medical Center: Saint Mary Campus

West Suburban Medical Center

Brighton Park Animal Hospital

Evangelist Hinsdale Hospital

Holy Cross Hospital

University of Chicago Physicians Group

Advocate Trinity Hospital

Provena Holy Family Hospital and Health Care Centers

Jackson Park Hospital and Medical Center

Aurora

University Hospitals
Each one with a separate ID service.

Provena Holy Family Medical Center

Provena Memorial Hospital

St. Catherine Hospital

Provena Community Hospital

Methodist Hospital: Northlake Campus

St James Hospital And Health Center

Community Hospitals

Served by 2 main ID private practices and 2 main centralized Microbiology laboratories

Provena Mercy Healthcare Centers: South Campus

Saint Anthony Medical Center Emr

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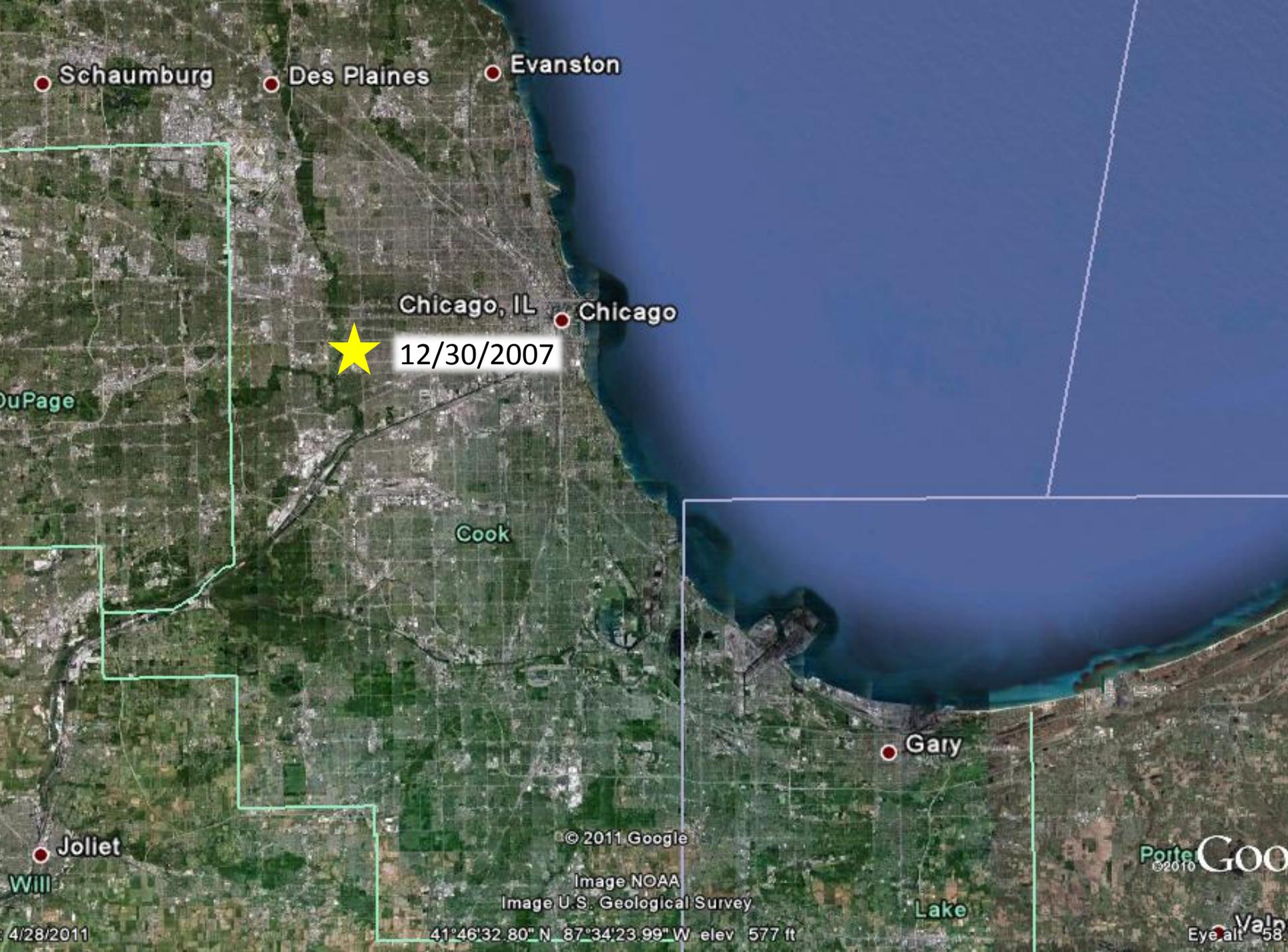
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41°47'01.48" N 87°21'57.11" W elev 529 ft

Image Date: 4/28/2011

Retrospective evaluation of Microbiology databases in NW Indiana

Looking for carbapenem-resistant *K.
*pneumoniae**



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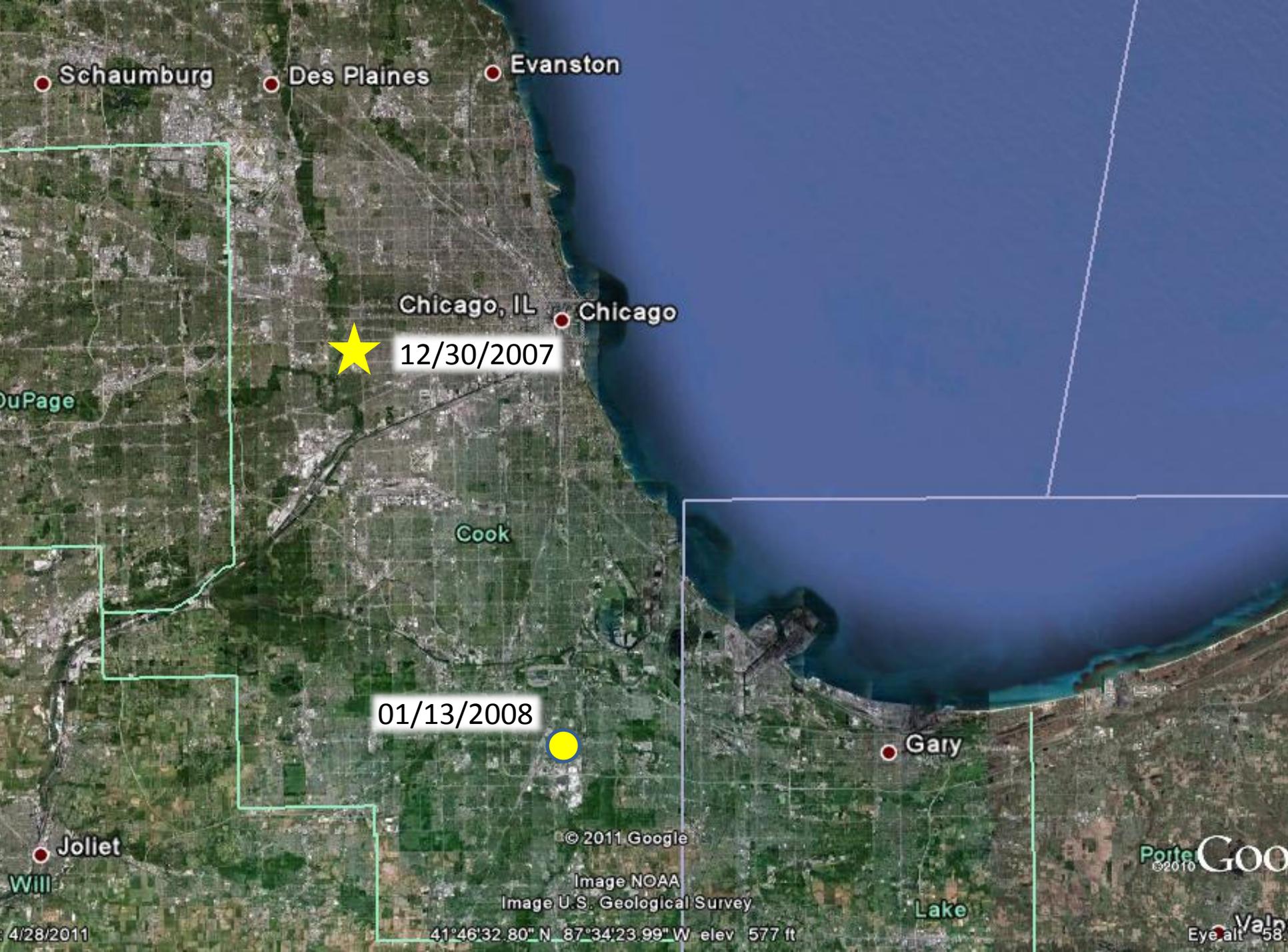
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Cases were concentrating at an LTACH...

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What's an LTACH?

- Long-term acute care hospital
- Accepts critically ill patients requiring mechanical ventilator weaning, long term intravenous antibiotics, complex decubital wounds
- Patients are required to stay in facility for at least 25 days

What's an LTACH?

- Patients are admitted from various acute care hospitals from the region
- Patients are either transferred back to acute care hospitals, long term care facilities (nursing homes or skilled facilities within the region) or home

LONG TERM ACUTE CARE HOSPITALS

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LONG TERM CARE FACILITIES

Chicago

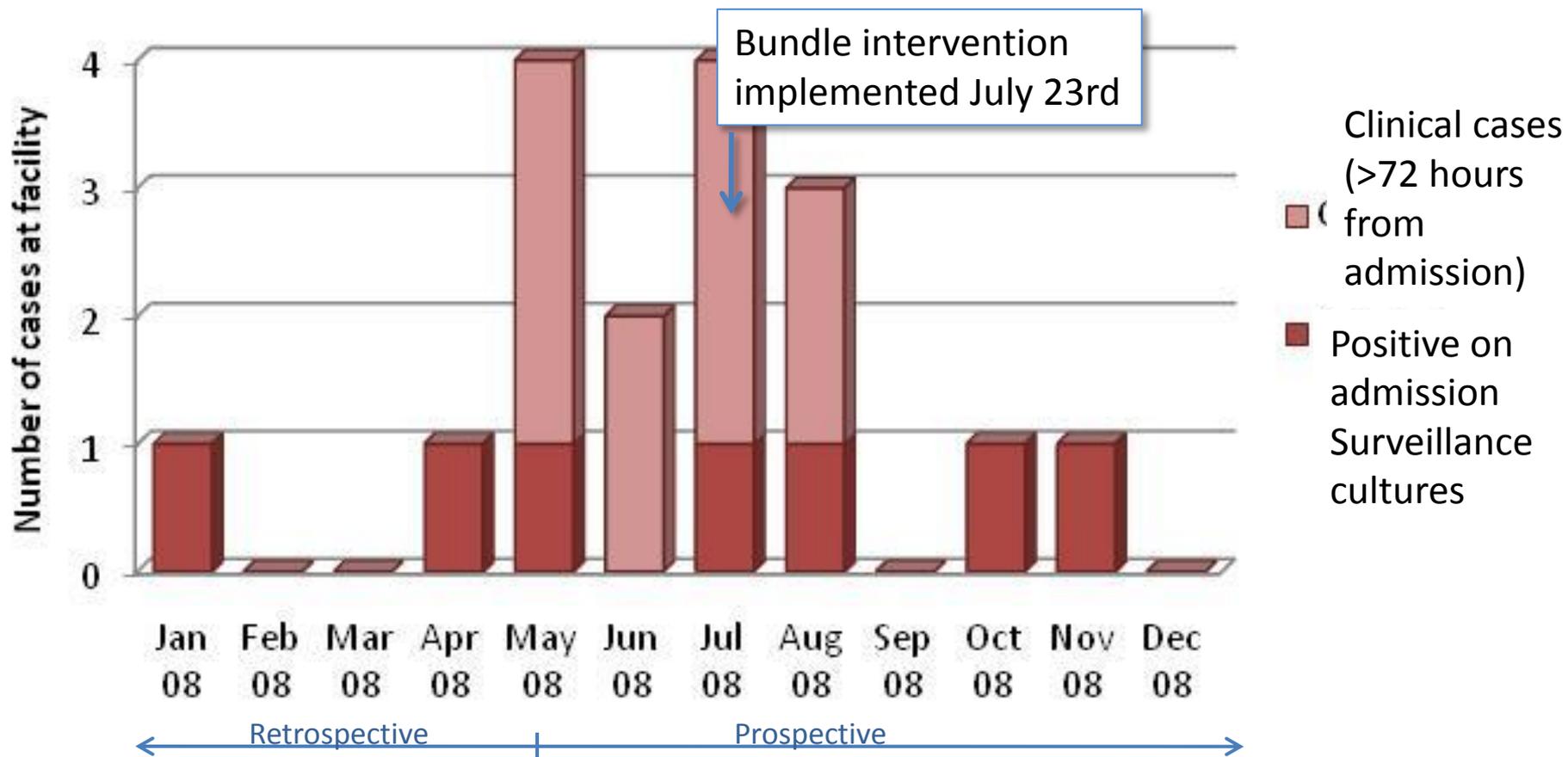


Wittenberg Village, a Lutheran Life Community NORTHWEST INDIANA

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Number of new cases at LTACH



Nosocomial and healthcare related infections

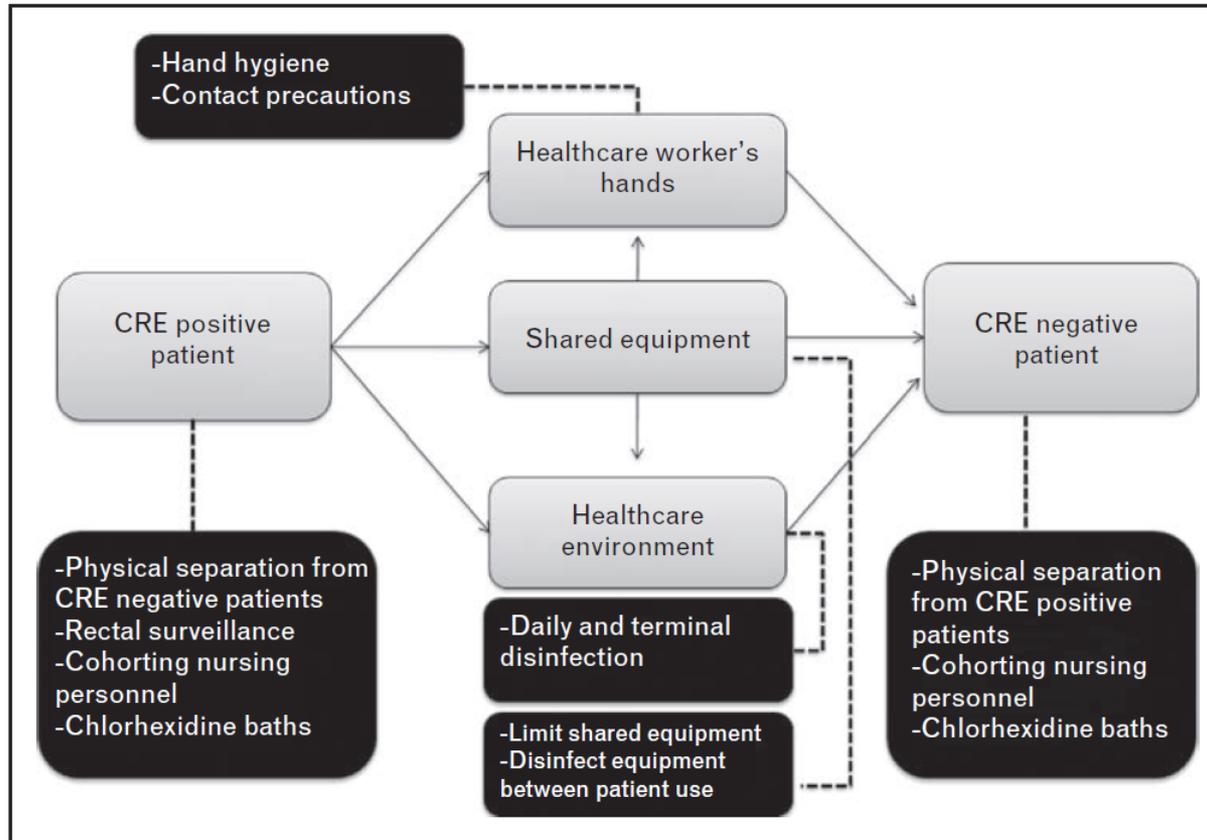
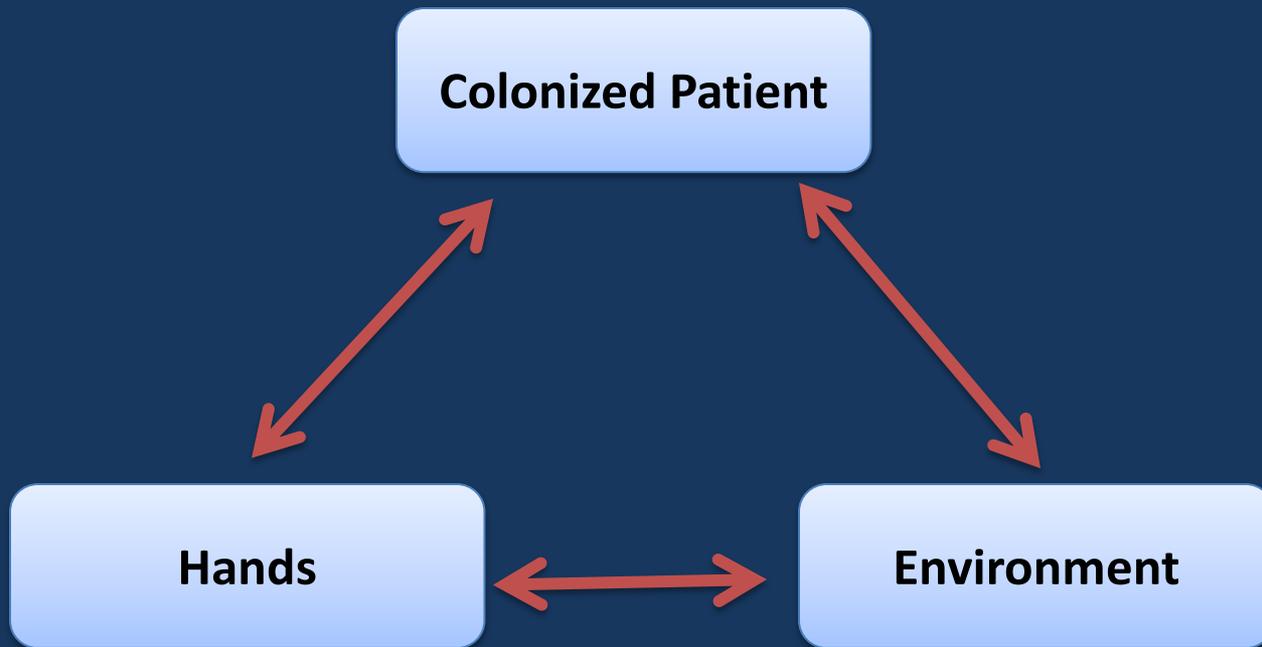


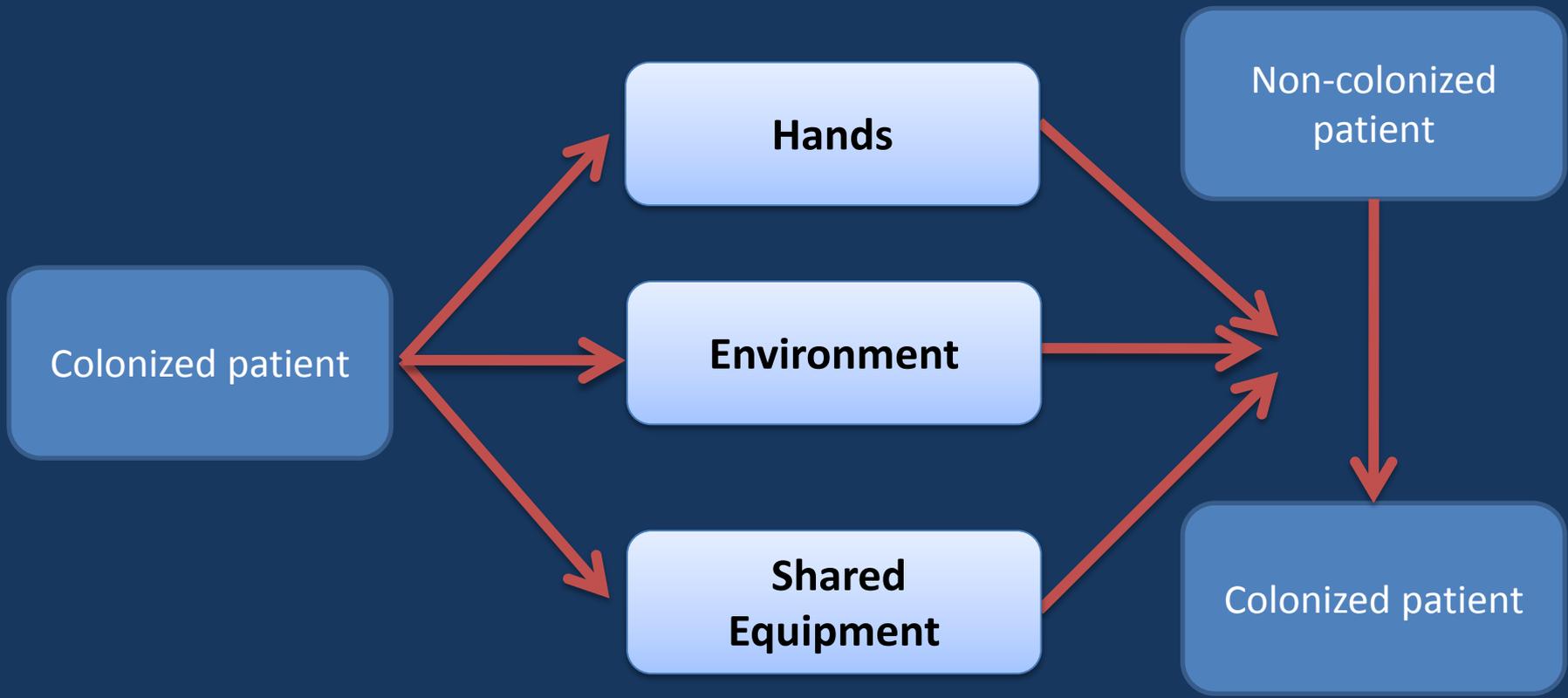
FIGURE 1. Horizontal transmission pathways of carbapenem-resistant *Enterobacteriaceae*. CRE, carbapenem-resistant *Enterobacteriaceae*. Light boxes: components of transmission pathways. Dark boxes: interventions aimed at mitigating horizontal transmission.

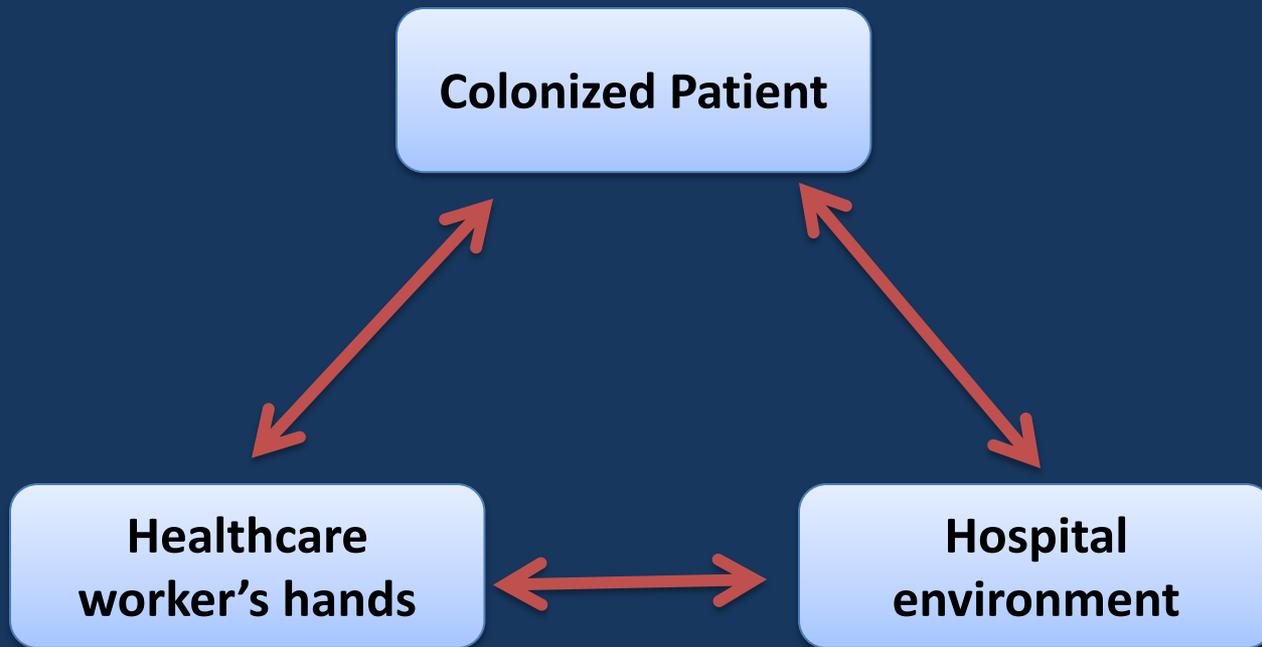
Colonized patient



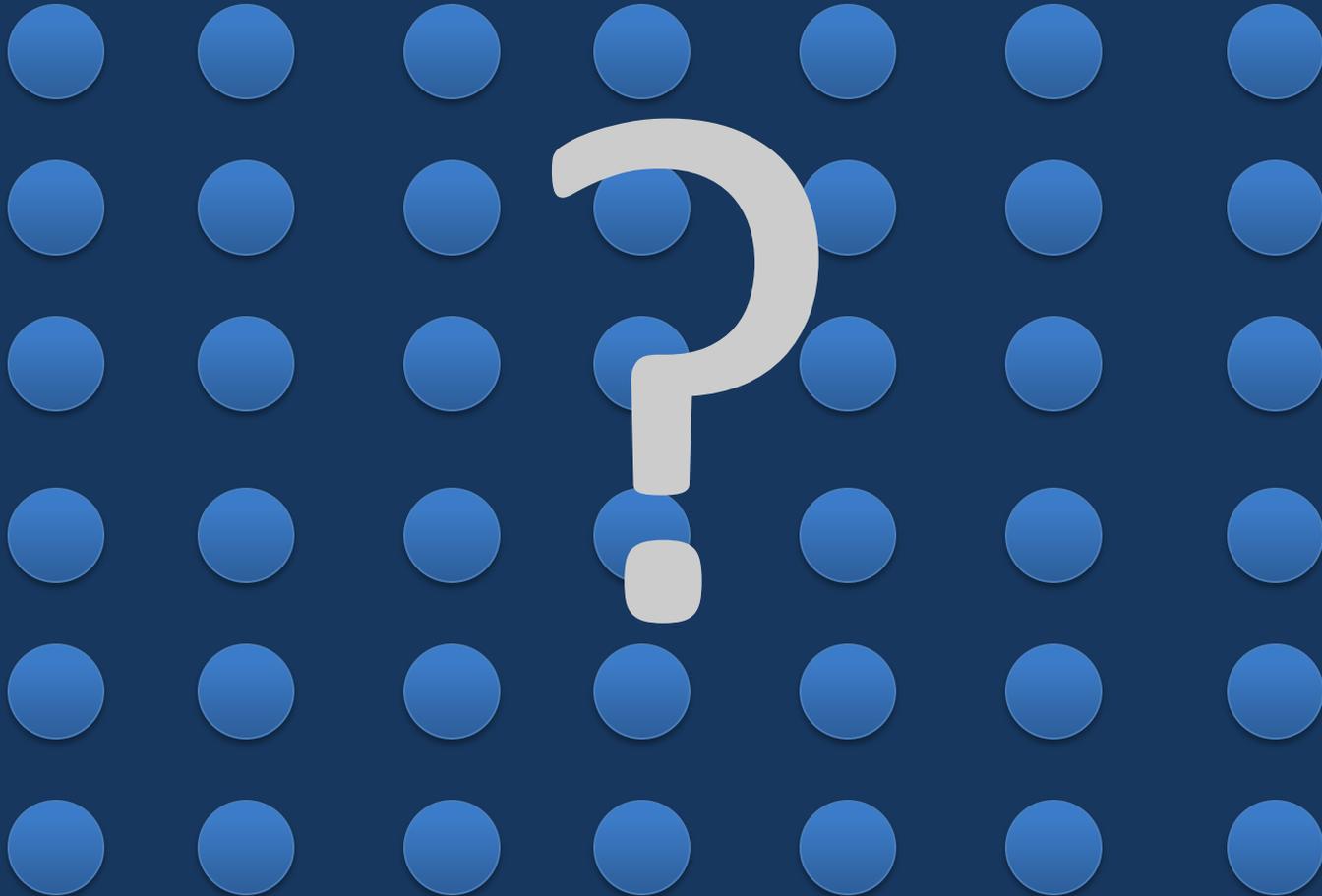
Non-colonized
patient

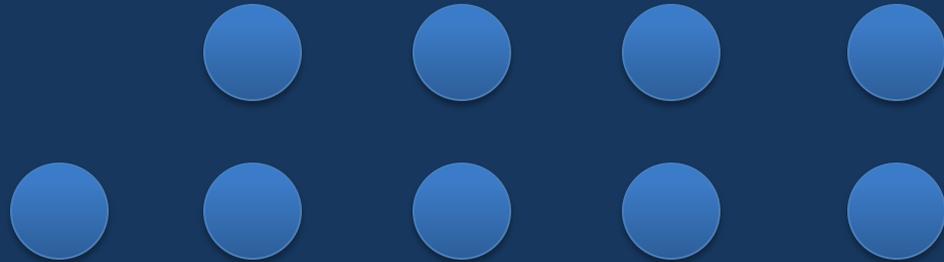
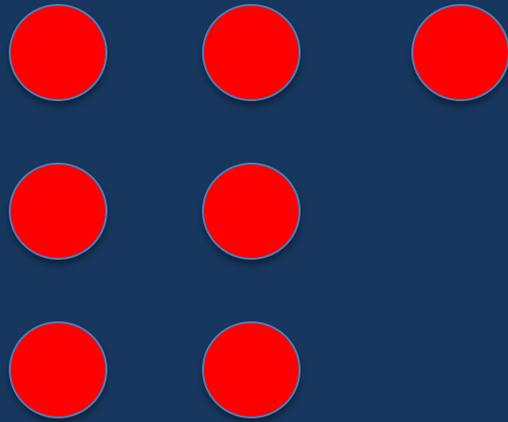




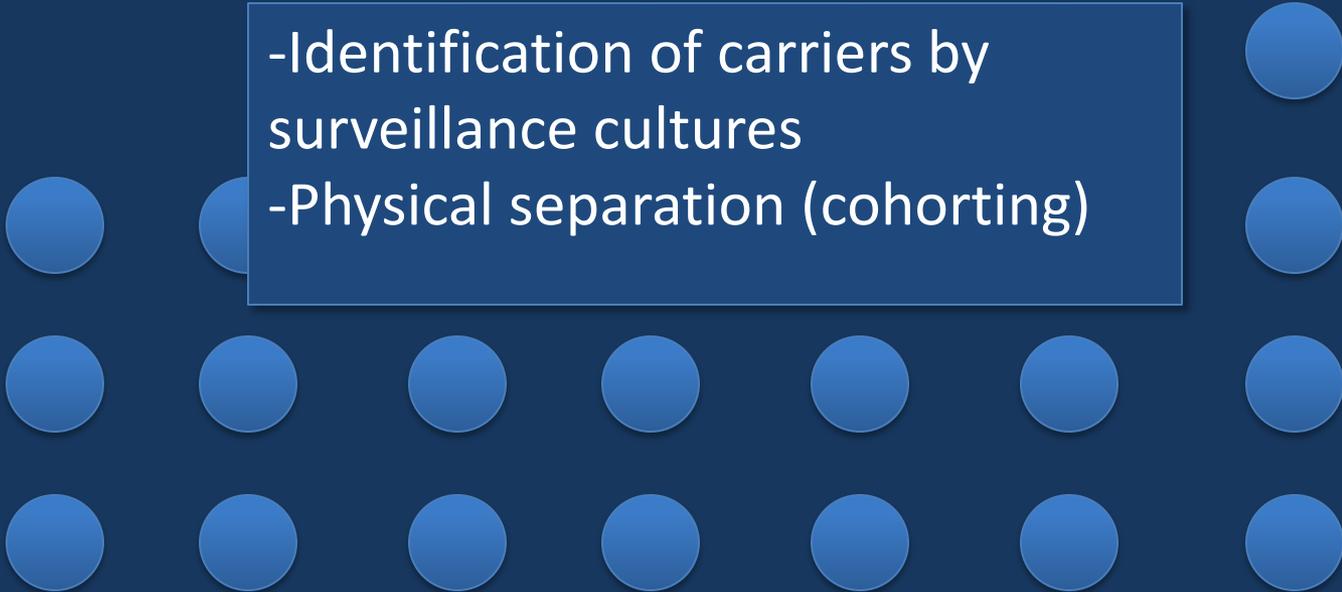


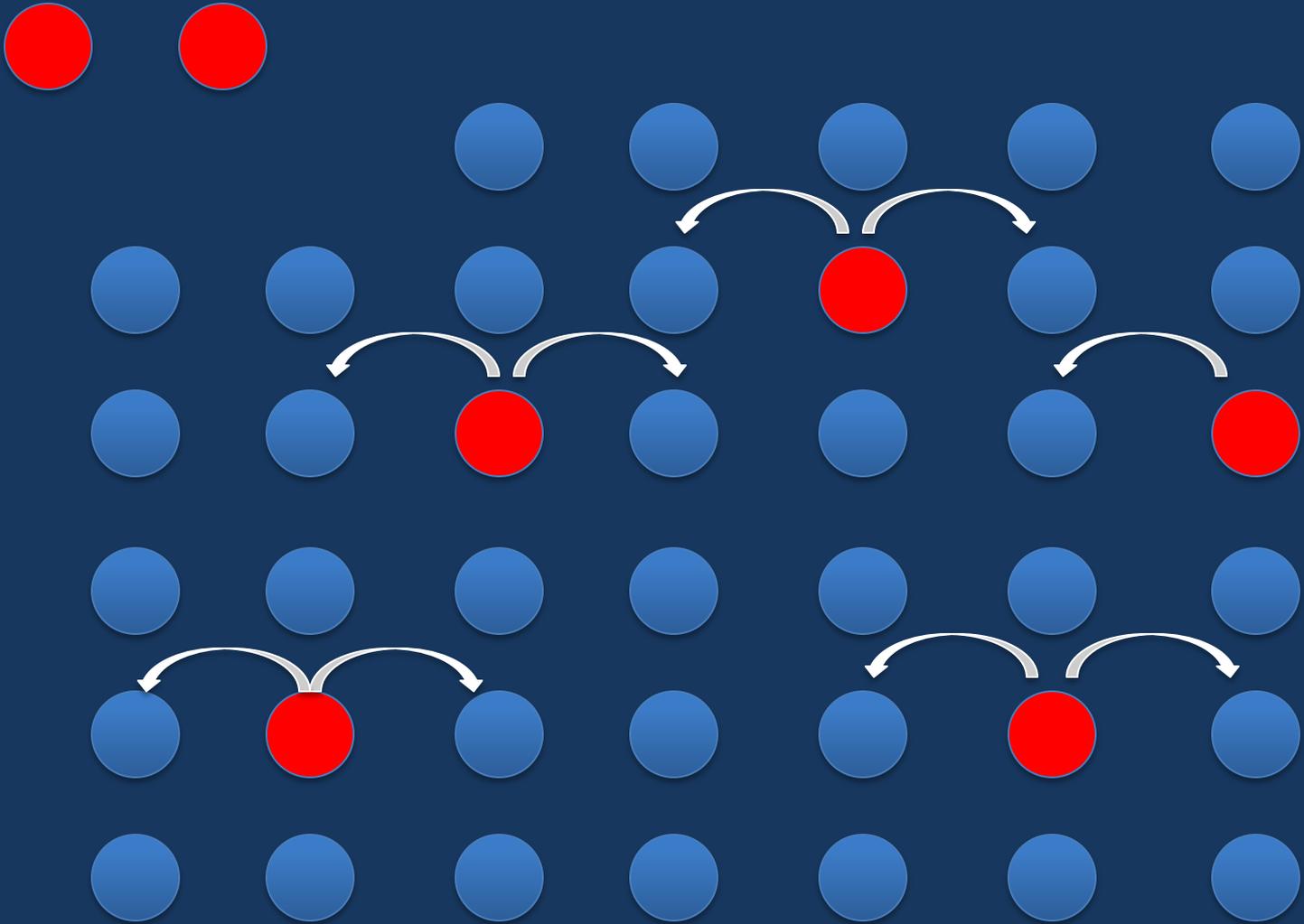
- Increase the distance
- Decrease contamination of hands and clothes
- Increase environmental disinfection



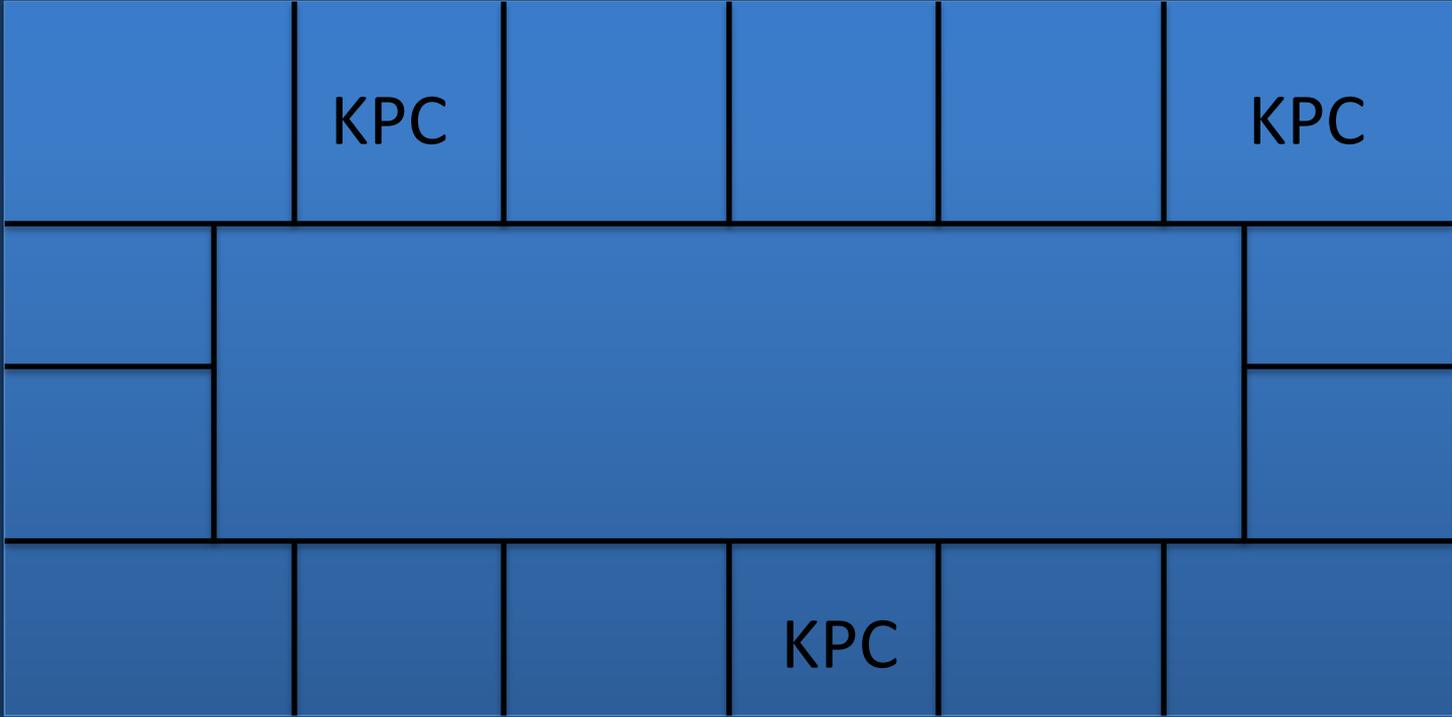


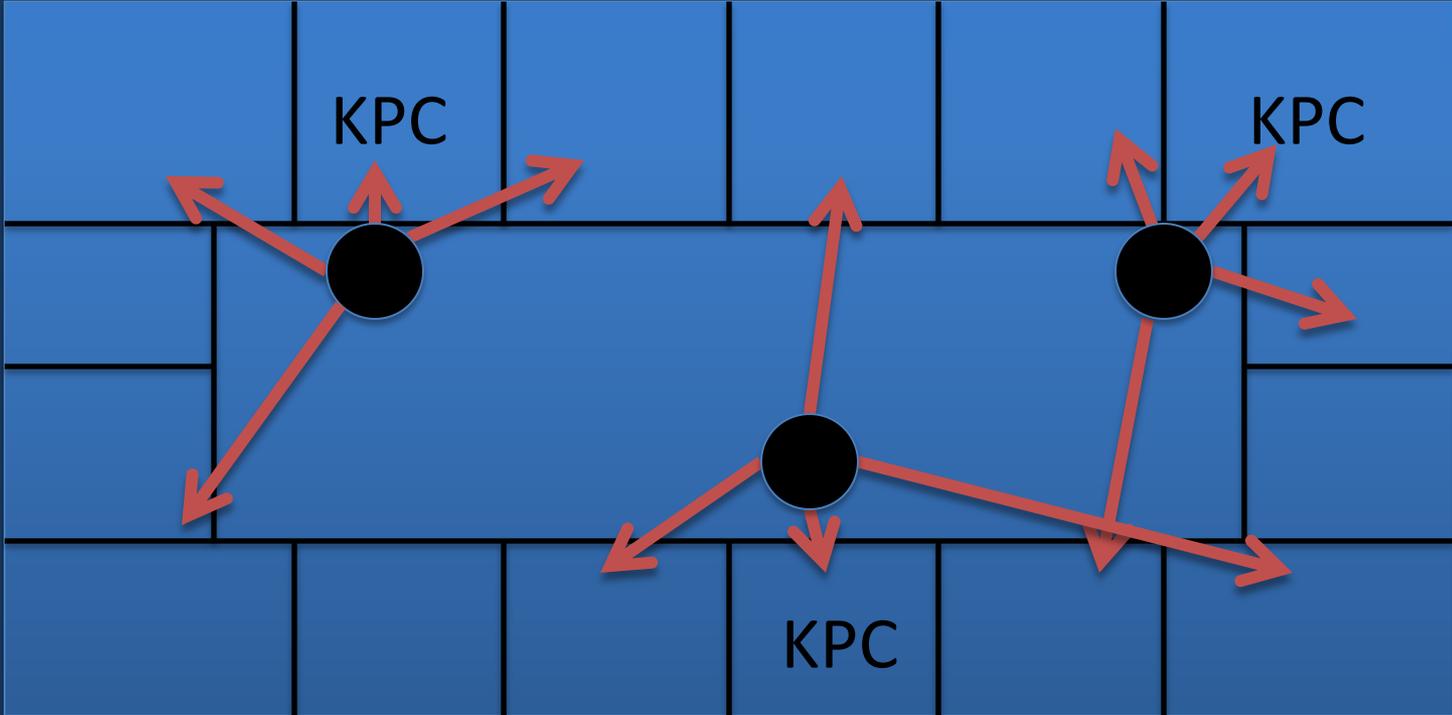
-Identification of carriers by
surveillance cultures
-Physical separation (cohorting)

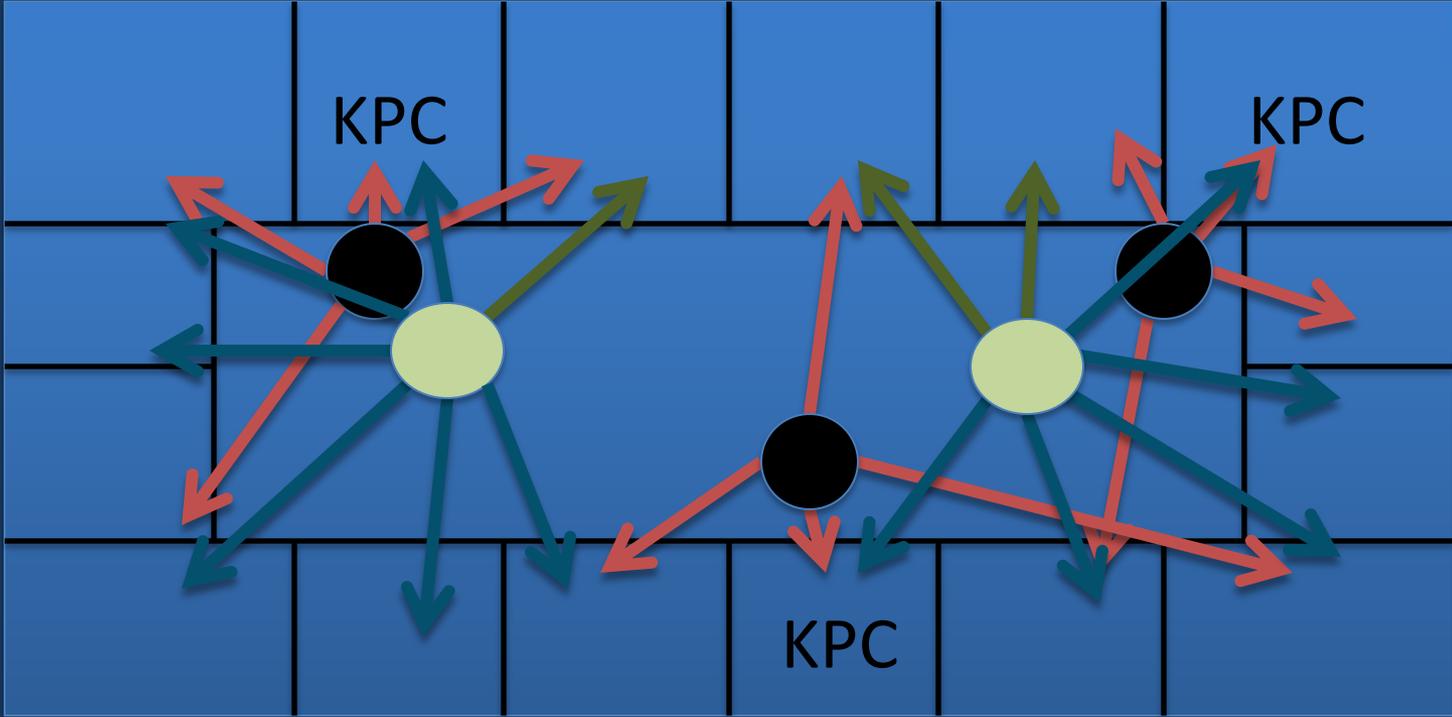




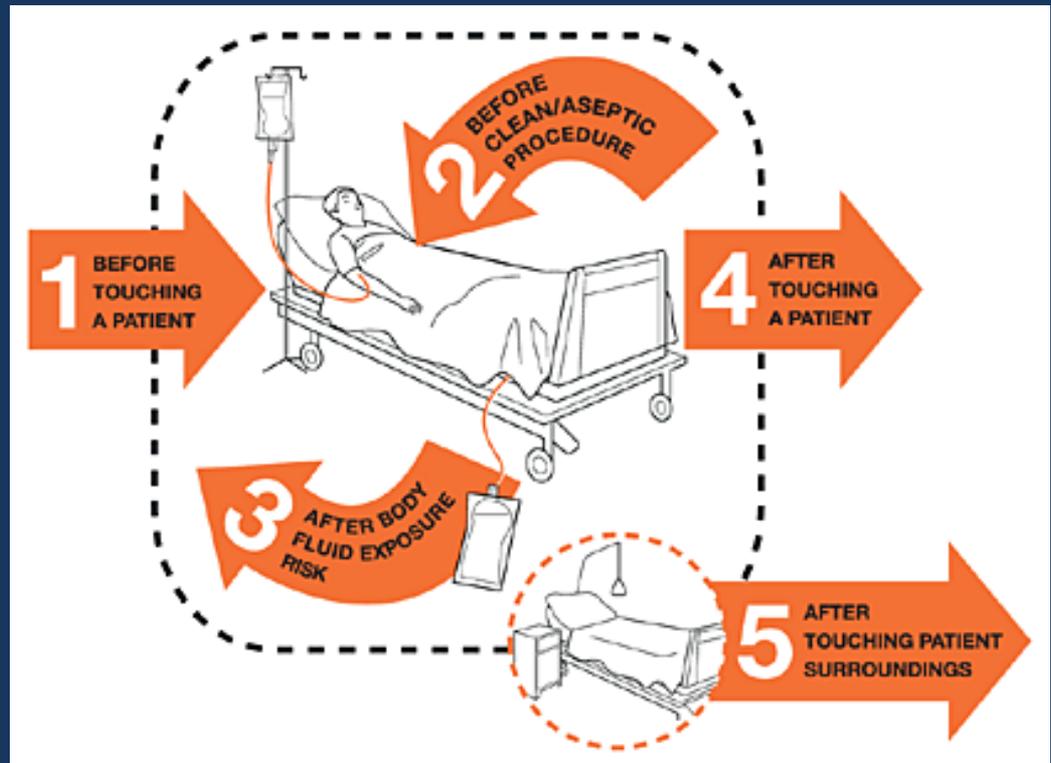


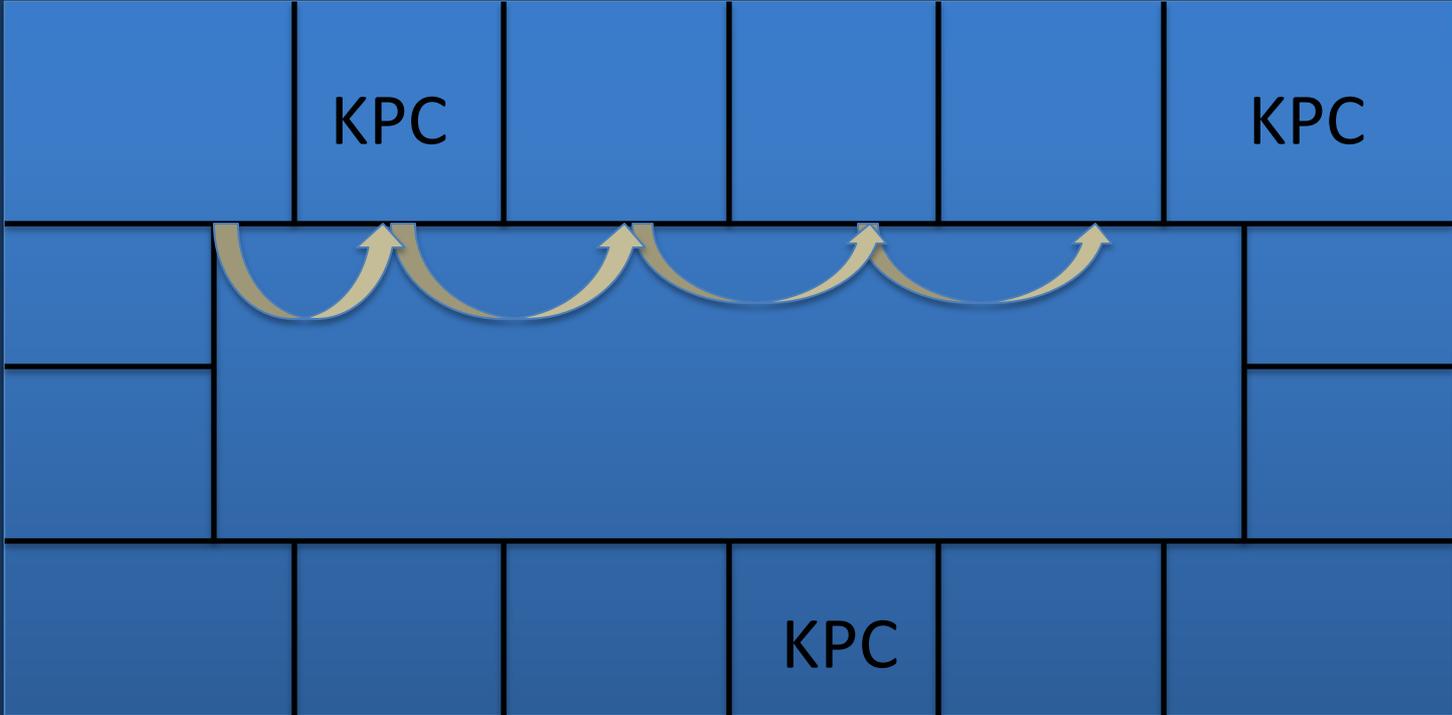


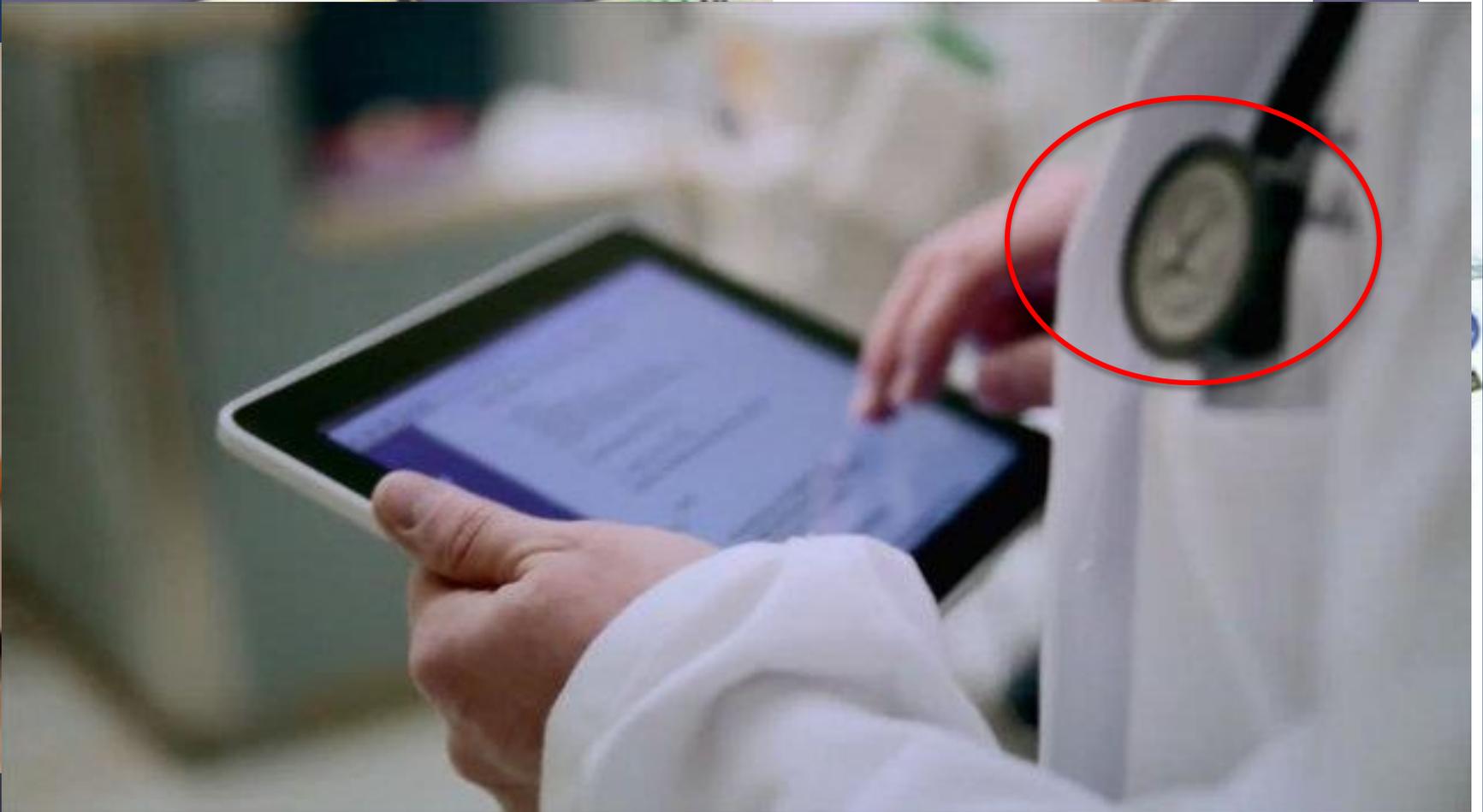




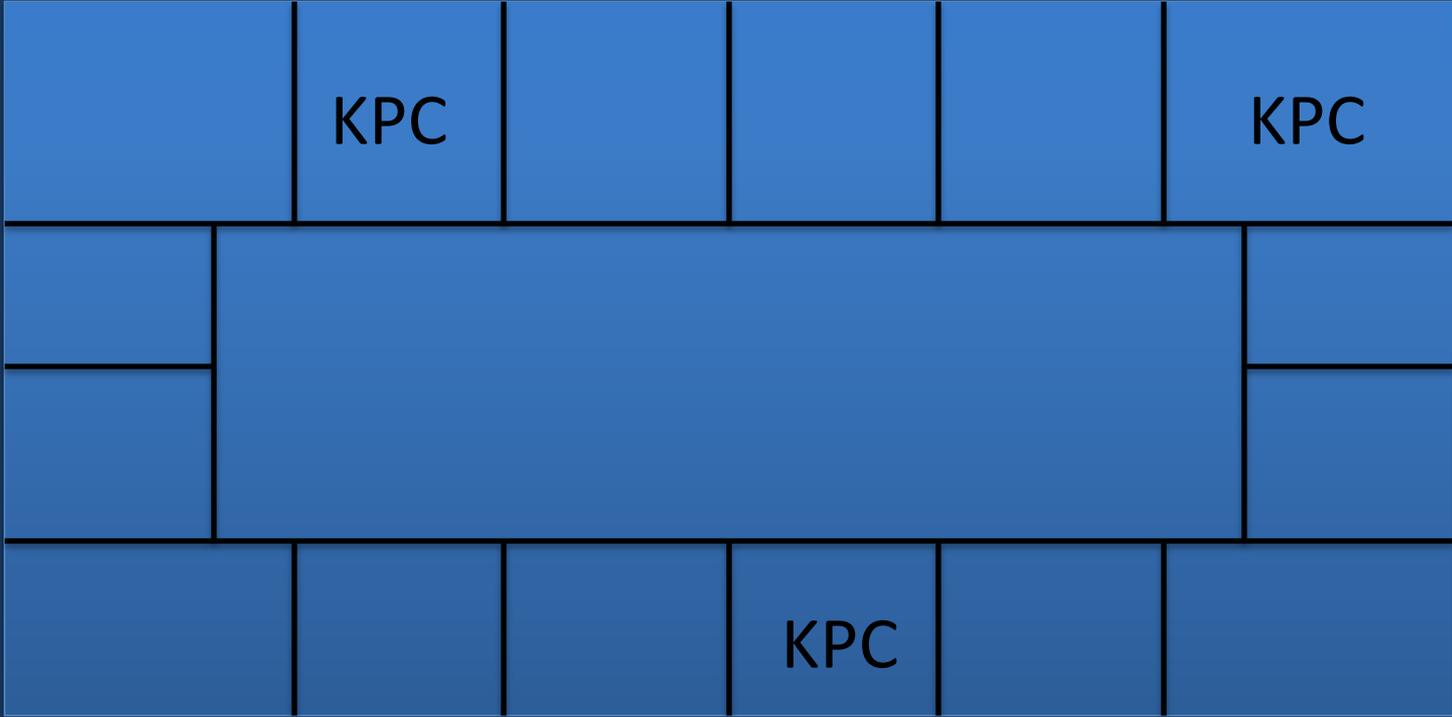
In the ideal world

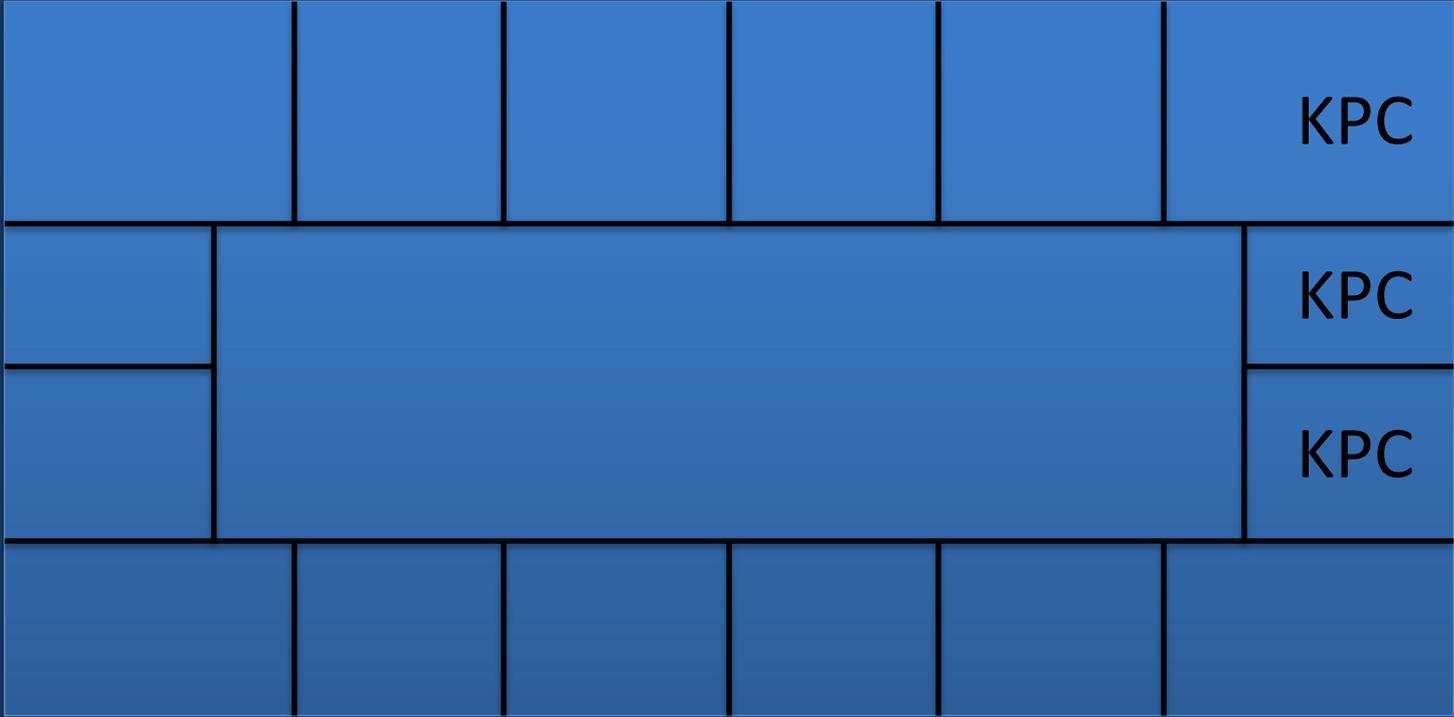




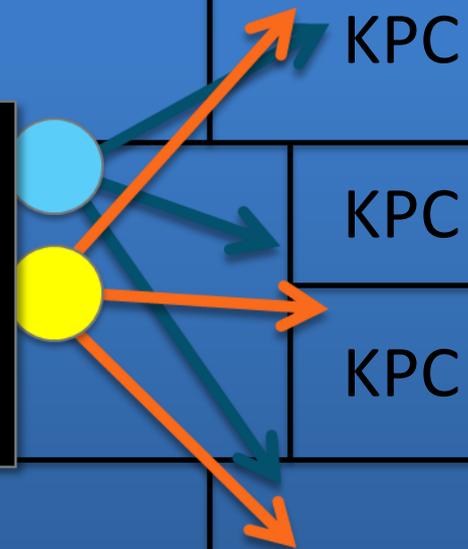








- 
- Identification of carriers by surveillance cultures
 - Physical separation (cohorting)
 - Cohorting nursing personnel



Bundle intervention

July 23, 2008

Daily 2%
chlorhexidine baths

Environmental
cleaning

- Surveillance cultures on admission
- Point prevalence surveillances

Isolation precautions

Personnel education

Nosocomial and healthcare related infections

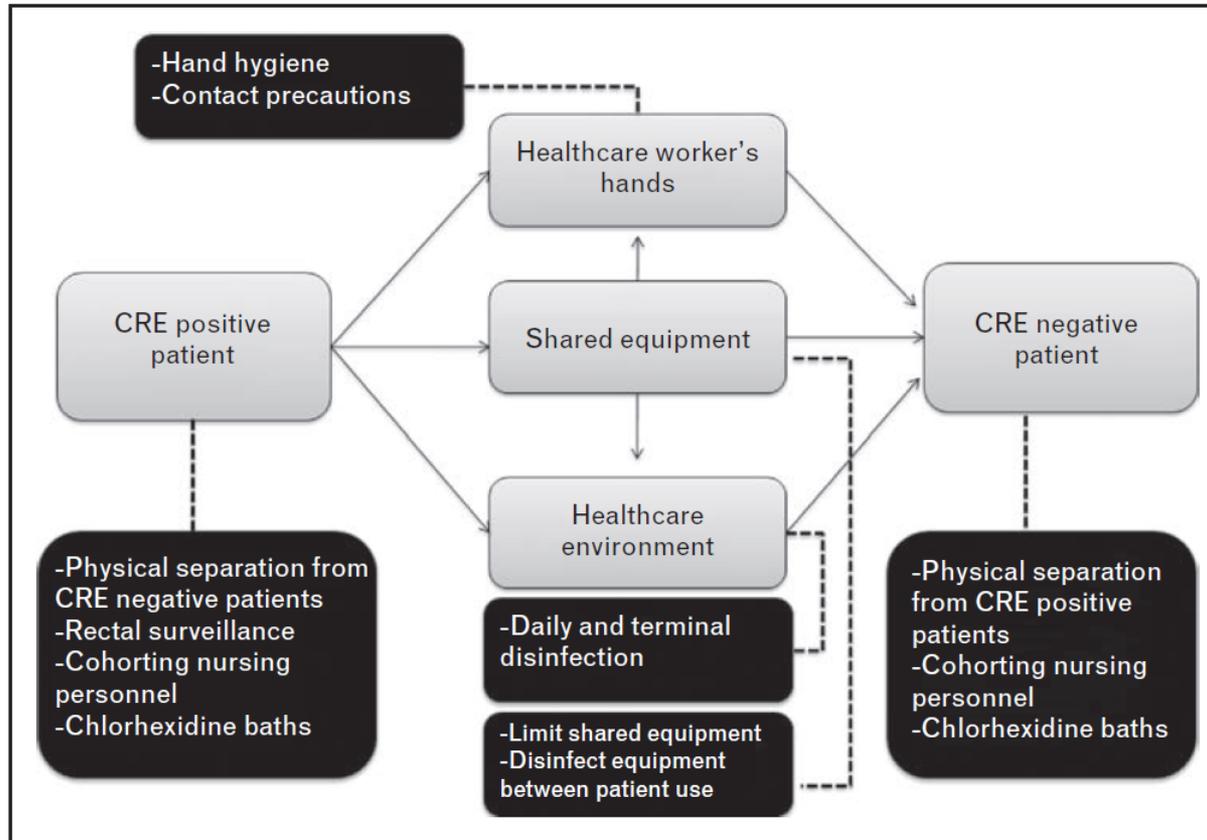


FIGURE 1. Horizontal transmission pathways of carbapenem-resistant *Enterobacteriaceae*. CRE, carbapenem-resistant *Enterobacteriaceae*. Light boxes: components of transmission pathways. Dark boxes: interventions aimed at mitigating horizontal transmission.

Daily 2% chlorhexidine baths

- On July 23rd all consecutive patients underwent CHG baths

• Pharmacy department mixed 4% bulk CHG in a 1:2 dilution with tap water



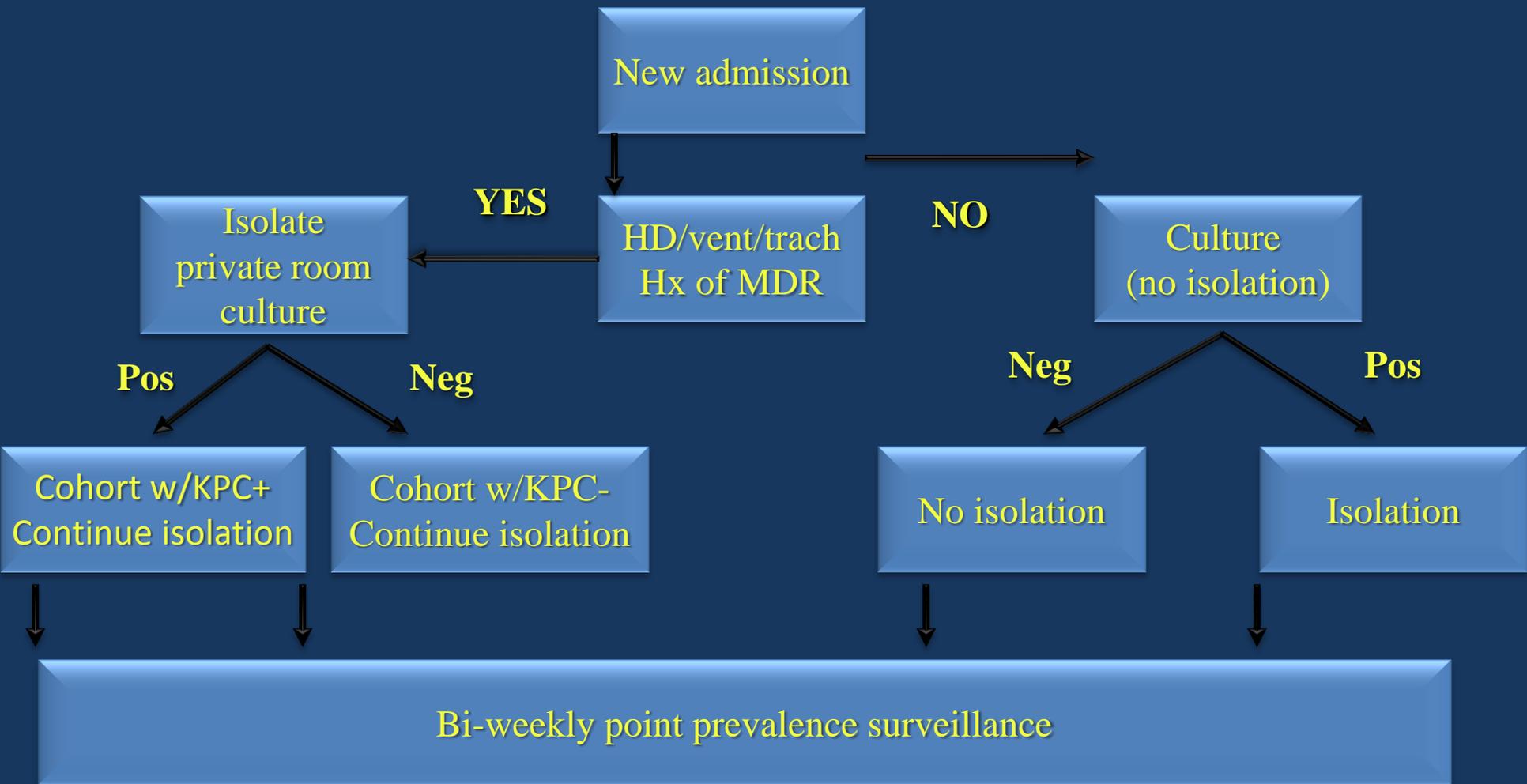
Environmental cleaning

- Observation of cleaning personnel
- **High contact surfaces were not cleaned >> this was modified on July 23, 2008**



Environmental cultures

- 3 rooms were cultured
- Cultures were done a week after coaching cleaning personnel



Personnel education

- In services to all personnel
- Educational pamphlets
- Eliminating personal objects during in-room dialysis

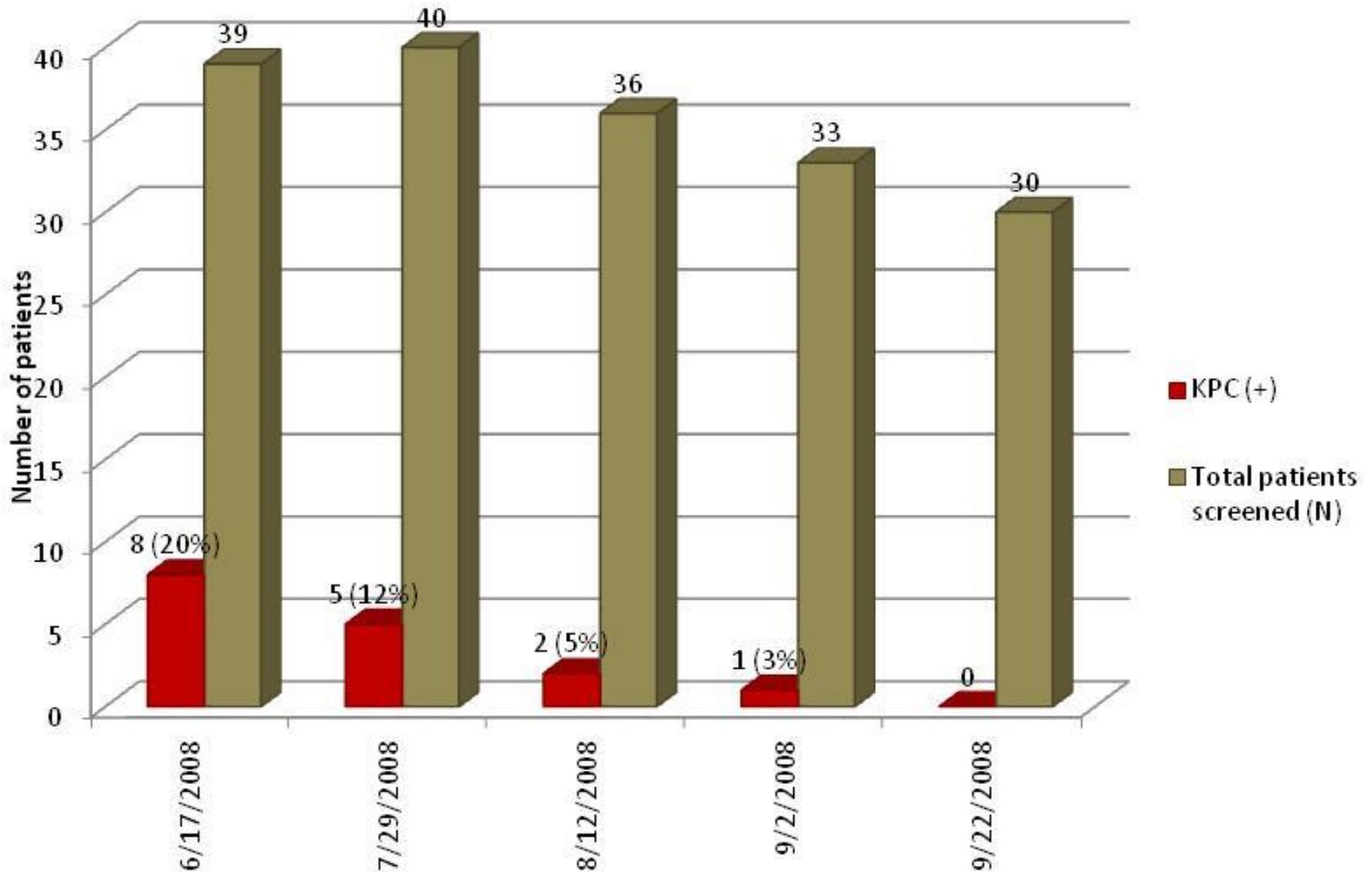
Surveillance cultures on admission

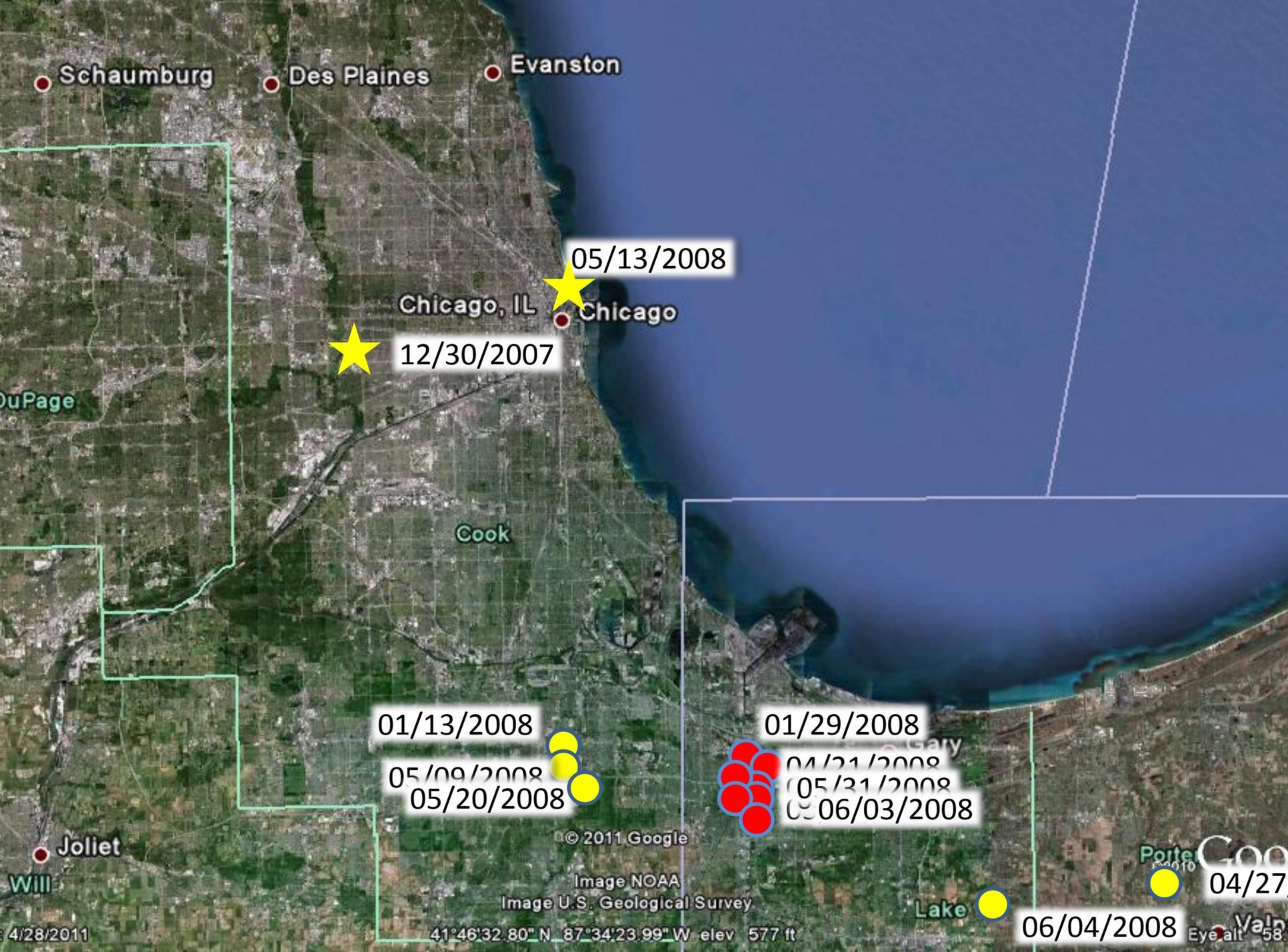
- All patients underwent surveillance cultures on admission (all 2008)
- Sites:
 - Nares
 - Tracheal secretions
 - Wounds
 - Rectal
 - Central line insertion sites
 - Gastrostomy tube sites.

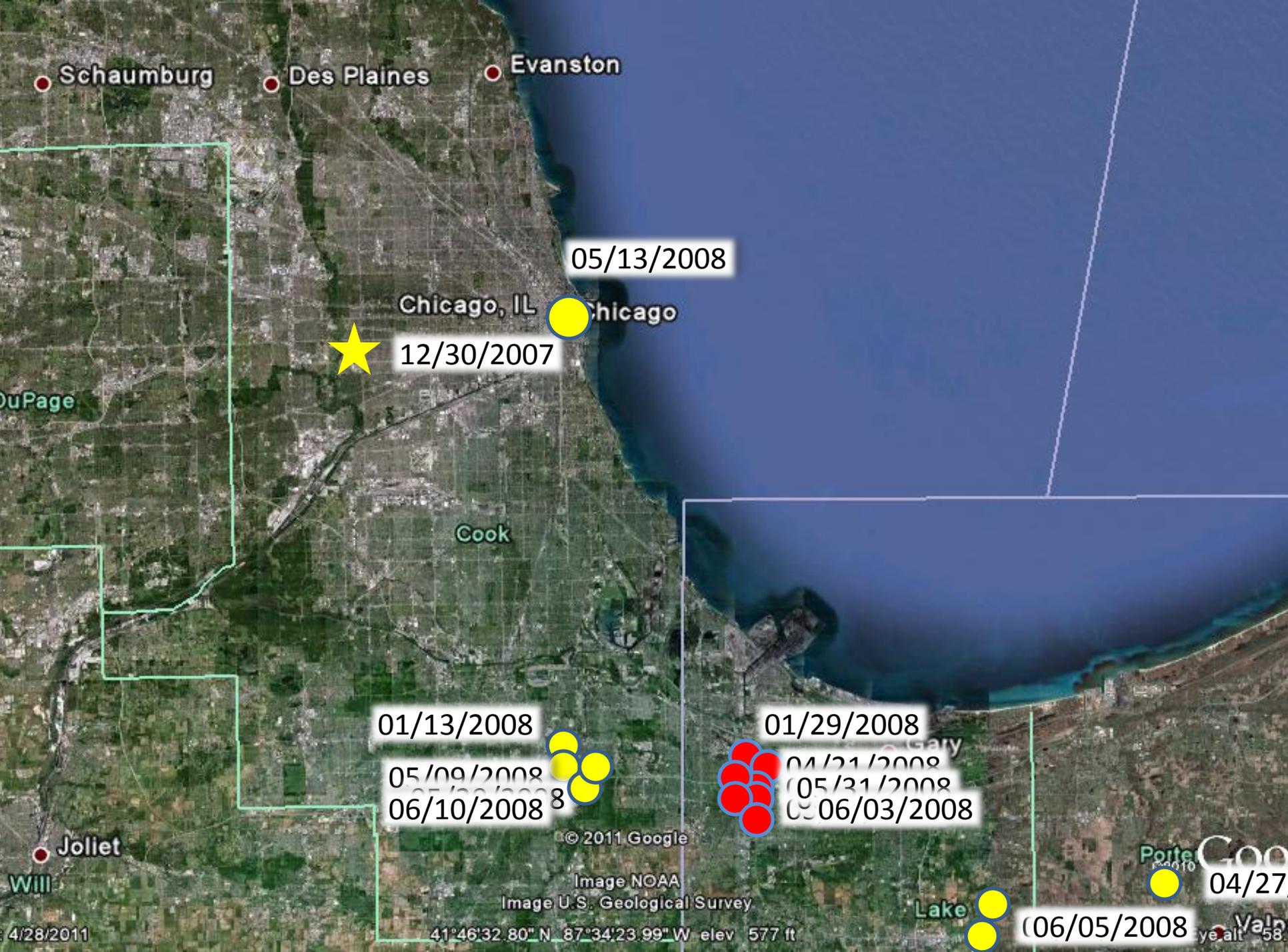
Point prevalence surveillances (PPS)

- Baseline PPS (before bundle intervention)
- 5 subsequent PPSs
- All patients in the institution underwent rectal swab cultures evaluated for KPC organisms

Proportion of KPC positive patients at LTACH







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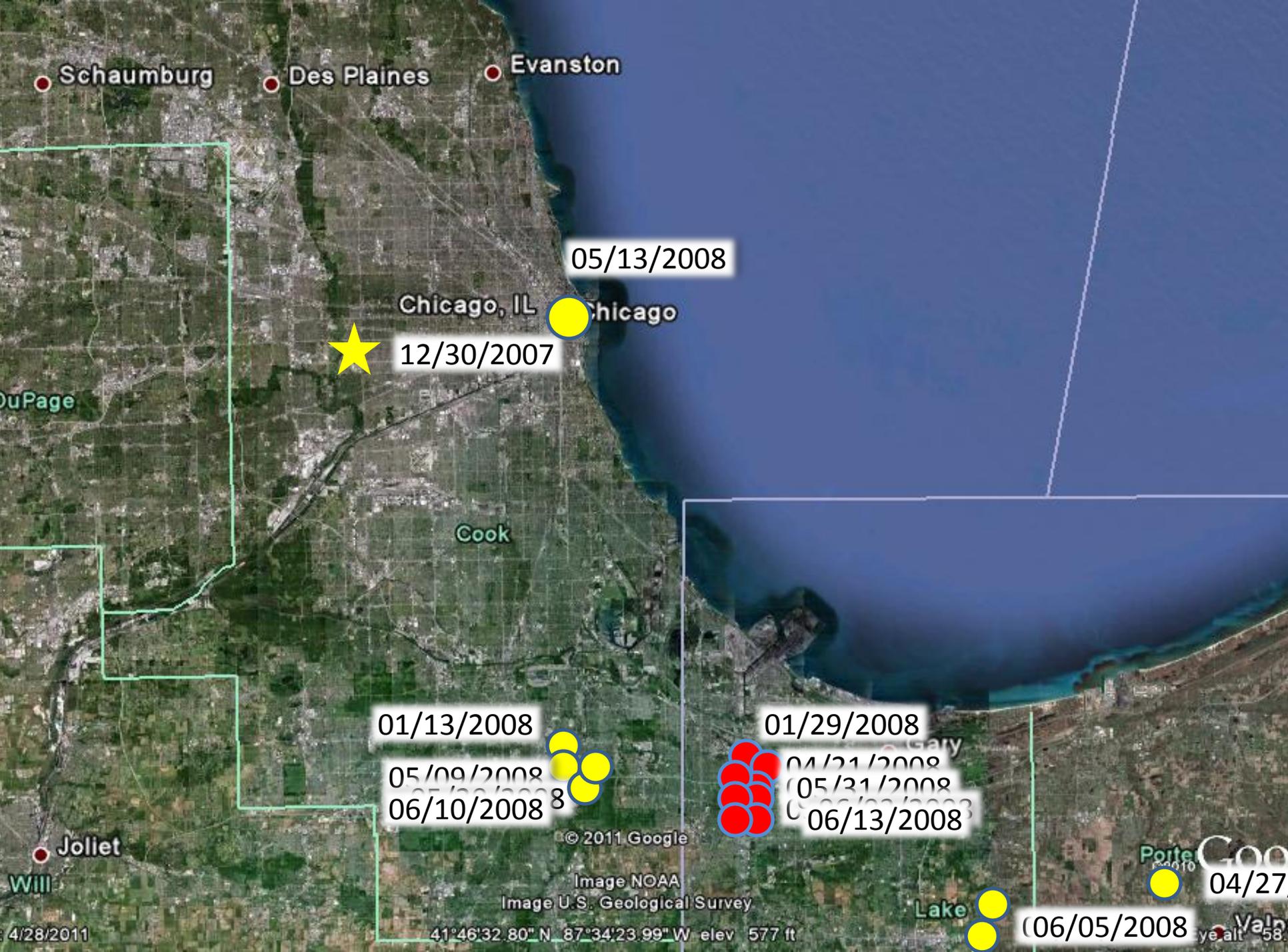
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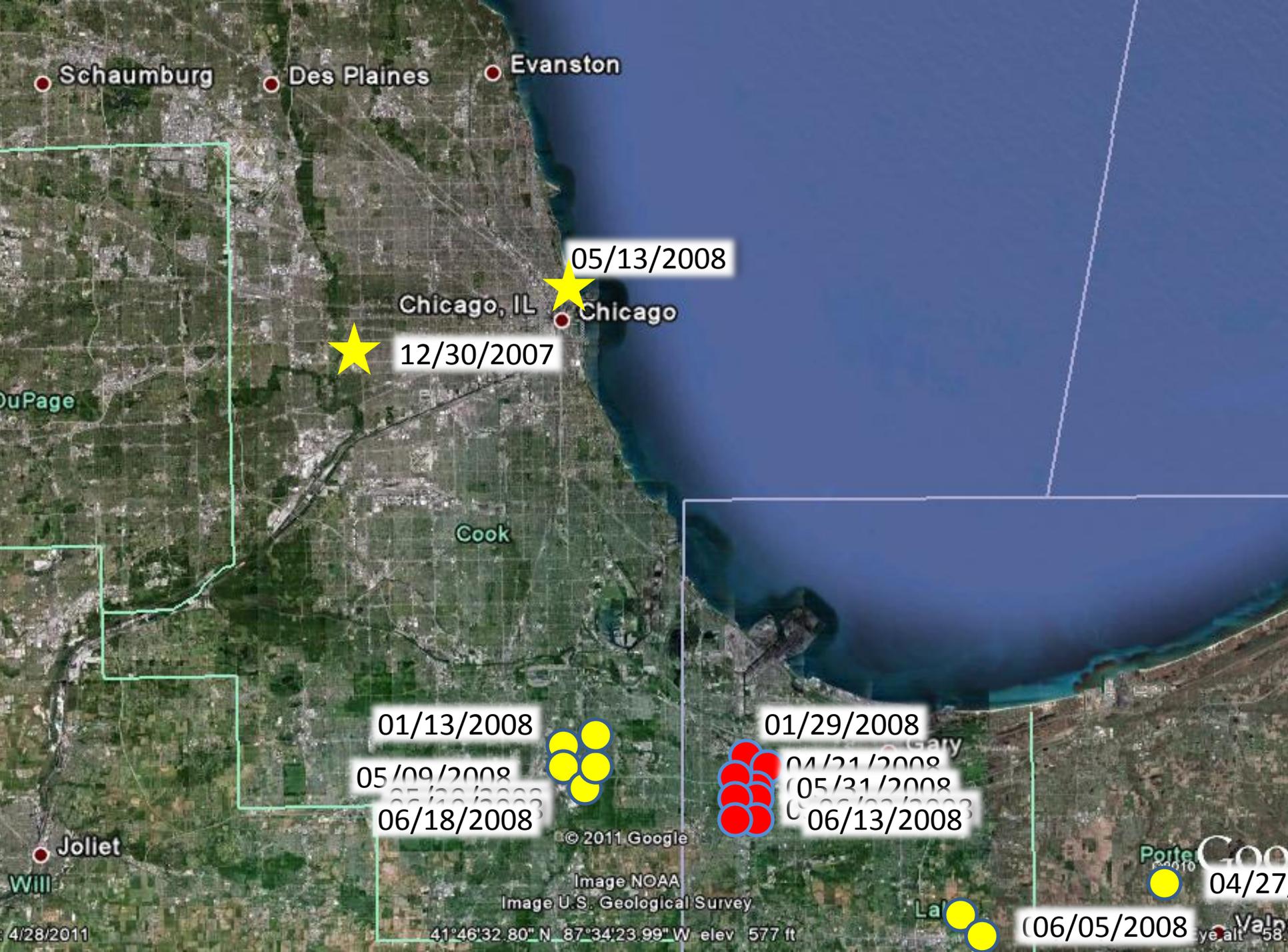
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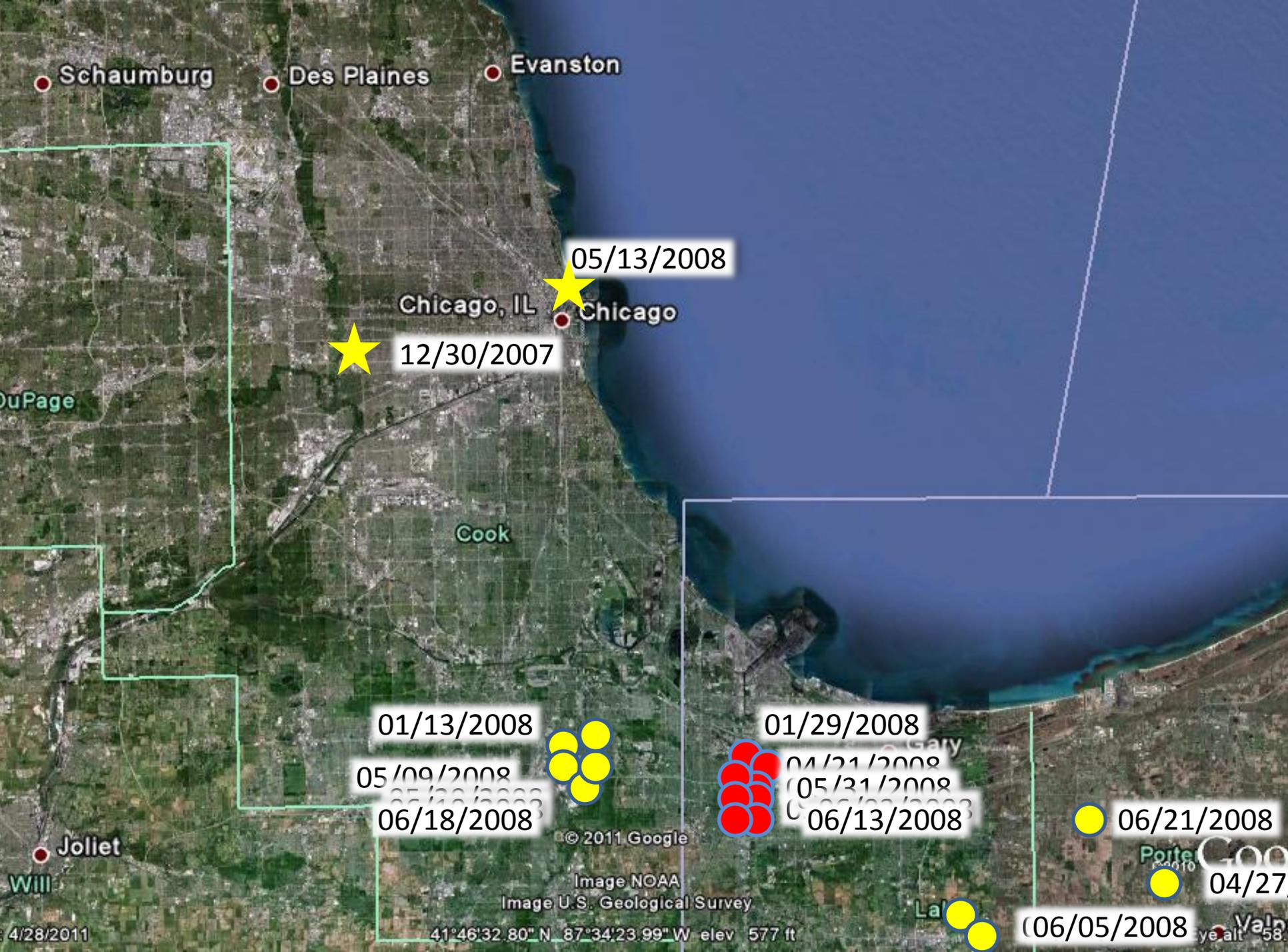


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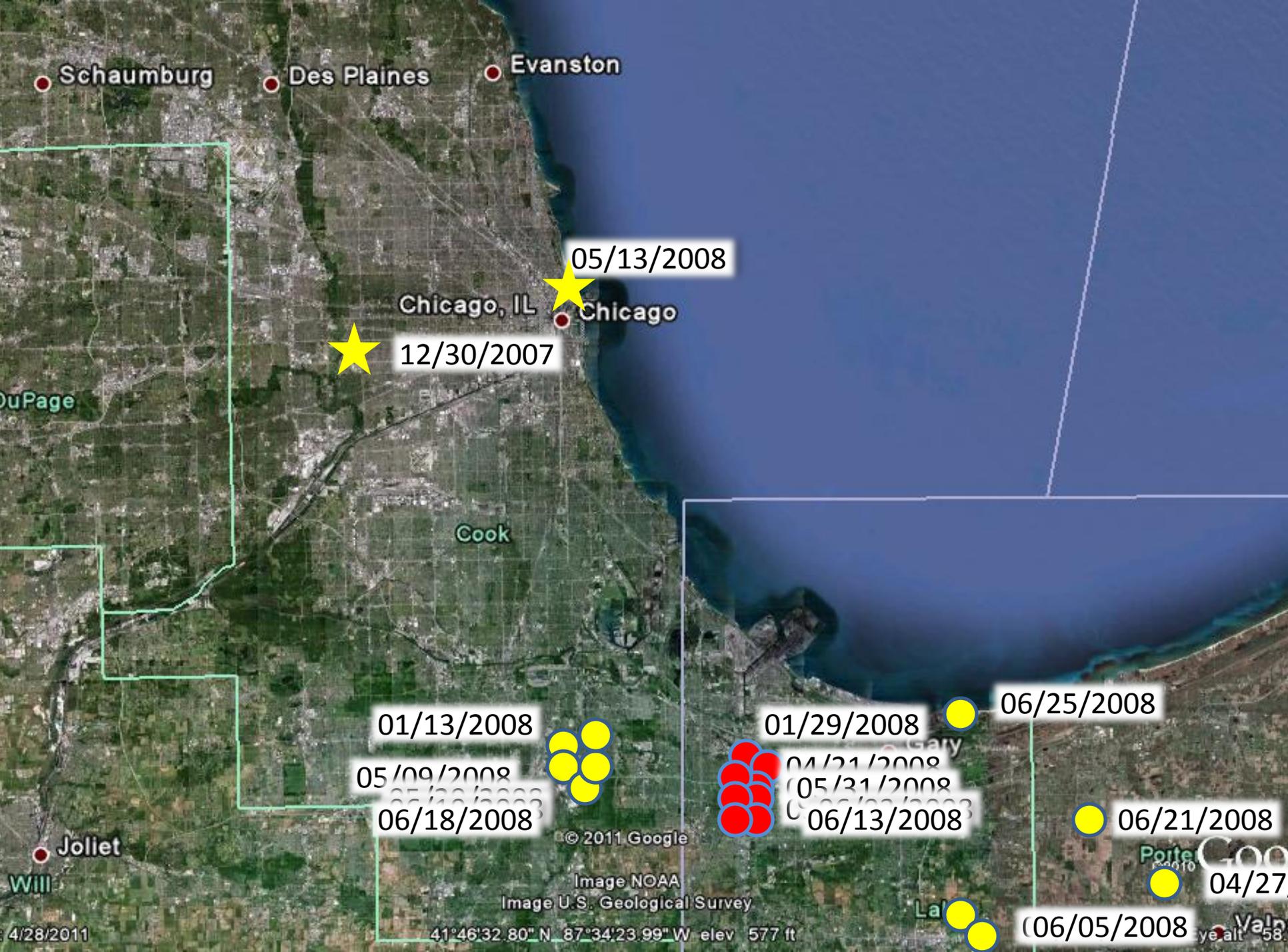
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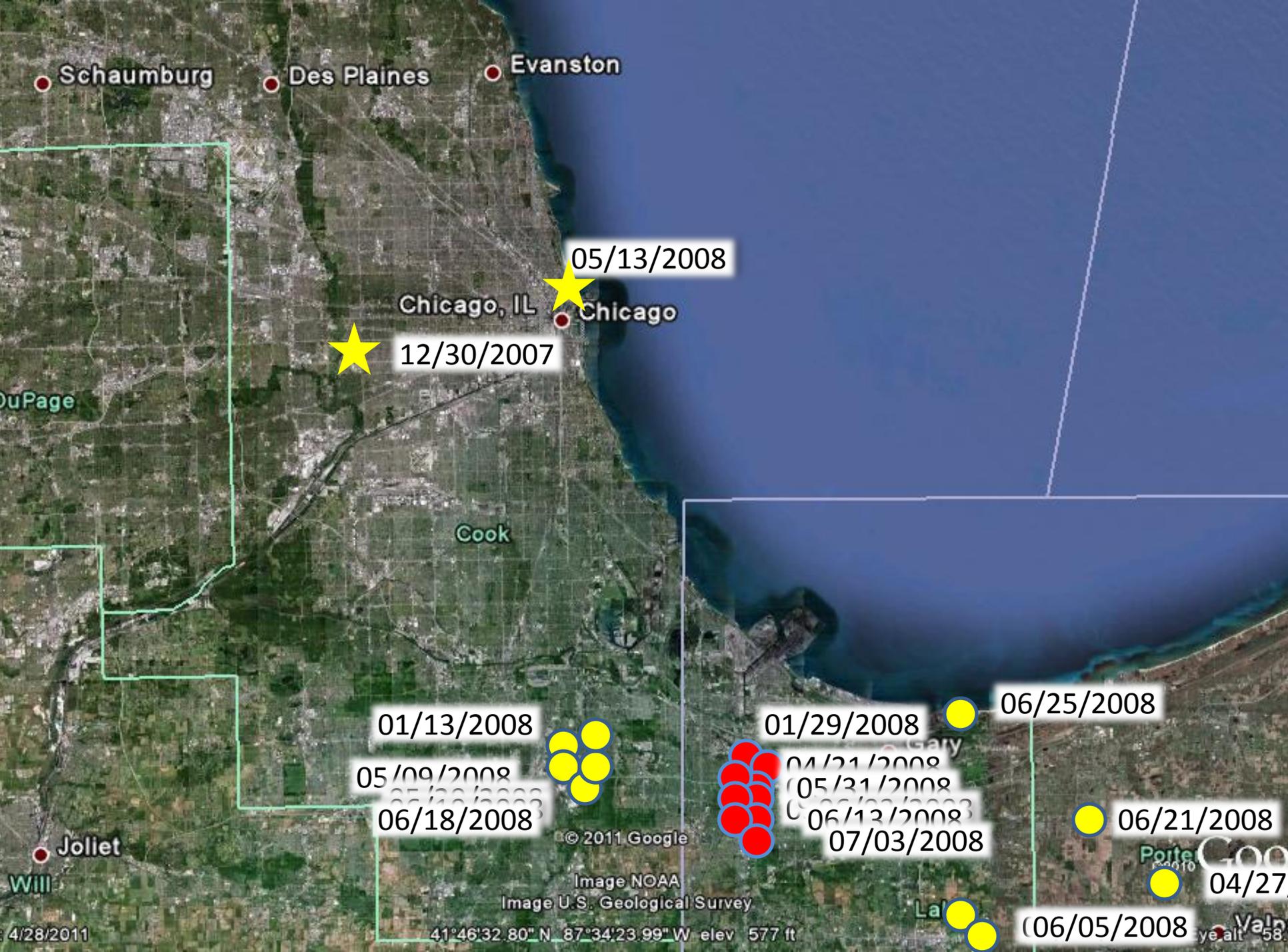
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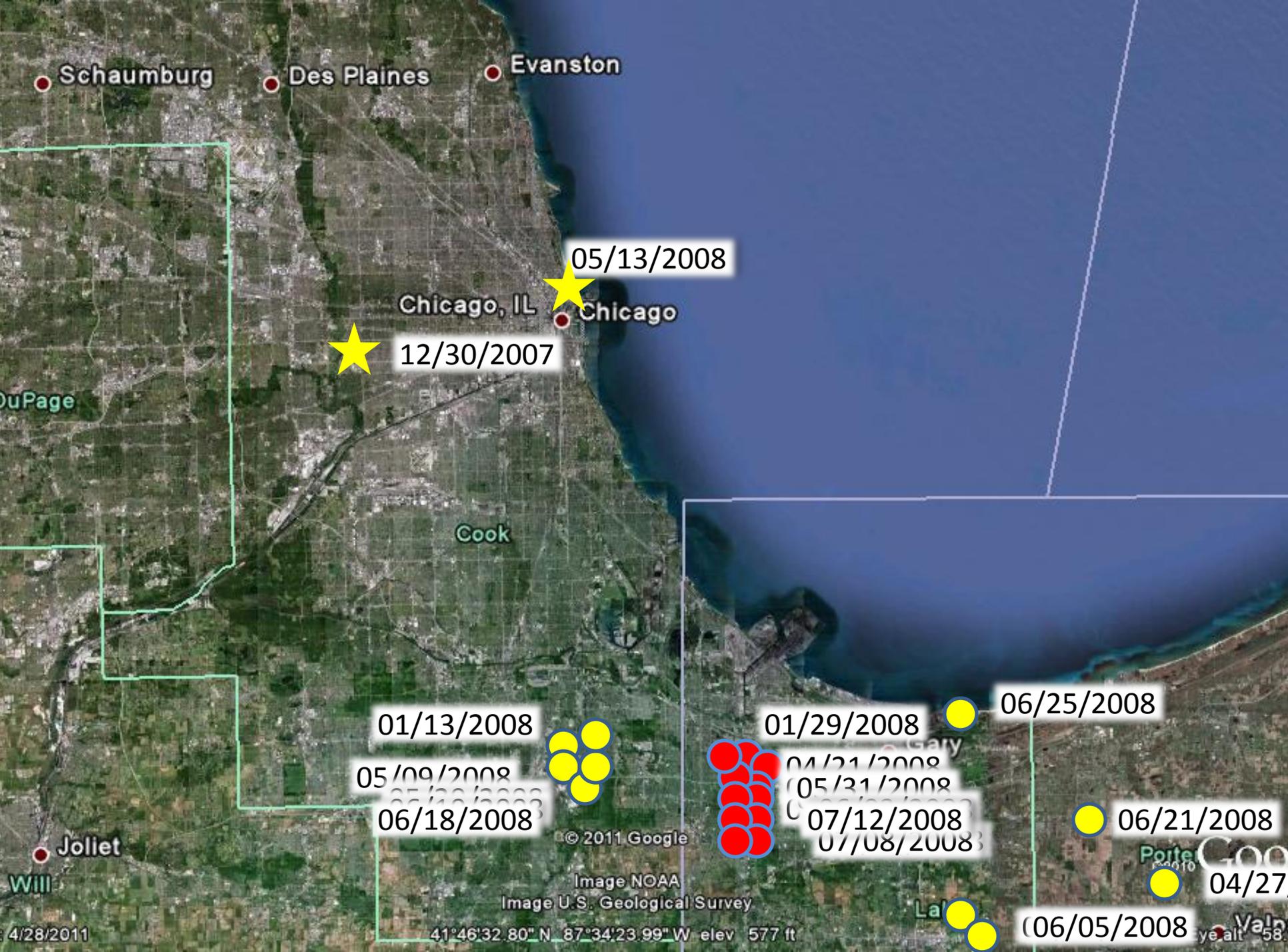
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06/21/2008

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06/25/2008



06/21/2008



04/27



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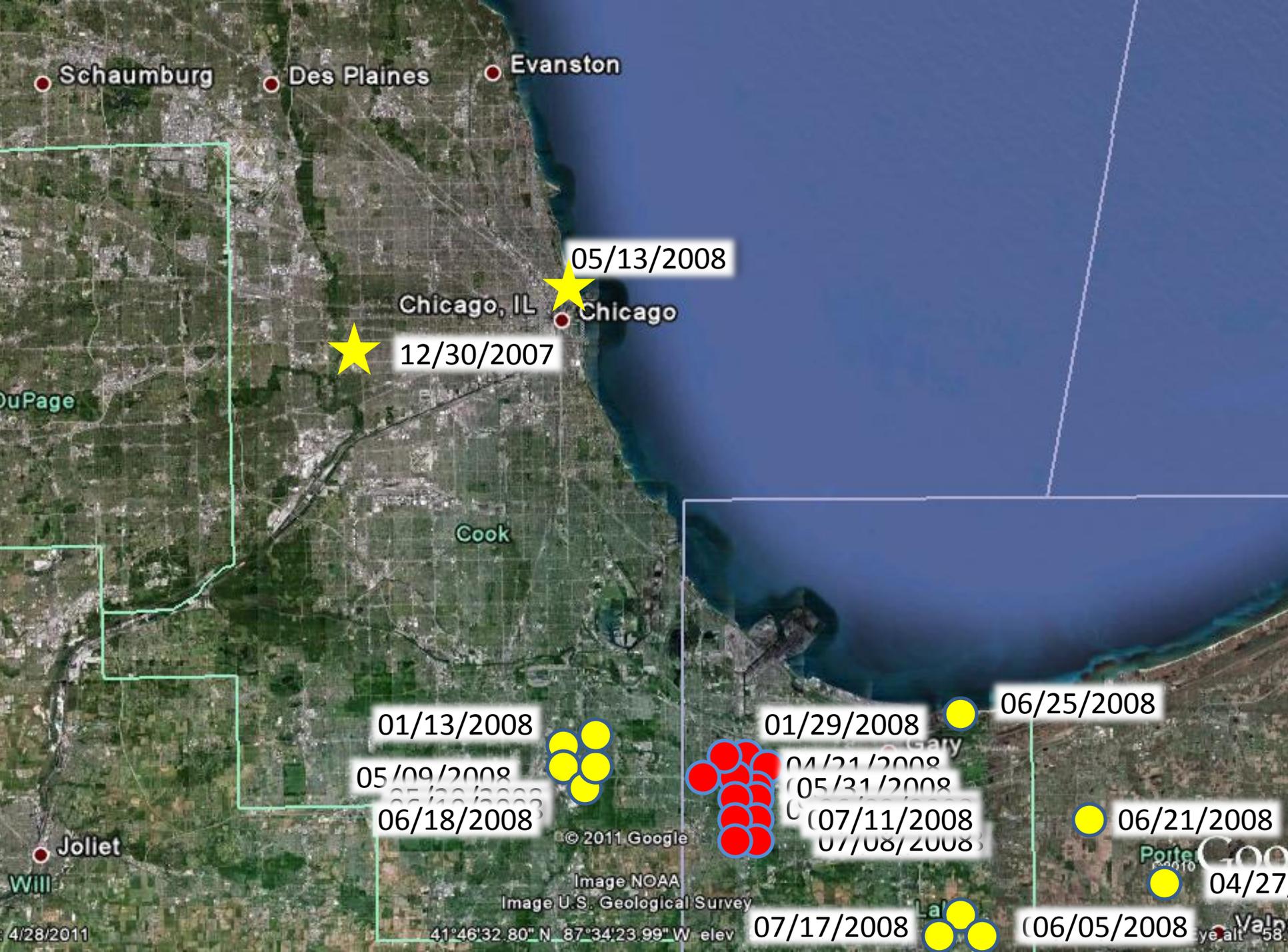
Image NOAA

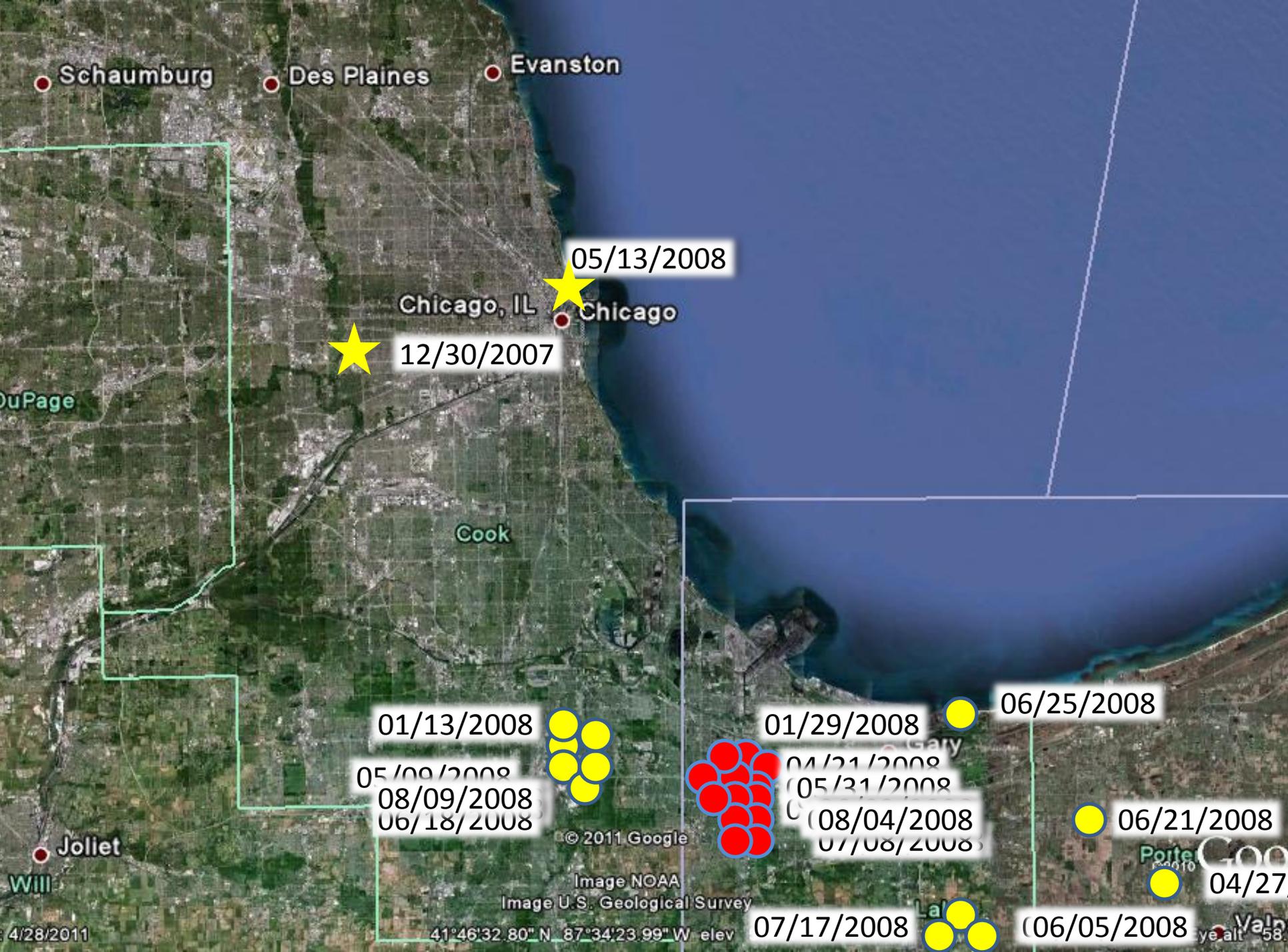
Image U.S. Geological Survey

41°46'32.80" N 87°34'23.99" W elev 577 ft

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04/27

06/05/2008



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Image NOAA

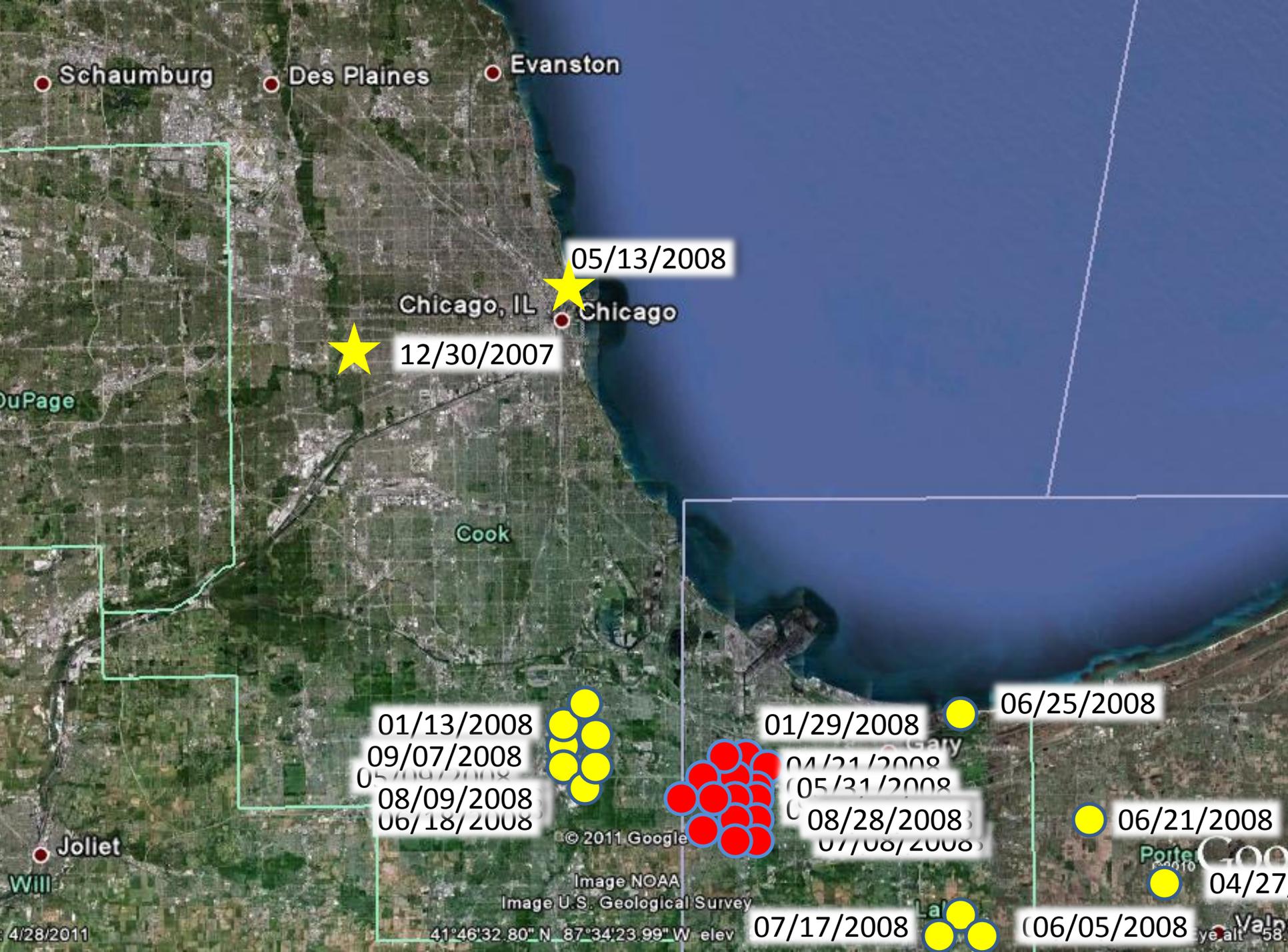
Image U.S. Geological Survey

41°46'32.80" N, 87°34'23.99" W elev

07/17/2008

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41°46'32.80" N 87°34'23.99" W elev

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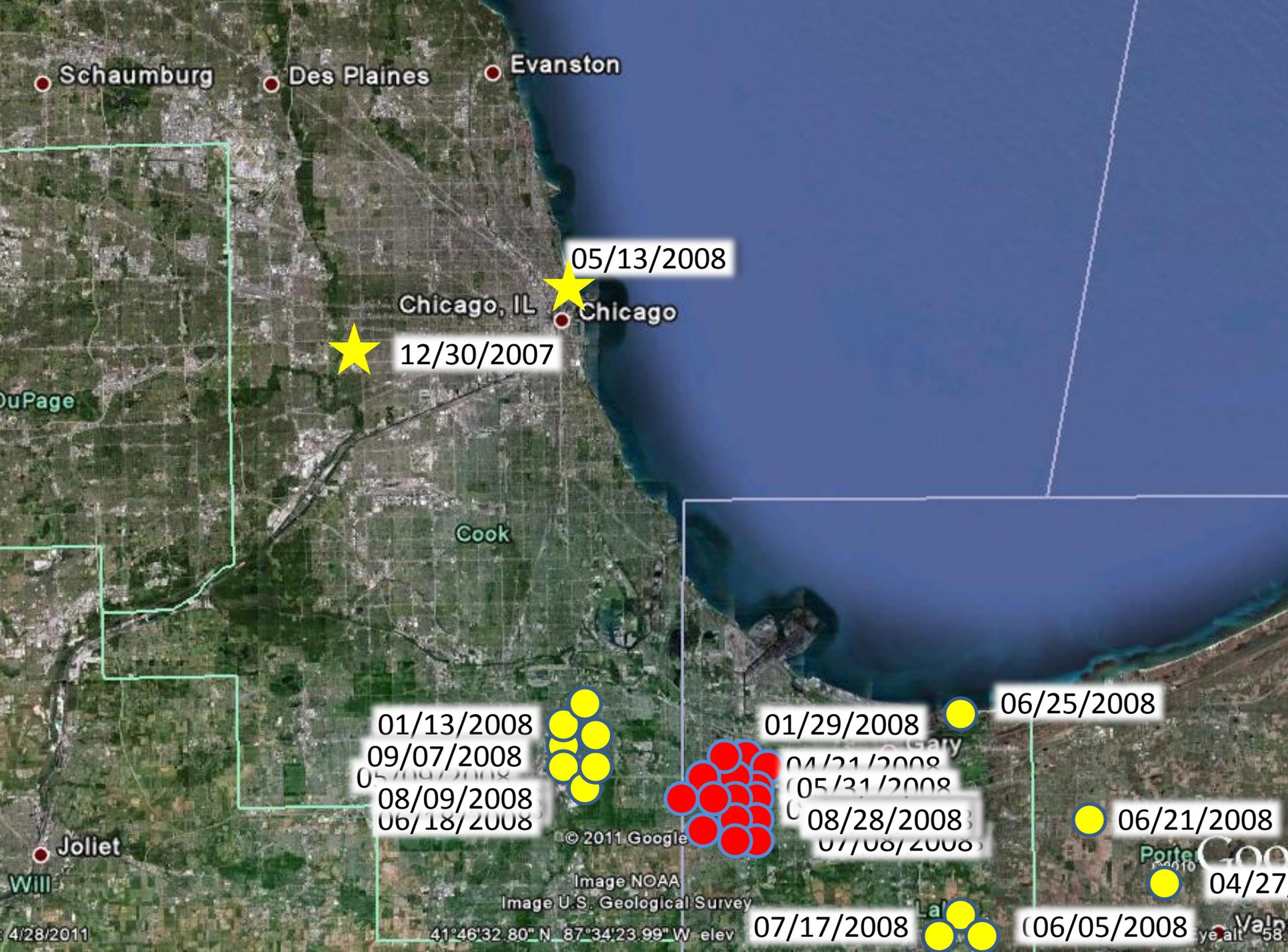
Image NOAA

Image U.S. Geological Survey

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41°46'32.80" N 87°34'23.99" W elev

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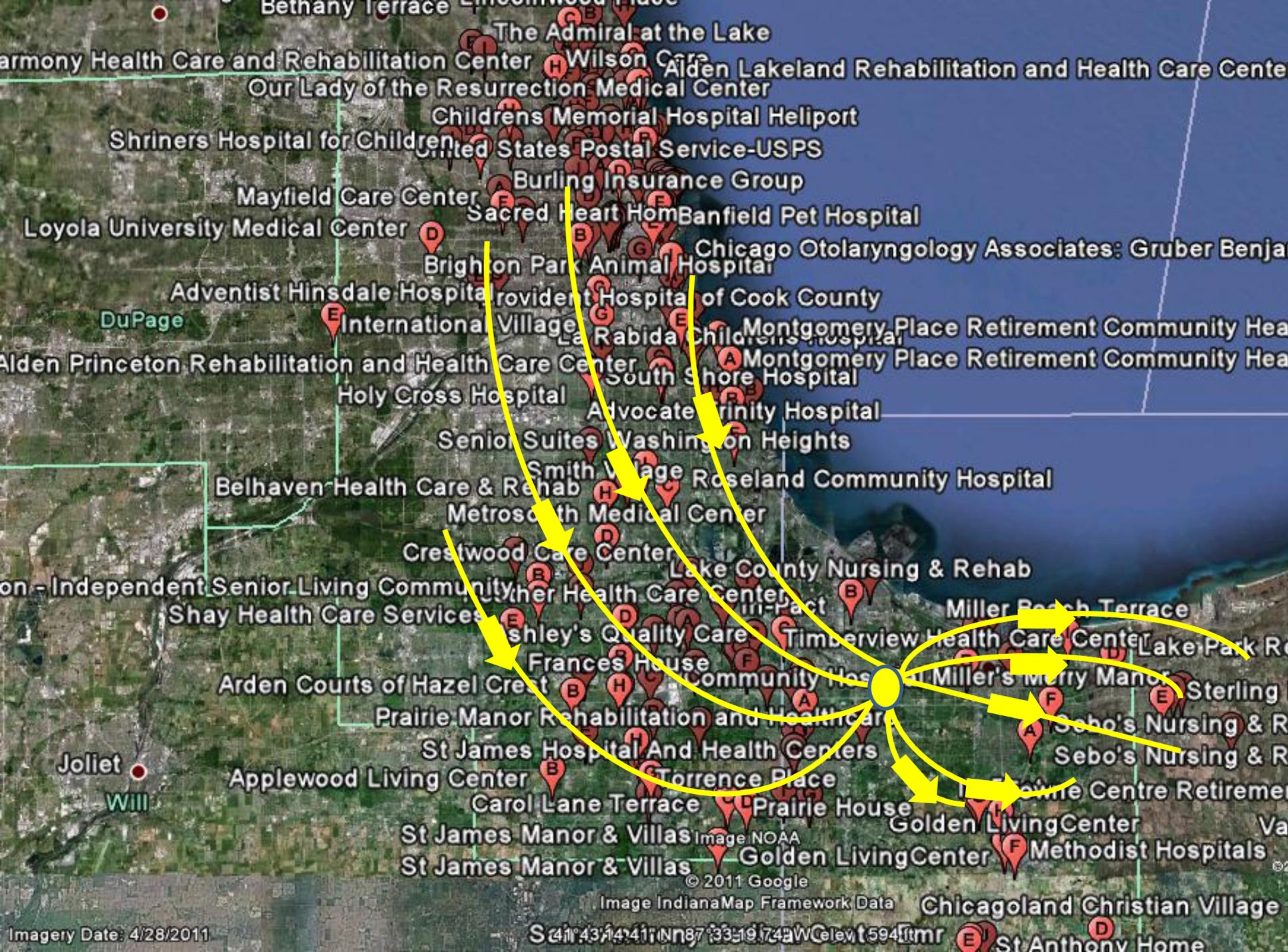
Image NOAA

Image U.S. Geological Survey

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Bethany Terrace
 The Admiral at the Lake
 Harmony Health Care and Rehabilitation Center
 Wilson Care
 Aiden Lakeland Rehabilitation and Health Care Center
 Our Lady of the Resurrection Medical Center
 Childrens Memorial Hospital Heliport
 Shriners Hospital for Children
 United States Postal Service-USPS
 Mayfield Care Center
 Burling Insurance Group
 Loyola University Medical Center
 Sacred Heart Home
 Banfield Pet Hospital
 Brighton Park Animal Hospital
 Chicago Otolaryngology Associates: Gruber Benjamin
 Adventist Hinsdale Hospital
 Provident Hospital of Cook County
 International Village
 La Rabida Childrens Hospital
 Montgomery Place Retirement Community Health
 Aiden Princeton Rehabilitation and Health Care Center
 South Shore Hospital
 Holy Cross Hospital
 Advocate Trinity Hospital
 Senior Suites Washington Heights
 Smith Village
 Roseland Community Hospital
 Belhaven Health Care & Rehab
 Metro South Medical Center
 Crestwood Care Center
 Lake County Nursing & Rehab
 Independent Senior Living Community
 Her Health Care Center
 Shay Health Care Services
 Ashley's Quality Care
 Timberview Health Care Center
 Miller Beach Terrace
 Frances House
 Community Hospital
 Miller's Merry Manor
 Lake Park Retirement
 Arden Courts of Hazel Crest
 Prairie Manor Rehabilitation and Health Care
 St James Hospital And Health Centers
 Sebo's Nursing & Rehabilitation
 Sebo's Nursing & Rehabilitation
 Applewood Living Center
 Torrence Place
 Prairie Centre Retirement
 Carol Lane Terrace
 Prairie House
 Golden Living Center
 St James Manor & Villas
 Golden Living Center
 Methodist Hospitals
 St James Manor & Villas
 Golden Living Center
 Methodist Hospitals



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Joliet

Will

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Image IndianaMap Framework Data
ChicagoLand Christian Village
St Anthony Home

Imagery Date: 4/28/2011

41°43'14.41"N 87°33'19.74"W Elev: 594ft

Epidemiological hypothesis

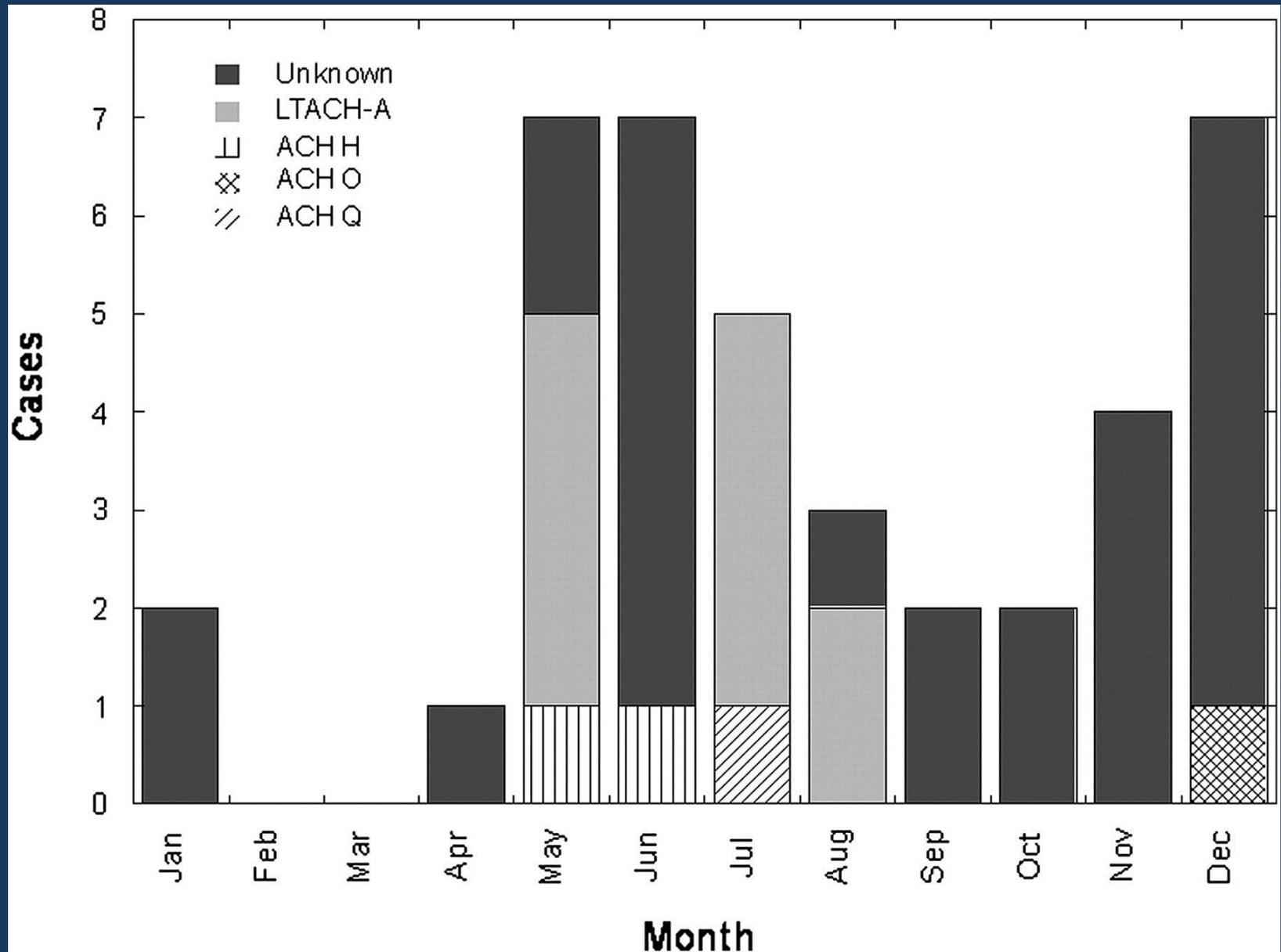
Acute care
hospitals

Epicenter

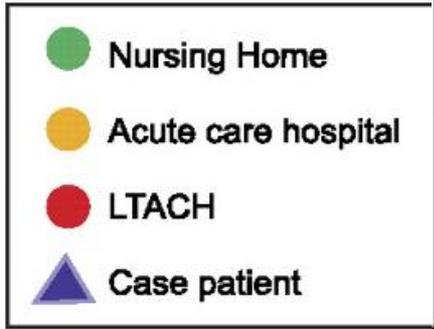
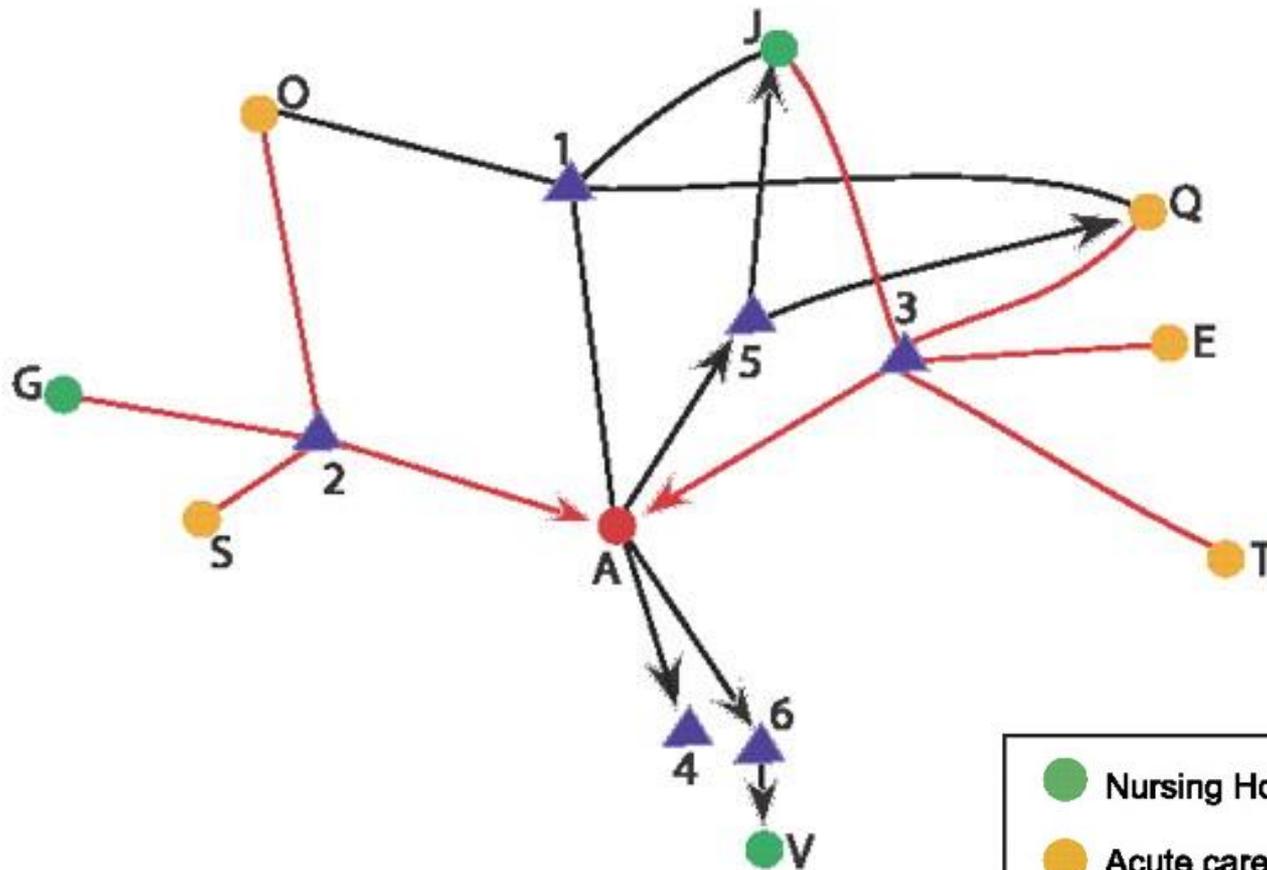
Nursing
homes

LTACH

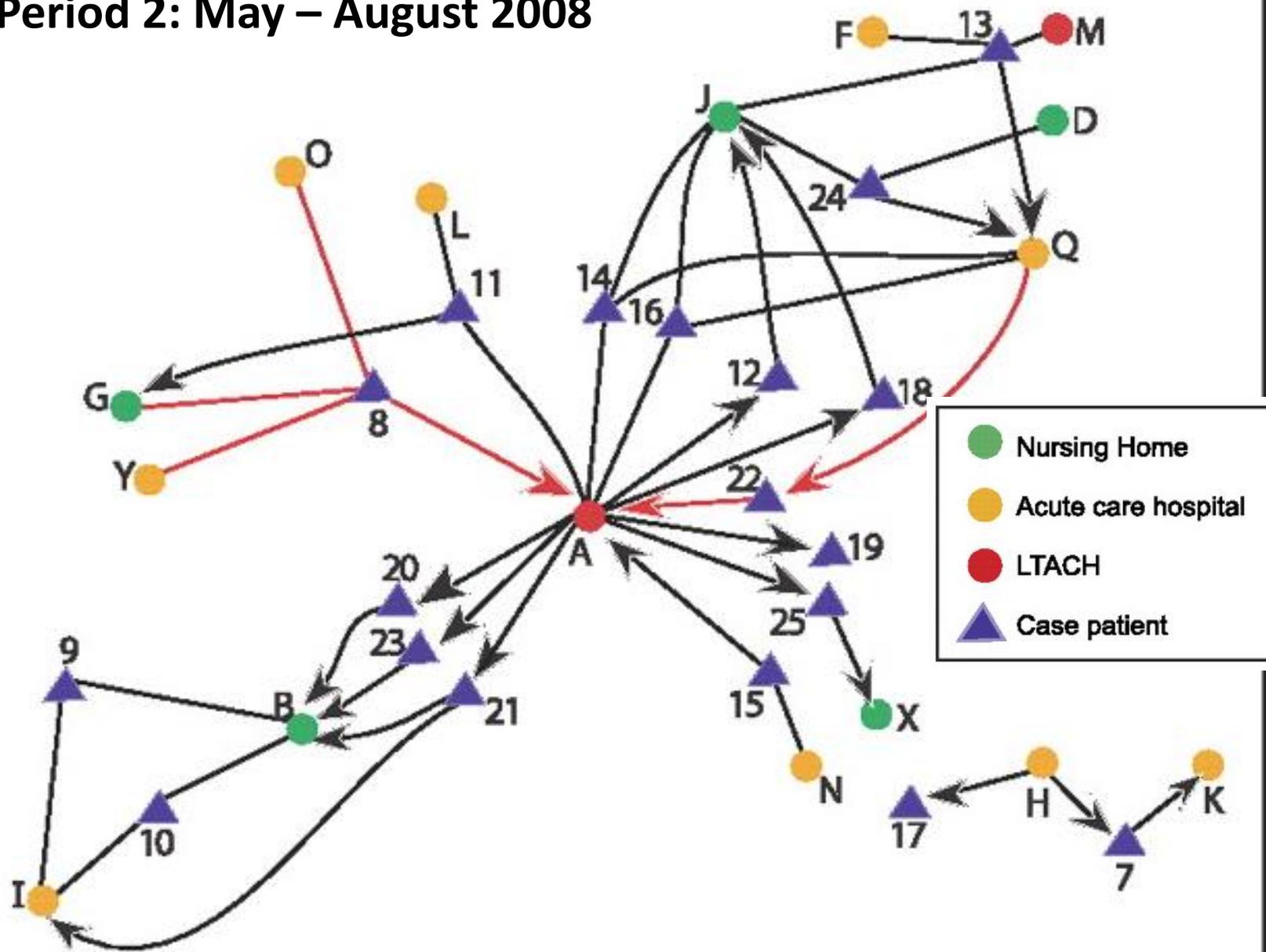
Epidemic curve of 40 patients that were colonized or infected with *Klebsiella pneumoniae* carbapenemase (KPC)–producing Enterobacteriaceae.



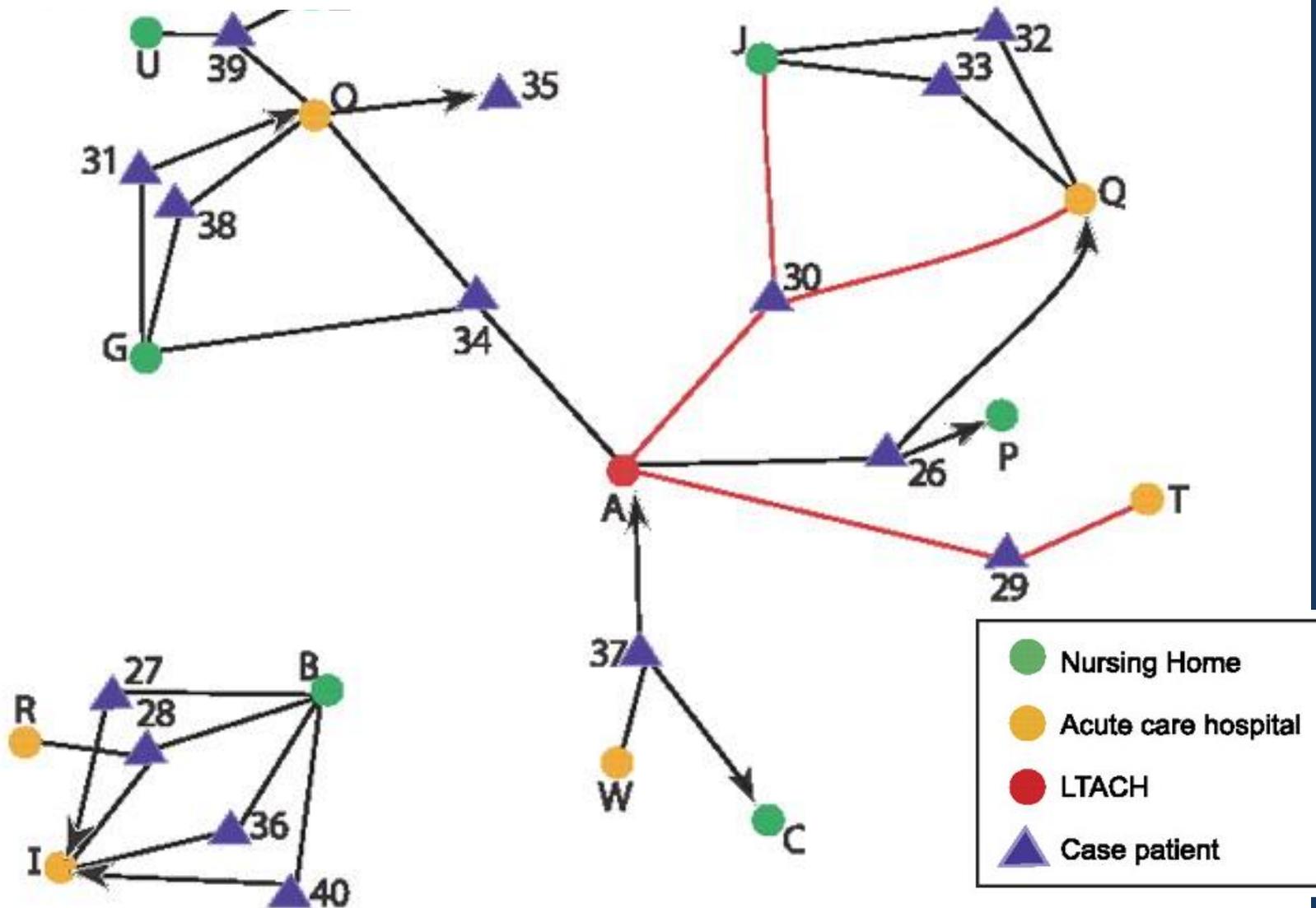
Period 1: January – April 2008

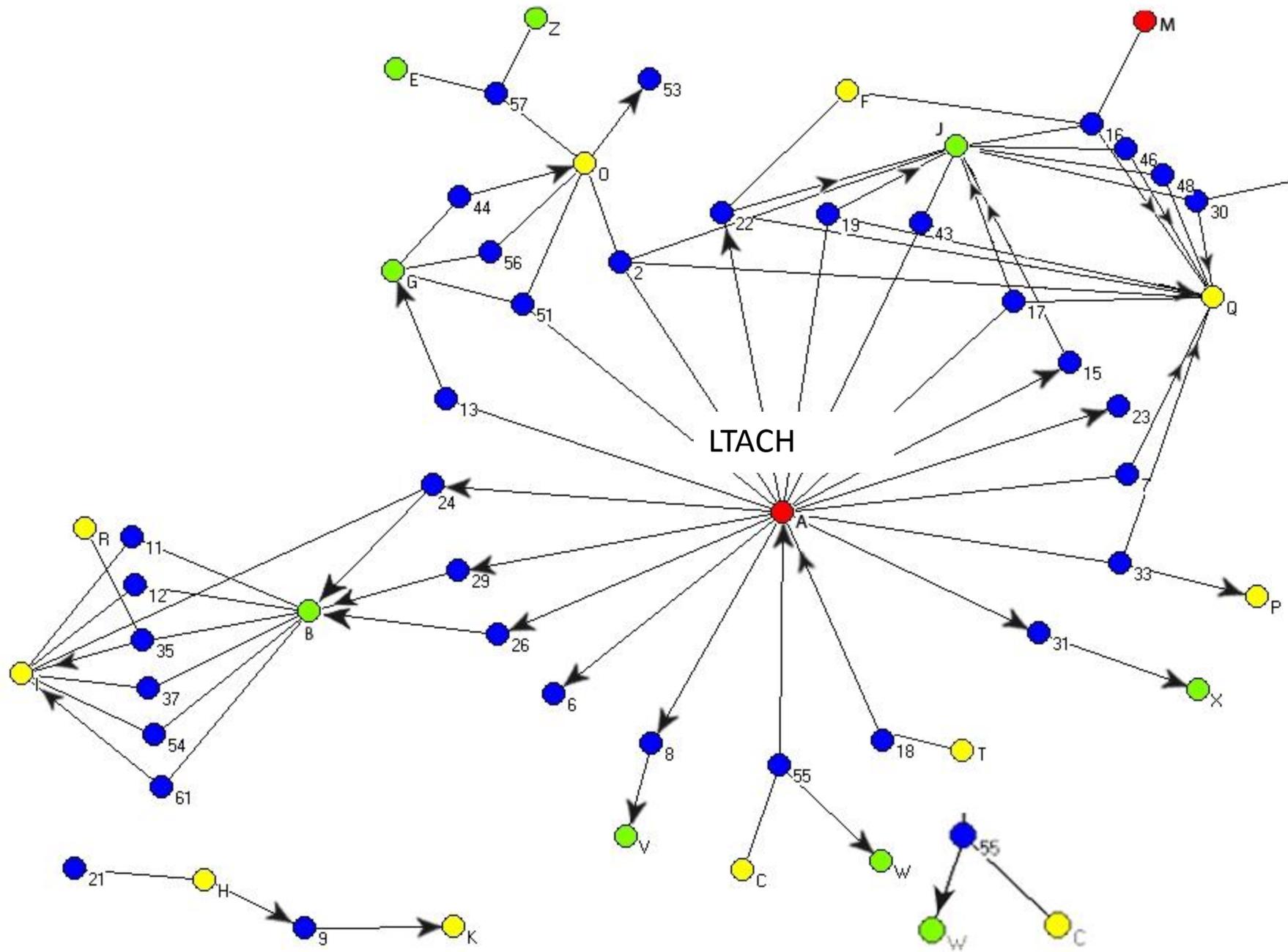


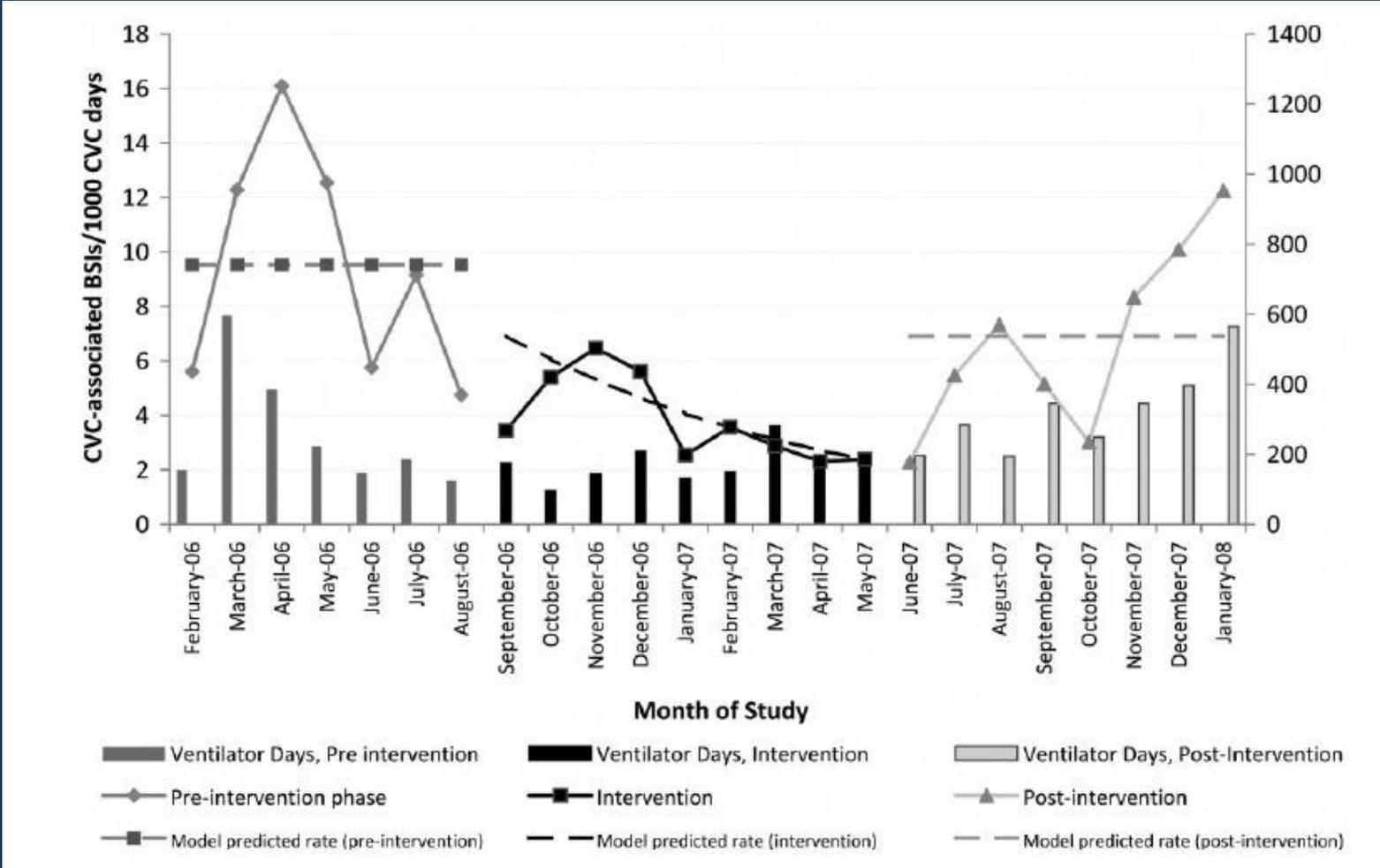
Period 2: May – August 2008



Period 3: September – December 2008







Munoz-Price LS, et al. Infect Control Hosp Epidemiol 2009; 30:1031-35

IMPLEMENTATION OF CHLORHEXIDINE BATHS

- Remove all non-compatible products from the units (soaps, lotions, skin barriers, etc)
- In-service staff giving the baths
- Personally observe baths in a regular basis
- Quantify the usage of the product by the units

CHALLENGES DURING IMPLEMENTATION OF CHLORHEXIDINE

- Chlorhexidine doesn't foam
- Personnel perceives this lack of foaming as lack of cleaning
- Mixing with other products (soap and water) might happen at the bedside, especially with liquid preparations

Pre-Acute Care

Acute Care

Post-Acute Care

Today's Continuum of Care.

Most appropriate care in the most appropriate setting.



Acuity



Home



Wellness & Fitness Center



Retail Pharmacy

Physician Offices/Clinics



Urgent Care Center



Diagnostic Imaging Center



Ambulatory Procedure Center



Emergency Department



Hospital



Inpatient Rehabilitation



Outpatient Rehabilitation



Extended Care Facility



Skilled Nursing Facility



Home Health and Hospice



Home