

# *Nocardia* Infections in Arizona

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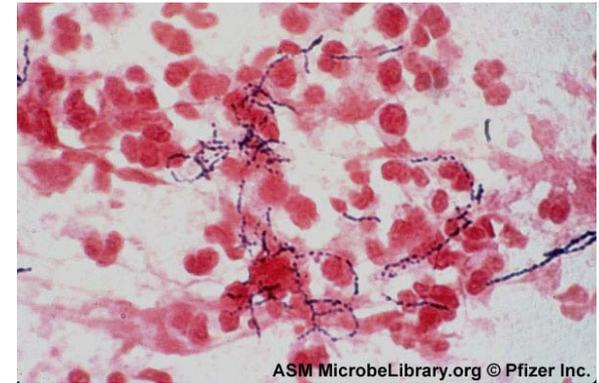
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# Background - Epidemiology

- Infectious agent:
  - Gram-positive bacilli
  - *Nocardia spp*
- Occurrence: sporadic in people and animals worldwide; found in soil
- Incidence: 500-1,000 new cases of *Nocardia* infection occur annually in US



# Background - Epidemiology

- Transmission: Inhalation or skin inoculation
- Incubation period: Uncertain; probably a few days to a few weeks
- Communicability: Not directly transmitted from humans or animals
- Risk factors: Immunocompromised (ie alcohol, diabetes, steroid use, malignancy)

# Background – Clinical features

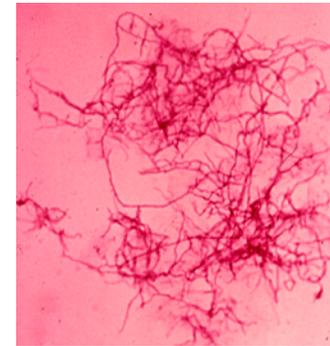
- 80% of nocardiosis cases present as invasive pulmonary infection, disseminated infection, or brain abscess; 20% present as cellulitis
- Complications
  - Pleural effusion
  - Empyema
  - Pericarditis
  - Mediastinitis
  - Brain Abscess
  - Disseminated disease



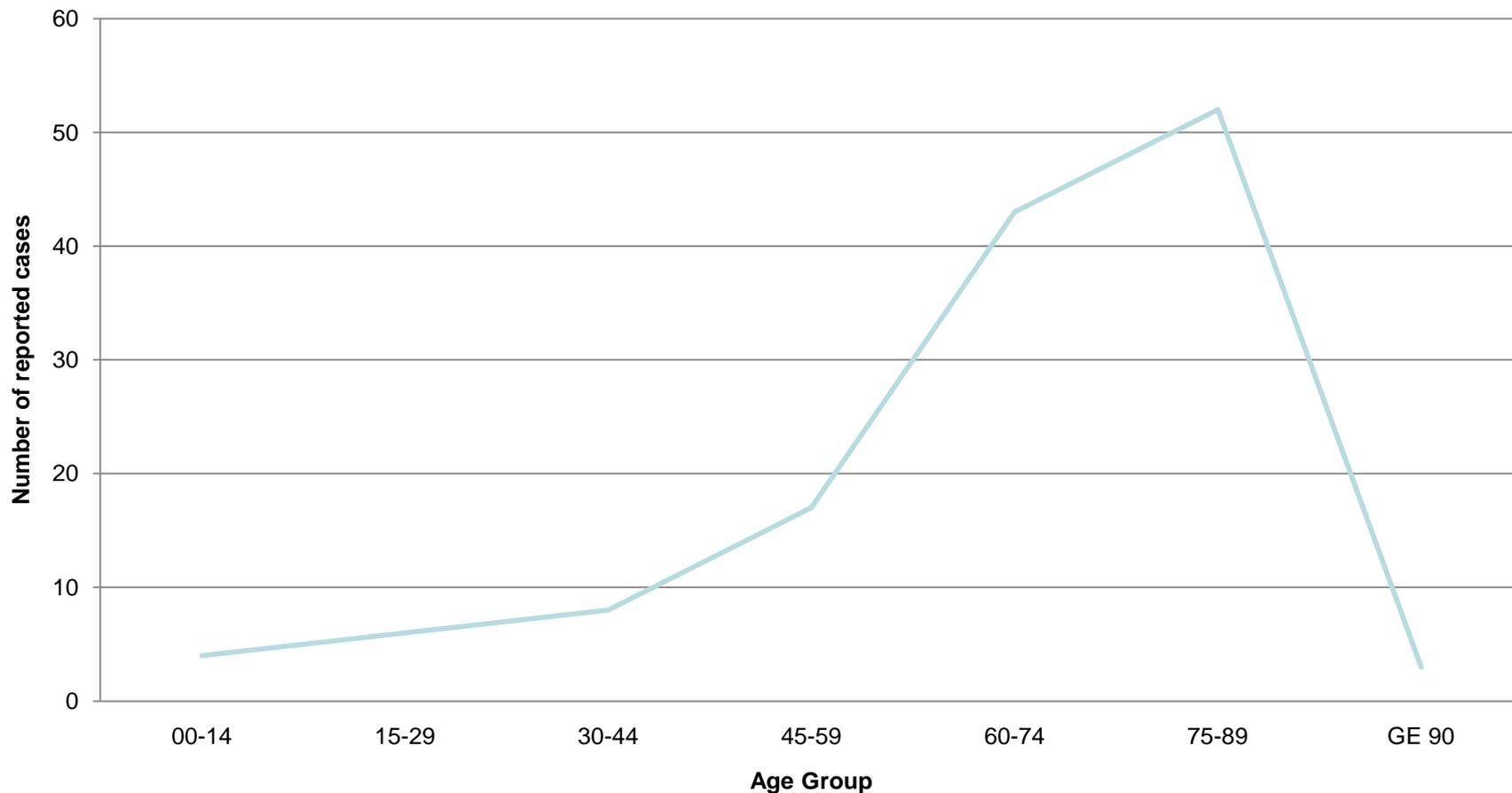
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# Background - Diagnosis

- Frequently misdiagnosed as tuberculosis
  - upper lobe involvement
  - weakly acid-fast stain
- Slow growth on culture (5-21 days)



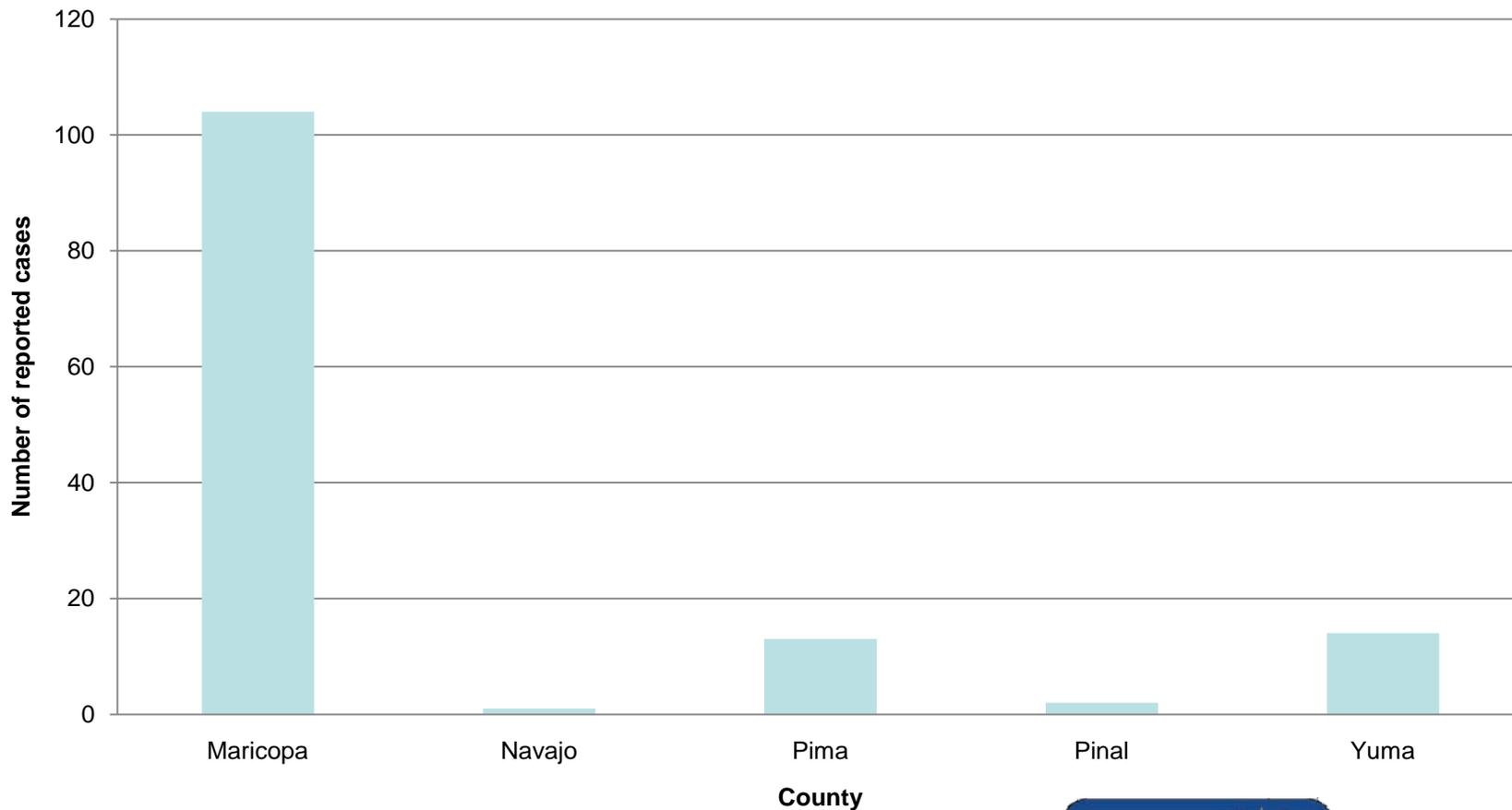
# Reported Nocardiosis Cases by Age, 2007-2008



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# Reported Nocardiosis Cases by County, 2007-2008



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# *Nocardia* Study - Methods

- August 2007 – January 2009
- Isolates submitted to CDC for species confirmation and susceptibility analyses
- Medical records reviewed
  - Risk factors
  - Diagnosis
  - Treatment
  - Outcomes

# *Nocardia* Study – Preliminary Results

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# *Nocardia* Study – Risk Factors

- 55 medical records reviewed
- 45 (73%) were 60 y.o. or older
- 29 (53%) were current smokers or had a history of smoking
- 40 (73%) had underlying pulmonary problems
  - 19 (35%) had COPD
  - 15 (27%) had a concurrent lung infection
  - 5 (9%) had asthma

# *Nocardia* Study – Risk Factors

- 30 (55%) were immunocompromised or had a history of being immunocompromised
  - 14 (25%) had cancer (ie lung, breast, esophageal); 7 (13%) had history of cancer
  - 7 (13%) had diabetes mellitus

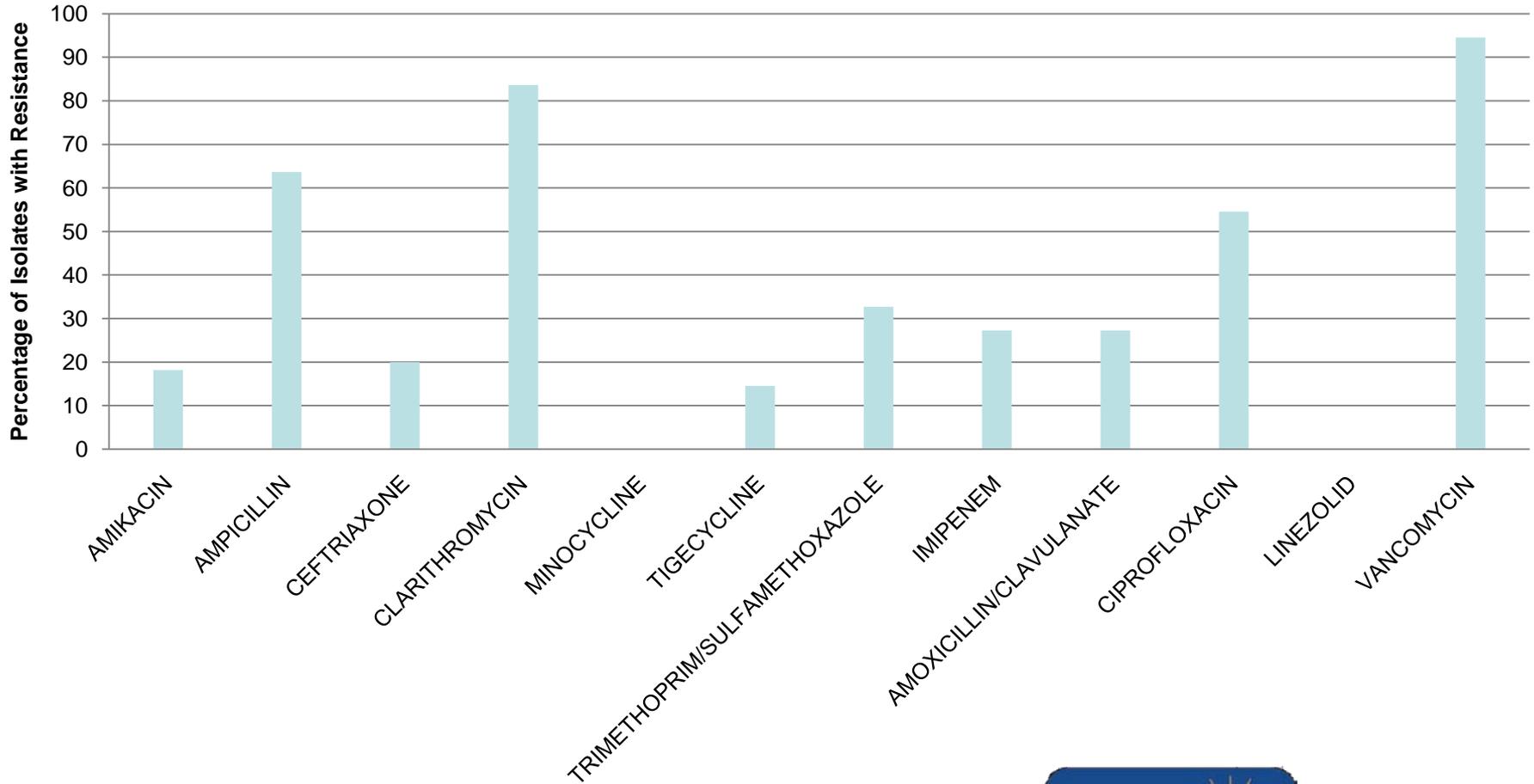
# *Nocardia* Study - Diagnosis

- 22 (40%) were not diagnosed with nocardiosis by a physician
- 31 (56%) were diagnosed with nocardiosis by a physician
  - Length of time from sx onset to date of diagnosis by a physician
    - Mean: 67 days

# *Nocardia* Study - Treatment

- 29 (54%) were treated with appropriate antibiotics for *Nocardia* infection
  - Mean: 164 days (5.5 months)
- Types of Antibiotics
  - Trimethoprim/sulfamethoxazole (Bactrim): 23 (79%)
  - Imipenem: 4 (14%)
  - Minocycline: 3 (10%)
  - Linezolid (Zyvox): 3 (10%)
  - Amikacin: 2 (7%)
  - Ciprofloxacin: 1 (3%)
  - Ceftriaxone (Rocephin): 1 (3%)

# Nocardia Study – Susceptibility Results



Antibiotic

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# *Nocardia* Study - Outcomes

- 28 (51%) were hospitalized
  - Mean: 8 days
- 20 (36%) recovered
  - Mean: 6.5 months (197 days)
- 12 (22%) died

# *Nocardia* Study - Limitations

- *Nocardia* infection is not reportable. Analyses done only on isolates received at state lab
- Medical records lacked complete information or information regarding nocardiosis

# *Nocardia* Study - Conclusions

- Common factors in patients with nocardiosis include being immunocompromised or have underlying pulmonary problems and being of older age
- Nocardiosis is often misdiagnosed or undiagnosed
- Nocardiosis should be considered in any patient who presents with brain, soft tissue, or cutaneous lesions, and a concurrent or recent pulmonary process

# Take Home Points

- Education of providers in the diagnosis and treatment of *Nocardia* infections
- Improvement in the exchange of test results between submitting hospital and provider

# Acknowledgments

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# Questions?

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