Alaska Antimicrobial Stewardship Collaborative (A2SC) announces the Alaska specific **Community-Acquired Pneumonia (CAP) Treatment Guidelines**. These clinical guidelines are intended to aid in the selection of antimicrobial therapy for patients residing in Alaska who present with community acquired pneumonia. Treatment guidelines available for the following Alaska care setting:

- Adult Inpatient CAP Treatment Guidelines
- Adult Ambulatory CAP Treatment Guidelines
- Pediatric Inpatient CAP Treatment Guidelines
- Pediatric Ambulatory CAP Treatment Guidelines

These guidelines will help Alaska physicians and pharmacists ensure patients receive the right antibiotic at the right time and only when necessary. As a companion to the guidelines the 2019 Alaska State Antibiogram is also available to help guide the best antibiotic choice.

Community-Acquired Pneumonia Guidelines are available for download on the A2SC website: [https://www.ashnha.com/antimicrobial-stewardship/](https://www.ashnha.com/antimicrobial-stewardship/)


Antibiotics save lives, but any time antibiotics are used, they can cause side effects and lead to antibiotic resistance. In U.S. doctors’ offices and emergency departments, at least 47 million antibiotic prescriptions each year are unnecessary, which makes improving antibiotic prescribing and use a national priority.

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**About Alaska Antimicrobial Stewardship Collaborative**

The Alaska Antimicrobial Stewardship Collaborative (A2SC) is an active partnership of hospitals and other health care stakeholders dedicated to developing innovative strategies to ensure appropriate antibiotic use. A2SC’s goal is a simple one: all patients in Alaska will receive the right antibiotic at the right time and only when necessary.

The emergence of antibiotic-resistant bacteria caused by the misuse and overuse of antibiotics is pushing the healthcare industry to re-evaluate how medicine is practiced. Together we will accelerate positive changes to achieve this critical goal. Visit our [website](https://www.ashnha.com/antimicrobial-stewardship/) for more information.
### Alaska Antimicrobial Stewardship Collaborative

#### ADULT Inpatient Community-Acquired Pneumonia (CAP) Guideline

<table>
<thead>
<tr>
<th>Major Criteria</th>
<th>Minor Criteria</th>
<th>Severity and Risk Factor Considerations</th>
</tr>
</thead>
</table>
| • Septic shock with need for vasopressors  
  • Respiratory failure requiring mechanical ventilation | • Respiratory rate ≥ 30 breaths/min  
  • Pao2/Fio2 ratio ≤ 250  
  • Multilobar infiltrates  
  • Confusion/disorientation  
  • Uremia (BUN ≥ 20 mg/dl)  
  • Leukopenia (WBC < 4,000 cells/μl)  
  • Thrombocytopenia (plts < 100,000/μl)  
  • Hypothermia (<36°C)  
  • Hypotension requiring aggressive fluid resuscitation | NOTE: Prior categorization of healthcare-associated pneumonia (HCAP) has been abandoned. The following are NOT predictive of multi-drug resistant pneumonia and should NOT be used alone as an indication for empiric broad-spectrum coverage:  
  • Hospitalized in an acute care hospital for 2 or more days within 90 days of infection  
  • Resided in a nursing home or long term care facility  
  • Received recent chemotherapy or wound care in last 30 days  
  • Attended a hemodialysis clinic in the last 30 days |

### Treatment Recommendations

<table>
<thead>
<tr>
<th>Infection</th>
<th>Standard Treatment</th>
<th>Hospitalized within 90 days PLUS IV antibiotics*</th>
<th>Prior MRSA in Respiratory Culture*</th>
<th>Prior Pseudomonas in Respiratory Culture*</th>
<th>Duration</th>
</tr>
</thead>
</table>
| **Non-Severe** | **Preferred Therapy:**  
  o Ceftriaxone 1g IV q24hr **PLUS**  
  Azithromycin 500mg PO/IV q24hr x3 days  
  **Anaphylactic β-Lactam Allergy:**  
  o Levofoxacin 750mg PO/IV q24hr | Empiric treatment for MRSA or P. aeruginosa not recommended  
  Escalate based upon culture results | **Preferred Therapy:**  
  o Vancomycin 15mg/kg x1 then (Pharmacy to Dose)  
  o Ceftriaxone 1g IV q24hr **PLUS** Azithromycin 500mg PO/IV q24hr x3 days  
  **Anaphylactic β-Lactam Allergy:**  
  o Levofoxacin 750mg PO/IV q24hr | **Preferred Therapy:**  
  o Vancomycin 15mg/kg x1 then (Pharmacy to Dose)  
  o Ceftriaxone 1g IV q24hr **PLUS** Azithromycin 500mg PO/IV q24hr x3 days  
  **Anaphylactic β-Lactam Allergy:**  
  o Levofoxacin 750mg PO/IV q24hr | **5 days** for patients without immunosuppression or structural lung disease  
  **7 days** for patients with moderate immunosuppression or structural lung disease  
  **10-14 days** for poor clinical response, initial inappropriate treatment, or significant immunosuppression |

| **Severe** (1 major or ≥ 3 minor criteria) | **Preferred Therapy:**  
  o Ceftriaxone 1g IV q24hr **PLUS**  
  Azithromycin 500mg PO/IV q24hr x3 days  
  **Anaphylactic β-Lactam Allergy:**  
  o Levofoxacin 750mg PO/IV q24hr +/- Vancomycin 15mg/kg (Pharmacy to Dose) | Empiric MRSA treatment:  
  Add Vancomycin 15mg/kg (Pharmacy to Dose)  
  **Empiric P. aeruginosa treatment:**  
  Substitute Cefepime 2g IV q8hr for ceftriaxone | **Empiric MRSA treatment:**  
  Add Vancomycin 15mg/kg (Pharmacy to Dose)  
  **Empiric P. aeruginosa treatment:**  
  Substitute Cefepime 2g IV q8hr for ceftriaxone | **Empiric MRSA treatment:**  
  Add Vancomycin 15mg/kg (Pharmacy to Dose)  
  **Empiric P. aeruginosa treatment:**  
  Substitute Cefepime 2g IV q8hr for ceftriaxone | **10-14 days** for poor clinical response, initial inappropriate treatment, or significant immunosuppression |

### Suspected* or confirmed Influenza

| Oral options to consider for de-escalation of β-lactam (total duration IV + PO as above)** | **Prefered Therapy:**  
  o Amoxicillin 1g PO TID*  
  o Augmentin 875mg BID  
  **Consider additional** amoxicillin 1g BID in addition to Augmentin for CAP complicated by empyema, asplenia or Strep pneumonia PenG MIC 2-4  
  **Non-Anaphylactic Penicillin Allergy:**  
  o Cefuroxime axetil 500mg PO BID | Oseltamivir 75mg PO BID 5 days |

### Consideration

* Prior positive cultures within 1 year. If empiric treatment for MRSA or P. aeruginosa, blood and respiratory cultures should be collected prior to antibiotic administration  
* If patient reports penicillin allergy, inquire about onset and severity of symptoms, as well as prior beta-lactam exposure and update patient medical record. Severe or life-threatening allergic reactions may include: anaphylaxis, angioedema, urticaria, Stevens-Johnson Syndrome (SJS), etc.  
* Dosage recommendations based upon an assumed CrCl > 80 ml/min. If patient has diminished renal function, doses should be dose-reduced.  
* Certain patient populations are at a higher risk for influenza related complications and may require treatment in absence of confirmed influenza. Refer to local guidelines.  
* **Patient should complete macrolide therapy**  
  ^ Strept pneumo and/or cefinase negative H.influenzae / M.cattarrhalis use high-dose amoxicillin  
  # Severe immunosuppression: Neutropenia (WBC < 4 or ANC < 500), HIV+ with CD4 < 200, active chemotherapy, undergone solid organ transplant on active immunosuppression, Moderate immunosuppression: all other diseases (including long-term steroid use with prednisone at 10mg/day or equivalent)
# Alaska Antimicrobial Stewardship Collaborative (A2SC)
## Adult Ambulatory Community-Acquired Pneumonia (CAP) Treatment Guideline

### Common Etiologies
- **Bacterial:** S. pneumoniae, H. influenzae, Chlamydia pneumoniae, Mycoplasma pneumoniae, M. catarrhalis
- **Respiratory viruses:** influenza A & B, adenovirus, respiratory syncytial virus, parainfluenza, COVID-19

### Diagnostic Criteria Tools

#### Pneumonia Severity Index (PSI) Scoring Tool

<table>
<thead>
<tr>
<th>Risk Class (Points)</th>
<th>Mortality (%)</th>
<th>Recommended site of care</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (&lt;50)</td>
<td>0.1</td>
<td>Outpatient</td>
</tr>
<tr>
<td>II (51-70)</td>
<td>0.6</td>
<td>Outpatient</td>
</tr>
<tr>
<td>III (71-90)</td>
<td>2.8</td>
<td>Outpatient or brief inpatient</td>
</tr>
<tr>
<td>IV (91-130)</td>
<td>8.2</td>
<td>Inpatient</td>
</tr>
<tr>
<td>V (&gt;130)</td>
<td>29.2</td>
<td>Inpatient</td>
</tr>
</tbody>
</table>

### Demographics
- Age (1 point per year)
- Male (Age)
- Female (Age -10)
- Nursing home residency +10

### Comorbidities
- Neoplasia +30
- Liver disease +20
- Heart Failure +10
- Cerebrovascular disease +10
- Renal disease +10

### Physical Exam/Vitals
- Confusion +20
- Resp rate >30 +20
- SBP <90 +20
- Temperature <35C or >40C +15
- HR >125 bpm +15

### Labs/Imaging
- Arterial pH <7.35 +30
- BUN >30mg/dL +20
- Sodium <130 +20
- Glucose >250 +10
- Hematocrit <30% +10
- Pleural Effusion +10
- PaO2 <60 +10

### Lab Investigation
- Arterial pH
- BUN
- Sodium
- Glucose
- Hematocrit
- Pleural Effusion
- PaO2

### Therapy Duration

- **Typically healthy, no structural lung disease:** 5 days
- **Moderately immunocompromised, suspected or proven MRSA or P. aeruginosa, or moderate structural lung disease (ie. diabetes, asplenia):** 7 days

### Antibiotic Selection

#### No comorbidities or risk factors for MRSA or *Pseudomonas aeruginosa*
- **Amoxicillin 1gm PO TID x5-7 days**

#### Comorbidities present*
- **Amoxicillin/Clavulanate 875mg/125mg PO BID x 5-7 days** **PLUS**
- **Azithromycin 500mg PO daily x 3 days**

#### Risk factors for MRSA or *Pseudomonas aeruginosa*
- **Treatment should be based on previous culture & susceptibility, IV antimicrobials may be required**

#### Non-anaphylactic PCN allergy:
- **Cefuroxime 500mg PO BID x 5-7 days** **PLUS**
- **Azithromycin 500mg PO daily x 3 days**

#### Anaphylactic PCN allergy:
- **Levofloxacin 750mg PO daily x 5 days**

### CONSIDERATIONS
- *Consider additional Amoxicillin 1g BID in addition to Augmentin for CAP complicated by empyema, asplenia or Strep pneumoniae PenG MIC 2-4*
- For patient diagnosed with influenza, it is recommended to also treat with anti-influenza agents; most benefit is seen if started within 48 hours of symptom onset

### References
- Approved A2SC Advisory April 2021
Alaska Antimicrobial Stewardship Collaborative (A2SC)
Pediatric (>3mo) Inpatient Community Acquired Pneumonia (CAP) Treatment Guideline

### Initial Testing/Imaging
- **Vital Signs:** VS including BP and Pulse Oximetry
- **Labs:**
  - Blood work: CBC with differential, CRP, blood culture
  - Viral Testing: Influenza PCR during influenza season and COVID
  - Sputum gram stain and culture: if intubating, collect at time of initial ET tube placement; consider testing in older children who can produce sputum sample
  - Urinary antigen detection testing is not recommended in children; false-positive tests are common.
- **Radiography:**
  - AP and lateral CXR

### Inpatient Admission Criteria
<table>
<thead>
<tr>
<th>Pediatric Floor</th>
<th>PICU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory distress</strong></td>
<td><strong>Respiratory support:</strong> Intubated or requiring non-invasive positive pressure ventilation</td>
</tr>
<tr>
<td><strong>SpO2 &lt;90% on room air</strong></td>
<td><strong>Concern for respiratory failure</strong></td>
</tr>
<tr>
<td><strong>Unable to tolerate PO</strong></td>
<td><strong>Concern for sepsis</strong></td>
</tr>
<tr>
<td><strong>Suspected or documented CAP caused by pathogen with increased virulence (ex. CA-MRSA)</strong></td>
<td><strong>FiO2 needs HNFC &gt;50% to keep saturation ≥92%</strong></td>
</tr>
<tr>
<td><strong>Concerns about observation at home, inability to comply with therapy, inability to be followed up</strong></td>
<td><strong>Altered mental status</strong></td>
</tr>
</tbody>
</table>

### Treatment Selection

#### Suspected Bacterial Pneumonia
**Most Common Pathogens:** *Streptococcus pneumoniae*, *Haemophilus influenzae*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Parenteral Treatment</th>
<th>Oral Step-Down</th>
</tr>
</thead>
</table>
| Previously healthy AND Fully immunized | **Preferred:** Amoxicillin 50mg/kg IV q6hr (max 12g/day)  
**Alternatives:**  
Non-Type 1 β-Lactam Allergy: Ceftriaxone 50mg/kg IV q24hr (max 2g/day)  
Type 1 β-Lactam Allergy: Levofloxacin  
<5 years: 10mg/kg IV BID (max dose 750mg/day)  
>5 years: 10mg/kg IV q24hr (max dose 750mg/day) | Antibiotic choice:  
- If culture positive: based on cultures and susceptibilities  
- If culture negative: refer to Ambulatory CAP Treatment Guidelines |
| Not appropriately immunized with PCV13 + Hib OR Suspicion for *H. influenzae* OR Severe disease and/or Complicated Pneumonia | **Preferred:** Ceftriaxone 50mg/kg IV q24hr (max 2g/day)  
**Alternatives:**  
Type 1 β-Lactam Allergy: Levofloxacin  
<5 years: 10mg/kg IV/PO BID (max dose 750mg/day)  
>5 years: 10mg/kg IV/PO q24hr (max dose 750mg/day) | Antibiotic Duration:  
- Uncomplicated pneumonia: complete a 10 day course  
- Complicated pneumonia: dependent on clinical response, in general 2-4 week course |
| Suspicion for *S. aureus* | In addition to one of the above antibiotics, add:  
Clindamycin 10mg/kg IV q6hr (max 900mg/dose)  
For PICU or Severe Infection: Vancomycin 15mg/kg IV q6hr (max 4g/day) | Antibiotic choice: Based on cultures and susceptibilities  
Antibiotic duration: May require longer treatment |

#### Suspected Atypical Pneumonia
**Most Common Pathogens:** *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Preferred Treatment</th>
<th>Oral Step-Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>In ≥5yo empirically add macrolide if atypical CAP cannot be ruled out</td>
<td>Azithromycin 10mg/kg IV daily x 1-2 days then transition to oral step down if possible (max 500mg/dose)</td>
<td>Azithromycin 10mg/kg PO daily to complete a 3 day course (max 500mg/dose)</td>
</tr>
</tbody>
</table>

#### Suspected Viral Pneumonia
**Most Common Pathogens:** Influenza A & B, Adenovirus, Respiratory Syncytial Virus, Parainfluenza

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Preferred Treatment</th>
<th>Oral Step-Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most common in &lt;5yo</td>
<td>No antimicrobial therapy is necessary. If influenza positive, see influenza guidelines for treatment algorithm.</td>
<td></td>
</tr>
</tbody>
</table>

### CONSIDERATIONS
- Children should show clinical signs of improvement within 48-72 hours allowing de-escalation of therapy based on available culture results and consideration of transition to oral step-down therapy
- If no improvement or worsening pursue further diagnostic work up as indicated, consider broadening antibiotics and formal infectious disease consultation

**REFERENCES:**
### Criteria for Respiratory Distress
- Tachypnea, in breaths/min:
  - Age 0-2mo: >60
  - Age 2-12mo: >50
  - Age 1-5yo: >40
  - Age >5yo: >20
- Dyspnea
- Retractions
- Grunting
- Nasal flaring
- Apnea
- Altered mental status
- Pulse oximetry <90% on room air

### Criteria For Outpatient Management
- Mild CAP: no signs of respiratory distress
- Able to tolerate PO
- No concerns for pathogen with increased virulence (ex. CA-MRSA)
- Family able to carefully observe child at home, comply with therapy plan, and attend follow up appointments

### Testing/Imaging for Outpatient Management
- Vital Signs: Standard VS and Pulse Oximetry
- Labs: No routine labs indicated
- Influenza PCR during influenza season
- COVID testing
- Blood cultures if not fully immunized OR fails to improve/worsens after initiation of antibiotics
- Urinary antigen detection testing is not recommended in children; false-positive tests are common.
- Radiography: No routine CXR indicated
- AP and lateral CXR if fails initial antibiotic therapy
- AP and lateral CXR 4-6 weeks after diagnosis if recurrent pneumonia involving the same lobe

### Treatment Selection

#### Suspected Viral Pneumonia
**Most Common Pathogens:** Influenza A & B, Adenovirus, Respiratory Syncytial Virus, Parainfluenza

- **No antimicrobial therapy is necessary.**
- If influenza positive, see influenza guidelines for treatment algorithm.

#### Suspected Bacterial Pneumonia
**Most Common Pathogens:** Strepococcus pneumoniae, Haemophilus influenzae

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Preferred Treatment</th>
<th>Treatment Alternatives for β-Lactam Allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously healthy AND Appropriately Immunized for Age</td>
<td>Amoxicillin 45mg/kg PO BID (Max dose 4000mg/day) x5 days*</td>
<td>Non-anaphylactic β-Lactam Allergy: Cefprozil suspension 15mg/kg PO BID (max 1000mg/day) x5 days*</td>
</tr>
<tr>
<td>Not appropriately immunized with PCV13 + Hib OR Suspicion for H. influenzae</td>
<td>Amoxicillin/clavulanate &lt;40kg: (ES 600mg/42.5mg/5mL) 45mg/kg PO BID or 15mg/kg PO TID (Max dose 4000mg/day) x5 days* &gt;40kg: 875mg/125mg PO BID PLUS Amoxicillin 1g PO BID x5 days*</td>
<td>Cefuroxime tablets 15mg/kg PO BID (Max 1000mg/day) x5 days*</td>
</tr>
</tbody>
</table>

#### Suspected Atypical Pneumonia
**Most Common Pathogens:** Mycoplasma pneumoniae, Chlamydophila pneumoniae

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Preferred Treatment</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most common in ≥5yo In ≥5yo macrolide may be empirically added if there is no clinical evidence that distinguishes bacterial from atypical CAP</td>
<td>Azithromycin 10mg/kg PO daily (Max dose 500mg/day) x3 days</td>
<td>For children &gt;7yo: Doxycycline 1-2 mg/kg PO BID (Max dose 200mg/day) x10 days</td>
</tr>
</tbody>
</table>

### CONSIDERATIONS
- *Exclusion criteria for short course therapy includes: pneumonia with atypical pathogens, hospital acquired pneumonia (admission for >48 hours in previous 2 months, CAP in previous month, or lung abscess in previous 6 months), empyema or necrotizing pneumonia, preexisting pulmonary disease, congenital heart disease, history of aspiration, malignant neoplasm, immunodeficiency, or kidney dysfunction.
- Children should show clinical signs of improvement within 48-72 hours

**REFERENCES:**

**Approved A2SC Advisory April 2021**
2019 Alaska State Antibiogram

The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24. Tribal health facilities and many smaller hospitals customarily include both inpatient and outpatient isolates, while some hospitals may only include inpatients.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant Enterobacteriaceae (CRE): there were 3 cases of CRE reported in Alaska in 2019. None were carbapenemase-producing.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
  - “NED” indicates that there was Not Enough Data to report the value: either only one facility reported data for that drug-bug combination or <30 isolates were tested.

- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to all the hospitals in Alaska for participating in this project to the extent of their ability. These statewide data include all the hospitals used in the Regional Antibiograms, plus Norton Sound Regional Medical Center.

**Important note:** This year, a number of facilities did not make antibiograms. The decrease in data means there will not be regional antibiograms for the Northern Region, and there are substantially fewer data points in the Southeast region.

For more information and the methods used for the analyses, please see the “Regional Antibiogram Project — Alaska, 2014–2015” Epidemiology Bulletin.
## Statewide data

| Species                     | Penicillin | Ampicillin | Oxacillin | Amoxicillin-sulbactam | Amoxicillin | Cefazolin | Cefuroxim | Levofuroxim | Moxifloxacin | Ticarcillin | Tobramycin | Trimethoprim-sulfamethoxazole | Gatifloxacin | Lincosamid | Linezolid | Tetracycline | Nitrofurantoin | Quinupristin-dalfopristin | Rifampin | Tigecycline | Strep syn |
|-----------------------------|------------|------------|-----------|-----------------------|-------------|-----------|-----------|-------------|--------------|-------------|------------|----------------|----------------|-------------|------------|-------------|----------------|----------------|----------------|-------------|-------------|----------|
| **Total Staphylococcus aureus** | 4% (2539) | 0% (292) | 62% (5293) | 53% (625) | 55% (262) | 58% (1961) | 63% (643) | 64% (3138) | 69% (5299) | 69% (1545) | 97% (292) | 80% (5273) | 48% (3725) | 99% (5299) | 99% (4440) | 98% (4884) | 99% (3978) | 93% (5299) | 100% (4435) | 100% (1546) | 99% (2007) | 100% (1464) |
| MSSA                        | 7% (1350) | 0% (121) | 97% (290) | 100% (1141) | 100% (NED) | 89% (2088) | 92% (2904) | 100% (971) | 100% (169) | 85% (3068) | 70% (1888) | 100% (836) | 99% (1635) | 99% (2527) | 99% (2937) | 97% (2904) | 99% (2923) | 99% (792) | 100% (1168) |
| MRSA                        | 0% (943)  | 0% (95)  | 0% (60)  | 0% (60)  | NED (0% (235) | 29% (1489) | 32% (2010) | 31% (648) | 93% (123) | 69% (2216) | 10% (1414) | 99% (2224) | 99% (1708) | 97% (2224) | 99% (2224) | 87% (1563) | 87% (1919) | 88% (648) | 99% (183) |
| **Staphylococcus lugdunensis** | 48% (111) | 85% (153) | 98% (153) | 99% (153) | 99% (153) | 79% (153) | 79% (153) | 100% (153) | 99% (153) | 100% (153) | 100% (153) | 96% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) | 100% (153) |
| **Coag-negative Staphylococcus (inc. S. epidermidis)** | 13% (670) | 8% (1144) | 44% (136) | 43% (136) | 41% (269) | 48% (241) | 76% (779) | 78% (1085) | 82% (150) | NED (1091) | 65% (830) | 38% (1142) | 88% (816) | 58% (1144) | 97% (621) | 86% (1087) | 99% (141) | 99% (362) |
| **Enterococcus faecalis** | 99% (881) | 99% (899) | R | R | R | 87% (611) | 94% (860) | 100% (143) | R | 11% (404) | 99% (928) | R | 82% (503) | R | 97% (651) | 26% (697) | 99% (914) | R | 42% (108) | 100% (211) | 74% (267) |
| **Enterococcus spp.** | 90% (90% | 253) | 9% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) |
| **Group B Streptococcus** | 100% (275) | S | 100% (275) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) | 62% (210) | 67% (253) |
| **Streptococcus pneumoniae (all)** | 93% (98) | 98% (44) | 100% (138) | 97% (78) | 99% (143) | 100% (186) | 95% (136) | 87% (186) | 100% (186) | 94% (136) | 94% (136) | 91% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) | 94% (136) |
| **S. pneumoniae - non-CSF** | 80% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) | 99% (270) | 99% (295) |
| **S pneumoniae - meningitis** | 76% (292) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) | 93% (270) | 95% (295) |
### Statewide data

<table>
<thead>
<tr>
<th>Species</th>
<th>Amoxicillin+clavulanic acid</th>
<th>Ampicillin+Tazobactam</th>
<th>Ceftazidime</th>
<th>Ceftazolin</th>
<th>Ceftobiprim</th>
<th>Pseudomonas aeruginosa</th>
<th>erratam</th>
<th>Gentamicin</th>
<th>Tobramycin</th>
<th>Amikacin</th>
<th>Ertapenem</th>
<th>Trimeth+Sufla</th>
<th>Tetracycline</th>
<th>Nitrofurantoin</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acinetobacter baumannii</em></td>
<td>98% (48)</td>
<td>83% (48)</td>
<td>92% (93)</td>
<td>R</td>
<td>R</td>
<td>87% (75)</td>
<td>87% (78)</td>
<td>87% (92)</td>
<td>99% (78)</td>
<td>87% (92)</td>
<td>99% (78)</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td><em>Citrobacter freundii</em></td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>88% (133)</td>
<td>97% (83)</td>
<td>87% (99)</td>
<td>100% (83)</td>
<td>47% (53)</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td><em>Klebsiella aerogenes</em></td>
<td>R</td>
<td>R</td>
<td>93% (113)</td>
<td>R</td>
<td>R</td>
<td>88% (133)</td>
<td>100% (91)</td>
<td>100% (83)</td>
<td>100% (83)</td>
<td>100% (70)</td>
<td>100% (70)</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td><em>Enterobacter cloacae</em></td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>87% (350)</td>
<td>80% (244)</td>
<td>84% (285)</td>
<td>98% (288)</td>
<td>NED (350)</td>
<td>R</td>
<td>82% (219)</td>
<td>98% (350)</td>
<td>R</td>
<td>R</td>
<td>NED (350)</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>86% (4789)</td>
<td>57% (8962)</td>
<td>64% (7650)</td>
<td>98% (9028)</td>
<td>79% (9395)</td>
<td>88% (4324)</td>
<td>95% (9420)</td>
<td>96% (8139)</td>
<td>97% (7344)</td>
<td>63% (2222)</td>
<td>93% (4784)</td>
<td>50% (2222)</td>
<td>89% (4470)</td>
<td>93% (2222)</td>
</tr>
<tr>
<td><em>Klebsiella oxytoca</em></td>
<td>86% (97)</td>
<td>0% (41)</td>
<td>65% (216)</td>
<td>95% (216)</td>
<td>57% (155)</td>
<td>88% (216)</td>
<td>94% (184)</td>
<td>99% (97)</td>
<td>100% (97)</td>
<td>96% (148)</td>
<td>99% (148)</td>
<td>99% (184)</td>
<td>NED (101)</td>
<td>R</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td>98% (468)</td>
<td>R</td>
<td>87% (1174)</td>
<td>98% (1174)</td>
<td>85% (1202)</td>
<td>94% (522)</td>
<td>97% (1206)</td>
<td>98% (1012)</td>
<td>98% (219)</td>
<td>92% (219)</td>
<td>100% (219)</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em></td>
<td>95% (206)</td>
<td>86% (478)</td>
<td>90% (488)</td>
<td>99% (526)</td>
<td>76% (524)</td>
<td>95% (243)</td>
<td>93% (890)</td>
<td>99% (309)</td>
<td>99% (310)</td>
<td>97% (111)</td>
<td>100% (111)</td>
<td>56% (248)</td>
<td>94% (526)</td>
<td>94% (243)</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>R</td>
<td>R</td>
<td>95% (837)</td>
<td>R</td>
<td>R</td>
<td>92% (763)</td>
<td>93% (766)</td>
<td>R</td>
<td>R</td>
<td>70% (450)</td>
<td>90% (846)</td>
<td>97% (834)</td>
<td>92% (521)</td>
<td>R</td>
</tr>
<tr>
<td><em>Serratia marcescens</em></td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>85% (82)</td>
<td>98% (82)</td>
<td>99% (82)</td>
<td>99% (82)</td>
<td>R</td>
<td>R</td>
<td>99% (82)</td>
<td>100% (82)</td>
<td>94% (82)</td>
<td>100% (81)</td>
<td>NED (81)</td>
</tr>
</tbody>
</table>

2019 State Antibiotics- SURVEILLANCE DATA ONLY
The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant Enterobacteriaceae (CRE): there were 3 cases of CRE in Anchorage/Mat-Su residents in 2019.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
  - “NED” indicates that there was Not Enough Data to report the value: either only one facility reported data for that drug-bug combination or <30 isolates were tested.

- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to the following facilities for providing data in support of this project:
  - Alaska Native Medical Center
  - Alaska Regional Hospital
  - Mat-Su Regional Medical Center
  - Providence Alaska Medical Center
| Species                               | Penicillin | Ampicillin | Oxacillin | Cefazolin | Cefotaxime | Cefprozolin | Levofloxacin | Clarithromycin | Erythromycin | Vancomycin | Gentamicin | GenSyn | Trimethoprim-sulfamethoxazole | Nitrofurantoin |
|---------------------------------------|------------|------------|-----------|-----------|------------|-------------|--------------|----------------|--------------|-------------|------------|--------|--------|--------------------------------|---------------|
| Total Staphylococcus aureus           |            |            |           | 60% (3410) | 57% (1862) | 64% (3410) | 67% (3410)  | 79% (3410)    | 47% (1862)  | 100% (3410) | 99% (3410) | 97% (3410) | 100% (3410) | 100% (3410) |
| MSSA                                  | 5% (1107)  | S (3410)   | 100%      | 91% (1323) | 94% (2139) | 85% (2321) | 72% (1141)   | 100% (2321)   | 100% (1141) | 98% (2321)  | 100%      | 98% (2321) | 100% (2321) |
| MRSA                                  | R (26% (1031) | 28% (1405) | 66% (1619) | 10% (817)  | 100% (1619) | 99% (1619) | 97% (1619)   | 100% (1201)   | 100% (1619) | 97% (1619)  | 100%      | 97% (1619) | 100% (1619) |
| Coag-negative Staphylococcus          | NED (43% (477)) | NED (1405) | NED (1619) | 71% (420)  | 57% (477)  | NED (477)  | 100% (420)   | 84% (477)     | 47% (477)   | NED (477)  | 99%       |        |                                  |               |
| Staphylococcus epidermidis            | 3% (102)   | 39% (215)  | 23% (91)  | 66% (136)  | 61% (158)  | 55% (215)  | NED (215)   | 100% (158)    | 82% (215)   | 61% (215)  | NED (215) | 100%   | (215)                                      |               |
| Enterococcus faecalis                 | 99% (596)  | 99% (596)  | R (311)   | 89% (528)  | 93% (528)  | R (528)    | 99% (596)   | R (596)       | 82% (423)   | R (996)    | 99%       | (423)  | 99% (423)                                 |               |
| Enterococcus faecium                  | 57% (60)   | 58% (60)   | R (60)    | R (60)     | NED (60)   | R (60)     | NED (60)    | 78% (60)      | 97% (60)    | R (95)     | 95%       | (60)   | 53% (60)                                   |               |
| Streptococcus pneumoniae (all)        |            |            |           |           | 100%       | 100%       | NED         | 87%           | 100%        |            |           |        |                                  |               |
| S. pneumoniae - non-CSF               | 80% (295)  | 99% (270)  | 99% (295) | 99% (270)  | 99% (125)  | NED (125) | 87% (125)   | 100% (125)    |            |            |           |        |                                  |               |
| S pneumoniae - meningitis             | 76% (292)  | 93% (270)  | 95% (295) |            |            |           |             |               |            |            |           |        |                                  |               |

2019 State Antibiograms - SURVEILLANCE DATA ONLY
# State Antibiograms - SURVEILLANCE DATA ONLY

<table>
<thead>
<tr>
<th>Species</th>
<th>Amoxicillin+ clavulanic acid</th>
<th>Ampicillin</th>
<th>Ampicillin+Sulbactam</th>
<th>Piperacillin+Troxaminic acid</th>
<th>Cefadroxil</th>
<th>Cefadroxil-neosetam</th>
<th>Cefepime</th>
<th>Gentamicin</th>
<th>Tobramycin</th>
<th>Amikacin</th>
<th>Meropenem</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Trimeth-Sulfa</th>
<th>Tetracycline</th>
<th>Nitrofurantion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacter baumanii</td>
<td>98% (46)</td>
<td>85% (46)</td>
<td>83% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>98% (46)</td>
<td>96%</td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td>R R R R R R R R R R R R R R R</td>
<td>R</td>
<td>R R R R R R R R R R R</td>
<td>84% (74)</td>
<td>85% (74)</td>
<td>99% (74)</td>
<td>99% (74)</td>
<td>96% (61)</td>
<td>100% (74)</td>
<td>100% (74)</td>
<td>82% (45)</td>
<td>95% (74)</td>
<td>98% (61)</td>
<td>96% (45)</td>
<td>82% (45)</td>
<td>NED</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>R R R R R R R R R R R R R R R</td>
<td>83% (253)</td>
<td>R R R R R R R R R R R</td>
<td>79% (154)</td>
<td>82% (214)</td>
<td>99% (253)</td>
<td>99% (253)</td>
<td>98% (253)</td>
<td>98% (253)</td>
<td>98% (253)</td>
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<td>96% (253)</td>
<td>94% (253)</td>
<td>93% (253)</td>
<td>43%</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>85% (2838)</td>
<td>56% (4559)</td>
<td>63% (5017)</td>
<td>97% (5017)</td>
<td>90% (5017)</td>
<td>86% (3296)</td>
<td>78% (3723)</td>
<td>93% (5017)</td>
<td>96% (5017)</td>
<td>96% (5017)</td>
<td>92% (5017)</td>
<td>94% (5017)</td>
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<td>100% (5017)</td>
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<td>84% (80)</td>
<td>85% (80)</td>
<td>100% (80)</td>
<td>85% (80)</td>
<td>100% (80)</td>
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<td>99% (80)</td>
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<td>99% (80)</td>
<td>99% (80)</td>
<td>99% (80)</td>
<td>99%</td>
</tr>
<tr>
<td>Klebsiella oxytoca</td>
<td>86% (92)</td>
<td>69% (175)</td>
<td>94% (175)</td>
<td>47% (175)</td>
<td>47% (175)</td>
<td>90% (175)</td>
<td>95% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>94% (175)</td>
<td>83%</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
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<td>86% (729)</td>
<td>98% (729)</td>
<td>95% (729)</td>
<td>92% (729)</td>
<td>86% (535)</td>
<td>96% (729)</td>
<td>96% (161)</td>
<td>98% (616)</td>
<td>98% (729)</td>
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<td>98% (616)</td>
<td>97% (3535)</td>
<td>15% (648)</td>
<td>100% (648)</td>
<td>96% (729)</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
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<td>90% (327)</td>
<td>99% (327)</td>
<td>94% (327)</td>
<td>96% (191)</td>
<td>96% (191)</td>
<td>100% (191)</td>
<td>99% (191)</td>
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<td>94% (191)</td>
<td>94% (327)</td>
<td>100% (327)</td>
<td>100% (327)</td>
<td>92%</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>R R R R R R R R R R R R R R</td>
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<td>90% (547)</td>
<td>92% (562)</td>
<td>68% (402)</td>
<td>89% (630)</td>
<td>96% (630)</td>
<td>92% (479)</td>
<td>94% (630)</td>
<td>87% (652)</td>
<td>82% (630)</td>
<td>R R R R R R R R R R</td>
<td>100% (630)</td>
<td>97% (630)</td>
<td>97% (630)</td>
<td>97%</td>
</tr>
<tr>
<td>Serratia marcesens</td>
<td>85% (81)</td>
<td>99% (81)</td>
<td>99% (81)</td>
<td>100% (81)</td>
<td>94% (81)</td>
<td>100% (81)</td>
<td>100% (81)</td>
<td>99% (81)</td>
<td>99% (81)</td>
<td>99% (81)</td>
<td>99% (81)</td>
<td>100% (81)</td>
<td>100% (81)</td>
<td>97% (81)</td>
<td>99% (81)</td>
<td>99%</td>
</tr>
<tr>
<td>Stenotrophomonas maltophilia</td>
<td>84% (32)</td>
<td>84% (32)</td>
<td>85% (32)</td>
<td>99% (32)</td>
<td>94% (32)</td>
<td>100% (32)</td>
<td>100% (32)</td>
<td>97% (32)</td>
<td>97% (32)</td>
<td>97% (32)</td>
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<td>97% (32)</td>
<td>97% (32)</td>
<td>97% (32)</td>
<td>97% (32)</td>
<td>97%</td>
</tr>
</tbody>
</table>

2019 State Antibiograms - SURVEILLANCE DATA ONLY
2019 Alaska State Antibiogram: Gulf Coast Region

The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant Enterobacteriaceae (CRE): there were no cases of CRE in a Gulf Coast resident in 2019.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
  - “NED” indicates that there was Not Enough Data to report the value: either only one facility reported data for that drug-bug combination or <30 isolates were tested.

- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to the following facilities for providing data in support of this project:
  - Central Peninsula Hospital
  - South Peninsula Hospital
  - Providence Valdez Medical Center
### Gulf Coast Region data

| Species                        | Penicillin | Ampicillin | Oxacillin | Ciprofloxacin | Clindamycin | Erythromycin | Vancomycin | Gentamicin | Trimethoprim-sulfamethoxazole | Linezolid | Tetracycline | Nitrofurantoin | Rifampin  | Trimethoprim-sulfamethoxazole | Linezolid | Tetracycline | Nitrofurantoin | Rifampin  | Trimethoprim-sulfamethoxazole | Linezolid | Tetracycline | Nitrofurantoin | Rifampin  | Trimethoprim-sulfamethoxazole | Linezolid | Tetracycline | Nitrofurantoin | Rifampin  | Trimethoprim-sulfamethoxazole | Linezolid | Tetracycline | Nitrofurantoin | Rifampin  | Trimethoprim-sulfamethoxazole |
|-------------------------------|------------|------------|-----------|--------------|-------------|--------------|------------|------------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|-----------|--------------|----------------|-----------|--------------------------------|
| Total Staphylococcus aureus   | 9% (338)   | 62% (350)  | 63% (356) | 64% (331)    | 43% (356)   | 100% (366)   | 99% (356)  | 99% (356)  | 99% (356)                         | 99% (356) | 99% (356)    | 99% (356)    | 99% (356) | 100% (356)                         | 99% (356) | 99% (356)    | 99% (356)    | 99% (356) | 100% (356)                         | 99% (356) | 99% (356)    | 99% (356)    | 99% (356) | 100% (356)                         | 99% (356) | 99% (356)    | 99% (356)    | 99% (356) | 100% (356)                         |
| MSSA                          | 16% (196)  | S (208)    | 84% (208) | 65% (191)    | 100% (208)  | 98% (208)    | 99% (208)  | 99% (208)  | 99% (208)                         | 99% (208) | 99% (208)    | 99% (208)    | 99% (208) | 100% (208)                         | 99% (208) | 99% (208)    | 99% (208)    | 99% (208) | 100% (208)                         | 99% (208) | 99% (208)    | 99% (208)    | 99% (208) | 100% (208)                         |
| MRSA                          | 0% (125)   | R (131)    | 29% (131)| 73% (123)    | 100% (131)  | 98% (123)    | 99% (123)  | 99% (123)  | 99% (123)                         | 99% (123) | 99% (123)    | 99% (123)    | 99% (123) | 100% (123)                         | 99% (123) | 99% (123)    | 99% (123)    | 99% (123) | 100% (123)                         | 99% (123) | 99% (123)    | 99% (123)    | 99% (123) | 100% (123)                         |
| Staphylococcus epidermidis    | 10% (147)  | 50% (149)  | 68% (147)| 72% (120)    | 100% (147)  | 84% (120)    | 99% (120)  | 99% (120)  | 99% (120)                         | 99% (120) | 99% (120)    | 99% (120)    | 99% (120) | 100% (120)                         | 99% (120) | 99% (120)    | 99% (120)    | 99% (120) | 100% (120)                         | 99% (120) | 99% (120)    | 99% (120)    | 99% (120) | 100% (120)                         |
| Enterococcus faecalis         | 100% (219)| 100% (219)| 84% (219)| R (219)      | 7% (219)    | 100% (219)   | R (219)   | 91% (219)  | 23% (219)                         | 100% (219)| 100% (219)   | 100% (219)   | 100% (219)| 100% (219)                         | 100% (219)| 100% (219)   | 100% (219)   | 100% (219)| 100% (219)                         | 100% (219)| 100% (219)   | 100% (219)   | 100% (219)| 100% (219)                         |
| Group B Streptococcus         | 100% (40)  | S (35)     | 97% (35) | 43% (36)     | 100% (36)   | 100% (36)    | 100% (36)  | 26% (36)   | 100% (36)                         | 100% (36) | 100% (36)    | 100% (36)    | 100% (36) | 100% (36)                         | 100% (36) | 100% (36)    | 100% (36)    | 100% (36) | 100% (36)                         | 100% (36) | 100% (36)    | 100% (36)    | 100% (36) | 100% (36)                         | 100% (36) | 100% (36)    | 100% (36)    | 100% (36) | 100% (36)                         |

2019 State Antibiograms - SURVEILLANCE DATA ONLY
## Gulf Coast Region data

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Amoxicillin+ clavulanic acid</th>
<th>Ampicillin</th>
<th>Ampicillin+Sulbactam</th>
<th>Piperacillin-Tazobactam</th>
<th>Cefazolin</th>
<th>Cefuroxime</th>
<th>Ceftriaxone</th>
<th>Ceftazidine</th>
<th>Cefepime</th>
<th>Gentamicin</th>
<th>Tobramycin</th>
<th>Imipenem</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Trimeth+ Sulf</th>
<th>Nitrofurantoin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Escherichia coli</strong></td>
<td>88%</td>
<td>58%</td>
<td>66%</td>
<td>99%</td>
<td>91%</td>
<td>95%</td>
<td>96%</td>
<td>98%</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
<td>100%</td>
<td>89%</td>
<td>89%</td>
<td>83%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>(64)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(519)</td>
<td>(583)</td>
<td>(560)</td>
<td>(64)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(583)</td>
<td>(543)</td>
</tr>
<tr>
<td><strong>Klebsiella pneumoniae</strong></td>
<td>100%</td>
<td>R</td>
<td>88%</td>
<td>100%</td>
<td>98%</td>
<td>100%</td>
<td>NED</td>
<td>100%</td>
<td>100%</td>
<td>98%</td>
<td>100%</td>
<td>98%</td>
<td>98%</td>
<td>98%</td>
<td>96%</td>
<td>46%</td>
</tr>
<tr>
<td><strong>Proteus mirabilis</strong></td>
<td>72%</td>
<td>79%</td>
<td>100%</td>
<td>78%</td>
<td>88%</td>
<td>92%</td>
<td>95%</td>
<td>NED</td>
<td>92%</td>
<td>90%</td>
<td>87%</td>
<td>90%</td>
<td>79%</td>
<td>R</td>
<td>79%</td>
<td>R</td>
</tr>
<tr>
<td><strong>Pseudomonas aeruginosa</strong></td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>100%</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>98%</td>
<td>100%</td>
<td>91%</td>
<td>100%</td>
<td>98%</td>
<td>91%</td>
<td>91%</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
<td>(47)</td>
</tr>
</tbody>
</table>

2019 State Antibiograms- SURVEILLANCE DATA ONLY
2019 Alaska State Antibiogram: Interior Region

The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant Enterobacteriaceae (CRE): there were no cases of CRE in a Interior resident in 2019.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
  - “NED” indicates that there was Not Enough Data to report the value: either only one facility reported data for that drug-bug combination or <30 isolates were tested.

- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to the following facilities for providing data in support of this project:
  - Fairbanks Memorial Hospital
  - Bassett Army Community Hospital
<table>
<thead>
<tr>
<th>Species</th>
<th>Penicillin</th>
<th>Ampicillin</th>
<th>Cefotaxime</th>
<th>Ceftriaxone</th>
<th>Cefuroxime</th>
<th>Oxacillin</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Clindamycin</th>
<th>Erythromycin</th>
<th>Vancomycin</th>
<th>Trimethoprim-sulfamethoxazole</th>
<th>Tetracycline</th>
<th>Nitrofurantoin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coag-negative Staphylococcus</td>
<td>55% (251)</td>
<td>78% (251)</td>
<td>78% (251)</td>
<td>69% (251)</td>
<td>45% (251)</td>
<td>99% (251)</td>
<td>56% (251)</td>
<td>83% (251)</td>
<td>99% (251)</td>
<td>56% (251)</td>
<td>83% (251)</td>
<td>99% (251)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Interior Region data

<table>
<thead>
<tr>
<th>Species</th>
<th>Amoxicillin+ clavulanic acid</th>
<th>Ampicillin</th>
<th>Piperacillin+Tazobactam</th>
<th>Cefazolin</th>
<th>Ceftriaxone</th>
<th>Gentamicin</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Trimeth-Sulfa</th>
<th>Nitrofurantoin</th>
<th>Tobramycin</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em></td>
<td>64% (1647)</td>
<td>NED (1647)</td>
<td>27% (1647)</td>
<td>97% (1647)</td>
<td>95% (1647)</td>
<td>90% (1647)</td>
<td>90% (1647)</td>
<td>96% (1647)</td>
<td>91% (1647)</td>
<td>95% (1647)</td>
<td></td>
</tr>
<tr>
<td><em>Klebsiella spp.</em></td>
<td>96% (165)</td>
<td>33% (197)</td>
<td>98% (197)</td>
<td>98% (197)</td>
<td>98% (197)</td>
<td>98% (197)</td>
<td>93% (197)</td>
<td>31% (197)</td>
<td>99% (197)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2019 Alaska State Antibiogram: Southeast Region

The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant Enterobacteriaceae (CRE): there were no cases of CRE reported in a Southeast resident in 2019.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
  - “NED” indicates that there was Not Enough Data to report the value: either only one facility reported data for that drug-bug combination or <30 isolates were tested.

- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to the following facilities for providing data in support of this project:
  - Bartlett Regional Hospital
  - PeaceHealth Ketchikan Medical Center
### Southeast Region data

<table>
<thead>
<tr>
<th>Species</th>
<th>Ampicillin</th>
<th>Oxacillin</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Clindamycin</th>
<th>Erythromycin</th>
<th>Vancomycin</th>
<th>Trimethoprim-sulfamethoxazole</th>
<th>Tetacycline</th>
<th>Nitrofurantoin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Staphylococcus aureus</strong></td>
<td>69% (356)</td>
<td>71% (356)</td>
<td>71% (356)</td>
<td>83% (356)</td>
<td>51% (356)</td>
<td>100% (356)</td>
<td>94% (356)</td>
<td>96% (356)</td>
<td>100% (356)</td>
<td></td>
</tr>
<tr>
<td><strong>Enterococcus faecalis</strong></td>
<td>100% (53)</td>
<td>87% (53)</td>
<td>87% (53)</td>
<td>R (53)</td>
<td>9% (53)</td>
<td>100% (53)</td>
<td>R (53)</td>
<td>94% (53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Ampicillin</td>
<td>Piperacillin+Tazobactam</td>
<td>Cefazolin</td>
<td>Ceftazidime</td>
<td>Cefepime</td>
<td>Cefoxitin</td>
<td>Gentamicin</td>
<td>Tobramycin</td>
<td>Ertapenem</td>
<td>Ciprofloxacin</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------</td>
<td>-------------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
<td>-----------</td>
<td>------------</td>
<td>------------</td>
<td>-----------</td>
<td>---------------</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>57%</td>
<td>98%</td>
<td>93%</td>
<td>96%</td>
<td>97%</td>
<td>99%</td>
<td>94%</td>
<td>95%</td>
<td>96%</td>
<td>100%</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>R (92)</td>
<td>97%</td>
<td>95%</td>
<td>93%</td>
<td>93%</td>
<td>97%</td>
<td>96%</td>
<td>98%</td>
<td>97%</td>
<td>100%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>97% (36)</td>
<td>100%</td>
<td>97%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>97%</td>
<td>97%</td>
<td>97%</td>
<td>100%</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>R (39)</td>
<td>R</td>
<td>90%</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
<td>85%</td>
<td>82%</td>
<td>82%</td>
<td>82%</td>
</tr>
</tbody>
</table>

2019 State Antibiotics - SURVEILLANCE DATA ONLY
2019 Alaska State Antibiogram: Southwest Region

The following tables show the proportion of isolates of various bacterial species that tested susceptible to various antibiotics during 2019. These data were aggregated from the antibiograms produced by Alaska hospitals in order to create aggregate regional resistance pattern summaries. These antibiograms can be helpful for health care providers in selecting appropriate empiric antimicrobial therapy for their patients until specific individual laboratory test results are available. They can also be helpful for determining antibiotic stewardship priorities within hospitals and emerging resistance patterns in a broader service area.

- **Methodology:** Individual hospitals prepared their own facility antibiograms, which were shared with the Alaska Section of Epidemiology. Aggregated susceptibility percentages were calculated as the proportion of all tested isolates for the region that were susceptible. Values are only reported when more than one facility provided data for the given species-antibiotic combination. Intrinsic resistance is indicated with an “R”, following the guidance of CLSI document M100-S24.

- **Multi-Drug Resistant Organisms of Note:**
  - Vancomycin-resistant *Staphylococcus aureus* (VRSA): no cases of VRSA have ever been reported in Alaska. VRSA is reportable to the Alaska Section of Epidemiology.
  - Carbapenem-resistant *Enterobacteriaceae* (CRE): there were no cases of CRE reported in a Southwest resident in 2019.

- **Legend:**
  - The top value in each square is the percent of isolates of that species that tested susceptible to that antibiotic.
  - The lower value in each square indicates the number of tested isolates for that bacteria-antibiotic combination.
  - “R” indicates intrinsic resistance to that antibiotic, while “S” indicates definitional susceptibility.
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- **Limitations:** Individual facilities often use different methods to test for antimicrobial susceptibility, different methods to build their antibiograms, and different antibiotics in their pharmacies. These factors limit interpretation of these data. Additionally, antimicrobial susceptibility testing done in the laboratory does not always predict how effective that drug will be when used to treat a patient. Data are not stratified by infection site, which influences antibiotic choice and effectiveness.

- **Contributing Facilities:** Thanks to the following facilities for providing data in support of this project:
  - Kanakanak Hospital
  - Yukon-Kuskokwim Delta Regional Hospital
<table>
<thead>
<tr>
<th>Species</th>
<th>Penicillin</th>
<th>Cefotaxime</th>
<th>Ceftriaxone</th>
<th>Cefuroxime</th>
<th>Oxacillin</th>
<th>Levofloxacin</th>
<th>Clindamycin</th>
<th>Erythromycin</th>
<th>Vancymycin</th>
<th>Trimethoprim-sulfamethoxazole</th>
<th>Tetracycline</th>
<th>Nitrofurantoin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total <em>Staphylococcus aureus</em></td>
<td>9% (532)</td>
<td>NED</td>
<td></td>
<td></td>
<td></td>
<td>68% (532)</td>
<td>80% (532)</td>
<td>92% (532)</td>
<td>54% (532)</td>
<td>99% (532)</td>
<td>100% (532)</td>
<td>99% (509)</td>
</tr>
<tr>
<td>MSSA</td>
<td>13% (362)</td>
<td>S</td>
<td>95% (362)</td>
<td>94% (362)</td>
<td>74% (362)</td>
<td>100% (362)</td>
<td>100% (362)</td>
<td>99% (362)</td>
<td>99% (362)</td>
<td>99% (362)</td>
<td>100% (362)</td>
<td>NED</td>
</tr>
<tr>
<td>MRSA</td>
<td>NED</td>
<td>R</td>
<td>50% (170)</td>
<td>90% (170)</td>
<td>11% (170)</td>
<td>99% (170)</td>
<td>99% (170)</td>
<td>99% (170)</td>
<td>NED</td>
<td>NED</td>
<td>NED</td>
<td>NED</td>
</tr>
<tr>
<td><em>Enterococcus faecalis</em></td>
<td>98% (51)</td>
<td></td>
<td></td>
<td></td>
<td>98% (51)</td>
<td>NED</td>
<td>42% (51)</td>
<td>100% (51)</td>
<td>NED</td>
<td>25% (51)</td>
<td>100% (51)</td>
<td>NED</td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td>92% (38)</td>
<td>97% (35)</td>
<td>97% (38)</td>
<td>100% (38)</td>
<td>100% (38)</td>
<td>97% (38)</td>
<td>89% (38)</td>
<td>100% (38)</td>
<td>95% (38)</td>
<td>95% (38)</td>
<td>NED</td>
<td>NED</td>
</tr>
<tr>
<td>Coagulase-negative Staph</td>
<td>16% (200)</td>
<td></td>
<td></td>
<td></td>
<td>53% (200)</td>
<td>93% (200)</td>
<td>75% (200)</td>
<td>39% (200)</td>
<td>99% (200)</td>
<td>82% (200)</td>
<td>91% (200)</td>
<td>98% (200)</td>
</tr>
</tbody>
</table>

2019 State Antibiotics - SURVEILLANCE DATA ONLY
### Southwest Region data

<table>
<thead>
<tr>
<th>Species</th>
<th>Amoxicillin+ clavulanic acid</th>
<th>Ampicillin</th>
<th>Piperacillin+Tazobactam</th>
<th>Cefaclorin</th>
<th>Ceftriaxone</th>
<th>Gentamicin</th>
<th>Ciprofloxacin</th>
<th>Levofloxacin</th>
<th>Trimeth-Sulfa</th>
<th>Tetracycline</th>
<th>Nitrofurantion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enterobacter cloacae</strong></td>
<td>0% (33)</td>
<td>0% (33)</td>
<td>100% (33)</td>
<td>0% (33)</td>
<td>85% (33)</td>
<td>97% (33)</td>
<td>100% (33)</td>
<td>100% (33)</td>
<td>94% (33)</td>
<td>100% (33)</td>
<td>39% (33)</td>
</tr>
<tr>
<td><strong>Escherichia coli</strong></td>
<td>89% (1165)</td>
<td>50% (1165)</td>
<td>99% (1165)</td>
<td>91% (1165)</td>
<td>97% (1165)</td>
<td>85% (1165)</td>
<td>85% (1165)</td>
<td>71% (1165)</td>
<td>77% (1165)</td>
<td>98% (1165)</td>
<td></td>
</tr>
<tr>
<td><strong>ESBL E. coli</strong></td>
<td>80% (40)</td>
<td>0% (40)</td>
<td>98% (40)</td>
<td>0% (40)</td>
<td>83% (40)</td>
<td>45% (40)</td>
<td>45% (40)</td>
<td>43% (40)</td>
<td>38% (40)</td>
<td>100% (40)</td>
<td></td>
</tr>
<tr>
<td><strong>Klebsiella pneumoniae</strong></td>
<td>98% (66)</td>
<td>0% (66)</td>
<td>97% (66)</td>
<td>92% (66)</td>
<td>100% (66)</td>
<td>100% (66)</td>
<td>100% (66)</td>
<td>98% (66)</td>
<td>89% (66)</td>
<td>53% (66)</td>
<td></td>
</tr>
<tr>
<td><strong>Proteus mirabilis</strong></td>
<td>100% (47)</td>
<td>91% (47)</td>
<td>100% (47)</td>
<td>96% (47)</td>
<td>96% (47)</td>
<td>98% (47)</td>
<td>98% (47)</td>
<td>94% (47)</td>
<td>0% (47)</td>
<td>0% (47)</td>
<td></td>
</tr>
</tbody>
</table>