

**Antibiotic Resistance:
A New Public Health Problem
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**Antibiotics Aren't Always
the Answer**

Why Not?

Viruses vs. Bacteria



Antibiotics Will Help:

Ear Infections

Strep Throat

Sinus Infections



Antibiotics DO NOT Help:

Common Cold

Bronchitis/cough illness

Most Sore Throats

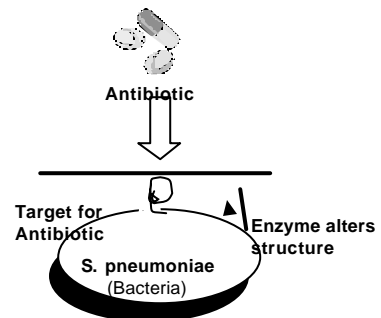
Flu



**General Mechanisms of
Resistance**

When bacteria are exposed to
any antibiotic.....

Bacteria may develop
ways to deny the
antibiotic access to the
binding site.



Examples of Emerging Antibiotic Resistant Pathogens

- Penicillin and multidrug resistant *Streptococcus pneumoniae*
- Multidrug resistant *M. tuberculosis*
- Methicillin resistant *Staphylococcus aureus*
- Vancomycin resistant Enterococci
- Fluoroquinolone resistant *Campylobacter*



Notable Antimicrobial Resistance

- *Enterococcus* species
 - penicillin, vancomycin, aminoglycosides
- *Staphylococcus* species
 - oxacillin, glycopeptides
- *Streptococcus* species
 - penicillin, macrolides
- *Acinetobacter* species
 - pan resistances
- *Pseudomonas* species
 - carbapenems
- *Enterobacteriaceae*
 - broad spectrum β lactams

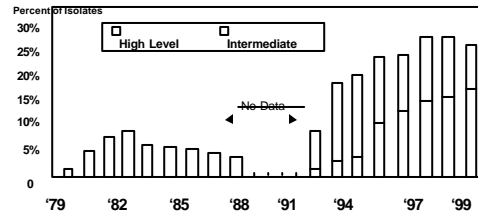


Facts About Antibiotic Resistance

- The frequency of drug resistant *S. pneumoniae* in the U.S. is 25-45%. In Holland it's <1%.
- Antibiotic resistance is acquired during a course of treatment, and the resistant bacteria can spread to others.



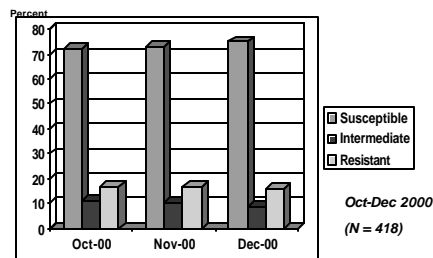
Penicillin-Resistant Pneumococcal Infections in US, 1979-1999



1979-1994: CDC Sentinel Surveillance Network
1995-1997: CDC Active Bacterial Core Surveillance

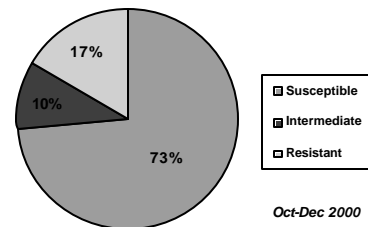


Streptococcus pneumoniae New York State (excluding NYC)



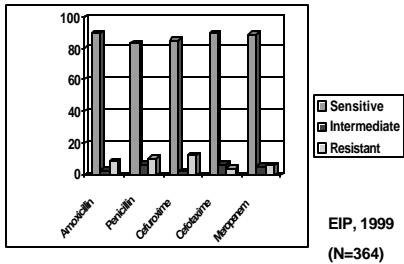
Division of Field Epidemiology, New York State Department of Health, March 9, 2001

Streptococcus pneumoniae New York State (excluding NYC)

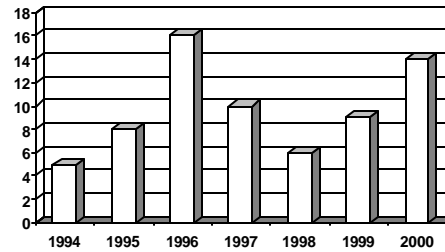


Division of Field Epidemiology, New York State Department of Health, March 9, 2001

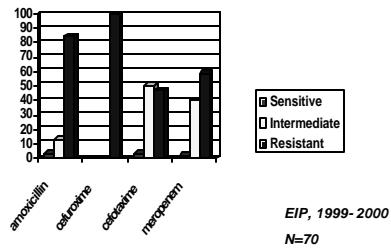
**Susceptibility Results
Streptococcus pneumoniae**



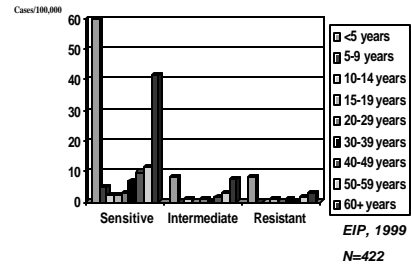
**Penicillin Resistant S. pneumoniae
(In-patients) Percent Resistant**



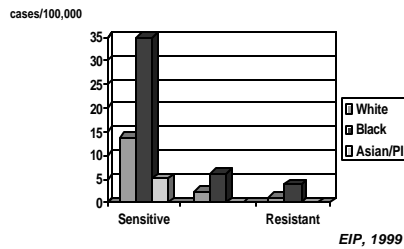
**Penicillin Resistant S. pneumoniae
Susceptibility to Other B-lactam
antibiotics**



**Streptococcus pneumoniae
Rates by Age**



**Streptococcus pneumoniae
Rates by Race**



**Frequency of Resistant
S. Pneumoniae**

	1998	1999	2000
Rochester Area Co.	8.3%	17.7%	17.1%
Albany Area Co.		22.9%	22.7%

**NEW YORK CITY DATA
Drug Resistance Rates**

S. pneumoniae isolates from invasive disease cases

Year	Cases	Int	High	Int Rt	High Rt	Total Rt	R%>
1996	2077	183	124	8.81	5.97	14.78	-
1997	1857	187	110	10.07	5.92	15.97	8
1998	1709	212	126	12.40	7.77	20.17	36
1999	1261	182	108	14.43	8.56	22.99	56
2000	1482	230	154	15.52	10.39	25.91	75

NYCDOH 5/01

What Causes this Problem?

Antibiotics are being prescribed for the wrong reasons.

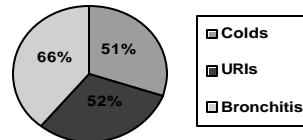
Unnecessary Antibiotic Prescriptions

Colds 18.0 million
Coughs 13.0 million
Fluid in the ear 7.0 million
Non-strep sore throats 6.5 million
Green or yellow runny noses 6.5 million

TOTAL: 50 Million

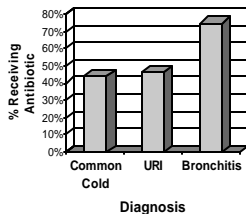
Inappropriate Antibiotic Use

National Ambulatory Medical Care Survey of office based physicians, patients > 18 years



Gonzalez et al, JAMA 1997;278:901-4

Inappropriate Antibiotic Prescribing is Common in Children



More than 40% of children with URI or cold received inappropriate antibiotic therapy.

National sample of office-based physicians, 1992

Nyquist et al. JAMA 1998; 279:875-777

Reasons for Inappropriate Prescribing

Patient Concerns

- ✓ Expect to be cured
- ✓ Need to return to work
- ✓ Had antibiotics in the past

Physician Concerns

- ✓ Patient satisfaction
- ✓ Time pressures
- ✓ Diagnostic uncertainty
- ✓ Lack of follow-up

....Leads to Antibiotic Prescriptions

Why is antibiotic resistance a problem?

- First line antibiotics are becoming ineffective
- Some bacteria are resistant to almost all antibiotics
- Serious infections may become untreatable in the future
- Antibiotic resistant bacteria can spread from person to person



Means to Reduce Resistance

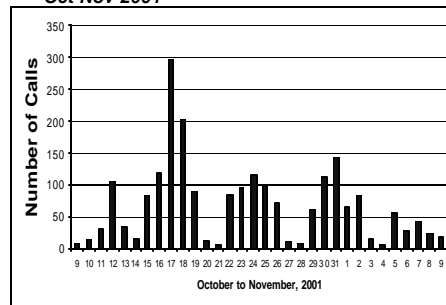
- Limiting the use of antibiotics
- Infection control measures
- Use antibiotics with the most selective effect on the offending bacterium



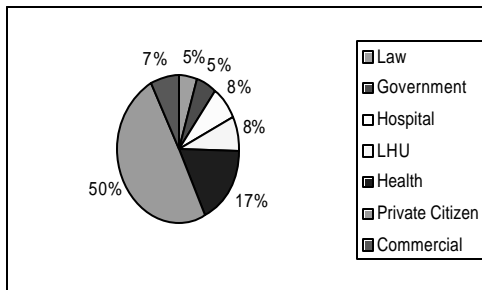
Control of Antimicrobial Resistance: "What's needed"

- Epidemiology/Laboratory
 - Susceptibility testing
 - Valid Data
 - Surveillance
 - Comparative data
 - Communication of trends
- Pharmacy
 - Antibiotic usage data
 - Antibiotic policies
 - Utilization reviews
- Physicians
 - Clinical guidelines
 - Implementation

NYS DOH Anthrax Hotline Oct-Nov 2001



NYS DOH Anthrax Hotline Call Affiliation



Should I keep a supply of antibiotics?

NO

Should I keep a supply of antibiotics?

- Storing antibiotics can be dangerous
 - side effects
 - resistance
 - out dates
- Antibiotics must be taken under the supervision of a doctor.

Practitioner Educational Campaign

- Grand Rounds
- New York Region Otitis Project
- Capital Region Otitis Project
- Observation Option Otitis Toolkit
- April 17, 2002 practitioner and stakeholder interactive conference



Public Educational Campaign

- Education for community groups
- URI Patient Brochure
- Viral URI Prescription Pad
- Daycare Initiative
- School Nursing Initiative



Everyone Plays a Role in Antibiotic Overuse



You can help reduce the spread of antibiotic resistance:

- Let the doctor decide if an antibiotic is needed
- Share information about antibiotic resistance
- Use proper infection control methods
- Visit our website at:
www.health.state.ny.us/nysdoh/antibiotic/antibiotic.htm



To learn more about antibiotic resistance.....

- Attend our First Annual Statewide Antibiotic Resistance Conference
- April 17, 2002 at the Hudson Valley Community College in Troy NY, from 4:30-9:00pm.
- Conference will discuss the global status of antibiotic resistance, barriers to reducing resistance and potential ongoing solutions for the problem.

