

Prudent Use of Antimicrobials in Humans

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Antimicrobial Resistance Arenas

- Hospitals (health-care institutions)
- Community
- Agriculture (veterinary medicine)
- International (developing countries)
- Clinical laboratory

Examples of Drug-Resistant Pathogens

Bacterial

S. pneumoniae
Staphylococci
Salmonella
Shigella
E. Coli
Enterococci
Pseudomonas
M. tuberculosis
N. gonorrhoeae

Viruses

HIV
Herpes simplex

Fungi

Candida sp.

Parasites

Malaria

CDC Plan for Addressing Emerging Infectious Disease

Threats: Antimicrobial Resistance

- Surveillance and Response
- Applied Research
- Prevention and Control
 - Judicious Antimicrobial Use
- Public Health Infrastructure

Antimicrobial Drug Use: The Major “Players”

Physicians	Patients/Consumers
Drug companies	Pharmacists
Health-care institutions	Clinical laboratories
Insurance companies	Agricultural producers
Managed care organizations	Veterinarians

- Government agencies (federal, state, local)
 - legislative bodies, regulatory agencies, payors
 - (HCFA, HRSA), scientific/public health agencies

Judicious Antimicrobial Drug Use

Directions to Pursue

Voluntary:

- Education/behavior change
 - Health care professionals
 - Patients/consumers
- Clinical practice guidelines
 - Indicators
- Cost-benefit analyses of judicious antimicrobial use

Directions to Pursue

Less voluntary:

- Reimbursement policies
- Formulatory controls
- Regulatory actions

National Campaign to Promote Judicious Antibiotic Use

Objectives:

- Decrease unnecessary antimicrobial use
- Reduce the spread of resistance

Approach:

- Establish partnerships with professional societies, public health agencies, and managed care
- Develop materials to educate physicians & the public
- Develop and implement intervention programs
- Assess impact on antibiotic use, resistance, and physician/patient satisfaction

Promoting Judicious Antimicrobial Use Outline

- Build on solid scientific foundation
- Assess current practice
 - target efforts
- Develop intervention
 - providers
 - patients
- Evaluate intervention

Importance of Pneumococcal Infections in the U.S.

<u>Type of infection</u>	<u># Cases/year</u>	<u>Rank</u>
Meningitis	5,000	2nd
Bloodstream infection	50,000	1st
Pneumonia	500,000	1st
Ear infection	7,000,000	1st

Association of Recent Antimicrobial Use and Invasive

Disease Caused By Resistant Pneumococci

<u>Study</u>	<u>Disease</u>	% Recent Antibiotic Use		Odds Ratio	<u>P-value</u>
		<u>NSSP</u>	<u>Sens SP</u>		
Jackson	Invasive	56%	14%	9.3	0.0009
Pallares	Invasive	65%	17%	9.3	<0.001
Tan	Invasive	70%	39%	3.7	0.02
Nava	Invasive	30%	11%	3.5	<0.001
Moreno	Bacteremia	57%	4%	3.6	<0.001
Block	Otitis media	69%	25%	6.7	<0.001

Leading Indications for Outpatient Antimicrobial Therapy; 1992 NAMCS

<u>Diagnosis</u>	<u># Rx</u>
Otitis media	23,648,000
Upper respiratory infection	17,922,000
Bronchitis	16,324,000
Pharyngitis	13,110,000
Sinusitis	12,961,000

McCaig & Hughes, JAMA 1995

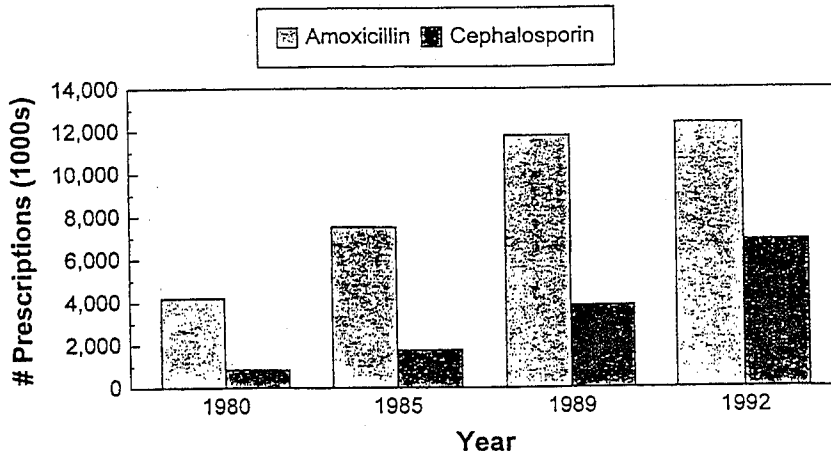
Antibiotic Use: Principal Conclusions from Four Physician Focus Groups

- All acknowledge overuse
 - estimates of own ability to decrease antibiotic use range from 20% to 50%
- Unrealistic parental expectations cited as the major factor
- Physician's diagnostic uncertainty
- Others

**Antibiotic Use: Principal Conclusions from
Four Parent Focus Groups**

- Physician should decide when antibiotics are indicated
- Many expect antibiotics for green nasal discharge
- Need prescription to facilitate return to day care
- Some concerns about resistance voiced

Use of Amoxicillin and Cephalosporins for Therapy of Otitis Media, 1980-1992

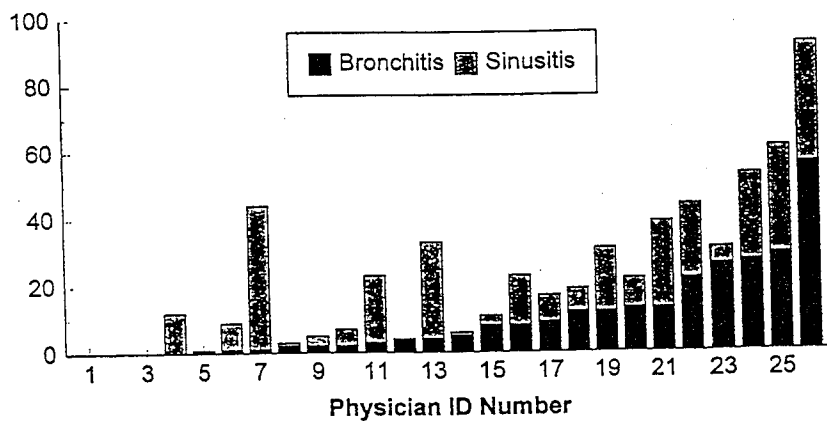


NAMCS data; McCaig and Hughes, JAMA, 1995

CDC

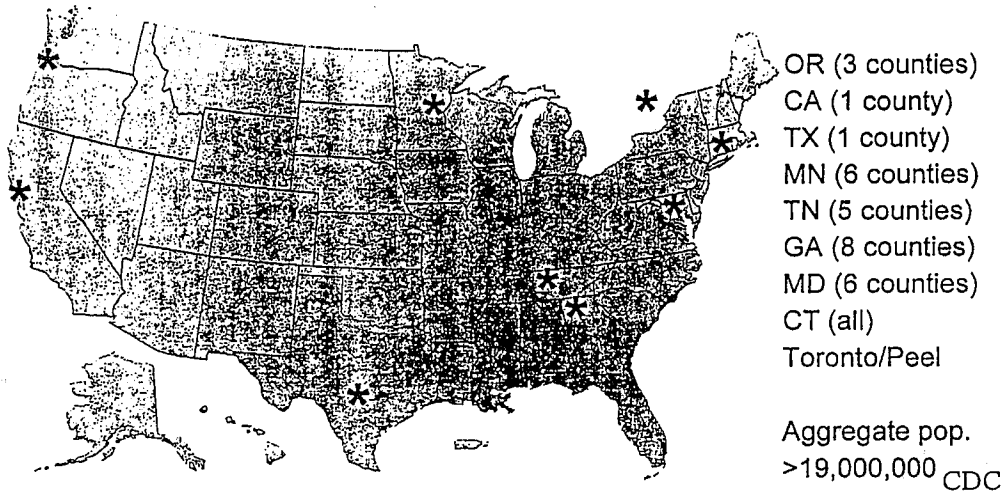
Antibiotic Prescribing for Bronchitis and Sinusitis by 26 Atlanta Physicians

Prescriptions per 30 child-years

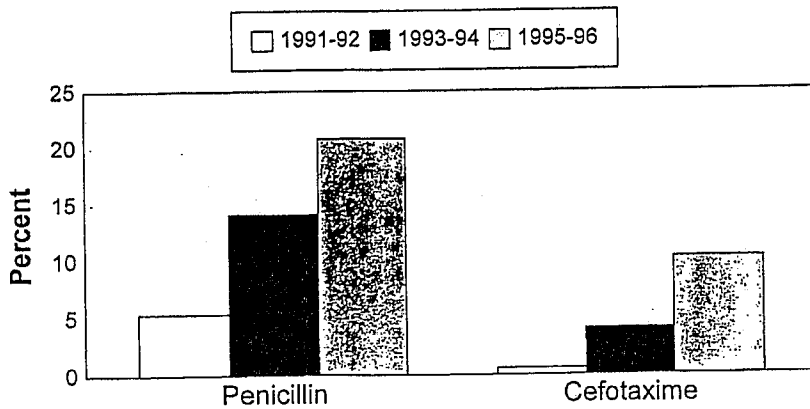


CDC

Invasive Pneumococcal Infections: Active Surveillance Areas: 1995-1996



Increasing Proportion of Pneumococci Not Susceptible to Penicillin and Cefotaxime, 1991-1996



1991-94: data from sentinel surveillance in 12 hospitals (n=1284)
1995-96: data from active surveillance in 9 geographic areas (n=4634)

CDC