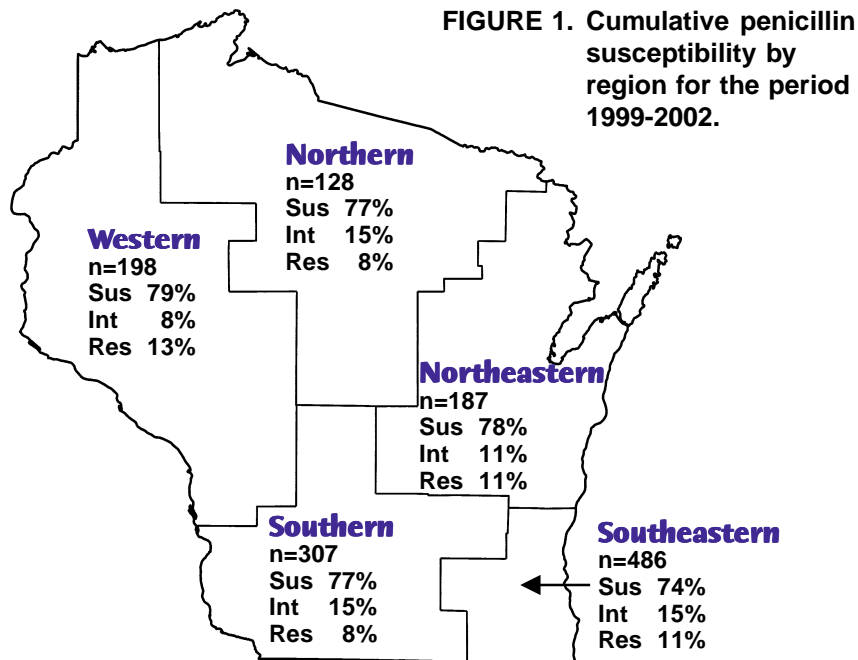


2002

WISCONSIN ANTIBIOTIC RESISTANCE REPORT Invasive *Streptococcus pneumoniae*



Highlights

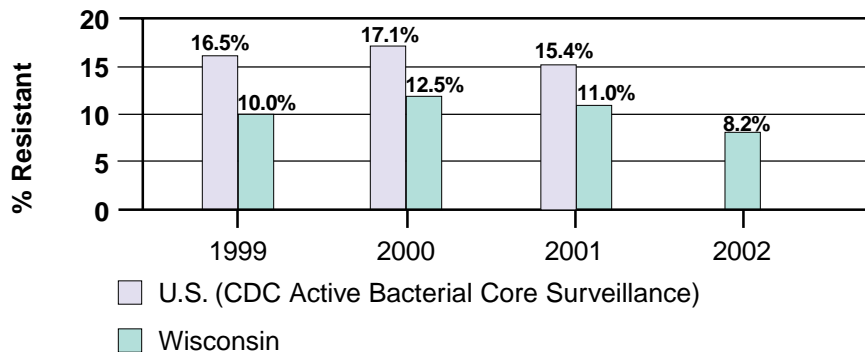
- The proportion of invasive isolates with high-level penicillin resistance declined from 11% in 2001 to 8% in 2002.
- The proportion of isolates with reduced susceptibility to multiple drugs has remained stable at approximately 12%.
- Quinolone resistance is emerging, but only 2 isolates had reduced susceptibility to levofloxacin in 2002.

Surveillance

Enhanced passive surveillance is used to identify invasive isolates of *S. pneumoniae* in Wisconsin. This activity is coordinated by the Wisconsin Division of Public Health through the invasive bacterial disease surveillance program. Participating hospitals and laboratories submit invasive bacterial isolates to the Wisconsin State Laboratory of Hygiene along with a report form that specifies the organism, source of specimen, and patient demographic characteristics. Duplicate isolates (e.g., from a hospital laboratory and a reference laboratory) and isolates obtained from non-Wisconsin residents are excluded.

Invasive isolates are defined as those obtained from blood, CSF, pleural fluid, or another normally sterile body site. In 2002 a total of 60 facilities submitted invasive pneumococcal isolates. Four facilities submitted isolates in 2002 but not earlier years; these accounted for 3.4% of all isolates received in 2002. Changes in the number of participating facilities did not account for the decline in penicillin resistance during 2002.

FIGURE 2. Temporal trends in penicillin resistance (MIC \geq 2.0 μ g/mL).



Laboratory Methods

Pneumococcal susceptibility testing was performed at the Marshfield Clinic Research Foundation. Susceptibilities to penicillin, cefotaxime, ceftriaxone, levofloxacin and meropenem were determined using the E test. Susceptibilities to erythromycin, vancomycin, trimethoprim-sulfamethoxazole, tetracycline and chloramphenicol were performed using disc diffusion. Minimum inhibitory concentrations (MICs) were interpreted as susceptible, intermediate or resistant according to the National Committee for Clinical Laboratory Standards (NCCLS) guidelines.

In January 2002, the NCCLS published new recommendations to increase the pneumococcal susceptibility breakpoints for cefotaxime and

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ceftriaxone in isolates obtained from blood or other non-meningeal sites. The new non-meningitis breakpoints are 2.0 µg/mL for intermediate and ≥4.0 µg/mL for resistant. The meningitis breakpoints are unchanged at 1.0 µg/mL for intermediate and ≥2.0 µg/mL for resistant. In this report, data for 2002 are reported separately for blood and CSF using the current breakpoints. Previous WARN susceptibility reports for the period 1999 through 2001 used the old breakpoints for ceftriaxone and cefotaxime, and these should not be directly compared with the 2002 results.

Results

TABLE 1. Demographic characteristics of source patients with invasive pneumococcal disease in 2002 and 2001.

	2002		2001	
	Number	(%)	Number	(%)
Age				
<5 years	57	(16%)	38	(15%)
5-19 years	17	(5%)	18	(7%)
20-39 years	35	(10%)	28	(11%)
40-59 years	63	(18%)	48	(19%)
60-79 years	104	(30%)	77	(30%)
80+ years	76	(22%)	46	(18%)
Gender				
Male	180	(51%)	139	(55%)
Female	172	(49%)	116	(45%)
Region of residence				
Northeastern	58	(16%)	41	(16%)
Northern	40	(11%)	21	(8%)
Southeastern	149	(42%)	97	(38%)
Southern	66	(19%)	61	(24%)
Western	39	(11%)	35	(14%)
Source of isolate				
Blood	326	(93%)	241	(95%)
Cerebrospinal fluid	18	(5%)	11	(4%)
Other	8	(2%)	3	(1%)
Total	352	(100%)	255	(100%)

TABLE 2. Antimicrobial susceptibility of 352 pneumococcal isolates in 2002.

	Susceptible	Intermediate	Resistant	Total Non-susceptible
β-lactam drugs				
penicillin	78.1%	13.6%	8.2%	21.8%
ceftriaxone (334 non-meningeal isolates)	98.8%	1.2%	0%	1.2%
ceftriaxone (18 meningeal isolates)	88.9%	11.1%	0%	11.1%
cefotaxime (334 non-meningeal isolates)	96.7%	2.1%	1.2%	3.3%
cefotaxime (18 meningeal isolates)	88.9%	5.6%	5.6%	11.2%
meropenem	93.2%	5.7%	1.1%	6.8%
Other drugs				
chloramphenicol	97.7%	0%	2.3%	2.3%
erythromycin	84.4%	0.3%	15.3%	15.6%
levofloxacin	99.4%	0.3%	0.3%	0.6%
tetracycline	93.8%	0%	6.3%	6.3%
trimethoprim-sulfamethoxazole	74.7%	2.6%	22.7%	25.3%
vancomycin	100.0%	0%	0%	0%

TABLE 3. Pneumococcal isolates with reduced susceptibility to penicillin and ≥ 2 non-beta-lactam antibiotics.

Year	Multi-drug Resistance	%
1999	43/410	10.5%
2000	32/289	11.1%
2001	29/255	11.4%
2002	43/352	12.2%