

## Original Article

# The 1997 Antimicrobial Resistance Surveillance Data

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For 1997, the antimicrobial resistance surveillance program (ARSP) of the Department of Health collected data from eleven hospitals - 9 in Metro Manila, 1 in the Visayas (the Celestino Gallares Memorial Hospital - CGMH) and 1 in Mindanao (Zamboanga Medical Center - ZMC). Resistance data for 27,559 isolates were reported and analyzed. CGMH reported 1,251 isolates whereas ZMC had 1,209 isolates which were increases of 12 and 31% respectively from the number reported in 1996.

The most common specimen sources were respiratory - 26%, blood - 23%, and urine - 19%. The distribution of the pathogens reported was as follows: *E. coli* - 15% with almost all pathogens coming from urine, *Pseudomonas aeruginosa* - 14% with most of the isolates obtained from respiratory specimens, *Klebsiella* - 11%, *Enterobacter* - 10.4%, *Acinetobacter* - 10%, *coagulase negative staphylococci* - 7.5%, *Staphylococcus aureus* - 5.4%, *Salmonella typhi* - 4%, *Proteus* - 3.2%, *V. cholerae* 01 - 2.1% and others at less than 2% each. There were 233 isolates of *Streptococcus pneumoniae*, 169 isolates of *Haemophilus influenzae* and 59 isolates of *Neisseria gonorrhea*. Most of the bacteria reported are nosocomial pathogens expected from tertiary level hospitals such as most of the participants of the program.

## ENTERIC PATHOGENS

Resistance rates of all *S. typhi* isolates to chloramphenicol, cotrimoxazole, and ampicillin remained low at 1.3%, 1.3% and 2.7%, respectively. Based on the above information, empiric therapy for suspected typhoid fever can consist of either chloramphenicol, cotrimoxazole or amoxycillin. *Salmonella paratyphi* A remained to be sensitive to ampicillin, chloramphenicol, and cotrimoxazole with rates of resistance ranging from 2.8 to 6.1%.

As has been previously observed, nontyphoidal *salmonellae* showed higher resistance rates to chloramphenicol (26%), ampicillin (32%), and cotrimoxazole (30%) compared to rates for *S. typhi*.

The resistance rate of *shigella* to ampicillin was 66%. Resistance to the drug of choice cotrimoxazole was 51% which is lower than the 1996 figure of 60% whereas that for nalidixic acid, the alternative drug, was 0%. Most isolates belonged to the subgroup flexneri and sonnei. Minimum inhibitory concentration (MIC) tests done on the cotrimoxazole-resistant *shigella* confirmed the data obtained by disc diffusion.

Resistance rates of *Vibrio cholerae* 01 to tetracycline, chloramphenicol, and cotrimoxazole were 8%, 4%, and 5% respectively.

## ARI PATHOGENS

Among the respiratory and invasive isolates of *S. pneumoniae*, 9%, 15%, and 6% were resistant to penicillin (as determined by screening with 1 µg oxacillin disk), cotrimoxazole, and chloramphenicol, respectively. The extent of resistance to the three aforementioned antimicrobials was slightly lower than those of 1996. Minimum inhibitory concentration test done on 13 clinical isolates of *S. pneumoniae* referred to RITM only showed 2 which were intermediately resistant. Almost all resistant isolates were reported from Metro Manila hospitals except 1 from CGMH which was resistant to penicillin and 2 from ZMC which were resistant to cotrimoxazole. Resistance to erythromycin was 3%.

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There was 3.7% resistance to chloramphenicol among isolates of *Haemophilus influenzae* at RITM but 1.9% and 5.7% of the isolates were resistant to cotrimoxazole and ampicillin, respectively.

#### **Staphylococci and other gram positive cocci**

1,383 (81%) of *S. aureus* isolates remained sensitive to oxacillin except several isolates from the following hospitals: Philippine General Hospital (PGH) - 200, Lung Center of the Philippines (LCP) - 32, Santo Tomas University Hospital (STUH) - 7, Bureau of Research and Laboratories - 6, Research Institute for Tropical Medicine (RITM) - 6, Celestino Gallares Memorial Hospital (CGMH) - 4, and Rizal Medical Center (RMC)- 1. MICs done by RITM on 98 oxacillin-resistant isolates from the PGH showed that 91 were truly methicillin resistant (MRSA). There was no confirmed vancomycin resistant isolate. Resistance to clindamycin, cotrimoxazole, and cefazolin was 19%, 16%, and 15%, respectively. In contrast, 40% of *Staphylococcus epidermidis* was resistant to this drug which was a little higher than the 38% reported in 1996.

#### **Gram negative bacilli**

For *Pseudomonas aeruginosa*, resistance to ceftazidime was 25%, to ciprofloxacin 43%, to amikacin 22% and to imipenem 19% which were all higher than 24%, 38% and 20% and 13% reported in the previous year. Among aminoglycosides, resistance to amikacin was lowest at 22% in comparison to rates for gentamicin, tobramycin, and netilmicin which ranged from 40-47%.

Many of the Enterobacteriaceae showed high resistance rates to several antibiotics tested. 69% and 81% of *E. coli* isolates were resistant to cotrimoxazole and ampicillin, respectively which were higher than those of 1996. Percent resistance to cephalothin was 46%, ampicillin - sulbactam 31%, ciprofloxacin - 33%, cefuroxime - 23%, cefotaxime - 9%, gentamicin - 25% and amikacin - 6%.

*Klebsiella* had high resistance rates (28-43%) against the aminoglycosides (gentamicin, netilmicin, and tobramycin) except for amikacin where the resistance rate was 10%. High resistance rates are likewise exhibited against first generation cephalosporins like cephalothin (45%) and second generation cephalosporins like cefamandole (45%). There are lower resistance rates against third generation cephalosporins like ceftriaxone (12%) and cefotaxime (15%). Resistance to ciprofloxacin was 26% and ampicillin-sulbactam - 43%.

#### **Neisseria gonorrhoeae**

Resistance to penicillin and the fluoroquinolones ciprofloxacin and ofloxacin was 84%, 62% and 62%, respectively which were

almost similar to data in 1996. Tetracycline resistance was 38%. No data was available for spectinomycin because of the unavailability of this sensitivity disk for most of 1997. In view of the above findings, the DOH STD Control Program now recommends cefixime given at a dose of 400 mg single dose as empiric treatment for suspected *N. gonorrhoeae* infection.

#### **SUMMARY**

1. There are high levels of antibiotic resistance associated with the following organisms: *Shigella*, nontyphoidal *Salmonella*, *E. coli*, *Klebsiella* and other members of the *Enterobacteriaceae*, nonfermentative gram negative bacilli like *P. aeruginosa* and *Neisseria gonorrhoeae*.
2. As in 1996, there were reports of penicillin-resistant *S. pneumoniae* by disc diffusion. MICs done on the penicillin-resistant *S. pneumoniae* isolates were within the "susceptible" category. No significant resistance was reported among *H. influenzae* tested against ampicillin, chloramphenicol, and cotrimoxazole.
3. A significant number of bacterial isolates with unusual resistance patterns have not been referred to RITM for confirmation which is needed to obtain a more accurate estimate of the resistance rates.

#### **RECOMMENDATIONS**

1. Awareness on the serious problem of antibiotic resistance in the Philippines should be increased among prescribers and the general public. In line with this, greater emphasis should be given on informing the public about rational antibiotic use and the risks of inappropriate antimicrobial usage.
2. Sustained support from the government and perhaps, the private sector (like the Philippine Society for Microbiology and Infectious Diseases, the Pediatric Infectious Diseases Society of the Philippines and other stakeholders) should be provided for surveillance activities which provisions for its expansion to other areas of the country to make the data more representative.
3. More intensive infection control measures have to be observed in the hospitals and communities to control the spread of antibiotic resistance especially MRSA. Patients transferred from a hospital harboring MRSA should be isolated and screened for this infection before being mixed with other patients to avoid the spread of this organism from one hospital to another.

4. Laws regulating dispensing of antibiotics should be strictly implemented by the appropriate government authorities.
5. Up-to-date antibiotic guidelines should be prepared based on most recent information on resistance patterns obtained, if possible, at the local level.
6. There is need to establish/strengthen/improve microbiology laboratories especially in areas outside of Metro Manila in order to have resistance data at the local level. In line with this recommendation, training programs on up-to-date methods in bacteriology have to be provided to medical technologists especially in areas outside of Metro Manila. The Philippine Association of Medical Technologists (PAMET) can perhaps take the lead in achieving this through their CME activities.

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