



**PEDIATRIC INFECTIOUS  
DISEASE SOCIETY OF THE  
PHILIPPINES**

# PIDSP Journal

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# PIDSP Journal

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# Pediatric Infectious Disease Society of the Philippines Journal

# The 1998 Antimicrobial Resistance Surveillance Data

Celia Carlos, M.D.\*

Resistance data for 18,297 isolates were reported and analyzed. The contributors were the Philippine General Hospital (PGH) – 8,298 (45%), National Kidney and Transplant Institute (NKI) – 1,917 (11%), Rizal Medical Center (RMC) – 1,863 (10%), Research Institute for Tropical Medicine (RITM) – 1,618 (9%), Celestino Gallares Memorial Medical Center (GMH), Tagbilaran City – 1,213 (7%), Lung Center of the Philippines (LCP) – 777 (4%), San Lazaro Hospital (SLH) – 714 (4%), Zamboanga Medical Center (ZMC), Zamboanga City – 619 (3%), Bureau of Research and Laboratories (BRL) – 511 (3%), Far Eastern University Hospital (FEU) – 226 (1%), Corazon Locsin Montelibano Memorial Regional Hospital (MMH), Bacolod City – 212 (1%), Eastern Visayas Regional Medical Center (EVR), Tacloban City – 190 (1%), Santo Tomas University Hospital (UST) – 139 (1%). The MMH and EVR started contributing data to the project from October 1998. Four STD clinics contributed data to the gonococcal resistance surveillance, namely the Sta. Rosa, Laguna, Sucat, Bacolod City and Tacloban City STD clinics.

The most common specimen sources were blood – 23%, urine – 20%, respiratory – 20%, wounds – 15%, and stool – 9%. There were 438 genital tract specimens reported. The distribution of the pathogens reported was as follow: *E. coli* – 15%, *Pseudomonas aeruginosa* – 12%, *Klebsiella* – 10%, *Enterobacter* – 10%, *Acinetobacter* – 8%, *Staphylococcus aureus* – 7%, *Vibrio cholerae* – 4% and others. Most of the bacteria reported are nosocomial pathogens expected from tertiary level hospitals such as most of the participants of the program.

## 1. Enteric pathogens

Resistance rates of all *Salmonella typhi* isolates to chloramphenicol, cotrimoxazole, and ampicillin remained low at 3%, 3% and 5%, respectively as compared to 1.3%, 1.3%, and 1.7% in 1997 although all figures were higher compared to those of 1997. It is difficult to compare data by regions because out of the 734 *S. typhi* isolates, very few were reported by the sentinel sites outside of Metro manila as follows: GMH – 29, EVR – 6, MMH – 0, and ZMC – 15. At the GMH, there was no resistance to ampicillin and chloramphenicol with 3% resistance to cotrimoxazole. Based on the above information, empiric therapy for suspected typhoid fever can consist of either chloramphenicol, cotrimoxazole or amoxicillin.

As has been previously observed, nontyphoidal salmonellae showed higher resistance rates to chloramphenicol (24%),

ampicillin (35%), and cotrimoxazole (24%) compared to rates for *S. typhi*. These rates did not differ significantly from 1997.

The resistance rates of *Shigella* to ampicillin was 68%. Resistance to the drug of choice cotrimoxazole was 51% which was almost the same as the figure in 1997 whereas that for nalidixic acid resistant *Shigella* in the antimicrobial resistance surveillance program.

Resistance rates of *Vibrio cholerae* 01 to tetracycline, chloramphenicol, and cotrimoxazole were 2%, 1%, and 5% respectively. Tetracycline resistance does not appear to be an important problem in GMH, ZMC, and EVR. There is still insufficient data on *V. cholerae* from MMH.

## 2. ARI pathogens

Among the respiratory and invasive isolates of *S. pneumoniae*, 14%, 13%, and 5% were resistant to penicillin (as determined by screening with 1 ug oxacillin disk), cotrimoxazole, and chloramphenicol, respectively. The extent of resistance to the three aforementioned antimicrobials was slightly lower than those of 1997 except for penicillin which showed an increase of 5%. Almost resistant isolates were reported from Metro manila hospitals. A study conducted by the antimicrobial resistance coordinating committee at the RITM on the resistance patterns of 100 *S. pneumoniae* isolates from nasal swabs of children 0-5 years old without a recent history or current evidence of respiratory infection showed a resistance rate of less than 1% against penicillin using minimum inhibitory concentration tests. Based on this information, penicillin, cotrimoxazole and chloramphenicol can still be used as empiric therapy for suspected pneumococcal infections but this has to be closely monitored in the light of alarming epidemics of drug-resistant *S. pneumoniae* in the surrounding Asian countries and the rest of the world.

There was 6% resistance to chloramphenicol among isolates of *Haemophilus influenzae* at RITM with 85% and 0% of the isolates being resistant to cotrimoxazole and ampicillin, These were higher for chloramphenicol and cotrimoxazole whose resistance rates were 4 and 2% respectively in 1997.

## 3. Staphylococci and other Gram positive cocci

85% of *Staphylococcus aureus* isolates remained sensitive to oxacillin except 168 isolates which came from the following hospitals: PGH – 122, ZMC – 10, RMC – 10, GMH – 15,

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RITM – 4, EVR – 3, BRL – 2, FEU – 1, and LCP – 1. MICs done by RITM on 84 oxacillin-resistant isolates from the PGH showed that 80 were truly methicillin resistant (MRSA). Other hospitals with confirmed MRSA were GMH (8) and RITM (3). In contrast, 42% of *Staphylococcus epidermidis* was resistant to oxacillin which was slightly higher than the 40% reported in 1997. Of the 23 *Enterococcus faecalis* isolates reported, 21% were resistant to ampicillin with 5% resistant to vancomycin; however, the latter isolates were not sent for confirmation to RITM. LCP and PGH reported the vancomycin resistant enterococci.

#### 4. Gram negative bacilli

For *Pseudomonas aeruginosa*, resistance to ceftazidime was 21%, to ciprofloxacin 37%, to amikacin 19% and to imipenem 16% which were generally lower than 25%, 43%, 22% and 19% reported for the 4 antibiotics in the previous year. Among aminoglycosides, resistance to amikacin was lowest at 19% in comparison to rates for gentamicin, tobramycin, and netilmicin which ranged from 30-35%. Resistance to imipenem had risen from less than 10% in 1992 to the present 16%. The resistance rates in Metro Manila were generally higher than those of GMH, ZMC, EVR and MMH.

Many of the Enterobacteriaceae showed high resistance rates to several antibiotics tested. 65% and 77% of *E. coli* isolates were resistant to cotrimoxazole and ampicillin, respectively which were lower than those of 1997. It, however, remains to be relatively susceptible to aminoglycosides and third generation cephalosporins, but exhibits high resistance to second generation cephalosporins (i.e. cefamandole at 20%) and beta lactam-beta lactamase inhibitors (i.e. ampicillin-sulbactam at 26%). Percent resistance to cephalothin was 54%, ciprofloxacin – 28%, ceftriaxone – 5%, gentamicin – 21% and amikacin – 4%.

*Klebsiella* had high resistance rates (27-33%) against the aminoglycosides (gentamicin, netilmicin, and tobramycin) except for amikacin where the resistance rate was 10%. The resistance rate of the organism against gentamicin was seen to be gradually rising from approximately 20% in 1988 to 30% in 1998. High resistance rates were likewise exhibited against first generation cephalosporins like cephalothin (46%) and second generation cephalosporins like cefamandole (26%) and the beta lactam-beta lactamase inhibitors like ampicillin sulbactam at 39%. There were lower resistance rates against third generation cephalosporins like ceftriaxone (11%) and the carbapenem imipenem (0.5%).

#### 5. *Neisseria gonorrhoeae*

Resistance to penicillin and the fluoroquinolones ciprofloxacin and ofloxacin was 82%, 63% and 68%, respectively. Tetracycline resistance was 22% which was lower than the rate reported in 1997 (38%). There was no resistance to spectinomycin, ceftriaxone and cefixime. In view of the above findings, the DOH STD Control Program now recommends cefixime and ceftriaxone as empiric treatment for suspected *N. gonorrhoeae* infection.

#### Recommendations

1. In view of reports documenting the appearance of vancomycin-intermediate *Staphylococcus aureus* in nearby countries like Japan, it is important that special attention should be devoted towards closely monitoring the resistance pattern of *S. aureus* especially methicillin (or oxacillin-resistant or MRSA) strains since vancomycin is a drug of last resort for therapy of MRSA. Furthermore, patients transferred from hospitals harboring MRSA should be screened for the presence of such organism through culture and sensitivity tests and put under strict isolation procedures until there is certainty that the patient is free of MRSA before being mixed with other patients of the receiving hospital. For *N. gonorrhoeae*, development of resistance to the new drug-of-choice cefixime should be watched out for.
2. For *Shigella*, cotrimoxazole resistance is extremely high that it is no longer appropriate to be considered the drug-of-choice for treatment of shigellosis. Nalidixic acid should be considered in its place.
3. There should be increased awareness on the serious problem of antibiotic resistance in the Philippines.
4. **Sustained support from the government and perhaps, the private sector and other stakeholders should be provided for surveillance activities with provisions for its expansion to other areas of the country to make the data more representative. The committee on ARSP strongly recommends its institutionalization in the Department of Health with provisions for a sustainable source of funding for personnel, maintenance and operating expenses, and capital outlay.** In view of recent plans to expand the surveillance program to include DOH retained and perhaps, other level hospitals, an initial survey of prospective sentinel sites should be conducted by the RITM coordinating committee to assess the status and needs of the laboratories of prospective sites.
5. Remedial action should immediately be implemented to control the serious problem of antibiotic resistance in the Philippines such as strict implementation of laws regulating dispensing of antibiotics, observation of more intensive infection control measures in the hospitals and communities, and undertaking activities promoting rational antibiotic use.
6. Up-to-date antibiotic guidelines should be prepared based on most recent information on resistance patterns, if possible, at the local level.
7. 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 pathologists and medical technologists especially in areas outside of Metro Manila. Follow-up visits and regular examination of quality control data should be conducted. The government needs to establish an external quality assurance (EQA) program in microbiology and perhaps require passing the EQA as a prerequisite for licensure of microbiology laboratories as is done abroad to compel laboratories to keep up with updated standards. However, such plans should be carefully discussed with the involved parties before its full implementation.

8. A referral system for confirming bacterial strains with "unusual" resistance patterns should be strengthened for the program to be able to pick-up emerging epidemics of specific drug-resistant bacteria so that control measures can be instituted early thereby aborting potentially life-threatening epidemics and obtaining more accurate data on the country's bacterial resistance problem.

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