

EXECUTIVE SUMMARY

The annual regional meeting of the countries participating in the network for monitoring/surveillance of resistance to antibiotics was officially opened with the attendance of the Minister of Health of Paraguay, Dr. Martín Chiola; the Director of Epidemiology, Dr. Gualberto Piñáñez; and the PAHO/WHO Representative in Paraguay, Mr. Diego Victoria. Dr. Julio Mazur of Paraguay was chosen as chair of the meeting, Dr. Dalia dos Prazeres Rodríguez of Brazil, as vice chair, and Ms. Elena Campos of Costa Rica, as rapporteur.

Performance Evaluation

The initial report was on the external evaluation of the bacterial identification performed by the national reference laboratories. In a blind test, the National Laboratory for Enteric Pathogens (NLEP) of Canada periodically sends a panel of strains to the organizing laboratory in each country for identification by the participating laboratories. In 2000, five strains of the genus *Salmonella*, five of *Shigella*, and five of *Vibrio cholerae* were sent. In the 19 laboratories that reported their results and which together had analyzed 285 samples, 50% were identified correctly. Of the 95 strains of *Salmonella* spp. sent, 37 (39%) were identified correctly; of the 95 strains of *Shigella* spp., 51 (54%) were identified correctly; and of the 76 strains of *Vibrio cholerae*, 55 (72%) were identified correctly.

The discrepancies between the NLEP and the participating laboratories never arose in the identification of the genus and only occasionally in the diagnosis of the species. However, there were often differences in the identification of serotypes. In the vast majority of cases, these discrepancies stemmed from the participating laboratories' lacking the antisera needed to identify some of the antigenic components of the species in question.

Reports were also presented on the results of the performance evaluation in terms of sensitivity to antibiotics. It was emphasized that the gold standard of agreement between the organizing laboratory and network participants is that the inhibition zone areas coincide up to 2 mm, under the Kirby-Bauer disk diffusion method. Of the 20 participating laboratories, and with a total of 65 to 165 antibiograms produced with the *Salmonella*, *Shigella*, and *Vibrio cholerae* species sent, five laboratories coincided with the organizing laboratory in over 80% of the observations. This number increased to 16 of 19 laboratories when the inhibition areas considered increased from 2 mm to 4 mm.

For inhibition zone areas ≤ 2 mm in diameter, the percentage of agreement between the NLEP and the participating laboratories improved in 8 of 15 laboratories between 1997 and 2000. When the inhibition area was expanded to 4 mm, that percentage improved in 13 of 15 laboratories.

The lack of agreement between the participating laboratories and the NLEP for antibiogram halos of over 2 mm indicates that these institutions should strive to improve their work. However, when the analysis of agreement between the NLEP and the other laboratories is based both on interpretations using the terms sensitive, intermediate, or resistant and the results of the antibiograms, the differences are much less important, with agreement in interpretation under 90% in only four laboratories.

The participants presented the results of the performance evaluations in their respective countries and consolidated information on the percentages of resistance in species isolated from the community and in sentinel hospitals in each country. They also showed the results obtained from the performance evaluation in some countries with respect to identifying and determining the susceptibility to antibiotics of other bacterial species, in addition to *Salmonella*, *Shigella*, and *Vibrio cholerae*. This program consists of annually sending two test panels with 10 unidentified specimens to each target laboratory for identification. In addition, in each laboratory the antibiotic sensitivity profiles must be determined. The organizing laboratory, the National Institute of Infectious Diseases (INEI), of Argentina, receives the results and prepares a detailed report, which it sends to each participant. This report describes the characteristics of the strains sent and the results of the biochemical identification, and compares the results of the sensitivity tests performed by the participating laboratory with those of the organizing laboratory. In this way, each facility can evaluate exactly what errors were made and try to correct them.

The general percentages of correct or acceptable identification were 94% and 87%, respectively, for the two surveys. For the interpretation of the sensitivity tests, the general percentages of agreement between the organizing laboratory and the participating laboratories were over 90% in both surveys. In the second survey, a slight increase over the first survey was observed, from 94% to 95.7%.

Evaluation of the Laboratories participating in the Network

A summary was made of the evaluation visits to date: Costa Rica, Nicaragua, and Venezuela in 1998; Brazil and Peru in 1999; and Argentina in 2000. During these visits it was borne in mind that the goal of the activities was to develop a laboratory-based program for monitoring resistance to antibiotics, with effective relationships between the epidemiology program and the laboratories to ensure that surveillance would be continuous and effective.

Monitoring of Other Species of Enteric Pathogens

Different types of enteropathogens with the potential for infecting man were described, along with their geographical distribution, epidemiological importance, and the methods for their diagnosis. The issue of the need for initiating surveillance of *Campylobacter* and *Escherichia coli* O157H:7 was raised.

World Surveillance System for *Salmonella* (Salm-surv)

It was mentioned that the growing need to establish communication among the countries, the obligation to continue to strengthen the capacity of laboratories, the eagerness to continue to train laboratory staff, to have a quality control program, and to improve access to surveillance data were sufficient reasons for establishing a world network for *Salmonella* surveillance. People and institutions interested in surveillance, serotyping, and the determination of antimicrobial resistance in *Salmonella* isolates participate in this network. The purpose of the network is to strengthen the

national and regional capacity of the laboratories involved and to facilitate communication among both the various disciplines and the different participating countries.

The World Surveillance System currently has 389 individual members and 90 institutional members from 103 countries. The participants were urged to promote participation in the network by their respective countries.

Quality Assurance

It was mentioned that the establishment of a quality assurance system depends on the decisions of leaders and managers and the example set by them and on all those involved taking responsibility for quality. Training for all staff, teamwork, and the promotion of initiative, as well as the availability of the necessary resources, are the cornerstones of the system.

In order to improve the end product, which is the information generated by the laboratories, and guarantee the safety of laboratory staff and the community, the following were proposed:

- Establishing and maintaining a quality assurance system throughout the public health laboratory networks of the Region.
- Ensuring that the information is accurate, timely, and of good quality.
- Improving performance.
- Reducing the risks of contamination inside and outside the physical facilities of the laboratory.
- Controlling costs and obtaining optimum benefits from expenditures.

Recommendations

The presentations of the participants and the ensuing discussions yielded the following recommendations:

1. Reports on resistance should include an indication of the category, either I (intermediate) or R (resistant).
2. In the future, the presentation of the data should follow a basic scheme modeled after the presentation used at the Malbrán Institute in Argentina. All the countries are familiar with this model. Each country, however, can include more information than is requested. The information will be organized as indicated in the PAHO publication “*Cómo escribir y publicar un artículo*” (How to Write and Publish an Article).
3. The information will be broken down into hospital strains and community strains. The former must cover data on *Acinetobacter* spp., *Enterococcus* spp., *Pseudomonas* spp., *Klebsiella* spp., *Enterobacter* spp., and *Staphylococcus aureus*; hospital data on *E. coli* will be optional. For bacteria of community origin, information on *Salmonella*, *Shigella*, *Vibrio cholerae*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Neisseria meningitidis*, and *E. coli* must be included.
4. The monitoring of *Campylobacter* spp. and strains of verotoxigenic *E. coli* will be strengthened. For the time being, monitoring the antibiotic resistance of the latter is not considered necessary.

Antisera for Typing Strains of *Salmonella* and *Shigella*

5. A survey of the participating countries' need for these antisera should be made. Countries that produce antisera should send them to the NLEP, so that this institution can carry out the quality control it offered.

Monitoring/Surveillance of Gonococci

6. Each country will inform PAHO about its national situation with respect to this activity, indicating how the network functions, the name of the national institution that conducts external quality control of the participating institutions—including performance evaluation, and the information published by the ministry of health in the past four years, indicating susceptibility of gonococcus isolates to antibiotics. If the information is provided in percentages, the denominators should be indicated, along with the name of the institution responsible for external quality control of the national reference laboratory. If external quality control of the national reference laboratory is not carried out, the date of its interruption should be indicated.

Evaluating the Performance of Participants in the Network of Each Country

7. Twice a year at the very least, participants will be sent a panel consisting of five samples of different species. In addition, an inspection visit will be conducted in which personnel from other similar institutions will participate.

Human Resources Development

8. Each country should promote the organization of local courses and take advantage of the training opportunities that exist in other countries.

Surveillance Policy

9. Each ministry of health will take the necessary steps to ensure that the information obtained from the monitoring of the species mentioned in the paragraphs above is part of the routine of the reference and service centers with recognized experience in microbiology. This information should be geographically representative, of verified quality, and disseminated periodically, both in the geographical area in which it was obtained and in other areas in the country.