Should “Antibiotics” Be Renamed “Antibacterials”?

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Antibiotic resistance poses a serious threat. In 1992, the CDC estimated that as many as 13,300 hospital patients died of antibiotic-resistant infections in the US. Since then, the number of antibiotic-resistant infections and associated deaths has risen every year.

A major risk factor is the volume of antibiotic use. The more antibiotics are used, the more they select for resistance. When resistance develops with well-reasoned antibiotic therapy, it is considered regrettable, but necessary. When this happens because of inappropriate or excessive use of antibiotics, it represents the waste of a precious resource.

One of the most infamous and inappropriate uses of antibiotics has been for viral upper respiratory infections. For decades, medical students have been taught that colds are caused by viruses and that viruses are unaffected by antibiotics. Nevertheless, of an estimated 110 million antibiotic prescriptions outside hospitals in the US each year, nearly 50 million are for colds, the flu, bronchitis, middle ear infections, and other illnesses usually due to viruses.

While some physicians may prescribe antibiotics because of misdiagnosis, others do so against their better judgment. Requests by patients and physicians’ perceptions of patients’ expectations have influenced physicians’ decisions to prescribe inappropriately. Many patients don’t understand that antibiotics are only for bacterial infections.

Reasons to Change the Name

Educational materials teach that antibiotics treat only bacterial infections, but the term “antibiotics” is vague, providing no indication of exactly what the drugs can do. Some patients know that bacteria and viruses differ, but still believe that antibiotics can treat both without any clue from the word that this is incorrect. It would thus make sense to call the drugs something implying bacterial specificity.

Coined in 1941 from the term “antibiosis,” an “antibiotic” is a substance produced by one microorganism that inhibits or kills another, but the term is often used as in this article – to refer exclusively to antibacterial drugs. What’s more, many so-called antibiotics (like methicillin and the fluoroquinolones) were never produced by microorganisms, but are partially or totally synthetic. To prevent confusion, some have begun to refer to both natural and synthetic antibiotics as “antimicrobials.” However, “antimicrobial” technically encompasses drugs that treat all microorganisms (i.e., bacteria, viruses, fungi, etc.), not just bacteria.

Finally, replacing the term “antibiotic”

Detecting Bacterial Resistance in Ecuador


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On April 22, 1999, Ecuador created a network of twelve hospitals to standardize antimicrobial sensitivity study methods and promote awareness of the antibiotic resistance problem (see Table 1). The overall objective of the network is to obtain information about levels of bacterial resistance to expedite control decisions.

The specific purposes of the network are to a) determine the sensitivity levels of bacterial strains from hospitalized, outpatient and emergency room patients, b) identify the microorganisms present in the different types of processed samples, c) identify the hospital services with problems of resistant strains, d) improve hospital procedures, and e) strengthen the hospital microbiology laboratories.

Data collection for this project required an extraordinary effort, as Ecuador went through many economic crises during the study period. Only 2.8% of the national budget is spent on health care. We had five presidents in a five-year period, leading to a lack of continuity in health care policies. During the last two years, we have collected data in spite of strikes, hospitals’ suspension of work, inadequate supply of reagents, and suspension of purchases of sensitivity disks.

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The network used the WHONET software to collect data on the bacterial strains isolated from each hospital. Diffusion tests were performed with sensitivity disks. The NCCLS (National Committee for Clinical Laboratory Standards) guidelines were followed.

Internal quality control tests were performed every two weeks to ensure that reagents, culture media and personnel were complying with the established guidelines. Each laboratory received several ATCC (American Type Culture Collection) strains: ATCC 25922 *Escherichia coli*, ATCC 27853 *Pseudomonas aeruginosa*, ATCC 25923 *Staphylococcus aureus* and ATCC 29212 *Enterococcus faecalis*. These ATCC strains were used to control the quality of sensitivity disks as well as the agar.

External quality control tests were performed twice a year. To date, three external controls have been performed in which five unknown strains were delivered to each participating center. The centers’ task was to identify the strain and perform an antibiogram.

Results presented here probably do not represent a complete picture of antibiotic resistance in Ecuador. Not all individuals have access to a hospital service. Also, not all infected patients are cultured, even if an infection is suspected. Additionally, not all infectious agents are easily identified, depending often on the equipment and expertise available to each microbiology laboratory. Furthermore, the diffusion test with sensitivity disks, while cost-effective and approved by the NCCLS, is limited to certain groups of bacteria, often requiring an alternative method, such as a minimum inhibitory concentration (MIC) or molecular test.

Results
Analysis was performed on 20,701 bacterial strains from April 1999 to December 2000. The ten most frequently isolated microorganisms were: *Escherichia coli* (32%), *Staphylococcus aureus* (19%), coagulate negative *Staphylococcus* (7%), *Klebsiella pneumoniae* (8%), *Pseudomonas aeruginosa* (6%), *Acinetobacter sp* (4%), *Haemophilus influenzae* (2%), *Enterococcus faecalis* (2%), *Streptococcus group A* (2%) and *Streptococcus pneumoniae* (1%).

The bacteria were isolated from 6,145 urine cultures (30%), 4,968 secretion cultures (24%) (such as nasal swabs, vaginal swabs, urethral swabs, and sputum), 1,658 samples from injuries and surgical injuries (8%), 1,319 throat swabs (6%), 1,002 blood cultures (5%), 835 catheters (4%) and 4,774 from other samples (23%), such as effusions, tissues, ocular, biopsy, skin and feces.

### Table 1. Members of the network

<table>
<thead>
<tr>
<th>Hospital</th>
<th># of beds</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>General de las Fuerzas Armadas (GFA)</td>
<td>1,026</td>
<td>Quito</td>
</tr>
<tr>
<td>Vizcaya (VZ)</td>
<td>700</td>
<td>Quito</td>
</tr>
<tr>
<td>Carlos Andrade Marin (HCA)</td>
<td>121</td>
<td>Quito</td>
</tr>
<tr>
<td>Bocar Ortiz (HBO)</td>
<td>224</td>
<td>Quito</td>
</tr>
<tr>
<td>Solán Espinoza Ayla (Selva) (SNQ)</td>
<td>160</td>
<td>Quito</td>
</tr>
<tr>
<td>Quito No 1 Policía Nacional (HPN)</td>
<td>121</td>
<td>Quito</td>
</tr>
<tr>
<td>Enrique García (HGE)</td>
<td>343</td>
<td>Quito</td>
</tr>
<tr>
<td>Patmnato San José Norte (PSL)</td>
<td>50</td>
<td>Quito</td>
</tr>
<tr>
<td>Vizcaya-Solcia (HVZ)</td>
<td>30</td>
<td>Pastaza</td>
</tr>
<tr>
<td>Instituto del Cancer Salo Cuenca (SLC)</td>
<td>31</td>
<td>Cuenca</td>
</tr>
<tr>
<td>Regional Horia Casteon (HEC)</td>
<td>130</td>
<td>Azogues</td>
</tr>
<tr>
<td>Regional Rodriguez Zambrano (HRZ)</td>
<td>200</td>
<td>Manta</td>
</tr>
</tbody>
</table>

In adults, *Staphylococcus aureus* resistance to oxacillin was 7.7% in outpatients and 34.4% in hospitalized patients. In children, the resistance to oxacillin was 3% in outpatients and 8% in hospitalized patients. The resistance to oxacillin varied among individual hospitals from 0% to 45% (Figure 1).

*Escherichia coli* cultures were resistant to ciprofloxacin in 24% of samples from outpatient adults and 36.4% of samples from hospitalized patients. The resistance of *E. coli* to aminoglycosides varied greatly among hospitals, with a high of 67% resistance to gentamicin in one hospital, suggesting that aminoglycoside rotation...
may be appropriate in this institution.

Resistance in *Pseudomonas aeruginosa* was 16.7% to imipenem in adult hospitalized patients and 31% in children. *P. aeruginosa* resistance to aminoglycosides such as gentamicin was 62.8% and 56.6%, respectively, for hospitalized adults and children, and was 56.2% to quinolones such as ciprofloxacin. The highest rates of resistance were found in hospitals with units for burn patients.

The *Haemophilus influenzae* b type strains, mainly isolated at the Baca Ortiz Children’s Hospital, were 5% resistant to ampicillin, 11% to chloramphenicol and 0% to ceftriaxone.

The reported resistance of *Streptococcus pneumoniae* strains to penicillin (1 µg oxacillin disk) varied from 2% to 17% (Figure 2). The majority of *Streptococcus pneumoniae* strains came from respiratory tract samples and presumably represented colonization. These percentages varied greatly when MICs were performed: 78 strains isolated from invasive processes (blood, CSF, pleural fluid) showed a 2.5% resistance to penicillin with a ≥ 2 µg/ml MIC, 3.8% of isolates showed an intermediate pattern (0.12-1 µg/ml MIC) and 93.5% of isolates were sensitive (<0.06 µg/ml MIC). These cutoff points comply with the NCCLS guidelines.

*Shigella* resistance varied from 65% to 77% for ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole, but was 0% for ceftriaxone, ciprofloxacin, and nalidixic acid.

Strains of *Salmonella* were 100% sensitive to quinolones, ceftriaxone, ampicillin, chloramphenicol and trimethoprim-sulfamethoxazole.

The number of strains isolated per hospital did not correlate with factors such as the number of beds or personnel. One 70-bed hospital processed almost the same number of samples as did a 367-bed hospital, while a 700-bed hospital showed figures similar to one with 224-beds. This can be due to factors such as lack of supplies and resources, strikes, non-working periods, or inconsistent use of the microbiology laboratory by each operative unit.

We hope this information will create awareness of the magnitude of bacterial resistance in Ecuador and its impact on morbidity and mortality. We hope this will lead to the creation of policies for its control, including education of healthcare personnel, quality improvement of laboratories, guidelines for empirical treatment, and limits on drug availability. Ultimately, we hope to use this information to establish measures that will reduce the antibiotic resistance levels in Ecuador.

**Extended-Spectrum β-Lactamases in *E. coli* and *K. pneumoniae* in Beirut**

Ziad Daoud† and Noha Hakime‡

Extended-spectrum β-lactamases (ESBLs) are a major cause of antibiotic resistance. These enzymes inactivate extended-spectrum β-lactam antibiotics, such as second and third generation cephalosporins, rendering these drugs ineffective against bacterial infection. ESBLs are found in hospitalized patients worldwide; the prevalence of ESBLs among clinical isolates varies between countries and institutions, ranging from 0% to 40%.1³-

Antibiotic resistance due to ESBLs arises from several factors. In all hospitals with high prevalence of ESBL production, a high volume and indiscriminate use of extended-spectrum cephalosporins is a common practice.⁴⁻⁵ Specific risk factors include length of hospital stay, severity of illness, time in the intensive-care unit, intubation and mechanical ventilation, urinary or arterial catheterization, and previous exposure to antibiotics.⁶⁻⁸

Building on previous reports of ESBL increases, we report an increase in ESBL production by the clinical strains of *Escherichia coli* and *Klebsiella pneumoniae* in a 300-bed hospital in Beirut, Lebanon (the Saint George University Hospital) from January 1995 to December 2000. Strains from different patients or from the same patient with different susceptibilities were identified using standard techniques⁹ and/or the API 20E system (BioMérieux, Marcy l’Etoile, France). Antimicrobial susceptibility testing was done using the Kirby-Bauer disk diffusion method and susceptibility was determined according to the National Committee for Clinical Laboratory Standards (NCCLS). We used the double-disk approximation test to detect ESBL production.⁹⁻¹⁰

Of 4,821 isolates of *E. coli* and 1,289 isolates of *K. pneumoniae*, enhanced zones of inhibition were observed with 58 isolates of *E. coli* and 200 isolates of *K. pneumoniae*; therefore, 1.2% of *E. coli* and 15.5% of *K. pneumoniae* were ESBL-producing organisms (Table 1). The 258 ESBL-producing isolates were recovered from 235 patients and from the following specimens (number of specimens in parentheses): urinary (169), blood (24), respiratory fluids (16), wound (33), and

ESBLs continued on page 4
ESBLs continued from page 3

With a more bacteria-oriented term could bring an unprecedented degree of attention and publicity to the imperativeness of reserving antibiotics for bacterial infections. After all, it is not every day that a term used for 60 years gets changed.

Reasons to Consider the Name “Antibacterial”

Establishing the need to change “antibiotic” to a more bacteria-related term is one thing. Choosing that term is another altogether. For several reasons, we suggest “antibacterial.”

Someone who has never heard an explanation for the term “antibacterial” could look at the term’s components and correctly surmise that it treats bacteria. The term would complement, rather than counteract, efforts to inform people about the bacterial specificity of the drugs.

Like “antimicrobials,” the term “antibacterials” encompasses both natural and synthetic drugs. Unlike “antimicrobials,” however, the term clearly refers to antibacterial drugs only. There is already a precedent for calling drugs that work against viruses “antivirals” and drugs that work against fungi “antifungals.” It seems logical to call drugs working against bacteria “antibacterials.”

To help gauge the expectations that the public might associate with the term “antibacterials” as compared with “antimicrobials,” the authors conducted a random telephone survey of households in Charlottesville, Virginia, and surrounding counties in March 2000. Among people who admitted asking their physician for an antibiotic when told that they have a viral infection, 20–40% fewer respondents thought that “antibacterials” could treat “viral infections,” “the flu,” or “viruses” as compared with the term “antibiotics” (unpublished data, Possner AB, Farr BM).

Precedents for Changing Names in Medicine to Change Perceptions

Although the authors could find no published proposal for replacing “antibiotics” with a more bacteria-related term such as “antibacterials,” several precedents exist in medicine for changing terminology to help change the public’s perceptions.

Related to antibiotic resistance, one study found that nearly four times as many respondents thought that “bronchitis” would require antibiotics as compared with a “chest cold.”

Before it was known as Magnetic Resonance Imaging (MRI), this diagnostic technology was called Nuclear Magnetic Resonance Scanning (NMRS). In the early 1980s, the term was changed to MRI because many patients worried about nuclear radiation and refused to undergo the scan.

Traditionally, anti-epileptic medications have been called “anticonvulsants,” but some seizures involve only momentary loss of awareness, not convulsions. Many neurologists have thus begun calling these drugs “anti-epileptics.”

For centuries, sexually transmitted diseases like syphilis and gonorrhea were known as “venereal diseases,” after the Roman goddess of love, Venus. To encourage people to seek treatment, “venereal disease” was replaced with “sexually transmitted disease,” avoiding some of the stigma accompanying the word “venereal.” Similarly, many doctors

Table 1. ESBL-producing E. coli and K. pneumoniae strains isolated between 1995 and 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>E. coli</th>
<th>K. pneumonia</th>
<th>Patients with &gt; 1 ESBL-producing strain</th>
<th>Total</th>
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<tr>
<td>1995</td>
<td>711</td>
<td>3 (0.4)</td>
<td>3</td>
<td>714</td>
</tr>
<tr>
<td>1996</td>
<td>614</td>
<td>2 (0.3)</td>
<td>2</td>
<td>616</td>
</tr>
<tr>
<td>1997</td>
<td>560</td>
<td>7 (1.3)</td>
<td>6</td>
<td>567</td>
</tr>
<tr>
<td>1998</td>
<td>771</td>
<td>7 (0.9)</td>
<td>7</td>
<td>778</td>
</tr>
<tr>
<td>1999</td>
<td>951</td>
<td>11 (1.2)</td>
<td>8</td>
<td>962</td>
</tr>
<tr>
<td>2000</td>
<td>1214</td>
<td>28 (2.3)</td>
<td>26</td>
<td>1242</td>
</tr>
</tbody>
</table>

Total 4821 58 (1.2) 52 1289 200 (15.5) 194 23

References
What is the appropriate duration of antibiotic therapy for acute otitis media, sinusitis and tonsillopharyngitis?

Prescribing the appropriate duration of a course of antibiotic therapy is as important as eliminating prescriptions for nonbacterial illnesses in practicing judicious use of antibiotics for upper respiratory tract infections.

How long is enough, and how long is too much? Therapeutic courses need to be of sufficient duration to result in a clinical cure to return patients as rapidly as possible to normal functioning and to prevent the progression of disease and the development of dangerous sequelae. However, unnecessarily lengthy courses of therapy may prevent the realization of these treatment goals by heightening the risk of development of bacterial resistance and side effects and by reducing compliance with the therapeutic regimen.

Prolonged courses of therapy heighten chances of noncompliance with the therapeutic regimen. Compliance rates in tonsillopharyngitis, for instance, in which antibiotic therapy is typically prescribed for 10 days, is inversely related to duration of therapy and has been observed to be as low as 8% by the ninth day of treatment in clinical studies.

Perhaps most important in this era of rapidly increasing prevalence of resistant organisms, unnecessarily lengthy courses of therapy may encourage the development of antibiotic resistance. For example, a study conducted in France demonstrates that β-lactam antibiotic treatment durations greater than 5 days compared with fewer than 5 days significantly increased risk of pharyngeal carriage of penicillin-resistant *Streptococcus pneumoniae*.

The risk of antibiotic resistance increased not only with long duration of therapy but also with administration of a low (i.e. lower than clinically recommended) daily dose of antibiotic. This is relevant to considerations about the appropriate duration of antibiotic therapy in the context of patients’ frequent practice of administering antibiotic only until they feel better, i.e. within two to five days for acute otitis media, sinusitis and tonsillopharyngitis. Surreptitious re-use of antibiotics may be especially prevalent in pediatric patients whose parents conserve antibiotic suspension to use from one respiratory infection to another. Antibiotics, particularly those in suspension, rapidly lose potency as they age, and low potency antibiotics are likely to promote the growth of resistant organisms. Thus for pediatric infections, noncompliance with a 10-day course of therapy by conserving doses for future infections may indirectly foster resistance by increasing the chances of administering insufficiently potent antibiotics (analogous to the low daily doses associated with increased risk of pharyngeal carriage of resistant *S. pneumoniae* in the French study).

The idea that a 10-day course of therapy is necessary for the effective treatment of respiratory infections originated from early tonsillopharyngitis studies in which parenteral and oral penicillin therapy administered for 9-11 days was more effective at eradication of Group A beta hemolytic *Streptococcus* than administration for 5 or 7 days. On the basis of data from these studies, the 10-day course of penicillin therapy became the gold standard for treatment of tonsillopharyngitis in the U.S. and was extrapolated arbitrarily to otitis media and sinusitis and to tonsillopharyngitis cases treated with antibiotics other than penicillin. This arbitrariness is reflected in the variation between countries in standard duration of therapy for acute otitis media. The standard duration of therapy for acute otitis media is 5 days in the U.K. and is 8 days in France.

The recognition that the 10-day duration of therapy for common respiratory infections does not derive from a strong scientific or medical rationale (with the exception of penicillin therapy for tonsillopharyngitis), and the increasing awareness of the adverse sequelae of long duration antibiotic therapy, have led some clinicians to call for shortening the duration of antibiotic therapy in some respiratory infections.

Data relevant to determining the optimum duration of therapy in acute otitis media, sinusitis and tonsillopharyngitis have been recently reviewed. The data demonstrate particularly strong justification for shortening the duration of therapy from the standard 10 days to 5 days in acute otitis media, in which 30 open label and controlled studies comparing therapeutic durations have been conducted. With over 7000 patients in these studies, about half receiving shortened antibiotic courses, the data are compelling in favor of standard 5 days of oral therapy. Exceptions may include patients with recurrent infection, in day care and children below two years of age. Twenty different studies involving over 4000 patients provide solid evidence indicating that tonsillopharyngitis, too, can be effectively treated with several different cephalosporins given for 5 days or with azithromycin for 5 days (at 12 mg/kg/day for all 5 days). Although only 6 studies involving just over 600 patients have examined short course treatment of acute maxillary sinusitis, the results are encouraging in suggesting that 5 days of therapy may also be appropriate for acute maxillary sinusitis.

Reference

APUA News

Agriculture and Antibiotics
A panel of experts convened by APUA from various fields in science and medicine concluded that antibiotic use in agriculture contributes to increasing antibiotic resistance in bacteria carried by humans. The panel's review of the scientific evidence showed that the transfer of bacteria from food animals to humans is a common occurrence. The panel concluded that the elimination of non-therapeutic use of antibiotics in food animals and agriculture will lower the burden of antimicrobial resistance in the environment with consequent benefits to human and animal health.

Specifically, the panel recommended 1) that antimicrobial agents should not be used in agriculture in the absence of disease, 2) the elimination of antibiotic use for growth promotion or to enhance feed efficiency (with the exception of ionophores and coccidiostats, because current evidence indicates that use of these antimicrobials does not affect resistance in human pathogens), 3) discontinuing agricultural use of critically important drugs needed for hard-to-treat human infections, such as fluoroquinolones and third generation (or higher) cephalosporins, except to treat refractory infections in individual animals, and 4) rapid review by regulatory agencies of alternatives to antibiotics, and, where possible, promoting changes in management and the use of probiotics or competitive exclusion products.


EU Antimicrobial Resistance Program
The European Union (EU) has a program to promote prudent use of antimicrobials. The European Commission's antimicrobial strategy outlines the ongoing and upcoming actions at the EU level, ranging from data collection on consumption to a series of preventive actions: support for raising awareness among doctors, veterinarians, farmers, and patients; precautionary "prescription only" use in all sectors including agriculture; better monitoring and reporting on residues in food; phasing out of all uses as growth promoters in feed and as markers in genetically modified organisms; and review of existing uses as food additives. In addition, research and development of new antimicrobials and of alternative treatments and vaccines is being encouraged. For more information, see http://europa.eu.int/comm/health/ph/others/antimicrob_resist/index_en.htm.

Local US Antimicrobial Resistance Program
The Tacoma-Pierce County (Washington, USA) health department designed an antimicrobial resistance program tailored to its mixed rural and urban population of 700,000. For information, see http://www.tpchd.org/antibiotic/index.htm.

APUA Welcomes New Advisory Board Members
APUA is pleased to announce the addition of two new members to its Scientific Advisory Board:

Dr. Paul Farmer is a medical anthropologist and infectious disease physician whose clinical responsibilities span three continents. Dr. Farmer is a world-renowned authority on tuberculosis treatment and control. Dr. Farmer has pioneered novel, community-based treatment strategies in resource-poor settings and written extensively about health and human rights.

Dr. Jay A. Levy is an AIDS and cancer researcher at UCSF. In 1983, he co-discovered the AIDS virus, HIV, that he originally called the AIDS-associated retrovirus (ARV). Dr. Levy's work with inactivating HIV in clotting factor preparations has protected many hemophiliacs from HIV infection. Dr. Levy's current work involves developing an AIDS vaccine and studying Kaposi's sarcoma.

APUA Exhibits
APUA provides information on appropriate antibiotic use through its exhibits at major health provider conferences around the US and the world.

The APUA Newsletter welcomes your feedback!

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APUA welcomes two new chapters, APUA-Yugoslavia and APUA-Costa Rica, to its global network of chapters. The chapter leader for Costa Rica is Carla Odio Pérez, MD, Pediatra Infectóloga, and the chapter leader for Yugoslavia is Sinisa Sevic, MD, Clinical Center Novi Sad. We look forward to working with you to promote prudent antibiotic use.

Dr. Emma Keuleyan, chapter coordinator of APUA-Bulgaria, received a travel grant from APUA-International to attend the APUA symposium Towards Controlling Antimicrobial Use and Resistance in Low-Income Countries held at the 10th International Congress on Infectious Diseases in Singapore in March. Dr. Keuleyan commented, “I applaud the organizing of symposia concerning low-income countries as an important step for limiting infectious diseases and antimicrobial resistance.” APUA’s travel grant was funded through the Wellcome Trust.

APUA-India organized the First International Conference of the Indian Society for Antimicrobial Chemotherapy from March 9-10, 2002. Professor S.K. Sharma, a member of APUA-India and a Professor of Medicine at the All India Institute of Medical Sciences in New Delhi, received the prestigious Professor Prem Chand Dandiya Endowment Trust award and gave an oration entitled “The Changing Face of Tuberculosis” to an audience of two hundred.

APUA-Nepal conducted training about the rational use of antibiotics for new medical graduates and house officers on January 21-23, 2002. Nineteen participants from seven hospitals and medical colleges of Kathmandu Valley attended the training. Eleven sessions were conducted by resource personnel from different organizations. The participants were evaluated before and after the training. The training was covered extensively by the television and print media. A certificate was distributed by acting chief drug administrator of the Department of Drug Administration. APUA-Nepal is preparing a report of the training.

Congratulations to Eduardo Savio Larriera, MD, APUA-Uruguay, on his appointment by the Ministry of Health as Uruguay's Infectious Disease Advisor.

APUA Chapter Meeting in Milan, Italy
On April 24, 2002, APUA held a chapter network meeting in Milan, Italy. The meeting, hosted by APUA-Italy chapter leader, Giuseppe Cornaglia, was attended by Kathleen T. Young, APUA Executive Director; Anibal Sosa, APUA Director for International Programs; Helen Giamarellou, APUA-Greece; Otto Cars, APUA-Sweden; Ian Gould, Scotland; Roman S. Kozlov, APUA-Russia; Waleria Hryniewicz, Pawet Grzesiowski and Tomasz Ozorowski, APUA-Poland; Rumyana Markovska, APUA-Bulgaria and Pentti Huovinen, Finland.

Dr. Phillip Jenkins of the World Health Organization provided an overview of the WHO Global Strategy for Containment of Antimicrobial Resistance. APUA chapter leaders presented antibiotic resistance challenges and activities in their countries.

Conclusion
Sixty years ago, humankind received something miraculous. Today, however, antibiotic efficacy is declining, in part because of overuse.

Society must continue searching for new antibiotics, but it must also find better ways to conserve those it has. Changing the term “antibiotics” to “antibacterials” will not single-handedly prevent misuse, but – in conjunction with educating people about the difference between bacteria and viruses – it might help.

References
Alliance for the Prudent Use of Antibiotics
75 Kneeland Street
Boston, MA 02111-1901 USA

If you are concerned about the public health threat of antibiotic resistance, become part of the solution. Make a tax-deductible contribution and join our global network of citizens, clinicians, researchers and policy makers.

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Founded in 1981 as a nonprofit organization, APUA is the only organization in the world solely dedicated to strengthening society’s defenses against infectious diseases through research and education on antibiotic use and antibiotic resistance. APUA’s mission is to improve infectious disease treatment and control worldwide through promoting appropriate antibiotic access and use and reducing antibiotic resistance. With members in over 100 countries and numerous foreign affiliated chapters, APUA provides a unique network to support country-based activities and facilitate international planning and communication. APUA’s resources include an international scientific advisory board with members of national academies of medicine and science and a professional staff with specialized expertise. APUA’s global network of affiliated chapters serves to tailor interventions to local customs and practices.

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