The INT carries out training, epidemiological surveillance, and technical support activities for the national and provincial programs. The provinces send out a monthly report of new cases on standard forms which contain basic information. In addition to permitting analysis by province, age, sex, site of lesion and bacteriology, treatment background, etc., these forms make it possible to obtain samples from patients for the purpose of performing periodic evaluations of the operative results of treatment.

In 1982 an analysis was made of the information available on the epidemiological situation and on the program for each province. The selected epidemiological indicators were mortality, morbidity (incidence), infection, and meningitis in children 0-4 years old. The tables and graphs for each indicator were analyzed in terms of quality of the information and in relation to what is expected of an effective control program. The document was completed with a practical evaluation task carried out as a self-instruction exercise by those responsible for the program in each province.

This type of exercise supplements the training received by program administrators during the annual course offered by the INT and other international courses, through applying the data to the special conditions of the program for which they are responsible, thus constituting continuing education, indirect supervision, and evaluation. The method could be utilized for regional evaluation of programs in other countries and for the evaluation of national programs, with the necessary adjustment to the different systems for registering information.

(Source: Tuberculosis and Acute Respiratory Diseases Program, Maternal and Child Health Program, PAHO.)

Infections due to Penicillinase-producing Neisseria gonorrhoeae in Florida, United States

From 1 January through 31 December 1981, a total of 436 infections due to penicillinase-producing Neisseria gonorrhoeae (PPNG) were reported in Florida—a marked increase over the number of cases in previous years. Only three cases were reported from 1976 through 1979, and 15 cases were reported in 1980. The increase in reported cases in 1981 was temporally related to a change in laboratory surveillance for PPNG strains. In mid-December 1980, all gonococcal isolates in cultures submitted to State branch laboratories were tested for beta-lactamase production, in contrast to the previous policy which limited testing to post-treatment isolates from patients not cured by their initial therapy. A total of 914 PPNG cases were reported in 1982, an increase of 110 per cent over the 436 cases reported in 1981. The epidemic has continued through the first quarter of 1983.

Most cases reported in Florida have been among residents of South Florida, especially the Miami-Dade County area. Dade County, with a population of 1.8 million (17 per cent of the State population) accounted for more than 60 per cent of the 1981 cases and more than half of the cases reported in Florida during 1982 (Table 1). Attempts at control were first made during

<table>
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<tr>
<td></td>
<td>Number</td>
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<td></td>
</tr>
<tr>
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<td>10</td>
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<td>1982</td>
<td>914</td>
<td>466</td>
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</tr>
<tr>
<td>1983*</td>
<td>—</td>
<td>389</td>
<td>54</td>
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*January through March 1983.
May 1981, when it became clear that an epidemic was occurring. Cultures were obtained from all men with positive smears for gonorrhea and the isolates were tested for beta-lactamase production. The practice in the Dade County sexually transmitted diseases (STD) clinic until then was to diagnose and treat men with urethritis on the basis of the findings on a gram-stained smear, without testing for gonococci. Control, however, was not achieved, and reported cases of PPNG infection continued unabated. The next attempt at control was in July 1981. A team was developed with the aim of centralizing and organizing the control approach. Also, efforts at tracing sexual contacts were intensified. In November (four months later) it appeared that control had been achieved, since only 16 cases were reported that month, compared to 61 cases in August 1981. The November low was short-lived, however, and the epidemic continued through 1982, with wide fluctuations in the number of cases reported monthly. After the August peak of 59 cases and the concern that a wave of migrants soon to arrive in the area would fuel the epidemic, an intensive intervention program was adopted in cooperation with the Centers for Disease Control (CDC), Atlanta, Georgia. Intervention methods included the widespread use of spectinomycin or cefotaxime in target areas as the initial antibiotic treatment for patients and contacts with gonococcal or presumed gonococcal infection. This policy was adopted not only in Dade County, but in neighboring regions reporting high PPNG morbidity, such as the Belle Glade, Palm Beach, and Fort Myers areas.

Additional measures included intensification of the ongoing control program, specifically to ensure that cultures were obtained from all men with positive urethral smears, all women undergoing pelvic examinations, and all known and suspected contacts of patients with gonorrhea. Patients with PPNG infections were interviewed promptly and in detail, and identified contacts were treated prophylactically with either spectinomycin or cefotaxime. A publicity campaign was mounted to alert private physicians to the problem especially in Dade County, and commercial laboratories were contacted and urged to perform beta-lactamase testing on all gonococcal isolates. In addition, several press and radio news releases alerted the public to the problem.

The results of the intervention measures were less dramatic than had been anticipated. Reported PPNG cases in Dade County, although declining initially, increased in December 1982 and January 1983, surpassing reported cases in each of the two preceding months (Figure 1).

A total of 466 PPNG cases was reported in Dade County during 1982, representing an increase of 66 per cent over the 281 cases reported in 1981. This trend is similar to that observed nationally, where reported cases continue to increase steadily. The 466 PPNG cases account for 5 per cent of all gonococcal isolates identified in Dade County during 1982. Of the 466 cases, 160 were women, making the ratio of females to males approximately 1:2. This ratio contrasts with the 1:1 ratio observed in the pre-epidemic period early in 1981. Twelve of the 160 women with PPNG admitted to prostitution or were suspected to be prostitutes. Five cases were reported among homosexual men. Except for one chain of infection (10 cases) among a white upper middle-class group of professionals who used drugs recreationally, most cases have been unrelated epidemiologically and have been among blacks living in the inner city area of Miami. Ages of cases ranged from 2 to 71 years, with a median age of 25. Morbidity was highest among the 20-24 age group, which accounted for one-third of the reported PPNG cases.

Several individuals were visiting Miami when they acquired their infections. In one case, a male patient was found to be infected with PPNG when his cultures were tested several days after inadequate treatment with ampicillin and probenecid. The patient did not return for a follow-up test, and field investigations revealed that he had returned to his home in Honduras. Only one case was reported among military personnel. The average time period from initial clinic visit to appropriate antibiotic therapy was 3.3 days; 31 per cent of all PPNG cases were identified through sexual contact tracing.

Failure to control the epidemic in Dade County may be related to the inability to identify a core group of persons such as prostitutes or asymptomatic carriers.

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**Figure 1. Reported PPNG cases, Dade County, Florida (USA), by month, July 1982-March 1983.**

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*CDC recommends that patients with PPNG infections and their sexual partners be treated with spectinomycin, 2 g intramuscularly in a single injection with probenecid, 1 g by mouth; or cefotaxime, 1 g, intramuscularly, in a single injection without probenecid.*
Prostitutes have played a major role in PPNG epidemics in Los Angeles and New York City, and innovative measures were often necessary to identify such persons. The lack of organized groups of prostitutes in Dade County makes identification even more difficult. Other factors have yet to be clarified, such as the role of gonococcal plasmids in maintaining the epidemic.

(Source: Wayne L. Greaves, M.D. and Phillip W. Strine. Centers for Disease Control, Center for Prevention Services, Division of Venereal Disease Control, Atlanta, Georgia, USA.)

Editorial Comment

Penicillinase-producing *N. gonorrhoeae* (PPNG) have been isolated in Argentina, Canada, Chile, Colombia, Costa Rica, Mexico, Panama, Suriname, Trinidad and Tobago, and the United States. Epidemiological evidence obtained from interviews of infected patients suggests that PPNG are also present in Grenada and Saint Lucia. To this growing list we can now add El Salvador, Grand Cayman Island, Grand Turk Island, and Honduras. Clearly PPNG are rapidly becoming well established in Caribbean and Latin American countries.

The outbreak in Miami and the special case who almost certainly returned to Honduras with inadequately treated PPNG illustrate the potential for rapid spread of PPNG to other countries.

PPNG pose a serious threat to gonorrhea control efforts. The loss of penicillin as an inexpensive, effective first drug for treatment of urethritis, results in a significant increase in treatment costs. Extensive use of second- and third-line drugs may be beyond the resources of most sexually transmitted disease control programs.

It is imperative that small pilot surveillance projects such as the Inter-American Collaborative Study of Antibiotic Susceptibility of *N. gonorrhoeae* (financed by the International Development Research Center of Canada in Argentina, Brazil, Chile, and Jamaica) be initiated to determine the presence and extent of PPNG. Ongoing or periodic monitoring of the frequency with which PPNG are isolated may assist indirectly in determining the efficacy of penicillin treatment regimens.

Development of a Leprosy Vaccine

Among the objectives of the ongoing research programs in leprosy immunology throughout the world is the development of a vaccine against the disease. In the Region of the Americas, the Pan American Center for Research and Training in Leprosy and Tropical Diseases (CEPIALET) in Caracas, Venezuela has been working on a vaccine for the prevention and cure of leprosy. The Director of CEPIALET, Dr. Jacinto Convit, recently described some of the findings of this work in a lecture given at the VI Public Health Congress held in Barquisimeto, Lara State, Venezuela. What follows is a summary of that presentation.

A specific immunologic defect for *Mycobacterium leprae* has been demonstrated in leprosy patients and in healthy persons who live in areas where leprosy is endemic. This immunologic defect can be found in healthy persons with persistently negative response to lepromin (Mitsuda reaction), in patients with the indeterminate form of leprosy who show a negative response to the Mitsuda test, and especially in the lepromatous form or in that part of the spectrum that is closest to being so.

Most of the population is highly resistant to leprosy in any of its forms; one can assume, therefore, that even patients with tuberculoid forms of the disease and those in the area of the spectrum closest to these forms, also have a partial immunologic defect.

The specificity of the immunologic defect was demonstrated several years ago with different species of *Mycobacterium*. The forms of low resistance to the disease respond to *M. leprae* by producing an undifferentiated macrophagic "incompetent" granuloma with numerous intracellular microorganisms. On the contrary, the behavior of these forms of the disease to BCG results in the production of an immune granuloma made up of epithelioid cells and giant cells with lymphoid cell infiltrate where intracellular microorganisms are not found.

A simple explanation used to interpret the immune defect is that it could constitute a macrophagic defect in the presentation of the antigen to the lymphoid cells necessary for development of the phenomena of cell-mediated immunity. This defect can be observed in the cell's inability to digest the bacilli. In these individuals, tests in vivo and in vitro do not show sensitized lymphoid cells.

Other possible explanations of the phenomenon could be absence of the recognition factor for the spe-