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THE CAPITOL FORUMS
On Health & Medical Care

PUBLIC HEALTH AT THE CROSSROADS: PAST, PRESENT, FUTURE
PART II: THE URBAN - SUBURBAN CONNECTION

16

Background information for the discussion at the

CAPITOL FORUM
on Wednesday, July 31, 1996
9:00 am - 1:00 pm
Masonic Temple Library
Trenton, New Jersey

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PUBLIC HEALTH II
THE URBAN-SUBURBAN CONNECTION

ISSUE: The general health status of the public is not protected from illness and disease based on geographic location or socio-economic class. Epidemiologic research, the surveillance of communicable and infectious diseases, public education, and the operation of public laboratory services are among the essential functions of public health. How is New Jersey's public health system -- with shrinking funding and resources -- responding to increased cases of Tuberculosis (a re-emerging communicable disease) and newly emerging tick-borne infectious diseases (such as Lyme disease), whose incidence rates have been highest in different geographic and demographic areas?

Increases in infectious and communicable diseases are not only urban public health issues, but also have significant health, monetary and social impacts on New Jersey's suburban and rural populations. How can our state's decentralized public health system meet the challenge of increased cases and the demand of intense research to monitor and treat these two illnesses and similar threats?

INTRODUCTION

In his "Devotions upon Emergent Occasions" (1627), the 17th century writer John Donne describes illness as an enemy that may invade the "fortress" of the body at any time, despite our most sophisticated knowledge and intensive vigilance:

> We study Health, and we deliberate upon our meats, and drink, and ayre, and exercises, and we hew and we polish every stone, that goes to that building; and so our Health is a long and a regular work; But in a minute a Canon batters all, overthrows all, demolishes all; a Sickness unprevented for all our diligence, unsuspected for all our curiositie . . .
> (Sontag, 1989)

Donne's concerns still echo through the centuries as we, in 1996, confront the challenges of responding to relatively "new" illnesses -- like tick-borne diseases -- and communicable diseases believed to be almost eradicated some 30 years ago and now re-emerging, such as Tuberculosis (TB). While the highest TB prevalence rates are in New Jersey's urban centers, cases are increasing in communities outside of the inner cities. Conversely, cases of Lyme disease and other emerging tick-borne diseases originally were clustered in rural and coastal areas of the state, but Lyme disease is now endemic throughout all 21 counties. Both illnesses present complex public health problems at a time when the public health system is undergoing significant changes with the impact of managed care delivery systems (See, Capitol Forums Issue Brief, "Public Health at the Crossroads," June 26, 1996).

TUBERCULOSIS

History

Tuberculosis (TB), an upper-respiratory infection characterized by cough, weight loss, night sweats and low-grade fever, is caused by a bacillus: *Mycobacterium tuberculosis*. The disease is transmitted by inhaling airborne droplets expelled by the cough or sneeze of a person with infectious TB. For centuries the only "weapons" thought to conquer TB were environmental and behavioral: cleanliness, air, well-ventilated rooms, good hygiene, and bed rest. It was not until the mid-20th century when the true cure for TB -- antibiotics -- was discovered. The antibiotics kill the bacillus which causes TB.

Up until the mid-1980s, there had been an historical decline in TB morbidity and mortality in the United States. This was attributed to the result in improvements in nutrition and housing in the first half of the century, as well as specific public health interventions, such as education, isolation and quarantine, which contained the spread of the disease (Bayer and Dupuis, 1995). From 1953 - the

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year of the introduction of the anti-tuberculosis drug isoniazid - through 1984, the number of TB cases across the country decreased from 84,304 to 22,255 (an average decline of 5 percent per year) (Ibid). Yet, nationally, the disease continued to be a significant problem for non-white minorities and low-income communities, where TB prevalence rates ran almost 100 percent higher than in the general population.

While almost all cases of TB are curable through available and highly effective medications, the afflicted person must comply with his or her treatment plan. Most people with TB can be treated and cured with a six to twelve-month course of antibiotic therapy; their contacts can be tested and treated - all on an outpatient basis. It was with antibiotic medication that the care and treatment of TB shifted from an inpatient institutional setting, to an outpatient and community setting. For example, in New Jersey, hospitals for TB patients, which had a presence in the state since the late 1800s, began to disappear in the 1950s, when the disease was coming under control through antibiotic therapy. Outpatient TB care has a strong emphasis on education and communication between health care providers and patients. For outpatient treatment to be effective and to prevent the spread of TB, it is critical to manage and monitor the treatment of persons with active TB.

The Re-Emergence of Tuberculosis

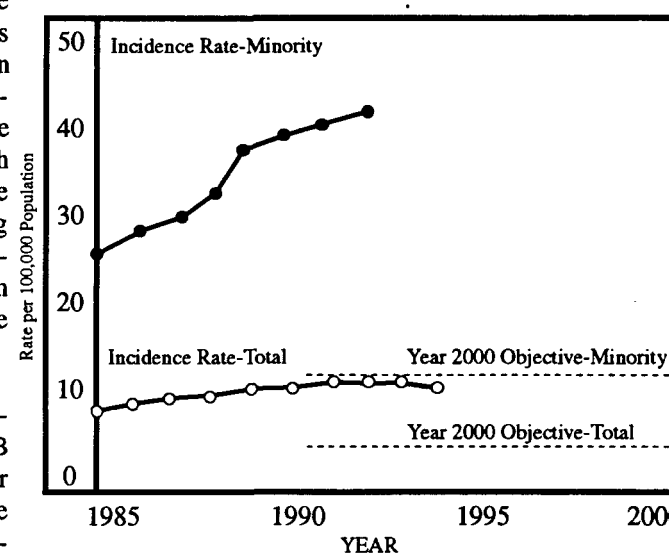
Beginning in 1985, the downward trend in TB cases began to reverse. Cases of TB increased more than 20 percent between 1985 and 1993 in the U.S. Since 1994, there have been small decreases (of 4-5 percent) in the number of TB cases nationally, reflecting the country's response to treat the disease and control its resurgence in the population.[1] What are the factors which are influencing the resurgence of TB at this time? New Jersey is one of many states which are grappling with the public health issue of TB, and the problem is global in breadth. The United States is experiencing an increase in re-emerging communicable diseases (once considered to be under control), such as TB and pneumococcal pneumonia, and in newly identified infectious diseases (including tick-borne diseases such as Lyme disease).

Researchers point to cutbacks in public funding (federal, state and local levels), reduction of facilities for TB control and treatment in the 1980s, and competition for public health monies at a time when TB cases were decreasing as significant policy factors in the re-emergence of TB. Identified high-risk factors for TB are: HIV infection, intravenous drug abuse, alcoholism, homelessness, poverty, malnutrition, institutionalization (such as in nursing facilities and long-term care facilities), foreign birth and contact with a person with active TB. Congregate settings, such as correctional facilities, homeless shelters, health-care facilities and drug-treatment centers, foster a high transmission rate for TB (*Morbidity and Mortality Weekly Report*, September 1995). The resurgence in TB cases is also related to the increased numbers of foreign-born persons from countries that have a high prevalence rate of TB. The Centers for Disease Control reported that while data indicates a decrease in the number of TB cases among U.S.-born persons, there are increased numbers of cases among foreign-born persons (*Journal of the American Medical Association*, June 5, 1996).

New Jersey

Since 1985, there has been a steady increase in cases of TB in New Jersey. In 1985, the state had 545 active cases of TB; ten years later in 1995, this number increased to 848 - a 56 percent increase. The greatest increase - 35 percent - occurred during the 8-year period between 1985 and 1993. Data on active cases of Tuberculosis in the state for the years 1994 and 1995 are showing a decrease in cases for those years. (See Appendix, "Active Cases of Tuberculosis in New Jersey 1986-1995"). The incidence rate of active TB among minorities in New Jersey increased between 1988 and 1992 and was more than three times the rate for the total population during that period (*Healthy New Jersey 2000 Update*, 1996).

ACTIVE TUBERCULOSIS INCIDENCE RATES
NEW JERSEY, 1985-1994 AND YEAR 2000 OBJECTIVES



Source: New Jersey Department of Health - 1996
Division of Epidemiology, Environmental and Occupational Health Services

[1] Between 1992 and the present, the U.S. Public Health Service increased funding to state and local health departments for TB prevention and TB control activities; in addition, some hospitals implemented practices to prevent nosocomial transmission of TB to visitors, workers and other patients within the facilities. Both activities may be connected to the decrease in reported TB cases in the period from 1993-1995.

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This recent decrease in overall cases has largely been in urban areas; however, TB is now appearing in suburban and rural areas in such high-risk groups as health care workers, who have contracted it through their work in hospitals, clinics and community settings.

In 1995, the New Jersey State Department of Health's (now Health and Senior Services) expenditures for TB control, through its Division of Epidemiology, Environmental and Occupational Health Services, were approximately $8.4 million; state funds accounted for $2.9 million and Federal grants added $5.5 million. Current expenditures represent a significant increase from the $2.1 million that was expended on TB control in the state in 1986.

In 1993, the states of New York and New Jersey accounted for close to 21 percent of the country's active TB cases. The AIDS epidemic has exacerbated the problems with the resurgence of TB, because persons with AIDS are at a higher risk of becoming infected with and transmitting TB. States with high numbers of AIDS cases, including New York, California, Texas, Florida and New Jersey, are all struggling with the current resurgence of cases of TB.

The highest prevalence rates of cases of active TB are in three northeastern cities: Newark, Jersey City and Paterson.[2] For example, of the 848 new cases of active TB in 1995, 149 (or 18 percent) were located in Newark. These numbers translate to a case rate of 57.6 per 100,000 population in Newark, as compared to a case rate of 2.7 per 100,000 in Clifton (New Jersey Department of Health Report, 1996) (See Appendix, "Active Tuberculosis [by major city] - 1986-1995").

Medical and social researchers agree that the increase in active TB cases in New Jersey is not only an urban problem, because of the possible diffusion of infectious TB from the inner city to the suburbs. In a recent CDC study, it was reported that the five counties in New Jersey that reported more than one case of multiple drug-resistant TB (Essex, Union, Hudson, Passaic and Middlesex) are located closest to New York City, a place in which high percentages of TB patients (close to 20 percent) had multiple drug-resistant TB (*Journal of the American Medical Association*, July 1994).

Multiple Drug-Resistant Tuberculosis (MDR-TB)

MDR-TB Spreads to the Suburbs

Jane W., a highly trained RN, decided to return to the work force after her two daughters reached high school age. As she searched the classifieds, she realized that the competition was tough, even for a nurse with her credentials; she had worked in both hospitals and home care settings before she and her husband decided to raise a family in the suburbs outside of Camden. After several weeks, Jane responded to an advertisement that seemed perfect, as it combined her love of nursing with her commitment to public health issues. The position was part-time and the facility was close to her home. During her interview at the correctional facility, Jane felt confident that the medical staff administrator was quite interested in her as a potential candidate for the position. Soon they were discussing health risks for the workers. As Jane had been employed in hospital settings, she was knowledgeable about the risk of contracting certain infectious diseases, such as Tuberculosis. She was also aware that skin test screening was necessary and, if found positive, a regimen of antibiotics would be prescribed.

Jane's concerns were somewhat raised when the woman interviewing her began to speak about multiple drug-resistant TB. She explained that it was a form of TB that was much more difficult to treat and that there were increased cases of it within the correctional facility. The interview concluded, with Jane's feeling that she would be offered the job. The following week, Jane's hopes were confirmed and she began work at the facility almost immediately. Jane had close contact with many inmates for physical examinations and blood tests; however, she always wore the necessary masks, gowns and gloves when doing so. Although she knew the risks involved in her work, she felt that she was following every precaution. She had a lingering concern, however, about another nurse's raising the question of the poor ventilation and air filtration in the facility; she remarked that TB cases were on the increase in the prison and kept emphasizing that TB is an airborne disease.

Six months later, Jane began coughing and her TB skin test was positive. She has begun traditional antibiotic therapy, but her symptoms are persisting. Her physician has referred her to a pulmonary specialist, as he is uncertain as to whether or not Jane may have contracted MDR-TB. Last week, Jane's elderly mother called to say that Jane's father, who visits Jane's house regularly, had come down with the "flu" - a fever and cough. Jane's entire family and personal contacts are now being tested for TB.

[2] An individual with active TB experiences symptoms of the disease; the TB bacilli are multiplying and the disease can spread to other individuals. Inactive TB infection id latent in the body; the individual has been exposed to TB, but has no symptoms and cannot spread it to other individuals. The infection can become active when the immune system is suppressed, as with AIDS and long-term chemotherapy treatments.

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The appearance of multiple drug resistant strains of TB has become a significant public health problem in the U.S., because the disease becomes even more difficult to treat if the patient does not complete a standard regimen of medication. Responses to antibiotics therapy are more difficult and longer courses of treatment are required in cases of multiple drug-resistant TB (MDR-TB). The fatality rate from multiple drug-resistant TB is high: it can be fatal in 50 to 80 percent of those who contract it.

Cases of multiple drug-resistant TB have created a strain on the outpatient care and treatment of TB, as well as a pressing demand for new and better TB drugs, diagnostics and preventive measures. These new forms of multiple drug-resistant TB are difficult and costly to treat. The total cost of treating one MDR-TB patient can reach $250,000 and some cases are not curable (27 *N.J.R.* 3659, October 1995).

Tuberculosis - Issues of Reporting and Compliance: National Overview

Infectious diseases are the third leading cause of death among Americans (National Institute of Allergy and Infectious Diseases [NIAID], 1996). TB is the world's leading cause of death from a single infectious organism, and kills more adults each year than AIDS, malaria and tropical diseases combined. An estimated 2 billion people - one-third of the world's population - are infected with the TB bacterium (Ibid).

On a national level, infectious disease reporting is decentralized, diffuse and discretionary on the part of many states. There is a National Notifiable Diseases Surveillance System (NNDSS), but reporting is voluntary. The Council of State and Territorial Epidemiologists, an association of state officials, designates diseases as nationally reportable. It is the states themselves, through legislatures, boards of health and local departments, that determine which diseases must be reported by physicians, laboratories, hospitals and other sources. Because the activity of surveillance is significantly labor-intensive and costly, most states rely primarily on passive surveillance, depending on these reports from health care providers. All states require the reporting of some important infectious diseases - AIDS, malaria, measles and TB; yet, the reporting of others, such as E. Coli, is not mandatory in many states. Given the de-centralized and under-funded nature of surveillance, there are major deficiencies in the infectious disease surveillance infrastructure throughout the country (Ibid). In late 1995, the Centers for Disease Control made ten awards (averaging about $200,000 each) to state or local health departments to enhance surveillance and response capacity for infectious diseases; New Jersey was one of the states receiving an award (National Health Policy Forum, June 1996).

Policy-makers grappling with the issues of the resurgence of tuberculosis are also confronted with difficult legal and ethical questions regarding the use of state power to promote public health (Bayer & Dupuis, 1996). The issue of compliance is significant in TB control and preventing transmission to others. Non-compliance with prescribed medication regimens and not finishing the course of medication are primary problems in treating TB. Non-compliance is high among the homeless and low-income populations for several reasons: long waiting times at public health clinics; stolen medications and more pressing immediate food and shelter concerns, once the individual symptoms are abated. The transient nature of the homeless population also impairs treatment regimens. The Centers for Disease Control report that within the homeless population, there is a compliance rate of approximately 55 percent regarding the completion of a medication regimen.

TB Control - The Complexity of Follow-up

Dr. S. is the pediatrician at a public health clinic serving the population of New Brunswick. Four weeks ago, he saw a new family who had emigrated from Pakistan the previous year. Their 6-year-old daughter, who had not yet been enrolled in school, was suffering from a fever, chills and persistent cough. Given the language problems, Dr. S. had difficulty learning how long the child had been sick before the family decided to stop using herbal remedies and to bring her into the clinic. Diagnostic tests indicated that the child had TB. Dr. S. prescribed antibiotic treatment and advised the parents to keep their daughter at home until she was no longer infectious; he informed the family that he wanted all individuals who had been in close contact with them to be tested and that he would send a social worker to their apartment to manage their case. At that time, the family indicated they wanted to cooperate with Dr. S.'s treatment regimen.

When the social worker tried to call the family, she could not get through to the individual answering the phone, who could not communicate in English. Her repeated attempts to stop by were thwarted as the family who had seen Dr. S. were never at home. Since their initial visit, the family has not been back to the clinic and at her last visit to their address, the social worker was told they had moved to a friend's home in Edison, where they were working in the friend's restaurant. At this point, follow-up with this family is not possible; they are lost to the public health system until the child enrolls in school at the end of the summer.

Members of this family, their friends and their daughter are coming in contact with the public every day, while their daughter's infectious TB remains untreated.

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States are looking to coercive measures such as Directly Observed Therapy, or DOT (which requires that the patient take his/her medication in the presence of a health care worker or other responsible third party), involuntary detention of noncompliant patients and forced administration of medications, as solutions to ensure that those with TB are fully treated and to reduce the risk of transmission by infected individuals. Current bio-medical ethics stress the rights of the individual and the principles of autonomy and self-determination. Yet, in the context of public health, can the state remain silent if the exercise of an individual's personal freedom threatens the health of the public -- e.g., a 45-year-old man with active TB does not want to comply with his medication regimen over the required 9 months because he feels better, he has been taking antibiotics for 6 months and his symptoms have abated? An underlying ethical principle in the development of the American public health system requires those with communicable diseases to behave in ways that are likely to reduce the risk of disease transmission (Ibid).

The national Advisory Council for the Elimination of Tuberculosis calls for the practice of Directly-Observed Therapy in areas where treatment compliance falls below 90 percent. The Council also recommended the least restrictive alternative when addressing state tuberculosis control laws: "before committing TB patients for inpatient treatments, state should adopt step-by-step interventions beginning with Directly-Observed Therapy and supplemented by incentives and enablers."

Regarding other innovative programs for the prevention and control of TB, the Advisory Council for the Elimination of Tuberculosis also recommends the screening of high-risk populations (homeless; AIDS; inmates) to detect patients who are infected and who could benefit from treatment to prevent infection from progressing to TB disease. A recent longitudinal study of a Directly-Observed Therapy (DOT) program in Baltimore analyzed the program's effectiveness over 11 years (Chaulk, et al, 1995). The study, which compared TB rates from Baltimore with five other cities with high TB case rates (Miami, San Francisco, Newark, Atlanta and Washington) found that Baltimore's program facilitated high treatment completion rates and evidence of cure. The study found a decrease in active TB cases for the period, compared with increases in the five other cities. The success of this community-based, DOT program is an encouraging sign in the treatment and control of TB. The Baltimore program continued through multiple periods of political change (i.e., the terms of three governors, three mayors, four city health commissioners) and substantial Federal cuts in TB control.

Tuberculosis - Issues of Reporting and Compliance: New Jersey

The New Jersey State Department of Health has received a $6.6 million grant ($2.2 million annually for three years) to operate the New Jersey Medical School National Tuberculosis Center in Newark. The Center is a joint project of the medical school, UMDNJ-University Hospital and the New Jersey Department of Health. It is one of three model TB prevention, control and education centers in the country supported by the Centers for Disease Control. The goals of the Center are to curb the disease through diagnostic, treatment and prevention programs, such as Directly-Observed Therapy (DOT); to develop and apply new treatments through research and clinical drug trials, and to serve as an educational resource to healthcare professionals. The Medical School has long been involved in TB treatment and research and has had success with innovative programs such as its outreach program, which tracks down TB patients in their homes and on the streets, to ensure they take their medications.

According to New Jersey's *Healthy New Jersey 2000 Update*, the state is developing and implementing TB education and training programs for health care workers; policies for TB control in correctional facilities and Directly Observed Therapy and management programs. The Update recommends support for operational research to evaluate the most cost-effective and cost-efficient intervention strategies for controlling TB, including the development of a total management information system for TB, with access by provider of care (*Healthy New Jersey 2000 Update*, 1996).

Under the New Jersey Administrative Code at *N.J.A.C.* 8:57-1, Tuberculosis is a reportable disease in all health and medical care settings, such as hospitals, clinics, physician's offices and laboratories. A 1992 CDC review of state laws governing TB control found that 43 states provided for the quarantine of TB patients within their own homes, with 35 specifying that quarantine last until the person was no longer infectious (Bayer & Dupuis, 1995). Forty-two states allowed the commitment of TB patients to treatment facilities and 24 permitted such confinement until the person no longer posed a health threat to others.

At *N.J.A.C.* 8:57-5, the Department of Health re-proposed new rules in October 1995 regarding the detention of non-compliant persons with tuberculosis. Local health officers and health care providers who treat TB will have additional reporting requirements under these rules. Physicians are required to monitor patient appointment-keeping behavior, take various steps to enforce compliance with prescribed treatment regimens and contact the Department of Health and/or local health authorities with known or suspected cases of active TB.

In its responses to public comment which necessitated the re-proposal of the rules, the Department stated that the key to compliance in building a treatment system for TB

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patients is to meet the individualized needs of many different patients. A system of this type requires maximum flexibility and responsiveness. The Division of Epidemiology advocates a team approach consisting of physicians, nurses, social workers and community outreach coordinated through a designated case manager. The Department's views on involuntary detention of non-compliant TB patients reflect that : "[I]nvoluntary detention and confinement have been narrowly circumscribed only for those patients who demonstrate a documented inability or unwillingness to complete their treatment through any other means" (27 *N.J.R.*3657). In its proposed rules, due process rights of these individuals are ensured. The proposed new rules are in response to the state's "attempting to strike a balance between [its] public health responsibility to control TB and to prevent its transmission, and the individual's right to freedom."

TICK-BORNE DISEASES

Ongoing research in the area of tick-borne infectious diseases is indicating the emergence of various infections, such as Lyme disease, ehrlichiosis and babesiosis. Lyme disease, which is transmitted by deer ticks, is now identified as the most common vector-borne disease[3] in the U.S. (National Health Policy Forum, June 1996). The identification of Lyme disease and the determination of its etiology was a coordinated effort among state and local surveillance actions to gather data and evidence about the disease and Federal support and research to discover its treatment. The Centers for Disease Control currently receives reports of 10,000 to 14,000 cases annually, and New Jersey is now surpassing Connecticut and New York in the number of reported cases. While funding and research for TB diagnosis, control and treatment have been re-established, the same is not true for Lyme disease. Funding and support for Lyme continue to be at lower rates than are necessary to launch a "full-scale" aggressive campaign against the disease. How does the public health system in New Jersey respond to a crisis like Lyme disease, when it is confronted by such "larger" public health problems as cancer, AIDS, heart disease and high rates of infant mortality?

Lyme disease is a multi-system inflammatory disease, which has progressive stages. It was first recognized approximately 20 years ago, when a clustering of rheumatoid arthritis-like cases among children in Old Lyme, Connecticut, was identified. Initially, it appeared that the source of the illness was unique to the town of Old Lyme. But within a few years, it became clear that people throughout the northeastern United States were being affected, primarily those living in places where housing had come to be developed in previously forested areas (Henig, 1994). It took close to ten years to determine that the infection was caused by a spirochete -- a type of infectious microorganism -- and was carried by deer ticks. Humans acquire the spirochete through the bite of freckle-sized ticks. These ticks and rodents -- usually white-footed mice, which pass the infection to feeding ticks -- are required to maintain the spirochete that causes Lyme disease in the natural environment. A regimen of antibiotics has been found to be most effective in the treatment of Lyme diseases, and work continues on the development of a vaccine.

The symptoms of the progressive stages of Lyme disease can range from mild to severely debilitating, depending upon the course of the disease and the stage when antibiotic treatments are initiated. The associated symptoms of Stage I, which occurs between one day and one month after a tick bite, are: fever, fatigue, malaise, stiff

Lyme Disease - A Family's Dilemma

Two years ago, A. and her husband and two children moved from Linden to a suburban home nestled on two acres in Belle Mead. Their first spring and summer at the house she was involved in a great deal of yard work. She and her husband were very concerned about ticks and the family did "tick checks every time the children had been playing out in the back yard. Although there were some close calls, neither child had been bitten by a tick.

During the past six months, A. has been feeling joint pain, muscle aches, headaches and extreme fatigue. She really began to worry when she could barely hold the steering wheel driving back home from work. Prior to that time, she had been a physically active 40-year-old working mother of two. Three months ago, her physician began testing for various illnesses; a blood test was negative for Lyme disease. He prescribed a 4-week course of antibiotic and warned her that she was going to "feel worse" before she felt better. He was also conducting diagnostic blood and urine tests during this period. A. did feel worse before she felt better; in fact, she did not feel better at all. She began having cog - nitive difficulties, could not concentrate and was extremely irritable. Her physician is now recommending intravenous antibiotic therapy. Yesterday, her supervisor called A. in to review her absenteeism during the past year and advised that it was not boding well for her continued position in the company. If she loses her job, she loses the family health insurance, because her husband is employed by a small business which does not carry him under its program.

[3] Deer ticks are the "vector" for the transmission of Lyme disease in that through ticks, humans are infected by the infectious microorganism which cause Lyme.

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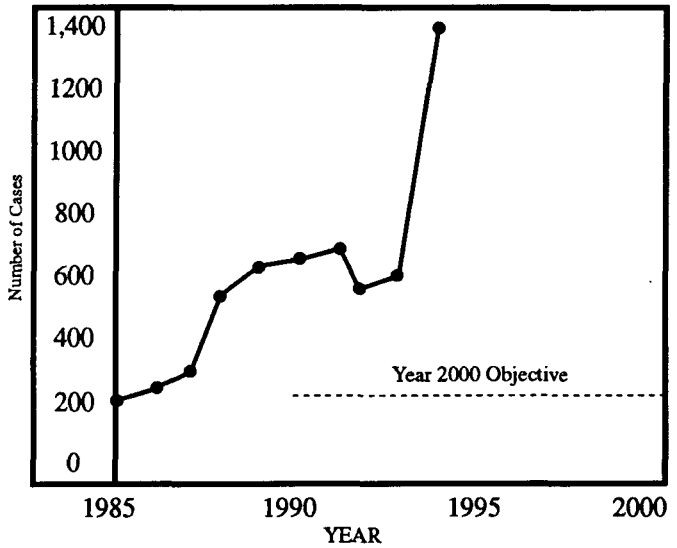
neck and sore muscles. Stage II usually occurs two to three months after the initial infection and includes cardiac and/or neurologic disease. Stage III, which may occur years after the initial infection and my occur in the absence of any preceding history suggestive of Lyme disease, includes arthritis and/or chronic neurologic manifestations, such as sensitivity to light, headache, extreme fatigue, difficulty in concentration, and emotional irritability (Sigal, 1990). Many Lyme cases are further complicated by misdiagnosis and inconclusive laboratory blood test results, leaving the patient feeling even more hopeless in the absence of a definitive diagnosis and appropriate treatment plan. Individuals afflicted with Lyme disease are also grappling with the emerging trend among insurers who are scrutinizing reimbursement levels for medical procedures and treatments, especially those that are long-term, which is often the case with antibiotic therapy for Lyme disease treatment.

What are some of the causal factors associated with Lyme disease and why has it emerged at this time? The ecological changes that occur with land development put people in closer contact with microbes from which they were previously insulated. For example, changing land use patterns in the Northeast are favorable to deer -- new housing brings deer into the backyards of suburbanites -- and deer ticks are conjectured to be the primary reason for the emergence of Lyme disease (National Health Policy Forum, 1996). This trend, together with hunting restrictions, has caused a boom in the deer population, which has sustained an increased population of deer ticks.

As required under *N.J.A.C.* 8:57-1, Lyme disease is a reportable disease in the state. In New Jersey, between 1988 and 1994, the incidence of Lyme disease (with rash) has increased from 530 to 1,306 cases, up over 240 percent.

LYME DISEASE (WITH RASH)
NEW JERSEY, 1985-1994 AND YEAR 2000 OBJECTIVE



Source: New Jersey Department of Health - 1996
Division of Epidemiology, Environmental and Occupational Health Services

The state's Year 2000 objective for the annual Lyme Disease incidence is set at 275. The Department of Health reports that meeting this goal is unlikely, "without the resources to deal with this problem more aggressively" (*Healthy People 2000 Update*, 1996). New Jersey's infectious control division receives funding from the Federal Centers for Disease Control for Lyme disease. Over the past five years, this grant has been approximately $125,000, which is channeled to programs at the county level. Funding from the state of New Jersey supports staff and administrative expenses, such as the costs associated with the publication of Lyme disease information brochures.

The Department reports in its 1996 *Healthy New Jersey 2000 Update* that current strategies for Lyme disease include active research to identify the most cost-effective strategies for dealing with the vector tick population that carries the disease and direct work with affected communities to assist them with designing specific management strategies. Educational programs emphasizing prevention through personal protection are recommended for addressing the problems of Lyme disease. Public health education campaigns are critical in the prevention of Lyme disease as there is no safe, effective and practical method of large-scale tick control. Research is a key component of addressing the Lyme disease problem, as there currently are not available highly specific and sensitive diagnostic tests for the illness.

Surveillance and Reporting

At the annual New Jersey Public Health Association conference in May 1996, the New Jersey Department of Health reported on its objective to develop an epidemiologic database to study Lyme disease trends in New Jersey. From January through December 1995, 273 physicians from 6 counties were randomly selected and enlisted to report new diagnoses of Lyme disease. Results indicated that a total of 114 physicians (41 percent) reported 537 cases of Lyme disease. Of that total, 65 percent met the CDC case definition of Lyme disease. The Department noted that because only 41 percent of the physicians reported a case of Lyme disease in 1995, it may demonstrate that significant differences exist among participating physicians with regard to recognition and diagnosis of Lyme disease. An additional curious trend is that only two of every three cases of Lyme disease diagnosed in New Jersey fit the CDC's case definition (which sets the specific technical blood analysis parameters in order to make a Lyme diagnosis); further research is being conducted throughout 1996 on Lyme disease trends in the state in order to unravel the complicated epidemiologic, diagnosis and treatment problems associated with Lyme.

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In June 1995, the New Jersey Department of Health made ehrlichiosis a reportable disease in the state, and active surveillance has been initiated. The disease, which is characterized by high fever, malaise, muscle pain, headache, nausea and other symptoms, is treatable by antibiotics. It is thought to be transmitted by tick bites, including dog and deer ticks. Two human tick-borne diseases caused by Ehrlichia are human granulocytic ehrlichiosis (HGE) and human monocytic ehrlichiosis (HME), which have been recognized in the U.S. since 1986.

Through its active surveillance efforts, the Department has identified at least 7 confirmed and 14 probable cases of ehrlichiosis in Atlantic, Ocean, Cape May, Essex, Burlington, Camden, Middlesex, Monmouth, Morris and Salem counties (Department of Health surveillance letter, April 1, 1996). The Department is in the process of continuing to define incidence, geographical distribution and clinical spectrum of the disease. A recent piece in *The New England Journal of Medicine* - "Ehrlichiosis -- In Pursuit of an Emerging Infection" -- cautioned about the increase of ehrlichiosis in the mid-Atlantic states and stressed the critical need for rigorous research for diagnosis and treatment of the disease, which has a fatality rate of 5 percent (January 1996).

THE URBAN-SUBURBAN CONNECTION

The outward suburban migrations from the central cities left behind poverty, social disintegration and extreme consequences for public health and order (Wallace, 1993). Three-quarters of the American population resides in a series of extended "urban-suburban complexes", which were created in the period of rapid suburbanization after World War II. By the mid-1980s, inner-city minority neighborhoods like Central Harlem were experiencing raised levels of contagious and chronic disease, substance abuse and violence, leading to life expectancies for adult males lower than those in Bangladesh (McCord and Freeman, 1990). Urban areas such as Central Harlem, Newark and south-central Los Angeles became "incubators" for contagious diseases, such as TB, which had been declining since the mid-1940s in this country.

There is more compelling evidence that shows that infectious diseases, new and old, cannot be left behind in the cities, keeping the suburbs invulnerable. Research on medical geography indicates that suburban isolation is "fragile", even if there is not forced displacement of populations from inner-city neighborhoods into adjacent suburbs (Gould, 1993). This is particularly true for infections like HIV or multiple drug-resistant TB. Challenges to public health in the suburbs will increase, as urban public health issues have reached a critical stage. Historically, great improvement in "the public health" was achieved in the population of the U.S. through an integrated series of programs, initiatives and policies that improved both living and working conditions in urban areas. Now, the political fragmentation, as well as de-centralized programs and funding sources, complicate the type of coordinated solution these public health and social problems demand.

CONCLUSION

In the sphere of public health, the goals of coordination among programs and equity in funding are complicated by several factors, which include multiple levels of administration and multiple, often co-mingled funding streams. The structure of New Jersey's decentralized public health system - - with 115 local health departments -- effects a wide range of variability in the types of services provided by the departments. The state plans to "re-structure" its public health system within the context of a dynamically changing health care delivery and financing system, which include managed health plans in both the public and private sector and new opportunities to explore public-private partnerships. This re-structuring requires sophisticated coordination and cooperation among all entities involved in order to meet the stated goals of public health and come closer to our Healthy New Jersey 2000 health status objectives. Our challenge continues to be one of meeting the primary public health goal to protect and promote the health of the public at a time when competition for public health funding and resources is strong and, as John Donne reminds us, our health remains more vulnerable than ever.

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HIGHLIGHTS FROM THE ISSUE BRIEF PUBLIC HEALTH I & II

TUBERCULOSIS

• Recent studies have indicated that Directly-Observable Therapy, which requires extensive coordination between outpatient health care providers and outreach workers, can significantly decrease the number of TB cases in the population and reduce the risk of developing multiple drug-resistant TB. What is New Jersey's commitment to provide consistent funding and resources to develop and maintain these programs?

• Several states have found success in establishing school-based health clinics in order to monitor children and adolescents and to provide the appropriate screening tests. Where does New Jersey stand on establishing school-based programs that offer coordinated services such as annual TB skin tests?

• As the CDC has reported, the highest rates of TB in New Jersey are in the counties which are the closest to New York City, which is experiencing a significant public health crisis in cases of TB and multi-drug resistant TB. Is any cooperation among inter-state health departments planned in order to develop coordinated programs for TB control?

• Environmental control of TB can be effected by various technologies, including air filtration, improved ventilation of buildings and the use of ultra-violet light. The cities of Los Angeles and New York, with the support of local utility companies, have been installing UV lights near the ceilings of homeless shelters; UV light is known to have a deleterious effect on the TB bacillus. Ongoing research is indicating that there are fewer cases of TB in the shelters equipped with UV light, when compared to those that are not. Is New Jersey receptive to experimenting with such public-private partnerships in innovative ways to control TB?

• Hospitals, long-term-care facilities and prisons are "high-risk" places for the transmission of TB; often buildings do not have sophisticated air filtration or ventilation systems. The risks continue to increase that someone entering the hospital for routine gall bladder surgery may contract TB, especially if that individual is elderly or immune-suppressed. Does government have a role in establishing more stringent air filtration and ventilation system standards in these facilities?

• In April of 1994, a passenger with infectious multiple drug-resistant tuberculosis traveled on a commercial airline flight across the country (*New England Journal of Medicine*, April 11, 1996). A research study found evidence that transmission of MDR-TB from passenger to passenger and from passenger to flight crew was possible aboard a commercial airliner. While the CDC has now developed suggested criteria and procedures for notifying passengers and flight crews after exposure to TB, how is New Jersey equipped to handle such notification to residents of the state, where major air travel takes place on a daily basis?

LYME DISEASE

• Controversy surrounds the potentially costly antibiotic treatments being prescribed for individuals with Lyme disease. One issue in particular is whether or not to prescribe antibiotics for an individual who tests positive for Lyme via a blood test, but is asymptomatic. In this time of limited funds and the managing of health care to avoid "inappropriate" treatments, what is the role of the Departments of Health and Insurance regarding treatment of Lyme?

• The emergence of new tick-borne diseases, such as ehrlichiosis, continues in New Jersey. What is the state's commitment to provide funding and support in order to conduct research and surveillance of these "new" diseases that are affecting its residents?

• Should there be a specific line-item for Lyme disease in the budget for infectious diseases, as there is for TB control and AIDS, given that the disease, which can be physically devastating, is epidemic in the state?

EMERGING AND RE-EMERGING DISEASES

• The New Jersey State Department of Health has as one of its goals the establishment of an electronic information system for data collection in each county. How will this system improve that surveillance and monitoring of diseases such as Lyme and TB?

• How can public-private partnerships be utilized to enhance the technical capacity of New Jersey's state laboratories, which are a valuable resource in the state's research of infectious and communicable diseases?

• According to a National Health Policy Forum Issue Brief, it is conjectured that some states are reluctant to mandate the reporting of newly recognized diseases because budgets and staffing limit their capacity for surveillance, either active or passive, and response. What are the potential prices to be paid if we do not support our surveillance capacity in New Jersey to monitor and respond to public health emergencies, like an E. Coli outbreak in an amusement park?

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• Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, speaking last month at a conference on new and re-emerging diseases, stressed that a strong commitment to basic and clinical research is critical to our preparedness for monitoring and controlling these diseases? What is New Jersey's commitment of funding and resources to state and local health departments for research and effective surveillance of infectious diseases? How much reliance can be kept on Federal funding for these activities?

• A recent Gallup poll found that 60 percent of patients use antibiotics inappropriately. For example, physicians are often pressured to prescribe antibiotics for the flu or colds, even though antibiotics have no effect on viruses. Such inappropriate usage may contribute to drug resistance on the part of the microbes, which have the ability to mutate to resist available drugs. What kind of public education campaign could be designed to educate patients and physicians about the risks associated with such practices?

PUBLIC HEALTH I

Organization and Funding

• Public health means many things to different people; how can a cohesive identity for public health be created so as to ensure adequate funding and resource allocation? Is the vision for public health in New Jersey one framed by a population-based model focused on providing core public health functions to the community, a direct services model, or a combination of both?

• The Department of Health at the state level is developing a public health infrastructure in the state to most effectively serve its constituents. How will the state handle the delicate task of "re-organizing" its de-centralized public health activities without alienating its local public health organizations which are critical in delivering community services?

• Managed care organizations are rapidly becoming major players in New Jersey's health care delivery system. How will New Jersey strategize working cooperatively with managed care organizations to effect public health activities in the state?

• In our evolving health care system, if New Jersey's public health officials decide to focus on population-based public health core function activities, and shift the provision of direct delivery services to managed care organizations and private health facilities, how will funding support be continued? In the current environment, much funding comes from Federal and state sources to support the provision of direct services. Will traditional funding sources continue to be supportive?

• What is the role of other executive departments within state government, such as the Departments of Insurance, Human Services, Environmental Protection and Community Affairs, in the evolving public health system?

AT-RISK GROUPS

• In a recent piece in The Milbank Quarterly, social researchers discuss the coming crisis of public health in the suburbs as a result of the deterioration of urban public health. By analyzing the social and health problems in neighborhoods such as the South Bronx and the central ward of Newark, they stress that the increase in communicable and infectious diseases in these communities are not only "inner-city" problems, but suburban problems as well, because of the likely diffusion of contagious diseases from inner city to suburbs. Only through an integrated system of initiatives, programs and policies can living and working conditions in urban areas be improved. What is New Jersey's commitment to funding such public health initiatives in inner cities, so as to enhance the quality of life for all of its citizens?

• All too often in the history of public health, political exigencies and interference have driven public health decision-making and strategies, often delaying actions which created serious health consequences. For example, the Federal government refused to act on urgings by the Centers for Disease Control in the early 1980s to act rapidly to deal with an emerging disease now known as AIDS. Such hesitancy, based on political conservatism, led to loss of lives and trust in the nation's blood supply. How do we in New Jersey guard against public health decisions being compromised by political agendas? How do we regain the loss of trust that the public holds in government to protect and ensure its health?

• In its report on the future of public health, the Institute of Medicine highlighted the weaknesses in public health activities concerning environmental health, mental health and the care of the indigent. Many states continue to administratively and programmatically isolate these services from general public health, creating fragmentation in services, policy development and fiscal accountability. The report calls on involvement at all governmental levels - national, state and local - to integrate services to these traditionally "isolated" population needs. What are New Jersey's plans in developing a public health infrastructure to integrate services to these populations?

• Across the country, states are challenged by the issue of whether or not to provide health care services for their "illegal alien" populations. While short-term savings may be accomplished by denying health services, such as immunizations, to this population, the long-term consequences, such as the re-emergence of infectious diseases

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such as TB, will have considerably more significant health and monetary impacts. Where does New Jersey stand on such complex public health issues?

RESEARCH

• Disease surveillance is the basic public health strategy against infection. The activity of surveillance is a significantly labor-intensive and costly. As a result, most state and local public health agencies rely primarily on passive surveillance, depending on reports from physicians, community providers, hospitals, laboratories and other health care facilities. Infectious disease reporting is decentralized, diffuse and largely discretionary. The states are left on their own in paying for surveillance of other diseases. As a result, there are major deficiencies in the surveillance infrastructure. For example, 24 states had fewer than one staff person performing surveillance of food and waterborne disease per million citizens. Yet, there is growing evidence that public water supply infrastructure is deteriorating and that we are importing more foreign-produced foods, which is posing new threats. At the recent annual conference of the New Jersey Public Health Association, a paper was presented which identified weaknesses in surveillance capacity in New Jersey and point out that while the current infectious disease surveillance system is focused on known identified diseases, it is unprepared to identify and respond to emerging infections, similar to Hantavirus. What resources do New Jersey's state and local health departments have for effective surveillance of infectious diseases in New Jersey? Can continued reliance be kept on federal funds?

• The questions of data collection and the development of accurate, current and comprehensive health information databases are critical in the formulation of public health policy. Projects such as the birth certificate registry, the statewide immunization database and the cancer registry require consistent support, both fiscal and technical. How will New Jersey ensure continued support for these projects, which are so sensitive to changing political climates?

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APPENDIX

Active Tuberculosis 1986-1995

Cases/Case Rate* for Major Citites in New Jersey

City	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986
Atlantic City	8/21.9	15/39.9	15/39.9	15/39.9	7/18.4	14/36.9	14/40.5	12/34.2	20/56.3	11/30.3
Camden	10/12.1	11/12.4	20/22.6	15/17.0	15/17.1	12/13.7	16/19.5	18/22.0	10/12.2	6/8.4
Clifton	2/2.7	2/2.9	3/4.3	8/11.4	7/9.8	7/9.7	6/7.8	4/5.2	4/5.2	7/9.1
East Orange	31/42.6	18/24.7	23/31.6	22/30.2	39/53.0	29/39.4	34/44.0	20/25.9	21/27.1	17/21.9
Edison	19/21.0	5/5.7	12/13.6	9/10.2	6/6.8	11/12.7	5/5.8	10/11.7	7/8.3	5/6.1
Elizabeth	28/26.3	19/17.0	18/16.1	26/23.3	14/12.6	28/25.5	32/30.5	29/27.5	33/30.9	36/32.6
Irvington	35/57.6	34/55.7	18/29.5	20/32.8	29/47.5	15/24.6	23/37.5	13/21.0	24/38.3	12/19.0
Jersey City	76/33.6	74/32.2	92/40.0	108/46.9	84/36.6	74/32.4	71/32.7	67/30.9	69/29.4	74/33.7
Newark	149/57.6	164/60.5	161/59.4	185/68.3	196/71.8	188/68.4	208/66.4	154/49.0	124/39.5	119/37.0
New Brunswick	5/12.1	6/14.0	4/9.3	5/11.6	11/26.0	3/7.1	6/15.2	13/32.5	8/20.2	4/10.0
Orange	14/48.7	14/47.1	11/37.0	18/60.6	9/30.1	9/30.1	13/41.3	14/44.3	9/28.2	6/28.1
Passiac	10/17.8	16/27.1	18/30.5	25/42.4	18/31.0	23/39.6	15/28.2	15/21.1	11/20.4	16/29.6
Paterson	43/31.1	90/63.1	85/59.6	95/66.6	69/48.7	81/57.5	73/52.5	81/58.0	54/38.7	53/38.5
Plainfield	10/22.3	11/23.9	4/8.7	3/6.5	10/21.5	8/17.2	10/22.4	4/8.9	5/10.9	6/13.0
Trenton	21/24.9	13/14.9	25/28.7	13/14.9	20/22.5	20/22.3	27/30.0	20/22.0	24/26.4	29/31.6
Union City	12/21.3	9/15.3	14/23.8	11/18.7	13/22.2	10/17.2	13/24.4	10/18.2	5/8.9	6/10.7
Union	2/3.9	4/8.2	5/10.2	3/6.1	7/14.1	4/8.0	7/13.7	5/9.7	3/5.9	6/11.8
Vineland	2/3.7	4/7.2	1/1.8	5/9.1	2/3.6	3/5.4	11/20.1	4/7.3	9/16.1	8/14.3
Woodbridge	7/7.4	6/6.4	6/6.4	7/7.5	8/8.5	10/10.7	6/6.4	8/8.5	7/7.4	2/2.1

*Rate Per 100,000 Population

Source: New Jersey Department of Health 1996

Active Tuberculosis-New Jersey 1986-1995

Counties Cases/Case Rate*

County	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986
Atlantic	24/10.3	19/8.4	25/11.0	25/11.0	16/7.1	25/11.1	31/14.5	20/9.5	28/14.0	22/10.5
Bergen	37/4.4	49/5.9	56/6.7	58/6.9	54/6.6	66/8.0	43/5.2	42/5.0	38/4.5	42/5.0
Burlington	14/3.5	9/2.2	14/3.4	13/3.2	22/5.0	17/4.3	8/2.0	19/4.8	13/3.3	10/2.6
Camden	15/3.0	21/4.1	31/6.1	35/6.9	34/6.7	26/5.6	30/6.0	37/7.4	27/5.5	18/3.7
Cape May	3/3.1	1/1.0	5/5.2	9/9.3	3/2.9	17/17.0	10/10.4	9/9.4	6/6.4	11/12.0
Cumberland	7/5.1	9/6.5	5/3.6	8/5.8	4/2.9	6/4.3	20/14.4	7/5.1	10/7.3	11/8.1
Essex	251/33.1	257/37.4	23634.3	268/34.9	300/38.6	259/33.3	298/35.6	220/26.0	197/23.4	163/19.2
Gloucester	7/2.9	10/4.3	11/4.7	8/3.4	7/3.0	8/3.5	8/3.6	5/2.3	6/2.8	5/2.4
Hudson	127/23.1	121/21.9	137/24.8	156/28.2	134/24.2	108/19.5	114/21.1	99/18.3	92/16.7	111/20.0
Hunterdon	2/1.7	1/0.9	1/0.9	1/0.9	4/3.6	4/3.7	5/5.0	1/1.0	6/6.1	5/5.3
Mercer	30/9.1	24/7.4	27/8.3	13/4.0	27/8.3	25/7.7	36/10.8	24/7.2	30/9.2	32/9.9
Middlesex	64/9.2	39/5.7	63/9.2	50/7.3	62/9.1	57/8.5	47/7.2	68/10.3	55/8.5	38/5.9
Monmouth	27/4.6	27/4.9	34/6.2	28/5.1	35/6.3	33/6.0	41/7.3	20/3.5	43/7.8	27/5.0
Morris	16/3.6	23/4.9	15/3.2	24/5.7	17/4.0	25/5.9	15/3.6	11/2.6	18/4.3	8/1.9
Ocean	20/4.3	11/2.5	12/2.7	13/2.9	14/3.2	25/5.8	19/4.6	12/2.9	11/2.7	23/5.9
Passaic	64/13.8	114/25.1	112/24.7	137/30.2	100/22.0	120/26.5	103/22.2	108/23.2	71/15.3	83/17.8
Salem	2/3.1	1/1.6	4/6.2	2/3.1	4/6.1	4/6.1	1/1.5	1/1.5	3/4.5	4/6.0
Somerset	17/6.4	15/6.2	10/4.1	11/4.5	13/5.4	13/5.4	9/3.9	5/2.2	7/3.2	8/3.7
Sussex	0	2/1.9	10/9.5	2/1.5	2/1.5	6/4.6	5/3.9	8/6.4	2/1.6	4/3.3
Union	63/12.7	57/11.7	43/8.8	51/10.4	53/10.8	58/11.7	62/12.4	62/12.4	58/11.5	70/13.8
Warren	1/1.0	3/3.3	2/2.2	5/5.4	4/4.3	1/2.1	0/0	2/2.2	2/2.2	1/1.1
State at Large	57	42	59	67	74	67	44	13	25	29
New Jersey Total	848/10.7	855/11.0	912/11.7	984/12.6	983/12.7	970/12.5	949/12.3	793/10.3	748/9.7	724/9.5

*Cases Per 100,000 Population (NJ Pop.=7,945,298)

Source: New Jersey Department of Health 1996

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