The Immunization Action Coalition presents . . .

Unprotected People
Volume II (Stories #11-20)

Stories of people who died or suffered from vaccine-preventable diseases

About the "Unprotected People" series: The Immunization Action Coalition (IAC) has published these stories for the purpose of making them available for our readers' review. We have not verified each story's content, for which the author is solely responsible. The views reflected in these stories are those of the writers and do not necessarily reflect the position of IAC.

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Unprotected People #11
Measles

Measles outbreak associated with an unvaccinated population

Although the information in the article entitled, "An Outbreak of Measles Associated with an Unvaccinated Population," is two years old, it highlights the timeless fact that members of unvaccinated communities, such as the religious community in which this outbreak occurred, continue to be victims of vaccine-preventable diseases.

This Minnesota story on a measles outbreak appeared in the February/March 1996 issue of the Minnesota Department of Health's Disease Control Newsletter. Shortly after the outbreak, most of the unvaccinated children and young adults in this religious community consequently chose to receive two doses of MMR vaccine.

The "Outbreak Summary" section of the article is reprinted here in its entirety:

In early 1996, two measles cases were reported to the Minnesota Department of Health (MDH). After a major resurgence of measles both nationally and in Minnesota during 1988–1991, Minnesota had been measles-free since July 1992. During the course of the 1996 case investigations, additional cases that had gone undetected by the medical community were identified with rash onsets dating back to December 6, 1995. During this outbreak, 14 laboratory-confirmed cases and 13 probable cases were reported to MDH. Of the 27 cases, two were Wisconsin residents. The last known rash onset was January 29, 1996. The majority of cases (17; 63%) occurred in persons 20–29 years of age, three were over 30 years of age, six were 10–19 years of age, and one case was an 18-month-old child. All but one of the cases were associated with a religious community whose members live in the St. Paul area and operate a community school. It is not clear how the virus entered this community. Of the 25 Minnesota residents, 22 had not received vaccination against measles. One (an 18-month-old infant) had a documented history of receiving measles-mumps-rubella (MMR) vaccine; one (a 25-year-old) had a probable vaccination history; and for one (a 35-year-old), the vaccination history remains unknown.

Many of the children and young adults (70%) in the religious community had not been immunized before onset of this outbreak; most have since received two doses of MMR. Two of the laboratory-confirmed cases occurred outside the religious community in a 35-year-old receptionist at a medical clinic where one of the cases had been treated, and in a 44-year-old woman residing in Hennepin County. This second case had no apparent association or exposure to the religious community.
Child dies of varicella encephalitis

IAC EXPRESS received the following case report via e-mail from a Canadian physician describing the death of a 3½-year-old boy from varicella encephalitis. At the time of his death, a vaccine against varicella was not yet available in Canada.

The physician’s e-mail is reprinted as follows:

A 3½-year-old boy developed chickenpox April 5, 1998. His 7-year-old brother had it at the same time. The younger child had a mild case with relatively few lesions.

Four days before admission the 3½-year-old became sleepy and developed a headache. Two days later he developed increasing lethargy, vomiting, drowsiness and disorientation. He was taken to our community hospital on April 11. He had a lowered level of consciousness, responding slightly to pain. The next morning he had shaking movements, probably due to acute herniation of the brain due to swelling. He became comatose, was transferred to a major medical center, and pronounced brain dead on April 13. Life support was discontinued, and he died. The autopsy confirms a diagnosis of varicella encephalitis.

At the time of his illness, varicella vaccine was not available in British Columbia.

A footnote: the mother of this child was devastated by his death. She has refused to set foot in our hospital again because of the unbearable memories, and plans to deliver the child she is now carrying in another city.

Dr. Kirsten Emmott
Comox, British Columbia, Canada
Unprotected People #13
Hepatitis A

Virus saps grad in her peak weeks

The following article appeared in the daily newspaper, The Spokesman-Review, on June 7, 1998. It is reproduced with permission from The Spokesman-Review, (Spokane, WA) Copyright 1998. By Cynthia Taggart, staff writer.

Just thinking about how she got sick nauseates Allison Jester all over again.

"To know how I got it is just disgusting," the Lake City High senior says, cringing.

She's thin, hardly a presence inside jeans not designed to be baggy. She tires so quickly that her days are a series of naps. That's what hepatitis A does. It's cleaned Allison out and broken her down, scared everyone around her and changed her life. And she did nothing to cause it.

Sometime in March, food or water she ingested was contaminated with infected feces.

It could have happened in Seattle or Bellingham, where she was checking out colleges. It could have happened after golf team practices at any burger joint that offers immediate relief to gnawing stomachs.

It could have happened at a grocery store or even a friend's house. Allison will never know. By the time she was diagnosed three weeks ago, the virus had incubated inside her for two months. Tracking its origin was impossible.

When the virus reached maturity, it devoured Allison's liver like a starving lion.

As her senior year began to culminate in stage productions, golf championships, debate tournaments, academic projects and pre-graduation bonding parties, Allison fell ill.

It began with nausea, fever and aches, which Allison interpreted as the flu. She had a major role in the school production of "Noises Off" and willed herself to make it through rehearsals.

“I didn't want to give that part up,” she says.

She forced herself through school, although she fell asleep in the auditorium during a special activity. She was so sick that she had to quit a high school golf tournament after the fourth hole.

By the weekend, her stomach refused to hold anything. Her mother, Patti, began to suspect hepatitis after she noticed Allison’s urine was unnaturally dark.

Doctors didn't agree with Patti and gave Allison an anti-nausea shot. But Allison continued to vomit the rest of the day until dehydration became a worry.

“I felt like I was going to die,” she says. “I had never felt so sick.”

Her parents took her to Kootenai Medical Center's emergency room that night. Patti sensed her diagnosis was right when blood test results sent nurses scurrying to warn everyone about Allison's infected body fluids. Hepatitis A zeroes in on the liver, weakening it so much that it can't process medications.

There's no treatment. The virus has to run its course, which varies from weeks to months. Most people fully recover.

Ingesting fecal-contaminated food or water is the only way to catch the A virus, unlike the more dangerous but slightly less common hepatitis B virus. Hepatitis B most often is transmitted through sexual contact.

Food servers who don't wash their hands after using the bathroom spread hepatitis A. Unwashed shellfish from contaminated water can carry the virus. Drinking water contaminated with sewage is another way to catch it.

Hepatitis A is so common that 152,000 cases are reported in this country each year. Forty cases already have been reported to Panhandle Health District

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through May this year, which equals the total number of cases in North Idaho in 1997.

The number of hepatitis A victims is rising so fast that public health agencies have launched a national campaign promoting good hygiene—the best prevention.

Allison's parents, younger sister and uneasy friends got immune globulin shots to boost their immune systems. Some friends panicked and stayed away from Allison. She tried to explain that the virus isn't spread through casual contact.

Doctors prescribed rest. Allison quit the play and her two jobs. School moved to her home. More than anything else, she wanted to compete in a national debate tournament in St. Louis, MO, on June 14. She was one of four students from Spokane and North Idaho to qualify.

"I was willing to give up everything to do that," she says.

Changing her senior project to accommodate her illness broke Allison's heart. She'd planned to photograph herself on a difficult rock climb in Post Falls. But she was in the hospital the weekend she scheduled the climb.

"I'll do that climb this summer for sure," she says.

Her appetite and energy are growing. She still wilts quickly beyond her house, but mustered the strength to march in Saturday's graduation ceremony.

"We've lamented that she's not been able to enjoy the last few weeks of her senior year," says Patti, who, like Allison, doesn't waste energy stewing over the unfairness of it all. "This is a special time of her life."

Allison will go to the national debate tournament, perhaps a touch more philosophical than she was before her illness.

"The hardest part was realizing I couldn't do everything I wanted," she says. "But it's made me step back a little. The little things don't matter. Things come your way you don't expect. You just deal with it."

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Unprotected People #14

Rabies

Man with no history of a bat bite dies of rabies

An article entitled “Human Rabies—Virginia, 1998” was published in the February 12, 1999, issue of the Morbidity and Mortality Weekly Report (MMWR). The article is a case report of a 29-year-old incarcerated man who did not have a definitive history of an animal bite was eventually diagnosed with rabies and subsequently died.

The “Editorial Note” states: “Since 1990, 27 human rabies cases have occurred in the United States (an average of three cases per year). Although 20 (74%) have been attributed to bat-associated variants of the rabies virus, a definitive history of a bat bite was established for only one of these cases.”

The “Editorial Note” further states that “medical personnel should consider rabies as a diagnosis in any case presenting with the acute onset and rapid progression of compatible neurologic signs, regardless of whether the patient reports a history of an animal bite. Although early diagnosis cannot save the patient, it may help minimize the number of potential exposures and the need for postexposure prophylaxis.

The full article is reprinted below:

**Human Rabies— Virginia, 1998**

On December 31, 1998, a 29-year-old man in Richmond, Virginia, died from rabies encephalitis caused by a rabies virus variant associated with insectivorous bats. This report summarizes the clinical and epidemiologic investigations by the Virginia Department of Health and CDC.

On December 14, 1998, an inmate at the Nottoway Correctional Center in Nottoway County, Virginia, developed malaise and back pain while working on a roadside clean-up crew. He sought medical care at the prison on December 15, complaining of muscle pains, vomiting, and abdominal cramps, and was treated with acetaminophen. His clinical signs progressed to include persistent right wrist pain, muscle tremors in his right arm, and difficulty walking. On December 18, the patient was sent to a Richmond emergency department, where he had a temperature of 103°F (39.4°C). He initially was alert and oriented but had visual hallucinations. During the next 12 hours, he became increasingly agitated and less oriented. Physical examination revealed anisocoria, increased tone in the right forearm, and hyperesthesia over the entire right side of the body. Intoxication with anticholinergic agents such as pesticides or Jimson weed was considered; however, toxicology studies were negative.

The patient’s condition worsened, with hypersalivation, priapism, and wide fluctuations in body temperature and blood pressure. He was intubated and heavily sedated on December 20. Laboratory findings included a white blood cell count of 20,800/μL (normal: 3700–9400/μL), myoglobinuria, and a compensated metabolic anion gap acidosis with renal insufficiency. Peak creatine phosphokinase levels were 130,900 U/L (normal: 50–450 U/L), indicating rhabdomyolysis. Analysis of cerebrospinal fluid (CSF) showed a white blood cell count of 57/μL (normal: 0–5/μL), protein levels of 128 mg/dL (normal: 12–60 mg/dL), and glucose levels of 46 mg/dL (normal: at least two thirds of a concurrent serum glucose value, which was approximately 136 mg/dL). A computed tomography scan of the patient’s head revealed no abnormal findings.

A diagnosis of rabies was first considered by the patient’s physician on December 20. Samples sent to CDC for testing on December 21 included a nuchal skin biopsy, which tested positive for rabies virus by direct fluorescent antibody test on December 22, and saliva and skin, which were positive by reverse-transcriptase polymerase chain reaction (RT-PCR) assay on December 23. The sequence of the amplified RT-PCR product showed greater than 99.7% DNA homology to a rabies virus variant associated with eastern pipistrelle bats (Pipistrellus subflavus) and silver-haired bats (Lasionycteris noctivagans). Serum and CSF samples obtained December 21 contained rabies virus neutralizing antibody titers of 1:50 and 1:36, respectively, by rapid fluorescent focus inhibition test (RFFIT). A serum sample obtained December 28 showed a

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rabies virus neutralizing antibody titer of 1:1200 by RFFIT. After the removal of all sedatives, the patient showed no purposeful movement and loss of brainstem reflexes. He died December 31.

Postexposure prophylaxis (PEP) was administered to 48 persons who possibly had contact with the patient's saliva between December 4 (10 days preceding the first clinical signs of illness) and death. Of the 48, 29 were prison inmates who reported possible contact with the patient's saliva, either while caring for him during his illness or through shared cigarettes or drinking and eating utensils. Three family members who visited the patient at the prison on December 6, 15 health-care providers, and the pathologist who conducted the autopsy also received PEP.

Family members, friends, and prison staff reported the patient had not indicated any contact with or bite from an animal in recent months, and prison medical records did not document evidence of a bite or scratch. The patient lived at a work center that housed up to 160 inmates in two separate dormitories. He had worked around the prison on a farm repairing fence lines and feeding cattle, in a paper recycling facility, and along roadways cleaning up trash and debris. No evidence of bats was found within the prison or on prison grounds, although inmates reported occasionally seeing bats flying near the outdoor lights in the summer. Several stray cats were reported to occasionally approach inmates at the facility; however, the patient was not known to have handled them.

The patient had been incarcerated at Nottoway for approximately 6 weeks after transfer from another correctional unit. At the other correctional facility, the patient worked inside the prison and on a road crew cutting brush and picking up trash along highways. No evidence of bats was found in the prison, and inmates reported that they had never seen bats inside the facility. Prison staff and inmates reported that they did not recall the patient ever being bitten by an animal while working, and that he usually did not handle small animals found by the road crews.

**Editorial Note:** This report describes the only case of human rabies diagnosed in the United States during 1998 and the first case in Virginia since 1953. A definitive history of an animal bite could not be established for this patient, and the most likely explanation is an unrecognized bat bite occurring either at the farm or recycling facility or while the patient was working on a road crew. Because the incubation period for rabies varies from several weeks to several months, he may have contracted rabies before his transfer to Nottoway.

Since 1990, 27 human rabies cases have occurred in the United States (an average of three cases per year). Although 20 (74%) have been attributed to bat-associated variants of the rabies virus, a definitive history of a bat bite was established for only one of these cases. Of the 20 attributed to bat-associated variants, 15 (75%) have been caused by the same eastern pipistrelle/silver-haired bat variant responsible for the death described in this report. Although bat-associated rabies virus variants theoretically can be secondarily transmitted from terrestrial mammals, an unrecognized bat bite is the most likely explanation for these cases.

The reasons for the preponderance of human rabies cases associated with the eastern pipistrelle/silver-haired bat variant remain speculative. Epidemiologic findings suggest that it can be transmitted following minor, undetected exposures. Insectivorous bats, such as those implicated in the human rabies deaths in the United States, have small teeth that may not cause an obvious wound in human skin. Accordingly, it is important to treat persons for rabies exposure when the possibility of a bat bite cannot be reasonably excluded. In all cases where bat-human contact has occurred, the bat should be collected and tested for rabies if possible. If the bat is not available for rabies testing, the need for PEP should be assessed by public health officials familiar with recent recommendations.

The total of 48 persons who received PEP after contact with the patient described in this report is similar to the mean of 49.8 persons who received PEP after exposures to human rabies cases during 1990–1997. Consideration of rabies before the patient's death may have minimized the number of hospital staff that received PEP in this case.

Although this patient did not exhibit classic hydrophobia, other typical clinical signs, such as hypersalivation, hallucinations, priapism, paresthesias, muscle spasms, and autonomic instability occurred. The use of sedatives may have masked hydrophobia in this patient. Medical personnel should consider rabies as a diagnosis in any case presenting with the acute onset and rapid progression of compatible neurologic signs, regardless of whether the patient reports a history of an animal bite. Although early diagnosis cannot save the patient, it may help minimize the number of potential exposures and the need for PEP.
In May 1998, IAC EXPRESS received an e-mail from a first-year Asian American medical student in which she shared the details of her mother’s sudden death from hepatitis B. The tragedy has motivated this student to educate herself and her family and other Asian Americans about the risks of this vaccine-preventable disease.

The student’s e-mail, reprinted with her permission, is as follows:

I recently suffered an immense loss. In the middle of January of this year, my mother experienced a sudden onset of peripheral edema and ascites. She tested negative for hepatitis B, but the doctors said that she had either liver cancer or severe cirrhosis. In the middle of February, a liver biopsy definitively diagnosed my mother as having hepatocellular carcinoma. This time, her hepatitis B serology came back positive, but her virus levels were low and nonreplicative. By the beginning of April, to the dismay of my family and all those who knew her, my mother fell into hepatorenal syndrome. She died while I was holding her days afterward, only two months after the diagnosis and one month after her intended early retirement.

Being a medical student, I could not help but feel helpless as I watched my mother slip away. What disturbed me even more was how unknowledgeable my cousins and I, all of whom are most likely infected with the same virus, were on the topic. I am writing to you today because I would like to stop feeling helpless. I would like to help educate my cousins, and other Asian Americans like us, of the risk that we face. Therefore, I would greatly appreciate it if you could inform me of the services that you provide, of the resources that you offer, and of the projects you plan. Please let me know how I can best join your effort, and how I can become actively involved with your organization. Thank you.

A First-Year Medical Student

Editor’s Note: The Coalition sent this student a packet of our hepatitis B educational materials and referred her to other national organizations that are involved in hepatitis B activities in Asian Pacific Islander American communities. The Coalition’s hepatitis B educational materials for providers and patients (some available in 16 languages) can be downloaded from our website at www.immunize.org
When I lost my mother to the disease of tetanus, I took it personally. I spent a year grieving about what I should have done differently so that she wouldn't have died. My thoughts were futile, but I had to reconcile myself somehow to her death.

In August 1996, my mother developed an infection in her big toe. The location was at the base of her toenail in the corner. This area was probably the site where tetanus got into her body. I learned later that a site could be as tiny as a thorn prick in the skin. Nevertheless, my mother often wore open-toed shoes, and the infected area must have become contaminated as she worked in her garden.

Tetanus thrives in compost and manure. My mother made compost from fruit and vegetable peelings, egg shells, etc. My husband and I raised farm animals and shared the resulting manure with Mom a couple of times. Hence, I feel some guilt because the manure that was to enrich her garden may have harmed her. Furthermore, she was the kind of person who used sterilized soil for her tomato seeds so they would have a disease-free start.

My mother told me that she was worried about the infected toe because it was deep purple. She said she washed it well after being in the garden, but wondered if she should get a shot. I explained that just the year before, I had cut my finger on a rusty piece of corrugated metal lodged at the end of a railroad tie. Ten years had passed since I had a tetanus shot, and I should have gone for a booster. The doctor was a half hour away, so I didn't go. Instead I looked up "tetanus" in an old 1950 medical book. The information indicated that once tetanus was contracted, symptoms would appear in 2 or 3 days to 2 or 3 weeks. I really worried during this period, was very vigilant for symptoms, but figured I probably wouldn't get tetanus. I knew I had taken a risk, and I tried to tell my mother it wasn't worth the worry I had gone through. As it turned out, she got busy and didn't go either.

Mom's infected toe healed perfectly, and she forgot about tetanus. When she began to feel poorly, she noticed a feeling in her throat. She described it as being like a sore throat, but different. She went to her neighborhood doctor whom she saw regularly and often. Her doctor did five tests. The results would be back in two days. Meanwhile, Mom went back home. That night she could barely swallow her blood pressure medicine. In the morning she called the doctor who then pushed for the test results. They were negative. The doctor questioned my mother further and told her to get an emergency appointment with a neurologist. The neurologist diagnosed the disease as tetanus and hospitalized her.

The next 10 days were a downward spiral. Mom developed double vision as the damaged nerves began to affect her voluntary muscles. At times her chest heaved in spasmodic waves as the muscles locked. The pain was worse than anything she'd ever experienced, even childbirth. When the pain medicines weren't adequate, the doctor paralyzed her to release her from the pain. Her kidneys failed. She suffered a heart attack and died.

The neighborhood doctor came to my mother's funeral. At communion time she stopped at our pew, held my father's hands in hers, and apologized. She said she never put 2 and 2 together until now. She never connected my mother's many gifts of garden vegetables with the potential for tetanus.

In looking back, I shudder to think of the years I went unprotected. No doctor offered me a booster for a period of 40 years. If people understood the horrific nature of the disease, many of them would ask a doctor to update them, as my family did within a month of my mother's death.

Signed,
A Loving Daughter
Unprotected People #17
Pneumococcal

Two deaths in a nursing home ignite pneumococcal vaccine campaign

Editor’s Note: Pneumococcal disease causes approximately 40,000 deaths, 500,000 cases of pneumonia, and 50,000 cases of bacteremia each year in the United States. A 1997 CDC survey indicated that only 45% of adults 65 years of age and older have received their recommended dose of pneumococcal vaccine (MMWR, October 2, 1998, vol. 47, no. 38).

The following article originally appeared in the Texas Department of Health’s newsletter, Accent on Health, on March 10, 1997, and was reprinted with permission in the Spring/Summer 1999 issue of NEEDLE TIPS.

According to Devora Goodnight, it wasn’t just luck that only two people died in a recent outbreak of deadly pneumococcal disease where she works at the Houston County Nursing Home in Crockett. What undoubtedly saved lives when the outbreak began was a combination of the nursing home staff’s recognizing the seriousness of the outbreak and their getting an immediate response from experts at the Texas Department of Health (TDH). But perhaps the most decisive single factor was the quick immunization of all potential patients with a vaccine which often is overlooked by physicians and patients alike.

After two patients died of streptococcal pneumonia infections and one other was stricken, Goodnight said, “We knew we had a situation that might cost many of our residents’ lives if it got further out of hand. We had never had anything like this happen before and didn’t even know what to expect if we called TDH for help. But we knew we would most likely lose more of our ‘family’ if we didn’t.”

At TDH’s Infectious Disease Control and Surveillance Division, epidemiologist Beverly Ray said that Goodnight and the home’s nursing director Debbie Hargrove showed “the highest standard of concern for their residents.”

Ray explained that although outbreaks of pneumococcal disease caused by the Streptococcus pneumoniae bacteria are rare, the bacteria spread rapidly among unimmunized people whose health may already be compromised. People in good health with normal immune systems are not as likely to develop infections, but ill people, such as elderly nursing home residents with existing problems, are especially at risk of developing pneumonia after exposure to the bacteria.

According to Ray, Streptococcus pneumoniae causes about half a million individual cases of pneumonia, some 3,000 cases of meningitis and about seven million ear infections in the United States every year. The most susceptible people are the elderly and ill, such as those at the Crockett nursing home, infants and toddlers, people with chronic health conditions such as diabetes or emphysema, and people without spleens or with weakened immune systems. Outbreaks of the disease occur most commonly during the winter months, among nursing home patients, jail or prison inmates, and other groups who share close living quarters and often breathe the same air.

The U.S. Centers for Disease Control and Prevention recommends that all people 65 years of age or older receive one dose of pneumococcal vaccine. Those at greatest risk for serious complications from pneumococcal disease need to receive a second dose five years later. The vaccine is effective against at least 23 different strains of streptococcal bacteria and is fast acting. However, Ray said that in a recent survey of Texans 65 and older, only 42 percent said they had been vaccinated against bacterial pneumonia.

Ray said, “This vaccine is one of the most effective, fastest-acting vaccines we have for averting outbreaks among such groups as nursing home resi-

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dents, yet it is unbelievably underused. We hope that physicians will offer the vaccine more often to their own patients who may be at risk, and that more patients or family members will remember to ask for the vaccine if they have not already had it.”

After TDH received the Crockett nursing home’s call for help on Jan. 23, Ray and a team of other epidemiology staff drove directly to Crockett to begin taking blood samples from about 90 nursing home residents and staff and obtaining permission to begin vaccinating as many of the residents as possible. Only 14 of 88 residents had previously been immunized. Vaccinations began the following morning, Jan. 24.

According to Hargrove, she and others on the nursing home staff “were amazed at how quickly TDH brought the outbreak under control.”

Although two patients out of the first three diagnosed with pneumococcal disease died, the remaining victim of the outbreak survived and has recovered. The vaccines which the other residents received have begun protecting the home’s residents from further infections. For a few days after the residents were vaccinated, some of their visiting friends and family members were advised to take antibiotics as an additional precaution against more pneumococcal infections, but no other cases occurred.

Goodnight said that the loss of the two residents who died from pneumococcal disease has been hard on the other residents and the staff alike. “They were part of our family. We always try to operate as one big family here, and a death is personal to all of us. We are just very, very grateful that help was there when we needed it to prevent even more tragedies,” she said.
The following case report of a mother who had a previous history of hepatitis B, but received no prenatal screening, serves to illustrate the importance of following the recommendation of the Advisory Committee on Immunization Practices to screen every pregnant woman during each pregnancy. Not only did this woman’s baby die of fulminant hepatitis B infection, but when hepatitis B screening was done for the surviving family members, it was found that the mother, father, and the other two young children were all positive for HBV.

This case report is excerpted from an Immunization Action Coalition (IAC) educational piece entitled “Universal prenatal screening for hepatitis B,” a piece that reviews neonatal transmission and screening rationale for health professionals. It was written for IAC by Deborah K. Freese, M.D., pediatric gastroenterologist and member of the transplant unit at Mayo Clinic. She is also a member of the IAC Advisory Board. Written in 1993, this educational piece continues to be distributed because there are still health professionals who do not screen every pregnant woman for HBsAg during each pregnancy.

The excerpt from Dr. Freese’s article follows:

**An Infant with Fulminant Hepatitis B**

The medical and economic costs of failing to screen for HBV can be illustrated on a more personal level by the case of a single infant recently cared for in the Twin Cities. This patient was the child of a middle-class couple from a farming community in a neighboring state.

During her initial prenatal visit, the mother gave a history of having had hepatitis of some sort 20 years previously. She was told at that time that she had recovered from the disease and would subsequently be immune to further hepatitis infections. Despite the fact that a previous history of hepatitis would place her in the “high-risk” category, no prenatal HBV screening was done. Pregnancy and delivery were uncomplicated, and the baby did well for the first two months of life.

At that time, the parents began noting feeding difficulties, irritability, and jaundice. Evaluation revealed severe coagulopathy, markedly elevated liver tests, and hypoglycemia. The infant was eventually referred for liver transplantation with the diagnosis of fulminant hepatitis B. The infant was admitted to the intensive care unit, received very aggressive medical management, and an urgent search for a donor was initiated. No suitable donor could be located, the child continued to deteriorate and died after two weeks from hepatic encephalopathy and herniation.

Hepatitis B screening was then done for the surviving family members. It was found that mother, father, and the other two young children were all positive for HBV. Mother and one child had significantly elevated liver tests and are undergoing further evaluation. It seems clear that had HBV screening been carried out, none of the children would have been infected and the death of the youngest could have been prevented.

The economic impact on the health care system from this one family alone is significant. It includes the costs of hospitalizations at two hospitals of the infant who died (approximately $100,000), the immediate costs of evaluation and possibly therapy for the surviving child with evidence of chronic hepatitis, and the long-term costs of monitoring and observation of both chronically infected children. Had successful liver transplantation been possible for the infant, the costs of that procedure and lifetime immunosuppression would have further increased the costs.

If you would like to read the complete article by Dr. Freese in camera-ready (PDF) format, go to: www.immunize.org/catg.d/p2120uni.pdf
In 1998, six people in Florida died of varicella. The case reports of their deaths were published in the May 14, 1999, issue of the Morbidity and Mortality Weekly Report (MMWR) as part of an article entitled “Varicella-Related Deaths Florida, 1998.”

The May 14th issue of IAC EXPRESS (#77) included these case reports. We are reprinting them here as an “Unprotected People” story because we believe these tragic deaths will convince those health professionals who still believe varicella is a harmless disease to begin vaccinating their susceptible patients.

**Case 1: Death of a 6-year-old**

On February 19, a healthy, unvaccinated 6-year-old boy developed a varicella rash, abdominal pain, malaise, and loss of appetite following exposure to a classmate with varicella. The child had asthma and intermittently had been on inhaled steroid therapy but had not received steroids within the previous month. On February 22, he was hospitalized with hemorrhagic skin lesions, tachycardia, tachypnea, and a platelet count of 89,000 (normal range: 150,000–350,000). Several hours after admission he developed pulmonary edema and respiratory insufficiency and required mechanical ventilation. He died on February 23. Tissue samples of multiple organs had a positive polymerase chain reaction for varicella zoster virus (VZV).

**Case 2: Death of a 58-year-old**

On March 27, a healthy, unvaccinated 58-year-old woman developed a varicella rash. She was born in Cuba and had moved to the United States in 1995. She did not have a history of or known exposure to varicella. On April 3, she was hospitalized with hemorrhagic skin lesions, tachycardia, tachypnea, and a platelet count of 89,000 (normal range: 150,000–350,000). Several hours after admission she developed pulmonary edema and respiratory insufficiency and required mechanical ventilation. She died on April 20.

**Case 3: Death of a 29-year-old**

On April 27, a healthy, unvaccinated 29-year-old man developed a varicella rash. In early April, his children had contracted varicella. On April 29, he sought care at a local emergency department for chest pain and respiratory distress. Chest radiographs showed bilateral pulmonary interstitial infiltrates. On April 30, he began coughing up blood, was intubated because of increasing respiratory insufficiency, and was treated with intravenous acyclovir and antibiotics. He developed sepsis, ARDS, and multiorgan failure, and died May 12.

**Case 4: Death of a 21-year-old**

On May 5, a 21-year-old unvaccinated female employee at a family child care center developed a varicella rash after exposure to a child with varicella. The employee had a history of asthma and was treated with 5 mg prednisolone per day. She was hospitalized on May 7 with varicella pneumonitis and received intravenous acyclovir on May 8, but she died the same day.

**Case 5: Death of an 8-year-old**

On July 11, an 8-year-old unvaccinated boy developed a maculopapular rash diagnosed clinically as varicella and confirmed by direct fluorescent antibody test on July 23. He had acute lymphocytic leukemia (ALL) and had been on immunosuppressive therapy since receiving a bone marrow transplant on May 15. He had not had varicella and had no known varicella exposure. He was treated with varicella zoster immunoglobulin on July 16 and acyclovir on July 23. He died on July 25 after recurrence of leukemia with a graft-versus-host reaction complicated by disseminated varicella, cellulitis, ileus, and hypertension.

(continued on next page)
Case 6: Death of a 45-year-old
On October 3, an unvaccinated 45-year-old man with diabetes mellitus, asthma, and cirrhosis of the liver developed a varicella rash. He was born in Cuba and had resided in the United States for 35 years. He had no history of varicella and no known exposure. He was not receiving steroids or immunosuppressive drugs. He was admitted to the hospital with varicella on October 5 and on October 6, treatment was initiated with oral acyclovir. He died on October 8; pathologic evidence from the post-mortem examination revealed VZV in all major organs.

Editorial Note: Five of the six case-patients who died because of varicella were eligible for vaccination. The sixth, a child with active ALL (case 5), was ineligible for vaccination. Under a special protocol, children with ALL who meet inclusion criteria may be vaccinated. Although one case-patient was receiving systemic steroids when she contracted varicella, the dose was not large enough to be a contraindication; varicella vaccine can be administered to adults receiving less than 20 mg prednisone per day or its equivalent, and to children receiving less than 2 mg per kg body weight per day or a total of less than 20 mg per day.

Two case-patients (2 and 6) were aged greater than 30 years and were born and raised in Cuba. The epidemiology of varicella in tropical regions differs from that in temperate regions. VZV is heat labile and may not survive and transmit well in warm climates. In the tropics, age distribution of cases and VZV seroprevalence data have indicated a higher proportion of cases occurring among adults. Clinicians should be aware of the greater susceptibility of adults to varicella when evaluating persons from tropical countries.
Unprotected People #20

Congenital Rubella Syndrome

Infant dies of congenital rubella syndrome

The following “Unprotected People” story was written for the Immunization Action Coalition and appeared in the Fall/Winter 1999-2000 issue of NEEDLE TIPS and the Hepatitis B Coalition News:

Rubella infection is usually a mild rash illness; however, during the first trimester of pregnancy, it can result in miscarriage, stillbirth, or an infant with a pattern of birth defects (i.e., congenital rubella syndrome [CRS]) as described in the following case report.

Case Report:

On April 15, 1999, a case of CRS was reported to the Arizona Department of Health Services in a 1½-month-old Hispanic infant. The infant was born prematurely at 34 weeks gestation. Complications noted at birth included pulmonary valve stenosis, patent ductus arteriosus, thrombocytopenia, congenital cataracts, intracranial calcifications, and probable hearing deficits. The 19-year-old foreign-born mother (gravida 1, para 0) had been living in the United States for two years prior to her pregnancy. She first obtained prenatal care at four months gestation, at which time she was rubella immune. She reported no rash during the first four months of pregnancy.

Although the neonate’s rubella IgM test was positive shortly after birth, cytomegalovirus was suspected as the cause of the infant’s congenital complications, in part due to the mother’s rubella immune status.*

There was a three-week delay in reporting this CRS case to the county health department. The Maricopa County Department of Public Health immunized household contacts immediately after receiving this report. The day following vaccination, two of the household contacts, who had recently moved into the home and participated in the care of the infant, developed rubella-like rash. The duration between the receipt of vaccine and the rash onset was too short for the rash to be caused by the vaccine. These contacts, however, could have been infected by the infant since infants with CRS can shed rubella virus for up to one year and can be the source for rubella outbreaks.

The infant died on June 9, 1999. The cause of death was listed as acute pulmonary hemorrhage as a consequence of complex congenital heart disease.

This is the fifth case of CRS reported in Arizona since 1994. In all five cases, the mothers were unimmunized, Hispanic, and foreign born.

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Rubella and Congenital Rubella Syndrome (CRS) Are Vaccine Preventable

Since the licensure of the rubella vaccine in 1969 in the United States, the incidence of rubella and congenital rubella syndrome (CRS) has decreased substantially. Reported rubella and CRS cases have been at record low levels since the mid-1990s. Most of the reported rubella cases in the United States since the mid-1990s, have occurred among young Hispanic adults who were born in countries either without a national rubella vaccination program or where such programs were recently implemented. Since 1996, several rubella outbreaks have occurred in work places such as meat packing plants where a majority of the employees are foreign born.

* Due to the timing of the mother’s routine prenatal serology, it could not be determined when her infection in pregnancy occurred. The infant’s defects, however, were consistent with rubella infection during the first trimester of pregnancy.
Almost all countries in the world have measles vaccination programs; however, in a World Health Organization survey of member countries in 1996, only 78 (36%) of the 214 member countries had national rubella vaccination programs representing only 20% of the global population. Because both are rash illnesses, many people confuse rubella and measles. In several of the recent outbreaks, many people thought they had been vaccinated for rubella, but instead they had been vaccinated for measles.

**Action You Can Take to Prevent Rubella and the Subsequent Tragic Consequences of Congenital Rubella Syndrome**

1. **VACCINATE PERSONS WHO DO NOT HAVE DOCUMENTED PROOF OF IMMUNITY TO RUBELLA.**

   In the United States, children should receive the first dose of MMR vaccine at age 12–15 months and the second dose at 4–6 years of age. Persons who are born after 1957 and who do not have a medical contraindication should receive at least one dose of MMR vaccine unless they have documentation of vaccination with at least one dose of measles-, rubella-, and mumps-containing vaccine.

2. **MAKE SURE YOUR FOREIGN-BORN PATIENTS ARE VACCINATED.**

   Rubella and CRS are at record low levels in the United States, primarily due to the success of the rubella vaccination program. However, rubella vaccination programs have only recently been introduced in many developing countries and many foreign-born persons may not be immune to rubella.

3. **THINK RUBELLA WHEN YOU SEE SUSPICIOUS RASHES.**

   Even though rubella is at record low levels, it still is introduced and it spreads in the United States. If someone presents with a rash illness that may be consistent with rubella or measles, rubella needs to be ruled out. Obtaining a rubella-specific IgM blood test is critical.

4. **THINK CRS WHEN YOU SEE ANY CONGENITAL MALFORMATION CONSISTENT WITH CRS.**

   CRS is rare in the United States, however, it does occur. In an infant born with ANY congenital malformation consistent with CRS, do not assume that a positive rubella titer drawn during pregnancy rules out CRS. If you suspect CRS, obtain a rubella-specific IgM blood test.

5. **REPORT ALL CASES OF RUBELLA AND CRS TO YOUR LOCAL OR STATE HEALTH DEPARTMENT.**

   Once a case of rubella or CRS has been identified, the health department must be contacted immediately. All cases should be investigated and control measures implemented.

Susan E. Reef, M D
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National Immunization Program, CDC

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DO NOT MISS THE DIAGNOSIS OF CONGENITAL RUBELLA SYNDROME! Classical findings include congenital heart defects, cataracts, and hearing loss.