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Tobacco Use, Access, and Exposure to Tobacco in Media Among Middle and High School Students — United States, 2004

Two of the national health objectives for 2010 are to reduce the prevalence of any tobacco use during the preceding month to ≤21% and the prevalence of current cigarette use to ≤16% among high school students (objectives 27-2a and 27-2b) (*1*). The National Youth Tobacco Survey (NYTS), conducted by CDC in 2004, provided estimates of current use of tobacco products and selected indicators related to tobacco use, including youth exposure to tobacco-related media and access to cigarettes. This report summarizes data from the 2004 NYTS and describes changes in tobacco use and indicators related to tobacco use since 2002 (*2*). During 2002–2004, middle school students reported decreases in pipe use, seeing actors using tobacco on television or in movies, and seeing advertisements for tobacco products on the Internet. Among high school students, no changes were observed in the use of tobacco or in access to tobacco products; however, seeing actors using tobacco on television or in movies declined slightly, and seeing advertisements for tobacco products on the Internet increased. The lack of substantial decreases in the use of almost all tobacco products among middle and high school students underscores the need to fully implement evidence-based strategies (e.g., increasing the retail price of tobacco products, implementing smoking-prevention media campaigns, and decreasing minors' access as part of comprehensive tobacco-control programs) that are effective in preventing youth tobacco use (*3*).

Similar to the 2002 NYTS (*2*), the sampling frame for the 2004 NYTS consisted of all U.S. public and private schools and was stratified by U.S. Census Bureau data by region and urbanicity; non-Hispanic black, Hispanic, and Asian students were oversampled. A total of 91 primary sampling units (PSUs) (i.e., large counties or groups of counties) were selected in the first stage of sampling, and 288 schools were selected from these PSUs in the second stage of sampling. Of these 288 eligible schools, 267 (93%) participated in the survey. In each school, typically five classes (approximately 125 students) were selected randomly from a required subject area (e.g., English) or a particular class period (e.g., all 2nd period classes). Participation was voluntary and anonymous, and school parental permission procedures were followed; students recorded their responses in a computer-scannable booklet.

Of 31,774 students who were sampled from the participating schools, 27,933 (88%) completed the survey (14,034 middle school students [grades 6–8], 13,738 high school students [grades 9–12], and 161 students unclassified with respect to grade). Data were weighted to be nationally representative. Statistical software was used to compute 95% confidence intervals for prevalence estimates. Differences in tobacco use estimates during 2002–2004 were assessed by using t-tests at two-tailed significance level. All statistically significant results were $p<0.05$. Current use of specific tobacco products (i.e., cigarettes, cigars, smokeless tobacco, pipes, bidis [leaf-wrapped, flavored cigarettes from India], or kreteks [clove cigarettes]) was defined as having used that product on at least 1 day during the 30 days preceding the survey. Current use of

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spring 2002 to spring 2004, the price increased only 4% (*6*). Although smoking-prevention media campaigns are effective in preventing youth smoking initiation (*7*), funding for these campaigns has declined substantially (*8*). In addition, during the preceding 3 fiscal years (FYs), a 28% decline in the total investment in statewide comprehensive tobacco-prevention and -control programs occurred, from $749.7 million in FY 2002 to $542.6 in FY 2004 (*8*). Finally, whereas factors preventing tobacco use (e.g., increasing the retail price of tobacco products, implementing smoking-prevention media campaigns, and funding for comprehensive state tobacco-prevention and -control programs) declined from 2002 to 2004, tobacco industry expenditures on tobacco advertising and promotion increased from $5.7 billion in 1997 to $12.5 billion in 2002 (*9*).

The findings in this report are subject to at least three limitations. First, these data apply only to youths who attended middle school or high school. Among persons aged 16–17 years in the United States, approximately 5% were not enrolled in a high school program and had not completed high school in 2000 (*2*). Second, the questionnaire was offered only in English. Thus, comprehension might have been limited for students with English as a second language. Third, significance testing did not control for possible changes in demographics from 2002 to 2004.

The decline in youth smoking prevalence since the late 1990s has been a public health success, reversing the pattern of increase in the early 1990s (*2*). However, the lack of substantial change among middle and high school students during the preceding 2 years emphasizes the need for sustained, comprehensive, evidence-based programs that demonstrate the ability to reduce adolescent smoking prevalence (*10*).

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Inadvertent Laboratory Exposure to *Bacillus anthracis* — California, 2004

On June 9, 2004, the California Department of Health Services (CDHS) was notified of possible inadvertent exposure to *Bacillus anthracis* spores at Children's Hospital Oakland Research Institute (CHORI), where workers were evaluating the immune response of mice to *B. anthracis*. This report summarizes the subsequent investigation by CDHS and CDC, including assessment of exposures, administration of postexposure chemoprophylaxis, and serologic testing of potentially exposed workers. The findings underscore the importance of using appropriate biosafety practices and performing adequate sterility testing when working with material believed to contain inactivated *B. anthracis* organisms.

On May 28, 2004, CHORI staff members injected 10 mice with a suspension believed to contain nonviable vegetative cells of *B. anthracis* Ames strain. The suspension was centrifuged and drawn into syringes on an open bench in the laboratory. The mice were injected in a separate animal-handling facility at CHORI. By May 30, all of the injected animals had unexpectedly died. The carcasses were removed from the cages, placed into a plastic biohazard bag, and frozen. The bedding was discarded as standard animal waste. The cages were sanitized in an automated washer.

On June 4, an additional 40 mice were injected with the same suspension. By June 7, all but one of these mice had died. All subsequent work was performed under a biological safety cabinet (BSC), and additional personal protective equipment (PPE) was used (e.g., protective clothing and gloves). Animal cages were brought into the BSC, and the surviving

animal was euthanized. The carcasses were removed, placed into double biohazard bags, and frozen. The bedding and cages were autoclaved.

On June 8, a sample of the original suspension was cultured; one mouse that died after the second experiment was necropsied and samples for cultures were obtained from its liver and peritoneal cavity. Within 24 hours, these cultures grew nonhemolytic gram-positive rods. Colony morphology was consistent with *B. anthracis*.

Suspension material and cultures were transported to a California Laboratory Response Network (LRN) reference laboratory for further identification. The California LRN confirmed that the organisms isolated were *B. anthracis* by using polymerase chain reaction and gamma phage lysis assay. At CDC, antimicrobial susceptibility testing revealed that the isolates were susceptible to penicillin, ciprofloxacin, and doxycycline. Multiple-locus variable-number tandem repeat analysis confirmed that the isolates were genotype 62, consistent with *B. anthracis* Ames strain (*1*).

On June 9, CDHS personnel visited the laboratory and animal-handling facility at CHORI to review the incident and laboratory procedures. No spills, puncture wounds, animal bites, or scratches were identified; however, initial handling of the suspension included snapping lids of microtubes, ejection of pipette tips, and centrifuging. The centrifuge tubes had snap-down tops, and the rotor was covered with a gasket. The laboratory procedures might have potentially expelled small drops of suspension but were considered unlikely to have released infectious aerosols. Because staff members believed they were working with inactive organisms, they had performed these activities on an open bench, and appropriate PPE was not consistently used until after the deaths of the second group of mice.

As part of routine laboratory procedure, horizontal surfaces had been cleaned with a buffered bleach solution (1:10 dilution) at the end of each day. After laboratory workers recognized the possibility of exposure to viable *B. anthracis* spores, all laboratory surfaces and hoods were cleaned twice more with the bleach solution. The animal facility was also sanitized with bleach and a quaternary ammonium disinfectant.

Twelve persons were involved in either the laboratory or its animal-handling facilities. Three of these persons had direct contact with the bacterial suspensions, cultures, or infected animals. Although at low risk for inhalation of *B. anthracis* spores, to further reduce their risk, the three workers with direct contact were recommended for postexposure chemoprophylaxis for prevention of inhalational anthrax (i.e., either ciprofloxacin 500 mg or doxycycline 100mg, orally twice daily for 60 days) (*2*). The nine persons who worked in the laboratory or animal-handling facility but who did not have direct contact were offered the same chemoprophylaxis regimen. All 12 were additionally offered, but declined, anthrax vaccine under an Investigational New Drug (IND) protocol for postexposure prophylaxis (*3*).

Eight of the 12 potentially exposed persons opted to take chemoprophylaxis, including the three persons for whom the regimen was recommended. One person subsequently had a rash consistent with adverse reaction to ciprofloxacin; doxycycline was substituted. No other adverse effects from chemoprophylaxis were reported. None of the potentially exposed persons had symptoms consistent with anthrax.

Serum specimens collected from nine (75%) of the 12 exposed persons 3–6 weeks after exposure were negative for IgG antibodies to *B. anthracis* protective antigen (PA) by enzyme-linked immunosorbent assay (*4*). Three persons did not provide sera for evaluation, including one person who had direct exposure to the bacterial suspensions and cultures.

Further investigation revealed that the suspension had been prepared by a separate contract laboratory in March 2004 and contained an estimated 1.5×10^9 vegetative organisms per 1 mL of phosphate-buffered saline solution. After heating the suspension at 140°F (60°C) for 2 hours, the contractor reported that the suspension revealed no spores and had no growth after 48 hours of incubation on sheep blood agar.

A sealed, screw-top tube containing the suspension was shipped to CHORI in a double-compartment package on wet ice and arrived intact. The tube of suspension was stored in a refrigerator until used. The suspension had been prepared specifically for the research laboratory and was not distributed to other facilities. All contractor laboratory personnel had received anthrax vaccine, and the suspension was prepared under biosafety level 3 (BSL-3) conditions.

Leftover suspension from the incidents at the research laboratory were provided to CDC for quantification of viable organisms and to confirm the presence of *B. anthracis* spores. Sample dilutions were plated in duplicate on sheep blood agar. Approximately 2.0×10^6 colony-forming units (CFU) were enumerated per milliliter of suspension after 24 hours of incubation at 98.6°F (37.0°C). Comparisons of heat-shocked (149°F [65°C] for 30 minutes) and non–heat-shocked samples at CDC indicated that the suspension primarily contained *B. anthracis* spores.

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Editorial Note: The findings in this investigation indicate that workers in a research laboratory unknowingly received and used a suspension from a contract laboratory that likely contained viable *B. anthracis* organisms. Manipulation of the suspension at the research laboratory was determined unlikely to have expelled infectious aerosols, and exposed workers were considered at low risk for inhalation of spores. CDC continues to work with state agencies and other federal agencies to investigate processing procedures at the contractor facility to determine why the suspension contained viable *B. anthracis* organisms.

B. anthracis spores are highly resistant to the effects of heat and chemical disinfection (*5*). Although the heat-killing procedures used by the contractor might have been lethal to vegetative cells, the procedures were not lethal to spores. Modifying suspension preparations by increasing the temperature and duration of heat-killing procedures or using formalin will increase the probability that spores are inactivated (*5,6*).

Inactivated suspensions of *B. anthracis* should be cultured both at the preparing laboratory before shipment and at the research laboratory several days before use to ensure sterility. Sensitivity of sterility testing might be enhanced by increasing the inoculum size and incubation time, and by inoculating in multiple media, including both solid and broth media. Such procedures would increase the probability of detecting even a small number of viable *B. anthracis* spores. CHORI staff members did not perform sterility testing on the suspension received in March 2004.

Because inhalation of viable *B. anthracis* spores can result in fatal infection, CDC recommends that laboratory personnel who routinely perform activities with clinical materials and diagnostic quantities of infectious cultures implement BSL-2 practices (*7*). These practices include use of appropriate PPE (e.g., gloves, gowns, or laboratory coats) and a BSC for procedures with the potential to expel infectious aerosols (e.g., centrifuging or ejection of pipette tips). Face protection (e.g., goggles, face shield, or splatter guard) should be used against anticipated splashes or sprays when potentially infectious materials require handling outside of the BSC. In the incidents described in this report, because CHORI staff members believed they were working with nonviable organisms, they did not fully implement BSL-2 practices until after the deaths in the second group of mice.

Research laboratory workers should assume that all inactivated *B. anthracis* suspension materials are infectious until inactivation is adequately confirmed. BSL-2 procedures should be applied to all suspension manipulations performed before confirming sterility. After sterility is confirmed, laboratory personnel should continue to use BSL-2 procedures while performing activities with a high potential for expelling aerosolized spores.

The Advisory Committee on Immunization Practices recommends routine anthrax vaccination of persons who work with production quantities or concentrations of *B. anthracis* cultures or perform other activities with a high potential for producing infectious aerosols (*8*). Facilities performing such work should have appropriate biosafety precautions in place to prevent exposure to *B. anthracis* spores; however, anthrax vaccination can be an additional layer of protection in the event of an unrecognized breach in practices or equipment failure. Because of the small potential for inadvertent exposure to aerosolized *B. anthracis* spores before or after sterility testing, vaccination might also be considered for researchers who routinely work with inactivated *B. anthracis* suspensions.

In addition, laboratories working with inactivated *B. anthracis* organisms should develop and implement training activities and incident-response protocols to ensure appropriate actions are taken in the event of a potential exposure. These protocols should describe mechanisms for offering counseling and postexposure chemoprophylaxis and obtaining paired sera from potentially exposed persons. Training at animal research facilities should emphasize prompt communication between animal handlers and researchers if animals are unexpectedly found dead and any special handling procedures are needed for carcasses and bedding. Finally, institutional biosafety committees should routinely review protocols and procedures to ensure that appropriate safety precautions are always in place.

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Estimated Influenza Vaccination Coverage Among Adults and Children — United States, September 1, 2004–January 31, 2005

In response to the unexpected shortfall in the 2004–05 influenza vaccine supply, CDC recommended in October 2004 that vaccine be reserved for persons in certain priority groups, including persons aged ≥65 years and 6–23 months, persons aged 2–64 years with conditions that increased their risk for influenza complications, residents of chronic-care facilities, close contacts of infants aged <6 months, and health-care workers with direct patient contact (*1*). In late December 2004, based on declining demand among these groups, two additional groups (i.e., healthy persons aged 50–64 years and household contacts of all persons at high risk) were added to the list of vaccination priority groups (*2*). To monitor influenza vaccination coverage during the 2004–05 season, the Behavioral Risk Factor Surveillance System (BRFSS), an ongoing, state-based, telephone survey of civilian, noninstitutionalized persons, added new questions to collect information on priority status and the month and year of vaccination for adults and children (*3*). This report is based on analysis of data collected during February 1–27, 2005, regarding respondent-reported receipt of influenza vaccination during September 1, 2004–January 31, 2005. The results of this analysis indicated that influenza vaccination coverage levels through January 2005 among adults in priority groups nearly reached those in recent years, whereas coverage levels among adults not in priority groups were approximately half of levels in 2003, in part because 9.3% of those unvaccinated persons in nonpriority groups declined vaccination this season. The results further suggested that designation of the priority groups successfully directed the nation's influenza vaccine supply to those at highest risk. In addition, vaccination coverage among children aged 6–23 months was notable (48.4%), given that 2004–05 was the first year this group was recommended for influenza vaccination (*4*).

In previous years, BRFSS asked adult respondents whether they had been vaccinated against influenza during the preceding 12 months. No influenza vaccination questions were asked regarding children, and the only questions related to high-risk medical conditions referred to diabetes and asthma. To more closely monitor coverage during this shortfall season, influenza vaccination questions were added during November 2004–February 2005 regarding children, priority group status, and month and year of vaccination. For comparison with the 2004–05 season, data from the 2003 National Health Interview Survey (NHIS) were used. Similar to the BRFSS survey question, NHIS routinely asks adult respondents if they received a "flu shot" during the preceding 12 months; NHIS also collects information on occupations and high-risk medical conditions. NHIS was conducted during 2003 and consisted of in-person interviews; the household response rate was 89.2%. For children, the only previous available national data on influenza vaccine coverage were collected in the 2003 National Immunization Survey (NIS), which reported on vaccination coverage during the 2002–03 season for children aged 6–23 months with an overall response rate among eligible households of 62.7% (*5*).

Because BRFSS data collection is ongoing, final response rates for February were not yet available. Preliminary estimates indicate that the median state-level response rate for February was 51.7% (range: 33.4%–69.8%), based on CASRO guidelines. Analysis was based on 26,868 interviews from 50 states and the District of Columbia.

Vaccination Coverage Among Adults

Among adults, influenza vaccination coverage through January of the 2004–05 season was highest among persons aged ≥65 years (62.7%), followed by health-care workers with patient contact (35.7%) and those aged 18–64 years with high-risk conditions (25.5%) (Table 1). In comparison, the 2003 NHIS indicated coverage of 65.6% for persons aged ≥65 years, 40.1% for health-care workers, and 34.2% for adults aged 18–64 years with high-risk conditions. In contrast, influenza vaccination coverage among healthy persons aged 18–64 years who were not health-care workers or contacts of children aged <6 months was lower than in the previous season (8.8% compared with 17.8%) (CDC, unpublished data, 2005). Among the reasons cited by respondents for not receiving vaccination, was "saving vaccine for people who need it more," cited by 9.3% of those who were not in priority groups and were not vaccinated. This represents approximately 17.5 million doses of vaccine potentially made available to persons in priority groups.

Vaccination uptake was higher in October and November and tapered off during December and January (Figure). Among the adults in the priority groups established in October,