Poisoning and Drug Overdose

Definition: All poisoning-related deaths and hospitalizations including accidental overdose of drug, wrong drug given or taken in error, and drug taken inadvertently; accidents in the use of drugs; and the damaging physiologic effects of ingestion, inhalation, or other exposure to a broad range of chemicals, including pesticides, heavy metals, gases/vapors, drugs, and a variety of common household substances, such as bleach and ammonia. Poisoning hospitalizations for 1989–2005 and deaths for 1980–1998 include all records with an ICD 9 code of E850-869, E950-E952, E962, E980-E982, or E972. Deaths for 1999–2005, the applicable ICD 10 codes include X40-X49, X60-X69, X85-X90, Y10-Y19, or Y35.2.

Summary

Washington State experienced 923 poisoning deaths in 2005 (age-adjusted death rate: 14 per 100,000). In the state and nationally, poisoning death rates have increased since 1980. In Washington, males ages 35–54 had the highest rates. More than 90% of poisoning deaths are drug overdoses, the majority involving multiple drugs. Nationally and in Washington, prescription opiate overdose deaths have fueled the increase in poisoning deaths. The increase in deaths mirrors an increase in the volume of opiates prescribed.

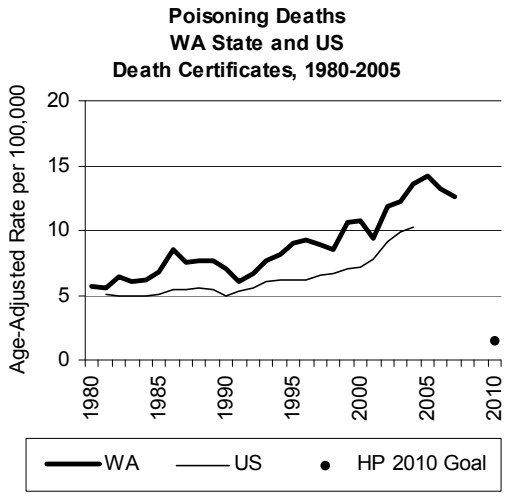
To date, interventions designed to change behaviors and risk factors associated with the epidemic of poisoning deaths have not been systematically evaluated. Promising strategies include strengthening regulatory measures to reduce unsafe use of drugs, increasing physician awareness, and supporting best practices for treating drug dependence.

This chapter is related to the chapter on Drug Abuse in that drug abuse and dependence can lead to poisoning. But this chapter contains information about other aspects of poisoning, and the Drug Abuse chapter contains information about other aspects of drug abuse and dependence.

Time Trends

Both Washington and the nation are experiencing rapid increases in poisoning deaths, although Washington's rates are higher than those nationally. From 1980–2005, age-adjusted poisoning death rates in Washington increased from 6 to 14 per 100,000. This increase has occurred among unintentional poisoning deaths, not those classified as suicides, homicides, or undetermined. In 1990, 33% of all poisoning deaths were unintended; by 2005, 74% of poisoning deaths were unintended.

Nationally, the increase in poisoning deaths is due primarily to increased overdoses of prescription pain relievers classified as opiates. The increase in these deaths matches the increase in sales for specific types of opiates used for pain management.[1] The mortality increases might be the result of greater use and abuse of potentially lethal opiates.[2] In Washington State from 1995–2004, methadone had the most dramatic increase in involvement in overdose deaths. In Washington in 2004, about 60% of prescription opiate deaths involved more than one drug; anti-anxiety and anti-depressants were most commonly involved.



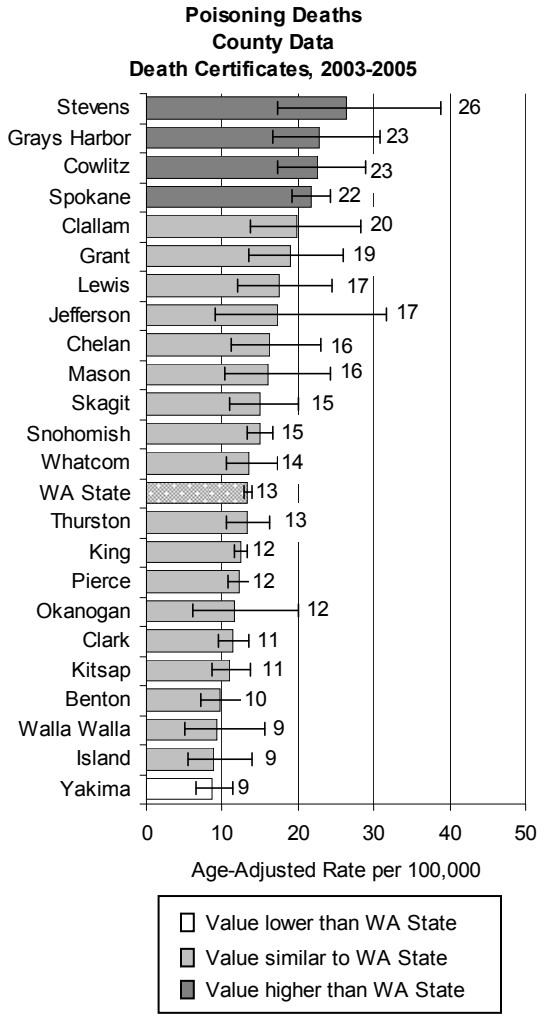
At the end of the 1990s, various entities in Washington State recognized the important use of opioids for chronic non-cancer pain.[3] These new policies reflected a major shift in thinking due in part to low-grade evidence suggesting that patients were suffering from under-treatment, and at the time, there was thought to be a low risk of addiction with chronic opiate use. The volume of prescription opiates distributed to hospitals and pharmacies in

Washington has increased dramatically since then. From 1997–2004, sales of methadone and oxycodone increased 974% and 580%, respectively. (Methadone dispensed in methadone maintenance treatment programs is not included.) As a result of the policy shifts, from 1996–2002, injured workers in Washington were likely to be prescribed more potent opiates and higher doses per prescription.[4]

Year 2010 Goals

The national *Healthy People 2010* goal is to reduce poisoning deaths to a rate of no more than 1.5 per 100,000. If the current trend continues, Washington's poisoning death rate will be about 10 times higher than this target and moving in the wrong direction.

Geographic Variation



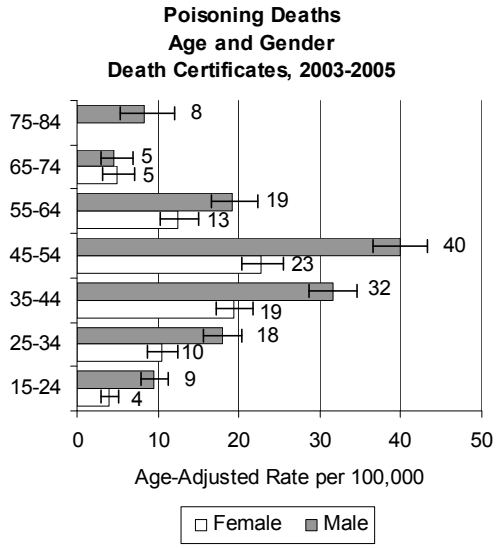
The preceding chart does not include 18 counties where fewer than 20 Washington residents died of poisoning during 2003–2005. Death rates for these counties fluctuate even when combining three years. For 2003–2005, Stevens, Grays Harbor, Cowlitz, and Spokane counties had age-adjusted poisoning death rates higher than the state rate. Only Yakima County had a poisoning death rate lower than the state rate.

Analysis of the variation in poisoning rates by census tract groupings for 2001–2005 indicate that residents living in parts of Spokane, Everett, Seattle, Tacoma, and Kelso were about two to three times more likely to die from poisoning than other Washington residents. This pattern suggests the problem might be concentrated in some but not all urban areas.

Age and Gender

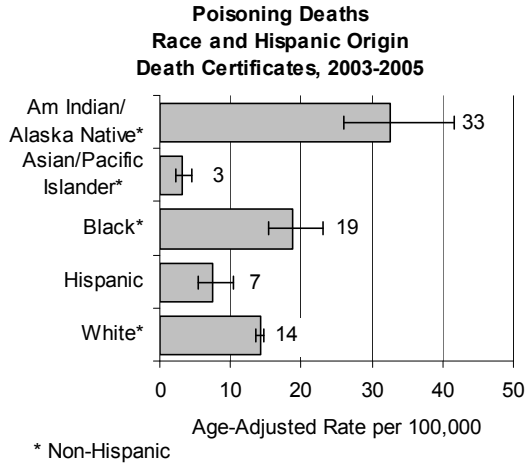
In 2003–2005 in Washington, the age-adjusted poisoning death rate for males was 17 per 100,000 compared to 10 per 100,000 for females. Males ages 35-54 were at the highest risk. Their poisoning death rate was 36 per 100,000, more than twice the overall rate. Deaths among licit and illicit drug users in Washington reveal a similar age and gender pattern; in the only study available, the average age of chronic pain patients who received opiate medications was 52.[5]

Children younger than 15 years, adults ages 85 years and older, and women ages 75-84 had fewer than 20 poisoning deaths for 2003–2005. Death rates for these groups are unstable, and the following chart does not include them.



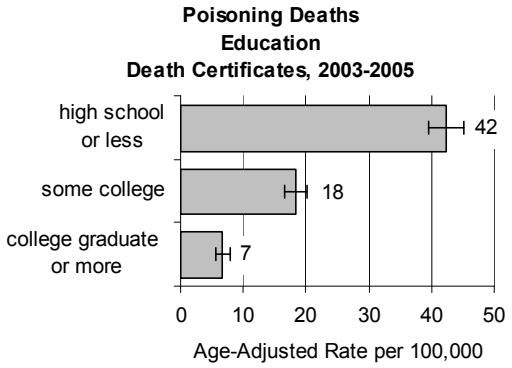
Race and Hispanic Origin

For 2003–2005 combined, American Indians and Alaska Natives had the highest age-adjusted poisoning death rate, and blacks had the next highest. Death rates for whites were in the middle, followed by people of Hispanic origin. Asians and Pacific Islanders had the lowest rates. Research has not assessed the relative importance of race, Hispanic origin, poverty, and education in relation to poisoning death rates.



Income and Education

In Washington, the age-adjusted poisoning death rate among those with a high school education or less is about six times the rate for those who have graduated from college.



Direct measures of income and poisoning death rates are not available in Washington. In 2001–2003, however, poisoning death rates were 7 per 100,000 among Washington residents living in areas where less than 5% of the population lived in poverty and 23 per 100,000 among those living in areas where at least 20% of people had incomes below the federal poverty level.[6]

Other Measures of Impact and Burden

Youth drug use. Estimates from the 2006 Healthy Youth Survey show that 4% of 8th graders, 10% of 10th graders, and 12% of 12th graders reported using a painkiller such as oxycodone or Percocet™ to get high in the previous month. There are no national surveys that ask precisely the same question. But the 2005 National Survey on Drug Use and Health found that 10% of youth ages 12-17 reported having used prescription pain relievers non-medically in their lifetime.[7]

Hospitalization. Poisonings can result in death, but more often they result in nonfatal injuries, many requiring hospitalization. In 2004, there were 5,165 nonfatal poisoning-related hospitalizations in Washington. Nonfatal poisoning hospitalizations outnumbered fatalities by a ratio of nearly 6 to 1.

Overall, poisoning hospitalizations have not increased in Washington. But opiate-related unintentional poisoning hospitalizations doubled from 4 per 100,000 in 1995 to 8 per 100,000 in 2004. These data do not include admissions to the U.S. Department of Veterans Affairs hospitals because they do not release drug and alcohol-related data.

Poisoning hospitalizations are highest among men ages 85 and older and females ages 15-54. In 2005, unintentional poisoning hospitalizations made up 42% of all poisoning hospitalizations; 49% were suicide attempts, and 9% were of undetermined origin.

Calls to the Washington State Poison Control Center. While adults have the highest poisoning death rates, most non-fatal poison exposures occur to children younger than six. In 2004, the Washington State Poison Control Center received 69,000 calls for advice about a possible human exposure to poison. About 90% of possible human exposures occurred at home, and of those, 52% involved children younger than six. Eighty-three percent of all exposure calls were handled without transfer to a health care facility; that figure rises to 94% of calls involving children younger than six. The most common substances involved in possible exposures were medications (analgesics, topical preparations, and cold and cough preparations are the top three), personal care products, and cosmetics.

Risk and Protective Factors

Misuse of prescription painkillers. The 2005 National Survey of Drug Use and Health found that the illicit drug category with the highest number of new users was people using prescription pain medications non--medically. The survey defines "non-medical" as either taking medication not prescribed to them or taking medication for the experience or feeling that it caused.[7] In 2005, 2.2 million people ages 12 and older began using prescription pain relievers non-medically, and about 4.7 million people were current users. Among the new non-medical users, more than half (55%) were women, and the average age at first use was 21 years. About 75% of new users had used an illicit drug previously. About 60% got their prescription drugs "from a friend or relative for free," 17% got them from a doctor, 4% got them from a drug dealer, and 1% reported purchasing them on the Internet.

According to the national 2005 Partnership Attitude Tracking Study, nearly one in five students in grades 7–12 reported having used an unprescribed prescription pain reliever (Vicodin™ or Oxycontin™) in their lifetime.[8] More than three in five teens said prescription pain relievers were easy to get from their parents' medicine cabinets, and half said they were easy to get using friends' or relatives' prescriptions. About 35% of teens believe prescription drugs are safer than illegal drugs. Parents are less likely to discuss the risks of abusing prescription medicines with their children than risks of marijuana use.[8]

Risks of legitimate chronic opiate use. Chronic opiate use is associated with the development of tolerance to its pain-relieving effect. Tolerance is defined as a decrease in a drug's effect over time. Chronic opiate use also may be associated with an increase in abnormal pain sensitivity. In an attempt to maintain pain relief, the dose is typically increased.

Respiratory depression (e.g., a decrease in the rate or depth of a patient's breathing) is one of the side effects of opiate use. Typically, opiate poisoning deaths are due to respiratory failure resulting from respiratory depression. As with pain relief, tolerance to respiratory depression develops with chronic opiate use. But tolerance to respiratory depression may be incomplete and may develop more slowly than tolerance to the pain relieving effect.[9]

Other illicit drug use. In adulthood, about half of individuals with a current drug disorder have a personality disorder.[10] Drug abuse and dependence are also associated with depression and anxiety disorders,[11] although these are more closely associated with drug dependence than drug abuse.[12] Family history of illicit drug use is also a risk factor for drug use disorders.[12]

For adolescents, having friends who use drugs is the strongest predictor of substance use. Personality traits associated with adolescent substance abuse include aggression, depression, impulsivity, sensation-seeking behavior, and positive attitudes toward substance use. Those who have poor grades in school and low commitment to education are more likely to engage in substance abuse. Lack of connectedness to parents, which can occur because of parental substance use, and poor parenting skills are also risk factors. Urban poverty might be a risk factor because adolescents are more likely to be solicited to buy drugs and to have witnessed drug sales and arrests in their neighborhoods.[13]

Child poisonings. Children ages five and younger are at risk of poisoning from household and personal care products, medicines, vitamins, and indoor plants. Childhood poisoning deaths have declined dramatically since 1980. This reduction might be related to a number of factors: development and widespread use of child-resistant packaging, reduction of the number of children's aspirin in bottles, the decreased use of aspirin for treatment of fever during childhood, the development of poison control centers, the use of ipecac to induce vomiting, and better medical care when children do swallow harmful products.[14]

Intervention Strategies

To date, interventions designed to change behaviors and risk factors associated with the epidemic of poisoning deaths among adults have not been systematically evaluated.

The following recommendations come from the North Carolina Task Force to Prevent Deaths from Unintentional Drug Overdoses (NCTF)[15] and the U.S. Centers for Disease Control and Prevention (CDC)[2] and might be relevant for Washington.

Education for the general public. The task force says educational interventions for the general public can raise awareness about the magnitude, risks, and signs of unintentional overdose, preventive behaviors, and available emergency and treatment resources. Additional research is needed to develop effective educational programs for both adults and school age children.

Education for medical care and law enforcement professionals. The NCTF recommends educational interventions for these professionals to raise awareness of the magnitude, risks, and signs of unintentional overdose and create practice guidelines and educational and credentialing requirements for prevention, treatment, and enforcement activities.

In Washington State, the Interagency Workgroup on Practice Guidelines (including the Department of Health and the Health Care Authority and the departments of Corrections, Labor and Industries, and Social and Health Services) in collaboration with actively practicing physicians who specialize in pain management has released a guideline on opioid dosing for chronic non-cancer pain. The guideline is part of a year-long educational campaign to improve care and safety when treating chronic non-cancer pain with opioids.

Clinical interventions. The NCTF recommends expanding forgery notification systems, improving emergency provider preparedness, increasing resources for recovering addicts, and broadening the evidence base for implementing new, effective outpatient and in-patient treatment programs. CDC recommends strengthening regulatory measures to reduce unsafe use of drugs.

In Washington, Medicaid identifies clients who have received 10 or more narcotic prescriptions per month from multiple providers. Medicaid provides a 12-month prescription history to providers to assist them in clinical decision-making and potentially reduce misuse of narcotics. In addition, Medicaid has developed a toolkit for the medical community with resource links to improve prescribing practices.

For patients who frequently visit emergency departments seeking pain medication, case management might reduce misuse of narcotics by creating professional collaboration and exchange of medical information between emergency room personnel, primary care doctors, and pharmacists. Hospitals in Olympia, Spokane, and Tacoma have started such case management programs.

Legislative initiatives. The NCTF recommends legislation to facilitate and fund an electronic prescription monitoring system for controlled substances. CDC recommends that states with prescription monitoring programs proactively identify and investigate patients and providers. The goals of such a system are (a) limiting access of controlled substances only to those with legitimate medical needs, (b) tracking instances in which controlled substances are abused, and (c) identifying potential controlled substance abusers and referring them to treatment.

In the only evaluation of this program, prescription-monitoring programs reduced per capita supply of prescription pain relievers and stimulants, potentially reducing their abuse. In addition, states that proactively investigated patients who filled multiple prescriptions from different health care providers and investigated providers whose prescribing practices were outside the standards of accepted medical practice were more effective in reducing the per capita supply than states that were reactive in their regulatory approach.[16] Researchers have not determined the effectiveness of these systems in reducing poisoning-related deaths or their impact on treating pain prevalence.

Law enforcement. The NCTF recommends that law enforcement provide more drug diversion agents to prevent illegal distribution of controlled medications.

Treatment of drug abuse. The NCTF recommends expanding and improving substance abuse treatment. Evidence-based treatment can achieve a 22% reduction in incidence or severity of drug disorders over a short time frame.[17] One example of drug abuse treatment is the Washington Screening, Brief Intervention and Referral and Treatment (WASBIRT) project that screens trauma, general medical, and other patients for alcohol or drug abuse or addiction and provides brief interventions or referrals for higher levels of care as needed. About half of those who received a WASBIRT screen needed brief intervention, about 16% needed referral to higher levels of care, and the remainder did not need intervention. Data from the WASBIRT project show reduced alcohol and drug use and increased abstinence among clients who participated in brief interventions and those referred to higher levels of care.[18]

Poison control centers. Poison control centers significantly reduce medical costs,[19] but it is unclear how many people know about their services.[20] By providing effective home management of poisoning emergencies, poison centers reduce calls to 911, prevent undue ambulance dispatches, and avoid hospital visits. Every call to a poison center saves about $175 in other medical spending.[19]

See Related Chapters: Alcohol Abuse and Dependence, Drug Abuse and Dependence, and Suicide

Data Sources (For additional detail, see Appendix B.)

Washington State Death Certificate Data: Washington State Department of Health, Vital Registration System Annual Statistical Files, Deaths 1980–2005, released December 2006.

Washington Hospitalization Data: Dataset compiled by the Washington State Department of Health Center for Health Statistics from the Washington Comprehensive Hospitalization Abstract System, Oregon Hospital Discharge data, and Veterans Hospital Administration datasets, December 2006.

Washington Healthy Youth Survey: Office of Superintendent of Public Instruction, Washington State departments of Health, Social and Health Services, and Community, Trade, and Economic Development, the Family Policy Council, and RMC Research, 2006.

National data: National Center for Injury Prevention and Control and National Centers for Health Statistics, U.S. Centers for Disease Control and Prevention.

For More Information

Department of Health Injury and Violence Prevention Program, (360) 236-2855. http://www.doh.wa.gov/hsqa/emstrauma/injury/

Washington State Department of Social and Health Services, Helping Patients with Drug Use Disorders, http://fortress.wa.gov/dshs/maa/pharmacy/ToolKit.htm

Washington State Division of Alcohol and Substance Abuse. http://www1.dshs.wa.gov/dasa/

Washington State Poison Center, http://www.wapc.org/

Endnotes

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